Supplemental Specifications and Detail Drawings

2021

City of Burnaby

Engineering Department

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Supplementary Specifications

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This Contract uses the Supplementary Specifications and Detail Drawings prepared by the City of Burnaby that are based on MMCD 2019 Edition Standard Documents. The Professional of Record's Seal applies to Sections of the Specifications and Standard Payment Clauses that are specific to the project. These sections, if any, are identified in **shaded text.**

Supplementary Specifications

MMCD Section 01 55 00 Traffic Control, Vehicle Access and Parking

1.0 GENERAL

Delete 1.0.6 and Replace with

1.0.6 .1 Provide temporary traffic control on all affected streets meeting all the standards and conditions of the Owner's Traffic Department.

.2 A Lane Closure Request application with a computer drafted Traffic Management Plan for each street shall be submitted to the Owner's Traffic Services a minimum of ten (10) Days prior the commencement of work for review. No work that affects traffic will be permitted until written acceptance is provided by the Owner. Update the application and Traffic Management Plan as required for re-submission.

.3 Approved Lane Closure Requests are circulated through the Owner's Engineering Department and to all emergency services. Co-ordinate with, and follow the conditions of the local Transit Supervisor.

.4 Contractor responsible for all costs and fees required for obtaining and maintain Traffic Permits

END OF SECTION

MMCD Section 03 30 20 Concrete Walks, Curbs and Gutters

1.0 GENERAL

1.5	**Inspection and Testing**	Add 1.5.2	1.5.2	One (1) compressive strength test (3 field-cured cylinders to CSA A23.2) shall be made for each 150 square meters of concrete work. In no case, however, shall there be less than one (1) strength test for concrete placed in one (1) day. The Contractor is to protect cylinders on Site for minimum forty eight (48) hours after which they can be sent to laboratory. One (1) cylinder shall be tested at seven (7) days, two (2) cylinders shall be tested at twenty eight (28) days.
		Add 1.5.3	1.5.3	In addition to field cured cylinders, one (1) compressive strength test (3 laboratory cured cylinders to CSA A23.2) shall be made for each 300 square metres of concrete work.

3.0 EXECUTION

3.17	**Acceptance**	Add 3.17.5	3.17.5	Concrete not meeting the minimum compressive strength criteria shall be rejected and must be removed And replaced at the Contractor's expense.

END OF SECTION

MMCD Section 03 30 53 Cast-In-Place Concrete

1.0	**GENERAL**	Append to 1.0.1		Street light and traffic signal bases, controller bases, concrete junction bases and concrete vaults.
1.1	**Related Work**	Add 1.1.10	1.1.10	Roadway Lighting Section 26 56 01.
		Add 1.1.11	1.1.11	Traffic Signals Section 34 41 13.

END OF SECTION

MMCD Section 26 56 01 Roadway Lighting

3.0 EXECUTION

3.1	**General**	Add 3.1.5	3.1.5	For tie-into or upgrading an existing installation, maintain the existing lighting system during hours of darkness.
3.3	**Concrete Bases**	Delete 3.3.6 and Replace with	3.3.6	Remove and dispose excavated material, backfill with granular base material. Compact around bases in layers not exceeding 300 mm to 95% Modified Proctor density.
3.5	**Underground Conduit**	Delete 3.5.1 and Replace with	3.5.1	Install RPVC underground conduits by excavating, trenching, and backfilling as shown on Supplementary Detail Drawing BBY-E102 unless shown otherwise on the Contract Drawings. For installing street light conduits in boulevards, hoe hog / ploughing methods may be used.
		Delete 3.5.2 and Replace with	3.5.2	Minimum cover over conduits to be 600 mm in boulevard areas and 900 mm for conduits in roadways.
		Delete 3.5.3 and Replace with	3.5.3	Place trench marker tape 300 mm above conduits when installing by excavating, trenching, and backfilling.
		Delete 3.5.4 and Replace with	3.5.4	Where specified on the Contract Drawings, install conduits under roadways to the alignment and elevations specified using fully directional drilling equipment. For street light conduits, tunnel/auger/drill conduits under roadways, lanes, driveways, or other specified locations.
3.7	**Electrical**	Add 3.7.3	3.7.3	Ballast circuits for HPS and MV luminaires to be constant wattage isolated (CWI).

3.8	**Wiring**	Delete 3.8.3 and Replace wit	3.8.3	Make conductor splices in pole hand holds or in junction boxes.
		Delete 3.8.11 and Replace with	3.8.11	Bond all luminaires, receptacles, steel junction box lids and vault lids with a No. 12 RW90 conductor or sized as shown on Supplementary Detail Drawing BBY-E116.
3.10	**Luminaires and Photocells**	Add 3.10.4	3.10.4	Double door for Cobra head roadway luminaires not required.
		Add 3.10.5	3.10.5	Pedestrian/ decorative luminaires to be as specified on the Contract Drawings.
		Add 3.10.6	3.10.6	Luminaire voltage, wattage and distribution type to be as specified on the Contract Drawings.
		Add 3.10.7	3.10.7	Confirm service voltage prior to ordering luminaires.

END OF SECTION

MMCD Section 26 56 02S **Conduit for Communication Network**

1.0 GENERAL

1.0.1 Section 26 56 02S refers to those portions of the Work that are unique to the supply and placement of conduit, junction boxes and splice vaults for communication network.

1.1 Related Work

1.1.1 Except as noted in this section, supply and installation requirements of Section 26 56 01 Roadway Lighting shall apply to conduit for communication network.

2.0 PRODUCTS

2.1 Rigid PVC Conduit (RPVC)

2.1.1 Conduit - DB2 Rigid polyvinyl chloride to CSA C22.2 No. 211.1.

2.1.2 Couplings, adaptors, bends and fittings - Rigid polyvinyl chloride to CSA C22.2 No. 85.

2.3.3 Cement – CSA certified as recommended by RPVC manufacturer.

2.2 Junction Boxes and Splice Vaults

2.2.1 Where approved by Contract Administrator, Precast Concrete Junction Box to CSA A23.4-16 with galvanized steel lid.

2.2.2 Composite or lightweight polymer concrete Junction Box to ANSI/SCTE-77 Tier 22, WUC 3.6, ASTM C857 A-16 with composite lid.

2.2.3 Splice vault 1520 mm x 1520 mm per Drawings.

2.2.4 Lids to be labeled with 100 mm high letters “COB COMM”.

3.0 EXECUTION

3.1 Underground Conduit

1.1.1 Install RPVC conduits in 100 mm sand surround with warning tape installed 300 mm below finished surface. Minimum cover 1070 mm in roadways. Minimum 900 mm depth for laterals.

3.2 Junction Boxes and Vaults

3.2.1 Install junction boxes and vaults on a 300 mm thick granular base of 19 mm crushed rock.

END OF SECTION

MMCD Section 31 05 17 Aggregates and Granular Materials

2.0 PRODUCTS

2.7	**Granular Pipe Bedding and Surround Material**	Delete 2.7.2		
		Add 2.7.4	2.7.4	Pipe bedding and surround material for poly-encased watermain to be clean, high electrical resistivity sand pipe bedding material (with less than 50 ppm chloride ions and less than 50 ppm sulfite ions), wash coarse natural or manufactured sand with 100% passing 6.00 mm sieve, 2.0% to 8.0% passing 0.150 mm sieve, and less than 5.0% passing 0.075 mm sieve.
2.9	**Crushed Granular Sub-base**	Replace the first line of 2.9.1 with:	2.9.1	To be 75 mm crushed rock (100% fractured with no natural fines or sands conforming to the following gradations:
2.10	**Granular Base**	Replace the first line of 2.10.1 with:	2.10.1	To be 19 mm crushed rock (100% fractured with no natural fines or sands conforming to the following gradations:
2.11	**Recycled Aggregate Material**	Add to 2.11.1		Recycled Concrete and Asphalt material may only be considered for Sidewalk and Multi-Use Pathway granular base and granular subbase. Do not use Recycled Concrete and Asphalt material where leachates could result in harm to environment.

END OF SECTION

MMCD Section 31 11 41 Shrub and Tree Preservation

3.0 EXECUTION

3.1	**Existing Trees**	Add 3.1.7	3.1.7	The Contractor is to arrange for an arborist approved by the Owner to determine construction and maintenance techniques when proposed work could disturb roots, trunks, or branches of existing trees.
3.3	**Lowering Grade Around Existing Trees**	Delete 3.3.2 and Replace with	3.3.2	If excavation through roots is required, excavate by hand or hydro vac and cut roots with sharp axe, tree lopper or saw. Seal cut edges 10 mm in diameter and larger with wound dressing.
3.4	**Pruning**	Delete 3.4.1 and Replace with	3.4.1	If required, selectively remove 1/3 of tree branches to reduce transpiration and compensate for dieback of roots in fill conditions and damage to root system in cut conditions.

END OF SECTION

MMCD Section 31 23 01 Excavating, Trenching and Backfilling

2.0 PRODUCTS

2.2	**Use of Specified Materials**	Delete 2.2.1 and Replace with	2.2.1	Backfill for over-excavated trench or structure excavations to be one of the following: .1 Type 1 granular pipe bedding and surround material; .2 Type 3 granular pipe bedding or Drain rock (only where approved by the Contract Administrator); .3 Concrete; .4 Controlled density fill.
2.2	**Use of Specified Materials**	Delete 2.2.3 and Replace with	2.2.3	Trench and excavation backfill to be one of the following: .1 Approved native material; .2 Pit run gravel; .3 Controlled density fill.

3.0 EXECUTION

3.1	**Site Preparation**	Add 3.1.5	3.1.5	Identify any survey monuments, iron pins and lead plugs that may be disturbed and arrange with the Owner's Survey Department five (5) Days prior to construction to reference locations before work commences.
		Add 3.1.6	3.1.6	Notify Owner's Survey Department within two (2) Days after construction is complete to initiate replacement of destroyed survey monuments, iron pins, and lead plugs.
3.3	**Excavation**	Delete 3.3.1.3 and Replace with	3.3.1	.3 Connections to existing sanitary and storm sewer systems to be made by Owner crews unless otherwise approved by the Owner.
		Delete 3.3.6 and Replace with	3.3.6	Hand excavation – excavate by hand if necessary to preserve or minimize damage to existing trees, shrubs, buildings and all similar existing features. If tree roots are encountered during excavation, Contractor to notify Owner's arborist for an inspection to determine if hand or vacuum truck excavation is required.

3.4	**Pipe Installation**	Modify 3.4.2	3.4.2		Delete reference to Standard Detail Drawing G6.
3.5	**Backfill and Compaction**	Add 3.5.4.4	3.5.4	.4	The frequency of density tests shall be one test per lesser of: .1 100 lineal metres of trench line per 300 mm layer; or .2 100 cubic metres of backfill material
3.6	**Surface Restoration**	Delete 3.6.6.5 and Replace with	3.6.6	.5	Maintain temporary patch to ensure safe and smooth conditions to the satisfaction of the Contract Administrator.
3.7	**Permanent Pavement Restoration**	Delete 3.6.7.1 and Replace with	3.6..7	.1	Unless otherwise approved by the Contract Administrator for climatic conditions, temporary patches to be removed within ninety (90) days and replaced with permanent patch, asphalt or concrete surface.

END OF SECTION

MMCD Section 31 24 13 Roadway Excavation, Embankment and Compaction

2.0 PRODUCTS

2.2	**Specified Materials**	Delete 2.2.1 and Replace with	2.2.1	Backfill for embankment fill (subgrade fill) to be: .1 Approved native or imported granular material; .2 Pit run gravel. .3 Recycled concrete and asphalt (RCA) where specified by Contract Administrator.

3.0 EXECUTION

3.5.7	**Compaction**	Add 3.5.7	3.5.7	The frequency of density tests shall be at least one (1) test per 400 square metres of surface area of each (maximum 300 mm thick) granular layer.

END OF SECTION

MMCD Section 32 01 11 Pavement Surface Cleaning and Removal of Pavement Markings

3.0 EXECUTION

3.1 Removals

Delete 3.1.1 and Replace with

3.1.1 In areas designated by the Contract Administrator, remove rubber tire deposits and paint markings by water blasting, rotary grinding, heater planning or other method approved by the Contract Administrator. Sand blasting not permitted.

END OF SECTION

MMCD Section 32 11 16.1 Granular Subbase

2.0 PRODUCTS

2.1 Specified Materials

Delete 2.1.1 and Replace with

2.1.1 Material for road subbase to be:

.1 75 mm minus crushed rock;

.2 Other materials when approved by the Contract Administrator.

3.0 EXECUTION

3.3 Compaction

Add 3.3.6

3.3.6 The frequency of density tests shall be at least one (1) test per 150 square metres placed.

3.5 Proof Rolling

Delete 3.5.1 and Replace with

3.5.1 For proof rolling use fully loaded single axle dump truck to 80kN (18,000 lb) minimum.

END OF SECTION

MMCD Section 32 11 23 Granular Base

3.0 EXECUTION

3.3 Compaction

Add 3.3.6 3.3.6 The frequency of density tests shall be at least one (1) test per 150 square meters placed.

Add 3.5.7 .7 At the discretion of the Contract Administrator and the Owner, the Contractor may be required to engage a Geotechnical Engineer to test the base surface for structural adequacy of the granular layers. The Geotechnical Engineer shall provide tests as necessary to confirm that the final Benkelman Beam test rebound requirements can be obtained with the designed thickness of asphalt pavement.

Allowable deflections of paved roads are as follows:

Road Classification	Maximum Allowable Deflection (mm)
Arterial	1.0
Collector	1.3
Local	1.7
Lane	1.7

In the event that the structure is deemed inadequate by the Geotechnical Engineer, the pavement and/or pavement structure shall be adequately strengthened to insure that the final deflections are not exceeded.

END OF SECTION

MMCD Section 32 12 16S Warm-Mix Asphalt Concrete

1.0 GENERAL

1.0.1 Section 32 12 16S refers to those portions of the Work that are unique to the supply and placement of warm-mix asphalt concrete paving.

1.0.2 Warm-Mix Asphalt (WMA) refers to asphalt mixtures produced at lower temperatures than Hot-Mix Asphalt (HMA). Temperature reductions may be achieved through proprietary system additives and/or water injection systems. Maximum WMA production temperature should be 135°C.

1.1 Related Work

1.1.1 Specification requirements for Section 32 12 16 Hot-Mix Asphalt Concrete Paving and Section 32 12 17 Superpave Hot-Mix Asphalt Concrete Paving shall apply to Warm- Mix Asphalt except as noted in this section.

1.6 Inspections and Testing

1.6.1 For arterial class roadways, the Contract Administrator may conduct Hamburg Wheel Tests (AASHTO T-324-16 standard test method) to determine rut resistance and moisture sensitivity. The following criteria will be used for acceptance:

Rut Resistance: < 7 mm at 10,000 passes;
Moisture Sensitivity: <12.5 mm at 20,000 passes.

2.0 PRODUCTS

2.1 Mix Design

2.1.1 An approved Hot-Mix Asphalt or Superpave Hot-Mix Asphalt mix design may be used for the Warm-Mix Asphalt mix design.

2.1.2 The WMA mix design submitted by the contractor shall include the name of the WMA technology, dosage rate, plant mixing temperature, and laboratory compaction temperature.

2.1.3 Mix design for Hot-mix asphalt to include AASHTO T283 to detect moisture damage potential of asphalt mix.

3.0 Execution

3.0.1 The plant discharge temperature of Warm-Mix Asphalt shall be within 7°C of the temperature designated on the Warm-Mix Asphalt mix design.

END OF SECTION

MMCD Section 32 12 16 Hot-Mix Asphalt Concrete Paving

1.0 GENERAL

1.1 Related Work Add 1.1.8 1.0.8 Warm-Mix Asphalt Concrete Section 32 12 16S.

1.6 Inspection and Testing Add 1.6.3 1.6.3 The Contractor shall submit a Quality Control Plan (QCP) for review and acceptance. As a minimum, the QCP will identify the testing laboratory undertaking the work, each of the specific testing methods that will be used for each specific product, and the frequency of all sampling and test methods to be used.

Add 1.6.4 1.6.4 For each 400 tonnes of production or portion thereof for of Hot Mix Asphalt Concrete mixtures, the Contractor shall submit to the Contract Administrator within seventy two (72) hours, one (1) set of Marshall mix properties.

Where asphalt mixture production is less than 400 tonnes in a single day, a minimum one (1) set of Marshall mix properties shall be provided for each day of production or portion thereof.

Add 1.6.5 1.6.5 Quality Assurance testing ordered by the Contract Administrator may include but not be limited to:

.1 Theoretical Maximum Specific Gravity, Asphalt Mix – ASTM D2041;
.2 Marshall Mix Density and Air Voids – ASTM D1559, D2726, D2712;
.3 Aggregate Gradation – ASTM C136 Field Density – ASTM D2726;
.4 Pavement Thickness and density by Cores;
.5 Density in Place by Nuclear Methods: ASTM D – 2950 – 91;
.6 Density in Place by the Electromagnetic Surface Contact Methods: ASTM 7113;
.7 Rut resistance and Moisture Sensitivity: Hamburg Wheel Tests AASHTO T-324-16;
.8 Tensile Strength Ratio AASHTO T283.

2.0 PRODUCTS

2.1 Materials

Delete 2.1.1 and Replace with

2.1.1 Asphalt cement: to CGSB-16.3-M90 Group A, grade 80-100

Delete 2.1.3(12) First paragraph

2.1.3 (12) Crushed fragments: at least 85% of particles by mass within each of following sieve designations ranges to have at least two (2) freshly fractured faces. Material to be tested according to ASTM C136 and ASTM C117.

2.2 Mix Design

Delete 2.2.1 and Replace with

2.2.1 Submit a current job mix formula to the Contract Administrator for review and approval. The mix design shall identify HMA or WMA with the respective mixing and compaction temperatures. The Contractor is encouraged to use up to 15% RAP is asphalt base course mixes and up to 10% RAP in asphalt surface course.

3.0 EXECUTION

3.5 Placing

Delete 3.5.4(3) and Replace with

3.5.4 (3) Surface course in layers of maximum 60mm each except for local residential streets where the maximum lift thickness for asphalt paving is 75 mm. Minimum lift thickness for surface course shall not be less than 35 mm for local residential streets and 50 mm for other classes of roads.

3.6 Compaction

Add 3.6.6

3.6.6 (1) Compaction to be checked by non-destructive testing techniques at 100 metre intervals along length of road for each lane, or, at least one (1) test for each 300 square meters of paving.

(2) In addition, one core required every 1,500 square meters for thickness and density and to calibrate non-destructive testing equipment. Minimum one (1) test for areas smaller than 1,500 square meters.

3.10 Finished Tolerances

Delete 3.10.4 and Replace with

3.10.4 In areas of standard concrete gutter, finished asphalt surface to be 10 mm higher than face of gutter at the discretion of the Contract Administrator. In areas of reverse gutter, finished asphalt surface to be flush with face of gutter.

Add 3.10.5 3.10.5 The Contractor shall ensure all manhole, water valve and third party utility boxes adjustments are completed using string lines and that all utilities match the road finished grade and crossfall.

END OF SECTION

MMCD Section 32 12 17 Superpave Hot-Mix Asphalt Paving

1.0 GENERAL

1.1	**Related Work**	Add 1.1.13	1.1.13	Warm-Mix Asphalt Concrete	Section 32 12 16S
1.4	**Submission of HMA Mix Design(s)**	Delete first sentence of 1.4.1 and replace with	1.4.1	Submit current Superpave HMA or WMA mix design(s) and trial mix test(s) from qualified asphalt testing laboratory meeting the requirements of this section to the Contract Administrator at least five (5) Days prior to commencing any asphalt paving work.	
1.6	**Inspection and Testing**	Delete 1.6.2.2 and Replace with	1.6.2	.2	For each 400 tonnes of production or portion thereof of Superpave Hot-Mix Asphalt Concrete mixtures, the Contractor shall submit to the Contract Administrator within seventy two (72) hours, one (1) set of Superpave mix properties. Where asphalt mixture production is less than 400 tonnes in a single day, a minimum one (1) set of Superpave mix properties shall be provided for each day of production or portion thereof.
		Add 1.6.2.9	1.6.2	.9	For arterial class roadways, the Contract Administrator may conduct Hamburg Wheel Tests (AASHTO T-324-16 standard test method) to determine rut resistance and moisture sensitivity. The following criteria will be used for acceptance: Rut Resistance: < 7 mm at 10,000 passes. Moisture Sensitivity: <12.5 mm at 20,000 passes.

2.0 PRODUCTS

		Delete 2.2.3 and Replace with	2.2.3	Where RAP will be incorporated in the mix, the mix design shall include RAP content. Contractors are encouraged to use up to 15% RAP in asphalt base course mixes and up to 10% RAP in asphalt surface course. Mix may contain up to 15% recycled asphalt cement replacement without changing binder grade.

3.0 Execution

3.6	**Compaction**	Add 3.6.6	3.6.6	(1)	Compaction to be checked by non-destructive testing techniques at 100 metre intervals along length of road for each lane, or, at least one (1) test for each 300 square meters of paving.
				(2)	In addition, one core required every 1,500 square meters for thickness and density and to calibrate

				non-destructive testing equipment. Minimum one (1) test for areas smaller than 1,500 square meters.
3.10	**Finished Tolerances**	Delete 3.10.5 and Replace with	3.10.5	In areas of standard concrete gutter, finished asphalt surface to be 10 mm higher than gutter pan at the discretion of the Contract Administrator. In areas of reverse gutter, finished asphalt surface to be flush with gutter pan.

END OF SECTION

MMCD Section 32 13 13 Portland Cement Concrete Paving

3.0 EXECUTION

3.4 Curbs and Gutters

Add 3.4.2

3.4.2 Drain tile is to be installed at a minimum depth of 500 mm below the gutter grade with drain rock placed for a minimum width of 150 mm greater than the drain tile diameter. See Burnaby Standard Detail Drawing BBY-C108 for details.

Add 3.4.3

3.4.3 Where there are street lighting bases behind the curb, the drain tile will pass behind the street light bases and street light ducting. Where drain tile and street lighting ducts and pole bases are to be installed behind the curb and gutter, the work must be coordinated in such a manner as to ensure that neither facility is damaged

END OF SECTION

MMCD Section 32 17 23 Painted Pavement Markings

1.0 GENERAL

1.2 Scope

Add 1.2.2

1.2.2 Permanent paint lines must be reinstated to existing standards on the base lift of asphalt if there is significant time lag between base and top lifts on a street.

Add 1.2.3

1.2.3 Spray painted temporary markings will not be accepted.

2.0 PRODUCTS

2.1 Materials

2.1.6 Pavement Markings

Add 2.1.6(10)

2.1.6(10) Methyl Methacrylate (MMA)

(1) Field Reacted Polymeric Methyl Methacrylate (MMA) Skid Resistant Paint to be ISO certified durable road marking material conforming to the following:

- Ultra-violet (UV) stable
- Minimum skid resistance of 49 BPN
- Glass beads must conform to AASHTO M247 Type 1 (standard gradation) specifications.

(2) Symbols used on MMA coated surface must also be MMA material. Neither thermoplastic nor paint materials are permitted.

Add 2.1.6(11)

2.1.6(11) Raised Pavement Markings

Raised Pavement Markings (RPM) shall be listed on the current edition of the Ministry of Transportation and Infrastructure Recognized Product List under section "Raised Surface Reflectors" and shall be reflective glass faced. Adhesive material shall be as recommended by the RPM manufacturer.

	Add 2.1.6(12)	2.1.6(12)	Temporary pavement marking tape: (1) Self-adhesive temporary pavement marking tape designed to provide reflective delineation. (2) To consist of high quality optical glass spheres embedded into weather and traffic-resistant binder on conformable metallic backing pre-coated with pressure sensitive adhesive. (3) Colour as specified. (4) To be readily removable by methods not requiring sandblasting, solvents or grinding.
	Add 2.1.6(13)	2.1.6(13)	Temporary Raised Pavement Markers (1) Adhesive or Peel and Stick plastic tabs that are flexible enough to resist traffic impact with double sided built in reflective strips.

3.0 EXECUTION

3.1 Equipment Requirements	Add 3.1.3	3.1.3	The Contractor shall maintain sufficient traffic control to safely permit the installation of temporary and permanent pavement markings.
3.3 Application	Delete 3.3.2.1 and Replace with	3.3.2	.1 The Contractor is to lay out pavement markings within twenty four (24) hours of completion of paving. Permanent markings on arterial roadways to be completed within five (5) Days of completion of overlay.

END OF SECTION

MMCD Section 32 31 13 Chain Link Fences and Gates

2.0 PRODUCTS

2.1 Materials

Delete 2.1.4(1) and Replace with	2.1.4	(1) Top and bottom brace rails: 48 mm nominal outside diameter, wall thickness 3.55 mm.
Delete 2.1.5		
Delete 2.1.10 and Replace with	2.1.10	All joints to be coped (saddle joints) and welded. No pinched joints or joint hardware permitted.

3.0 EXECUTION

3.2 Installation of Fence

Delete 3.2.12 and Replace with	3.2.12	Install top rail between posts. Fasten securely to terminal posts and secure waterproof caps and overhang tops.
Delete 3.2.13 and Replace with	3.2.13	Top and bottom rail to be welded construction with all welds coated with corrosion resistant finish. All joints, top and bottom rails shall be coped (saddle joints) and fitted.
Delete 3.2.15 and Replace with	3.2.15	Fabric to be secured to frame at maximum 100 mm intervals with 11 gauge core vinyl coated steel ties, double twisted.

END OF SECTION

MMCD Section 32 91 21 Topsoil and Finish Grading

2.0 PRODUCTS

2.11 Structural Growing Medium

Add 2.11

2.11 Structural growing medium composition shall conform to the specifications in the following **Table 2A** and related requirements specified in current Canadian Landscape Standards.

TABLE 2A: Properties of Structural Growing Medium

PARTICLE SIZE CLASS AND PROPERTIES	% Dry Weight and Composition
Acidity (pH)	5.5 – 6.5
Salinity (E.C) Maximum Saturation Extract Conductivity	3.0 milliohms / cm at 25 degrees C
Sand (Larger than 0.05mm and smaller than 2mm)	65 – 70%
Silt (larger than 0.002mm and smaller than 0.05mm)	5 – 15%
Clay (smaller than 0.002mm)	5 – 10%
Fines: Maximum Clay and Silt Combined	15%
Organic Content (OM)	10 – 15%
Carbon Nitrogen Ratio (C/N)	Maximum 33:1
Total Nitrogen (N)	0.2 – 0.5%
Available Phosphorus (P)	20 – 500ppm
Available Potassium (K)	50 – 1000ppm
Available Sodium (Na)(SAR)	(SAR) not to exceed 8.0

3.0 EXECUTION

3.4 Placing Growing Medium

Delete 3.4.5 and Replace with

.5 **Table 3** sets out minimum depths of growing medium after settlement for various types of subgrade.

TABLE 3: Minimum Growing Medium Depths			
Application	**Minimum Depths**		
	Over Prepared Subsoil		**Over Structures**
	Where subsoil has medium (loamy) texture	**Where subsoil has coarse (sandy) or fine (clay) texture**	
Low traffic lawn areas:			
i) irrigated	100 mm	150 mm	150 mm
ii) not irrigated	100 mm	150 mm	300 mm
High traffic lawn areas	100 mm	150 mm	----------
Planting medium			
i) ground cover areas	15 0mm	300 mm	300 mm
ii) shrub areas – small shrubs	300 mm	450 mm	300 – 500 mm
iii) shrub areas – large shrubs	450 mm	600 mm	500 – 900 mm
iv) tree pits	300 mm for 900 mm radius from the edge of the rootball	300 mm for 900 mm radius from the edge of the rootball	See Section 02950

END OF SECTION

MMCD Section 32 93 01 Planting of Trees, Shrubs and Ground Covers

2.0 PRODUCTS

2.1 Plant Material — Append to 2.1.2(9)

2.1.2 (9) Boulevard shade trees to be 6 cm calliper not branching before 1.8 m from finished ground elevation and in conformance with the Canadian Landscape Standard.

2.4 Mulch — Add 2.4.2

1.4.2 Mulch for tree bases to be bio cycle composted bark mulch 19 mm minus.

2.5 Stakes — Add 2.5.2

2.5.2 Tree ties are to be rubber fabric belting 38 mm wide.

3.0 EXECUTION

3.3 Planting — Delete 3.3.2(1) and Replace with

3.3.2 (1) Complete planting work during normal planting season from October to May. Do not plant in frozen ground or with frozen root balls. Do not plant during extremely hot, dry weather or during heavy rain.

Delete 3.3.4(1) and Replace with

3.3.4 (1)

.1 Plant all trees in holes large enough to accommodate entire rootball plus topsoil. See Supplementary Detail Drawing BBY-L101 and BBY-L102.

.2 Prepare tree planting area outside of tree pit to allow extended root growth. Area to extend 900 mm beyond the rootball to a depth of 300 mm. Apply 50-75 mm of tree base mulch.

.3 Plant to the top of the root zone level with existing grade. Plant trees so that after settlement they will be at original growing medium depth.

Append to 3.3.4(2)

3.3.4 (2) Cut nylon rope.

Add 3.3.4(5)

3.3.4 (5) Apply stem guard.

		Append to 3.3.6(5)	3.3.6	(5)	Keep mulch 100 mm to 150 mm away from trunk. Mulch must not touch the tree stem.
		Add 3.3.6(7)	3.3.6	(7)	Apply stem guard
3.5	**Watering**	Add 3.5.2	3.5.2		The Contractor is to water plants from installation to one year after Total Performance. The Contractor is to provide the Contract Administrator with watering and maintenance records prior to end of Maintenance Period (GC 25.0).
3.6	**Pruning**	Delete 3.6.3 and Replace with	3.6.3		Use only clean, sharp tools. Disinfect tools after each use between trees.
3.7	**Mulching**	Delete 3.7.2 and Replace with	3.7.2		Ensure depth of bark mulch is minimum 50 mm and maximum 100 mm after settlement.
		Add 3.7.3	3.7.3		Keep mulch 100 mm to 150 mm away from trunk.
3.9	**Maintenance**	Append to first sentence of 3.9.1			Except for watering to comply with 3.5.2 and continue for one year after Total Performance.
		Delete 3.9.1(5) and Replace with	3..9.1	(5)	Use of pesticides and herbicides not allowed.
3.10	**Conditions for Total Performance**	Delete 3.10.1(2) and Replace with	3.10.1	(2)	All plants are of species and varieties specified and planted in locations confirmed by the Contract Administrator.

END OF SECTION

MMCD Section 33 01 30.1 CCTV Inspection of Pipelines

1.0 GENERAL

1.2	**References**	Delete 1.2.2(1) and Replace with	1.2.2	(1)	CSA publication NASSCO Pipeline Assessment Certification Program (PACP) – Canadian Edition (V6.0 or greater).

2.0 PRODUCTS

2.2	**Materials**	Delete 2.2 and Replace with	2.2.2	.1	Digital video and picture data storage and digital report storage to be flash drive or portable hard drive compatible with the Owner's computer systems.
				.2	Photographs to be colour, minimum image size 90 mm x 70 mm and stored as per clause 2.2.1.

3.0 EXECUTION

3.1	**CCTV Inspection**	Delete 3.1.8 and Replace with	3.1.8	Record all digital videos at MPEG-2 standard or better on flash drive or portable hard drive compatible with the Owner's computer systems.
		Delete 3.1.14 and Replace with	3.1.14	Stop camera at each defect, change of condition of pipe and service connection to record defect in accordance with CSA-PACP codes.
3.2	**Recording Resolution**	Delete 3.2.1 and Replace with	3.2.1	At the beginning of each flash drive or when a substitute camera is introduced perform a recording resolution test with use of a Marconi or RETMA resolution chart.
3.3	**Site Coding Sheets**	Delete 3.3		
3.7	**Photographs and/or Digital Images**	Delete 3.7.1 and Replace with	3.7.1	Photograph all major structural and operational defects. (CSA-PACP defect codes B, C, D, F, H, J, R, K, L and F, R, I and OB).

3.8 Inspection Reporting Hard Copies & Digital Format

Delete 3.8.2 and Replace with

3.8.2 Present machine printed (hard copy) and computer generated data base reports according to CSA-PACP format.

(1) Each binder to commence with an index of all survey inspection reports contained within.

(2) Hard copy reports to be presented in tabular form in accordance with CSA-PACP.

(3) Reports to be presented in sections or drainage areas and / or by pipeline type or as specified in the Contract Documents.

(4) Computer database file to contain identical survey report information as printed report exclusive of photographs.

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(5) Digital information to be presented in tabular configuration in accordance with CSA-PACP in Microsoft Access ® (.MDB).

(6) Include Owner supplied scale drawings showing highlighted inspected pipeline. Drawing to be attached to inspection condition report for each section of pipeline surveyed.

Delete 3.8.3 and Replace with

3.8.3 Present report in 215 mm x 280 mm three ring (D type) binder.

Delete 3.8.4 and Replace with

3.8.4 Flash drives and portable hard drives to be attached securely to the binder.

Delete 3.8.5 and Replace with

3.8.5 Attach identical identification labels on three ring binder and flash drive.

Delete 3.8.8 and Replace with

3.3.8 Each flash drive to include a digital index of all inspection reports and observations with a digital link to the video survey.

END OF SECTION

MMCD Section 33 11 01 Waterworks

2.0 PRODUCT

2.2.1	Ductile Iron Pipe	Append to 2.2.1(2)	2.2.1	(2)	Use nitrile (Acrylonitrile Butadiene) gaskets where hydrocarbons are present or otherwise specified.
		Add 2.2.1.3	2.2.1	(3)	All watermain and fittings to be encased with low density polyethylene film to per ANSI/AWWA C105/A21.5 infused with anti-microbial compound and volatile corrosion inhibitor.
2.2.2	Polyvinyl Chloride (PVC) Pressure Pipe	Append to 2.2.2(2)	2.2.2	(2)	Use nitrile gaskets where hydrocarbons are present or otherwise specified.
2.2.3	High Density Polyethylene Pipe	Delete 2.2.3(1)(1) and Replace with	2.2.3	High Density Polyethylene Pipe: (1) Pipe: (1) Minimum DR11, blue stripe, ductile iron size outside diameter (DIOD) unless otherwise approved.	
		Add 2.2.3.(1)(4)	2.2.3(1)	(4)	To be blue-striped or solid blue colour exterior.
2.2.4	Fittings	Append to 2.2.4(5)	2.2.4	(5)	Use nitrile gaskets where hydrocarbons are present or otherwise specified.
2.2.7	Oriented Polyvinyl Chloride (PVCO) Pressure Pipe	Delete 2.2.7(1) and Replace with	2.2.7	(1) Pipe: (1) Pipe to be manufactured to specifications as follows: .1 Pipes 100 mm to 300 mm diameter – AWWA C909 rated to 235 psi minimum. .2 Pipes to be certified by Canadian Standards Association for pipe size ranges from 100mm to 600mm diameter – CSA B137.3.1	
2.5	**Service Connections, Pipe, Joints and Fittings**	Delete 2.5.4 and Replace with	2.5.4	For services 75 mm and larger, use fittings only to Clause 2.2.4 of this section.	
2.8	**Granular Pipe Bedding and Surround**	Add 2.8.3	2.8.3	Polyethylene encased watermain shall be bedded in washed coarse sand per Section 31 05 17 Clause 2.7.4.	

Material

3.0 EXECUTION

3.1 General

Add 3.1.2

3.1.2 The Contractor is not to open or close any valves on Owner water system. All valve operations by Owner forces only.

3.6 Pipe Installation

Add to 3.6.4

3.5.4 For all water main pipe materials, do not bend individual pipes to achieve deflection.

Add 3.6.15

3.6.15 Install joint restraint devices on all joints within 20 m of temporary end of main cap or where Owner forces will be performing tie-in to existing mains.

Add 3.6.16

3.6.16 Prior to construction, the Contractor shall locate and expose all utilities crossing the proposed watermain, water services, tie in locations and any other proposed works.

Add 3.6.17

3.6.17 When the watermain crosses a storm or sanitary sewer, the watermain shall be installed a minimum 0.5 m clear above the sewer. Where this is not possible, the watermain shall have a minimum 0.3 m clearance under the sewer with all joints within a 3.0 m horizontal distance from the sewer wrapped with heat shrink plastic or packed and wrapped with petrolatum tape in accordance to the following standards:

- ANSI/AWWA C214 (factory applied);
- ANSI/AWWA C209 (field applied);
- ANSI/AWWA C217-90 (petrolatum tape);
- All materials used are to have zero health hazard.

Installation shall be in accordance with the requirements of the Regional Health Engineer under the Health Act.

Add 3.6.18

3.6.18 All tie-ins to existing watermains and service connections will be performed by Owner crews unless otherwise noted. Prior to construction, the Contractor shall expose the existing watermain at the tie-in point in the presence of the Contract Administrator for a minimum of 0.9 m along its length to ensure that the new watermain or water service will be properly aligned and at the correct elevation to facilitate the tie-in. If deemed necessary by the Contract Administrator, the Contractor shall also expose the

				existing watermain 3.0 m from the tie-in point to prove its line and grade. All utilities between the tie-in point and the end of the new watermain shall be exposed and documented by the Contractor. The Contractor shall supply a minimum of one 6.0 m length of appropriate diameter pipe to the Owner for each tie-in location.
3.10	**Service Connection Installation**	Delete 3.10.1 and Replace with	3.10.1	Install service connections to 3.6 of this section, as shown on Supplementary Detail Drawings BBY-W102 and BBY-W103, and as directed by the Contract Administrator, BBY-WM1, BBY-WM2a, BBY-WM2b, and BBY-WM3.
		Delete 3.10.7 and Replace with	3.10.7	Tap main as shown on Supplementary Detail Drawings BBY-W102 and BBY-W103, not closer to a joint nor closer to adjacent service connections than recommended by manufacturer, or 1.0 m, whichever is greater. No two adjacent connections on the same pipe length to be on the same plane of pipe.
3.12	**Hydrants**	Delete 3.12.6 and Replace with	3.12.6	For hydrants not in service, place an orange painted sign, 30 cm x 30 cm, lettered “Not in Service” on the main port. The “Not in Service” signs shall be removed by the Owner after the tie-ins have been completed.
3.21	**Disinfection and Flushing Procedures**	Append to 3.21.8	3.21.8	Chlorinated water to be flushed to sanitary sewer or dechlorinated prior to entry to storm sewers.

END OF SECTION

MMCD Section 33 30 01 Sanitary Sewers

3.0 EXECUTION

3.6	**Pipe Installation**	Delete 3.6.6(2) and Replace with	3.6.6	(2) No bending of pipe barrel allowed.
3.10	**Service Connection Installation**	Delete 3.10.1 and Replace with	3.10.1	Install service connections to 3.6 of this section and as shown on applicable Supplementary Detail Drawing BBY-S120 or BBY-S113.
		Delete 3.10.4		
3.12	**Leakage Testing General**	Add 3.12.4	3.12.4	Low Pressure Air Test as detailed in Clause 3.14 required.
3.18	**Video Inspection**	Delete 3.18 and Replace with	3.18.1	The Contractor is to video inspect all completed sanitary sewer mains and service connections at the Contractor's expense immediately following completion of installation.
			3.18.2	The Contractor is to provide the Contract Administrator with report of inspection including video on flash drive conforming to Section 33 01 30.1 CCTV Inspection of Pipelines.
3.20	**Connections to Existing Mains**	Delete 3.20 and Replace with	3.20	Connections to existing sanitary sewer system to be made by Owner crews unless otherwise approved.

END OF SECTION

MMCD Section 33 40 01 Storm Sewers

2.0 PRODUCTS

2.6	**Service Connections**	Delete 2.6.1 and Replace with	2.6.1	Storm sewer service connections to be 150 mm minimum diameter, maximum diameter as specified on the Contract Drawings
		Add 2.6.11	2.6.11	Where required to add a service to existing pipe, all hubs to be of a type such that there is a stop that prevents hub from sliding into the pipe more than the thickness of the pipe wall.

3.0 EXECUTION

3.6	**Pipe Installation**	Delete 3.6.6(2)	3.6.6	(2) Smooth Profile PVC Pipe. No bending of pipe barrel allowed.
3.10	**Service Connection Installation**	Delete 3.10.1 and Replace with	3.10.1	(1) Install service connections to 3.6 of this section and as shown on applicable Supplementary Detail Drawing BBY-S114. (2) If connection cannot be installed at 2% grade (e.g. conflict with other utility) the record drawings must include a profile of the service including and utility crossings.
		Delete 3.10.2 and Replace with	3.10.2	Install 40 x 90 mm marker stake at service terminus. Paint and mark as shown on Supplementary Detail Drawing BBY-S114 and BBY-S120.
		Delete 3.10.3 and Replace with	3.10.3	Where specified, install inspection chamber at specified location, set plumb and to specified elevation as shown on Supplementary Detail Drawing BBY-S122. If inspection chamber is in driveway, lane or paved surface install cover or lid as shown on Supplementary Detail Drawing BBY-S122.
		Delete 3.10.4		
3.12	**Inspection and Testing**	Delete 3.12.1 and Replace with	3.12.1	The Contractor is to video inspect all completed storm sewer mains under 900mm in diameter, CB leads and service connections at the Contractor's expense immediately following completion of installation and cleaning. The Contractor is to provide the Contract Administrator with report of inspection including video on flash drive conforming to Section 33 01 30.1 CCTV Inspection of Pipelines.

3.14	**Connections to Existing Mains**	Delete 3.14.1 and Replace with	3.14.1	Connections to existing storm sewers to be made by Owner crews unless otherwise approved by the Owner.
		Delete 3.14.2		
3.15	**Perforated Drain Pipe**	Delete 3.15.1 and Replace with	3.15.1	Where shown on Contract Drawings or where directed by the Contract Administrator install perforated drain pipe adjacent to sidewalk or curb and gutter as shown on Supplementary Detail Drawing BBY-C108.

END OF SECTION

MMCD Section 33 44 01 Manholes and Catchbasins

2.0 PRODUCTS

2.1 Materials

2.1.7	Cast iron frame and cover	Delete 2.1.7 and Replace with	2.1.7	Cast Iron Frame and Cover: as shown on Supplementary Detail Drawing BBY-S106 and indicated in List of Approved Materials and Products for this section. .1 Frame and cover must conform to ASTM A48 and be designed to withstand H20 loading (H25 for arterial roadways). .2 Frame and cover must bear manufacturer identification. Do not mix frame and cover from different manufactures. .3 Any frame and cover assembly creating a point load on the concrete riser rings will not be permitted. .4 Do not install Self-Adjusting castings if: .1 there is less than 200 mm between top of concrete lid and finish grade for low profile unit; or .2 there is less than 300 mm between top of concrete lid and finish grade for standard profile unit; or .3 There is less than 110 mm thick pavement.
2.1.10	Precast catchbasin sections	Delete 2.1.10(1) and Replace with	2.1.10	(1) As shown on Supplementary Detail Drawing BBY-S107.
2.1.11	Catchbasin leads	Delete 2.1.11 and Replace with	2.1.11	Catchbasin leads to be minimum 150mm diameter and of PVC DR28.
2.1.13	Cast iron catchbasin frame and grate	Delete 2.1.13 and Replace with	2.1.13	Cast iron catchbasin frame and grate: as shown on Supplementary Detail Drawing BBY-S105 and indicated in List of Approved Materials and Products for this section.

2.1.16	Adjusting Rings	Add 2.1.16(3)	2.1.16	(3) Composite Rubber Expanded Polypropylene (EPP) rated to H25 loading.
		Add 2.1.16(4)	2.1.16	(4) Do not use Concrete or HDPE Rings with Self Adjusting Manhole Castings
2.1.19	Lawn drains	Delete 2.1.18 and Replace with	2.1.18	Lawn drains to be as shown on Supplementary Detail Drawing BBY-S112.
2.1.25	Sealant	Add 2.1.25	2.1.25	Sealant: Sealant between manhole risers, and between grade rings and casting, shall be hydrophobic polyurethane sealant and adhesive to ASTM D 2126.
3.0	**EXECUTION**			
3.3	**Manhole Installation**			
		Delete 3.3.13 and replace with	.13	Installation of interlocking High Density Polyethylene or Composite Rubber Expanded Polypropylene Manhole Adjustment Riser Rings.
		Add 3.3.17(4)	3.3.17	(4) Use composite rubber expanded polypropylene riser rings with Self-Adjusting manhole frame and cover.
		Add 3.3.17(5)	3.3.17	(5) Use watertight sealant to fill gap between frame and adjustment ring or concrete lid, and between adjustment ring and concrete lid.
		Add 3.3.17(6)	3.3.17	(6) Low profile castings (less than 200 mm height) to be fixed to concrete lid with 4 – 16 mm galvanized anchor bolts.
3.4	**Cleanout Installation**	Delete 3.4.1 and Replace with	3.4.1	Install clean outs as shown on Supplementary Detail Drawing BBY-S113 to standards and procedures described in 3.3 of this section.
3.5	**Catchbasin Installation**	Delete 3.5.1 and Replace with	3.5.1	Install catchbasins specified on the Contract Drawings as shown on Supplementary Detail Drawings BBY-S107, BBY-S108, BBY-S109, BBY-S110, BBY-S111 to standards and procedures described in 3.3 of this section.
3.6	**Lawn Drain Installation**	Delete 3.6.1 and Replace with	3.6.1	Install lawn drains as shown on Supplementary Detail Drawing BBY-S112.

3.9 Adjusting Tops of Existing Units

Delete 3.9.2(2) and Replace with

3.9.2 (2) When amount of raise is less than 300 mm use riser rings or cast-in-place form system.

Delete 3.9.4 and Replace with

3.9.4 Re-set gratings and frames to required elevation on not more than three (3) layers of (maximum 50 mm thick each) riser rings. Seal joints and make smooth.

END OF SECTION

MMCD Section 34 41 13 Traffic Signals

1.0 GENERAL

2.0 PRODUCTS

2.1	**General**	Delete 2.1.3		
2.6	**Poles and Anchor Bolts**	Add 2.6.7	2.6.7	Reinforcing steel to conform to CAN/CSA G30.18M 400R.
		Add 2.6.8	2.6.8	Anchor bolts to be as shown on Standard Detail Drawings E1.1 to E1.7.
		Add 2.6.9	2.6.9	Anchor bolts to be hot dip galvanized after fabrication.
		Add 2.6.10	2.6.10	Generally, poles as shown on Standard Detail Drawings E4.1 to E4.25 to be cross referenced to MOTH Standards by type and name.
		Add 2.6.11	2.6.11	I.D. label on pole to be "Type #" stamped on base plate or flange opposite manufactured year stamp.
		Add 2.6.12	2.6.12	Poles to be supplied with galvanized finish.
		Add 2.6.13	2.6.13	Poles requiring painting to be supplied by pole fabricator powder coat painted to the colour shown on the Contract Drawings.

3.0 EXECUTION

3.3	**Concrete Bases**	Delete 3.3.6 and Replace with	3.3.6	Remove and dispose excavated material, backfill with granular base material. Compact around bases in layers not exceeding 300 mm to 95% Modified Proctor density.
3.5	**Underground Conduit**	Delete 3.5.2 and Replace with	3.5.2	Minimum cover over conduits to be 600 mm in boulevard areas and 900 mm for conduits in roadways.

		Delete 3.5.3 and Replace with	3.5.3	Place trench marker tape 300 mm above conduits when installing by excavating, trenching, and backfilling. Trench marker tape not required for conduits installed using a suitable trenchless technology.
		Delete 3.5.4 and Replace with	3.5.4	Where specified on the Contract Drawings, install conduits under roadways to the alignment and elevations specified using fully directional drilling equipment. For street light conduits, tunnel/auger/drill conduits under roadways, lanes, driveways, or other specified locations.
3.7	**Traffic and Pedestrian Signal Head Mounting**	Add 3.7.5	3.7.5	Polycarbonate housings and doors not acceptable.
		Add 3.7.6	3.7.6	Heads and associated products to be in accordance with the recognized product list as specified on the Contract Drawings.
3.14	**Wiring**	Append to 3.14.3	3.14.3	Street lighting conductor splices may be made in junction boxes.

END OF SECTION

LIST OF APPROVED MATERIALS AND PRODUCTS

MMCD Section 26 56 01 Roadway Lighting

Subsection	Item Description	Approved Product	Comments / Restrictions
2.9	Marrettes	DryConn King Model 5 or 9	For use in junction boxes. Split bolts are also acceptable.
		Ideal Model 454	For use in hand holes, Split bolts are also acceptable.
3.4	Junction Boxes and Vaults	Oldcastle Duralite	Must be paired with matching cover Tier 22 for traffic loading.
		Oldcastle Synertech	Must be paired with matching cover Tier 22 for traffic loading.

END OF SECTION

MMCD Section 26 56 02S Conduit for Communication Network

Subsection	Item Description	Approved Product	Comments / Restrictions
2.1	Warning Tape	T&B Part No NAF-0709 Foil Backed Detectable Tape	Similar alternatives to be submitted for approval.
2.2	Concrete Junction Box	A.E.Concrete, Armtec, Langley Concrete	Galvanized Steel Checker Plate Covers with “COB COMM”. Only where requested. Use Composite or Lightweight Polymer Concrete when possible.
	Lightweight Polymer Concrete Junction Box	Oldcastle Synertech	Paired with Tier 22 Cover with “COB COMM”
	Composite Box	Oldcastle Duralite	Paired with Tier 22 Cover with “COB COMM”
	Splice Vault	Armtech or Langley Concrete	Designed for H20 Static Loading. Galvanized Steel Checker Plate Covers with “COB COMM”.

END OF SECTION

MMCD Section 33 11 01 Waterworks

Subsection	Item Description	Approved Product	Comments / Restrictions
2.2.1	Ductile Iron Pipe	Canada Pipe Company Ltd., Pacific States, and U.S. Pipe, all to AWWA C151	Special Thickness Class 52 for 100 mm, Class 50 for 150 mm and larger, cement mortar lined to AWWA C104.TR Flex restrained joint pipe for 300 mm and larger or where specified.
	Metallic Zinc Coated Ductile Iron Pipe.	U.S. Pipe, Canada Pipe Company Ltd	Pressure Class 350 for 150mm to 300mm Ductile Iron Pipe. External Zinc-based Coating-Part 1: Metallic Zinc with Finishing Layer (ISO 2004). Use with V-Bio Enhanced Polyethylene Encasement. Joint bonds may be required
	Polyethylene Encasement	V-Bio Enhanced Polyethylene Encasement	or Approved Equal Encasement per AWWA C105 installed per DIPRA modified method A.
2.2.2	Polyvinyl Chloride (PVC) Pressure Pipe	IPEX, C900 PVC, Royal Pipe, C900 PVC	Approved on a case-by-case basis, for limited applications only. PVC or PVCO to AWWA C900, CIOD, for 100 mm to 300 mm, unless otherwise specified.
2.2.3	High Density Polyethylene Pipe (HDPE)	SclairPipe	or Approved Equal Minimum DR11, blue stripe, ductile iron size outside diameter (DIOD) unless otherwise approved.
2.2.4.2	Ductile Iron Fittings	Terminal City Iron Works	Ductile iron fittings to C153 & C110, cement mortar lined.
		Metalfit (flange only)	C110, cement mortar lined.
		Sigma	C153 & C110, cement mortar lined.
		Star Pipe Products	C153 & C110, cement mortar lined.
2.2.4.12	Mech Couplings	Robar 1596 Steel barrel, DI end rings, with fusion bonded epoxy coating	T304 stainless steel fasteners, 100 mm to 250 mm, rated to 175 psi.
		Smith-Blair Inc. Omni 400 series ductile iron with epoxy coating	T304 stainless steel fasteners and anti-galling coating.

		Romac Style 501 coupling, ductile iron with fusion bonded epoxy coating	T304 stainless steel fasteners and anti-galling coating.
		Romac ALPHA coupling, ductile iron with fusion bonded epoxy coating	T304 stainless steel fasteners and anti-galling coating.
2.2.4.12	Mech Couplings	Hymax coupling (TPS) with fusion bonded epoxy coating	T304 stainless steel fasteners and anti-galling coating.
2.2.4.13	Joint Restraint Devices	Megalug Series 1100 & 1700 (EBBA Iron)	Ductile iron pipe up to 300 mm diameter.
		Uniflange Series 1309/1399	PVC/PVCO pipe up to 300 mm diameter.
		Uniflange Series 1400	Ductile iron pipe up to 300 mm diameter.
		Field Lok or Sure Stop 350 gaskets.	Not for use in casings. Match manufacturer to pipe selection.
		Stargrip Series 1000, 3000, 4000	1000 Series for PVC pipe to Ductile Iron Fittings; 3000 Series for Ductile Iron; 4000 Series for PVC/PVCO,
		Sigma One-LOK	Wedge Action Restraint for pipe up to 300 mm diameter
		Sigma PV -LOK	Serrated Restraint for pipe up to 300 mm diameter
2.2.7	Oriented Polyvinyl Chloride (PVCO) Pressure Pipe	IPEX, Bionax C909 PVCO Bionax SR PVCO Seismic Water Pipe	Approved on a case-by-case basis, for limited applications only. PVCO to AWWA C909, CIOD, for100 mm to 300 mm, unless otherwise specified. PVCO rated to 235 psi minimum.
2.3.2	Mainline Gate Valves	Clow Resilient Wedge Valve, AWWA C509	100 to 300 mm diameter.
		Mueller A-2362 Resilient Wedge Valve, AWWA C509	50 to 300 mm diameter.
		Mueller A-2361 Resilient Wedge Valve, AWWA C515	350 mm and larger.
		Terminal City Resilient Wedge Valve, AWWA C509	50 to 300 mm diameter.

2.3.5	Air Release, Air/Vacuum and Combination Air Valves	A.R.I. Optimal Flow Solutions	Or Approved Equivalent.
2.6	Hydrants	Clow Canada M93 Brigadier	One (1) pumper nozzle and two (2) hose nozzles. Minimum 1.2m bury depth. Painted white with red nozzle caps and dark green body cap 150 mm Tyton inlet.
2.6	Hydrants	Mueller Super Centurion 250, A-423	One (1) pumper nozzle and two (2) hose nozzles. Minimum 1.2m bury depth. Painted white with red nozzle caps and dark green weather cap. 150 mm Tyton inlet.
		Terminal City C-71-P Compression Hydrant	One (1) pumper nozzle and two (2) hose nozzles. Minimum 1.2m bury depth. Painted white with red nozzle caps and dark green weather cap. 150 mm Tyton inlet.
2.7	Corporation Stops, Curb Stops, and Brass Fittings (Burnaby Supplementary Detail Drawings W102, W103)	Cambridge Brass Valves	Full port ball valves with compression inlet and outlet connections, 360 degree turn, C800 No Lead.
		Mueller 300 Ball Valves	Full port ball valves with compression inlet and outlet connections, 360 degree turn, C800 No Lead.
		AY McDonald Ball Valves	Full port ball valves with compression inlet and outlet connections, 360 degree turn, C800 No Lead.
		Ford Ball Valves	Full port ball valves with compression inlet and outlet connections, 360 degree turn, C800 No Lead.
	Corporation Stops and Curb Stops – Insulating	Mueller 300 Insulated Ball Valves	Mueller N-35008 and Mueller N-35209-3.

END OF SECTION

MMCD Section 33 30 01 Sanitary Sewers

Subsection	Item Description	Approved Product	Comments / Restrictions
2.0	Sewer Couplings	Fernco	One (1) piece gasket and bushing, 300 series stainless steel clamps, with shear rings.
2.2	Plastic Pipe, Mainline Smooth Profile PVC Sewer Pipe	IPEX PVC Sewer Pipe	100 mm to 675 mm diameter, ring-tite gasket.
		Diamond Plastics PVC Sewer Pipe	100 mm to 375 mm diameter, Type PSM gasketed.
		Royal Pipe Co. PVC Sewer Pipe	100 mm to 675 mm diameter, gasketed.

END OF SECTION

MMCD Section 33 34 01 Sewage Forcemains

Subsection	Item Description	Approved Product	Comments / Restrictions
2.3.4	Air-release, Air/Vacuum and Combination Air Valves	A.R.I. Optimal Flow Solutions	Or approved equivalent.

END OF SECTION

MMCD Section 33 44 01 Manholes and Catchbasins

Subsection	Item Description	Approved Product	Comments / Restrictions
2.1.7	Manhole and Catch Basin Frames and Covers (Burnaby Supplementary Detail Drawings S104, S105, S106) (ARTERIAL & COLLECTOR, Other Road Classes with more than 100mm thick asphalt)	Self -Level Castings	Individual responsible for installation must be able to show proof of attending manufacturer's "Self-Levelling Manhole Installation Certification" workshop.
		East Jordan Iron Works – SELFLEVEL Assembly Model 3022-01 Dobney Foundry Self Level Casting DF630 East Jordan Iron Works – 3022-11A01 for low profile Dobney Foundry Self Level Casting DF630 Low Profile	All applications where greater than 200 mm between finish grade and top on concrete lid. Minimum asphalt thickness 110 mm. Less than 300 mm requires low profile casting. Bold down bottom section to concrete lid with 4 -16mm galvanized anchor bolts (through adjusting rings if necessary).
	Manhole and Catch Basin Frames and Covers (Burnaby Supplementary Detail Drawings S104, S105, S106) (RESIDENTIAL)	Dobney Foundry C44 or C44A. EJIW Q633007 Dobney C18. EJIW 114710	Low profile castings to be bolted to concrete lid with 4 -16 mm galvanized anchor bolts (through adjusting rings if necessary). Dobney C18 or EJIW 00114710 may be used only when approved by the Contract Administrator.
2.1.16	Adjusting Rings	East Jordan Iron Works Infra-Riser or equal Composite Rubber Expanded Polypropylene (EPP) rated to H25 loading, free of cracks, voids or defects.	Maximum 3 grade rings per installation permitted.
2.1.17	Sealant	X-Seal from SealGuard Inc.	Seal all joints between EPP adjusting rings, concrete to casting or adjustment ring surfaces. Alternatives to be hydrophobic polyurethane sealant and adhesive to ASTM D 2126.

END OF SECTION

MMCD Section 34 41 13 Traffic Signals

Subsection	Item Description	Approved Product	Comments / Restrictions
2.5	Concrete Junction Box	SynerTech - Tier 22 for Traffic Areas	Composite combining high density polymer concrete and lightweight sheet molding compound.
2.9	Marrettes	Ideal Direct Burial Model 60	For use in junction boxes.
		Ideal 30-341 or 30-342	For use in hand holes.
2.11	Service Panels	West Coast Electric 115426, 128284, 130060, 127652, 127258	For Streetlights and traffic signals.
2.16	Signal Head Housing - polycarbonate	Mobotrex 12”	
2.17	Signal Head LED	Dialight 12” XL 15	
2.19	Signal Mounting Hardware	Greenlite - all models, Pelco - models AS 0125-3-62-PNC / AS 0125-4-62-PNC	
2.20	Ped APS (Audible)	Polara Navigator EZ Comm EN25B	
2.21	Ped Buttons	Polara Bulldog	
2.26	Traffic Signal Cabinet	Econolite P44	
	Traffic Signal Controller	Econolite Cobalt	
	Traffic Signal Malfunction Management Unit (MMU)	Reno A&E 16 LEIP, Econolite 16LEIP	
2.27	Video Vehicle Detection	AutoScope Vision	
	Emergency Vehicle Pre-emption	GTT Opticom	
2.28	Service / UPS Combination Cabinet	Valid KSDA60-25-21-03	
	Uninterrupted Power Supply (UPS)	Alpha Technologies FXM 1100	
	Power Transfer Switch	Alpha Technologies (UATS)	
	Signal Comm, BB Radio	Encom E-Lite 5.8 GHz	
	Ethernet Switch	Cisco CX3650	
	Fibre-Comm, FPP, SFP	Corning	

END OF SECTION

MATERIALS TESTING

Section and Description		Minimum Testing Required	Comments
MMCD Section 03 30 20	Concrete Walks, Curbs and Gutters	Three (3) Field Cured Cylinders for each 150 square meters of concrete plus three (3) Laboratory Cured Cylinders for each 300 square meters of concrete.	Field cured cylinder means cured on Site for minimum forty eight (48) hours before taken to lab. In extreme cold (<1° C) or heat (>30° C) field cure for seven (7) days.
MMCD Section 03 30 53	Cast-in-Place Concrete	Three (3) Field Cured Cylinders for each 100 square meters of concrete plus three (3) Laboratory Cured Cylinders for each 200 square meters of concrete.	Field cured cylinder means cured on Site for minimum forty eight (48) hours before taken to lab. In extreme cold (<1° C) or heat (>30° C) field cure for seven (7) days.
MMCD Section 31 05 17	Aggregates and Granular Materials	Sieve analysis and proctors are required for each type of material to be used prior to the commencement of Work and every 1,000 tonnes during the Work.	
MMCD Section 31 23 01	Excavating, Trenching and Backfilling	Density Test to confirm compaction minimum one (1) test for lesser of (a) 100 lineal meters of trench for each 300 mm lift, or (b) 100 cubic metres of backfill material.	
MMCD SECTION 32 11 16.1	Granular Subbase	The frequency of density tests shall be at least one test per 150 square metres placed.	
MMCD Section 32 11 23	Granular Base	The frequency of density tests shall be at least one test per 150 square metres placed.	Benkelman Beam Test at the discretion of the Contract Administrator and the Owner.
MMCD Section 32 12 16S	Warm-Mix Asphalt Concrete	Hamburg Wheel Test (AASHTO T-324-16 standard test method), minimum one (1) per project plus one (1) every 5,000 tonnes mix.	Only required for Arterial and Collector Roads. Additional tests and Local Roads per applicable MMCD Section 32 12 16 or 32 12 17.

MMCD Section 32 12 16	Hot-Mix Asphalt Concrete Paving	Marshall test for each 400 tonnes or portion thereof, minimum one test for each asphalt type, per day, per site/location.	
		Compaction to be checked by non-destructive testing techniques at 100 metre intervals along length of road for each lane, or, at least one test for each 300 square meters of paving.	
		In addition, one core required every 1,500 square meters for thickness and density and to calibrate non-destructive testing equipment. Minimum one test for areas smaller than 1,500 square meters.	
		Hamburg Wheel Test (AASHTO T-324-16 standard test method), minimum one (1) per project plus one (1) every 5,000 tonnes mix.	Arterial and Collector Roads.
MMCD Section 32 12 17	Superpave Hot-Mix Asphalt Paving	Superpave mix properties for each 400 tonnes of production or portion thereof. Minimum one test per day, per site/location.	
		Hamburg Wheel Test (AASHTO T-324-16 standard test method), minimum one (1) per project plus one (1) every 5,000 tonnes mix.	Arterial and Collector Roads.
		Compaction Testing and Asphalt core requirements are the same as Section 32 12 16	

END OF SECTION

Supplementary Detail Drawings

April 2016

Engineering Department

MMCD STANDARD DETAIL DRAWINGS - CIVIL

1. Delete MMCD Standard Detail Drawings:

   - MMCD-G1, -G6, -S6, -S8, -S11, -S12, -S13, -S14, -S15, -W2a, -W2b, -W2c, -W2d, -W5, -W6, -C3, -C7, -C8, -C9, -C10, -C11, -C12, -C14, -R1.

2. Standard Detail Drawing MMCD-S9:

   - Delete factory installed test plug.

3. Standard Detail Drawings MMCD-S7:

   - Delete 2.0m offset into property. Connection to be terminated at property line ("PL") and marker post placed at PL.

   - Delete riser at main - connection to be laid at 2.0% grade from main to PL.

4. Standard Detail Drawing MMCD-G5:

   - Change 150 mm max. to 190 mm max.

MMCD STANDARD DETAIL DRAWINGS - ELECTRICAL

1. Delete MMCD Standard Detail Drawings:

   - E4.1, E4.2

		EXISTING	PROPOSED
WATER	Under 45 Degree Bends		
	45 Degree Bends		
	90 Degree Bends		
	Vertical Bends		
	45 Degree Tees		
	90 Degree Tees		
	135 Degree Tees		
	Crosses		
	Reducers		
	Adapters		
	Flanges		
	Caps		
	Plugs		
	Pipe Repair Locations		
	Valves		
	Closed Valves		
	Branch Valves		
	Air Valves		
	Check Valves		
	Hydrants		
	Meters		
SANITARY	Wyes		
	Cleanouts		
	Catch Basins		
	Pipe Repair Locations		
	Manholes		
	Pump Station Centroids		
	Chamber Centroids		

NO.	DATE	REVISION	APP'D	BY

City of Burnaby
ENGINEERING DEPARTMENT

SUPPLEMENTAL GENERAL LEGEND FOR CONTRACT DRAWINGS

DRAWN BY:	SCALE: N.T.S.	**BBY-** G101
APPRV'D BY:	DATE: 98-01-28	

		EXISTING	PROPOSED
DRAINAGE/ COMBINED	Wyes		
	Cleanouts		
	Catch Basins		
	Pipe Repair Locations		
	Manholes		
	Chamber Centroids		
ILLUMINATION	Davit Streetlight Pole		
	DSP's with Service Base and Photo Cell		
	DSP's with Duplex Receptacle		
	DSP's with Traffic Signal Davit Arm		
	Post Top Streetlight pole		
	Junction Box		
	Service on or from Hydro Pole		
	Hydro Service Box		
	Service in Hydro Kiosk		
	Streetlight on Red Phase Conductor		R
	Streetlight on Black Phase Conductor		B

NO.	DATE	REVISION	APP'D	BY

City of Burnaby
ENGINEERING DEPARTMENT

SUPPLEMENTAL GENERAL LEGEND FOR CONTRACT DRAWINGS

DRAWN BY:	SCALE: N.T.S.	BBY- G101
APPRV'D BY:	DATE: 98-01-28	

		EXISTING	PROPOSED
ROADWORKS	Pole		
	Guy Wire		
	Valve		
	Hydrant		
	Sign Post		
	Street Light		
	Storm Sewer Manhole	O_D	$\bullet_D$
	Sanitary Sewer Manhole	O_S	$\bullet_S$
	Combined Sewer Manhole	O_C	$\bullet_C$
	B.C. Hydro Manhole	O_{BCH}	
	B.C. Telephone Manhole	O_{BCT}	
	Catch Basin		
	Elevation	×123.45	134.56
	Tree		
	Hedge		
	Street Base Line		
	Curbline		
	Sidewalk		
	Edge of Pavement		
	Ditch		
	Watercourse		
	Fence		
	Culvert		
	Retaining Wall		
	Track		
	Top of Bank		
	Bottom of Bank		

NO.	DATE	REVISION	APP'D	BY

City of Burnaby
ENGINEERING DEPARTMENT

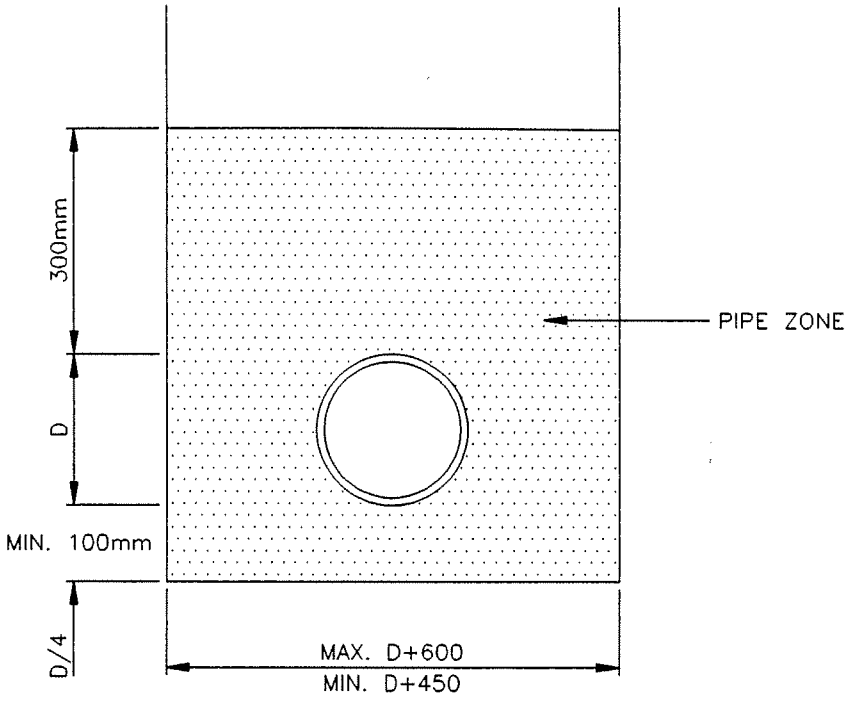
SUPPLEMENTAL GENERAL LEGEND FOR CONTRACT DRAWINGS

DRAWN BY:	SCALE: N.T.S.	**BBY-** G101
APPRV'D BY:	DATE: 98-01-28	

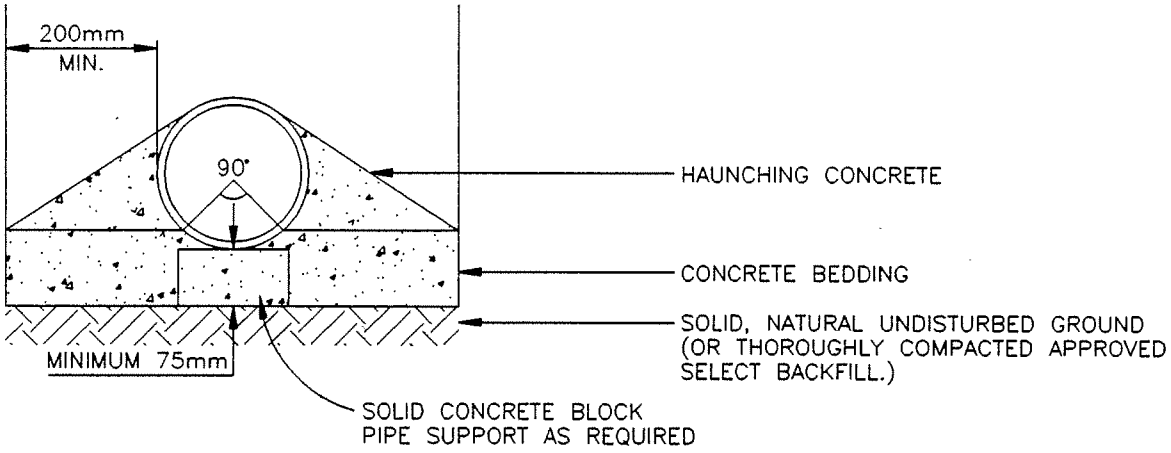
City of Burnaby

STORM AND SANITARY SEWER DETAILS

BBY-S101	Bedding, Backfill & Cradling in Pipe Zone [L423]
BBY-S102	Trapping Hood Details [L422]
BBY-S103	Catch Basin Frame & Grate (Type I & Modified Grate) [L416]
BBY-S104	Catch Basin Frame & Grate (Type V) [L1397]
BBY-S105	Adjustable Curb Inlet CB Frame (Type VA) [L2040]
BBY-S106	Cast Iron Manhole Frame & Cover [L696A]
BBY-S107	Typical Catch Basin Installation [L956]
BBY-S108	Catch Basin Type I [L416]
BBY-S109	Catch Basin Type II [L415]
BBY-S110	Curb Catch Basin Type V [L428C]
BBY-S111	Typical Offset Sump Catch Basin (Type VII) [L1155]
BBY-S112	Lawn Basin [L1027]
BBY-S113	Typical Clean-Out [L1154]
BBY-S114	3 Methods of Connecting Properties to New Storm Sewer [L944]
BBY-S115	Temporary Energy Dissipator [L1007A]
BBY-S116	Temporary Inlet Structure for Pipe Maximum 900mm Diameter [L1458]
BBY-S117	Standard Inlet Structure for Pipe Maximum 900mm Diameter [L1489]
BBY-S118	Pumped Force Main Connection
BBY-S119	Oil Interceptor Installation
BBY-S120	Service Connection to Storm or Sanitary Sewer
BBY-S121	Service Connection to Combined Sewer
BBY-S122	Inspection Chamber for 100mm to 200mm Service Connection
BBY-S123	Cast Iron Manhole Frame & Cover (Collectors & Arterials)



PIPE BEDDING



PIPE CRADLING

NOTE:

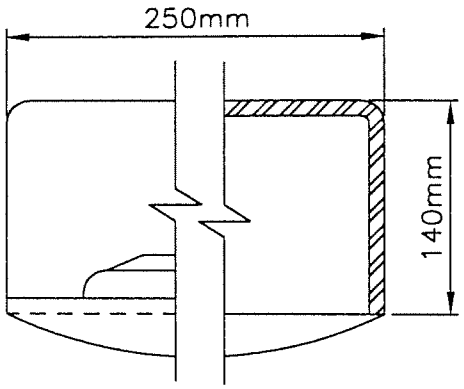
1. USE TYPE I GRANULAR PIPE BEDDING MATERIAL.
2. FOR DUCTILE IRON PIPE APPROVED NATIVE BACKFILL MATERIAL MAY BE USED WHEN THE PIPE ZONE IS BELOW THE SPECIFIED PAVEMENT STRUCTURE.
3. PIPE CRADLING USED FOR SOFT GROUND AS SHOWN ON DRAWINGS OR AS DIRECTED BY THE CONSTRUCTION ENGINEER.
4. CONCRETE 20MPa.

