



SUBDIVISION AND DEVELOPMENT BYLAW 2004-81

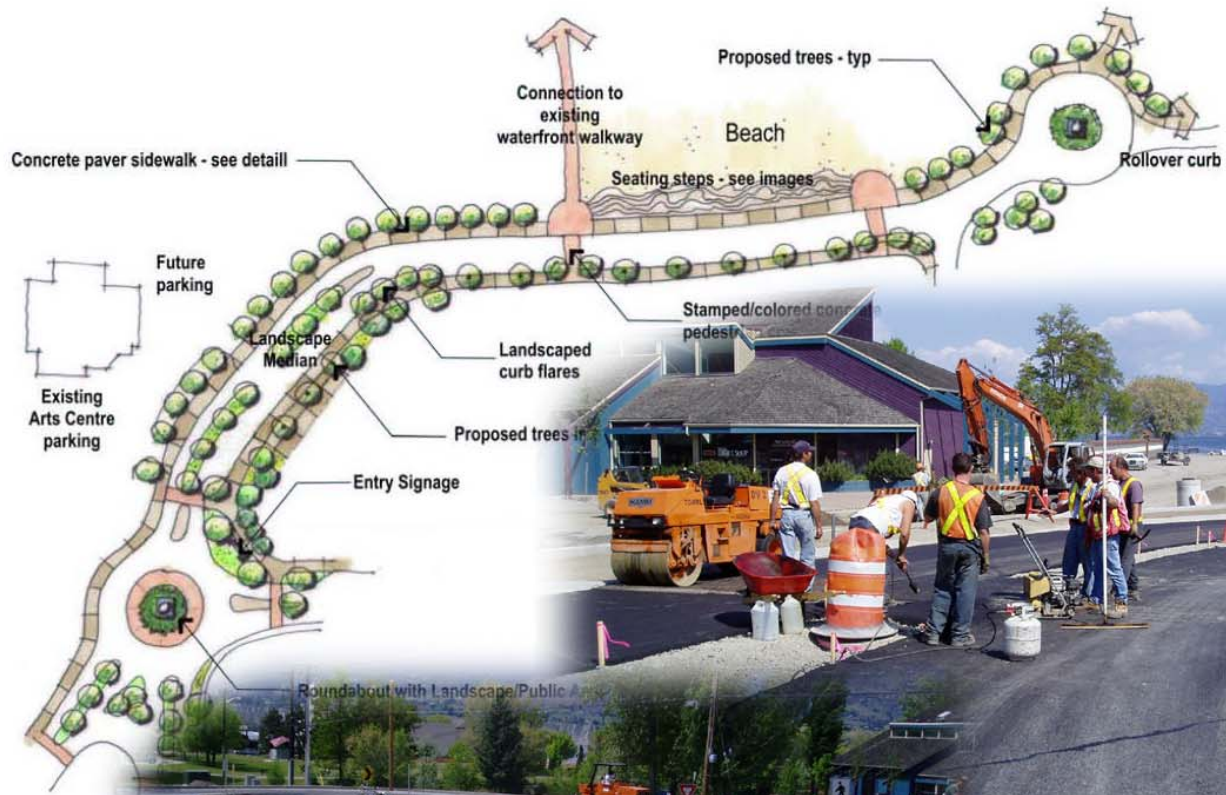


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1.0 PREFACE

- 1.1 This bylaw is an update to Subdivision and Development Bylaw 88-47. The City has made every effort to incorporate current design criteria based on provincial standards and localized conditions. It is our goal to see development occur in a fashion that respects the vision of the Official Community Plan, the environment, and the citizens of Penticton.

With this bylaw the City adopts the Master Municipal Construction Document published by the Master Municipal Construction Documents Association. Other significant additions include a Submission and Approval section and a Hillside Development section.

2.0 GUIDELINES FOR USE

- 2.1 This bylaw sets out the minimum acceptable standards for the design and construction of municipal infrastructure within the City of Penticton. This bylaw is not a design manual or a construction specifications manual. It is the responsibility of the Owner to employ the services of a Consulting Engineer to ensure that the standards stipulated herein are adhered to.

3.0 UPDATE PROCESS

- 3.1 The update process for Subdivision and Development Bylaw 88-47 started in 1998 with a review of the Master Municipal Construction Document. In 1999, a review was completed of servicing requirements, and in 2001 a draft of the bylaw was complete. The draft was reviewed internally in 2002 and presented to the public in 2003.

In 2004, Shawn Boven, AScT, City of Penticton Engineering Technologist was assigned the task of completing the bylaw and was dedicated to it full time. Significant accomplishments were made in 2004 based on new input and feedback from various City departments including Engineering, Public Works, Electrical, Planning, and Parks. Mr. Boven was instrumental in bringing the bylaw to successful completion through coordination of efforts, organization of meetings and achieving resolution to outstanding issues. Mr. Boven reviewed, formatted, and consolidated pertinent information into the bylaw.

4.0 ACKNOWLEDGEMENTS

- 4.1 The City of Penticton would like to acknowledge the following individuals for their efforts in the development of this bylaw.
- 4.1.1 Mr. Mitch Moroziuk, P.Eng, MBA, Director of Development and Engineering Services.
 - 4.1.2 Mr. Marty Willfong, P.Eng, City Engineer.
 - 4.1.3 Mr. Roy Christensen, Design Supervisor.
 - 4.1.4 Mr. Len Robson, AScT, Public Works Manager.
 - 4.1.5 Ms. Donna Butler, City Planner.
 - 4.1.6 Mr. Terry Andreychuk, Electrical Utility Operations Manager.
 - 4.1.7 Ms. Debbie Bjorndal, Public Works Secretary.
 - 4.1.8 Mr. Ed Harris, Electrical Utility Technician.
 - 4.1.9 Mr. Shawn Boven, AScT, Engineering Technologist.
 - 4.1.10 Mr. Darryl Haddrell, Development Technician.
 - 4.1.11 Mr. Ben Sajna, CAD Technician.
 - 4.1.12 Ms. Chandra Moncrieff, AScT, Engineering Technologist.
 - 4.1.13 Ms. Evelyn Pisis, Development Services Secretary.

4.1.14 Ms. Julie Holowaty, Planning Secretary

5.0 ENQUIRIES

- 5.1 It is the City of Penticton's intention to periodically update and/or expand the Subdivision and Development Bylaw to reflect current technology and/or errors or omissions. Enquiries, comments and suggestions are welcome and should be directed to:

City of Penticton
171 Main Street
Penticton, BC V2A 5A9

Attention: City Engineer



Marty Willfong, P.Eng, City Engineer

END OF SECTION

This is a consolidated bylaw prepared by The Corporation of the City of Penticton for convenience only. The city does not warrant that the information contained in this consolidation is current. It is the responsibility of the person using this consolidation to ensure that it accurately reflects current bylaw provisions.

THE CORPORATION OF THE CITY OF PENTICTON

SUBDIVISION AND DEVELOPMENT BYLAW

NO. 2004-81

Consolidated for convenience only.

Amended by Bylaw 2008-52 - August 5, 2008
Amended by Bylaw 2008-65 - October 20, 2008
Amended by Bylaw 2009-09 - Feb. 16, 2009 (Sch G)
Amended by Bylaw 2009-48 - Oct 19, 2009 (Sch G)
Amended by Bylaw 2009-77 (Sch E, Form 6 and 1.0 Engineering Requirements)
Amended by Bylaw 2010-41
Amended by Bylaw 2010-86 - Dec. 6, 2010
Amended by Bylaw 2013-25 – July 2, 2013

THE CORPORATION OF THE CITY OF PENTICTON
BYLAW NO. 2004-81

A BYLAW OF THE CORPORATION OF
THE CITY OF PENTICTON
SUBDIVISION AND DEVELOPMENT BYLAW

WHEREAS it is deemed advisable and expedient to regulate the provision of *works and services* in connection with the *subdivision and development* of land within the City of Penticton, pursuant to the powers granted by the Local Government Act:

NOW THEREFORE the Municipal Council of The Corporation of the City of Penticton in open meeting assembled ENACTS as follows:

1.0 TITLE

1.1 This bylaw may be cited as the *“Subdivision and Development Bylaw”*.

2.0 DEFINITIONS

2.1 In this bylaw and the schedules attached thereto, unless the content otherwise requires:

2.1.1 **“Applicant”** means a person applying for the approval of a *subdivision* or a *building permit*.

2.1.2 **“Approving Officer”** means a person appointed to that position by the *City* under the *Land Title Act*.

2.1.3 **“Building Official”** means a person appointed to that position by the *City* under Building Bylaw #94-45.

2.1.4 **“Building Costs”** means the cost of a *development* as established by Schedule "A" to Building Bylaw #94-45.

2.1.5 **“Building Permit”** means a permit authorizing a *development* issued under Building Bylaw # 94-45.

2.1.6 **“Building Permit Servicing Agreement”** means an agreement under Section 940 of the *Local Government Act* as it applies to land being developed.

2.1.7 **“City”** means The Corporation of the City of Penticton, or the land lying within the corporate boundaries of The Corporation of the City of Penticton, as the context may require.

- 2.1.8 **“City Engineer”** means the person appointed to that position by the *City*, and their designate.
- 2.1.9 **“Construction Completion Certificate (CCC)”** means the written document as set out in Schedule “E” of this bylaw by which the *City* confirms that the *Developer* has installed and completed the *works and services* in accordance with this bylaw.
- 2.1.10 **“Construction Inspector”** means a person who, under the direction of the *City*, inspects the construction of the *works and services*.
- 2.1.11 **“Construction Schedule”** means a schedule indicating the planned start and completion dates of the major activities involved in installing the *works and services*.
- 2.1.12 **“Consulting Engineer”** means a professional engineer, registered under *the Engineers and Geoscientists Act* in British Columbia, who is employed or retained by a consulting engineering firm.
- 2.1.13 **“Council”** means the City Council of the *City*.
- 2.1.14 **“Day”** means working day as generally recognized by the construction industry in the *City* and for clarification does not include Saturdays, Sundays and other holidays which the construction industry in the *City* recognizes as non-working days.
- 2.1.15 **“Developer”** means the party or contractor who has the authority to act on behalf of and represent the *Owner* in carrying out *works and services* under this bylaw.
- 2.1.16 **“Develop or Development”** means an activity that requires a *building permit*.
- 2.1.17 **“Director of Development and Engineering Services”** means the person appointed to that position by the *City*, and their designate.
- 2.1.18 **“Duplex”** means a building as defined as such in Zoning Bylaw #87-65.
- 2.1.19 **“Electrical Engineer”** means the person appointed to that position by the *City*, and their designate.
- 2.1.20 **“Estimated Cost”** means the total cost of constructing *works and services* estimated by the *Owner's Consulting Engineer* and approved by the *City Engineer*.
- 2.1.21 **“Excess or Extended Services”** has the meaning prescribed by the *Local Government Act*.

- 2.1.22 **“Fees and Charges Bylaw”** means the City of Penticton *Fees and Charges Bylaw 2012-5015* as amended from time to time. (Bylaw 2013-25)
- 2.1.23 **“Final Acceptance Certificate (FAC)”** means the written document as set out in Schedule “E” of this bylaw by which the *City* confirms that the *Developer* has fulfilled the warranty obligations and all other requirements of this bylaw in relation to *works and services*.
- 2.1.24 **“Final Subdivision Approval”** means that approval granted by the *Approving Officer* when all relevant requirements of this bylaw, the *Local Government Act*, the *Land Title Act* any other relevant bylaws and legislation have been fulfilled.
- 2.1.25 **“General Manager, Electrical Utility”** means the person appointed to that position by the *City*, and their designate.
- 2.1.26 **“Highway”** has the meaning prescribed by the *Community Charter*.
- 2.1.27 **“Lane”** means a *highway* abutting the rear of a lot and identified as such on the *Roads Classification Map*.
- 2.1.28 **“MMCD”** means the Master Municipal Construction Document published by the Master Municipal Construction Documents Association dated April 2000.
- 2.1.29 **“Owner”** means the registered *Owner* of the site being *subdivided* or *developed* or his duly authorized agent.
- 2.1.30 **“Pre-construction Meeting”** means a meeting between an *Owner/Developer*, his contractor or contractors, his *Consulting Engineer*, any and all agencies and/or utility companies either directly or indirectly affected by the *construction schedule* and the *City* held prior to the start of any *works and services* construction.
- 2.1.31 **“Quality Control and Assurance Form”** means the form as set out as Schedule "E" of this bylaw.
- 2.1.32 **“Roads Classification Map”** means the map prepared by the *City* and attached to this bylaw that identifies the classification of roads within the *City*.
- 2.1.33 **“Subdivide or Subdivision”** means the division of land into 2 or more parcels, whether by plan, apt descriptive words or otherwise.
- 2.1.34 **“Subdivision Early Registration Agreement”** means an agreement under Section 940 of the *Local Government Act* as it applies to land being *subdivided*.

- 2.1.35 **“Warranty Agreement”** means an agreement between the *Owner* and the *City* in the form set out in Schedule "F" of this bylaw.
- 2.1.36 **“Works and Services”** includes highways, sidewalks, boulevards, boulevard crossings, transit bays, street lighting, wiring, electrical distribution systems, water distribution systems, fire hydrant systems, sewage collection and disposal systems, drainage collection and disposal systems and such other infrastructure or systems should be required by this bylaw in connection with the *subdivision* or *development* of land.
- 2.1.37 **“Zone”** means *zone* as created by City of Penticton Zoning Bylaw #87-65.
- 2.2 All other words, terms and expressions in this bylaw shall be interpreted in accordance with their definitions in the *Community Charter*, the *Land Title Act*, the *Local Government Act* and the *Interpretation Act*.
- 2.3 A reference in this bylaw to another bylaw of the *City* is a reference to that bylaw as amended from time to time and to any future bylaws relating to the same subject matter.

3.0 ADMINISTRATION

- 3.1 The *Director of Development and Engineering Services* and the *City Engineer* are appointed to administer this bylaw.
- 3.2 The *Director of Development and Engineering Services* or their designate is hereby authorized to enter at all reasonable times upon any property or premises to inspect it in connection with their duties under this bylaw and to ascertain whether the provisions of this bylaw are being complied with.
- 3.3 If a proposed *subdivision* or *development* is in an area of the *City* in which *works and services* of the types prescribed by this bylaw have already been installed, and the existing *works and services* do not conform to the standards in this bylaw, the *City Engineer* may authorize the approval of a *subdivision* or the issuance of a *Building Permit* without the *works and services* being improved to the standards prescribed by this bylaw if the level of service already provided to the *subdivision* or *development* and to adjacent areas is, in the opinion of the *Director of Development and Engineering Services*, adequate and in accordance with standards generally accepted as good engineering practice in existing *developed areas*.

4.0 CONFORMITY WITH REGULATIONS

- 4.1 No person shall *subdivide* or *develop* land in the *City* contrary to the provisions of this bylaw.

5.0 MINIMUM LOT FRONTAGE ON A HIGHWAY

- 5.1 No parcel being created by any *subdivision* shall have less than 1/10 of its perimeter fronting on a *highway*, except that the *Approving Officer* may exempt any parcel from this provision.

6.0 WORKS AND SERVICES REQUIRED AS A CONDITION OF SUBDIVISION

- 6.1 All *works and services* required to be constructed and installed by this bylaw shall be engineered, supplied, constructed and installed at the expense of the *Owner*.
- 6.2 The *works and services* must be engineered and installed in accordance with the standards and specifications as set out in Schedule "G" - Design Criteria and Schedule "H" – Construction Criteria attached to and forming part of this bylaw and must be in operation for one year, during which the *Owner* must remedy any defects in the *works and services* before they are accepted by the *City*.
- 6.3 Subject to Sentence 6.5 and 6.6 every *Owner* making a *Subdivision Application* is required to provide the following *works and services* within the *subdivision* and on that portion of a *highway* immediately adjacent to the site being *subdivided* up to the center line of the *highway*.
- 6.3.1 highways, sidewalks, boulevards, boulevard crossings, transit bays, street lighting and underground wiring, and
- 6.3.2 a water distribution system, a fire hydrant system, a sewage collection system and a drainage collection system, electrical distribution system, and a drainage disposal system.
- 6.4 The water, sewer and drainage collection system required under Sentence 6.3 must be connected at the expense of the *Owner* to the *City* water, sewer and drainage collection systems.
- 6.5 For a *subdivision* of land that is designated FG, A and RC by the *Zoning Bylaw*, the following *works and services* minimum requirements shall apply:
- 6.5.1 Provided each lot being created is suited to an on-site sanitary sewage disposal system meeting the requirements of the Ministry of Health of the Province of British Columbia, a sewage collection system connected to the *City* system is not required.
- 6.5.2 For a *subdivision* creating only 2 lots and having no further *subdivision* potential a water distribution system connected to the *City* water system is not required if the *Owner* provides a well on each lot. Each well must meet the domestic water quality requirements of the Ministry of Health of the Province of British Columbia and must be able to provide a continuous flow of at least 14 liters per minute (3 imperial gallons per minute).

6.5.3 Electrical servicing may be overhead.

6.6 For a *subdivision* of land that is designated Industrial by the Zoning Bylaw and the land is not within the *City's Sewer Area*, an on-site sanitary sewage disposal system meeting the requirements of the Ministry of Health of the Province of British Columbia may be used in place of connection to the *City* sanitary sewage system.

7.0 FINAL SUBDIVISION APPROVAL

7.1 Subject to Section 8.0 of this bylaw, upon completion of the construction of the *works and services* required by this bylaw as approved by the *Director of Development and Engineering Services*, an *Owner* may make application for *Final Subdivision Approval* and shall provide as required by the *Approving Officer* the following:

7.1.1 Warranty securities in the form and amount set out in Schedule "F" of this bylaw;

7.1.2 Payment to the *City* of all the costs of connecting all utilities to serve the proposed *subdivision*;

7.1.3 Payment to the *City* of all costs for upgrading the existing *works and services* or installing new *works and services* that will be undertaken by the *City*;

7.1.4 Payment to the *City* of the application fee and final plan signing fee prescribed in the *City's Fees and Charges Bylaw*;

7.1.5 Payment to the *City* of all applicable Development Cost Charges required as prescribed in the *City's Development Cost Charges Bylaw*;

7.1.6 Three (3) copies of all duly executed covenants, statutory rights of way and all other relevant documents;

7.1.7 Completed *Quality Control and Assurance Form* and *Construction Completion Certificate* as set out in Schedule "E" of this bylaw;

7.1.8 Confirmation of receipt of:

7.1.8.1 as-built drawings; CADD Disk

7.1.8.2 reports for material tests;

7.1.8.3 all other test results;

7.1.8.4 operation manuals;

7.1.9 And one copy of the *subdivision* plan showing all existing buildings accurately located and identified in accordance with the new property lines.

8.0 SUBDIVISION EARLY REGISTRATION AGREEMENT

- 8.1 Notwithstanding Section 7.0 of this bylaw, the *Owner* may make application for *Final Subdivision Approval* prior to the completion of the construction and installation of the required *works and services* if the *Owner*.
- 8.1.1 Enters into a *Subdivision Early Registration Agreement* with the *City* in the form as set out in Schedule "C"; "with such amendments thereto as approved by Council".
- 8.1.2 Deposits with the *City* the security as set out in Schedule "C"; and
- 8.1.3 Complies with section 7.1.1 through 7.1.6 and 7.1.10 and 7.1.11.

9.0 WORKS AND SERVICES REQUIRED AS A CONDITION OF BUILDING PERMIT

- 9.1 All *works and services* required to be constructed and installed by this bylaw shall be engineered, supplied, constructed and installed at the expense of the *Owner*.
- 9.2 The *works and services* must be engineered and installed in accordance with the standards and specifications as set out in Schedule "G" - Design Criteria and Schedule "H" – Construction Criteria attached to and forming part of this bylaw and must be in operation for one year, during which the *Owner* must remedy any defects in the *works and services* before they are accepted by the *City*.
- 9.3 Except as otherwise provided in this section every *Owner* making an application for a *Building Permit* is required, if the *Building Costs* exceed \$150,000, to provide the following *works and services* within the *development* and on that portion of a *highway* immediately adjacent to the lot being *developed* up to the center line of the *highway*:
- 9.3.1 highways, sidewalks, boulevards, boulevard crossings, transit bays, street lighting and underground wiring and
- 9.3.2 a water distribution system, a fire hydrant system, a sewage collection system and a drainage collection system, electrical distribution system, and a drainage disposal system.
- 9.4 The water, sewer, and drainage collection systems required under Sentence 9.3 must be connected at the expense of the *Owner* to the *City* water, sewer and drainage collection systems.
- 9.5 The requirement to provide *works and services* within the *development* as set out in this section shall only apply to land that is designated RM1, RM2A or RCC in the Zoning Bylaw.
- 9.6 Except as set out in sentence 9.7, an *Owner* who wishes to *develop* land designated FG, A, RC, R1, R2, R3, RSM, RD1, RD2, M1, M2 or M3 in the Zoning

Bylaw is exempt from the requirements of this section to provide *works and services* on that portion of a *highway* immediately adjacent to the site being *developed*.

- 9.7 An *Owner* who applies to construct a *duplex* on land adjacent to a *lane* that does not conform to the standards set out in Schedules "G" and "H" of this bylaw, must upgrade the full width of the lane adjacent to the land to the standards set out in Schedules "G" and "H" of this bylaw, or provide cash in lieu of construction equivalent to the cost of constructing the *lane*. The City will hold the cash in lieu and use the funds to construct the *lane* at an opportune time.
- 9.8 An *Owner* who applies for a Building Permit that would authorize the construction of a building or structure on land serviced by the City's Water Distribution System or fire hydrant system that does not conform to the standards set out in Schedules "G" and "H" of this bylaw, except land designated FG, RC, R1, R2, R3, RSM, RD1 and RD2 in the Zoning Bylaw, or for a building permit that would authorize the construction of a single family dwelling on land designated A in the Zoning Bylaw, shall at the *Owner's* choice either improve, upgrade or extend the Water Distribution System required for the proposed development in order to meet requirements of Table 3.2 or provide assurance from a qualified professional that the building or structure will conform to the British Columbia Building Code's Fire Protection requirements.
- 9.9 The value of the work authorized by the building permit will be calculated based on the building costs as prescribed in the *Building Bylaw* for all building permits issued in respect of the land on which the *development* occurs within a 24 month period from the time the first permit is issued.
- 9.10 Subject to Section 10.0 of this bylaw, an *Owner* must complete the construction of the *works and services* required by this section as approved by the *Director of Development and Engineering Services* prior to the issuance of a *Building Permit* and provide the following:
 - 9.10.1 Warranty securities in the form and amount set out in Schedule "D" of this bylaw;
 - 9.10.2 Payment to the *City* of all the *City's* costs of connecting all utilities to serve the proposed *development*;
 - 9.10.3 Payment to the *City* of all costs for upgrading the existing *works and services* or installing new *works and services* that will be undertaken by the *City*;
 - 9.10.4 Three (3) copies of all duly executed restrictive covenants, statutory rights of way and all other relevant documents;
 - 9.10.5 Completed *Quality Control and Assurance Form* and *Construction Completion Certificate* as set out in Schedule "E" of this bylaw;
 - 9.10.6 Confirmation of receipt of:

- 9.10.6.1 as-built drawings; CADD Disk
- 9.10.6.2 reports for material tests;
- 9.10.6.3 all other test results;
- 9.10.6.4 operation manuals.

10.0 BUILDING PERMIT SERVICING AGREEMENT

10.1 Notwithstanding Section 9.0 of this bylaw, the *Owner* may apply for a *Building Permit* prior to the completion of the construction and installation of the required *works and services* if the *Owner*.

10.1.1 Enters into a Building Permit Servicing Agreement with the *City* in the form set out in Schedule "D";

10.1.2 Deposits with the *City*, the security set out in Schedule "D";

10.1.3 Conforms to sections 9.9.2 through 9.9.6.

11.0 STARTING WORKS AND SERVICES CONSTRUCTION

11.1 Installation of any *works and services* required for a *subdivision* or a *development* shall not commence until:

11.1.1 The *City* has confirmed in writing to the *Owner* the requirements of this bylaw;

11.1.2 The *Owner* has had completed at his cost, all reports and engineered drawings as set out in Schedule "A" of this bylaw;

11.1.3 The *Owner* has paid for the cost of the water meter(s) and has paid an administration fee in the amount as prescribed in the *City's "Fees and Charges Bylaw 2012-5015"*. (Bylaw 2013-25)

11.1.4 The *Owner* has paid a rectification and repair contingency fee in the amount as prescribed in the *City's "Fees and Charges Bylaw 2012-5015"* for the purpose of rectifying, repairing or replacing a highway, including sidewalks and boulevards, a public work, or other *City* property that has been altered or damaged by an activity related to the installation of the *works and services*. (Bylaw 2013-25)

11.1.5 The *Owner* has submitted to the *City* a completed *Quality Control and Assurance Form* as set out in Schedule "E" of this bylaw;

11.1.6 The *Owner* has provided to the *City* a copy of the contractor's *construction schedule*;

11.1.7 The *Owner* has applied for and received approval of a *City of Penticton Traffic Bylaw #94-39 Schedule "F" "Application to Construct, Use and Maintain Works Within a Roadway or Lane"*;

11.1.8 A *Pre-Construction Meeting* has been held; and

11.1.9 The *Owner* has entered into a *Warranty Agreement* in the form as set out in Schedule "F" of this bylaw.

11.2 Any amount of security provided under this section that is not required for a purpose referred to in sentence 11.1.4 must be returned to the *Owner*.

12.0 ENGINEERED DRAWINGS

12.1 The *Owner* shall prepare and submit to the *Director of Development and Engineering* engineered drawings in accordance with the requirements of Schedule "A" of this bylaw for all *works and services* required under this bylaw.

12.2 The *Owner* shall determine, co-ordinate and submit to the *City*, engineering designs from utility companies or other agencies when providing electrical, telephone, television, and gas or mail delivery services.

12.3 All engineered drawings shall bear the seal of a professional engineer and must be accepted by the *Director of Development and Engineering Services* prior to the commencement of construction or installation of any *works and services*.

12.4 Upon completion of the *works and services* required by this bylaw the *Owner* shall prepare and submit to the *Director of Development and Engineering Services* operating manuals and as-built drawings, prepared to the standards prescribed in Schedule "A" of this bylaw and sealed by a Professional Engineer.

13.0 LATECOMER CHARGES

13.1 The interest rate applicable to latecomer charges under Section 939 of the *Local Government Act* will equal the prime lending rate of the chartered bank used by the *City*, less one percent.

14.0 EXCESS CAPACITY OF WORKS AND SERVICES

14.1 The design of any *highway*, sanitary sewer, water, or storm drainage system must be adequate to serve the land being *subdivided* or *developed*, as well as any other land that is tributary to the system or to which the system will provide service.

14.2 The *Director of Development and Engineering Services* may specify in respect of any system the area of land that is tributary or the area to which it will provide service, based on the *City's Official Community Plan* and zoning regulations and any long-range plans for the *City's highway*, sanitary sewer, water and storm drainage systems.

14.3 If compliance with sentence 14.1 requires use of larger diameter pipe or materials or greater pavement widths than would be required to serve only the land being *subdivided* or *developed*, the *Owner* shall install the *works and services* and the *City* shall upon acceptance of the *works and services* make

payment to the *Owner* in respect of the excess capacity of the *works and services* in accordance with sentence 14.4.

14.4 Payments under sentence 14.3 shall be made only in respect of the actual cost of:

14.4.1 sanitary sewer pipe materials in excess of 200 mm diameter;

14.4.2 water pipe materials in excess of 150 mm diameter, except in areas zoned Industrial where payments shall be made only in respect of the actual cost of water pipe materials in excess of 200 mm diameter;

14.4.3 storm drainage pipe materials in excess of 300 mm in diameter;

14.4.4 paving materials for pavement widths in excess of 12 m;

14.5 And no payment shall be made in respect of the costs of installing such materials or any other matter. Payments shall only be made upon acceptance of the *works and services* by the *City* and presentation of the *Owner's* account in a form prescribed for that purpose by the *Director of Development and Engineering Services*.

15.0 SEVERABILITY

15.1 If any section, subsection, clause, sentence or phrase of this bylaw is for any reason held to be invalid by the decision of any court of competent jurisdiction, the invalid portion shall be severed and the portion that is invalid shall not affect the validity of the remaining portions of this bylaw.

16.0 SCHEDULES "A" TO "H"

16.1 Schedules "A" through "H" are attached to and form part of this bylaw (Schedules are located separately in the Clerk's Department in vault and may be viewed upon request).

17.0 REPEAL OF PREVIOUS BYLAW

17.1 Subdivision and Development Bylaw 88-47 is hereby repealed.

READ A FIRST time this 6th day of December, 2004
READ A SECOND time this 17th day of January, 2005
READ A THIRD time this 17th day of January, 2005
RECONSIDERED AND FINALLY PASSED AND ADOPTED
this 7th day of February, 2005

Original signed by

C. David Perry, Mayor

Original signed by

Leo den Boer, Administrator/City Clerk

Certified a true copy of Bylaw No.
2004-81 as adopted

Original signed by

Leo den Boer, Administrator/City Clerk

1.0 GENERAL

- 1.1 This section addresses submission and approval requirements with respect to pre-design reports, engineered drawings, redline changes and as-built drawings. Typically, a subdivision will require a pre-design report including conceptual drawings, engineered drawings based on the approved pre-design report, and as-built record drawings at construction completion.

2.0 PRE-DESIGN REPORT SUBMISSION REQUIREMENTS

- 2.1 A pre-design report (6 copies) is required for all *subdivisions* of five parcels or more. The *City Engineer* may also require a pre-design report for *subdivisions* of less than five parcels, where the *City Engineer* deems it appropriate.
- 2.2 The pre-design report must be submitted bearing the seal and signature of a design professional that has the appropriate experience and is registered with the Association of Professional Engineers and Geoscientists of British Columbia.
- 2.3 The pre-design report must cover at minimum the following:
- 2.3.1 **General:**
- 2.3.1.1 Impact statement regarding adjacent lands and where appropriate, soil stability, erosion control, or environmental issues.
- 2.3.1.2 Pre-design requirements shall be extended beyond the *development* limits to a distance which enables the *City* to ensure that future extensions will meet the requirements and shall be not less than 60 metres.
- 2.3.1.3 The pre-design report shall assess how existing infrastructure will be affected by the demands placed on it by the proposed *subdivision* or *development*.
- 2.3.2 **Existing Site Conditions:**
- 2.3.2.1 The pre-design report shall provide information regarding the existing land use, the existing infrastructure (roadways, water, sanitary sewer, storm sewer, and utilities), and the geotechnical conditions.
- 2.3.3 **Water System:**
- 2.3.3.1 The pre-design report is to include an overall conceptual plan showing the proposed water system and how it connects to existing infrastructure.
- 2.3.3.2 The pre-design report shall analyze the proposed water system under Average Day Demand, Maximum Day Demand, Peak Hour Demand, Night Filling Demand, and Maximum Day Demand plus fire flow requirements. Calculations must be made in accordance with Schedule "G", Section – 00100, Water Systems. The system shall be analyzed for fire flow demand, maximum and minimum velocity and maximum and minimum pressures.
- 2.3.3.3 The water section of the pre-design report shall also address the following:

2.3.3.3.1 Distribution Mains:

- 2.3.3.3.1.1 Sub-surface soil conditions
- 2.3.3.3.1.2 Corrosive soils.
- 2.3.3.3.1.3 High water table.
- 2.3.3.3.1.4 Pipe material.
- 2.3.3.3.1.5 Pipe bedding requirements.
- 2.3.3.3.1.6 Trenching and backfilling requirements.
- 2.3.3.3.1.7 Fire flow requirements.
- 2.3.3.3.1.8 Hydrant spacing.
- 2.3.3.3.1.9 Water main sizing.

2.3.3.3.2 Reservoirs:

- 2.3.3.3.2.1 Site plan showing location.
- 2.3.3.3.2.2 Geotechnical report on foundation conditions.
- 2.3.3.3.2.3 Design standards.
- 2.3.3.3.2.4 Storage volume.
- 2.3.3.3.2.5 Shape.
- 2.3.3.3.2.6 Number of cells.
- 2.3.3.3.2.7 Material selection (concrete or steel).
- 2.3.3.3.2.8 Expandability.
- 2.3.3.3.2.9 Site security.
- 2.3.3.3.2.10 Controls and monitoring.
- 2.3.3.3.2.11 Operating protocol.
- 2.3.3.3.2.12 S.C.A.D.A.
- 2.3.3.3.2.13 Appearance.
- 2.3.3.3.2.14 Capital and operating costs.

2.3.3.3.3 Pumping Stations:

- 2.3.3.3.3.1 Site plan showing location.
- 2.3.3.3.3.2 Structure.
- 2.3.3.3.3.3 Floor plan.
- 2.3.3.3.3.4 Site security.
- 2.3.3.3.3.5 Pumping capacity.
- 2.3.3.3.3.6 Standby power.
- 2.3.3.3.3.7 Peak shaving energy requirements.
- 2.3.3.3.3.8 Controls and monitoring.
- 2.3.3.3.3.9 Operating protocol.
- 2.3.3.3.3.10 S.C.A.D.A.
- 2.3.3.3.3.11 Appearance.
- 2.3.3.3.3.12 HVAC.
- 2.3.3.3.3.13 Capital and operating costs.

2.3.3.3.4 Pressure Reducing/Sustaining Stations:

- 2.3.3.3.4.1 Site plan showing location.
- 2.3.3.3.4.2 Structure.
- 2.3.3.3.4.3 Design flows.
- 2.3.3.3.4.4 Continuous, emergency or fire flow operation.
- 2.3.3.3.4.5 Controls and monitoring.
- 2.3.3.3.4.6 Operating protocol.
- 2.3.3.3.4.7 S.C.A.D.A.
- 2.3.3.3.4.8 HVAC.
- 2.3.3.3.4.9 Capital and operating costs.

2.3.4 Sanitary Sewer System:

- 2.3.4.1 The pre-design report is to include an overall conceptual plan showing the proposed sanitary sewer system and how it connects to existing infrastructure.
- 2.3.4.2 The pre-design report shall include the proposed sanitary sewer design calculations which will take into account the peak flow and infiltration flow, maximum and minimum velocities, pipe size and grade.
- 2.3.4.3 The sewer section of the pre-design report shall also address the following:

2.3.4.3.1 Collection System:

- 2.3.4.3.1.1 Sub-surface soil conditions.
- 2.3.4.3.1.2 Corrosive soils.
- 2.3.4.3.1.3 High water table.
- 2.3.4.3.1.4 Pipe bedding requirements.
- 2.3.4.3.1.5 Trenching and backfilling requirements.

2.3.4.3.2 Lift Stations:

- 2.3.4.3.2.1 Site plan showing location.
- 2.3.4.3.2.2 Sub-surface soils conditions.
- 2.3.4.3.2.3 High water table.
- 2.3.4.3.2.4 Design flows and catchment area.
- 2.3.4.3.2.5 Type of lift station.
- 2.3.4.3.2.6 Aesthetics, noise, odour control.
- 2.3.4.3.2.7 Site security.
- 2.3.4.3.2.8 Peak shaving energy requirements.
- 2.3.4.3.2.9 Controls and monitoring.
- 2.3.4.3.2.10 Operating protocol.
- 2.3.4.3.2.11 S.C.A.D.A.
- 2.3.4.3.2.12 Safety for operators and public.
- 2.3.4.3.2.13 Capital and operating costs.

2.3.5 Storm Sewer System:

- 2.3.5.1 The pre-design report is to include an overall conceptual plan showing the proposed storm sewer system and how it connects to existing infrastructure.
- 2.3.5.2 The pre-design report shall include storm drainage tributary area plans and storm sewer calculations for major and minor storm conditions. Calculations must be made in accordance of Schedule "G", Section – 00300, Storm Drainage.
- 2.3.5.3 The storm sewer section of the pre-design report shall also address the following:

2.3.5.3.1 Collection System:

- 2.3.5.3.1.1 Sub-surface soil conditions.
- 2.3.5.3.1.2 Corrosive soils.
- 2.3.5.3.1.3 High water table.
- 2.3.5.3.1.4 Pipe material.
- 2.3.5.3.1.5 Pipe bedding requirements.
- 2.3.5.3.1.6 Trenching and backfilling requirements.

2.3.5.3.2 Lift Stations:

- 2.3.5.3.2.1 Site plan showing location.
- 2.3.5.3.2.2 Sub-surface soils conditions.
- 2.3.5.3.2.3 High water table.
- 2.3.5.3.2.4 Design flows and catchment area.
- 2.3.5.3.2.5 Type of lift station.
- 2.3.5.3.2.6 Aesthetics, noise, odour control.
- 2.3.5.3.2.7 Site security.
- 2.3.5.3.2.8 Peak shaving energy requirements.
- 2.3.5.3.2.9 Controls and monitoring.
- 2.3.5.3.2.10 Operating protocol.
- 2.3.5.3.2.11 S.C.A.D.A.
- 2.3.5.3.2.12 Safety for operators and public.
- 2.3.5.3.2.13 Capital and operating costs.

2.3.5.3.3 Stormwater Treatment Devices:

- 2.3.5.3.3.1 Source point treatment.
- 2.3.5.3.3.2 End of pipe treatment.
- 2.3.5.3.3.3 Sediment removal.
- 2.3.5.3.3.4 Hydrocarbon removal.
- 2.3.5.3.3.5 On-site disposal methods.
- 2.3.5.3.3.6 Capital and operating costs.

2.3.5.3.4 Overland Flows:

- 2.3.5.3.4.1 Overland flow paths.
- 2.3.5.3.4.2 Maximum velocity.
- 2.3.5.3.4.3 Erosion protection and control.
- 2.3.5.3.4.4 Detention / retention facilities.

2.3.5.3.1 Outfalls:

- 2.3.5.3.1.1 High water table.
- 2.3.5.3.1.2 Erosion protection.
- 2.3.5.3.1.3 Sediment control.
- 2.3.5.3.1.4 Permit requirements.
- 2.3.5.3.1.5 Review impacts of 100 year storm event.

2.3.6 Transportation:

2.3.6.1 The pre-design report is to include an overall conceptual transportation network plan showing the proposed transportation network and how it connects to the existing network.

2.3.6.2 The transportation section of the pre-design report shall also address the following:

2.3.6.2.1 Roads:

- 2.3.6.2.1.1 Traffic loads.
- 2.3.6.2.1.2 Road classification.
- 2.3.6.2.1.3 Design speed.
- 2.3.6.2.1.4 Sub-surface soil conditions.
- 2.3.6.2.1.5 Road structure.

- 2.3.6.2.1.6 Road cross section.
- 2.3.6.2.1.7 Boulevard details including trees.
- 2.3.6.2.1.8 Transit stops.
- 2.3.6.2.1.9 Horizontal and vertical alignment.
- 2.3.6.2.1.10 Drainage.

2.3.6.2.2 Pedestrians:

- 2.3.6.2.2.1 Sidewalks.
- 2.3.6.2.2.2 Pathways.
- 2.3.6.2.2.3 Nature trails.
- 2.3.6.2.2.4 Links to existing network.

2.3.6.2.3 Bicycles:

- 2.3.6.2.3.1 Bike lanes
- 2.3.6.2.3.2 Bike paths.
- 2.3.6.2.3.3 Links to existing network.

2.3.7 Utility Services:

- 2.3.7.1 The pre-design report shall provide details with respect to the general location of all utilities, including gas, electrical street lighting, telephone, and cable television. The utility services shall be shown on an overall conceptual utility services plan.

3.0 PRE DESIGN REPORT SUBMISSION AND APPROVAL PROCESS

- 3.1 Six (6) copies of the pre-design report are to be submitted to the *City Engineer*. The *City Engineer* will distribute the pre-design report to the Public Works Manager, Parks Supervisor and the General Manager, Electrical Utility for review and comment.
- 3.2 The *City Engineer* will solicit verbal comments from the Fire Chief, consolidate the comments from other departments and reply back to the *Developer* in writing within 28 days.
- 3.3 The *Developer* may request a meeting with the *City Engineer* to discuss the comments.
- 3.4 The *Developer* is to revise the pre-design report to address the comments returned from the *City*. Six (6) copies of the revised pre-design report are to be submitted to the *City Engineer*. The *City Engineer* will review the revised pre-design report to ensure it complies with the previously issued comments.
- 3.5 Once satisfied that all issues have been addressed, the *City Engineer* will provide written approval of the pre-design report.
- 3.6 The *City Engineer* will distribute copies of the approved pre-design report to the Public Works Manager, Parks Supervisor, and General Manager, Electrical Utility and the *Developer*.

4.0 CONCEPTUAL DESIGN DRAWINGS

- 4.1 Six (6) copies of conceptual design drawings are to be submitted as part of the pre-design report. The conceptual design drawings must include at minimum:
 - 4.1.1 An overall water system plan.

- 4.1.2 An overall sanitary sewer system plan.
 - 4.1.3 An overall storm sewer system plan.
 - 4.1.4 An overall transportation network plan.
 - 4.1.5 An overall site grading plan.
- 4.2 One redline mark up copy of the conceptual design drawings will be returned with the comments from the pre-design report review.

5.0 ENGINEERED DRAWING SUBMISSION REQUIREMENTS

- 5.1 All engineered design drawings being submitted for approval shall bear the seal and signature of a design professional that has the appropriate experience and is registered with the Association of Professional Engineers and Geoscientists of British Columbia. Six (6) copies are required for each submission.
- 5.2 The pre-design report must be approved prior to submission of engineered design drawings.
- 5.3 Detailed "Required Drawing Items" shall be in compliance with the engineering design and as-built drawing submission check list that follows in Table 11.1 and with the sample subdivision drawing provided by the *City*.
- 5.4 A sample *subdivision* drawing set is attached in section 12.0 of this schedule. This is the level of detail that the *City* requires in order to review and approve applications in a timely manner. A digital version of the drawing is available at www.penticton.ca to aid the designer in the production of drawings. The Consultant's CAD work will be checked against the digital template.
- 5.5 AutoCAD shall be used for design drawings. The digital file (AutoCAD DWG format) is to be included with the submission of the hard copy drawings.

6.0 ENGINEERED DRAWING APPROVALS

- 6.1 Six (6) copies of the engineered drawings are to be submitted to the *City Engineer*. The *City Engineer* will distribute the engineered drawings to the Public Works Manager, Parks Supervisor and the General Manager, Electrical Utility for review and comment.
- 6.2 The *City Engineer* will solicit verbal comments from the Fire Chief, consolidate the comments from other departments and reply back to the *Developer* in writing within 28 days. A set of redline markup drawings showing the requested changes to the design will also be provided with the written comments.
- 6.3 The *Developer* may request a meeting with the *City Engineer* to discuss the comments.
- 6.4 The *Developer* is to revise the engineered drawings to address the comments returned from the *City*. Six (6) copies of the revised engineered drawings are to be submitted to the *City Engineer*. The *City Engineer* will review the revised engineered drawings to ensure compliance with the previously issued comments.
- 6.5 Once satisfied that all issues have been addressed, the *City Engineer* will circulate the drawings to the Public Works Manager, Parks Supervisor and General Manager, Electrical Utility for signature and approval of the drawings. Final signature and approval will be by the *City Engineer*.

- 6.6 When the drawings are approved they will be stamped "Approved For Construction" and be distributed to the *City Engineer*, Public Works Manager, Parks Supervisor, and General Manager, Electrical Utility and the *Developer*.

7.0 CHANGES TO THE APPROVED DESIGN – REDLINE CHANGES

- 7.1 Changes to the approved design drawings will be considered.
- 7.2 Six (6) copies of the proposed changes are to be submitted to the *City Engineer* who will review the proposed changes and a determination will be made as to the suitability of the change.
- 7.3 If the proposed change is acceptable as submitted, one copy marked "Changes Approved" will be returned to the *Developer* within 5 days. The *City Engineer* will distribute the remaining copies to the Public Works Manager, Parks Supervisor and General Manager, Electrical Utility.
- 7.4 If the proposed change is not acceptable a written reply will be returned to the developer within 5 days at which point other alternatives may be considered.

8.0 AS-BUILT DRAWING SUBMISSION REQUIREMENTS

- 8.1 All as-built drawings being submitted for approval shall bear the seal and signature of a design professional that has the appropriate experience and is registered with the Association of Professional Engineers and Geoscientists of British Columbia. As-built drawings are to be submitted by the Consultant and approved by the *City Engineer* prior to the issuance of a *Construction Completion Certificate*.
- 8.2 AutoCAD shall be used for as-built drawings. The digital file (AutoCAD DWG format) is to be included with the submission of the hard copy drawings.
- 8.3 Detailed "Required Drawing Items" shall be in compliance with the engineering design and as-built drawing submission check list that follows in Table 11.1 and with the sample subdivision drawing provided by the *City*.
- 8.4 A sample *subdivision* drawing set is attached in section 12.0 of this schedule. This is the level of detail that the *City* requires in order to review and approve as-built drawings submissions in a timely manner. A digital version of the drawing is available at www.penticton.ca to aid the designer in the production of drawings. The Consultant's CAD work will be checked against the digital template.

9.0 AS-BUILT DRAWING APPROVALS

- 9.1 Six (6) copies of the as-built drawings are to be submitted to the *City Engineer*. The *City Engineer* will distribute the as-built drawings to the Public Works Manager, Parks Supervisor and the General Manager, Electrical Utility for review and comment.
- 9.2 The *City Engineer* will consolidate the comments from other departments and reply back to the *Developer* in writing within 14 days. A set of redline markup drawings showing the requested changes to the as-built will also be provided with the written comments.
- 9.3 The *Developer* is to revise the as-built drawings to address the comments returned from the *City*. Six (6) copies of the revised as-built drawings are to be submitted to the *City Engineer*.

The *City Engineer* will review the revised engineered drawings to ensure compliance with the previously issued comments.

- 9.4 Once satisfied that all issues have been addressed, the *City Engineer* will circulate the drawings to the Public Works Manager, Parks Supervisor and General Manager, Electrical Utility for signature and approval of the drawings. Final signature and approval will be by the *City Engineer*.
- 9.5 When the drawings are approved they will be stamped "Approved As-Built" and be distributed to the City Engineer, Public Works Manager, Parks Supervisor, and General Manager, Electrical Utility and the *Developer*

10.0 DRAWING STANDARDS

- 10.1 Sheet Size: Precut sheets to be 594 mm x 841 mm. (A-1 sheet size).
- 10.2 Sheet Material: 3 mil mylar matte both sides with half plan half profile.
- 10.3 Grid Standards: 2 mm x 10 mm as shown on sample sheet.
- 10.4 Lettering: Lettering is to an open style of Vertical Gothic (e.g. Leroy or AutoCAD - Romans).
- 10.5 Scales:
- 10.5.1 Overall drawings scale: 1:1000
 - 10.5.2 Plan view scale: 1:500
 - 10.5.3 Profile view horizontal scale: 1:500
 - 10.5.4 Profile view vertical scale: 1:50
- 10.6 Sheet Border: Border line width to be 1.0 mm. Top and bottom border to be 67 mm respectively from edge of sheet. Left and right border to be 100 mm from edge of sheet.
- 10.7 Title Block: Located in the lower right hand corner of the sheet (87 mm x 165 mm).
- 10.7.1 Title block shall describe the contents of the drawing (e.g. key plan, roadworks, etc.) and shall clearly indicate the location of the works by road name(s) and/or legal description.
- 10.8 Sheet Layout:
- 10.8.1 Maintain a minimum clearance of 20 mm between the TOP PLAN VIEW and the UTILITY PLAN VIEW.
 - 10.8.2 Place north arrow close to the TOP PLAN VIEW and to the right hand side of the sheet point either towards the top of the page or towards the left hand edge.
 - 10.8.3 Show control distances and offset location dimensions in metres and elevations to 3 decimal places.
 - 10.8.4 Show pipe sizes in mm as per A.S.T.M. specifications using 1" = 25 mm.
 - 10.8.5 Existing imperial dimensions except for pipe sizes are to be soft converted to metric using the factor: 1 inch (1") = 25.4 mm or 1 foot (1') = 0.3048 m.

11.0 ENGINEERED DRAWING AND AS-BUILT DRAWING CHECKLIST

Table 11.1 will be used by the *City* to check engineered design drawings and as-built drawing submissions.

Table 11.1

Required Drawing Items	Yes	No	N/A	Comments
Drawings				
Cover Sheet				
Composite Plan				
Road (Plan / Profile)				
Water (Plan / Profile)				
Storm Drainage (Plan / Profile)				
Sanitary Sewer (Plan / Profile)				
Lot Grading Plan				
Storm Management Plan (catchment area / overland flow)				
Erosion and Sediment Control Plan				
Street Light Plan				
Street Signs, Markings and Traffic Control Devices				
Traffic Control / Flow Plan				
Construction Details				
Road Cross-Sections				
General Drawing Requirements				
All sheets signed and sealed by P.Eng				
Drawing Scale 1:500				
Standard A1 sheet size with Title Block				

Conforms to Preliminary Layout Approval				
Plan / Profile Drawings with Grid				
North Arrow and Geodetic Datum				
Manholes Identified by Numbers on Plan and Profile				
Survey Monument Location and Elevation				
Composite Plan				
Lot and Plan Numbers, Road Names				
All Sanitary, Storm and Water Works				
Lamp Standards and Utility Poles				
Power and Communication				
Natural Gas				
Curb & Gutter, Sidewalks				
Integrated Survey Monuments				
Right-Of-Ways, Easements				
Natural Features (creeks etc.)				
Road Design				
Centreline Chainage to be indicated at 10 m intervals.				
Offset of Existing and Proposed Utilities				
Road Width from FOC to FOC				
Bicycle <i>Lanes</i>				
Curb & Gutter – Type and Offset (FOC to Property Line)				
Curb Return Radii and Profiles with Spot Elevations at Quarter Points				

Sidewalks, Wheelchair Ramps, Driveway Letdowns				
Existing Driveways, Sidewalks, Curbs, Culverts, Utility Poles				
Existing Fences, Trees, Ditches, Streams, Natural Features				
Boulevard Landscaping, Irrigation				
Luminaire / Pole Locations				
Manhole and Catch Basin Locations				
Water Valve Box Locations				
Traffic Signs / Road Markings				
Traffic Islands and Medians				
Retaining Walls, Guard Rails, Temporary Barricades				
Original Surface Profile at Centre Line and Property Line				
Design Profile of Centre Line and Gutter Line				
Walkways, Fencing, Stairs, Railings				
Spot Elevations Through Cul-De-Sacs and Intersections				
Horizontal Sight Distance				
Horizontal Curve Data:				
- Centerline Radius				
- Chainage, BC, EC, PI				
- Delta Angle, Tangent Length, Arc Length				
Vertical Curve Data:				
- Chainage at BVC, EVC, PVI, Low Point				

- Elevations at BVC, EVC, PVI, Low Point				
- Length of Vertical Curve				
- 'K' Values				
Cross Sections:				
- 20 m Intervals for New Road Construction				
- 10 m Intervals for Widening Existing Roads				
- Grades of Boulevards to Right-Of-Way Limits				
- Original and Design Grades With Cut and Fill				
- Driveways				
Super Elevation:				
- Chainage Beginning and End				
- Chainage Full Length of Super Elevation				
Storm Drainage				
Original and Final Ground Surface Profile				
Pipe Profile, Depth, Length, Size, Material				
Elevations at all Utility Crossings and Clearances				
Manhole and Rim Elevations and Inverts				
Service Connection Grades and Inverts at Property Line				
Open Channel, Ditch, Rip Rap – Profiles and Cross Sections				
Location of Existing Utilities				

Ditch and Pipe Flow Directional Arrows				
Pipe Offsets from Property Line				
Manhole and Drywell Identification Numbers				
Inverts of All Pipes Entering and Exiting All Manholes				
Catch Basin Locations				
Intake and Outfall Locations and Details				
Sanitary Sewer				
Original and Ground Surface Profile				
Pipe Profile, Depth, Length, Size, Material				
Elevations of all Utility Crossings and Clearances				
Manhole Rim Elevations and Inverts				
Service Connection Grades and Inverts at Property Line				
Location of Existing Utilities				
Pipe Flow Directional Arrows				
Pipe Offsets From Property Lines and Water Mains				
Manhole Identification Numbers				
Inverts of All Pipes Entering and Exiting All Manholes				
Water				
Original and Final Ground Surface Profile				
Pipe Profile, Depth, Length, Size, Material				
Elevations at all Utility Crossings and Clearances				

Service Locations, Size, Depths at Property Line				
Location of Existing Utilities				
Offsets From Property Lines and Sewer Mains				
Fitting Details				
Valves, Curb Stops, Blow-Offs, Hydrants, Air Valve Locations				
Storm Water Management				
Location Plan – Site and Watershed Catchment Area				
Development Area Highlighted				
Contours of Existing Ground (1 m < 20%, 2 m > 20%)				
Major Flood Route – 100 Year Storm Event				
Detention Pond Detail				
Major Cut and Fill Areas (shaded)				
Area (m ²) of Development and Total Catchment Area				
Sub-Catchment Area Boundaries – Coefficients and Areas				
Pipe System Calculations, Size, Grade, Minor / Major Flow				
Directional Arrows of Flow				
Erosion and Sediment Control				
Control Detail at Existing and Proposed Catch Basins				
Control Detail in Swales and Gullies				
Control Detail onto Adjacent Properties				

Control of Soil Loss and Movement				
Siltation Control Pond Details				
Lot Grading Plan				
Site Area and 30 m Beyond				
Contours of Existing Ground (1 m <20%, 2 m >20%)				
Existing and Proposed Elevations – Each Corner of Lots				
Swales and Major Flood Routing				
Directional Flow Arrows on Streets and Over Lots				
Easements and Right-Of-Ways				
Catch Basin Locations and Top of Gate Elevations				
Minimum Building Elevations (MBE) on Each Lot				
Proposed Ground Elevations at Building Envelope				
Building Envelope and Typical Lot Grading Detail				

END OF SECTION

SAMPLE DEVELOPMENT DRAWINGS

Proposed Development Penticton BC

SAMPLE DEVELOPMENT DRAWINGS

INSERT YOUR LOGO HERE

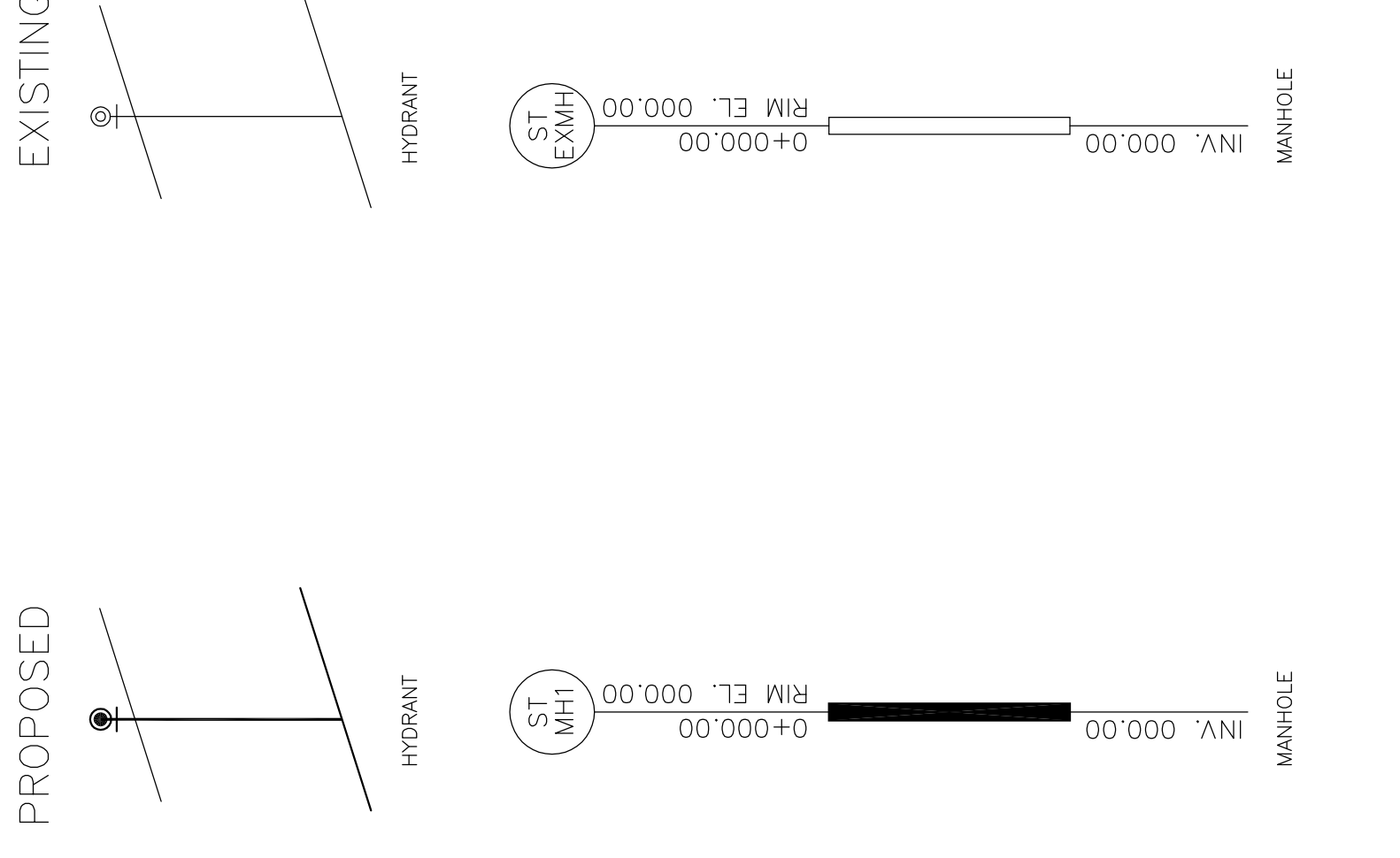
NOVEMBER 2004

SYMBOLS

PLAN VIEW

PROPOSED	EXISTING
CURB	CURB
PAVEMENT EDGE	PAVEMENT EDGE
STORM DRAIN	STORM DRAIN
SANITARY SEWER	SANITARY SEWER
WATER MAIN	WATER MAIN
GAS MAIN	GAS MAIN
U/G TEL. & ELE.	U/G TEL. & ELE.
FENCE LINE	FENCE LINE
EDGE OF PAVEMENT	EDGE OF PAVEMENT
EDGE OF SHOULDER	EDGE OF SHOULDER
EDGE OF SIDEWALK	EDGE OF SIDEWALK
EDGE OF DRIVEWAY	EDGE OF DRIVEWAY
HYDRANT	HYDRANT
WATER VALVE	WATER VALVE
CATCH BASIN	CATCH BASIN
MANHOLE	MANHOLE
PADMOUNT TRANSFORMER	PADMOUNT TRANSFORMER
POLE TRAN. & STREET LIGHT	POLE TRAN. & STREET LIGHT
SECONDARY SERVICE BOX	SECONDARY SERVICE BOX
STREET LIGHT	STREET LIGHT
POWER POLE	POWER POLE
CONIFEROUS TREE	CONIFEROUS TREE
JUNCTION BOX	JUNCTION BOX
ANCHOR	ANCHOR
DECIDUOUS TREE	DECIDUOUS TREE

PROFILE VIEW



ABBREVIATIONS

Description	Abbreviation	Description	Abbreviation	Description	Abbreviation
Abandoned	ABAND	Diameter	DIA	Length	LGTH
Abbreviation	ABBREV	Dimension	DIM	Length of Curve	LC
Acre	AC	Distance	DIST	Lift Station	LSTA
Air Valve	AV	Ditch	D	Lip of Gutter	LG
Anchor	ANC	Double	DBL	Low Point	LP
Asbestos Concrete	AB.CONC	Drain	DRN	Main Valve	MV
Asphalt	ASPH	Drawing	DWG	Manhole	MH
Asphalt Walk	ASPH W	Drive	DR	Master Municipal Construction Documents	MMCD
Avenue	AVE	Driveway	DWV	Maximum	MAX
Average	AVG	Drop Manhole	DMH	Mechanical Joint	MJ
Back of Curb	BOC	Dry Well	DW	Median	MED
Back of Walk	BOW	Ductile Iron	DI	Median	m
Basement	BSMT	Easement	ESMT	Meter	M
BC Gas	BCG	East	E	Meter Chamber	MC
BC Hydro	BCH	Edge of Median	EM	Millimetre	mm
BC Telephone	TEL	Edge of Pavement	EP	Minimum	MIN
Bearing	BRG	Edge of Shoulder	ES	Ministry of Transportation	MoT
Bedding	BED	Elbow	ELBW	Minutes	MIN or'
Beginning of Curve	BC	Electric	ELEC	Monolith	MONO
Beginning of Vertical Curve	BVC	Electric Light	ELEV	Monolith Sidewalk	MON
Bench Mark	BM	Elevation	ELEV	Monument	MON
Between	BTWIN	End of Curve	EC	Mortar Joint	MJ
Block	BLK	End of Vertical Curve	EVC	No Post Guard Rail	NPGR
Blow Off	B/O	Estimate	EST	North	N
Bottom	BTM	Existing	EX	North Side	N/S
Boulevard	BLVD	Face of Curb	FOC	Not to Scale	NTS
Boundary	BDY	Face of Walk	FOW	Number	NO or #
Box	BOX	Feet or Foot	FT	Number	NO or #
Building	BLDG	Flange	FLG	On Centre	OC or O/C
Cable Television	TV	Flanged Outlet	F/O	Opposite Face	OF
Calculated	CALC	Floor	FLR	Original Ground	OG
Canadian National Railway	CNR	Footing	FTG	Ornamental Street Light	OSL
Canadian Pacific Railway	CPR	Force Main	FM	Outlet Chamber	OC
Canadian Standards Association	CSA	Found	FD	Outside Diameter	OD
Capacity	CAP	Galvanized	GALV	Over Head	O/H
Catch Basin	CB	Garbage	GAR	Parallel	PAR
Catholic Protection	CP	Garden	GDN	Parkway	PKWY
Centimetre	CM	Gas Service	GS	Pavement	PAV
Centre Line	CL	Gas Valve	GV	Pedestrian Light	PDL
Check Valve	CV	Geoid	GRM	Per	/
Checked	CHKD	Grade	GR	Percent	%
Chord	CH	Grate	GRT	Perforated Pipe	PF
Circle	CIR	Gravel	GRV	Phase	PH
Class	CL	Guard Rail	GRND	Pipe	PIPE
Clean Out	C/O	Gutter	GUT	Place	PL
Concrete	CONC	Gutter	GUT	Plan Profile	PLG
Concrete Walk	CONC SWLK	Hectare	HA	Plug	PLUG
Conduit	COND	Height	HT	Point	PNT
Construction/Construct	CONSTR or CONST	Hectometre	HM	Point of Compound Curve	PCC
Contour	CONTR	Height	HT	Point of Curve	POC
Control (Traffic Signal)	CTR	High Point	HP	Point of Intersection	PI
Copper	CU	Highway	HWY	Point of Tangent	PVI
Control Point	CPT	Horizontal	HOSP	Point of Vertical Intersection	PP/SL
Corner	COR	Hydrant	HYD	Pole with Street Light	LBS
Corrugated Metal Pipe	CMP	Inch	IN or"	Pounds per Square Inch	PSI
Coupling	CPLG	Inlet Chamber	IC	Power Poles	PP
Court	CT	Inside Diameter	ID	Pressure Reducing Valve	PRV
Creek	CRK	Insulate	INS	Property Line	PL
Crescent	CRS	Intake Structure	IS	Proposed	PROP
Crossfall	C-FALL	Intersection	INT	Pump Station	P.S.
Cul-de-sac	CULV	Invert	INT	Quantity	QTY
Culvert	CULV	Iron Pin, Found Iron Pin	IP, FIP	Radius	RAD or R
Curb and Gutter	C & G	Joint	JT	Railway	R/R
Deflection	DEG or °	Junction Box	JB	Raised Face	RF
Degree	DEG or °	Kilogram	KG	Rectifier	RECT
Delta	Δ	Kilometres	KM	Reducer	RED
Department	DEPT	Kilometres Per Hour	KM/H	Reference	REF
Design Flow	DESQ	Kiosk	KSK	Registered Plan	RP
		Lateral	LAT	Reinforced	REIN
		Lead	L	Replacement	REPL
		Left	LT	Reservoir	RES

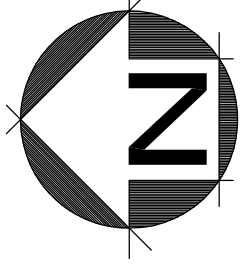


LEGEND:

- K001 - Legend / Index Plan
- C001 - Overall Roads and Sidewalk Plan
- C002 - Overall Underground
- C003 - Overall Electrical, Telephone, Cable TV, Gas
- C004 - Overall Grading and Drainage Plan
- C005 - Overall Traffic Marking & Signage
- P001 - Plan Profile - Sample Road
- D001 - Details
- D002 - Details
- D003 - Details

INDEX PLAN

<p>NOTES:</p>	<p>APPROVED FOR CONSTRUCTION</p> <table border="0"> <tr> <td>PUBLIC WORKS Mgr.</td> <td>DATE</td> </tr> <tr> <td>ELECTRICAL DIV. Eng.</td> <td></td> </tr> <tr> <td>PARKS DIVISION Super.</td> <td></td> </tr> <tr> <td>CITY ENGINEER</td> <td></td> </tr> <tr> <td>AS-BUILT APPROVAL</td> <td></td> </tr> </table>	PUBLIC WORKS Mgr.	DATE	ELECTRICAL DIV. Eng.		PARKS DIVISION Super.		CITY ENGINEER		AS-BUILT APPROVAL		<p>SCALE: HORZ. _____ INTS. VERT. _____</p> <p>DRAWN BY _____ FIELD BOOK</p> <p>DESIGN BY _____</p> <p>DATE: NOVEMBER 2004</p> <p>DRAWING No.: K001</p> <p>SHEET No.: 1 OF 10</p>
PUBLIC WORKS Mgr.	DATE											
ELECTRICAL DIV. Eng.												
PARKS DIVISION Super.												
CITY ENGINEER												
AS-BUILT APPROVAL												
<p>CITY OF PENTICTON</p> <p>ENGINEERING DEPARTMENT</p>												
<h1>LEGEND / INDEX PLAN</h1>												



CITY OF PENTICTON
ENGINEERING DEPARTMENT

OVERALL ROADS AND SIDEWALK
PLAN

SCALE: HORZ. 1:1000 VERT. _____
DRAWN BY _____ FIELD BOOK _____
DESIGN BY _____
DATE: NOVEMBER 2004
DRAWING No.: C001
SHEET No.: 2 OF 10

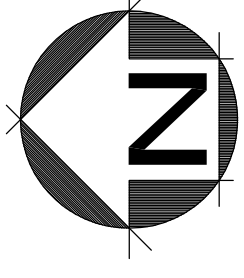
APPROVED FOR CONSTRUCTION DATE _____
PUBLIC WORKS Mgr. _____
ELECTRICAL DIV. Eng. _____
PARKS DIVISION Super. _____
CITY ENGINEER _____
AS-BUILT APPROVAL _____
ENGINEER _____
DATE: _____

ISSUE	DATE	DRN	CHD	APPROVED	DESCRIPTION

REVISIONS

NOTES:
1. ROLL-OVER RESIDENTIAL CURB AND GUTTER WITH GUTTER AS SHOWN ON DETAIL SHEET





CITY OF PENTICTON
ENGINEERING DEPARTMENT

OVERALL UNDERGROUND UTILITY PLAN

SCALE: HORZ. 1:1000 VERT. _____	FIELD BOOK
DRAWN BY _____	BOOK _____
DESIGN BY _____	
DATE: NOVEMBER 2004	
DRAWING No.: C002	
SHEET No.: 3 OF 10	

APPROVED FOR CONSTRUCTION	DATE
PUBLIC WORKS Mgr.	
ELECTRICAL DIV. Eng.	
PARKS DIVISION Super.	
CITY ENGINEER	
AS-BUILT APPROVAL	

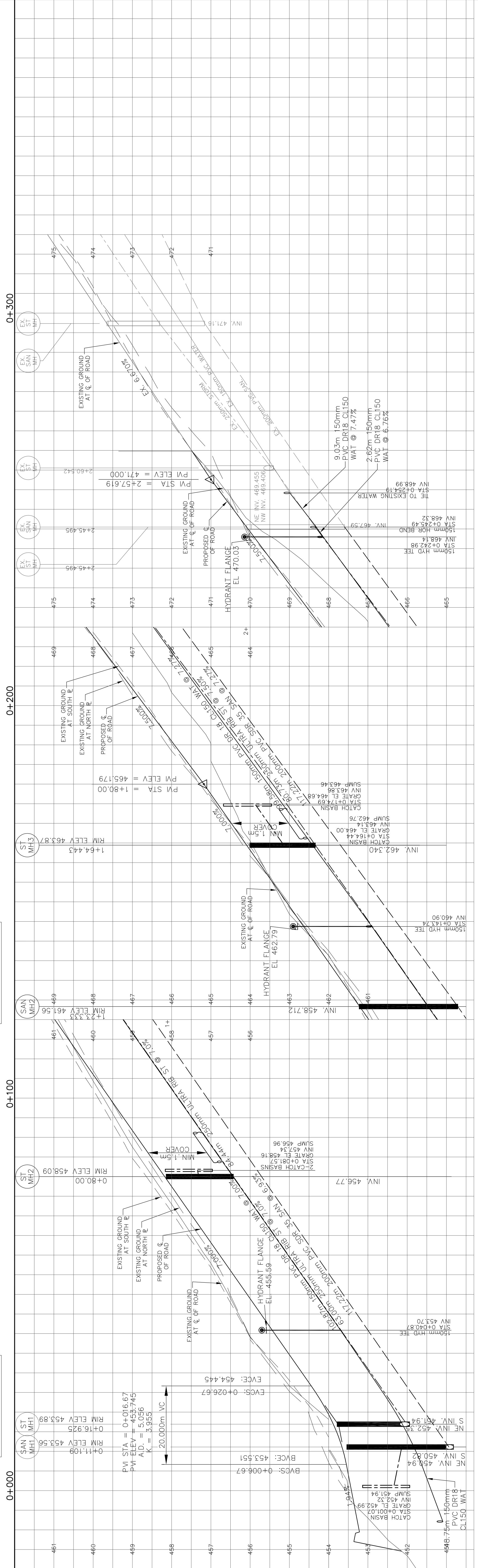
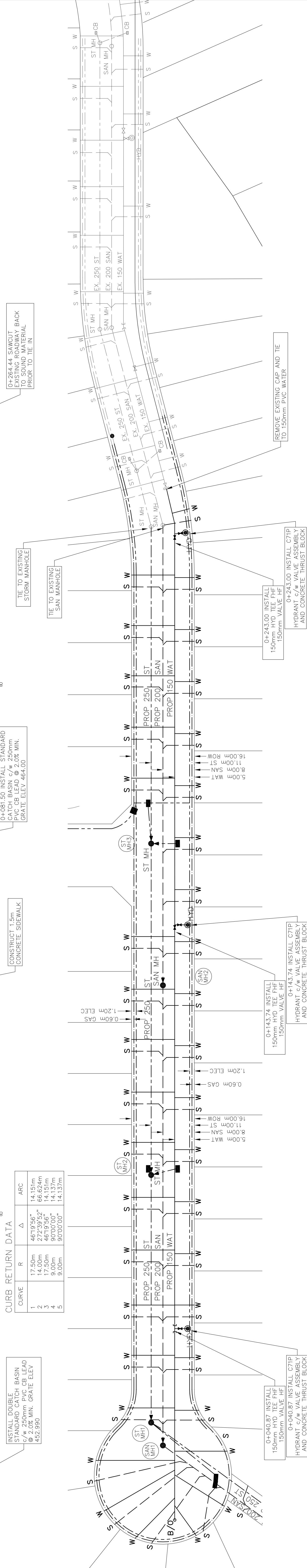
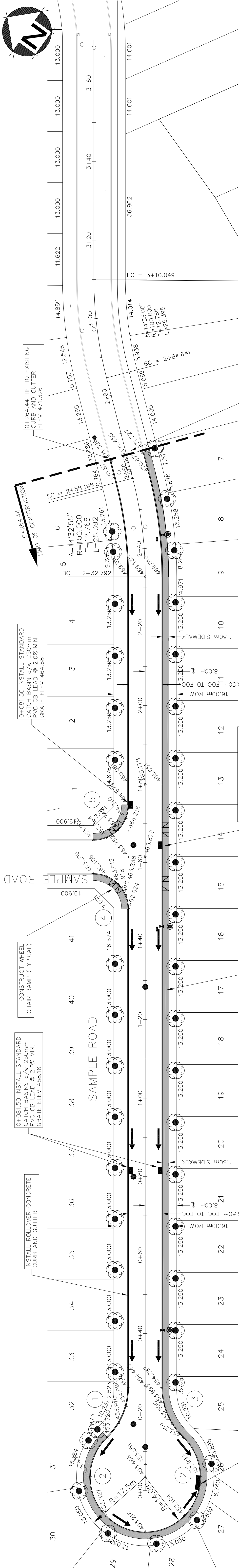
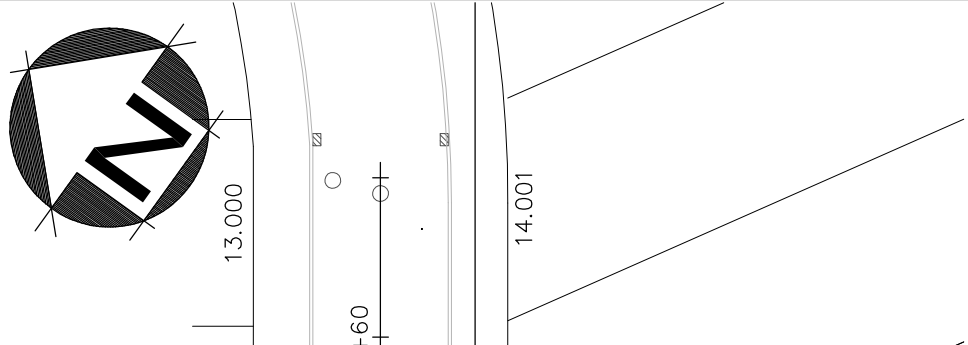
DESCRIPTION	DATE	DRN	CH'D	APPROVED

ISSUE	DATE	DRN	CH'D	APPROVED	DESCRIPTION

REVISIONS

NOTES:
1. HIGH BASIS TOP INLET TYPE 1 AS SHOWN ON DETAILS SHEET
2. MANHOLE TYPE AS PER MUCD DWG'S
3. HYDRANTS TO BE TERMINAL CITY C7IP



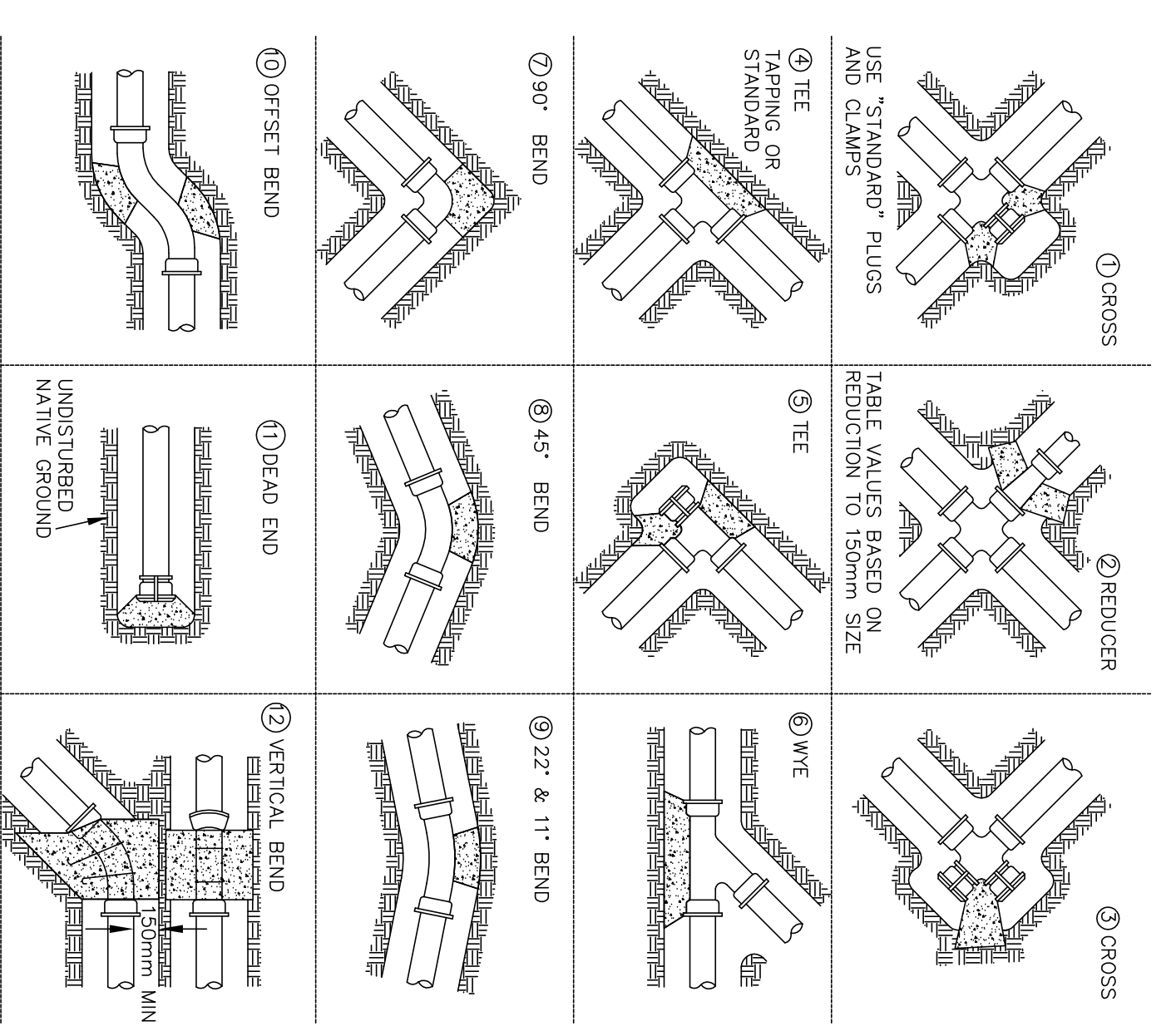


CITY OF PENTICTON
ENGINEERING DEPARTMENT

PLAN AND PROFILE
SAMPLE ROAD

SCALE: HORIZ. 1:500 VERT. 1:50	DATE	APPROVED FOR CONSTRUCTION	DATE
DRAWN BY: B.S.	DATE: NOVEMBER 2004	PUBLIC WORKS Mgr.	DATE
DESIGN BY:	DRAWING No.: P001	ELECTRICAL DIV. Eng.	DATE
		PARKS DIVISION Super.	DATE
		CITY ENGINEER	DATE
		AS-BUILT APPROVAL	DATE

NOTES:
 1. CURB ELEVATIONS TO GUTTER
 2. ALL ASPHALT ELEVATIONS TO TOP OF PAVEMENT
 3. ALL CURVE INFORMATION TO FACE OF CURB
 4. TREES SPECIES TO BE HEDGE MAPLE

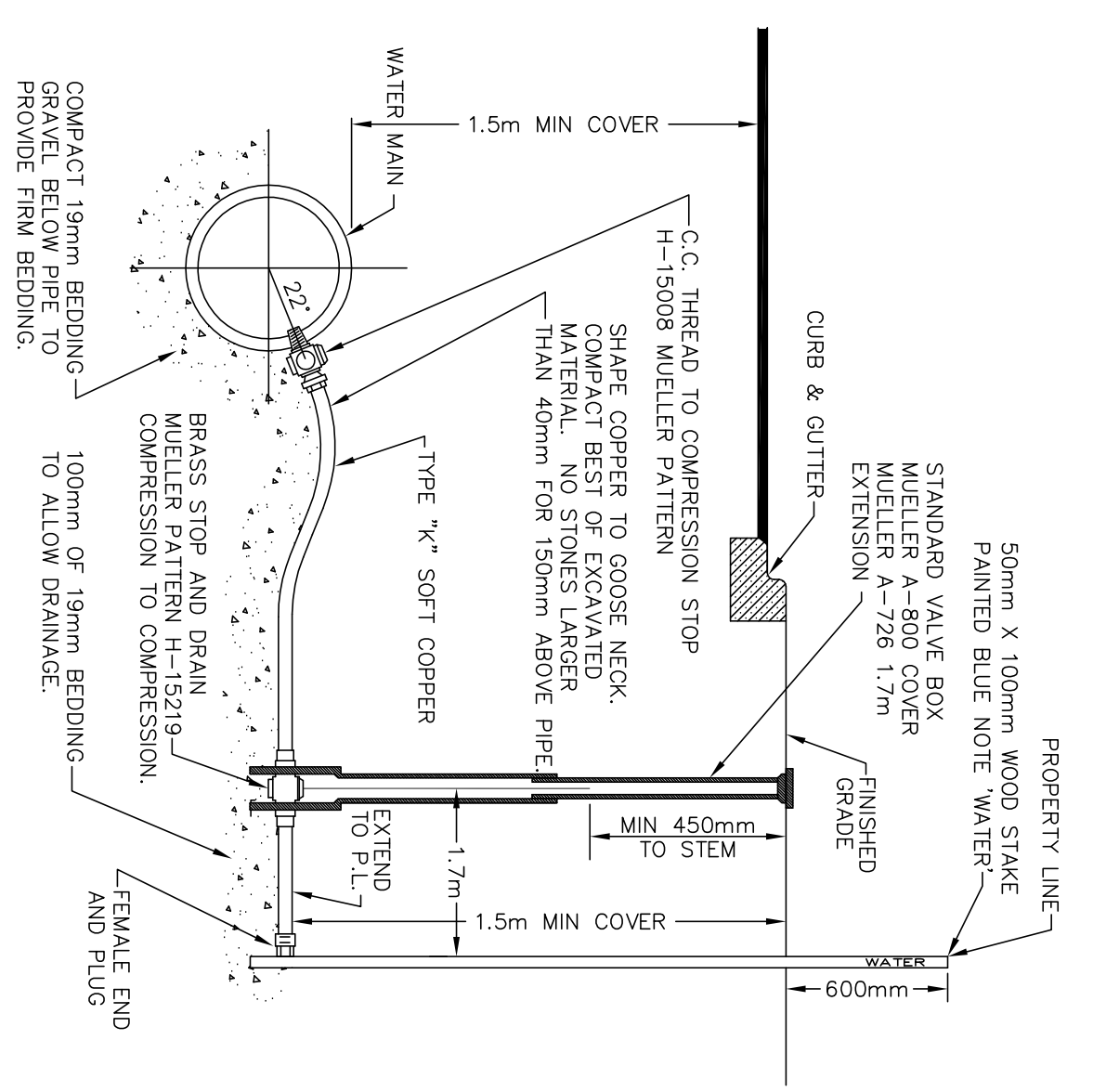


NOTE:
 1) USE PLASTIC BETWEEN CONCRETE & FITTINGS.
 2) THRUST BLOCKS SHALL BE PROPERLY FORMED USING WOOD AND OTHER SUITABLE MATERIAL.

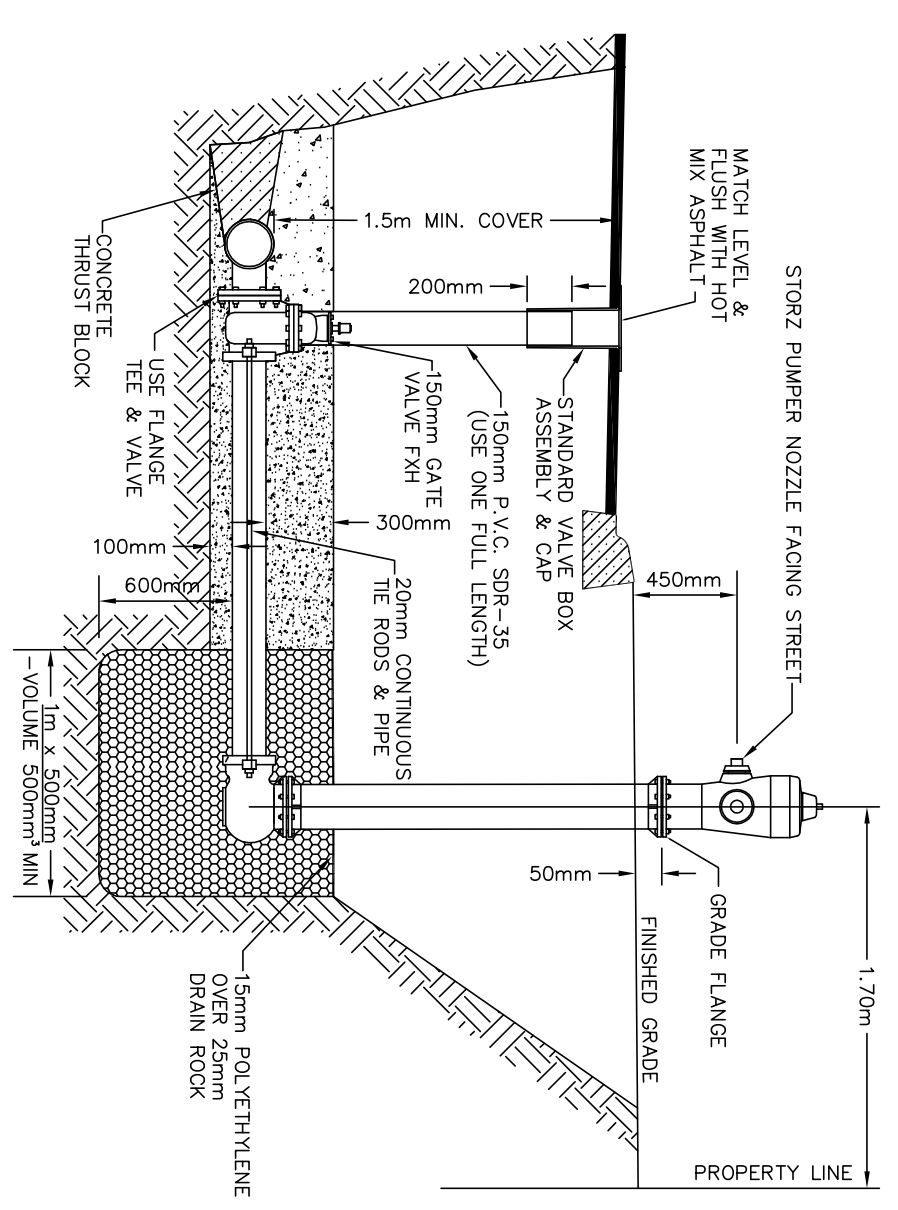
NOTE: MILLIMETER DIMENSIONS APPLY TO THE LARGEST DIAMETER END OF THE FITTING. MINIMUM THRUST AREAS FOR FITTINGS AT 1034 KPA PRESSURE AND FOR SOILS WITH MIN. BEARING OF 107 KPA (NOT TO BE USED FOR SOFT CLAY, MUCK ETC.)

TYPE OF FITTING	FITTING SIZE	FITTING FACE	OPTIMUM RECESS IN WALL		HEIGHT
			LENGTH	RECESS IN WALL	
CROSS	D	150	300	500	450
	W	200	350	750	600
	H	250	375	975	750
REDUCER	D	150	300	500	450
	W	200	350	750	600
	H	250	375	975	750
TEE	D	150	300	500	450
	W	200	350	750	600
	H	250	375	975	750
45° WYE	D	150	300	500	450
	W	200	350	750	600
	H	250	375	975	750
90° BEND	D	150	300	500	450
	W	200	350	750	600
	H	250	375	975	750
45° BEND	D	150	300	500	450
	W	200	350	750	600
	H	250	375	975	750
22° BEND	D	150	300	500	450
	W	200	350	750	600
	H	250	375	975	750
CAPS & PLUGS	D	150	300	500	450
	W	200	350	750	600
	H	250	375	975	750

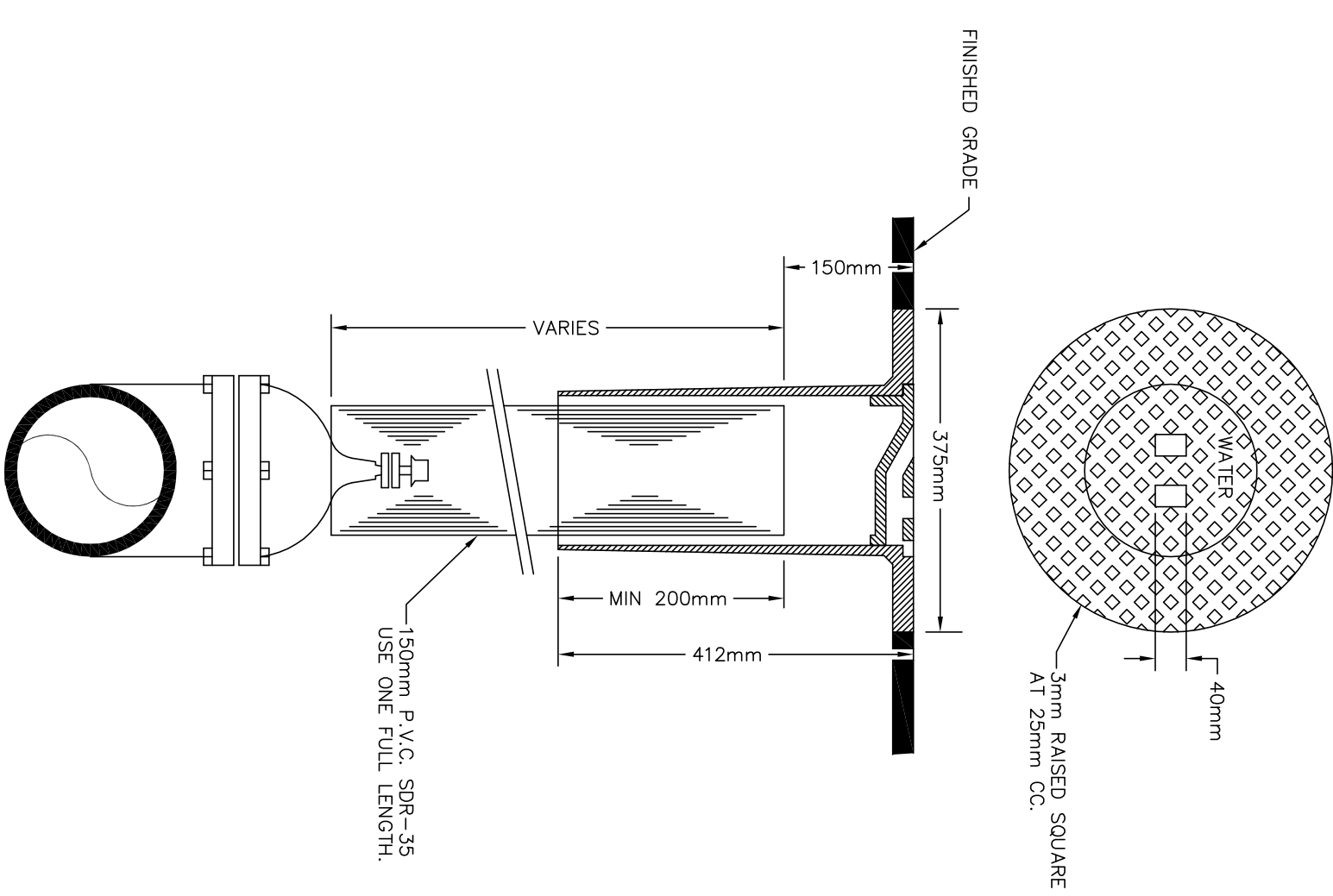
NOTE:
 1) THRUST BLOCKS FOR MAINS LARGER THAN 300mm DIA. OR WHERE FROM NATIVE GROUND UNDISTURBED SHALL BE DESIGNED BY A PROFESSIONAL ENGINEER AND SHOWN ON THE ENGINEERING DRAWINGS.
 2) WHERE GROUND CANNOT BE EXCAVATED TO FREE STANDING UNDISTURBED SOIL, SHALL BE DRIVEN PRIOR TO EXCAVATING FOR THRUST BLOCK. PILING SHOULD BE USED ONLY BELOW THE PERMANENT WATER TABLE.



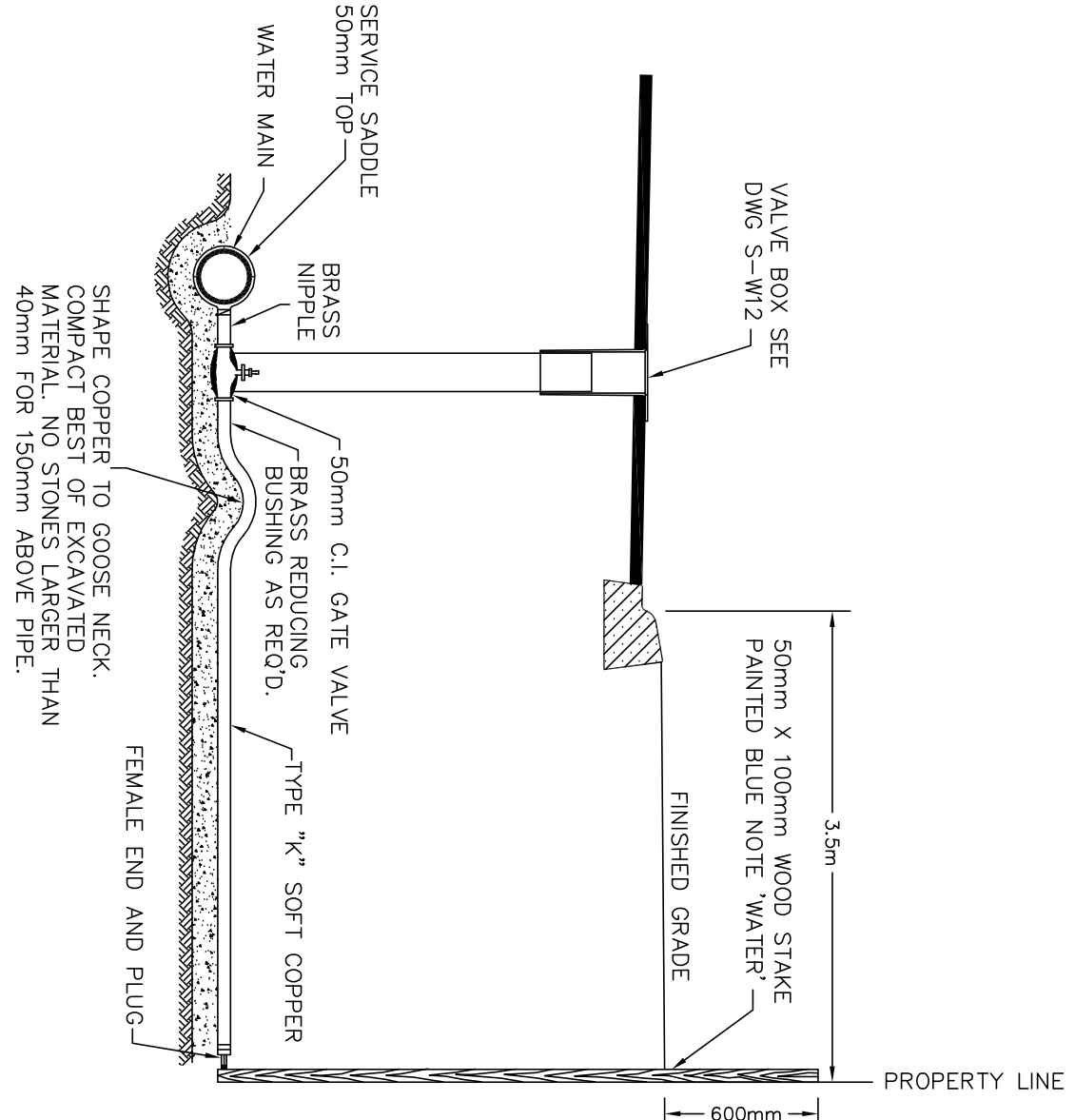
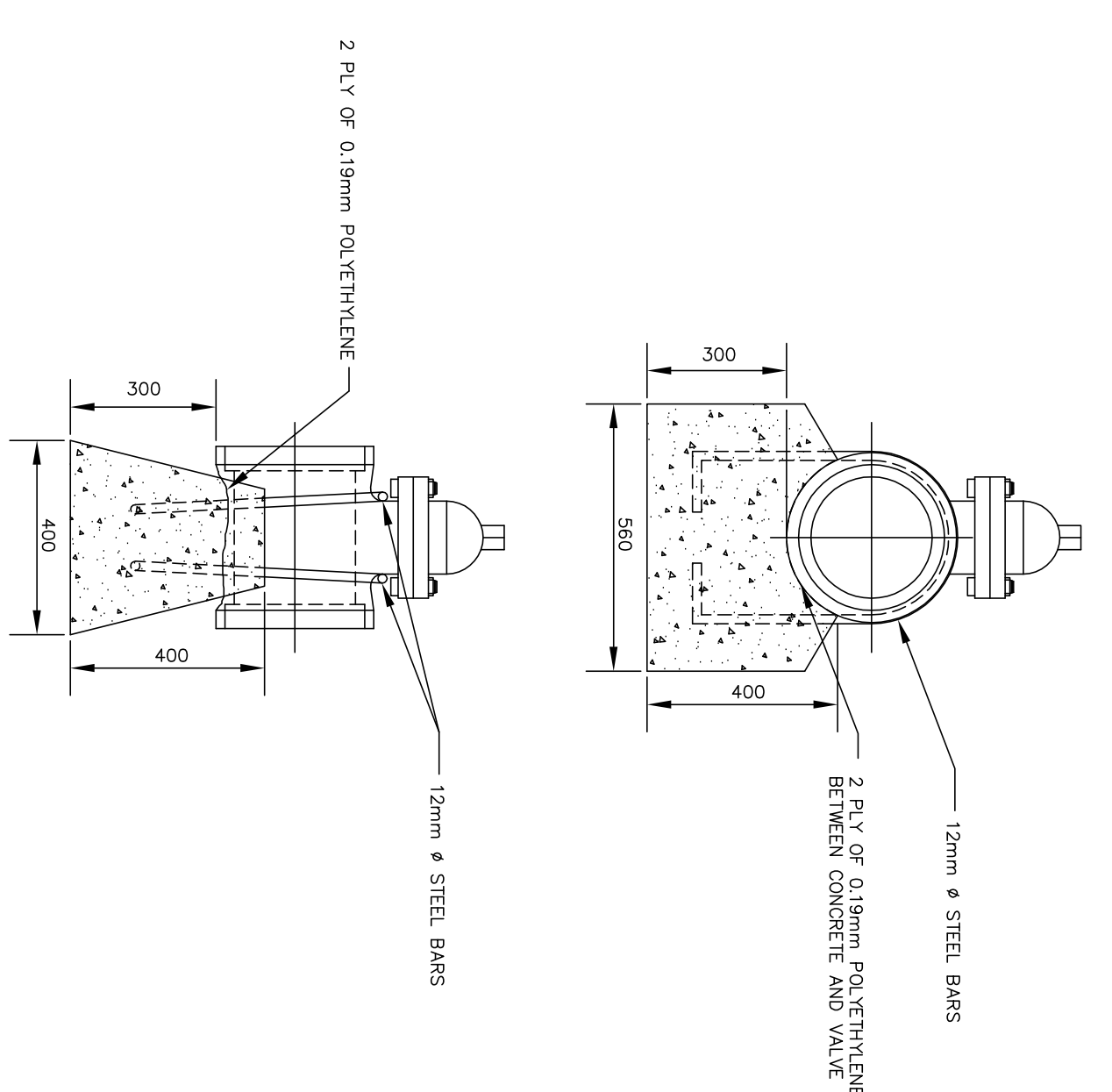
NOTE:
 1. WHEN SERVICE SADDLE REQUIRED, USE ROBAR DOUBLE STRAP SADDLE TAPPED C.C. THREAD
 2. CONNECTIONS TO MAIN SHALL BE AT LEAST 1m APART.
 3. SERVICES SHALL BE INSTALLED 90° FROM MAIN TO PROPERTY LINE.



NOTE:
 1) ALL PIPE FITTINGS & HOBANTS SHALL BE ELECTRICALLY CONDUCTIVE IF METAL PIPE IS USED
 2) THE EXTERIOR OF THE HOBANT SHALL BE BELOW THE GRADE FLANGE SHALL BE COATED WITH ONE COAT OF GOAL TAR.
 3) HOBANT NOT LOCATED AT INTERSECTION SHALL BE LOCATED ON THE PROJECTION OF A LOT
 4) LINE BETWEEN TWO LOTS & 1.7m FROM PROPERTY LINE.



NOTE:
 ANCHOR REQUIRED FOR ISOLATED MAIN LINE VALVES WHERE NO TEE OR CROSS FITTING IS PART OF THE VALVE INSTALLATION.



NOTE:
 1) ONLY COMPRESSION COUPLINGS SHALL BE USED.
 2) USE DOUBLE STRAP SERVICE SADDLE.
 3) SERVICES SHALL RUN 90° FROM MAIN TO PROPERTY LINE.
 4) USE TEFLON TAPE FOR ALL THREADED FITTINGS.

NOTES:
 1. SEE MMCD GOLD EDITION FOR DETAILS NOT REFERENCED IN THIS DRAWING SET

REVISIONS	ISSUE	DATE	DRN	CHD	APPROVED	DESCRIPTION	APPROVED FOR CONSTRUCTION	DATE	SCALE: HORIZ. NTS. VERT.	DRAWN BY	FIELD BOOK	DESIGN BY	DATE	DRAWING No.:	SHEET No.:	CITY OF PENTICTON ENGINEERING DEPARTMENT	DETAILS
													NOVEMBER 2004	D003	10 OF 10		

1.0 APPEAL PROCESS

- 1.1 The City of Penticton recognizes that occasionally a *Developer* may not agree with certain technical points contained within *This Bylaw*. In the event of a disagreement, the following *Appeal Process* shall be instituted. It should be noted that this *Appeal Process* is for technical points related to the design or construction of the *works and services* only.

2.0 FIRST STAGE APPEAL

- 2.1 The *Developer* will prepare and submit to the *Director of Development and Engineering Services* a written First Stage Appeal which lists the specific points of contention in this bylaw pertaining to the technical aspects of the project. The *Director of Development and Engineering Services* will review the submission and seek additional information from other sources as required. The *Director of Development and Engineering Services* will then render a written finding within 30 days of receipt of the written request for a First Stage Appeal. Should the *Developer* not agree with the First Stage Appeal findings, a Final Appeal may be initiated.

3.0 FINAL APPEAL

- 3.1 The *Developer* will prepare and submit to the *City Administrator* a written Final Appeal, which lists the specific points of contention in this bylaw pertaining to the technical aspects of the project. The Final Appeal shall be accompanied by a deposit in the amount of \$500.00 to cover the cost of the appeal as described in this Schedule. The *City Administrator* will review the submission, seek written submissions from others as required and determine who is required to present material at the Final Appeal. The Administrator will distribute all written material to the Standards Review Committee, those presenting, and set a date for the Final Appeal.
- 3.2 The Standards Review Committee will be chaired by the *City Administrator* and a further three representatives from the following list one of whom must either be the *City Engineer* or an independent municipal professional engineer with a license to practice in the province of British Columbia.
- 3.2.1 Standards Review Committee Members:
- 3.2.1.1 City of Penticton *City Engineer*.
 - 3.2.1.2 City of Penticton City Planner.
 - 3.2.1.3 City of Penticton Manager of Public Works.
 - 3.2.1.4 Municipal Engineer Licensed to practice in the province of BC.
 - 3.2.1.5 Representative from the *Development* Community.
 - 3.2.1.6 Representative from the Real Estate Community.
 - 3.2.1.7 *Development* Representative from another Engineering Department in a BC Municipality.
- 3.3 On the Hearing date, the Standards Review Committee will receive the *Developer's* written and oral presentations; receive written and oral presentations by other parties that the Administrator deems to be necessary; discuss the merits of the appeal, and render a written decision complete with an explanation. The written decision is to be issued 30 days from the date of request for a Final Appeal. A refund or invoice for additional expenses shall be issued by the Administrator within 60 days from the date of request for a Final Appeal.
- 3.4 The *Developer* shall be responsible for all outside party costs of the Final Appeal. The Appeal Process shall be considered to be additional to any time lines specified in this bylaw.

END OF SECTION

THE CORPORATION OF THE CITY OF PENTICTON

AGREEMENT

NATURE OF AGREEMENT

FILE:
DATE:

AGREEMENT#
RESOLUTION#

PARTICULARS: SUBDIVISION EARLY REGISTRATION AGREEMENT

THIS AGREEMENT made the day of , Two Thousand and .

BETWEEN: THE CORPORATION OF THE CITY OF PENTICTON, a body corporate duly incorporated under the laws of the Province of British Columbia, having an office at 171 Main Street, in the City of Penticton, Province of British Columbia

(the "City")

AND:

(the "Developer")

WHEREAS:

- A. The *Developer* is the registered *owner* or holder of a Registered Right to Purchase lands and premises situated, lying and being in the City of Penticton, Province of British Columbia, and more particularly known and described as:
- (the "Land")
- B. The *Developer* wishes to *subdivide* the Land, or part thereof, in the manner shown on a plan of *Subdivision* which has been submitted by the *Developer* to the *Approving Officer* of the *City* for approval, a copy of which plan is attached hereto as Schedule "A" (the "Subdivision Plan");
- C. The *Developer* is desirous of entering into this Agreement with the *City* pursuant to the provisions of Section 940 of the *Local Government Act*, in order to obtain approval from the *Approving Officer* of the Subdivision Plan prior to completion of the construction and installation on and off the Land of all *works and services* required by the *City* to be constructed and installed on and off the Land by the *Developer* in accordance with the *City Subdivision and Development Bylaw #2004-81*.

NOW THIS AGREEMENT WITNESSES that in consideration of the premises and of the mutual covenants and agreements herein contained, the parties hereto covenant and agree as follows:-

1. In this Agreement, unless the context otherwise requires:

"Approving Officer" shall mean the person appointed by the Council to that office, and his or her deputy.

"Complete" or **"Completion"** or any variation of these words, when used with respect to the Works, shall mean completion of the Works, or a part thereof as the context requires, in accordance with the provisions of this Agreement and to the satisfaction of the Director as so certified by him in writing.

"Contractor" shall mean persons employed by the *Developer* in construction and installation of the Works and includes any subcontractor employed by them.

"Director" shall mean the Director of Development and Engineering appointed by the Council, and his or her deputy.

"Works" shall mean all works, services, and other improvements required to be constructed or installed, both on and off the Land, by the *Developer* under Article 2 of this Agreement.

2. The *Developer* covenants and agrees to construct and install on the Land and adjacent to the Land as the case may be, in accordance with plans and specifications (the "Plans and Specifications") initialled by each of the parties for identification, the following *Works*: (Delete those not applicable)
 - a. Sanitary sewage *works and services* - Plans and Specifications _____, dated _____;
 - b. Water *works and services* - Plans and Specifications _____, dated _____;
 - c. Drainage *works and services* - Plans and Specifications _____, dated _____;
 - d. Road *works and services* on all *highways* on the Land shown as such on the Subdivision Plan, and adjacent and abutting *highways*, including:
 - i) roadway clearing and grubbing, grading, drainage and surfacing including paving,
 - ii) curbs and gutters,
 - iii) sidewalks,
 - iv) boulevards,all as set out in Plans and Specifications _____, dated _____;
 - e. Walkways - Plans and Specifications _____, dated _____;
 - f. Electrical and telephone including street lights - Plans and Specifications _____, dated _____.
3. Each of the parties acknowledges having in its possession a true copy of the Plans and Specifications and acknowledges and agrees that the Plans and Specifications are incorporated into and made part of this Agreement.
4. The *Developer* or its Contractors shall carry out the design, construction and installation of the Works in accordance with the Plans and Specifications, in accordance with the provisions of the Subdivision and Development Bylaw of the *City* from time to time in force, and under the supervision of a professional engineer. Wherever the Plans and Specifications and the Bylaw conflict, the provisions of the Bylaw shall govern.
5. The cost of designing, providing, constructing and installing the Works shall be borne by the *Developer*.
6. If requested by the *City*, the *Developer* shall obtain and provide to the *City* free of charge, true copies of all contracts and subcontracts entered into by the *Developer* or its Contractors and relating to construction and installation of the Works.
7. The decision of the Director shall be final and binding on all parties hereto in determining whether or not the construction and installation of the Works or any part thereof has been carried out and completed in accordance with the provisions of this Agreement.

8. The *Developer* shall cause the construction and installation of the Works to be carried out and completed not later than the _____ day of _____, 20_____ (the "Completion Date") and shall, prior to seeking the Director's certificate as to completion of the Works, provide to the *City* operating manuals for the Works and as-built drawings of the Works complying with the requirements of the Subdivision and Development Bylaw.
9. Unless provided otherwise in this Agreement, the *Developer* covenants and agrees that no building construction shall occur on the Land prior to the completion of the Works.
10.
 - a. The *Developer* further covenants and agrees to pay the *City* from time to time as and when the same are billed by the *City*, all applicable fees, including administration fees, engineering fees and legal costs incurred by the *City* and related to the *subdivision* of the Land and construction and installation of the Works.
 - b. As security for due and proper performance by the *Developer* of its obligations under Articles 2 and 8, the *Developer* has deposited with the *City* cash or a clean, irrevocable letter of credit, in the amount of \$ _____, being the cost of constructing and installing all of the Works required to be constructed and installed by the *Developer* under the terms of this Agreement as estimated by the Director.
 - c. The *Developer* agrees that if the Works or any part thereof are not completed in accordance with the provisions of this Agreement and by the Completion Date, or if the *Developer* shall be in default of any of its covenants herein contained, and such default shall continue for a period of fourteen (14) *days* or more after notice thereof has been given by the *City* to the *Developer*, the *City* may call for and receive the funds secured by the Letter of Credit and the *City* may complete the Works at the cost of the *Developer* and deduct from any funds held by the *City* as security hereunder, the cost of such completion, and the balance of the security, if any, shall be returned to the *Developer* less any administration fees required by the *City* and the security required under Article 19.
 - d. If there is insufficient security on deposit with the *City*, then the *Developer* shall pay such deficiency to the *City* immediately upon receipt of the *City's* invoice for completing the Work. It is understood and agreed that the *City* may do such Works either by itself, or by contractors employed by the *City*.
 - e. Any invoice rendered by the *City* to the *Developer* under the provisions of this Article 10 shall be regarded as charges for work done or services provided to the Land under the provisions of Section 258 of the *Community Charter* and may in addition to any other remedy available to the *City*, be collected in the same manner and with the like remedies as ordinary taxes upon land and improvements are collected under the *Local Government Act*.
 - f. In the event that the *City* elects to complete the Works at the cost of the *Developer*, the *Developer* agrees to provide to the *City* all plans and specifications for the Works that are in the *Developer's* possession or are under the control of the *Developer*, and to transfer to the *City* all the *Developer's* right and title to any materials of any nature and wherever located, that the *Developer* has purchased for the construction and installation of the Works.
11. The *City* will consent in writing to reductions in the amount of security provided under Article 10 of this Agreement from time to time as portions of the Works are completed. The amount of each reduction will be equal to the value of the portion of Works completed less 25%. Upon completion of all the Works, the security will be released and Article 12 will apply.

12. The *Developer* agrees to remedy at its expense any defects in the Works appearing during the period commencing on the Completion Date as confirmed in writing by the *City* and ending on the date that is one year thereafter (the "Warranty Period"), and agrees to repair any damage to other works or property, including works to which the Works are connected, that is caused by such defects, but nothing in this Agreement requires the *Developer* to remedy any condition caused by ordinary use of the Works or the negligence of the *City*, its employees or agents.
13. If revision of any as-built drawing or operation manual is, in the reasonable opinion of the Director, necessary as a result of the *Developer* remedying any defect in the Works, the *Developer* shall at its expense promptly supply to the *City* revised drawings or manuals as the case may be.
14. Prior to undertaking any work in compliance with Article 12, the *Developer* shall obtain the approval of the Director.
15. The Director may, at any time during the Warranty Period, inform the *Developer* of the existence of defects in the Works of which the *City* becomes aware, and require the *Developer* to remedy the defect in accordance with Article 12, and in such cases the approval referred to in Article 14 shall be deemed to have been given. If in the reasonable opinion of the Director the defect requires an immediate remedy and the *City* is unable, upon making reasonable efforts, to contact the *Developer*, the *City* may undertake the remediation of the defect in the Works at the *Developer's* expense and the provisions of Article 19 shall apply as if the *Developer* had failed to remedy a defect in the Works.
16. In the event of any disagreement between the *Developer* and the *City* as to whether any particular condition constitutes a defect in the Works, the Plans and Specifications shall govern the matter, and if the Plans and Specifications do not address the issue then the standards and specifications in the Subdivision and Development Bylaw shall govern the matter. The Director's interpretation of the bylaw shall be determinative.
17. For the purpose of remedying defects in the Works in accordance with this Agreement, the *City* permits the *Developer* to occupy and use the *City's highways* subject to such terms and conditions as may be imposed by the Director in issuing approvals under Article 14.
18. The *Developer* shall not employ any person or Contractor in the construction and installation of the Works required by this Agreement who, in the reasonable opinion of the Director, is unfit, incapable or unskilled, and shall employ and keep at the site of the Works a competent general works superintendent capable of speaking, reading and writing the English language. Any directions and requirements communicated to the superintendent by the *City* shall be deemed to have been communicated to the *Developer*.
19. As security for the performance of its obligations under Articles 12 and 13, the *Developer* agrees that the *City* may retain from the security provided under Article 10 \$ _____, being 5% of the cost of the Works. In the event that the *Developer* fails to remedy any defect in the Works or supply any drawing or manual within a reasonable time of being required to do so, the *City* may remedy the defect or supply the document at the *Developer's* expense and draw on the security to cover the cost. Any shortfall shall be recoverable from the *Developer* by the *City* as a contract debt. If the Warranty Period has not expired at the time the security is drawn upon, the *Developer* shall immediately increase or replace the security to the amount set out in this Article. Any unused security shall be returned to the *Developer* without interest on the expiry of the Warranty Period.
20. The *Developer* shall at its expense take out and maintain until the end of the Warranty Period comprehensive general liability insurance against claims for bodily injury including death and property damage or loss, arising from the *Developer's* operations on the *City's highways* in carrying out its obligations under this Agreement. Such insurance shall name the *City* as an insured and shall insure the

City and the *Developer* in the same manner and to the same extent as if individual policies in the amount of at least two million dollars had been issued to each. The policy shall contain a provision requiring the insurer to give the *City* thirty days' written notice before any alteration or cancellation of the policy shall be effective. A certificate of such insurance shall be provided to the Director before the *Developer* enters on any *highway* to perform the *Developer's* obligations under this Agreement.

21. The *Developer* indemnifies and saves the *City* harmless from:
 - a. all costs, expenses, damages, claims, demands, actions, suits and liabilities by whomever brought or made and however arising whether directly or indirectly from any defect in the construction and installation of the Works or from any injury or damage caused by such defect or any work done pursuant to this Agreement to remedy such defect, whether to persons or property, except any injury or damage caused by the negligence or other fault of the *City*;
 - b. all costs and expenses incurred by the *City* in constructing, repairing, replacing or maintaining any Works or property affected by any defect in the Works and which the *City* either owns or is by duty or custom obliged to construct, repair, replace or maintain; and
 - c. all expenses and costs incurred by reason of liens for non-payment of labour or material, Workers' Compensation Board assessments, unemployment insurance, or federal or provincial tax.
22. The definitions of words and phrases in the Subdivision and Development Bylaw shall apply in the interpretation of this Agreement.
23. The *Developer* shall at its sole expense obtain for the benefit of the *City* and in the *City's* standard form for such instruments, any statutory right of way required for any portion of the Works that is located on any land that is not a *highway*.
24. The *Developer* acknowledges that no part of the Works constitutes *excess or extended services* for the purposes of section 939 of the *Local Government Act* other than any part expressly identified as such under this Agreement.
25. The *Developer* acknowledges and agrees that immediately upon issuance by the Director of his certificate stating that the Works have been completed, all right, title and interest in and to the Works shall immediately pass to and vest in the *City*, but nothing herein contained shall derogate from the obligation of the *Developer* to maintain the Works for a period of one year following completion as aforesaid.
26. It is understood and agreed that the *City* has made no representations, covenants, warranties, guarantees, promises or agreements (oral or otherwise) with the *Developer* other than those contained in this Agreement. In the event that any part of this Agreement is declared to be void by a court of competent jurisdiction, then such part shall be deemed to be severed from this Agreement and the remainder shall continue in full force and effect.
27. Any demand or notice required or permitted to be given under the provisions of this Agreement shall be in writing and may be given by mailing such notice by prepaid registered post to the party concerned at the address for such party first above recited, and any such notice or demand mailed as aforesaid shall be deemed to have been received by the party to whom it is addressed on the second business *day* after the date of posting thereof.
28. Wherever the singular or masculine is used herein, the same shall be construed as meaning the plural, feminine or body corporate or politic where the text or the parties so require.

- 29. Time is of the essence of this Agreement.
- 30. This Agreement and the terms, covenants and conditions herein contained shall enure to the benefit of and be binding upon the parties hereto and their respective heirs, executors, administrators, successors and assigns.

IN WITNESS WHEREOF the parties hereto have executed this Agreement at the City of Penticton, Province of British Columbia, the *day* and year first above written.

The Corporate Seal of

THE CORPORATION OF THE CITY OF PENTICTON
was hereunto affixed in the presence of:

MAYOR

DEVELOPER

CLERK
(For use where *Developer* is a Corporation, see below)

DEVELOPER

The Corporate Seal of

THE CORPORATION OF THE CITY OF PENTICTON
A G R E E M E N T

NATURE OF AGREEMENT

**FILE:
DATE:**

**AGREEMENT#
RESOLUTION#**

PARTICULARS: BUILDING PERMIT SERVICING AGREEMENT

THIS AGREEMENT made the *day* of , Two Thousand and .

BETWEEN: THE CORPORATION OF THE CITY OF PENTICTON, a body corporate duly incorporated under the laws of the Province of British Columbia, having an office at 171 Main Street, in the City of Penticton, Province of British Columbia

(the "*City*")

AND:

(the "*Developer*")

WHEREAS:

A. The *Developer* is the registered *owner* or holder of a Registered Right to Purchase lands and premises situated, lying and being in the City of Penticton, Province of British Columbia, and more particularly known and described as:

(the "*Land*")

B. The *Developer* wishes to construct on the Land, or part thereof, in the manner shown on a plan of *development* which has been submitted by the *Developer* to the Director of Development and Engineering for approval, a copy of which plan is attached as Schedule "A" (the "*Development Plan*");

C. The *Developer* is desirous of entering into this Agreement with the *City* pursuant to the provisions of Section 940 of the *Local Government Act*, in order to obtain a *building permit* from the Director of Development and Engineering and prior to completion of the construction and installation of all *works and services* required by the *City* to be constructed and installed on the Land and adjacent and abutting *highways* by the *Developer* in accordance with the City Subdivision and Development Bylaw #2004-81.

NOW THIS AGREEMENT WITNESSES that in consideration of the premises and of the mutual covenants and agreements herein contained, the parties hereto covenant and agree as follows:-

1. In this Agreement, unless the context otherwise requires:

"**Complete**" or "**Completion**" or any variation of these words, when used with respect to the Works, shall mean completion of the Works, or a part thereof as the context requires, in accordance with the provisions of this Agreement and to the satisfaction of the Director as so certified by him in writing.

"**Contractor**" shall mean persons employed by the *Developer* in construction and installation of the Works and includes any subcontractor employed by them.

"**Director**" shall mean the Director of Development and Engineering appointed by the Council, and his or her deputy.

"**Works**" shall mean all works, services, and other improvements required to be constructed or installed, both on and off the Land, by the *Developer* under Article 2 of this Agreement.

2. The *Developer* covenants and agrees to construct and install on the Land and adjacent to the Land as the case may be, in accordance with plans and specifications (the "Plans and Specifications") initialled by each of the parties for identification, the following Works: (Delete those not applicable)
 - a. All access aisles on the Land as shown on the Development Plan;
 - b. Drainage *works and services* - Plans and Specifications _____, dated _____;
 - c. Sanitary sewage *works and services* - Plans and Specifications _____, dated _____;
 - d. Water *works and services* - Plans and Specifications _____, dated _____;
 - e. Road *works and services* on all *highways* abutting and adjacent to the Land, including:
 - i). roadway clearing and grubbing, grading, drainage and surfacing including paving,
 - ii) curbs and gutters,
 - iv) sidewalks,
 - v) boulevards,all as set out in - Plans and Specifications _____, dated _____;
 - f. Walkways - Plans and Specifications _____, dated _____;
 - g. Electrical and telephone including street lights - Plans and Specifications _____ dated _____.
3. Each of the parties hereto acknowledges having in its possession a true copy of the Plans and Specifications and acknowledges and agrees that the Plans and Specifications are incorporated into and made part of this Agreement.
4. The *Developer* or its Contractors shall carry out the design, construction and installation of the Works in accordance with the Plans and Specifications, in accordance with the provisions of the Subdivision and Development Bylaw of the *City* from time to time in force, and under the supervision of a professional engineer. Wherever the Plans and Specifications and the Bylaw conflict, the provisions of the Bylaw shall govern.
5. The cost of providing, construction and installing the Works shall be borne by the *Developer*.
6. If requested by the *City*, the *Developer* shall obtain and provide to the *City* free of charge, true copies of all contracts and subcontracts entered into by the *Developer* or its Contractors and relating to the construction and installation of the Works.

7. The decision of the Director shall be final and binding on all parties hereto in determining whether or not the construction and installation of the Works or any part thereof has been carried out and completed in accordance with the provisions of this Agreement.
8. The *Developer* shall cause the construction and installation of the Works to be carried out and completed not later than the ___day of _____ 20_____ (the "Completion Date") and shall, prior to seeking the Director's certificate as to completion of the Works, provide to the *City* operating manuals for the Works and as-built drawings of the Works complying with the requirements of the Subdivision and Development Bylaw.
9. The *Developer* covenants and agrees to pay to the *City* from time to time as and when the same are billed by the *City*, all inspection fees, administration fees, engineering fees, and legal costs incurred by the *City* and related to the *development* of the Land and construction and installation of the Works.
10.
 - a. As security for due and proper performance by the *Developer* of all its obligations under Article 2, the *Developer* has deposited with the *City* cash or a clean irrevocable letter of credit in the amount of \$_____, being the cost of constructing and installing all of the Works required to be constructed and installed by the *Developer* under the terms of this Agreement as estimated by the Director.
 - b. The *Developer* agrees that if the Works or any part thereof are not completed in accordance with the provisions of this Agreement and by the Completion Date, or if the *Developer* shall be in default of any of his covenants herein contained, and such default shall continue for a period of fourteen (14) days after notice thereof has been given by the *City* to the *Developer*, the *City* may call for and receive the funds secured by the Letter of Credit and the *City* may complete the Works at the cost of the *Developer* and deduct from any funds held by the *City* as security hereunder, the cost of such completion, and the balance of the security, if any, shall be returned to the *Developer* less any administration fees required by the *City*.
 - c. If there is insufficient money on deposit with the *City* under the Letter of Credit, then the *Developer* shall pay such deficiency to the *City* immediately upon receipt of the *City's* invoice for completing the Works. It is understood and agreed that the *City* may do such Works either by itself, or by contractors employed by the *City*.
 - d. Any invoice rendered by the *City* to the *Developer* under the provisions of this Article 10 shall be regarded as charges for work done or services provided to the Land under the provisions of Section 258 of the *Community Charter* and may in addition to any other remedy available to the *City*, be collected in the same manner and with the like remedies as ordinary taxes upon land and improvements are collected under said Act.
 - e. In the event that the *City* elects to complete the works at the cost of the *Developer*, the *Developer* agrees to provide to the *City* all plans and specifications for the Works that are in the *Developer's* possession or are under the control of the *Developer*, and to transfer to the *City* all of the *Developer's* right and title to any materials of any nature and wherever located, that the *Developer* has purchased for the construction and installation of the Works.
11. The *City* will consent in writing to reductions in the amount of security provided under Article 10 of this Agreement from time to time as portions of the required Works are completed. The amount of each reduction will be equal to the value of the portion of Works completed less 25%. Upon completion of all the Works, the security will be released and Article 12 will apply.

12. The *Developer* agrees to remedy at its expense any defects in the Works appearing during the period commencing on the Completion Date as confirmed in writing by the *City* and ending on the date that is one year thereafter (the "Warranty Period"), and agrees to repair any damage to other works or property, including works to which the Works are connected, that is caused by such defects, but nothing in this Agreement requires the *Developer* to remedy any condition caused by ordinary use of the Works or the negligence of the *City*, its employees or agents.
13. If revision of any as-built drawing or operation manual is, in the reasonable opinion of the Director, necessary as a result of the *Developer* remedying any defect in the Works, the *Developer* shall at its expense promptly supply to the *City* revised drawings or manuals as the case may be.
14. Prior to undertaking any work in compliance with Article 12, the *Developer* shall obtain the approval of the Director.
15. The Director may, at any time during the Warranty Period, inform the *Developer* of the existence of defects in the Works of which the *City* becomes aware, and require the *Developer* to remedy the defect in accordance with Article 12, and in such cases the approval referred to in Article 14 shall be deemed to have been given. If in the reasonable opinion of the Director the defect requires an immediate remedy and the *City* is unable, upon making reasonable efforts, to contact the *Developer*, the *City* may undertake the remediation of the defect in the Works at the *Developer's* expense and the provisions of Article 19 shall apply as if the *Developer* had failed to remedy a defect in the Works.
16. In the event of any disagreement between the *Developer* and the *City* as to whether any particular condition constitutes a defect in the Works, the Plans and Specifications shall govern the matter, and if the Plans and Specifications do not address the issue then the standards and specifications in the Subdivision and Development Bylaw shall govern the matter. The Director's interpretation of the bylaw shall be determinative.
17. For the purpose of remedying defects in the Works in accordance with this Agreement, the *City* permits the *Developer* to occupy and use the *City's highways* subject to such terms and conditions as may be imposed by the Director in issuing approvals under Article 14.
18. The *Developer* shall not employ any person or Contractor in the construction and installation of the Works required by this Agreement who, in the reasonable opinion of the Director, is unfit, incapable or unskilled, and shall employ and keep at the work site on the Land during any work performed under this Agreement a competent general works superintendent capable of speaking, reading and writing the English language. Any directions and requirements communicated to the superintendent by the *City* shall be deemed to have been communicated to the *Developer*.
19. As security for the performance of its obligation under Articles 12 and 13, the *Developer* agrees that the *City* may retain from the security provided under Article 10 \$_____, being 5% of the cost of the Works. In the event that the *Developer* fails to remedy any defect in the Works or supply any drawing or manual within a reasonable time of being required to do so, the *City* may remedy the defect or supply the document at the *Developer's* expense and draw on the security to cover the cost. Any shortfall shall be recoverable from the *Developer* by the *City* as a contract debt. If the Warranty Period has not expired at the time the security is drawn upon, the *Developer* shall immediately increase or replace the security to the amount set out in this Article. Any unused security shall be returned to the *Developer* without interest on the expiry of the Warranty Period.

20. The *Developer* shall at its expense take out and maintain until the end of the Warranty Period comprehensive general liability insurance against claims for bodily injury including death and property damage or loss, arising from the *Developer's* operations on the *City's highways* in carrying out its obligations under this Agreement. Such insurance shall name the *City* as an insured and shall insure the *City* and the *Developer* in the same manner and to the same extent as if individual policies in the amount of at least two million dollars had been issued to each. The policy shall contain a provision requiring the insurer to give the *City* thirty *days* written notice before any alteration or cancellation of the policy shall be effective. A certificate of such insurance shall be provided to the Director before the *Developer* enters on any *highway* to perform the *Developer's* obligations under this Agreement.
21. The *Developer* indemnifies and saves the *City* harmless from:
- a. all costs, expenses, damages, claims, demands, actions, suits and liabilities by whomever brought or made and however arising whether directly or indirectly from any defect in the construction and installation of the Works or from any injury or damage caused by such defect or any work done pursuant to this Agreement to remedy such defect, whether to persons or property, except any injury or damage caused by the negligence or other fault of the *City*;
 - b. all costs and expenses incurred by the *City* in constructing, repairing, replacing or maintaining any Works or property affected by any defect in the Works and which the *City* either owns or is by duty or custom obliged to construct, repair, replace or maintain; and
 - c. all expenses and costs incurred by reason of liens for non-payment of labour or material, Workers' Compensation Board assessments, unemployment insurance, or federal or provincial tax.
22. The definitions of words and phrases in the Subdivision and Development Bylaw shall apply in the interpretation of this agreement.
23. The *Developer* shall at its sole expense obtain for the benefit of the *City* and in the *City's* standard form for such instruments, any statutory right of way required for any portion of the Works that is located on any land that is not a *highway*.
24. The *Developer* acknowledges that no part of the Works constitutes excess or extended services for the purposes of section 939 of the *Local Government Act*, other than any part expressly identified as such in this Agreement.
25. Any demand or notice required or permitted to be given under the provisions of this Agreement shall be in writing and may be given by mailing such notice by prepaid registered post to the party concerned at the address for such party first above recited, and any such notice or demand mailed as aforesaid shall be deemed to have been received by the party to whom it is addressed on the second business *day* after the date of posting thereof.
26. The *Developer* acknowledges and agrees that immediately upon issuance by the Director of his certificate stating that the Works have been completed, all right, title and interest in and to the Works shall immediately pass to and vest in the *City*, but nothing herein contained shall derogate from the obligation of the *Developer* to maintain the Works for a period of one (1) year following completion as aforesaid.
27. It is understood and agreed that the *City* has made no representations, covenants, warranties, guarantees, promises or agreements (oral or otherwise) with the *Developer* other than those contained in this Agreement. In the event that any part of this Agreement is declared to be void by a court of competent jurisdiction, then

such part shall be deemed to be severed from this Agreement and the remainder shall continue in full force and effect.

- 28. Wherever the singular or masculine is used herein, the same shall be construed as meaning the plural, feminine or body corporate or politic where the text or the parties so require.
- 29. Time is of the essence of this Agreement.
- 30. This Agreement and the terms, covenants and conditions herein contained shall enure to the benefit of and be binding upon the parties hereto and their respective heirs, executors, administrators, successors and assigns.

IN WITNESS WHEREOF the parties hereto have executed this Agreement at the City of Penticton, Province of British Columbia, the *day* and year first above written.

The Corporate Seal of

THE CORPORATION OF THE CITY OF PENTICTON

was hereunto affixed in the presence of:

MAYOR

DEVELOPER

CLERK

DEVELOPER

(FOR USE WHERE *DEVELOPER* IS A CORPORATION, SEE BELOW)

The Corporate Seal of

was hereunto affixed in the presence of:

This Schedule sets out the City's minimum standards for quality in design, construction and record-keeping for the *works and services* to be designed and constructed in accordance with all schedules of this bylaw.

1.0 ENGINEERING REQUIREMENTS

- 1.1 The *Owner* shall demonstrate to the satisfaction of the *City* that the services of one *Consulting Engineer* are retained to undertake the design, inspection, testing and record-keeping for the *works and services*.
- 1.2 The *Owner* shall provide the *City* with the *Owner / "Consulting Engineering"* confirmation letter of agreement as outlined in Section 6.0 – Quality Assurance Agreement.

2.0 CONSTRUCTION REQUIREMENTS

- 2.1 The *Owner (Consulting Engineer)* shall demonstrate that to the satisfaction of the *City Engineer* that he has or shall retain the services of one or more qualified Contractors to undertake the construction of the *works and services*.
- 2.2 The *Owner (Consulting Engineer)* shall ensure that its Contractor(s) constructs the *works and services* in accordance with the design, drawings, plans and specifications approved for construction by the *City*.

3.0 CONSTRUCTION PROGRAM AND SCHEDULE

- 3.1 Following the approval of the design drawings and prior to the commencement of the construction of any *works and services*, a construction program summarizing methods, and schedules shall be submitted to the *City*.
 - 3.1.1 Preconstruction Meeting:
 - 3.1.1.1 The *Consulting Engineer* shall co-ordinate pre-construction notices or meetings with the *City* and all agencies/*owners* or other utilities which may be directly or indirectly affected by the work schedule.
- 3.2 The *Consulting Engineer* is required to schedule regular site inspections during construction to ensure that all *works and services* constructed satisfy the intent of the design and conform to the approved drawings, plans and specifications.

4.0 RECORD KEEPING

- 4.1 The *Owner's (Consulting Engineer)* record-keeping must detail the procedures that will be used to ensure and verify that proper records will be kept throughout the design, construction and warranty phases of the *development*.
 - 4.1.1 Details of any field design or construction change orders to the drawings, plans and specifications to which changes are approved by the *City*.
 - 4.1.2 Deficiency Identification Forms (Items of the works that are either not supplied or constructed in accordance with the design (drawings, plans and specifications) or that require remedial or corrective action).

4.1.3 Inspection and test records documentation copies to the *City*.

5.0 INSPECTIONS / AS-BUILTS

- 5.1 Notwithstanding the generality of the foregoing, the *Owner* shall ensure that its *Consulting Engineer* provides the *City* with the following:
- 5.1.1 Certification prior to paving that it has tested those items of the *works and services* that are below areas to be paved and that same comply with the design (drawings, plans and specifications). Such certification shall be accompanied by all test and inspection reports plus video tapes and reports on pipe lines.
 - 5.1.2 Field measurement records of *works and services* completed that have been used by the *Consulting Engineer* to accurately prepare as-built AutoCAD disk that are filed with the *City*.
 - 5.1.3 Certification prior to acceptance by the *City* that all infrastructure works have been constructed inspected and tested in accordance with the design (drawings, plans and specifications) and are operational.

6.0 QUALITY CONTROL AND ASSURANCE FORM

To: The City of Penticton
Development and Engineering Services Department

I or We
Owner: Name: _____

Address: _____

Consulting Engineer: Name: _____

Address: _____

For Project: _____

Agree to supply, the *City* of Penticton, behalf of the *Owner*, the professional services to certify compliance with the approved engineered drawings and Subdivision and Development Bylaw 2004-81.

- 1. Engineering Designs and Drawing Approvals Including Calculations to support Design Criteria
- 2. Estimated or Tendered Construction Costs Including Security Deposit Requirements And Inspection and Contingency Deposits Required
- 3. Preconstruction Meeting and Notifications Including Contractor, Schedule, Methods and Materials And Associated *City* or other Utility Works
- 4. Site Inspections and Quality Testing in accordance with Approved Drawings and Bylaw Standards and Specifications
- 5. As-built Drawings and Testing Records Including Infrastructure Plan & Profile, Location & Grade and Lot Servicing Records Locations & Depths
- 6. *Construction Completion Certificates*
- 7. Final Acceptance Certificates
- 8. Proof of Professional Liability Insurance

Date: _____

Owner (Signature)

Engineering Consultant (Signature)

7.0 CONSTRUCTION COMPLETION CERTIFICATE

Date: _____

Owner: _____

Consulting Engineer: _____

Contractor: _____

Dear Sirs:

RE: _____

This is to certify that to the best of our knowledge all *works and services* in connection with the above noted project were complete as of _____ in accordance with the approved engineering and as-built drawings including inspections, testing, and acceptance as per Subdivision and Development Bylaw 2004-81.

This does not exempt the *owner* from any further requirements or agreement responsibilities which may come to the knowledge of the *City* during the one year maintenance period.

Based on the above construction completion date the maintenance period shall extend to _____ and the 25% bond in the amount of \$ _____ will be confirmed for release on this date, in compliance with issuance of a *Final Acceptance Certificate*.

Consulting Engineer

Professional Seal

City Engineer's Approval

C: Director of Engineering and Development
Director of Corporate Services
General Manager, Electrical Utility
Public Works Manager
Planner

8.0 FINAL ACCEPTANCE CERTIFICATE

Date: _____

Owner: _____

Consulting Engineer: _____

Contractor: _____

Dear Sirs:

RE: _____

This is to certify that to the best of our knowledge all *works and services* in connection with the above noted project achieved Final Acceptance as of _____.

Based on the above date, it is recommended that the *City* accept the *works and services* and release the 25% maintenance bond in the amount of \$ _____.

Consulting Engineer

Professional Seal

City Engineer's Approval

C: Director of Engineering and Development
Director of Corporate Services
General Manager, Electrical Utility
Public Works Manager
Planner

END OF SECTION

THE CORPORATION OF THE CITY OF PENTICTON

A G R E E M E N T

NATURE OF AGREEMENT

**FILE:
DATE:**

**AGREEMENT#
RESOLUTION#**

PARTICULARS: WORKS AND SERVICES WARRANTY AGREEMENT

THIS AGREEMENT made the _____ day of _____, in the year 20_____.

BETWEEN: (the "Owner")

AND: THE CORPORATION OF THE CITY OF PENTICTON, a body corporate duly incorporated under the laws of the Province of British Columbia, having an office at 171 Main Street, in the City of Penticton, Province of British Columbia

("the City")

WHEREAS: The *Owner* has installed *works and services* on the *City's highways* in connection with the *subdivision or development* of the *Owner's* land legally described as (*insert legal description*), which *works and services* are described in Schedule A attached to and forming part of this Agreement (the "Works"); and

WHEREAS: It is the responsibility of the *Owner* to install the Works in accordance with standards and specifications prescribed by the *City*, which standards and specifications include a requirement that the *Owner* remedy any defect in the Works becoming apparent during the first year of operation of the Works (the "Warranty Period"); and

WHEREAS: The *Owner* has requested the issuance of *development* approvals in respect of the *Owner's* land immediately following the completion of installation of the Works, and before the expiry of the Warranty Period;

THIS AGREEMENT is evidence that, in consideration of the mutual promises set out in the Agreement and the payment of one dollar by the *City* to the *Owner*, the receipt of which is acknowledged by the *Owner*, the parties agree as follows:

1. The *Owner* agrees to remedy at its expense any defects in the Works appearing during the period commencing on the Completion Date of the Works as confirmed in writing by the Director of Development and Engineering of the *City* (the "Director") and ending on the date that is one year thereafter (the "Warranty Period"), and agrees to repair any damage to other works or property, including works to which the Works are connected, that is caused by such defects, but nothing in this Agreement requires the *Owner* to remedy any condition caused by ordinary use of the Works or the negligence of the *City*, its employees or agents.
2. If revision of any as-built drawing or operation manual is, in the reasonable opinion of the Director, necessary as a result of the *Owner* remedying any defect in the Works, the *Owner* shall at its expense promptly supply to the *City* revised drawings or manuals as the case may be.
3. Prior to undertaking any work in compliance with paragraph 1, the *Owner* shall obtain the approval of the Director.

4. The Director may, at any time during the Warranty Period, inform the *Owner* of the existence of defects in the Works of which the *City* becomes aware, and require the *Owner* to remedy the defect in accordance with paragraph 1, and in such cases the approval referred to in paragraph 3 shall be deemed to have been given. If in the reasonable opinion of the Director the defect requires an immediate remedy and the *City* is unable, upon making reasonable efforts, to contact the *Owner*, the *City* may undertake the remediation of the defect in the Works at the *Owner's* expense and the provisions of paragraph 8 shall apply as if the *Owner* had failed to remedy a defect in the Works.
5. In the event of any disagreement between the *Owner* and the *City* as to whether any particular condition constitutes a defect in the Works, the plans and specifications for the Works shall govern the matter, and if the plans and specifications do not address the issue then the standards and specifications in the Subdivision and Development Bylaw of the *City* shall govern the matter. The Director's interpretation of the bylaw shall be determinative.
6. For the purpose of remedying defects in the Works in accordance with this Agreement, the *City* permits the *Owner* to occupy and use the *City's highways* subject to such terms and conditions as may be imposed by the Director in issuing approvals under paragraph 3.
7. The *Owner* shall not employ any person or contractor in the repair of defects in the Works required by this Agreement who, in the reasonable opinion of the Director, is unfit, incapable, or unskilled, and shall employ and keep at the site of any work performed under this Agreement a competent general works superintendent capable of speaking, reading and writing the English language. Any directions and requirements communicated to the superintendent by the *City* shall be deemed to have been communicated to the *Owner*.
8. As security for the performance of its obligations under this Agreement, the *Owner* has deposited with the *City* cash or a clean, irrevocable letter of credit in the amount of \$ _____, being 5% of the cost of constructing the Works as estimated by the Director. In the event that the *Owner* fails to remedy any defect in the Works within a reasonable time of being required to do so under paragraph 4 or supply revised drawings or manuals under paragraph 2, the *City* may remedy the defect or supply the documents at the *Owner's* expense and draw on the security to cover the cost. Any shortfall shall be recoverable from the *Owner* by the *City* as a contract debt. If the Warranty Period has not expired at the time the security is drawn upon, the *Owner* shall immediately increase or replace the security to the amount set out in this paragraph. Any unused security shall be returned to the *Owner* without interest on the expiry of the Warranty Period.
9. The *Owner* shall at its expense take out and maintain until the end of the Warranty Period comprehensive general liability insurance against claims for bodily injury including death and property damage or loss, arising from the *Owner's* operations on the *City's highways* in carrying out its obligations under this Agreement. Such insurance shall name the *City* as an insured and shall insure the *City* and the *Owner* in the same manner and to the same extent as if individual policies in the amount of at least two million dollars had been issued to each. The policy shall contain a provision requiring the insurer to give the *City* thirty *days'* written notice before any alteration or cancellation of the policy shall be effective. A certificate of such insurance shall be provided to the Director before the *Owner* enters on any *highway* to perform the *Owner's* obligations under this Agreement.
10. The *Owner* indemnifies and saves the *City* harmless from:
 - a. all costs, expenses, damages, claims, demands, actions, suits and liabilities by whomever brought or made and however arising whether directly or indirectly from any defect in the construction and installation of the Works or from any injury or damage caused by such defect or any work done pursuant to this Agreement to remedy such defect, whether to persons or property, except any injury or damage caused by the negligence or other fault of the *City*;

- b. all costs and expenses incurred by the *City* in constructing, repairing, replacing or maintaining any works or property affected by any defect in the Works and which the *City* either owns or is by duty or custom obliged to construct, repair, replace or maintain; and
 - c. all expenses and costs incurred by reason of liens for non-payment of labour or material, Workers' Compensation Board assessments, unemployment insurance, or federal or provincial tax.
11. The definitions of words and phrases in the Subdivision and Development Bylaw shall apply in the interpretation of this Agreement.
12. Time is of the essence of this Agreement.

IN WITNESS OF WHICH the authorized signatories of the parties have set their hands on the date and year written above.

(INSERT NAME OF OWNER/DEVELOPER)

Authorized Signatory

Authorized Signatory

The Corporate Seal of
THE CORPORATION OF THE CITY OF PENTICTON
was hereunto affixed in the presence of:

MAYOR

CLERK

SCHEDULE A

(ATTACH DESCRIPTION OF *WORKS AND SERVICES* FROM SERVICING AGREEMENT OR REPORT OF OWNER'S ENGINEER)

1.0 GENERAL

- 1.1 The water distribution system design should be prepared under the direction of a design professional who has the appropriate experience and is registered with the Association of Professional Engineers and Geoscientists of British Columbia.
- 1.2 Consulting Engineers retained by the Owner to design the works and services must consult with the City Engineer to determine what existing information may be of assistance to them.
- 1.3 The water system design is to be done utilizing a calibrated water model acceptable to the City Engineer unless the system design, as determined by the City Engineer, is not complex. Should the City of Penticton have a calibrated water model, it will be made available to the Consultant.

2.0 PER CAPITA DEMAND

- 2.1 The design criteria noted in Table 2.1 must be used for most applications. Where, in the opinion of the City Engineer, the flow characteristics of the development area are substantially different the criteria may be modified.

Table 2.1

Demand	Flow (L/c/d)
Average Day Demand (ADD)	700 litres per capita per day (L/c/d)
Maximum Day Demand (MDD)	1750
Peak Hour Demand (PHD)	2625

3.0 FIRE FLOW DEMAND

- 3.1 The design criteria noted in this subsection must be used except where, in the opinion of the City Engineer, the flow characteristics of the Development Area are substantially different, the criteria may be modified to take into account the differences.
- 3.2 The minimum fire gravity flows and flow duration shown in Table 3.2 must be met for the Official Community Plan land use designation applicable to the land being subdivided or developed under maximum day demand conditions.

DESIGNED FIRE GRAVITY FLOW AND FLOW DURATION AS PER CURRENT OFFICIAL COMMUNITY PLAN LAND USE DESIGNATION

TABLE 3.2

LAND USE DESIGNATION as per OCP	DESIGNED FIRE FLOW [l/s]	DURATION HOURS [h]
Agriculture (AG)	60	2.0
Country Residential (CR)	60	2.0
Low Density Residential (LR)	60	2.0
Multi Family Low Density (MFLD)	90	2.0
Multi Family Medium Density (MFMD)	90	2.0
Medium Density Residential (MR)	90	2.0
High Density Residential (HR)	150	2.5
Administration/Institutional (A)	150	2.5
Okanagan Lake Waterfront (OW)	150	2.5
General Commercial (GC)	150	2.5
Service Commercial (SC)	150	2.5
Tourist Commercial (TC)	150	2.5
Downtown Commercial (DC)	225	2.5
Industrial (I)	225	3.0
Columbia Heights Neighborhood	150	2.0
Greenfield Development (New Planning areas)	90	2.0

- 3.3 The minimum fire flow volume can be reduced by 10% if in the City Engineer's opinion the level of additional fire protection that would be provided for the expenditure required to realize it, is determined to be marginal.
- 3.4 Land not subject to any of the designations in Table 3.2 shall have a minimum fire flow requirement of 90 l/s for 2.0 hours, unless otherwise specified.

4.0 WATER DISTRIBUTION SYSTEM PIPE FORMULA

- 4.1 The system shall be designed to provide day to day domestic supply and demand flows for fire protection.
- 4.2 Design computations for water distribution systems will be based on the Hazen-William's formula:

4.2.1
$$Q = \frac{CD^{2.63} S^{0.54}}{278\ 780}$$

4.2.2 Where: Q = Rate of flow in L/S

D = Internal pipe diameter in mm

S = Slope of hydraulic grade line in m/m

C = Roughness Coefficient suitable for the type and age of the pipe being modeled

5.0 WATER PRESSURE

- 5.1 The design criteria noted in this subsection must be used except where, in the opinion of the City Engineer, the flow characteristics of the development area are substantially different, the criteria may be modified to take into account the differences.
- 5.2 The water system must be designed to provide gravity flow domestic water at the designed building main floor elevation on each parcel in accordance with Table 5.2.

Table 5.2

Pressure	Kpa (psi)
Maximum Static Pressure	1034 (150)
Minimum System Pressure at ADD	275 (40)
Minimum System Pressure at PHD	250 (36)
Minimum System Pressure at MDD + Fire Flow	140 (20)

6.0 HYDRAULIC NETWORK CONSIDERATION

- 6.1 The maximum length of any permanent non-interconnected water main is 150 m. All mains exceeding 150 m, unless it is a temporary situation, must be looped.
- 6.2 Where the water system network is inadequate, installation of supplementary mains may be required and may necessitate the provision of rights-of-way in favor of the City.
- 6.3 In residential areas, water mains servicing fire hydrants must be 150 mm diameter or larger.
- 6.4 Water mains in commercial/industrial/institutional areas shall be designed to take into account anticipated demands and fire flows, and the minimum allowable size is 200 mm.
- 6.5 The maximum allowable design velocity shall not exceed the following:
- | | |
|--|------------|
| 6.5.1 Pump supply, reservoir trunk mains | 2.0 m/sec. |
| 6.5.2 Distribution lines: At PHD | 2.0 m/sec. |
| 6.5.3 Fire Flow Conditions | 4.0 m/sec. |
- 6.6 The minimum allowable design velocity is 0.15 m/sec.

7.0 MINIMUM DEPTH OF COVER

- 7.1 The cover over any domestic water main or service must not be less than 1.5 m.
- 7.2 The cover over any irrigation water main must not be less than 1.0 m.

8.0 MINIMUM CLEARANCE

- 8.1 At all locations, there must be a minimum lineal horizontal clearance of 1m between the water main and other existing or proposed underground services or open ditches, except sanitary sewers and storm drains.
- 8.2 A minimum horizontal clearance of 3 m must be maintained between the water main and a sanitary sewer or storm drain, or where this is not possible, the clearance shall be in accordance with the Ministry of Health regulations.

- 8.3 Where it is necessary for the water main to cross other underground services, the crossing must be made at an angle greater than 20 degrees horizontal.
- 8.4 The minimum vertical clearance between pipes at the crossing point must be in accordance with Ministry of Health Regulations.
- 8.5 The design drawings must indicate whether the water main passes over or under other underground services in which it is crossing.

9.0 HORIZONTAL ALIGNMENT AND CORRIDORS

- 9.1 Water mains must be normally designed to be parallel to the road centerline.
- 9.2 Water mains must be located within the designated corridor normally in the road right-of-way or a dedicated easement as indicated in the applicable Standard Drawings of the typical cross section for that road.
- 9.3 Curved mains permitted, subject to meeting manufacturer's recommendation only.
- 9.4 Water main extensions shall extend to and terminate at the furthest property line of the last lot it serves.
- 9.5 When the utility is required to cross private land(s), the right-of-way must be sufficient to repair or replace the utility line and be a minimum of 6.0 m wide.

10.0 VERTICAL ALIGNMENT

- 10.1 Water mains must be designed to minimize high points in the main. Where a high point is unavoidable, either a hydrant, or air release valve should be installed at that point.
- 10.2 A fire hydrant must be installed at low points in the water main.
- 10.3 Where the slope of water main exceeds 10%, the design must provide for proper anchorage of the pipe.

11.0 VALVES

- 11.1 In general, valves must be located as follows:
 - 11.1.1 In intersections, in a cluster at the pipe intersection or at the projected property lines, to avoid conflicts with curbs and sidewalks:
 - 11.1.1.1 4 valves at "X" intersection
 - 11.1.1.2 3 valves at "T" intersection
 - 11.1.2 Not more than 150 m apart for single family residential areas.
 - 11.1.3 Must be at both ends of a utility right-of-way.
 - 11.1.4 It is possible to isolate a section of water main by operating no more than 4 valves.
 - 11.1.5 In locations and at a frequency so that not more than one hydrant is out of service when a section of the main line is turned off.
 - 11.1.6 An isolation gate valve is required for each hydrant.

- 11.2 Valves must be the same diameter as the main up to 300 mm diameter and may be reduced by one size less than the pipe size for mains greater than 300 mm in diameter. Gate valves must be used up to and including 300 mm diameter.
- 11.3 Butterfly valves with gear operators will be allowed in mains larger than 300 mm.

12.0 HYDRANTS

- 12.1 The Consulting Engineer must consider the existing and intended use in the area, and ensure that adequate spacing is provided in accordance with the Standard Hydrant Distribution table in the "Water Supply for Public Fire Protection 1999" - published by Fire Underwriters Survey. Preferred locations at intersection corner cuts.
- 12.2 Hydrants must be located so that the spacing is never greater than 180 m in 'Low Density Residential' areas identified within the OCP and 90m in all other areas.
- 12.3 The design and locations of the hydrants must not conflict with existing or proposed street lights, power poles, transformers or driveways, etc.

13.0 AIR VALVES

- 13.1 The general application of the three types of air valves must be:
- 13.1.1 Air/vacuum valves for filling or discharging mains and preventing negative pressures.
- 13.1.2 Air release valves at high points for small air release during normal operation.
- 13.1.3 Combination valves for combination of air/vacuum and air release valves.
- 13.2 Combination air valves must be installed at the summit of all mains 250 mm diameter and larger, except where the difference in grade between the summit and valley is less than 600 mm.
- 13.3 Air valves are not required on water mains 200 mm diameter and smaller, except under special needs as determined by the professional engineer retained by the Owner to design the Works or as required by the City.

14.0 BLOW OFFS

- 14.1 Blow-offs or hydrants are required at the dead ends of all water mains.

15.0 CHAMBER DRAINAGE / VENTING

- 15.1 Chambers or manholes containing valves, blow-offs, or other appurtenances are to allow adequate room for maintenance, including head room and side room. Engineered Shop Drawings are required.
- 15.2 When designing chambers or manholes containing valves, blow-off, or other appurtenances, the City of Penticton Domestic Water Bylaw (2003-34) must be adhered to.

- 15.3 The access opening must be suitable for removing valves and equipment.
- 15.4 The chamber is to be provided with a drain to a sanitary sewer manhole. Adequate venting is to be provided.

16.0 THRUST RESTRAINT

- 16.1 Concrete thrust blocking and/or adequate joint restraining devices must be provided at bends, tees, wyes, reducers, plugs, caps, valves, hydrants and blow-offs.
- 16.2 Bends at 5 degrees do not require thrust blocking and/or adequate joint restraining devices.
- 16.3 The restraining device system must take into account potential future excavations of the road in the vicinity of the water main.
- 16.4 The City can request engineered calculations for the thrust block design, based on fitting type, water pressure and soil conditions.

17.0 CORROSION PROTECTION

- 17.1 Where there is a potential for encountering corrosive soils, a geotechnical corrosion analysis on the alignment of any proposed metallic water main should be conducted to determine the corrosiveness of the native soils. If the soils are determined to be corrosive, measures such as cathodic protection should be included to prevent the corrosion of the water main and appurtenances.
- 17.2 Cathodic protection is required in areas as identified by the City Engineer.

18.0 WATER METERS

- 18.1 The required meter size(s) must be indicated on the design drawings, complete with flow requirements. The City will supply and install all meters at the Developer's expense. Compound meters are to be used for meters 50 mm or larger.
- 18.2 Main line flow metering with electronic connection to the City SCADA system may be required, as determined by the City Engineer.
- 18.3 Irrigation service metering may be required as determined by the City Engineer.
- 18.4 A meter chamber is required for all panhandle lots and irrigation services.

19.0 SERVICE CONNECTIONS

- 19.1 19 mm diameter is the minimum service connection size and may be tapped directly into water mains, unless the main is curvilinear.
- 19.2 50 mm diameter service connections must be made using service saddles, and a gate valve.
- 19.3 Main stops must be staggered and not less than 1 m apart, along the main line.

- 19.4 No tappings permitted at an angle of greater than 30 degrees, or less than 10 degrees above the horizontal centre line plane of the pipe.
- 19.5 The preferred location of the curb stop at the end of each service pipe is located 1.7 m offset from the property line, on the road right-of-way, and at the center of each lot. Where such location will conflict with other services, the location may be revised with the approval of the City.
- 19.6 A double set of services installed at the common property line is permitted.
- 19.7 Services and curb stops must have a minimum cover of 1.5 m and curb stops must be no deeper than 2.0 m.

20.0 RESERVOIRS

20.1 General

20.1.1 Reservoir design should include a preliminary design that requires the approval of the *City Engineer* before detailed design begins. Preliminary designs should cover the followings issues:

- 20.1.1.1 Material selection (concrete or steel).
- 20.1.1.2 Design standards.
- 20.1.1.3 Volume.
- 20.1.1.4 Shape.
- 20.1.1.5 Number of cells.
- 20.1.1.6 Geotechnical report on foundation conditions.
- 20.1.1.7 Appearance.

20.2 Capacity

20.2.1 Reservoirs should be designed to suit the particular circumstances. Reservoir capacity should be calculated by the following formula:

- 20.2.1.1 Total Storage Volume = A+B+C
- 20.2.1.2 Where A = Fire Storage (as determined by FUS Guidelines)
- 20.2.1.3 Where B = Equalization Storage (25% of Maximum Day Demand)
- 20.2.1.4 Where C = Emergency Storage (25% of A + B)

20.2.2 Subject to the results of a detailed engineering analysis and approval from the City Engineer, the requirement for emergency storage (C) may be reduced or eliminated based on consideration of the following:

- 20.2.2.1 Dependability of the water source.
- 20.2.2.2 Reliability of the supply system.
- 20.2.2.3 Presence of more than one supply source.
- 20.2.2.4 Whether the reservoir is part of a large system.
- 20.2.2.5 Presence of other reservoir(s) in the system.
- 20.2.2.6 Availability of standby power.
- 20.2.2.7 The need for adequate circulation of the reservoir to maintain water quality.

20.3 Structural Design

20.3.1 The reservoir must be designed in accordance with the BC Building Code and one of the following specialty codes:

- 20.3.1.1 American Concrete Institute (ACI) 350/350R: Code Requirements for Environmental Engineering Concrete Structures and Commentary.
- 20.3.1.2 Portland Cement Association (PCA): Circular Concrete Tanks Without Pre-stressing.
- 20.3.1.3 ACI 350.3/350.3R: Seismic Design of Liquid Containing Concrete Structures and Commentary.
- 20.3.1.4 American Water Works Association (AWWA) D110: AWWA Standard for Wire and Strand-Wound Circular Pre-stressed Concrete Water Tanks with Circumferential Tendons.
- 20.3.1.5 AWWA D100: AWWA Standard for Welded Steel Tanks for Water Storage.
- 20.3.1.6 AWWA D103: AWWA Standard for Factory-Coated Bolted Steel Tanks for Water Storage.

20.4 Design Features

- 20.4.1 Two cells, each containing one-half the total required volume and capable of being drained and filled independently. A single cell reservoir may be considered under the following circumstances:
 - 20.4.1.1 The total volume is less than 4500 m³.
 - 20.4.1.2 There is alternative storage available.
 - 20.4.1.3 There is an alternative supply source available.
 - 20.4.1.4 An alternative storage or supply source is scheduled to be available within five years.
- 20.4.2 Overflow drain sized to handle the maximum design inflow.
- 20.4.3 Separate inlet and outlet pipes, located and oriented to provide circulation within the reservoir.
- 20.4.4 Independent drain outlet at the bottom.
- 20.4.5 Roof access hatch sized and located for safe and convenient access for personnel, parts, temporary ventilation facilities and cleaning equipment into each cell.
- 20.4.6 Hatches to be watertight, steel, complete with hinges and related hardware, drains, locks, and intrusion alarm.
- 20.4.7 Ventilation pipes or openings sized to handle appropriate intake and exhaust air volumes for filling and draining the reservoir. Include security considerations.
- 20.4.8 Reservoir floor to slope to drain sump in concrete structures and in steel structures where possible. Drain as low as possible in steel reservoirs.
- 20.4.9 Drain sump in concrete reservoirs to be a minimum of 1000 mm x 1000 mm x 400 mm. The invert of the drain pipe is to be flush with sump floor. Grating to be installed over sump.
- 20.4.10 Zoned sub-drains under floor to collect, drain and allow for monitoring of any leakage.
- 20.4.11 Stairways to be constructed of stainless steel or aluminum. Interior wall ladder from roof access to floor required. All ladders and stairs to meet WCB regulations, including attachment points for fall arrest equipment.

- 20.4.12 All pipework within the reservoir to be PVC, stainless steel, fibreglass or steel or ductile iron coated to AWWA standards.
- 20.4.13 All metal parts within the reservoir, including bolts, nuts, screws, anchors, ladders, etc. to be stainless steel.
- 20.4.14 Pressure transducer or ultrasonic level controls required for each cell.
- 20.4.15 Sample lines for at least one sample per 1000 m³ volume within each cell.
- 20.4.16 Wash down connection required in each cell, complete with backflow preventer and 65 mm diameter pipe.
- 20.4.17 Convenient maintenance access required.
- 20.4.18 Fencing, lighting, locks, alarms and other security facilities to minimize vandalism and prevent water contamination.
- 20.5 Valve Chambers**
- 20.5.1 Reservoir piping should incorporate a valve chamber with the following features:
- 20.5.1.1 All valves associated with the reservoir operation.
 - 20.5.1.2 Entrance at grade, large enough to permit safe removal of largest equipment.
 - 20.5.1.3 Lifting beams and hoists where necessary to enable removal of equipment.
 - 20.5.1.4 Interior and exterior of all steel piping to be coated to AWWA standards, or be made of stainless steel.
 - 20.5.1.5 Floor drains and drainage system.
- 20.6 Additional Design Features**
- 20.6.1 Additional design features, which may be required subject to system operations details, include the following:
- 20.6.1.1 Sampling ports for inlet and outlet reservoir water.
 - 20.6.1.2 Flow measurement and recording for both the inflow and the outflow.
 - 20.6.1.3 Heat, light and ventilation to local and WCB standards.
 - 20.6.1.4 Level monitoring system and connection to SCADA, if applicable. For system consistency, the SCADA design will be done by the City at the Developer's expense.
 - 20.6.1.5 Provision for re-chlorination facilities.

21.0 PUMP STATIONS

21.1 General

- 21.1.1 Pumping capacity should be designed to suit the particular circumstances. In general, capacity should meet maximum day demand with the largest pump out of service and balancing storage on line. If balancing storage is not on line, pumping capacity should meet peak hour demand with the largest pump out of service, and stand-by power should be provided to allow the greater of maximum day demand plus fire flow or peak hour demand during a power outage.

21.2 Design Features

- 21.2.1 Structure, piping and mechanical systems designed in accordance with seismic requirements.
- 21.2.2 Reinforced concrete, blockwork or brick construction; aesthetically pleasing.
- 21.2.3 Access doorways sized for safe and convenient removal and replacement of the largest piece of equipment. Lifting hooks or rails with pulley blocks as required.
- 21.2.4 Adequate HVAC and lighting.
- 21.2.5 Standby power is required.
- 21.2.6 Electric motors to be 600 volt, 3 phase, premium efficiency, with thermal protection. Lower voltage (208V, 3 phase) may be considered, depending upon service voltage available from power company.
- 21.2.7 Motors 100 HP and above to have analogue vibration recording and protection.
- 21.2.8 Air relief discharge and pilot lines to be piped to floor drains.
- 21.2.9 Housekeeping pad for motor control centre.
- 21.2.10 Hydraulically operated or motorized pump control valves with isolation valves, unless pumps have variable speed drives which control transient pressures.
- 21.2.11 Flow meters and totalizers.
- 21.2.12 Spring return on "Silent" check valves.
- 21.2.13 High pressure and surge relief valves with isolation valves, if warranted by system characteristics and transient analysis.
- 21.2.14 Suction and discharge pressure gauges for each pump with isolation valves.
- 21.2.15 Mechanical pump seals.
- 21.2.16 Water quality sampling ports.
- 21.2.17 Interior and exterior of pipework coated to AWWA standards, or use stainless steel.
 - 21.2.17.1 Inlet piping colour: Mid Blue
 - 21.2.17.2 Outlet piping colour: Mid Blue
 - 21.2.17.3 Drain piping: Gull Grey
 - 21.2.17.4 All other piping: Mid Blue
- 21.2.18 Pump system to be PLC controlled and connected to SCADA system, if applicable. For system consistency, the SCADA design will be done by the City at the Developer's expense.
- 21.2.19 Hours meters and ammeters for each pump.

21.2.20 Power factor correction if required by the power company.

21.2.21 The Motor Control Centre is to be in a room separate from the pumping and equipment area.

21.2.22 Noise attenuation to suit the location.

21.2.23 Equipment to be CSA approved and to have a minimum one-year guarantee on parts and labour. Designer is to provide three sets of Operating and Maintenance Manuals. All Equipment must be tested prior to acceptance.

21.2.24 For system consistency and ease of operation, the SCADA design is to be completed by the City at the Developer's expense.

22.0 PRESSURE REDUCING STATIONS

22.1 General

22.1.1 Pressure reducing stations design parameters should be reviewed and approved by the City Engineer before detailed design proceeds.

22.2 Preliminary Design Parameters

22.2.1 Design Flows:

22.2.1.1 Peak Hour

22.2.1.2 Maximum Day plus fire.

22.2.2 Continuous, emergency or fire flow operation.

22.2.3 Location.

22.2.4 Chamber details:

22.2.4.1 Controls and monitoring.

22.2.4.2 HVAC.

22.3 Design Features

22.3.1 Minimum chamber size: 3 x 2 x 2 m (inside height).

22.3.2 Parallel pressure reducing valves.

22.3.3 Isolating valves.

22.3.4 Air release valves.

22.3.5 Upstream and downstream pressure gauges.

22.3.6 Interior and exterior of pipework coated to AWWA standards, or use stainless steel.

22.3.6.1 Inlet piping colour: Mid Blue

22.3.6.2 Outlet piping colour: Mid Blue

22.3.6.3 Drain piping: Gull Grey

- 22.3.6.4 All other piping: Mid Blue
- 22.3.7 Forced air ventilation plus heat and light, subject to review by the City Engineer.
- 22.3.8 External kiosk, if electrical and electronic equipment is included.
- 22.3.9 PLC controls with connection to SCADA system if applicable, including:
 - 22.3.9.1 Security switches.
 - 22.3.9.2 Discharge and suction pressure transmitters.
 - 22.3.9.3 Flowmeter.
 - 22.3.9.4 Uninterruptible power supply (UPS).
 - 22.3.9.5 Operator interface panel and modem.
- 22.3.10 For system consistency, the SCADA design will be done by the City at the Developer's expense.

END OF SECTION

1.0 GENERAL

- 1.1 The sanitary sewage collection system design should be prepared under the direction of a design professional who has the appropriate experience and is registered with the Association of Professional Engineers and Geoscientists of British Columbia.
- 1.2 Consulting Engineers retained by the Owner to design the works and services must consult with the City Engineer to determine what existing information may be of assistance to them.
- 1.3 The sanitary sewer system is to be designed using a calibrated sanitary sewer model acceptable to the City Engineer, unless the City Engineer determines the system is not complex. Should the City have a calibrated sanitary sewer model, it will be made available to the Consultant.

2.0 DESIGN FLOWS

- 2.1 The sanitary sewer system must be designed based on the following criteria:
 - 2.1.1 Residential Average Domestic Flow Rate = 400 litres/capita/day
 - 2.1.2 Commercial Average Flow Rate = 22,000 litres/day/hectare
 - 2.1.3 Infiltration rates for pipes not in the water table = 5,000 l/ha/d
 - 2.1.4 Infiltration rates for pipe in the water table = 8,000 l/ha/d
 - 2.1.5 The design flows shall be calculated using the average daily flows plus the infiltration rate.
 - 2.1.6 Peak flows use the Harmon Formula:
$$H = 1 + \frac{14}{4 + P^{0.5}}$$
Where H = Peaking Factor (Peak Flow Rate / Average Flow Rate)
P = Population in thousands
 - 2.1.7 The commercial and industrial lands, peak flows shall be determined using the population equivalent of the calculated average daily flow. Therefore, the peaking factor shall be selected for the appropriate equivalent population when the average daily flow is divided by 400 l/c/d.

3.0 PIPE FLOW FORMULAS

- 3.1 Gravity Sewers: Manning's formula must be used.

$$3.1.1 \quad Q = \frac{AR^{0.667}S^{0.5}}{n}$$

Where: Q = design flow in m³/s.
A = cross sectional area in m².
R = hydraulic radius (area/wetted perimeter) in m.

n = Roughness Coefficient.
n = Value suitable for the type and age of pipe being modelled.

- 3.2 Force Main Sewers: Hazen-Williams formula must be used.

$$3.2.1 \quad Q = \frac{CD^{2.63}S^{0.54}}{278780}$$

Where: Q = design flow in l/s.
D = internal pipe diameter in mm.
S = slope of the hydraulic grade line in m/m.

C = Roughness Coefficient.
C = Value suitable for the type and age of pipe being modelled.

4.0 MINIMUM PIPE DIAMETER

- 4.1 The minimum permitted size of pipe is:
- 4.1.1 200 mm diameter mains – residential.
 - 4.1.2 250 mm diameter mains – industrial.
 - 4.1.3 100 mm diameter – services and force mains.

5.0 MINIMUM VELOCITIES

- 5.1 The minimum velocity must be 0.6 m/s.
- 5.2 There is no maximum velocity however consideration must be given to scour problems and the dynamic loading on manholes where flow exceeds 3.0 m/s.
- 5.3 Anchoring must be incorporated where the grade(s) of the sewer is/are 15% or greater in accordance with MMCD Drawing No. G8.

6.0 MINIMUM GRADE

- 6.1 The grade of any sewer is governed by the minimum velocity requirement of 0.6 m/s. If the calculated design flow is not expected to produce a velocity of at least 0.6 m/s then the minimum grade shall be calculated on the basis of the pipe flowing 35% full at a theoretical velocity of 0.6 m/s.
- 6.2 The last end section of a main that will not be extended in the future must have a minimum grade of 1.0% where 200 mm diameter pipe is proposed.
- 6.3 Recommended minimum grades shall be as noted in Table 6.3.

Table 6.3

Pipe Diameter (mm)	Minimum Grade (m/100)
100	1.60
150-200	0.50
250-350	0.30

375-450

0.15

7.0 MINIMUM DEPTH AND COVER

- 7.1 The minimum depth of the sewer main (from the finished surface of the road or grade to the top of the pipe) must be suitable to service the basement(s) of adjacent properties as required in the "Service Connection" section.
- 7.2 The absolute minimum cover over a pipe must be 1.0 m (measured from the finished surface to the top of pipe) or comply with manufacturer's recommendations.
- 7.3 The depth of the sewer must be sufficient to provide "gravity flow" service connections to both sides of the roadway and must allow for future extension(s) to properly service all of the upstream tributary lands for ultimate development.
- 7.4 In house sump pumps consideration shall be an option to reduce excessive main depths over 4.0 m to invert.

8.0 ALIGNMENTS AND CORRIDORS

- 8.1 Sanitary sewers must be located within the road right-of-way as noted in the applicable Standard Drawing Typical Cross Section for that road.
- 8.2 When the utility is required to cross private land(s), the right-of-way must a minimum of 6.0 m wide for a single pipe or wider if required to accommodate WCB side slope requirements.
- 8.3 Sewer main extensions shall extend to and terminate at the furthest property line of the last lot it serves.

9.0 CURVED SEWER

- 9.1 Subject to meeting manufacturer's specifications, horizontal and vertical curves are permitted and will require a constant offset and/or must be uniform throughout the curve.
- 9.2 The design velocity must exceed 0.91 m/s and the curve midpoint and two 1/4 points are to be located by survey and shown on the as-constructed drawings with an elevation and offset of the invert at each point.

10.0 MANHOLES

- 10.1 Manholes are required at:
 - 10.1.1 all changes in vertical grade.
 - 10.1.2 all changes in horizontal direction.
 - 10.1.3 all changes in main pipe sizes.
 - 10.1.4 all intersecting sewers.
 - 10.1.5 all terminal section (for future extensions).
 - 10.1.6 downstream end of curved sewers.
 - 10.1.7 all lot services greater than 100 mm diameter.
 - 10.1.8 spacing intervals in conformance with Table 10.1.8.

Table 10.1.8

Pipe Diameter (mm)	Maximum Distance (m)
200-375	125
450-750	155
900 and larger	185

10.2 In all cases a manhole is required at the upper end of a sewer for flushing and cleaning.

10.3 Sanitary manhole rim elevations in off road areas must be designed to be:

10.3.1 above the adjacent storm manhole rim elevation.

10.3.2 above the surrounding ground so that infiltration from ponding will not occur.

11.0 HYDRAULIC LOSSES ACROSS MANHOLES

11.1 The following criteria must be used:

11.1.1 The springline of the downstream pipe must not be higher than the springline of the upstream pipe.

11.1.2 Minimum drop in invert levels across manholes:

11.1.2.1 Straight run - no extra drop required other than slope of pipe.

11.1.2.2 Deflections up to 45° - 25mm drop max.

11.1.2.3 Deflections 45° to 90° - 50mm drop min.

11.1.3 Exterior drop manholes must be installed in accordance with MMCD standard drawings. Where invert elevation difference exceeds 600 mm.

11.1.4 All benching shall be designed to prevent any solid deposition or flow disruption.

12.0 SERVICE CONNECTIONS

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

12.2 Connections to new mains must be made using standard wye fittings. Connections to existing mains must be made using wye saddles.

12.3 The standard minimum size for single family residential service connections shall be 100 mm.

12.4 The size of commercial and multi-family service shall comply with the Provincial Building Code.

12.5 The minimum depth of a service at the property line must be 1.0 m provided that gravity service to the Minimum Building Elevation is available.

12.6 Where rear yard sewers are necessary, due to steep topography, the minimum cover must be 1.0 m provided that gravity service to the Minimum Building Elevation is available.

12.7 Service connections may be permitted into manholes provided that:

- 12.7.1 The connection is not in an adverse direction to the flow in the sewer main.
- 12.7.2 The connection enters the manhole so the service crown is no lower than the sewer main crown.

13.0 SANITARY LIFT STATIONS

13.1 General

- 13.1.1 The use of sanitary pump stations is to be discouraged. Any proposed use of lift stations must receive prior approval from the City Engineer. Sanitary lift stations should normally be located within a right-of-way outside the required road dedication.
- 13.1.2 Sanitary lift stations will require a pre-design report. Refer to Schedule "J" – Section 00150 – Pre-Design for details.

13.2 Design Criteria:

- 13.2.1 Pumps must be:
 - 13.2.1.1 Capable of passing solids up to 75 mm in size.
 - 13.2.1.2 Equipped with hour meters.
 - 13.2.1.3 Easily removed for maintenance.
 - 13.2.1.4 Operate with a motor running at 1750 RPM's.
 - 13.2.1.5 Operate on a 347/600 volt electrical source (pump motors 5 h.p. and greater to be 600 volt 3 phase type).
 - 13.2.1.6 Able to operate alternately and independently of each other.
 - 13.2.1.7 Able to meet maximum flow condition with one pump in failure mode.
 - 13.2.1.8 Designed so that each pump does not cycle more than 4 times in one hour under normal operating conditions. For example, in a duplex pump station that is designed to alternate the pump starts, each motor can have a maximum of 4 starts an hour which could result in a total of 8 motor starts per hour for this station.
 - 13.2.1.9 Motor cables, power cables, etc., must be continuous from within the pump station to within the kiosk unless an adequate exterior pull pit and junction box is installed.
- 13.2.2 Levels to be controlled by ultrasonic level transmitter with emergency high and low level floats.
- 13.2.3 All auxiliary equipment and control panels must be mounted in a suitable kiosk adjacent to the station. The kiosk must be located a minimum of 3.0 m from the station lid.
- 13.2.4 The control kiosk must be designed to contain all control and telemetry equipment on the front panel and all power equipment on the rear panel.
- 13.2.5 Check valves must be ball lift check valves.
- 13.2.6 All stations require an explosion-proof exhaust fan which can be activated by manual switch, and which meets WCB requirements for ventilation in a confined space.
- 13.2.7 The entrances to all stations must be waterproof and be provided with a suitable lock. The access must be a minimum 900 mm X 900 mm in size. The access hatch shall have:
 - 13.2.7.1 An aluminum ¼" tread plate.
 - 13.2.7.2 A perimeter drain.
 - 13.2.7.3 A perimeter sealing gasket.
 - 13.2.7.4 A slam lock with an aluminum removable sealing plug and opening tool.
 - 13.2.7.5 A flush lifting handle.
 - 13.2.7.6 A gas spring assist cylinder.
 - 13.2.7.7 A 90 degree hold open arm.

- 13.2.7.8 A flush fitting padlock tang.
- 13.2.7.9 The hatch must be reinforced for 1465 kg/m² (300 lbs/sq.ft). All fasteners to be made of 316 stainless steel.
- 13.2.7.10 The entrance must be above ground level where feasible but in no case more than 300 mm above the ground.
- 13.2.7.11 Access into the station must be by an aluminum ladder. The location of the ladder must not interfere with the removal and installation of pump, etc. The ladder must be designed to extend and lock at least 600 mm above the station entrance. A platform is to be provided above high water level float to permit wet well access. The platform is to be a fibreglass grating. The access, ladder and platform to meet WCB standards.
- 13.2.8 All wiring must be explosion-proof, Class 1, Division 2, and electrical design and installation is subject to the acceptance of the Provincial Safety Inspector. Metal stations must be protected by impressed current cathodic protection.
- 13.2.9 All stations must provide an automatic generator for standby power in case of power failure. Provision for a telemetry system must be included for connection into the City's telemetry system. For small lift stations with an ultimate capacity less than 100 units, emergency storage may be considered in place of standby power. Emergency storage is to be based on 8 hours of average day flows.
- 13.2.10 All equipment must be CSA approved and have at least a one year guarantee for parts and labour. The Consulting Engineer is to provide the City with three sets of Operating and Maintenance Manuals. All pumps to be factory tested prior to installation.
- 13.2.11 A gate valve is required on the influent line and each pump discharge. The gate valves must be outside the station and be complete with square operating nut and nelson box.
- 13.2.12 If a lift station is authorized by the City Engineer to be constructed in an area that may be subject to vehicle loads, the roof and cover of the lift station must be designed to withstand a loading of H-20 (Highways Standard).
- 13.2.13 Provision(s) must be made for standby pumping from an external source. An adapter flange ("Kamlock") complete with a quick coupling and lockable cap is required.
- 13.2.14 The area around the lift station and all associated equipment or building must be asphalted. The size and area to be determined by the requirements for maintenance.
- 13.2.15 The surfaces of all steel components and fibreglass stations must receive at least two coats of two component white epoxy enamel. All concrete stations must be designed and constructed to prevent sulphide attack and include epoxy coated rebar, and the concrete surface must be coated with at least two coats of blue epoxy and then an additional 2 coats of white epoxy.
- 13.2.16 The wet well bottom must be benched to direct solids into the pump suction. The influent line must be located tangent to the wet well to encourage scouring of the wet well.
- 13.2.17 The station shall be complete with an Uninterruptable Power Supply (UPS) to serve all alarms and controls.
- 13.2.18 The pump control panel must incorporate an operator interface (Panelmate or equivalent), and the panel must be complete with a lamp test button.
- 13.2.19 Separate starter enclosures must be provided for each pump.
- 13.2.20 PLC control to be based on City of Penticton standards.
- 13.2.21 Station communication to be provided via radio transmission compliant with the City's telemetry system, and an antenna must be installed on a suitable mast or pole to ensure reliable transmission.
 - 13.2.21.1 An hour meter must be built into the panel for each pump.
 - 13.2.21.2 An amp meter must be provided for each pump.
 - 13.2.21.3 Minimum storage between the high level alarm and the start of overflow under the more critical of:
 - 13.2.21.3.1 Minimum 1 hour in wet well at average wet weather flow.

13.2.21.3.2 Minimum 1 hour in wet well and influent pipes at peak wet weather flow.

13.2.21.4 Station to have a magnetic flow meter.

13.2.21.5 Station to allow removal of pumps using hoist truck with a 1.8 m boom.

13.2.21.6 Where vandalism or safety is a concern, perimeter fencing is to be provided. The fence must be made of black chain link.

13.2.21.7 Landscaping acceptable to the City is to be provided, including irrigation.

13.2.21.8 Noise control may be required when criteria in section 16.0 are exceeded.

13.2.21.9 Odour control may be required when criteria in section 15.0 are exceeded.

13.2.21.10 Minimum barrel size must be 2440 mm (8') in diameter.

14.0 FORCE MAIN

14.1 In conjunction with sanitary pumping facilities, the following criteria must be noted in the design of force main systems. Design computations for force mains must be made using a C value appropriate for the type of pipe. The Hazen Williams formula identified in section 3.2 must be used.

14.2 Velocity

14.2.1 At the lowest pump delivery rate anticipated to occur at least once per day, a minimum cleansing velocity of 1.0 m/sec should be maintained. Maximum velocity should not exceed 3.5 m/sec.

14.3 Air Relief Valve

14.3.1 An automatic air relief valve must be placed at high points in the force main to prevent air locking.

14.4 Termination

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

14.5 Size

14.5.1 The minimum size for force mains is 100 mm in diameter.

14.6 Materials

14.6.1 With the exception of valves, the material selected for force mains must meet the standards specified for water mains and must adapt to local conditions such as character of industrial wastes, soil characteristics, exceptionally heavy loadings, abrasion and similar problems.

14.6.2 Valves used on force mains shall be lubricated plug valves sufficient for long term use in a corrosive environment.

14.7 Loads and Transient Pressures

14.7.1 All force mains must be designed to prevent damage from superimposed loads, or from water hammer or column separation phenomena.

15.0 CORROSION AND ODOUR CRITERIA

- 15.1 Dissolved sulphide maximum limit at any point in the system is to be 0.5 mg/l.
- 15.2 Odour Criteria:
 - 15.2.1 At 10 m from any gravity main, force main, manhole and lift station or other sewer facility (summer conditions, winds between 2 – 10 km/hr), 1.0 odour units.
 - 15.2.1.1 Where sewer facilities are close to houses parks or walkways, 0.0 odour units.
 - 15.2.2 Analysis for odour and sulphides may be required.

16.0 NOISE CONTROL CRITERIA

- 16.1 Noise levels for facilities must not exceed 65 dB at property line or 20 m away, whichever is closer.

17.0 ON-SITE SEWAGE DISPOSAL (SEPTIC) REQUIREMENTS

- 17.1 Where permitted, site conditions and on-site sewage disposal systems shall be approved by the Provincial Ministry of Health Permit.

END OF SECTION

1.0 GENERAL

- 1.1 Stormwater Management System refers to the overall stormwater management plan for the major and minor system and should be designed based on the principles contained in the Stormwater Planning Guidebook for British Columbia dated May 2002.
- 1.2 Storm Drainage System refers to the piped network. Storm Drainage Systems shall be designed, analyzed and approved in accordance with Standard Engineering Practices and the criteria requirements within the City's Master Drainage Plan or as noted in this schedule.
- 1.3 Run-off flows from the subdivision or development must be limited to the five year return period pre-developed runoff condition.
- 1.4 Consulting Engineers retained by the Owner to design the works and services must consult with the City Engineer to determine what existing information may be of assistance to them. Should the City have a calibrated storm water model, it will be made available to the Consultant.
- 1.5 All developments require a storm drainage plan.
- 1.6 The presence of an existing municipal drainage system does not mean or imply there is adequate capacity to receive the proposed design flows, nor does it indicate that the existing system pattern is acceptable to the City.
- 1.7 Existing facilities which are undersized or inadequate to accept additional drainage must be defined for upgrading to accommodate the appropriate development design flows. Alternative drainage proposals may be considered.

2.0 MINOR AND MAJOR SYSTEMS

- 2.1 Each drainage system must consider the following stormwater analysis of runoff components:
 - 2.1.1 The minor system consists of drainage works, pipes, and ditches, which convey flows of a 5 year return frequency, with no pipe surcharging.
 - 2.1.2 Developments less than 5 hectares require minor storm system design.
 - 2.1.3 The major system exceeds the capacity of the minor system and consists of surface runoff paths, roadways and watercourses which convey flows of a 100 year return frequency. Major runoff path routing is required wherever surface overland flows are anticipated. Creeks regulated by the Ministry of Water, Lands & Air Protection may require design to a 1:200 year flood.
 - 2.1.4 Developments larger than 5 hectares require both minor and major system designs.

3.0 DRAINAGE DESIGN METHODS AND FLOWS

- 3.1 Storm drainage systems must be designed using conventional methods (pipes, culverts, etc.) and Stormwater Management techniques (lot grading, detention, etc.).

- 3.2 The owner must provide to the City all calculations and plans pertinent to the design of the proposed drainage system. All designs must take into consideration post-development upstream flows.
- 3.3 It must be shown that all existing or downstream drainage facilities are capable of handling the projected increase in drainage created by any development.
- 3.4 Stormwater must be directed to an acceptable discharge point such as the lake, a major creek, a ditch or trunk main with adequate capacity.
- 3.5 The lot grading plan shall show all existing and proposed elevations at lot corners, flow paths, and how overland drainage that runs through the development or from lot to lot will be controlled. The lot grading plan also should show the information pertaining to water and sewer services.
- 3.6 All storm drainage system elements servicing areas larger than 10 hectares must be designed using computer modeling software approved by the City Engineer.
- 3.7 For developments where the tributary areas are less than 10 hectares, and detention facilities are not involved, the Rational formula may be used.
- 3.8 The Rational method shall be used to calculate minor storm flows. The formula
- $$Q = \frac{CAI}{360}$$
- shall apply, where:
- Q = runoff peak during 5 year (m^3/s).
- C = runoff coefficient for particular ground surfaces.
- A = area of tributary drainage area (Ha).
- I = rainfall intensity (mm/hr).
- 3.9 Runoff coefficients (C) for storm sewer design shall be assumed to be not less than the values given in Table 3.9.