NO.	DATE	REVISION	APP'D	BY
1	97/01	GENERAL REVISION (L423)		JK

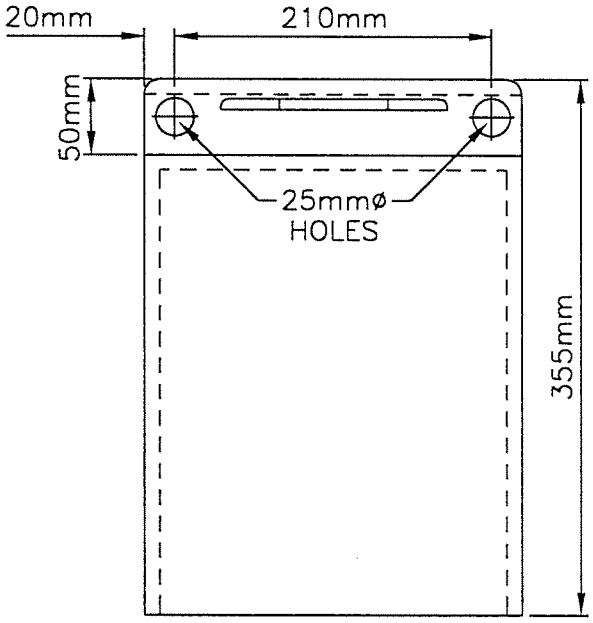
City of Burnaby
ENGINEERING DEPARTMENT

BEDDING, BACKFILL AND CRADLING IN PIPE ZONE

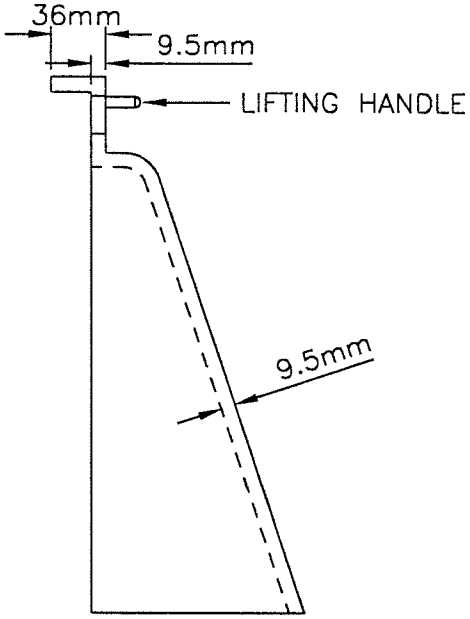
DRAWN BY:	SCALE: N.T.S.	BBY- S101
APPRV'D BY:	DATE: JUNE 70	



PLAN



FRONT ELEVATION



SIDE ELEVATION

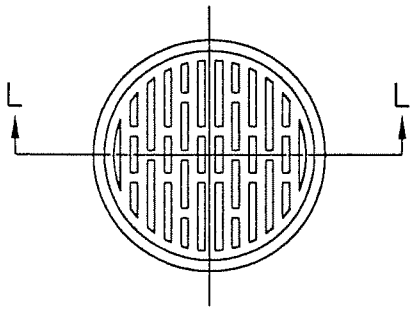
NOTE:
1. FOR 150mm OR 200mmø LEADS.
2. CASTINGS SHALL MEET ASTM A48 CLASS 25 GREY IRON SPECIFICATIONS.
3. CASTING FINISH SHALL BE BITUMINUOUS DIP COATED.
4. CASTING SHALL MEET MINIMUM WEIGHT REQUIREMENT:
   TRAPPING HOOD 9.1 kg ±5%.

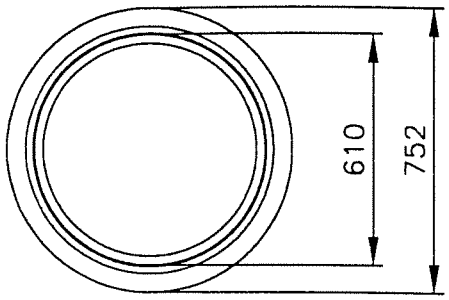
NO.	DATE	REVISION	APP'D	BY
2	2000/01	NOTES REVISED		JK
1	97/01	GENERAL REVISION (L422)		JK

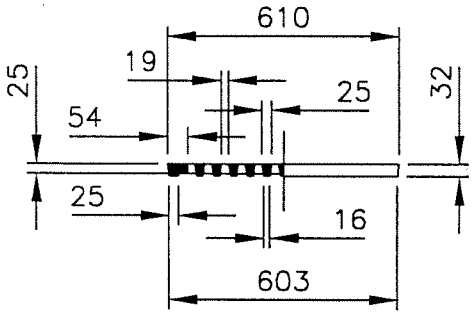
City of Burnaby
ENGINEERING DEPARTMENT

TRAPPING HOOD DETAILS

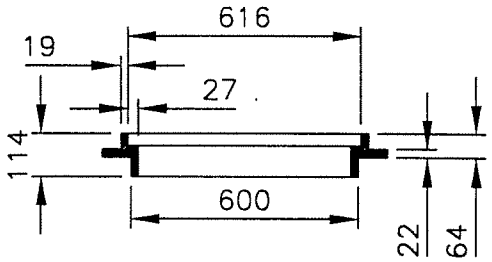
DRAWN BY:	SCALE: N.T.S.	BBY- S102
APPRV'D BY:	DATE: FEB 65	





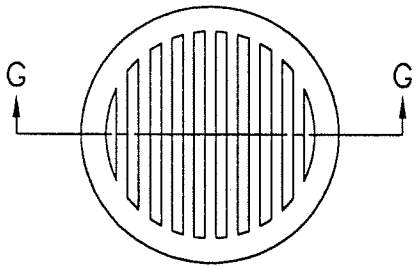


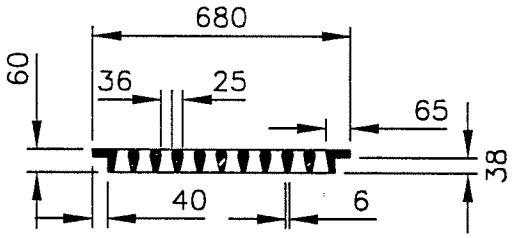
SECTION L–L



FRAME

MODIFIED GRATE





SECTION G–G

TYPE I GRATE

NOTES:

1. CASTINGS SHALL MEET ASTM A48 CLASS 25 GREY IRON SPECIFICATIONS.
2. CASTING FINISH SHALL BE BITUMINOUS DIP COATED.
3. CASTINGS SHALL MEET MINIMUM WEIGHT REQUIREMENTS:

MODIFIED GRATE	43 kg ±5%
FRAME	58 kg ±5%
TYPE I GRATE	51 kg ±5%

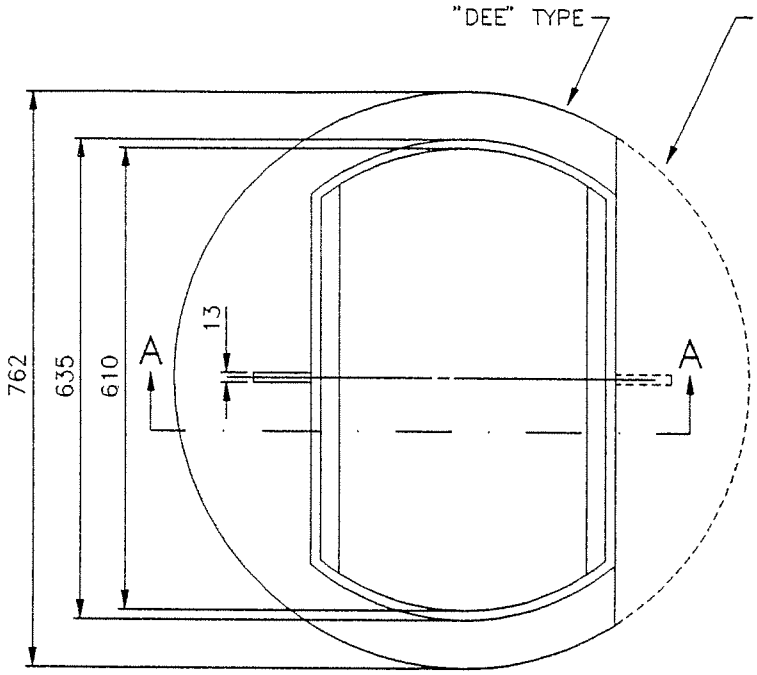
4. MODIFIED GRATE AND FRAME SHALL BE CERTIFIED H20 LOADING.
5. ALL DIMENSIONS IN mm.

NO.	DATE	REVISION	APP'D	BY
2	2000/01	NOTES REVISED		JK
1	97/01	GENERAL REVISION (L416)		JK

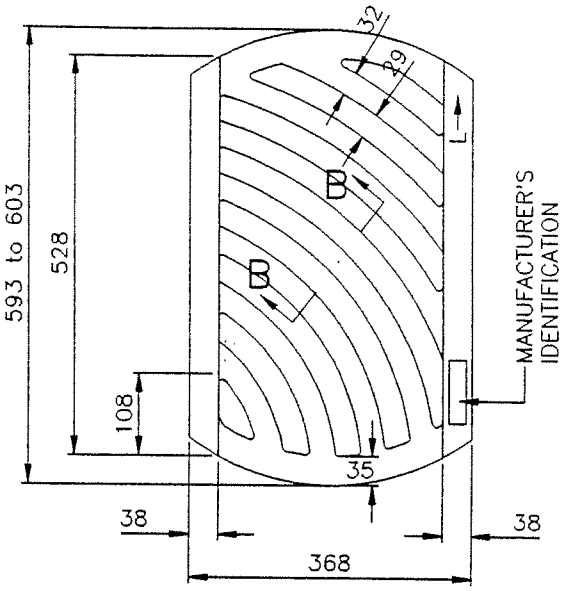
City of Burnaby
ENGINEERING DEPARTMENT

CATCH BASIN FRAME AND GRATE (TYPE I & MODIFIED GRATE)

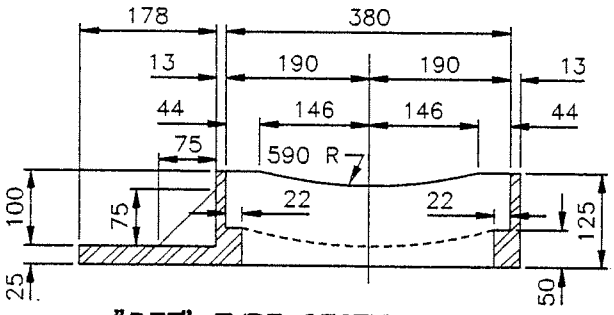
DRAWN BY:	SCALE: N.T.S.	BBY- S103	
APPRV'D BY:	DATE: FEB 65		



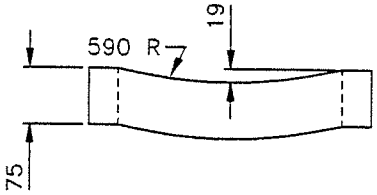
PLAN OF FRAME



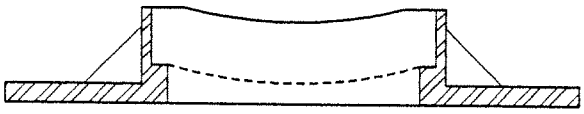
PLAN OF GRATE



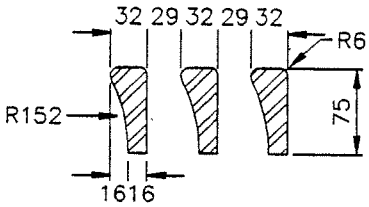
"DEE" TYPE SECTION A–A



END ELEVATION OF GRATE



"ROUND" TYPE SECTION A–A



SECTION B–B

NOTE:
1. FRAME AND GRATE SHALL BE CERTIFIED H20 LOADING AND 6.64kN IMPACT LOADING.
2. CASTINGS SHALL MEET ASTM A48 CLASS 25 GREY IRON SPECIFICATIONS.
3. CASTING FINISH SHALL BE BITUMINOUS DIP COATED.
4. CASTINGS SHALL MEET MINIMUM WEIGHT REQUIREMENTS:

DEE FRAME	59kg ± 5%
ROUND FRAME	72kg ± 5%
GRATE	61kg ± 5%

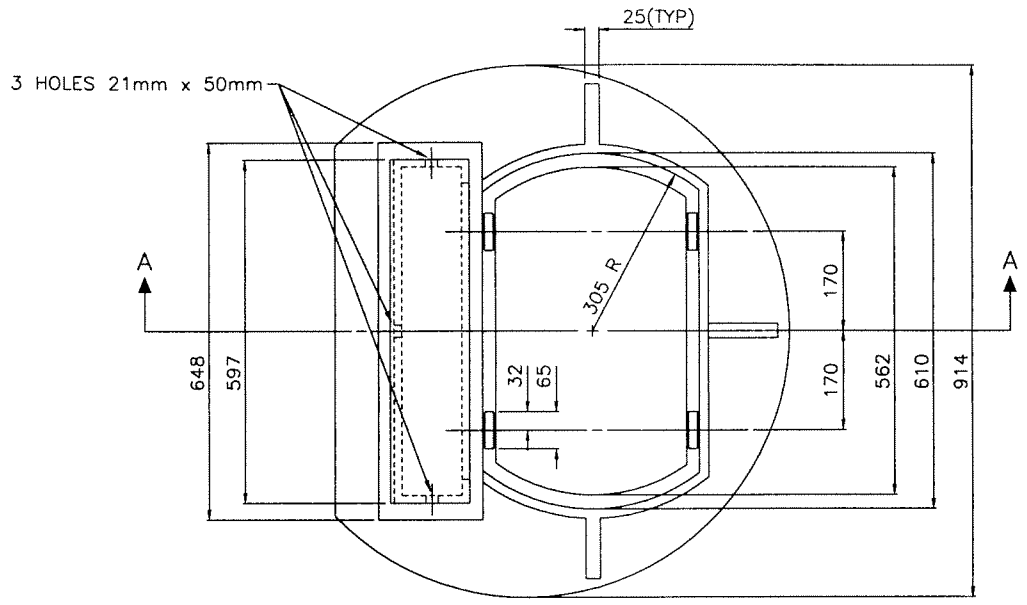
5. GRATE SHALL BE LEFT OR RIGHT HAND AND STAMPED ACCORDINGLY.
6. ALL DIMENSIONS IN mm.

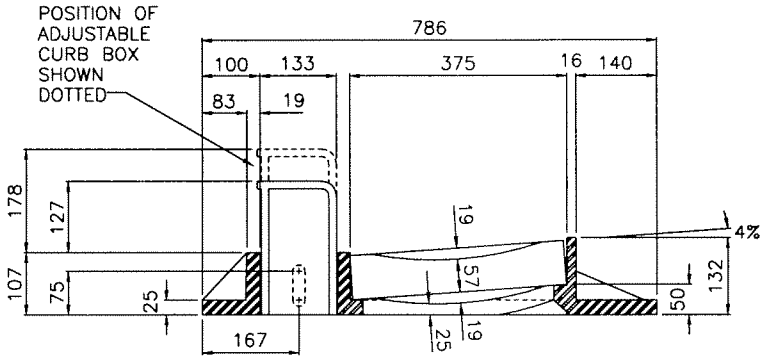
NO.	DATE	REVISION	APP'D	BY
1	97/01	GENERAL REVISION (L1397)		JK

City of Burnaby
ENGINEERING DEPARTMENT

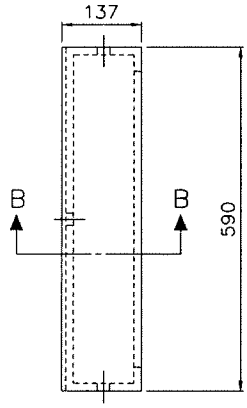
CATCH BASIN FRAME AND GRATE (TYPE V)

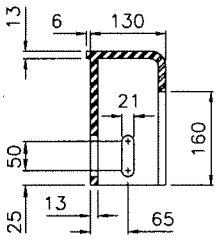
DRAWN BY:	SCALE: N.T.S.	BBY- S104
APPRV'D BY:	DATE: NOV 72	



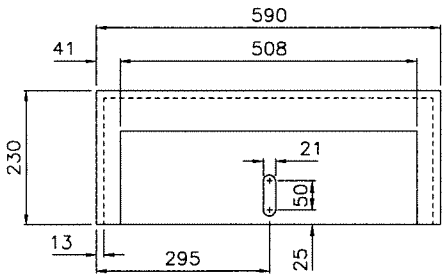


SECTION A–A





SECTION B–B



ADJUSTABLE CURB BOX

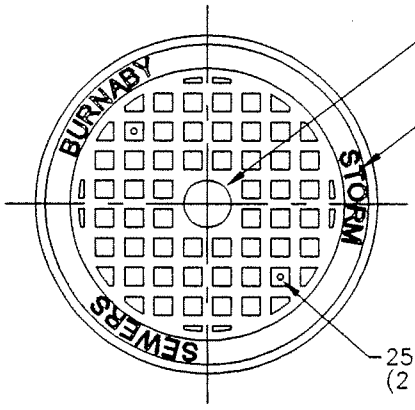
NOTE:
1. FRAME AND GRATE SHALL BE CERTIFIED H20 LOADING AND 6.64kN IMPACT LOADING.
2. CASTINGS SHALL MEET ASTM A48 CLASS 25 GREY IRON SPECIFICATIONS.
3. CASTING FINISH SHALL BE BITUMINOUS DIP COATED.
4. CASTINGS AND APPURTENANCES SHALL MEET MINIMUM WEIGHT REQUIREMENTS:
   FRAME 127kg ± 5%
5. SEE S104 FOR GRATE DETAILS.
6. REQUIRES 3 GALVANIZED BOLTS 19mmø65mm LG. C/W NUT AND 2 LOCK WASHERS.
7. ALL DIMENSIONS IN mm.

NO.	DATE	REVISION	APP'D	BY
2	2004/04	FRAME DIMENSION ADDED		GF
1	97/01	GENERAL REVISION (L2040)		JK

City of Burnaby
ENGINEERING DEPARTMENT

ADJUSTABLE CURB INLET C.B. FRAME (TYPE VA)

DRAWN BY:	SCALE: N.T.S.	**BBY-**	S105
APPRV'D BY:	DATE: FEB 86		

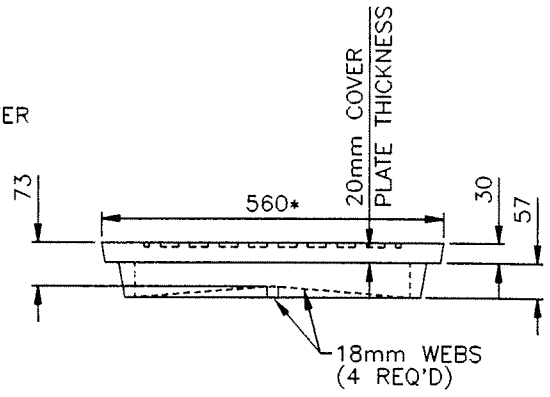


MANUFACTURER'S IDENTIFICATION

SANITARY, COMBINED, WATER (ALTERNATE NOTATIONS AS REQUIRED)

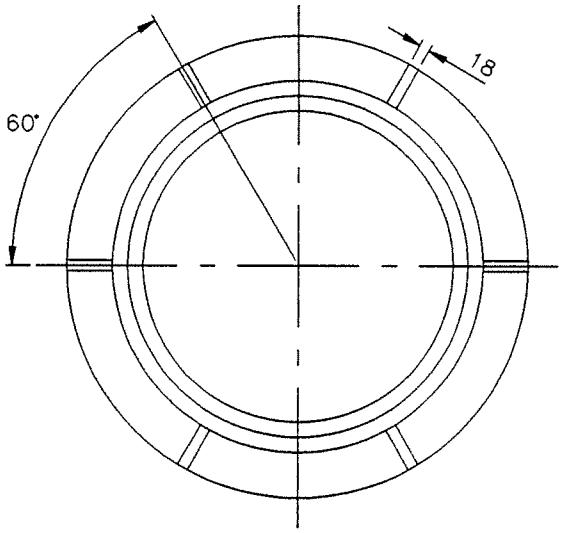
25mm DIAMETER HOLE (2 REQ'D)

PLAN

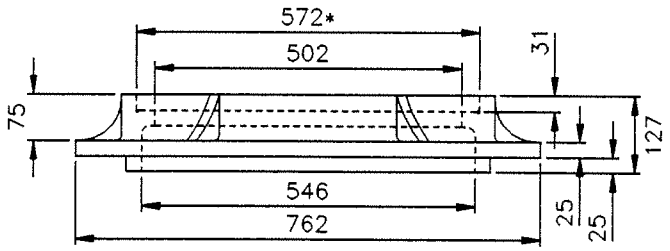


ELEVATION

COVER



PLAN



ELEVATION

FRAME

NOTE:

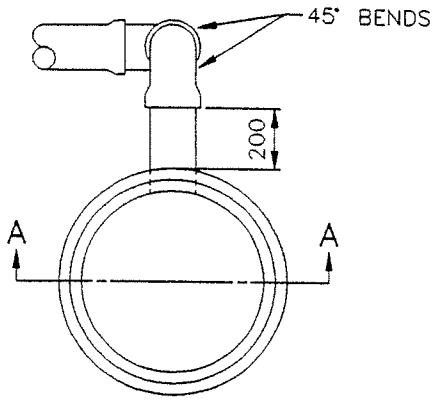
1. FRAME AND COVER SHALL BE CERTIFIED H20 LOADING AND 6.64kN IMPACT LOADING.
2. CASTINGS SHALL MEET ASTM A48 CLASS 25 GREY IRON SPECIFICATIONS.
3. CASTING FINISH SHALL BE BITUMINOUS DIP COATED.
4. CASTINGS SHALL MEET MINIMUM WEIGHT REQUIREMENTS:
   COVER 66kg ± 5%
   FRAME 84kg ± 5%
5. SEATING SURFACES SHALL BE MACHINED FOR NON-ROCKING FIT IN ALL POSITIONS.
6. ALLOWABLE TOLERANCE ON FRAME AND COVER SEATING DIMENSIONS (*) SHALL BE ±0.5%.
7. ALL DIMENSIONS IN mm.

NO.	DATE	REVISION	APP'D	BY
1	97/01	GENERAL REVISION (L696A)		JK

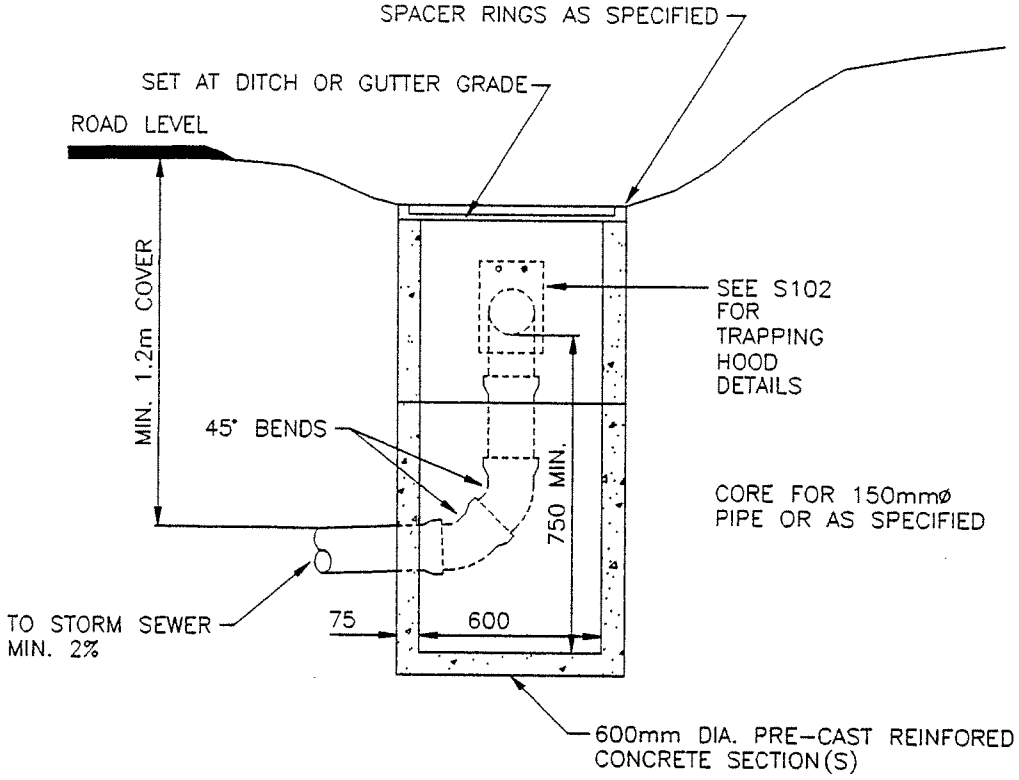
City of Burnaby
ENGINEERING DEPARTMENT

CAST IRON MANHOLE FRAME & COVER

DRAWN BY: H. SMITH	SCALE: N.T.S.	**BBY-**	S106
APPRV'D BY:	DATE: OCT 66		



PLAN



SECTION A–A

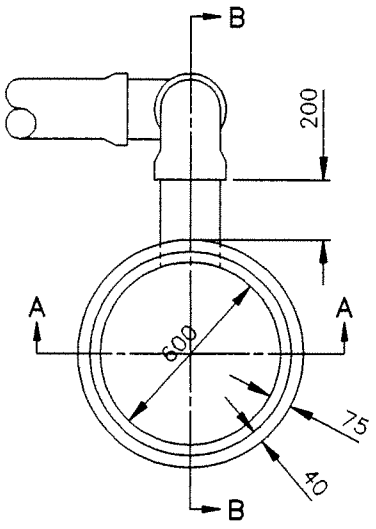
NOTE:
1. FOR 150mmø C.B. LEADS USE 45° BENDS.
2. FOR 200mmø C.B. LEADS OR LARGER, 90° BENDS MAY BE USED.
3. SECURE TRAPPING HOOD WITH 16mmø GALVANIZED PINS. PINS TO BE SLOPED UP AT 20° TOWARDS THE GRATE.
4. GROUT TO SEAL PIPE OPENING, LIFTING HOLES, TEMPORARY DRAIN HOLE(S), SECTIONS, AND SPACER RINGS, INSIDE AND OUT.
5. ALL DIMENSIONS IN mm.

NO.	DATE	REVISION	APP'D	BY
1	97/01	GENERAL REVISION (L956)		JK

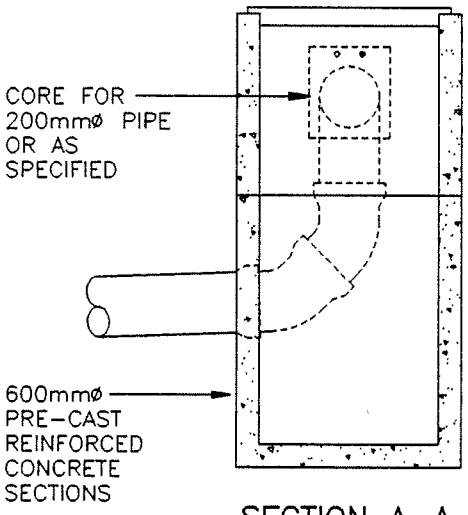
City of Burnaby
ENGINEERING DEPARTMENT

TYPICAL CATCH BASIN INSTALLATION

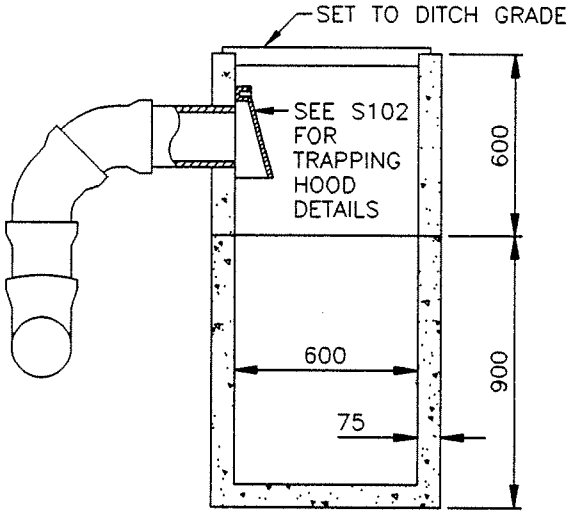
DRAWN BY:	SCALE: N.T.S.	BBY-	S107
APPRV'D BY:	DATE: JUNE 68		



PLAN



SECTION A–A



SECTION B–B

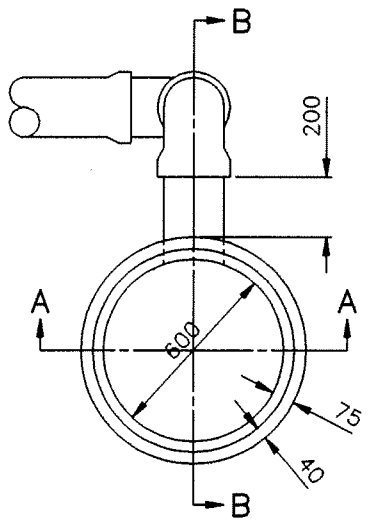
NOTES:
1. USE TYPE I OPEN GRATE S103 FOR ROAD SIDE DITCH INSTALLATIONS.
2. USE MODIFIED GRATE FOR BOULEVARD SWALE INSTALLATIONS, OR PAVED AREAS.
3. SEE S107 FOR TYPICAL INSTALLATION DETAILS.
4. GROUT TO SEAL PIPE OPENING, LIFTING HOLES, TEMPORARY DRAIN HOLE(S), SECTIONS, AND SPACER RINGS, INSIDE AND OUT.
5. ALL DIMENSIONS IN mm.

NO.	DATE	REVISION	APP'D	BY
1	97/01	GENERAL REVISION (L416)		JK

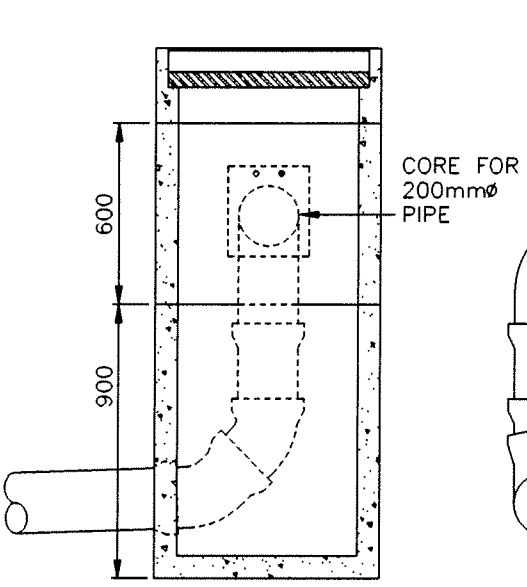
City of Burnaby
ENGINEERING DEPARTMENT

CATCH BASIN TYPE I

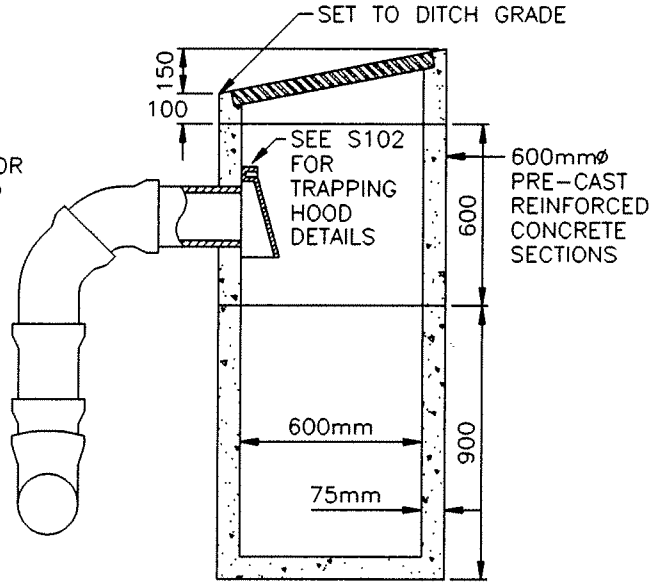
DRAWN BY:	SCALE: N.T.S.	BBY- S108	
APPRV'D BY:	DATE: FEB 65		



PLAN



SECTION A–A



SECTION B–B

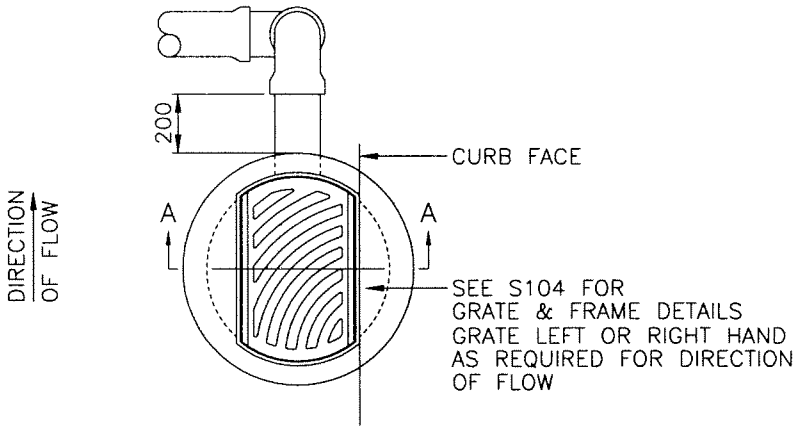
NOTE:
1. TYPE I OPEN GRATE OR EQUIVALENT. (SEE S103)
2. GROUT TO SEAL PIPE OPENING, LIFTING HOLES, TEMPORARY DRAIN HOLE(S), SECTIONS, AND SPACER RINGS, INSIDE AND OUT.
3. SEE S107 FOR TYPICAL INSTALLATION DETAILS.
4. ALL DIMENSIONS IN mm.

NO.	DATE	REVISION	APP'D	BY
1	97/01	GENERAL REVISION (L415)		JK

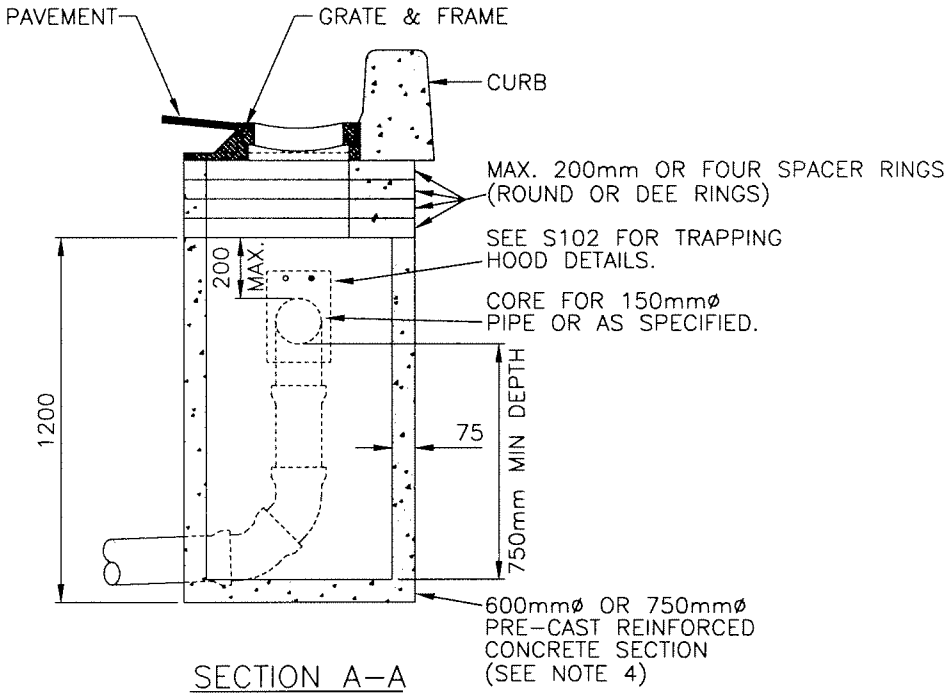
City of Burnaby
ENGINEERING DEPARTMENT

CATCH BASIN TYPE II

DRAWN BY:		SCALE: N.T.S.	BBY- S109
APPRV'D BY:		DATE: JAN 67	



PLAN
(CURB & PAVEMENT NOT SHOWN)



SECTION A–A

NOTE:
1. USE "DEE" FRAME AND RINGS WHEN CB'S ARE INSTALLED WITH CURB & GUTTER.
2. USE "ROUND" FRAME AND RINGS WHEN CB'S ARE INSTALLED WELL IN ADVANCE OF CURB & GUTTER WORKS.
3. CB VA USED AT ALL SAG POINTS.
4. FOR CB VA USE ADJUSTABLE CURB INLET FRAME S105, 900ø ROUND SPACER RINGS AND 750ø BARREL.
5. EXPANSION JOINT REQUIRED IN CURB & GUTTER AT MIDDLE OF CB FRAME FOR TYPE V INSTALLATIONS OR 1m EACH SIDE OF FRAME FOR TYPE VA INSTALLATIONS.
6. GROUT TO SEAL PIPE OPENING, LIFTING HOLES, TEMPORARY DRAIN HOLE(S), SECTIONS, AND SPACER RINGS, INSIDE AND OUT.
7. SEE S107 FOR TYPICAL INSTALLATION DETAILS.
8. ALL DIMENSIONS IN mm.

NO.	DATE	REVISION	APP'D	BY
3	2004/04	BARREL SIZE SUMP DEPTH ADDED AND CHANGED		GF
2	2003/01	BARREL SIZE INCREASED FOR VA FRAME		GF
1	97/01	GENERAL REVISION (L428C)		JK

City of Burnaby
ENGINEERING DEPARTMENT

CURB CATCHBASIN TYPE V

DRAWN BY:	SCALE: N.T.S.	BBY- S110
APPRV'D BY:	DATE: OCT 67	

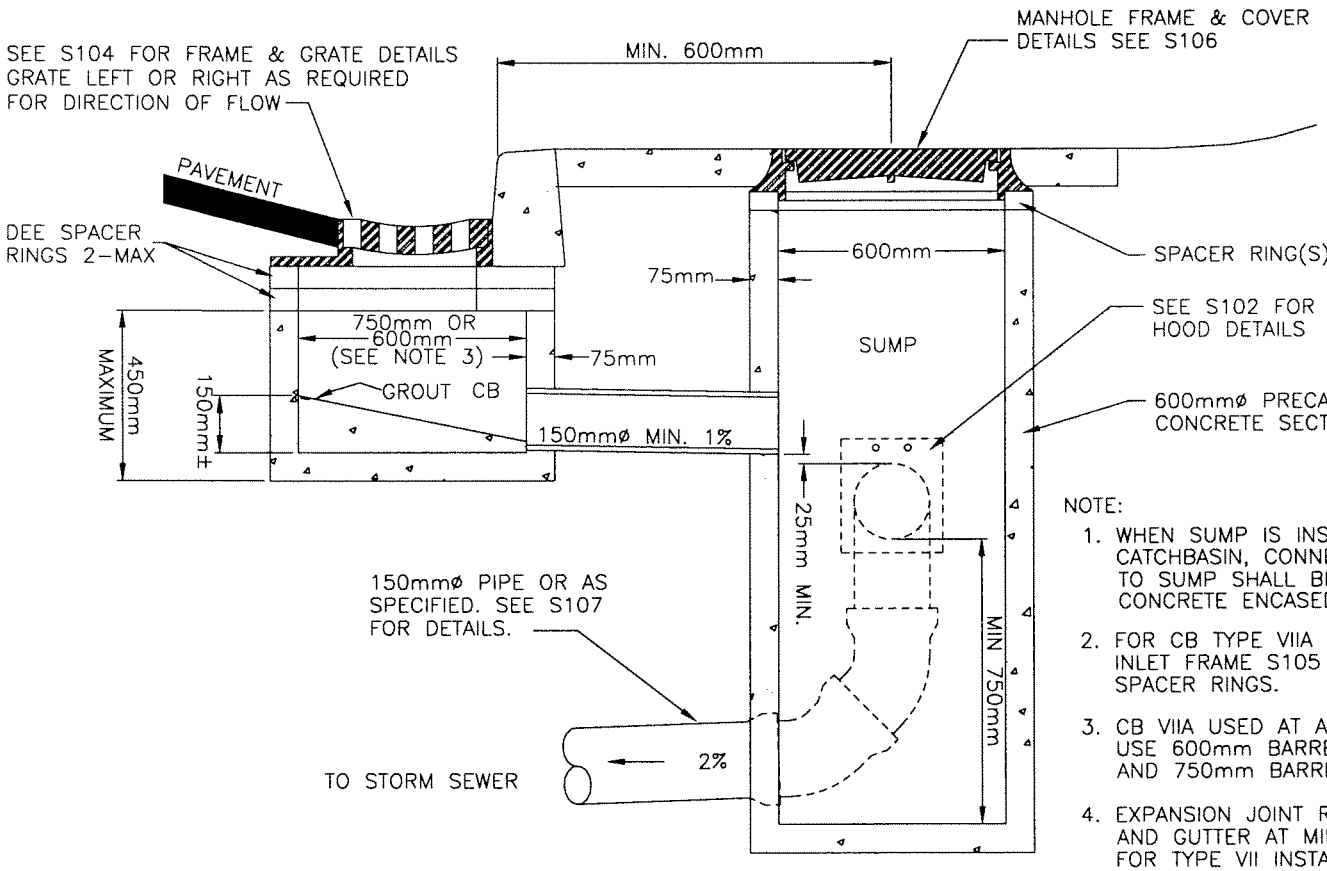
City of Burnaby
ENGINEERING DEPARTMENT

TYPICAL OFFSET SUMP CATCH BASIN (TYPE VII)

DRAWN BY:
APPRV'D BY:
SCALE: N.T.S.
DATE: FEB 70

BBY- S111

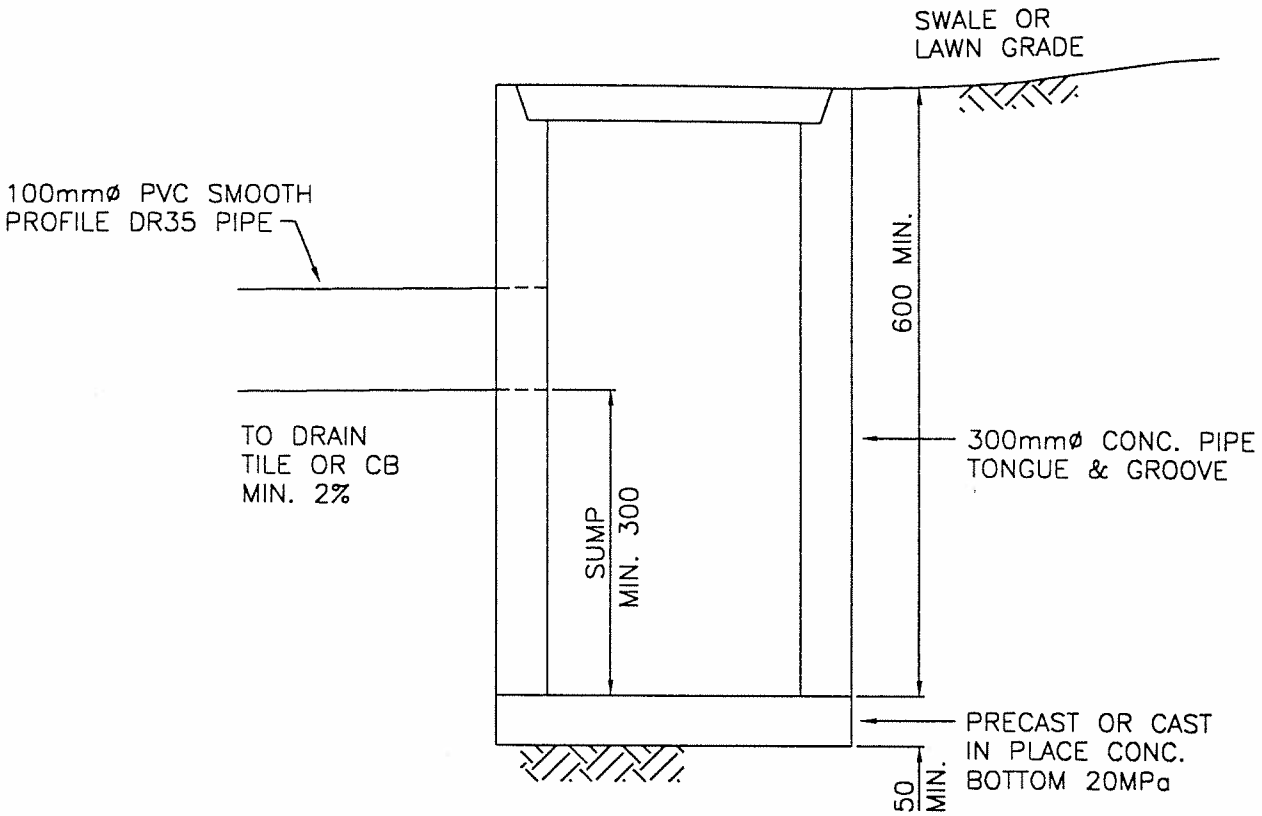
NO.	DATE	REVISION	APP'D
2	2004/04	REVISED BARREL SIZE	GF
1	97/01	GENERAL REVISION (L1155)	JK



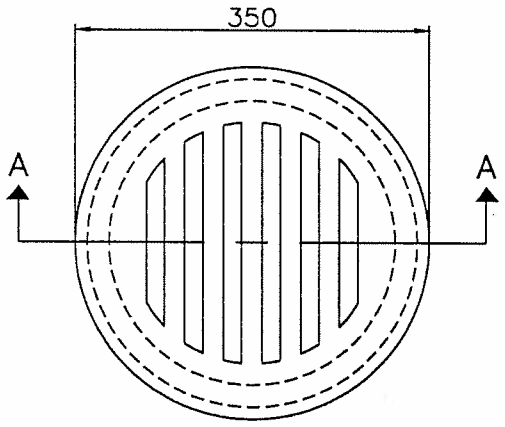
SECTION

NOTE:

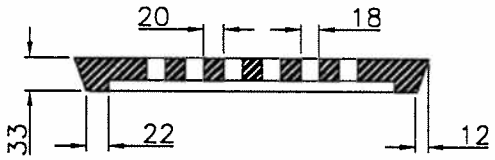
1. WHEN SUMP IS INSTALLED ROADSIDE TO CATCHBASIN, CONNECTION PIPE FROM CB TO SUMP SHALL BE DUCTILE IRON OR CONCRETE ENCASED.
2. FOR CB TYPE VIIA USE ADJUSTABLE CURB INLET FRAME S105 AND 900ø ROUND SPACER RINGS.
3. CB VIIA USED AT ALL SAG POINTS. USE 600mm BARREL FOR TYPE V11 AND 750mm BARREL FOR TYPE V11A
4. EXPANSION JOINT REQUIRED IN CURB AND GUTTER AT MIDDLE OF CB FRAME FOR TYPE VII INSTALLATIONS OR 1m EACH SIDE OF FRAME FOR TYPE VIIA INSTALLATIONS.
5. GROUT TO SEAL PIPE OPENING, LIFTING HOLES, TEMPORARY DRAIN HOLE(S), SECTIONS, AND SPACER RINGS, INSIDE AND OUT.
6. SEE S107 FOR TYPICAL SUMP INSTALLATION DETAIL.



SECTION



GRATE



SECTION A–A

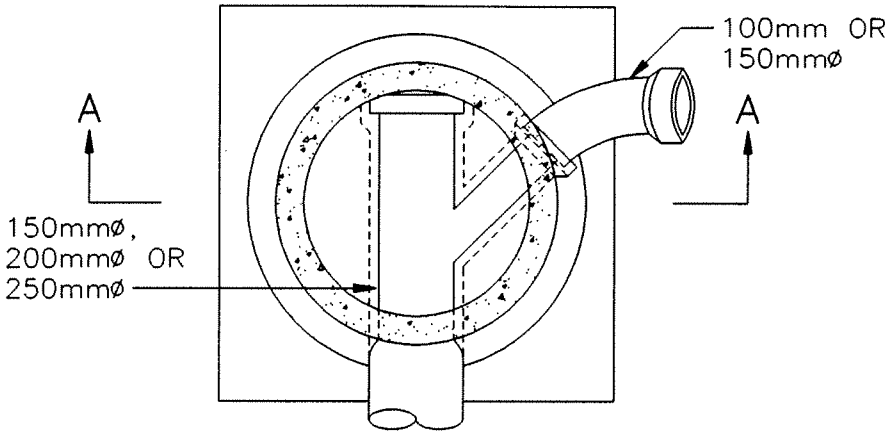
NOTE:
1. FOR USE IN BOULEVARD AREAS BETWEEN SIDEWALK AND PROPERTY LINE.
2. FOR DRAINAGE AREA LESS THAN 100m^2.
3. GROUT AS NECESSARY TO SEAL PIPE OPENING.
4. CASTING SHALL MEET ASTM A48 CLASS 25 GREY IRON SPECIFICATIONS.
5. CASTING FINISH SHALL BE BITUMINOUS DIP COATED.
6. CASTING SHALL MEET MINIMUM WEIGHT REQUIREMENT:
   GRATE 13kg ±5%
7. GRATE SHALL BE CERTIFIED H20 LOADING.

NO.	DATE	REVISION	APP'D	BY
2	2000/01	NOTES REVISED		JK
1	97/01	GENERAL REVISION (L1027)		JK

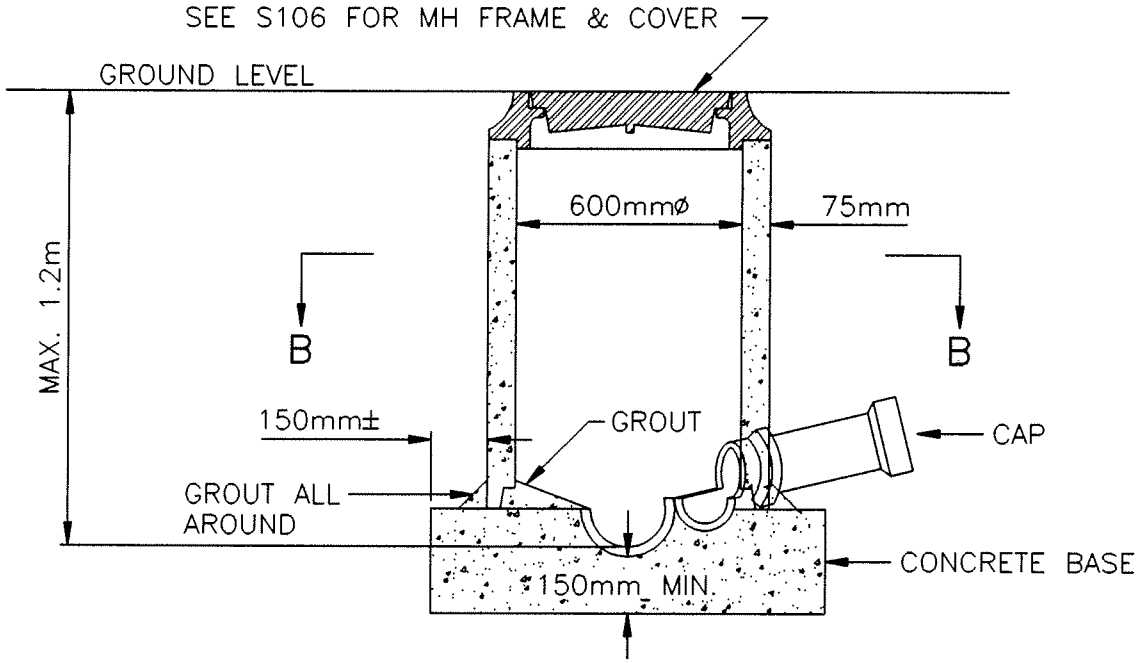
City of Burnaby
ENGINEERING DEPARTMENT

LAWN BASIN

DRAWN BY:	SCALE: N.T.S.	BBY- S112
APPRV'D BY:	DATE: DEC 68	



SECTION B–B



SECTION A–A

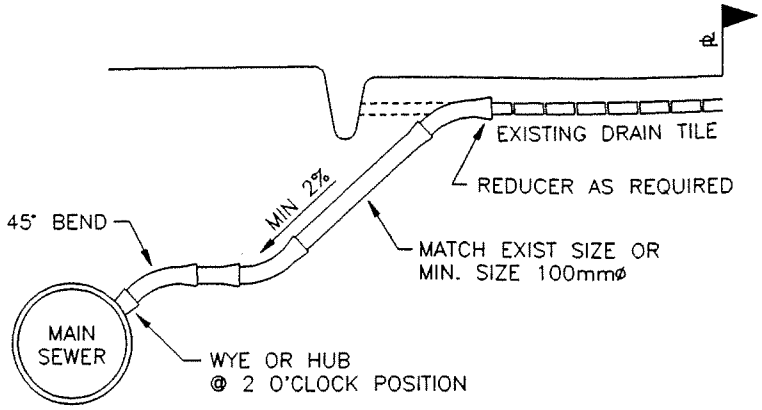
NOTE:
THIS TYPE OF CLEAN–OUT TO BE USED ONLY AT THE END OF THE LINE IN AN EASEMENT OR LANE IF THE DEPTH IS 1.2m OR LESS.

NO.	DATE	REVISION	APP'D	BY
1	97/01	GENERAL REVISION (L1154)	BTD	JK

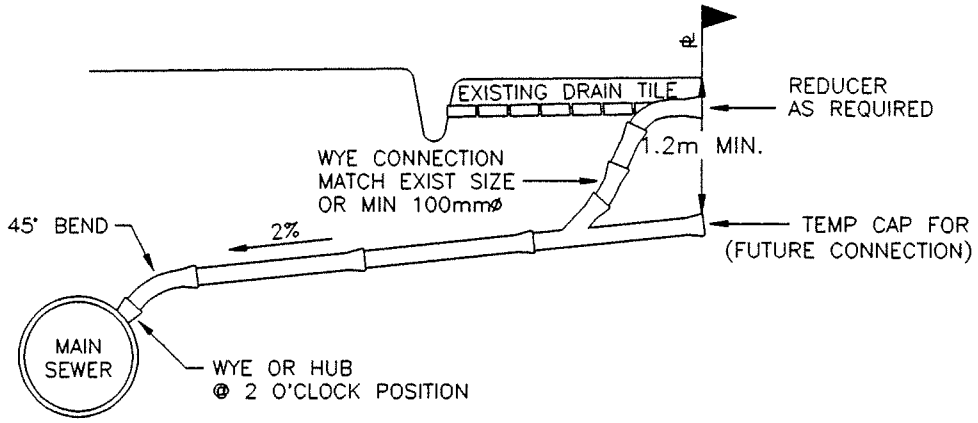
City of Burnaby
ENGINEERING DEPARTMENT

TYPICAL CLEAN–OUT

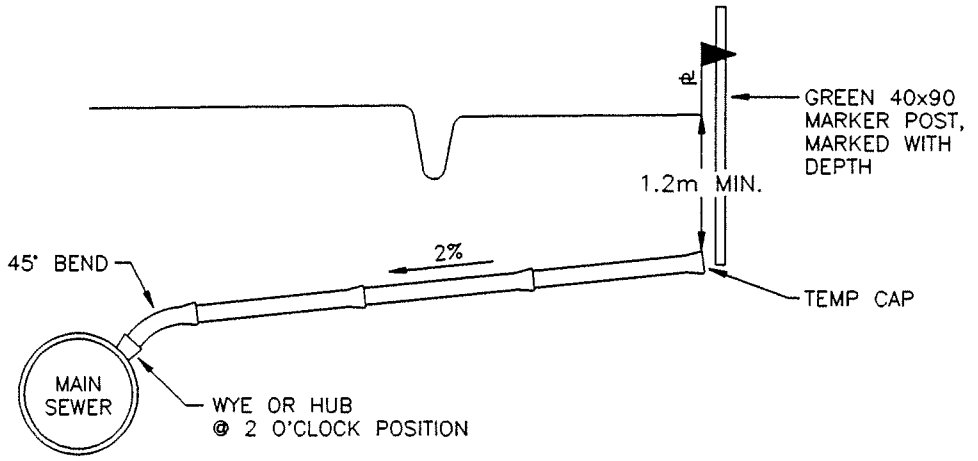
DRAWN BY:	SCALE: N.T.S.	**BBY-**	S113
APPRV'D BY:	DATE: FEB 70		



TYPE A. TEMPORARY CONNECTION TO EXISTING DRAIN TILE



TYPE B. PERMANENT CONNECTION TO EXISTING DRAIN TILE



TYPE C. PERMANENT CONNECTION – NO EXISTING DRAIN TILE

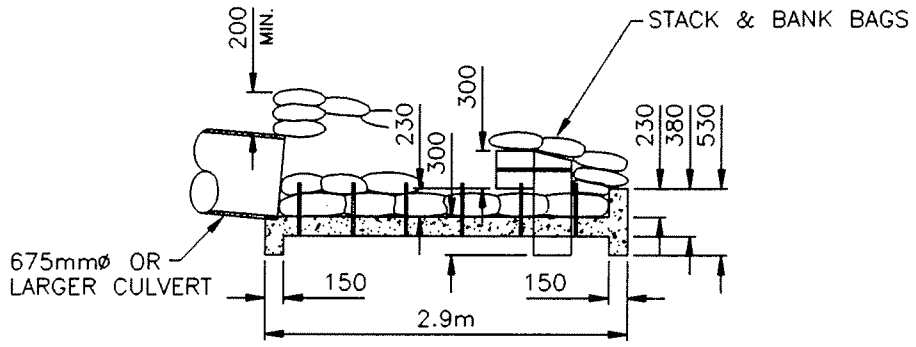
NOTES:
1. CONNECTIONS MINIMUM 150mmø OR AS SHOWN ON THE DRAWINGS.
2. RISER SERVICE ONLY PERMITTED FOR TYPE B WYE CONNECTION TO EXIST TILE @ PROPERTY LINE.
3. MARKER POST TO EXTEND MINIMUM 1.0m ABOVE EXIST GROUND SURFACE.

NO.	DATE	REVISION	APP'D	BY
1	97/01	GENERAL REVISION (L944)	BBY	JK

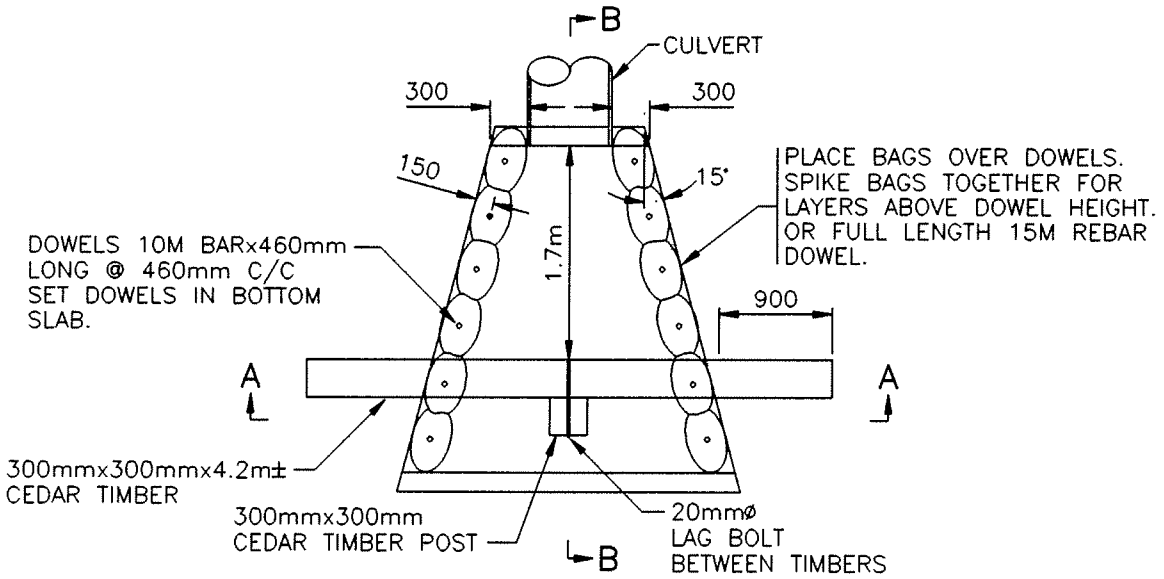
City of Burnaby
ENGINEERING DEPARTMENT

3 METHODS OF CONNECTING PROPERTIES TO NEW STORM SEWER

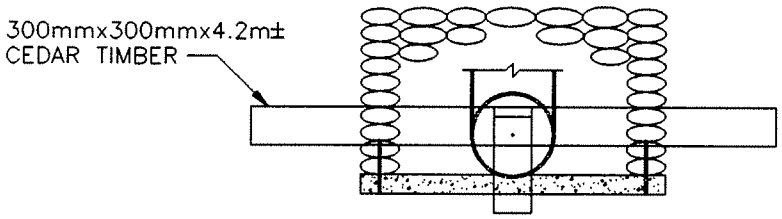
DRAWN BY:	SCALE: N.T.S.	BBY-	S114
APPRV'D BY:	DATE: JUNE 68		



SECTION B–B



PLAN



SECTION A–A

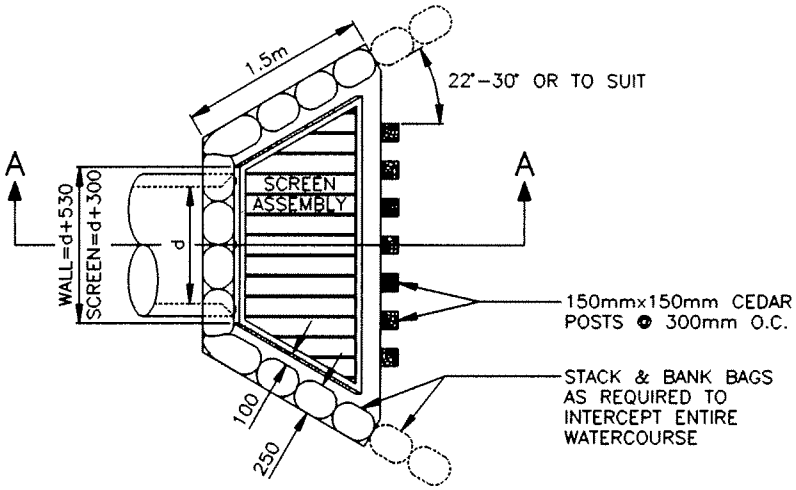
NOTE:
1. CONCRETE SHALL BE 32MPa.
2. ALL DIMENSIONS IN mm UNLESS OTHERWISE SHOWN.

NO.	DATE	REVISION	APP'D	BY
1	97/01	GENERAL REVISION (L1007A)		JK

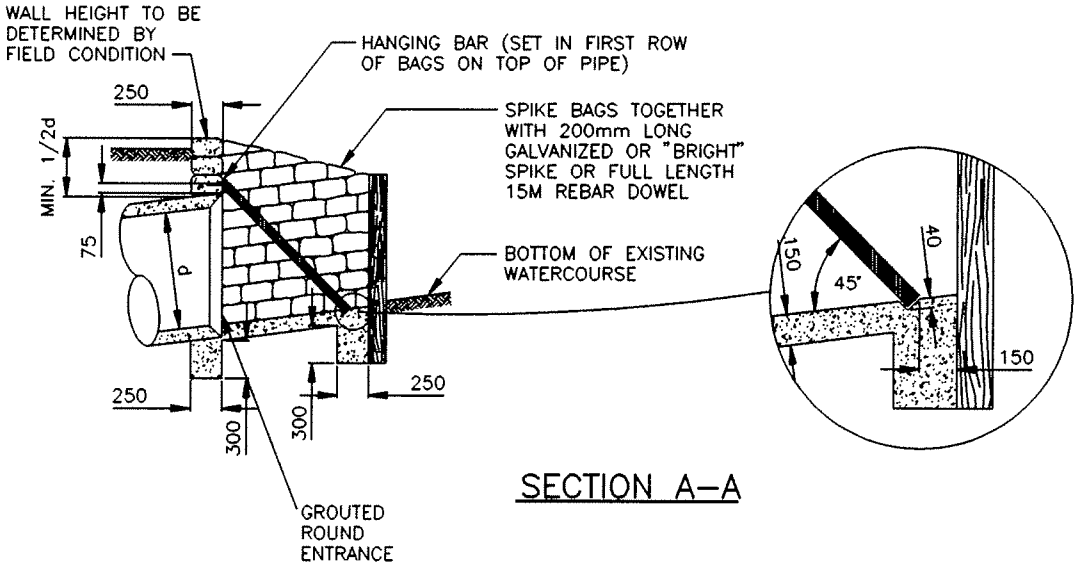
City of Burnaby
ENGINEERING DEPARTMENT

TEMPORARY ENERGY DISSIPATOR

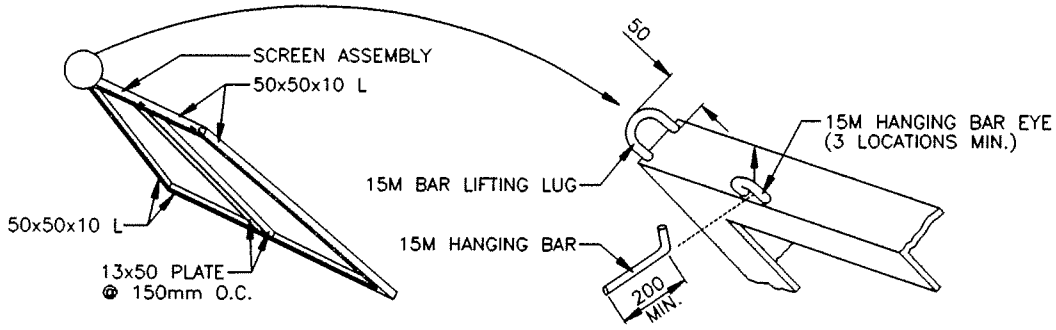
DRAWN BY:		SCALE: N.T.S.	BBY- S115
APPRV'D BY:		DATE: MAY 73	



PLAN



SECTION A–A



SCREEN ASSEMBLY

NOTE:

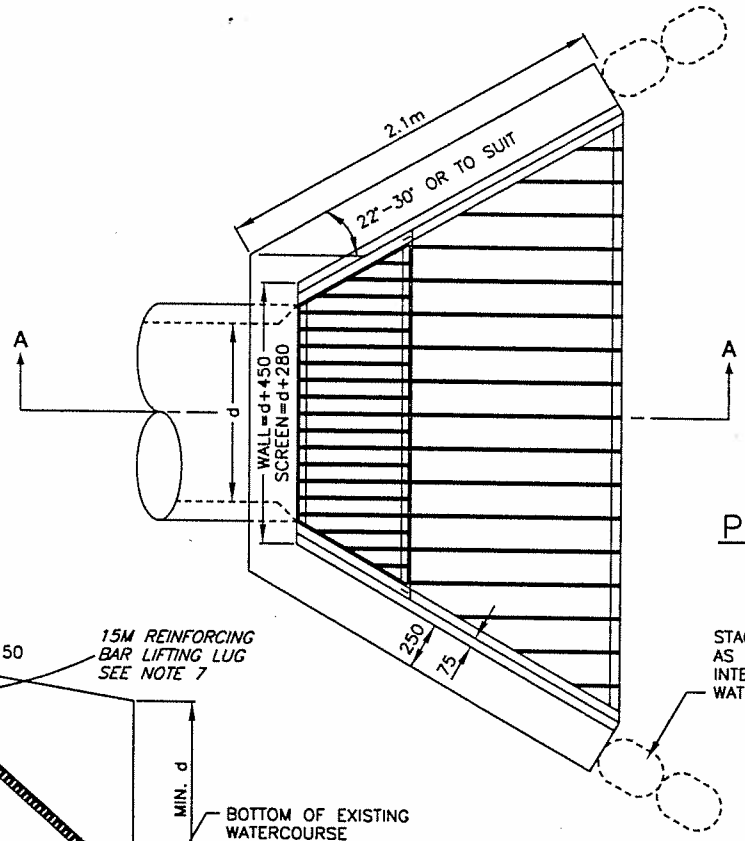
1. SCREEN ASSEMBLY SHALL BE FABRICATED BY WELDING.
2. ALL COMPONENTS SHALL BE A36 STRUCTURAL STEEL.
3. CONCRETE SHALL BE 32MPa.
4. ALL DIMENSIONS IN mm. UNLESS OTHERWISE SHOWN.

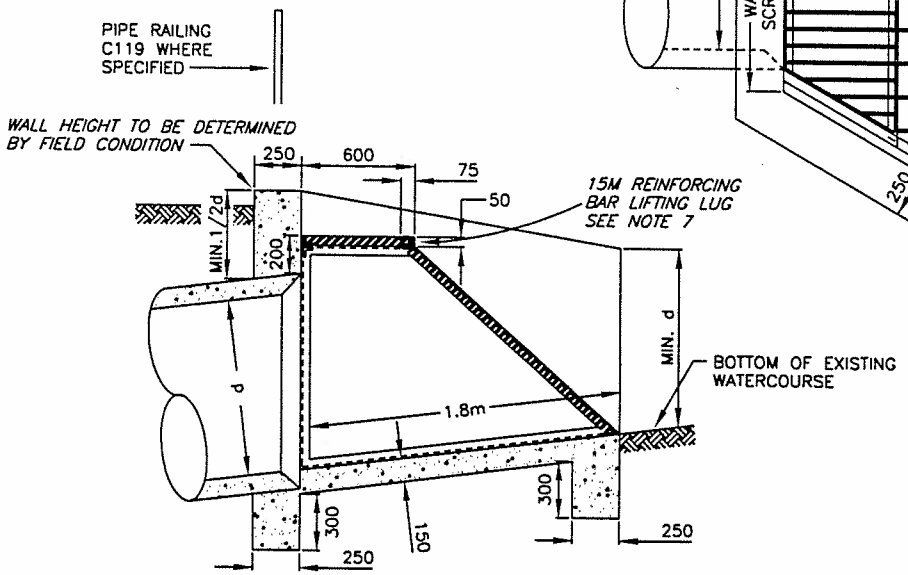
NO.	DATE	REVISION	APP'D	BY
1	97/01	GENERAL REVISION (L1458)	BD	JK

City of Burnaby
ENGINEERING DEPARTMENT

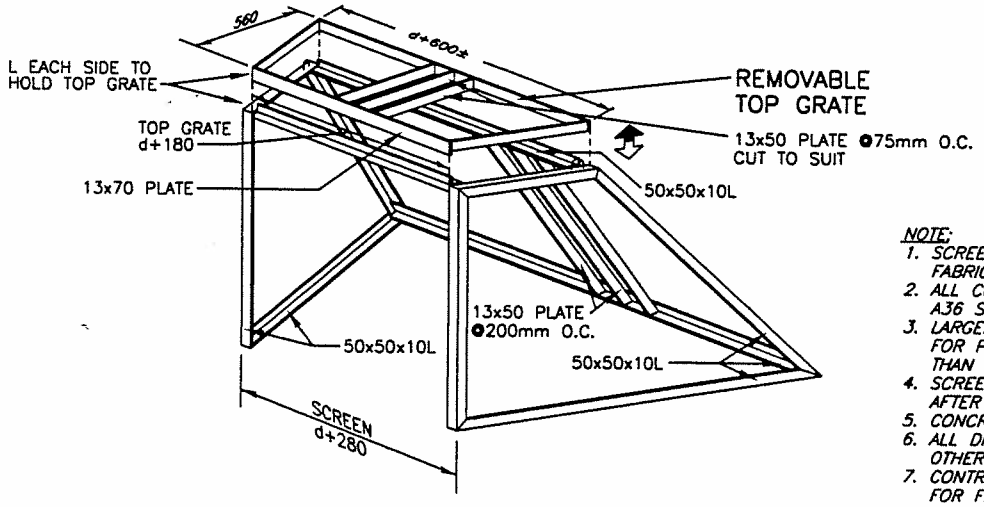
TEMPORARY INLET STRUCTURE FOR PIPE MAX. 900mmø

DRAWN BY:	SCALE: N.T.S.	BBY- S116
APPRV'D BY:	DATE: JAN 74	





SECTION A–A



SCREEN ASSEMBLY

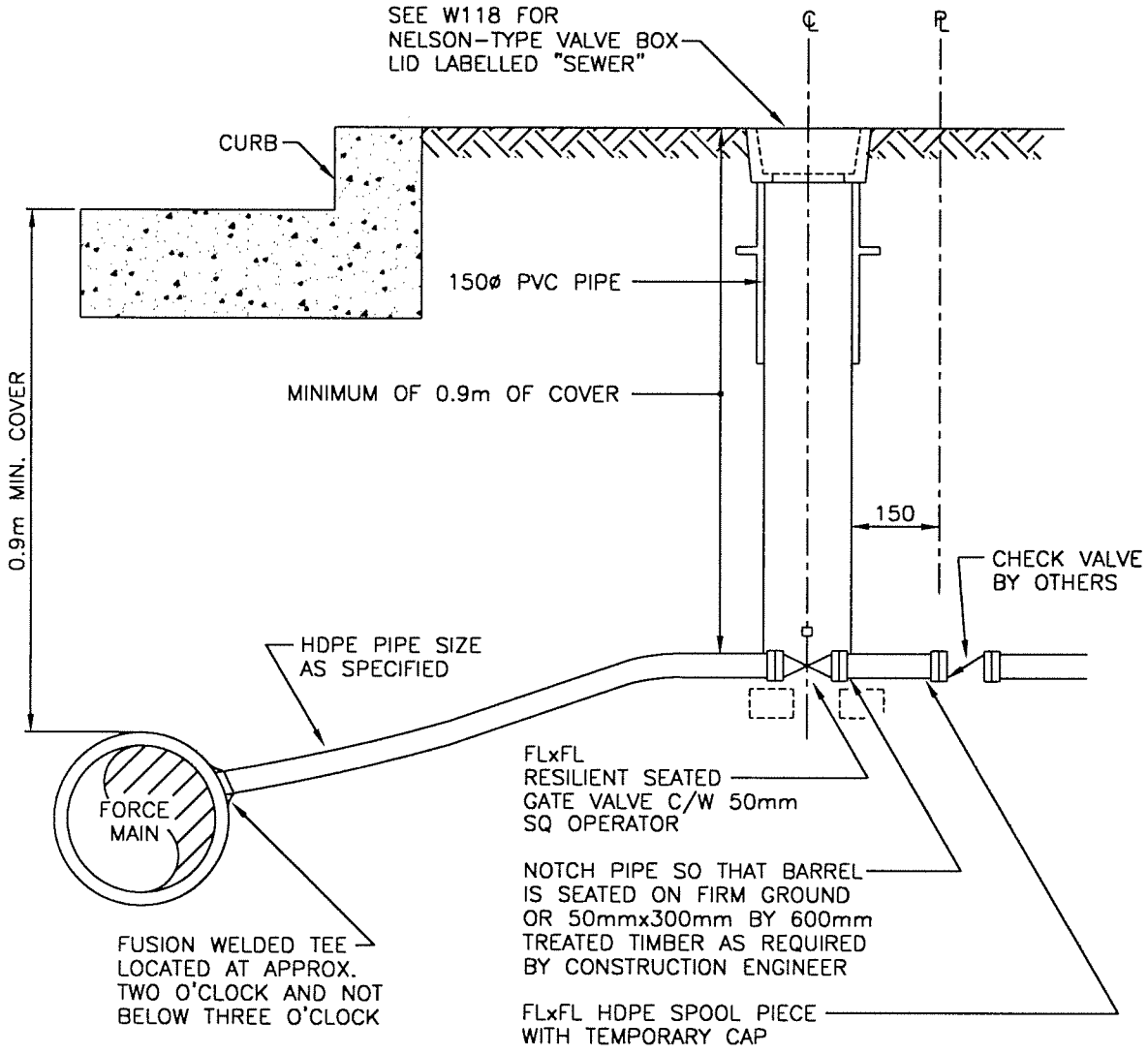
NOTE:
1. SCREEN ASSEMBLY SHALL BE FABRICATED BY WELDING.
2. ALL COMPONENTS SHALL BE A36 STRUCTURAL STEEL.
3. LARGER BARS TO BE USED FOR PIPE DIAMETER GREATER THAN 900mm ø.
4. SCREEN HOT DIPPED GALVANIZED AFTER FABRICATION.
5. CONCRETE SHALL BE 32MPa. (CAST IN PLACE)
6. ALL DIMENSIONS IN mm. UNLESS OTHERWISE SHOWN.
7. CONTRACTOR CAN SUBSTITUTE A "HINGE" SYSTEM FOR FRONT GRILL AND HANGERS FOR TOP REMOVABLE GRATE, SUBJECT TO APPROVAL BY A STRUCTURAL ENGINEER AND THE CITY

NO.	DATE	REVISION	APP'D	BY
2	99/02	NOTE 7 ADDED		HL
1	97/01	GENERAL REVISION (L1489)		JK

City of Burnaby
ENGINEERING DEPARTMENT

STANDARD INLET STRUCTURE FOR PIPE MAX. 900mmø

DRAWN BY:		SCALE: N.T.S.	BBY- S117
APPRV'D BY: BCD		DATE: JAN 74	



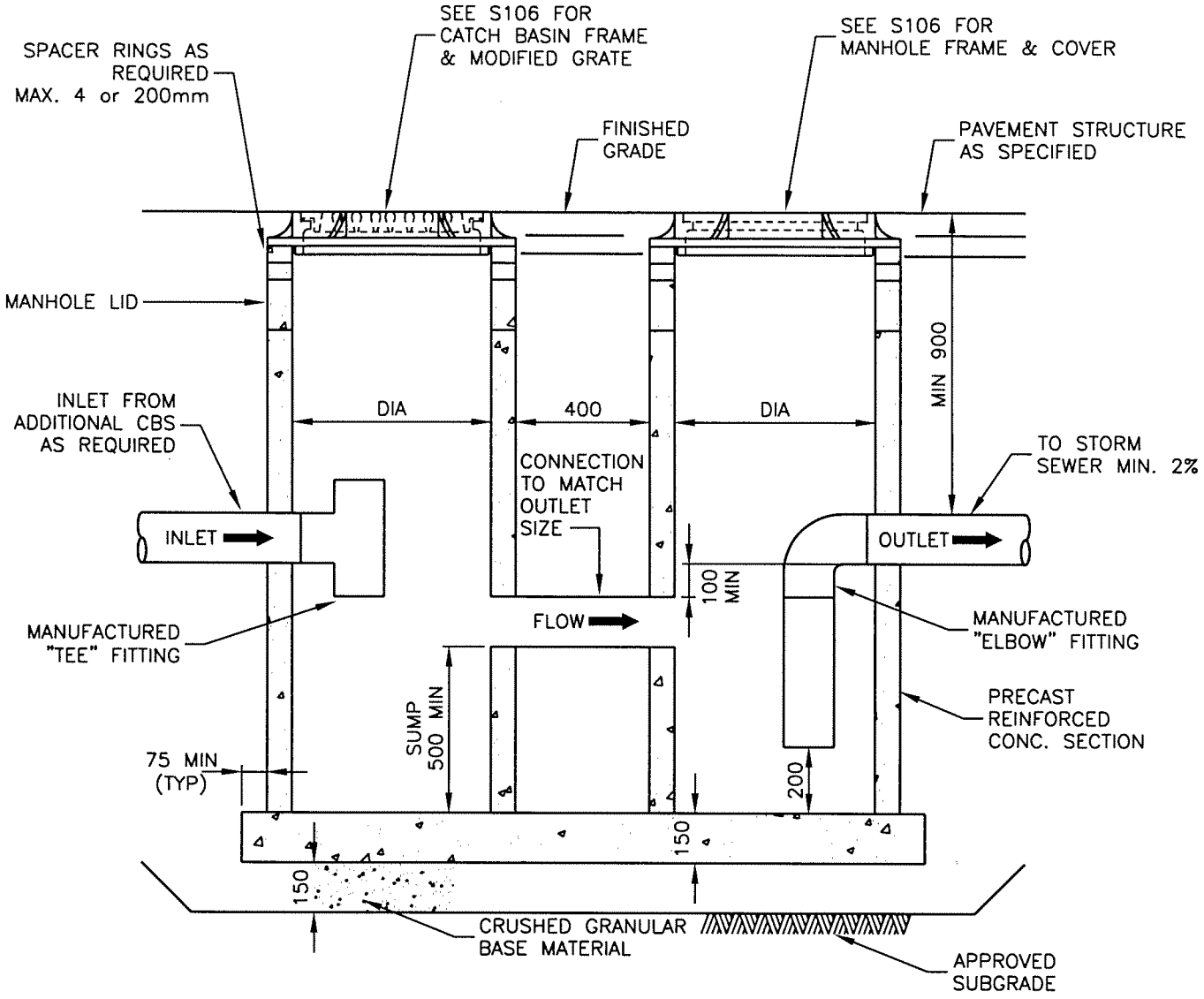
NOTES:
1. HDPE PIPE SHALL HAVE SAME OR GREATER PRESSURE RATING AS THE FORCE MAIN.
2. HDPE PIPE TO BE SNAKED TO ALLOW FOR EXPANSION AND CONTRACTION.
3. FOR DITCH CROSSINGS MINIMUM DEPTH OF COVER OVER THE CONNECTION SHALL BE 1.5m MEASURED FROM THE CROWN OF THE ROAD OR 0.3m BELOW DITCH INVERT WHICHEVER IS GREATER.
4. ALL DIMENSIONS IN mm UNLESS OTHERWISE NOTED.

NO.	DATE	REVISION	APP'D	BY
1	2000/01	NOTES REVISED		JK

City of Burnaby
ENGINEERING DEPARTMENT

PUMPED FORCE MAIN CONNECTION

DRAWN BY: J. KO	SCALE: N.T.S.	**BBY-** S118	
APPRV'D BY:	DATE: OCT 97		



MAXIMUM PAVED PARKING AREA	BARREL DIA	OUTLET SIZE
600m²	600mmø	150mmø
1750m²	750mmø	150mmø
3700m²	900mmø	200mmø

NOTES:

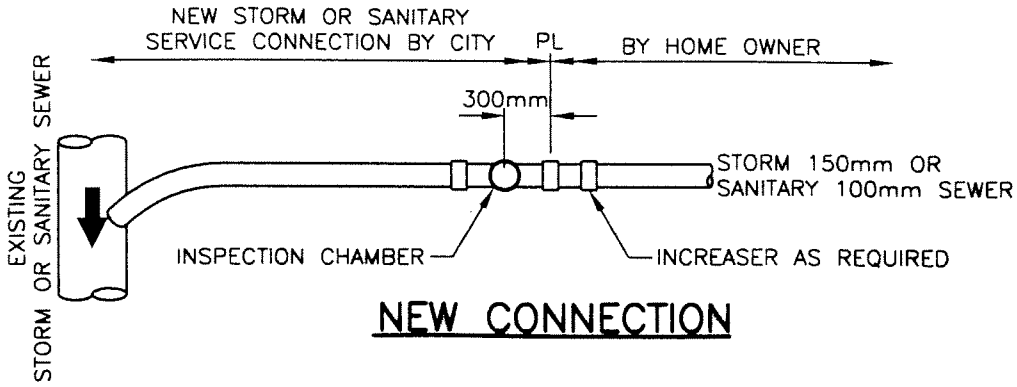
1. GROUT TO SEAL PIPE OPENING, LIFTING HOLES, SECTION AND SPACER RINGS, INSIDE AND OUT
2. CONCRETE ENCASE PIPES WITH LESS THAN 900mm COVER
3. DOUBLE MANHOLE LIDS MAY BE USED WHERE INTERCEPTOR IS NOT INSTALLED IN A PARKING AREA
4. PRECAST UNIT MAY BE USED PROVIDING IT MEETS THE MIN. CAPACITY REQUIREMENTS. AS APPROVED BY CONSTRUCTION ENGINEER.
5. MANHOLE LID SECTION MAY BE OMITTED FOR 600mmø BARRELS
6. USE 150x150x3 WWF IN CONCRETE SLAB WHEN THE SLAB LENGTH EXCEEDS 2m

NO.	DATE	REVISION	APP'D	BY

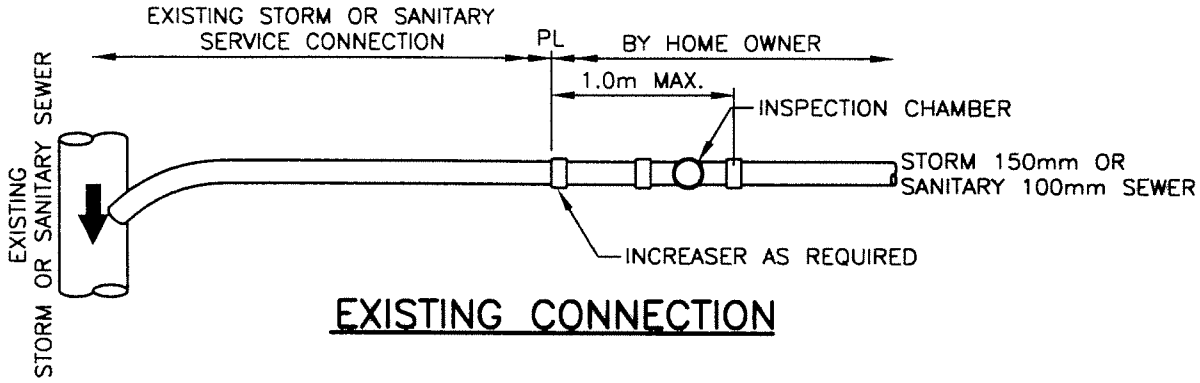
City of Burnaby
ENGINEERING DEPARTMENT

OIL INTERCEPTOR INSTALLATION

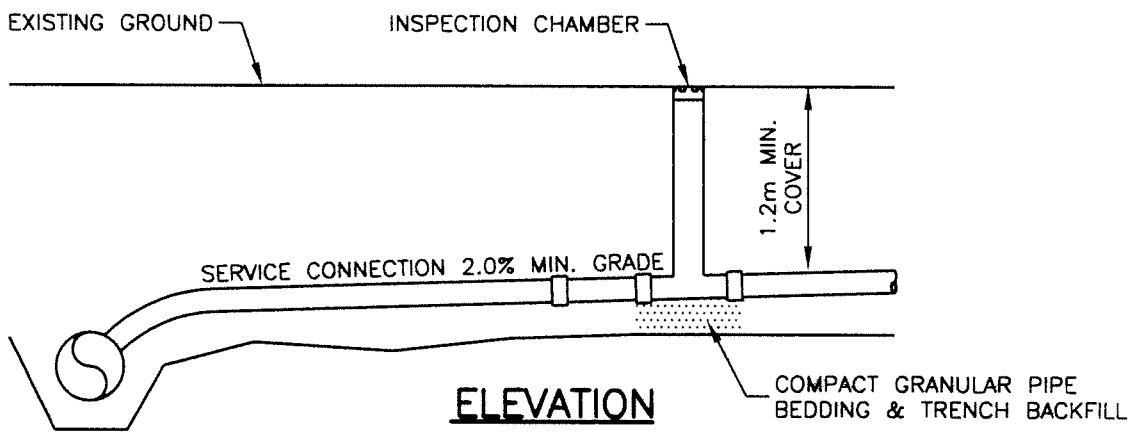
DRAWN BY: HLOUIE	SCALE: N.T.S.	**BBY-** S119
APPRV'D BY: BOD	DATE: 99-02-08	



NEW CONNECTION



EXISTING CONNECTION



ELEVATION

NOTE:

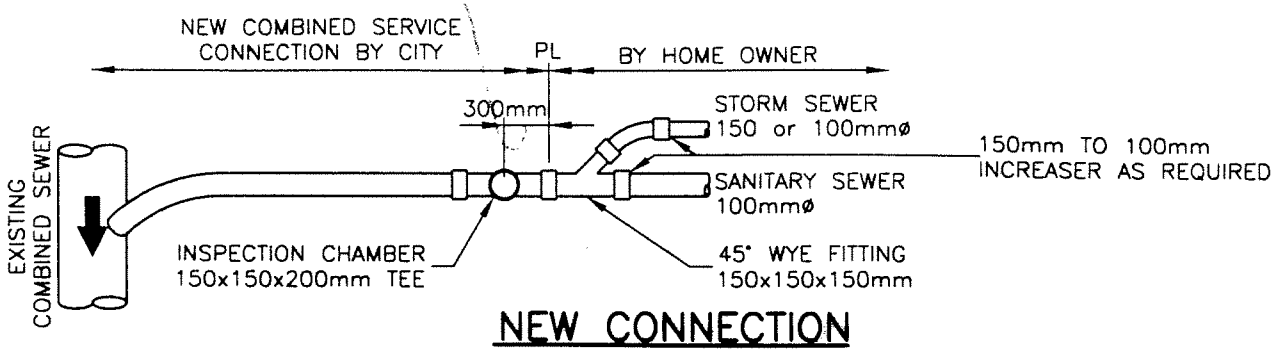
1. INSPECTION CHAMBER AND RISER PIPE SHALL BE PLUMB VERTICAL
2. INSPECTION CHAMBER LIDS SHALL BE COLOURED "GREEN FOR STORM" AND "RED FOR SANITARY"
3. STORM SEWER CONNECTIONS TO BE 150mm INSPECTION CHAMBERS OR AS SPECIFIED ON CONTRACT DRAWINGS
4. SANITARY SEWER CONNECTIONS TO BE 100mm INSPECTION CHAMBERS OR AS SPECIFIED ON CONTRACT DRAWINGS
5. SEE DRAWING BBY-S122 FOR DETAILS OF INSPECTION CHAMBER AND INSTALLATION REQUIREMENTS
6. HOME OWNER SHALL BE RESPONSIBLE FOR LOCATION AND PROTECTING ALL EXISTING UNDERGROUND UTILITIES ON PRIVATE PROPERTY DURING CONSTRUCTION
7. HOME OWNER RESPONSIBLE TO PLUG INSPECTION CHAMBER FOR TESTING ON PRIVATE PROPERTY
8. HOME OWNER MUST REMOVE PLUG AND FLAPS IN INSPECTION CHAMBER AFTER TESTING AS PER PLUMBING DEPARTMENT INSPECTION
9. HOME OWNER TO INSTALL INSPECTION CHAMBER WHEN TYING TO EXISTING SERVICE CONNECTION UNDER PLUMBING DEPARTMENT INSPECTION

NO.	DATE	REVISION	APP'D	BY
1	2001/11	SERVICE CONNECTION DETAIL, COLOURED LIDS AND NOTES		HL
1	2000/01	GENERAL REVISION		JK

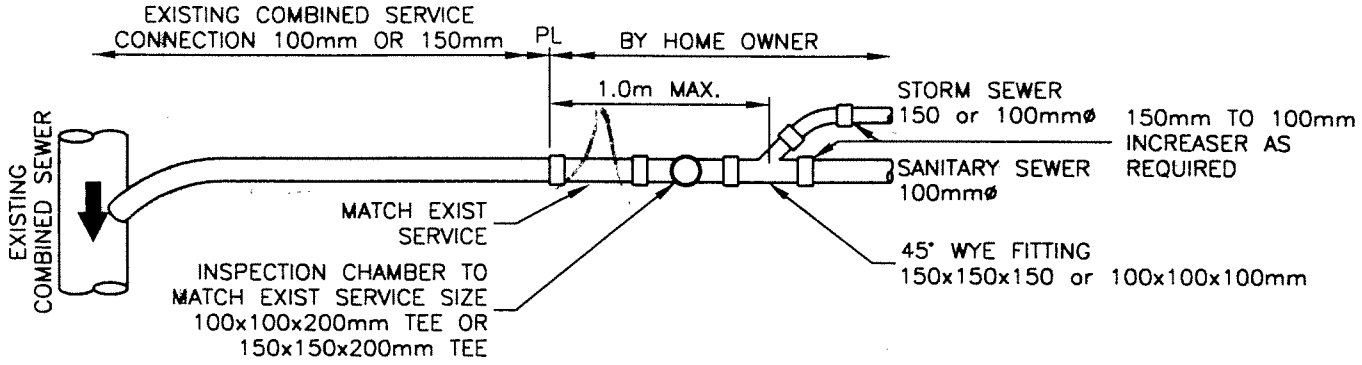
City of Burnaby
ENGINEERING DEPARTMENT

SERVICE CONNECTION TO STORM OR SANITARY SEWER

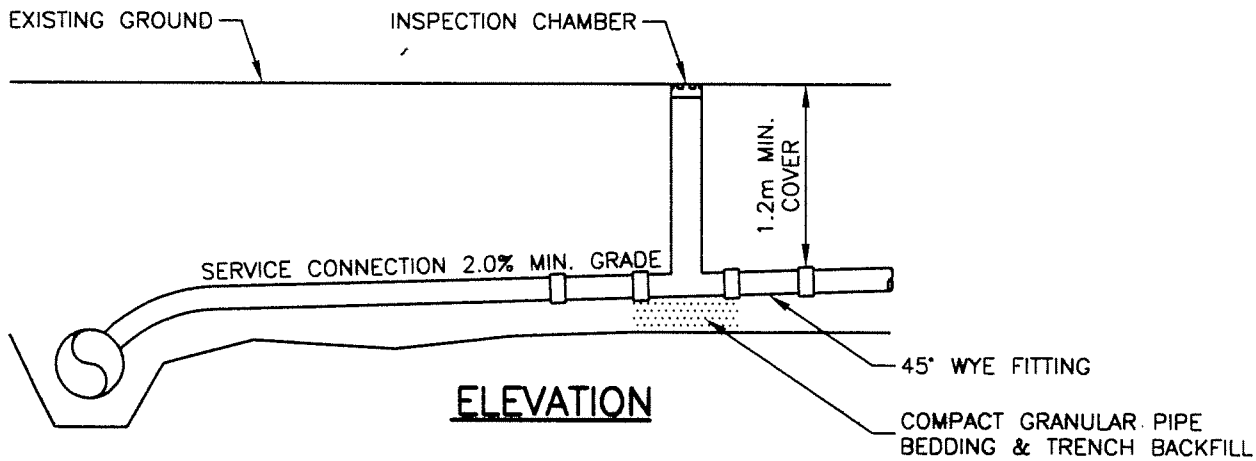
DRAWN BY: HLOUIE	SCALE: N.T.S.	BBY-	S120
APPRV'D BY:	DATE: 99-02-24		



NEW CONNECTION



EXISTING CONNECTION



ELEVATION

NOTE:

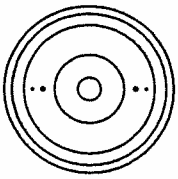
1. INSPECTION CHAMBER AND RISER PIPE SHALL BE PLUMB VERTICAL
2. INSPECTION CHAMBER LID SHALL BE COLOURED "RED FOR COMBINED"
3. SEE DRAWING BBY-S122 FOR DETAILS OF INSPECTION CHAMBER AND INSTALLATION REQUIREMENTS
4. HOME OWNER SHALL BE RESPONSIBLE FOR LOCATION AND PROTECTING ALL EXISTING UNDERGROUND UTILITIES ON PRIVATE PROPERTY DURING CONSTRUCTION
5. HOME OWNER RESPONSIBLE TO PLUG INSPECTION CHAMBER FOR TESTING ON PRIVATE PROPERTY
6. HOME OWNER MUST REMOVE PLUG AND FLAPS IN INSPECTION CHAMBER AFTER TESTING AS PER PLUMBING DEPARTMENT
7. HOME OWNER TO INSTALL INSPECTION CHAMBER WHEN TYING TO EXISTING SERVICE CONNECTION UNDER PLUMBING DEPARTMENT INSPECTION
8. HOME OWNER CAN ROTATE WYE FITTING TO SUIT LOCATION OF STORM SEWER PIPE

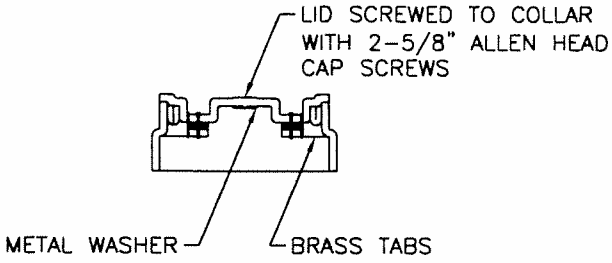
NO.	DATE	REVISION	APP'D	BY
2	2001/12	SERVICE CONNECTION DETAIL, COLOURED LIDS AND NOTES		HL
1	2000/01	GENERAL REVISIONS		JK

City of Burnaby
ENGINEERING DEPARTMENT

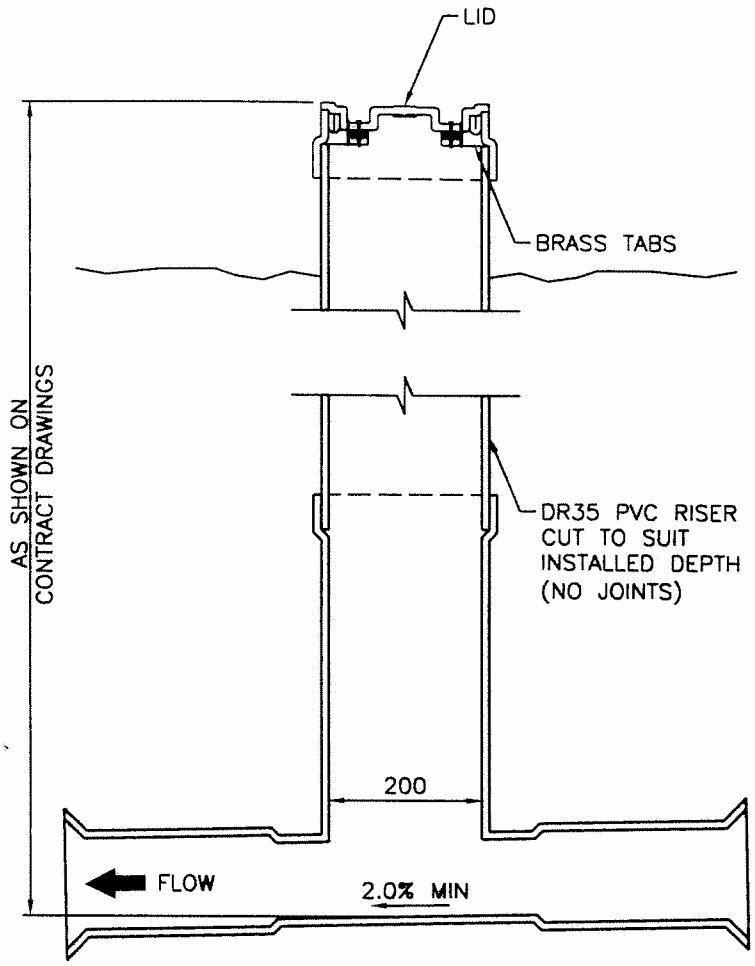
SERVICE CONNECTION TO COMBINED SEWER

DRAWN BY: HLOUIE	SCALE: N.T.S.	BBY-	S121
APPRV'D BY:	DATE: 99-02-24		

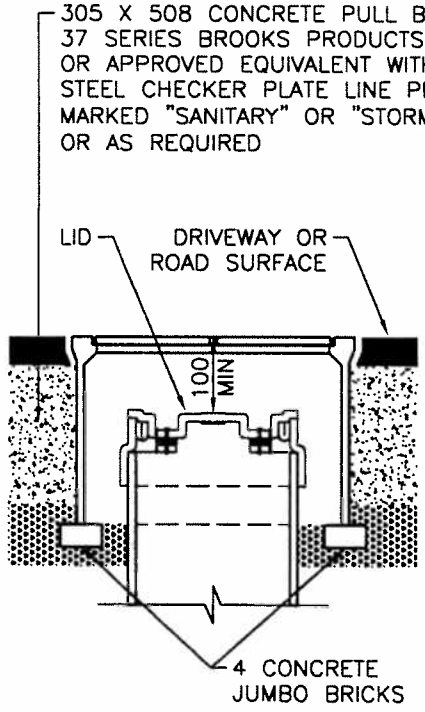




LID DETAIL



INSTALLATION IN BOULEVARD



INSTALLATION IN DRIVEWAY AND ROAD

NOTE:

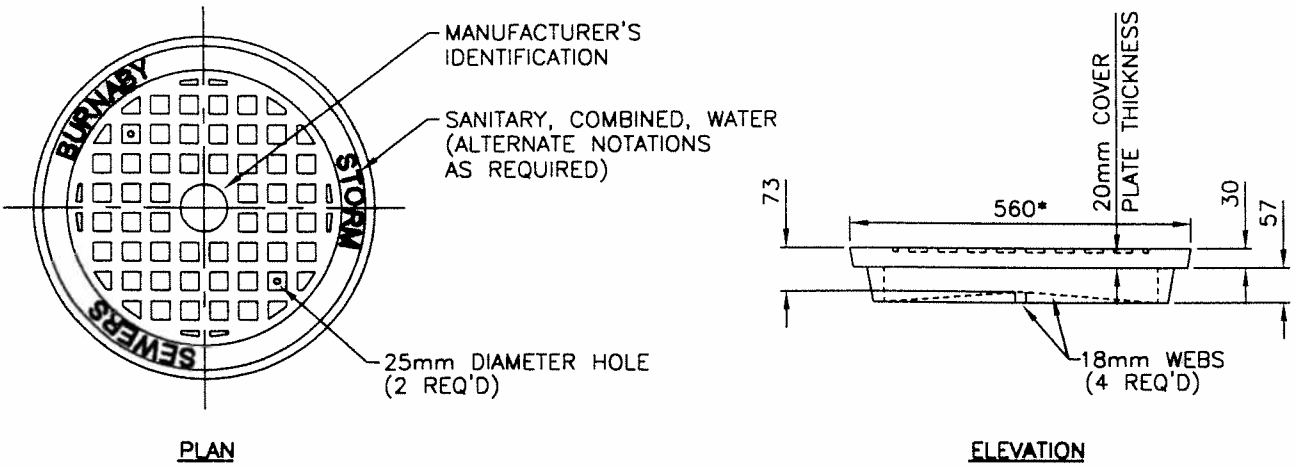
1. REFER TO DRAWING BBY-S120 & BBY-S121 FOR INSTALLATION REQUIREMENTS
2. INSPECTION CHAMBER TO BE APPROVED MANUFACTURED FITTING
3. INSPECTION CHAMBER LID SHALL BE FLUSH WITH FINAL LOT GRADING
4. LIDS SHALL BE COLOURED "GREEN FOR STORM" AND "RED FOR SANITARY" & COMBINED
5. REFER TO CONTRACT DRAWINGS FOR SITE SPECIFIC DIMENSIONS AND SECTION 02731 OF MASTER MUNICIPAL SPECIFICATIONS FOR DETAILS SPECIFICATIONS
6. FACTORY INSTALLED PLUGS IN INSPECTION CHAMBERS ARE NOT PERMITTED

NO.	DATE	REVISION

City of Burnaby
ENGINEERING DEPARTMENT

INSPECTION CHAMBER FOR 100mm TO 200mm SERVICE CONNECTION

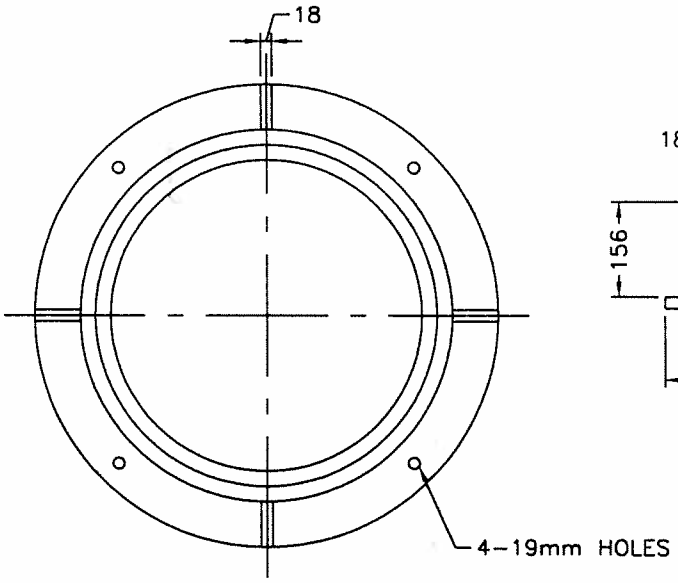
DRAWN BY: HLOUIE	SCALE: N.T.S.	BBY-	S122
APPRV'D BY: BJD	DATE: 2001-12-17		

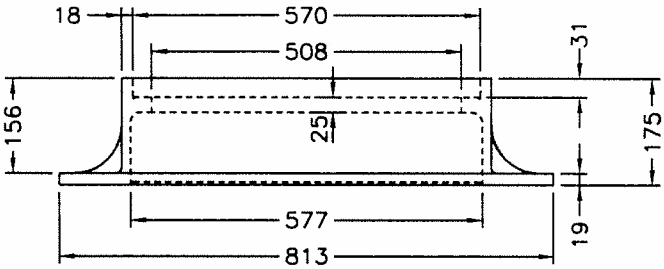


PLAN

ELEVATION

COVER





PLAN

ELEVATION

FRAME

NOTE:

1. FRAME AND COVER SHALL BE CERTIFIED H20 LOADING AND 6.64kN IMPACT LOADING.
2. CASTINGS SHALL MEET ASTM A48 CLASS 25 GREY IRON SPECIFICATIONS.
3. CASTING FINISH SHALL BE BITUMINOUS DIP COATED.
4. CASTINGS SHALL MEET MINIMUM WEIGHT REQUIREMENTS:
   COVER 66kg ± 5%
   FRAME 78kg ± 5%
5. SEATING SURFACES SHALL BE MACHINED FOR NON-ROCKING FIT IN ALL POSITIONS.
6. ALLOWABLE TOLERANCE ON FRAME AND COVER SEATING DIMENSIONS (*) SHALL BE ±0.5%.
7. ALL DIMENSIONS IN mm.

NO.	DATE	REVISION	APP'D	BY
1	2002-05	GENERAL REVISION		HL

City of Burnaby
ENGINEERING DEPARTMENT

CAST IRON MANHOLE FRAME & COVER

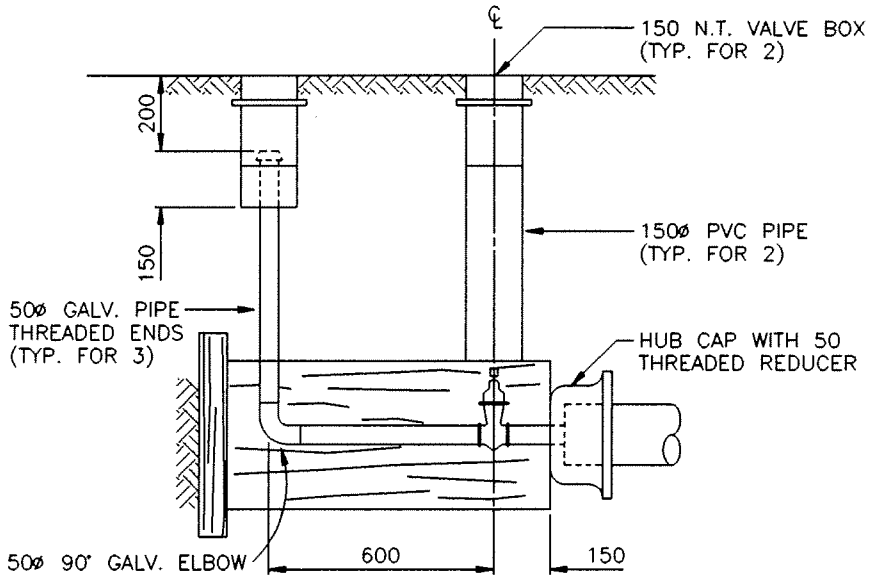
(COLLECTORS & ARTERIALS)

DRAWN BY: HLOUIE	SCALE: N.T.S.	BBY-	S123
APPRV'D BY:	DATE: 2002-03		

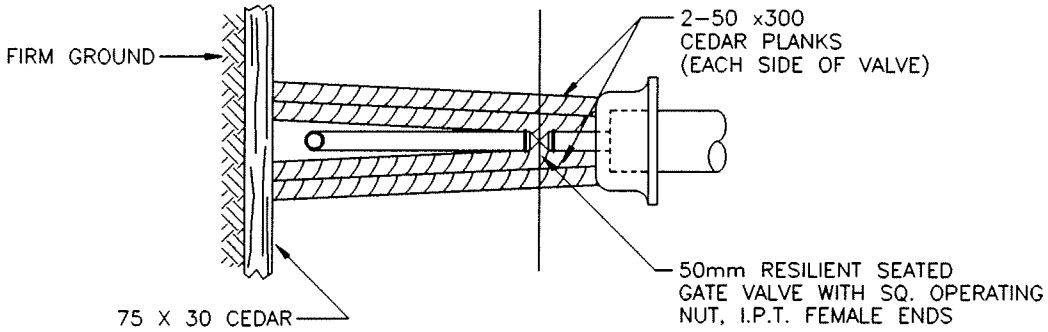
City of Burnaby

WATERWORKS DETAILS

BBY-W101	Temporary End of Watermain [L689]
BBY-W102	Typical 20mm & 25mm Service Connection [L700]
BBY-W103	Typical 38mm & 50mm Service Connection [L2226]
BBY-W104	Cathodic Protection Ground Level Test Station Details
BBY-W105	Big Fink Test Station Terminal
BBY-W106	Joint Continuity Bond
BBY-W107	Wire Fastening Detail
BBY-W108	Standard Test Station
BBY-W109	Isolation Test Station
BBY-W110	Sacrificial Anode Station @ Isolation Test Point
BBY-W111	Standard Sacrificial Anode Station
BBY-W112	Sacrificial Anode Station with Lateral or Service Connection
BBY-W113	Foreign Utility Test Station
BBY-W114	Impressed Current Cathodic Protection Rectifier Installation
BBY-W115	Horizontal Anode Installation
BBY-W116	Semi-Deep Anode Well Installation
BBY-W117	* Not Included at this Time
BBY-W118	Nelson-Type Valve Box
BBY-W119	Fire Hydrant Installation for HDPE Pipe
BBY-W120	MR6 Valve Box
BBY-W121	Air Valve Assembly Shallow Bury Application
BBY-WM1	General Layout for Typical Water Meter Installation
BBY-WM 2a	Outside Installation for 19mm & 25mm Meters
BBY-WM2b	Outside Installation for 19mm & 25mm Meters (Setter without Meter)
BBY-WM3	Outside Installation for 38mm & 50mm Meters



ELEVATION



PLAN

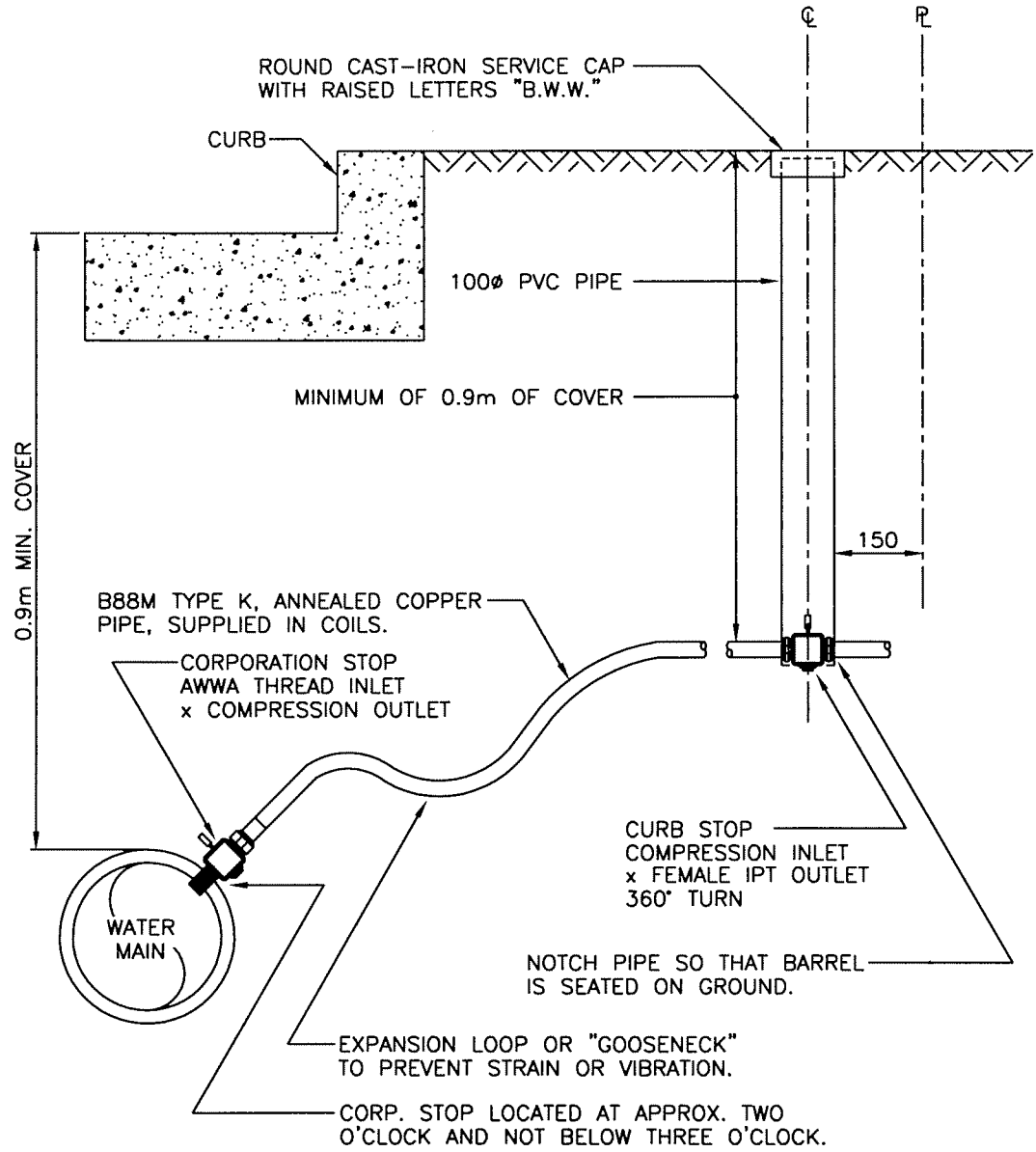
NOTES:
1. HUB CAP SHALL BE TER-MECH JOINT.
2. ALL DIMENSIONS IN MM UNLESS OTHERWISE NOTED.
3. IF FINAL CONNECTION TO THE EXISTING WATER SYSTEM IS SCHEDULED TO BE PERFORMED WITHIN 90 DAYS, THE 50mm GATE VALVE CAN BE A WHEEL OPERATED AWWA STANDARD GATE VALVE.

NO.	DATE	REVISION	APP'D	BY
1	97/01	GENERAL REVISION (L689)	BC	JK

City of Burnaby
ENGINEERING DEPARTMENT

TEMPORARY END OF WATERMAIN

DRAWN BY: SMITH	SCALE: N.T.S.	**BBY-**	W101
APPRV'D BY:	DATE: NOV 60		



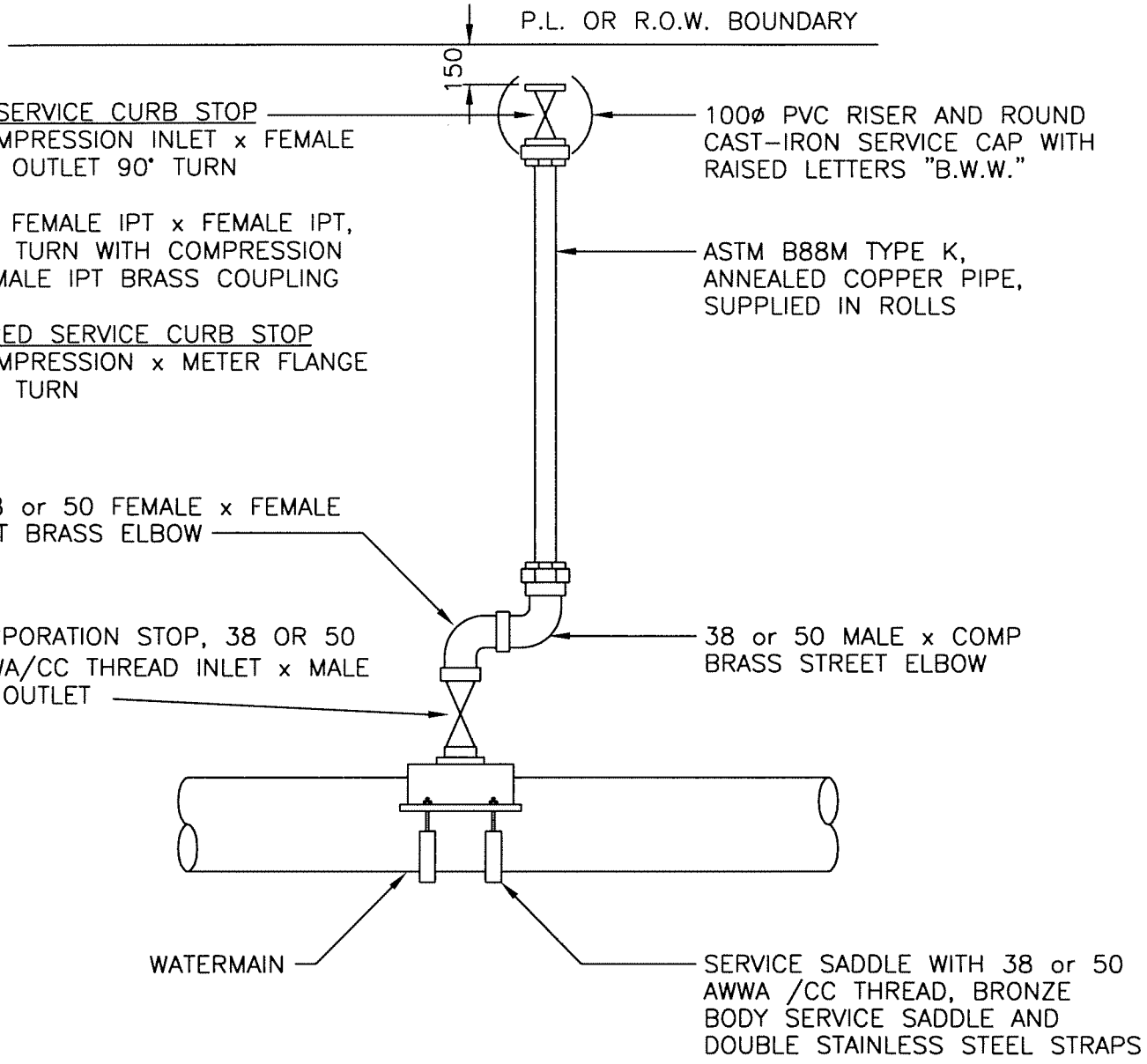
NOTES:
1. 20mmø CONNECTIONS SHALL BE DIRECT TAP INTO D.I. MAINS.
2. 25mmø CONNECTIONS SHALL BE INSTALLED WITH BRONZE BODY SERVICE SADDLE AND DOUBLE STAINLESS STEEL STRAPS.
3. ALL BALL VALVES SHALL BE FULL FLOW, FULL PORT.
4. FOR DITCH CROSSINGS MINIMUM DEPTH OF COVER OVER THE SERVICE CONNECTION SHALL BE 1.5m MEASURED FROM THE CROWN OF THE ROAD OR 0.3m BELOW DITCH INVERT WHICHEVER IS GREATER.
5. ALL DIMENSIONS IN MM UNLESS OTHERWISE NOTED.

NO.	DATE	REVISION	APP'D	BY
3	2003/01	NOTES ALLOW APPROVED PRODUCTS		GF
2	2000/01	NOTES REVISED		JK
1	97/01	GENERAL REVISION (L700)		JK

City of Burnaby
ENGINEERING DEPARTMENT

TYPICAL 20mm & 25mm SERVICE CONNECTION

DRAWN BY: AMKS	SCALE: N.T.S.	**BBY-**	W102
APPRV'D BY:	DATE: MAY 68		



NOTES

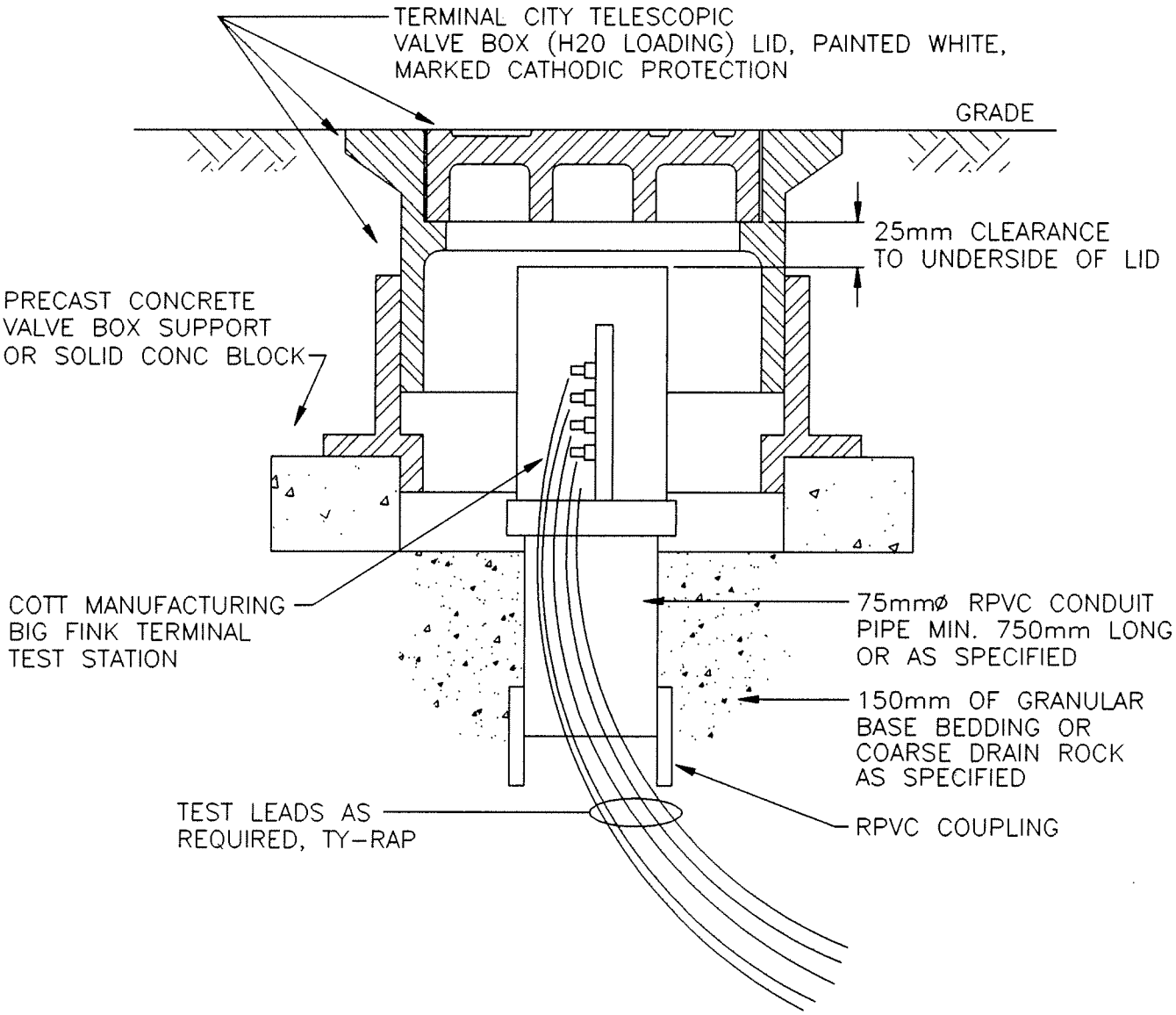
1. MINIMUM 0.9m COVER EXCEPT DITCH CROSSINGS SHALL BE 1.5m OF COVER MEASURED FROM THE CROWN OF THE ROAD.
2. ALL BALL VALVES SHALL BE FULL FLOW, FULL PORT.
3. ALL DIMENSIONS IN MM UNLESS OTHERWISE NOTED.

NO.	DATE	REVISION	APP'D	BY
3	2003/01	NOTES ALLOW APPROVED PRODUCTS		GF
2	01/03	GENERAL REVISION		HL
1	97/01	GENERAL REVISION (L2226)		JK

City of Burnaby
ENGINEERING DEPARTMENT

TYPICAL 38mm & 50mm SERVICE CONNECTION

DRAWN BY: CALOCERO	SCALE: N.T.S.	**BBY-**	W103
APPRV'D BY:	DATE: FEB 90		



NOTES:

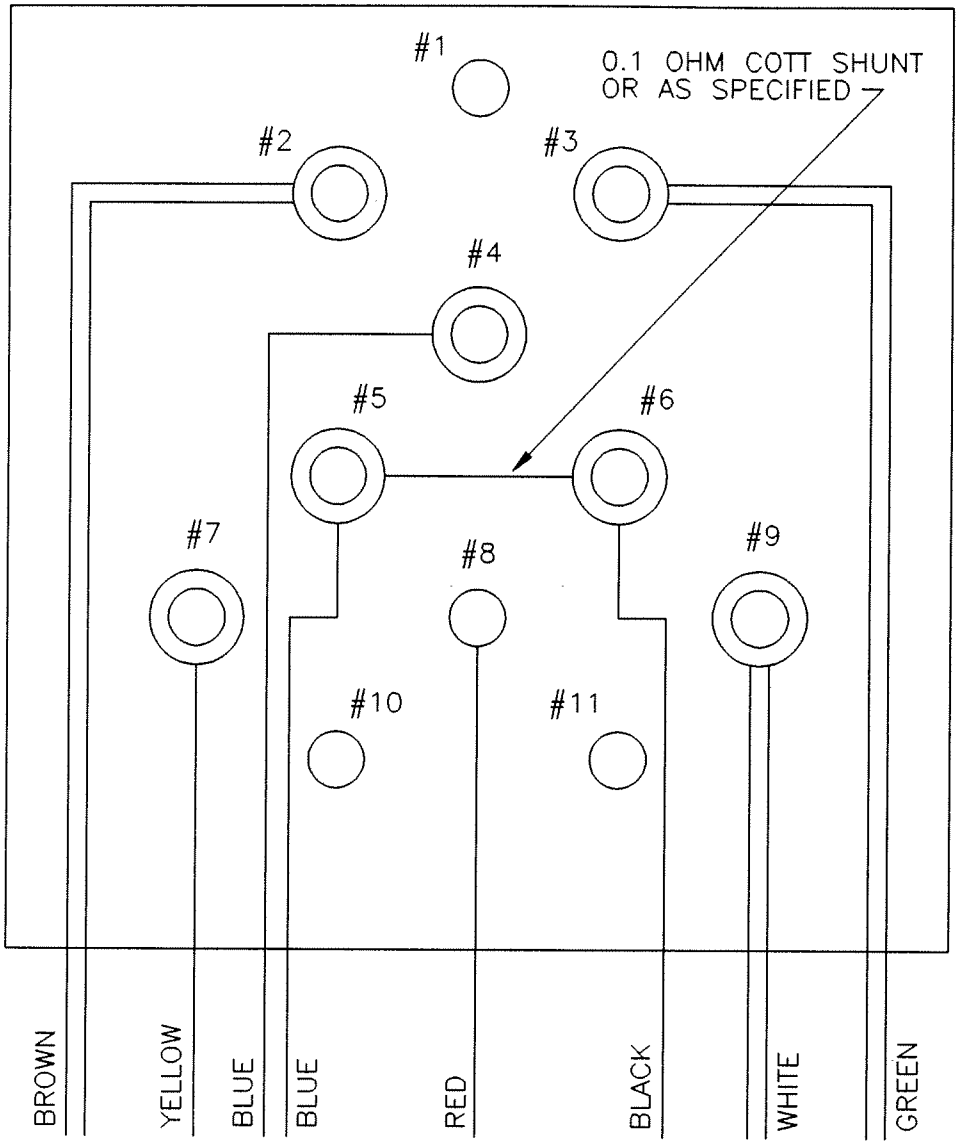
1. TEST STATION LOCATED BEHIND ROAD CURB (SIDEWALK) OR DIRECTLY OVER PIPE ABOVE WIRE CONNECTION POINT AS SPECIFIED.
2. TERMINAL BLOCK AND LEADS SHALL EXTEND MIN. 500mm ABOVE VALVE BOX GRADE.
3. NO BEDDING MATERIAL INSIDE VALVE BOX OR PVC PIPE.
4. WHERE TEST LEADS ARE UNDER THE ROADWAY, THEY SHALL BE BURIED A MINIMUM 900mm BELOW THE ROAD, WITH WARNING TAPE 300mm ABOVE THE LEADS.