Table 3.9

Description of Area	Run Off Coefficient
Business	
Downtown	0.82
Neighbourhood	0.60
Industrial	
Light Area	0.65
Heavy Area	0.75
Residential	
Suburban	0.30
Single Family	0.40
Multi Units - Detached	0.55
Multi Units - Attached	0.65
Apartment Dwelling Area	0.60
Parks	0.15
Playgrounds	0.25
Unimproved Areas	0.15

3.10 Manning's equation must be used gravity storm sewer pipe design where:

$$3.10.1 \quad Q = \frac{AR^{0.667}S^{0.5}}{n}$$

Where: Q = design flow in m³/s.
 A = cross sectional area in m².
 R = hydraulic radius (area/wetted perimeter) in m.

n = roughness coefficient.
 n = 0.013 for concrete pipe.
 n = 0.011 for PVC pipe.

3.11 The roughness coefficients for use in Manning's Equation shown in Table 3.11 shall be used as a minimum:

Table 3.11

Pipe	Roughness Coefficient (n)
Concrete Pipe	0.013
PVC Pipe	0.011
Corrugated Metal Pipe - Unpaved	0.024 – 0.033
25% Paved	0.021 – 0.028
100% Paved	0.013
Overland Flow	
Smooth Asphalt	0.012
Asphalt or Concrete Paving	0.014
Packed Clay	0.300
Light Turf	0.200
Dense Turf	0.350
Dense Shrubbery	0.400

3.12 Drainage Areas

- 3.12.1 The entire tributary drainage area for the storm drainage systems under design must be delineated according to the topography of the land and include all other contributing areas.
- 3.12.2 Contour maps provided through the City can be expected to be reasonably indicative of the actual condition. Consulting Engineers are cautioned not to interpret them to be exact and correct.
- 3.12.3 It is the Consulting Engineer's responsibility to ensure that they obtain true and accurate elevations for the development of the site.

3.13 Rainfall Intensities

- 3.13.1 Time of Concentration:
 - 3.13.1.1 For the Time of Concentration refer to the Intensity Duration Frequency Curves shown in Supplementary Standard Detail Drawing S-S31.
 - 3.13.1.2 Use 10 minutes for paved areas and 15 minutes for grassed areas.
- 3.13.2 Rainfall Return Frequency:
 - 3.13.2.1 Minor System Design – 5 year return period.
 - 3.13.2.2 Major System Design – 100 year return period.
 - 3.13.2.3 200 year return period where required by the Ministry of Environment.
 - 3.13.2.4 For major structures such as bridges, the 200 year return period must be used.

4.0 MINIMUM AND MAXIMUM VELOCITIES

- 4.1 The minimum velocity for pipes flowing full, or half full, must be 1.0 m/s.
- 4.2 The maximum velocity is 3.0 m/s except when entering a stream.
- 4.3 Where drainage discharge enters a natural watercourse or stream the maximum velocity is 1.0 m/s.

5.0 MINIMUM PIPE DIAMETER

- 5.1 The minimum pipe diameter shall be as shown in Table 5.1

Table 5.1

Description	Minimum Pipe Diameter (mm)
Storm Drainage Main Pipe	250
Culverts	375
Catch Basin Leads	250
Leads to Foundation Drains Only	100
Leads to Roof Drains & Foundation Drains	100

6.0 MINIMUM GRADE

- 6.1 The minimum pipe grade shall be as shown in Table 6.1.

Table 6.1

Pipe Diameter (mm)	Minimum Pipe Grade (m/100m)
100 – 150	1.0
200 – 250	0.50
300 – 375	0.30
400 – 450	0.25
525	0.20
600 – 900	0.15
1050 – Larger	0.10

7.0 MINIMUM DEPTH OF COVER

- 7.1 Subject to the correct pipe loading criteria the minimum depth of cover must be:
- 7.1.1 For storm drains: 1.5 m in traveled areas and 1.0 m elsewhere,
 - 7.1.2 For culverts: across roads 0.3 m; across driveways 0.2 m
 - 7.1.3 For catch basin leads: 0.9 m

8.0 HORIZONTAL ALIGNMENT AND CORRIDORS

- 8.1 Except as noted in 8.2 storm sewer mains must be located within the road right-of-way as noted in the applicable Standard Drawing Typical Cross Section for that road classification.
- 8.2 When the utility is required to cross private land(s), the right-of-way must sufficient to repair or replace the utility and be a minimum of 6.0 m wide.

9.0 CURVED PIPES

- 9.1 Subject to meeting manufacturer's specifications, horizontal and vertical curves are permitted and will require a constant offset and/or must be uniform throughout the curve.
- 9.2 Increase minimum grades by 30% throughout curved sections of pipe.
- 9.3 The curve midpoint and two ¼ points are to be located by survey and shown on the as-constructed drawings with an elevation and offset of the invert at each point.

10.0 MANHOLES

- 10.1 Manholes are required at:
- 10.1.1 Changes in vertical grade greater than 1.0 %.
 - 10.1.2 Intersecting storm drains.
 - 10.1.3 Changes in pipe size.
 - 10.1.4 Changes in horizontal direction.
 - 10.1.5 Downstream end of curved storm drains.
 - 10.1.6 Catch basin lead connections.
 - 10.1.7 For services 150 mm diameter or larger.
- 10.2 The maximum distance between manholes shall be as shown in Table 11.2.

Table 11.2

Pipe Diameter (mm)	Maximum Distance (m)
375 and smaller	125
450 to 750	155

900 and larger

185

11.0 HYDRAULIC LOSSES IN MANHOLES

11.1 The following criteria must be used:

11.1.1 The crown of the downstream pipe must not be higher than the crown of the upstream pipe.

11.1.2 Minimum drop in invert levels across manholes:

11.1.2.1 Straight run - no drop required, other than slope of pipe.

11.1.2.2 Deflections up to 45° - 25 mm drop.

11.1.2.3 Deflections 45° to 90° - 50 mm drop.

11.2 Exterior drop manholes must be installed in accordance with MMCD Standard Detail Drawing S3 where the invert elevation difference exceeds 600 mm. Interior drop manholes are not permitted.

12.0 SERVICE CONNECTIONS

12.1 Service connections where permitted shall:

12.1.1 Be installed to parcels fronting the main.

12.1.2 Have a minimum diameter of 100 mm except for industrial/commercial which shall have minimum diameter of 150 mm.

13.0 TEMPORARY CLEAN OUTS

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

13.1.1 Future extension of the main is designed as an overall phased development.

13.1.2 Clean-outs are not considered a permanent structure.

14.0 CATCH BASINS

14.1 Catch basins must be provided at regular intervals along roadways, lanes or walkways and at low points of the B.C. or E.C. (upstream) at curb returns. Interference with crosswalks and wheelchair ramps is not permitted.

14.2 Catch basin spacing must be designed to drain a maximum area of 700 m² on road grades up to 3% and 500 m² on steeper grades; maximum spacing is to be 150 m.

14.3 Side inlet rolled type catch basins are required for road grades exceeding 5%. See Supplementary Standard Detail Drawings S-S11f.

14.4 Side inlet vertical type catch basins may be used for road grades less than 5%. See Supplementary Standard Detail Drawing S-S11c.

15.0 DITCHES, CULVERTS AND INLET / OUTLET STRUCTURES

15.1 Ditches adjacent to roadways must conform to the following criteria:

- 15.1.1 Maximum depth should be established based on width of right-of-way, slopes and traffic safety criteria.
- 15.1.2 Minimum grade is 0.5%.
- 15.1.3 Maximum velocity is 1.0 m/s (unlined ditch) - see also 15.2.
- 15.2 Ditching, swales or natural drainage courses exceeding 6% require a properly designed ditch cross section that will control erosion taking into account soil type, water flow and velocity. The design should include geo-fabric, use of layered graded granular material of increasing coarseness and rip rap.
- 15.3 The minimum right-of-way width for a ditch must be 5.0 m where the ditch crosses private property. The ditch must be offset in the right-of-way to permit a 3.0 m wide access for maintenance vehicles. Additional right-of-way may be required to facilitate the ditch and the access. The top of the ditch adjacent to the property line must be a minimum 1.0 m away from the property line.
- 15.4 The design of structures where culverts or ditches form part of the storm system (See Standard Supplementary Detail Drawing S-R10 – Typical Rural Local Road Cross Section) must consider level access to hydrants, transformers and driveways. The culvert must be installed at the same grade as the ditch.
- 15.5 The Standard Drawings for inlet and outlet structures must be used in the design of these facilities.

16.0 FRENCH DRAINS

- 16.1 The use of french drains shall only be permitted where the topography and soil conditions are proven adequate to the acceptance of the City. A soils report will be required to support the design.

17.0 DRAINAGE DRYWELLS

- 17.1 Where lands have acceptable soils, alternative on site disposal system such as a rockpit drywells will be encouraged.
- 17.2 Drainage dry wells may be allowed where they provide a suitable alternate method of storm water dispersal for parking lots adjacent to apartment and commercial developments. Geotechnical engineering data (i.e. percolation tests, etc.) and design details will be required to support their use.
- 17.3 Where drainage drywells are used as a means for disposal, drainage drywell wall surface areas shall be sized using Darcy's empirical law:

Q = A K i where:
Q = rate of flow in m³/s.
A = cross sectional area of soil through which flow takes place in m².
K = coefficient of permeability in m/s.
i = hydraulic gradient or headloss over a given flow distance, dimensionless.
- 17.4 Coefficients of permeability (k) are as shown in Table 17.4.

Table 17.4

Typical Soil	K Value (m/sec)*	Relative Permeability
Coarse gravel	over 10^{-3}	Very permeable
Sand, fine sand	10^{-3} to 10^{-5}	Medium permeability
Silty sand, dirty sand	10^{-5} to 10^{-7}	Low permeability
Silt	10^{-7} to 10^{-9}	Very low permeability
Clay	Less than 10^{-9}	Practically impervious

* to convert to feet per minute, multiple above values by 197; to convert to feet per day, multiple by 2.83×10^3

- 17.5 Upon determination of permeability factor, a safety factor of 2 shall be applied.
- 17.6 Drainage drywells, unless otherwise approved by the City Engineer, shall be located in the road boulevard or in other lands dedicated to the City for the purpose of drainage disposal.
- 17.7 The depth of the drywell will vary in accordance with the requirements derived from Darcy's empirical law.

18.0 EROSION & SEDIMENT CONTROL

- 18.1 The consulting engineer will be required to demonstrate how work will be undertaken and completed so as to prevent the release of silt, raw concrete and concrete leachate, and other deleterious substances into any ditch, storm drain, watercourse or ravine. Construction and excavation wastes, overburden, soil or other deleterious substances must be disposed of or placed in such a manner as to prevent their entry into any water-course, ravine, storm drain system, or restrictive covenant area.
- 18.2 Should siltation or erosion controls be required, details of the proposed works are to be included in the approved drawings and must be installed as part of the works.
- 18.3 All siltation control devices must be situated to provide ready access for cleaning and maintenance.
- 18.4 Proposed siltation control structures must be maintained throughout the course of construction and to the end of the maintenance period (final acceptance). Changes in the design of the structure will be required if the proposed structure is found to be inadequate.

19.0 NATURAL WATERCOURSES

- 19.1 All proposals for works affecting natural watercourses must be forwarded (by the Consulting Engineer retained by the Owner to design the Works) to the appropriate Provincial Government Agencies.

END OF SECTION

1.0 GENERAL

- 1.1 All road classifications and designations for vertical and horizontal alignment elements will be designed utilizing information contained in this section, and in compliance with:
 - 1.1.1 The current edition of the Transportation Association of Canada - Geometric Design Guide for Canadian Roads.
- 1.2 Consulting Engineers retained by the Owner to design the works and services must consult with the City to determine what existing information may be of assistance to them.
- 1.3 The City may require an independent Traffic Impact Study to determine the requirements or warrants for deceleration and acceleration turning lanes or traffic control signalization for access off major roads for safety reasons and to minimize disruption to traffic.

2.0 ROAD CLASSIFICATION FUNCTIONS

- 2.1 Please refer to Table 2.1 for the characteristics of rural roads.

Table 2.1 – Rural Road Characteristics

	Rural Locals	Rural Collectors
service function	traffic movement secondary consideration	traffic movement and land access of equal importance
land service	land access primary consideration	traffic movement and land access of equal importance
traffic volume vehicles per day (typically)	<1000 AADT	<5000 AADT
flow characteristics	interrupted flow	interrupted flow
design speed (km/h)	50 - 110	60 - 110
average running speed (km/h) (free flow conditions)	50 - 90	50 – 90
vehicle type	predominantly passenger cars, light to medium trucks and occasional heavy trucks	all types, up to 30% trucks in the 3 t to 5 t range
normal connections	locals, collectors	locals, collectors, arterials

- 2.2 Please refer to Table 2.2 for the characteristics of urban roads.

Table 2.2 – Urban Road Characteristics

	Public Lanes		Locals		Collectors	
	Residential	Commercial	Residential	Industrial / Commercial	Residential	Industrial / Commercial
traffic service function	traffic movement not a consideration		traffic movement secondary consideration		traffic movement and land access of equal importance	
land service / access	land access only consideration		land access primary function		traffic movement and land access of equal importance	
traffic volume vehicles per day (typically)	<500	<1000	<5000	<3000	<8000	1000 – 12 000
flow characteristics	interrupted flow		interrupted flow		uninterrupted flow	
design speed (km/h)	30 – 40		30 – 50		50 – 80	
average running speed (km/h)	20 – 30		20 – 40		30 – 70	
vehicle type	passenger and service vehicles	all types	passenger and service vehicles	all types	passenger and service vehicles	all types
desirable connections	public lanes, locals		public lanes, locals, collectors		locals, collectors, arterials	
transit service	not permitted		generally avoided		permitted	
accommodation of cyclists	no restrictions or special facilities required		no restrictions or special facilities required		no restrictions or special facilities required	
accommodation of pedestrians	pedestrians permitted, no special facilities		sidewalks normally on one or both sides	sidewalks provided where required	sidewalks provided both sides	sidewalks provided where required
parking (typically)	some restrictions		no restrictions or restrictions one side only		few restrictions other than peak hour	
min. int. spacing	as needed		60		60	
right-of-way width (m)(typically)	6 – 10		15 – 22		20 – 24	

Footnotes to Table 3.0

1. The minimum right-of-way width may be increased to 25 m at controlled intersections for a minimum distance of 120 m back from the intersection, depending on the lane configuration (See standard detail drawings).
2. Roadway structure to be designed by a Geotechnical Engineer based on site specific soil conditions and traffic loadings.
3. Short grades less than 150 m in length may be 1% higher on urban roads, and 2% higher on low volume rural roads.
4. The minimum pavement width must be increased to accommodate bicycle lanes, auxiliary lanes, bus bays and medians where required as directed by the City Engineer.
5. With properly posted speed reductions and the City Engineer's approval, the minimum curve centre line radii may be reduced.
6. The boulevard width is measured from the face of curb to property line or from edge of pavement to property line on roads without curbs.
7. Road width is measured from face of curb to face of curb on roads with curbs and edge of asphalt to edge of asphalt otherwise.
8. Sidewalk is required on both sides of a street with multi-family development and commercial zones. In industrial areas the sidewalk is required only if it is necessary to form part of an existing sidewalk network or link walkways, crosswalks or bicycle paths.
9. A sidewalk is required on one side of a road that ends in a cul-de-sac. The sidewalk must extend to the furthest in the cul-de-sac.

4.0 HORIZONTAL ALIGNMENT

- 4.1 All horizontal alignment elements shall be designed in accordance with the Alignment and Lane Section of the current edition of the Transportation Association of Canada Geometric Design Guide for Canadian Roads.
- 4.2 The minimum road design speed, right-of-way width, pavement width, parking lane width, boulevard width, curve centre line radii and crowned crossfall shall be as shown in Table 3.0.

5.0 VERTICAL ALIGNMENT

- 5.1 All vertical alignment elements shall be designed in accordance with the Alignment and Lane Section of the current edition of the Transportation Association of Canada Geometric Design Guide for Canadian Roads.
- 5.2 Vertical curves shall be designed to provide safe stopping sight distances.
- 5.3 Vertical curves shall be provided at all grade changes greater than 1%.
- 5.4 Vertical curve length is calculated by the equation $L=KA$ where:
 - 5.4.1 L = the length of the vertical curve in meters.
 - 5.4.2 K = a constant related to lines and geometry of a parabolic curve.
 - 5.4.3 A = is the algebraic difference in grades in percent.
- 5.5 Minimum K values for vertical curve design shall be as shown in Table 3.0.

6.0 BIKEWAYS

- 6.1 Special provision for bicycles is required on Collector Roads where projected traffic volumes are expected to exceed 10,000 vehicles per day within 20 years of the time of subdivision or development and the road forms part of a bicycle network.

- 6.2 The curb lane is to be widened to 4.3 m and the right-of way widened to accommodate a 3.5 m boulevard. Refer to Supplementary Standard Detail Drawing S-R22.

7.0 CUL-DE-SACS

- 7.1 Cul-de-sac bulbs shall be used to terminate "no exit" roads and shall have the following pavement radii to ensure emergency or operations vehicle access.
- 7.1.1 Residential – 14.0 m pavement, 17.5 m property.
 - 7.1.2 Industrial – 20.0 m pavement, 23.5 m property.
 - 7.1.3 Commercial – 20.0 m pavement, 23.5 m property.
- 7.2 Maximum length of cul-de-sac streets to be 150 m to the end of the bulb when there is no alternate access from the bulb, and 210 m when there is alternate access (e.g. lane or walkway) and a looped water main is provided.
- 7.3 Roads must be constructed to the end of the furthest property line of the last lot being built. If the road is to continue in the future then a temporary turn around complete with barrier posts must be constructed. The temporary turn around must be constructed to allow maintenance vehicles and garbage trucks to turn around.

8.0 ROAD CROSS SECTIONS

- 8.1 Roads shall be centre line crowned with a minimum slope of 2% (maximum 4%) to the gutter or edge of minimum shoulder.
- 8.2 Offset from centre line crown may be considered where topography or property access grades are a factor.
- 8.3 Directing storm run-off to gutters, catch basins or ditching is the prime design requirement.

9.0 ROAD WORKS STRUCTURE

- 9.1 The minimum road works structure is as shown in Table 3.0. Each road structure is to be designed based on site specific soil conditions and traffic loadings. The road works structure must be designed by a qualified Geotechnical Engineer.

10.0 INTERSECTIONS

- 10.1 Intersections are to be designed and located within a range of angles between 70° and 110°.
- 10.2 The grade of the minor road will normally be changed to conform to the cross section of the major road. The grade of the road with the higher classification shall predominate.
- 10.3 No through road grade exceeding 8% shall be permitted at intersections.
- 10.4 Side street grade at an intersection shall be equal to the cross slope of the major road for a distance of 20 m on both sides of the intersection.
- 10.5 The minimum spacing between intersections is:
- 10.5.1 Along Collector Streets 60 m.

10.5.2 Along Local Streets, 4 way intersections 60 m.

10.5.3 Along Local Streets, 3 way intersections 40 m.

11.0 CURB RETURN RADII

11.1 A minimum of 9 m curb return radii shall be provided at all intersections except as shown in Table 11.3.

11.2 The minimum property corner cut shall be 5 m x 5 m except as show in Table 11.3.

Table 11.3

Description	Radius	Corner Cut
intersections with collectors	12 m	8.5 m x 8.5 m
intersection in industrial areas	17 m	13.5 m x 13.5 m

12.0 DRIVEWAYS / CROSSOVERS

12.1 All lots must be provided with a practical access driveway.

12.2 Driveway grades are to be set such that minimum cover over utilities within the boulevard is maintained.

12.3 Beyond the boulevard the maximum driveway grade is 20%.

12.4 Driveways with grade changes in excess of 1% must incorporate vertical curves in their design. The formula, length of vertical curve (m) = 0.5 x the algebraic difference in grades (in percent) must be used.

12.5 Access to large development parking areas shall be by curb returns rather than a driveway letdown.

12.6 Lanes exiting onto an 8.5 m pavement residential road shall have a sidewalk letdown.

12.7 Driveways to corner lots must be located a minimum of 7 m from the face of curb on the flanking street to the top of the flare where the flanking street is classified local and 10 m where the flanking street is classified collector.

12.8 Driveways must be a minimum of 0.5 m from a property line and there must be a minimum of 1.0 m between driveway crossovers.

12.9 Driveways must be located a minimum of 1 m from hydrants, poles, street lights or street signs.

- 12.10 The maximum number of driveways permitted per parcel is 2. If warranted by traffic volumes, additional driveways may be permitted at the discretion of the City Engineer.
- 12.11 The sidewalk thickness at the driveway crossover shall be a minimum of 200 mm for a commercial driveway, 100 mm for a residential driveway and 200 mm for a lane.
- 12.12 The minimum and maximum width of driveway crossovers is as set out in Table 12.12.

Table 12.12

Land Use Type	Access Type	Min Width	Max Width
Residential	One Way	3.0	4.3
	Two Way	3.0	7.3
Commercial	One Way	4.5	7.5
	Two Way	7.2	12.0
Industrial	One Way	5.0	9.0
	Two Way	9.0	15.0

13.0 BUS STOPS AND BUS BAYS

- 13.1 The City Engineer may require at the time of *subdivision* or *development*, the construction of a bus stop or bus pull-in bay on existing or future bus routes and within school zones.
- 13.2 Bus stops and waiting area pads are to be designed and constructed in accordance with Supplementary Standard Detail Drawing S-G11 – Standard Bus Stop Dimensions.
- 13.3 Bus bays are to be designed and constructed in accordance with Supplementary Standard Detail Drawing S-G12 – Standard Bus Bay Dimensions.
- 13.4 A protected bus bay may be required in a school zone and is to be designed and constructed in accordance with Supplementary Standard Detail Drawing S-G13 – Standard School Bus Bay.

14.0 WHEELCHAIR RAMPS

- 14.1 Wheelchair ramps must be provided at all intersection curb returns as an integral part of the sidewalk or to link walkways, crosswalks, and bicycle paths. Design at the mid point of the curb return.

15.0 WALKWAYS / SIDEWALKS

- 15.1 Concrete sidewalks must be provided on roads in or adjacent to *subdivisions* or *developments* in accordance with Table 3.0.
- 15.2 The maximum gradient for walkways is 15%. Concrete stairs are to be installed where required to suit the terrain of the site, when the grade exceeds 15%.
- 15.3 Retaining walls shall be installed for walkways as required to suit the site topography. The design shall be specific to the situation and must be certified by a professional engineer.
- 15.4 Paved walkways shall be a minimum of 3.0 m wide and shall be designed to provide minimal elevation interference with adjacent lots.
- 15.5 Multi-use recreational pathways shall be a minimum of 4.0 m wide.

16.0 EMERGENCY ACCESS ROUTES

- 16.1 Alternate access routes are required where the development main road access exceeds 10% and there is no alternate access route.
- 16.2 Maximum grade 15%.
- 16.3 Right-of-way width to be 6.0 m.
- 16.4 Road paved width to be 6.0 m.
- 16.5 Restrict non-emergency vehicles' access through the use of removable restriction posts.
- 16.6 Shared use with pedestrian trails is permitted.

17.0 BOULEVARDS / STREETSCAPES

- 17.1 Boulevards shall be defined as the area between the face of curb, back of walk or the edge of pavement and the property line.
- 17.2 For any works to be constructed within an existing road right-of-way, a Schedule "F" Permit from Traffic Bylaw 94-39 to "Construct Works within a Right-Of-Way" must be filled out and approved by the City.
- 17.3 A minimum grade of 2% must be maintained from the property line to the back of curb, back of walk, or to the back side of a ditch.
- 17.4 The design of boulevards and streetscape improvements shall consider the items listed below. The determination of what is to be addressed rests with the Director of Engineering and Development. In determining which items are to be included, consideration will be given to the road classification of the street, the zoning of adjacent properties and any revitalization initiatives including:
 - 17.4.1 Concrete sidewalk, asphalt cable strip.
 - 17.4.2 Trees, shrubs and other plant materials.
 - 17.4.3 Grass and other ground cover vegetation.

- 17.4.4 Paving stones in a variety of materials.
 - 17.4.5 Street furniture including benches, trash receptacles and planters.
 - 17.4.6 Transit shelters, retaining walls.
 - 17.4.7 Traffic control signs and signals and guide signs.
 - 17.4.8 Utility and lighting poles, utility cabinets, transformers.
 - 17.4.9 Mail boxes, parking meters.
 - 17.4.10 Hydrants, valves, irrigation.
 - 17.4.11 Newspaper vending boxes.
 - 17.4.12 Outdoor telephones, information kiosks.
 - 17.4.13 Bicycle racks.
- 17.5 The location of street furniture and items located in the boulevard shall avoid conflicts with other development features and vehicle site lines and shall retain safe pedestrian travel, particularly for the handicapped or disabled.
- 17.6 Street Trees:
- 17.6.1 Road design standards provide adequate room for tree planting and landscaping within the right-of-way. This enables the City to expand Penticton's urban forest, and beautification while minimizing the conflicts associated with trees and other utilities.
 - 17.6.2 The planting of trees on all new City residential roads shall be a requirement of all subdivision and servicing of land.
 - 17.6.3 The developer shall prepare and submit to the City a Landscaping Plan for review and approval. The Landscaping Plan shall show tree planting locations and species based on an approved City tree species list.
 - 17.6.4 Trees to be planted along streets typically shall be:
 - 17.6.4.1 Randomly spaced to provide one tree in front of each lot and a separation dependent upon the species but typically 8 to 12 m apart.
 - 17.6.4.2 Columnar in shape for retail and high-density areas, and broader and more spreading in shape elsewhere.
 - 17.6.4.3 Height of the first branch to be a minimum 1.8 m and a minimum caliper of 6 cm.
 - 17.6.5 Trees shall not be planted within:
 - 17.6.5.1 6 m from street intersections, and crosswalks – protect sight lines.
 - 17.6.5.2 6 m from street lighting – protect illumination.
 - 17.6.5.3 3 m from utility poles, junction boxes, vaults.
 - 17.6.5.4 2 m from catch basins, driveways, utility services, hydrants and manholes.
 - 17.6.5.5 No underground utilities to pass directly under the rootball.
 - 17.6.5.6 When selecting tree species near overhead power lines, the designer shall ensure that the canopy of the mature tree will maintain the minimum distances as required by Electrical Regulations.
 - 17.6.5.7 Consideration should be given in locating trees within the boulevards to avoid obstructing traffic signs, driveways, and sight lines.
 - 17.6.5.8 The view corridor of main windows or patios.
 - 17.6.6 Trees planted with a "soft" landscape surrounding them such as turf or soil shall be planted in accordance with Supplementary Standard Detail Drawing S-R18a.
 - 17.6.7 Trees with a "hard" landscape surrounding them such as concrete or paving stones shall be planted in accordance with Supplementary Standard Drawing S-R18b.

18.0 TRAFFIC CONTROL DEVICES

- 18.1 All proposed traffic islands, retaining walls, guardrails, and permanent barricades must be designed in keeping with good engineering practice, and as per the current edition of the Transportation Association of Canada Geometric Design Guidelines for Canadian Roads.

- 18.2 Traffic signs are to be designed in accordance with the current edition of the Transportation Association of Canada Manual of Uniform Traffic Control Devices for Canada.
- 18.3 Crosswalks to be designed in accordance with the current edition of the Province of British Columbia Ministry of Transportation and Highways Pedestrian Crossing Control Manual for British Columbia.
- 18.4 For Traffic Paint Markings - City of Penticton "Transportation Plan, Bicycle Network Master Plan" [BNMP] as approved by Council.
- 18.5 For all utility poles and tie-downs which require relocating prior to road construction, the utility must confirm the feasibility of their relocation prior to design completion.

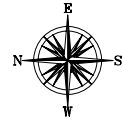
19.0 COMMUNITY MAILBOXES

- 19.1 These guidelines apply to all newly constructed developments, as well as those undergoing major renovation.
- 19.2 The Developer shall:
 - 19.2.1 Supply, install and locate the mail delivery equipment to Canada Post Specifications and to the satisfaction of the City Engineer.
 - 19.2.2 Ensure that all mail delivery equipment is accessible by persons with physical disabilities.

END OF SECTION

CITY OF PENTICTON ROAD CLASSIFICATION MAP

SCALE 1:10000



ROAD CLASSIFICATION INDEX

URBAN ROADS

LOCAL - RESIDENTIAL	—	16 m	8.5 m
LOCAL - INDUSTRIAL / COMMERCIAL	—	20 m	12 m
COLLECTOR - RESIDENTIAL	—	20 m	12 m
COLLECTOR - INDUSTRIAL	—	21 m	14 m
COLLECTOR - COMMERCIAL	—	21 m	14 m

RURAL ROADS

LOCAL	—	16 m	8 m
COLLECTOR	—	20 m	10 m

LANES

RESIDENTIAL	—	6 m	6 m
PRIMARY ACCESS / COMMERCIAL	—	7.5 m	7.5 m

ARTERIAL

ARTERIAL (HIGHWAY 97)	—	25 m	18 m
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NOTE: TO BE REVISED UPON COMPLETION OF A ROAD CLASSIFICATION EXERCISE



AMENDED BY BYLAW No.

1997-09		
2009-09		
2009-06		

1.0 GENERAL

- 1.1 In steep slopes areas where it is impossible to conform to the Design Criteria as set out in Schedule "G" of this bylaw, the City Engineer may approve subdivision or development required works or services which vary the conventional design criteria required by Schedule "G".
- 1.2 Before agreeing to vary any part of Schedule "G" the City Engineer must be satisfied that the variance is warranted due to the topographical constraint involved and the varied criteria is presented and acceptable as good engineering practice, environmentally sound, and does not adversely affect transportation or public safety.
- 1.3 Steep slopes are defined as lands in their natural state that have a slope angle exceeding 20% or greater for a minimum horizontal distance of 10 meters, or adjacent off-site areas where existing or potential sloughing or stability warrants concern.
- 1.4 Slopes greater than 30% may require special consideration.
- 1.5 Detailed geotechnical, slope stability and hydrological reports shall be required as part of the Pre-Design Report and shall be submitted prior to approval of a subdivision or development. It should be noted that the pre-design requirements in Schedule "A" still apply and these pre-design requirements are in addition. In steep slope areas the Pre-Design Report will have to specifically address and provide recommendations for:
 - 1.5.1 Slope stability concerns.
 - 1.5.2 A Lot Grading and Drainage Management Plan that mitigates the potential impacts onsite and downstream. The Drainage Management Plan shall include:
 - 1.5.2.1 Existing and proposed topography.
 - 1.5.2.2 Key cross sections showing cuts and fills related to building sites, roads and retaining walls.
 - 1.5.2.3 Erosion and sedimentation control and protection.
 - 1.5.2.4 Pre and post development hydro geological conditions.
 - 1.5.2.5 Protection of natural drainage patterns or water courses.
 - 1.5.2.6 Environmental impacts on vegetation due to changes drainage patterns.
 - 1.5.2.7 Drainage control around future buildings and between upper and lower lots.
 - 1.5.2.8 Control and discharge of roof and footing drainage.
 - 1.5.3 Underground infrastructure pipe bedding, trench backfill and mechanical restraints.
 - 1.5.4 Roadwork structure, tack coat requirements and guard rail requirements.
 - 1.5.5 Driveway access concerns.
 - 1.5.6 Building Code structural or foundation requirements.
 - 1.5.7 Restrictions on irrigation and removal of vegetation.
 - 1.5.8 Environmental impact assessment.
 - 1.5.9 A list of requirements on a lot by lot basis pertaining to covenants that may be required.
- 1.6 The Consulting Engineer is expected to use innovative design techniques that minimize impacts to future land owners, maintenance operations and sensitive steep slopes and natural drainage areas.

2.0 ROADS

- 2.1 Vertical Alignment:

- 2.1.1 Engineered design grades shall be as per Table 11.0 – Hillside Streets Standards Table of this section.
- 2.1.2 Alternate Access routes must be incorporated that ensure emergency or maintenance vehicular access.
- 2.2 Horizontal Alignment:
 - 2.2.1 Only where surveyed topography determines that a lesser radii must be used, the radius may be reduced with approval from the City Engineer and the addition of speed reduction and warning signs.
 - 2.2.2 The requirement for guard rail installation will be on the basis of warrant analysis as per the Transportation Association of Canada Geometric Design Guide for Canadian Roads.

3.0 ROADWORKS / CROSS SECTIONS

- 3.1 Roadway cross sections may be reduced in width as illustrated in Supplementary Standard Detail Drawings S-HS1 and S-HS2 and as shown in Table 11.0 of this Section.
- 3.2 Roadway cross sections may be further reduced in width if parking is to be located on private lots or if special pullout parking areas are established in strategic positions.
- 3.3 Boulevard grades in excess of 2% may be designed to a point 1.0 m back from the back of sidewalk, or up to the back of curb where on-street parking is provided and to a point 2.4 m back where parking is adjacent to the street, behind the curb, as long as it can be demonstrated that the depth of bury on underground utilities will not be negatively impacted and there is sufficient space for snow storage.
- 3.4 In areas where the boulevard grade exceeds 2% the City Engineer may require the Developer to undertake boulevard slope stabilization and planting.
- 3.5 In no case shall the grade from the property line to the back of sidewalk, back of curb or back of ditch be less than 1%.
- 3.6 Level access clearance 1.3 m around fire hydrants, transformers and vaults must be established.
- 3.7 Final boulevard grade or sloping shall direct surface runoff away from transformers, vaults and splice boxes.

4.0 ROAD LANE GRADE SEPARATION (SPLIT-ROAD SECTION)

- 4.1 To minimize excessive cut/fill slope protection of large trees, improve practical property access or allowance for gravity sanitary sewer connections for down slope lots to the street cross-sectional separated grade (one way) lanes are a design option.
- 4.2 Centre median cross-section slopes shall be protected from erosion and designed to be maintenance free.
- 4.3 Utility offsets would be established within the down slope road section with storm and sanitary in common trench.

5.0 INTERSECTION GRADES / SITE CLEARANCES

- 5.1 Through street maximum grade is 8% unless this must be exceeded by design to service lands beyond and protect horizontal and vertical site distances.
- 5.2 Cut/fill slopes, vegetation planting, retaining wall structures and parking, shall be designed to protect all site distances.

6.0 STORM DRAINAGE

- 6.1 Catch Basin grates on road grades exceeding 6% require sloping into (opposite) the downhill road grade to catch surface flows.
- 6.2 High side gutter elevation to catch basin grate shall be 75 mm.
- 6.3 Ditching, swales or natural drainage courses exceeding 6% require a properly designed ditch cross section that will control erosion taking into account soil type, water flow and velocity. The design should include geo-fabric, use of layered graded granular material of increasing coarseness and rip rap.

7.0 UNDERGROUND UTILITY CORRIDORS

- 7.1 Side yard and rear yard underground utility corridors shall only be approved if they are included in an easement that restricts the construction of permanent structures and required that the cost of removing and reconstructing fences and landscaping placed within the easement are the property owner's responsibility.
- 7.2 The design of the underground utility corridor shall consider depth of bury, access, separation from private structures and long term operational maintenance.
- 7.3 The use of private on-site sewage pumps shall be a standard practice on the down slope lots.
- 7.4 Utility service and transformer boxes, which need to be at road grade, would require suitable grading and retaining structures.

8.0 RETAINING WALLS / STAIRWAYS

- 8.1 Retaining walls or stairways required to facilitate access from the street or adjacent lot are to be engineered and shall be placed on private property, not in the road right-of-way.
- 8.2 Any retaining or landscape structure across a boulevard or median required to maintain surface utilities at road grade or to facilitate split road sections shall be engineered to protect the location and depth of all underground utilities.

9.0 DRIVEWAY ACCESS

- 9.1 Access by easement across adjacent properties to achieve practical access can be an engineered option for a maximum of 3 lots.

- 9.2 In areas with severe vertical curves, driveway locations may have to be restricted to maintain proper sight lines and stopping sight distance.

10.0 SITE RESTORATION

- 10.1 Disturbed areas within the road right-of-way or on disturbed areas of the site that are not within what will be formal landscaped areas or building sites shall be restored to a natural condition or to a condition that will prevent erosion prior to substantial completion being issued in the case of a road right-of-way or final occupancy in the case of a Building Permit application
- 10.2 Restoration practices employed shall be specifically tailored to address the type and degree of disturbance and the specific conditions of the site.
- 10.3 Restoration practices include:
- 10.3.1 Grading to natural contours.
 - 10.3.2 Construction of properly designed erosion control devices.
 - 10.3.3 Scarification and loosening of compacted soil following by hydro seeding.
 - 10.3.4 Planting of trees and shrubs.
 - 10.3.5 Maintenance to ensure growth.

11.0 HILLSIDE STREETS STANDARDS TABLE

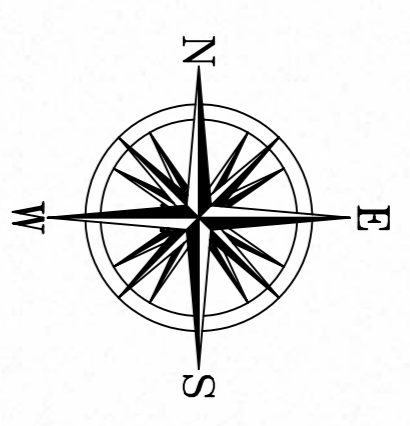
Table 11.0

STREET TYPE	CONDITION ¹	DESIGN SPEED	MAX. GRADE	ROW WIDTH	PAVEMENT WIDTH (m) ²	PARKING	CURB & GUTTER	SIDEWALK ³	STREET TREES
LOCAL STREET									
Development fronts both sides	A	40	15	14	6.0	above curb both sides	rollover	1	optional
Development fronts one side	B	40	15	12	6.0	above curb one side	rollover	1	optional
No Development fronting	C	40	15	10	6.0	none permitted	barrier	1	optional
COLLECTOR STREET									
Development fronts both sides	A	50	11	18	8.6	above curb both sides	rollover	2	2 sides
Development fronts one side	B	50	11	15	8.6	above curb one side	rollover	1	2 sides
No Development fronting	C	50	11	14	8.6	none permitted	barrier	1	2 sides
HILLSIDE EMERGENCY VEHICLE ACCESS		20	11	4.5	4.5				

Footnotes:

1. Condition refers Standard Detail Drawings S-HS1 and S-HS2.
2. Pavement width measured from face of curb.
3. Sidewalks should terminate at a destination or connect with another sidewalk or pathway. The number indicates one or both sides of the street.
4. Sidewalks are not required on local streets in steep slope areas unless they are required to provide connectivity to schools, parks, commercial areas or lands beyond. If this is the case, the right-of-way width may be reduced accordingly.
5. Roadway cross sections may be further reduced in width if parking is to be established at strategic locations.
6. One way lane widths require 3.0 m traveled lane plus 2.5 m parking or cycling width.

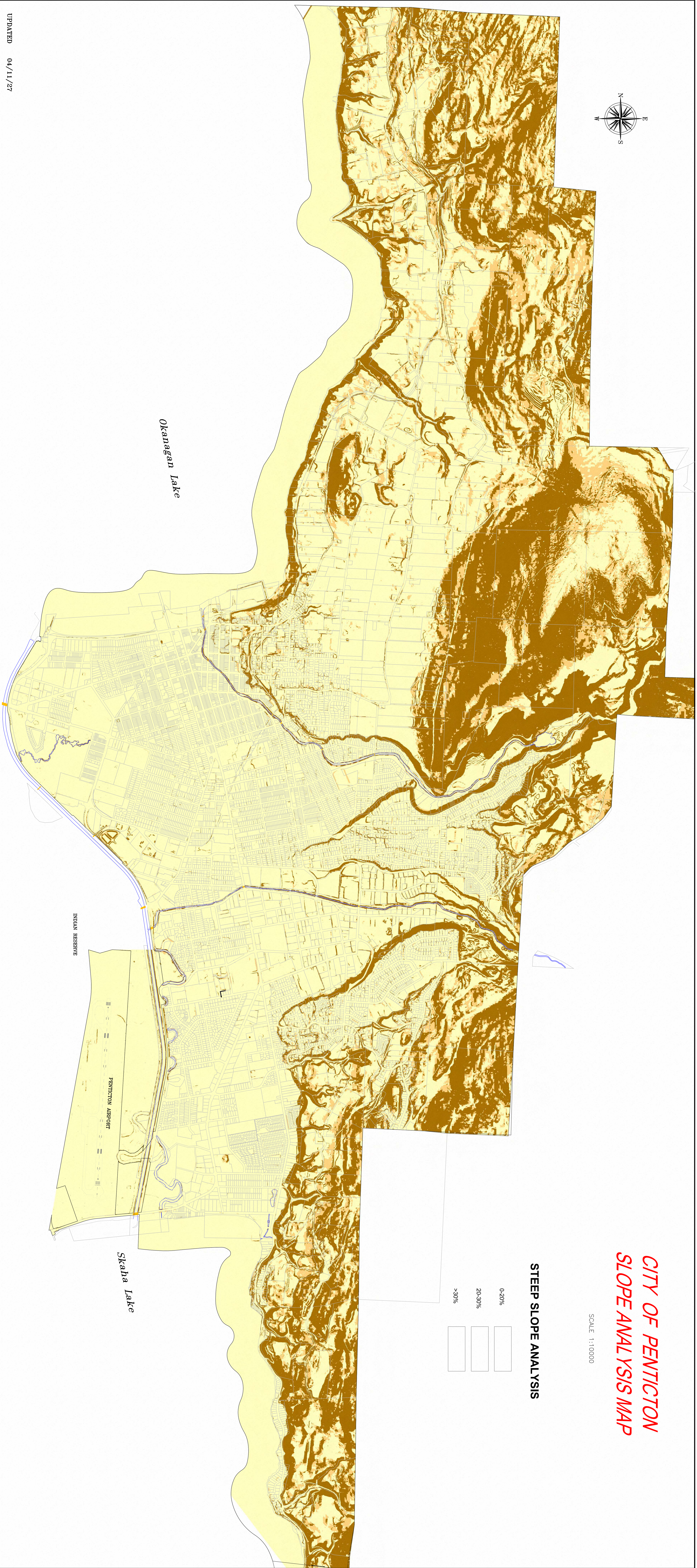
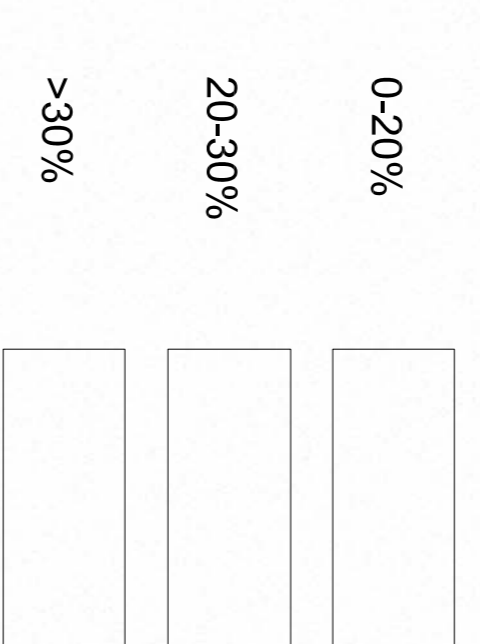
END OF SECTION



CITY OF PENTICTON SLOPE ANALYSIS MAP

SCALE 1:10000

STEEP SLOPE ANALYSIS



UPDATED 04/11/27

1.0 ELECTRICAL STREET LIGHTING AND COMMUNICATION WIRING

- 1.1 Electrical power supply, street lighting and communications systems shall be designed and approved by the General Manager, Electric Utility and to the criteria requirements noted in this schedule.
- 1.2 Consulting Engineers retained by the Owner to design the works and services must consult with the General Manager, Electric Utility to determine what existing information may be of assistance to them.

2.0 GENERAL

- 2.1 The electrical and communications systems must be designed and installed at the Owner's expense, in accordance with the requirements of the appropriate utility company standards and in accordance with all applicable Municipal codes and regulations, Provincial Statutes, regulations and/or standards.
- 2.2 It is standard practice that electrical design plans are prepared prior to design co-ordination with the other utility companies. (Telephone, Cable, Gas)
 - 2.2.1 Details of design such as vertical and horizontal location of service boxes, size and type of conduits and gas mains, kiosk dimensions and ducting and all wiring details shall be as per specifications and drawings provided by Penticton Electrical Utility, Schedule "A", and the appropriate telephone, cable and gas utilities.
- 2.3 Where overhead distribution is permitted, pole and anchor locations must be approved by the General Manager, Electric Utility and any other affected utility company. Care must be taken to avoid aerial trespass, or conflicts with all other utility infrastructure.
- 2.4 Plans and agreements for rights of way for anchors, pad-mounted transformers, etc., must be provided and registered prior to construction.

3.0 CONDUITS

- 3.1 All conduits must be designed and installed at a constant depth as per Supplementary Standard Detail Drawing U-D-1 and on the alignment specified in the design drawings supplied by the Penticton Electric Utility. When installed in a boulevard, all conduit, with the exception of rigid PVC streetlight conduit, must be concrete encased. Under a paved roadway all conduit must be concrete encased.

4.0 ELECTRICAL / COMMUNICATIONS

- 4.1 Electrical systems must be provided to serve each lot within the subdivision. The location of all facilities and structures must be in accordance with the engineering drawings as approved by the City.
- 4.2 Electrical transformers, junction boxes, vaults, and streetlights are normally set at the projection of a lot line.

4.3 Designs shall eliminate location conflicts with other utilities such as fire hydrants, valves or splice boxes.

5.0 STREETLIGHTING

5.1 Luminaire Types:

- 5.1.1 All road classification areas except special treatment areas, Davit Type c/w LED cobra head luminaire as per Electric Utility Distribution Standards Drawing O-E-L-2A & 2B. See also Supplementary Standard Drawing U-L-4.
- 5.1.2 Special treatment areas, Post Top 100 Watt High Pressure Sodium. Special treatment areas are areas such as Main Street, Marina Way and Front Street. The use of 100 Watt High Pressure Sodium luminaires is subject to approval of the City's Director of Operations. See Supplementary Standard Drawing U-L-5.
- 5.1.3 Walkways, Post Top 150 Watt High Pressure Sodium.
- 5.1.4 Parking Lots, Davit Type LED cobra head luminaire as per Electric Utility Distribution Standards Drawing O-E-L-2A & 2B. See also Supplementary Drawing U-L-4.
- 5.1.5 All non-LED luminaires are to be equipped with Instant Re-Strike/Dual Element Lamps.
- 5.1.6 All luminaires are to be equipped with photo eyes.
- 5.1.7 All Decorative Lighting shall be of the LED type, as per Supplementary Standard Drawing U-L-9.

5.2 For desired levels of illumination please refer to Table 5.2.

Table 5.2

Roadway Classification	Land Use					
	Urban Commercial/Industrial		Urban Residential		Rural	
	Lux (Avg)	Uniformity (Avg:Min)	Lux (Avg)	Uniformity (Avg:Min)	Lux (Avg)	Uniformity (Avg:Min)
Arterial	17	3:1	13	3:1	9	3:1
Collector	12	4:1	9	4:1	6	4:1
Local	9	6:1	7	6:1	4	6:1
Walkway	20	6:1	12	6:1	6	6:1
Parking Lot	20	3:1	12	6:1	12	6:1

-
- 5.3 Luminaires shall be located on one side of the road where the pavement width is 12.0 m or less.
- 5.4 Luminaires shall be located on both sides of the road in either a staggered or opposite pattern where the pavement width is greater than 12.0 m.
- 5.5 In general spacing of luminaires shall be based on the road classification and as follows:
- 5.5.1 Arterial Roads:
- 5.5.1.1 Opposite or staggered, both sides of the road, 45 m.
- 5.5.2 Commercial & Industrial Collector Roads:
- 5.5.2.1 Opposite or staggered, both sides of the road, + or - 45 m, located within 0.3 m of a projection of the property line.
- 5.5.3 Residential Collector Roads:
- 5.5.3.1 Spaced one side of the road, + or - 45 m, located within 0.3 m of a projection of the property line.
- 5.5.4 Local Roads:
- 5.5.4.1 Spaced one side of the road, + or - 90 m, located within 0.3 m of a projection of the property line.
- 5.5.5 Cul-de-sac Bulbs:
- 5.5.5.1 Placement may vary dependant on the lay out of the adjacent properties and is subject to the approval of the General Manager, Electrical Utility.
- 5.5.6 Walkways:
- 5.5.6.1 Spaced one side of the walkway at 30 m.
- 5.5.7 Parking Lots:
- 5.5.7.1 Spaced in such a way as to provide adequate lighting as determined by the General Manager, Electrical Utility and so as not to directly throw light onto streets, lanes or adjacent properties.
- 5.6 Intersections:
- 5.6.1 Illumination levels differ for different classifications of roadways and where these roads meet, a transition area shall be incorporated. The road with the lower illumination level shall have a gradual increase in illumination level until the higher level is reached.
- 5.7 Curves:
- 5.7.1 Luminaires should be located on the inside of a curve where possible, to avoid potential conflict with vehicles over running the curve.
- 5.7.2 On curves the luminaire spacing shall be reduced by 55% on the insides of bends and by 70% on the outside of bends to ensure uniformity of illumination.

6.0 COMMUNICATION WIRING

- 6.1 The owner must make arrangements with the appropriate communication and cable television company for design and installation of services in accordance with their requirements and standards.
- 6.2 Underground electrical, telephone and cable television, where installed, must be sufficiently complete prior to construction of sidewalks, curbs and gutters and street paving, to avoid damage to these improvements.

END OF SECTION

1.0 STANDARD DETAIL DRAWING INDEX AND MMCD SUPPLEMENTS

- 1.1 Use Table 1.1 to determine the status of the Standard Detail Drawings contained in the MMCD. For the most part the City adopts them however there are some that are deleted and some that the City has added for further clarification.

Table 1.1

Drawing Number	Drawing Name	Status
GENERAL DETAILS		
G0	DRAWING INDEX – GENERAL DETAILS	DELETE
G1	GENERAL LEGEND FOR CONTRACT DRAWINGS	DELETE
G2	LEGEND FOR MATERIALS	MMCD
G3	LEGEND FOR STREET LIGHT AND TRAFFIC SIGNAL DRAWINGS	DELETE
G4	UTILITY TRENCH	DELETE
G5	PAVEMENT RESTORATION	MMCD
G6	CONCRETE ENCASMENT FOR WATERMAIN / SEWER SEPARATION	MMCD
G7	CONCRETE PROTECTION FOR UNDERGROUND UTILITIES	MMCD
G8	PIPE ANCHOR BLOCKS	MMCD
S-G4	PIPE TRENCH DETAIL	CITY
S-G9	TYPICAL LOT SERVICING LOCATIONS	CITY
S-G10	STREET LIGHT SPACING AND PATTERNS	CITY
S-G11	STANDARD BUS STOP DIMENSIONS	CITY
S-G12	STANDARD BUS BAY DIMENSIONS	CITY
S-G13	STANDARD SCHOOL BUS BAY	CITY

Drawing Number	Drawing Name	Status
STORM AND SANITARY SEWERS		
S0	DRAWING INDEX – STORM AND SANITARY SEWERS	DELETE
S1	STANDARD AND SUMP MANHOLES	MMCD
S2	STANDARD MANHOLE CONNECTION DETAILS	MMCD
S3	MANHOLE CONNECTION DETAILS – DROP AND RAMP TYPE	MMCD
S4	INSIDE DROP MANHOLE	DELETE
S5	PRECAST RISER MANHOLE	MMCD
S6	SEWER CLEANOUT	MMCD
S7	SANITARY SEWER SERVICE CONNECTION	DELETE
S8	STORM SEWER SERVICE CONNECTION	MMCD
S9	INSPECTION CHAMBER FOR 100 TO 200 SANITARY SEWER CONNECTION	MMCD
S10	INSPECTION CHAMBER FOR 250 TO 375 STORM SEWER CONNECTION	MMCD
S11	TOP INLET CATCH BASIN	DELETE
S12	LAWN DRAINS	MMCD
S13	STORM SEWER INLET WITH SAFETY GRILLAGE	MMCD
S14	CONCRETE BLOCK ENDWALL	MMCD
S15	DRIVEWAY CULVERT WITH CONCRETE BLOCK ENDWALLS	MMCD
S-S7	SANITARY AND STORM SEWER SERVICE CONNECTION	CITY
S-S11a	CATCH BASIN – TYPE 1, TOP INLET	CITY
S-S11b	CATCH BASIN – TYPE 1, FRAME AND GRATE	CITY
S-S11c	CATCH BASIN – TYPE 2, SIDE INLET	CITY
S-S11d	CATCH BASIN – TYPE 2, SIDE AND GUTTER CASTINGS	CITY

Drawing Number	Drawing Name	Status
S-S11e	CATCH BASIN – TYPE 2, SIDE INLET TOP SLAB	CITY
S-S11f	CATCH BASIN – TYPE 3, ROLLCURB FRAME AND GRATE	CITY
S-S11g	CATCH BASIN ON > 6% GRADE ROAD	CITY
S-S16	DRAINAGE DRYWELL	CITY
S-S17	MANHOLE FRAME AND COVER	CITY
S-S17a	FLOATING MANHOLE FRAME AND COVER	CITY
S-S18	MANHOLE – CAST IN PLACE	CITY
S-S20	SUB-BASE (PERFORATED) DRAIN	CITY
S-S21	COMMERCIAL DRIVEWAY SUMP	CITY
S-S22	PREBENCHED MANHOLE BENCHING	CITY
S-S23	MANHOLE REQUIREMENT FOR SERVICES	CITY
S-S25	TYPICAL URBAN FRONT LOT DRAINAGE	CITY
S-S26	TYPICAL RURAL FRONT LOT DRAINAGE	CITY
S-S27	TYPICAL URBAN SPLIT LOT DRAINAGE	CITY
S-S28	TYPICAL RURAL SPLIT LOT DRAINAGE	CITY
S-S29	TYPICAL URBAN REAR LOT DRAINAGE	CITY
S-S30	TYPICAL RURAL REAR LOT DRAINAGE	CITY
S-S31	RAINFALL INTENSITY DURATION FREQUENCY CURVES	CITY
WATERWORKS		
W0	DRAWING INDEX - WATERWORKS	DELETE
W1	TYPICAL THRUST BLOCK ARRANGEMENTS	DELETE
W2a	WATER SERVICE CONNECTION – SERVICE BOX	DELETE
W2b	WATER SERVICE CONNECTION – VALVE BOX	DELETE

Drawing Number	Drawing Name	Status
W2c	METER INSTALLATION FOR 19 AND 25 mm SERVICE CONNECTIONS	DELETE
W2d	METER INSTALLATION FOR 38 AND 50 mm SERVICE CONNECTIONS	DELETE
W3	GATE VALVE INSTALLATION	MMCD
W4	FIRE HYDRANT INSTALLATION	DELETE
W5	TEST POINT INSTALLATION	MMCD
W6	AIR VALVE ASSEMBLY – 25 AND 50 mm VALVES	MMCD
W7	AIR VALVE ASSEMBLY – 100 mm VALVE	MMCD
W8	BLOW OFF FOR WATERMAIN	MMCD
W9	BLOW DOWN CHAMBER	DELETE
W10	WATERWORKS CHAMBER DRAIN	MMCD
S-W1	TYPICAL THRUST BLOCK ARRANGEMENTS	CITY
S-W1a	TYPICAL THRUST BLOCK REQUIREMENTS	CITY
S-W2	WATER SERVICE CONNECTION FOR 19 AND 25 mm	CITY
S-W4	FIRE HYDRANT INSTALLATION	CITY
S-W11	WATER SERVICE CONNECTION 37 AND 50 mm	CITY
S-W11a	WATER SERVICE CONNECTION 100 mm AND OVER	CITY
S-W12	STANDARD VALVE BOX ASSEMBLY	CITY
S-W13	STANDARD COMBINATION AIR VALVE INSTALLATION	CITY
S-W14	FROSTPROOF 19 AND 25 mm METER VAULT	CITY
S-W15	METER INSTALLATION 19 AND 25 mm	CITY
S-W16	METER INSTALLATION 38 AND 50 mm	CITY
S-W17	METER INSTALLATION 75 mm AND LARGER	CITY

Drawing Number	Drawing Name	Status
S-W18	VALVE ANCHORING DETAILS – 250, 300 AND 400 mm	CITY
S-W19	WATERMAIN RELOCATION	CITY
CONCRETE AND MISCELLANEOUS DETAILS		
C0	DRAWING INDEX – CONCRETE AND MISCELLANEOUS DETAILS	DELETE
C1	CONCRETE SIDEWALK, INFILL AND BARRIER CURB	MMCD
C2	CONCRETE SIDEWALK AND BARRIER CURB	MMCD
C3	CONCRETE SIDEWALK AND ROLLOVER CURB	MMCD
C4	CONCRETE CURB – NARROW BASE	MMCD
C5	CONCRETE BARRIER CURB – WIDE BASE	MMCD
C6	CONCRETE MEDIAN CURB AND INTERIM CURBS	MMCD
C7	DRIVEWAY CROSSING FOR BARRIER CURBS	MMCD
C8	WHEELCHAIR RAMP FOR SIDEWALK, INFILL AND BARRIER CURB	MMCD
C9	WHEELCHAIR RAMP FOR SIDEWALK AND BARRIER CURB	MMCD
C10	CONCRETE WALKWAY	MMCD
C11	BICYCLE BAFFLE	MMCD
C12	REMOVABLE RESTRICTION POST	MMCD
C13	CHAIN LINK FENCE FOR WALKWAY	MMCD
C14	HANDRAIL FOR CONCRETE RETAINING WALL	MMCD
S-C16	CONCRETE RETAINING WALL 1.2 m HIGH	CITY
S-C18	ROLLOVER CURB WITH GUTTER	CITY
S-C18a	PENTICON ROLLED CURB AND GUTTER	CITY
S-C19	INTERLOCKING UNIT PAVER	CITY

Drawing Number	Drawing Name	Status
S-C19a	HOLLAND BLOCK UNIT PAVERS	CITY
S-C20	CONCRETE STAIRWAY DETAILS	CITY
S-C21	STREET NAME AND SIGN POST STANDARD	CITY
ROADWORKS		
R0	DRAWING INDEX – ROADWORKS	DELETE
R1	PAVED SHOULDERS	MMCD
S-R2	URBAN LOCAL RESIDENTIAL ROAD	CITY
S-R3	URBAN RESIDENTIAL BOULEVARD DETAILS	CITY
S-R4	URBAN LOCAL COMMERCIAL ROAD	CITY
S-R4a	URBAN LOCAL INDUSTRIAL ROAD	CITY
S-R5	URBAN COLLECTION RESIDENTIAL ROAD	CITY
S-R6	URBAN COLLECTOR INDUSTRIAL ROAD	CITY
S-R6a	URBAN COLLECTOR COMMERCIAL ROAD	CITY
S-R7	URBAN COLLECTOR WITH LEFT TURN LANE - SECTION	CITY
S-R8	URBAN COLLECTOR WITH LEFT TURN LANE – PLAN	CITY
S-R9	URBAN COLLECTOR BOULEVARD DETAILS	CITY
S-R10	RURAL LOCAL ROAD	CITY
S-R11	RURAL COLLECTOR ROAD	CITY
S-R12	LANES – RESIDENTIAL	CITY
S-R12a	LANES – COMMERCIAL/MULTI-FAMILY PRIMARY ACCESS LANE OR PARKING LOT	CITY
S-R13	URBAN LOCAL RESIDENTIAL CUL-DE-SAC	CITY
S-R14	URBAN INDUSTRIAL/COMMERCIAL CUL-DE-SAC	CITY
S-R15	RURAL LOCAL CUL-DE-SAC	CITY
S-R16	URBAN LOCAL RESIDENTAIL EXPANDED CORNER	

Drawing Number	Drawing Name	Status
E3.6	CONCRETE VAULT	DELETE
E4.1	UNDERGROUND CONDUIT IN PAVED AREAS	DELETE
E4.2	UNDERGROUND CONDUIT IN NON-PAVED AREAS	DELETE
E5.1	LUMINAIRE POLE (TYPE 2 SHAFT)	MMCD
E5.2	LUMINAIRE POLE (TYPE 2 SHAFT)	MMCD
E5.3	SIGNAL POLE (TYPE 1 SHAFT)	MMCD
E5.4	SIGNAL POLE (TYPE 1 SHAFT)	MMCD
E5.5	SIGNAL POLE (TYPE 3 SHAFT)	MMCD
E5.6	SIGNAL POLE (TYPE 3 SHAFT)	MMCD
E5.7	SIGNAL POLE (TYPE 6 SHAFT)	MMCD
E5.8	SIGNAL POLE (TYPE 6 SHAFT)	MMCD
E5.9	SIGNAL POLE (TYPE 7 SHAFT)	MMCD
E5.10	SIGNAL POLE (TYPE 7 SHAFT)	MMCD
E5.11	SIGNAL POLE (TYPE S SHAFT)	MMCD
E5.12	SIGNAL POLE (TYPE S SHAFT)	MMCD
E5.13	SIGNAL POLE (TYPE S SHAFT)	MMCD
E5.14	SIGNAL POLE (TYPE L SHAFT)	MMCD
E5.15	SIGNAL POLE (TYPE L SHAFT)	MMCD
E4.16	SIGNAL POLE (TYPE L SHAFT)	MMCD
E5.17	SIGNAL POSTS (TYPE 4, 4A AND 5 SHAFTS)	MMCD
E5.18	SIGNAL POSTS (TYPE 4, 4A AND 5 SHAFTS)	MMCD
E5.19	POST TOP LUMINIARE POLES	MMCD
E5.20	POST TOP LUMINAIRE POLES	MMCD

Drawing Number	Drawing Name	Status
S-R18a	TREE PLANTING DETAIL – SOFTSCAPE	CITY
S-R18b	TREE PLANTING DETAIL – HARDSCAPE	CITY
S-R20	DRIVEWAY GRADES	CITY
S-R21	MULTI-USE PAVED PATHWAY	CITY
S-R21a	MULTI-USE PATHWAY WITH UNIT PAVERS	CITY
S-R22	BIKE LANES	CITY
HILLSIDES		
S-HS1	HILLSIDES – LOCAL	CITY
S-HS2	HILLSIDES – COLLECTOR	CITY
S-HS3	PLAN VIEW OF PARKING PULLOUT AREAS	CITY
ELECTRICAL		
E1.1	CONCRETE BASE INDEX	MMCD
E1.2	TYPE A AND B SONOTUBE CONCRETE BASES	DELETE
E1.3	TYPE C, C1, C2 & C3 TRAPEZOIDAL SHAPE CONCRETE BASES	MMCD
E1.4	TYPE C, C1, C2 & C3 TRAPEZOIDAL SHAPE CONCRETE BASES	MMCD
E1.5	TYPE C4 & C5 SPEAD FOOTING SHAPE CONCRETE BASES	MMCD
E1.6	TYPE C4 & C5 SPREAD FOOTING CONCRETE BASES	MMCD
E1.6	TYPE C4 & C5 SPREAD FOOTING CONCRETE BASES	MMCD
E1.7	TYPE C4 & C5 SPREAD FOOTING CONCRETE BASES	MMCD
E1.8	TYPE E2 TRAPEZOIDAL SHAPE CONCRETE BASE	MMCD
E1.9	TYPE E2 TRAPEDOIDAL SHAPE CONCRETE BASE	MMCD
E1.10	TYPES F1, L1 & S1 SPREAD FOOTING SHAPE CONCRETE BASES	MMCD

Drawing Number	Drawing Name	Status
E1.11	TYPES F1, L1 & S1 SPREAD FOOTING SHAPE CONCRETE BASES	MMCD
E1.12	TYPES F1, L1 & S1 SPREAD FOOTING SHAPE CONCRETE BASES	MMCD
E1.13	TYPES F2, L2 & S2 TRAPEZOIDAL SHAPE CONCRETE BASES	MMCD
E1.14	TYPES F2, L2 & S2 TRAPEZOIDAL SHAPE CONCRETE BASES	MMCD
E1.15	1" DIAMETER ANCHOR BOLTS	MMCD
E1.16	ANCHOR BOLT CAGE FOR TYPE 6, 7 AND S POLES	MMCD
E1.17	ANCHOR BOLT CAGE FOR TYPE L POLES	MMCD
E1.18	CONCRETE BASE FOR POST MOUNTED FLASHER LUMINAIRE (PRECAST)	MMCD
E1.19	POLE BASE INSTALLATION DETAILS	DELETE
E1.20	POLE BASE INSTALLATION DETAILS	DELETE
E2.1	TYPE M (NEMA CABINET) CONCRETE CONTROLLER BASE	MMCD
E2.2	TYPE P (NEMA CABINET) CONCRETE CONTROLLER BASE	MMCD
E2.3	MODEL 170 CONCRETE CONTROLLER BASE	MMCD
E2.4	CONTROLLER INSTALLATION (FOR TYPE P & M CABINETS)	MMCD
E2.5	CONTROLLER INSTALLATION (FOR MODEL 170 CABINETS)	MMCD
E2.6	TYPE F CONTROLLER PEDESTAL	MMCD
E2.7	TYPE F CONTROLLER PEDESTAL	MMCD
E3.1	ROUND PLASTIC JUNCTION BOXES	DELETE
E3.2	TYPE 37 AND 66 CONCRETE JUNCTION BOXES	DELETE
E3.3	LARGE CONCRETE JUNCTION BOXES	DELETE
E3.4	LARGE CONCRETE JUNCTION BOXES	DELETE
E3.5	CONCRETE VAULT	DELETE

Drawing Number	Drawing Name	Status
E5.21	SERVICE BASE	DELETE
E5.22	POLE ACCESSORIES	MMCD
E6.1	POST TOP SIGNAL HEAD MOUNTING	MMCD
E6.2	SIDE OF POLE SIGNAL HEAD MOUNTING (METHOD 1)	MMCD
E6.3	SIDE OF POLE SIGNAL HEAD MOUNTING (METHOD 2)	MMCD
E6.4	SIDE OF POLE SIGNAL HEAD MOUNTING (METHOD 3)	MMCD
E6.5	OVERHEAD SIGNAL HEAD MOUNTING (SPRING CUSHION END HANGER METHOD)	MMCD
E6.6	OVERHEAD SIGNAL HEAD MOUNTING (SPRING CUSHION MID HANGER METHOD)	MMCD
E6.7	OVERHEAD SIGNAL HEAD MOUNTING (PLUMBIZER METHOD)	MMCD
E6.8	OVERHEAD SIGNAL MOUNTING (PLUMBIZER METHOD)	MMCD
E6.9	OVERHEAD SIGNAL HEAD MOUNTING (ADJUSTABLE BRACKET METHOD)	MMCD
E6.10	OVERHEAD SIGNAL HEAD MOUNTING ON POLE ARM (BALL HANGER METHOD)	MMCD
E6.11	OVERHEAD SIGNAL HEAD MOUNTING ON (BALL HANGER METHOD)	MMCD
E6.12	AUDIBLE SIGNALS	MMCD
E7.1	PEDESTRIAN PUSHBUTTON WITH SEPARATE SIGN	MMCD
E7.2	PEDESTRIAN PUSHBUTTON WITH INTEGRAL SIGN	MMCD
E7.3	PEDESTRIAN PUSHBUTTON POST	MMCD
E8.1	UNDERGROUND DIP SERVICE	DELETE
E8.2	SERVICE PANEL IN SERVICE BASE (MOUNTING DETAILS)	MMCD
E8.3	SERVICE PANEL IN SERVICE BASE (MOUNTING DETAILS)	MMCD
E8.4	60A STREETLIGHT AND 100A STREETLIGHT / TRAFFIC SIGNAL SERVICE PANEL IN SERVICE BASE (PANEL DETAILS)	MMCD

Drawing Number	Drawing Name	Status
E8.5	60A (120/240V) STREET LIGHTING SERVICE PANEL IN SERVICE BASE (WIRING DIAGRAM)	MMCD
E8.6	100A (120/240V) TRAFFIC SIGNAL / STREET LIGHTING SERVICE PANEL IN SERVICE BASE (WIRING DIAGRAM)	MMCD
E8.7	100A TRAFFIC SIGNAL / STREETLIGHTING SERVICE PANEL ON POLE (MOUNTING DETAILS)	MMCD
E8.8	100A TRAFFIC SIGNAL / STREETLIGHTING SERVICE PANEL ON POLE (MOUNTING DETAILS)	MMCD
E8.9	100A (120/240V) TRAFFIC SIGNAL / STREET LIGHTING SERVICE PANEL (WIRING DIAGRAM)	MMCD
E8.10	SERVICE GROUND PLATE INSTALLATION DETAIL	DELETE
E8.11	LUMINAIRE WIRING IN POLE HANDHOLE	DELETE
E8.12	SIGNAL CABLE WIRING IN POLE HANDHOLE	MMCD
E8.13	SIGNAL CABLE COLOUR CODE SAMPLE (ONTARIO SPEC METHOD)	MMCD
E8.14	MINIMUM CLEARANCES TO OVERHEAD POWERLINES	MMCD
E8.15	POLE MOUNTED RECEPTACLE	MMCD
E8.16	TELEPHONE DEMARCATION ENCLOSURE MOUNTING DETAILS ON CONTROLLER OR POLE	MMCD
E8.17	TELEPHONE CONDUIT ON UTILITY POLE	MMCD
E8.18	CONDUIT TIE-IN TO TELEPHONE VAULT, MANHOLE JUNCTION BOX	MMCD
E9.1	TYPICAL DETECTOR LOOP TYPES	MMCD
E9.2	DETECTOR LOOPS	MMCD
E9.3	DETECTOR LOOPS	MMCD
E9.4	DETECTOR LOOP TO SHIELDED CABLE SPLICES	MMCD
E9.5	DETECTOR LOOP PROCEDURES AND RULES	MMCD
E9.6	DETECTOR LOOP PROCEDURES AND RULES	MMCD

Drawing Number	Drawing Name	Status
E9.7	TYPICAL LAYOUT FOR DIAMOND AND ROUND TRAFFIC SIGNAL DETECTOR LOOPS	MMCD
E9.8	PRE-FORMED DIAMOND DETECTOR LOOP INSTALLATION DETAILS	MMCD
E9.9	PRE-FORMED DIAMOND DETECTOR LOOP INSTALLATION DETAILS	MMCD
E9.10	PRE-FORMED DIAMOND DETECTOR LOOP INSTALLATION DETAILS	MMCD
E10.1	FLASHER LUMINAIRE AND SIGNS ON PERFORATED STEEL TUBING	MMCD
E10.2	FLASHER LUMINAIRE AND SIGNS ON PERFORATED STEEL TUBING	MMCD
E10.3	FLASHER LUMINAIRE AND SIGNS ON STEEL POLE	MMCD
E10.4	FLASHER LUMINAIRE AND SIGNS ON STEEL POLE	MMCD
E11.1	OVERHEAD EXTRUDED ALUMINUM ADVANCE WARNING SIGN ASSEMBLY DETAILS	MMCD
E11.2	OVERHEAD EXTRUDED ALUMINUM ADVANCE WARNING SIGN INSTALLATION DETAILS	MMCD
E11.3	OVERHEAD EXTRUDED ALUMINUM ADVANCE WARNING SIGN INSTALLATION DETAILS	MMCD
E11.4	OVERHEAD EXTRUDED ALUMINUM SIGN INSTALLATION DETAILS	MMCD
E11.5	OVERHEAD EXTRUDED ALUMINUM SIGN INSTALLATION DETAILS	MMCD
E11.6	OVERHEAD EXTRUDED ALUMINUM SIGN ASSEMBLY DETAILS	MMCD
E11.7	OVERHEAD EXTRUDED ALUMINUM SIGN ASSEMBLY DETAILS	MMCD
E11.8	OVERHEAD EXTRUDED ALUMINUM SIGN ASSEMBLY DETAILS	MMCD
E11.9	OVERHEAD EXTRUDED ALUMINUM SIGN LUMINAIRE INSTALLATION DETAILS	MMCD
E11.10	JUNCTION BOX INSTALLATION DETAILS ON SIGN ARMS	MMCD

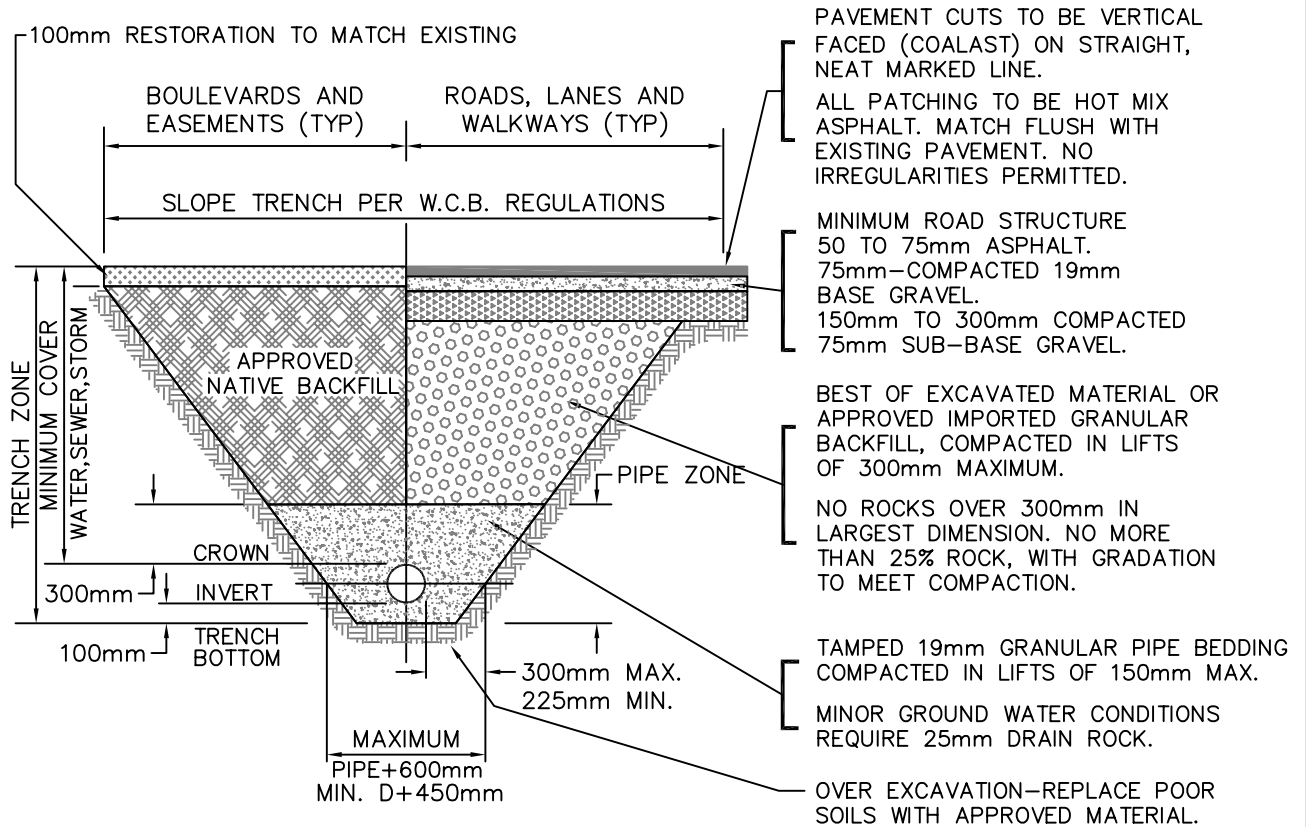
Drawing Number	Drawing Name	Status
U-M-1	ELECTRICAL DISTRIBUTION SYSTEM DRAWING LEGEND	CITY
M-C-1	METER CABINET INSTALLATION DETAILS	CITY
M-K-1	KIOSK PAD PRIMARY METERING INSTALLATION	CITY
M-K-1A	METERING KIOSK PAD	CITY
U-D-1	STANDARD TRENCH DETAIL CITY ELECTRICAL & FIBER, TELEPHONE & CABLE	CITY
U-J1-1	1 PHASE PRIMARY JUNCTION BOX INSTALLATION DETAILS	CITY
U-J3-1	3 PHASE PRIMARY JUNCTION BOX (TYPE 832) INSTALLATION DETAILS	CITY
U-K-1	TYPE 1818 (TOP HALF) PADMOUNT SWITCHGEAR KIOSK	CITY
U-K-1A	PADMOUNT SWITCHGEAR KIOSK FOOTING SPECIFICATIONS	CITY
U-L-1	STREETLIGHTING STANDARD PEDESTAL	CITY
U-L-2	DISTRIBUTION / STREETLIGHTING PEDESTAL	CITY
U-L-3	DISTRIBUTION / STREETLIGHTING RETROFIT PEDESTAL	CITY
U-L-4	STREETLIGHT LUMINAIRE POLE & DISTRIBUTION BASE (TYPE A & B)	CITY
U-L-5	POST-TOP TYPE STREETLIGHT WITH DISTRIBUTION BASE (RESIDENTIAL USE ONLY)	CITY
U-L-6	STREETLIGHTING SERVICE & PANEL LAYOUT (O/H OR U/G)	CITY
U-L-7	STREETLIGHTING CONTROL PANEL (SCHEMATIC)	CITY
U-L-8	STREETLIGHTING U/G WIRING WITH CONCRETE PEDESTAL	CITY
U-L-9	DECORATIVE STREETLIGHT 36 INCH BASE INSTALLATION DETAILS	CITY
U-L-9A	36 INCH BASE DETAIL FOR DECORATIVE STREETLIGHTS	CITY
U-L-9B	3/4 INCH DIA. ANCHOR BOLT DETAIL FOR DECORATIVE STREETLIGHTS – 36 INCH BASE	CITY
U-L-10	STREETLIGHT DISTRIBUTION BASE DETAIL	CITY

Drawing Number	Drawing Name	Status
U-Q-1	TYPICAL POLE RISER & PILASTER (1 PH. OR 3 PH. & WOOD OR STEEL)	CITY
U-V1-1	SINGLE PHASE PRE-CAST TRANSFORMER PAD	CITY
U-V1-2	SINGLE PHASE PRE-CAST TRANSFORMER PAD TYPE 2 FOR RETROFIT	CITY
U-V3-1	THREE PHASE PRE-CAST TRANSFORMER PAD	CITY
U-X-1	STANDARD LOCATIONS FOR TELUS & CABLE T.V. JUNCTION BOXES WHERE AN ELECTRICAL SERVICE BOX IS USED	CITY
U-X-2	TYPICAL RESIDENTIAL LOT SERVICING LOCATIONS	CITY
U-X-3	UNDERGROUND RESIDENTIAL SERVICE	CITY
U-X-5	1 PHASE DIP SERVICE	CITY
U-X-6	1 PHASE TAP WITH U/G DIP SERVICE	CITY
U-X-7	SERVICE BOX INSTALLATION DETAIL	CITY

END OF SECTION



STANDARD DETAIL DRAWINGS



NOTE: ALL COMPACTION TO MIN. 95% MODIFIED PROCTOR DENSITY

2004

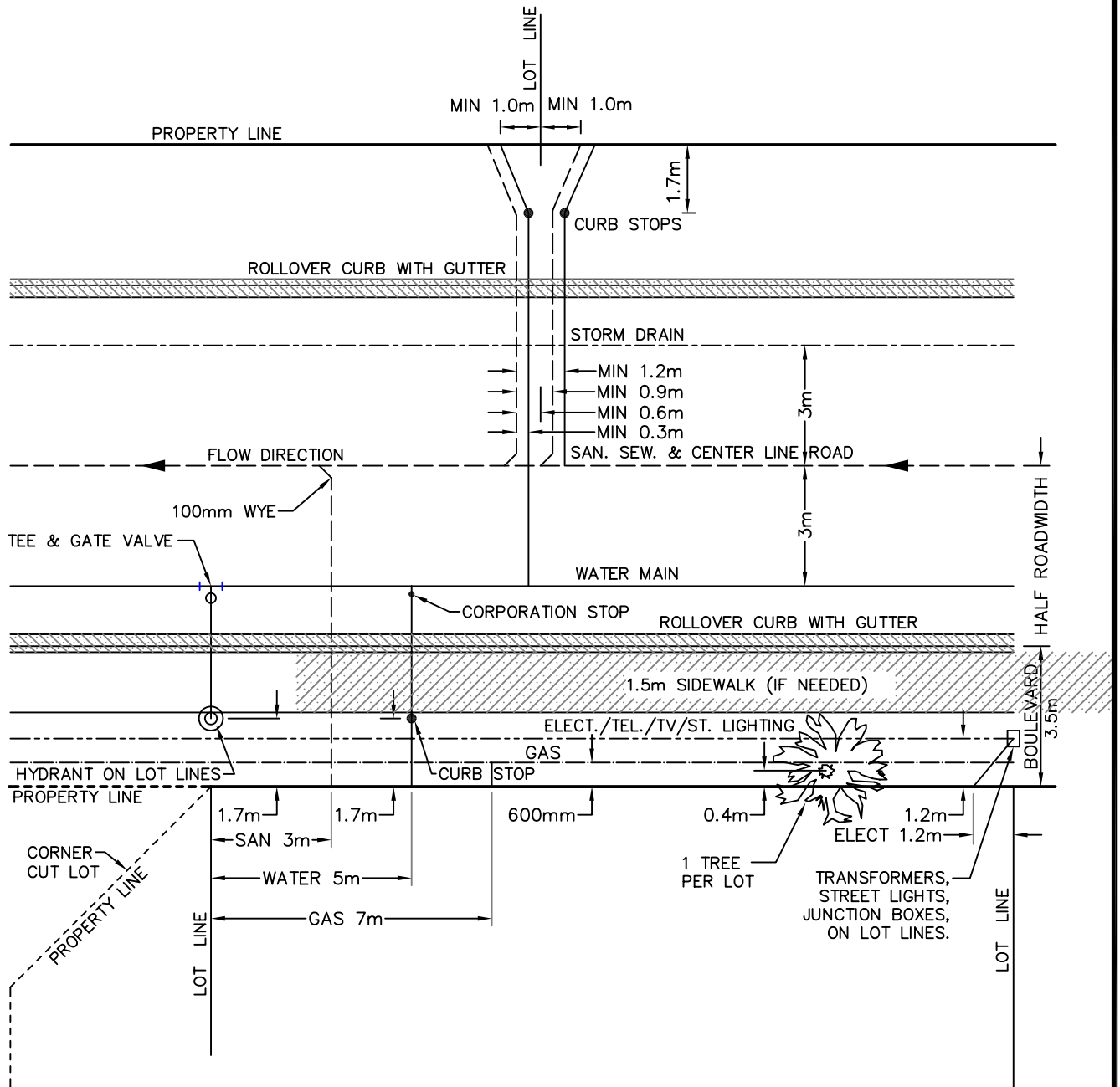
PIPE TRENCH DETAIL

APPROVED
 NOVEMBER, 2004

DRAWING NUMBER:
 S-G4



STANDARD DETAIL DRAWINGS



NOTES:

- CITY IS NOT RESPONSIBLE FOR OWNERSHIP OR MAINTENANCE OF SERVICES OF PRIVATE PROPERTY
- TERMINATE AND MARK ALL SERVICES AT FRONT PROPERTY LINE WITH WOOD STAKES.
- ENDS OF ANY WATER SERVICE EXTENDED INTO PRIVATE PROPERTY TO HAVE FILTER CLOTH OR APPROVED EQUIVALENT TAPED ON END TO ALLOW TESTING OF CURBSTOP
- SEWER SERVICES MUST BE PROPERLY CAPPED

2004

LOT SERVICING LOCATIONS

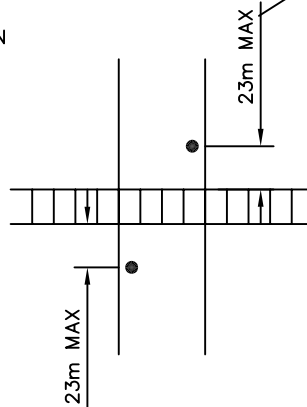
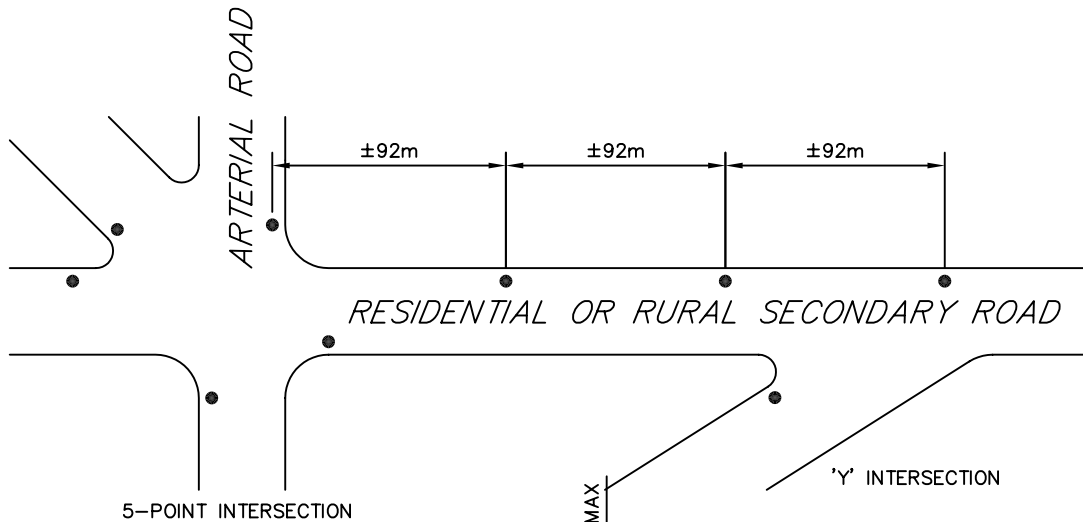
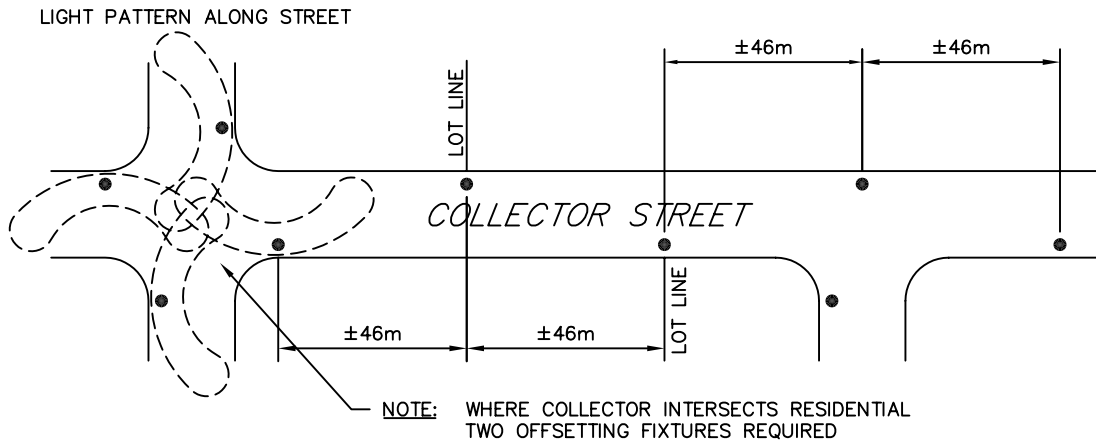
APPROVED
NOVEMBER, 2004

DRAWING NUMBER:
S-G9



STANDARD DETAIL DRAWINGS

RECOMMENDED STANDARD MOUNTING ARRANGEMENTS FOR DIFFERENT TYPES OF INTERSECTIONS

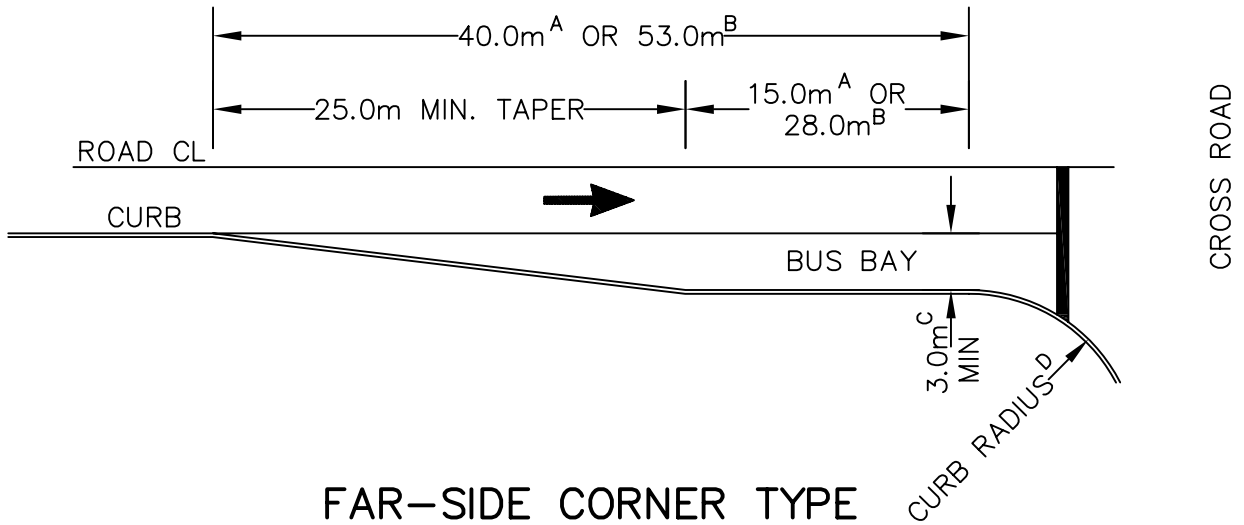


LEVEL WALKWAY OR ISOLATED PEDESTRIAN CROSSWALK

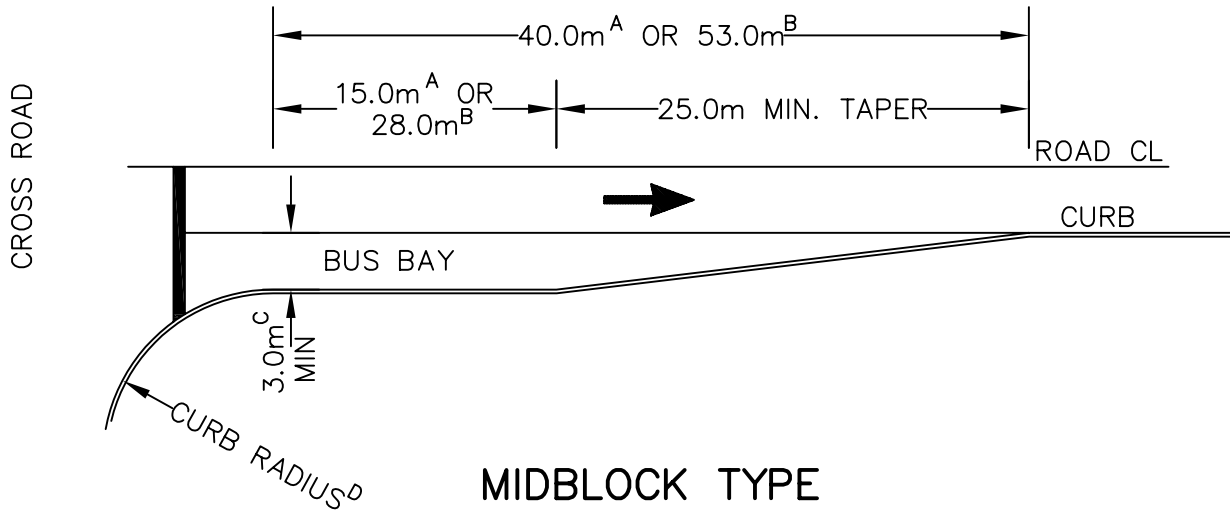


STANDARD DETAIL DRAWINGS

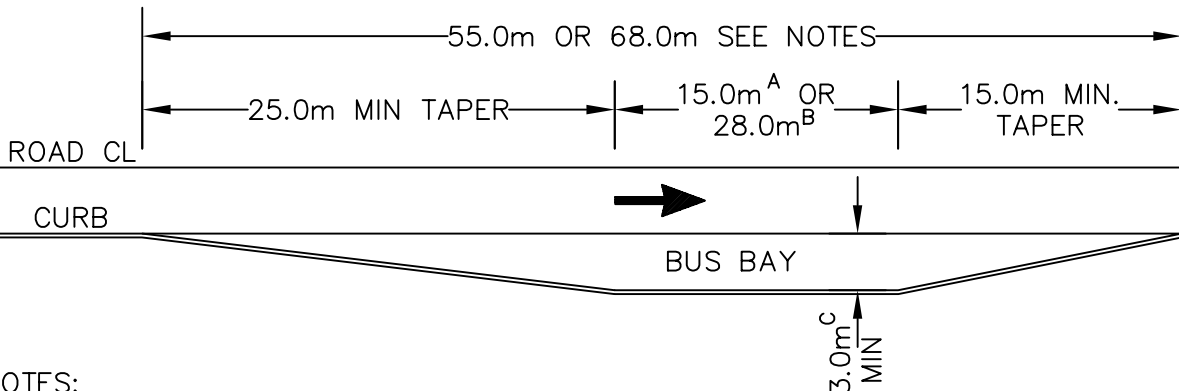
NEAR-SIDE CORNER TYPE



FAR-SIDE CORNER TYPE



MIDBLOCK TYPE



NOTES:

- A. DIMENSIONS TO ACCOMODATE A SINGLE CITY BUS.
- B. DIMENSIONS TO ACCOMODATE TWO CITY BUSES.
- C. DIMENSION INCREASED TO 3.5M IF USED AS A COMBINATION BUS BAY, RIGHT-TURN BAY.
- D. REFER TO THE TAC MANUAL FOR DESIGN VEHICLE TURNING RADIUS.