NO.	DATE	REVISION	APP'D	BY

City of Burnaby
ENGINEERING DEPARTMENT

CATHODIC PROTECTION
GROUND LEVEL TEST STATION DETAILS

DRAWN BY: J. KO	SCALE: N.T.S.	**BBY-**	W104
APPRV'D BY: MP	DATE: 97-05-14		



TERMINAL BOARD CONNECTIONS

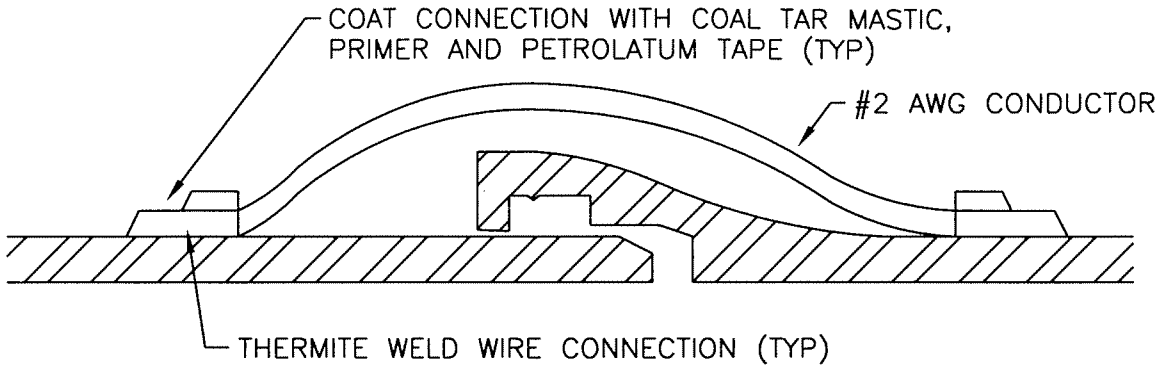
#1 – SPARE
#2 – CONNECTION TO UNPROTECTED LATERAL OR SERVICE – BROWN TERMINAL
#3 – CONNECTION TO FOREIGN UTILITY – GREEN TERMINAL
#4 – SACRIFICIAL MAGNESIUM ANODE (SPARE) – BLUE TERMINAL
#5 – SACRIFICIAL MAGNESIUM ANODE – BLUE TERMINAL
#6 – CONNECTION TO PROTECTED MAIN – BLACK TERMINAL
#7 – CONNECTION TO PROTECTED MAIN (SPARE) – YELLOW TERMINAL
#8 – CONNECTION TO ZINC REFERENCE ELECTRODE – RED TERMINAL
#9 – CONNECTION TO UNPROTECTED MAIN – WHITE TERMINAL
#10,11 – SPARE

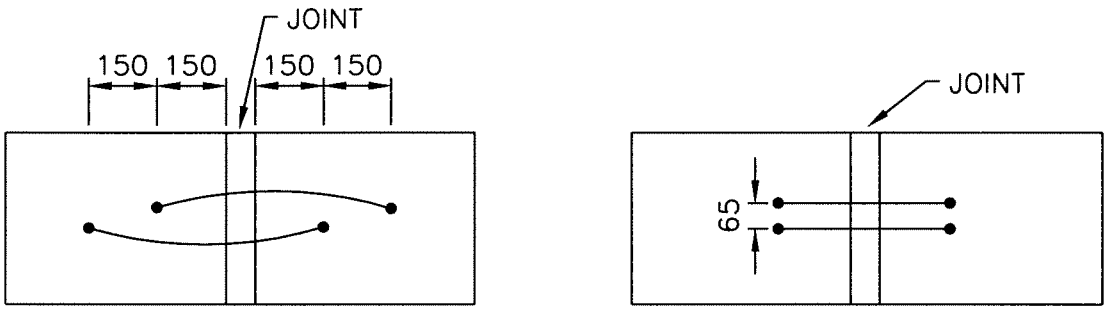
NO.	DATE	REVISION	APP'D	BY

City of Burnaby
ENGINEERING DEPARTMENT

BIG FINK TEST STATION TERMINAL

DRAWN BY: J. KO	SCALE: N.T.S.	**BBY-** W105	
APPRV'D BY: MP	DATE: 97-05-14		

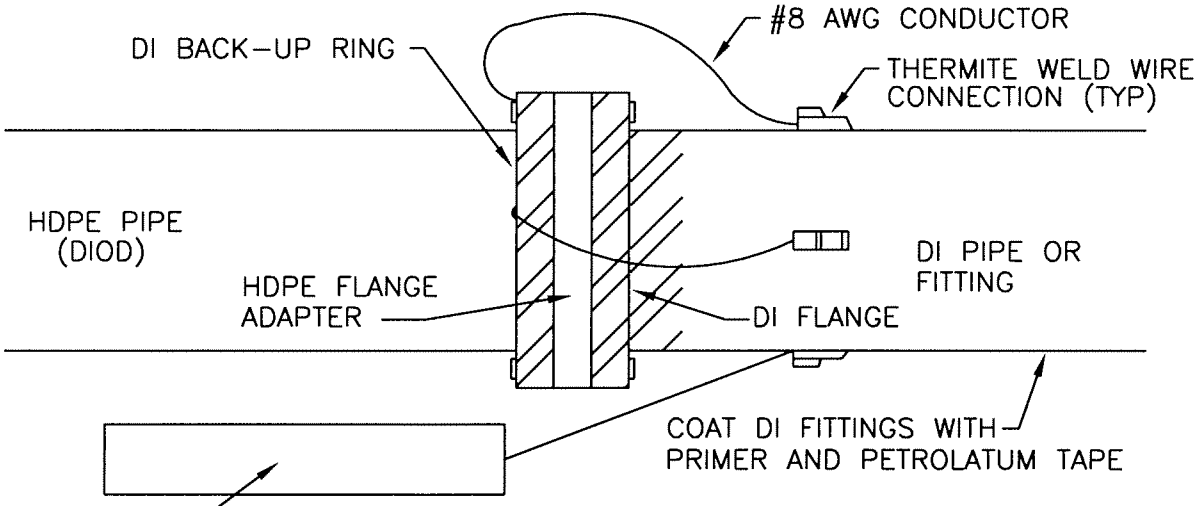




FOR PIPES < 300mmø

FOR PIPES >= 300mmø

STEEL OR DI PIPE CONNECTION



HDPE TO DI FLANGE CONNECTION

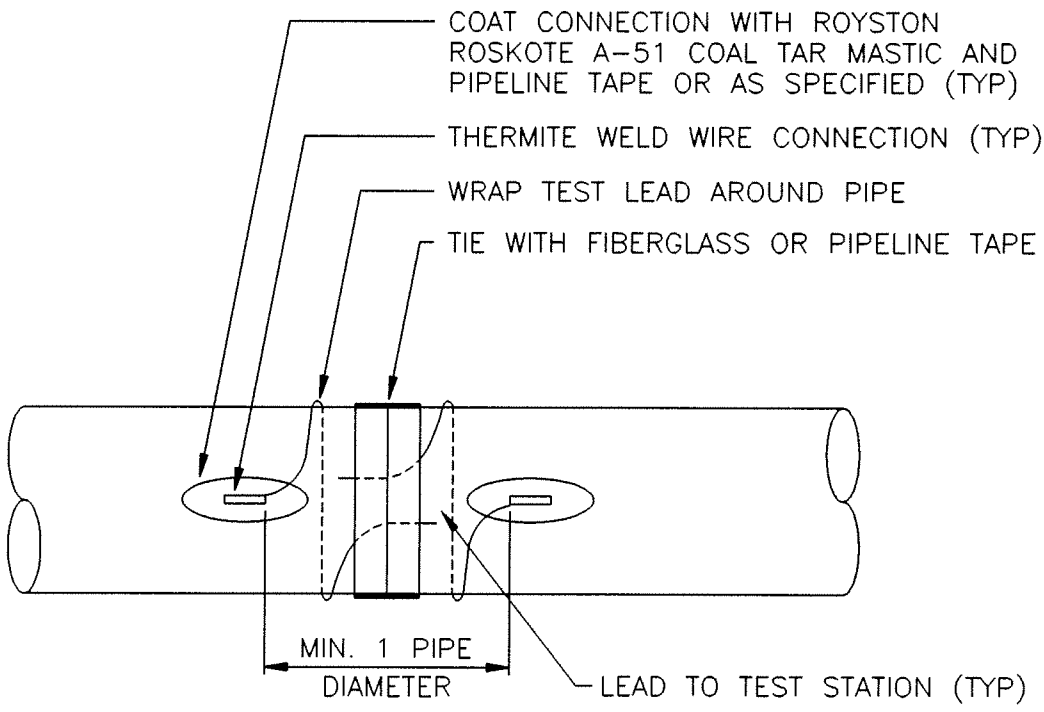
NOTES:
1. PROVIDE SUFFICIENT SLACK IN BOND CABLE TO ALLOW APPLICATION OF PETROLATUM TAPE ON PIPE OR FITTING UNDER THE BOND CABLES.
2. CONDUCTORS SHALL BE STRANDED COPPER, TYPE RWU90 XLPE INSULATED, WHITE IN COLOUR.

NO.	DATE	REVISION	APP'D	BY
2	2003/01	PRIMER AND ANODE ADDED		GF
1	2000/01	HDPE BONDING ADDED		JK

City of Burnaby
ENGINEERING DEPARTMENT

JOINT CONTINUITY BOND

DRAWN BY: J. KO	SCALE: N.T.S.	**BBY-**	W106
APPRV'D BY:	DATE: 97-05-14		

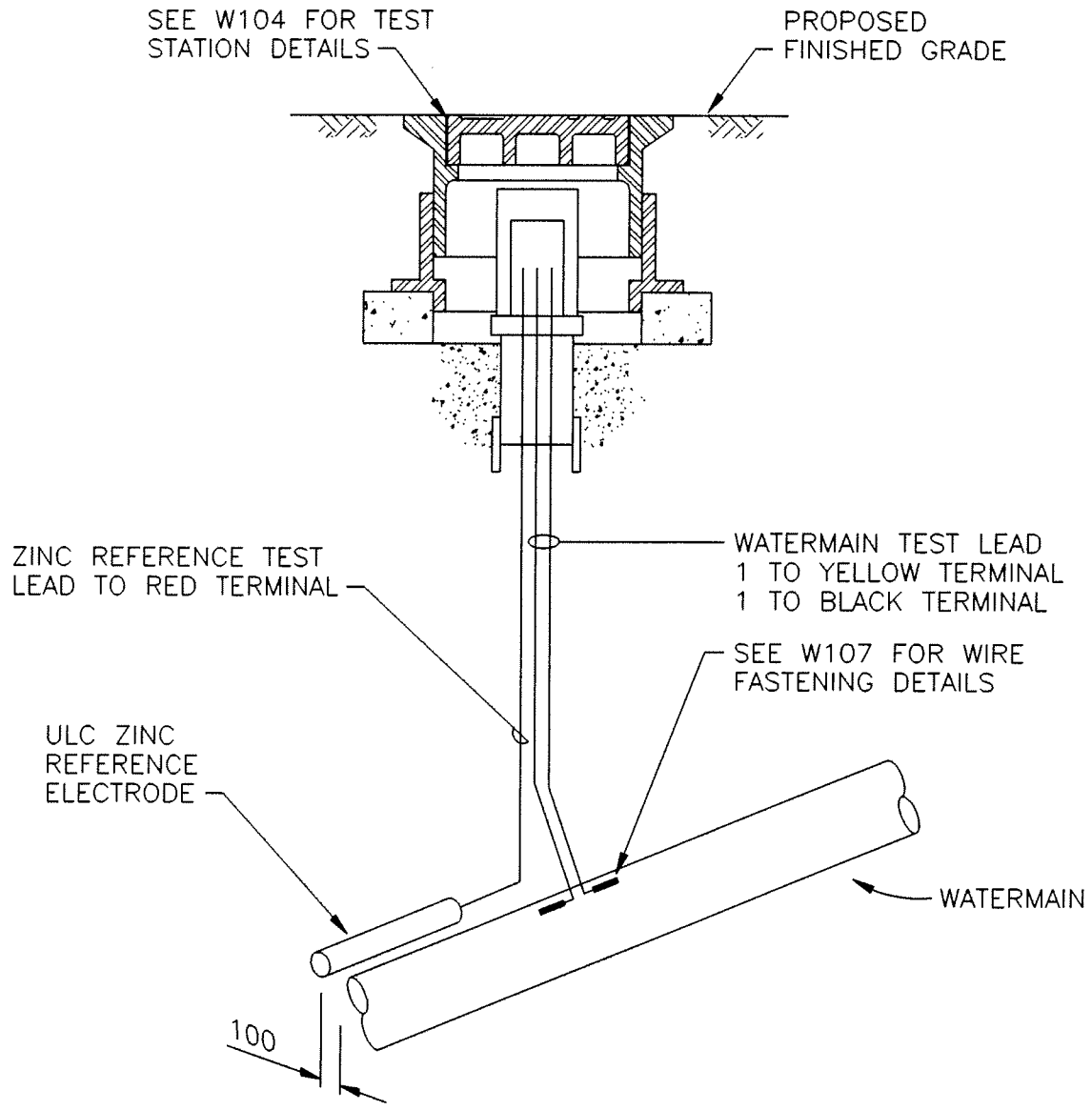


NO.	DATE	REVISION	APP'D	BY

City of Burnaby
ENGINEERING DEPARTMENT

WIRE FASTENING DETAIL

DRAWN BY: J. KO	SCALE: N.T.S.	**BBY-** W107	
APPRV'D BY: MP	DATE: 97-05-14		



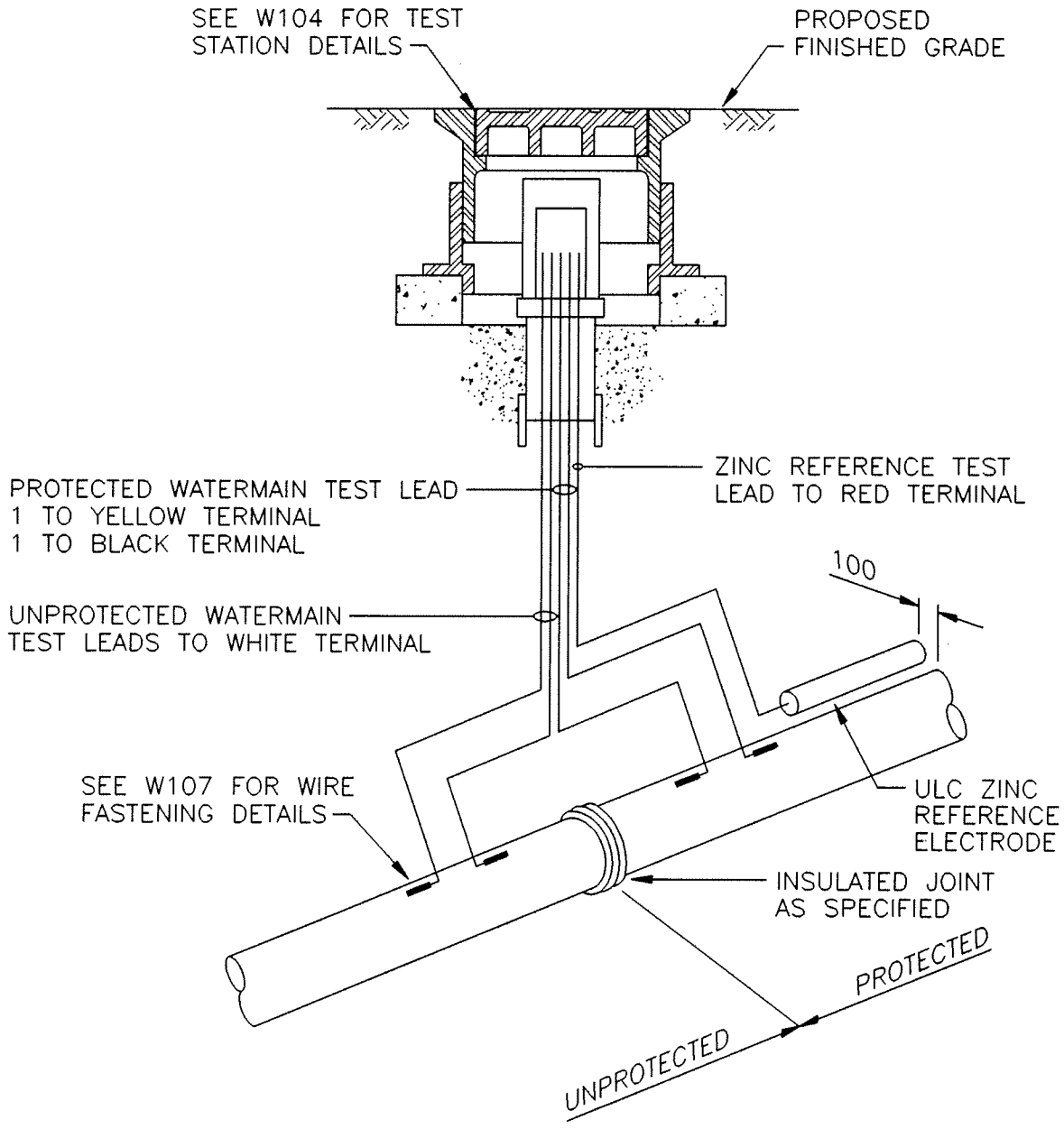
NOTES:
1. ALL CONDUCTORS SHALL BE STRANDED COPPER, INSULATED TYPE RWU90 X-LINK.
2. ALL CONDUCTORS SHALL BE #10 AWG AND COLOUR CODED AS SHOWN FOR TERMINAL COLOUR.

NO.	DATE	REVISION	APP'D	BY

City of Burnaby
ENGINEERING DEPARTMENT

STANDARD TEST STATION

DRAWN BY: J. KO	SCALE: N.T.S.	**BBY-**	W108
APPRV'D BY: MP	DATE: 97-05-14		



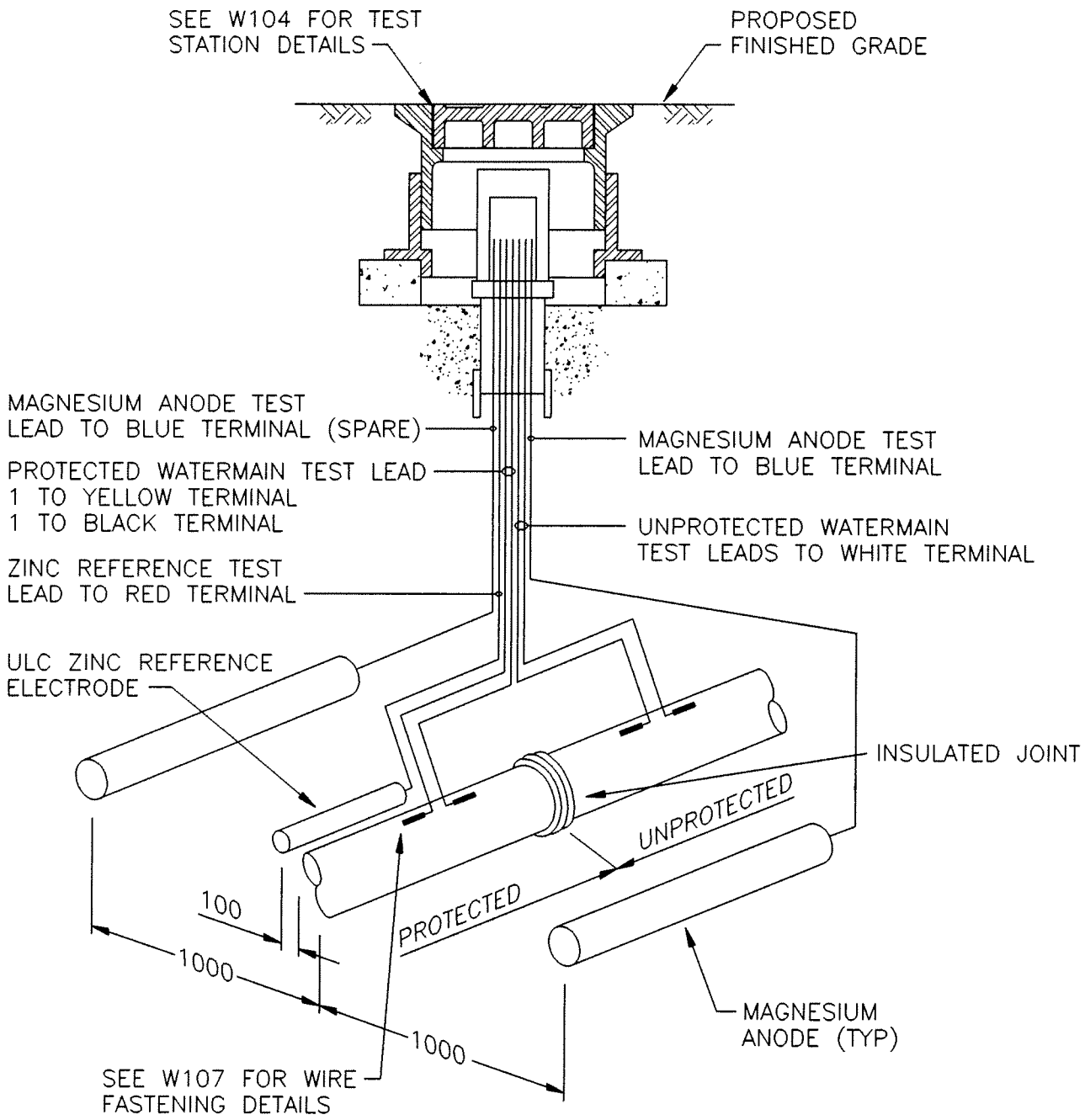
NOTES:
1. ALL CONDUCTORS SHALL BE STRANDED COPPER, INSULATED TYPE RWU90 X-LINK.
2. ALL CONDUCTORS SHALL BE #10 AWG AND COLOUR CODED AS SHOWN FOR TERMINAL COLOUR.

NO.	DATE	REVISION	APP'D	BY

City of Burnaby
ENGINEERING DEPARTMENT

ISOLATION TEST STATION

DRAWN BY: J. KO	SCALE: N.T.S.	**BBY-**	W109
APPRV'D BY: MP	DATE: 97-05-14		



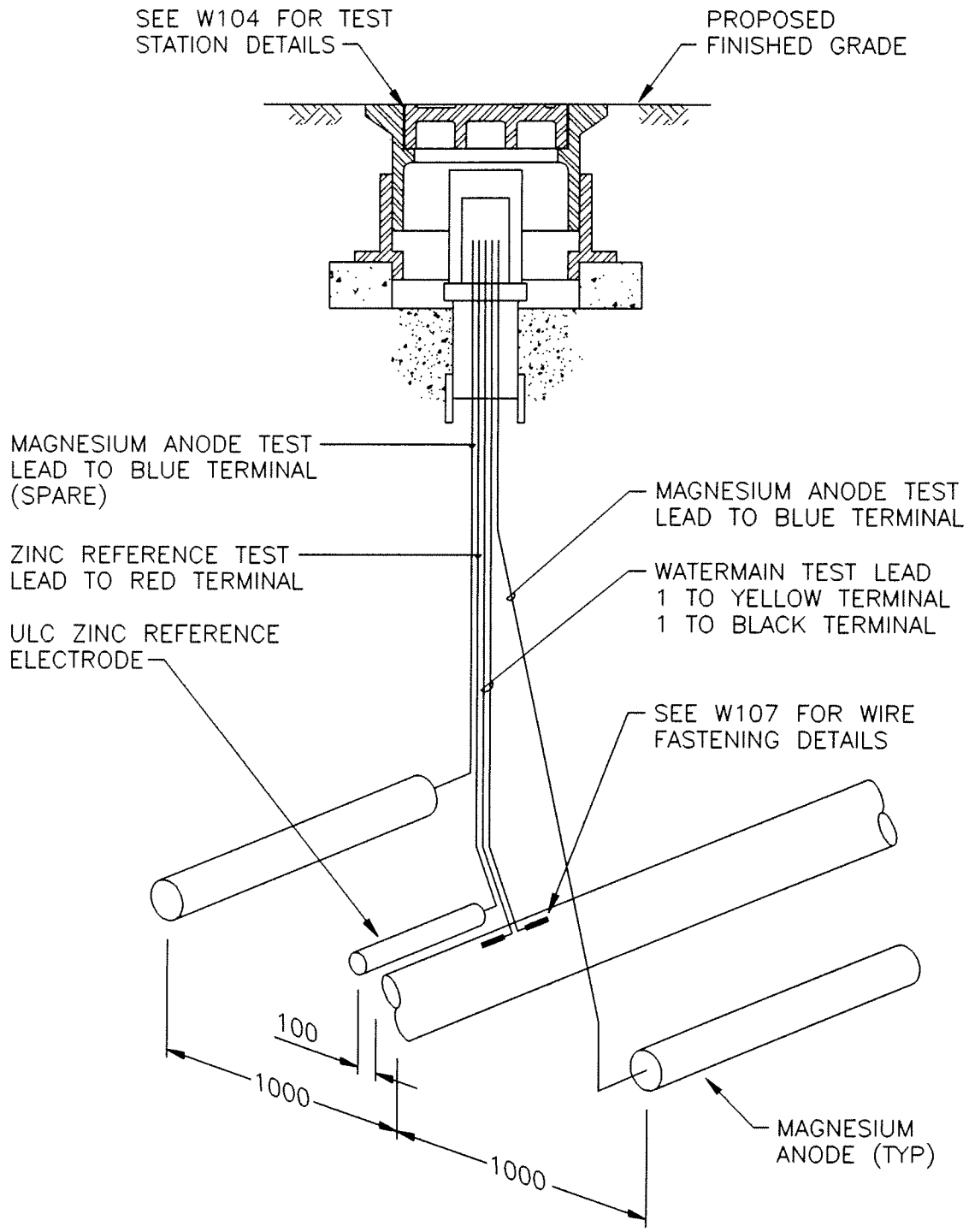
NOTES:
1. ALL CONDUCTORS SHALL BE STRANDED COPPER, INSULATED TYPE RWU90 X-LINK.
2. ALL CONDUCTORS SHALL BE #10 AWG AND COLOUR CODED AS SHOWN FOR TERMINAL COLOUR.

NO.	DATE	REVISION	APP'D	BY

City of Burnaby
ENGINEERING DEPARTMENT

SACRIFICIAL ANODE STATION @ ISOLATION TEST POINT

DRAWN BY: J. KO	SCALE: N.T.S.	**BBY-**	W110
APPRV'D BY: MP	DATE: 97-06-03		



NOTES:

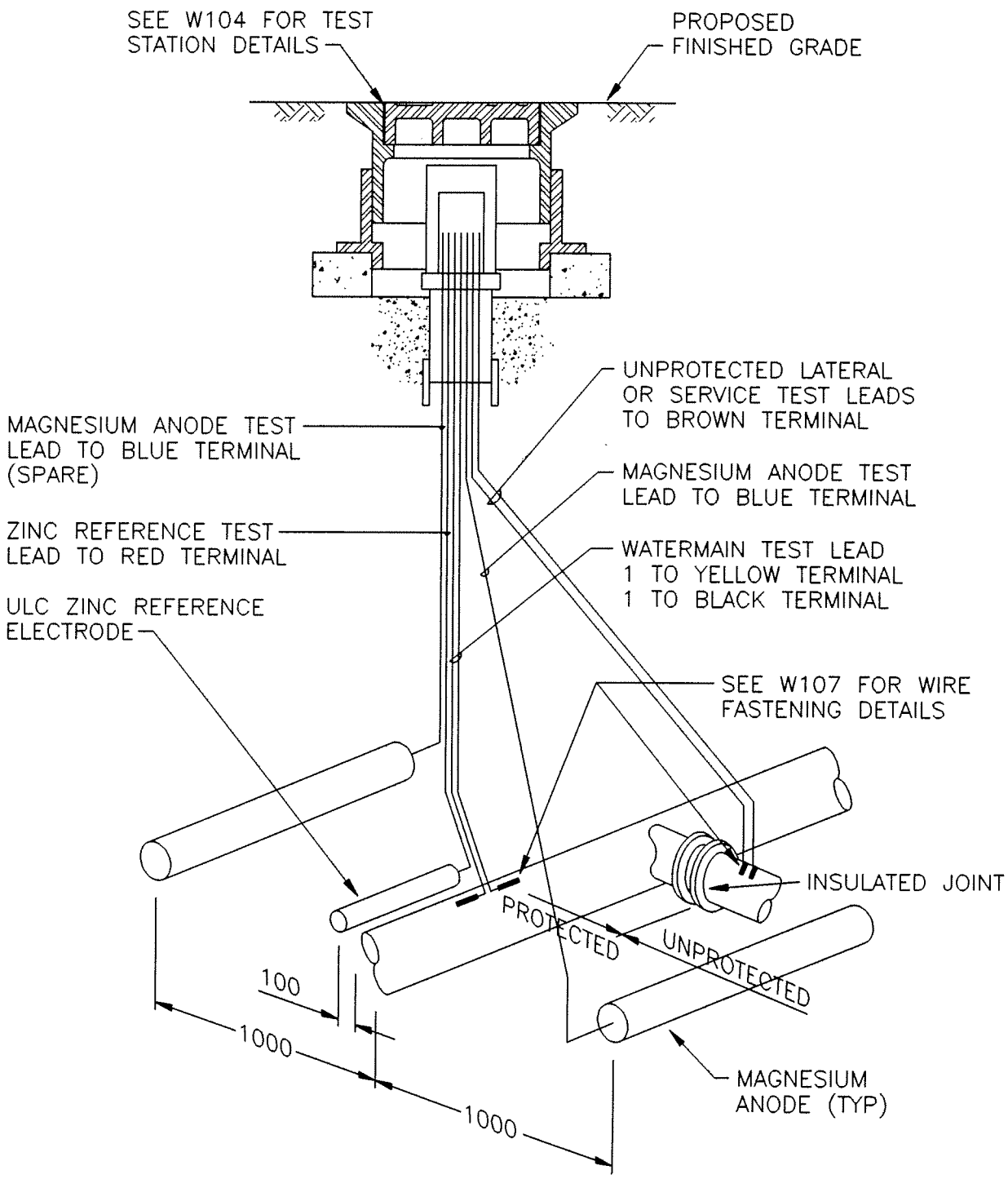
1. ALL CONDUCTORS SHALL BE STRANDED COPPER, INSULATED TYPE RWU90 X-LINK.
2. ALL CONDUCTORS SHALL BE #10 AWG AND COLOUR CODED AS SHOWN FOR TERMINAL COLOUR.

NO.	DATE	REVISION	APP'D	BY

City of Burnaby
ENGINEERING DEPARTMENT

STANDARD SACRIFICIAL ANODE STATION

DRAWN BY: J. KO	SCALE: N.T.S.	**BBY-**	W111
APPRV'D BY: MP	DATE: 97-05-14		



NOTES:

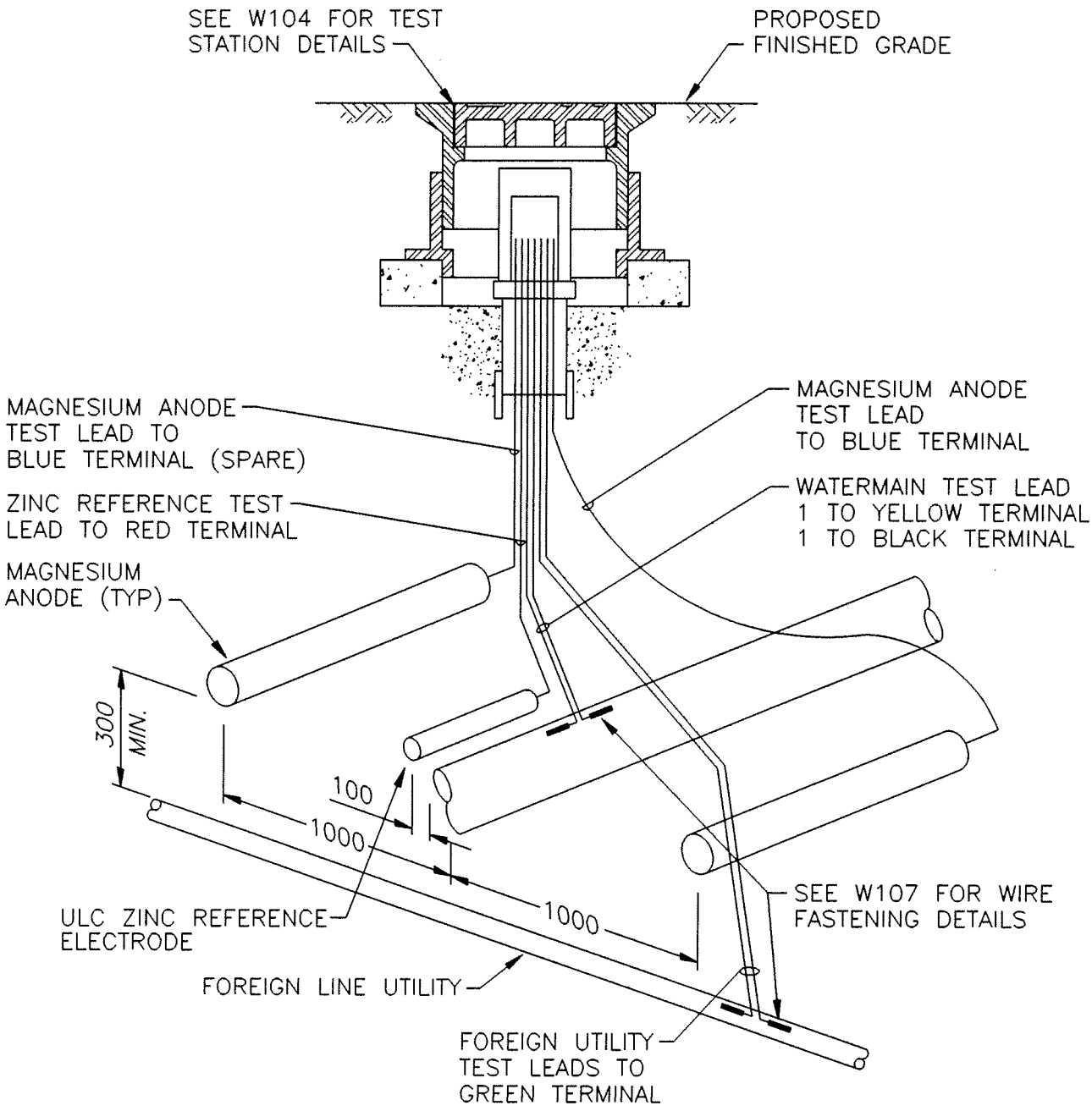
1. ALL CONDUCTORS SHALL BE STRANDED COPPER, INSULATED TYPE RWU90 X-LINK.
2. ALL CONDUCTORS SHALL BE #10 AWG AND COLOUR CODED AS SHOWN FOR TERMINAL COLOUR.

NO.	DATE	REVISION	APP'D	BY

City of Burnaby
ENGINEERING DEPARTMENT

SACRIFICIAL ANODE STATION WITH LATERAL OR SERVICE CONNECTION

DRAWN BY: J. KO	SCALE: N.T.S.	**BBY- W112**	
APPRV'D BY: MP	DATE: 97-06-02		



NOTES:

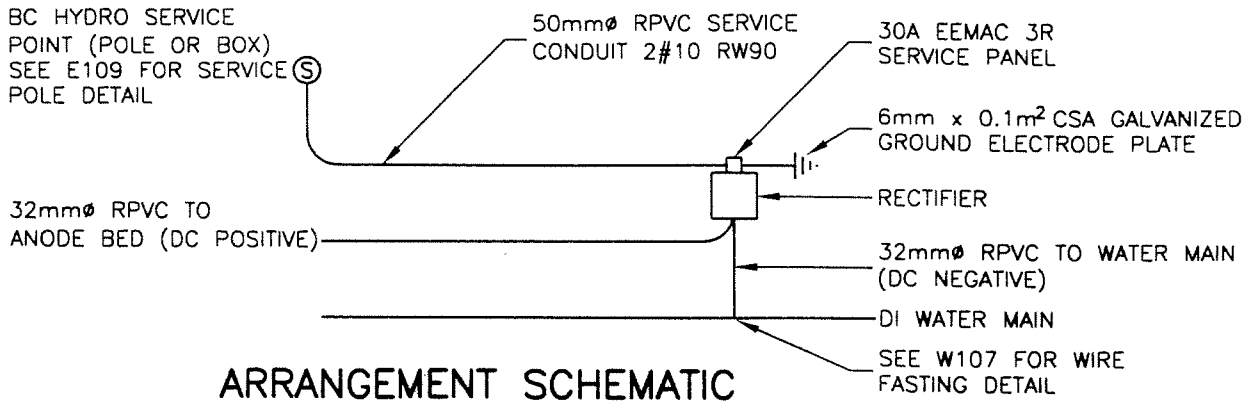
1. ALL CONDUCTORS SHALL BE STRANDED COPPER, INSULATED TYPE RWU90 X-LINK.
2. ALL CONDUCTORS SHALL BE #10 AWG AND COLOUR CODED AS SHOWN FOR TERMINAL COLOUR.
3. CONNECTION TO FOREIGN UTILITY AS PER THE UTILITY APPROVAL PERMIT.

NO.	DATE	REVISION	APP'D	BY

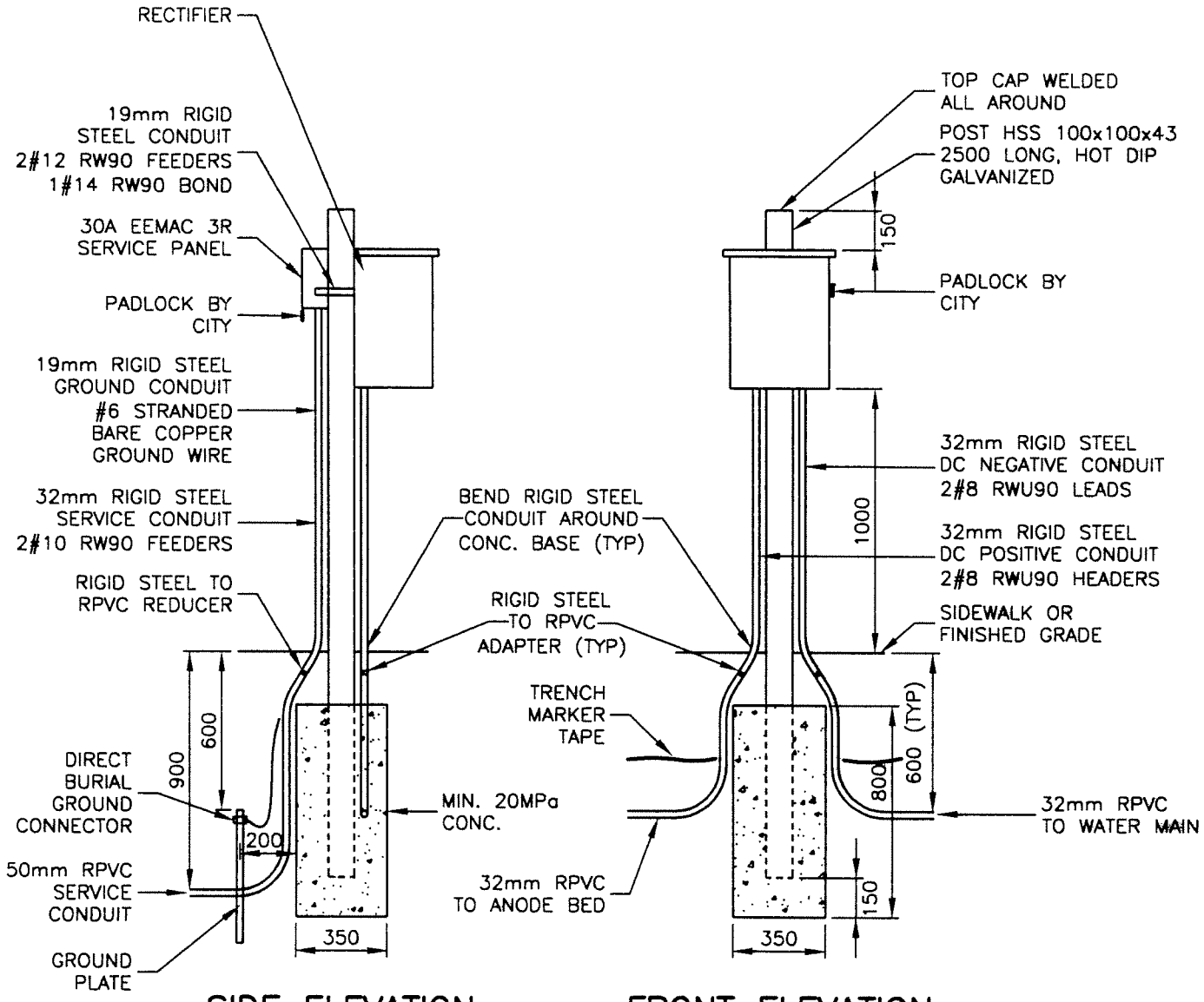
City of Burnaby
ENGINEERING DEPARTMENT

FOREIGN UTILITY TEST STATION

DRAWN BY: J. KO	SCALE: N.T.S.	**BBY-** W113	
APPRV'D BY: MP	DATE: 97-05-14		



ARRANGEMENT SCHEMATIC



SIDE ELEVATION

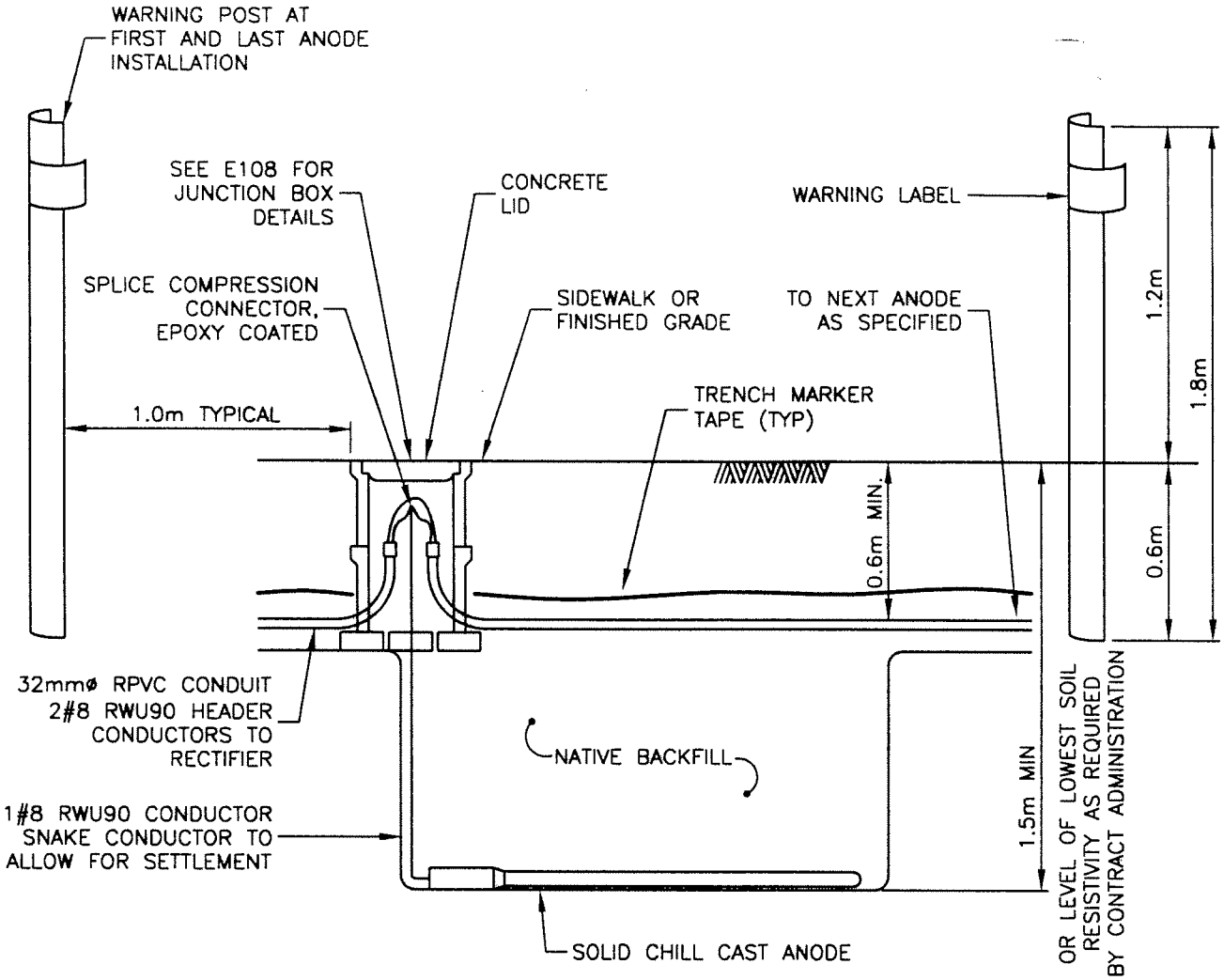
FRONT ELEVATION

NO.	DATE	REVISION	APP'D	BY

City of Burnaby
ENGINEERING DEPARTMENT

IMPRESSED CURRENT CATHODIC PROTECTION RECTIFIER INSTALLATION

DRAWN BY: HLOUIE	SCALE: N.T.S.	**BBY-**	W114
APPRV'D BY:	DATE: 99-02-18		



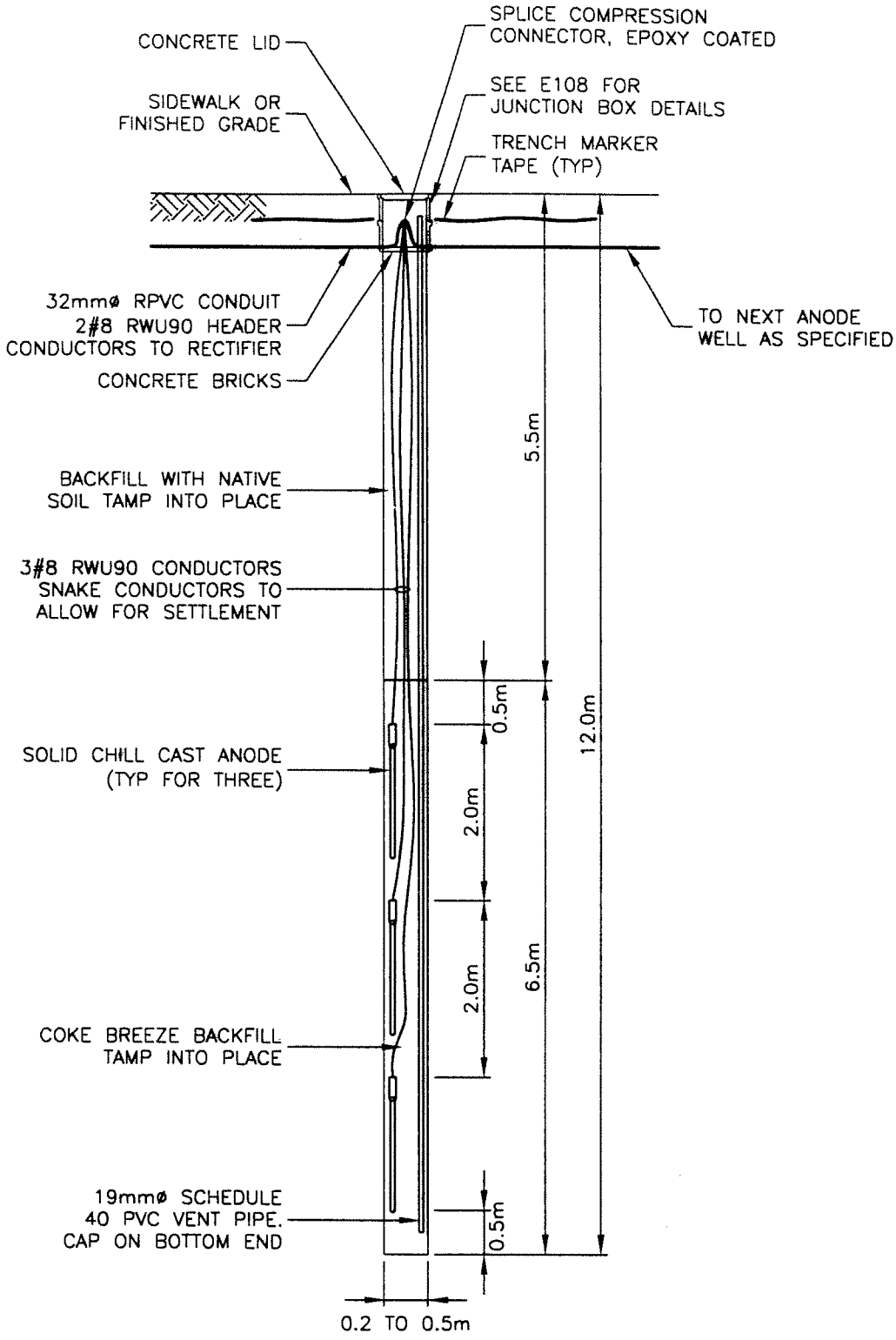
NOTES:
1. SPACE ANODES 6m APART WHEN 2 OR MORE ANODES ARE SPECIFIED
2. ALTERNATE ANODE CONNECTIONS TO HEADER CONDUCTORS WHEN 2 OR MORE ANODES ARE SPECIFIED
3. HEADER CONDUCTORS SPLICED TOGETHER AT LAST ANODE JUNCTION BOX TO PROVIDE CONTINUOUS LOOP TO RECTIFIER
4. COIL MIN. 0.5m OF CONDUCTORS IN JUNCTION BOX TO ALLOW FOR SETTLEMENT
5. JUNCTION BOX REQUIRED FOR FIRST & LAST ANODE CONNECTIONS. OTHER SPLICES MAY BE DIRECT BURRIED AS APPROVED BY CONSTRUCTION ENGINEER

NO.	DATE	REVISION	APP'D	BY

City of Burnaby
ENGINEERING DEPARTMENT

HORIZONTAL ANODE INSTALLATION

DRAWN BY: HLOUIE	SCALE: N.T.S.	BBY-	W115
APPRV'D BY:	DATE: 99-02-18		



NOTES:

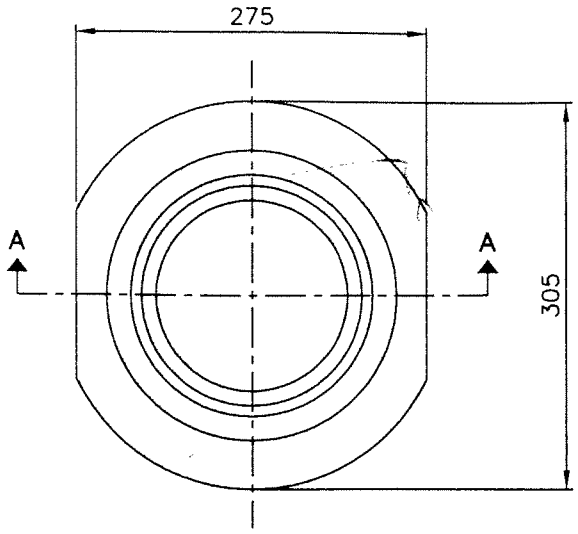
1. WHEN LESS THAN 3 ANODES ARE SPECIFIED, MAINTAIN MINIMUM COVER OF COKE BREEZE ABOVE AND BELOW ANODE AS SHOWN
2. ALTERNATE ANODE CONNECTIONS TO HEADER CONDUCTORS WHEN 2 OR MORE ANODES ARE SPECIFIED
3. HEADER CONDUCTORS SPLICED TOGETHER IN LAST WELL JUNCTION BOX TO PROVIDE CONTINUOUS LOOP TO RECTIFIER

NO.	DATE	REVISION	APP'D	BY

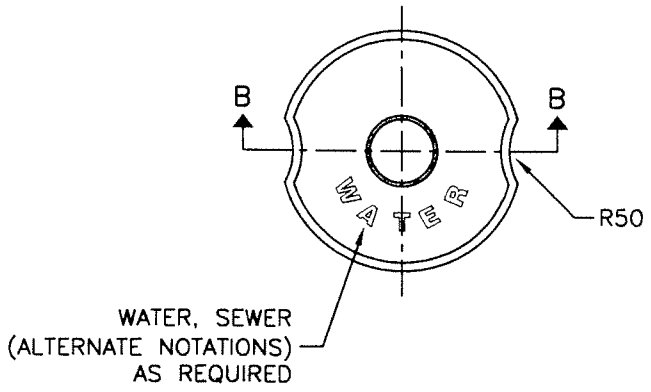
City of Burnaby
ENGINEERING DEPARTMENT

SEMI-DEEP ANODE WELL INSTALLATION

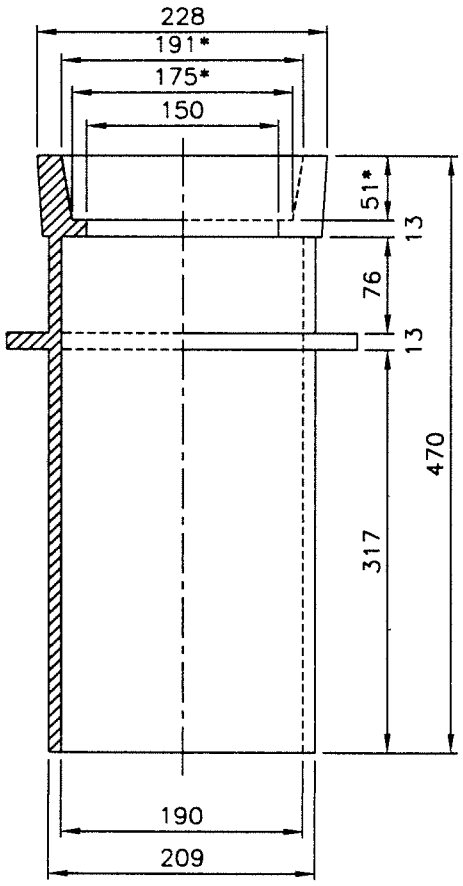
DRAWN BY: HLQUIE	SCALE: N.T.S.	BBY- W116	
APPRV'D BY:	DATE: 99-02-17		



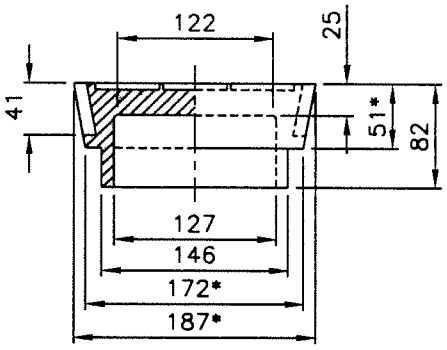
PLAN



PLAN



SECTION A–A
VALVE BOX



SECTION B–B
LID

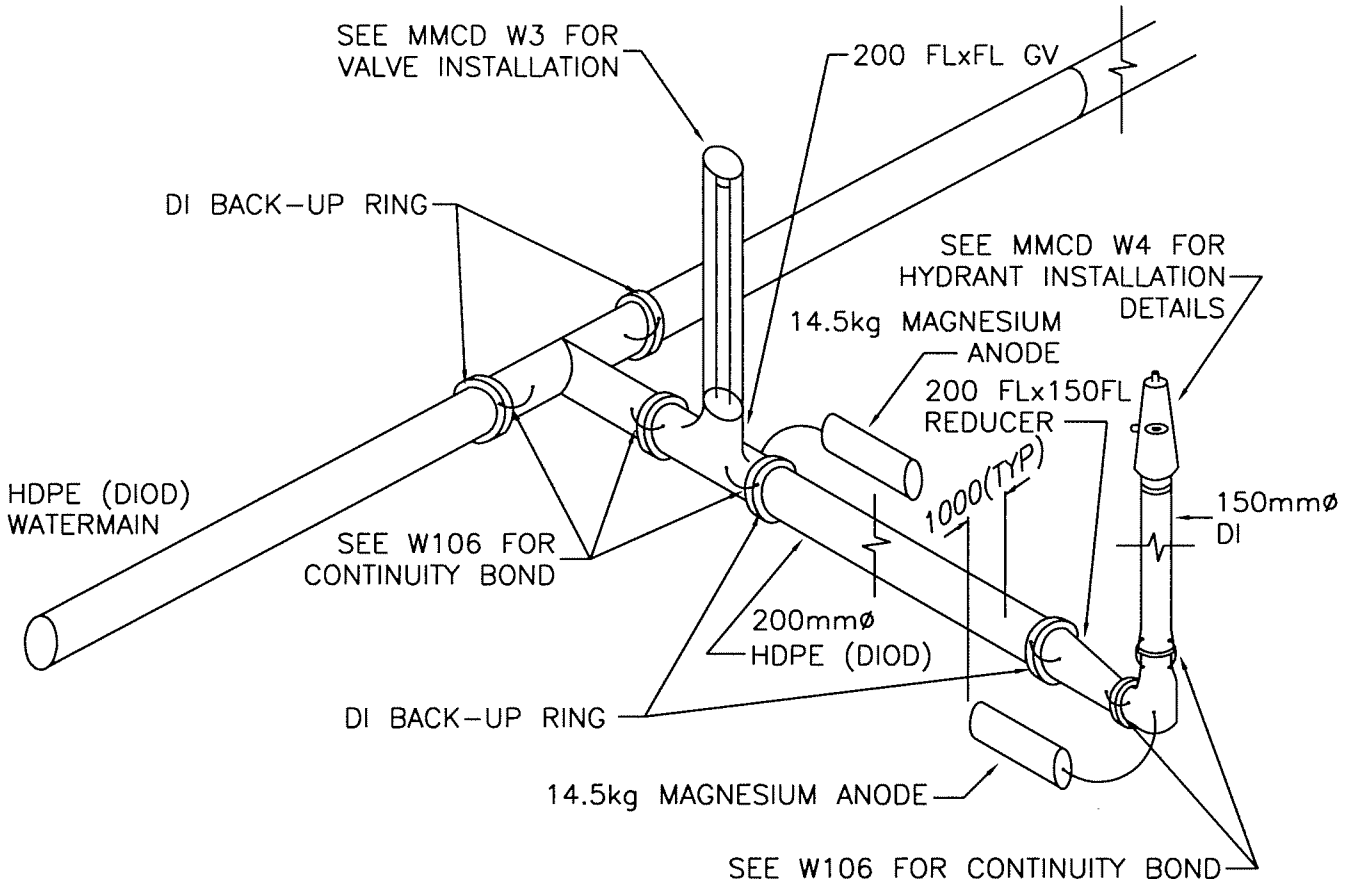
NOTE:
1. CASTINGS SHALL MEET ASTM A48 CLASS 25 GREY IRON SPECIFICATIONS.
2. CASTING FINISH SHALL BE BITUMINOUS DIP COATED.
3. CASTINGS SHALL MEET MINIMUM WEIGHT REQUIREMENTS:
   VALVE BOX & LID 38kg ±5%
4. ALLOWABLE TOLERANCE ON VALVE BOX AND LID SEATING DIMENSIONS (*) SHALL BE ±1%.
5. ALL DIMENSIONS IN mm.
6. NELSON–TYPE VALVE BOX SHALL BE INSTALLED IN ALL CONCRETE SURFACES AND BOULEVARDS

NO.	DATE	REVISION	APP'D	BY
1	2002–06	REVISED SEATING DIMENSIONS	DKS	HL

City of Burnaby
ENGINEERING DEPARTMENT

NELSON–TYPE VALVE BOX

DRAWN BY: J. KO	SCALE: N.T.S.	**BBY-** W118
APPRV'D BY:	DATE: 2000–02	



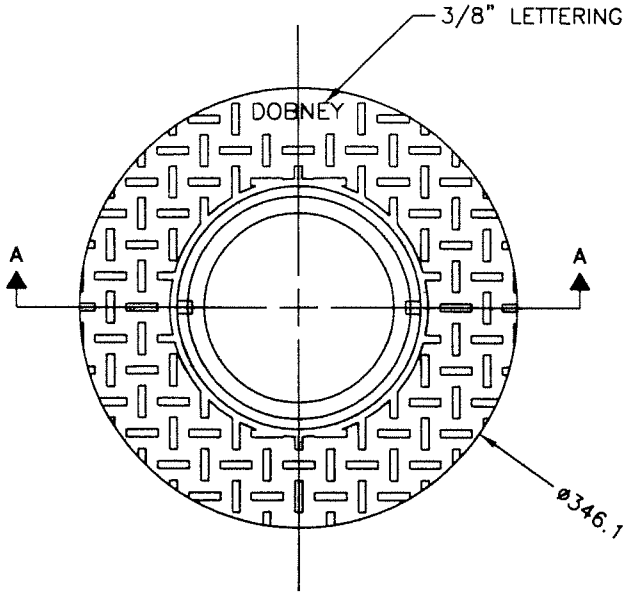
NOTE:
1. ALL HDPE PIPE TO BE DR11 DIOD.
2. HDPE PIPE TO HAVE FLANGE ADAPTER WITH A DI BACK-UP RING FOR CONNECTION TO ALL FITTINGS.
3. ALL BELOW GROUND DI PIPE AND FITTINGS TO BE COATED WITH PRIMER AND PETROLATUM TAPE.
4. BOND ALL CONNECTED DI FITTINGS TOGETHER.
5. PROVIDE 2 CONTINUITY BOND CONNECTIONS PER FITTING.
6. INSTALL ANODES PARALLEL TO HYDRANT CONNECTION PIPE.

NO.	DATE	REVISION	APP'D	BY
1	2003/01	PRIMER AND BACK-UP RING ADDED		GF

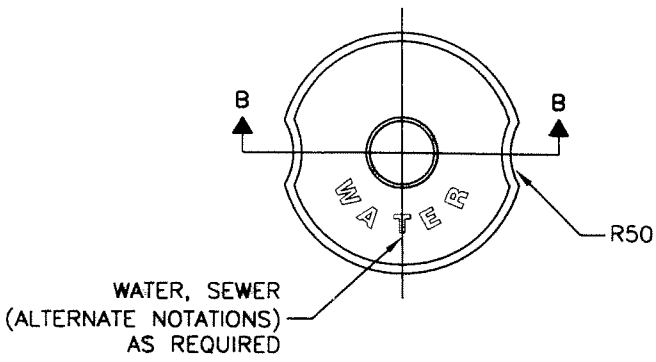
City of Burnaby
ENGINEERING DEPARTMENT

FIRE HYDRANT INSTALLATION FOR HDPE PIPE

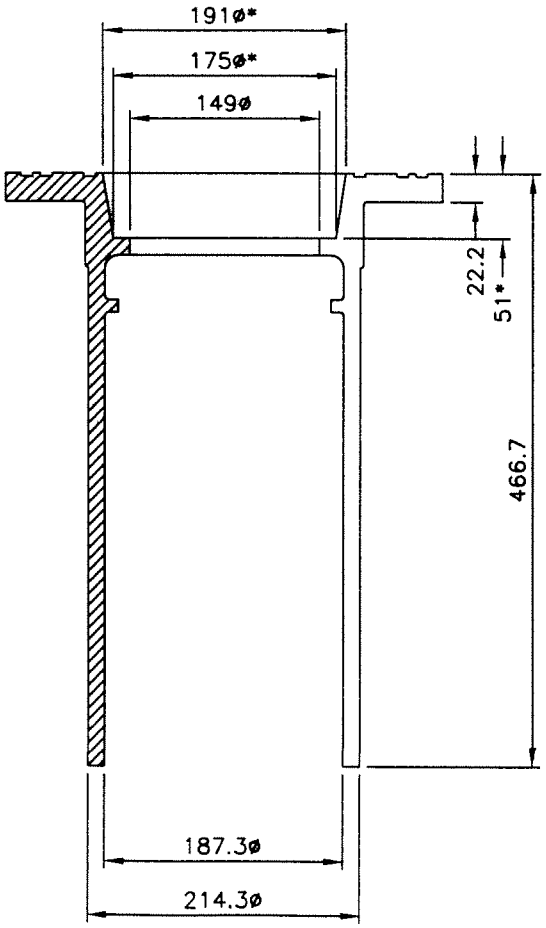
DRAWN BY: J. KO	SCALE: N.T.S.	**BBY-** W119
APPRV'D BY:	DATE: 2000-02-10	



PLAN

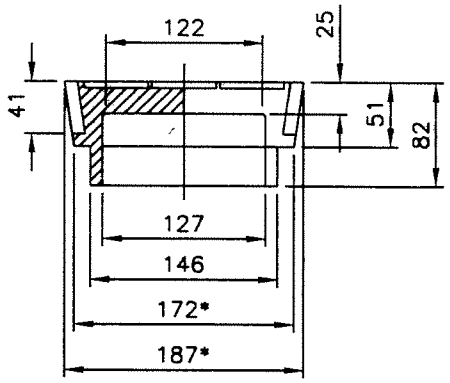


PLAN



SECTION A–A

VALVE BOX



SECTION B–B

LID

NOTE:

1. CASTINGS SHALL MEET ASTM A48 CLASS 25 GREY IRON SPECIFICATIONS.
2. CASTING FINISH SHALL BE BITUMINOUS DIP COATED.
3. CASTINGS SHALL MEET MINIMUM WEIGHT REQUIREMENTS: VALVE BOX 31 kg ±5% & VALVE LID 6kg ±5%
4. ALLOWABLE TOLERANCE ON VALVE BOX AND LID SEATING DIMENSIONS (*) SHALL BE ±1%
5. ALL DIMENSIONS IN mm.
6. MR6 VALVE BOX SHALL BE INSTALLED IN ALL ASPHALT PAVEMENT SURFACE

NO.	DATE	REVISION	APP'D	BY

City of Burnaby
ENGINEERING DEPARTMENT

MR6 VALVE BOX

DRAWN BY: HLOUIE	SCALE: N.T.S.	BBY-	W120
APPRV'D BY:	DATE: 2002–05–15		

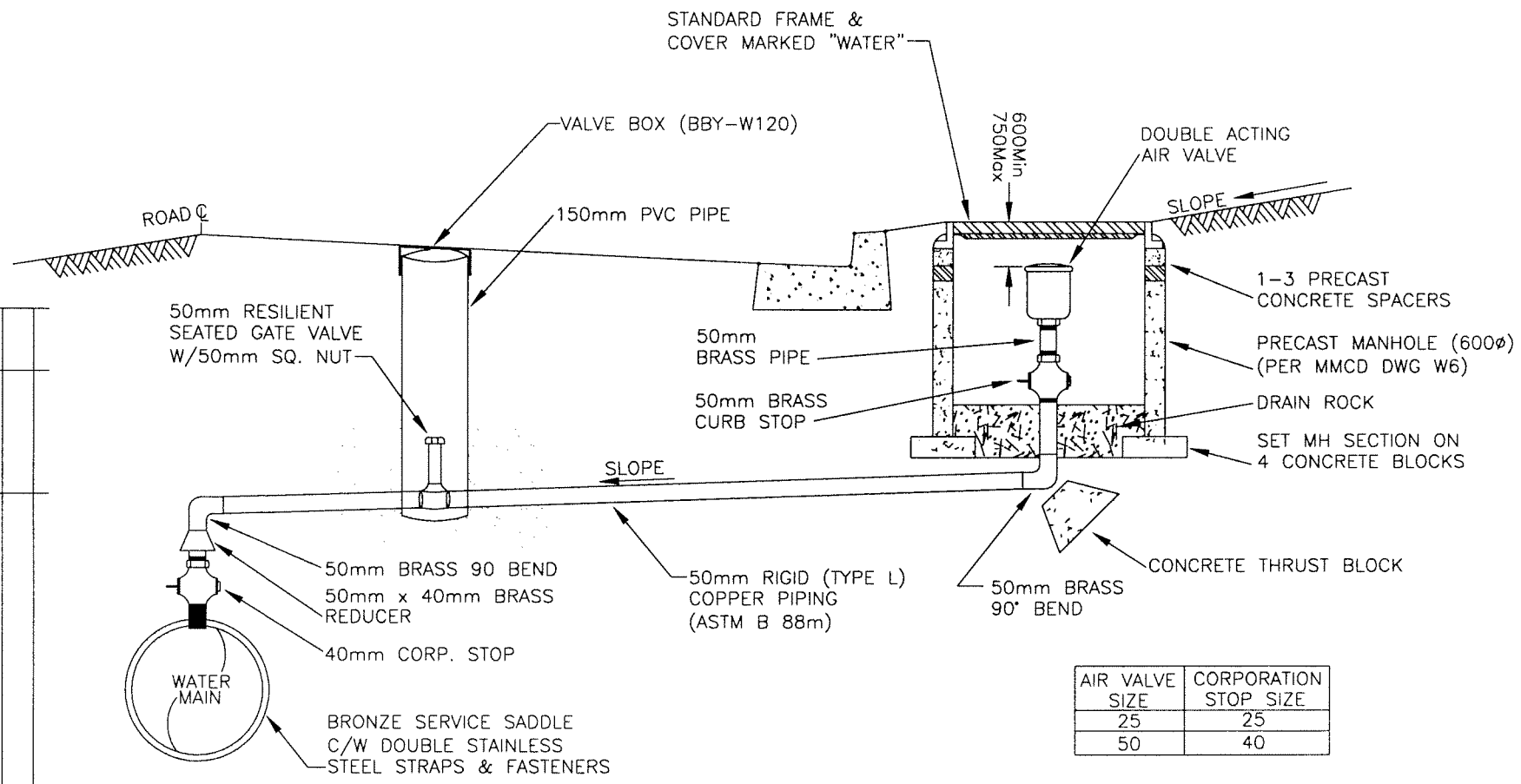
City of Burnaby
ENGINEERING DEPARTMENT

AIR VALVE ASSEMBLY
SHALLOW BURY APPLICATION

DRAWN BY: G.FUNK | SCALE: N.T.S.
APPRV'D BY: | DATE: 2004-04-06

BBY- W121

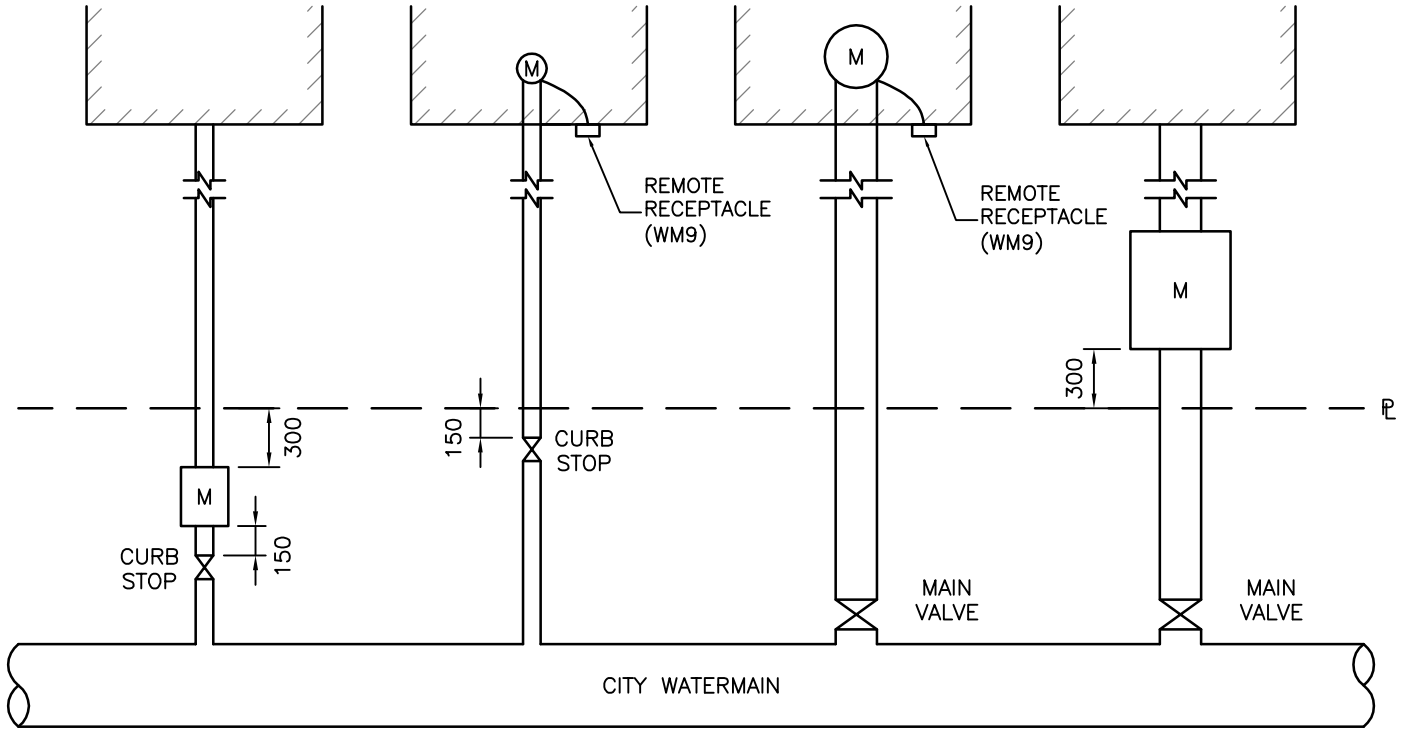
NO.	DATE	REVISION	APP'D	BY



AIR VALVE SIZE	CORPORATION STOP SIZE
25	25
50	40

NOTE:

NOT TO USED IN AREAS WITH HIGH WATER TABLE. PROVIDE VENTING PIPE FROM AIR VALVE TO SURFACE C/W GOOSENECK WHERE SUBJECT TO FLOODING.



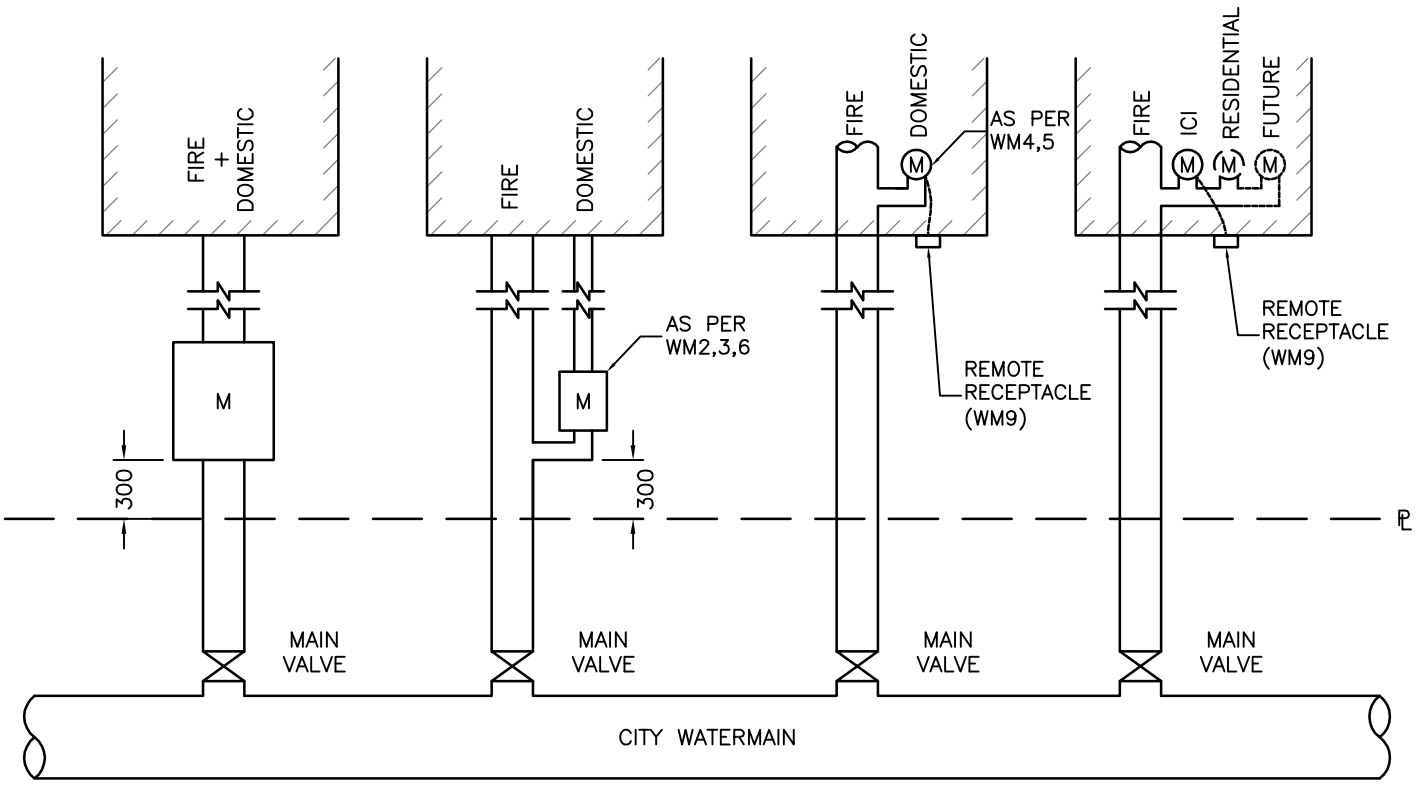
WM2a/b (19–25mm)
WM3 (38–50mm)

WM4 (19–25mm)

WM5 (38–250mm)

WM6 (75–250mm)

DOMESTIC SERVICE ONLY



WM7
COMBINED OUTSIDE

SEPARATED OUTSIDE

SEPARATED INSIDE

WM8
MIXED USE
SEPARATED INSIDE

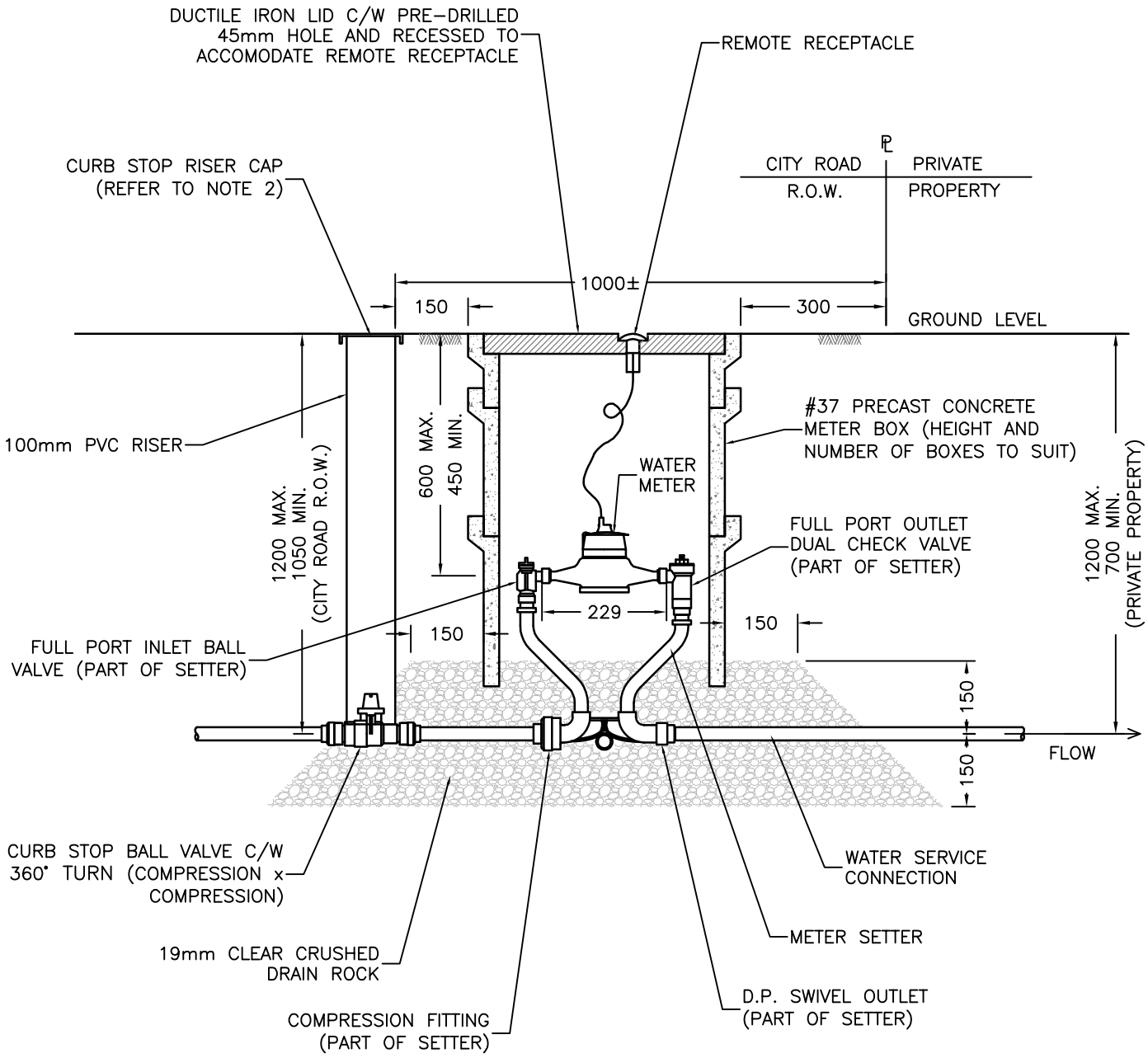
DOMESTIC + FIRE SERVICES

NO.	DATE	REVISION	APP'D	BY

City of Burnaby
ENGINEERING DEPARTMENT

GENERAL LAYOUT
FOR TYPICAL WATER METER INSTALLATIONS

DRAWN BY: URBAN	SCALE: N.T.S.	BBY-	WM1
APPRV'D BY:	DATE: 2016–03–22		



NOTES:

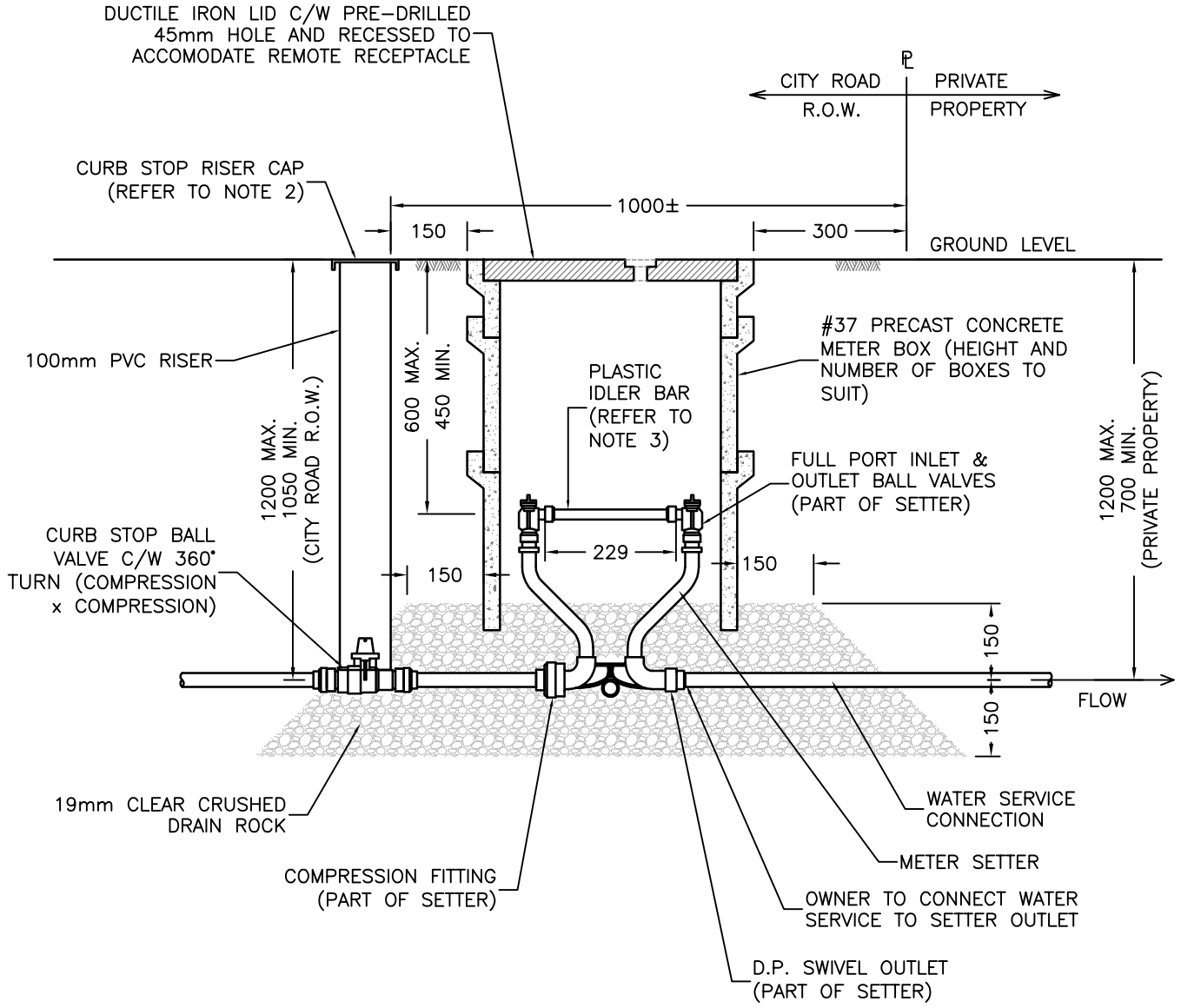
1. THIS DRAWING SHOULD BE REVIEWED IN CONJUNCTION WITH THE CITY OF BURNABY WATER METER DESIGN GUIDELINES AND SUPPLEMENTARY SPECIFICATIONS.
2. FOR CURB STOP RISERS, DUCTILE IRON LID TO BE PROVIDED IN LANDSCAPED AREAS. NELSON BOX TO BE INSTALLED IN DRIVEWAYS OR OTHER HARD SURFACES.
3. ALL DIMENSIONS ARE IN MILLIMETRES.

NO.	DATE	REVISION	APP'D	BY

City of Burnaby
ENGINEERING DEPARTMENT

OUTSIDE INSTALLATION
FOR 19mm AND 25mm METERS

DRAWN BY: URBAN	SCALE: N.T.S.	BBY-	WM2a
APPRV'D BY:	DATE: 2016-03-22		



NOTES:

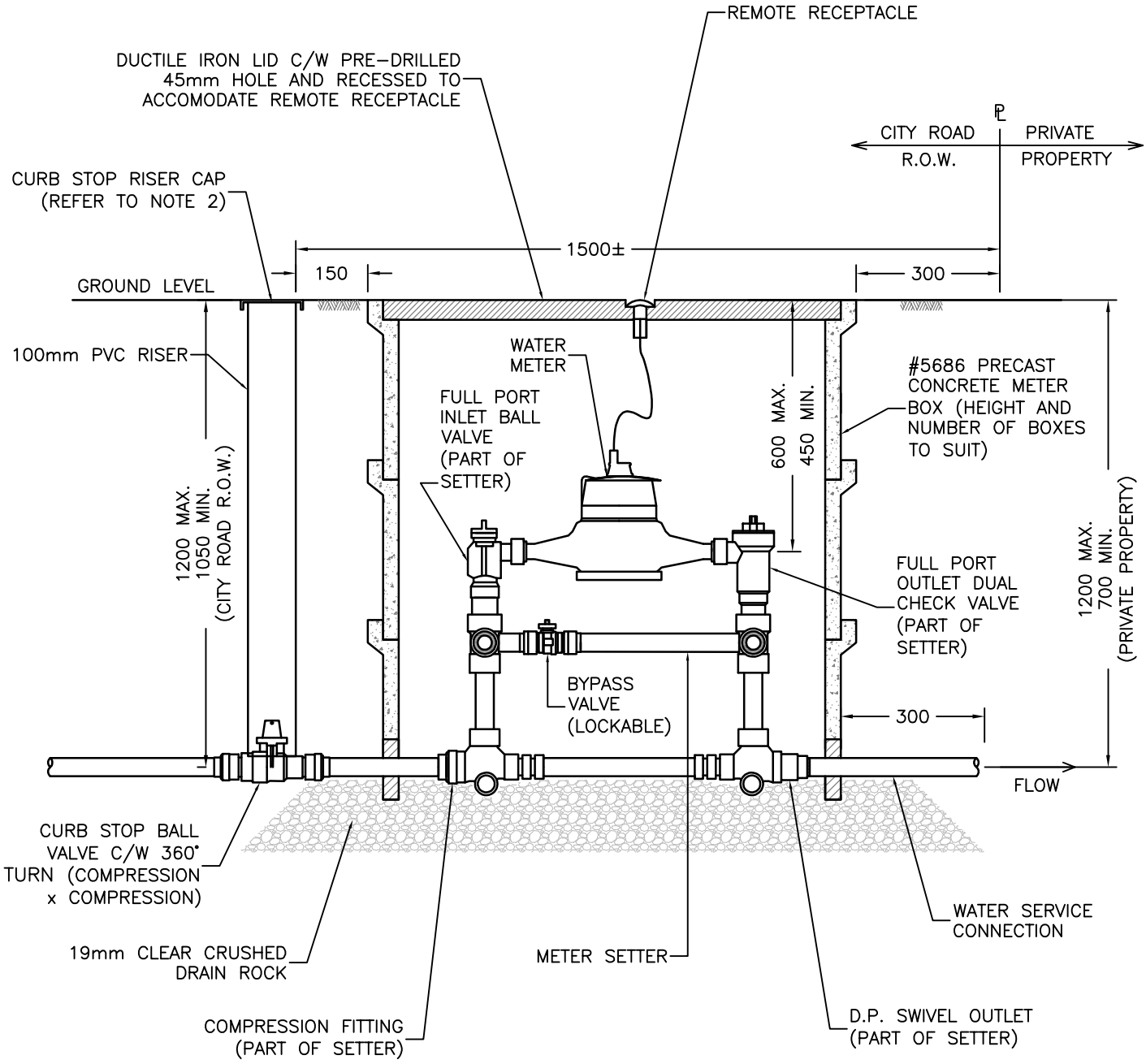
1. THIS DRAWING SHOULD BE REVIEWED IN CONJUNCTION WITH THE CITY OF BURNABY WATER METER DESIGN GUIDELINES AND SUPPLEMENTARY SPECIFICATIONS.
2. FOR CURB STOP RISERS, DUCTILE IRON LID TO BE PROVIDED IN LANDSCAPED AREAS. NELSON BOX TO BE INSTALLED IN DRIVEWAYS OR OTHER HARD SURFACES.
3. PLASTIC IDLER BAR TO BE INSTALLED IN PLACE OF WATER METER UNTIL FURTHER NOTICE FROM THE CITY OF BURNABY.
4. ALL DIMENSIONS ARE IN MILLIMETRES.

NO.	DATE	REVISION	APP'D	BY

City of Burnaby
ENGINEERING DEPARTMENT

OUTSIDE INSTALLATION
FOR 19mm AND 25mm METERS
(SETTER WITHOUT METER)

DRAWN BY: URBAN	SCALE: N.T.S.	BBY-	WM2b
APPRV'D BY:	DATE: 2016-03-22		



NOTES:

1. THIS DRAWING SHOULD BE REVIEWED IN CONJUNCTION WITH THE CITY OF BURNABY WATER METER DESIGN GUIDELINES AND SUPPLEMENTARY SPECIFICATIONS.
2. FOR CURB STOP RISERS, DUCTILE IRON LID TO BE PROVIDED IN LANDSCAPED AREAS. NELSON BOX TO BE INSTALLED IN DRIVEWAYS OR OTHER HARD SURFACES.
3. ALL DIMENSIONS ARE IN MILLIMETRES.

NO.	DATE	REVISION	APP'D	BY

City of Burnaby
ENGINEERING DEPARTMENT

OUTSIDE INSTALLATION
FOR 38mm AND 50mm METERS

DRAWN BY: URBAN	SCALE: N.T.S.	BBY-	WM3
APPRV'D BY:	DATE: 2016-03-22		

City of Burnaby

CONCRETE AND MISCELLANEOUS DETAILS

BBY-C101	Sidewalk Details [L346]
BBY-C102	Sidewalk Crossing Details [L346]
BBY-C103	Monolithic Curb & Sidewalk Details [L1372]
BBY-C104	Wheelchair Ramp [L1501]
BBY-C105	Curb Details [L785]
BBY-C106	Typical Pipe Barrier for Sidewalks [L1063]
BBY-C107	Tree Surround
BBY-C108	Drain Tile Details [L345]
BBY-C109	Stair Details [L1488]
BBY-C110	Standard Arrangement of Connector Walks & Steps to Properties Below Street Level when Retaining Wall is Required [L1488]
BBY-C111	Standard Arrangement of Connector Walks & Steps to Properties Above Street Level when Retaining Wall is Required [L1491]
BBY-C112	Standard Arrangement of Connector Walks & Steps to Properties Above Street Level when Retaining Wall is Not Required [L1493]
BBY-C113	Standard Arrangement of Connector Walks & Steps to Properties Below Street Level when Retaining Wall is Not Required [L1494]
BBY-C114	Standard Arrangement of Connector Walks & Steps to Properties Above Street Level where Retaining Wall is Required and Wall Exists at Property Line [L1495]
BBY-C115	Standard Arrangement of Connector Walks & Steps to Properties Below Street Level where Retaining Wall is Required and Wall Exists at Property Line [L1496]
BBY-C116	Gravity Retaining Walls [L602]
BBY-C117	Integrated Retaining Wall & Curb Sidewalk [L769]
BBY-C118	Split Stone Revetment [L1247]
BBY-C119	Pipe Railing Detail [L1505]
BBY-C120	Single Gate Details [L2707]
BBY-C121	Trail Bollard
BBY-C122	Precast Reinforced Concrete Barrier [L1654]
BBY-C123	Survey Monument

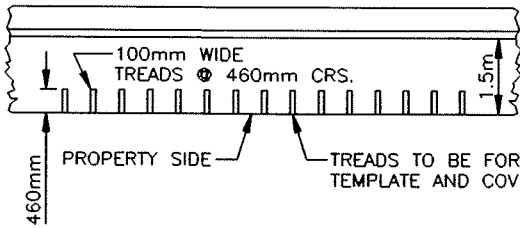
City of Burnaby
ENGINEERING DEPARTMENT

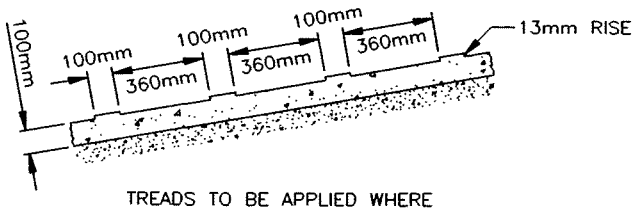
SIDEWALK DETAILS

DRAWN BY:
APPRV'D BY:
SCALE: N.T.S.
DATE: MAY 69

BBY- C101

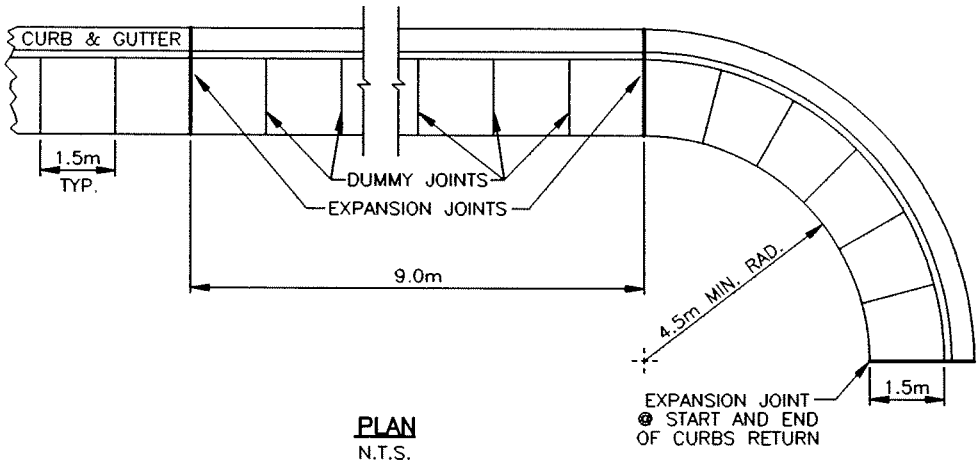
NO.	DATE	REVISION	APP'D
1	97/01	GENERAL REVISION (L346)	JK





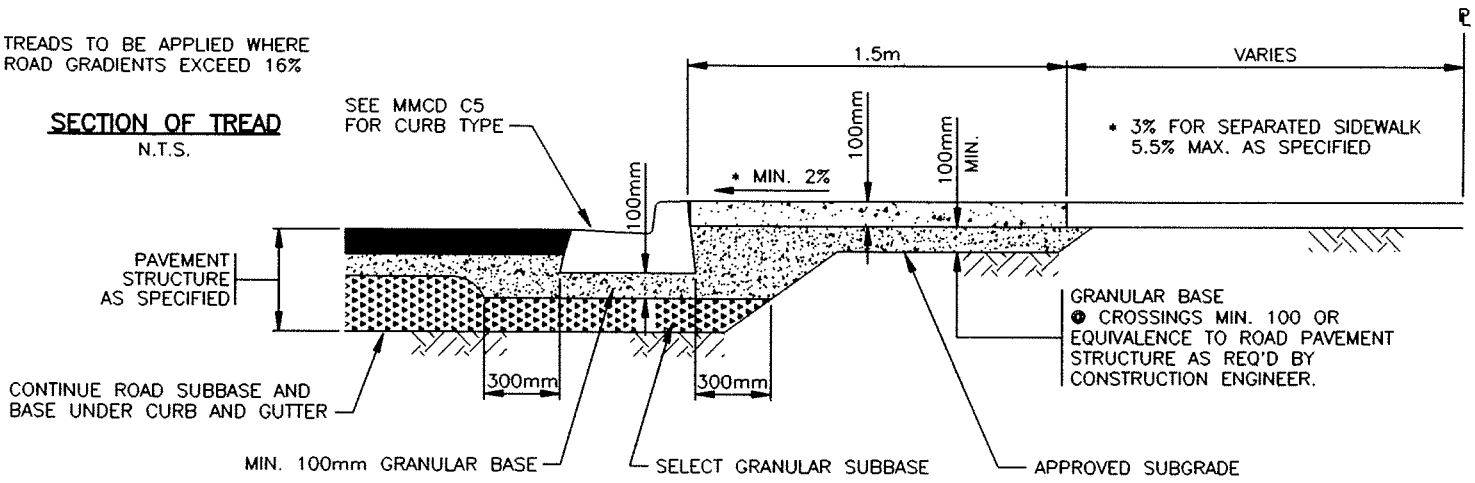
TREADS TO BE APPLIED WHERE
ROAD GRADIENTS EXCEED 16%

SEE C104 FOR
WHEELCHAIR RAMP.

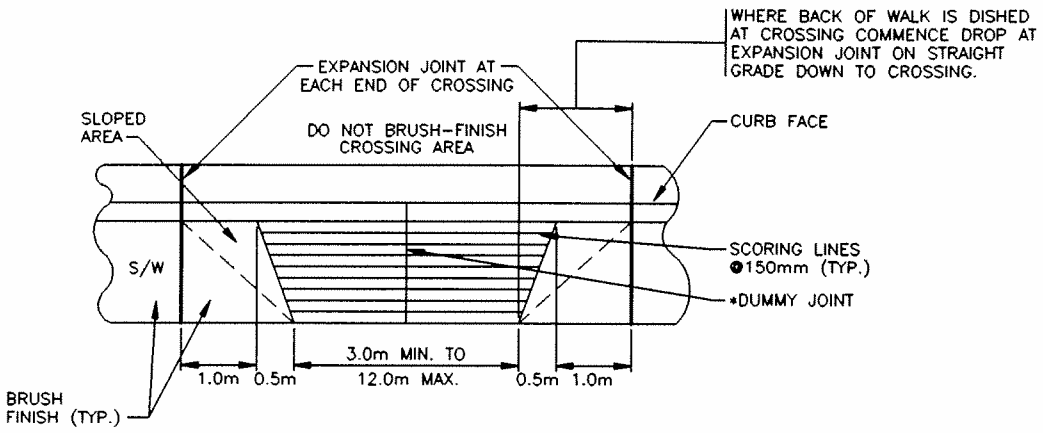


PLAN
N.T.S.

SECTION OF TREAD
N.T.S.

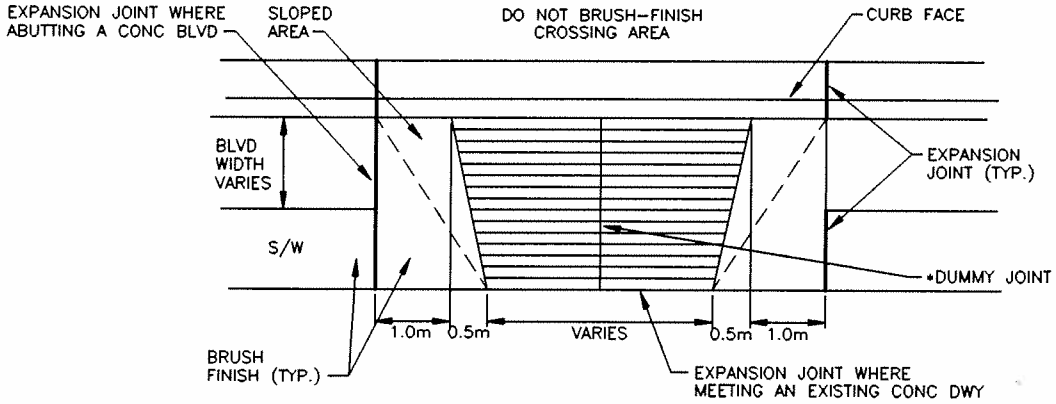


SECTION A–A



TYPICAL ABUTTING SIDEWALK CROSSING

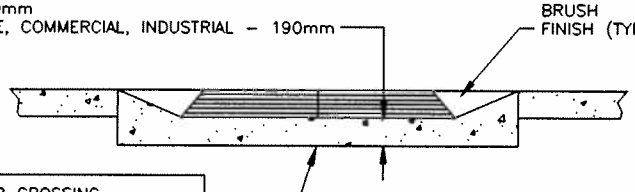
N.T.S.



TYPICAL SEPARATED SIDEWALK CROSSING

N.T.S.

CROSSING THICKNESS
RESIDENTIAL – 140mm
MULTI-FAMILY, LANE, COMMERCIAL, INDUSTRIAL – 190mm



HEIGHT OF CURB LIP FOR CROSSING
40mm – FOR CROWN PAVEMENT
25mm – HIGH SIDE-CROSS FALL PAVEMENT
50mm – LOW SIDE-CROSS FALL PAVEMENT
50mm – ALL REVERSE OR DISHED CROSSINGS

UNDERSIDE OF CROSSING SLAB TO BE FORMED FLAT BETWEEN EXPANSION JOINTS, NOT SHAPED PARALLEL TO SURFACE OF CONCRETE.

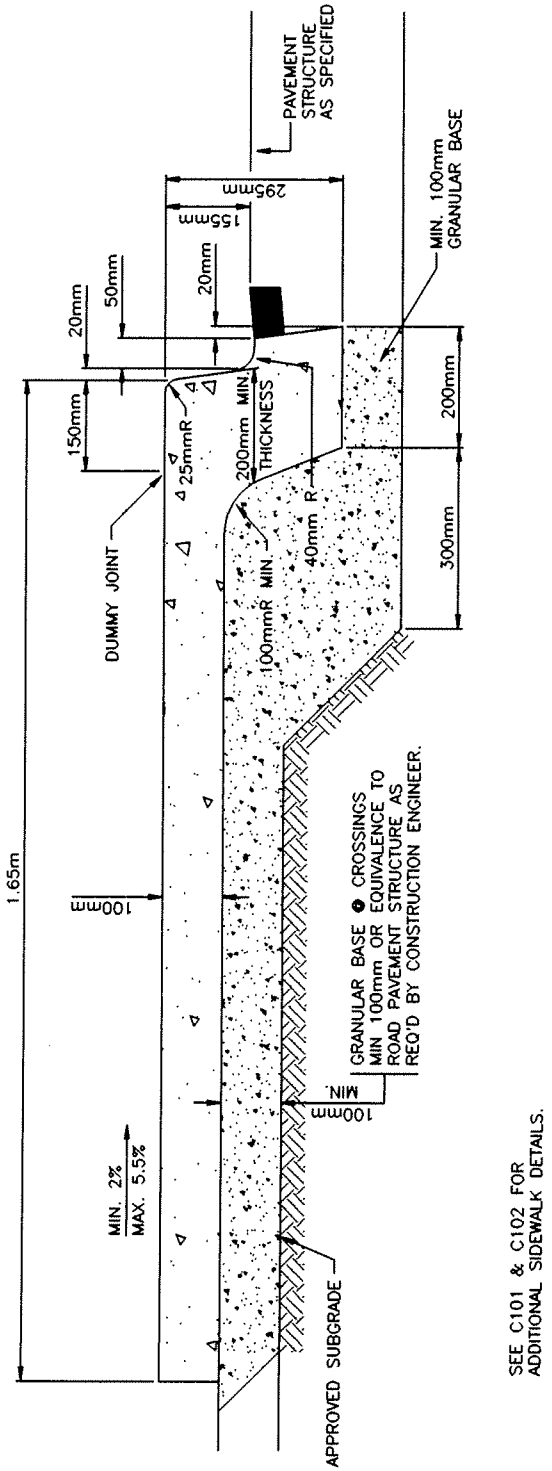
NOTE:
1. MAXIMUM DISH FOR BACK OF WALK 100mm.
2. * WHERE DRIVEWAY WIDTH EXCEEDS 6m, DUMMY JOINT SHALL BE A CONTROL JOINT.

NO.	DATE	REVISION	APP'D	BY
1	97/01	GENERAL REVISION (L346)	BG	JK

City of Burnaby
ENGINEERING DEPARTMENT

SIDEWALK CROSSING DETAILS

DRAWN BY:	SCALE: N.T.S.	**BBY-** C102	
APPRV'D BY:	DATE: MAY 69		

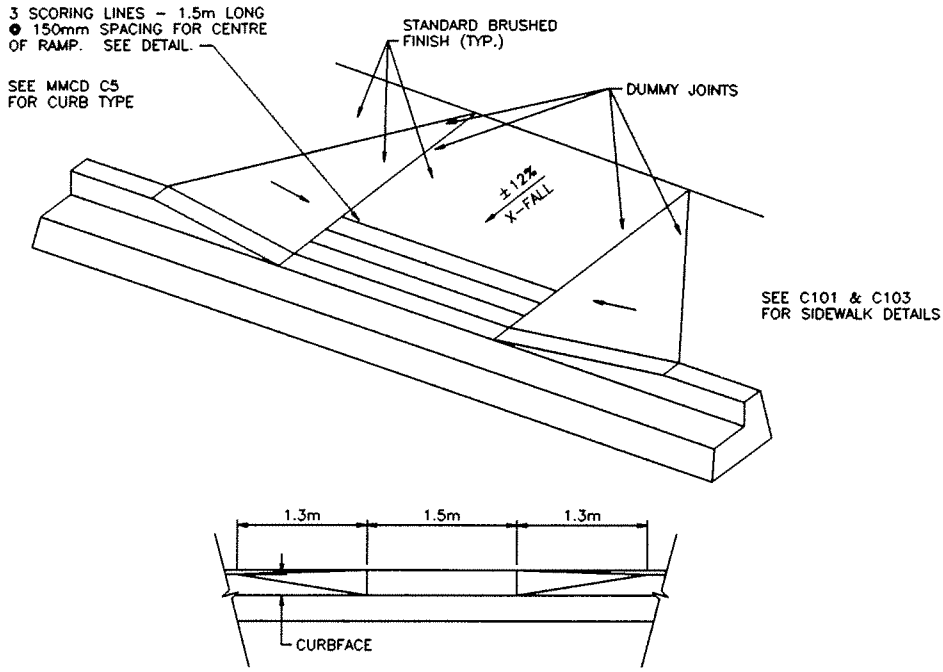


NO.	DATE	REVISION	APP'D	BY
1	97/01	GENERAL REVISION (L1372)		JK

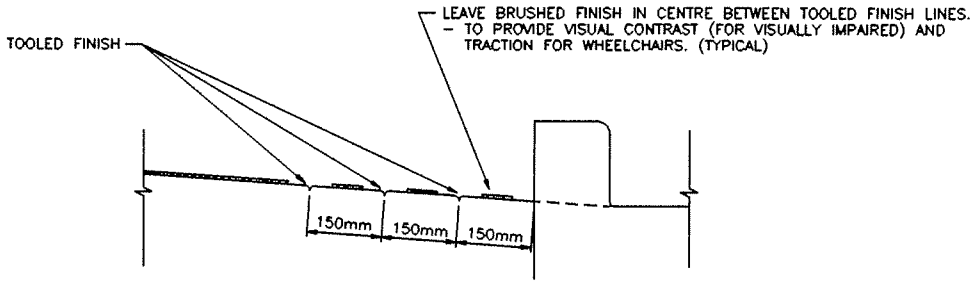
City of Burnaby
ENGINEERING DEPARTMENT

MONOLITHIC CURB & SIDEWALK DETAILS

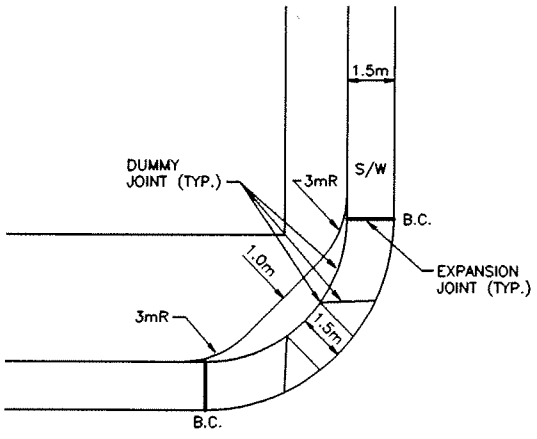
DRAWN BY:	SCALE: N.T.S.	**BBY-**	C103
APPRV'D BY:	DATE: SEP 72		



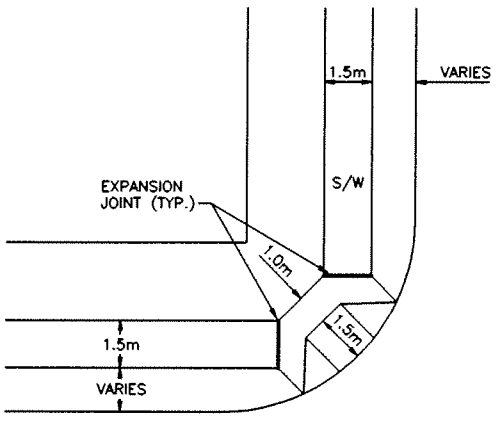
FRONT ELEVATION



DETAIL



ABUTTING WALK APPLICATION



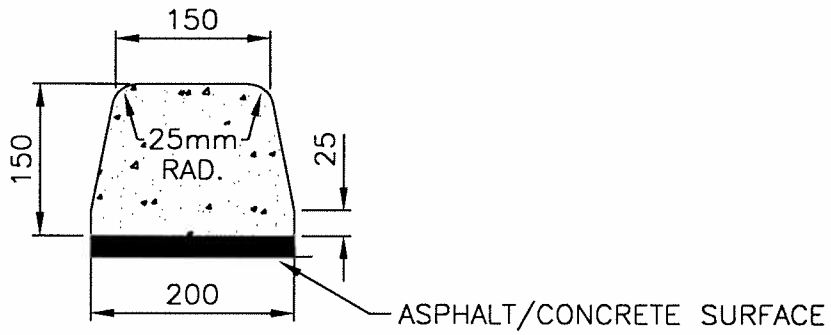
SEPARATED WALK APPLICATION

NO.	DATE	REVISION	APP'D	BY
1	97/01	GENERAL REVISION (L1501)	BW	JK

City of Burnaby
ENGINEERING DEPARTMENT

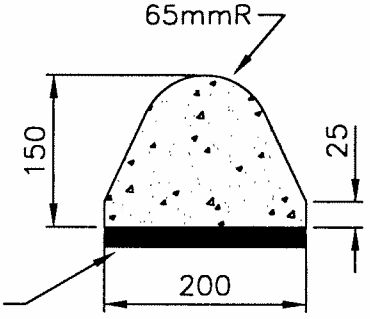
WHEELCHAIR RAMP

DRAWN BY:	SCALE: N.T.S.	BBY- C104
APPRV'D BY:	DATE: NOV 78	



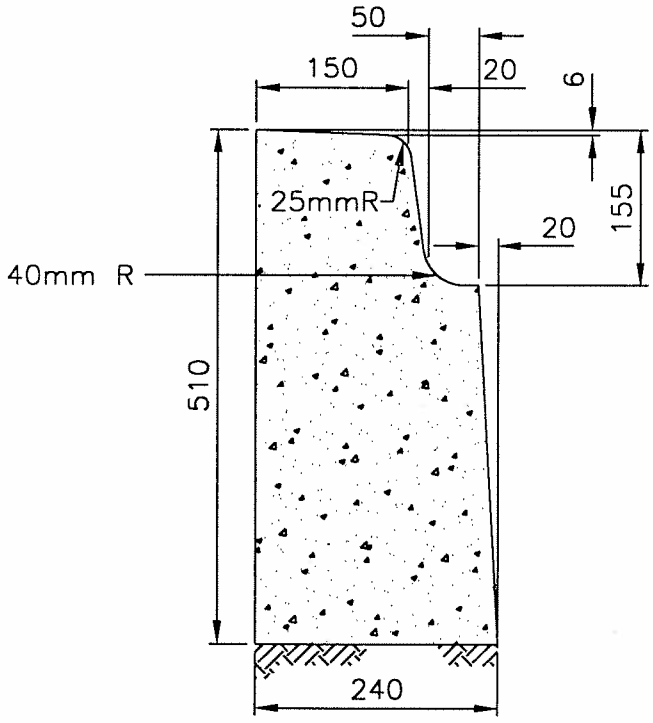
(TYPE C)

CONCRETE OR ASPHALT
AS SPECIFIED.

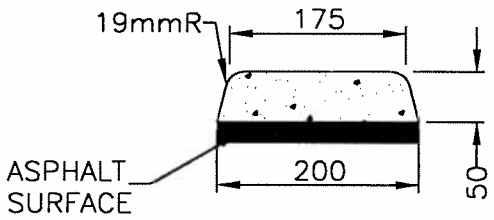


(TYPE E)

CONCRETE OR ASPHALT
AS SPECIFIED.

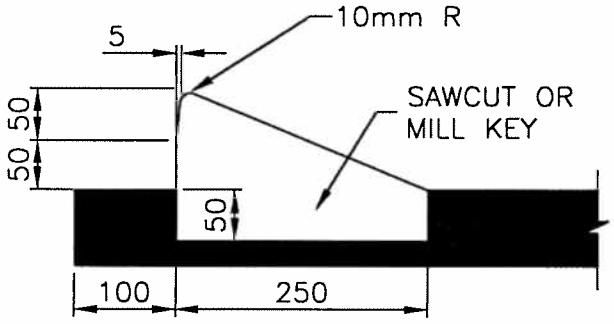


(TYPE D)



(TYPE F)

ASPHALT



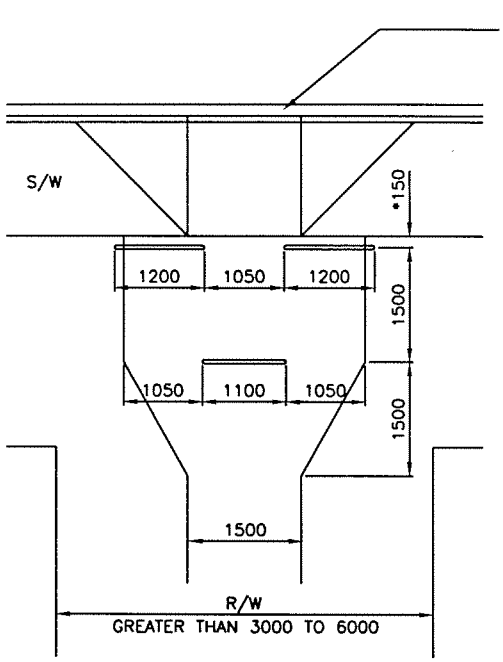
MEDIAN CURB
WHEELCHAIR LETDOWN

NO.	DATE	REVISION	APP'D	BY
3	2000/01	MEDIAN CURB WHEELCHAIR LETDOWN ADDED		JK
2	99/04	TYPE F CURB ADDED		HL
1	97/01	GENERAL REVISION (L785)		JK

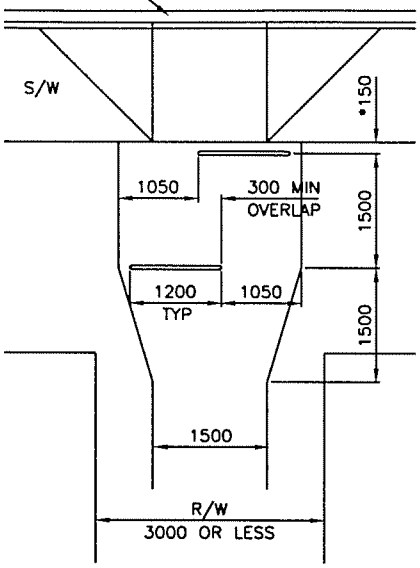
City of Burnaby
ENGINEERING DEPARTMENT

CURB DETAILS

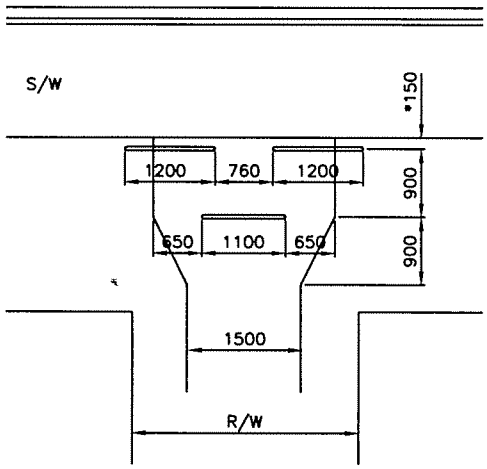
DRAWN BY:	SCALE: N.T.S.	**BBY-**	C105
APPRV'D BY:	DATE: JAN 74		



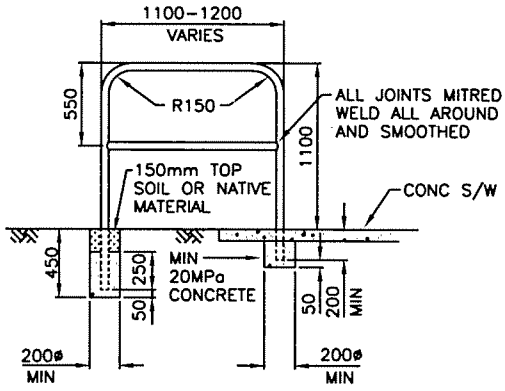
WALKWAY ON WIDE R/W
NO STAIRS



WALKWAY ON NARROW R/W
NO STAIRS



WALKWAY WITH STAIRS



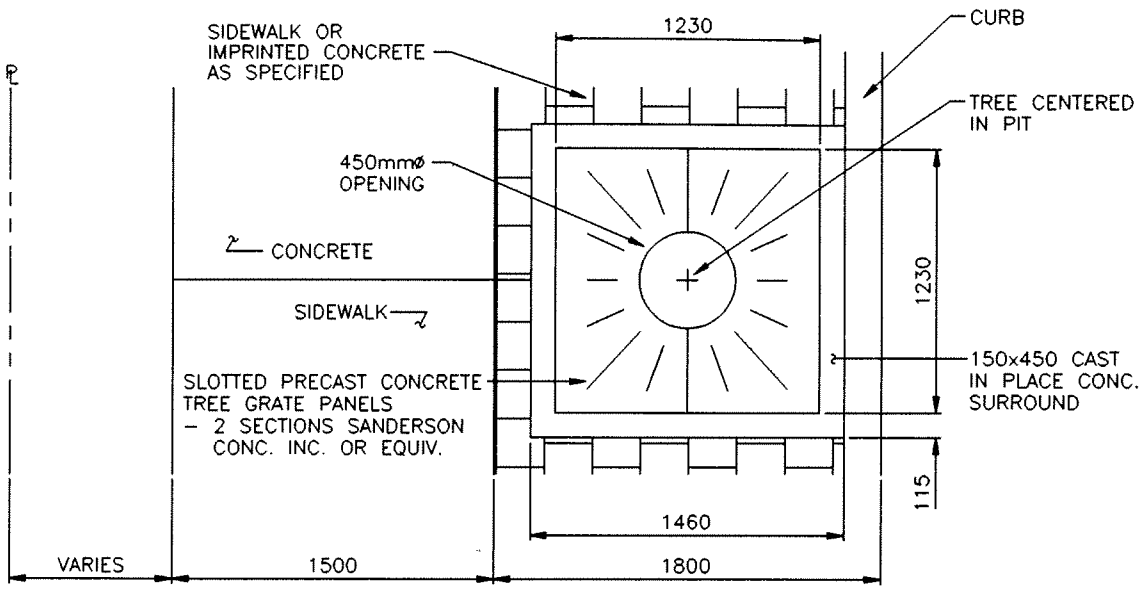
NOTES:
1. POSTS 50mmø SCHEDULE 40 GALVANIZED PIPE.
2. RAILS MIN 40mmø SCHEDULE 40 GALVANZED PIPE.
3. ALL POSTS SHALL BE INSTALLED PLUMB.
4. ALL RAILS SHALL BE INSTALLED PARALLEL TO THE WALKWAY.
5. FIELD WELDS SHALL BE PAINTED WITH 2 COATS OF "GALVACON" OR EQUAL.
6. * 150mm SET BACK FROM BACK OF SEPARATED OR ABUTTING WALK, 1800mm FROM CURB FACE WITHOUT ADJOINING WALK.

NO.	DATE	REVISION	APP'D	BY
2	99/01	TOPSOIL DEPTH INCREASED		HL
1	97/01	GENERAL REVISION (L1063)		JK

City of Burnaby
ENGINEERING DEPARTMENT

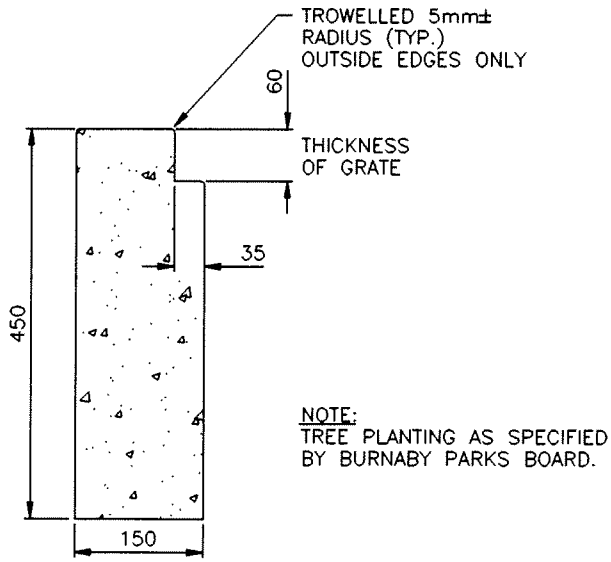
TYPICAL PIPE BARRIER FOR SIDEWALKS

DRAWN BY:		SCALE: N.T.S.	BBY- C106
APPRV'D BY:		DATE: APR 69	



SIDEWALK & TREE SURROUND PLAN

N.T.S.



NOTE:
TREE PLANTING AS SPECIFIED
BY BURNABY PARKS BOARD.

DETAIL OF CONCRETE TREE GRATE SURROUND

N.T.S.

NO.	DATE	REVISION	APP'D	BY
1	97/01	GENERAL REVISION		JK

City of Burnaby
ENGINEERING DEPARTMENT

TREE SURROUND

DRAWN BY: J. KO	SCALE: N.T.S.	**BBY-** C107	
APPRV'D BY:	DATE: 96-07-29		

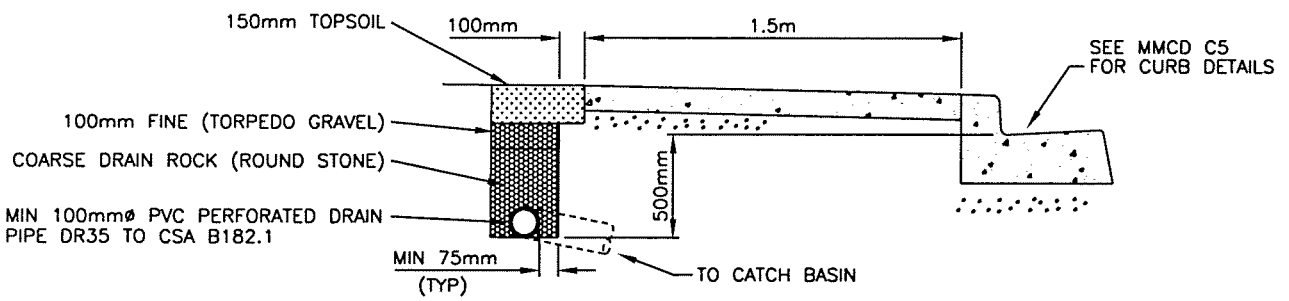
City of Burnaby
ENGINEERING DEPARTMENT

DRAIN TILE DETAILS

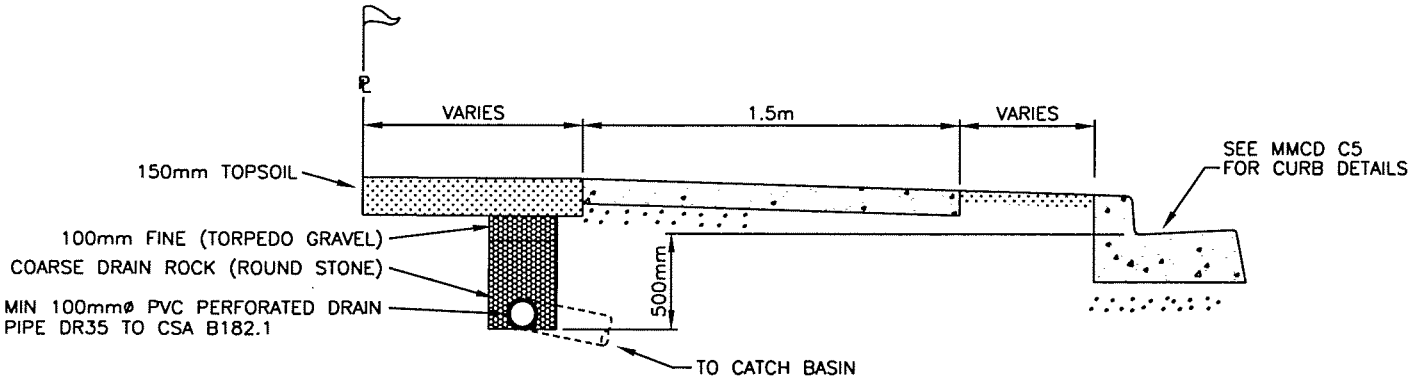
DRAWN BY:
APPRV'D BY:
SCALE: N.T.S.
DATE: MAY 69

BBY- C108

NO.	DATE	REVISION	APP'D	BY
2	99/01	TOPSOIL DEPTH INCREASED		HL
1	97/01	GENERAL REVISION (L345)		JK



DRAIN TILE WITH ABUTTING SIDEWALK



DRAIN TILE WITH SEPARATED SIDEWALK

NOTES:
1. CONNECT DRAIN TILE TO EACH ADJOINING CATCH BASIN.
2. DRAINS ON HIGH SIDE OF STREET OR AS REQUIRED BY CONSTRUCTION ENGINEER.
3. PIPE INSTALLED WITH PERFORATIONS DOWN

FOR SIDEWALK DETAILS SEE C101 & C103.

City of Burnaby
ENGINEERING DEPARTMENT

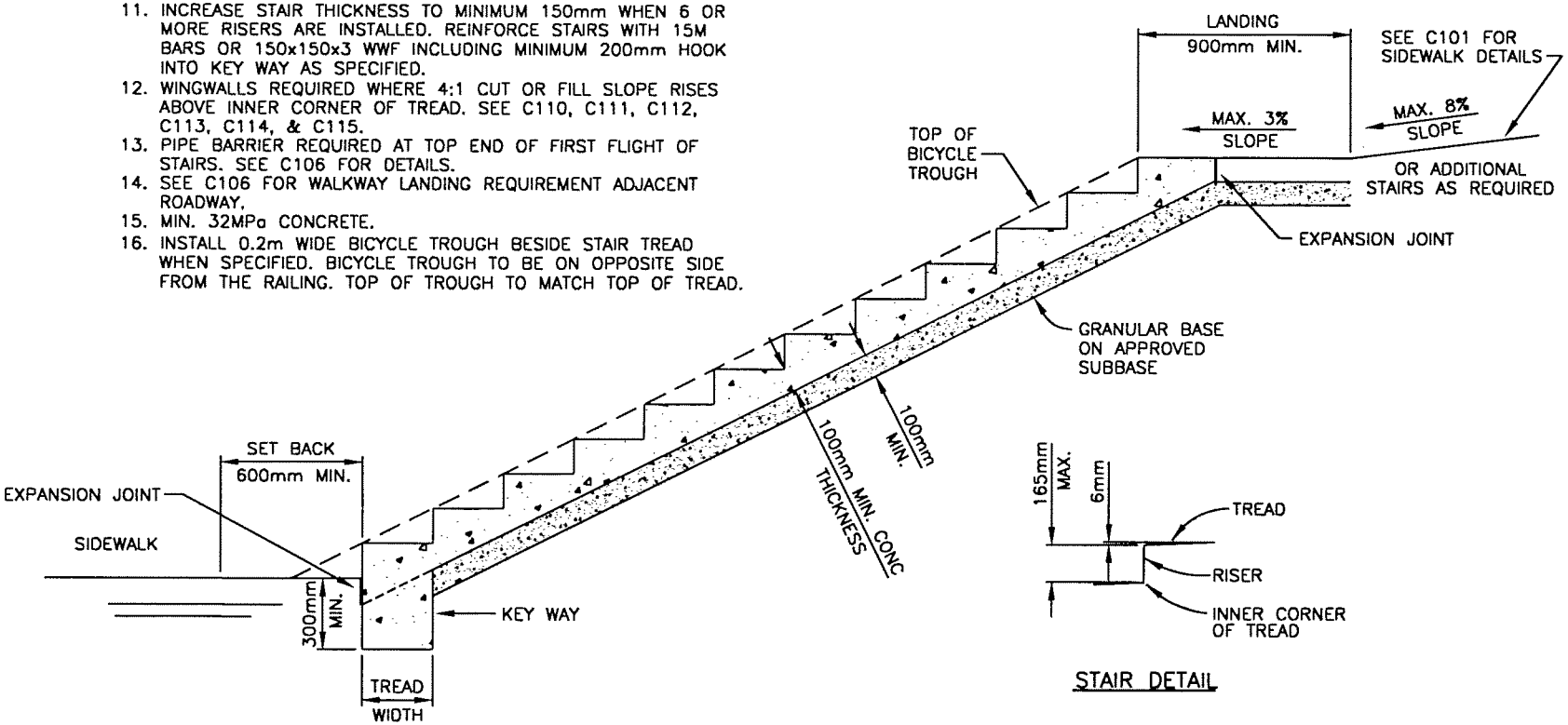
STAIR DETAILS

DRAWN BY:
APPRV'D BY:
SCALE: N.T.S.
DATE: AUG 73

BBY- C109

NO.	DATE	REVISION	APP'D
2	2000/01	BICYCLE TROUGH ADDED	JK
1	97/01	GENERAL REVISION (L1488)	JK

NOTES:
1. VARY THE NUMBER OF RISERS AS REQUIRED BY DIFFERENCE IN ELEVATION.
2. ALL STEPS TO BE IN ONE FLIGHT, TO A MAX. OF 12 RISERS IN ANY ONE FLIGHT OF STAIRS.
3. MIN. 900mm LANDING REQUIRED BETWEEN ADJACENT FLIGHT OF STAIRS.
4. ALL STEPS IN EACH FLIGHT SHALL BE EQUAL, ADJACENT FLIGHTS IN A CONTINUOUS RUN SHALL BE THE SAME.
5. SUM OF TREAD PLUS RISER SHALL BE A MAX OF 470mm.
6. MIN. TREAD SIZE 300mm.
7. RAILING REQUIRED WHEN 3 OR MORE RISERS ARE INSTALLED, SEE C119 FOR RAILING DETAILS.
8. RAILING INSTALLED ON ONE SIDE ONLY, THE LOW OR CUT SIDE OF THE EMBANKMENT.
9. RAILING AND BICYCLE TROUGH INSTALLED IN ADDITION TO THE SPECIFIED WALK WIDTH.
10. KEY WAY REQUIRED WHEN 6 OR MORE RISERS ARE INSTALLED.
11. INCREASE STAIR THICKNESS TO MINIMUM 150mm WHEN 6 OR MORE RISERS ARE INSTALLED. REINFORCE STAIRS WITH 15M BARS OR 150x150x3 WWF INCLUDING MINIMUM 200mm HOOK INTO KEY WAY AS SPECIFIED.
12. WINGWALLS REQUIRED WHERE 4:1 CUT OR FILL SLOPE RISES ABOVE INNER CORNER OF TREAD. SEE C110, C111, C112, C113, C114, & C115.
13. PIPE BARRIER REQUIRED AT TOP END OF FIRST FLIGHT OF STAIRS. SEE C106 FOR DETAILS.
14. SEE C106 FOR WALKWAY LANDING REQUIREMENT ADJACENT ROADWAY.
15. MIN. 32MPa CONCRETE.
16. INSTALL 0.2m WIDE BICYCLE TROUGH BESIDE STAIR TREAD WHEN SPECIFIED. BICYCLE TROUGH TO BE ON OPPOSITE SIDE FROM THE RAILING. TOP OF TROUGH TO MATCH TOP OF TREAD.



STAIR DETAIL

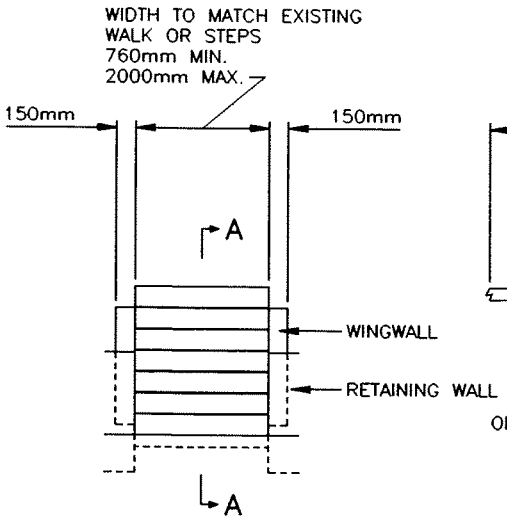
City of Burnaby
ENGINEERING DEPARTMENT

STANDARD ARRANGEMENT OF CONNECTOR WALKS AND STEPS TO PROPERTIES BELOW STREET LEVEL WHEN RETAINING WALL IS REQUIRED

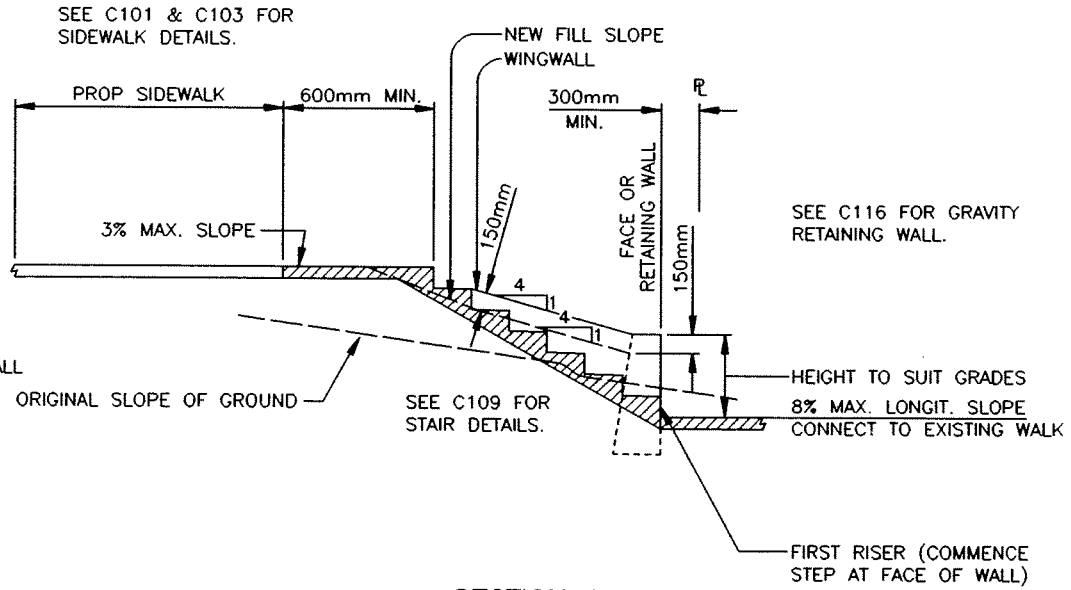
DRAWN BY:
APPRV'D BY:
SCALE: N.T.S.
DATE: AUG 73

BBY- C110

NO.	DATE	REVISION	APP'D BY
1	97/01	GENERAL REVISION (L1488)	JK



FRONT ELEVATION



SECTION A–A

ANY VARIATIONS FROM THIS STANDARD MUST RECEIVE APPROVAL OF THE INSPECTOR BEFORE COMMENCING CONST. OF WALKS AND/OR STEPS.

NOTES:
1. VARY THE NUMBER OF RISERS AS REQUIRED BY DIFFERENCE IN ELEVATIONS.
2. ALL STEPS TO BE IN ONE FLIGHT.
3. FIRST RISER COMMENCES AT FACE OF RETAINING WALL.
4. WING WALLS ARE REQUIRED WHERE 4:1 CUT OR FILL SLOPE RISES ABOVE INNER CORNER OF TREAD.
5. WHERE HEIGHT OF WING WALL EXCEED 600mm, USE GRAVITY RETAINING WALL C116 OR REINFORCED WALL AS SPECIFIED.

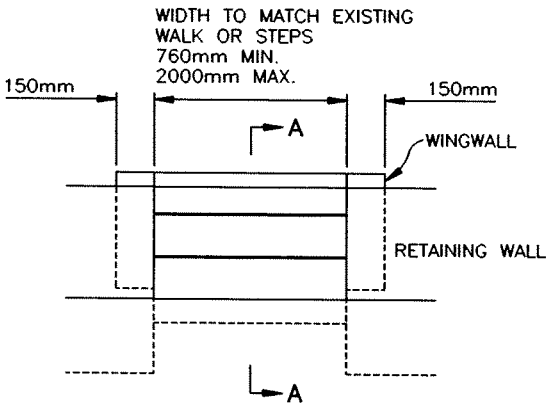
City of Burnaby
ENGINEERING DEPARTMENT

STANDARD ARRANGEMENT OF CONNECTOR WALKS AND STEPS TO PROPERTIES ABOVE STREET LEVEL WHEN RETAINING WALL IS REQUIRED

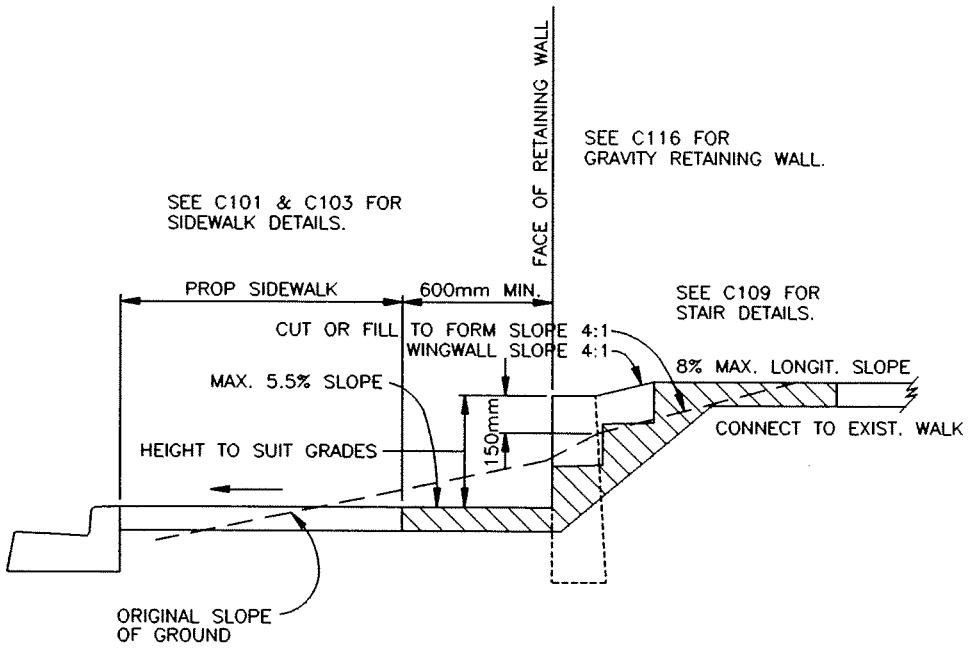
DRAWN BY:
APPRV'D BY:
SCALE: N.T.S.
DATE: AUG 73

BBY- C111

NO.	DATE	REVISION	APP'D BY
1	97/01	GENERAL REVISION (L1491)	JK



FRONT ELEVATION



SECTION A–A

ANY VARIATIONS FROM THIS STANDARD MUST RECEIVE APPROVAL OF THE INSPECTOR BEFORE COMMENCING CONST. OF WALKS AND/OR STEPS.