2004

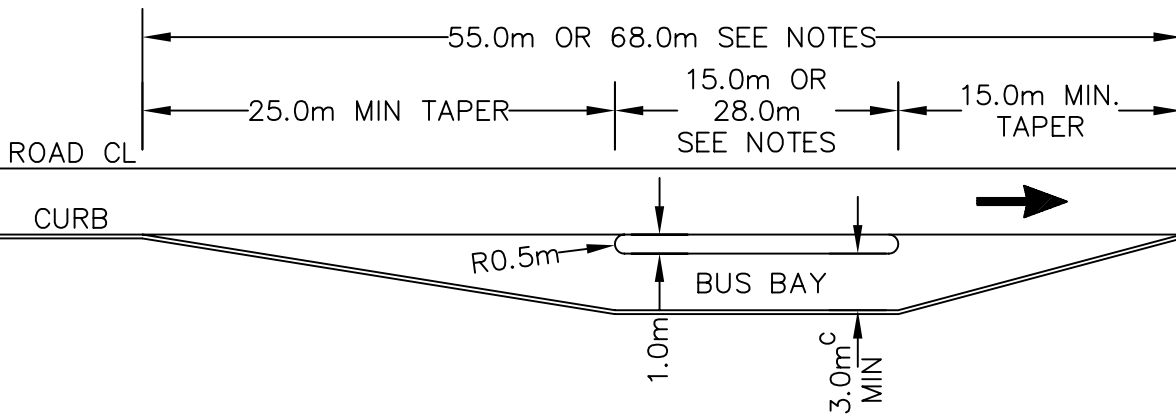
STANDARD BUS BAY DIMENSIONS

APPROVED
NOVEMBER, 2004

DRAWING NUMBER:
S-G12



STANDARD DETAIL DRAWINGS



NOTES:

- A. DIMENSIONS TO ACCOMODATE A SINGLE CITY BUS.
- B. DIMENSIONS TO ACCOMODATE TWO CITY BUSES.
- C. DIMENSION INCREASED TO 3.5M IF USED AS A COMBINATION BUS BAY, RIGHT-TURN BAY.
- D. REFER TO THE TAC MANUAL FOR DESIGN VEHICLE TURNING RADIUS.

2004

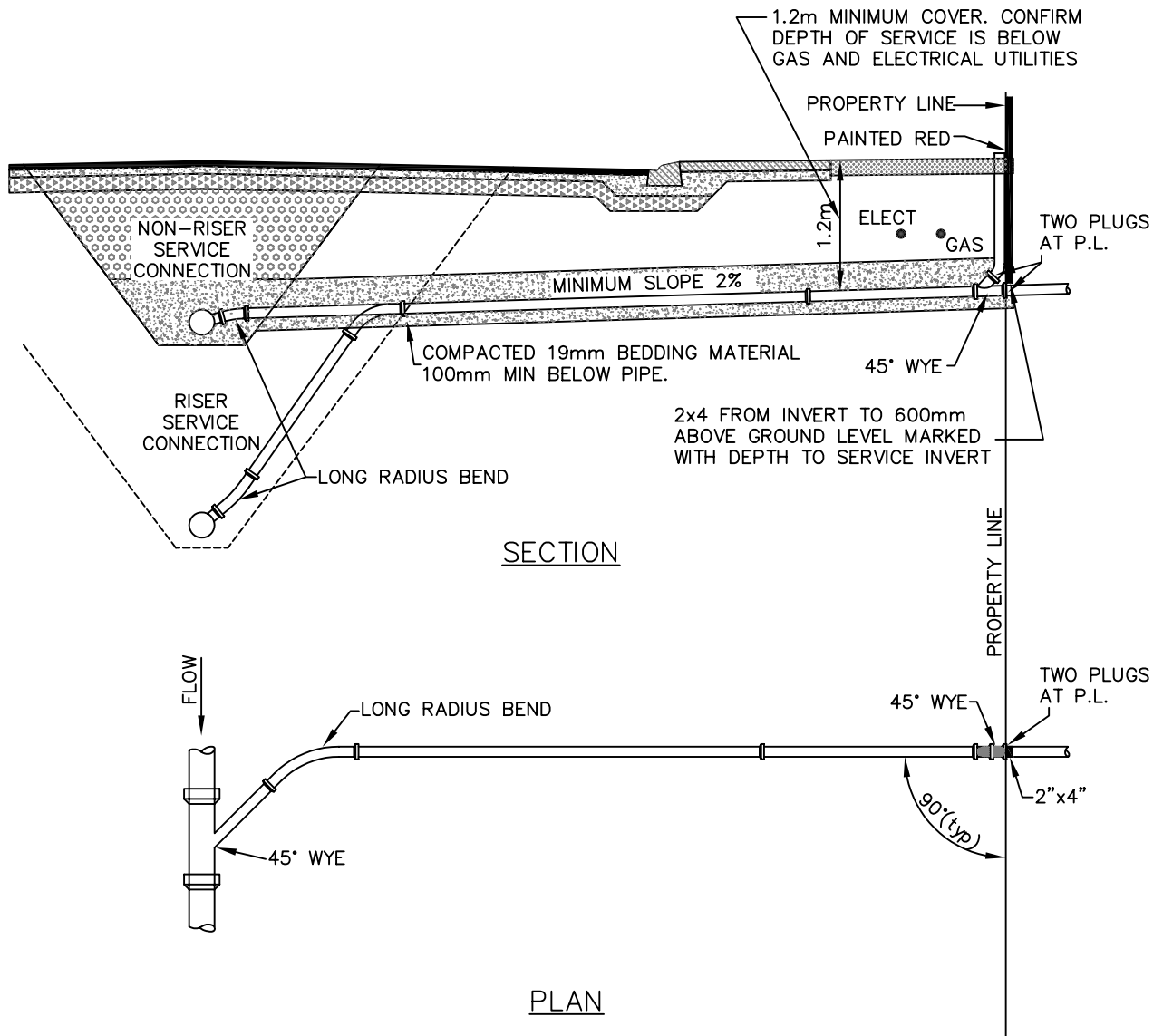
STANDARD SCHOOL BUS BAY

APPROVED
NOVEMBER, 2004

DRAWING NUMBER:
S-G13



STANDARD DETAIL DRAWINGS



NOTES

- 1) CAST IRON STRAP ON SADDLE CAN REPLACE THE WYE & 45° BEND AT MAIN.
- 2) BEDDING BACKFILL SEE (TYPICAL TRENCH DETAIL)
- 3) PLUMBING PERMIT REQUIRES EXTENSION OF SERVICE WYE TO SURFACE WITH CAP.

2004

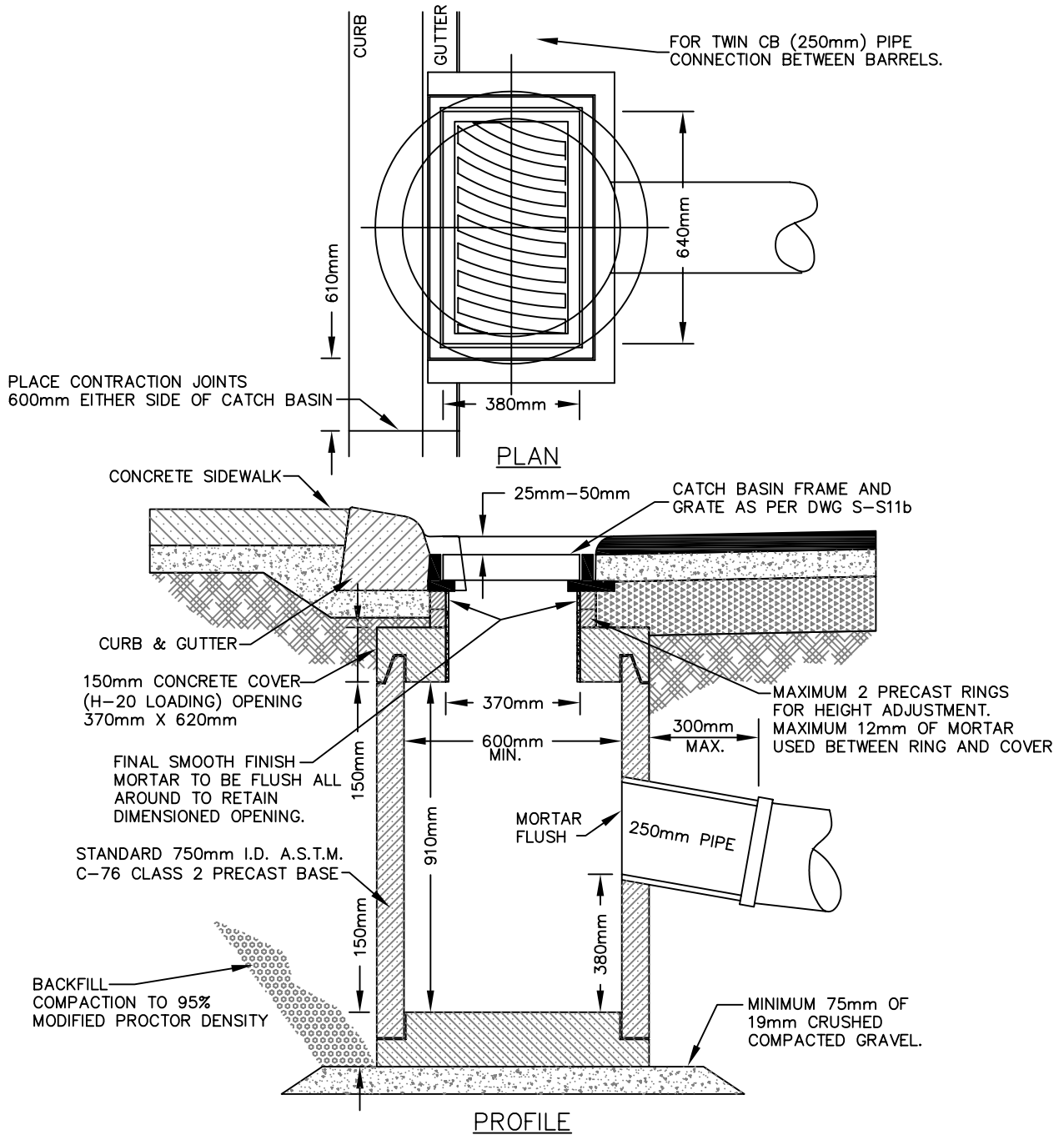
SANITARY AND STORM SERVICE CONNECTIONS

APPROVED
NOVEMBER, 2004

DRAWING NUMBER:
S-S7



STANDARD DETAIL DRAWINGS

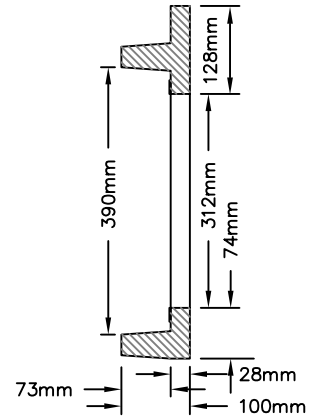
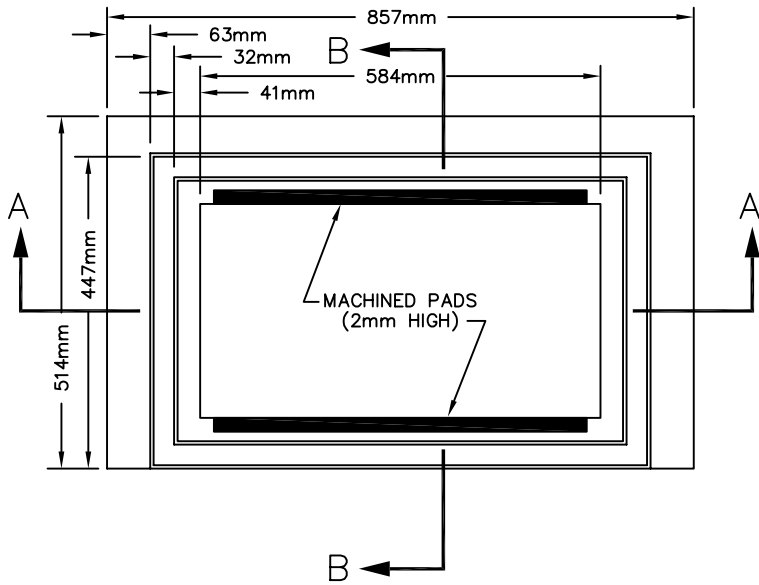


2004

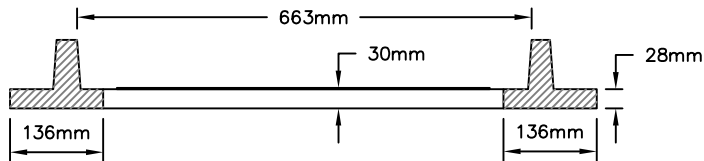
CATCH BASIN-TYPE 1, TOP INLET

APPROVED
NOVEMBER, 2004

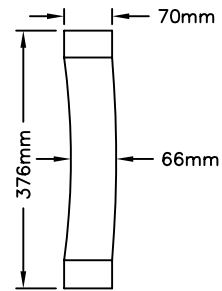
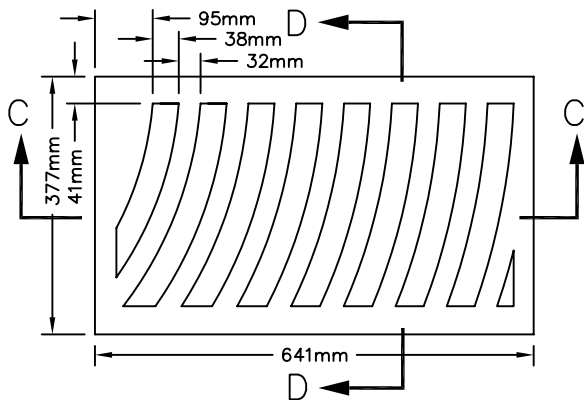
DRAWING NUMBER:
S-S11a



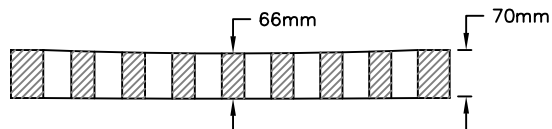
SECTION B-B



SECTION A-A



SECTION D-D

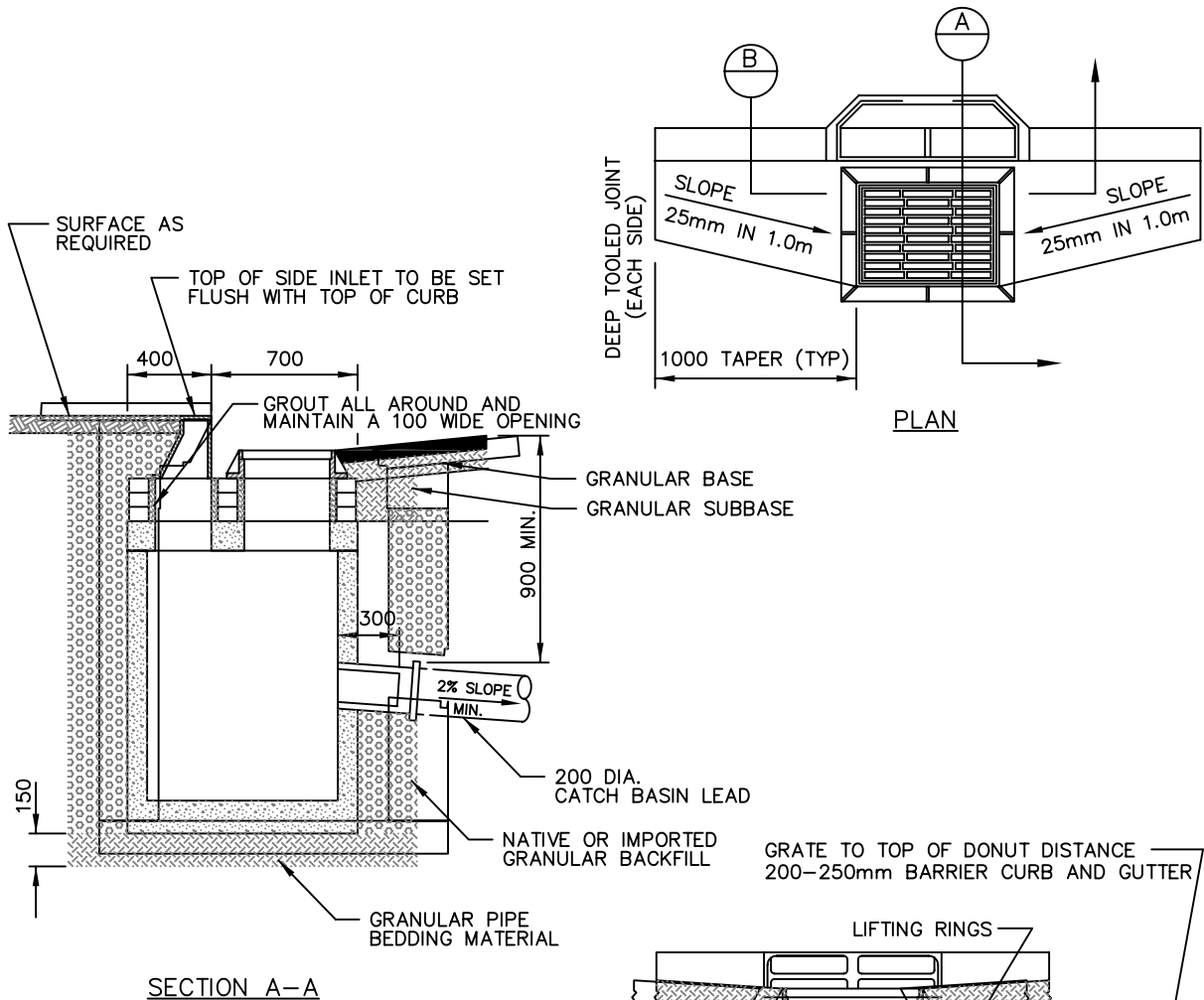


SECTION C-C

NOTE:
 MATERIAL TO BE CAST STEEL OR CAST IRON.
 ALLOWANCE TO BE MADE FOR MACHINING THE BEARING SURFACES.

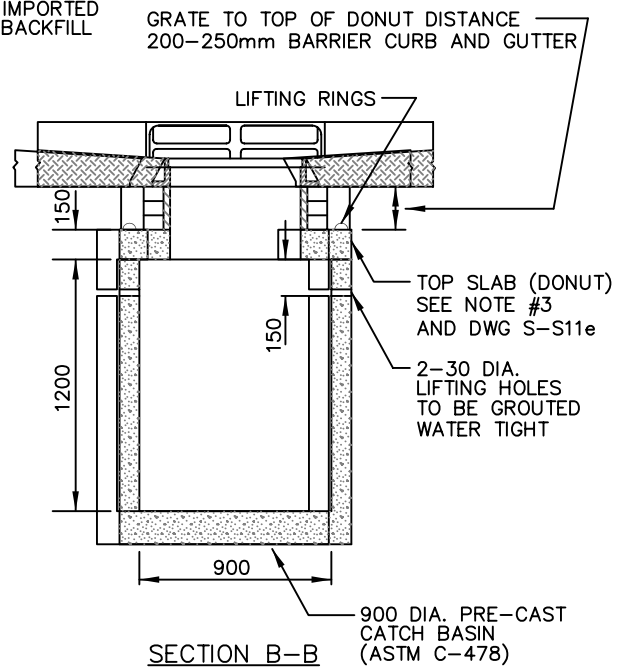


STANDARD DETAIL DRAWINGS



NOTES:

1. FOR DETAILS OF METAL CASTINGS SEE DWG S-S11d
2. FOR DETAILS OF TOP SLAB SEE DWG S-S11e
3. a) METAL CASTINGS ADJUSTED TO GRADE WITH CONCRETE BRICKS. INSIDE SURFACES TO BE GROUTED SMOOTH.
- b) FOR INSTALLATION OF CATCH BASIN WITHOUT CURB AND GUTTER, BLOCK CURB INLET OPENING IN TOP SLAB WITH SOLID NON-DECOMPOSABLE MATERIAL.
4. GRATE TO BE SET BELOW FIRST LIFT OF ASPHALT WHERE FINAL LIFT IS NOT BEING INSTALLED WITHIN ONE MONTH.



2004

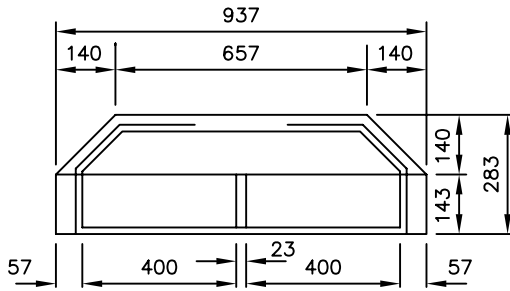
CATCH BASIN—TYPE 2, SIDE INLET

APPROVED
NOVEMBER, 2004

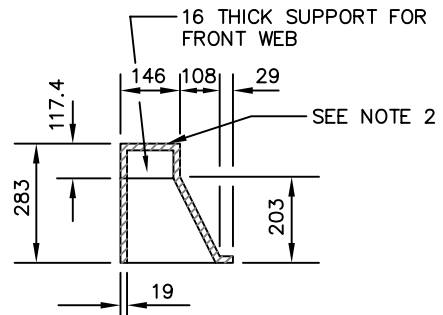
DRAWING NUMBER:
S-S11c



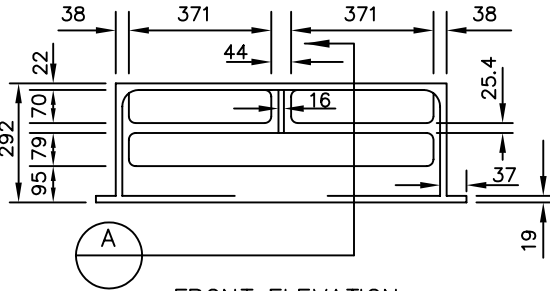
STANDARD DETAIL DRAWINGS



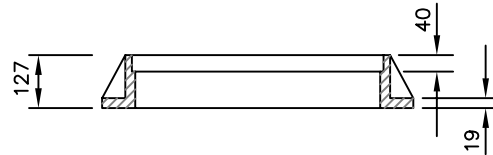
BOTTOM VIEW
(CURB INLET CASTING)



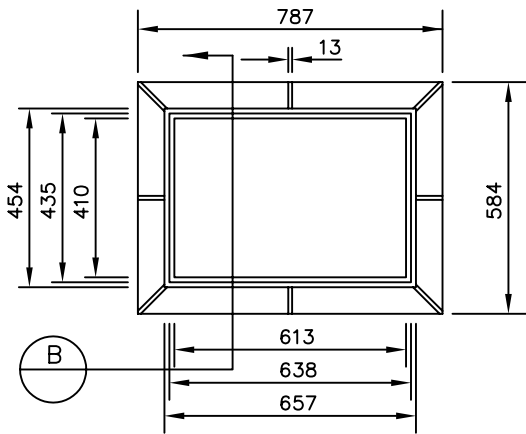
SECTION A-A



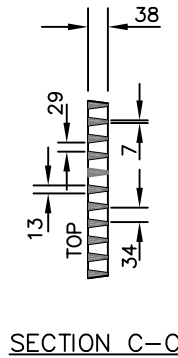
FRONT ELEVATION
(CURB INLET CASTING)



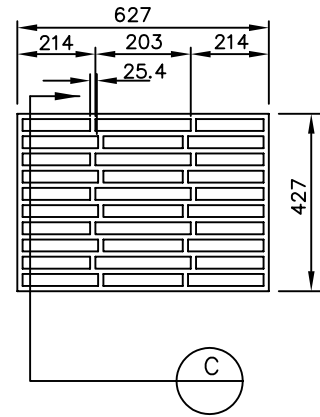
SECTION B-B



PLAN VIEW
(CATCH BASIN FRAME CASTING)



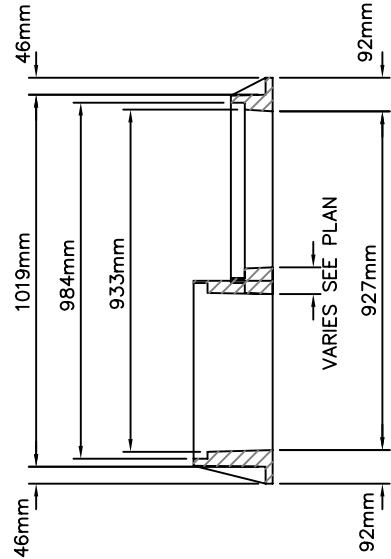
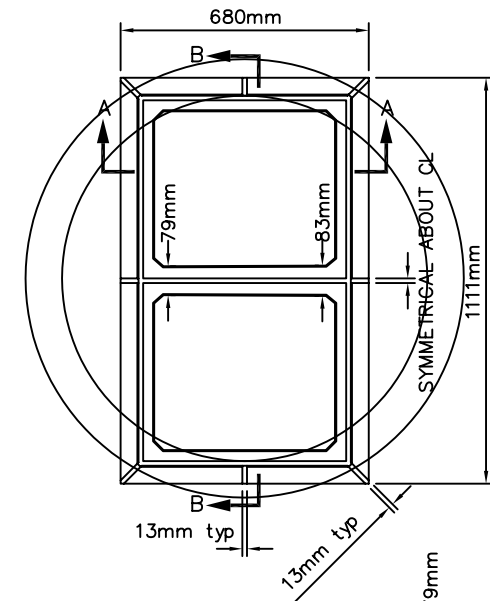
SECTION C-C



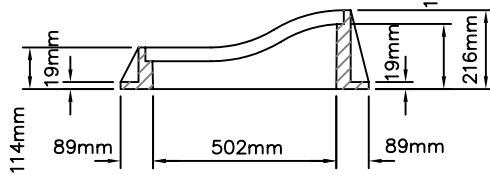
PLAN VIEW
(CATCH BASIN GRATE)

NOTES:

1. CURB INLET CASTING GRATE AND FRAME CASTING TO BE DESIGNED FOR H-20 LOADING



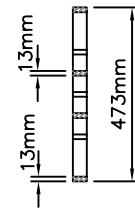
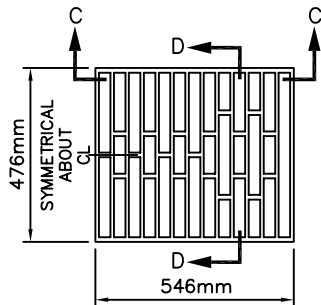
SECTION B-B



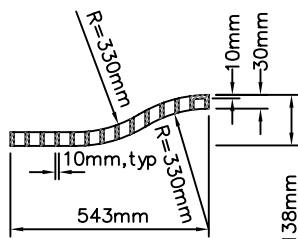
SECTION A-A

NOTE:

MATERIAL: ASTM A48 CLASS 30 GREY IRON
 FINISH: BITUMINOUS DIP
 ALLOWANCE TO BE MADE FOR MACHINING THE BEARING SURFACES



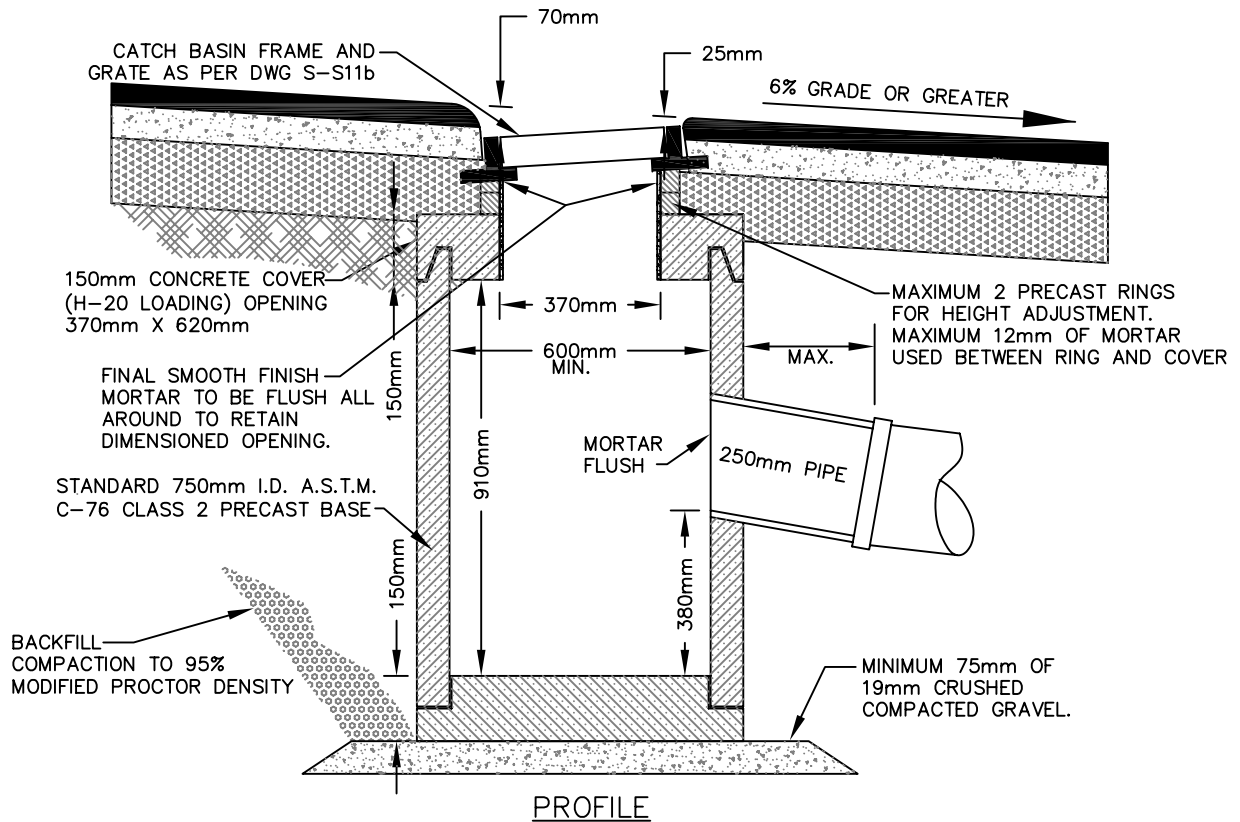
SECTION D-D



SECTION C-C

NOTE:

*MATERIAL: DUCTILE IRON GRADE 60-40-14
 *ALLOWANCE TO BE MADE FOR MACHINING THE BEARING SURFACES.
 *INSTALL ON H-20 CONCRETE LID OVER 1000mm DIAMETER MANHOLE BARREL, 1000mm DEEP WITH CONCRETE BASE.



2004

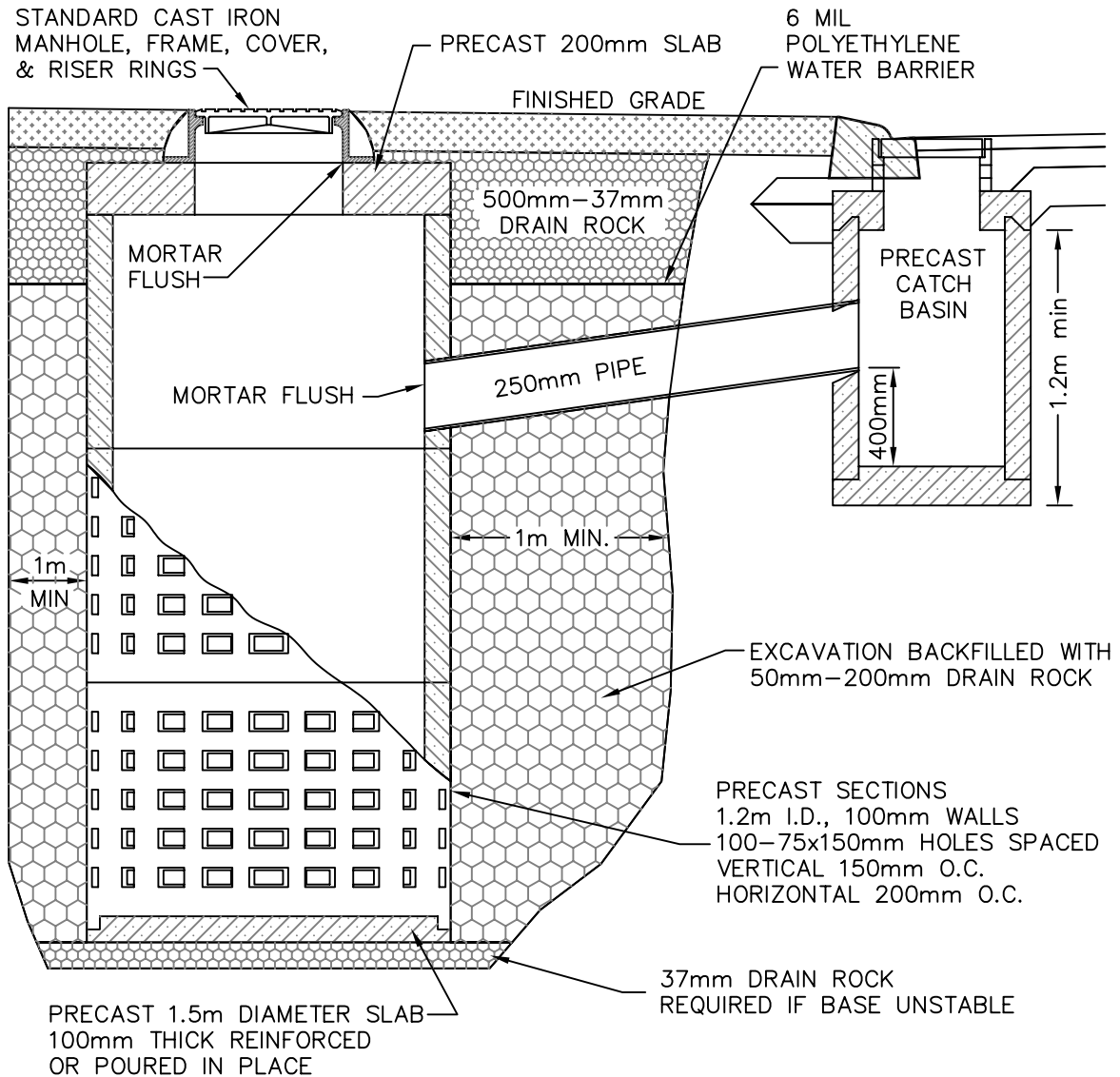
CATCH BASIN ON >6% GRADE ROAD

APPROVED
NOVEMBER, 2004

DRAWING NUMBER:
S-S11g



STANDARD DETAIL DRAWINGS



NOTE: THE DEPTH, SIZE & SPACING OF DRAINAGE DRYWELLS WILL DEPEND UPON THE AREA DRAINED, AND NATIVE GROUND CONDITIONS.

2004

DRAINAGE DRYWELL

APPROVED
NOVEMBER, 2004

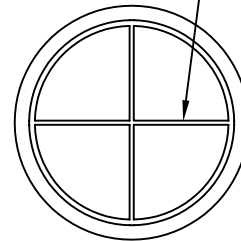
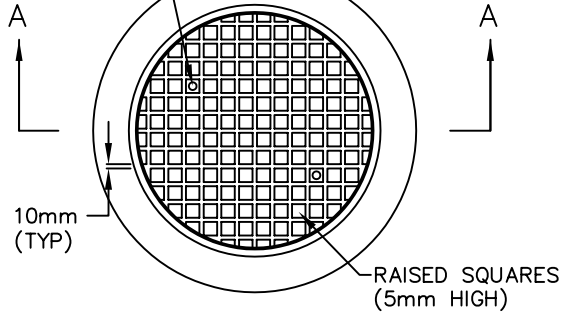
DRAWING NUMBER:
S-S16



STANDARD DETAIL DRAWINGS

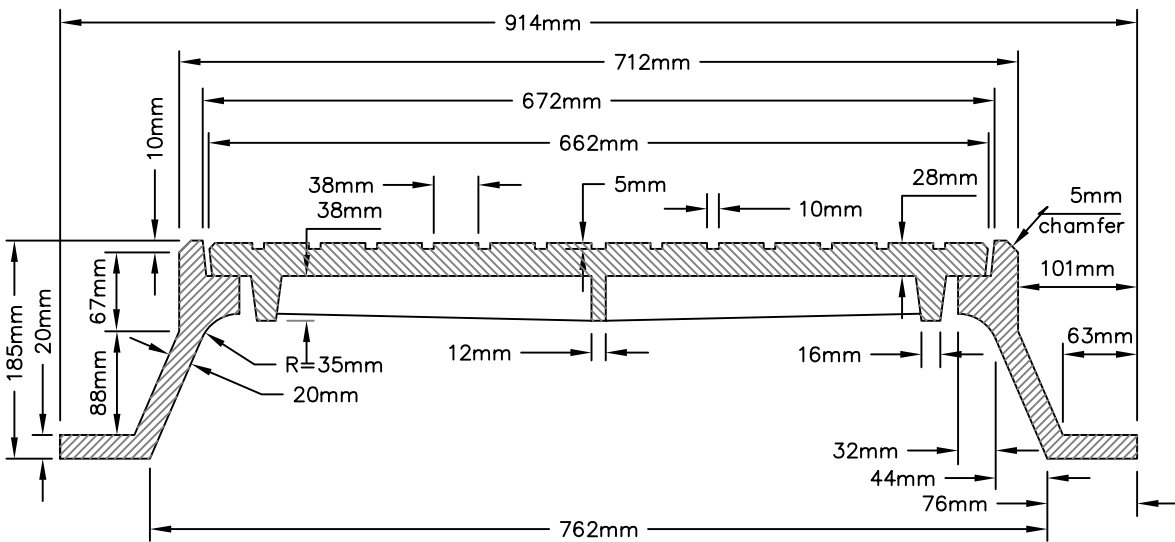
2-22mm DIA PICK-OUT HOLES REQ'D

WEBBING TO ACCOMMODATE SPECIFIED LOAD



PLAN

COVER-BOTTOM VIEW



SECTION A-A

NOTES:

1. THE FRAME AND COVER SHALL BE CAST IRON IN ACCORDANCE WITH ASTM A-48 CLASS 308.
2. THE MANUFACTURER'S LOGO AND THE HEAT SERIES NUMBER SHALL BE CAST INTO THE FRAME AND COVER.
3. COVER AND FRAME TO BE ABLE TO WITHSTAND 175 KN (40,000LBS) LOAD.
4. THE CONTACT SURFACES BETWEEN THE FRAME AND THE COVER ARE TO BE MACHINED SMOOTH.

2004

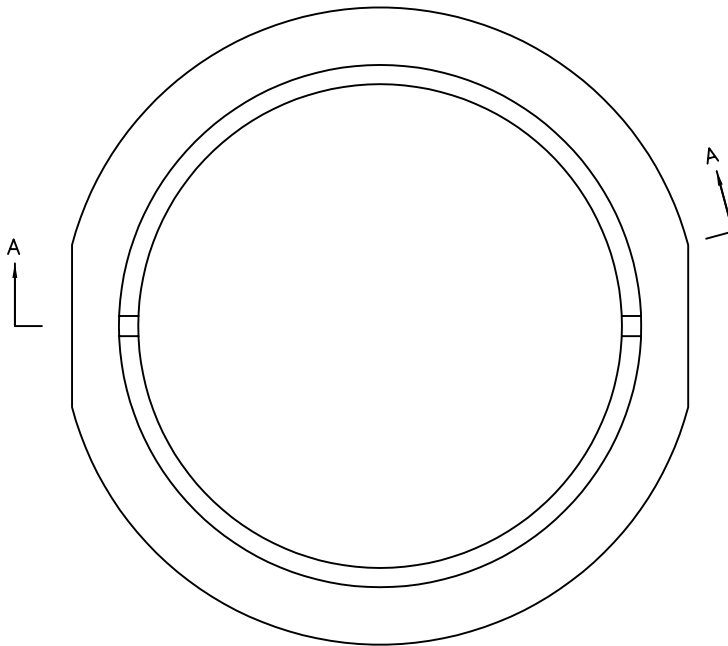
MANHOLE FRAME AND COVER

APPROVED
NOVEMBER, 2004

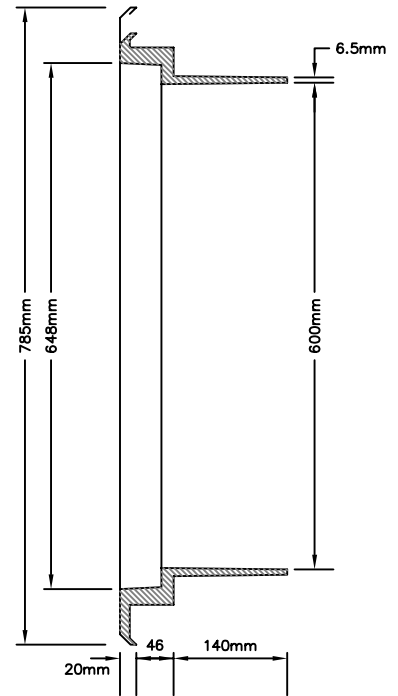
DRAWING NUMBER:
S-S17



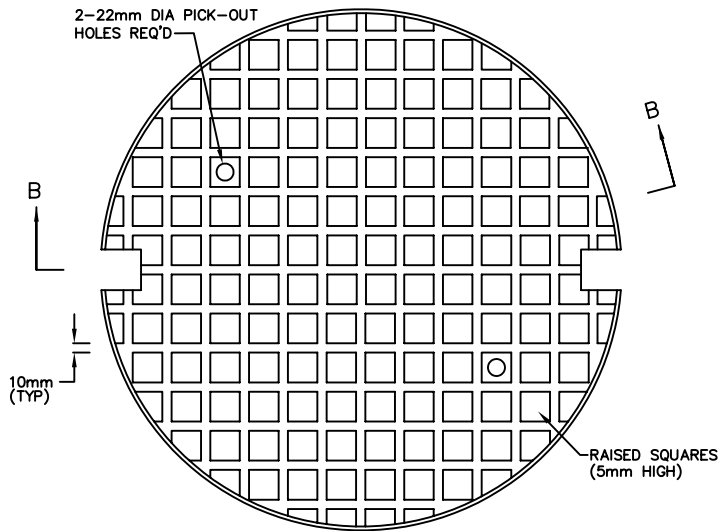
STANDARD DETAIL DRAWINGS



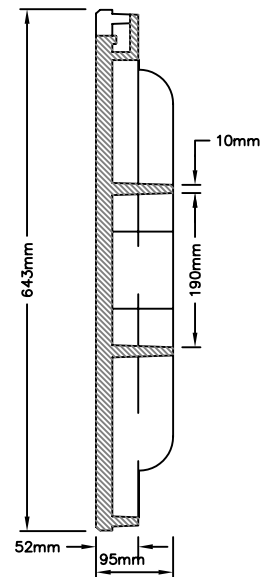
MANHOLE FRAME



SECTION A-A



MANHOLE COVER



SECTION B-B

2004

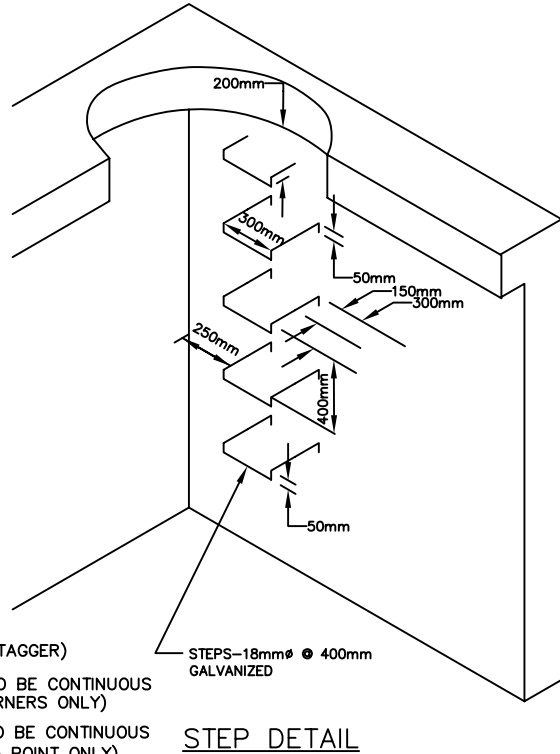
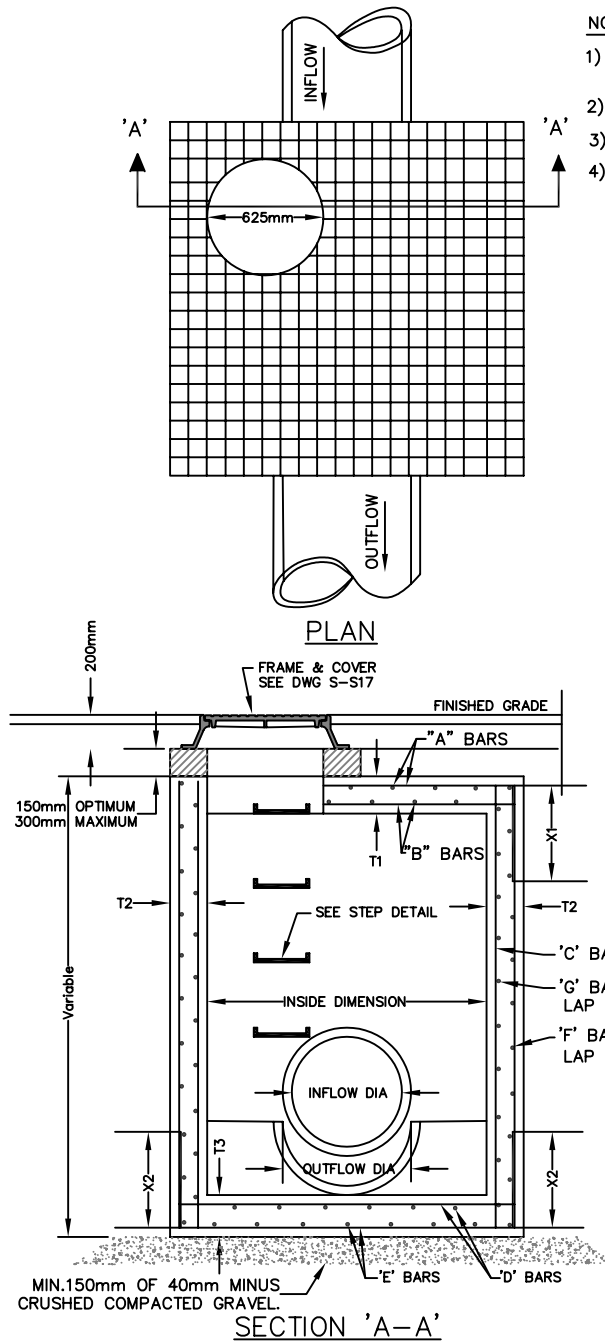
FLOATING MANHOLE FRAME AND COVER

APPROVED
NOVEMBER, 2004

DRAWING NUMBER:
S-S17a

NOTES:

- 1) COVER FOR REINFORCING STEEL SHALL BE 50mm EXCEPT FOR BOTTOM ROW OF BARS IN BASE SLAB WHERE 75mm COVER SHALL BE USED.
- 2) CONCRETE STRENGTH TO BE 30 MPa IN 28 DAYS.
- 3) ALL LAPS TO BE 150mm MINIMUM
- 4) M.H. STEP TO BE INSTALLED ABOVE SLAB TOP TO SUIT.



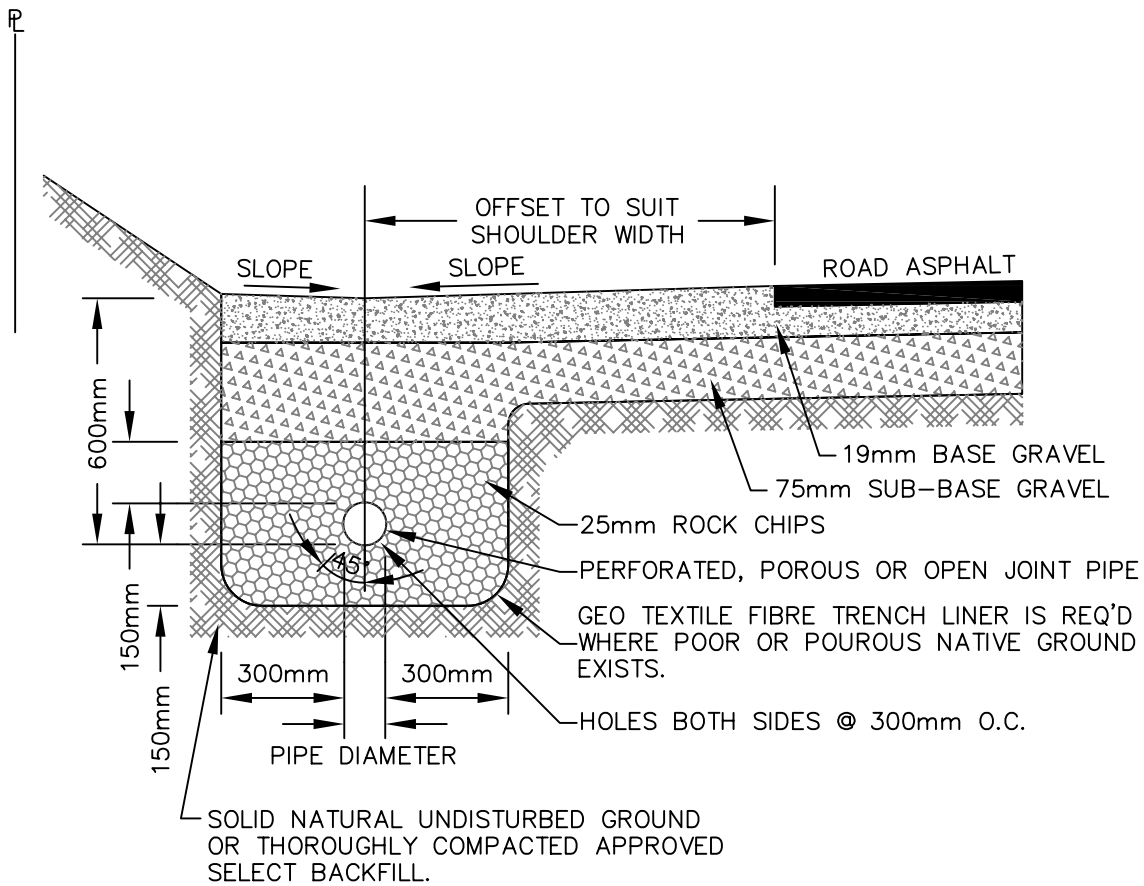
INSIDE DIMENSION	BOTTOM SLAB				WALLS				TOP SLAB		
	THICKNESS T ₃	HORIZONTAL		LAP X ₂	THICKNESS T ₃	VERT. 'C' BARS BOTH FACES	HORIZONTAL		THICKNESS T ₁	HORIZONTAL	
		'D' BARS UPPER FACE	'E' BARS UPPER FACE				'F' BARS OUTER FACE	'G' BARS INNER FACE		'A' BARS UPPER FACE	'B' BARS LOWER FACE
1200 x 1200mm	225mm	10M@ 225mm	10M@ 225mm	25-150mm	200mm	10M@ 450mm	10M@ 300mm	10M@ 300mm	200mm	15M@ 150mm	15M@ 150mm
1500 x 1500mm	225mm	15M@ 300mm	15M@ 300mm	25-225mm	200mm	10M@ 450mm	10M@ 225mm	10M@ 225mm	225mm	15M@ 150mm	15M@ 150mm
1800 x 1800mm	225mm	15M@ 250mm	15M@ 250mm	25-225mm	200mm	10M@ 450mm	15M@ 250mm	10M@ 300mm	225mm	20M@ 190mm	20M@ 190mm
2100 x 2100mm	225mm	15M@ 225mm	15M@ 225mm	25-225mm	200mm	10M@ 450mm	20M@ 250mm	10M@ 250mm	225mm	20M@ 165mm	20M@ 165mm
2400 x 2400mm	225mm	15M@ 200mm	15M@ 200mm	25-250mm	200mm	10M@ 450mm	20M@ 200mm	15M@ 250mm	250mm	20M@ 165mm	20M@ 165mm
2700 x 2700mm	225mm	15M@ 175mm	15M@ 175mm	25-250mm	225mm	10M@ 450mm	20M@ 190mm	15M@ 250mm	250mm	20M@ 150mm	20M@ 150mm

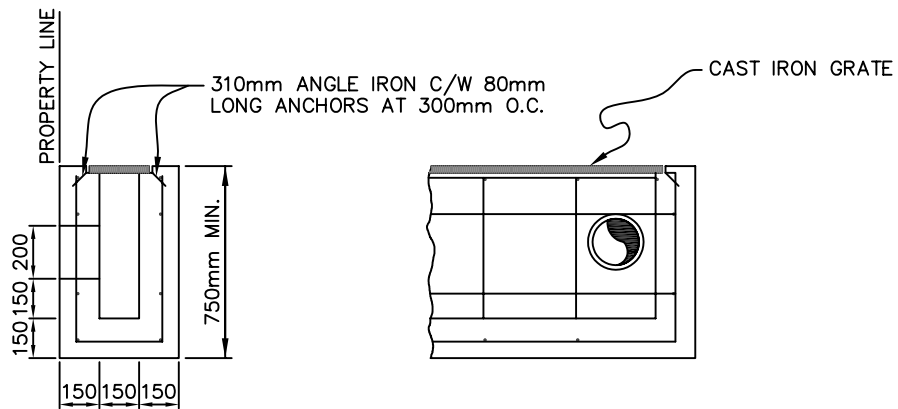
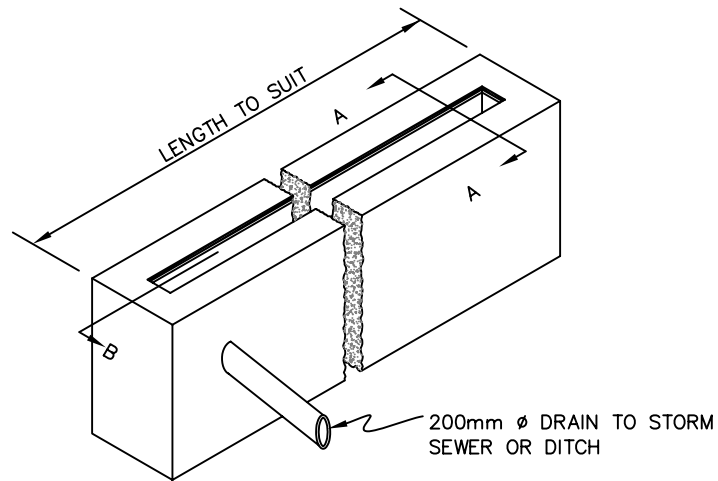
2004

MANHOLE – CAST IN PLACE

APPROVED
NOVEMBER, 2004

DRAWING NUMBER:
S-S18



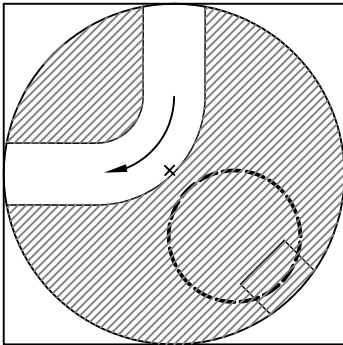


SECTION A-A

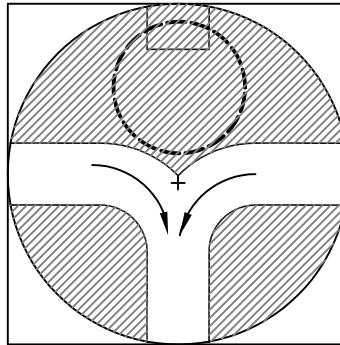
SECTION B

- 1) GRATING SHALL BE DOBNEY B-10 OR EQUAL.
- 2) ALL CONCRETE - 30 MPa.
- 3) REINFORCING 30M @ 300mm BOTH WAYS.

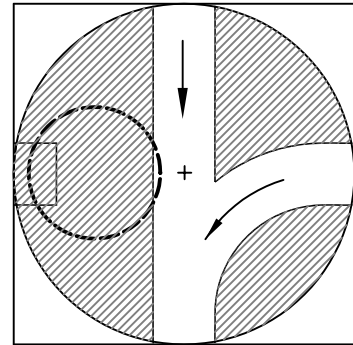
ALL DIMENSIONS SHOWN IN MILLIMETERS UNLESS OTHERWISE INDICATED.



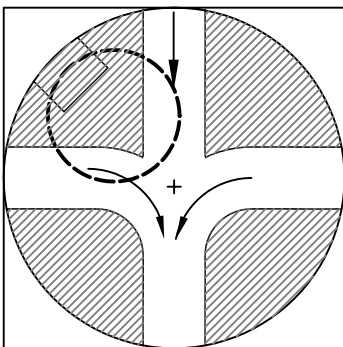
1. RIGHT ANGLE BEND



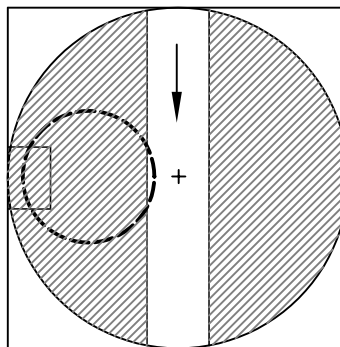
2. TEE CONNECTION



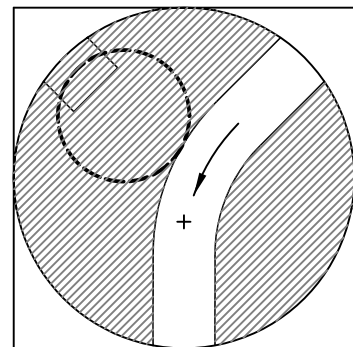
3. THREE WAY JUNCTION



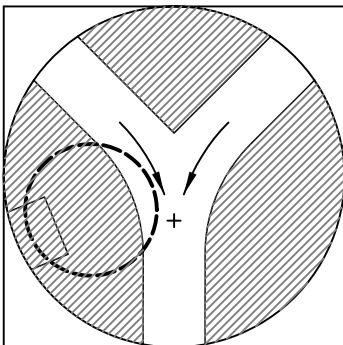
4. FOUR WAY JUNCTION



5. STRAIGHT THROUGH



6. 45° BEND



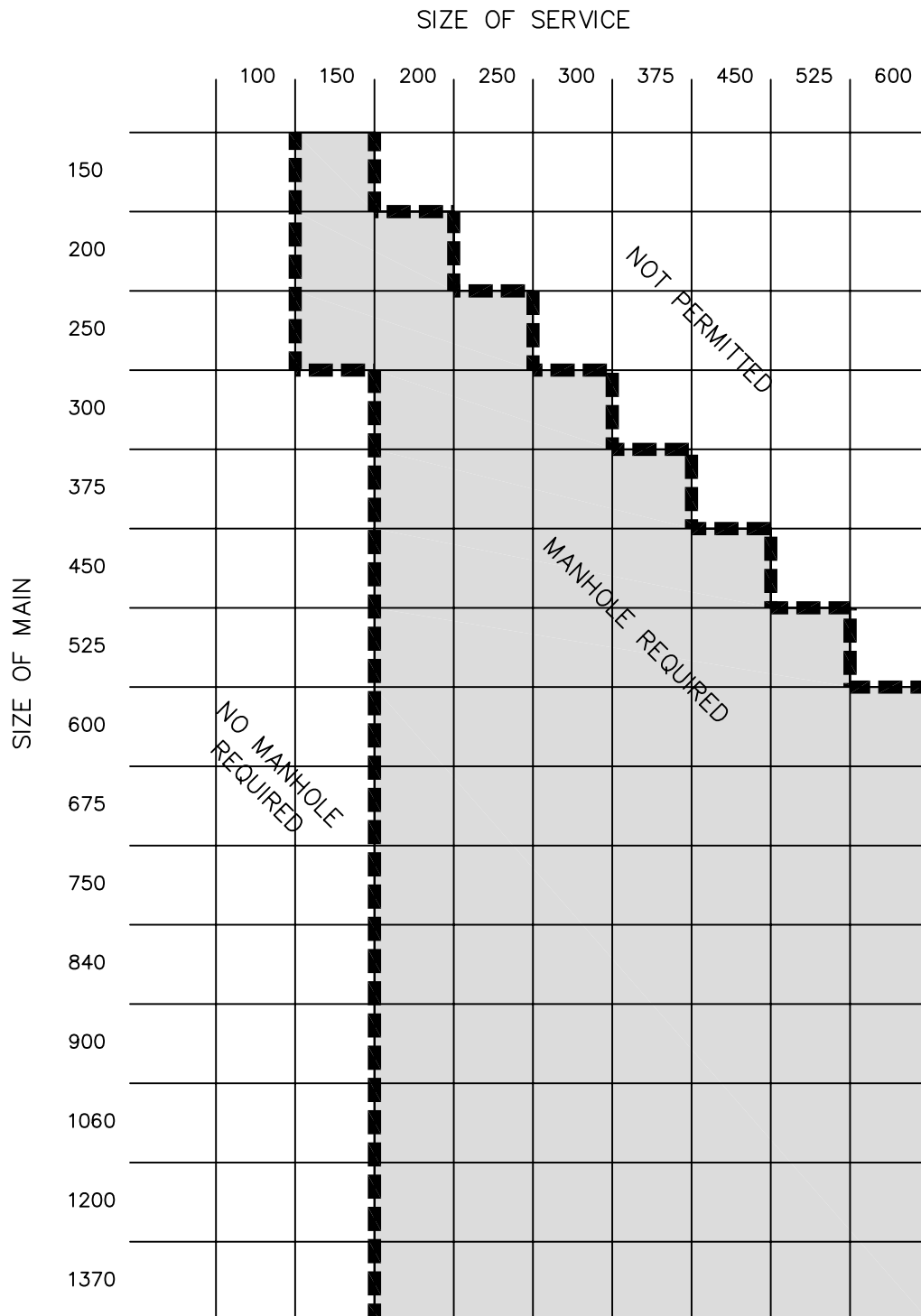
7. WYE CONNECTION

NOTES:

1. ALL CHANNELS SHALL BE MINIMUM DEPTH EXCEEDING 50% OF PIPE SIZE. BENCHING (SHADED AREAS) SHALL BE SMOOTH FINISHED—SLOPE TO PIPE CHANNEL.
2. MANHOLE RUNG LOCATIONS SHALL BE AS SHOWN UNLESS OTHERWISE NOTED ON THE CONSTRUCTION DRAWINGS.
3. MORTAR EXTERIOR MANHOLE PIPE INLET DIAMETER TO BE WATER TIGHT.

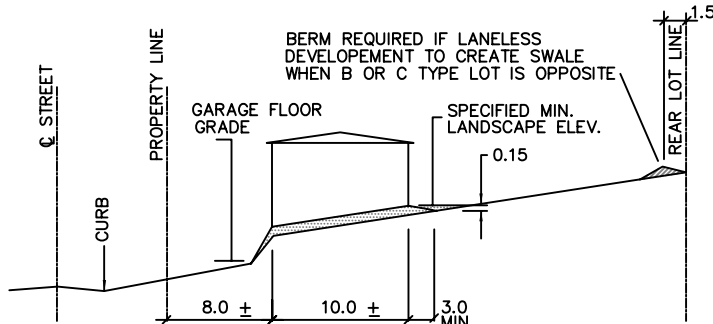
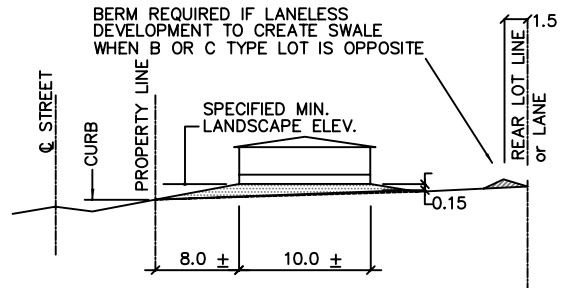
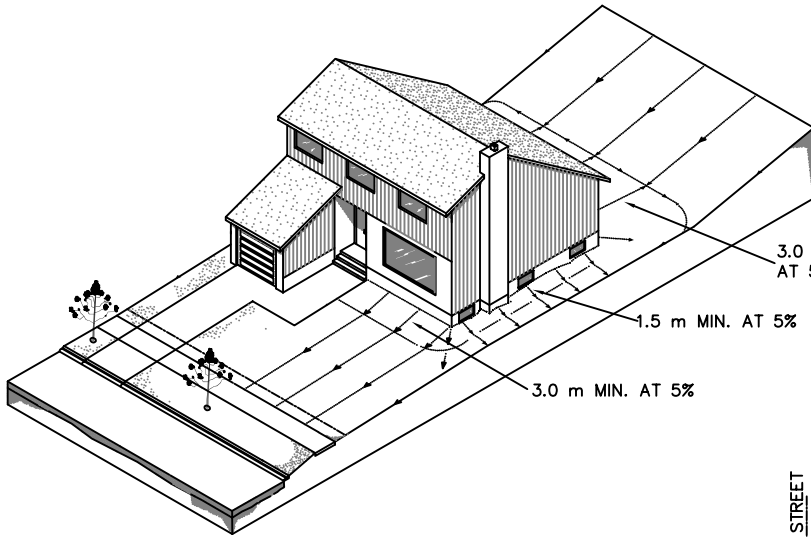


STANDARD DETAIL DRAWINGS



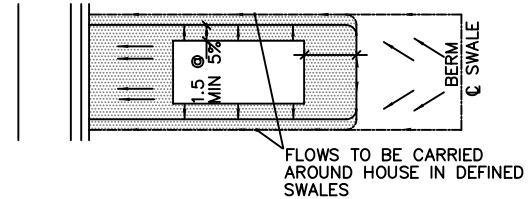
NOTES:

1. ALL CATCH BASIN LEADS MUST BE CONNECTED TO A MANHOLE.



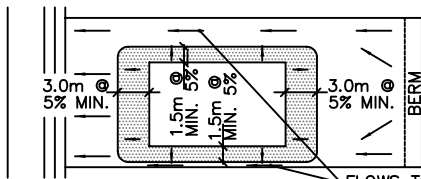
ELEVATION

ELEVATION



FLows TO BE CARRIED AROUND HOUSE IN DEFINED SWALES

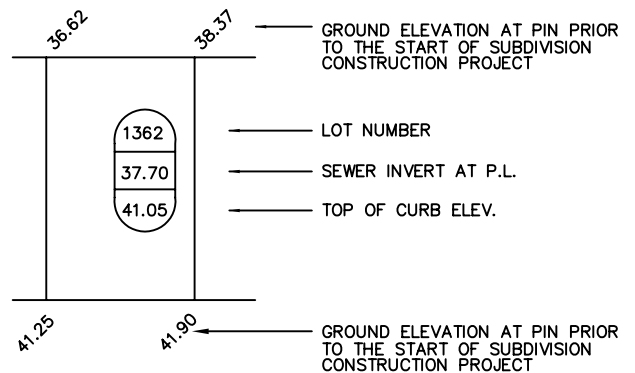
PLAN



FLows TO BE CARRIED AROUND HOUSE IN DEFINED SWALES LOCATED BESIDE LOT LINES

PLAN

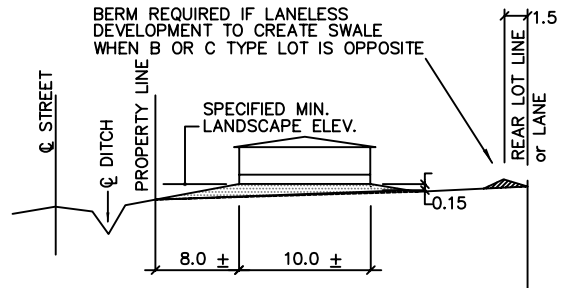
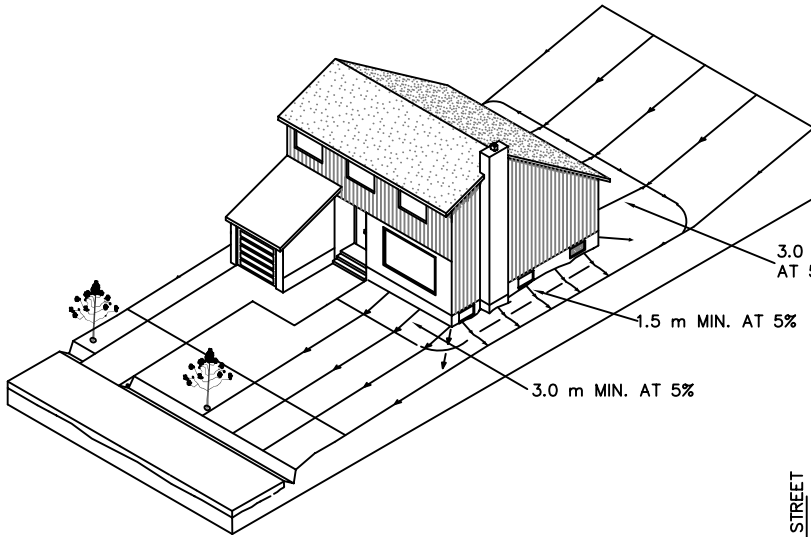
CONVENTIONAL AND SPLIT BUNGLOW HOUSE TYPE



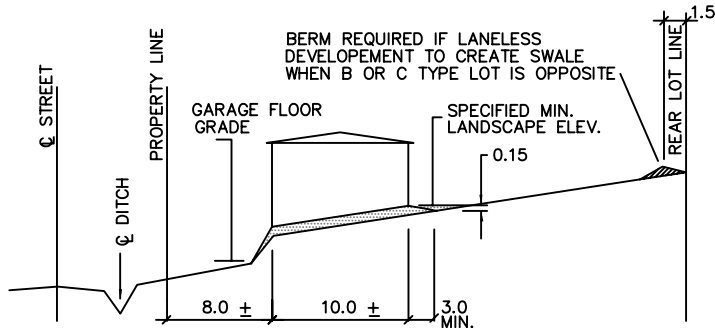
BASEMENT GARAGE AND FRONT WALKOUT HOUSE TYPE

NOTE:

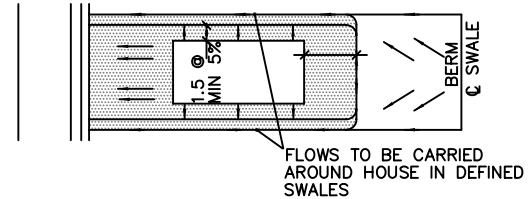
1. THE GRADING SHOWN ON THIS DETAIL IS PROVIDED AS A RECOMMENDATION ONLY, WITH THE EXCEPTION OF THE AREA IMMEDIATELY ADJACENT TO THE HOUSE WHICH IS GOVERNED BY THE NATIONAL BUILDING CODE
2. FINISH LANDSCAPE ELEVATION ADJACENT TO HOUSE TO BE 0.15m ABOVE EXISTING GROUND
3. ALL DIMENSIONS IN METRES UNLESS NOTED OTHERWISE.



ELEVATION

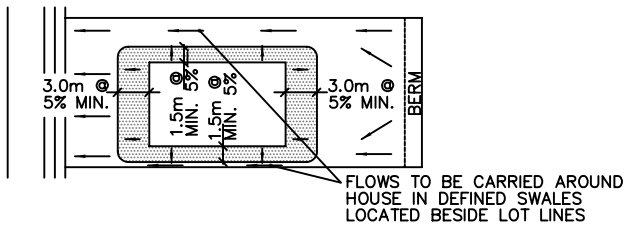


ELEVATION



PLAN

CONVENTIONAL AND SPLIT BUNGALOW HOUSE TYPE

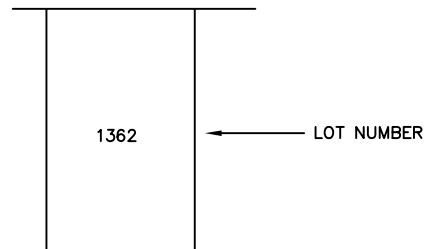


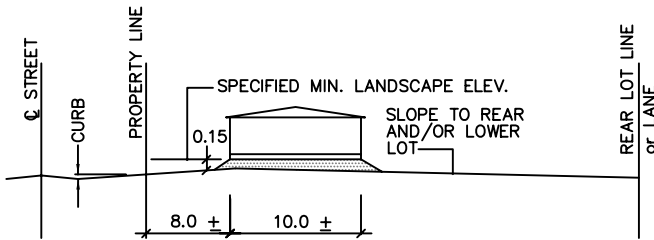
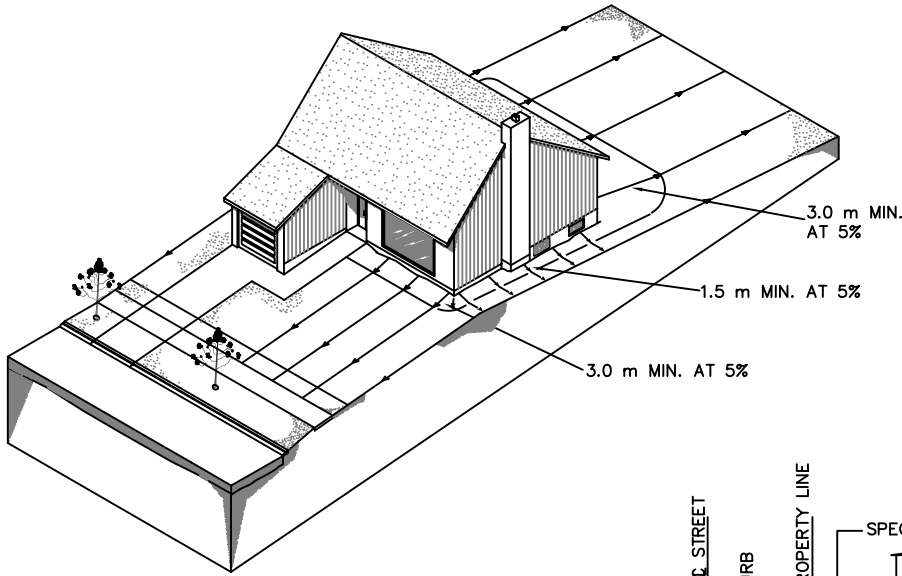
PLAN

BASEMENT GARAGE AND FRONT WALKOUT HOUSE TYPE

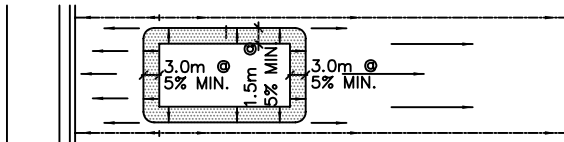
NOTE:

1. THE GRADING SHOWN ON THIS DETAIL IS PROVIDED AS A RECOMMENDATION ONLY, WITH THE EXCEPTION OF THE AREA IMMEDIATELY ADJACENT TO THE HOUSE WHICH IS GOVERNED BY THE NATIONAL BUILDING CODE
2. FINISH LANDSCAPE ELEVATION ADJACENT TO HOUSE TO BE 0.15m ABOVE EXISTING GROUND
3. ALL DIMENSIONS IN METRES UNLESS NOTED OTHERWISE.

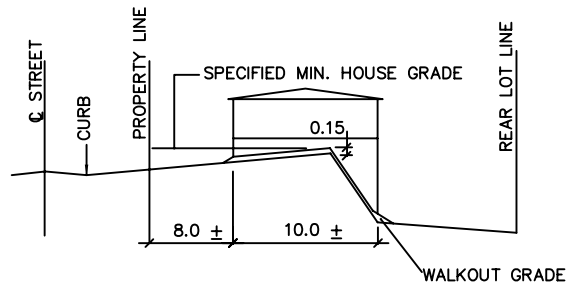




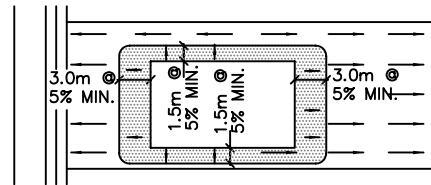
ELEVATION



PLAN
CONVENTIONAL HOUSE TYPE



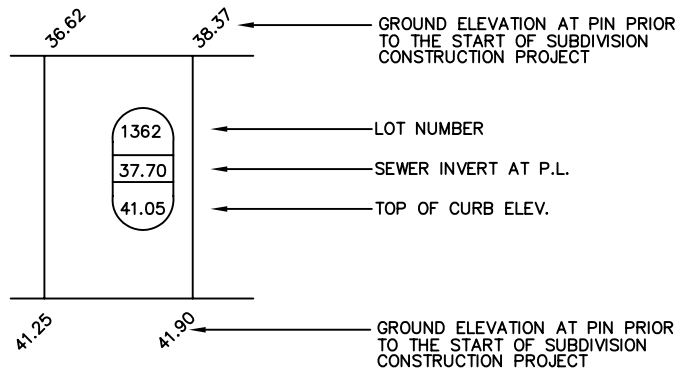
ELEVATION

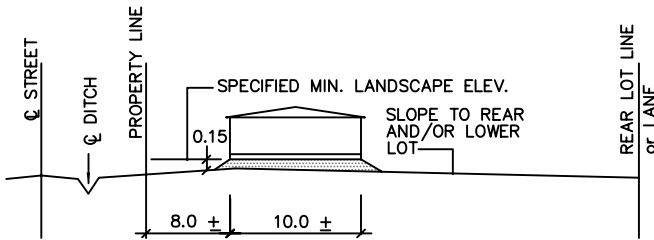
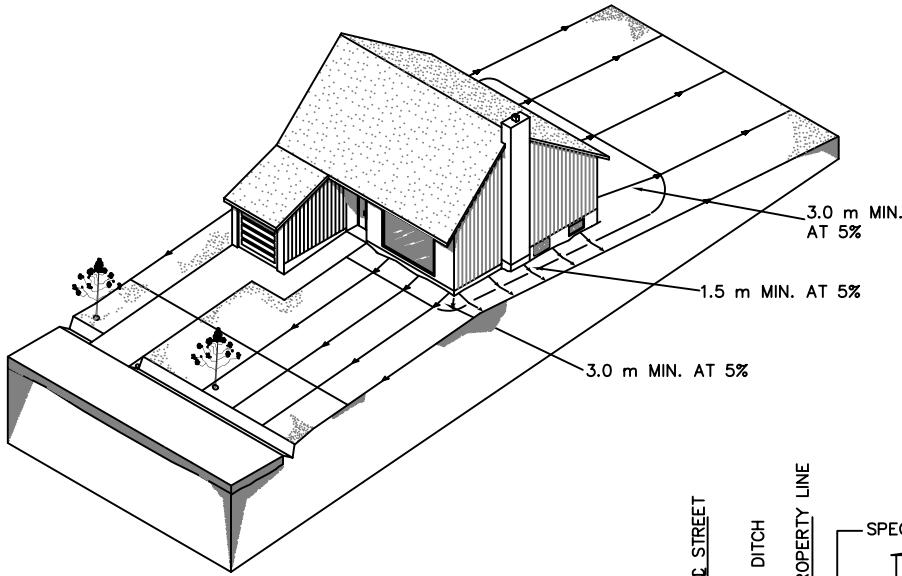


PLAN
WALKOUT OR BACKSPLIT HOUSE TYPE

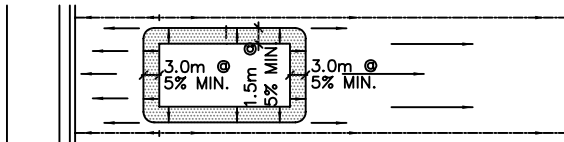
NOTE:

1. THE GRADING SHOWN ON THIS DETAIL IS PROVIDED AS A RECOMMENDATION ONLY, WITH THE EXCEPTION OF THE AREA IMMEDIATELY ADJACENT TO THE HOUSE WHICH IS GOVERNED BY THE NATIONAL BUILDING CODE
2. FINISH LANDSCAPE ELEVATION ADJACENT TO HOUSE TO BE 0.15m ABOVE EXISTING GROUND
3. ALL DIMENSIONS IN METRES UNLESS NOTED OTHERWISE.

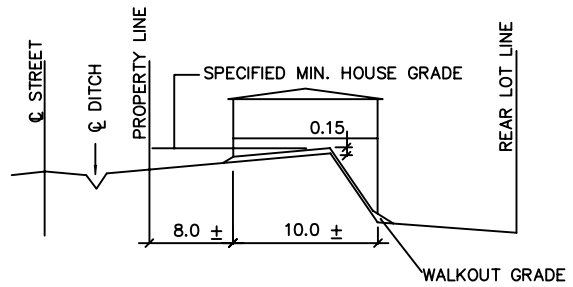




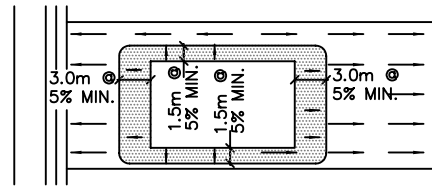
ELEVATION



PLAN
CONVENTIONAL HOUSE TYPE



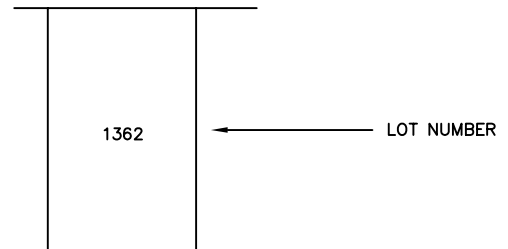
ELEVATION

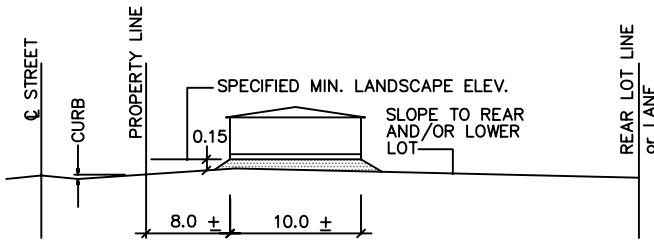
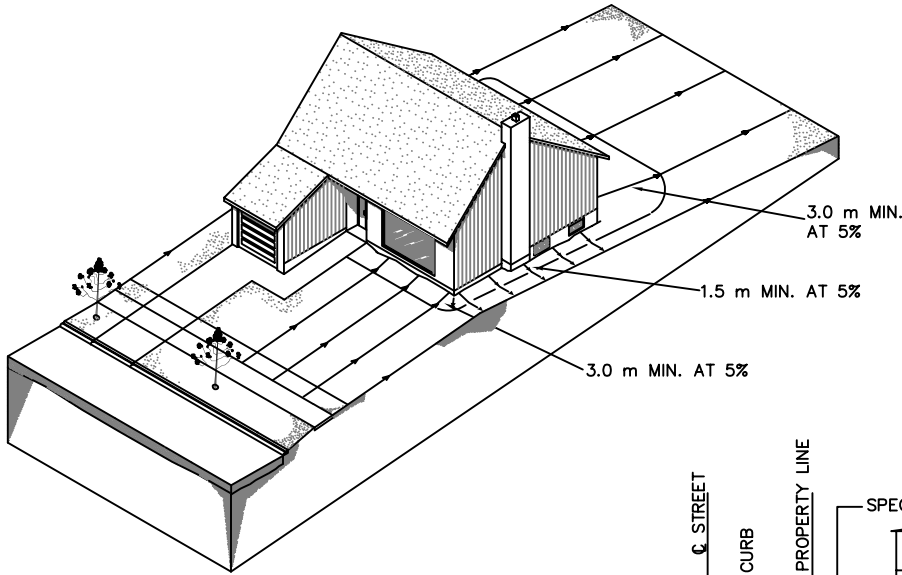


PLAN
WALKOUT OR BACKSPLIT HOUSE TYPE

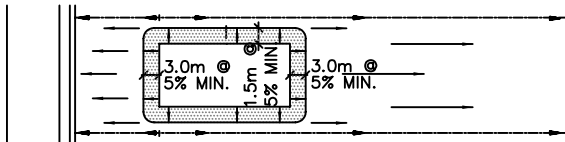
NOTE:

1. THE GRADING SHOWN ON THIS DETAIL IS PROVIDED AS A RECOMMENDATION ONLY, WITH THE EXCEPTION OF THE AREA IMMEDIATELY ADJACENT TO THE HOUSE WHICH IS GOVERNED BY THE NATIONAL BUILDING CODE
2. FINISH LANDSCAPE ELEVATION ADJACENT TO HOUSE TO BE 0.15m ABOVE EXISTING GROUND
3. ALL DIMENSIONS IN METRES UNLESS NOTED OTHERWISE.

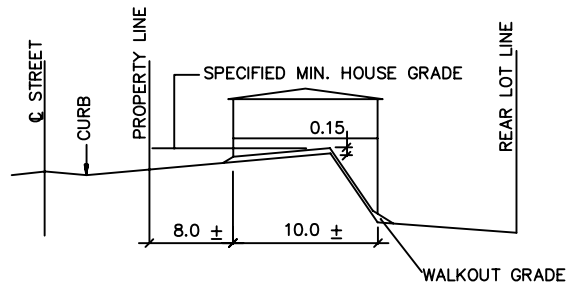




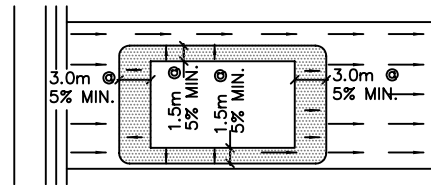
ELEVATION



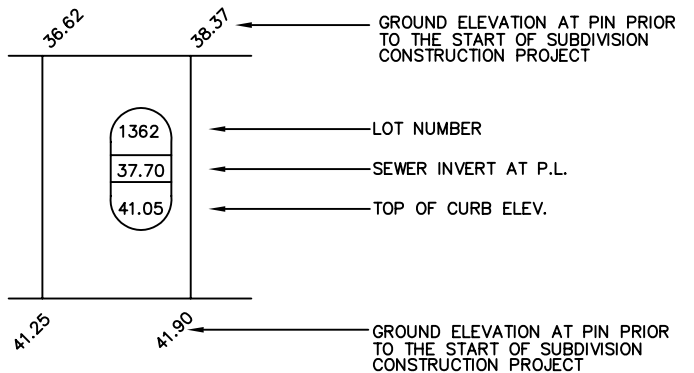
PLAN
CONVENTIONAL HOUSE TYPE



ELEVATION

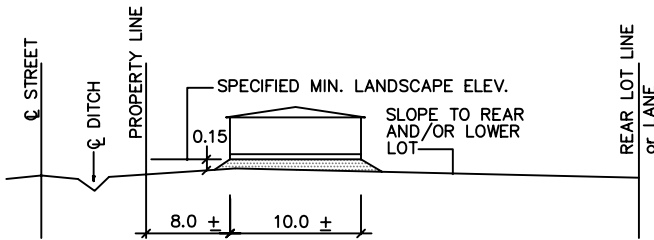
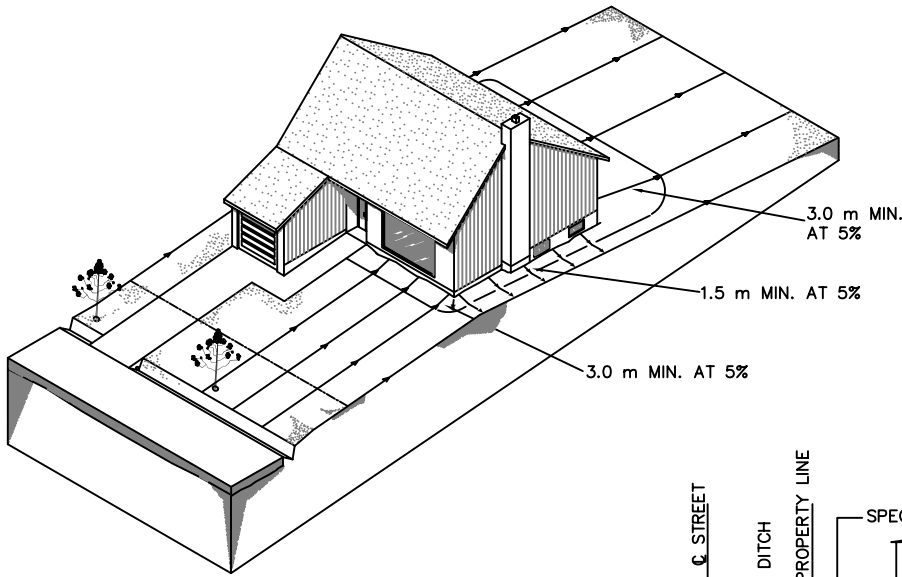


PLAN
WALKOUT OR BACKSPLIT HOUSE TYPE

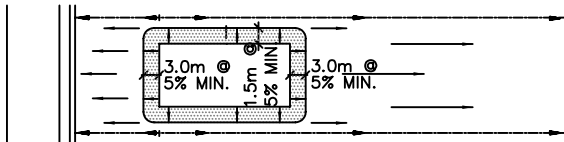


NOTE:

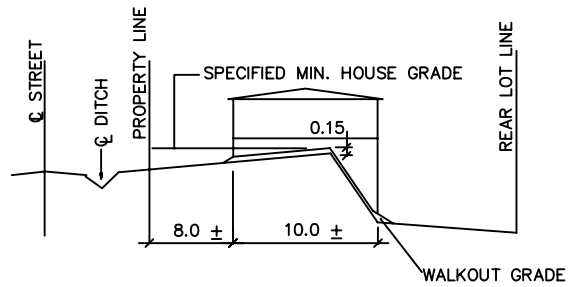
1. THE GRADING SHOWN ON THIS DETAIL IS PROVIDED AS A RECOMMENDATION ONLY, WITH THE EXCEPTION OF THE AREA IMMEDIATELY ADJACENT TO THE HOUSE WHICH IS GOVERNED BY THE NATIONAL BUILDING CODE
2. FINISH LANDSCAPE ELEVATION ADJACENT TO HOUSE TO BE 0.15m ABOVE EXISTING GROUND
3. ALL DIMENSIONS IN METRES UNLESS NOTED OTHERWISE.