NOTES:
1. VARY THE NUMBER OF RISERS AS REQUIRED BY DIFFERENCE IN ELEVATIONS.
2. ALL STEPS TO BE IN ONE FLIGHT.
3. FIRST RISER COMMENCES AT FACE OF RETAINING WALL.
4. WING WALLS ARE REQUIRED WHERE 4:1 CUT OR FILL SLOPE RISES ABOVE INNER CORNER OF TREAD.
5. WHERE HEIGHT OF WING WALL EXCEED 600mm USE GRAVITY RETAINING WALL C116 OR REINFORCED WALL AS SPECIFIED.

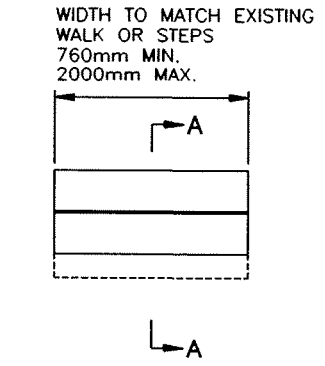
City of Burnaby
ENGINEERING DEPARTMENT

STANDARD ARRANGEMENT OF CONNECTOR WALKS AND STEPS TO PROPERTIES ABOVE STREET LEVEL WHEN RETAINING WALL IS NOT REQUIRED

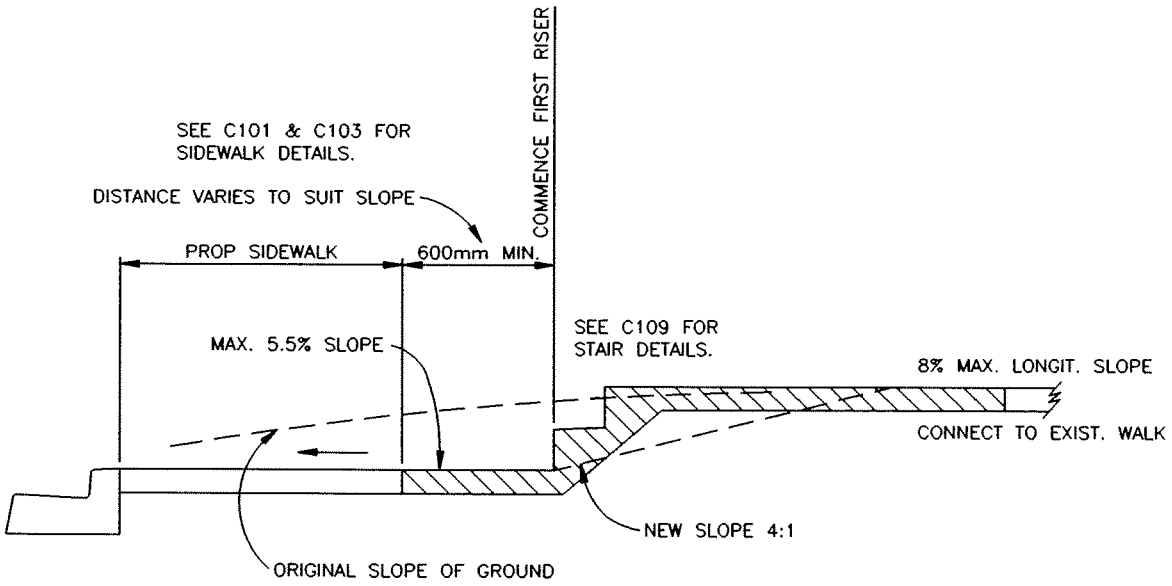
DRAWN BY:
APPRV'D BY:
SCALE: N.T.S.
DATE: AUG 73

BBY- C112

NO.	DATE	REVISION	APP'D BY
1	97/01	GENERAL REVISION (L1493)	JK



FRONT ELEVATION



SECTION A–A

ANY VARIATIONS FROM THIS STANDARD MUST RECEIVE APPROVAL OF THE INSPECTOR BEFORE COMMENCING CONST. OF WALKS AND/OR STEPS.

NOTES:
1. VARY THE NUMBER OF RISERS AS REQUIRED BY DIFFERENCE IN ELEVATIONS.
2. WINGWALLS ARE REQUIRED WHERE 4:1 CUT OR FILL SLOPE RISES ABOVE INNER CORNER OF TREAD.
3. ALL STEPS TO BE IN ONE FLIGHT.

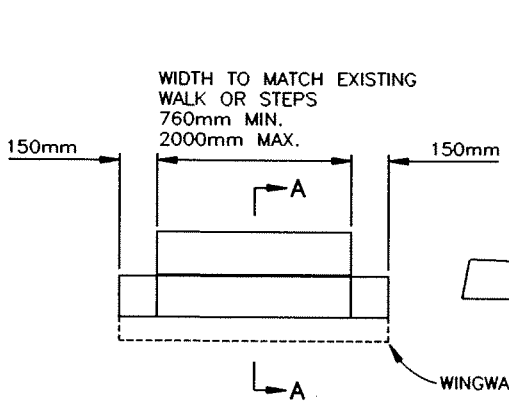
City of Burnaby
ENGINEERING DEPARTMENT

STANDARD ARRANGEMENT OF CONNECTOR WALKS AND STEPS TO PROPERTIES BELOW STREET LEVEL WHEN RETAINING WALL IS NOT REQUIRED

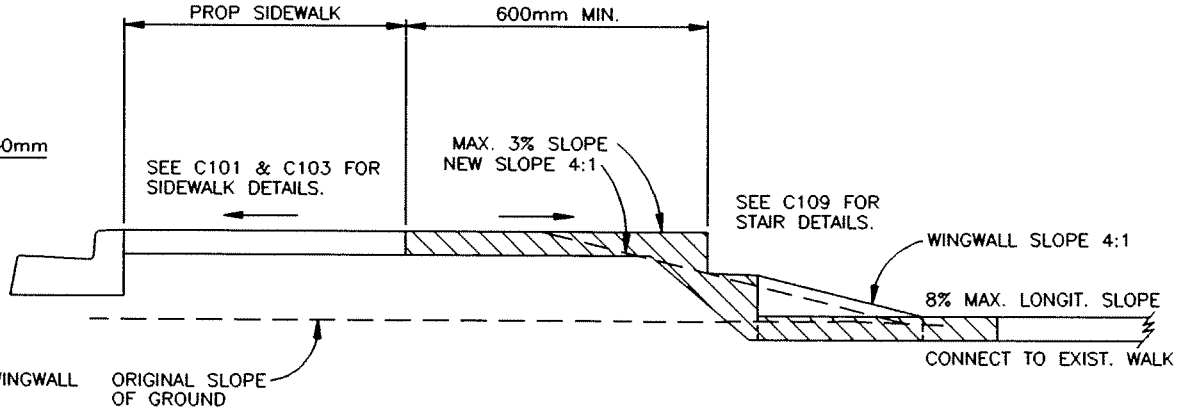
DRAWN BY:
APPRV'D BY:
SCALE: N.T.S.
DATE: AUG 73

BBY- C113

NO.	DATE	REVISION	APP'D BY
1	97/01	GENERAL REVISION (L1494)	JK



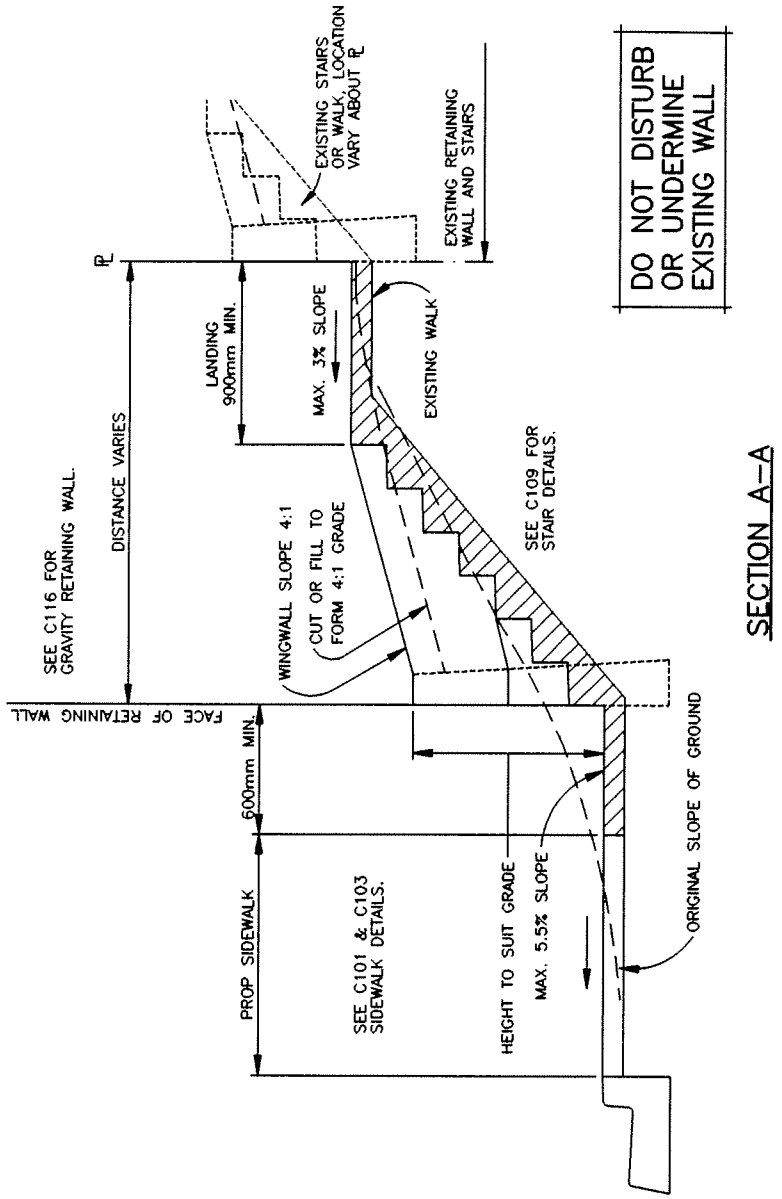
FRONT ELEVATION



SECTION A–A

ANY VARIATIONS FROM THIS STANDARD MUST RECEIVE APPROVAL OF THE INSPECTOR BEFORE COMMENCING CONST. OF WALKS AND/OR STEPS.

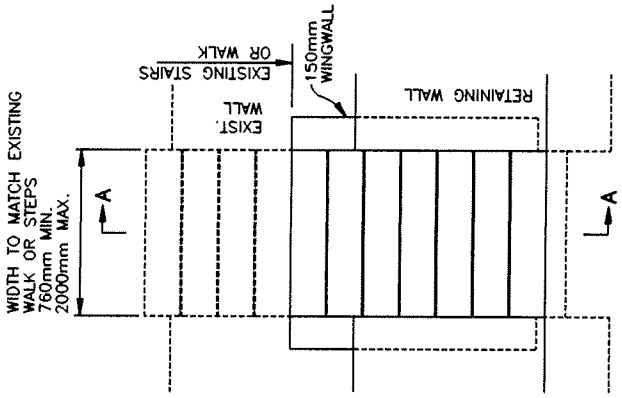
NOTES:
1. VARY THE NUMBER OF RISERS AS REQUIRED BY THE DIFFERENCE IN ELEVATIONS.
2. WINGWALLS ARE REQUIRED WHERE 4:1 CUT OR FILL SLOPE RISES ABOVE INNER CORNER OF TREAD.
3. ALL STEPS TO BE IN ONE FLIGHT.



SECTION A–A

DO NOT DISTURB OR UNDERMINE EXISTING WALL

NOTES:
1. VARY THE NUMBER OF RISERS AS REQUIRED BY THE DIFFERENCE IN ELEVATIONS.
2. ALL STEPS TO BE IN ONE FLIGHT.
3. FIRST RISER BEGINS AT FACE OF RETAINING WALL.
4. WING WALLS ARE REQUIRED WHERE 4:1 CUT OR FILL SLOPE RISES ABOVE INNER CORNER OF TREAD.
5. WHERE HEIGHT OF WING WALLS EXCEED 600mm USE GRAVITY RETAINING WALL C116 OR REINFORCED WALL AS SPECIFIED.



FRONT ELEVATION

ANY VARIATIONS FROM THIS STANDARD MUST RECEIVE APPROVAL OF THE INSPECTOR BEFORE COMMENCING CONST. OF WALKS AND/OR STEPS.

NO.	DATE	REVISION	APP'D	BY
1	97/01	GENERAL REVISION (L1495)		JK

City of Burnaby
ENGINEERING DEPARTMENT

STANDARD ARRANGEMENT OF CONNECTOR WALKS AND STEPS TO PROPERTIES ABOVE STREET LEVEL WHERE RETAINING WALL IS REQUIRED AND WALL EXISTS AT P.L.

DRAWN BY:	SCALE: N.T.S.	**BBY- C114**
APPRV'D BY:	DATE: AUG 73	

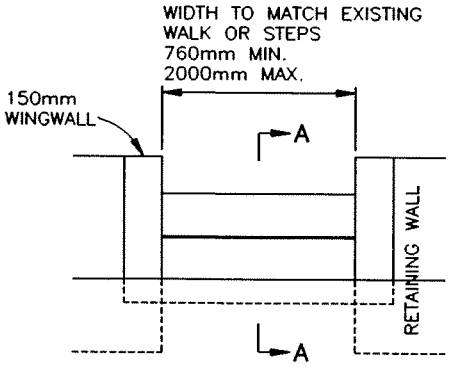
City of Burnaby
ENGINEERING DEPARTMENT

STANDARD ARRANGEMENT OF CONNECTOR WALKS AND STEPS TO PROPERTIES BELOW STREET LEVEL WHERE RETAINING WALL IS REQUIRED AND WALL EXISTS AT P.L.

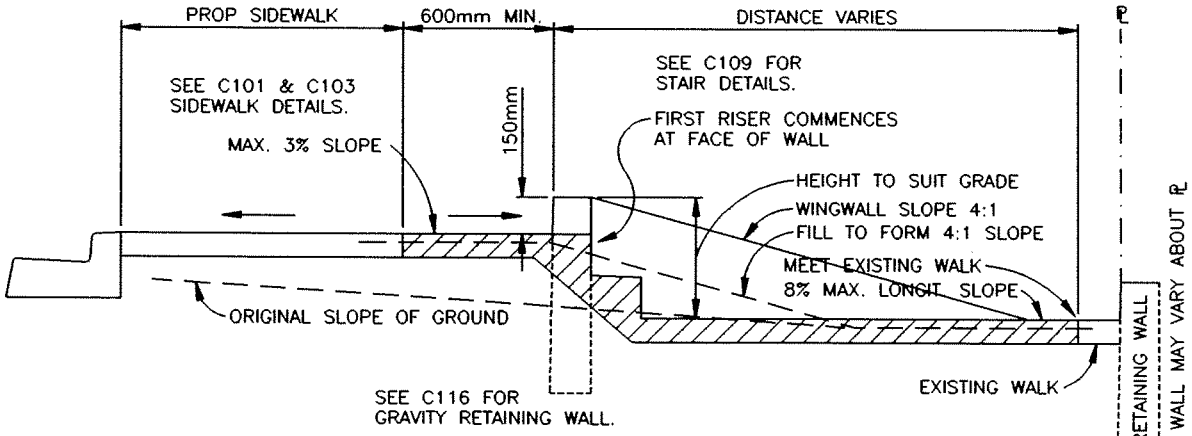
DRAWN BY:
APPR'D BY:
SCALE: N.T.S.
DATE: AUG 73

BBY- C115

NO.	DATE	REVISION	APP'D BY
1	97/01	GENERAL REVISION (L1496)	JK



FRONT ELEVATION



SECTION A–A

ANY VARIATIONS FROM THIS STANDARD MUST RECEIVE APPROVAL OF THE INSPECTOR BEFORE COMMENCING CONST. OF WALKS AND/OR STEPS.

NOTES:
1. VARY THE NUMBER OF RISERS AS REQUIRED BY DIFFERENCE IN ELEVATIONS.
2. ALL STEPS TO BE IN ONE FLIGHT.
3. COMMENCE TOP RISER AT FACE OF RETAINING WALL.
4. WING WALLS ARE REQUIRED WHERE 4:1 CUT OR FILL SLOPE RISES ABOVE INNER CORNER OF TREAD.

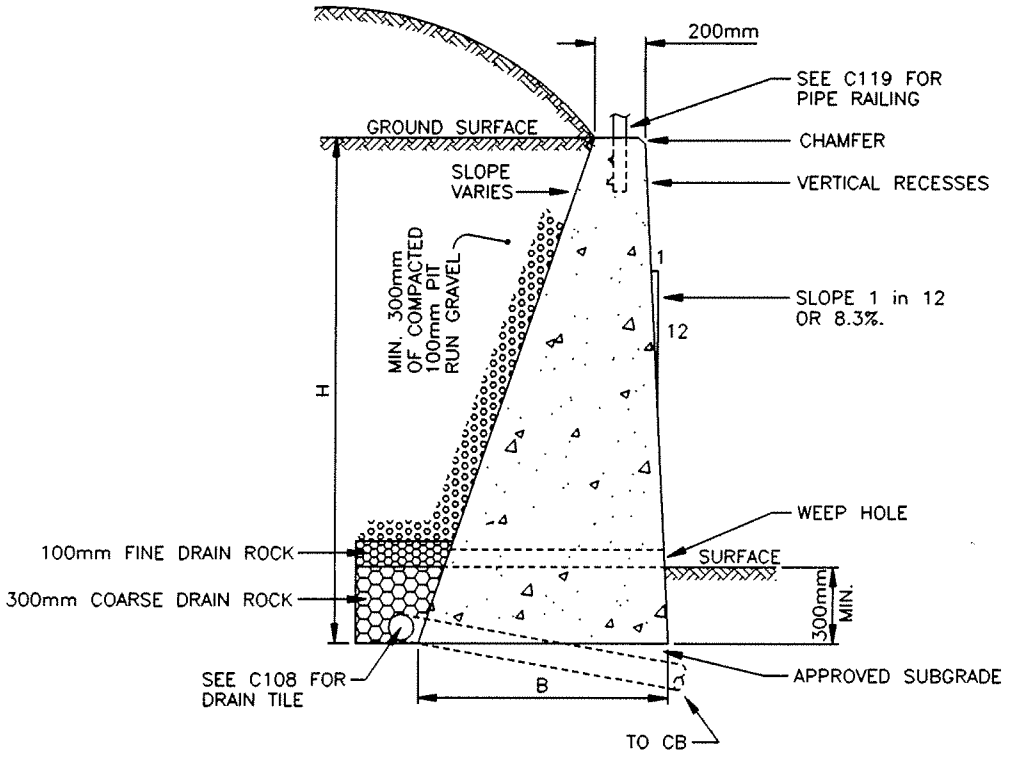
WITHOUT SURCHARGE

H	B	VOL. OF CONCRETE
METERS	METERS	CU. M. PER METER
1.0	.6	.40
1.25	.7	.56
1.5	.8	.75
1.75	.9	.96
2.0	1.0	1.20
2.25	1.1	1.46
2.5	1.3	1.88
2.75	1.4	2.20
3.0	1.6	2.70
3.25	1.7	3.09

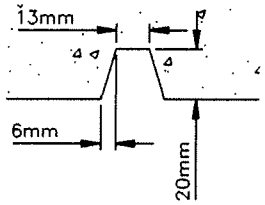
WITH SURCHARGE

H	B	VOL. OF CONCRETE
METERS	METERS	CU. M. PER METER
1.0	.6	.40
1.25	.7	.56
1.5	.9	.83
1.75	1.1	1.14
2.0	1.2	1.40
2.25	1.3	1.69
2.5	1.5	2.13
2.75	1.8	2.75
3.0	2.0	3.30
3.25	2.3	4.06

SURCHARGE APPLICATION
WHERE GROUND RISES ABOVE
TOP OF WALL EXCEEDING 4:1
SLOPE OR TRAFFIC LOADING.



NOTES:
1. MIN. 32Mpa CONCRETE.
2. WALL FRONT FACE SHALL HAVE A RUBBED FINISH.
3. CHAMFER ALL EXTERNAL CORNERS 25mm x 25mm.
4. INSTALL VERTICAL RECESSES IN FRONT FACE OF WALL @ 300mm C/C.
5. LOCATE JOINTS AT PROPERTY LINE OR MAXIMUM 15m INTERVAL.
6. JOINTS SHALL HAVE A 50mm x 150mm WIDE KEY.
7. INSTALL 6mm STYROFOAM IN JOINT, SEAL WITH GREY COLOUR SIKAFLEX-15LM OR EQUAL.
8. CONNECT DRAIN TILE TO EACH ADJOINING CATCH BASIN.
9. WEEP HOLES MIN. 100mmø PVC SMOOTH PROFILE DR35 PIPE @ 5.0m C/C AS REQUIRED BY CONSTRUCTION ENGINEER.
10. SEE C110, C111, C112, C113, C114, & C115 FOR CONNECTOR WALK, STAIRS ARRANGEMENT.



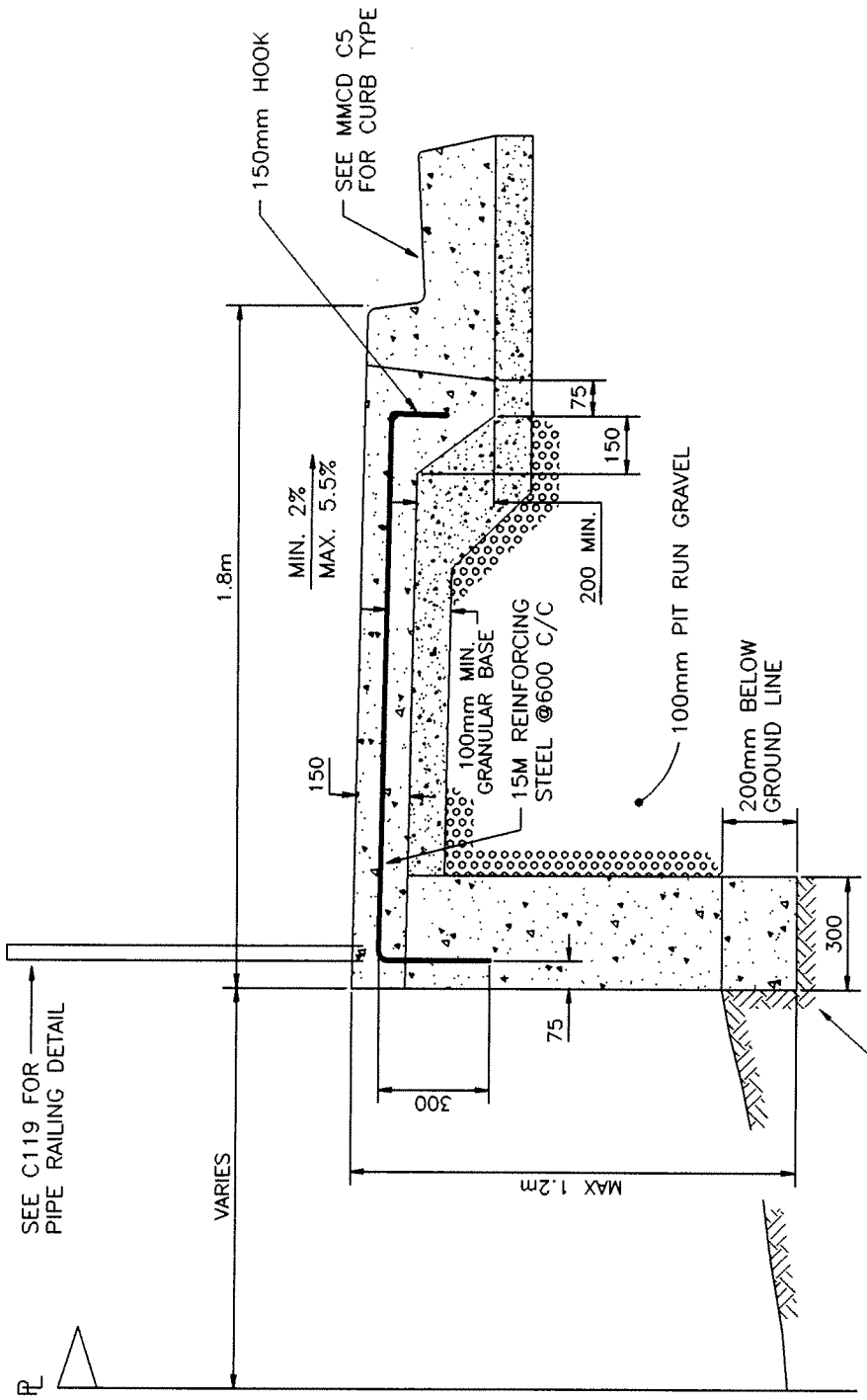
DETAIL: VERTICAL RECESSES

NO.	DATE	REVISION	APP'D	BY
1	97/01	GENERAL REVISION (L602)		JK

City of Burnaby
ENGINEERING DEPARTMENT

GRAVITY RETAINING WALLS

DRAWN BY:	SCALE: N.T.S.	BBY- C116
APPRV'D BY:	DATE: APR 66	



NOTE:
1. CURB KEY NOT REQUIRED WHEN USING MONOLITHIC CURB SIDEWALK SEE C103.
2. DRAIN TILE BEHIND WALL AS REQUIRED BY CONSTRUCTION ENGINEER SEE C108.
3. CONCRETE SHALL BE 32MPa.
4. ALL DIMENSIONS IN mm UNLESS OTHERWISE NOTED.

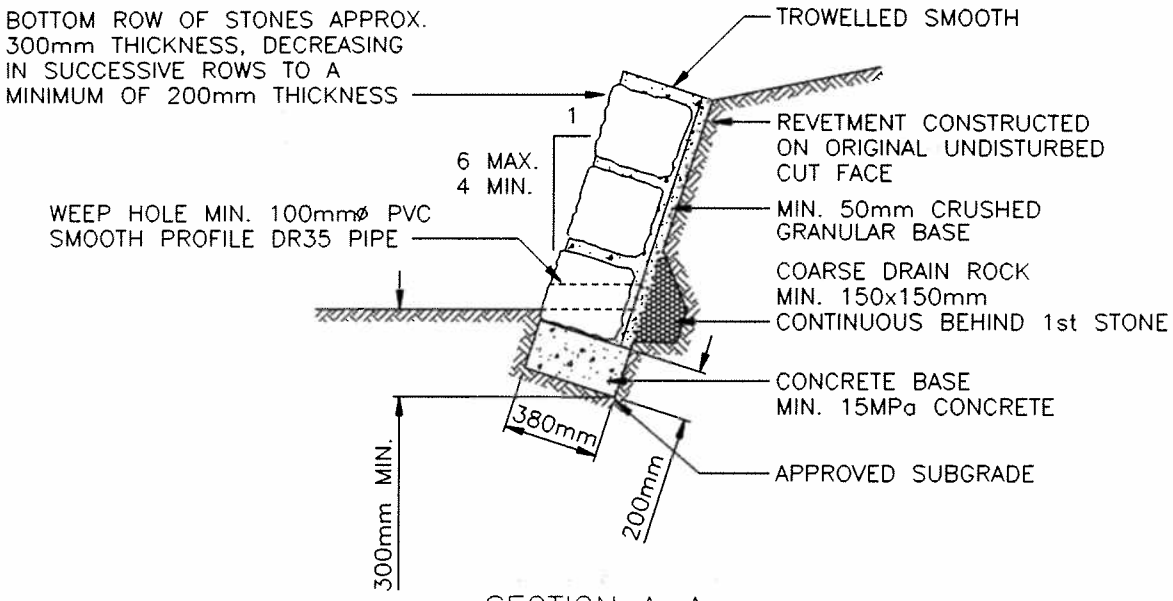
SEE C101 & C102 FOR ADDITIONAL SIDEWALK DETAILS

NO.	DATE	REVISION	APP'D	BY
1	97/01	GENERAL REVISION (L769)		JK

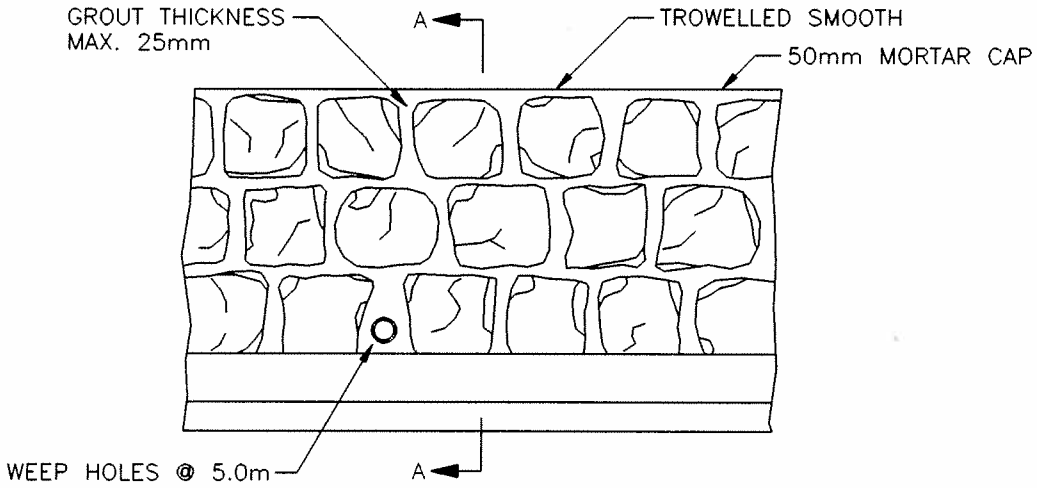
City of Burnaby
ENGINEERING DEPARTMENT

INTEGRATED RETAINING WALL & CURB SIDEWALK

DRAWN BY:	SCALE: N.T.S.	**BBY- C117**	
APPRV'D BY:	DATE: APR 70		



SECTION A–A



ELEVATION

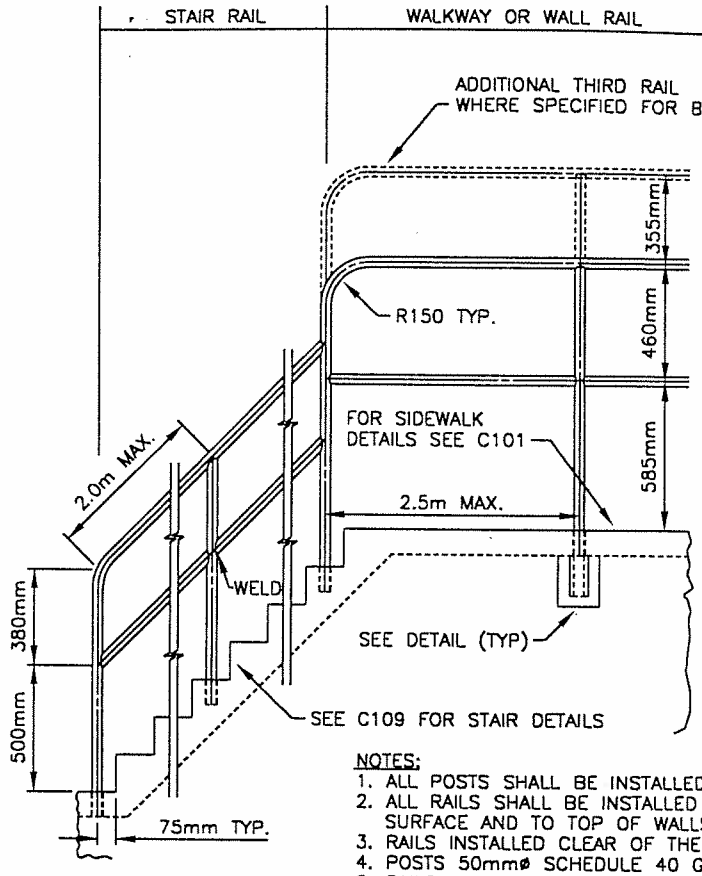
NOTES:
1. MAX. WALL HEIGHT 1.0m ABOVE GRADE.
2. DRAIN TILE BEHIND WALL AS REQUIRED BY CONSTRUCTION ENGINEER (SEE C108).
3. STONES SHALL BE A SPLIT GRANITE ROCK UNIFORM IN COLOUR.
4. STONES SHALL HAVE A MIN. 4 SPLIT FACES.
5. WALL FRONT FACE SHALL ALWAYS BE A SPLIT FACE WITH NO VISIBLE DRILL HOLES.
6. STONES SHALL HAVE AN AVERAGE FRONT FACE OF 0.06m^2 OR GREATER.
7. RECTANGULAR STONES SHALL BE SET WITH THE GREATEST LENGTH PARALLEL TO THE GROUND.
8. STAGGER STONES TO AVOID CONTINUOUS VERTICAL SEAMS.
9. GROUT/MORTAR SHALL BE A 3:1 SAND TO CEMENT MIXTURE WITH WATER TO PRODUCE A STIFF MIX.
10. LOCATE JOINTS AT PROPERTY LINE OR MAXIMUM 15m INTERVALS.

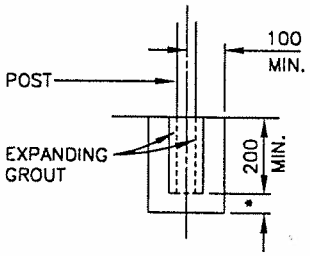
NO.	DATE	REVISION	APP'D	BY
1	97/01	GENERAL REVISION (L1247)	BLF	JK

City of Burnaby
ENGINEERING DEPARTMENT

SPLIT STONE REVETMENT

DRAWN BY:	SCALE: N.T.S.	BBY- C118
APPRV'D BY:	DATE: SEP 73	





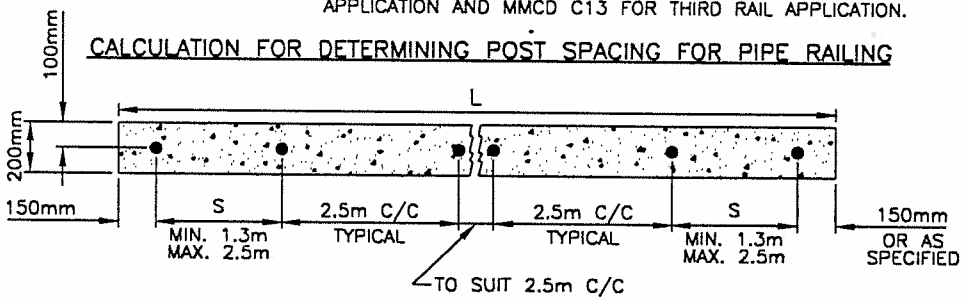
300mm MIN. IMBEDMENT
WHERE THIRD RAIL SPECIFIED

* MIN. 50mm CONCRETE BELOW BOTTOM OF RAIL INSERT

DETAIL
N.T.S.

NOTES:
1. ALL POSTS SHALL BE INSTALLED PLUMB.
2. ALL RAILS SHALL BE INSTALLED PARALLEL TO THE WALKWAY SURFACE AND TO TOP OF WALLS, OR PARALLEL TO STAIR INCLINE.
3. RAILS INSTALLED CLEAR OF THE SPECIFIED WALK WIDTH.
4. POSTS 50mmø SCHEDULE 40 GALVANIZED PIPE.
5. RAILS MIN 40mmø SCHEDULE 40 GALVANIZED PIPE.
6. ALL JOINTS MITRED, WELDED ALL AROUND AND SMOOTHED.
7. HEIGHT OF POSTS SHALL VARY WHERE RAIL IS INSTALLED IN STAIR WING WALLS. HEIGHT OF RAIL REMAINS CONSTANT TO THE STAIRS.
8. FIELD WELDS SHALL BE PAINTED WITH 2 COATS OF "GALVACON" OR EQUAL.
9. FIRST AND LAST SPANS SHALL BE EQUAL AS PER BELOW.
10. FOR RAILINGS IMBEDDED IN EARTH SEE C106 FOR STANDARD APPLICATION AND MMCD C13 FOR THIRD RAIL APPLICATION.

CALCULATION FOR DETERMINING POST SPACING FOR PIPE RAILING



L = LENGTH OF WALL IN M.
N = NO. OF WHOLE 2.5m SPANS
S = LENGTH OF FIRST AND LAST SPAN

TO CALCULATE S, FIRST CALCULATE N IN WHOLE NUMBERS

$$N = \frac{L-.3}{2.5}$$

$$S = \frac{(L-.3) - (N \times 2.5)}{2}$$

IF S IS LESS THAN 1.2m ADD 1.25m REDUCE NO. WHOLE 2.5m SPANS BY 1

(EXAMPLE)

L = 20 METERS

$$N = \frac{20-.3}{2.5} = \frac{19.7}{2.5} = 7.88$$

DROP DECIMAL

$$S = \frac{(20-.3) - (7 \times 2.5)}{2} = \frac{19.7-17.5}{2} = \frac{2.2}{2} = 1.1m$$

BUT 1.1 IS LESS THAN 1.2

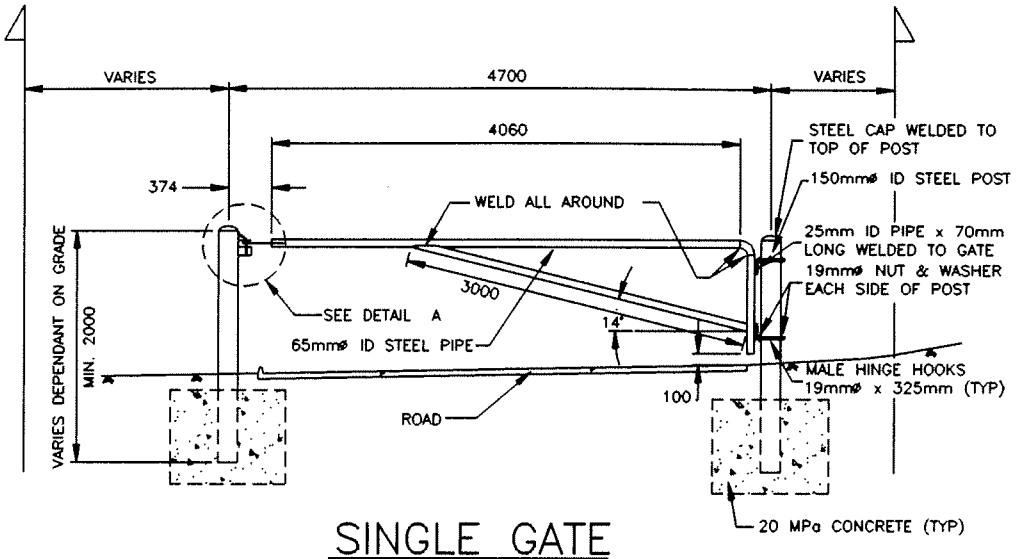
THEREFORE $S = 1.1 + \frac{2.5}{2} = 2.35$

NO.	DATE	REVISION	APP'D	BY
1	97/01	GENERAL REVISION (L1505)		JK

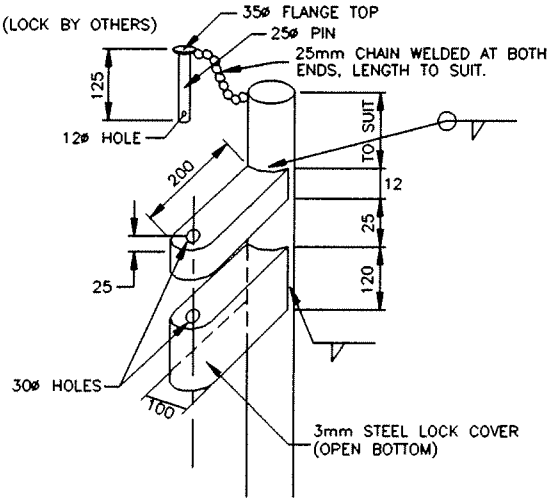
City of Burnaby
ENGINEERING DEPARTMENT

PIPE RAILING DETAIL

DRAWN BY:	SCALE: N.T.S.	BBY-	C119
APPRV'D BY:	DATE: NOV 73		

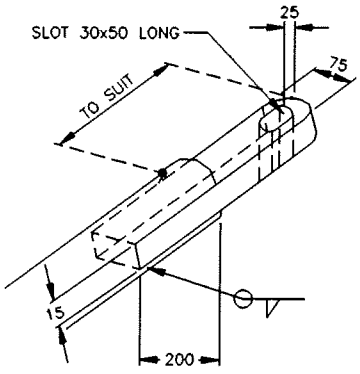


SINGLE GATE
N.T.S.

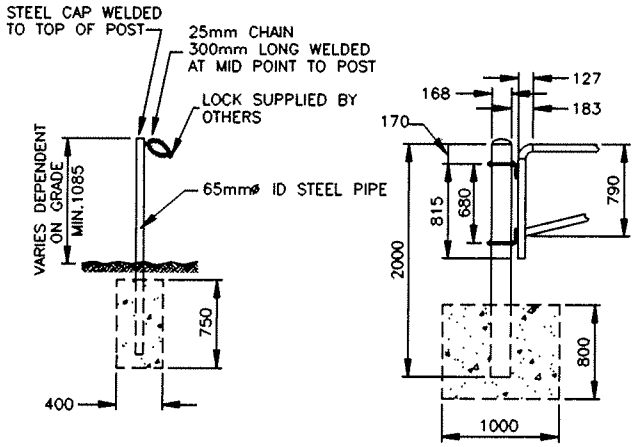


NOTES:

1. ALL GATE COMPONENTS SHALL BE A36 MILD STEEL
2. ALL PIPE SHALL BE STANDARD WALL THICKNESS
3. ALL COMPONENTS SHALL HAVE PRIME COAT & TWO COATS OF WHITE ENAMEL PAINT
4. ALL POSTS SHALL BE INSTALLED PLUMB AND GATE SWING LEVEL
5. ALL DIMENSIONS IN mm.



DETAIL A
N.T.S.



GATE STOP POST TO BE PLACED 3400mm FROM THE GATE POST

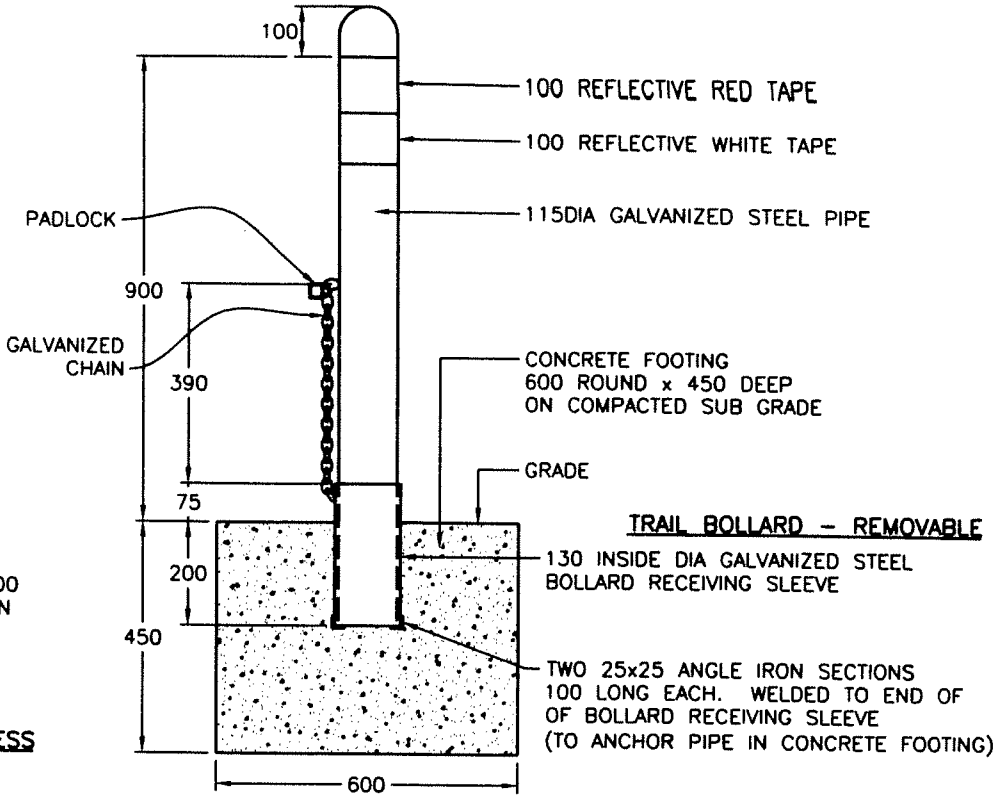
POST DETAILS
N.T.S.

NO.	DATE	REVISION	APP'D	BY
1	97/01	GENERAL REVISION (L2707)		JK

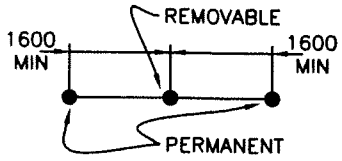
City of Burnaby
ENGINEERING DEPARTMENT

SINGLE GATE DETAILS

DRAWN BY: G. FUNK	SCALE: N.T.S.	**BBY-** C120	
APPRV'D BY:	DATE: 96-12-10		



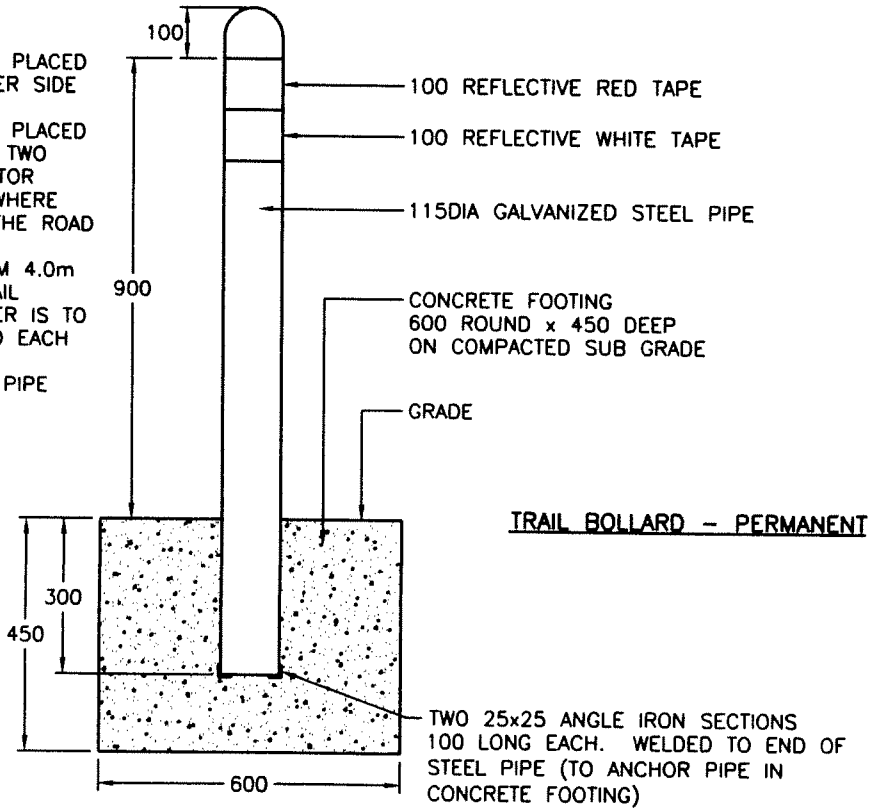
TRAIL BOLLARD – REMOVABLE



SPACING FOR SERVICE ACCESS

NOTE:

1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. A SINGLE REMOVABLE BOLLARD WILL BE PLACED IN THE CENTRE OF THE TRAIL, ON EITHER SIDE OF DRIVEWAYS.
3. A SINGLE REMOVABLE BOLLARD WILL BE PLACED IN THE CENTRE OF THE TRAIL BETWEEN TWO PERMANENT BOLLARDS, TO PREVENT MOTOR VEHICLES FROM ACCESSING THE TRAIL WHERE THE TRAIL PROVIDES A SHORT CUT IN THE ROAD NETWORK.
4. BOLLARDS WILL BE SET BACK A MINIMUM 4.0m FROM ANY INTERSECTION OR URBAN TRAIL
5. AN AMBER REFLECTIVE PAVEMENT MARKER IS TO BE PLACED 2.0m IN FRONT AND BEHIND EACH BOLLARD
6. POST TO BE SCHEDULE 40 GALVANIZED PIPE



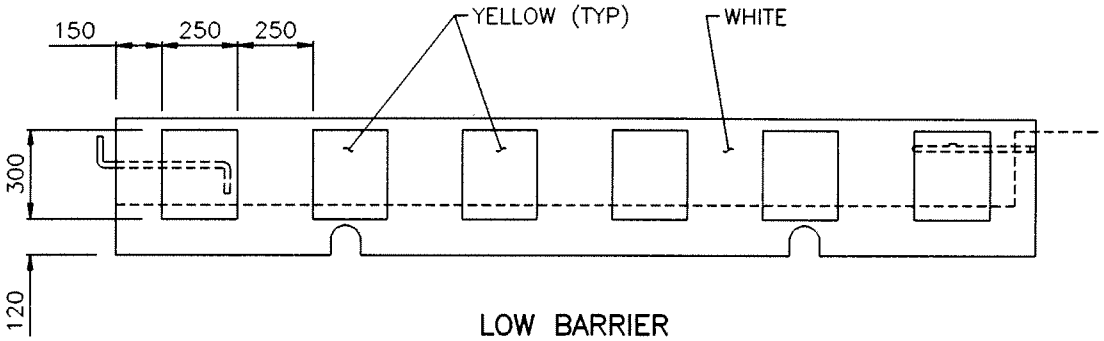
TRAIL BOLLARD – PERMANENT

NO.	DATE	REVISION	APP'D	BY
2	2006/09	CHANGES TO STEEL BOLLARD		HL
1	97/01	GENERAL REVISION		JK

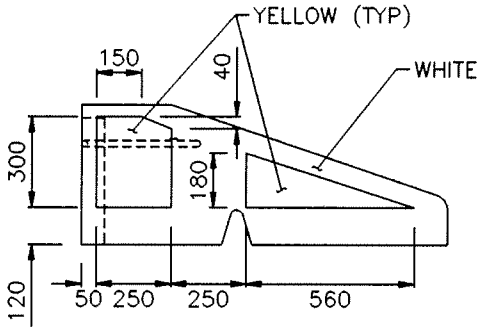
City of Burnaby
ENGINEERING DEPARTMENT

TRAIL BOLLARD

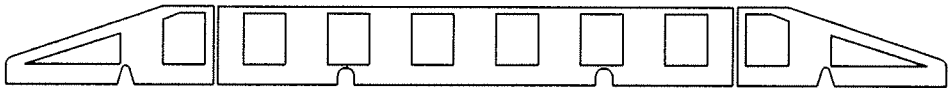
DRAWN BY: J. KO	SCALE: N.T.S.	BBY-	C121
APPRV'D BY:	DATE: 1996-06-05		



LOW BARRIER



BULL–NOSE



TYPICAL ARRANGEMENT

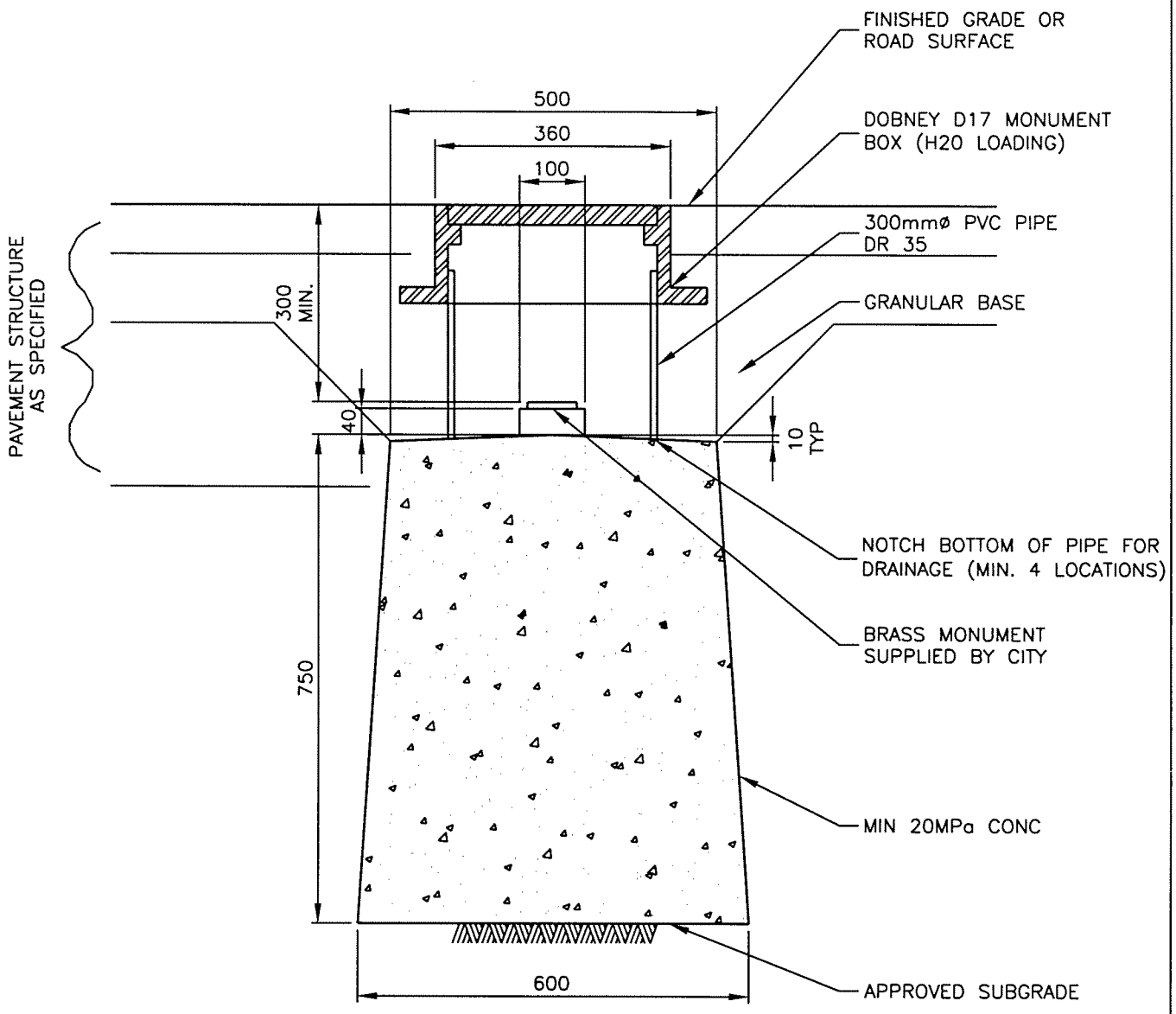
NOTES:
1. PRECAST CONCRETE BULL–NOSE (CBN–1) AND LOW BARRIER (CLB–1) SHALL BE MANUFACTURED TO MINISTRY OF TRANSPORTATION AND HIGHWAYS STANDARD SPECIFICATIONS SP323.
2. BULL–NOSE AND LOW BARRIER SHALL HAVE MESH TYPE REINFORCING.
3. BULL–NOSE SHALL BE EITHER HOOK OR EYE SECTIONS AS REQUIRED.
4. PAINT SHALL BE TO CGSB 1–GP–74M ALKYD TRAFFIC PAINT.
5. PAINT COLOURS SHALL BE TO CGSB 1–GP–12C
   YELLOW 505–308
   WHITE 513–301

NO.	DATE	REVISION	APP'D	BY
1	97/09	GENERAL REVISION (L1654)		JK

City of Burnaby
ENGINEERING DEPARTMENT

PRECAST REINFORCED CONCRETE BARRIER

DRAWN BY:		SCALE: N.T.S.	BBY- C122
APPRV'D BY:		DATE:	



NOTES:

1. USE OF BELL OR JOINT END OF PIPE NOT ALLOWED
2. REST PVC PIPE ON CONCRETE MONOLITH
3. MIN. 40mm CLEARANCE BETWEEN PVC PIPE AND MONUMENT BOX LID FLANGE
4. NO GRANULAR BASE INSIDE MONUMENT BOX OR PVC PIPE
5. MONOLITH SQUARE OR CIRCULAR
6. SLOPE MONUMENT PINNACLE TO MONOLITH ON 2 SIDES
7. CONTACT SURVEY DEPT. MIN. 48hrs PRIOR TO WORK TO OBTAIN POSITIONING AND BRASS MONUMENT

NO.	DATE	REVISION	APP'D	BY

City of Burnaby
ENGINEERING DEPARTMENT

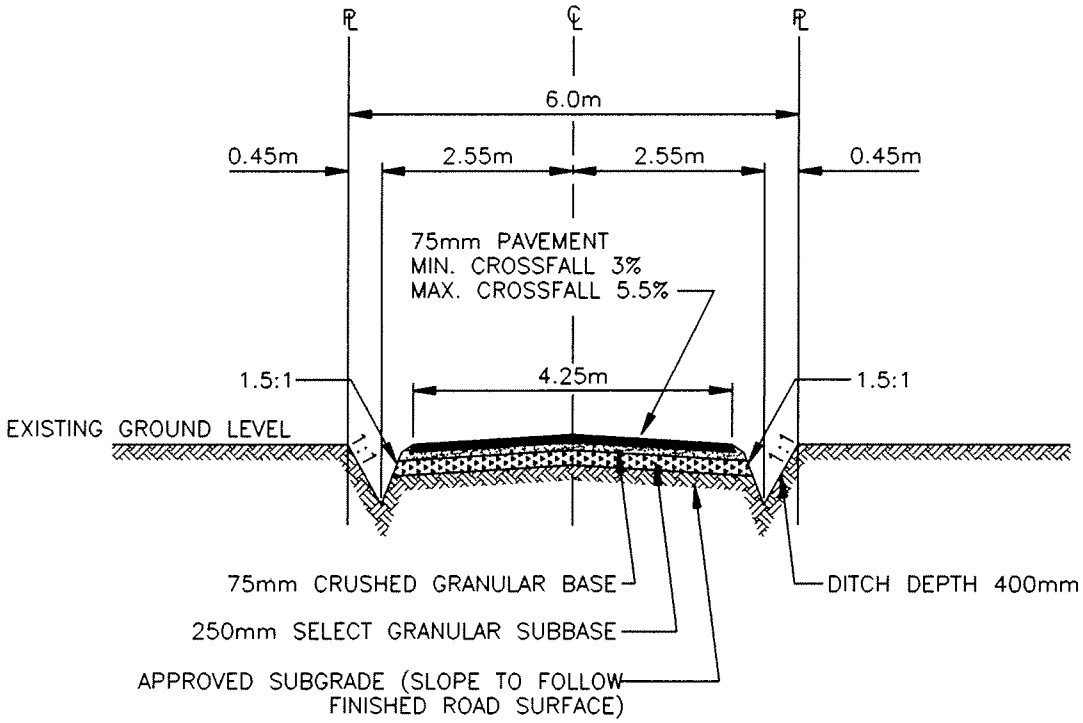
SURVEY MONUMENT

DRAWN BY: HLOUIE	SCALE: N.T.S.	**BBY-** C123
APPRV'D BY:	DATE: 99-02-09	

City of Burnaby

ROADWORKS DETAILS

BBY-R101	Typical Lane Crown Section [L878]
BBY-R102	Typical Lane Cross-Fall Section [L880]
BBY-R103	Typical Cross Section of Finished Paved Street with Curb & Gutter & Abutting Sidewalks (Residential) [L173]
BBY-R104	Typical Cross Section of Finished Paved Street with Curb & Gutter & Abutting Sidewalks (Collector) [L1184]
BBY-R105	Typical Cross Section of Finished Paved Street with Curb & Gutter & Abutting Sidewalks (Commercial or Industrial) [L1185]
BBY-R106	Typical Cross Section for Interim Paved Street [L167]
BBY-R107	Typical Cross Sections for Elimination of Ditches & Construction of Swales [L1442]
BBY-R108	Urban Trail
BBY-R109	Median/Island Installation
BBY-R110	Truck Wheel Wash Detail



NOTE:

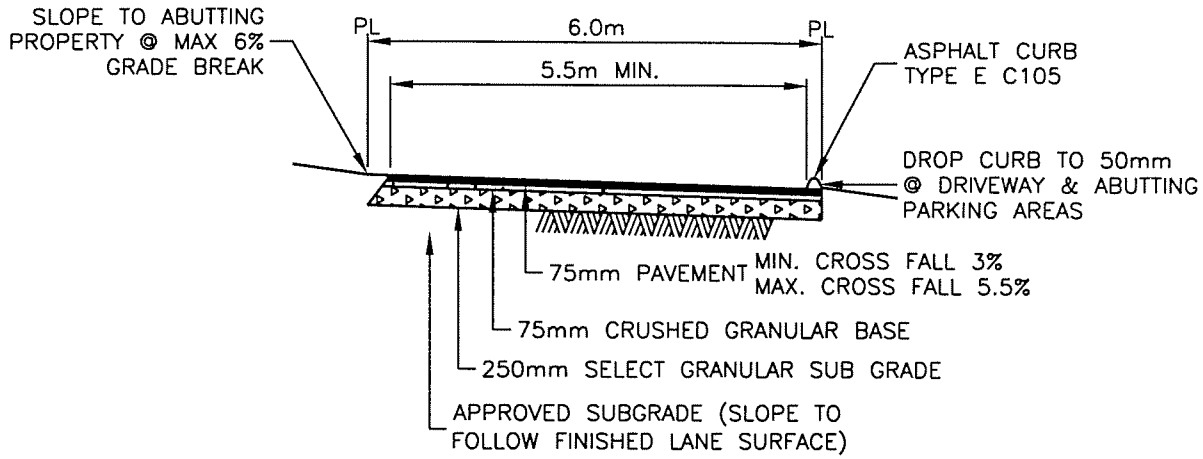
1. THIS SECTION IS APPLICABLE WHERE THE PROPERTIES ON BOTH SIDES ARE TO BE SERVED WITH A DITCH FOR DRAIN TILE DISPOSAL.
2. TWO DITCH-TYPE (I OR II) C.B.'S ARE TO BE PROVIDED WHEN THE LANE INTERSECTS A STORM SEWER ON A STREET OR AN EASEMENT. IF THE OPEN DITCHES ARE NOT OF EXCESSIVE LENGTH, A 250mm CULVERT MY BE INSTALLED FROM ONE DITCH INTO THE C.B. BARREL IN THE OTHER DITCH.

NO.	DATE	REVISION	APP'D	BY
1	97/01	GENERAL REVISION (L878)	BG	JK

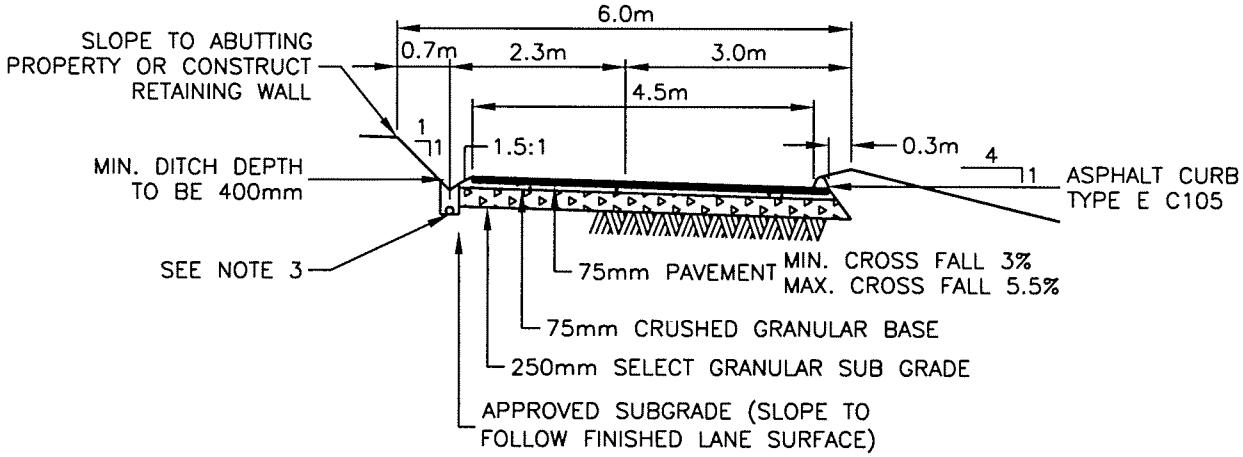
City of Burnaby
ENGINEERING DEPARTMENT

TYPICAL LANE CROWN SECTION

DRAWN BY:	SCALE: N.T.S.	**BBY-**	R101
APPRV'D BY:	DATE: FEB 68		



COMMERCIAL LANE



WHERE DEVELOPER CONTROLS ABUTTING PROPERTIES, BOULEVARD SLOPES (CUT OF FILL) ARE TO BE MADE OUTSIDE OF THE LANE ALLOWANCE

RESIDENTIAL LANE

NOTE: RESIDENTIAL LANE

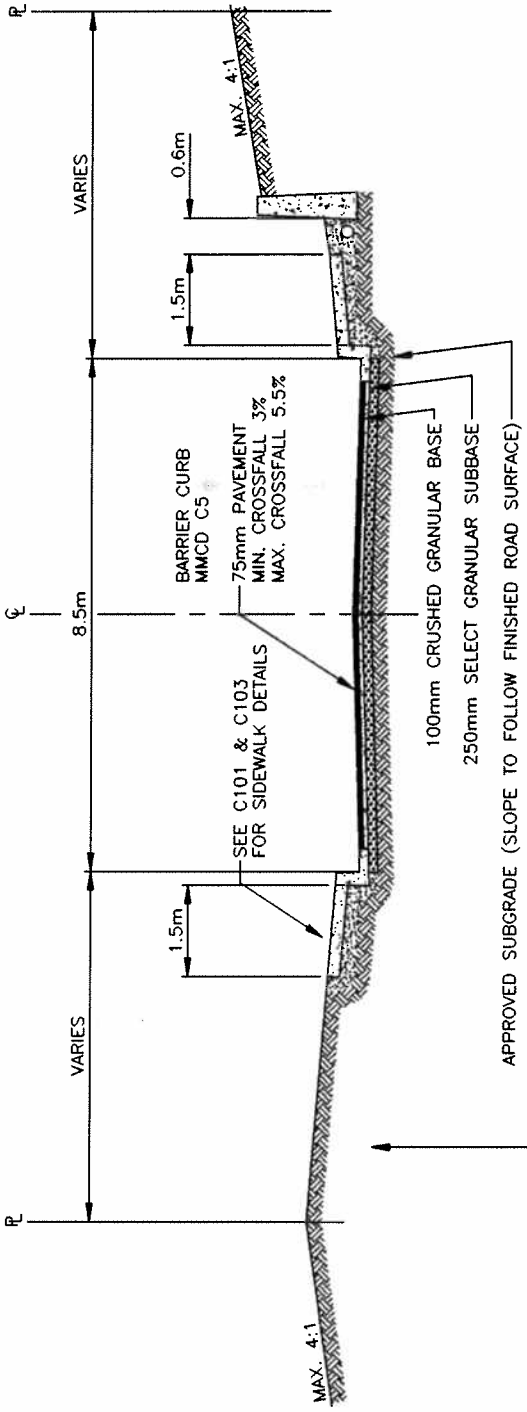
1. SECTION IS APPLICABLE WHERE THE PROPERTIES ON THE HIGH SIDE REQUIRED A DITCH FOR DRAIN TILE DISCHARGES
2. A DITCH TYPE (I OR II) CB AND A TYPE V CB ARE TO PROVIDED WHEN THE LANE INTERSECTS A STORM SEWER ON A STREET OR AN EASEMENT. IF THE OPEN DITCH IS NOT OF EXCESSIVE LENGTH, A 250mm CULVERT MAY BE TAPPED INTO THE BARREL OF THE TYPE V CB
3. DITCH MAY BE REPLACED WITH DRAIN TILE (C108) WHERE PROPERTY DRAINS ARE CONNECTED TO A STORM SEWER SYSTEM

NO.	DATE	REVISION	APP'D	BY
2	99/02	COMMERCIAL SECTION ADDED		HL
1	97/01	GENERAL REVISON (L880)		JK

City of Burnaby
ENGINEERING DEPARTMENT

TYPICAL LANE CROSS FALL SECTION

DRAWN BY: HLOUIE	SCALE: N.T.S.	**BBY-**	R102
APPRV'D BY: BG	DATE: 99-02-24		



NOTE:
WHERE DEVELOPER CONTROLS ABUTTING PROPERTIES, SIDEWALK GRADE EXTENDED TO PROPERTY LINE THEN 4:1 SLOPE.

SEE DWGS C110,C111,C112,C113,C114,C115 FOR BOULEVARDS.

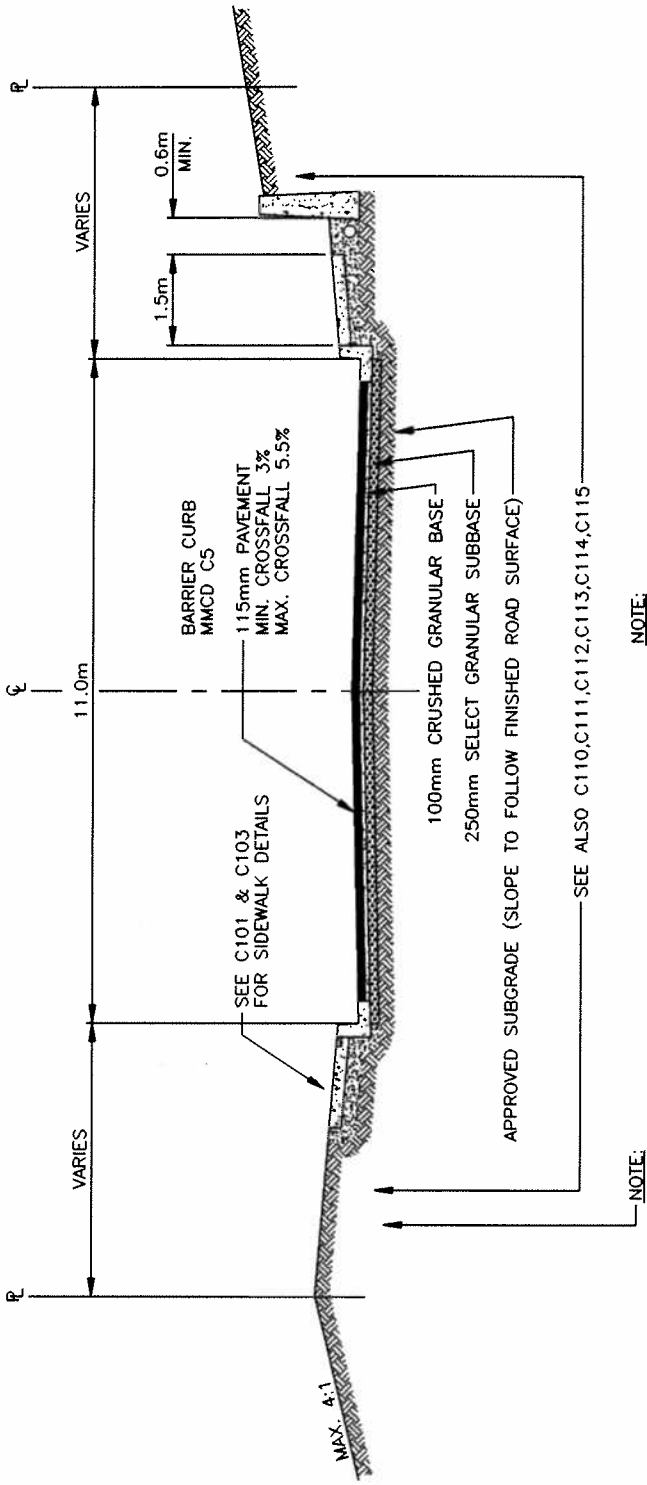
NOTE:
1. WHERE DEVELOPMENT ABUTS EXISTING PROPERTIES, SIDEWALK GRADE EXTENDED TO 0.6m BACK OF WALK THEN 4:1 SLOPE AND/OR RETAINING WALL TO MEET EXISTING GRADE AT PROPERTY LINE.
2. WHEN PAVING UNDERTAKEN IN TWO LIFTS
   LOWER COURSE MIN. 50mm
   UPPER COURSE MIN. 35mm
3. SEE C108 FOR DRAIN TILE APPLICATIONS.

NO.	DATE	REVISION	APP'D	BY
1	97/01	GENERAL REVISION (L173)	BLS	dK

City of Burnaby
ENGINEERING DEPARTMENT

TYPICAL CROSS SECTION OF FINISHED PAVED STREET WITH CURB & GUTTER & ABUTTING SIDEWALKS (RESIDENTIAL)

DRAWN BY:	SCALE: N.T.S.	**BBY- R103**
APPRV'D BY:	DATE: APR 70	



NOTE:

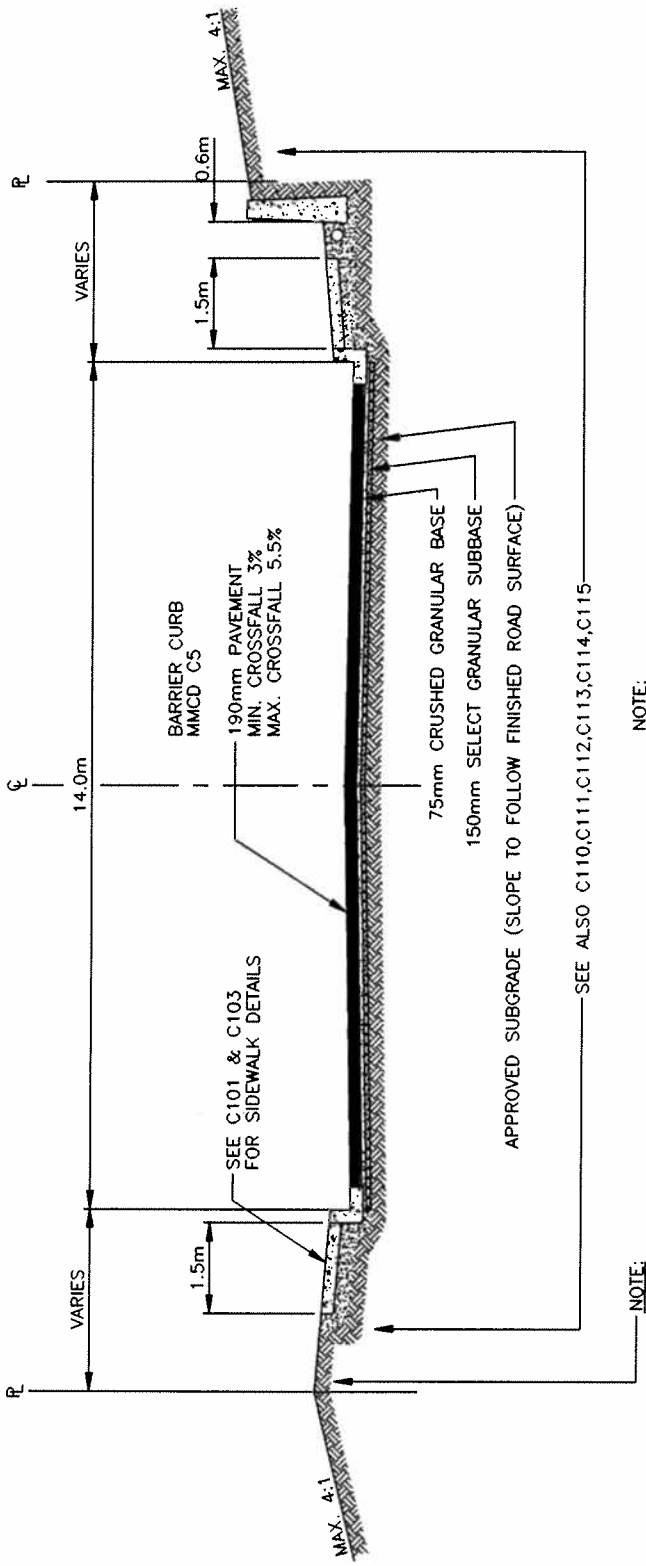
1. WHERE DEVELOPMENT ABUTS EXISTING PROPERTIES, SIDEWALK GRADE EXTENDED TO 0.6m BACK OF WALK THEN 4:1 SLOPE AND/OR RETAINING WALL TO MEET EXISTING GRADE AT PROPERTY LINE.
2. WHERE FINAL PAVING IS TO BE DELAYED UNTIL AFTER COMPLETION OF DEVELOPMENT
   LOWER COURSE MIN. 75mm
   UPPER COURSE MIN. 50mm
3. SEE C108 FOR DRAIN TILE APPLICATIONS.
4. PARABOLIC BONING SECTIONS REQUIRED PRIOR TO FINAL PAVING.

NO.	DATE	REVISION	APP'D	BY
1	97/01	GENERAL REVISION (L1184)	BG	JK

City of Burnaby
ENGINEERING DEPARTMENT

TYPICAL CROSS SECTION OF FINISHED PAVED STREET WITH CURB & GUTTER & ABUTTING SIDEWALKS (COLLECTOR)

DRAWN BY:	SCALE: N.T.S.	**BBY- R104**
APPRV'D BY:	DATE: MAR 71	



NOTE:
1. WHERE DEVELOPMENT ABUTS EXISTING PROPERTIES, SIDEWALK GRADE EXTENDED TO 0.6m BACK OF WALK THEN 4:1 SLOPE AND/OR RETAINING WALL TO MEET EXISTING GRADE AT PROPERTY LINE.
2. ALTERNATE PAVEMENT STRUCTURE IF SPECIFIED:
   140mm PAVEMENT
   100mm CRUSHED GRANULAR BASE
   300mm SELECT GRANULAR SUBBASE
3. SEE C108 FOR DRAIN TILE APPLICATIONS.
4. PARABOLIC BONING SECTIONS REQUIRED PRIOR TO FINAL PAVING.

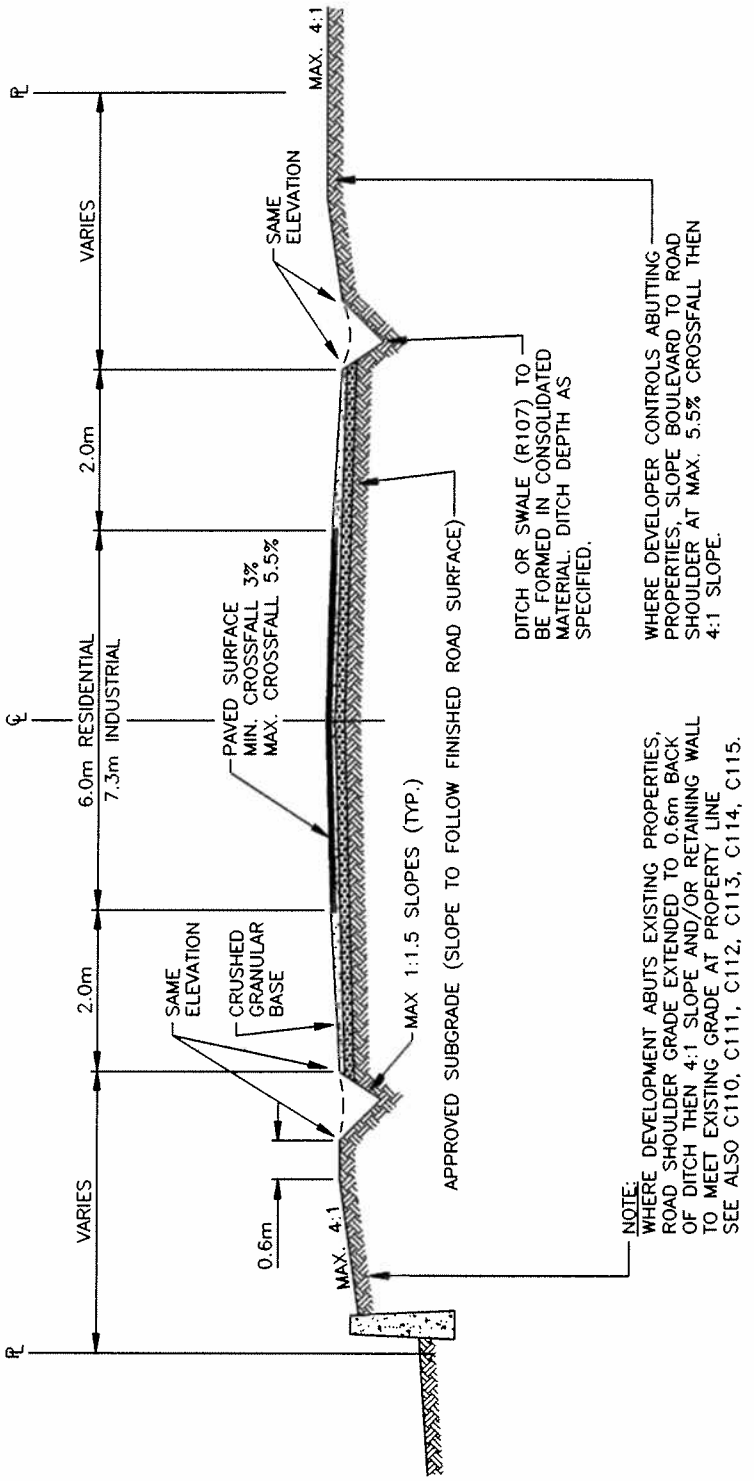
NOTE:
WHERE DEVELOPER CONTROLS ABUTTING PROPERTIES, SIDEWALK GRADE EXTENDED TO PROPERTY LINE THEN 4:1 SLOPE.

NO.	DATE	REVISION	APP'D	BY
1	97/01	GENERAL REVISION (L1185)		JK

City of Burnaby
ENGINEERING DEPARTMENT

TYPICAL CROSS SECTION OF FINISHED PAVED STREET WITH CURB & GUTTER & ABUTTING SIDEWALKS (COMMERCIAL OR INDUSTRIAL)

DRAWN BY:	SCALE: N.T.S.	**BBY- R105**
APPRV'D BY:	DATE: MAR 71	



NOTES:
1. PAVEMENT STRUCTURE AS PER CLASSIFICATION USE SEE R103, R104, R105.
2. DITCHES MAY BE ELIMINATED WHEN TYPE 'E' ASPHALT CURBS C105 ARE INSTALLED TO CONTROL DRAINAGE. ASPHALT WIDTH INCREASED TO ACCOMODATE CURBS.
3. WHEN CURBS ARE USED, PLACE CRUSHED GRANULAR BASE OR TOPSOIL TO TOP OF CURB AS SPECIFIED.

NO.	DATE	REVISION	APP'D	BY
1	97/10	GENERAL REVISION (L167)		JK

City of Burnaby
ENGINEERING DEPARTMENT

TYPICAL CROSS SECTION FOR INTERM PAVED STREET

DRAWN BY: R.G.R.	SCALE: N.T.S.	**BBY-**	R106
APPRV'D BY:	DATE: MAY 70		

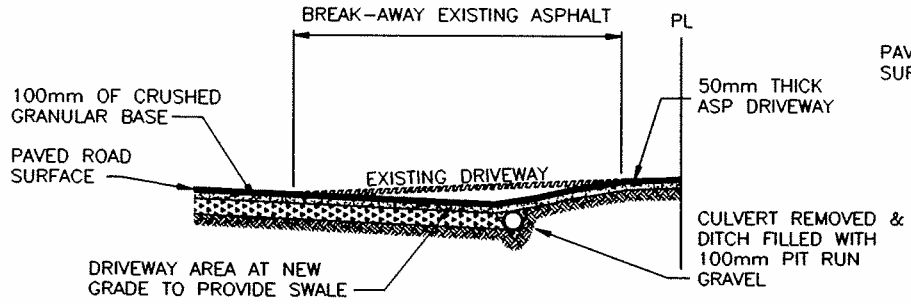
City of Burnaby
ENGINEERING DEPARTMENT

TYPICAL CROSS SECTIONS FOR ELIMINATION OF DITCHES & CONSTRUCTION OF SWALES

DRAWN BY:
APPRV'D BY:
SCALE: N.T.S.
DATE: APR 73

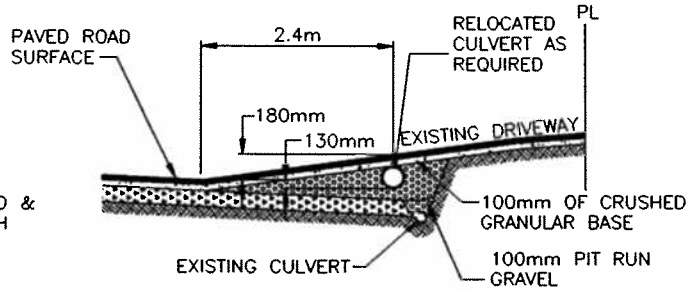
BBY- R107

NO.	DATE	REVISION	APP'D BY
1	97/01	GENERAL REVISION (L1442)	JK



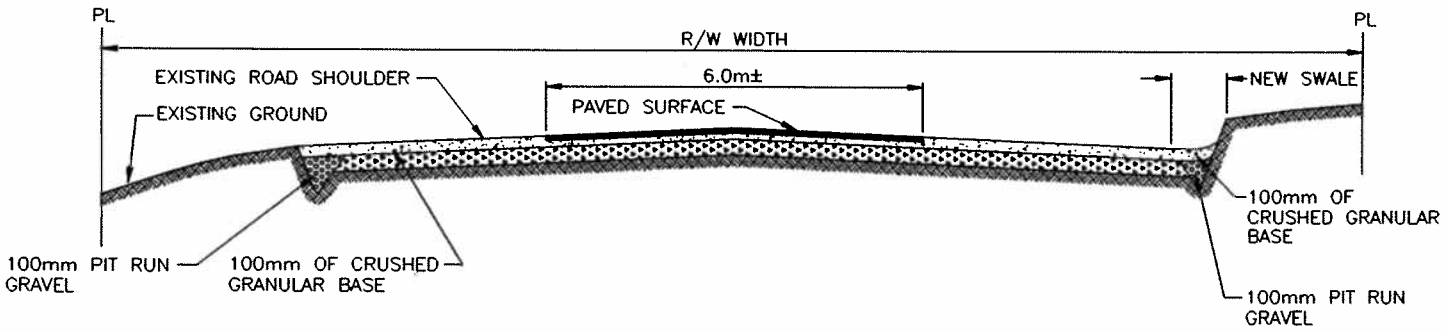
TYPICAL WHERE DRIVEWAY CAN BE LOWERED & SWALED

NOTE:
ALL EXISTING CBs IN DITCHES TO BE RAISED TO NEW SWALE DRAINAGE GRADE.

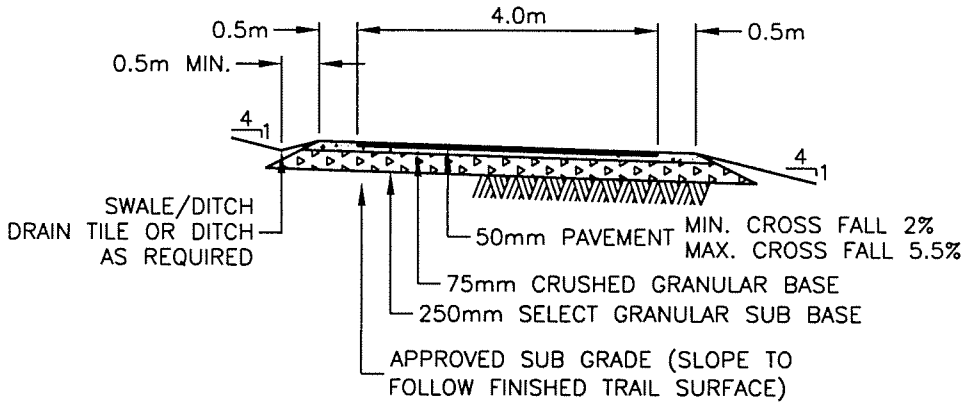


WHERE DRIVEWAY IS 180mm OR MORE ABOVE THE EDGE OF PAVEMENT PLACE CULVERT UNDER DRIVEWAY 2.4m FROM EDGE OF PAVEMENT

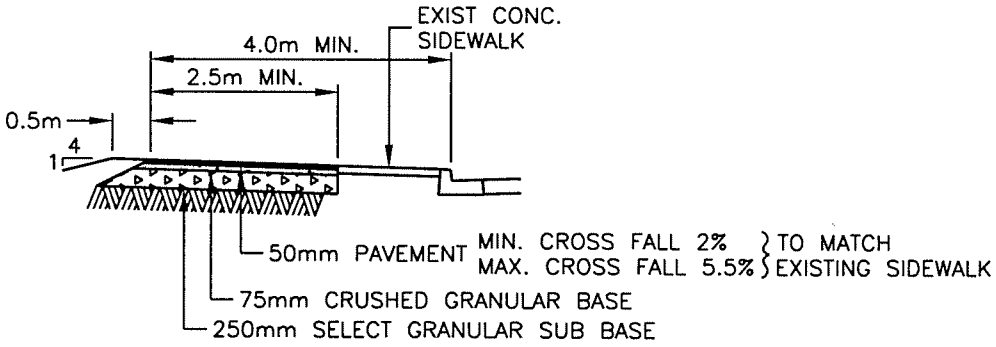
TYPICAL WHERE DRIVEWAY CANNOT BE LOWERED & SWALED



TYPICAL FOR DITCH ELIMINATION



COMBINED URBAN TRAIL



BIKE TRAIL/SIDEWALK

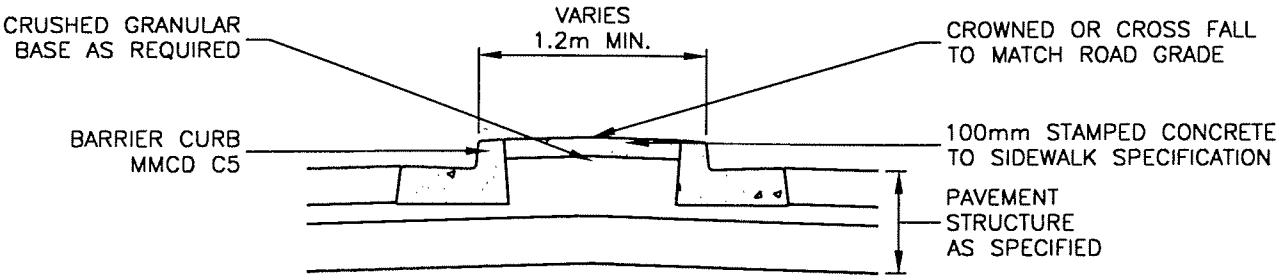
NOTES:
1. USE BIKEWAY PIPE RAILING C119 FOR WALLS ADJACENT TRAIL
2. 0.5m MIN. HANDLE BAR CLEARANCE BETWEEN EDGE OF PAVED SURFACE AND RAILING OR FENCE FOR SINGLE POINT OBSTRUCTION 0.3m MIN. CLEARANCE REQUIRED.
3. WHERE STREET LIGHTS OR ADVISORY SIGNS ARE LOCATED IN THE SIDEWALK THE 4.0m WIDTH IS MEASURED FROM THE BACK OF THE STREET LIGHT OR SIGN
4. WHERE A NEW SIDEWALK IS CONSTRUCTED WITH A BIKE TRAIL THE FULL BASE STRUCTURE IS CONTINUOUS UNDER THE SIDEWALK

NO.	DATE	REVISION	APP'D	BY

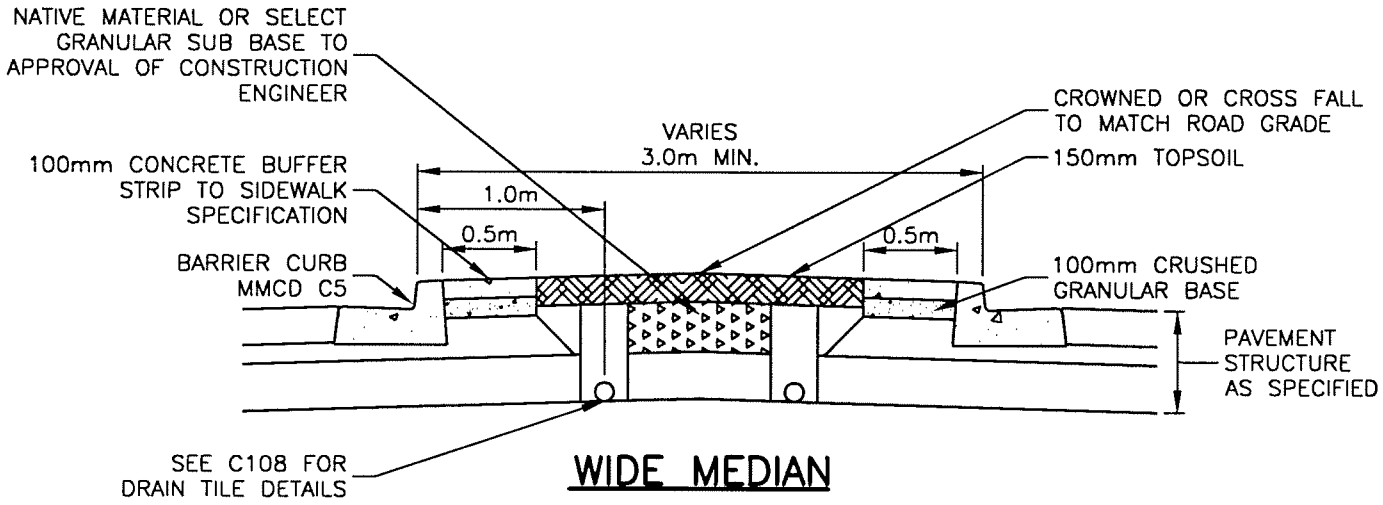
City of Burnaby
ENGINEERING DEPARTMENT

URBAN TRAIL

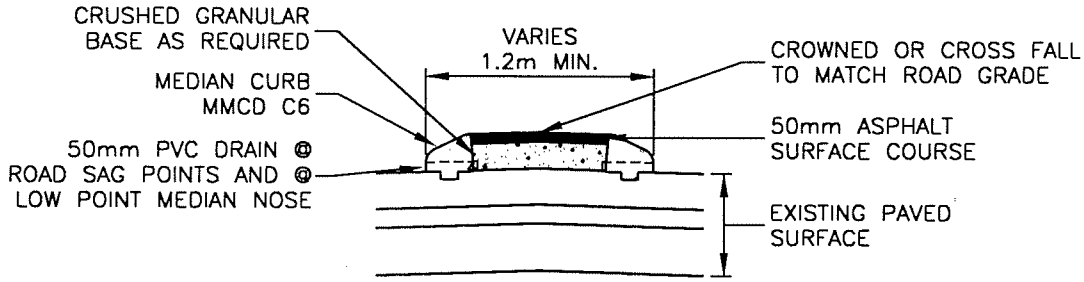
DRAWN BY: HLOUIE	SCALE: N.T.S.	**BBY-** R108	
APPRV'D BY:	DATE: 99-02-23		



NARROW MEDIAN/ISLAND



WIDE MEDIAN



TEMPORARY MEDIAN/ISLAND

NOTES:

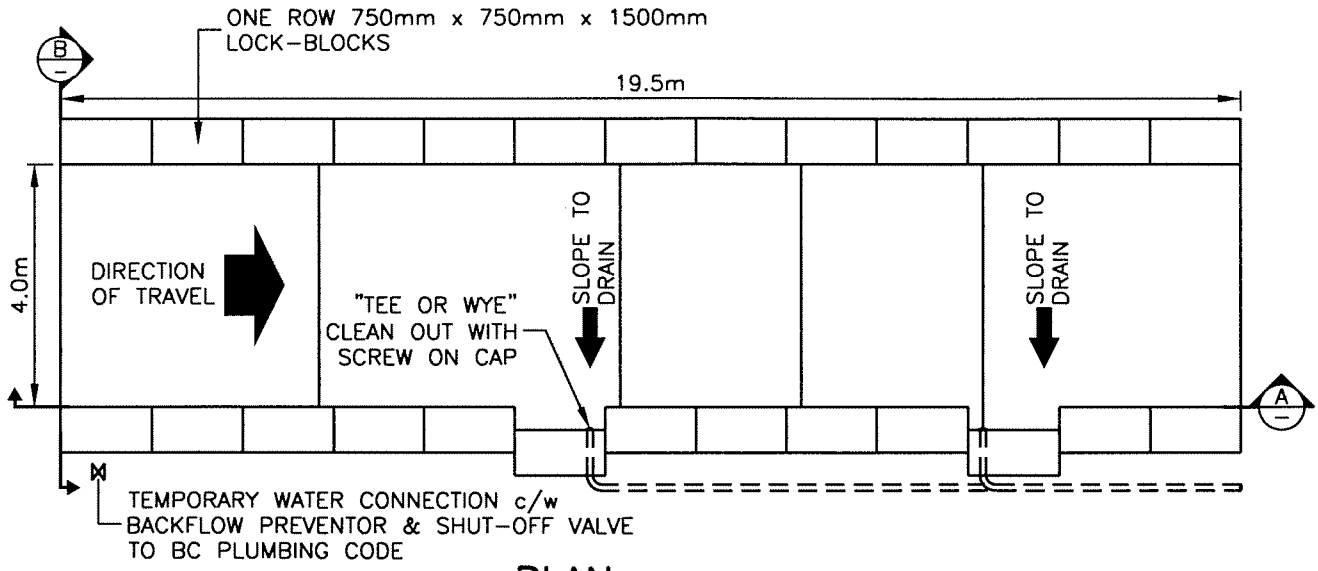
1. CURB & GUTTER (MMCD C5) REQUIRED FOR ALL MEDIAN/ISLAND ON NEW ROAD CONSTRUCTION & EXISTING ROADS WHERE PAVEMENT REMOVAL AND BASE REGRADING IS REQUIRED
2. MEDIAN CURB (MMCD C6) ONLY USED WHERE ADDING A MEDIAN/ISLAND ON TOP OF AN EXISTING PAVED ROADWAY
3. FULL CONCRETE INFILL BETWEEN THE CURBS EXTENDED TO THE POINT WHERE MEDIAN WIDTH BECOMES 3.0m
4. CONCRETE BUFFER STRIPS REQUIRED ADJACENT TO CURB ON BOTH SIDES FOR ALL MEDIANS EXCEEDING 3.0m IN WIDTH
5. ASPHALT INFILL ONLY ALLOWED FOR TEMPORARY MEDIAN/ISLAND AS APPROVED BY THE CITY ENGINEER
6. WHEELCHAIR RAMPS REQUIRED AT MEDIANS/ISLANDS FOR DESIGNATED CROSSWALKS. WHEELCHAIR RAMP & CONNECTION WALKS BETWEEN RAMPS TO BE CONCRETE SIDEWALK, WITH INFILL AREAS TO BE STAMPED CONCRETE
7. ONLY SINGLE MEDIAN DRAIN TILE REQUIRED FOR CROSS FALL ROADWAYS & WHERE SUBGRADE GRADING CREATES A SINGLE LOW POINT AS APPROVED BY CONSTRUCTION ENGINEER
8. TOPSOIL REQUIREMENTS TO PARKS SPECIFICATIONS FOR DESIGNATED TREE PLANTING AREAS
9. STAMPED CONCRETE TO BE USED BRICK, BASKET WEAVE PATTERN, BOCA PINK(D106) IN COLOUR WITH A SANDSTONE RELEASE AGENT AND SEALER. HIGH GLOSS SEALERS NOT ACCEPTABLE FOR PEDESTRIAN AREAS
10. FULL CURB HEIGHT CONCRETE INFILL REQUIRED FOR MEDIAN NOSE.

NO.	DATE	REVISION	APP'D	BY
1	2000/01	DRAIN & NOTE ADDED		JK

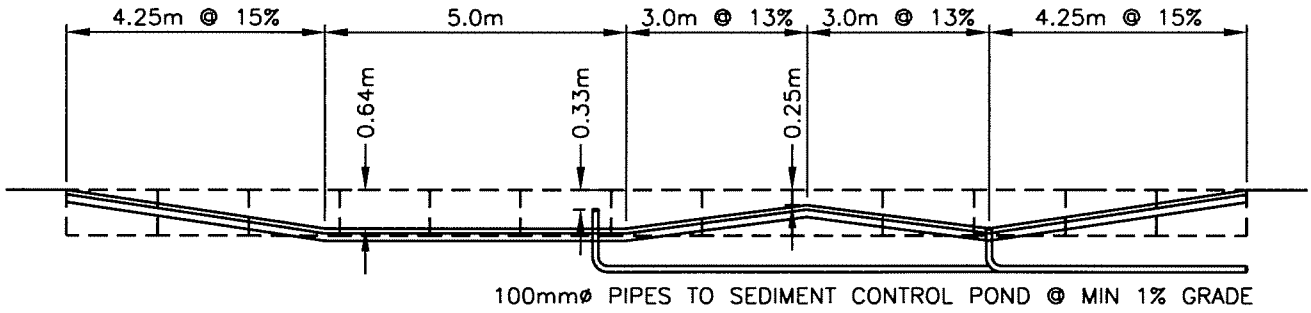
City of Burnaby
ENGINEERING DEPARTMENT

MEDIAN/ISLAND INSTALLATION

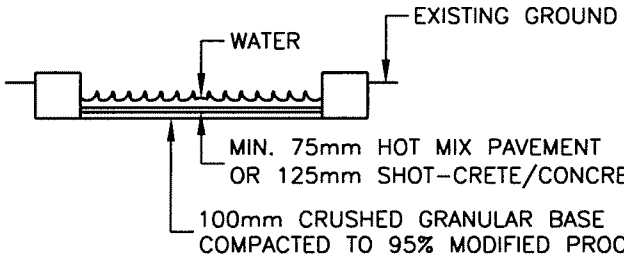
DRAWN BY: HLOUIE	SCALE: N.T.S.	**BBY-**	R109
APPRV'D BY:	DATE: 99-02-22		



PLAN



SECTION A



SECTION B

NOTE:
1. ALL LOCK BLOCKS AND JOINTS TO BE GROUTED TO FORM LEAK TIGHT SYSTEM
2. PROTECT DRAINS BY RECESSING LOCK BLOCKS AT LOW POINTS
3. DRAIN OPENING TO HAVE A MANUFACTURED SLOTTED DRAIN CAP
4. WHEEL WASH TO APPROVAL OF ENVIRONMENTAL SERVICES

NO.	DATE	REVISION	APP'D	BY
1	2003-01	LENGTH ADJUSTED		

City of Burnaby
ENGINEERING DEPARTMENT

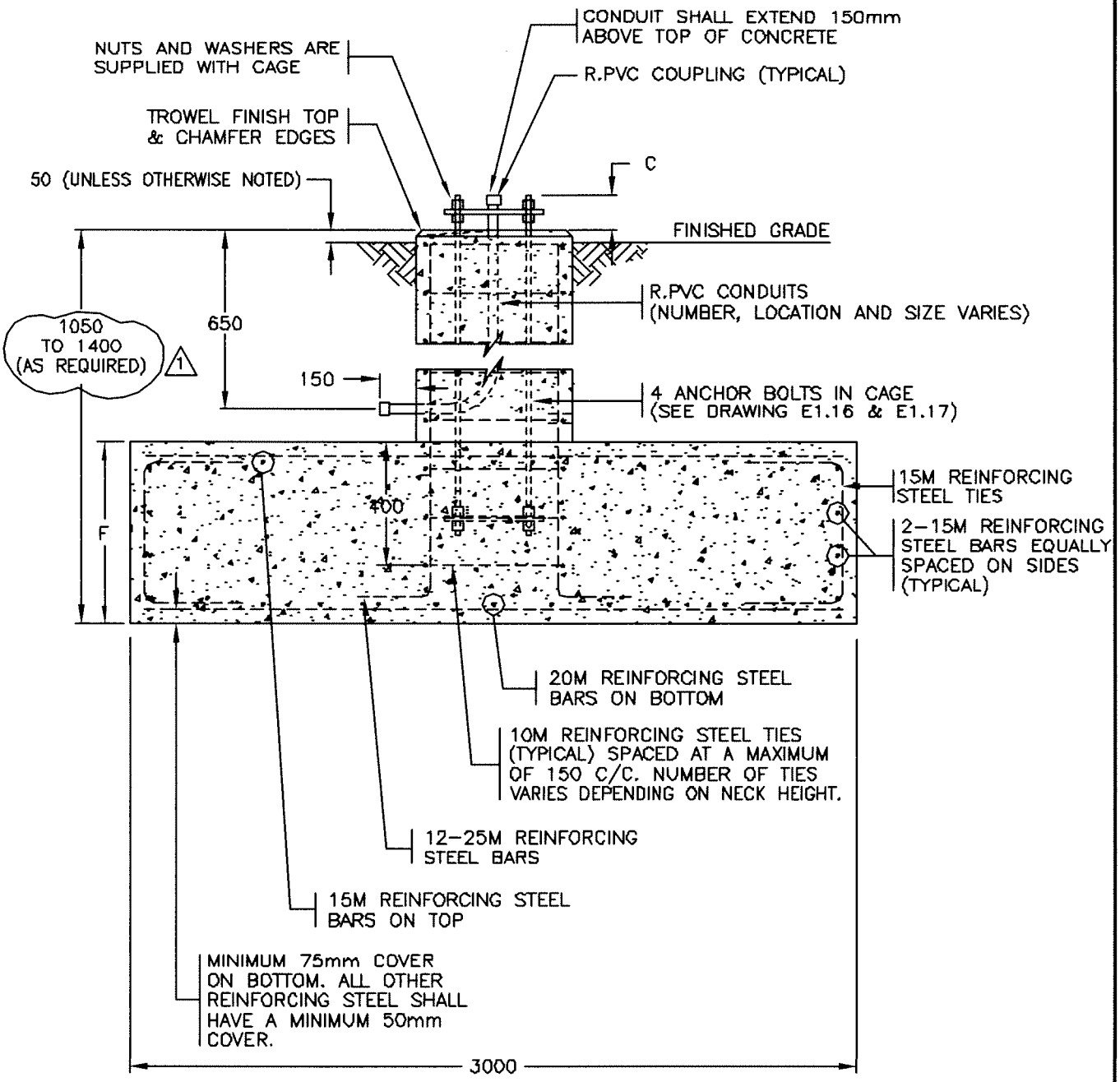
TRUCK WHEEL WASH DETAIL

DRAWN BY: HLOUIE	SCALE: N.T.S.	**BBY-** R110
APPRV'D BY:	DATE: 2001-05-11	

City of Burnaby

ELECTRICAL DETAILS

BBY-E101	Conduit Trench Construction [L833]
BBY-E102	Location of Street Lighting Poles [L806]
BBY-E115	Pedestrian Head Clamshell Mounting Details [L2288]
BBY-E116	Illuminated Bus Shelter Connection Details
BBY-E117	Typical Combined Street Lighting & Receptacle Service Panel
E1.6-Rev.1	Type C4 & C5 Spread Footing Concrete Bases
E1.11-Rev.1	Types F1, L1 & S1 Spread Footing Shape Concrete Bases
E5.21-Rev.1	Service Base
E7.3-Rev.1	Pedestrian Push Button Post
E8.2-Rev.1	Service Panel in Service Base (Mounting Details)
E8.3-Rev.1	Service Panel in Service Base (Mounting Details)
E8.5-Rev.1	60A (120/240V) Street Lighting Service Panel in Service Base (Wiring Diagram)
E8.6-Rev.1	100A (120/240V) Traffic Signal/Street Lighting Service Panel in Service Base (Wiring Diagram)
E8.9-Rev.1	100A (120/240V) Traffic Signal/Street Lighting Service Panel (Wiring Diagram)
E8.10-Rev.1	Service Ground Plate (Installation Detail)
E8.12-Rev.1	Signal Cable Wiring in Pole Handhole
E8.13-Rev.1	Signal Cable Colour Code Sample
E8.15-Rev.1	Pole Mounted Receptacle
E9.4-Rev.1	Detector Loop to Shielded Cable Splices



ELEVATION

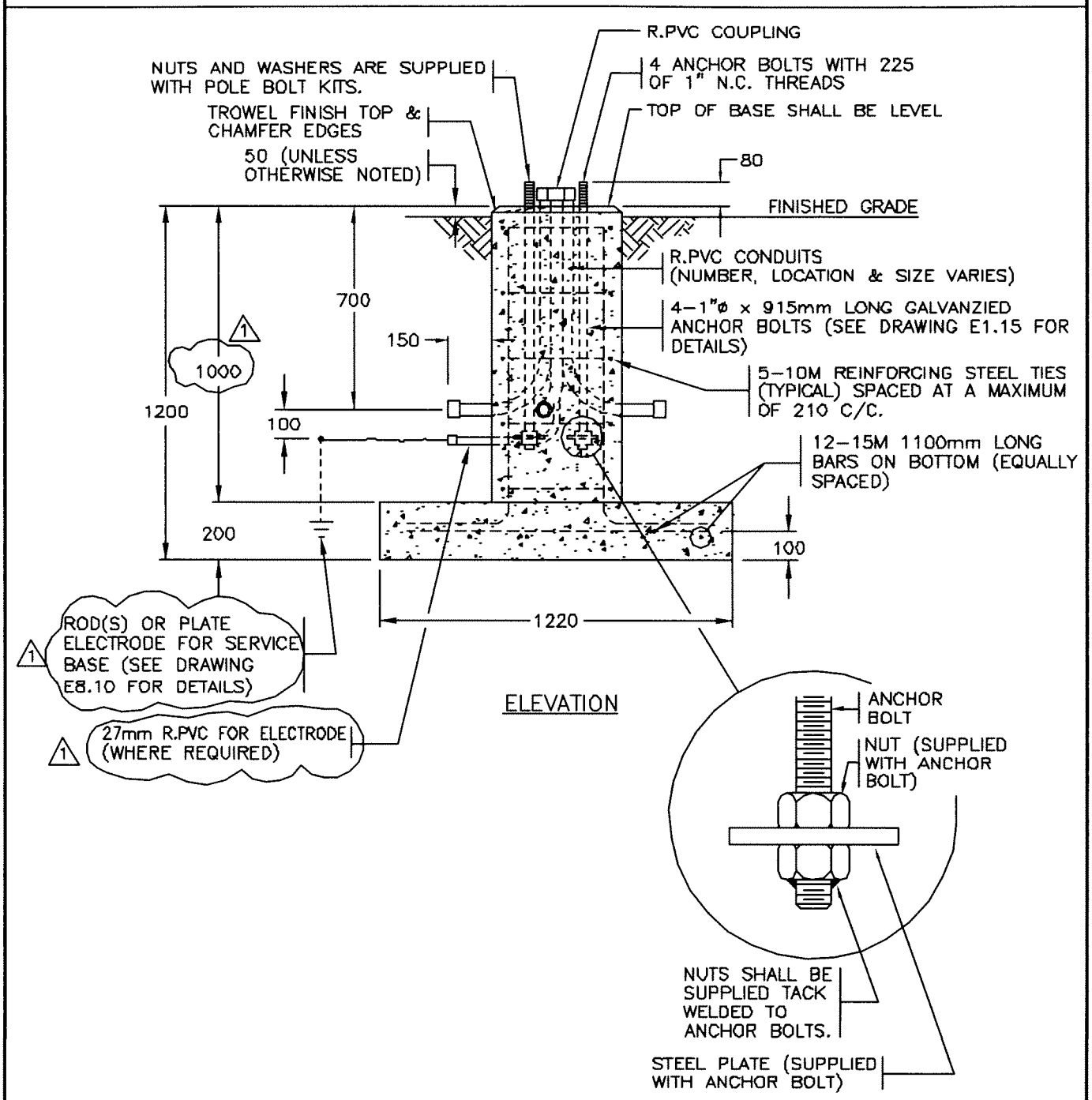
SEE E1.10 FOR NOTES AND ADDITIONAL DETAILS

NOT TO SCALE

LRM JAN 2, 2003

TYPES F1, L1 & S1 SPREAD FOOTING SHAPE CONCRETE BASES

DRAWING NUMBER: 1 E1.11—Rev.1



SEE DRAWING E1.5 FOR NOTES AND ADDITIONAL DETAILS

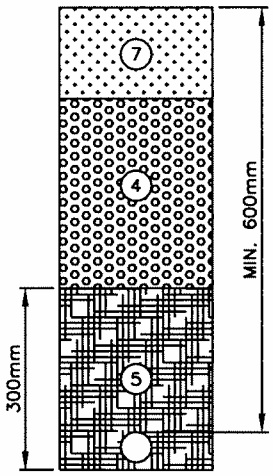
NOT TO SCALE

TYPE C4 & C5 SPREAD FOOTING CONCRETE BASES

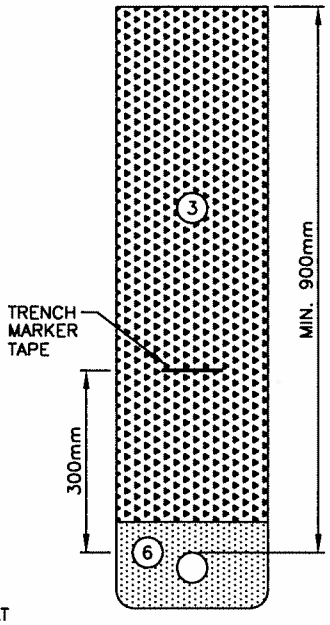
DRAWING NUMBER: 1 E1.6—Rev.1

LRM JAN 2,2003

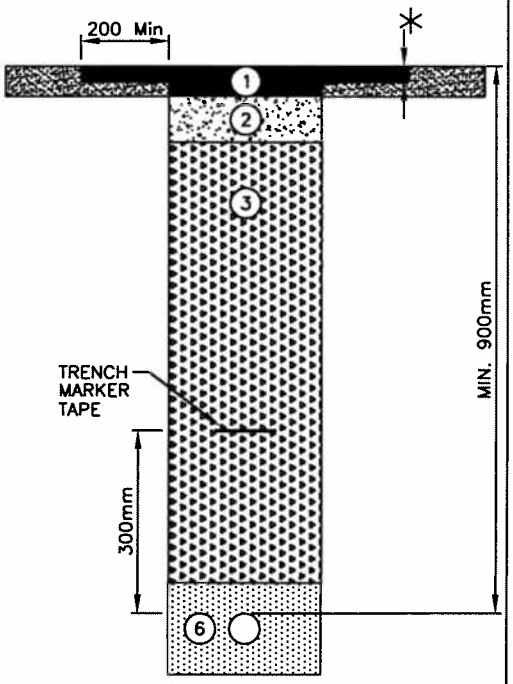
A. TYPICAL TRENCH CONSTRUCTION
BEHIND EXISTING CURB OR SIDEWALK.



B. TYPICAL TRENCH CONSTRUCTION ON UNFINISHED ROADWAYS, GRAVEL SHOULDERS OR UNPAVED AREAS. PRIOR TO CURB OR SIDEWALK CONSTRUCTION.



C. TYPICAL TRENCH CONSTRUCTION OF ROADWAYS OR COMMERCIAL DRIVEWAYS CROSSINGS.



1. ASPHALT OR CONCRETE THICKNESS TO EQUAL THAT WHICH IS REMOVED OR A MINIMUM COMPACTED THICKNESS OF 75mm OF ASPHALT OR 100mm OF CONCRETE.

2. GRANULAR BASE COMPACTED DEPTH OF 100mm OF CRUSHED GRANULAR BASE MATERIAL.

3. GRANULAR SUBBASE SELECT GRANULAR SUBBASE MATERIAL TO BE PLACED IN UNIFORM LAYERS NOT EXCEEDING 300mm COMPACTED THICKNESS.

4. MACHINE PLACED BACKFILL EITHER NATIVE EXCAVATED OR BORROW MATERIAL FREE OF ROOTS WITH NO STONES OR OTHER MATERIAL GREATER THAN 200mm IN LARGEST DIMENSION.

5. HAND PLACED & HAND TAMPED UNCLASSIFIED MATERIAL OBTAINED FROM EXCAVATION OR OTHER SOURCE, FREE OF ROOTS, WOOD, BOULDERS, CINDERS, ASH OR FROZEN MATERIAL. THE MAXIMUM SIZE OF THE STONES SHALL NOT EXCEED 50mm IN ITS LARGEST DIMENSION.

6. CONDUIT BEDDING A 50mm BED OF CRUSHED GRANULAR BASE MATERIAL AND THE CONDUIT COVERED WITH A FURTHER 50mm OF CRUSHED GRANULAR BASE.

7. TOP SOIL 150mm THICKNESS FOR GRASSED AREAS OR AREAS AS REQUIRED BY CONSTRUCTION ENGINEER.

8. NUMBER AND SIZE OF CONDUITS MAY VARY.

9. SURFACE RESTORATION TO MATCH EXISTING OR AS SPECIFIED ON CONTRACT DRAWINGS.

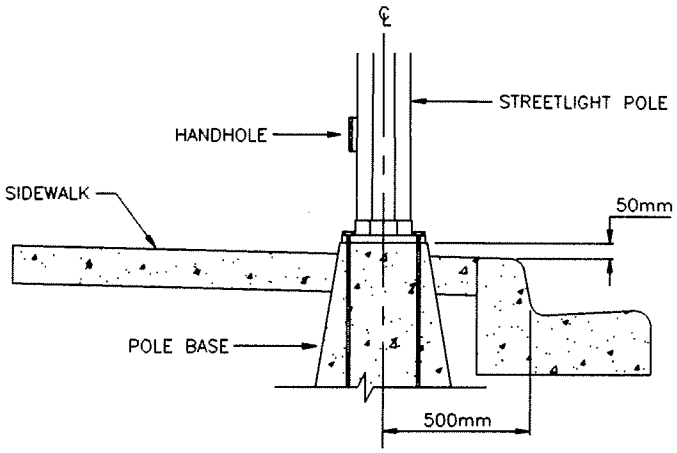
* 35mm FOR 8.5m ROAD WIDTH
50mm FOR 11m OR GREATER ROAD WIDTH

NO.	DATE	REVISION	APP'D	BY
3	2003/01	PAVEMENT RESTORATION AMENDED		GF
2	99/04	TOPSOIL DEPTH INCREASED		HL
1	97/01	GENERAL REVISION (L833)		JK

City of Burnaby
ENGINEERING DEPARTMENT

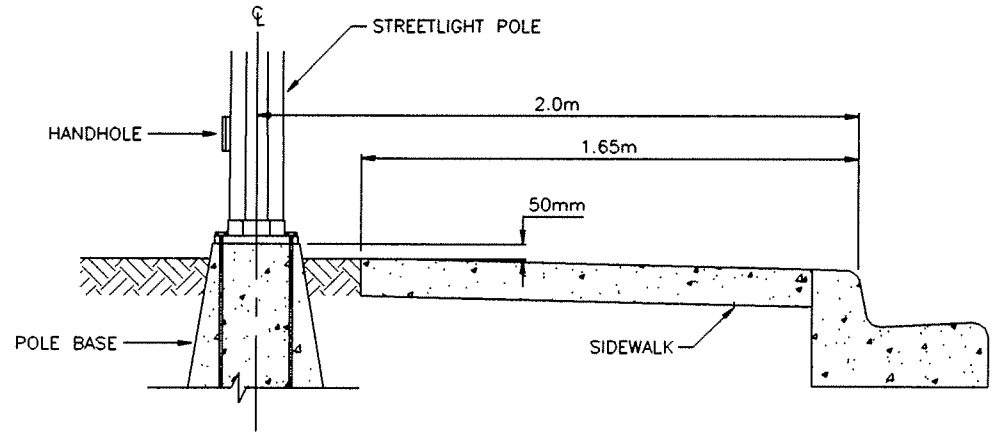
CONDUIT TRENCH CONSTRUCTION

DRAWN BY:	SCALE: N.T.S.	BBY-	E101
APPRV'D BY:	DATE: APR 70		



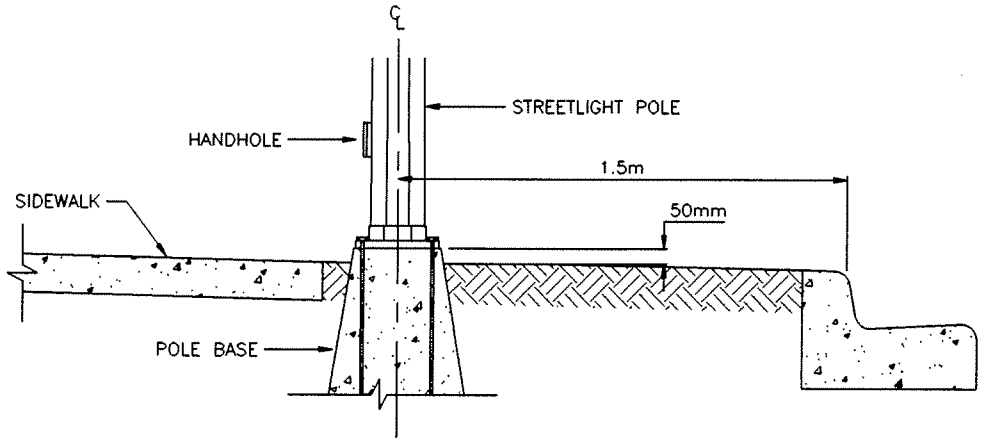
CLASSIFICATION A

FOR STREETS 14m AND GREATER IN WIDTH



CLASSIFICATION B

FOR STREETS WITH ABUTTING WALKS OR STREETS 11m AND LESS IN WIDTH



CLASSIFICATION C

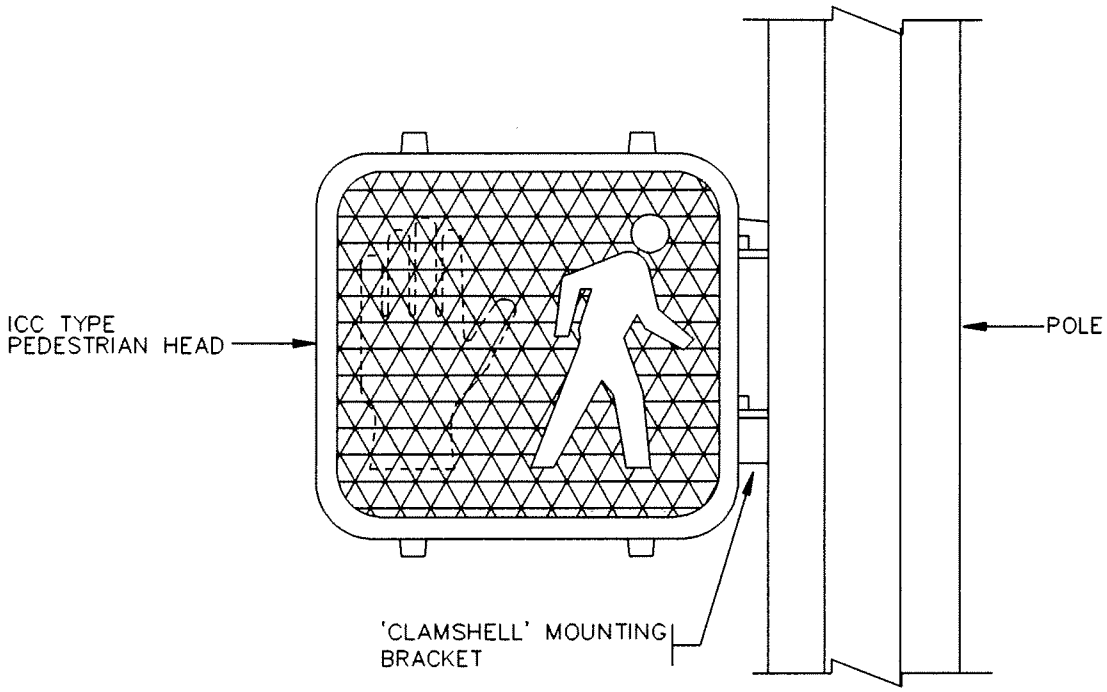
FOR STREETS WITH SEPARATED SIDEWALKS

NO.	DATE	REVISION	APP'D	BY
1	97/09	GENERAL REVISION (L806)		JK

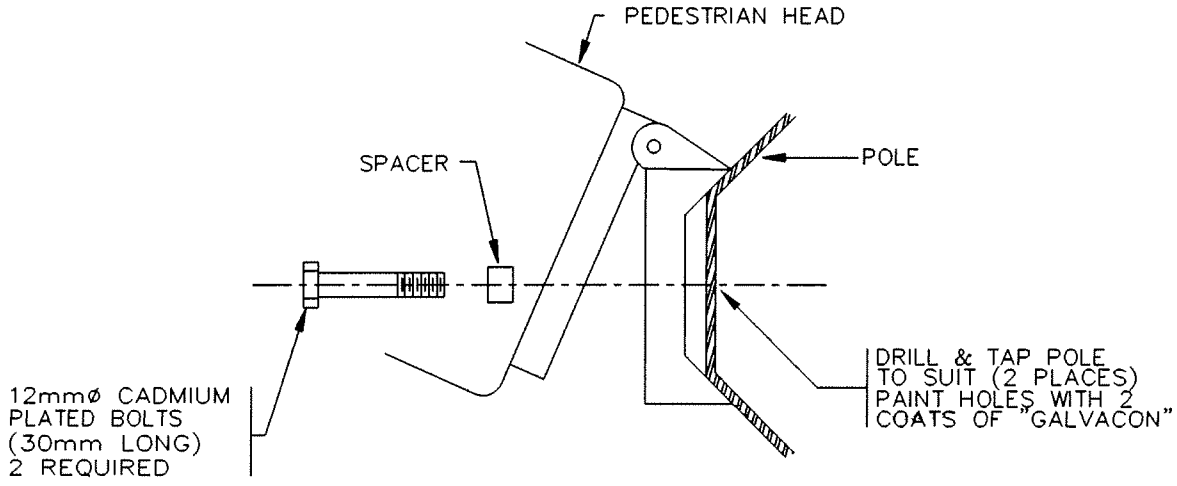
City of Burnaby
ENGINEERING DEPARTMENT

LOCATION OF STREET LIGHTING POLES

DRAWN BY:	SCALE: N.T.S.	BBY- E102
APPRV'D BY:	DATE: APR 70	



PEDESTRIAN HEAD



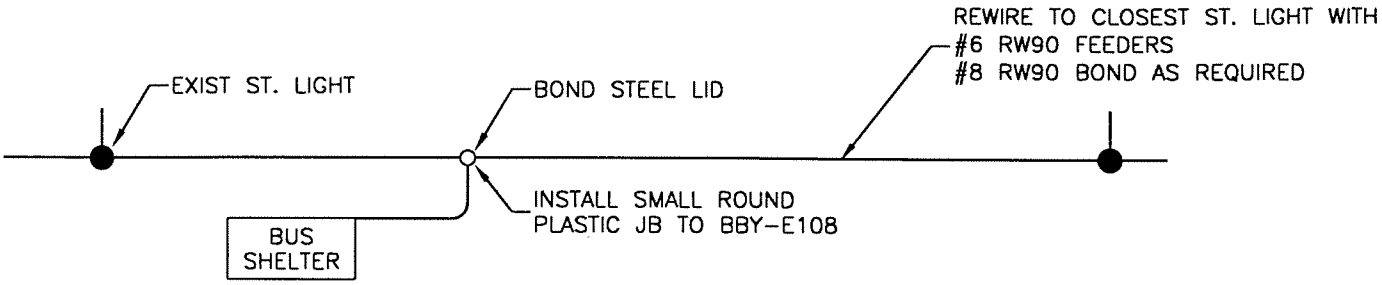
PLAN

NO.	DATE	REVISION	APP'D	BY
1	97/01	GENERAL REVISION (L2288)		JK

City of Burnaby
ENGINEERING DEPARTMENT

PEDESTRIAN HEAD CLAMSHELL MOUNTING DETAILS

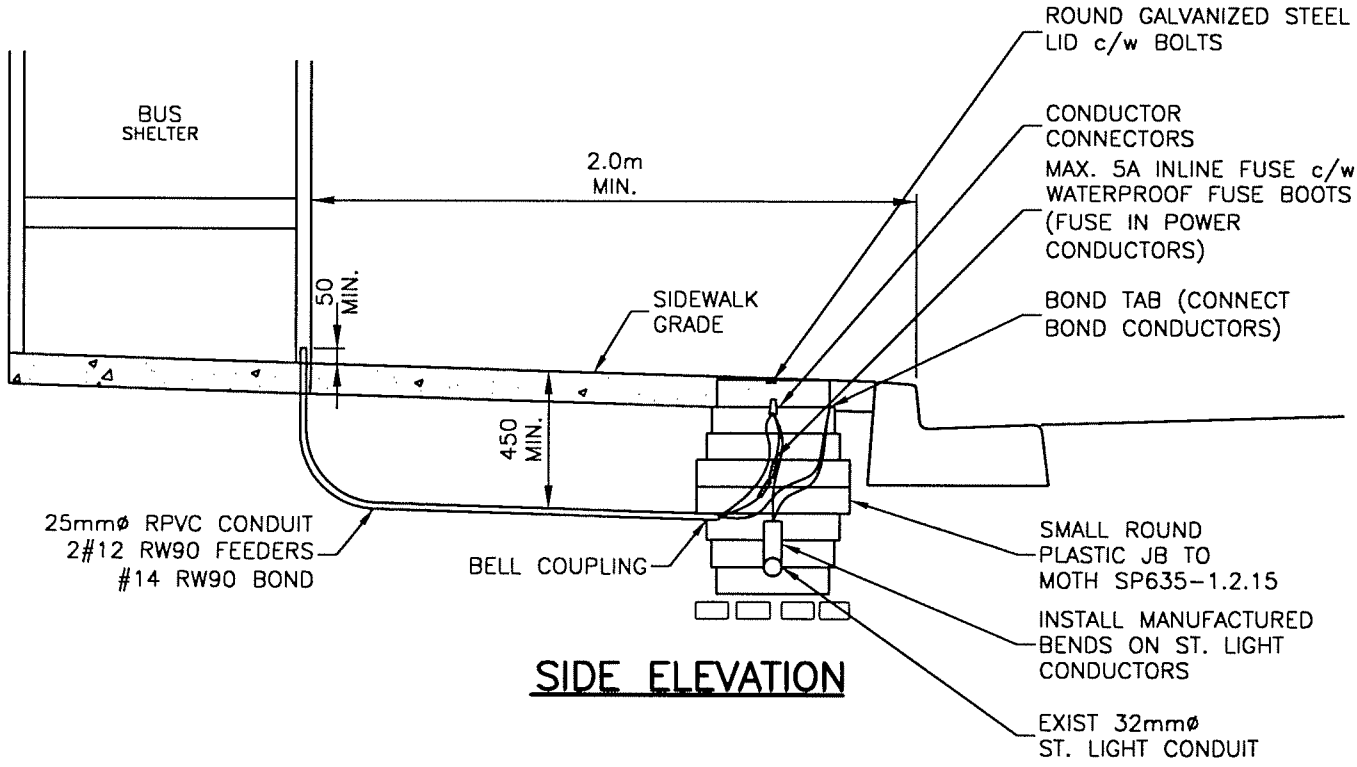
DRAWN BY: RF	SCALE: N.T.S.	**BBY-** E115
APPRV'D BY:	DATE: 92-03-09	



ARRANGEMENT SCHEMATIC

NOTES:
1. CONTACT BURNABY BUILDING DEPT. FOR ELECTRICAL PERMIT & INSPECTION
2. CONTACT BURNABY ENGINEERING DEPT. (TRAFFIC) FOR LOCATION & PERMIT APPROVAL
3. INSTALL JB IN SINGLE SIDEWALK PANEL. SAW CUT PANEL ONLY ON JOINT LINES
4. INSTALL TEMPORARY SIDEWALK REPAIR IN ASPHALT FINAL CONCRETE REPAIR BY BURNABY

NOTES: FOR ENGINEERING PERMIT APPROVAL REQUIREMENT
1. SKETCH SHOWING SITE LOCATION WITH STREET NAMES & NORTH ARROW
2. SHOW OR GIVE SERVICE LOCATION & SERVICE VOLTAGE
3. GIVE WATTAGE'S OF PROPOSED FIXTURES
4. APPROVAL / PAYMENT TO BC HYDRO FOR POWER CONSUMPTION
5. PAYMENT FOR PERMANENT SIDEWALK REPAIRS



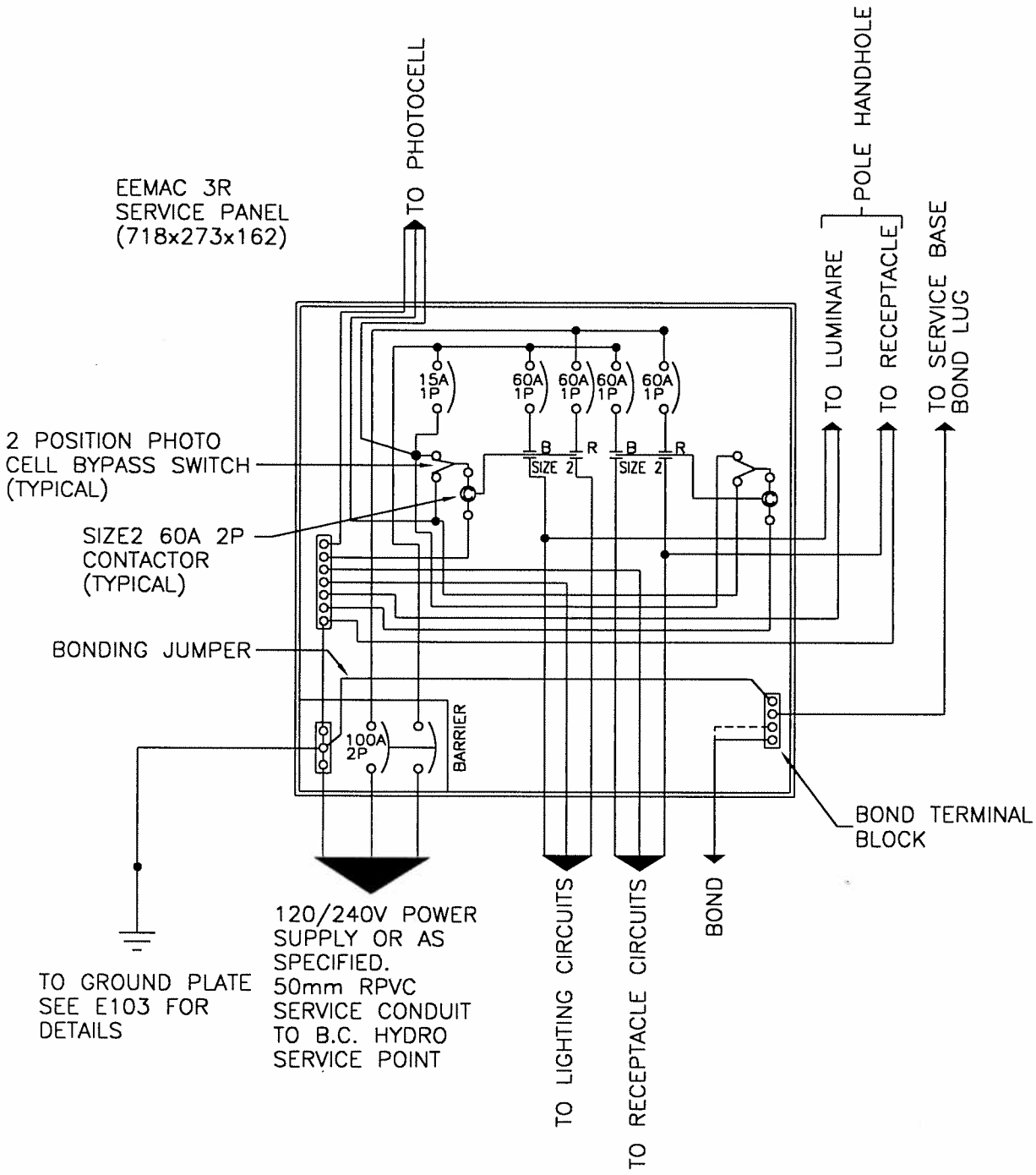
SIDE ELEVATION

NO.	DATE	REVISION	APP'D	BY
1	2000/01	NEW MOTH REFERENCE		JK

City of Burnaby
ENGINEERING DEPARTMENT

ILLUMINATED BUS SHELTER CONNECTION DETAILS

DRAWN BY: HLOUIE	SCALE: N.T.S.	**BBY-**	E116
APPRV'D BY:	DATE: 99-02-09		



NOTE:
1. SEPARATE BOND REQUIRED FOR EACH CONDUIT.
2. MAXIMUM LOAD FOR EACH RECEPTACLE SHALL BE 400W.
3. MAXIMUM OF 14 RECEPTACLES PER CIRCUIT.