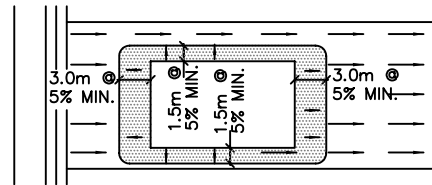
ELEVATION



PLAN
CONVENTIONAL HOUSE TYPE



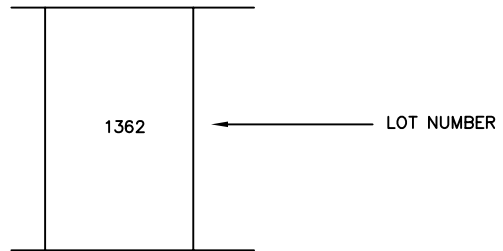
ELEVATION



PLAN
WALKOUT OR BACKSPLIT HOUSE TYPE

NOTE:

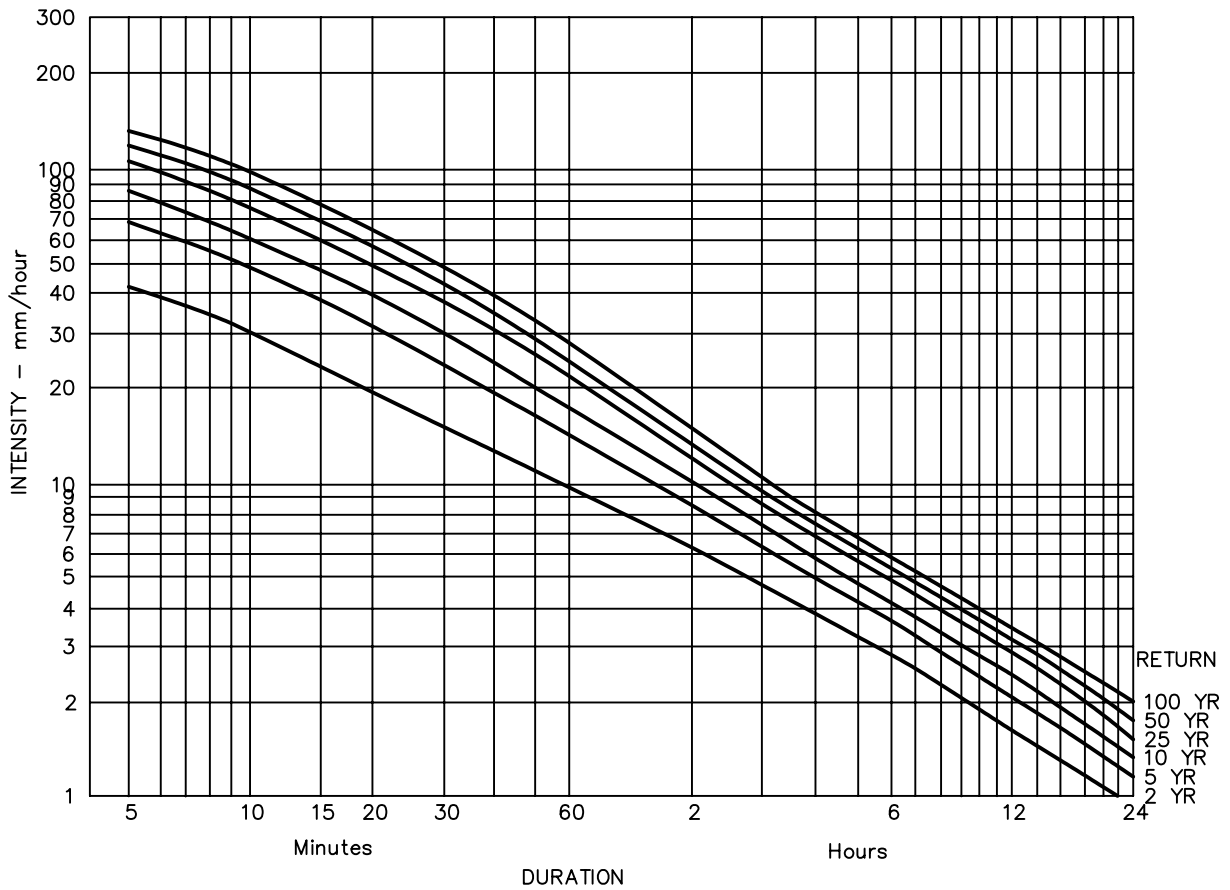
1. THE GRADING SHOWN ON THIS DETAIL IS PROVIDED AS A RECOMMENDATION ONLY, WITH THE EXCEPTION OF THE AREA IMMEDIATELY ADJACENT TO THE HOUSE WHICH IS GOVERNED BY THE NATIONAL BUILDING CODE
2. FINISH LANDSCAPE ELEVATION ADJACENT TO HOUSE TO BE 0.15m ABOVE EXISTING GROUND
3. ALL DIMENSIONS IN METRES UNLESS NOTED OTHERWISE.





STANDARD DETAIL DRAWINGS

PENTICTON AIRPORT INTENSITY DURATION FREQUENCY CURVES



BASED ON RECORDING RAIN GAUGE DATA FOR THE PERIOD OF 1953-1990 (34 YEARS RECORDED)

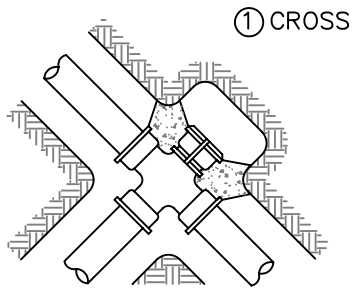
LATITUDE 49°28', LONGITUDE 119°36', ELEVATION 341m

2004

RAINFALL INTENSITY DURATION
FREQUENCY CURVES

APPROVED
NOVEMBER, 2004

DRAWING NUMBER:
S-S31



USE "STANDARD" PLUGS AND CLAMPS

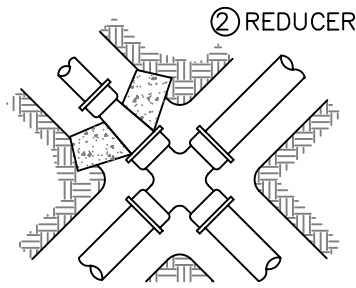
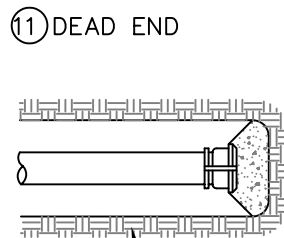
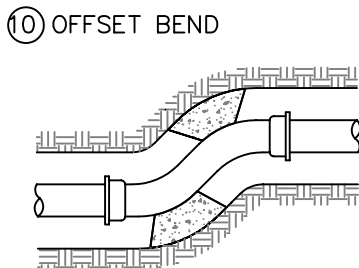
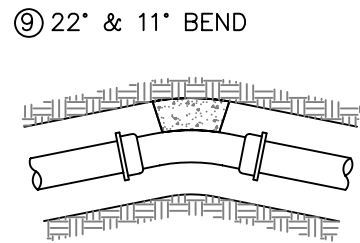
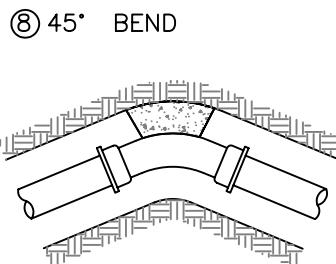
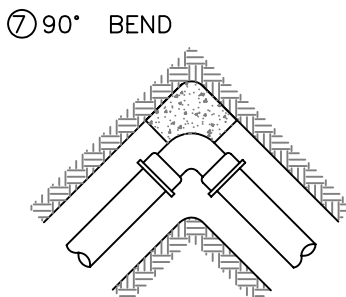
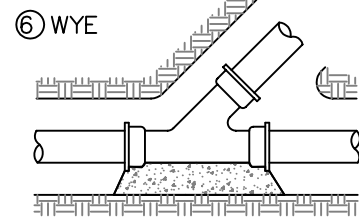
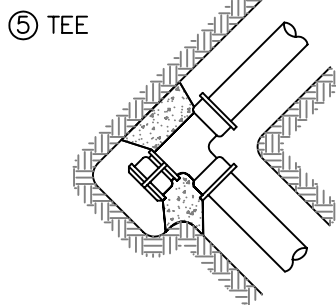
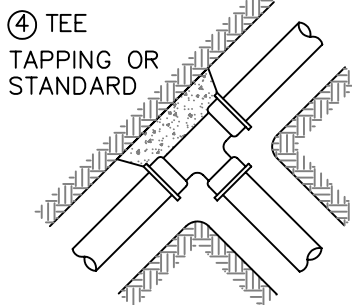
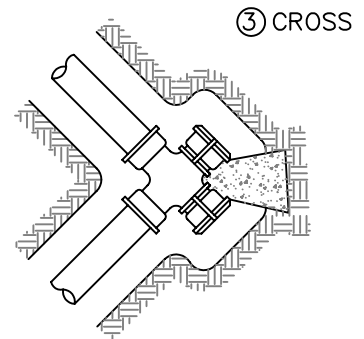
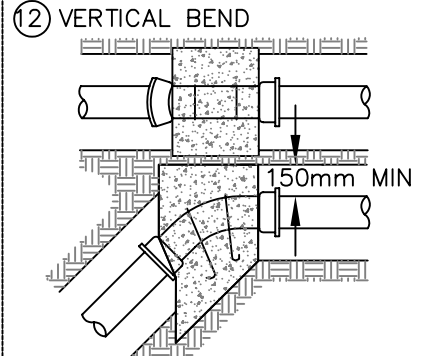


TABLE VALUES BASED ON REDUCTION TO 150mm SIZE



UNDISTURBED
NATIVE GROUND



NOTE:

- 1) USE PLASTIC BETWEEN CONCRETE & FITTINGS.
- 2) THRUST BLOCKS SHALL BE PROPERLY FORMED USING WOOD AND OTHER SUITABLE MATERIAL.



STANDARD DETAIL DRAWINGS

NOTE: MILLIMETER DIMENSIONS APPLY TO THE LARGEST DIAMETER END OF THE FITTING.

MINIMUM THRUST AREAS FOR FITTINGS AT 1034 KPA PRESSURE AND FOR SOILS WITH MIN. BEARING OF 107 KPA (NOT TO BE USED FOR SOFT CLAY, MUCK ETC.)

TYPE OF FITTING	FITTING SIZE	OUTSIDE OF FITTING TO BEARING FACE	RECESS IN TRENCH WALL	LENGTH	HEIGHT
<i>CROSS</i>	D	W	W1	L	H
	150	300		500	450
	200	350		750	600
	250	375		975	750
	300	400		1200	900
<i>REDUCER</i>	D	W	W1	L	H
	150	300	150	450	450
	200	350	200	600	600
	250	375	250	750	750
	300	400	300	900	900
<i>TEE</i>	D	W	W1	L	H
	150	300		600	450
	200	350		750	600
	250	375		975	750
	300	400		1200	900
<i>45° WYE</i>	D	W	W1	L	H
	150	300	300	450	450
	200	350	400	600	600
	250	375	500	750	750
	300	400	600	900	900
<i>90° BEND</i>	D	W	W1	L	H
	150	300		900	450
	200	350		1050	600
	250	375		1425	750
	300	400		1625	900
<i>45° BEND</i>	D	W	W1	L	H
	150	300		450	450
	200	350		600	600
	250	375		750	750
	300	400		900	900
<i>22° BEND 11.5° BEND</i>	D	W	W1	L	H
	150	300		450	225
	200	350		600	300
	250	375		825	450
	300	400		900	450
<i>CAPS & PLUGS</i>	D	W	W1	L	H
	150	300		600	450
	200	350		750	600
	250	375		975	750
	300	400		1200	900

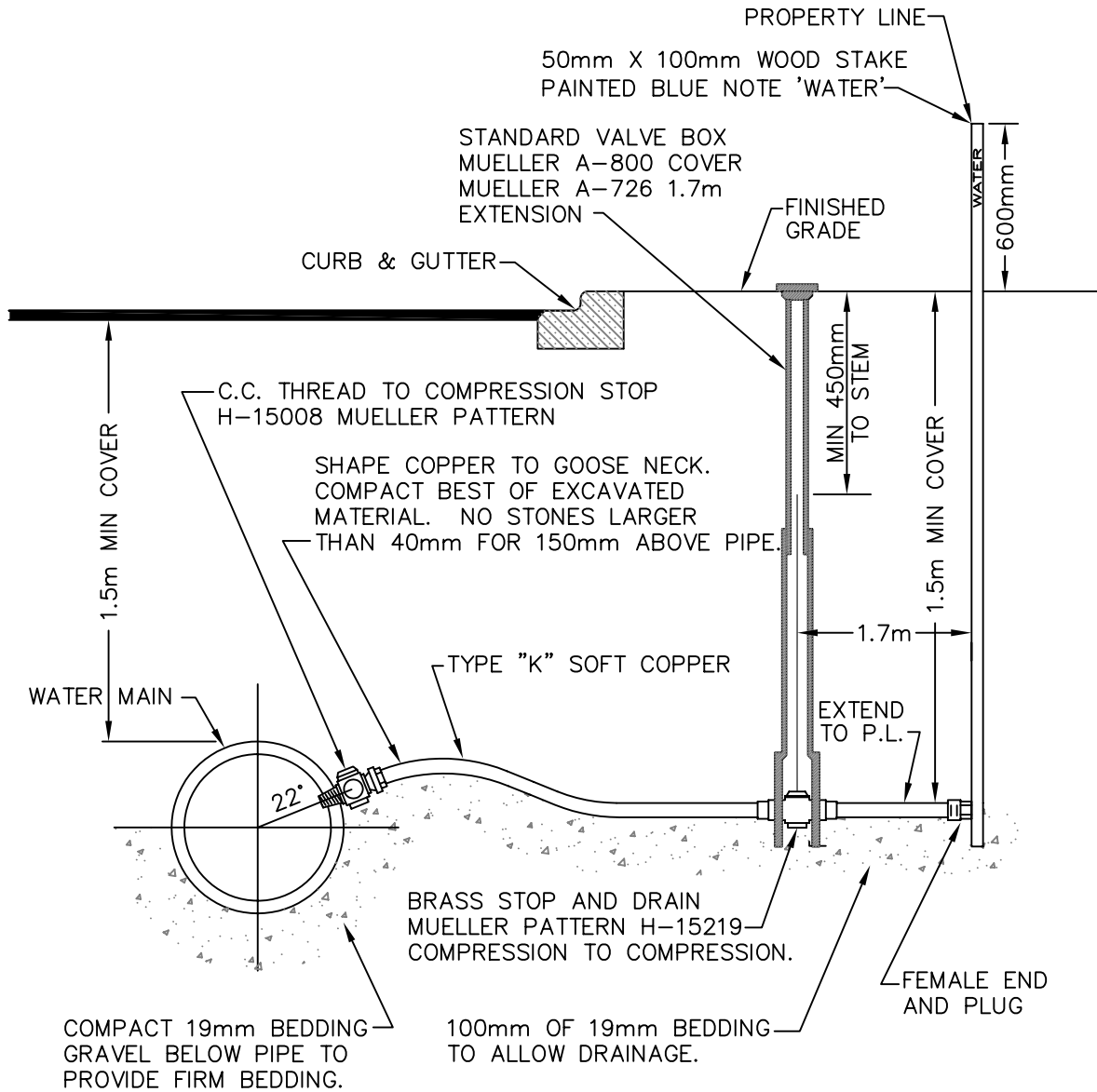
NOTES:

- 1) THRUST BLOCKS FOR MAINS LARGER THAN 300mm DIA. OR WHERE POOR NATIVE GROUND CONDITIONS EXIST SHALL BE DESIGNED BY A PROFESSIONAL ENGINEER AND SHOWN ON THE ENGINEERING DRAWINGS.
- 2) WHERE GROUND CANNOT BE EXCAVATED TO FREE STANDING UNDISTURBED SOIL, SMALL PLANK SHEET PILING SHALL BE DRIVEN TO PROVIDE UNDISTURBED THRUST AREA. PILING TO BE DRIVEN PRIOR TO EXCAVATING FOR THRUST BLOCK. PILING SHOULD BE USED ONLY BELOW THE PERMANENT WATER TABLE.

TYPICAL THRUST BLOCK
REQUIREMENTS

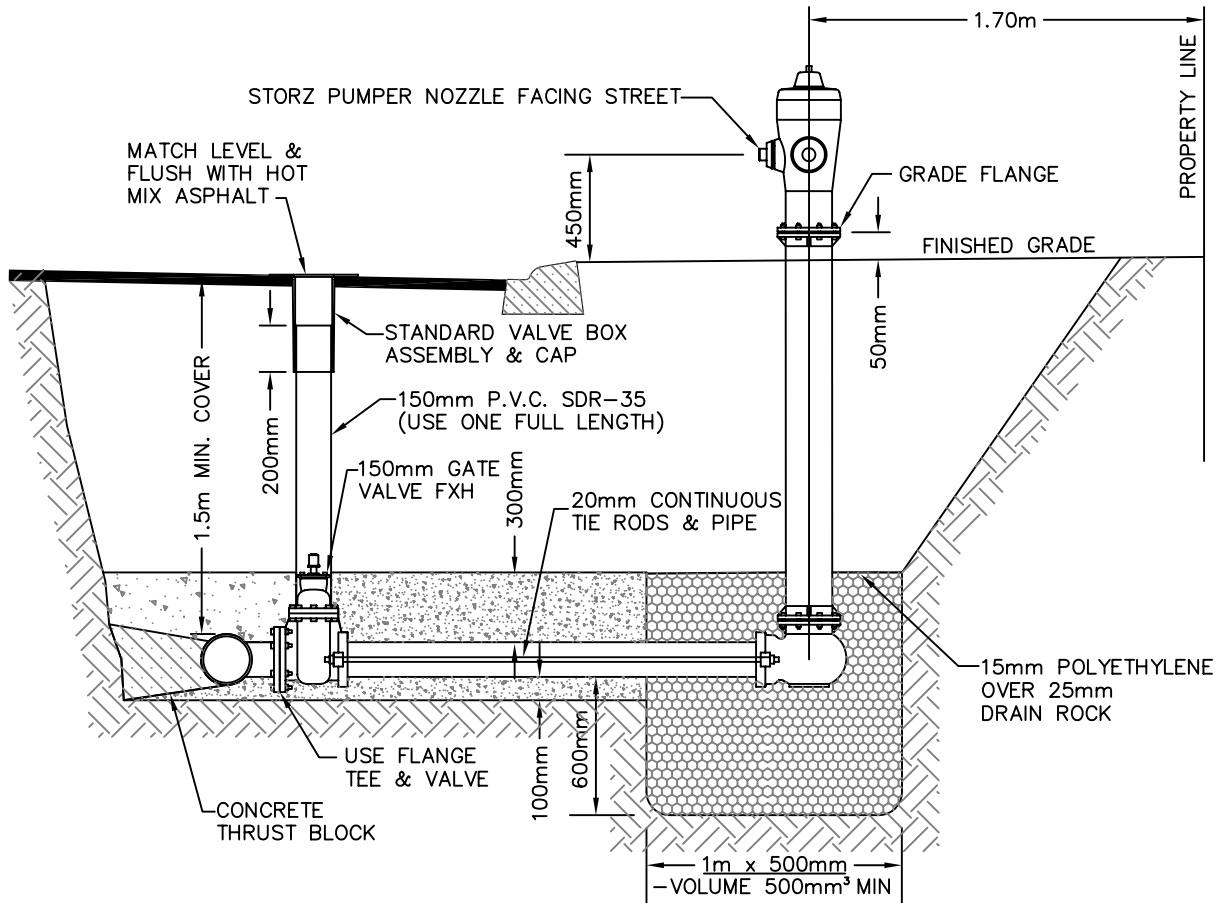
APPROVED
NOVEMBER, 2004

DRAWING NUMBER:
S-W1a



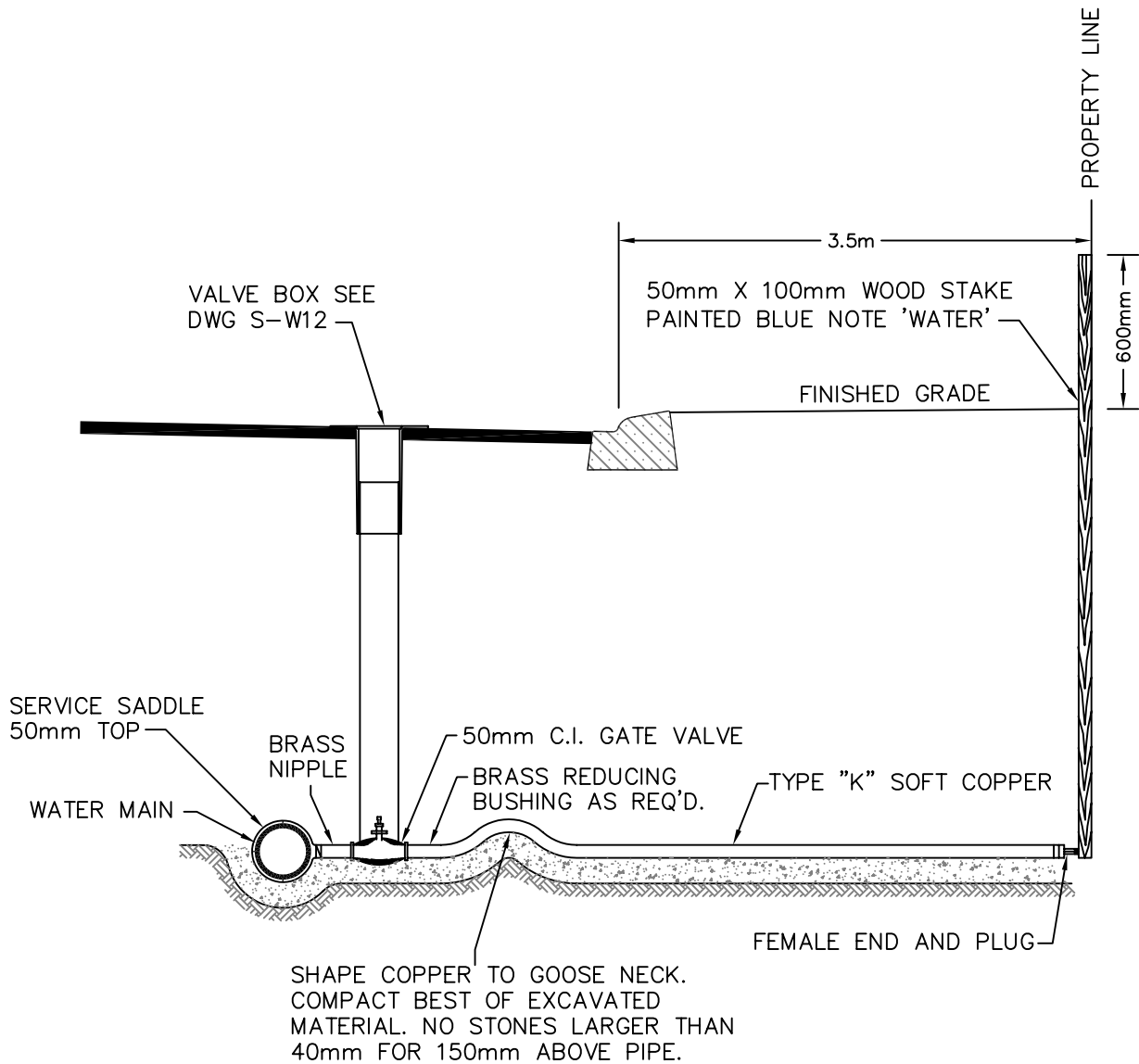
NOTE:

1. WHEN SERVICE SADDLE REQUIRED, USE 'ROBAR' DOUBLE STRAP SADDLE TAPPED C.C. THREAD.
2. CONNECTIONS TO MAIN SHALL BE AT LEAST 1m APART.
3. SERVICES SHALL BE INSTALLED 90° FROM MAIN TO PROPERTY LINE.



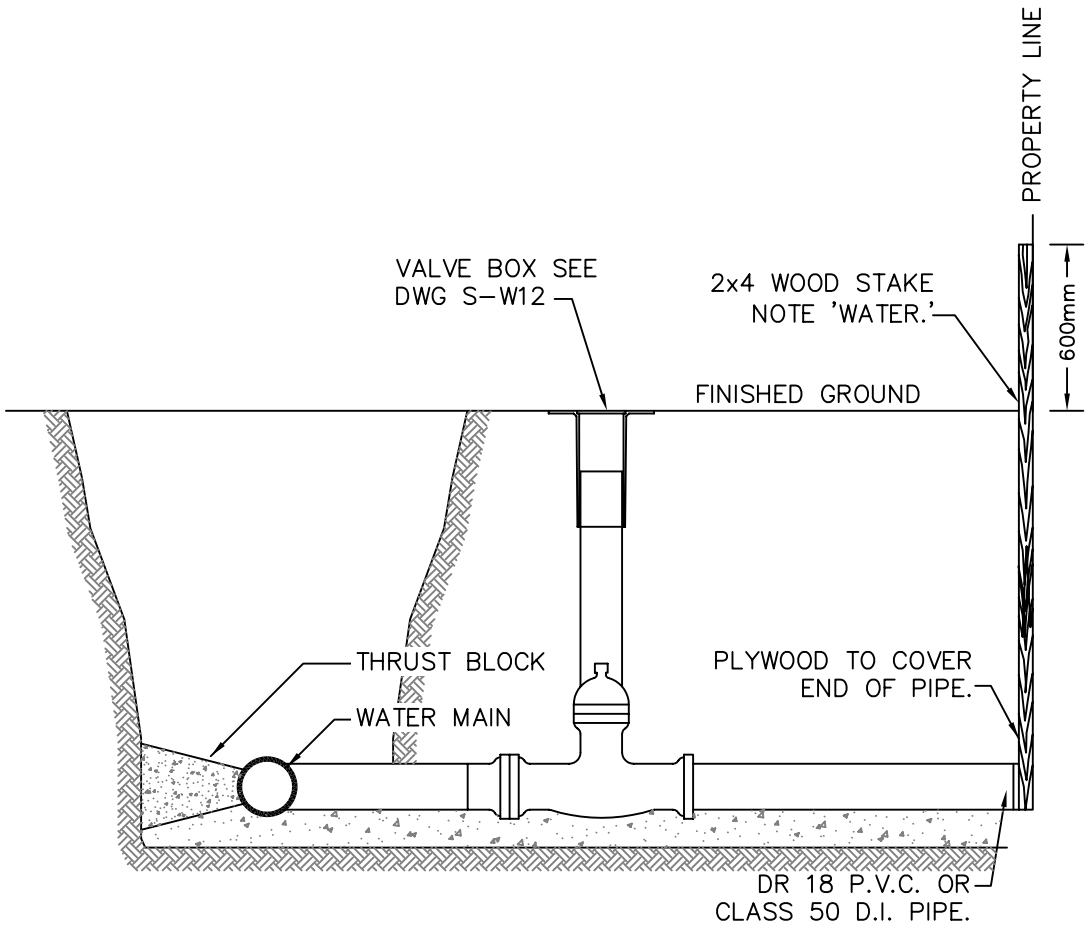
NOTES:

- 1) ALL PIPE, FITTINGS & HYDRANTS SHALL BE ELECTRICALLY CONDUCTIVE IF METAL PIPE IS USED.
- 2) THE EXTERIOR OF THE HYDRANT BARREL BELOW THE GRADE FLANGE SHALL BE COATED WITH ONE COAT OF COAL TAR.
- 3) HYDRANT NOT LOCATED AT INTERSECTION SHALL BE LOCATED ON THE PROJECTION OF A LOT LINE BETWEEN TWO LOTS & 1.7m FROM PROPERTY LINE.

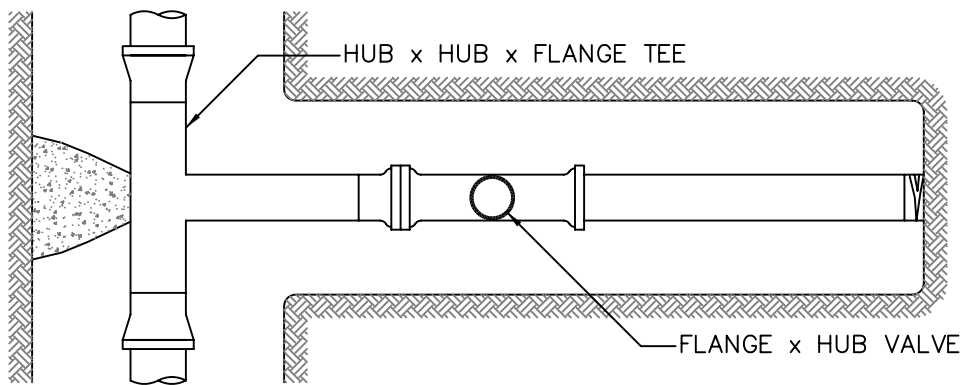


NOTES:

- 1) ONLY COMPRESSION COUPLINGS SHALL BE USED.
- 2) USE DOUBLE STRAP SERVICE SADDLE.
- 3) SERVICES SHALL RUN 90° FROM MAIN TO PROPERTY LINE.
- 4) USE TEFLON TAPE FOR ALL THREADED FITTINGS.



SIDE VIEW



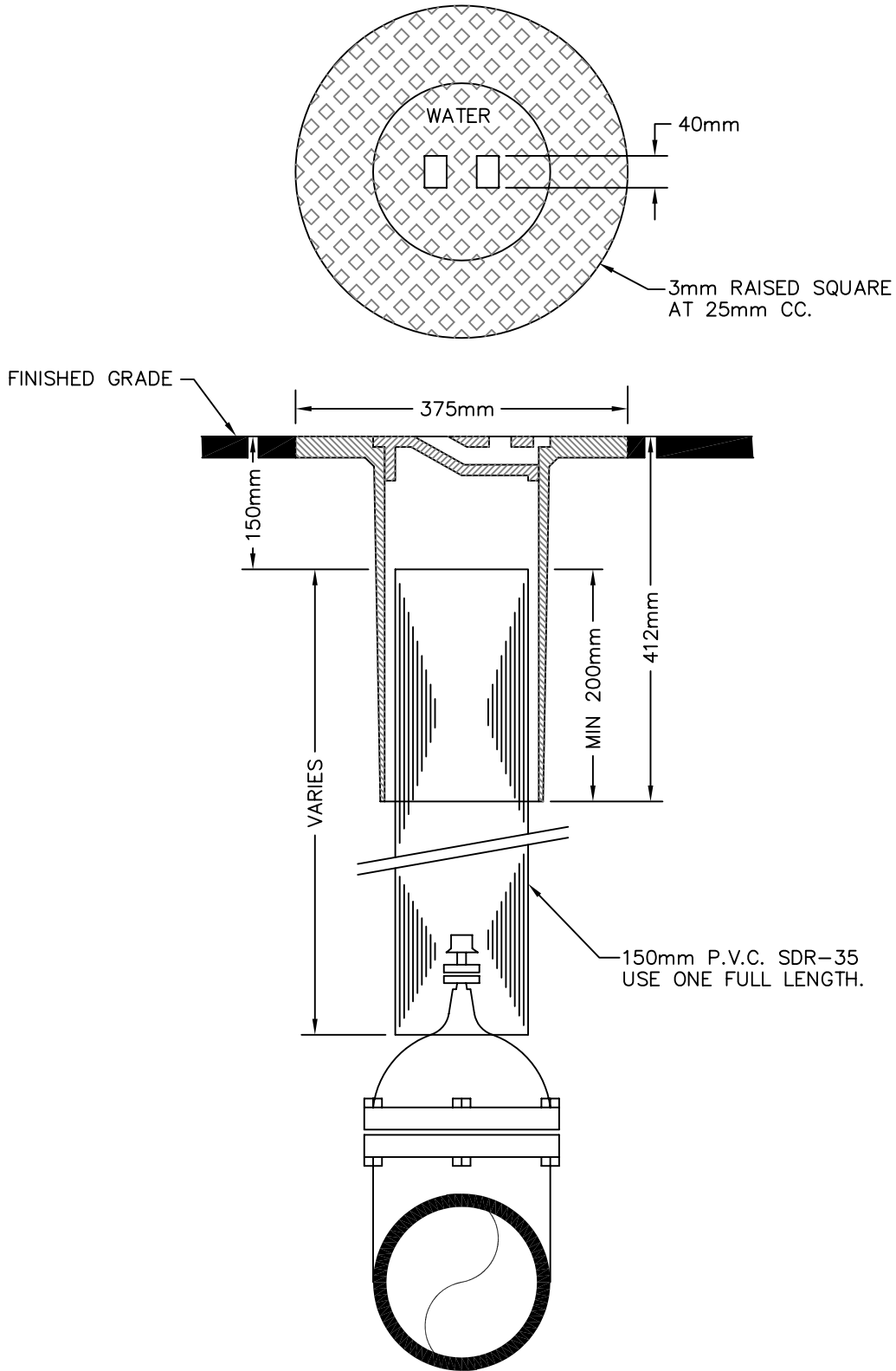
TOP VIEW

NOTE:

- 1) ALL PIPE FITTINGS SHALL BE ELECTRICALLY CONDUCTIVE IF METAL PIPE IS USED.



STANDARD DETAIL DRAWINGS



2004

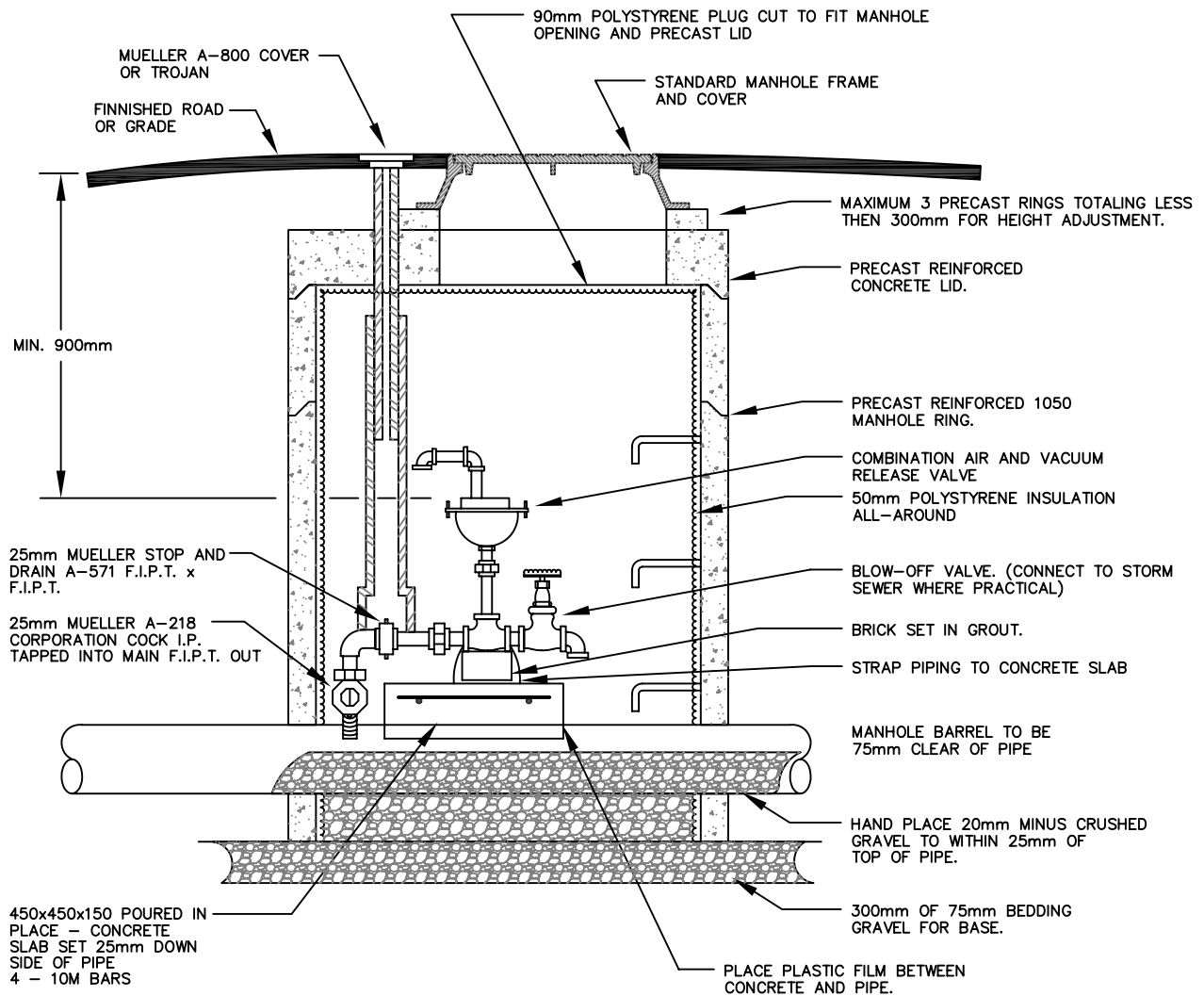
STANDARD VALVE BOX ASSEMBLY

APPROVED
NOVEMBER, 2004

DRAWING NUMBER:
S-W12



STANDARD DETAIL DRAWINGS



NOTE :- ALL FITTINGS TO BE BRASS

2004

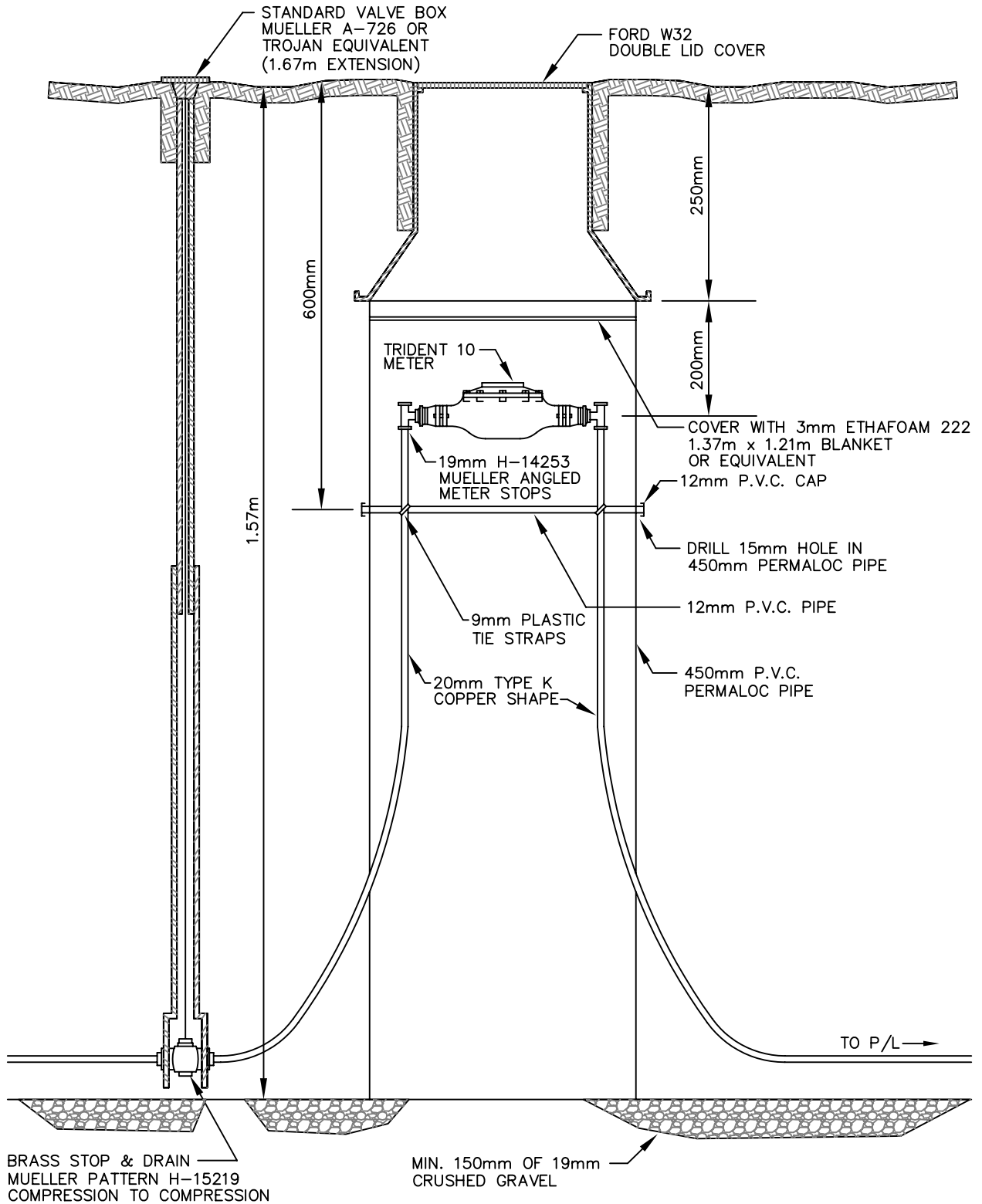
STANDARD COMBINATION AIR VALVE INSTALLATION

APPROVED
NOVEMBER, 2004

DRAWING NUMBER:
S-W13



STANDARD DETAIL DRAWINGS

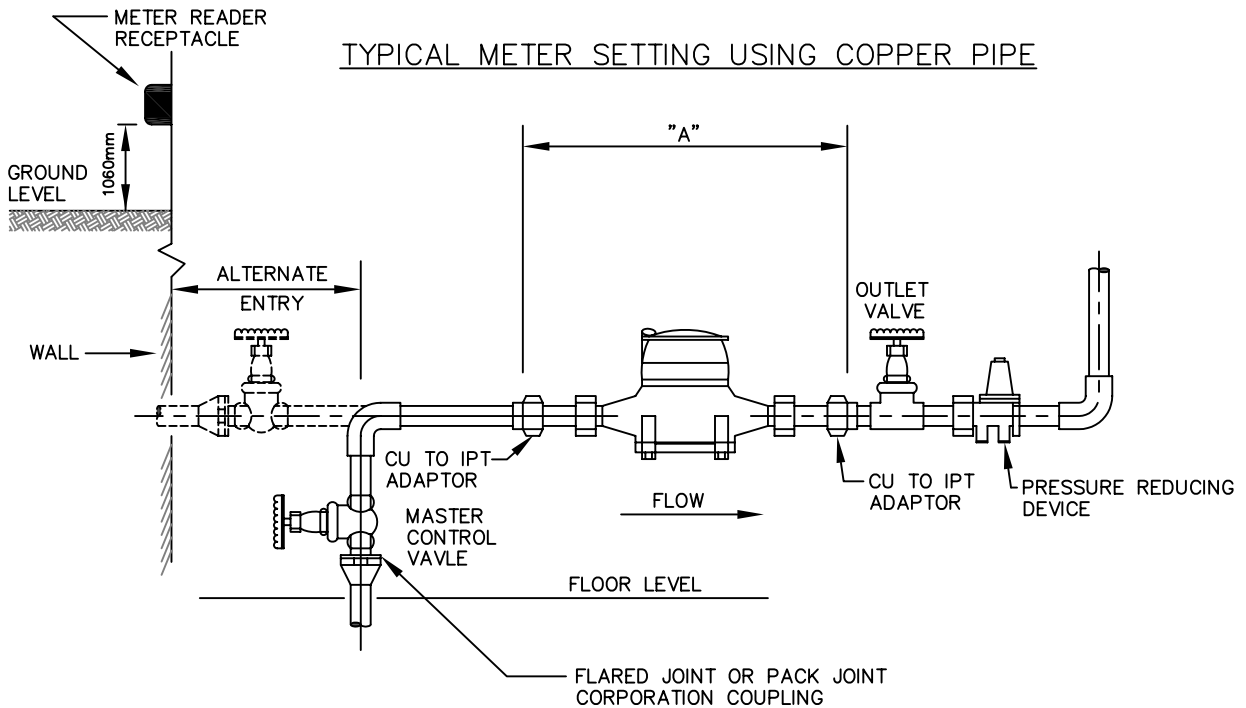


2004

FROSTPROOF 19mm AND 25mm METER VAULT

APPROVED
NOVEMBER, 2004

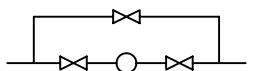
DRAWING NUMBER:
S-W14



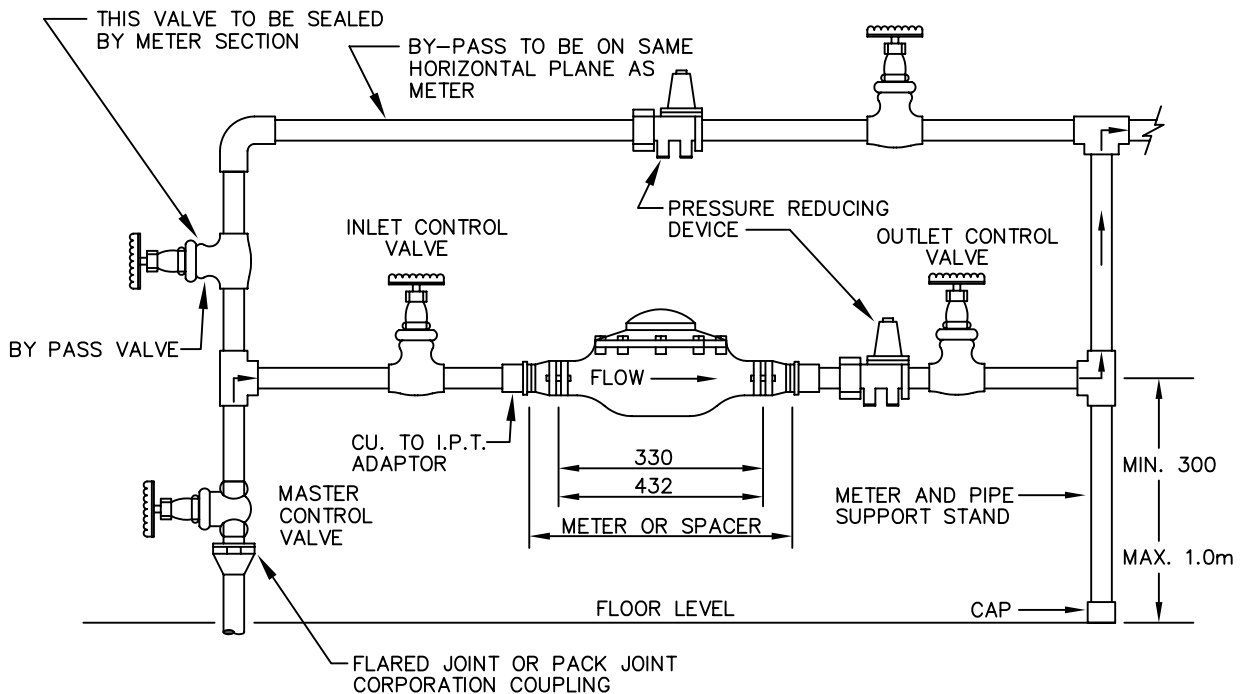
METER SIZE	"A"
20mm	450mm
25mm	450mm

NOTE:

1. PIPING ON EACH SIDE OF METER MUST BE ADEQUATELY SUPPORTED PER BUILDING & LICENCE & CITY WATERWORKS METER SECTION.
2. PIPING FOR METER MUST BE ON HORIZONTAL PLANE.
3. MINIMUM DISTANCE OF 175mm BETWEEN ANY WALL AND A METER OR METER TREE.
4. VALVES ARE REQUIRED ADJACENT TO METERS (INLET AND OUTLET SIDE), ADDITIONAL VALVE MAY BE INSTALLED IN INDIVIDUAL UNITS IF REQUIRED.
5. THE AREA FOR 600mm IN FRONT OF THE METER SHALL BE FREE OF OBSTRUCTION TO ALLOW FOR CONVENIENT READING AND SERVICING OF THE METER, 1.0m HEADROOM MUST BE PROVIDED IN THIS AREA.
6. EXCEPT WHERE NOTED, ALL FITTINGS AND PIPE ARE TO BE SOLDERED COPPER.
7. WHERE SOLDERED VALVES ARE BEING USED, COPPER TO FEMALE I.P.T. ADAPTERS MUST BE SUPPLIED TO ACCOMMODATE METER TAILPIECES.
8. PLACEMENT OF A METER IN A BATHROOM OR BEDROOM IS NOT PERMITTED.
9. THE MASTER CONTROL VALVE MUST BE EASILY ACCESSIBLE AND LOCATED IMMEDIATELY AFTER THE WATER SERVICE ENTERS THE BUILDING AND IMMEDIATELY AHEAD OF THE METER.
10. THE PRESSURE REDUCING VALVE MUST BE COMPLETELY ACCESSIBLE FOR SERVICING.



BYPASS FOR COMMERCIAL INSTALLATIONS ONLY

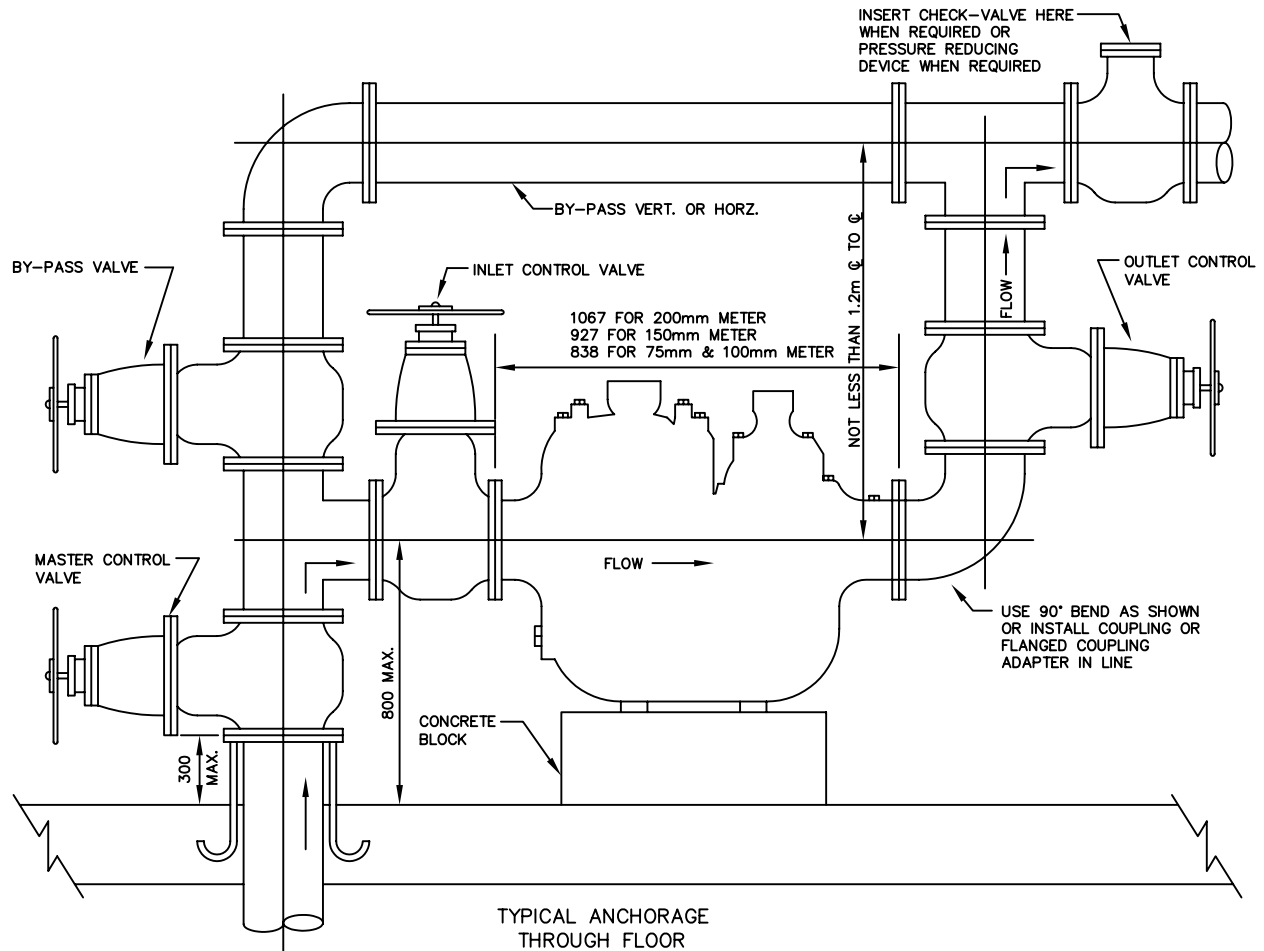


TYPICAL METER SETTING USING COPPER PIPE

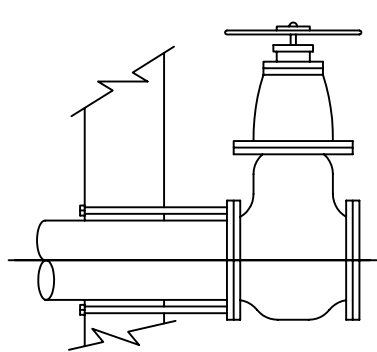
NOTE:

1. PIPING ON EACH SIDE OF METER MUST BE ADEQUATELY SUPPORTED TO THE SATISFACTION OF WATERWORKS METER SECTION.
2. PIPING FOR METER MUST BE ON HORIZONTAL PLANE.
3. MINIMUM DISTANCE OF 225mm BETWEEN ANY WALL AND A METER OR METER TREE.
4. VALVES ARE REQUIRED ADJACENT TO METERS (INLET AND OUTLET SIDE), ADDITIONAL VALVE MAY BE INSTALLED IN INDIVIDUAL UNITS IF REQUIRED.
5. ALTERNATE ARRANGEMENT OF PIPING AND VALVING MUST HAVE THE APPROVAL OF THE WATERWORKS METER SECTION PRIOR TO INSTALLATION.
6. THE AREA FOR 600mm IN FRONT OF THE METER SHALL BE FREE OF OBSTRUCTION TO ALLOW FOR CONVENIENT READING AND SERVICING OF THE METER, 2.0m HEADROOM MUST BE PROVIDED IN THIS AREA.
7. IN NO CASE SHALL A METER BE INSTALLED IN A BATHROOM OR BEDROOM.
8. EXCEPT WHERE NOTED, ALL FITTINGS AND PIPE ARE TO BE SOLDERED COPPER.
9. WHERE SOLDERED VALVES ARE BEING USED, COPPER TO FEMALE I.P.T. ADAPTERS MUST BE SUPPLIED TO ACCOMMODATE METER TAILPIECES.
10. BY-PASS PRV AND PIPING MAY BE ONE SIZE SMALLER THAN MAIN PIPING.

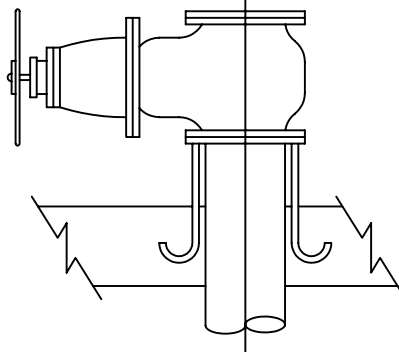
SERVICE ENTERS THE BUILDING AND IMMEDIATELY AHEAD OF THE METER.



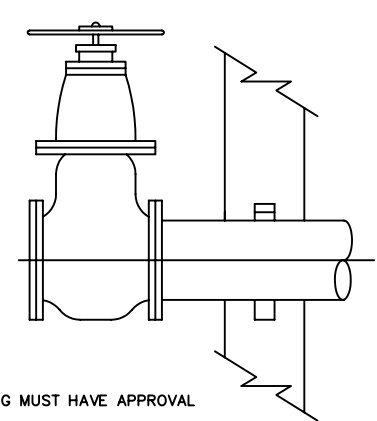
ANCHORAGE THROUGH WALL



TYPICAL ANCHORAGE THROUGH FLOOR

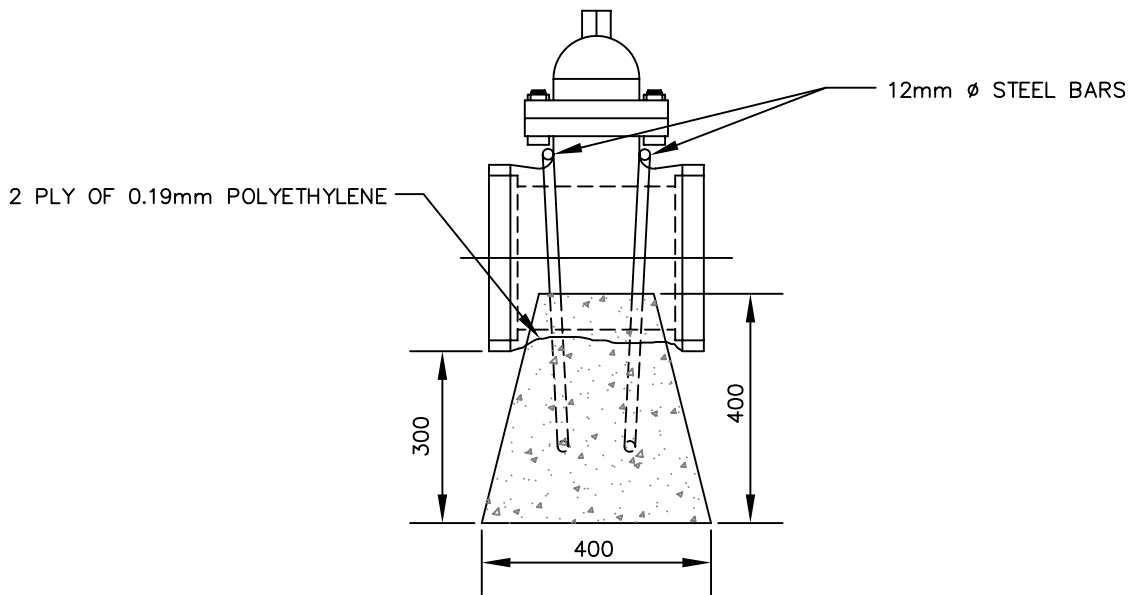
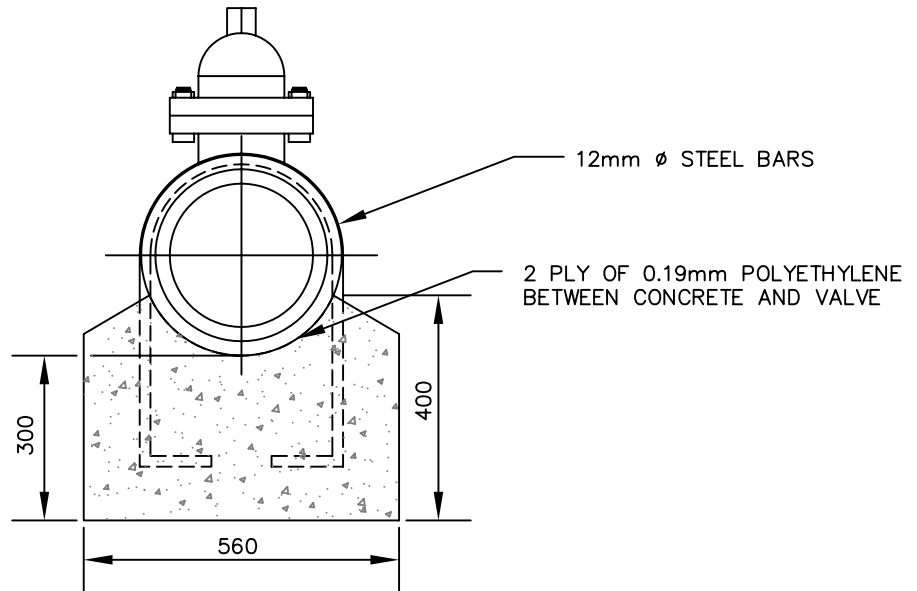


ANCHORAGE THROUGH WALL



NOTE: -

1. ALTERNATIVE FOR BY-PASS COULD BE AT SIDE OF METER (VALVE ARRANGEMENT REMAIN THE SAME)
2. INSTALLATION REQUIRING A METER BY-PASS OR AN ALTERNATIVE ARRANGEMENT OF PIPING AND VALVING MUST HAVE APPROVAL OF THE WATERWORKS METER SECTION PRIOR TO INSTALLATION.
3. THE SPACE ABOVE, 600mm BEHIND AND 1.0m IN FRONT OF METER SHALL BE CLEAR AND FREE OF CONSTRUCTION TO ALLOW FOR CONVENIENT READING INSTALLATION AND SERVICING OF METER.
4. RISING SPIN HOLE VALVES TO BE USE FOR BY-PASS AND CONTROL VALVES.
5. METER CONTROL VALVE SHALL BE ADEQUATELY ANCHORED.
6. ADEQUATE ANCHORAGE MUST BE PROVIDED AT ALL BENDS.
7. INSPECTION AND APPROVAL BY THE WATERWORKS METER SECTION AS OUTLINED IN 2 ABOVE TO ENSURE EASE OF INSTALLATION AND MAINTENANCE OF THE METER AND DOSE NOT CONSTITUTE ACCEPTANCE OR RESPONSIBILITY FOR ADEQUATE DESIGN AND INSTALLATION OF ANY ASSOCIATED VALVING AND PIPING.
8. ANY PART OF THE METER, VALVE OR OPERATOR SHALL NOT BE CLOSER THAN 450mm TO ANY WALL.

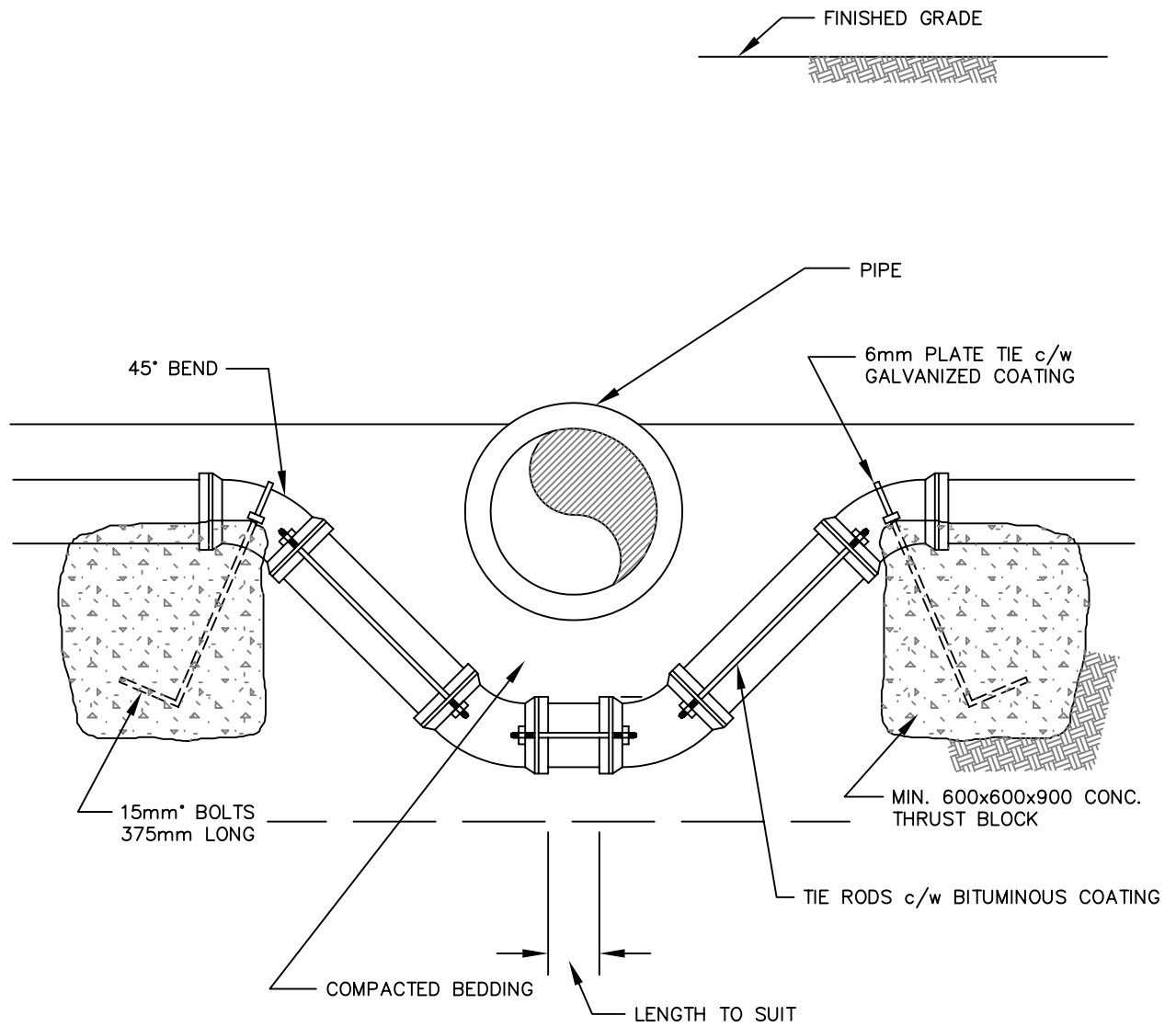


NOTE:

ANCHOR REQUIRED FOR ISOLATED MAIN LINE VALVES WHERE NO TEE OR CROSS FITTING IS PART OF THE VALVE INSTALLATION.



STANDARD DETAIL DRAWINGS



2004

WATERMAIN RELOCATION

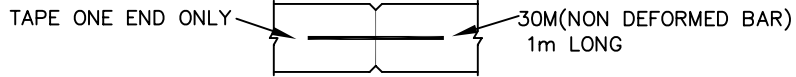
APPROVED
NOVEMBER, 2004

DRAWING NUMBER:
S-W19

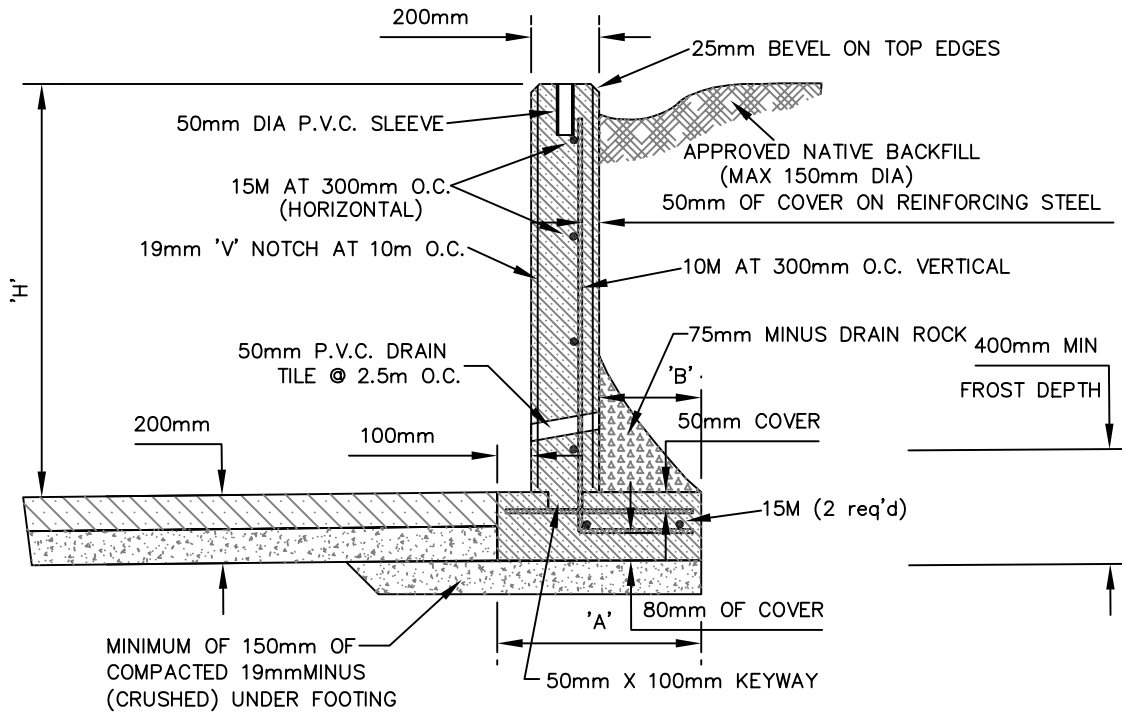


STANDARD DETAIL DRAWINGS

1 BAR REQ'D FOR EACH
1.2m OF WALL HEIGHT



EXPANSION JOINT DETAIL AT (10m) O.C. OR CENTER POINT



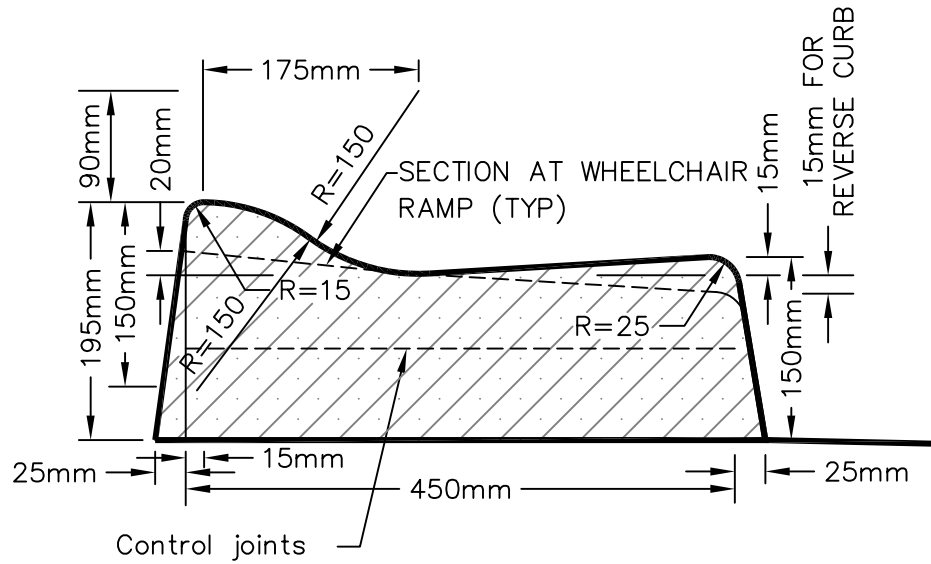
VIBRATE PLACEMENT OF 25mpa CONCRETE.

NOTE:

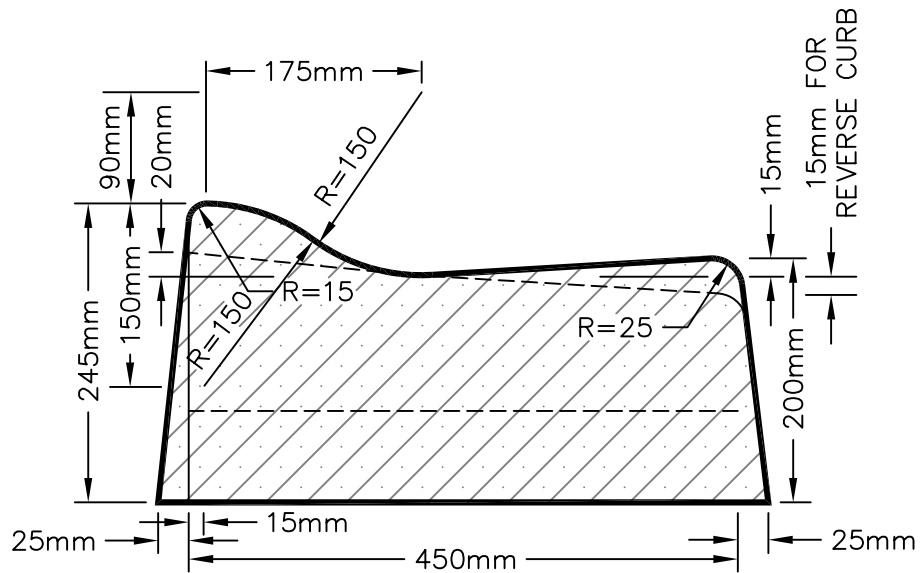
ENGINEERING DWG. REQUIRED FOR CONSTRUCTION
OF WALLS OVER 1.2m HIGH, OR WHERE
UNSTABLE GROUND CONDITIONS EXIST.

FOR WALLS UP TO 1.2m HIGH, ON STABLE
GROUND, WITH NO VEHICULAR SURCHARGE.

'H'	'A'	'B'
600mm	400mm	100mm
900mm	500mm	200mm
1200mm	600mm	300mm



RESIDENTIAL ROLLOVER CURB WITH GUTTER



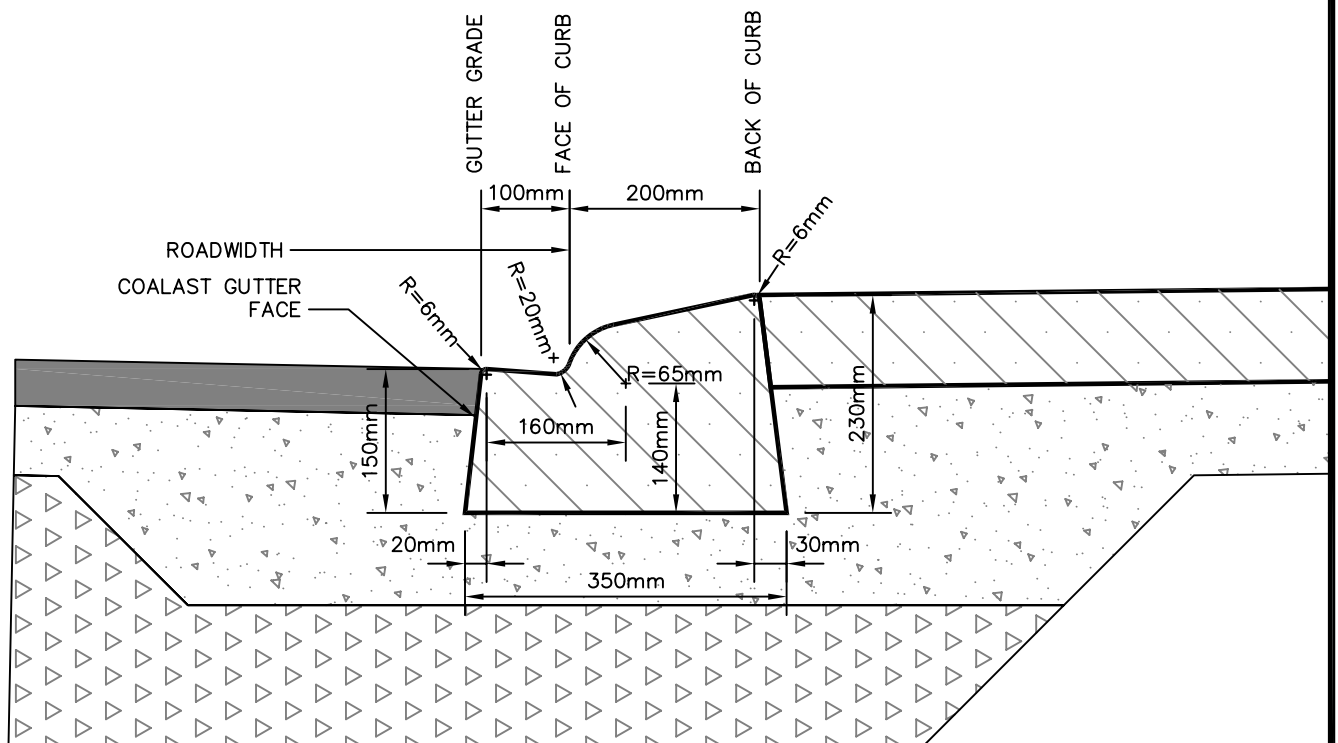
INDUSTRIAL ROLLOVER CURB WITH GUTTER

NOTE:

1. Sections shown are for machine extruded curbs.
2. Refer to contract drawings and section 02523 for detailed specifications.



STANDARD DETAIL DRAWINGS



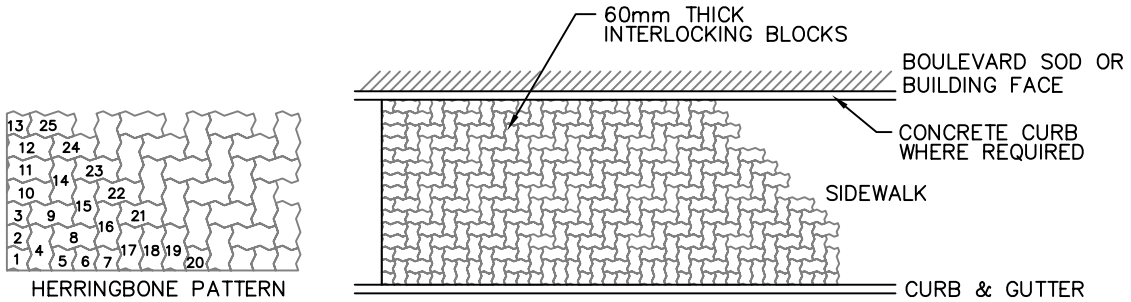
NOTE: -RETROFIT ONLY

2004

PENTICTON—ROLLED CURB
AND GUTTER

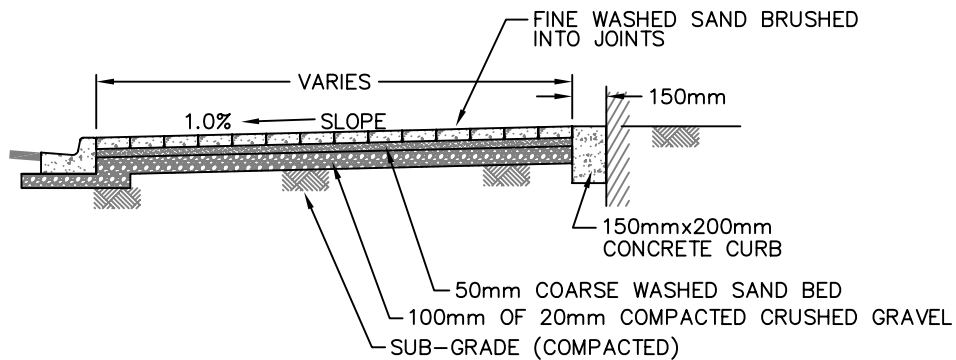
APPROVED
NOVEMBER, 2004

DRAWING NUMBER:
S-C18a



1. COLOR—"OKANAGAN SUNSET" OR TAN.
2. UNIPAVE—225mm X 112mm, NORMAL SIZE.
3. MINIMUM CONCRETE COMPRESSIVE STRENGTH—55mpa.
(A.S.T.M. C936—86)

PLAN

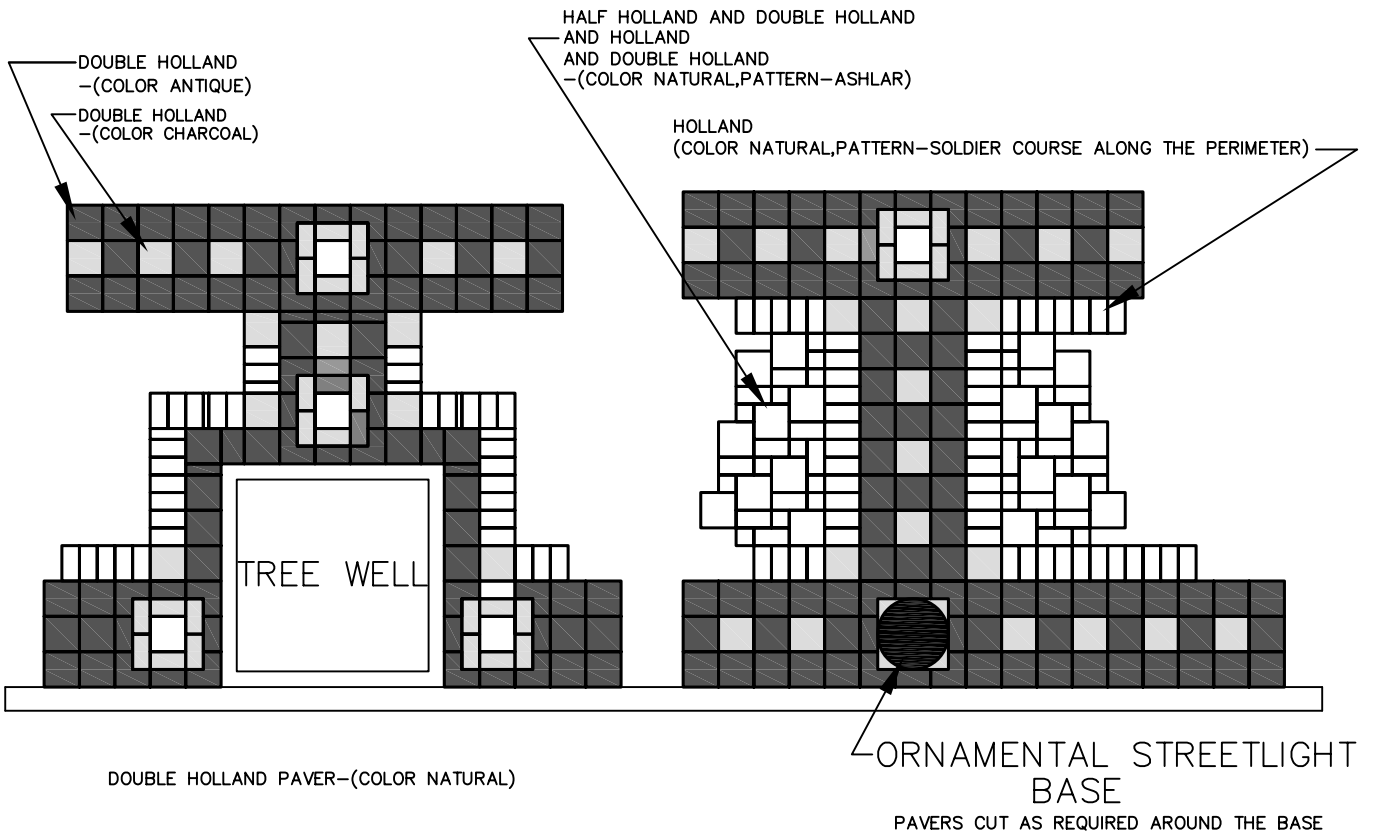


SECTION

NOTE: COMPACT BLOCKING INTO PLACE WITH FLAT BASE VIBRATORY COMPACTOR.

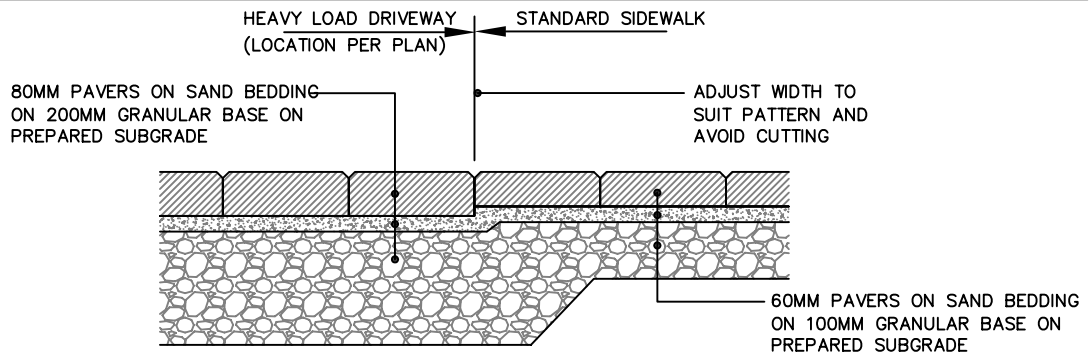


STANDARD DETAIL DRAWINGS



DOUBLE HOLLAND PAVER--(COLOR NATURAL)

PAVERS CUT AS REQUIRED AROUND THE BASE

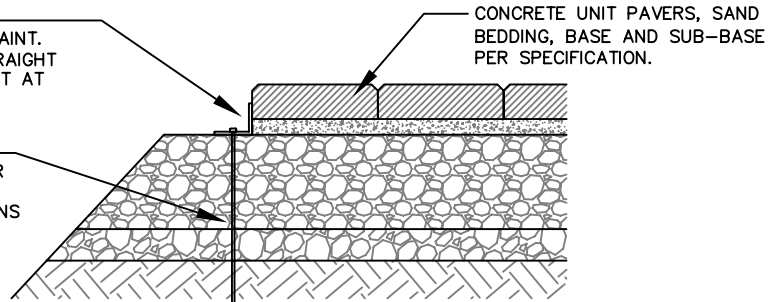


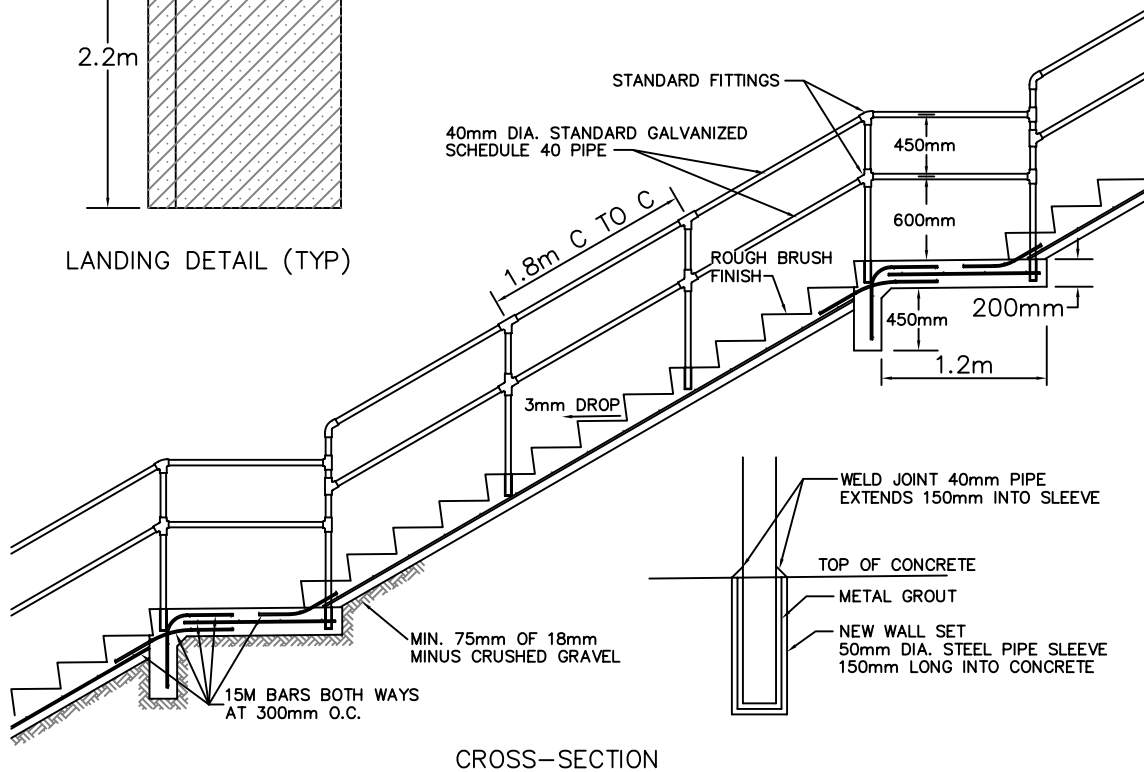
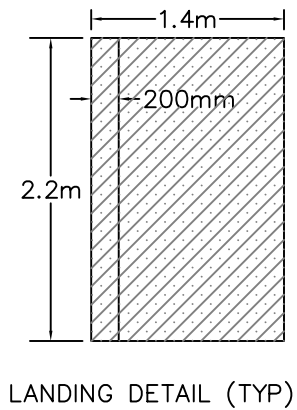
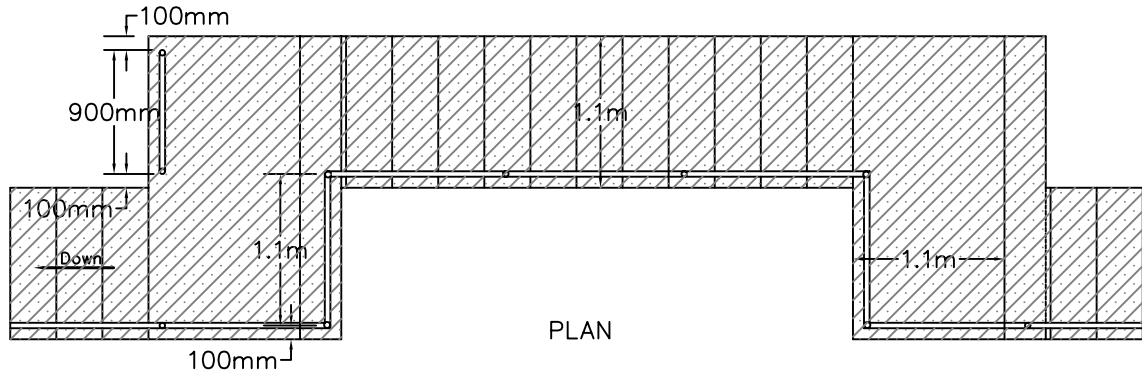
NOTE:

1. USE 80mm PAVERS ONLY AT DRIVEWAYS INDICATED MAINTAIN COLOR AND PATTERN PER PLAN.
2. GRANULAR BASE AT DRIVEWAYS TO BE COMPACTED IN TWO EQUAL LIFTS.
3. INSTALL MANUFACTURED EDGE AT ALL LOCATIONS NOT ADJACENT TO HARD SURFACES.

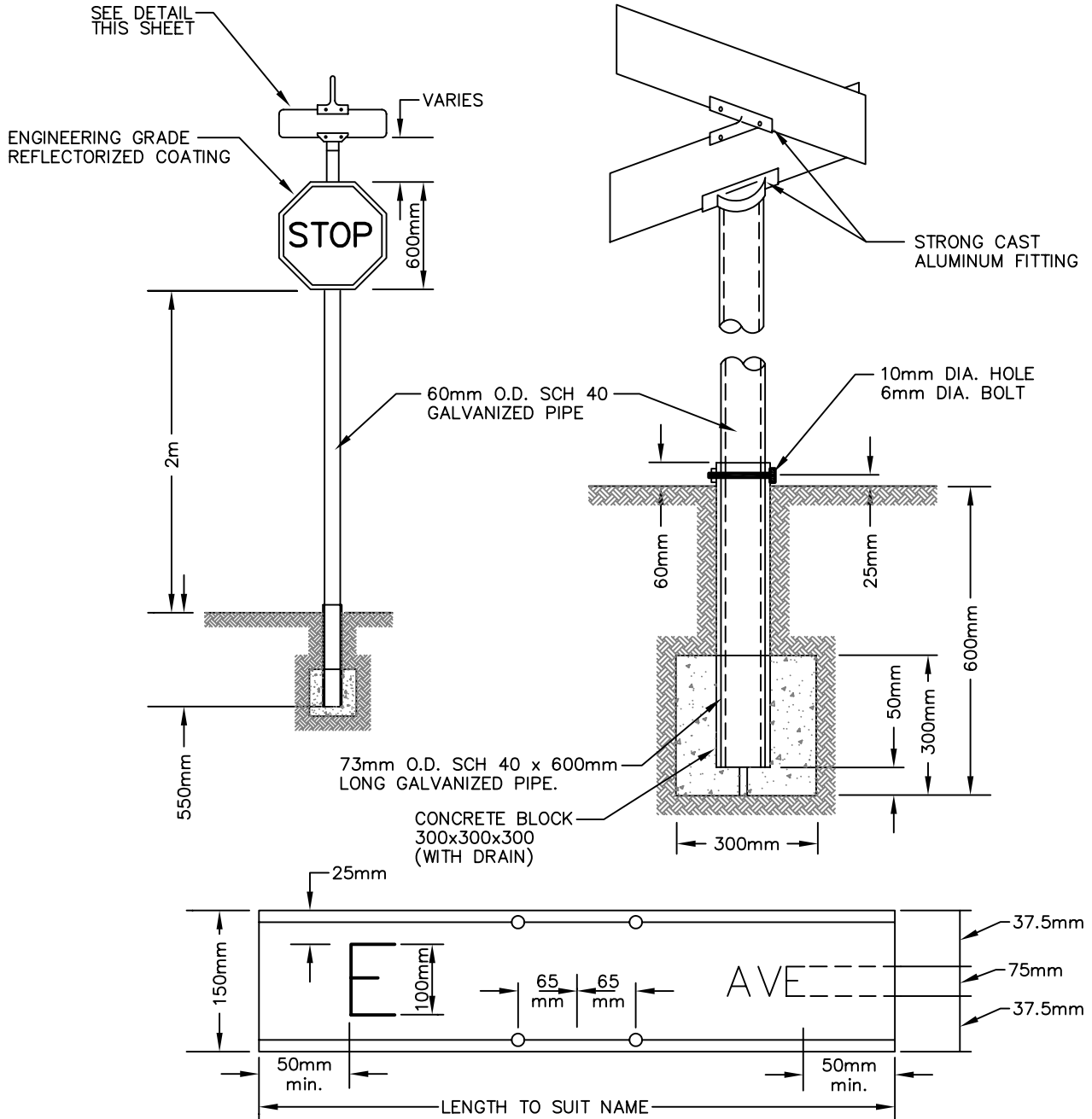
DIMEX CORP. EDGEPRO
MANUFACTURED PAVER RESTRAINT.
USE RIGID RESTRAINT FOR STRAIGHT
RUNS AND FLEXIBLE RESTRAINT AT
CURVES.

3/8"X300 LANDSCAPE SPIKE
EXTEND INTO UNDISTURBED OR
COMPACT SUBGRADE. MAX.
450 O.C. ON FLEXIBLE SECTIONS
AND MAX. 600 O.C. ON RIGID
SECTIONS.





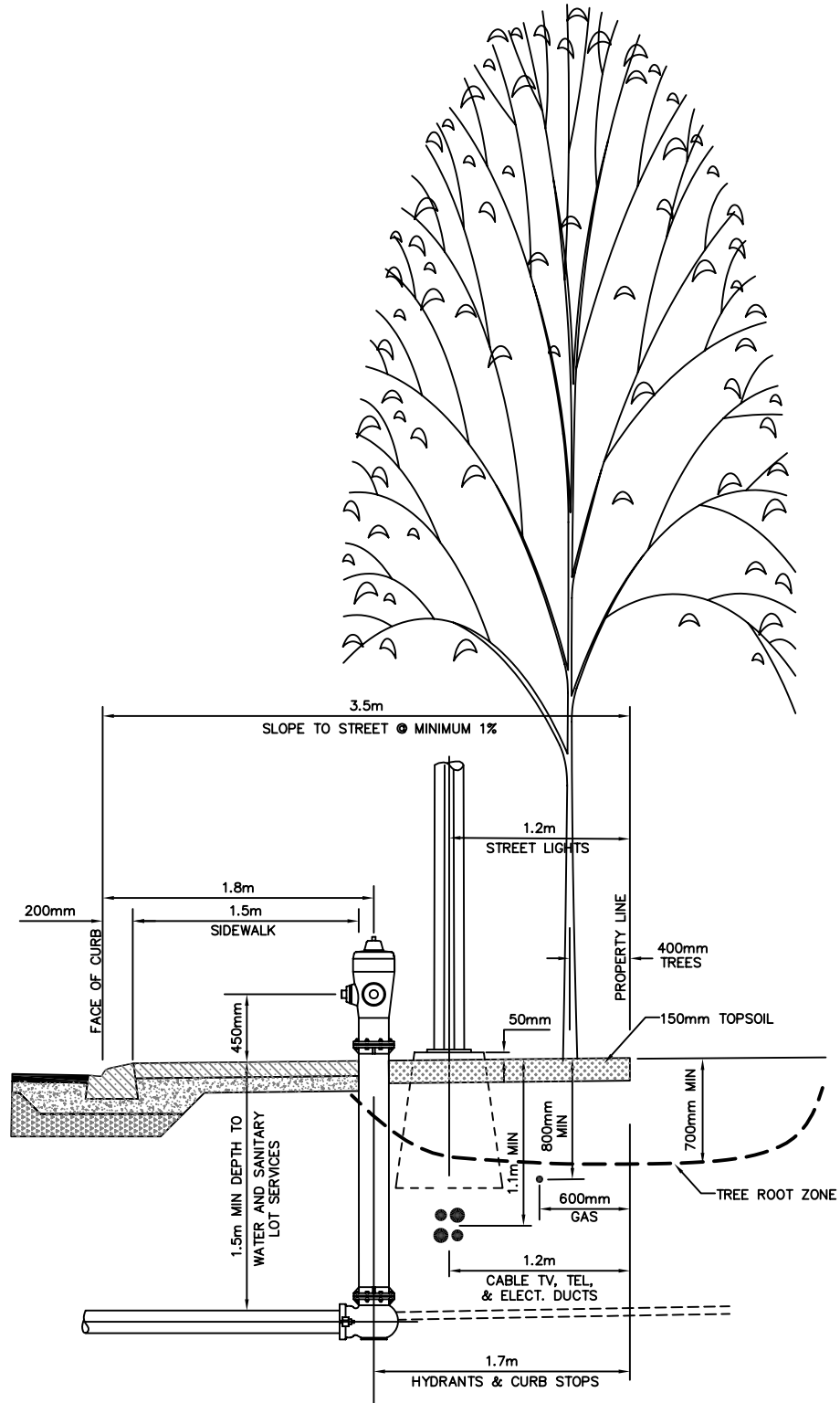
NOTE: (RISER)—125mm TO 190mm (RUN)—250mm TO 360mm



NOTES:

SIGN DETAIL

1. ALL SIGNS TO CONFORM TO LATEST ISSUE OF THE UNIFORM TRAFFIC CONTROL DEVICES FOR CANADA.
2. STREET NAME SIGNS TO BE:
 - A) WHITE REFLECTORIZED LETTERING ON BLUE REFLECTORIZED BACKGROUND.
 - B) LETTERING ON BOTH SIDES, HIGHWAY GOTHIC MEDIUM FONT.
 - C) SIGNS ARE TO BE THICK EXTRUDED ALUMINUM.



NOTE: -DIMENSIONS OR CONDITIONS MAY VARY WITHIN EXISTING RIGHTS-OF-WAY
-RESTORATIONS MUST EQUAL PRE-CONSTRUCTION CONDITIONS

2004

URBAN RESIDENTIAL BOULEVARD
DETAILS

APPROVED
NOVEMBER, 2004

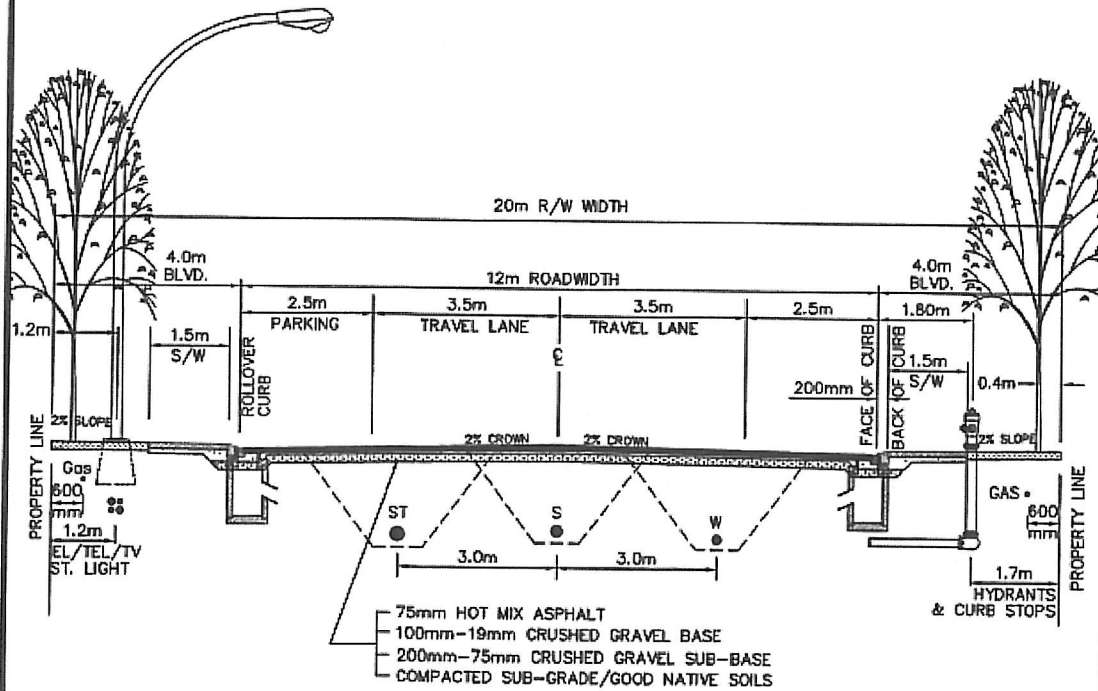
DRAWING NUMBER:
S-R3

URBAN LOCAL COMMERCIAL ROAD, Drawing number S-R4



STANDARD DETAIL DRAWINGS

NOTE: - DIMENSIONS OR CONDITIONS MAY VARY WITHIN EXISTING RIGHTS-OF-WAY.
 - RETROFIT DIMENSIONS MAY BE ACCEPTED WITHIN EXISTING RIGHTS-OF-WAY.



MINIMUM COVER FROM FINISHED GRADE

- WATER-----1.50m
- STORM-----1.50m
- SANITARY-----1.00m
- ELECTRICAL-----1.10m
- GAS-----0.80m
- TEL/TV-----0.80m

NOTE: THE STRUCTURAL ROAD ELEMENTS SHOWN ARE THE MINIMUM REQUIREMENTS. THE ROAD STRUCTURE IS TO BE DESIGNED BASED ON SITE SPECIFIC SOIL CONDITIONS TRAFFIC LOADINGS.

2011

URBAN LOCAL COMMERCIAL ROAD

APPROVED
 JANUARY, 2011

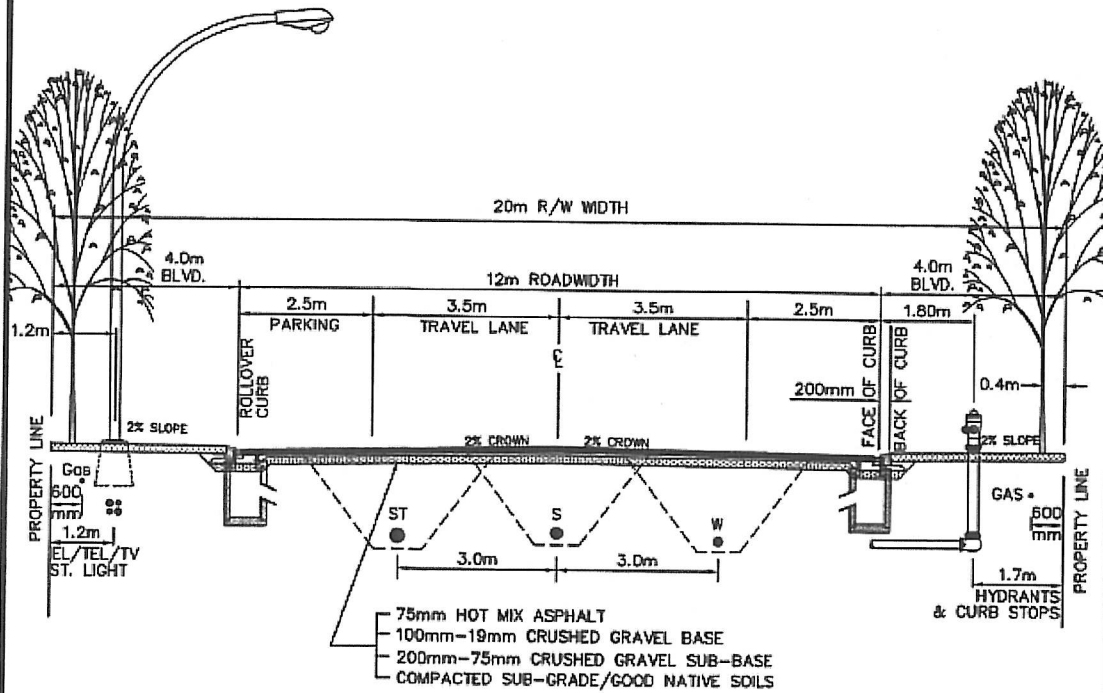
ULU50
 DRAWING NUMBER:
 S-R4

URBAN LOCAL INDUSTRIAL ROAD, Drawing number S-R4a



STANDARD DETAIL DRAWINGS

NOTE: - DIMENSIONS OR CONDITIONS MAY VARY WITHIN EXISTING RIGHTS-OF-WAY.
 - RETROFIT DIMENSIONS MAY BE ACCEPTED WITHIN EXISTING RIGHTS-OF-WAY.



MINIMUM COVER FROM FINISHED GRADE

WATER	1.50m
STORM	1.50m
SANITARY	1.00m
ELECTRICAL	1.10m
GAS	0.80m
TEL./TV	0.80m

NOTE: THE STRUCTURAL ROAD ELEMENTS SHOWN ARE THE MINIMUM REQUIREMENTS. THE ROAD STRUCTURE IS TO BE DESIGNED BASED ON SITE SPECIFIC SOIL CONDITIONS TRAFFIC LOADINGS.

2011

URBAN LOCAL INDUSTRIAL ROAD

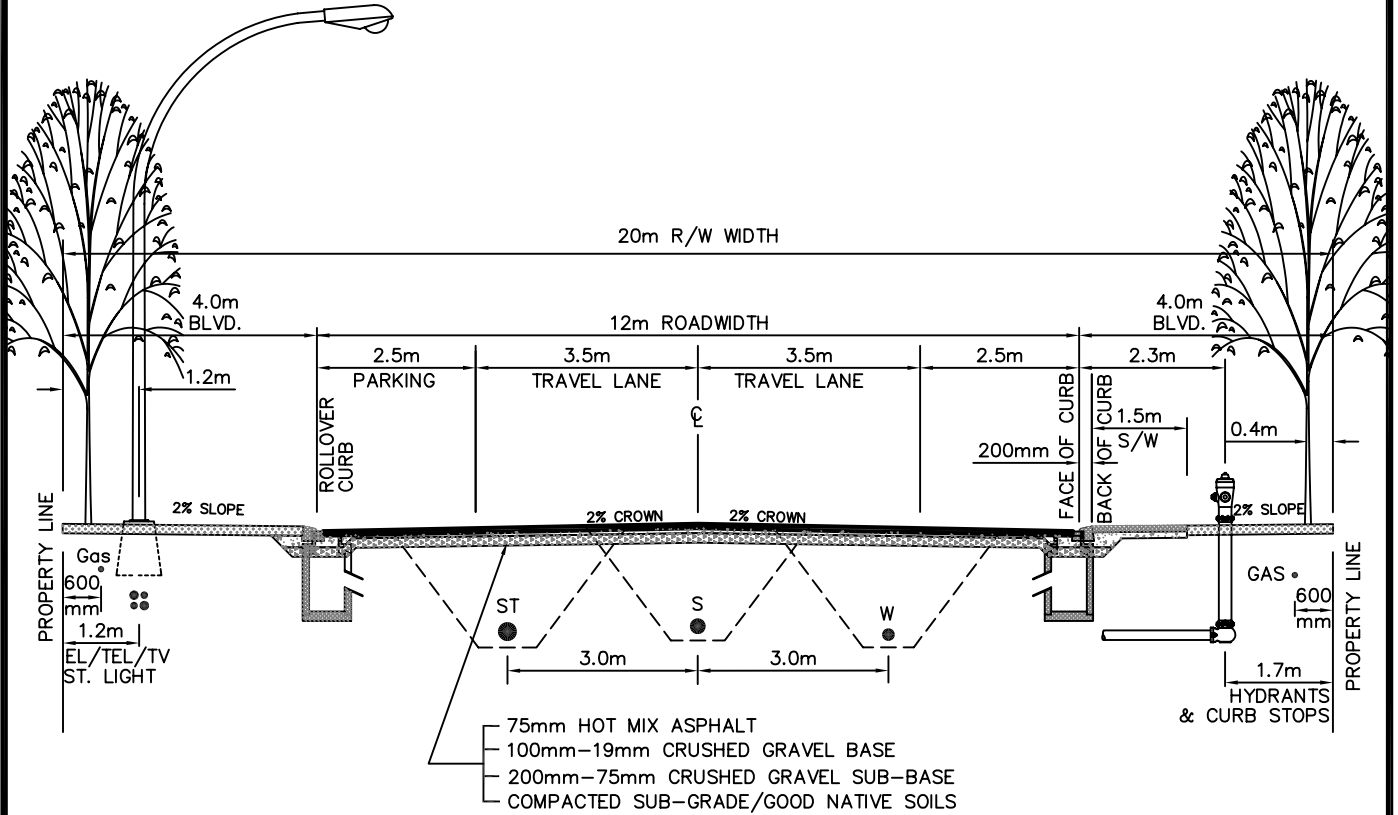
APPROVED
 JANUARY, 2011

ULU50
 DRAWING NUMBER:
 S-R4a



STANDARD DETAIL DRAWINGS

NOTE: - DIMENSIONS OR CONDITIONS MAY VARY WITHIN EXISTING RIGHTS-OF-WAY.
 - RETROFIT DIMENSIONS MAY BE ACCEPTED WITHIN EXISTING RIGHTS-OF-WAY.



MINIMUM COVER FROM FINISHED GRADE

WATER-----	1.50m
STORM-----	1.50m
SANITARY-----	1.00m
ELECTRICAL-----	1.10m
GAS-----	0.80m
TEL./TV-----	0.80m

NOTE: THE STRUCTURAL ROAD ELEMENTS SHOWN ARE THE MINIMUM REQUIREMENTS. THE ROAD STRUCTURE IS TO BE DESIGNED BASED ON SITE SPECIFIC SOIL CONDITIONS TRAFFIC LOADINGS.

2004

URBAN COLLECTOR
RESIDENTIAL ROAD

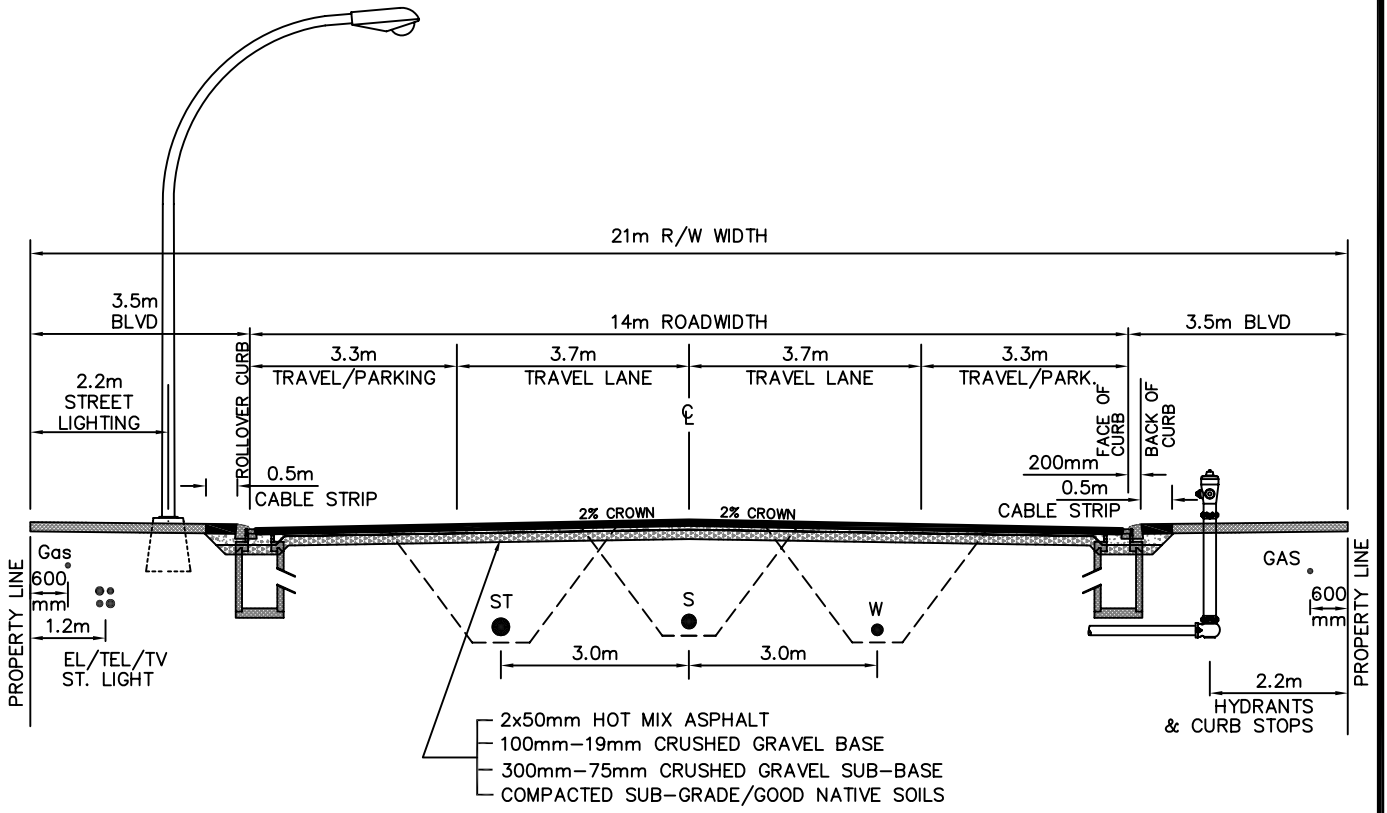
APPROVED
NOVEMBER, 2004

UCU60
DRAWING NUMBER:
S-R5



STANDARD DETAIL DRAWINGS

NOTE: - DIMENSIONS OR CONDITIONS MAY VARY WITHIN EXISTING RIGHTS-OF-WAY.
 - RETROFIT DIMENSIONS MAY BE ACCEPTED WITHIN EXISTING RIGHTS-OF-WAY.



MINIMUM COVER FROM FINISHED GRADE

- WATER-----1.50m
- STORM-----1.50m
- SANITARY-----1.00m
- ELECTRICAL-----1.10m
- GAS-----0.80m
- TEL./TV-----0.80m

NOTE: THE STRUCTURAL ROAD ELEMENTS SHOWN ARE THE MINIMUM REQUIREMENTS. THE ROAD STRUCTURE IS TO BE DESIGNED BASED ON SITE SPECIFIC SOIL CONDITIONS TRAFFIC LOADINGS.

2004

URBAN COLLECTOR INDUSTRIAL ROAD

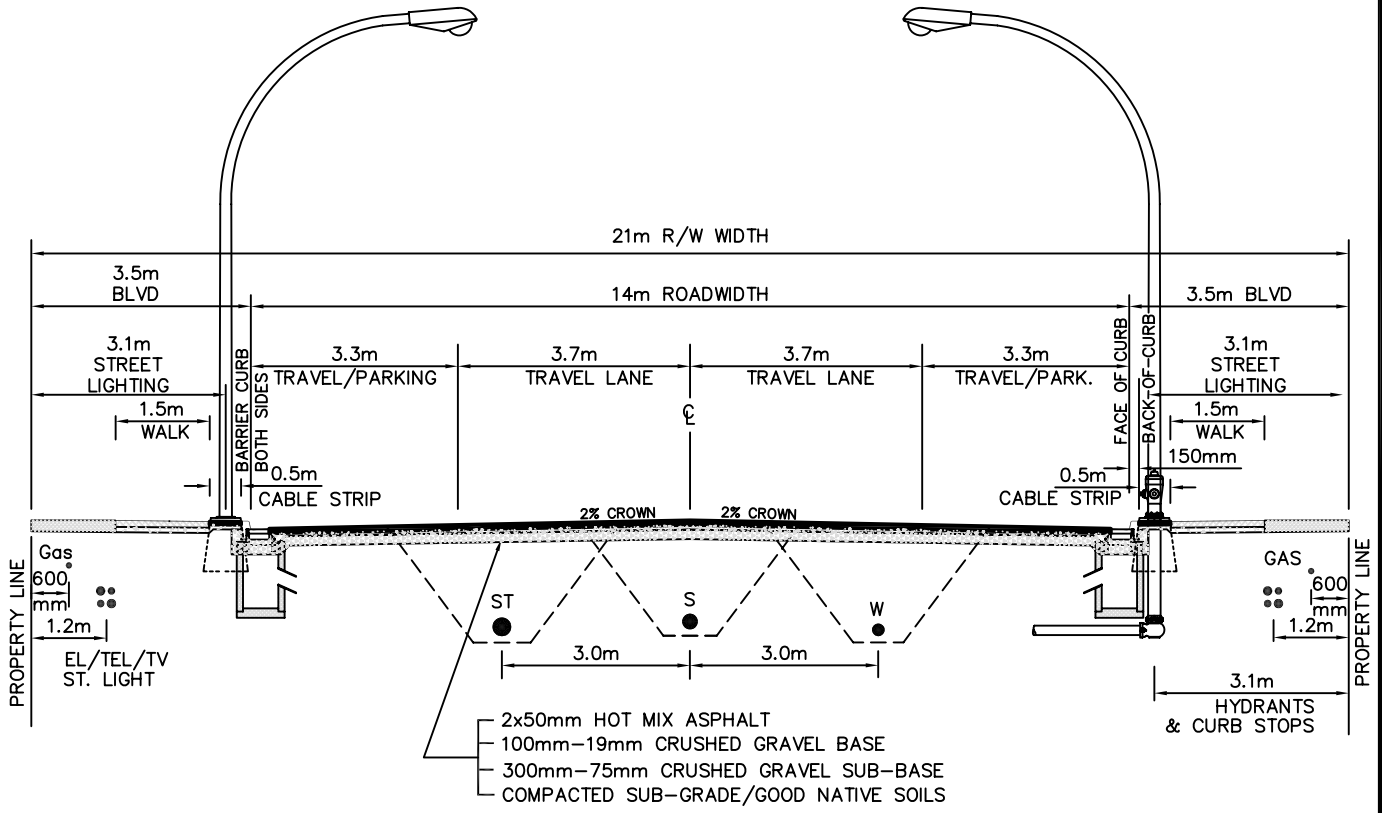
APPROVED
 NOVEMBER, 2004

UCU60
 DRAWING NUMBER:
S-R6



STANDARD DETAIL DRAWINGS

NOTE: - DIMENSIONS OR CONDITIONS MAY VARY WITHIN EXISTING RIGHTS-OF-WAY.
 - RETROFIT DIMENSIONS MAY BE ACCEPTED WITHIN EXISTING RIGHTS-OF-WAY.



MINIMUM COVER FROM FINISHED GRADE

- WATER-----1.50m
- STORM-----1.50m
- SANITARY-----1.00m
- ELECTRICAL-----1.10m
- GAS-----0.80m
- TEL./TV-----0.80m

NOTE: THE STRUCTURAL ROAD ELEMENTS SHOWN ARE THE MINIMUM REQUIREMENTS. THE ROAD STRUCTURE IS TO BE DESIGNED BASED ON SITE SPECIFIC SOIL CONDITIONS TRAFFIC LOADINGS.

2004

URBAN COLLECTOR
COMMERCIAL ROAD

APPROVED

NOVEMBER, 2004

UCU60

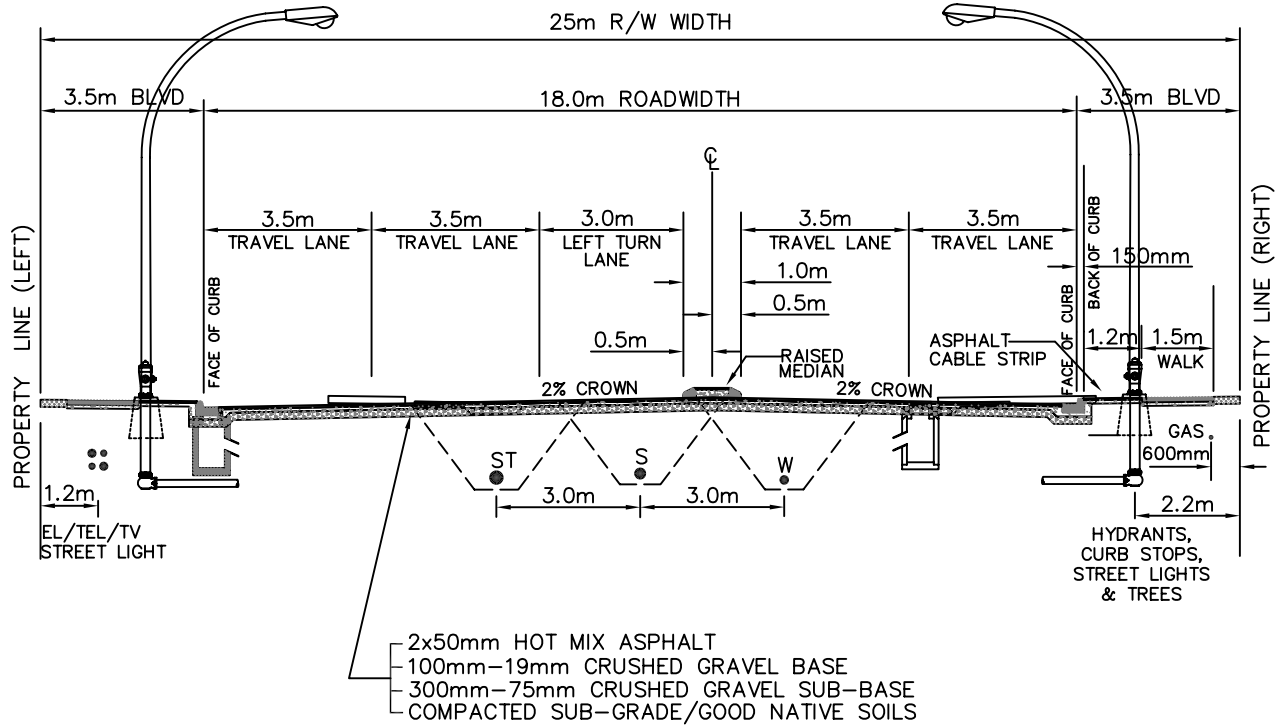
DRAWING NUMBER:

S-R6a



STANDARD DETAIL DRAWINGS

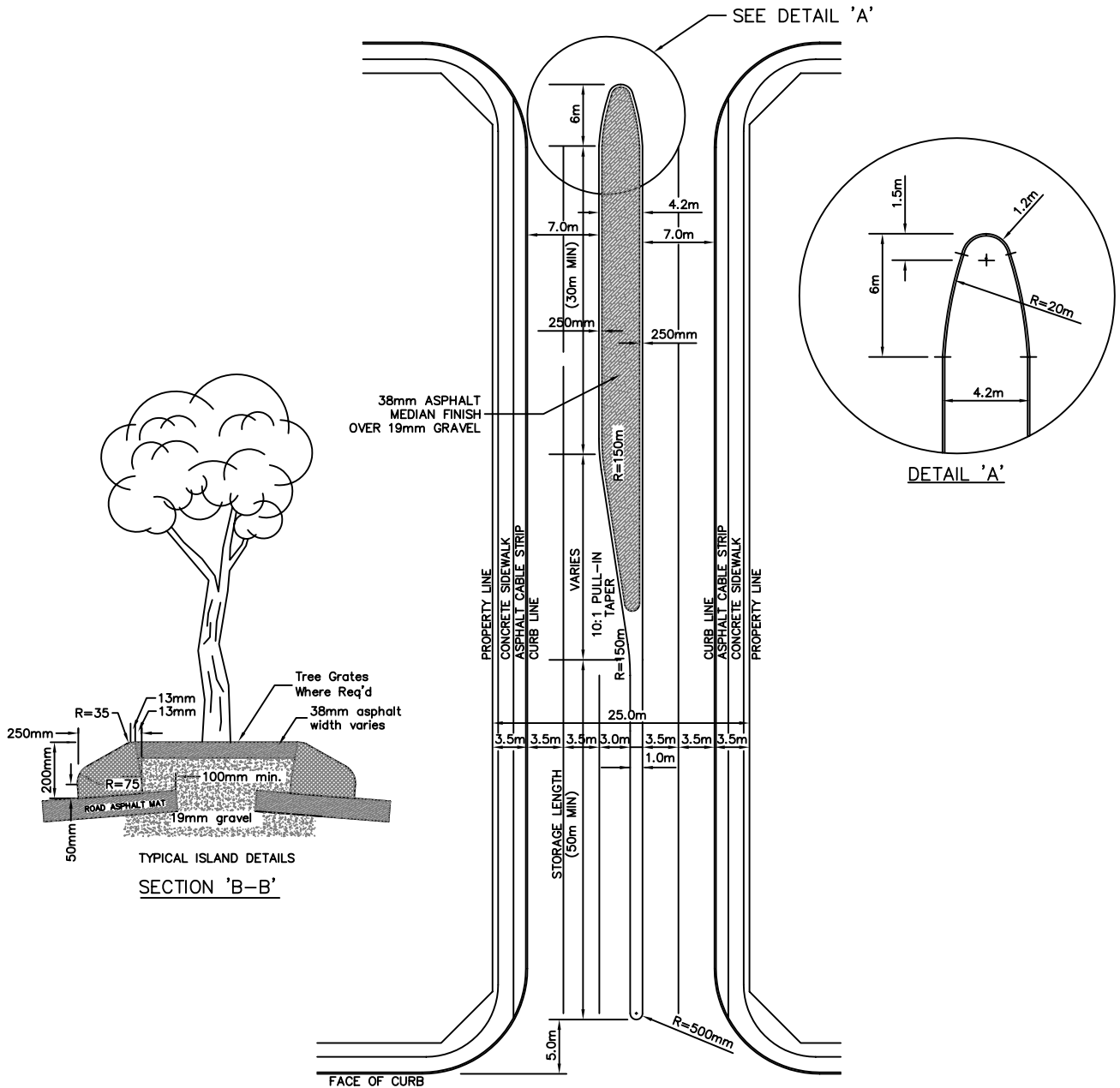
NOTE:- DIMENSIONS OR CONDITIONS MAY VARY WITHIN EXISTING RIGHTS-OF-WAY.
 - RETROFIT DIMENSIONS MAY BE ACCEPTED WITHIN EXISTING RIGHTS-OF-WAY.



MINIMUM COVER FROM FINISHED GRADE

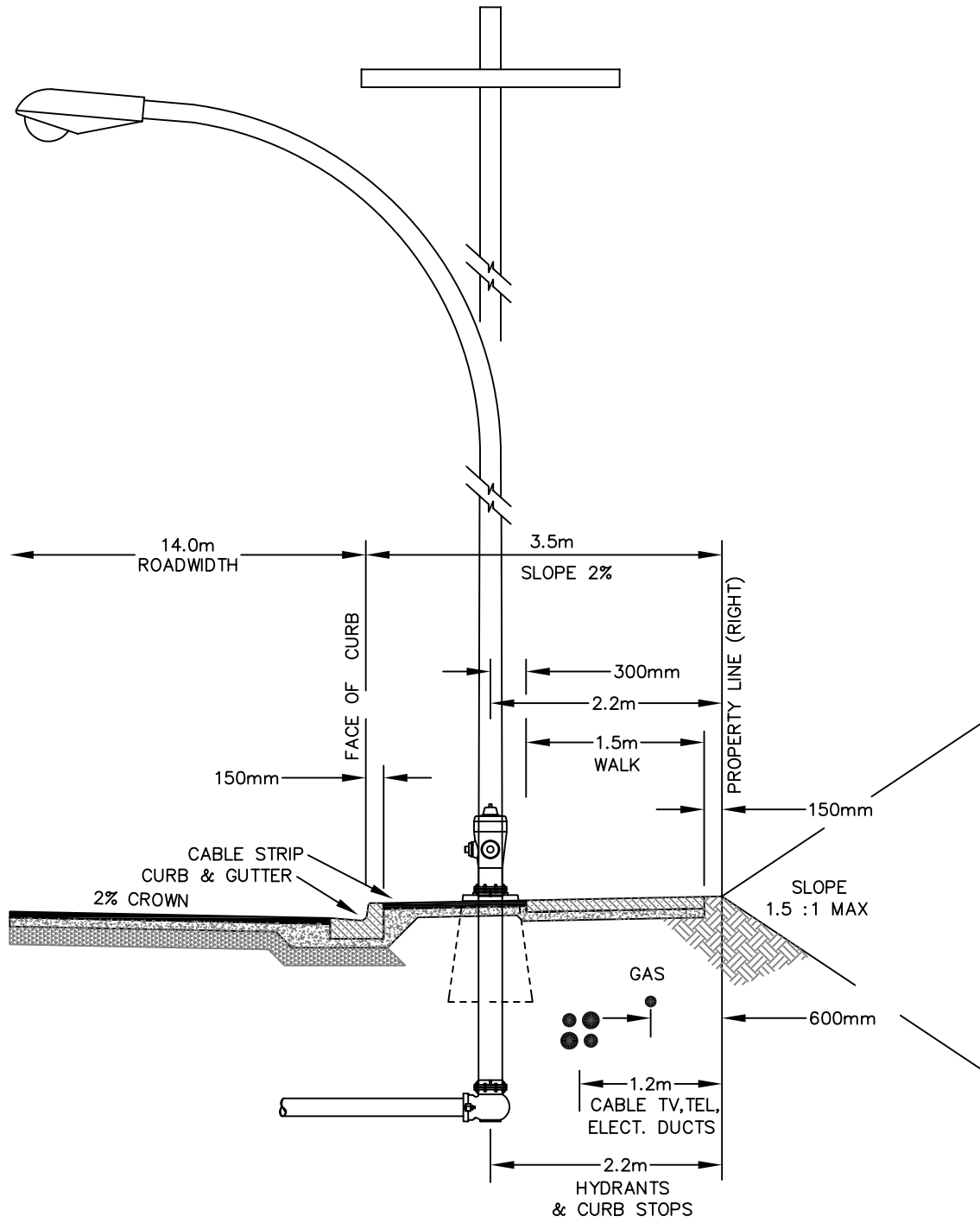
WATER-----	1.50m
STORM-----	1.00m
SANITARY-----	1.00m
ELECTRICAL-----	1.10m
GAS-----	0.80m
TEL./TV-----	0.80m

NOTE: THE STRUCTURAL ROAD ELEMENTS SHOWN ARE THE MINIMUM REQUIREMENTS.
 THE ROAD STRUCTURE IS TO BE DESIGNED BASED ON SITE SPECIFIC SOIL CONDITIONS
 TRAFFIC LOADINGS.





STANDARD DETAIL DRAWINGS



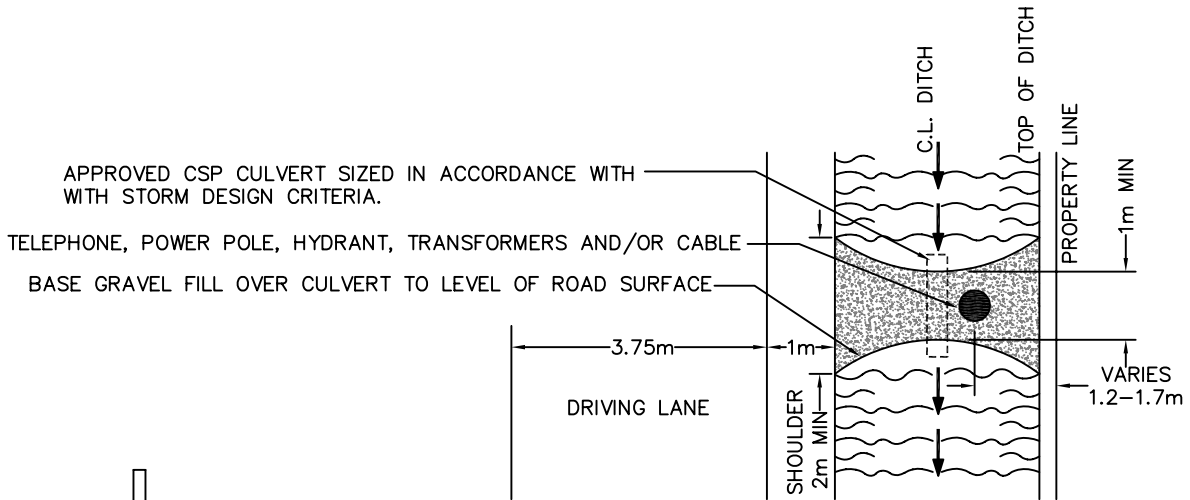
NOTE: CONDITIONS MAY VARY WITHIN EXISTING RIGHTS OF WAY

2004

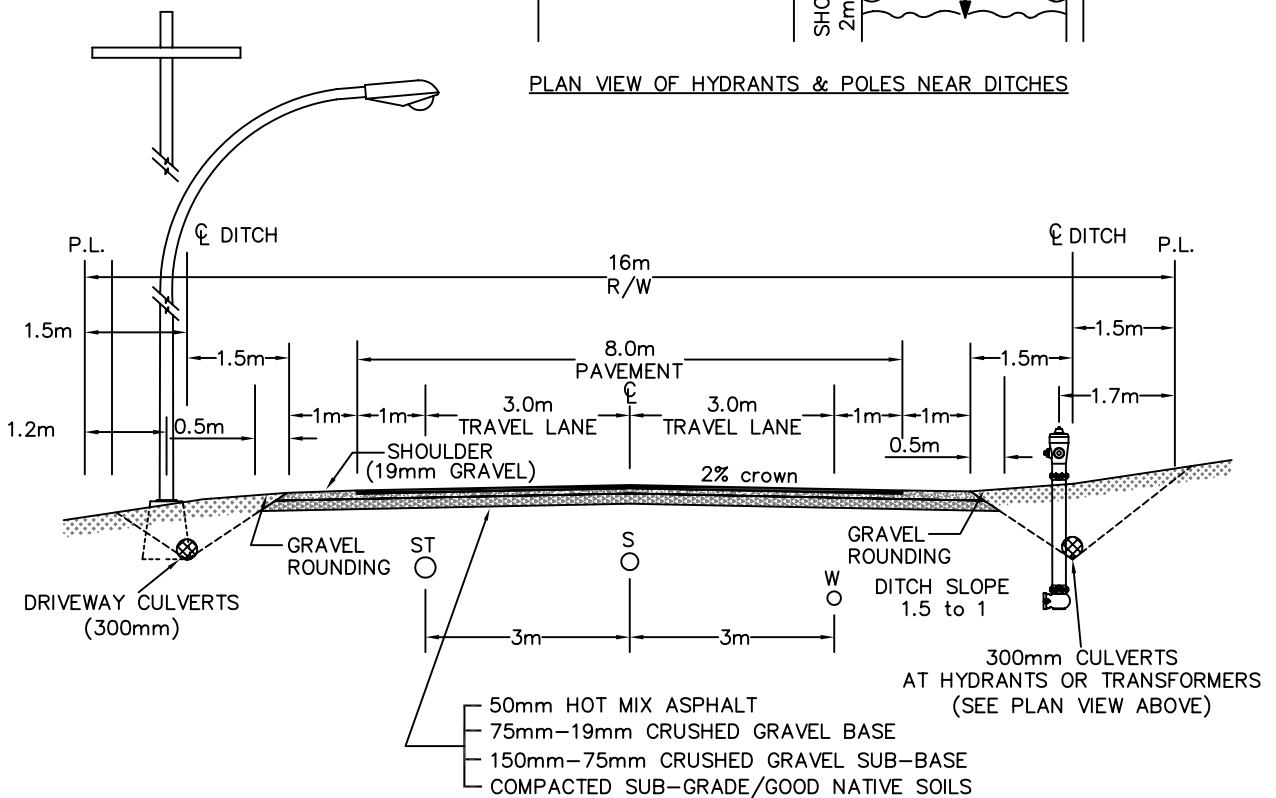
URBAN COLLECTOR BOULEVARD DETAILS

APPROVED
NOVEMBER, 2004

DRAWING NUMBER:
S-R9

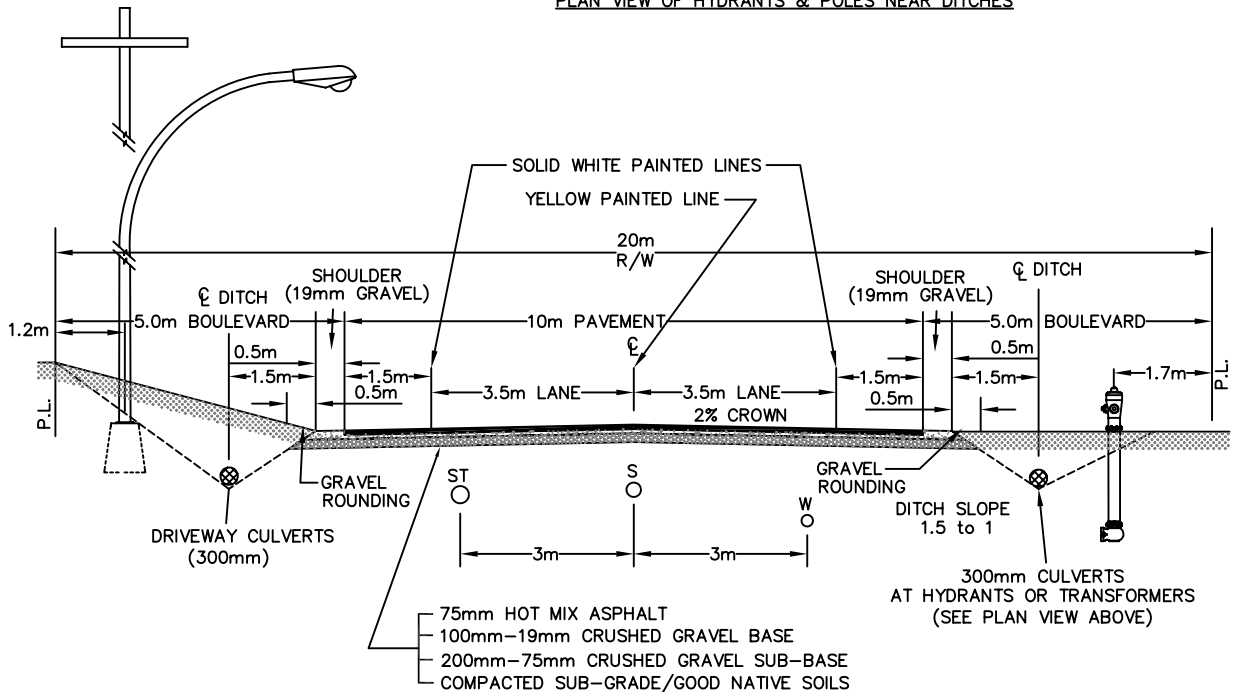
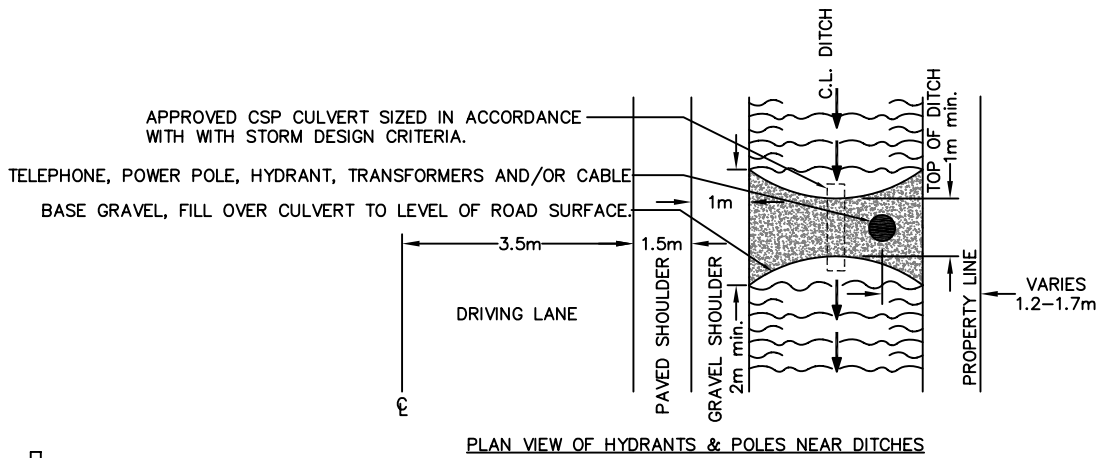


PLAN VIEW OF HYDRANTS & POLES NEAR DITCHES



NOTES:

- 1) THE MAXIMUM DRIVEWAY GRADE SHALL BE 20%. THE MAXIMUM BOULEVARD SLOPE SHALL BE NO GREATER THAN 50% OF DRIVEWAY GRADE (10%).
- 2) 16ga CORRUGATED METAL CULVERTS SHALL BE INSTALLED IN ALL DRIVEWAYS OF COUNTRY RESIDENTIAL TYPE ROADS. THE MINIMUM SIZE SHALL BE 300mm DIA OR LARGER IF REQUIRED BY THE DRAINAGE AREA.
- 3) THE ROAD STRUCTURE IS TO BE DESIGNED BASED ON SITE SPECIFIC SOIL CONDITIONS TRAFFIC LOADINGS.

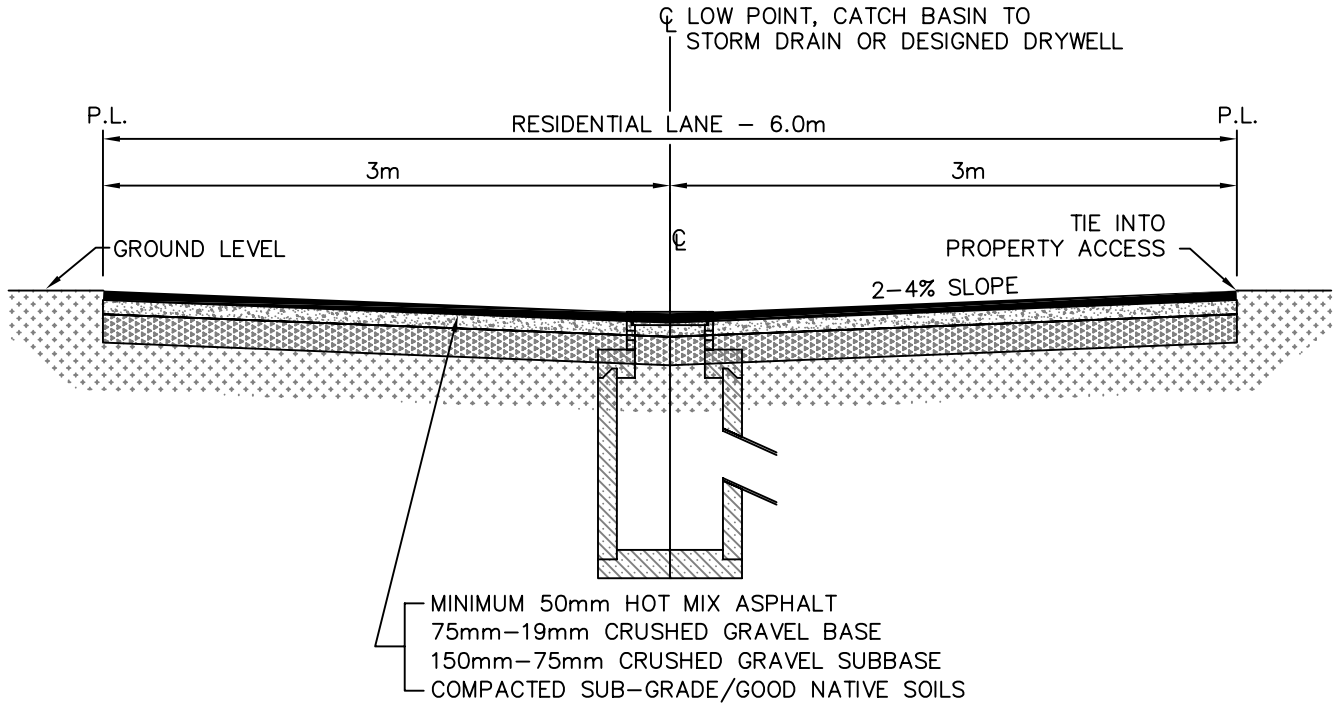


NOTES:

- 1) THE MAXIMUM DRIVEWAY GRADE SHALL BE 20%. THE MAXIMUM BOULEVARD SLOPE SHALL BE NO GREATER THAN 50% OF DRIVEWAY GRADE (10%).
- 2) 16ga CORRUGATED METAL CULVERTS SHALL BE INSTALLED IN ALL DRIVEWAYS OF COUNTRY RESIDENTIAL TYPE ROADS. THE MINIMUM SIZE SHALL BE 300mm DIA OR LARGER IF REQUIRED BY THE DRAINAGE AREA.
- 3) THE ROAD STRUCTURE IS TO BE DESIGNED BASED ON SITE SPECIFIC SOIL CONDITIONS TRAFFIC LOADINGS.



STANDARD DETAIL DRAWINGS



NOTE: THE STRUCTURAL ROAD ELEMENTS SHOWN ARE THE MINIMUM REQUIREMENTS. COMPACTED DESIGN THICKNESS MUST BE INCREASED WHEN POOR SUB-GRADE MATERIAL IS ENCOUNTERED.

LANE STANDARDS

NO. OF PARKING STALLS/BYLAW	R/W WIDTH	PAVED WIDTH	PAVE ADJ. FRONTAGE	PAVE TO NEAR STREET	CATCH BASIN TO DRYWELL
RESIDENTIAL - 2 STALLS	6.0	6.0	NO	NO	NO
DUPLEX 2-4 STALLS	6.0	6.0	YES	NO	NO
MULTIPLE FAMILY COMMERCIAL a. LESS THAN 20 STALLS	6.0	6.0	YES	NO	NO
MULTIPLE FAMILY COMMERCIAL b. EXCEED 20 STALLS	6.0	6.0	YES	YES	YES

LANES-RESIDENTIAL

APPROVED

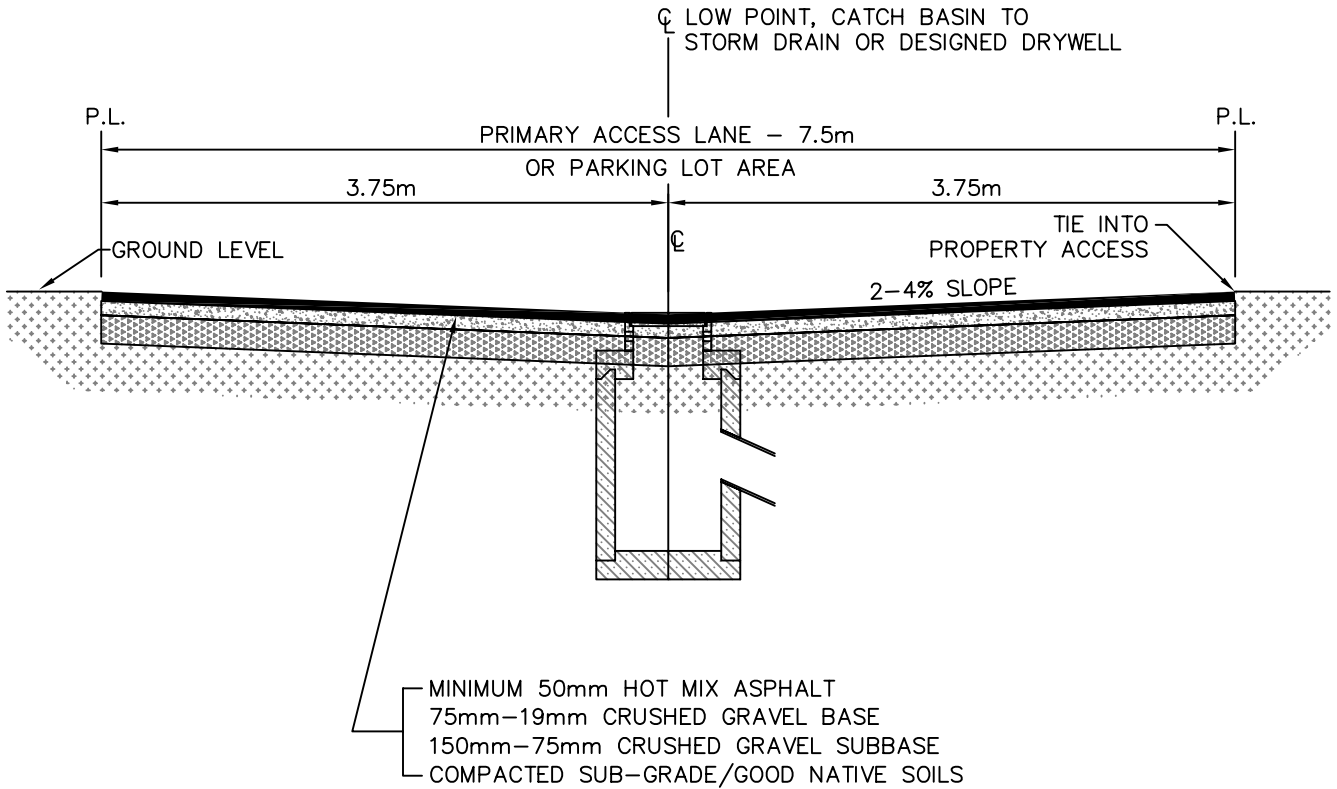
NOVEMBER, 2004

DRAWING NUMBER:

S-R12



STANDARD DETAIL DRAWINGS



NOTE: THE STRUCTURAL ROAD ELEMENTS SHOWN ARE THE MINIMUM REQUIREMENTS. COMPACTED DESIGN THICKNESS MUST BE INCREASED WHEN POOR SUB-GRADE MATERIAL IS ENCOUNTERED.

LANE STANDARDS

NO. OF PARKING STALLS/BYLAW	R/W WIDTH	PAVED WIDTH	PAVE ADJ. FRONTAGE	PAVE TO NEAR STREET	CATCH BASIN TO DRYWELL
RESIDENTIAL - 2 STALLS	7.5	7.5	NO	NO	NO
DUPLEX 2-4 STALLS	7.5	7.5	YES	NO	NO
MULTIPLE FAMILY COMMERCIAL a. LESS THAN 20 STALLS	7.5	7.5	YES	NO	NO
MULTIPLE FAMILY COMMERCIAL b. EXCEED 20 STALLS	7.5	7.5	YES	YES	YES

2004

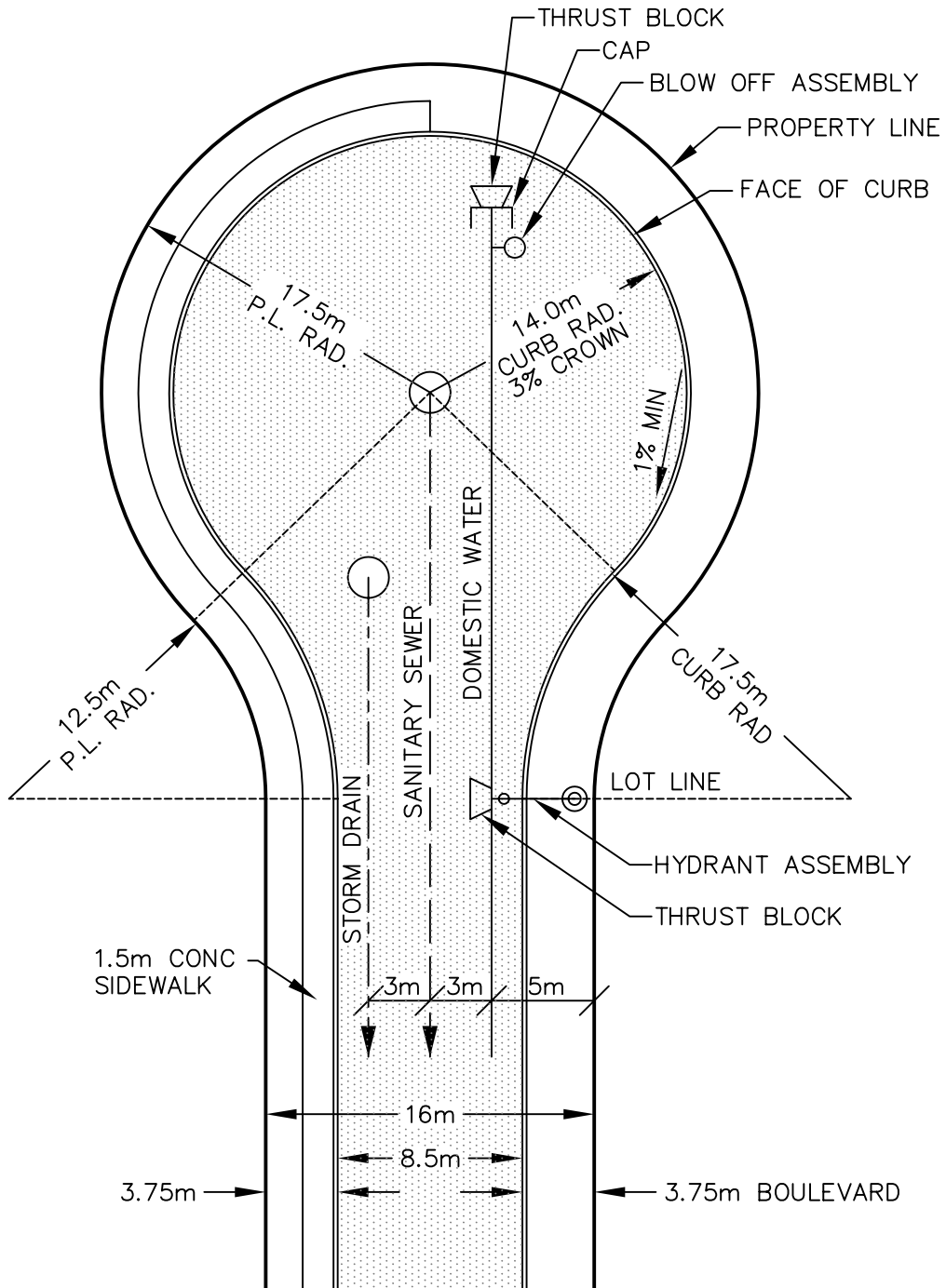
**LANES-COMMERCIAL / MULTI-FAMILY
 PRIMARY ACCESS LANE OR PARKING LOT**

APPROVED
 NOVEMBER, 2004

DRAWING NUMBER:
S-R12a



STANDARD DETAIL DRAWINGS



NOTE: FOR ROAD WIDTHS, UTILITY OFFSETS & GRAVEL DEPTHS SEE DWG. S-R2
DIMENSIONS OR CONDITIONS MAY VARY WITHIN EXISTING RIGHT OF WAY

2004

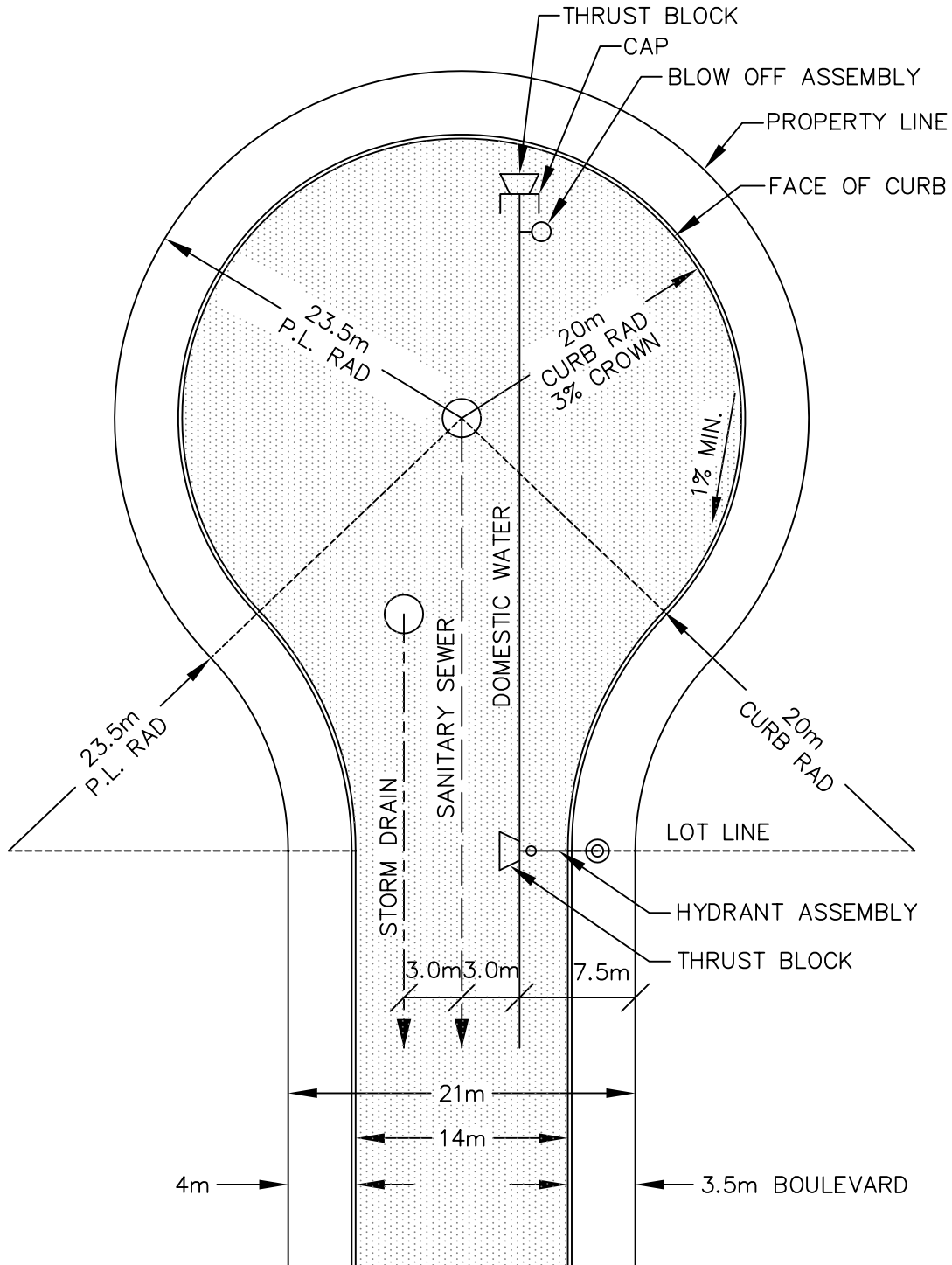
URBAN LOCAL RESIDENTIAL CUL-DE-SAC

APPROVED
NOVEMBER, 2004

DRAWING NUMBER:
S-R13



STANDARD DETAIL DRAWINGS



NOTE: FOR ROAD WIDTHS, UTILITY OFFSETS & GRAVEL DEPTHS SEE DWG S-R5
DIMENSIONS OR CONDITIONS MAY VARY WITHIN EXISTING RIGHT OF WAY

2004

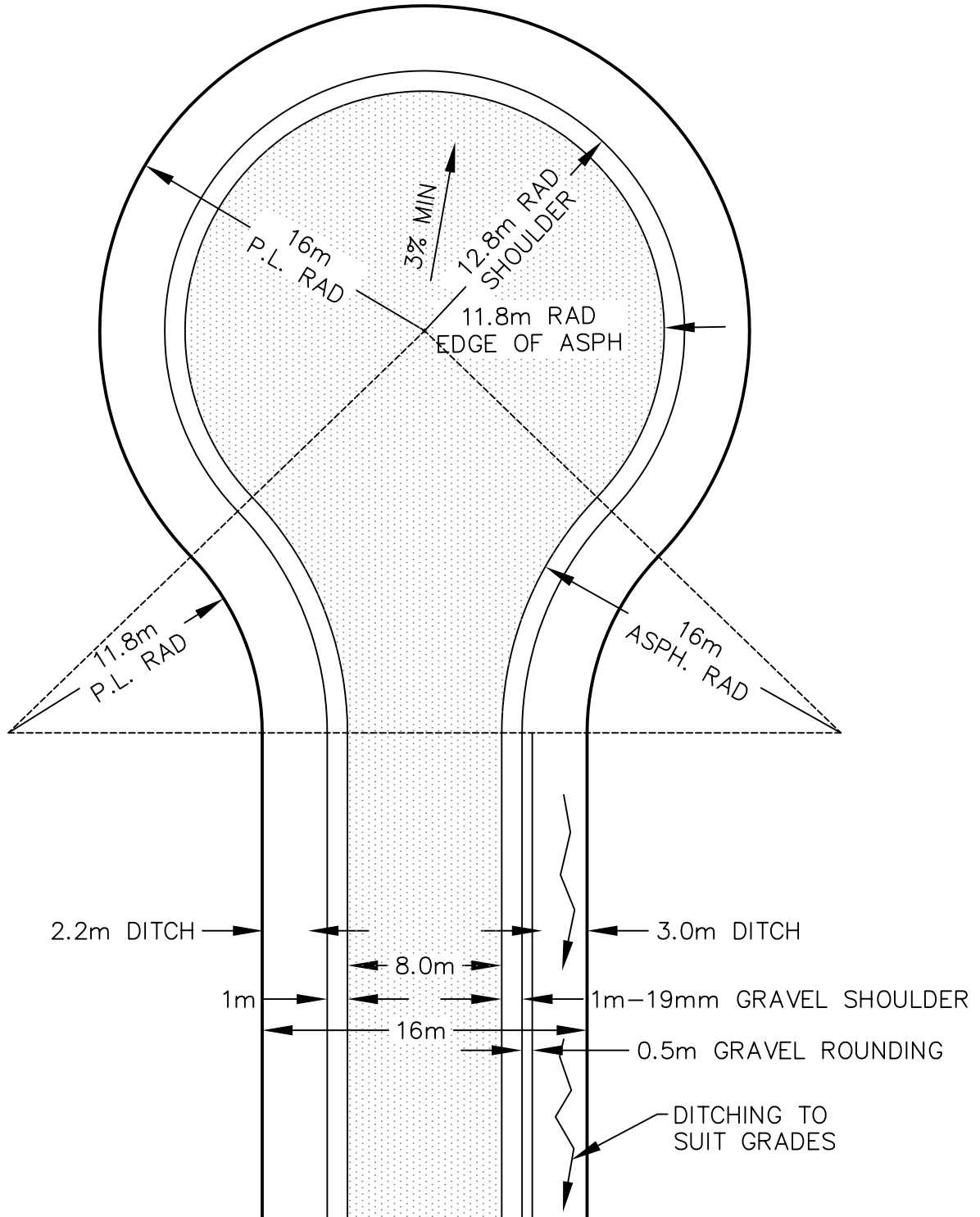
**URBAN COLLECTOR INDUSTRIAL
CUL-DE-SAC**

APPROVED
NOVEMBER, 2004

DRAWING NUMBER:
S-R14



STANDARD DETAIL DRAWINGS



NOTE: FOR ROAD WIDTHS, UTILITY OFFSETS & GRAVEL DEPTHS SEE DWG S-R10 DIMENSIONS OR CONDITIONS MAY VARY WITHIN EXISTING RIGHT OF WAY

2004

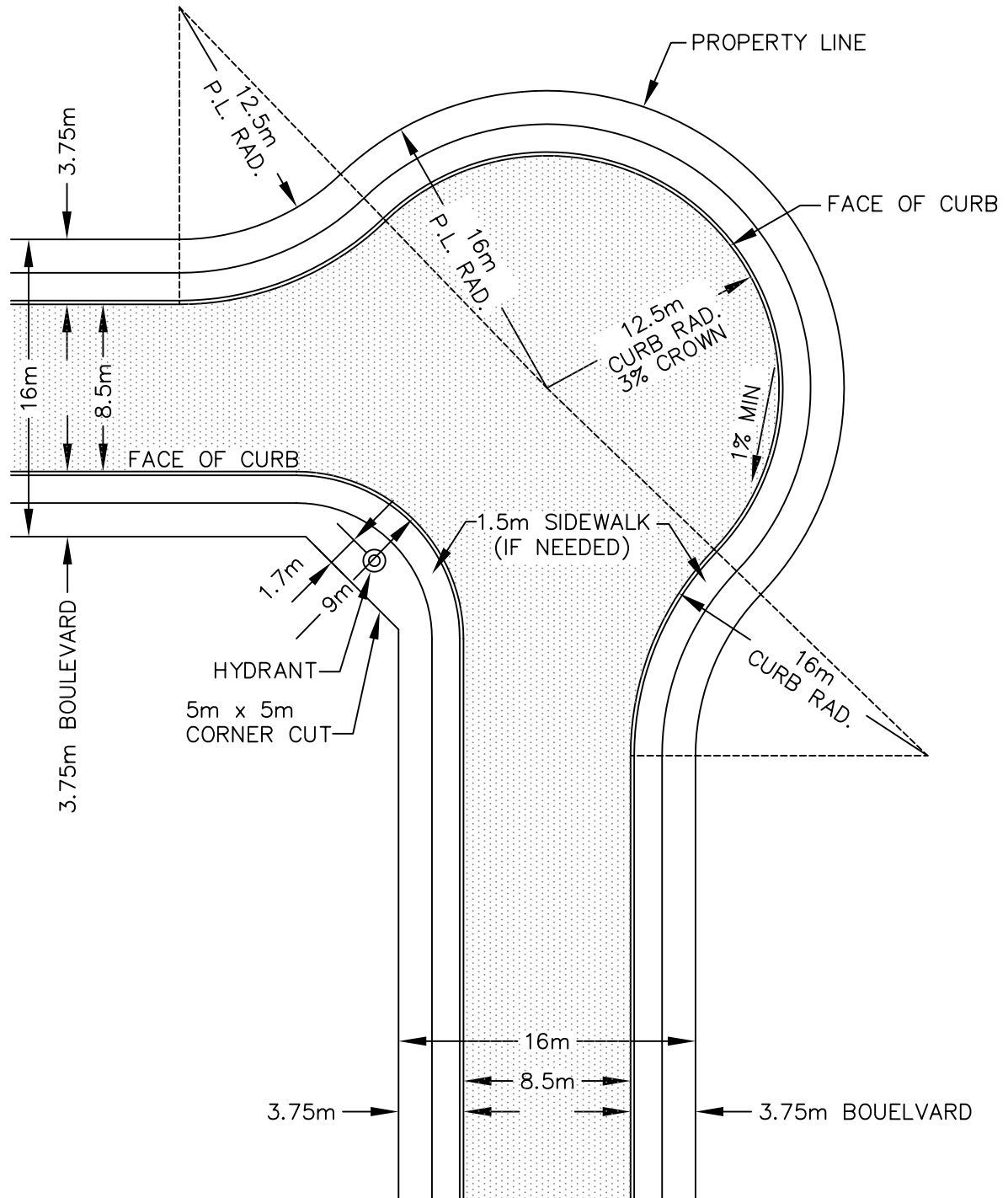
RURAL LOCAL CUL-DE-SAC

APPROVED
NOVEMBER, 2004

DRAWING NUMBER:
S-R15



STANDARD DETAIL DRAWINGS



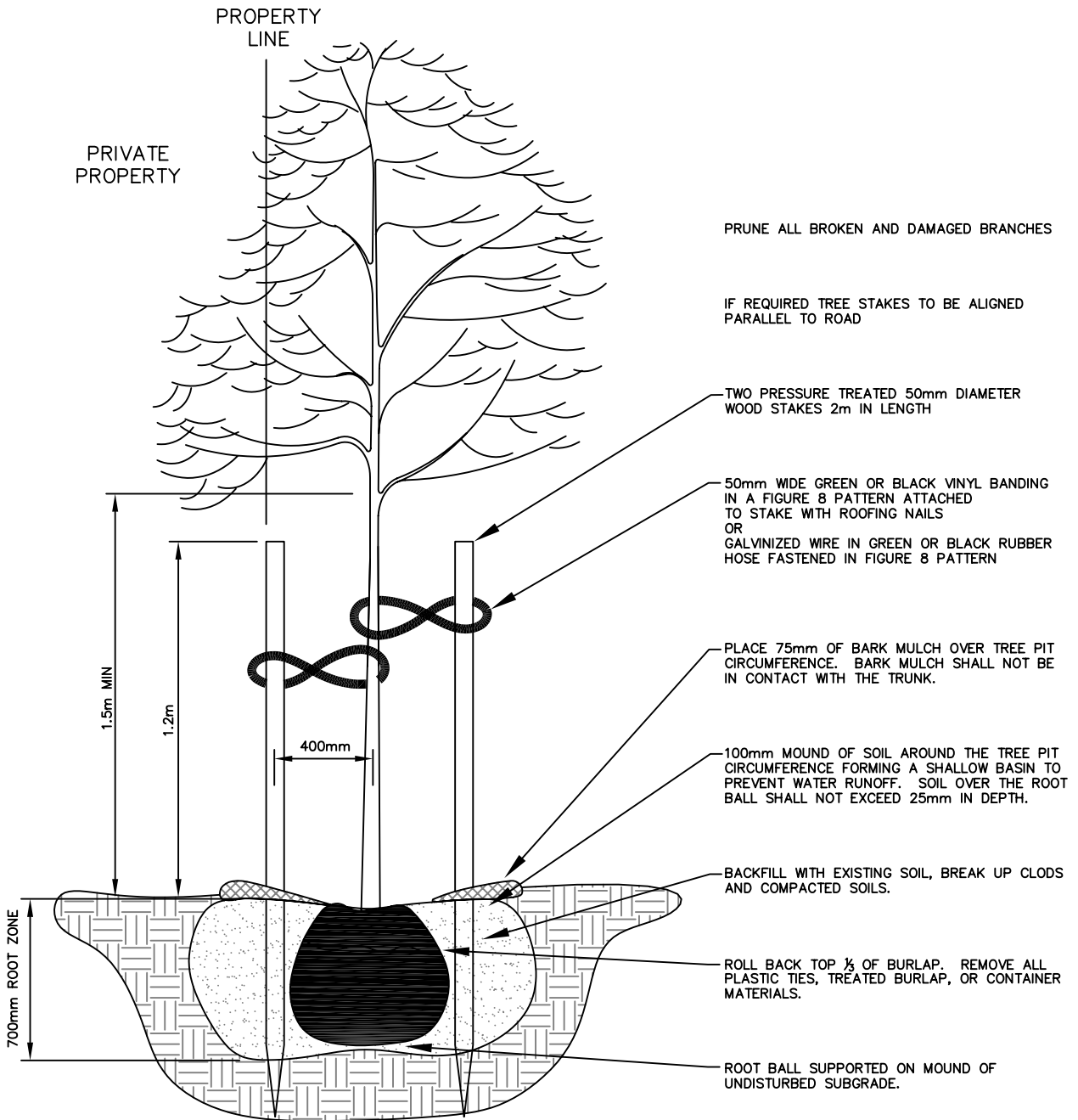
NOTE: FOR ROAD WIDTHS, UTILITY OFFSETS & GRAVEL DEPTHS SEE DWG S-R2
DIMENSIONS OR CONDITIONS MAY VARY WITHIN EXISTING RIGHT OF WAY

2004

URBAN LOCAL RESIDENTIAL EXPANDED CORNER

APPROVED
NOVEMBER, 2004

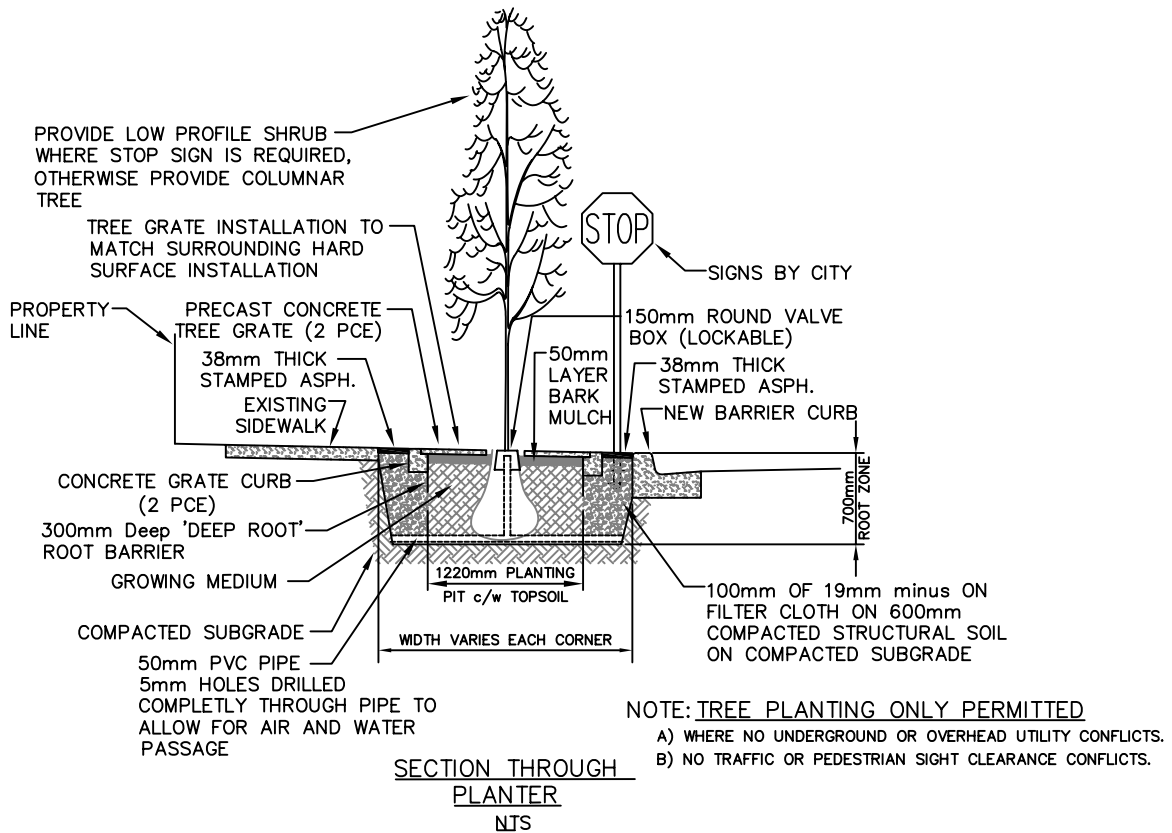
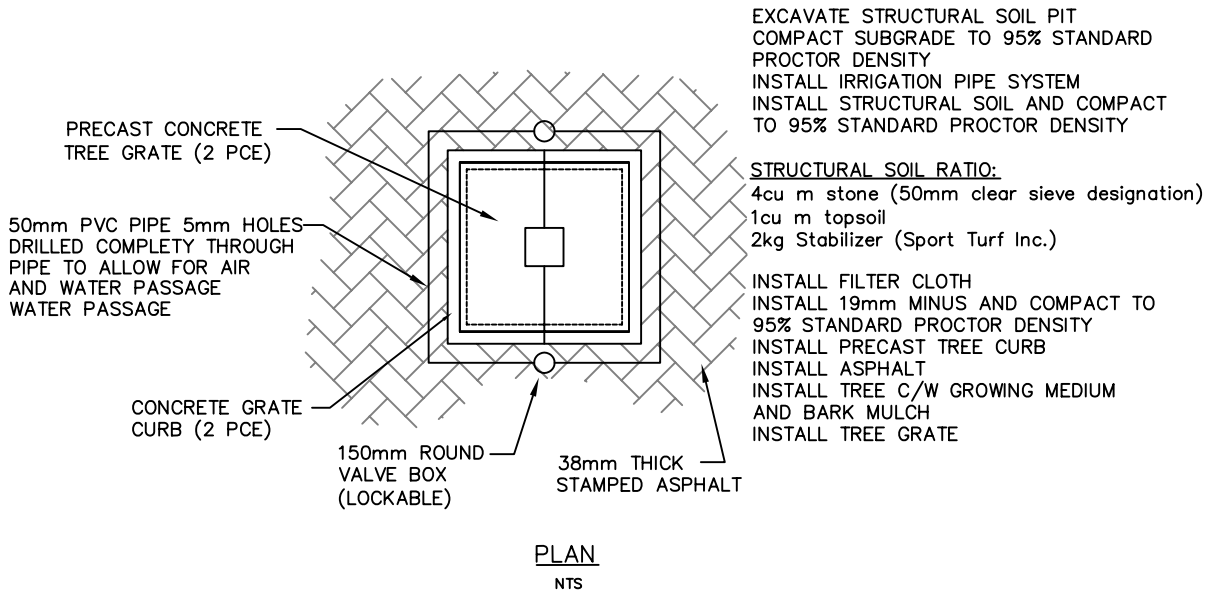
DRAWING NUMBER:
S-R16



ALL PLANTING PITS SHOULD BE DUG BY HAND AS UNDERGROUND SERVICES MAY EXIST NEAR STREET LOCATIONS



STANDARD DETAIL DRAWINGS



2004

TREE PLANTING DETAIL – HARDSCAPE

APPROVED
NOVEMBER, 2004

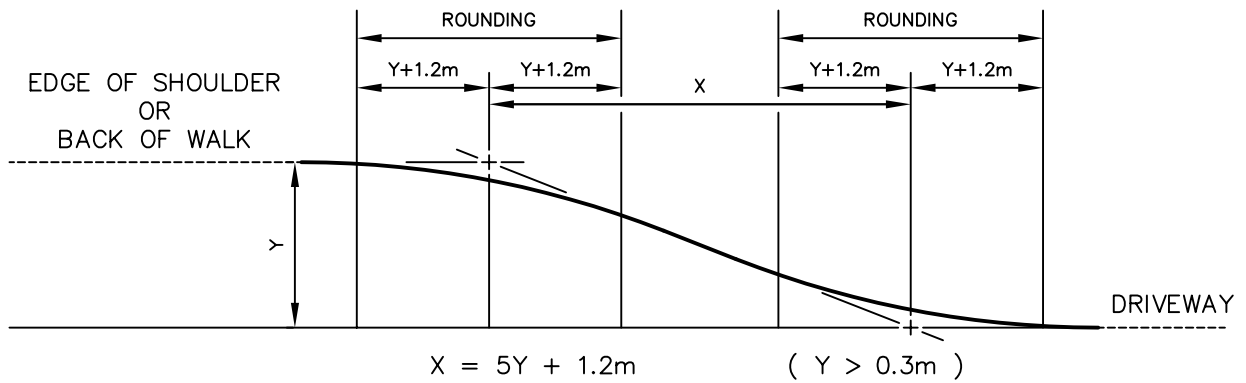
DRAWING NUMBER:
S-R18b



STANDARD DETAIL DRAWINGS

DRIVEWAY PROFILE

WHERE DRIVEWAYS INVOLVE AN ELEVATION DIFFERENCE IN EXCESS OF 0.3m, THE FOLLOWING PROFILE CAN BE USED TO DEFINE THE MAXIMUM GRADE AND VERTICAL CURVATURE. (NOTE THAT GRADES SHALL NOT EXCEED 20% IN ANY CASE.)

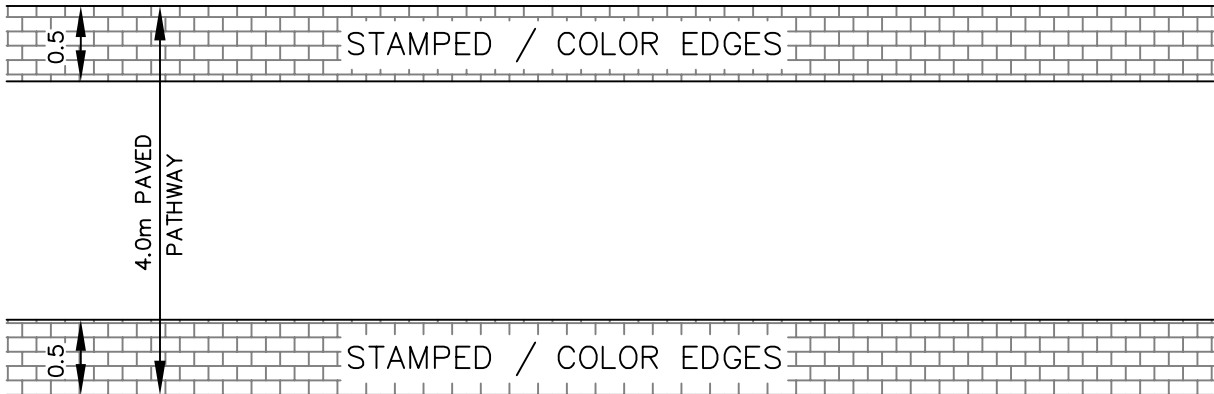


NOTE:

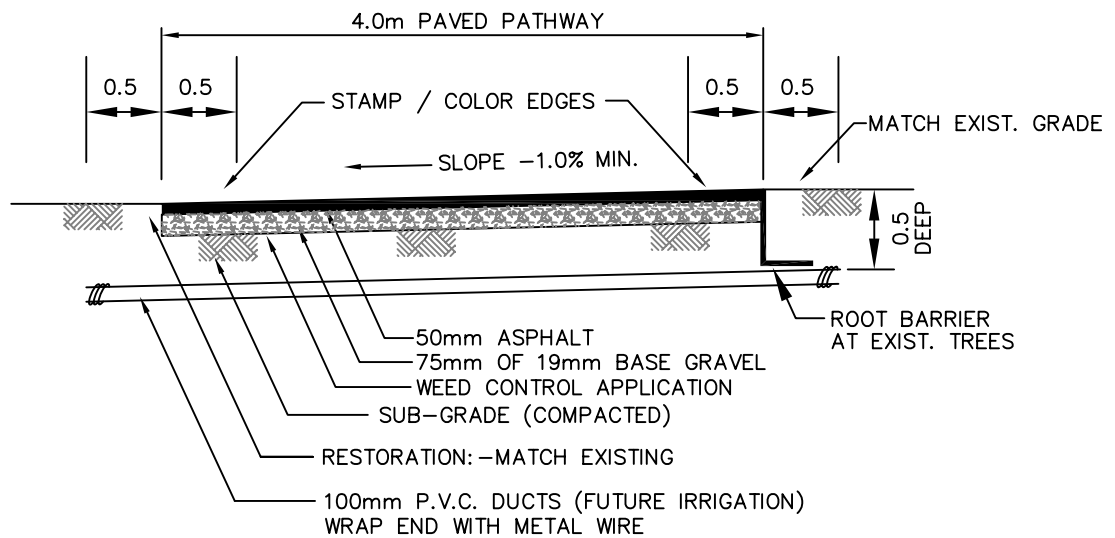
PROFILE MAY BE USED FOR BOTH POSITIVE OR NEGATIVE GRADES BY REVERSING DRIVEWAY ROAD LOCATION.



STANDARD DETAIL DRAWINGS



PLAN



TYPICAL SECTION MULTI-USE PATHWAY

WALK - CYCLE - ROLLERBLADE

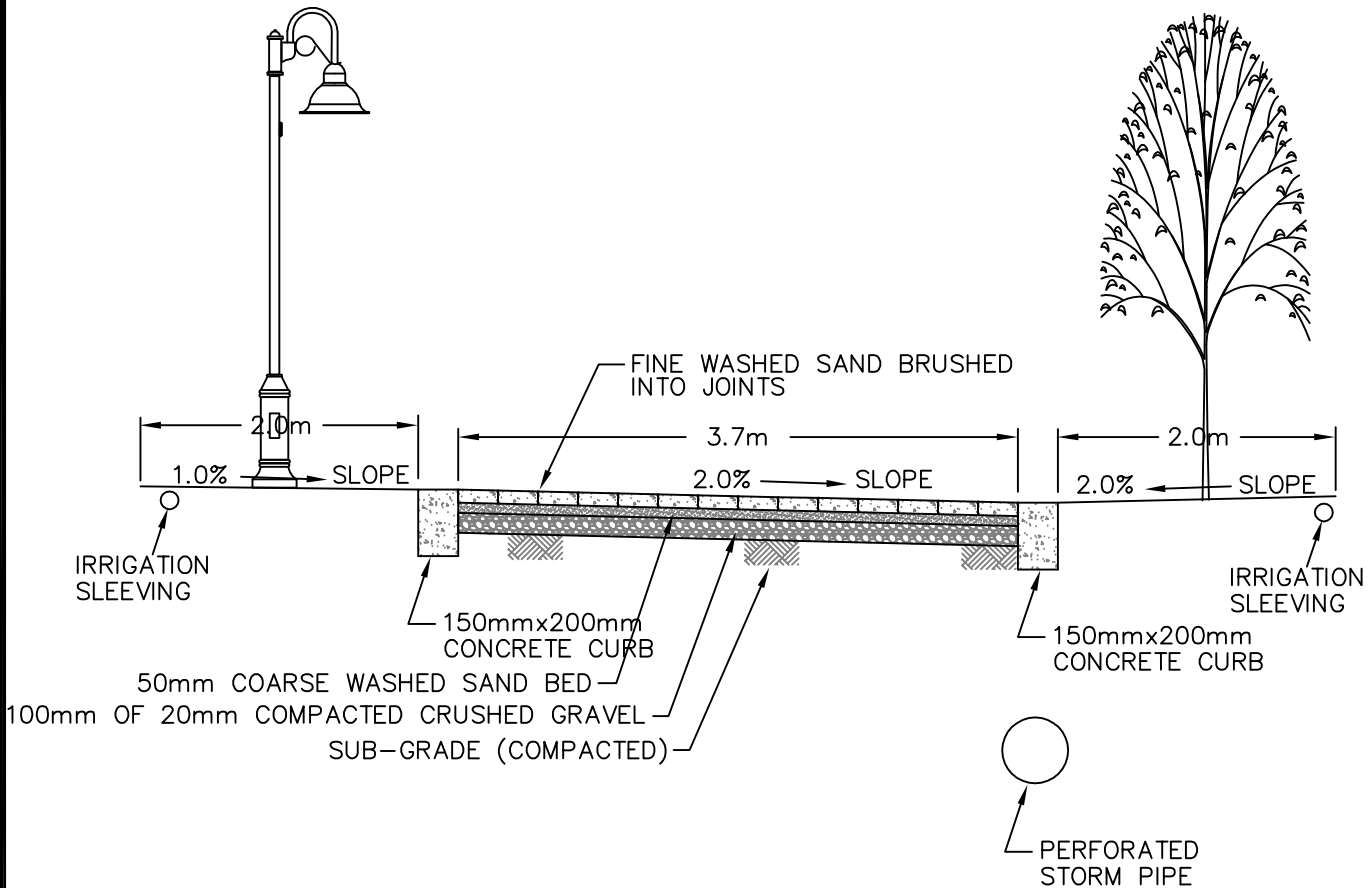
1.0m 1.5m 1.5m

2004

MULTI-USE PAVED PATHWAY

APPROVED
NOVEMBER, 2004

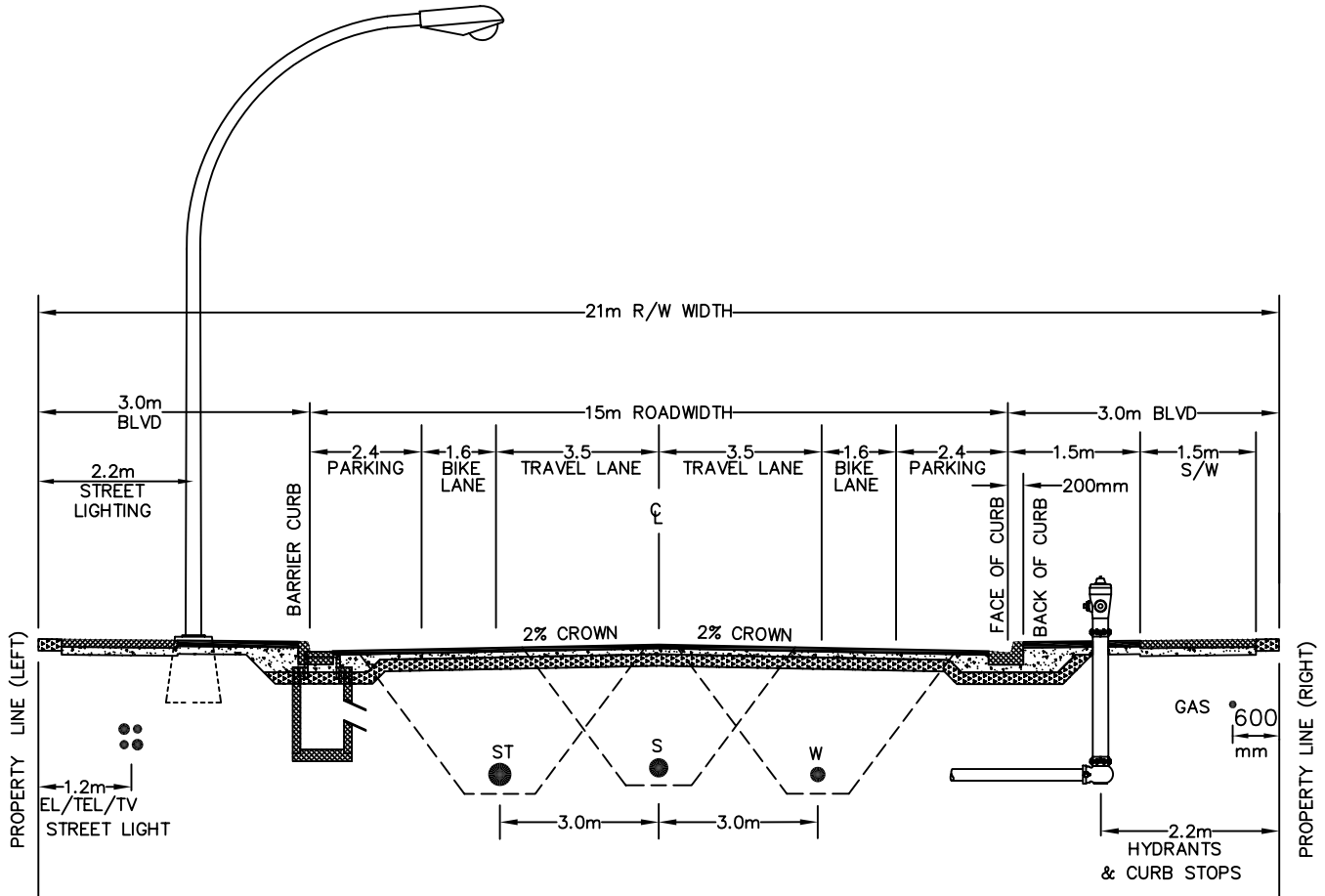
DRAWING NUMBER:
S-R21



NOTE: LANDSCAPE DESIGN SHALL BE COMPLETED BY LANDSCAPE ARCHITECT OR CONTRACTOR WITH EXPERIENCE IN DESIGN AND INSTALLING NATIVE SPECIES. USE OF DROUGHT TOLERANT MATERIAL WILL BE ENCOURAGED. STREET FURNITURE SUCH AS BENCHES AND WASTE RECEPTACLES SHALL BE INSTALLED AT THE DISCRETION OF THE CITY ENGINEER.



STANDARD DETAIL DRAWINGS

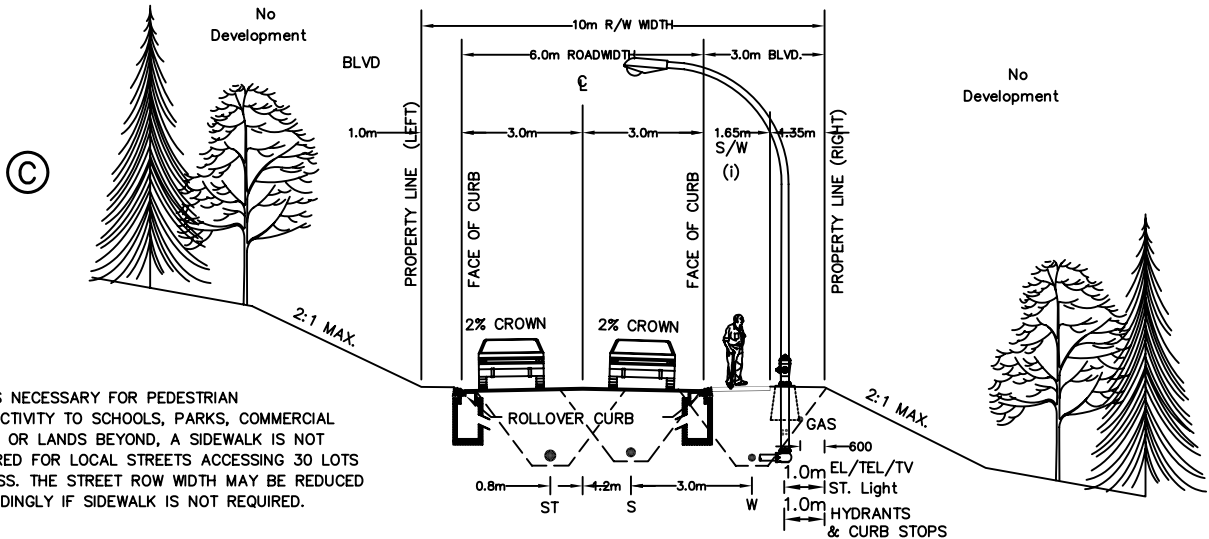
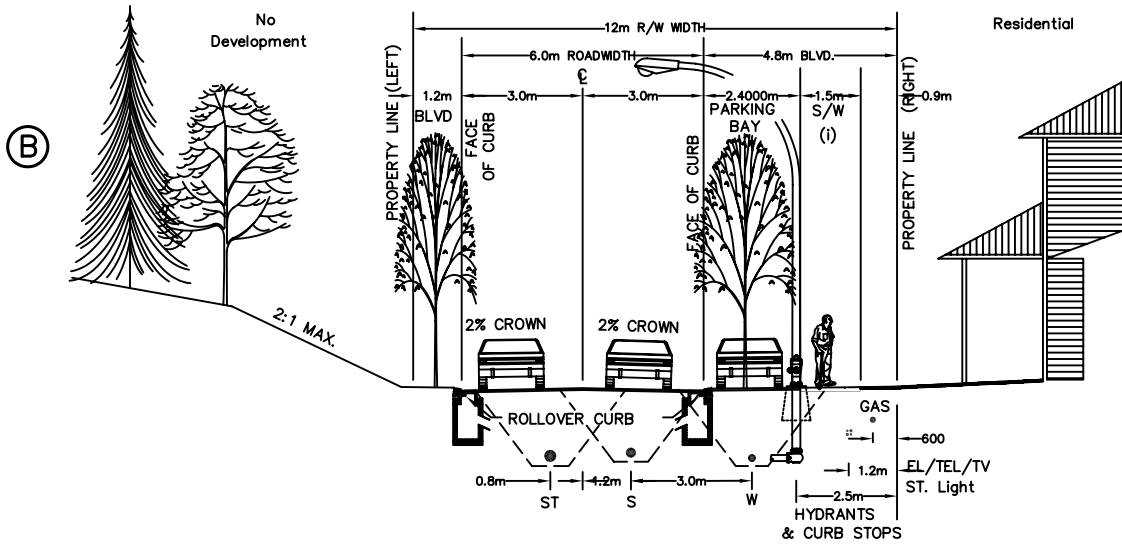
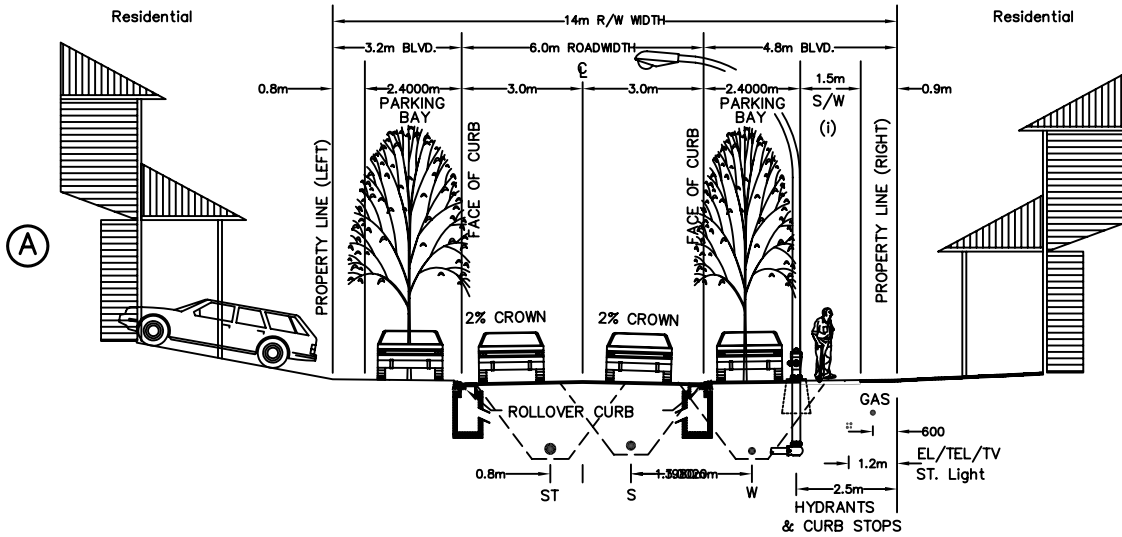


2004

BIKE LANES

APPROVED
NOVEMBER, 2004

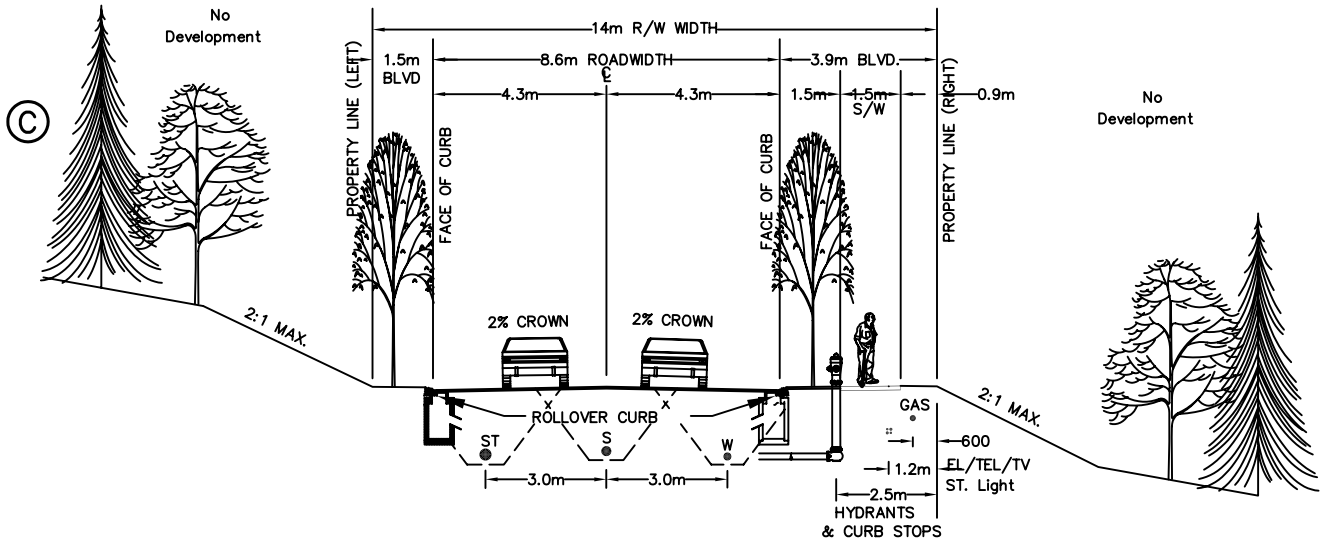
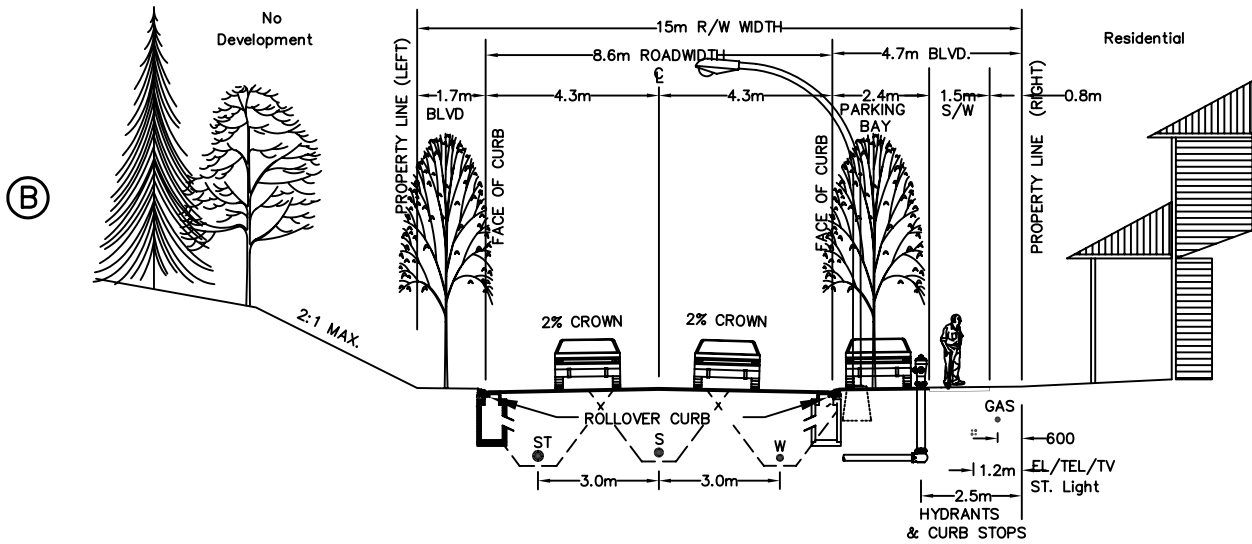
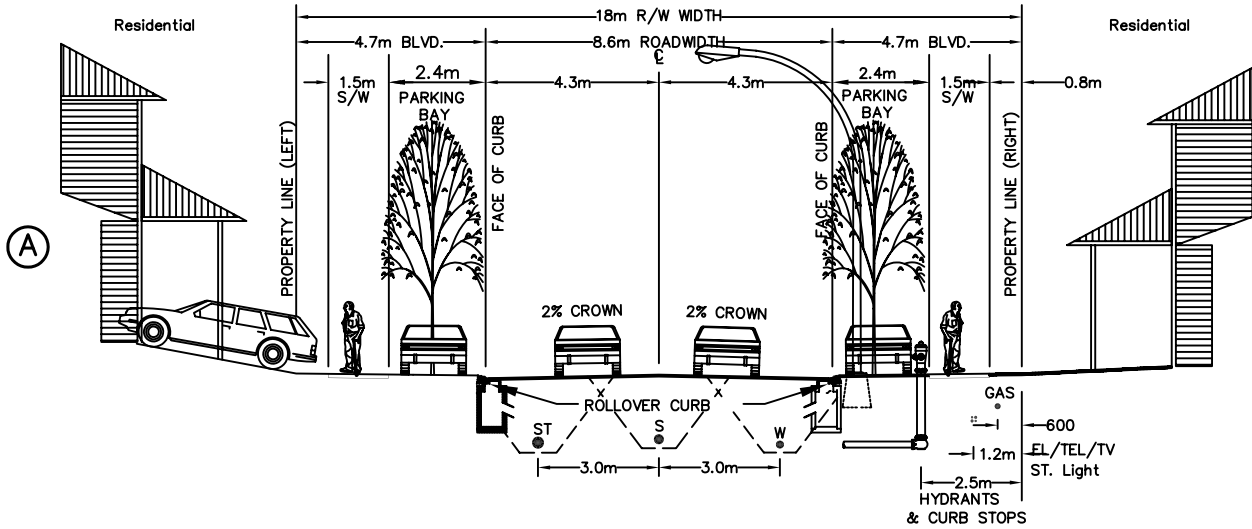
DRAWING NUMBER:
S-R22



(i)—UNLESS NECESSARY FOR PEDESTRIAN CONNECTIVITY TO SCHOOLS, PARKS, COMMERCIAL AREAS OR LANDS BEYOND, A SIDEWALK IS NOT REQUIRED FOR LOCAL STREETS ACCESSING 30 LOTS OR LESS. THE STREET ROW WIDTH MAY BE REDUCED ACCORDINGLY IF SIDEWALK IS NOT REQUIRED.



STANDARD DETAIL DRAWINGS



2004

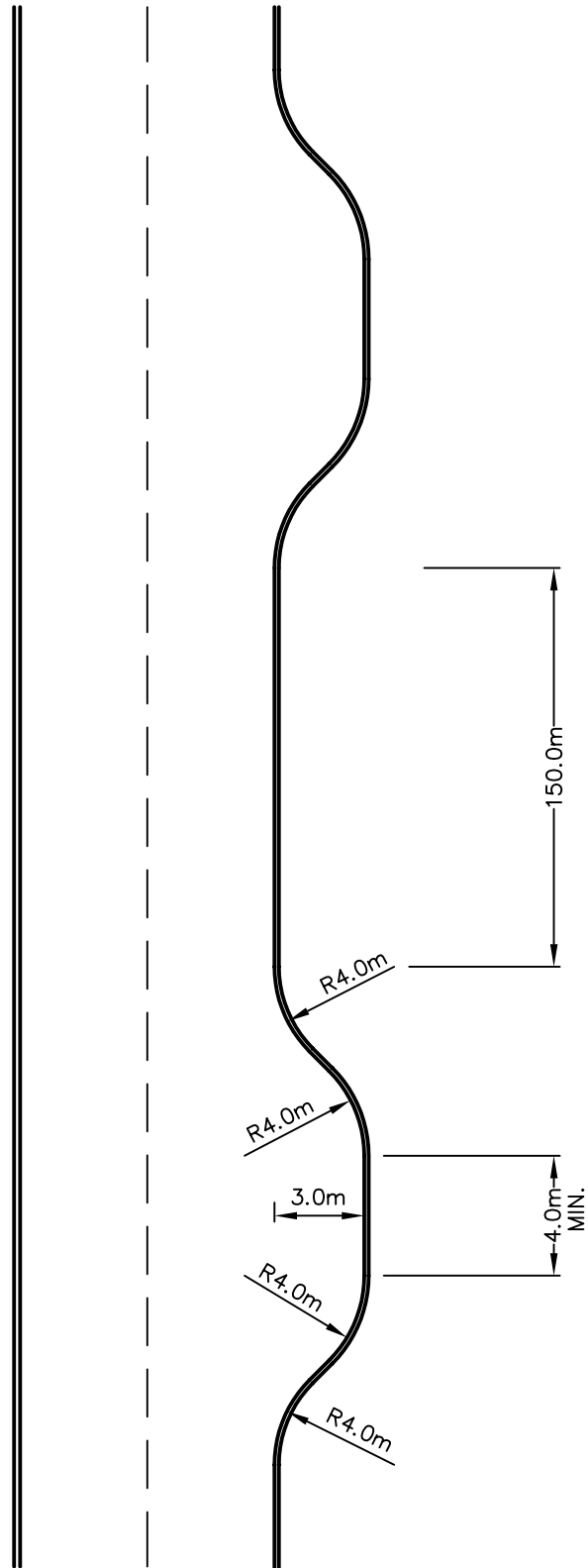
HILLSIDES – COLLECTOR

APPROVED
NOVEMBER, 2004

DRAWING NUMBER:
S-HS2



STANDARD DETAIL DRAWINGS



2004



















PLAN VIEW OF PARKING PULLOUT
AREAS FOR HILLSIDES

APPROVED
NOVEMBER, 2004

DRAWING NUMBER:
S-HS3



STANDARD DETAIL DRAWINGS

	ELECTRICAL DISTRIBUTION POLE
	ELECTRICAL DISTRIBUTION DIP POLE
	ELECTRICAL DISTRIBUTION POLE ANCHOR
	PRIMARY OVERHEAD WIRE
	PRIMARY UNDERGROUND CABLE IN DUCT
	SECONDARY OVERHEAD WIRE
	SECONDARY UNDERGROUND WIRE IN DUCT
	FIBEROPTIC UNDERGROUND CABLE IN DUCT
	3 ϕ PRIMARY ELECTRICAL VAULT
	1 ϕ PRIMARY ELECTRICAL VAULT
	1 ϕ PADMOUNT TRANSFORMER
	3 ϕ PADMOUNT TRANSFORMER
	1 ϕ POLE-MOUNTED TRANSFORMER
	3 ϕ POLE-MOUNTED TRANSFORMERS
	SECONDARY SERVICE BOX
	SECONDARY SERVICE BOX WITH DISTRIBUTION
	STREETLIGHT STANDARD
	STREETLIGHT STANDARD WITH DISTRIBUTION

2004

ELECTRICAL DISTRIBUTION SYSTEM
DRAWING LEGEND

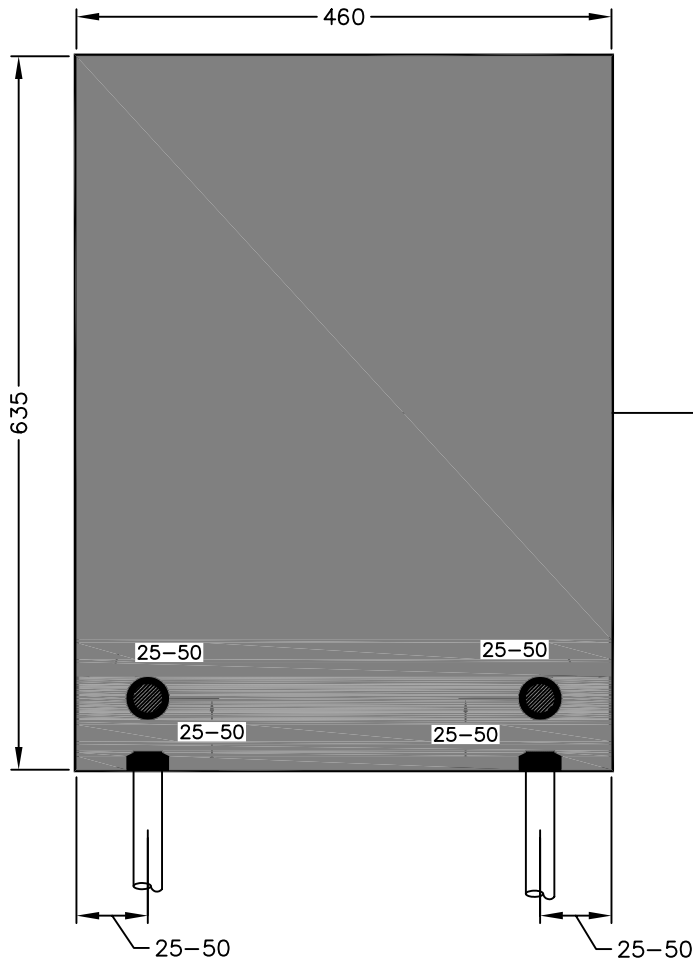
APPROVED
NOVEMBER, 2004

DRAWING NUMBER: U-M-1



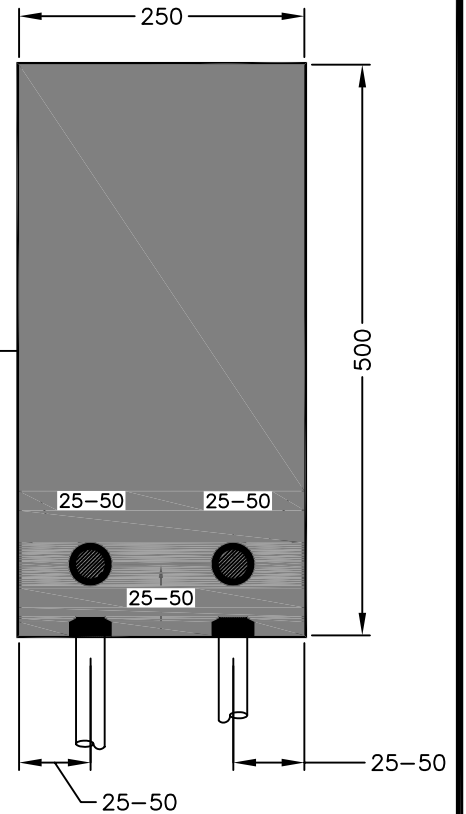
STANDARD DETAIL DRAWINGS

POLYPHASE METER CABINET (230mm DEPTH)



CONDUIT TO POLYPHASE METER CABINET FROM SWITCHGEAR/C.T.'s TO BE 32mm (1 1/4") EMT

SINGLE PHASE METER CABINET (250mm DEPTH)

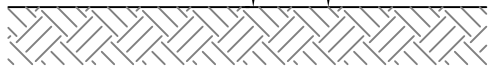


CONDUIT TO SINGLE PHASE METER CABINET FROM SWITCHGEAR/C.T.'s TO BE 25mm (1") EMT

NOTES:

- 1) ALL DIMENSIONS IN MILLIMETERS.
- 2) CONDUIT CAN BE FROM EITHER SIDE OF CABINET AS INDICATED ON ABOVE DWG.'s.
- 3) CONDUIT ENTERING EITHER CABINET FROM THE BOTTOM ARE NOT REQUIRED TO BE OF ANY SPECIFIED DISTANCE FROM THE BACK OF THE CABINET, BUT SHOULD BE AS CLOSE AS POSSIBLE TO THE BACK.
- 4) LOCATION OF METER CABINETS ON OR IN BUILDING'S TO BE APPROVED BY CITY ELECTRICAL DIVISION.
- 5) ONE CONDUCTOR GOES THROUGH CT IN ONE DIRECTION AND THE OTHER GOES THROUGH THE OPPOSITE WAY.

FINISHED GRADE OR FLOOR



2004

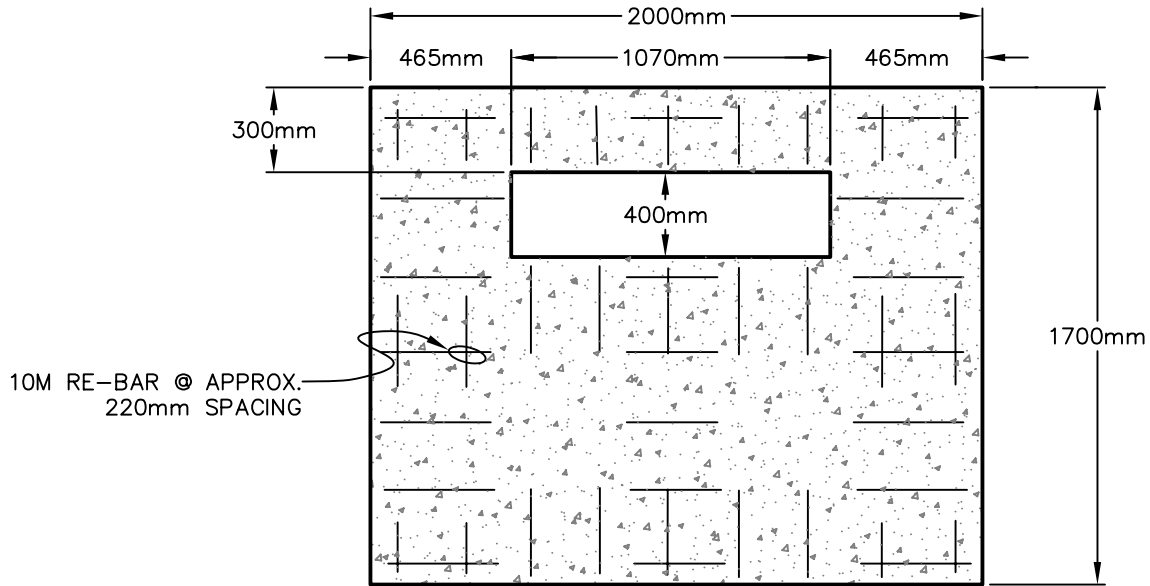
METER CABINET INSTALLATION DETAILS

APPROVED
NOVEMBER, 2004

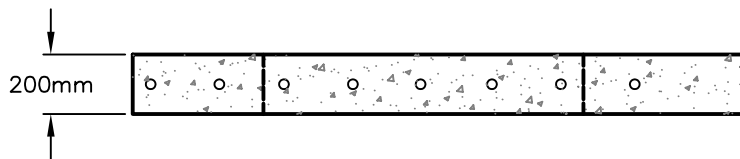
DRAWING NUMBER:
M-C-1



STANDARD DETAIL DRAWINGS



PLAN VIEW



SIDE VIEW

GENERAL NOTES

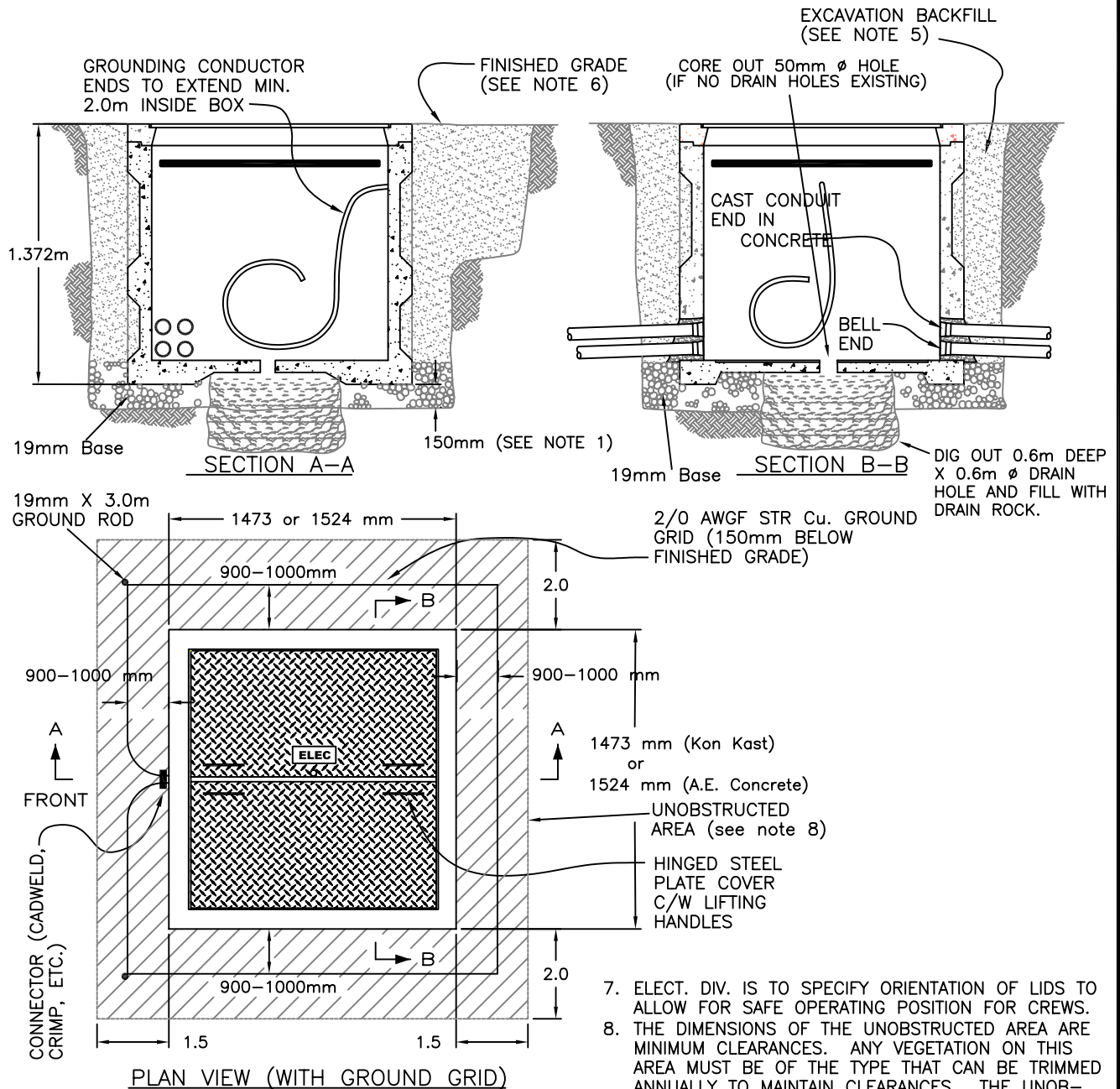
1. Cement to CAN CSA-A5 type 10 normal cement.
2. Concrete strength 35 MPA @ 28 days
3. Reinforcing steel to CSA G-30.16 Gr 400 Weldable
4. Site installation & backfilling of products are responsibility of others

2004

METERING KIOSK PAD

APPROVED
NOVEMBER, 2004

DRAWING NUMBER:
M-K-1A



NOTES:

1. ESTABLISH LEVEL BASE WITH 19mm MINUS AND ADJUST TOP OF LID TO MATCH FINISHED GRADE.
2. BREAK OUT KNOCK OUTS AS REQUIRED AND INSTALL THE CONDUIT AS SHOWN.
3. INSTALL GROUNDING CONNECTOR AND GROUND RODS AS SHOWN.
4. INSTALL DRAIN HOLE IN BASE OF VAULT OVER HOLE DUG OUT AND FILLED WITH DRAIN ROCK (as shown).
5. BACK FILL THE EXCAVATION AND COMPACT THE BACKFILL MATERIAL AS REQUIRED IN SPECIFICATIONS.
6. RESTORE THE SURFACE AT FINISHED GRADE AS REQUIRED IN SPECIFICATIONS.

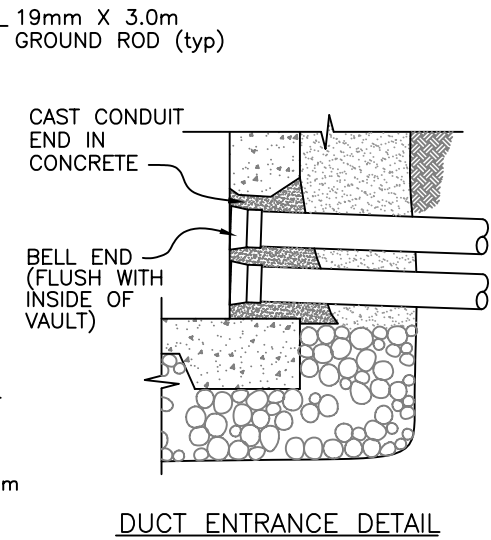
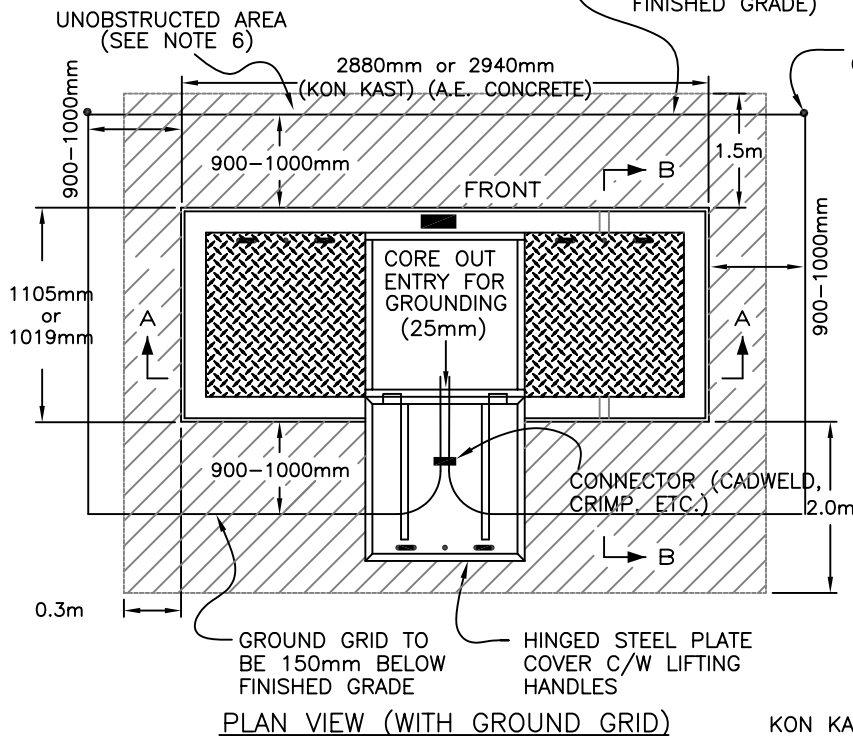
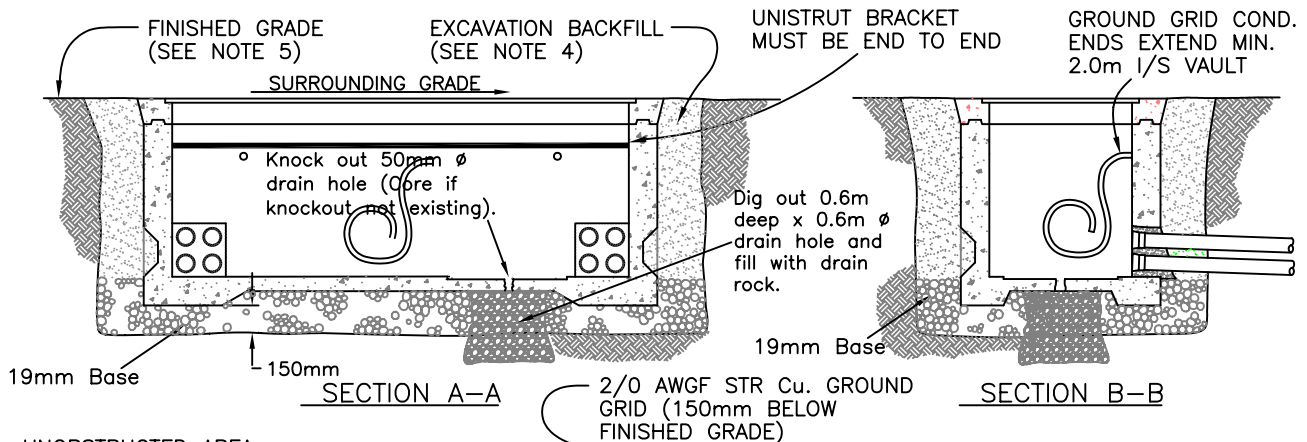
7. ELECT. DIV. IS TO SPECIFY ORIENTATION OF LIDS TO ALLOW FOR SAFE OPERATING POSITION FOR CREWS.
8. THE DIMENSIONS OF THE UNOBSTRUCTED AREA ARE MINIMUM CLEARANCES. ANY VEGETATION ON THIS AREA MUST BE OF THE TYPE THAT CAN BE TRIMMED ANNUALLY TO MAINTAIN CLEARANCES. THE UNOBSTRUCTED AREA ALLOWS ACCESS FOR OPERATING PERSONNEL.

ACCEPTABLE PRODUCTS

KON KAST PRODUCTS LTD., KELOWNA
 58"X58" VAULT DWG'S #1021PEN & #1022PEN
 A.E. CONCRETE PRECAST PRODUCTS LTD., SURREY
 60"X60" VAULT & CONC. NECK WITH LID (STEEL)



STANDARD DETAIL DRAWINGS



ACCEPTABLE PRODUCTS

KON KAST PRODUCTS LTD., KELOWNA
 832 JCT. VAULT & COLLAR #1132 PEN & 1133 PEN.
 A.E. CONCRETE PRECAST PRODUCTS LTD., SURREY
 HYDRO 832 JCT. VAULT & COLLAR
 (BCH DRAWING #ES54 D4-01.01)

NOTES:

- ESTABLISH LEVEL BASE WITH 19mm MINUS AND ADJUST TOP OF LID TO MATCH FINISHED GRADE.
- BREAK OUT KNOCK OUTS AS REQUIRED AND INSTALL THE CONDUITS AS SHOWN.
- INSTALL GROUNDING CONNECTOR AND GROUND RODS AS SHOWN.
- BACK FILL THE EXCAVATION AND COMPACT THE BACKFILL MATERIAL AS REQUIRED IN SPECIFICATIONS.
- RESTORE THE SURFACE AT FINISHED GRADE AS REQUIRED IN SPECIFICATIONS.
- THE DIMENSIONS OF THE UNOBSTRUCTED AREA ARE MINIMUM CLEARANCES. ANY VEGETATION ON THIS AREA MUST BE OF THE TYPE THAT CAN BE TRIMMED ANNUALLY TO MAINTAIN CLEARANCES. THE UNOBSTRUCTED AREA ALLOWS ACCESS FOR OPERATING PERSONNEL.
- ELECT. DIV. IS TO SPECIFY ORIENTATION OF LIDS TO ALLOW FOR SAFE OPERATING POSITION FOR CREWS.
- ENSURE THAT VAULT IS LEVEL IN ALL PLANES.
- ENSURE THAT DRAIN IS LOCATED TO ALLOW FOR BEST DRAINAGE.
- IF SURROUNDING GRADE IS SLOPED, THEN COLLAR & LID CAN BE GROUTED UP ON ONE END TO FOLLOW TERRAIN.
- GROUND WIRE ENTRY TO BE SAME SIDE AS LID HINGES.

2004

3 PHASE PRIMARY JUNCTION BOX (TYPE 832) INSTALLATION DETAILS

APPROVED

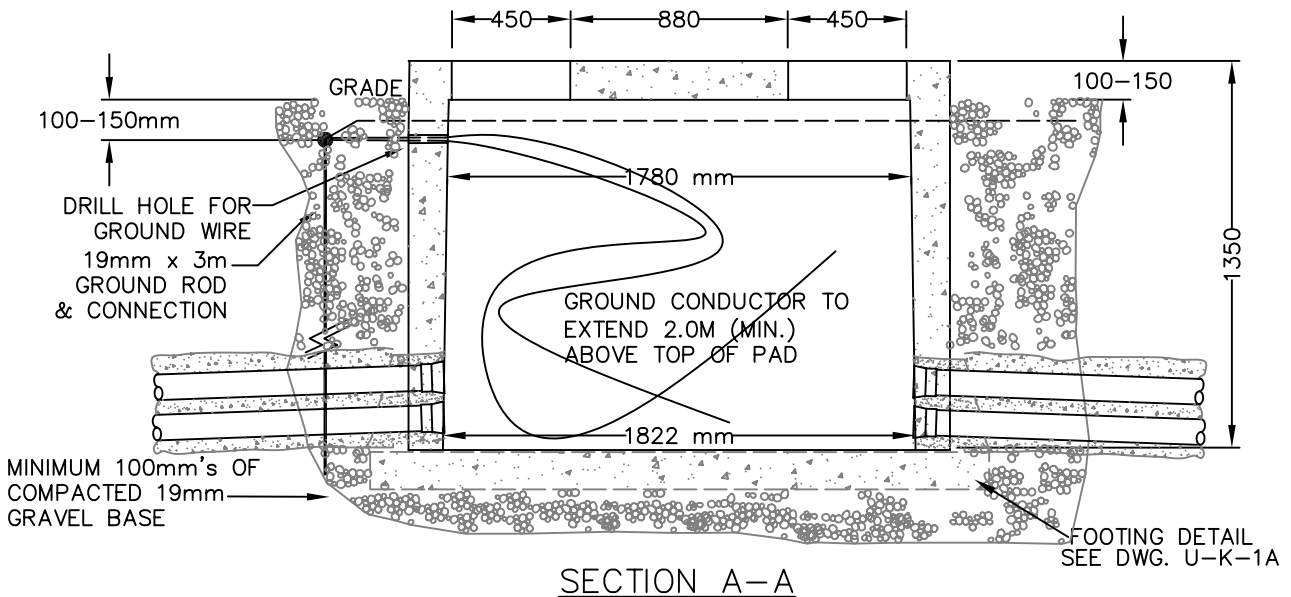
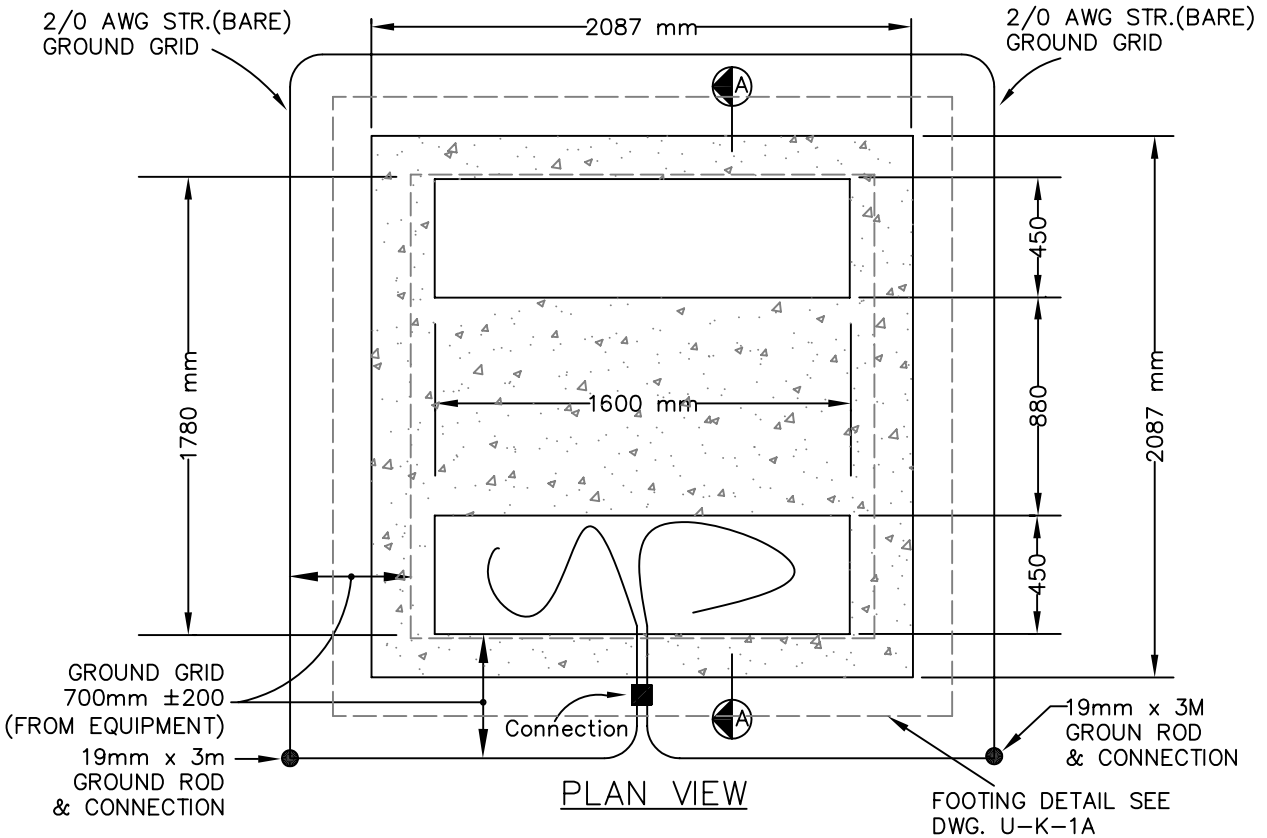
DRAWING NUMBER:

NOVEMBER, 2004

U-J3-1



STANDARD DETAIL DRAWINGS



NOTES:

- 1) PRE-CAST KIOSK AS PER A.E. CONCRETE. (SURREY B.C.)
- 2) FOOTING REQUIRED AS PER DWG. U-K-1A (CITY OF PENTICTON)
- 3) CONDUIT QUANTITY, SIZE AND ORIENTATION TO BE DETERMINED BY THE C.O.P. ELECTRICAL DIVISION.

2004

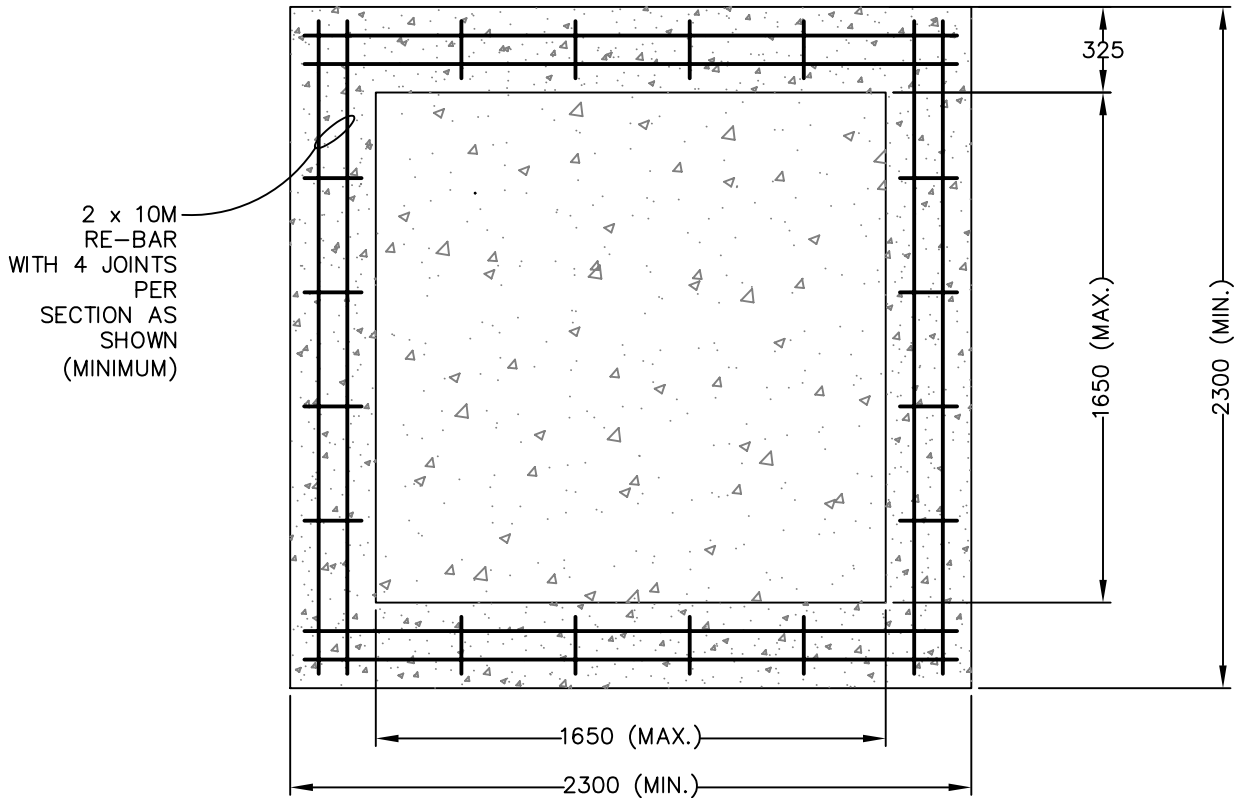
**TYPE 1818 (TOP HALF)
PADMOUNT SWITCHGEAR KIOSK**

APPROVED
NOVEMBER, 2004

DRAWING NUMBER:
U-K-1

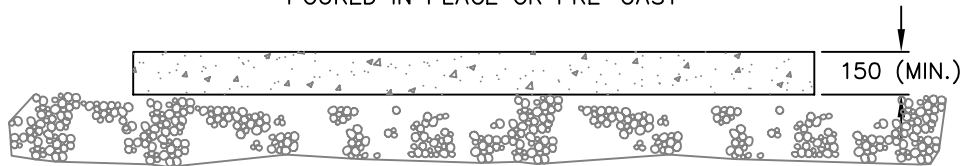


STANDARD DETAIL DRAWINGS



PLAN VIEW

POURED IN PLACE OR PRE-CAST



ELEVATION

NOTES:

- 1) CONDUITS INSTALLED TO BE CONCRETE ENCASED UP TO & INCLUDING BENDS, BACKFILLED WITH 19mm MINUS & COMPACTED PRIOR TO FOOTING INSTALLATION.
- 2) CONDUIT SIZE & QUANTITY TO BE DETERMINED BY CITY ELECTRICAL DIVISION.
- 3) UTILITY R.O.W. MAY BE REQUIRED FOR KIOSK PAD DUE TO BEING LOCATED ON PRIVATE PROPERTY.
- 4) CONCRETE TO BE 30 MPa (MIN.), TROWELLED & LEVEL.

2004

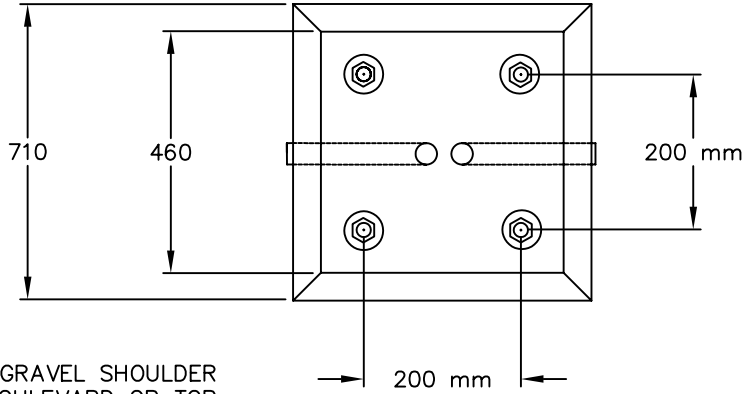
PADMOUNT SWITCHGEAR KIOSK FOOTING SPECIFICATIONS

APPROVED
NOVEMBER, 2004

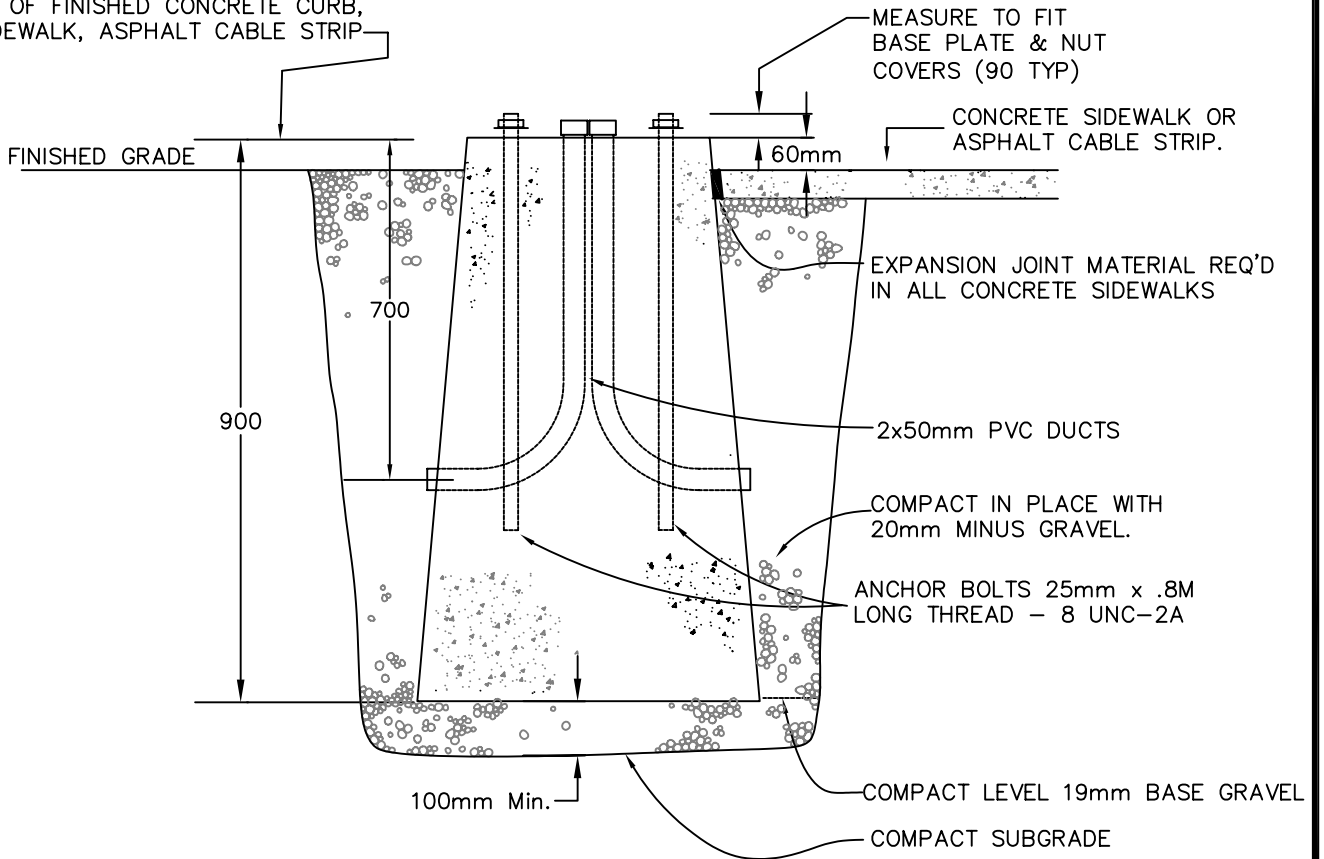
DRAWING NUMBER:
U-K-1A



STANDARD DETAIL DRAWINGS



60mm; ABOVE GRAVEL SHOULDER OR FINISHED BOULEVARD OR TOP OF FINISHED CONCRETE CURB, SIDEWALK, ASPHALT CABLE STRIP



NOTES

- LUBRIPLATE EXPOSED PORTION OF ANCHOR BOLTS OR USE OTHER SUITABLE GREASE

ALL DIMENSIONS IN MILLIMETRES

2004

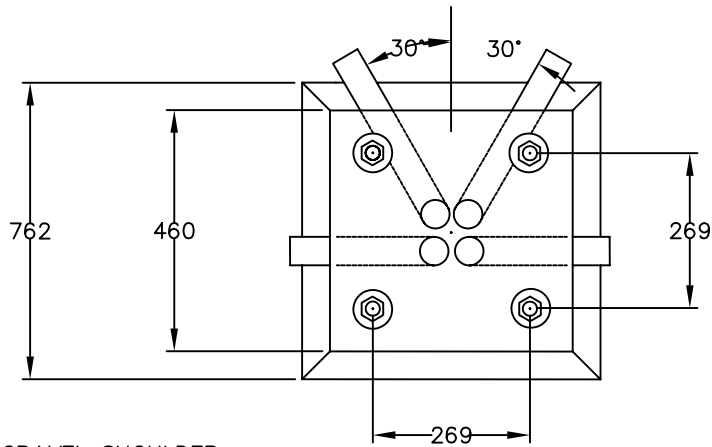
STREETLIGHTING STANDARD PEDESTAL

APPROVED
NOVEMBER, 2004

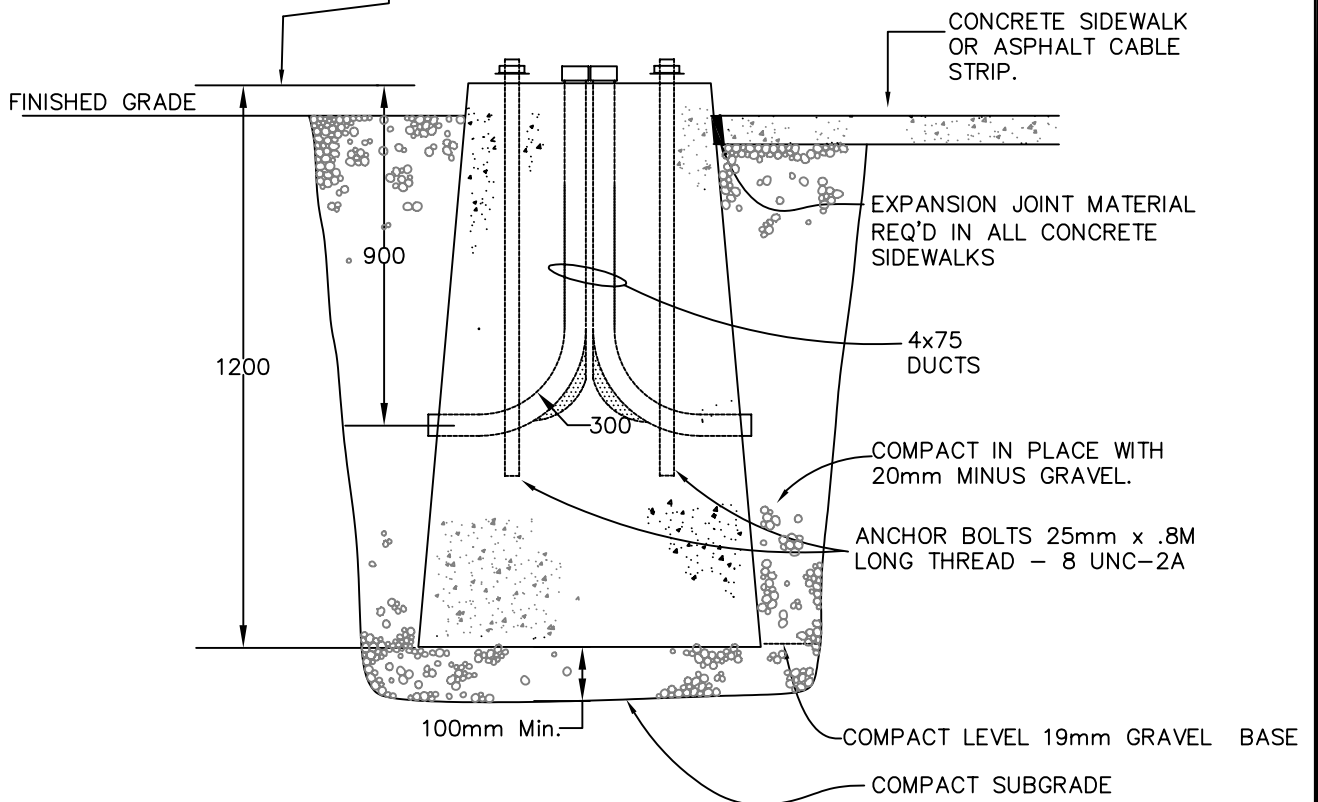
DRAWING NUMBER:
U-L-1



STANDARD DETAIL DRAWINGS



60mm; ABOVE GRAVEL SHOULDER
OR FINISHED BOULEVARD OR TOP
OF FINISHED CONCRETE CURB,
SIDEWALK, ASPHALT CABLE STRIP



NOTES

- LUBRIPLATE EXPOSED PORTION OF ANCHOR BOLTS OR USE OTHER SUITABLE GREASE
- DUCT BENDS TO BE MIN. RADIUS OF 300mm

ALL DIMENSIONS IN MILLIMETERS

2004

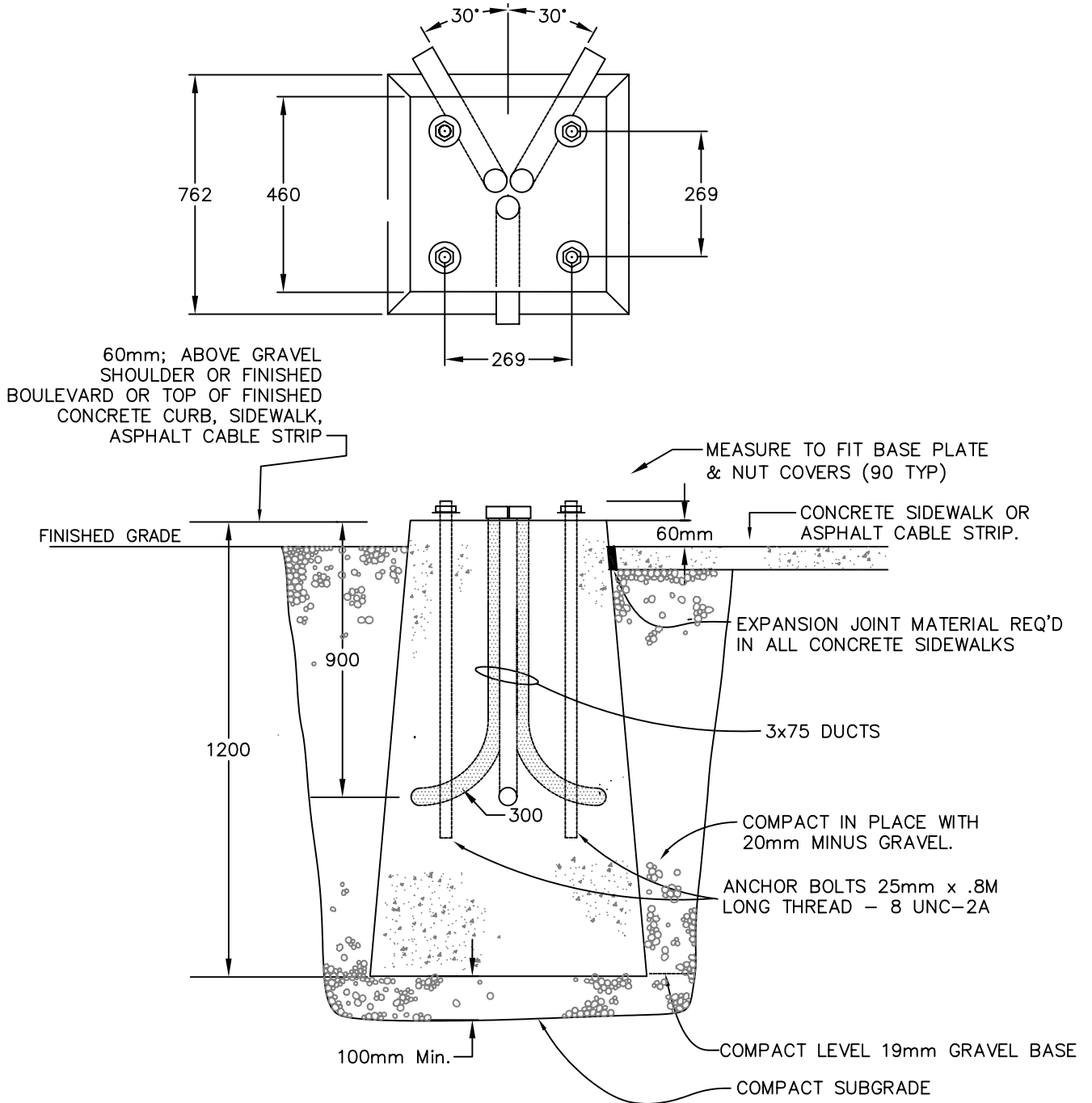
DISTRIBUTION / STREETLIGHTING
PEDESTAL

APPROVED
NOVEMBER, 2004

DRAWING NUMBER:
U-L-2



STANDARD DETAIL DRAWINGS



NOTES

- LUBRIPLATE EXPOSED PORTION OF ANCHOR BOLTS OR USE OTHER SUITABLE GREASE
- DUCT BENDS TO BE MIN. RADIUS OF 300mm

ALL DIMENSIONS IN MILLIMETRES

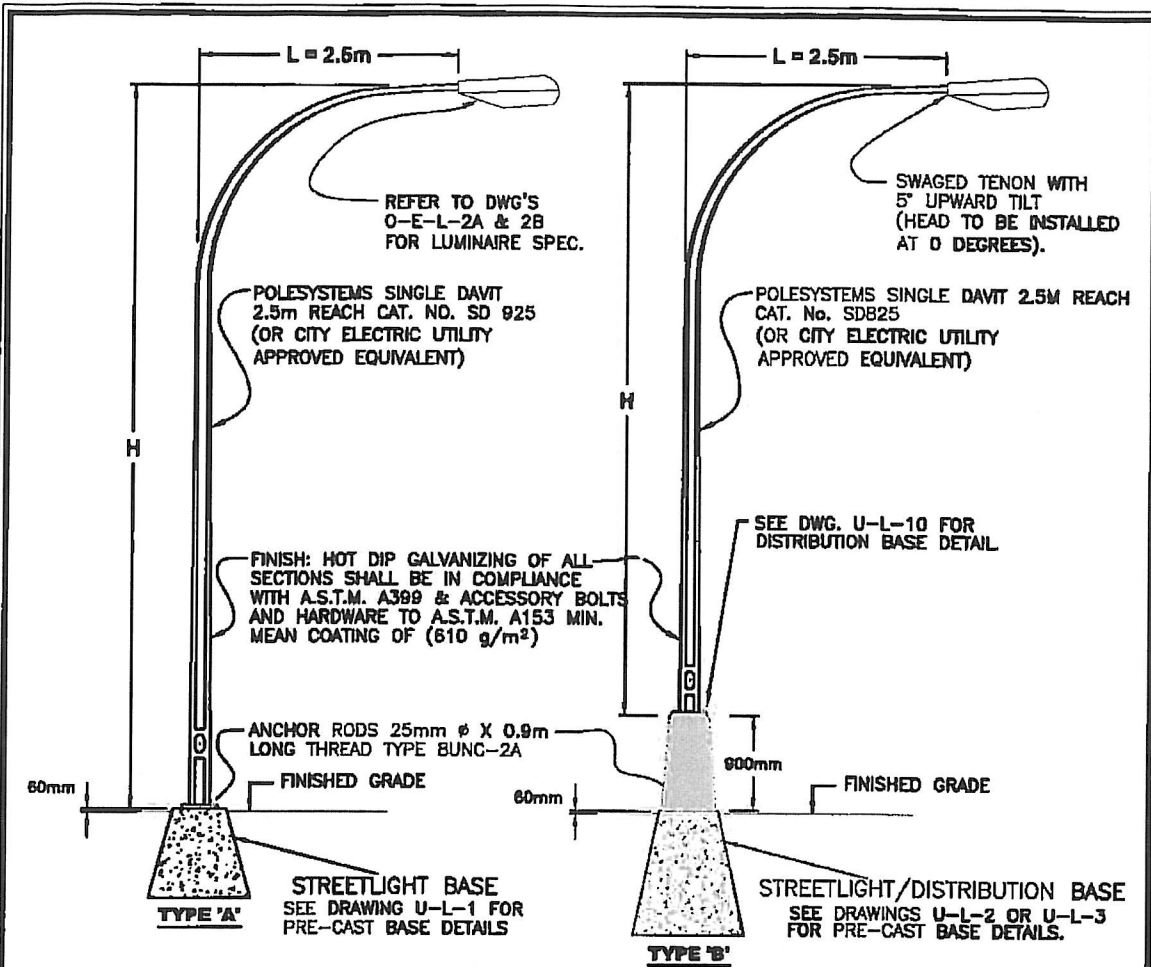
2004

DISTRIBUTION/STREETLIGHTING
RETROFIT PEDESTAL

APPROVED
NOVEMBER, 2004

DRAWING NUMBER:
U-L-3

STANDARD DETAIL DRAWINGS U-L-4

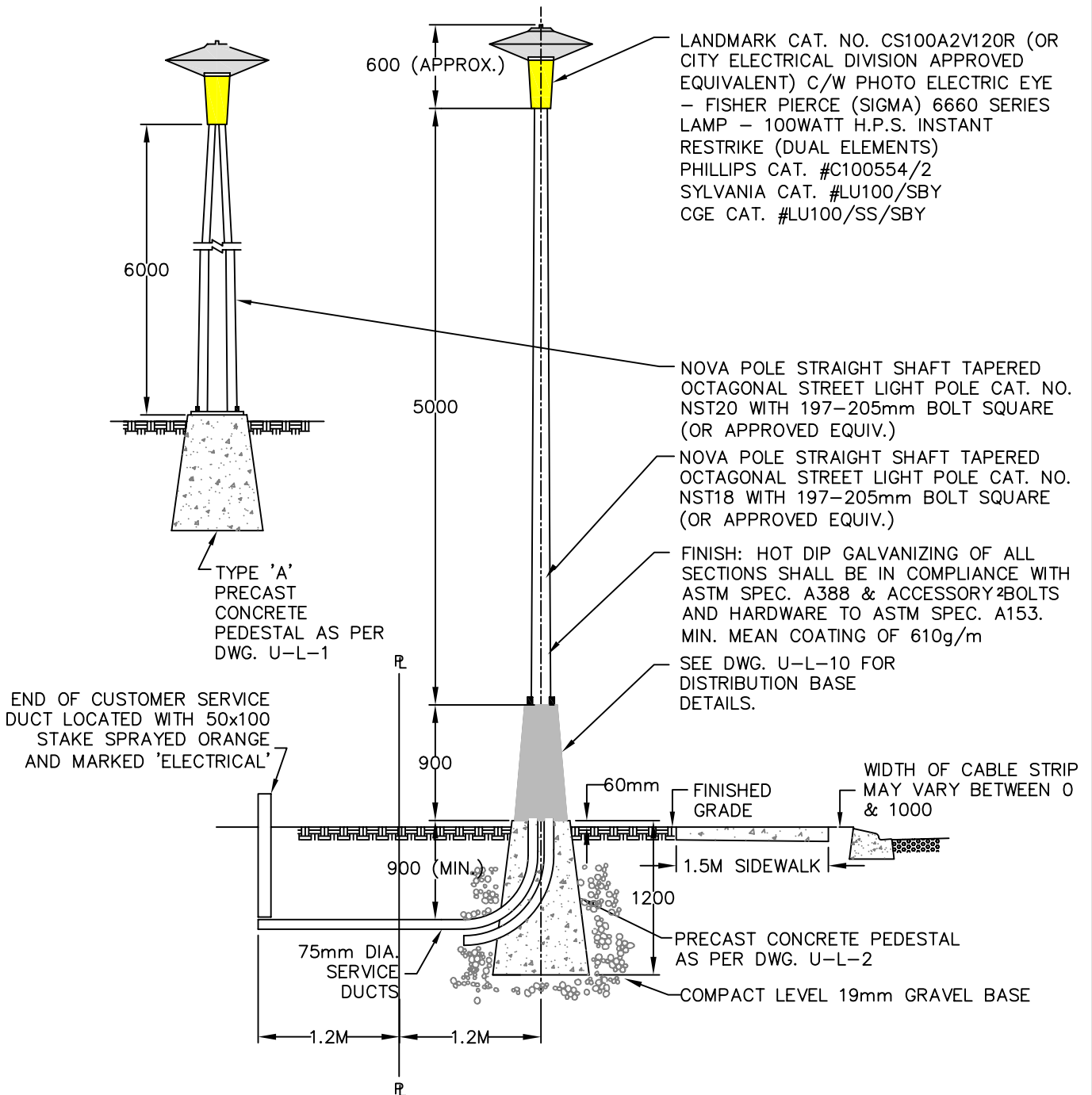


ROAD CLASS.	TYPE 'A'			TYPE 'B'		
	L (m)	H (m)	HEIGHT (m)	L (m)	H (m)	HEIGHT (m)
ARTERIAL	2.5	9.0	9.0	2.5	8.0	9.0
COLLECTOR	2.5	9.0	9.0	2.5	8.0	9.0
LOCAL	2.5	9.0	9.0	2.5	8.0	9.0

NOTES:

1. PHOTO EYE - FISHER PIERCE (SIGMA 6660 SERIES).
2. SEE CITY STANDARD DRAWINGS O-E-L-2A & O-E-L-2B FOR LUMINAIRE SPECIFICATION.
3. EQUIVALENTS MAY BE USED ONLY IF APPROVED BY THE CITY'S DIRECTOR OF OPERATIONS.
4. SPACING & SETBACK TO BE APPROVED BY A P.ENG.

<p>ENGINEER'S STAMP</p>	DRAWN BY: E.G.H.	<p>ELECTRIC UTILITY DISTRIBUTION STANDARDS</p>	
	CHK'D. BY: E.A.L.		
	APP'D. BY: J.M.S.	<p>STREETLIGHT POLE & DISTRIBUTION BASE (TYPE A & B)</p>	
	SCALE: N.T.S.	DATE: OCT. 2011	SEC. U-L



NOTE: ALL DIMENSIONS IN MILLIMETERS.

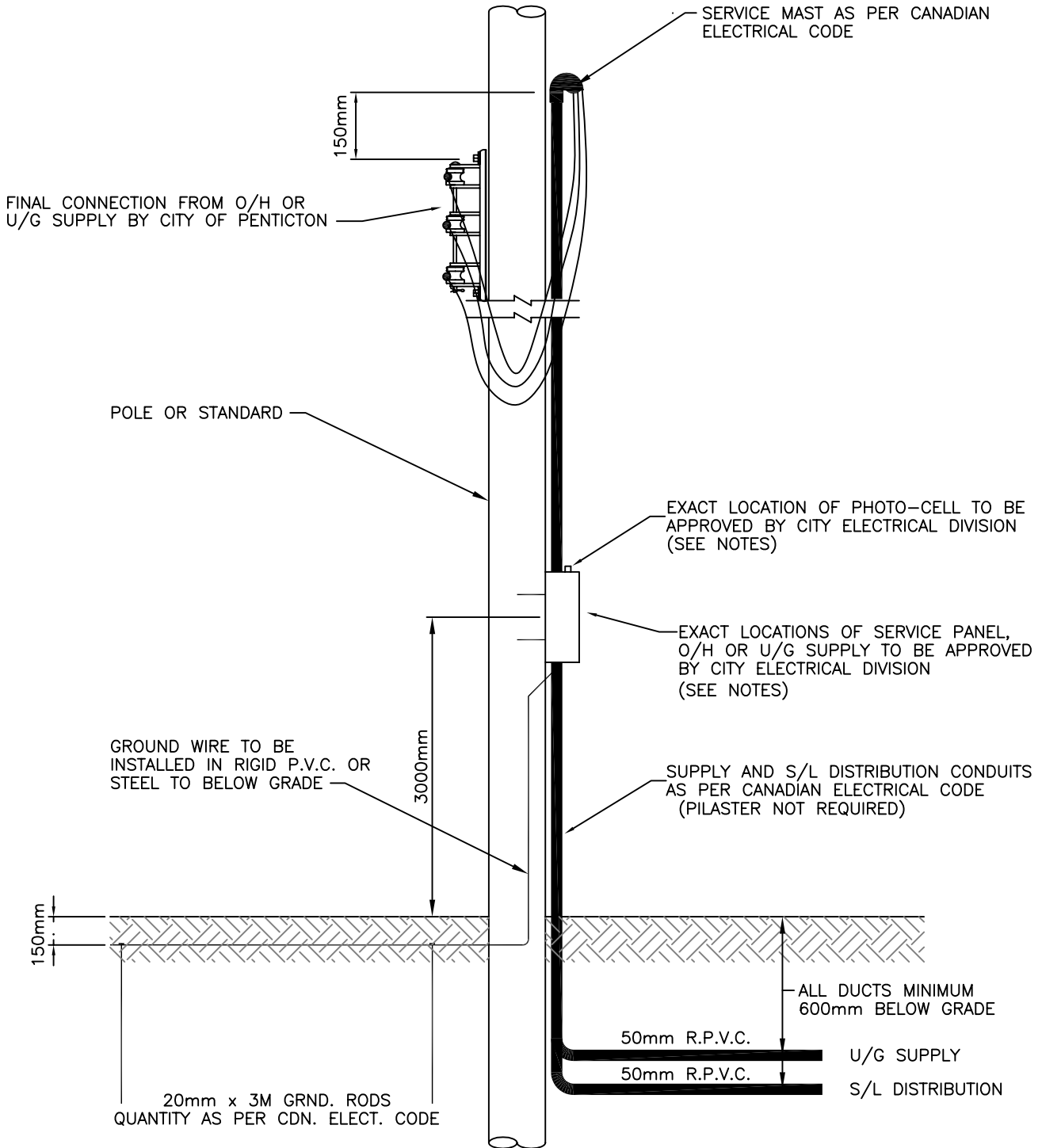
POST-TOP TYPE STREETLIGHT WITH DISTRIBUTION BASE (RESIDENTIAL USE ONLY)

APPROVED
NOVEMBER, 2004

DRAWING NUMBER:
U-L-5



STANDARD DETAIL DRAWINGS



NOTES:
 MOST INSTALLATIONS DO NOT REQUIRE A S/L PANEL, HOWEVER, IF SPECIFIED VARIOUS TYPES OF S/L CONTROL PANEL INSTALLATIONS ARE ACCEPTABLE, SUBJECT TO CITY ELECTRICAL DIVISION APPROVAL.

2004

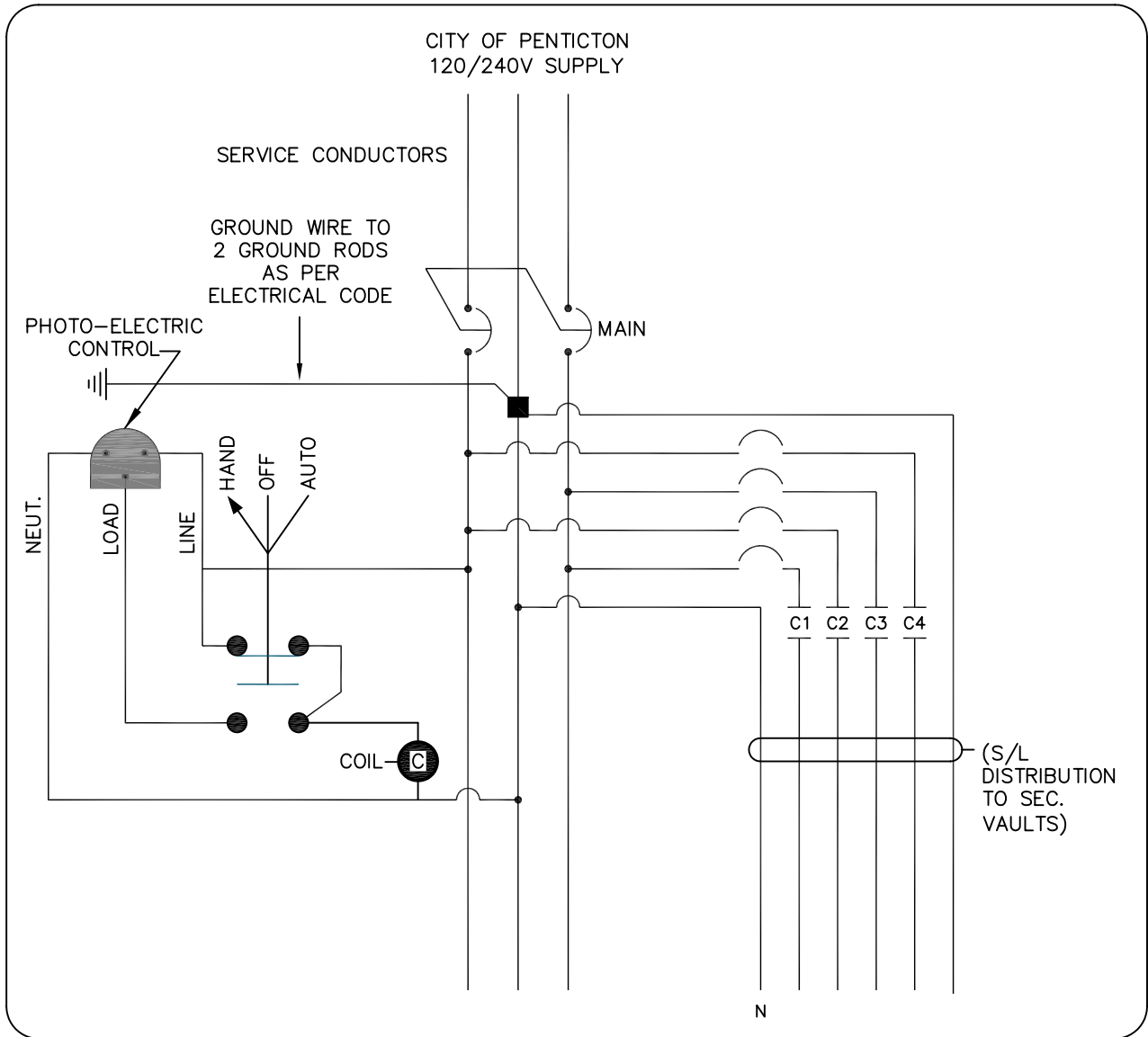
STREETLIGHTING SERVICE & PANEL LAYOUT (O/H OR U/G)

APPROVED
 NOVEMBER, 2004

DRAWING NUMBER:
 U-L-6



STANDARD DETAIL DRAWINGS



NOTES: THE FOLLOWING ITEMS TO BE APPROVED BY THE CITY OF PENTICTON ELECTRICAL DIVISION FOR EACH INSTALLATION

1. MAIN WEATHERPROOF CABINET DIMENSIONS
2. SERVICE PANEL - MAIN SIZE & NO. OF CIRCUITS
3. LIGHTING CONTACTOR RATINGS OR SPECS.
4. S/L DISTRIBUTION BREAKER & WIRE SIZE
5. NO. OF POLES REQUIRED ON CONTACTOR
6. CONDUCTOR SIZE (ALL WIRE TO BE RW90)
7. GREEN GRND. WIRE TO BE INSTALLED THROUGHOUT S/L DISTRIBUTION.

2004

STREETLIGHTING CONTROL PANEL (SCHEMATIC)

APPROVED
NOVEMBER, 2004

DRAWING NUMBER:
U-L-7



STANDARD DETAIL DRAWINGS

TYPICAL DETAIL FOR U/G STREET LIGHT WIRING USING PRECAST CONCRETE BASE

- GREEN (#12 STR. CU. TW75-40C)
- WHITE (#12 STR. CU. RW90-40C)
- BLACK (#12 STR. CU. RW90-40C)

TO LUMINAIRE
HOT
NEUTRAL
GROUND

STANDARD

GOULD GEB 11-11 WATERPROOF FUSE HOLDER C/W/ 10A GOULD OTM FUSE OR EQUAL AND TWO B307 TYPE INSULATING BOOTS SHALL BE INSTALLED IN EACH LUMINAIRE LIVE CONDUCTOR

GROUND WIRE BONDED TO STANDARD WITH HARDWARE PROVIDED

60mm; ABOVE GRAVEL SHOULDER OR FINISHED BOULEVARD OR TOP OF FINISHED CONCRETE CURB, SIDEWALK, ASPHALT CABLE STRIP

FINISHED GRADE

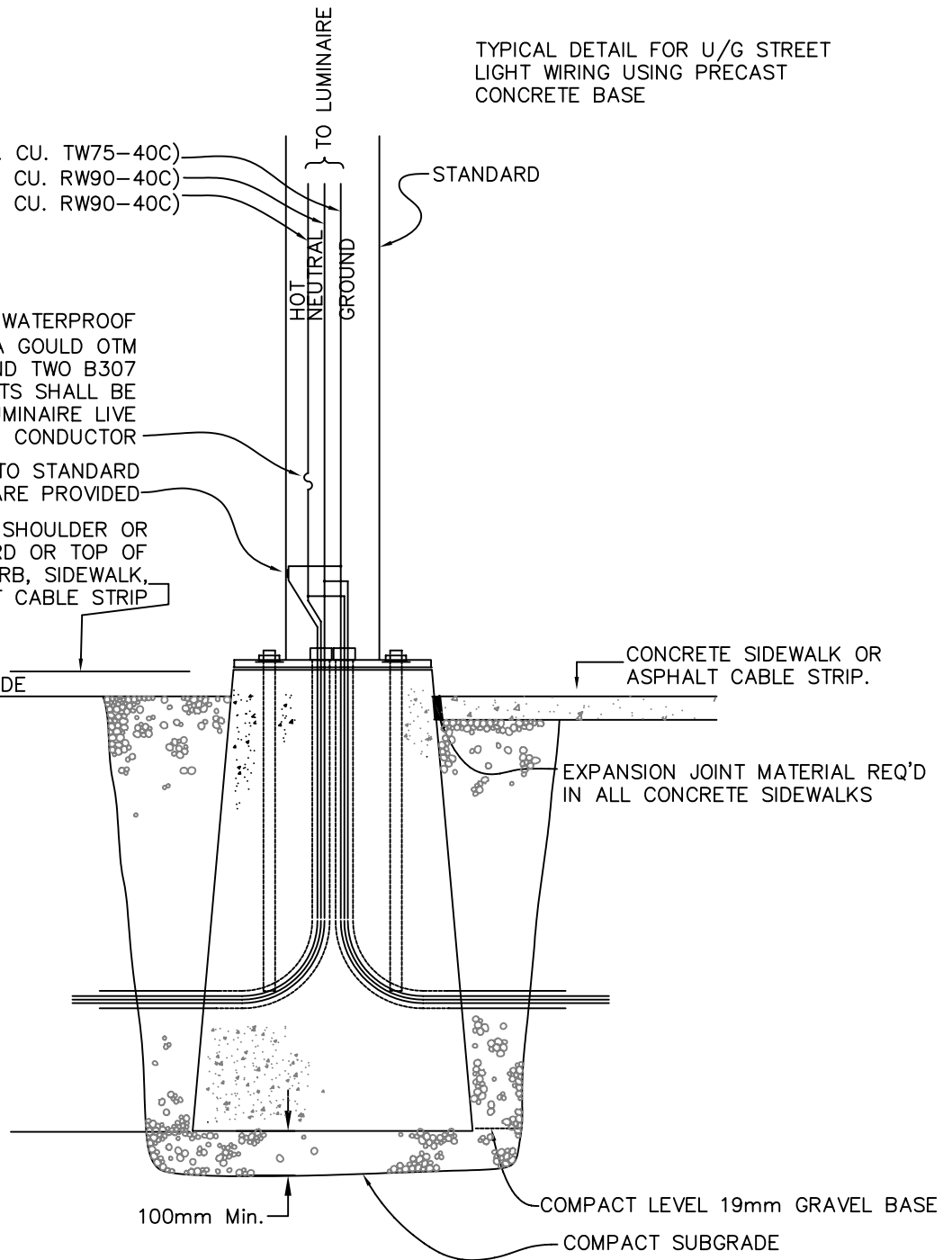
CONCRETE SIDEWALK OR ASPHALT CABLE STRIP.

EXPANSION JOINT MATERIAL REQ'D IN ALL CONCRETE SIDEWALKS

100mm Min.

COMPACT LEVEL 19mm GRAVEL BASE

COMPACT SUBGRADE



2004

STREETLIGHTING U/G WIRING WITH CONCRETE PEDESTAL

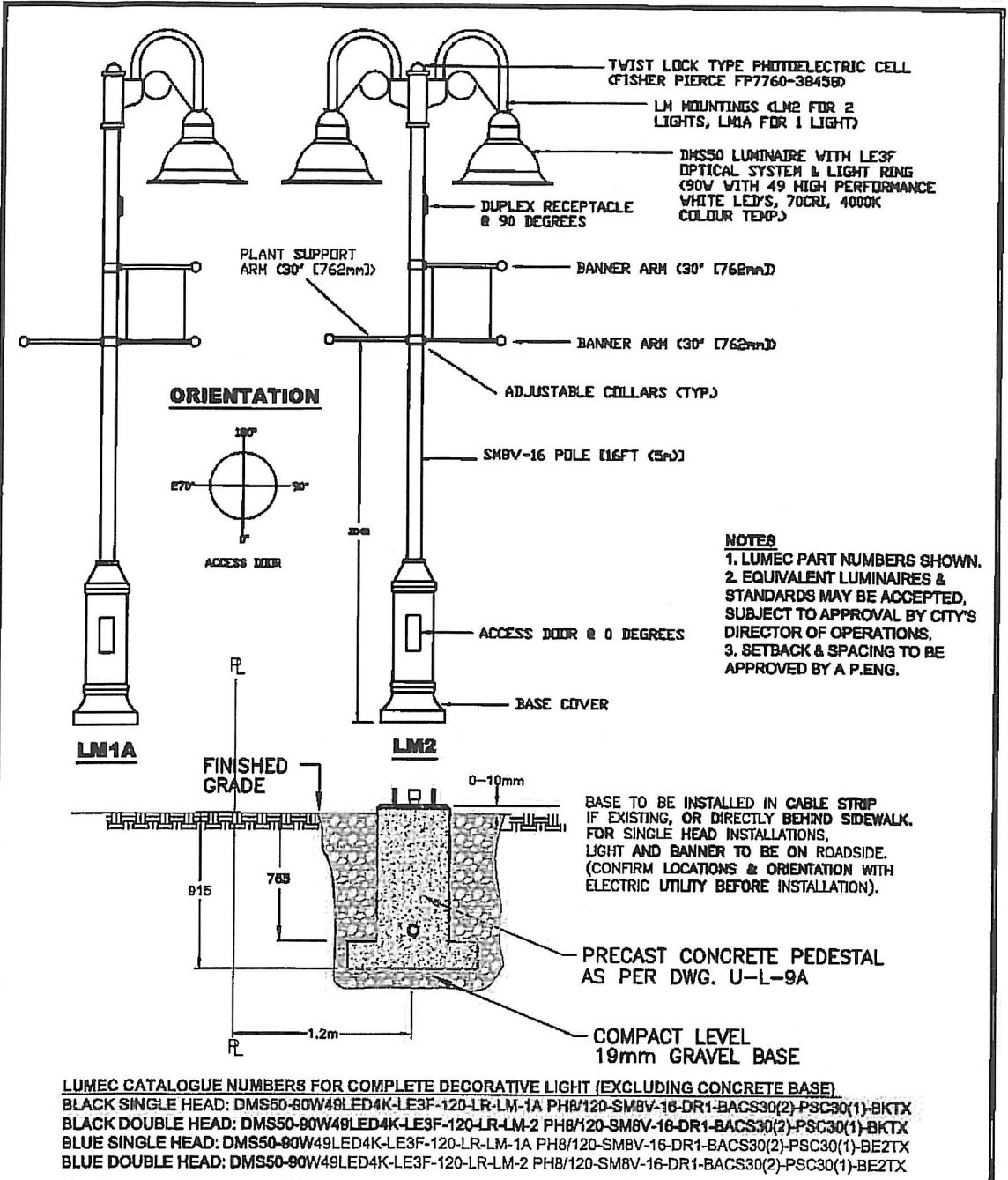
APPROVED

NOVEMBER, 2004

DRAWING NUMBER:

U-L-8

STANDARD DETAIL DRAWINGS U-L-9



Jim Spreng

2011-10-06
ENGINEER'S STAMP

DRAWN BY: E.G.H.
 CHK'D. BY: E.A.L.
 APP'D. BY: J.M.S.
 SCALE: N.T.S.

THE CITY OF

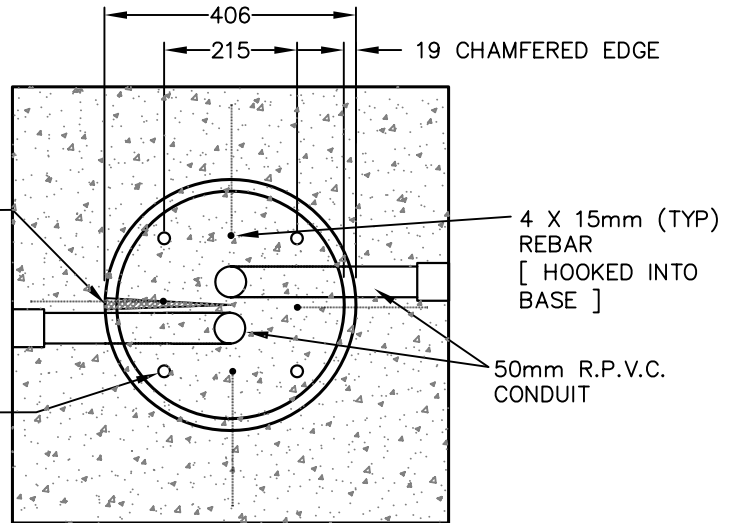
 ELECTRIC UTILITY
 DISTRIBUTION STANDARDS

DECORATIVE STREETLIGHT
 SPECIFICATIONS & INSTALLATION
 DETAIL
 (TYPICAL)

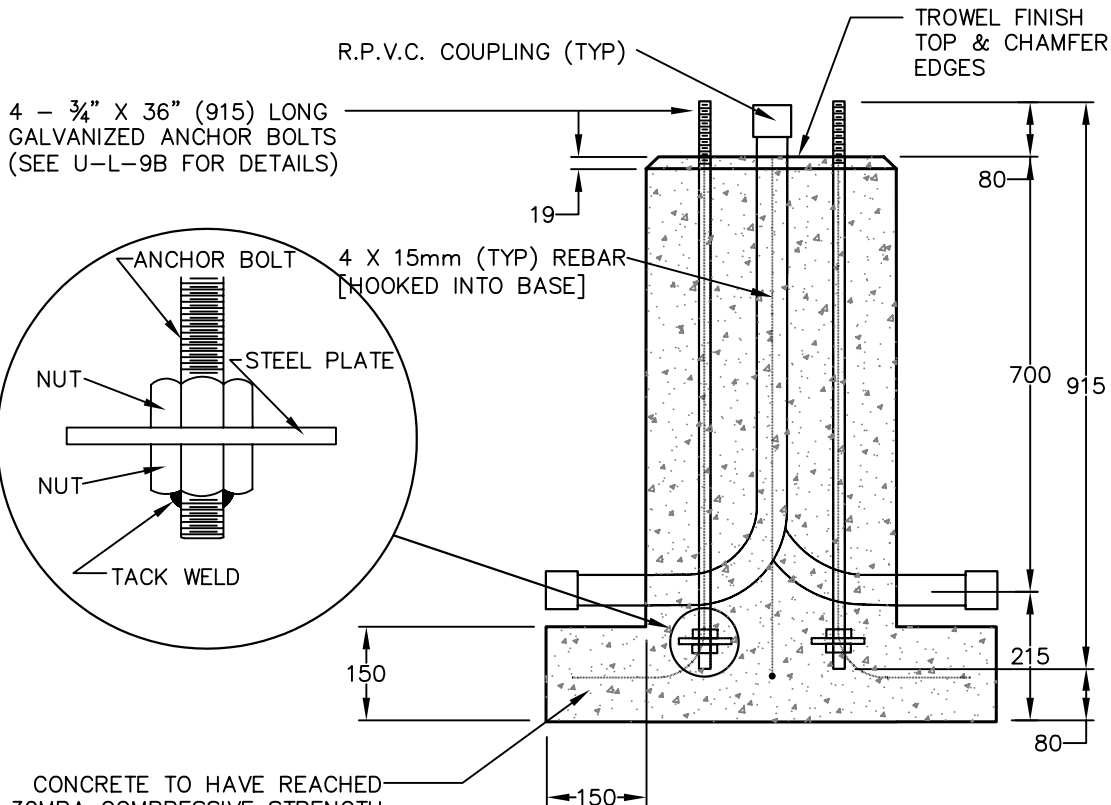
DATE: OCT. 2011 SEC. U-L DWG.# 9

'V' GROOVE DRAIN TO START AT ZERO DEPTH AND WIDTH IN THE CENTRE OF THE BASE AND EXTEND TO A 10mm DEPTH AND WIDTH AT THE OUTSIDE EDGE (ORIENT IN THE SAME DIRECTION AS CONDUIT)

305mm BOLT CIRCLE DIAMETER



PLAN VIEW



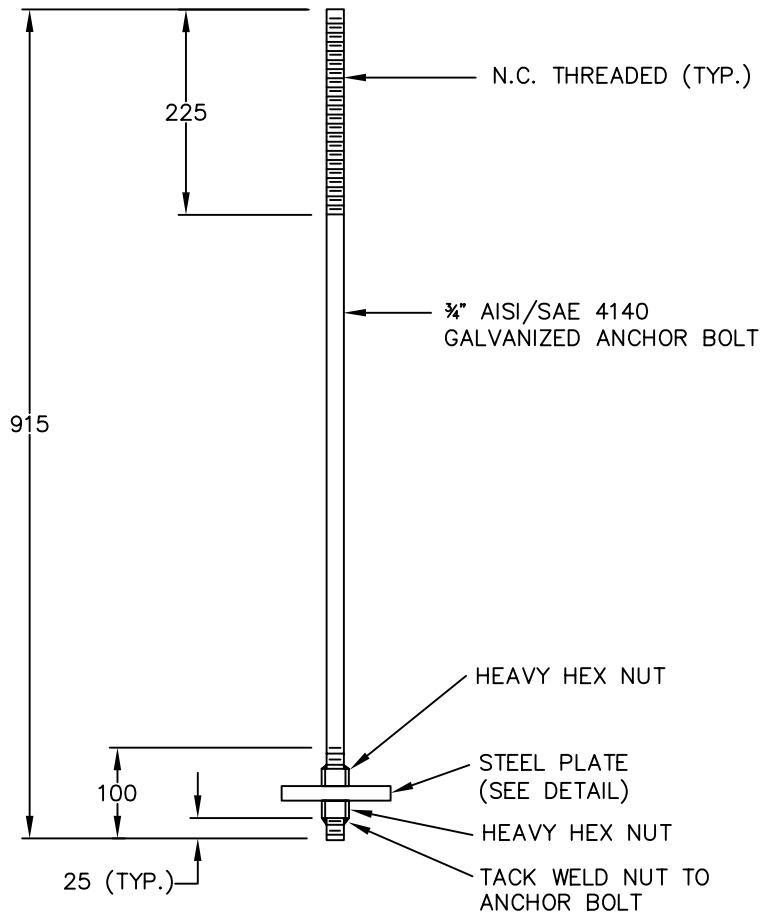
CONCRETE TO HAVE REACHED 30MPA COMPRESSIVE STRENGTH BEFORE INSTALLING STANDARD.

ELEVATION

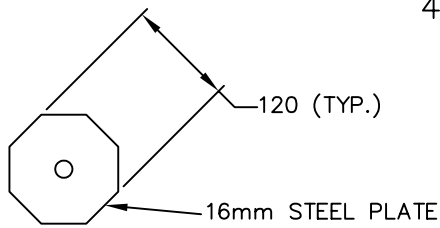
NOTE:
ALL DIMENSIONS ARE IN MILLIMETERS
UNLESS SHOWN OTHERWISE



STANDARD DETAIL DRAWINGS



ANCHOR BOLT
4 PER SET



STEEL PLATE
4 PER SET

NOTE:
ALL DIMENSIONS ARE IN MILLIMETERS
UNLESS SHOWN OTHERWISE

**3/4" DIAMETER ANCHOR BOLT
DETAIL FOR STREETLIGHTS
(36" BASE)**

APPROVED

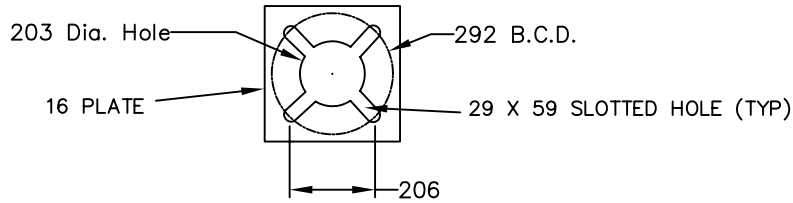
NOVEMBER, 2004

DRAWING NUMBER:

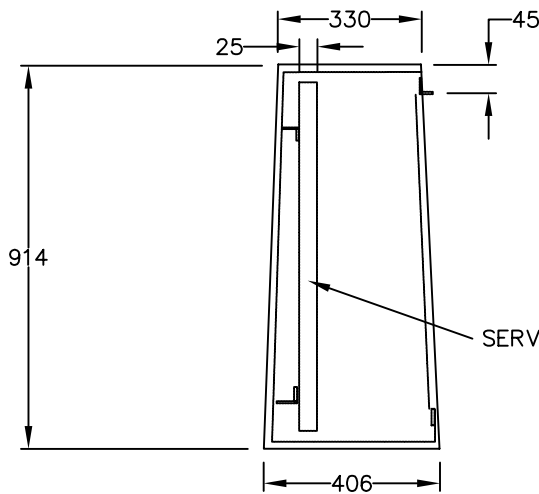
U-L-9B



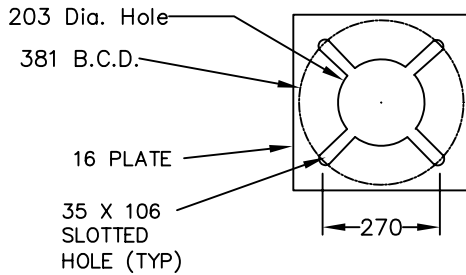
STANDARD DETAIL DRAWINGS



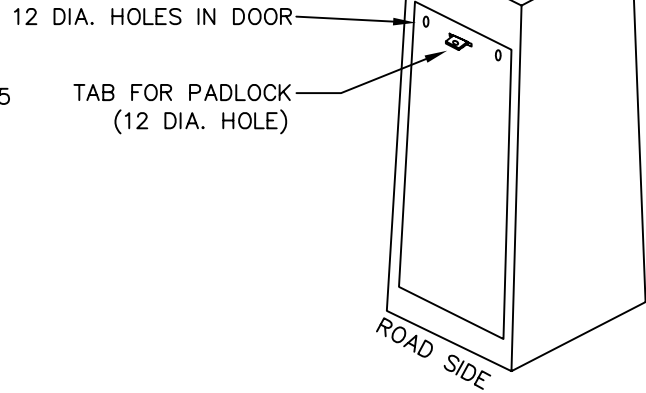
TOP VIEW



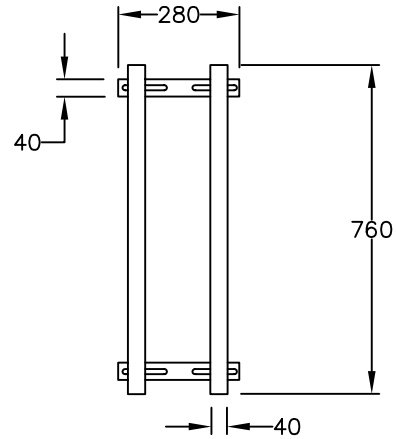
ELEVATION



BOTTOM VIEW



SERVICE PANEL SUPPORT CHANNELS



SERVICE PANEL SUPPORT CHANNELS

NOTES:

1. BASES ARE SUPPLIED C/W 4 X 3/8" x 1" LONG STAINLESS STEEL BOLTS, NUTS & WASHERS.
2. BASE TO BE USED WITH TYPE 2 SHAFTS AND POST TOP POLES.
3. BASE TO BE HOT DIPPED GALVANIZED AFTER FABRICATION.
4. ALL DIMENSIONS IN MILLIMETERS UNLESS SHOWN OTHERWISE.
5. DISTRIBUTION BASE MAY NOT BE EXACTLY AS SHOWN.
6. DIMENSIONS MAY VARY SLIGHTLY BETWEEN SUPPLIERS.

ACCEPTABLE PRODUCTS:

WESTCOAST ENG. CAT # WCE-TB-36G (shown)
NOVA POLE PRODUCT CODE # NTB36

CITY OF PENTICTON STOCK # 20-05-036.
WEIGHT: 79 KG

2004

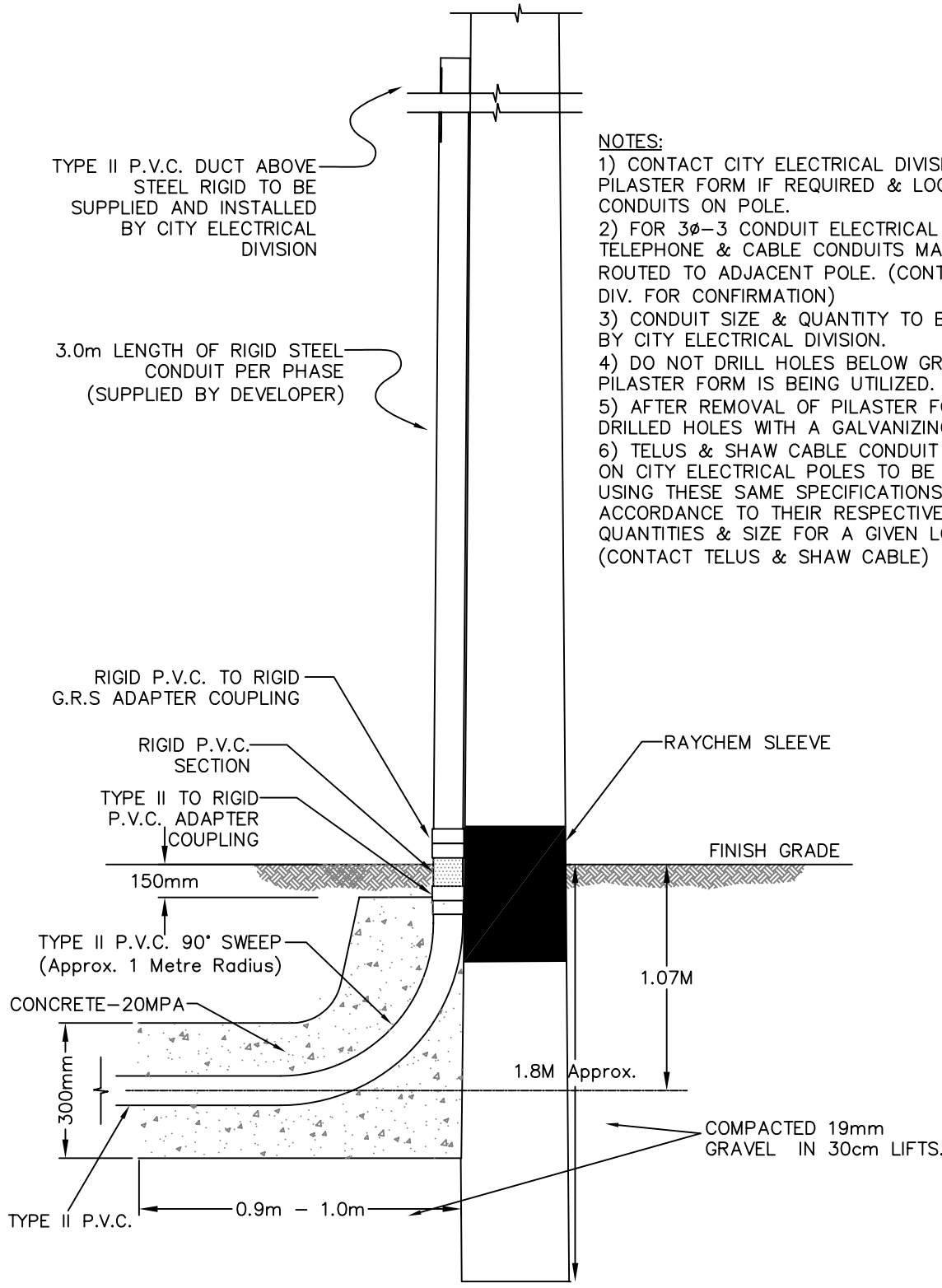
**STREETLIGHT DISTRIBUTION
BASE DETAIL**

APPROVED
NOVEMBER, 2004

DRAWING NUMBER:
U-L-10



STANDARD DETAIL DRAWINGS



- NOTES:**
- 1) CONTACT CITY ELECTRICAL DIVISION FOR U/G PILASTER FORM IF REQUIRED & LOCATION OF CONDUITS ON POLE.
 - 2) FOR 3 ϕ -3 CONDUIT ELECTRICAL INSTALLATIONS TELEPHONE & CABLE CONDUITS MAY HAVE TO BE ROUTED TO ADJACENT POLE. (CONTACT ELECT. DIV. FOR CONFIRMATION)
 - 3) CONDUIT SIZE & QUANTITY TO BE DETERMINED BY CITY ELECTRICAL DIVISION.
 - 4) DO NOT DRILL HOLES BELOW GROUND LINE IF PILASTER FORM IS BEING UTILIZED.
 - 5) AFTER REMOVAL OF PILASTER FORM, SPRAY DRILLED HOLES WITH A GALVANIZING PAINT.
 - 6) TELUS & SHAW CABLE CONDUIT INSTALLATIONS ON CITY ELECTRICAL POLES TO BE INSTALLED USING THESE SAME SPECIFICATIONS BUT IN ACCORDANCE TO THEIR RESPECTIVE CONDUIT QUANTITIES & SIZE FOR A GIVEN LOCATION. (CONTACT TELUS & SHAW CABLE)

2004

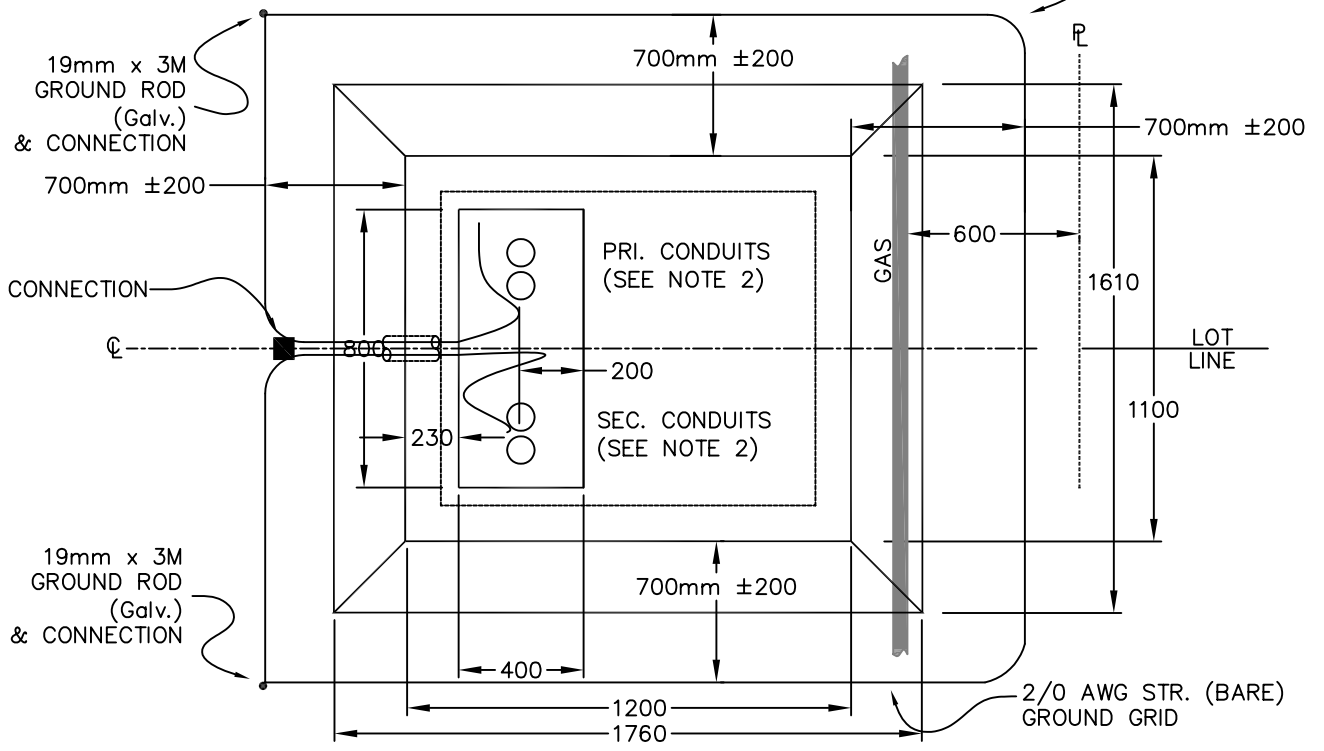
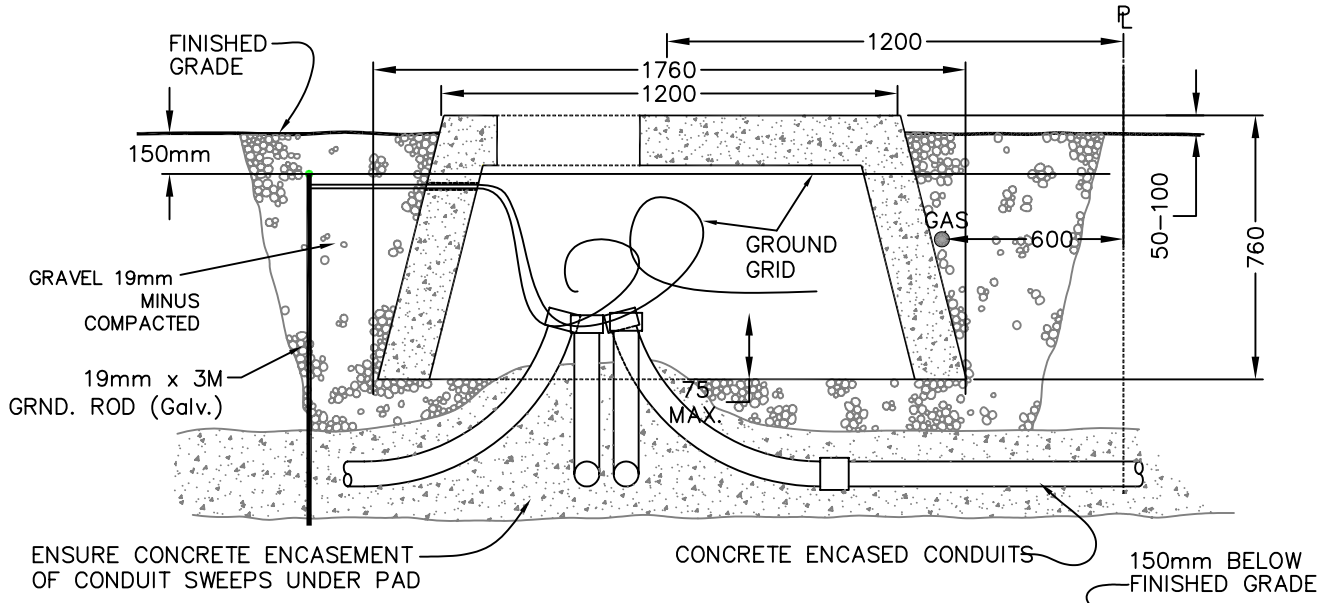
TYPICAL POLE RISER & PILASTER (1 PH OR 3 PH & WOOD OR STEEL)

APPROVED
NOVEMBER, 2004

DRAWING NUMBER:
U-Q-1



STANDARD DETAIL DRAWINGS



- NOTES:
- 1) ANY VARIATIONS TO PRE-CAST PAD MUST BE APPROVED BY CITY ELECTRICAL DIVISION.
 - 2) CONDUIT SIZE AND QUANTITY TO BE DETERMINED BY ELECTRICAL DIVISION.
 - 3) ALL CONDUCTORS AT PAD TO REACH A MINIMUM 2.0M's ABOVE PAD.

2004

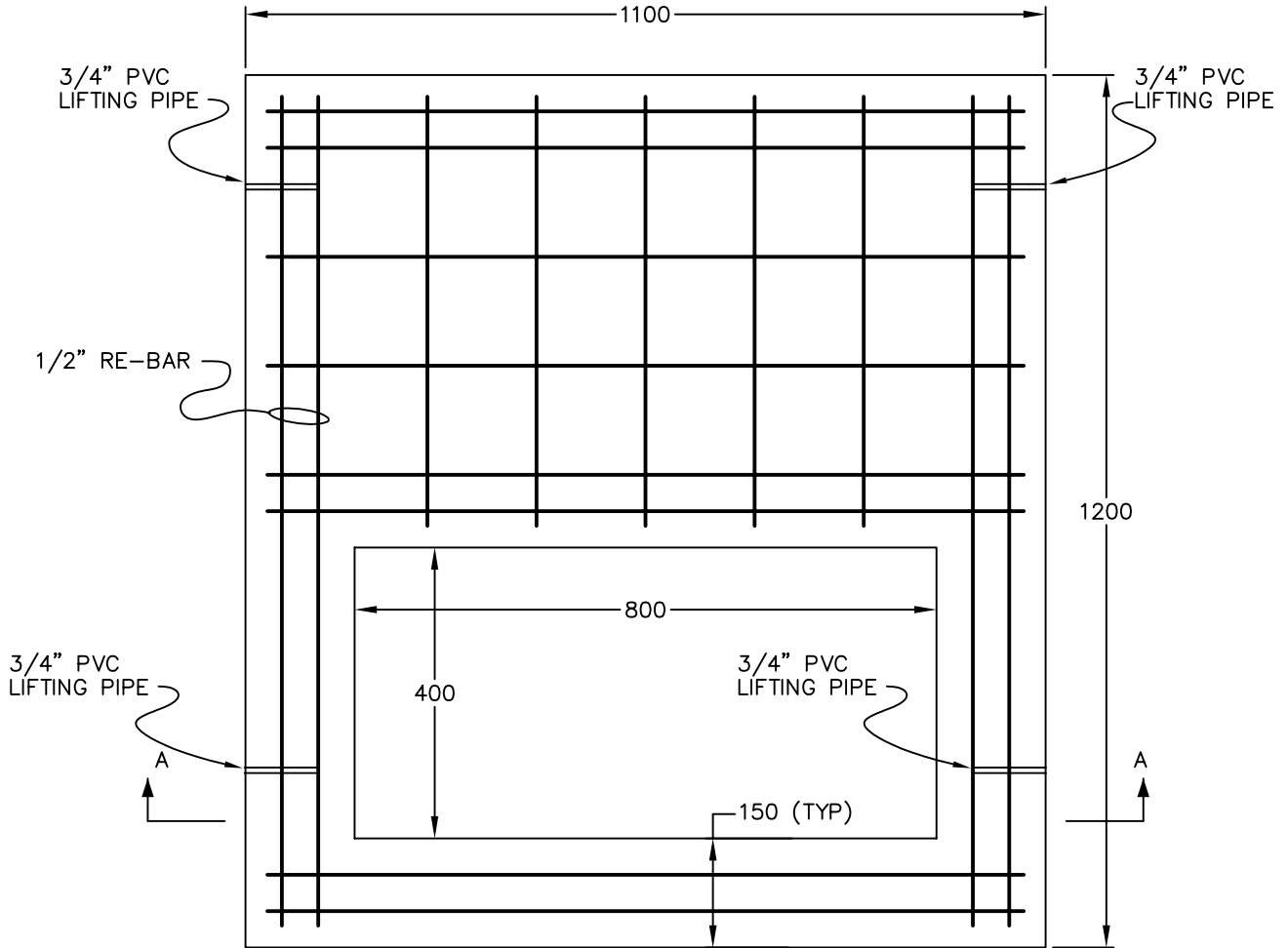
SINGLE PHASE PRE-CAST TRANSFORMER PAD

APPROVED
NOVEMBER, 2004

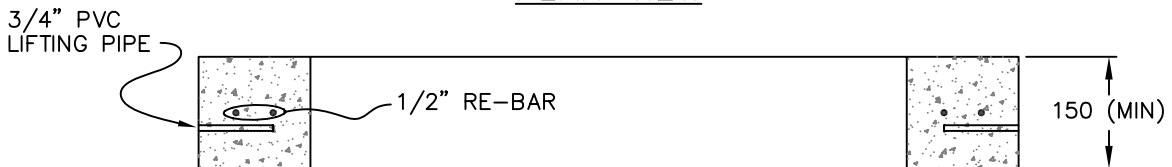
DRAWING NUMBER:
U-V1-1



STANDARD DETAIL DRAWINGS



PLAN VIEW



SECTION A-A

2004

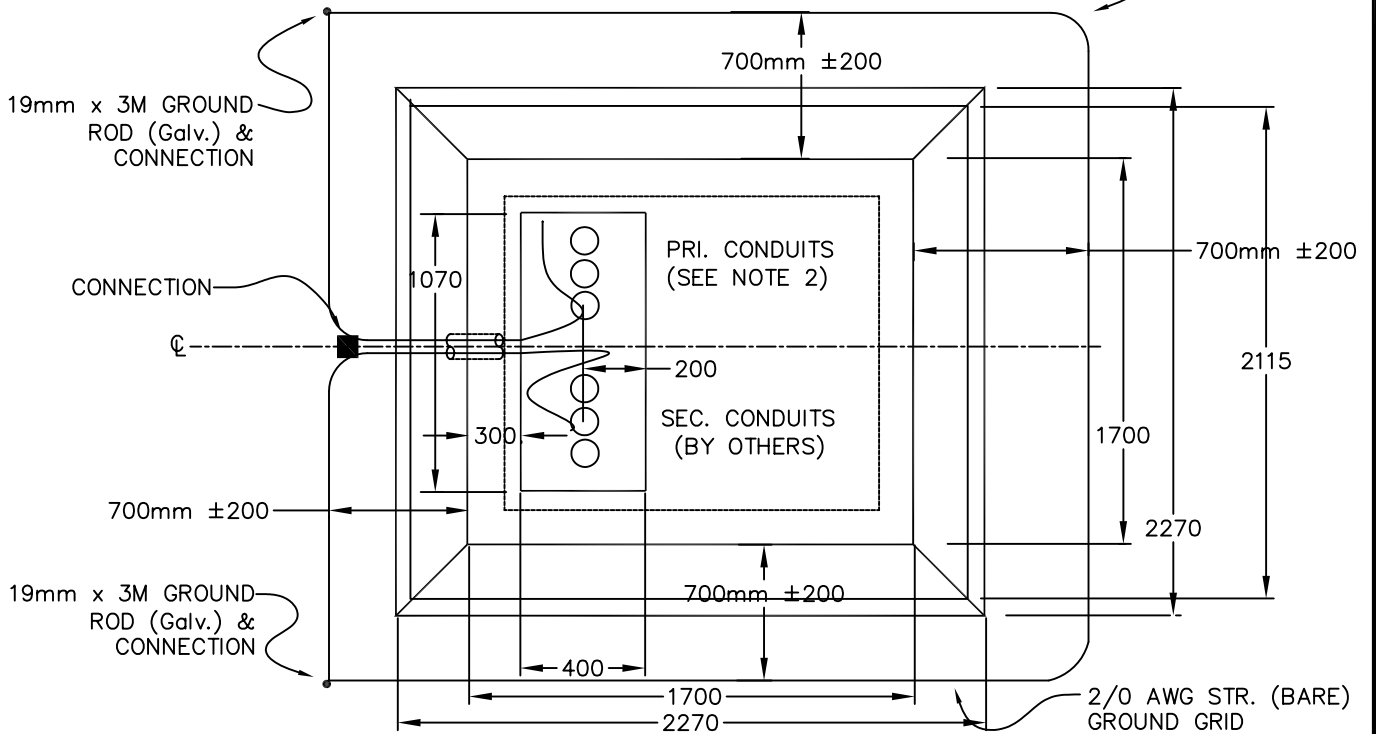
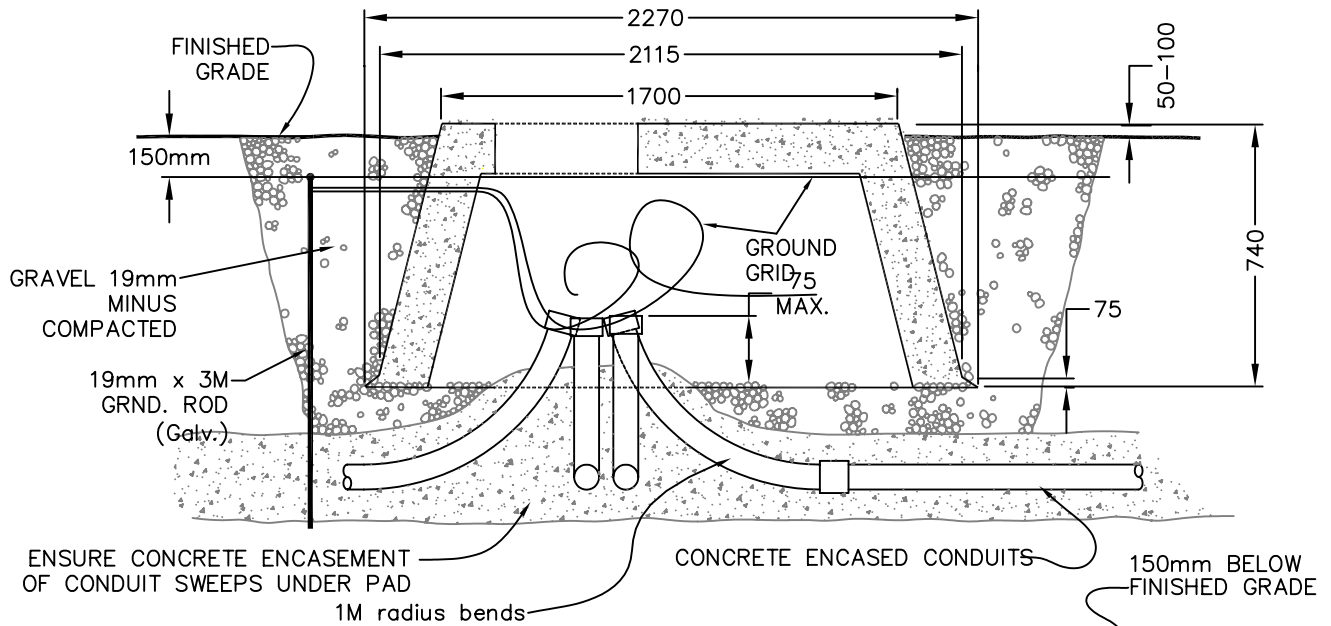
SINGLE PHASE PRECAST TRANSFORMER
PAD TYPE 2 FOR RETROFIT

APPROVED
NOVEMBER, 2004

DRAWING NUMBER:
U-V1-2



STANDARD DETAIL DRAWINGS



NOTES:

- 1) ANY VARIATIONS TO PRE-CAST PAD MUST BE APPROVED BY CITY ELECTRICAL DIVISION.
- 2) CONDUIT SIZE AND QUANTITY TO BE DETERMINED BY ELECTRICAL DIVISION.
- 3) ALL CONDUCTORS AT PAD TO REACH A MINIMUM 2.0M's ABOVE PAD.
- 4) UTILITY R.O.W. NORMALLY REQUIRED FOR 3Ø TRANSF. DUE TO BEING LOCATED ON PRIVATE PROPERTY.
- 5) MAX. SUPERIMPOSED LOAD 5,000 Kg.

2004

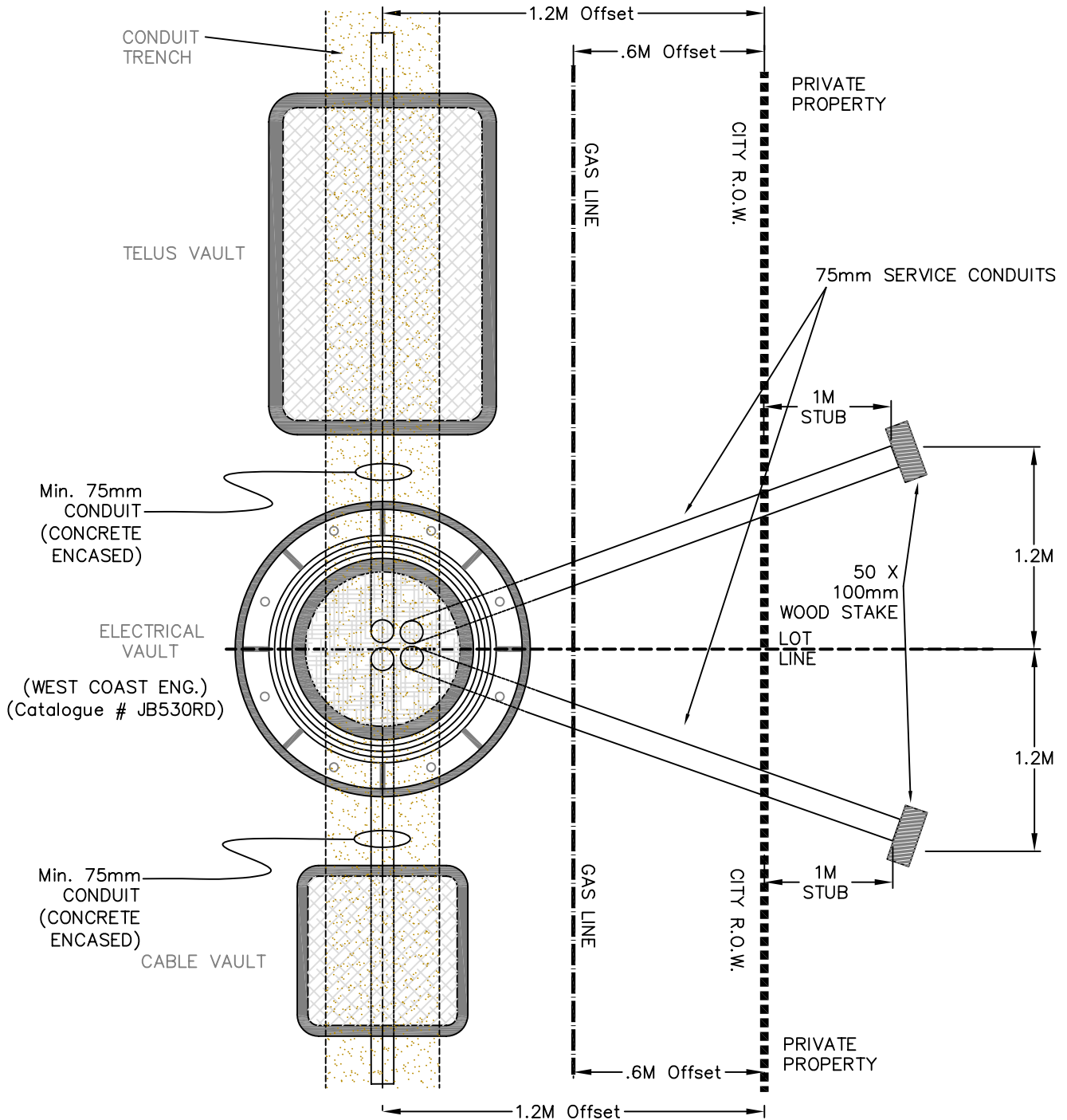
THREE PHASE PRE-CAST TRANSFORMER PAD

APPROVED
NOVEMBER, 2004

DRAWING NUMBER:
U-V3-1



STANDARD DETAIL DRAWINGS



NOTES:

1. ESTABLISH LEVEL BASE WITH 19mm MINUS AND ADJUST TOP OF LID TO MATCH FINISHED GRADE.
2. ROUND PLASTIC VAULT C/W GALVANIZED LID OR CITY ELECTRICAL DIVISION APPROVED EQUIVALENT.

STANDARD LOCATIONS FOR TELUS & CABLE T.V. JUNCTION BOXES WHERE AN ELECTRICAL SERVICE BOX IS USED

APPROVED

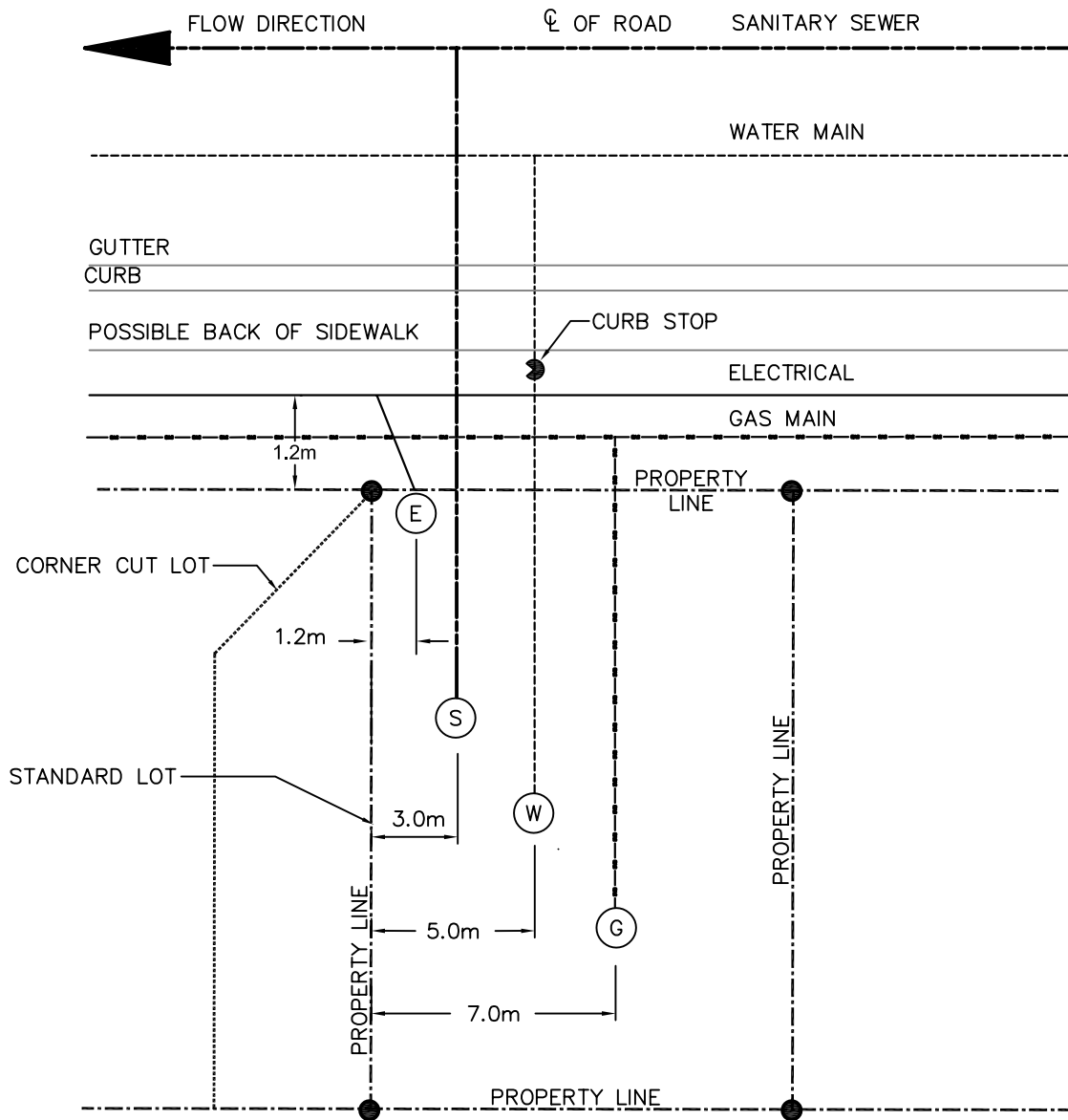
NOVEMBER, 2004

DRAWING NUMBER:

U-X-1



STANDARD DETAIL DRAWINGS



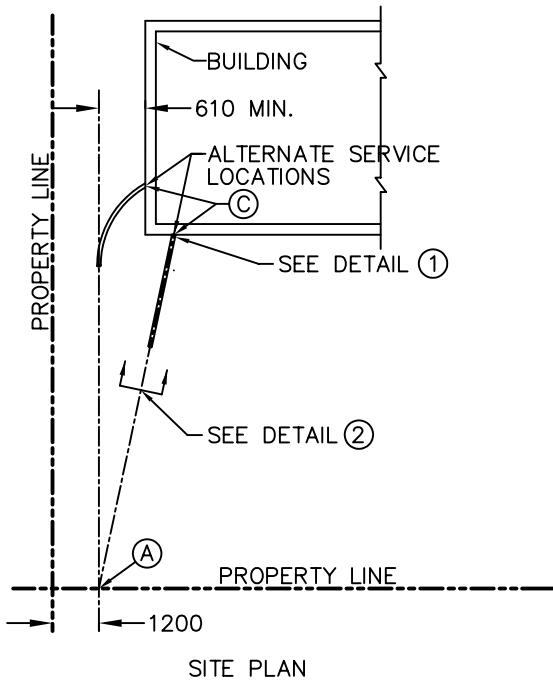
- (S) SANITARY SERVICE
- (W) WATER SERVICE
- (G) GAS SERVICE
- (E) ELECTRICAL SERVICE

2004

TYPICAL RESIDENTIAL LOT SERVICING LOCATIONS

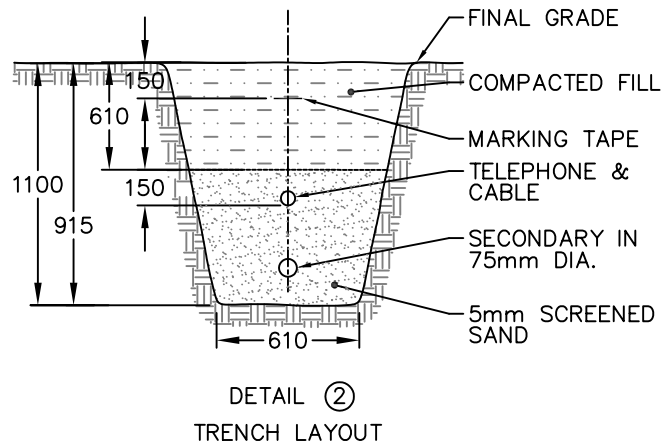
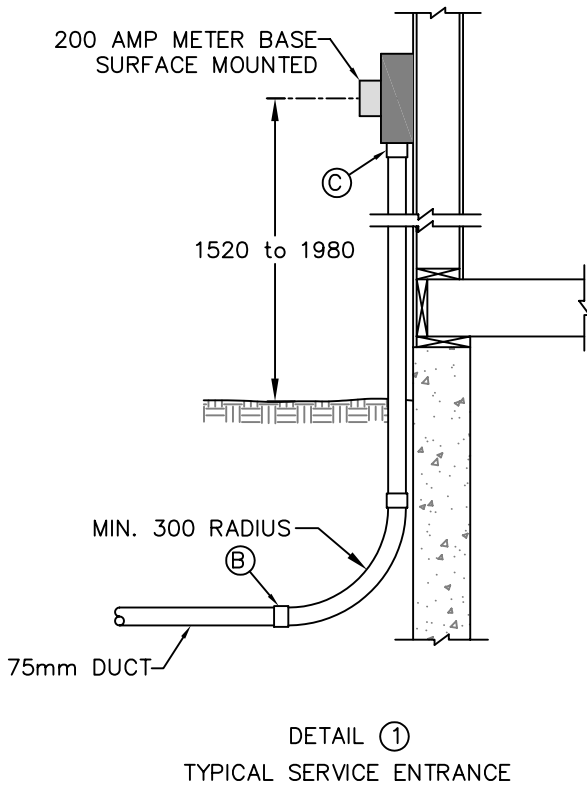
APPROVED
NOVEMBER, 2004

DRAWING NUMBER:
U-X-2



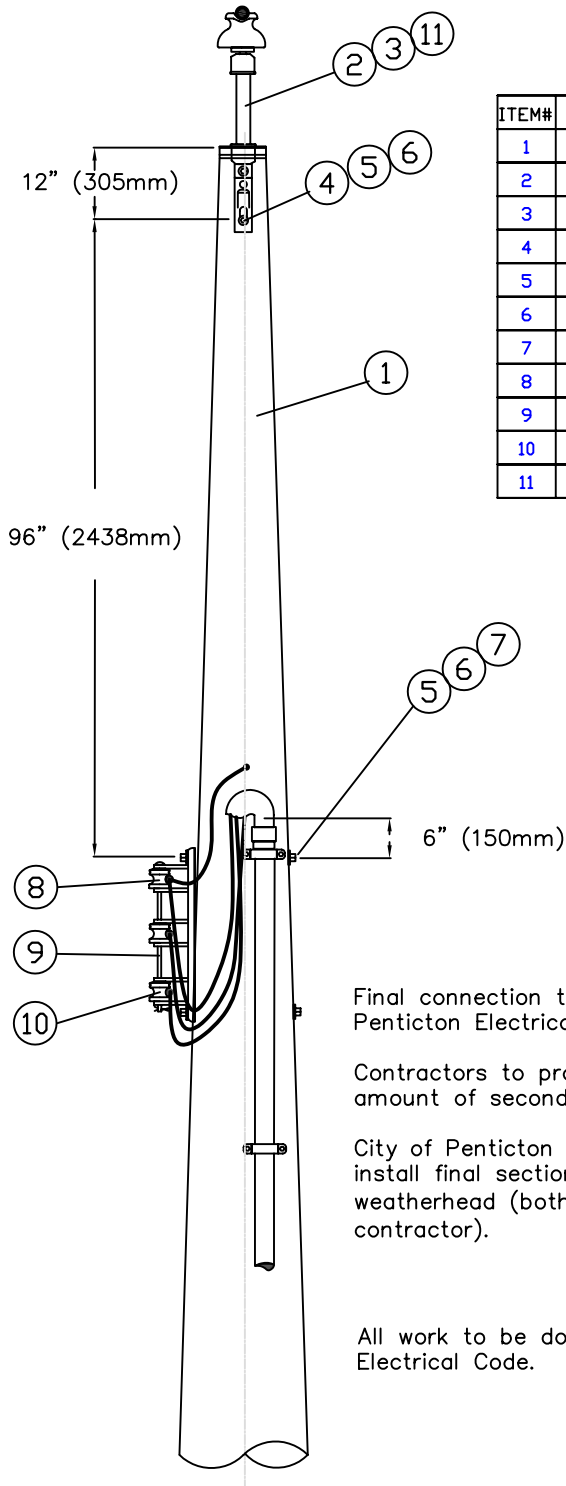
NOTES:

1. METER SOCKET MUST BE LOCATED ON AN OUTSIDE WALL WITHIN 1m OF THE CORNER OF THE BUILDING NEAREST THE POINT OF SERVICE.
2. METER SHALL NOT BE INSTALLED IN CARPORT, BREEZEWAY OR SIMILAR AREAS.
3. CUSTOMER TO SUPPLY 75mm DUCT AS FOLLOWS: DUCT FROM POINT (A) TO POINT (B) TO BE TYPE DB2. DUCT FROM POINT (B) TO POINT (C) APPROVED RIGID P.V.C. OR STEEL DUCT IS REQUIRED.
4. IF SOURCE IS AERIAL, RIGID P.V.C. OR STEEL IS REQUIRED FROM TERMINAL POLE TO THE BOTTOM OF THE TRENCH AT THE POLE.
5. CONTACT CITY ELECTRICAL DIVISION FOR LOCATION OF CONDUIT ON CITY POLE (FOR ITEM 4).
6. TOTAL BENDS FROM POINT (A) TO POINT (C) MUST NOT EXCEED 135° AND HAVE MINIMUM RADIUS OF 300mm (12").
7. FROM POINT (A) TO POINT (C) AND BEYOND, THE INSTALLATION MUST COMPLY WITH C.S.A. STANDARDS AND BE APPROVED BY THE LOCAL INSPECTOR.
8. CUSTOMER TO SUPPLY SERVICE CONDUCTORS FROM POINT (A) TO POINT (C).
9. FOR SERVICES OVER 200 AMPS, CONTACT CITY ELECTRICAL DIVISION.
10. RE: DETAIL ① SERVICE ENTRANCE CONDUIT AND METER BASE MAY BE FLUSH MOUNTED IF CONSTRUCTION PERMITS.
11. THE CITY WILL MAKE THE ELECTRICAL CONNECTION TO ITS DISTRIBUTION SYSTEM.





STANDARD DETAIL DRAWINGS



ITEM#	QTY	STOCK#	DESCRIPTION
1	1	20-05-026	POLE,STEEL,CLASS 3-SX,45 FT.
2	1	02-17-700	INSULATOR,BRACKET,1-PHASE
3	1	02-20-200	INSULATOR,PIN-TYPE,LOW VOLTAGE,CEMA CLASS 55-4
4	2	02-23-027	BOLT,MACHINE,GALV.,5/8X8 IN.
5	3	01-07-125	WASHER,FLAT,PLATED,5/8 IN. BOLT SIZE
6	3	01-07-150	WASHER,LOCK,PLATED,5/8 IN. BOLT SIZE
7	2	02-23-018	BOLT,MACHINE,GALV.,5/8X10 IN.
8	1	02-20-320	INSULATOR,SECONDARY SPOOL,WHITE
9	1	02-24-335	RACK,SECONDARY HEAVY DUTY,8 IN. SPACING,3 WIRE
10	2	02-20-330	INSULATOR,SECONDARY SPOOL,BROWN OR GREY
11	1	AS REQ'D	TIE,URBAN,PREFORMED

Final connection to be done by City of Penticton Electrical Division.

Contractors to provide an adequate amount of secondary conductor.

City of Penticton Electrical Utility will install final section of conduit & weatherhead (both supplied by contractor).

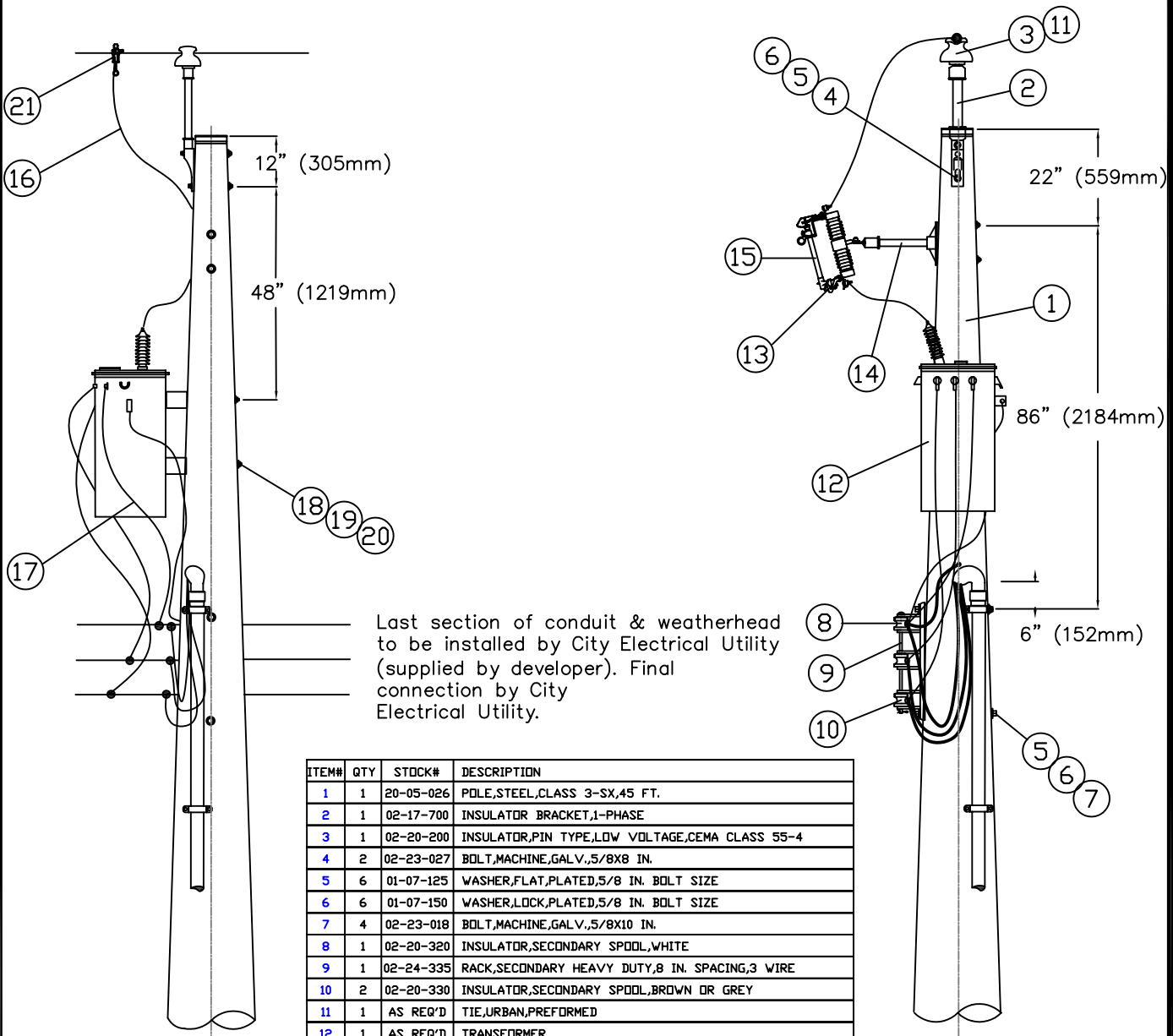
All work to be done as per Canadian Electrical Code.

Notes:

1. Contact City Electrical Division for location, size & number of conduits on pole.
2. Conduits to be located away from traffic wherever possible.
3. Telus & Shaw conduits to be installed as per U-Q-1.



STANDARD DETAIL DRAWINGS



Last section of conduit & weatherhead to be installed by City Electrical Utility (supplied by developer). Final connection by City Electrical Utility.

ITEM#	QTY	STOCK#	DESCRIPTION
1	1	20-05-026	POLE,STEEL,CLASS 3-SX,45 FT.
2	1	02-17-700	INSULATOR BRACKET,1-PHASE
3	1	02-20-200	INSULATOR,PIN TYPE,LOW VOLTAGE,CEMA CLASS 55-4
4	2	02-23-027	BOLT,MACHINE,GALV.,5/8X8 IN.
5	6	01-07-125	WASHER,FLAT,PLATED,5/8 IN. BOLT SIZE
6	6	01-07-150	WASHER,LOCK,PLATED,5/8 IN. BOLT SIZE
7	4	02-23-018	BOLT,MACHINE,GALV.,5/8X10 IN.
8	1	02-20-320	INSULATOR,SECONDARY SPOOL,WHITE
9	1	02-24-335	RACK,SECONDARY HEAVY DUTY,8 IN. SPACING,3 WIRE
10	2	02-20-330	INSULATOR,SECONDARY SPOOL,BROWN OR GREY
11	1	AS REQ'D	TIE,URBAN,PREFORMED
12	1	AS REQ'D	TRANSFORMER
13	1	02-24-050	CUTOUT,100 AMP,12000 AMP INTERRUPTING,27KV
14	1	02-17-850	BRACKET,CUTOUT & ARRESTER,1 PHASE
15	1	AS REQ'D	FUSE LINK
16	2	AS REQ'D	WIRE,COPPER,POLY COVERED FOR RISERS
17	1	03-00-005	WIRE,COPPER,POLY COVERED FOR NEUTRAL
18	2	02-23-022	BOLT,MACHINE,GALV.,3/4X10 IN.
19	2	01-07-152	WASHER,FLAT,PLATED,3/4 IN. BOLT SIZE
20	2	01-07-155	WASHER,LOCK,PLATED,3/4 IN. BOLT SIZE
21	1	AS REQ'D	CLAMP,HOT LINE

Notes:
 1. Contact City Electric Utility for location of conduits on pole.
 2. Conduits to be located away from traffic wherever possible.
 3. All work & material as per the Canadian Electrical Code.

2004

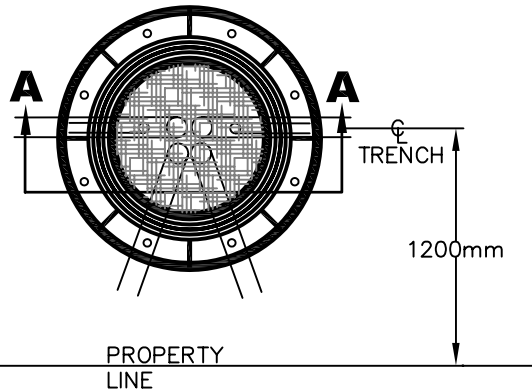
1 PHASE TAP WITH U/G DIP SERVICE

APPROVED
 NOVEMBER, 2004

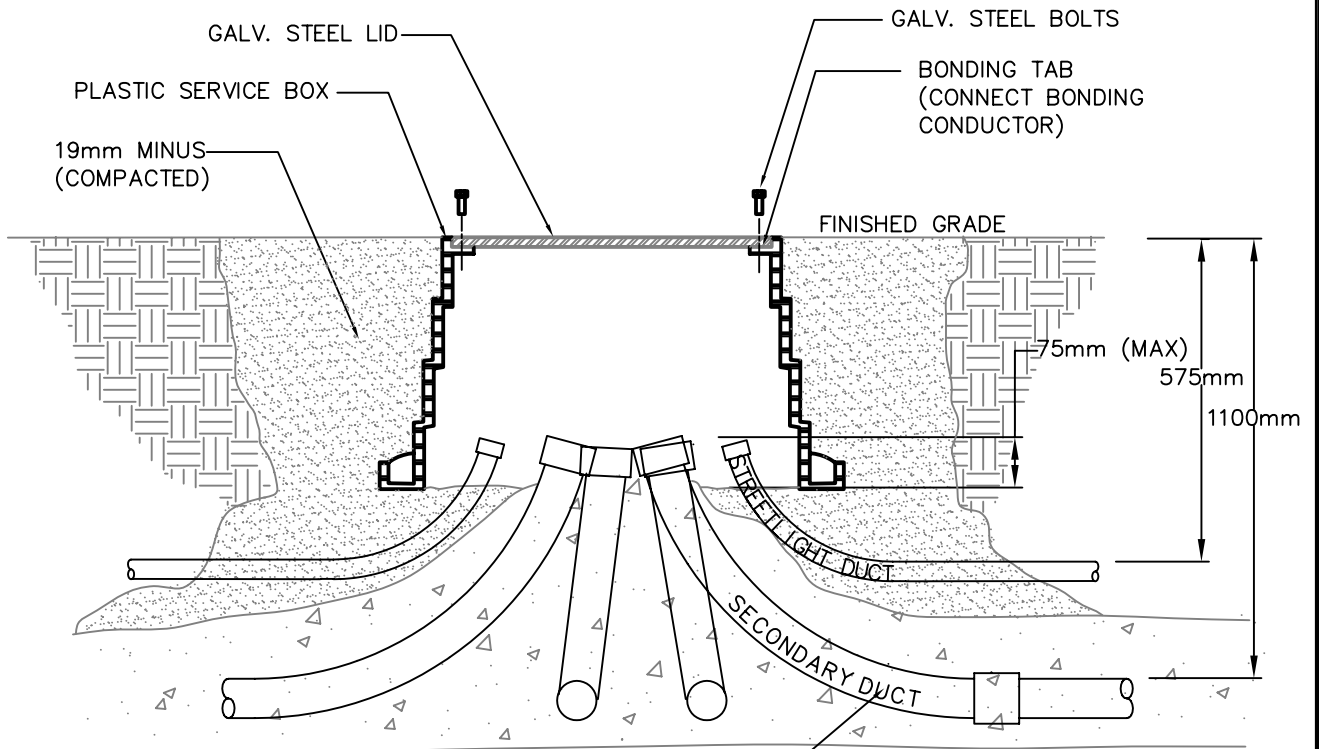
DRAWING NUMBER:
 U-X-6



STANDARD DETAIL DRAWINGS



PLAN VIEW



X-SECTION A - A

NOTES

1. INSTALL GALV. STEEL LID ON PLASTIC JUNCTION BOX PRIOR TO BACKFILLING, TAMPING AND PAVING OPERATIONS.
2. INSTALL TOP OF SERVICE BOX FLUSH WITH FINISHED GRADE.
3. ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE NOTED.
4. STREETLIGHT DUCT IS NOT CONCRETE ENCASED.

2004

SERVICE BOX INSTALLATION DETAIL

APPROVED

NOVEMBER, 2004

DRAWING NUMBER:

U-X-7

1.0 GENERAL

- 1.1 Works provided pursuant to this bylaw shall be in accordance with the Master Municipal Construction Document, Volume II, dated April 2000, which is filed in the Municipal Clerk's office, and which is hereby incorporated by reference into this bylaw.
- 1.2 For the purposes of this bylaw, strike the word "Contractor" in the Master Municipal Construction Document, and replace it with the word "Developer".
- 1.3 For purposes of this bylaw, delete the Measurement and Payment subsection in each section of the Master Municipal Construction Document. It is not the intent of the City to govern the relationship between a Developer and a Contractor.

2.0 SUPPLEMENTS TO THE MMCD

- 2.1 These Supplementary Specifications amend, add to, delete or govern over the Master Municipal Construction Document, Volume II, dated April 2000.
- 2.2 Section numbers in the City of Penticton supplement coincide with those of the Master Municipal Specifications.
- 2.3 Please refer to Table 2.3 for a detailed list of the supplemental information.

Table 2.3 – Supplements to the MMCD

SECTION	SUB SECTION	TITLE	SUPPLEMENTARY SPECIFICATION
01535 - TEMPORARY FACILITIES	1.2	Installation & Removal	Add Clause 1.2.3 which reads: "Manhole insert blocks shall be placed in all manholes prior to any roadworks and removed immediately following hot-mix paving. The 19 mm plywood half circles are to be placed on top of the benching to prevent debris from entering or plugging any pipe lines."
01570 - TRAFFIC REGULATION	1.0	General	Add Clause 1.0.5 which reads: "The Contractor shall be responsible for protecting and/or removing and returning to City Yards, all existing street name or traffic signs. Damage to existing signing will result in replacement costs being invoiced to the Contractor. The Contractor shall notify the City, in writing, of any existing damage to these items prior to start of work." Add Clause 1.0.6 which reads: "The City will be responsible for the replacement of existing or the installation of all new street name, or traffic signs. The cost of supply and installation of traffic and street identification signs will be borne by the Developer."
02223 – EXCAVATING, TRENCHING AND BACKFILLING	1.7	Disposal	Add Clause 1.7.2 which reads: "The Contractor shall be responsible for disposing off-site any excess or rejected excavated material. The Contractor shall supply the City with the location of any site to be utilized within the City limits."
	3.3	Excavation	Add Clause 3.3.13 which reads: "Watermain Crossings: Where any trench excavation undermines an existing non-p.v.c. watermain the exposed main, for the full width of trench plus 300 mm both sides, shall be replaced."
	3.5	Backfill and Compaction	Add Clause 3.5.3.1.2 which reads: "Backfill Materials: It is intended to use native material for backfill where suitable. If, in the opinion of the City Engineer, portions of the native material are unsuitable for backfill, he may direct the

			Developer to dispose of the native fill and import granular fill in the trench. Subsections .1-.5 still apply."
02233 – GRANULAR BASE	1.3	Samples	Add Clause 1.3.2 which reads: "Testing of existing native subgrade is required. 75 mm subgrade gravel requires soils / sieve analysis and proctor density at the start of the project and prior to placement of 19 mm base gravel. The compaction density test is required per every 500 square metres."
02244 – GRANULAR SUBBASE	1.3	Samples	Add Clause 1.3.2 which reads: "Testing of 19 mm gravel base material for road is required. It requires soils / sieve analysis and proctor density at the start of the project. Compaction tests are required per every 100 lineal metres of curbs or sidewalks and one for every 500 square metres of road base. Test results are to be reported to the City Engineer prior to placement of concrete or asphalt."
02515 – UNIT PAVING	2.1	Materials	Delete Clause 2.1.5 and replace with: "The colour, pattern and dimensions should be as shown on the approved engineered drawings."
02523 – CONCRETE WALKS, CURBS AND GUTTERS	3.7	Driveway Crossings and Wheel Chair Ramps	Add Clause 3.7.2 which reads: "Where access must be maintained for tourist, commercial, institutional, or any businesses, the concrete curb drops and cross-over aprons must be poured in two sections if an alternate access is not possible. No drops in curbs or sidewalks are permitted for driveways except where barrier curb and gutter is installed, and for wheelchair ramps at all intersections."
02580 – PAINTED PAVEMENT MARKINGS	1.0	General	Add Clause 1.0.2 which reads: "All centre line and pavement markings will be undertaken by the City and paid for by the Developer."
02666 - WATERWORKS	2.1	General	Add Clause 2.1.2 which reads: "A list of pre-approved products for use in the City of Penticton is provided as part of these supplementary specifications. Please refer to Section 3.0 of this schedule."
	2.2	Mainline Pipe, Joints and Fittings	Add Clause 2.2.2.3 which reads: "Joints to be minimized by use of full length pipes. Short lengths extensions with intermittent couplings or clamps are not permitted."
	2.3	Valves and Valve Boxes	Delete "300 mm from property line" and replace with "1.7 m from property line" through entire section.
	2.5	Service Connections, Pipe, Joints and Fittings	Delete from Clause 2.5.1: "Polyethylene to AWWA C901, Pressure Class 160 tubing certified to CSA B137.1 or". Delete from Clause 2.5.5: "flared or".
	2.6	Hydrants	Delete Clause 2.6.1.6.3 and replace with "Hydrant ports must be supplied with a Storz Pumper Nozzle Connection." Delete Clause 2.6.2 and replace with "Hydrants will be painted by the City and the cost borne by the Developer."
	2.7	Underground Service Line Valves and Fittings	Add to Clause 2.7.3.2: "Gate valves only permitted." Delete Clause 2.7.3.5 Delete "75 mm" from Clause 2.7.4 and replace with "37 mm".
	3.3	Trenching	Delete "1.0 m" from Clause 3.3.3 and replace with "1.5 m".
	3.6	Pipe Installation	Add Clause 3.6.11 which reads: "Where existing water services conflict with a new main installation and the copper service must be cut, the Contractor shall supply the pipe and fittings to make the necessary repairs. The intent of this item is to allow for the continual laying of new mains. Repairs must be done utilizing compression fittings for copper service

			lines.”
	3.10	Service Connection Installations	Delete Clause 3.10.10 Delete “50 mm” from Clause 3.10.11 and replace with “25 mm”.
	3.12	Hydrants	Delete Clause 3.12.4
	3.13	Thrust Blocks	Delete Clause 3.13.6
	3.19	Testing Procedure	Amend Clause 3.19.2 to say the minimum test pressure is “1724 Kpa (250 p.s.i)”.
02721 – STORM SEWERS	2.0	Products	Add Clause 2.0.1 which reads: “A list of pre-approved products for use in the City of Penticton is provided as part of these supplementary specifications. Please refer to Section 3.0 of this schedule.”
	2.1	Concrete Pipe	Delete “900 mm” in Clause 2.1.1 and replace with “675 mm”. Add Clause 2.1.1.1 which reads: “Pipe 675 mm in diameter and smaller to be P.V.C.”
	3.12	Video Inspection	Add Clause 3.12.1.1 which reads: “Storm sewers must be video inspected following completion of flushing and prior to paving.” Add Clause 3.12.4 which reads: “Video inspection typewritten report to include 35 mm still colour photos at 20 m intervals or each service location plus any deficient or irregular item identifiable.” Add Clause 3.12.5 which reads: “Video tapes shall be full colour VHS format (500 line resolution) to define chainage location of any leak, crack, debris, flow obstruction or any other observation of significance.”
02725 – MANHOLES AND CATCHBASINS	2.1	Materials	Delete “150 mm diameter” and replace with “250 mm diameter” in Clause 2.1.11 Add Clause 2.1.16.1 which reads: “Steel riser rings welded to the top of existing manhole frames is not permitted.”
	3.3	Manhole Installation	Delete “25 mm” and replace with “19 mm” in Clause 3.3.3 Add Clause 3.3.9.1 which reads: “ ‘Conseal’ continuous joint sealer is permitted.”
02731 – SANITARY SEWERS	2.0	Products	Add Clause 2.0.1 which reads: “A list of pre-approved products for use in the City of Penticton is provided as part of these supplementary specifications. Please refer to Section 3.0 of this schedule.”
	2.1	Concrete Pipe	Delete “900 mm” in Clause 2.1.1 and replace with “675 mm”. Add Clause 2.1.1.1 which reads: “Pipe 675 mm in diameter and smaller to be P.V.C.”
	3.18	Video Inspection	Add Clause 3.12.1.1 which reads: “Sanitary sewers must be video inspected following completion of flushing and prior to paving.” Add Clause 3.12.4 which reads: “Video inspection typewritten report to include 35 mm still colour photos at 20 m intervals or each service location plus any deficient or irregular item identifiable.” Add Clause 3.12.5 which reads: “Video tapes shall be full colour VHS format (500 line resolution) to define chainage

			location of any leak, crack, debris, flow obstruction or any other observation of significance."
15465 – INTEGRATED SURVEY MONUMENTS	1.0	General	New Section. Add Clause 1.0.1 which reads: "The City of Penticton was constituted as Integrated Survey Area No. 12 on by Order in Council No. 782-73. It is the responsibility of the City to ensure the integrity of the Integrated Survey System by maintaining the monuments in the proper condition and density and installing new monuments to provide adequate coverage of new developments and boundary expansions."
	2.0	Density of Monuments	New Section. Add Clause 2.0.1 which reads: "The required density of control monuments in urban areas according to Section 3.01 of the Official Survey Act is every 2 blocks or 500 meters, whichever is less. Each monument must be inter-visible with at least one other monument. The demand for inter-visibility will at times require higher density than the above."
	3.0	Type of Monuments	New Section. Add Clause 3.0.1 which reads: "The monuments shall be installed by the Applicant under the supervision of the City or a BC Land Surveyor. They shall be set in a sidewalk, concrete curb or set under the road surface. Other types shall be approved by the City."
	4.0	City Administration	New Section. Add Clause 4.0.1 which reads: "The quantity, location, density and type of control monuments will be determined by the City or his representative in accordance with the Official Survey Act."
	5.0	BC Land Surveyor's Involvement	New Section. Add Clause 5.0.1 which reads: "The monuments shall be tied to the Integrated Survey Network by a registered BC Land Surveyor in accordance with specific instructions from the Surveyor General of BC."
	6.0	Removal and Replacement	New Section. Add Clause 6.0.1 which reads: "If the approved design of the works requires the removal of an existing control monument, the cost of replacement and survey of the monument will be the responsibility of the Developer."
	7.0	Final Approval	New Section. Add Clause 7.0.1 which reads: "Prior to final approval of the works, all control monuments are to be in place and tied to the Integrated Survey Network to the satisfaction of the Survey General of the Province of BC."
	8.0	Costs	New Section. Add Clause 8.0.1 which reads: "All costs incurred installing and surveying of the Integrated Survey Monuments for the subdivision or damage to existing, during construction will be borne by the Developer."
16550 - ELECTRICAL	1.0.2	General	Add Clause 1.0.2 which reads: "The work to be carried out under this item includes the clearing of rights-of-way, excavation, supply, delivery, and installation of transformer pads, primary vaults, primary and secondary electrical ducts, duct spacers, secondary wire, street light bases, standards, and luminaires, services boxes, and other items necessary to the underground distribution system."
	1.0.3		Add Clause 1.0.3 which reads: "Backfilling of the electrical works and clean up, including sloping to finished grade as specified in the standard drawings or approved engineered drawings."
	1.0.4		Add Clause 1.0.4 which reads: "The work does not include the supply and installation of transformers, primary cable, cable terminations, and secondary service connections."
	2.1.6	Products	Add Clause 2.1.6 which reads: "All materials necessary and

		incidental to the installation of the electrical system except transformers, primary cable, cable terminations, and secondary service connections shall be supplied by the developer."
2.1.7		Add Clause 2.1.7 which reads: "Materials used in the execution of the work shall be a new first-grade product of a reputable manufacturer."
2.1.8		Add Clause 2.1.8 which reads: "Installations shall be in accordance with the current edition of the Canadian Electrical Code, B.C. Amendments, and these specifications. (Where the requirements of these specifications exceed those of the Canadian Electrical Code, these specifications shall apply.)"
2.2	Conduit / Duct	Add Clause 2.2 which reads: "All underground conduit for primary and secondary conductors shall be Type II PVC concrete encased. Conduit for streetlights shall be Rigid PVC."
2.3	Conduit / Duct Spacers	Add Clause 2.3 which reads: "Manufactured type PVC conduit spacers installed to proper tolerances as per Supplemental Standard Detail Drawing U-D-1."
2.4	Secondary Wire	Add Clause 2.4 which reads: "Secondary wire shall be type RW90-40C, sized and installed in accordance with the City approved design drawings. Secondary wire to include a #4 AWG stranded Type RW90-40C Green (ground) wire installed throughout the secondary duct from the associated padmount transformer."
2.5.1	Street Lighting	Add Clause 2.5.1 which reads: "Luminaires, standards, distribution bases, and pedestals shall be supplied and installed as detailed on the standard drawings."
2.5.2		Add Clause 2.5.2 which reads: "Street light wiring shall consist of 3 stranded conductors, 1 black or red (hot), 1 white (neutral), #12 RW90-40C insulation and 1 green (bond) #12 RW90-40C insulation sized in accordance with the MMCD Standard Detail Drawing E8.11 and as per Supplemental Standard Detail Drawing U-L-8."
2.6	Concrete	Add Clause 2.6 which reads: "Duct encasement shall be 15 mpa minimum."
2.7	Service Boxes	Add Clause 2.7 which reads: "Service boxes shall be a round type as per Supplementary Standard Detail Drawing U-X-7 with bolt down heavy duty steel galvanized cover or approved equivalent."
3.23.1	Line & Grade	Add Clause 3.23.1 which reads: "The Contractor will set all stakes or other marks on an offset for the line and grade of the various conduits to be installed."
3.23.2		Add Clause 3.23.2 which reads: "All elevations shown or referred to on the drawings should be geodetic."
3.23.3		Add Clause 3.23.2 which reads: "All conduit installed must be graded so that water does not lie in the pipe."
3.24	Clearing & Grubbing	Add Clause 3.23.4 which reads: "The Contractor shall carry out and be responsible for whatever clearing and rough grading that is considered necessary to install the electrical system to finished grade."
3.25.1	Excavation & Backfill	Add Clause 3.25.1 which reads: "Trenches shall be excavated to a true line and duct to be installed to the depth required as per Supplementary Standard Detail Drawing U-D-1."
3.25.2		Add Clause 3.25.2 which reads: "Care shall be exercised to avoid disturbing or softening the trench bottom below the required subgrade and any such disturbed, softened or

		loosened material shall be removed and replaced with an approved 19 mm crushed gravel thoroughly compacted."
3.25.3		Add Clause 3.25.3 which reads: "When the bottom of the excavated trench at subgrade is unstable, and cannot adequately support the conduit, the Contractor will be instructed to further excavate and/or widen the excavation and refill the trench with thoroughly compacted 19 mm crushed minus gravel to subgrade."
3.25.4		Add Clause 3.25.4 which reads: "The trench width shall be such that there will be a clear space of at least 75 mm between the trench wall and the outside of the conduit when laid in its required position."
3.25.5		Add Clause 3.25.5 which reads: "The excavated material not approved for backfill shall be loaded directly from the trenching machinery into trucks, and disposed of off-site."
3.25.6		Add Clause 3.25.6 which reads: "When trenching along or across a paved surface, the pavement cut and removal shall not be greater than the normal width of the trench plus 150 mm on either side."
3.25.7		Add Clause 3.25.7 which reads: "When excavating for house connections it will be permissible to neatly pile the excavated material at one side of the trench. All such trenches must be backfilled the same day."
3.25.8		Add Clause 3.25.8 which reads: "The trench shall be kept free of ground water and no such water shall be allowed to enter the duct."
3.26.1	Conduit / Duct Laying	Add Clause 3.26.1 which reads: "Before a conduit is laid, the trench bottom shall be free of all loose material."
3.26.2		Add Clause 3.26.2 which reads: "Conduits shall be laid to designed lines and grades using conduit spacers at maximum intervals of 2 m to maintain proper tolerance as per Supplemental Standard Detail Drawing U-D-1."
3.26.3		Add Clause 3.26.3 which reads: "The conduit and accessories shall be inspected for defects prior to lowering into the trench. Any defective, damaged or unsound conduit or accessory shall be replaced."
3.26.4		Add Clause 3.26.4 which reads: "All foreign matter or dirt shall be removed from the interior of the conduit before lowering into position in the trench."
3.26.5		Add Clause 3.26.5 which reads: "The interior of the conduit shall be kept clean during and after laying. Open ends of installed conduit shall be properly capped or plugged when laying is not in progress or on completion of work."
3.26.6		Add Clause 3.26.6 which reads: "Conduit integrity must be proven by successfully pulling a same sized mandrel through the conduit in the presence of the City Inspector or Electrical Utility employee."
3.26.7		Add Clause 3.26.2 which reads: "A plastic binder twine or other type of pull string approved by the City shall be installed in all empty conduits."
3.27.1	Backfilling / Approvals	Add Clause 3.27.1 which reads: "No backfilling of pouring of concrete encasement shall be done until the City Inspector has inspected conduits within the trenches and given the Contractor permission to backfill."
3.27.2		Add Clause 3.27.2 which reads: "When the conduit joining has been completed it shall be encased in a 75 mm concrete envelope, i.e., the thickness of the concrete from the outside of the conduit to the outside of the concrete shall be a

		minimum of 75 mm. Leftover concrete must be disposed of off-site and not dumped in the trench."
3.27.3		Add Clause 3.27.3 which reads: "Place backfill as per Supplemental Standard Detail Drawing U-D-1."
3.27.4		Add Clause 3.27.4 which reads: "For construction within right-of-ways which are controlled by the Provincial Government, the backfilling and road restoration shall be in accordance with the Provincial Ministry of Transportation specifications."
3.27.5		Add Clause 3.27.5 which reads: "No frozen material shall be used for backfill. If frost or snow gets into the floor or walls of the trench, it shall be removed before backfilling."
3.28.1	Service Boxes, Transformer Pads, Padmount switchgear Kiosks, Primary Vaults, and Grounding	Add Clause 3.28.1 which reads: "Service boxes shall be installed level with the proposed finished grade elevations as shown on the contract drawings and installed as shown on Supplemental Standard Detail Drawings U-X-1 and UX-7."
3.28.2		Add Clause 3.28.2 which reads: "Transformer pads shall be located at property line as shown on Supplemental Standard Detail Drawings U-V1-1 and U-V3-1 or at a location approved by the City of Penticton Electrical Utility."
3.28.3		Add Clause 3.28.3 which reads: "Primary vaults and switchgear kiosks to be installed at a location approved by the City Electrical Utility and installed according to Supplemental Standard Detail Drawings U-K-1, U-K-1A, U-J1-1 and U-J3-1."
3.28.4		Add Clause 3.28.4 which reads: "Ground grid to consist of 2 only 19 mm x 3 m ground rods, placed in accordance with Supplemental Standard Detail Drawings (M-K-1 and U-V3-1), joined with approved ground clamps to #2/0 AWG stranded copper ground wire forming a rectangular grid at a 1 m horizontal distance from the padmount switchgear, transformer, vaults metallic enclosure or lid on all 4 sides."
3.28.5		Add Clause 3.28.5 which reads: "A double #2/0 AWG stranded copper tail must be brought into the switchgear kiosk, transformer pad, or vault through the lifting holes of the pad or vault and extend a minimum of 2.0 m above the top of the kiosk, pad, or vault. If pre-cast lifting holes are not applicable, a hole is to be drilled 100 to 150 mm below finished grade to accommodate the double #2/0 AWG stranded copper tails feeding into kiosk, pad or vault."
3.28.6		Add Clause 3.28.6 which reads: "Grid burial should be minimum 100 mm to maximum 150 mm below finished grade."
3.29.1	Service Connection Conduits / Ducts	Add Clause 3.29.1 which reads: "All service connection conduits to lots shall be installed as shown on Supplemental Standard Detail Drawing U-X-3."
3.29.2		Add Clause 3.29.2 which reads: "Work on private property, untravelled public roads, easements, rights-of-way, etc. will be finished to the original condition of the property."
3.30.1	Conductors & Connections	Add Clause 3.30.1 which reads: "All secondary conductors pulled into transformer pads to extend a minimum of 2.0 m above the top of the pad."
3.30.2		Add Clause 3.30.2 which reads: "All primary and secondary wire and cable connections up to and including 750 mcm

		compressed conductors shall be supplied and installed by the City of Penticton's Electrical Utility at the developer/contractor's expense."
3.31.1	Metering Transformer Installations (For Services Greater Than 200 Amperes)	Add Clause 3.31.1 which reads: "The location of the meter cabinet to be approved by General Manager, Electric Utility."
3.31.2		Add Clause 3.31.2 which reads: The height of the meter cabinet is to be 1830 mm to center of cabinet from finished grade or floor as per Supplemental Standard Detail Drawing M-C-1."
3.31.3		Add Clause 3.31.2 which reads: "Plywood (3/4") supplied by City of Penticton to be installed by Contractor in meter cabinet."
3.31.3		Add Clause 3.31.3 which reads: "Conduit Size:"
3.31.3.1		Add Clause 3.31.3.1 which reads: "Single Phase – 25 mm (1") EMT."
3.31.3.2		Add Clause 3.31.3.2 which reads: "Poly Phase - 32mm (1 ¼") EMT."
3.31.4		Add Clause 3.31.4 which reads: "Conduit to enter bottom of cabinet 25 - 50 mm from either side when pipe is run on exterior of wall. If pipe comes through the wall it may enter back wall of meter cabinet between 25 – 50 mm from bottom of cabinet and 25 - 50 mm from side wall as per Supplemental Standard Detail Drawing M-C-1."
3.31.5		Add Clause 3.31.5 which reads: "An additional 19 mm (3/4" EMT) conduit may be required between the C.T. cabinet and main switch if access to main switch is not readily accessible through the C.T. cabinet."
3.31.6		Add Clause 3.31.6 which reads: "On a Three Phase installation polarity marks on current transformer must face the "line" side of the conductors."
3.31.7		Add Clause 3.31.7 which reads: "On a Single Phase installation the polarity mark must face the "line" side of the red leg."
3.32.1	Inspection, Testing and Acceptance	Add Clause 3.32.1 which reads: "The installation of electrical services requires notification to the City Electrical Utility for the following inspections:"
3.32.1.1		Add Clause 3.32.1.1 which reads: "Underground conduits, spacers and bedding materials before placement of concrete, and primary vaults, transformer pads, distribution bases, etc."
3.32.1.2		Add Clause 3.32.1.2 which reads: "After concrete has been placed and before backfilling."
3.32.1.3		Add Clause 3.32.1.3 which reads: "Concrete works forms for pilasters or other."
3.32.2		Add Clause 3.32.2 which reads: "The City will confirm both quality of materials and workmanship to see that they meet City Specifications."
3.32.3		Add Clause 3.32.3 which reads: "The Contractor must give 24 hours notification to City Electrical Utility (Phone 490-2535) of any proposed work."
3.32.4		Add Clause 3.32.4 which reads: "Failure to give notification of intended work may result in complete removal of work."
3.33.1	Ministry of Women's and Aboriginal	Add Clause 3.33.1 which reads: "The regulations require that the installation of underground raceway be performed by an electrical contractor who holds a certificate of Competency

		Affairs Electrical Safety Branch (Circular B03/87)	valid for the characteristics of the circuits which are to be drawn into the raceway and that the work be under the appropriate electrical permit."
	3.33.2		Add Clause 3.33.2 which reads: "A person or contractor who wishes to perform this type of installation but does not hold a valid certification of competency of the required grade may make application for a "Special Certificate" for the installation of underground raceway."

3.0 PRE-APPROVED MATERIALS AND PRODUCTS

3.1 Please refer to Table 3.1 for a list of pre-approved materials and products for use within the City of Penticton.

Table 3.1 – Approved Materials and Products

LIST OF APPROVED MATERIALS & PRODUCTS				
SECTION	SUB-SECTION	ITEM	APPROVED PRODUCT	COMMENTS
2666 - Waterworks	2.2.3	Fittings	Bibby Terminal City	All Cast or Ductile Iron
	2.2.10	Couplings Saddles	Viking Johnson Canadian Pacific Smith Blair Robar	Stainless Steel
	2.3.2	Mainline Gate Valves	Canada Valve Clow Bibby	All direct bury mainline valves resilient seal or solid wedge
	2.3.3	Butterfly Valves	Mueller Centre Line	Butterfly valves to be approved by Engineer
	2.3.5	Air and Vacuum Release Valve	Apco Valmatic	End flange to ANSI A21.10
	2.3.6	Mainline Valve Box	Dobney Robar	Cover marked "Water"
	2.3.7	Service Valve Box	Mueller, Ford, Cambridge Trojan	
	2.4.18	Valve Chamber Frames and Cover	Dobney	Cover marked "Water"
	2.5.1	Services	Type K. Copper	All Services
	2.6.1	Hydrants	Terminal City Canada Valve Clow Mueller	Storz Nozzle Port
	2.7.2	Corporation Stops	Mueller, Ford, Cambridge	All Brass 19mm/50mm
	2.7.3	Curb Stops	Mueller, Ford, Cambridge	All Brass 19mm/50mm

2721 - Storm Sewers	2.3.1	PVC Ribbed Pipe	Extruded Seamless Ultra rib	Ribs at right angles 90° to pipe access
02725 - Manholes	2.1.7	Frame & Cover		Frame and Cover
	2.1.17	Concrete Bricks	Not Permitted	
	2.1.22	Pre-benched Manhole Bases	Pipe Rubber "O" Rings Within Pre-cast Base	Integral Rubber Gaskets within Base
2731 - Sanitary Sewers	2.2.1	PVC Ribbed Pipe	Extruded Seamless Ultra Rib	Ribs at right angles 90° to pipe access

END OF SECTION