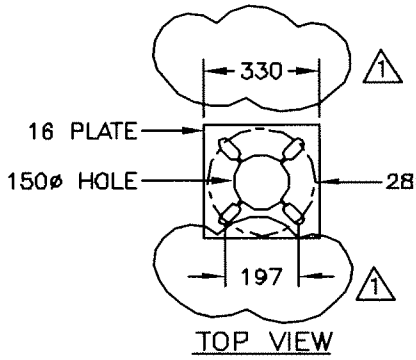
NO.	DATE	REVISION	APP'D	BY

City of Burnaby
ENGINEERING DEPARTMENT

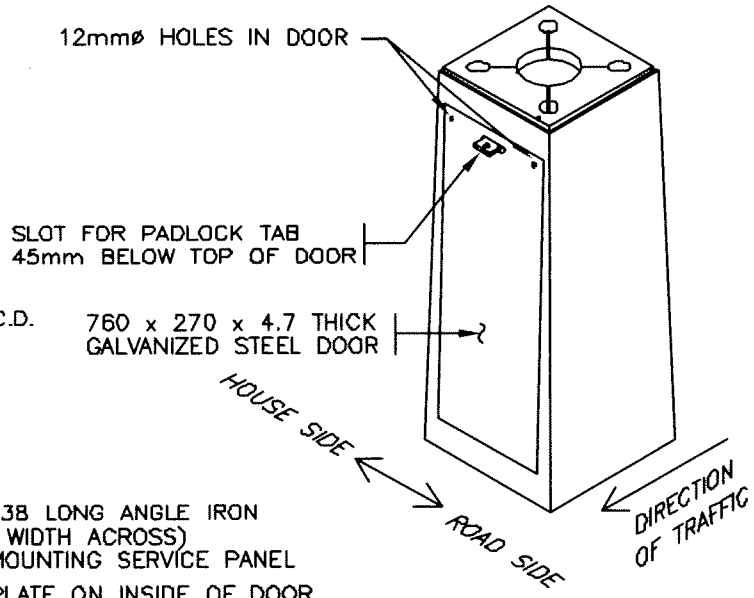
TYPICAL COMBINED STREET LIGHTING AND RECEPTACLE SERVICE PANEL

DRAWN BY: J. KO	SCALE: N.T.S.	**BBY-**	E117
APPRV'D BY:	DATE: 2000-02-09		

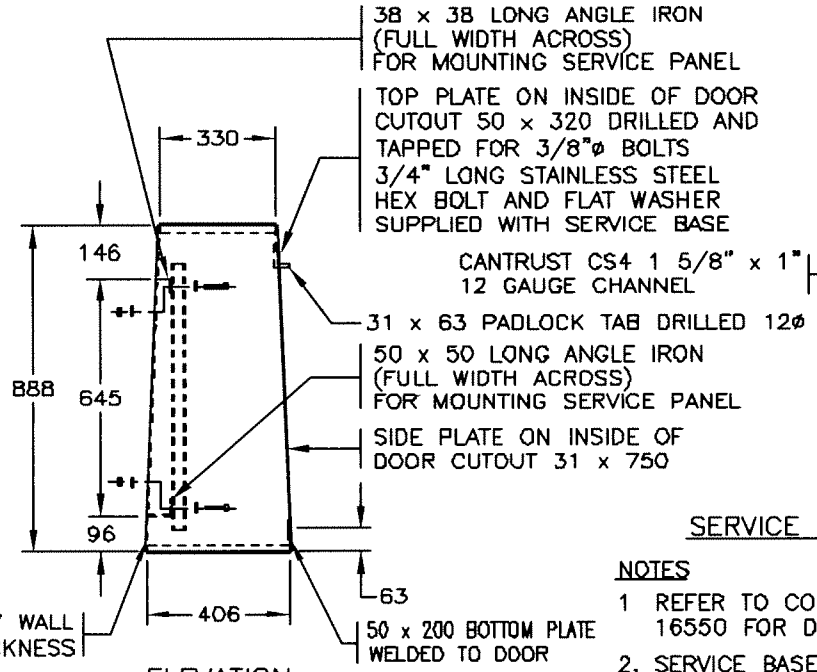
MMCD STANDARD DETAIL DRAWINGS



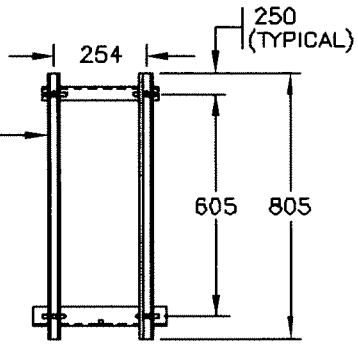
TOP VIEW



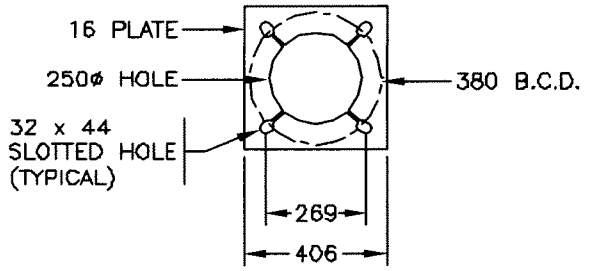
PICTORIAL VIEW



ELEVATION



SERVICE PANEL SUPPORT CHANNELS



BOTTOM VIEW

NOTES

1. REFER TO CONTRACT DRAWINGS AND SECTION 16550 FOR DETAILED SPECIFICATIONS.
2. SERVICE BASE TO BE USED WITH TYPE 2 SHAFTS AND POST TOP POLES ONLY.
3. SERVICE BASE TO BE HOT DIP GALVANIZED AFTER FABRICATION.
4. FABRICATION SHALL GENERALLY MEET THE REQUIRMENTS OF THE MINISTRY OF TRANSPORTATION AND HIGHWAYS MATERIAL STANDARDS SECTION 301 – "TRAFFIC SIGNAL, LUMINAIRE AND SIGN POLE STRUCTURES". (1)
5. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE NOTED.

SERVICE BASE BOLT KIT		
ITEM	QUANTITY	DESCRIPTION
POLE CONNECTION BOLTS	4 (1)	1"ø x 3" LONG A325 GALVANIZED BOLT, NUT AND 2 WASHERS.

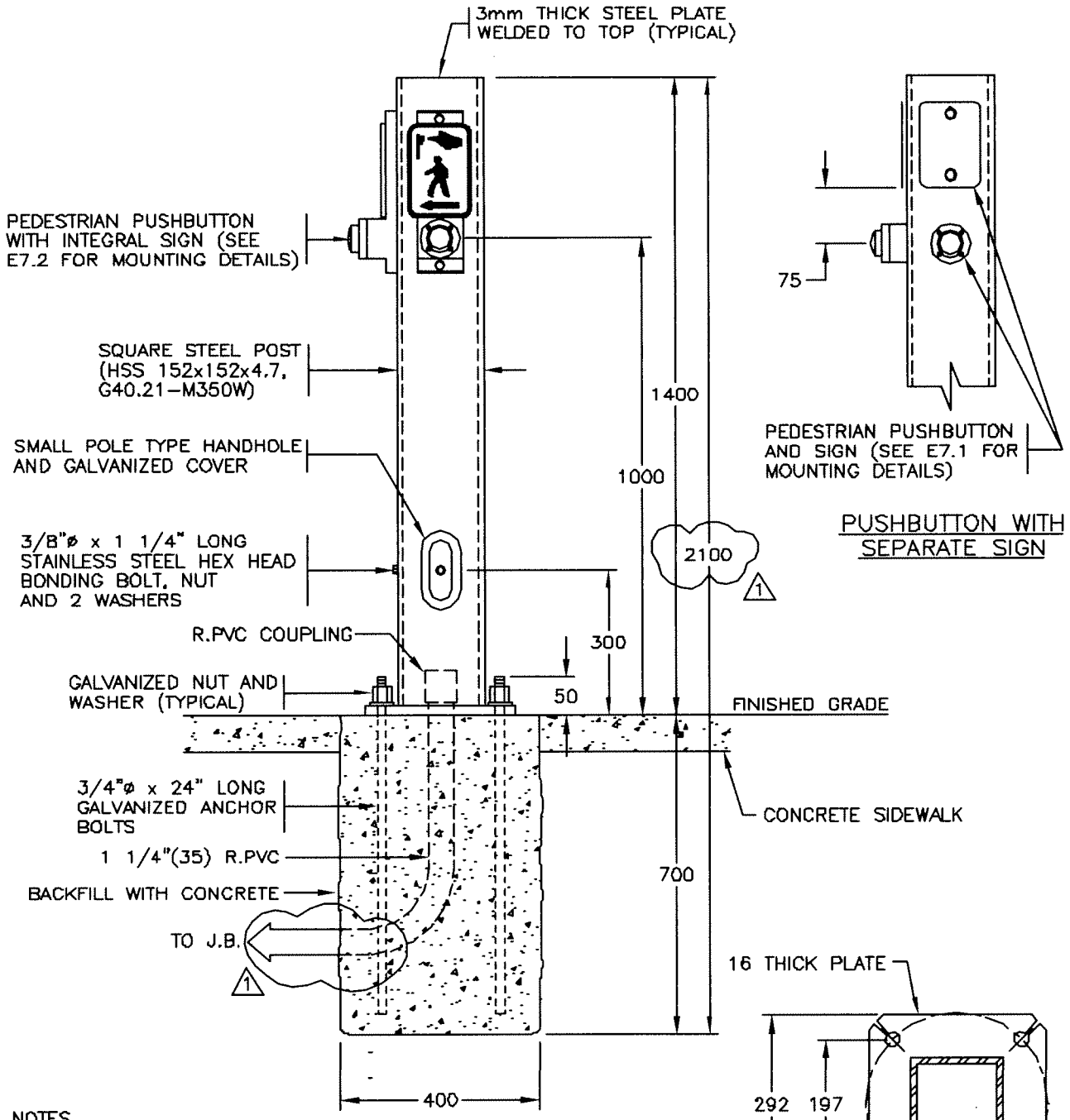
NOT TO SCALE

LRM DEC 31, 2002

SERVICE BASE

DRAWING NUMBER: (1)

E5.21 – Rev. 1



NOTES

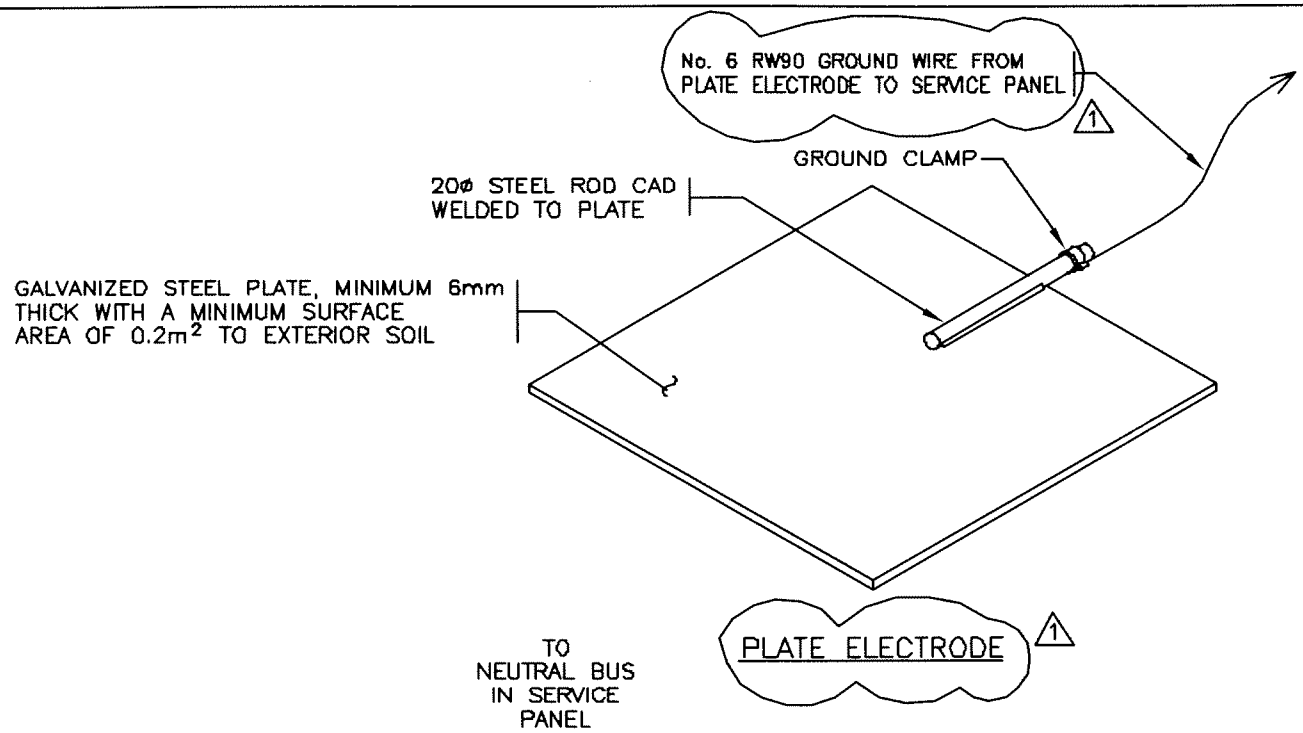
1. REFER TO CONTRACT DRAWINGS AND SECTION 16550 FOR DETAILED SPECIFICATIONS.
2. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE NOTED.
3. POST TO BE HOT DIP GALVANIZED AFTER FABRICATION.
4. POST FABRICATION TO MEET REQUIREMENTS OF MINISTRY OF TRANSPORTATION AND HIGHWAYS MATERIAL STANDARDS SECTION 301 – TRAFFIC SIGNAL, LUMINAIRES AND SIGN POLE STRUCTURES. 1

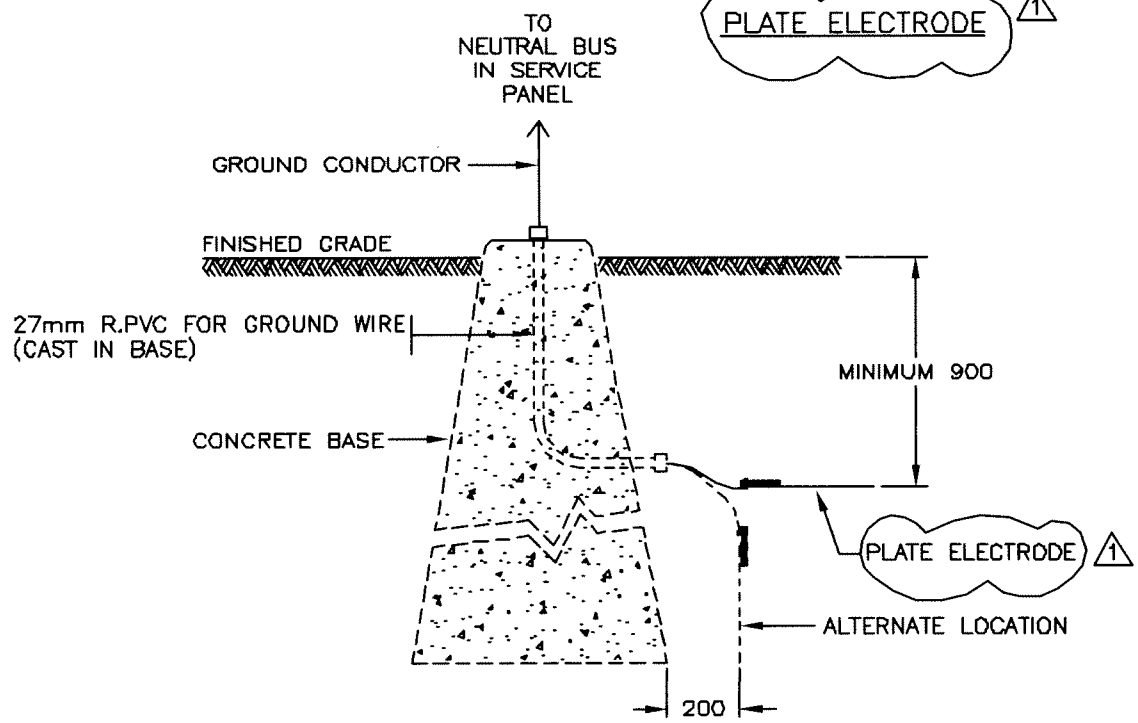
NOT TO SCALE

LRM DEC 31, 2002

PEDESTRIAN PUSHBUTTON POST

DRAWING NUMBER: 1
E7.3–Rev.1





ELEVATION

NOTES

1. REFER TO CONTRACT DRAWINGS AND SECTION 16550 FOR DETAILED SPECIFICATIONS.
2. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE NOTED.

NOT TO SCALE

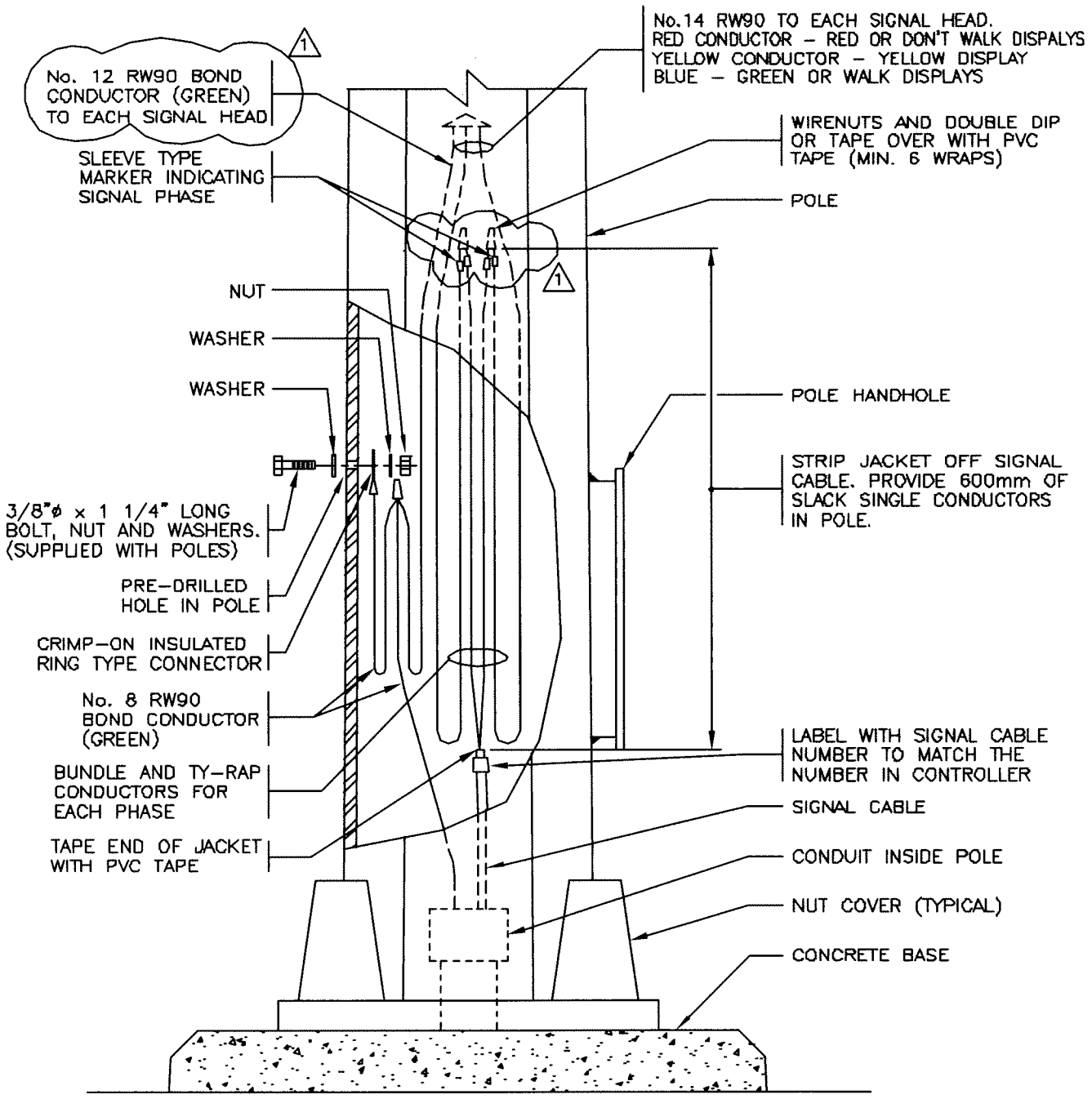
LRM JAN 2, 2003

SERVICE GROUND PLATE INSTALLATION DETAIL

DRAWING NUMBER: 1

E8.10—Rev.1

MMCD STANDARD DETAIL DRAWINGS



ELEVATION

NOTES

1. REFER TO CONTRACT DRAWINGS AND SECTION 16550 FOR DETAILED SPECIFICATIONS.

NOT TO SCALE

LRM DEC 31, 2002

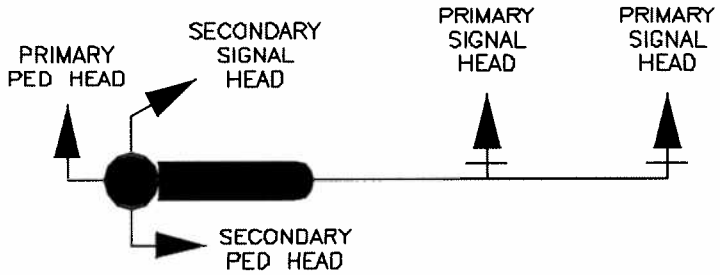
SIGNAL CABLE WIRING IN POLE HANDHOLE

DRAWING NUMBER: 1

E8.12–Rev.1

COLOUR CODING (19 CONDUCTOR SIGNAL CABLE)			
CONDUCTOR No.	SIGNAL ASSIGNMENT	LETTERING	CONDUCTOR COLOUR
1	NEUTRAL	WHITE ONE	WHITE
2	PB RETURN	WHITE TWO	WHITE
3	PRIMARY PB	–	BLACK
4	SECONDARY PB	–	ORANGE
5	PRIMARY RED	RED ONE	RED
6	SECONDARY RED	RED TWO	RED
7	SPARE	RED THREE	RED
8	PRIMARY PED DW	RED FOUR	RED
9	SECONDARY PED DW	RED FIVE	RED
10	PRIMARY AMBER	AMBER ONE	YELLOW
11	SECONDARY AMBER	AMBER TWO	YELLOW
12	PRIMARY LT AMBER	AMBER THREE	YELLOW
13	SECONDARY LT AMBER	AMBER FOUR	YELLOW
14	SECONDARY PED WALK	AMBER FIVE	YELLOW
15	PRIMARY GREEN	GREEN ONE	BLUE
16	SECONDARY GREEN	GREEN TWO	BLUE
17	PRIMARY LT GREEN	GREEN THREE	BLUE
18	SECONDARY LT GREEN	GREEN FOUR	BLUE
19	PRIMARY PED WALK	GREEN FIVE	BLUE

LT = LEFT TURN SIGNAL
DW = DON'T WALK
PB = PEDESTRIAN PUSHBUTTON



NOTES

1. REFER TO CONTRACT DRAWINGS AND SECTION 16550 FOR DETAILED SPECIFICATIONS.
2. CABLE TO BE POLYETHYLENE INSULATED POLYVINYL CHLORIDE JACKETED, RATED AT 600 VOLTS.
3. CONDUCTORS TO BE No.14 AWG STRANDED OR SOLID COPPER AS NOTED ON THE CONTRACT DRAWINGS.
4. REFERENCE TO CSA 22.2 No.239–97 △1

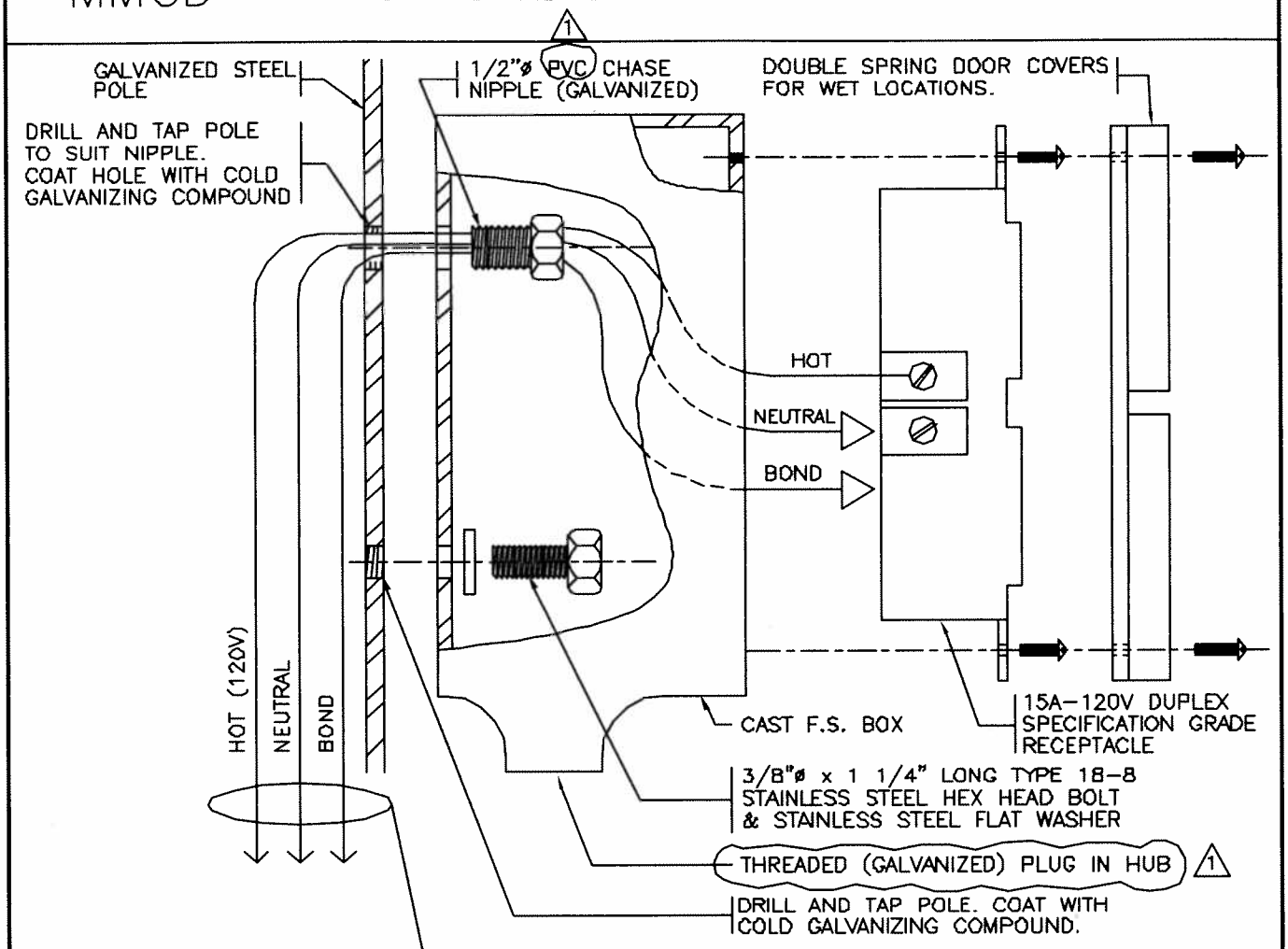
LRM JAN 2, 2003

SIGNAL CABLE COLOUR CODE SAMPLE

DRAWING NUMBER: △1 E8.13–Rev.1

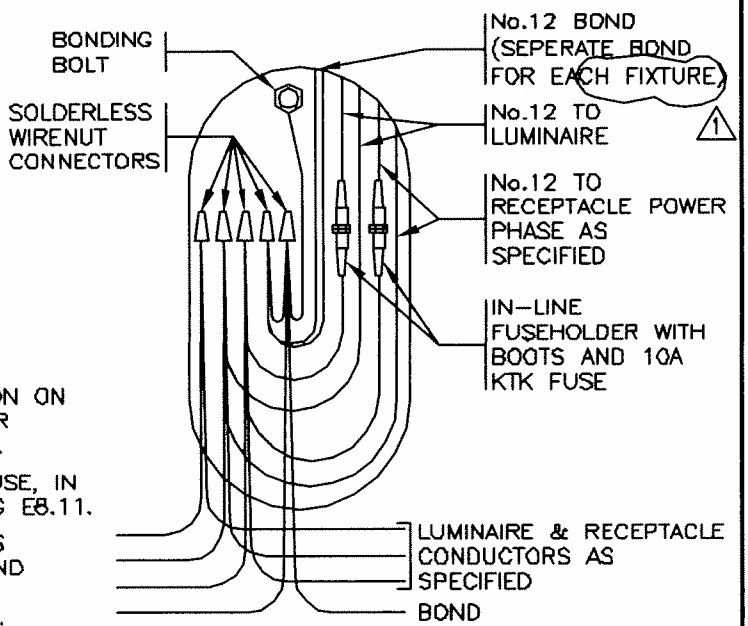
MMCD

STANDARD DETAIL DRAWINGS



1

2 No.12 RW90 RECEPT. CCTS.
1 No.12 RW90 BOND
TO POLE HANDHOLE.



STREETLIGHT WITH RECEPTACLE
HAND HOLE WIRING

NOTES

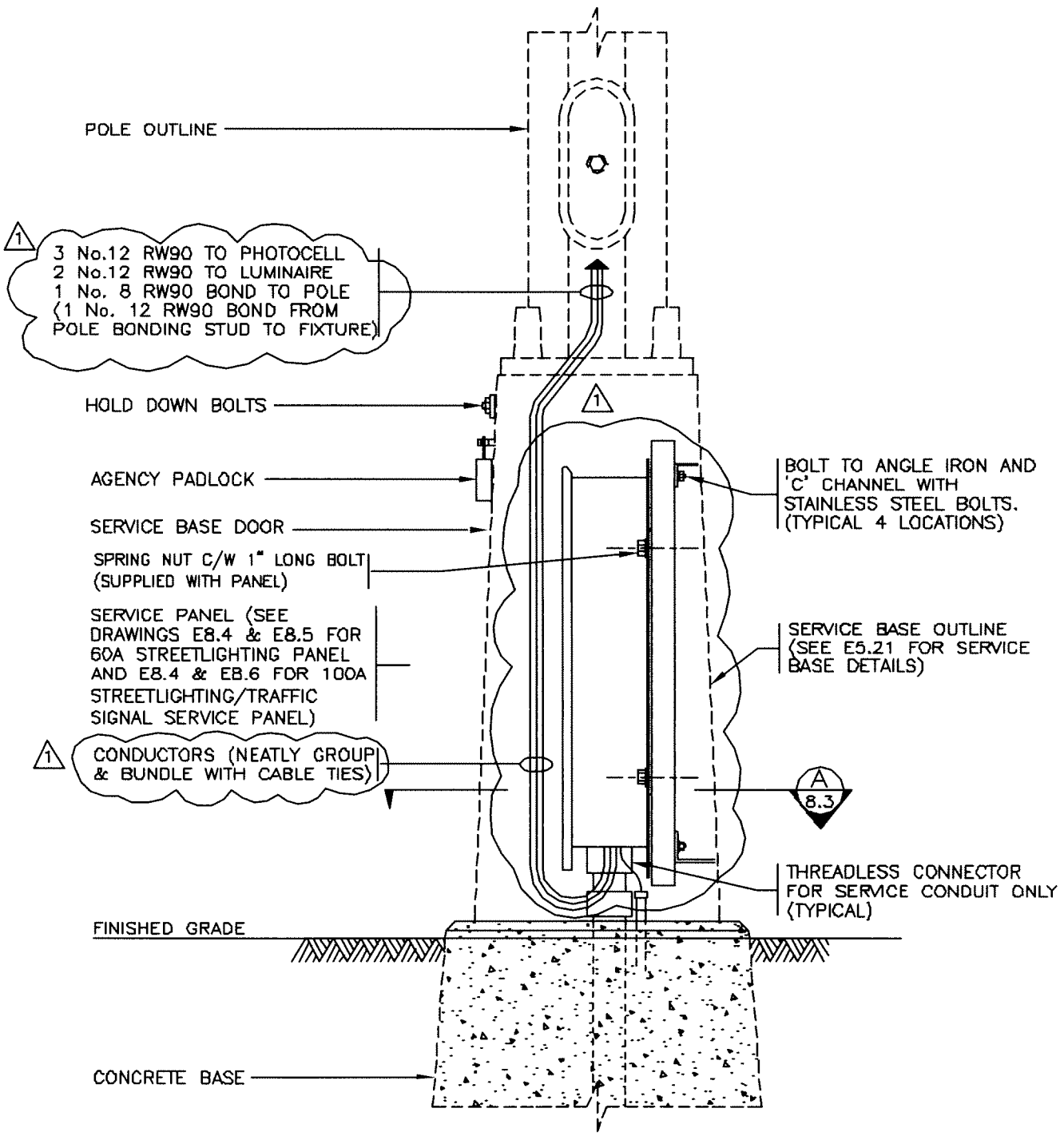
1. REFER TO CONTRACT DRAWINGS AND SECTION 16550 FOR DETAILED SPECIFICATIONS.
2. RECEPTACLE MOUNTING HEIGHT AND ORIENTATION ON POLE TO BE NOTED ON CONTRACT DRAWING OR TO BE PROVIDED BY CONTRACT ADMINISTRATOR.
3. FUSE RECEPTACLE CIRCUITS, WITH A 10AMP FUSE, IN HANDHOLE AT BASE OF POLE AS PER DRAWING E8.11.
4. RECEPTACLES TO NOT BE INSTALLED ON POLES WITHIN 15m OF A SIGNALIZED INTERSECTION AND NOT UNDER ANY CIRCUMSTANCES TO BE INSTALLED ON TRAFFIC SIGNAL OR SIGN POLES. 1

NOT TO SCALE

LRM DEC 31, 2002

POLE MOUNTED RECEPTACLE

DRAWING NUMBER: 1
E8.15-Rev.1



NOTES

1. REFER TO CONTRACT DRAWINGS AND SECTION 16550 FOR DETAILED SPECIFICATIONS.

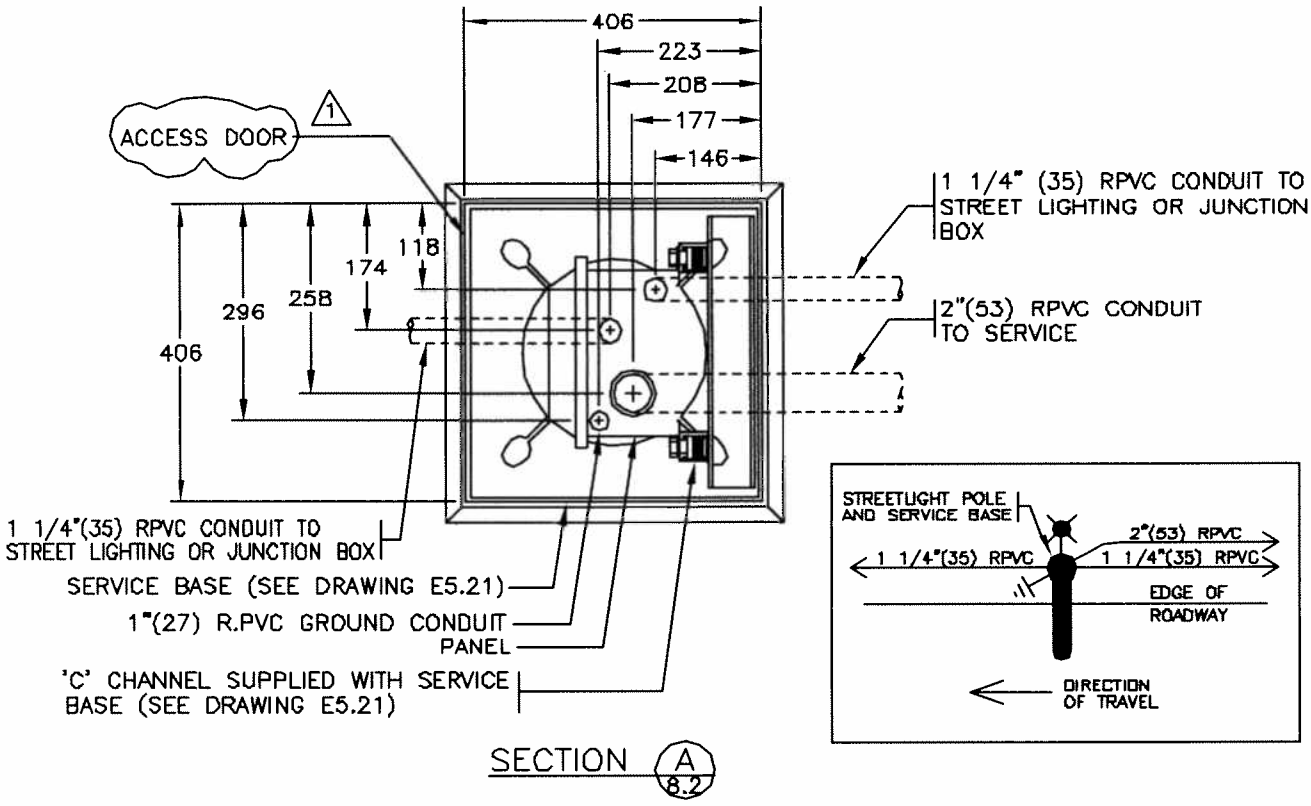
NOT TO SCALE

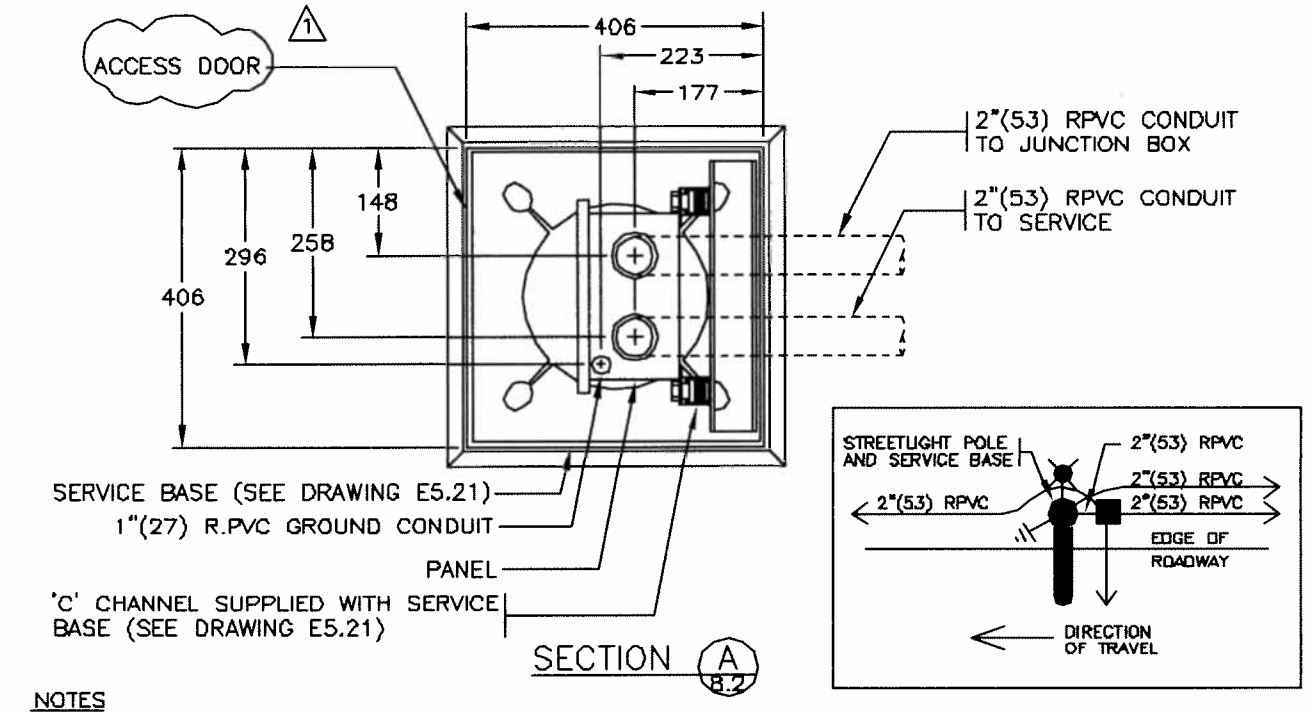
SM & LRM JAN 3, 2003

SERVICE PANEL IN SERVICE BASE (MOUNTING DETAILS)

DRAWING NUMBER: 1

E8.2—Rev.1





NOTES

1. REFER TO CONTRACT DRAWINGS AND SECTION 16550 FOR DETAILED SPECIFICATIONS.

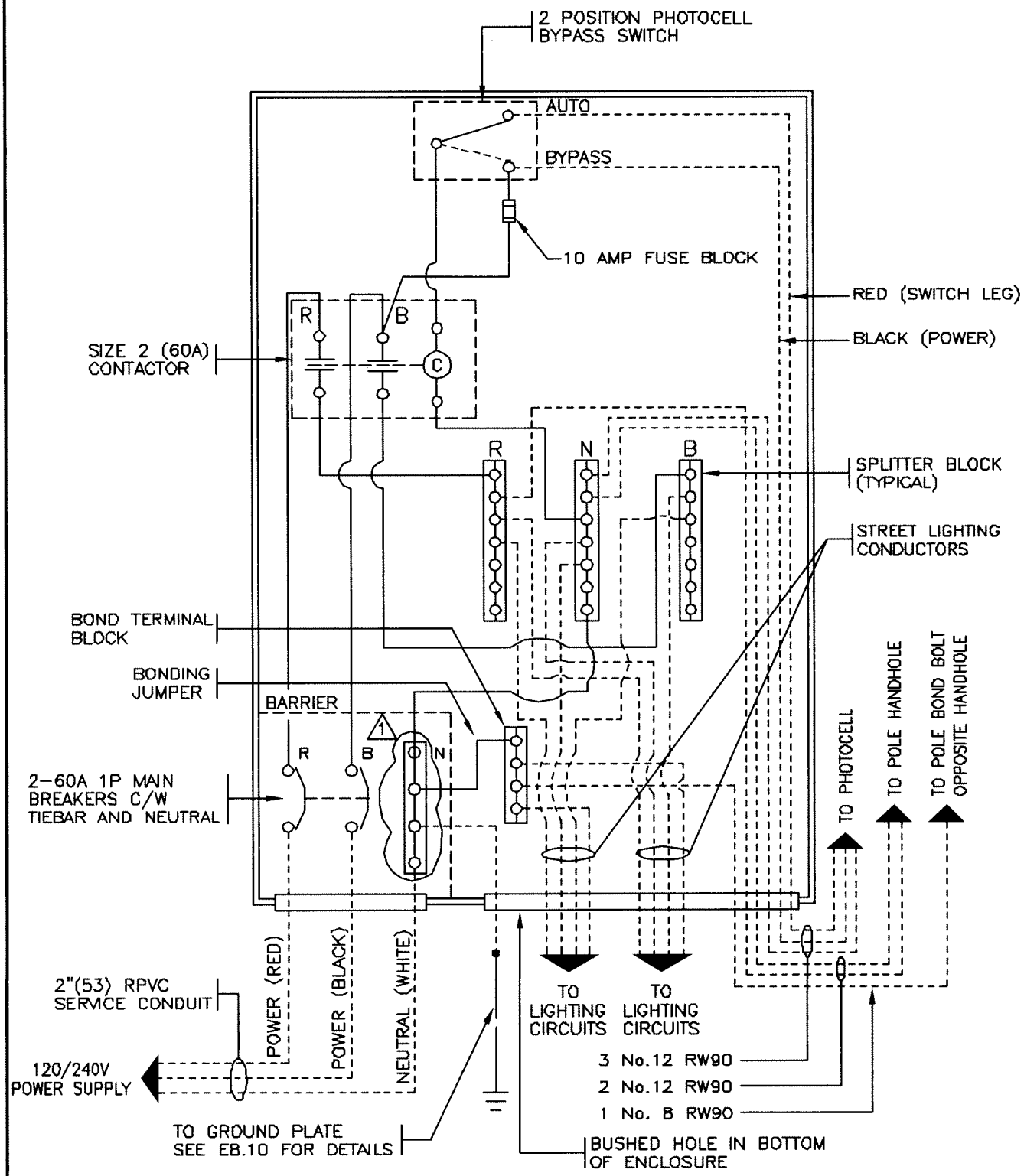
SCALE 1:10

SERVICE PANEL IN SERVICE BASE (MOUNTING DETAILS)

DRAWING NUMBER: 1

E8.3—Rev.1

SM & LRM JAN 2, 2003



-------- FIELD WIRING

WIRING DIAGRAM

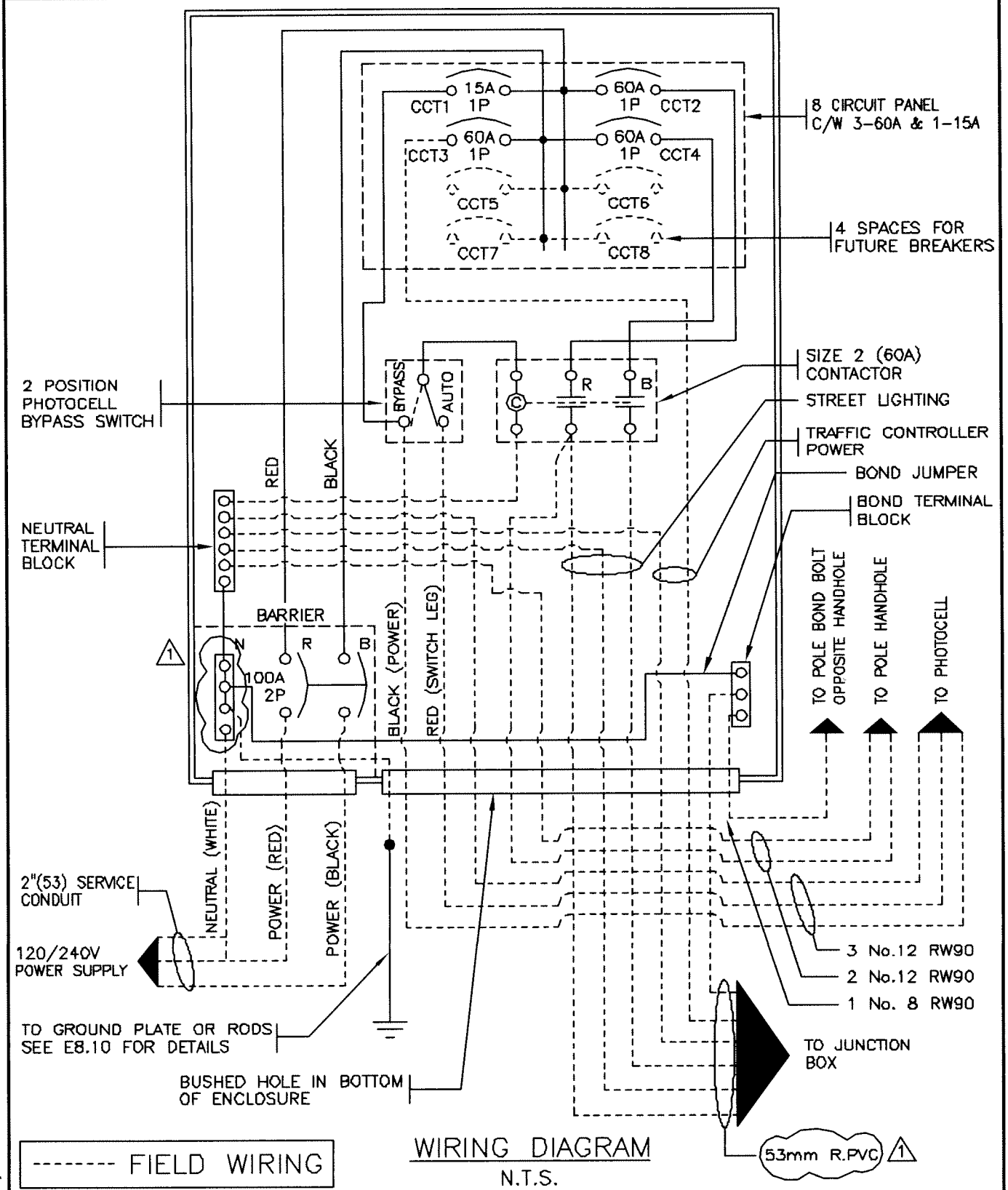
N.T.S.

60A (120/240V) STREET LIGHTING SERVICE PANEL IN SERVICE BASE (WIRING DIAGRAM)

DRAWING NUMBER: 1

E8.5—Rev.1

LRM JAN 2, 2003



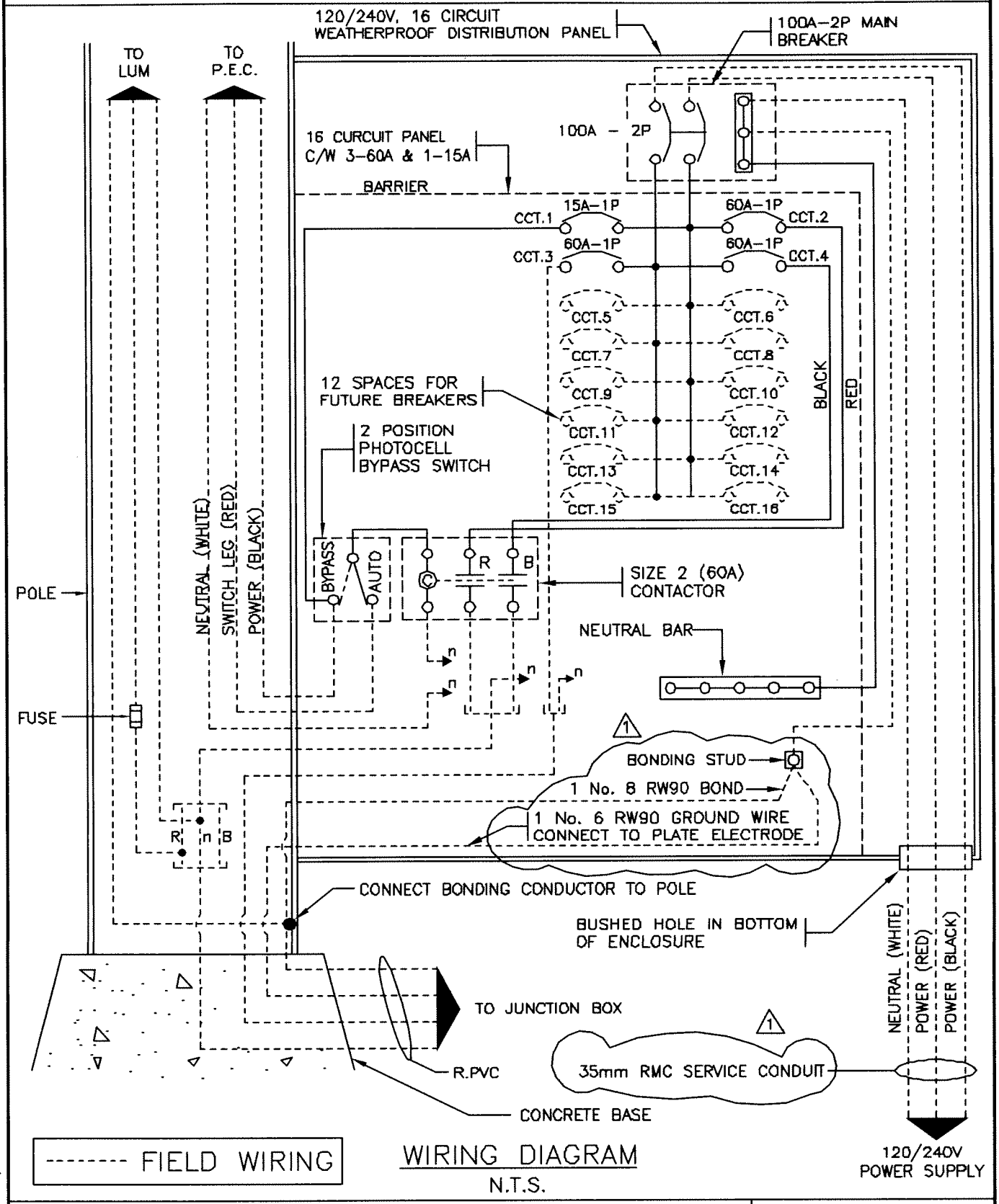
WIRING DIAGRAM
N.T.S.

LRM JAN 2, 2002

100A (120/240V) TRAFFIC SIGNAL/STREET LIGHTING SERVICE PANEL IN SERVICE BASE (WIRING DIAGRAM)

DRAWING NUMBER: 1
E8.6—Rev.1

MMCD STANDARD DETAIL DRAWINGS



WIRING DIAGRAM

N.T.S.

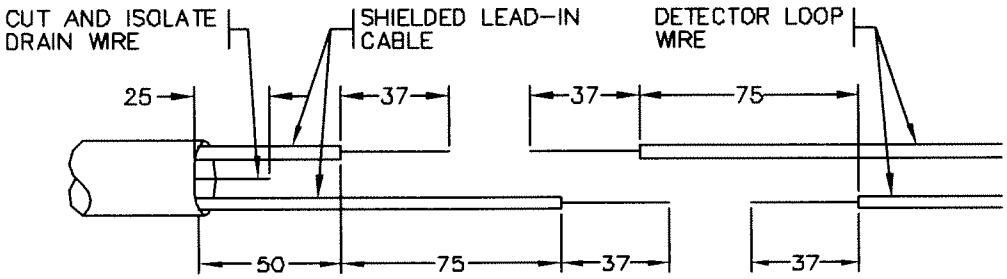
LRM JAN 2, 2003

100A (120/240V) TRAFFIC SIGNAL/STREET LIGHTING SERVICE PANEL (WIRING DIAGRAM)

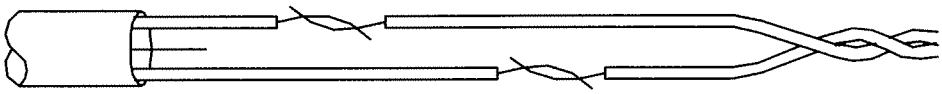
DRAWING NUMBER: 1

E8.9—Rev.1

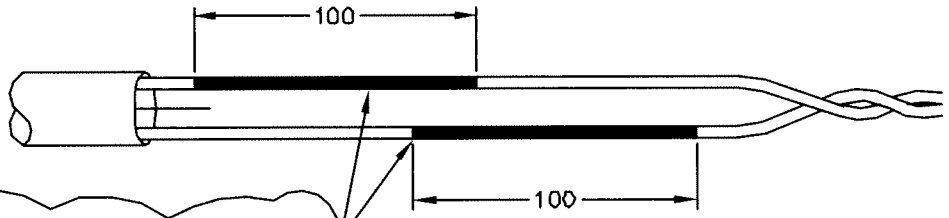
STEP 1. STRIP LOOP WIRES AND LEAD-IN CABLE AND SLIDE ON HEAT SHRINKS



STEP 2. TWIST BARE CONDUCTORS TOGETHER AND SOLDER WITH 60/40 (TIN/LEAD) RESIN SOLDER. (1)

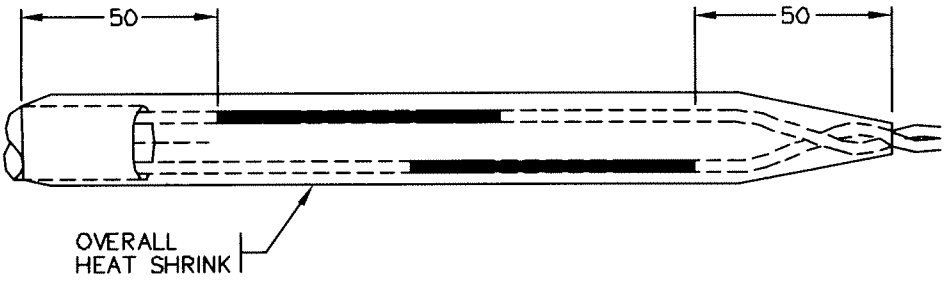


STEP 3. INSULATE EACH SOLDER JOINT SEPARATELY



(1) TAPE INDIVIDUAL CONDUCTORS WITH RUBBER AND PVC TAPE

STEP 4. ENVIRONMENTALLY SEAL TOTAL SPLICE.



NOTES

1. REFER TO CONTRACT DRAWINGS AND SECTION 16650 FOR DETAILED SPECIFICATIONS.
2. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE NOTED.
3. HEAT SHRINK SHALL BE T&B SHRINK-KON HS12-6L (1) INSTALL WITH T&B WT-1400 HEAT GUN.

NOT TO SCALE

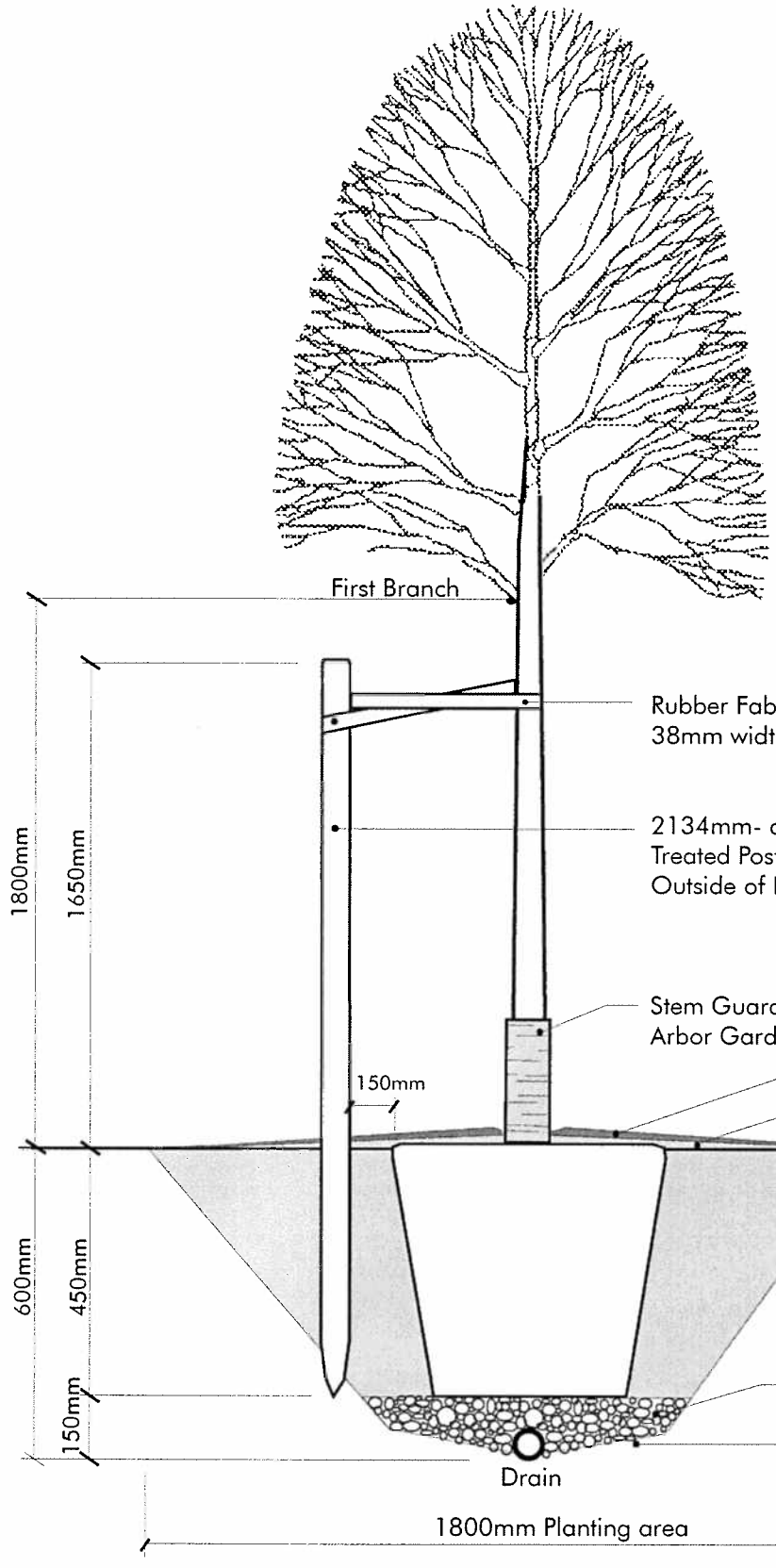
LRM DEC 31, 2002

DETECTOR LOOP TO SHIELDED CABLE SPLICES

DRAWING NUMBER: (1) E9.4-Rev.1

LANDSCAPE DETAILS

BBY-L101	Boulevard Tree Planting Detail: 6cm Caliper Shade Specimen
BBY-L102	Boulevard Tree Planting Detail for Hardscapes: Single Pit 6cm Caliper Specimen Shade Tree



NOTES

This detail strives to illustrate as qualitative a growing environment as possible for trees planted in very stressful sites.

* Backfill soil must be weed free and provide good water percolation and gas exchange.

* Pit must be well drained. If adequate natural drainage does not occur additional measures must be provided to ensure adequate drainage. EG: drain rock at bottom of pit that collects water and disperses it from the pit via drain connected to storm, gutter, lower elevation or more permeable medium.

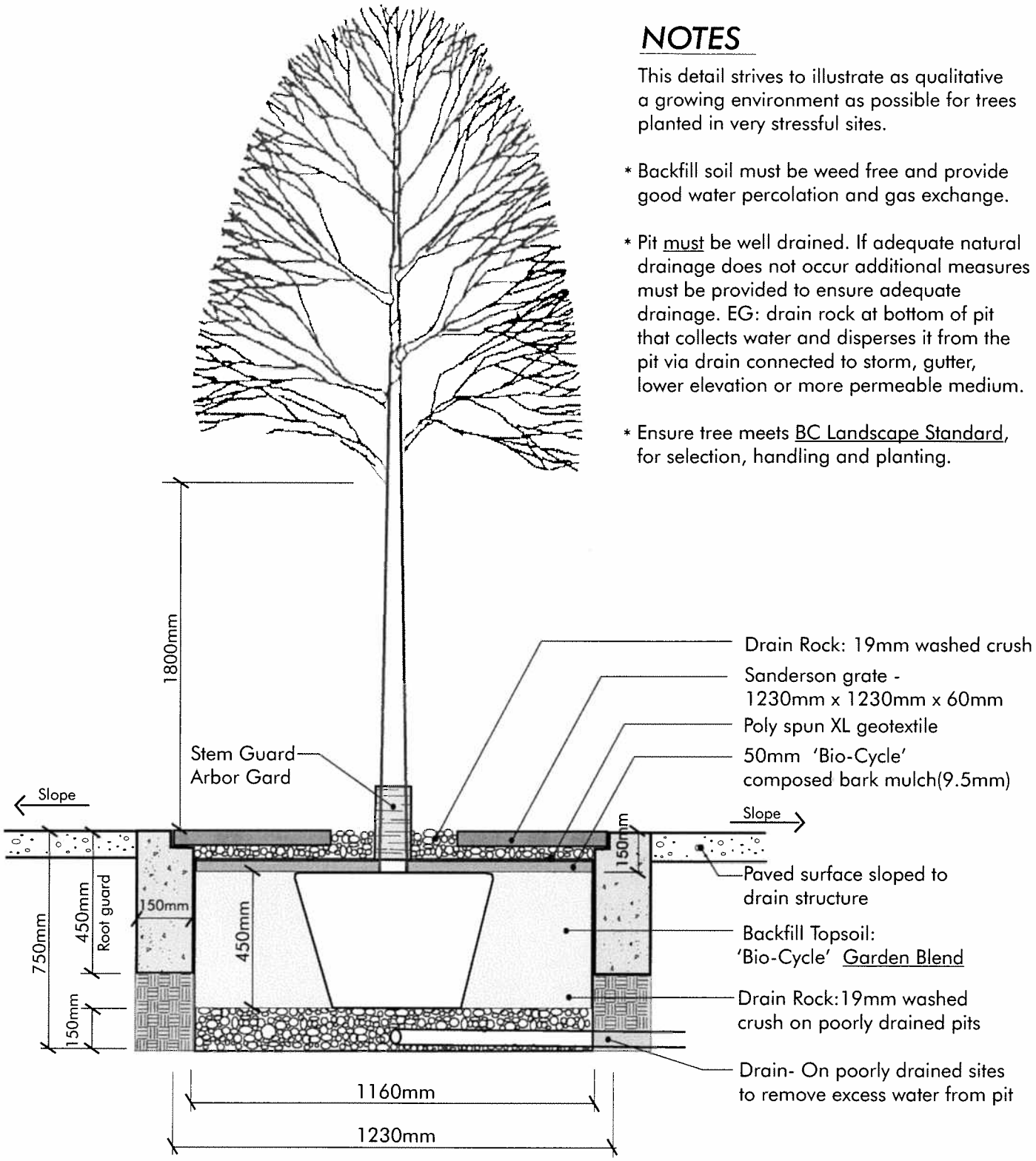
* Ensure tree meets BC Landscape Standard, for selection, handling and planting.

NO.	DATE	REVISION	APP'D	BY

City of Burnaby
Parks, Recreation & Cultural Services

BOULEVARD TREE PLANTING DETAIL: 6 CM CALIPER SHADE SPECIMEN

DRAWN BY: H.D.	SCALE: N.T.S.	**BBY-**	L101
APPV'D BY: B.R.	DATE: 2000-02-14		



NOTES

This detail strives to illustrate as qualitative a growing environment as possible for trees planted in very stressful sites.

* Backfill soil must be weed free and provide good water percolation and gas exchange.

* Pit must be well drained. If adequate natural drainage does not occur additional measures must be provided to ensure adequate drainage. EG: drain rock at bottom of pit that collects water and disperses it from the pit via drain connected to storm, gutter, lower elevation or more permeable medium.

* Ensure tree meets BC Landscape Standard, for selection, handling and planting.

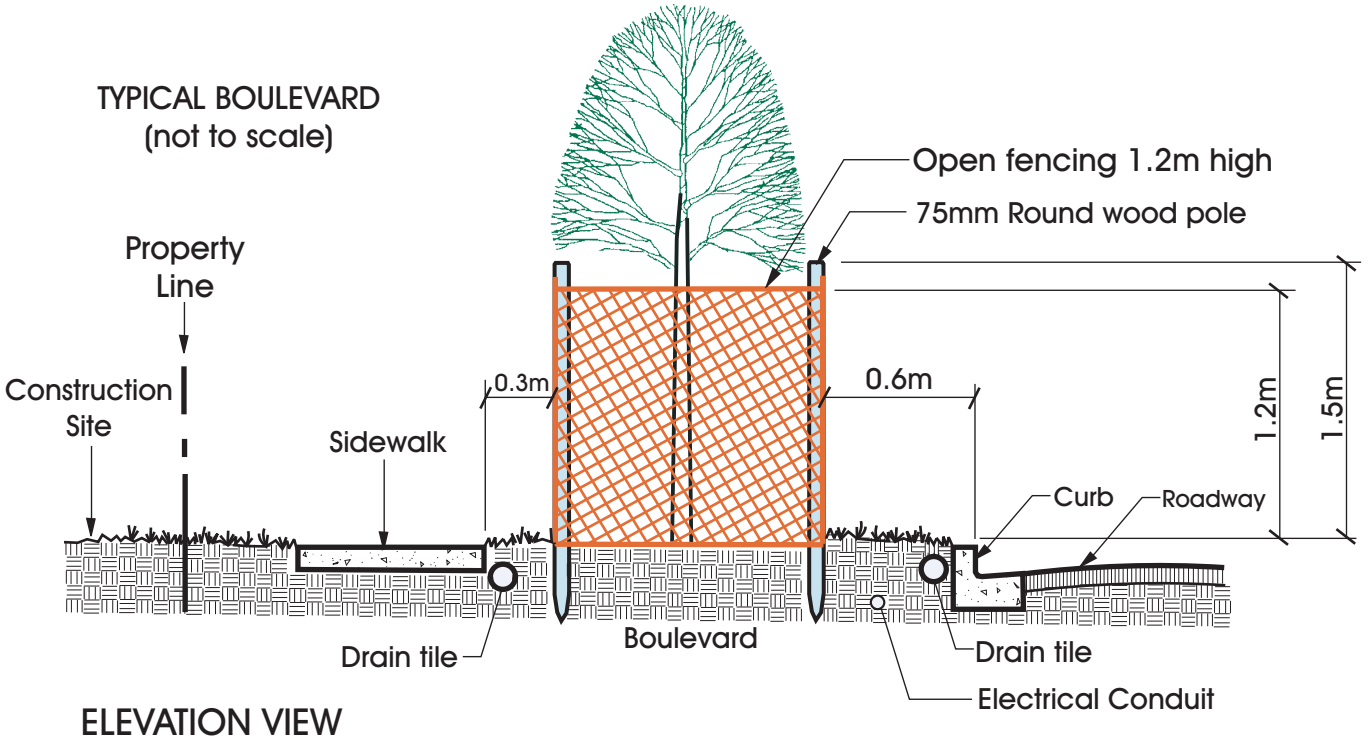
NO.	DATE	REVISION	APP'D	BY

City of Burnaby
Parks, Recreation & Cultural Services

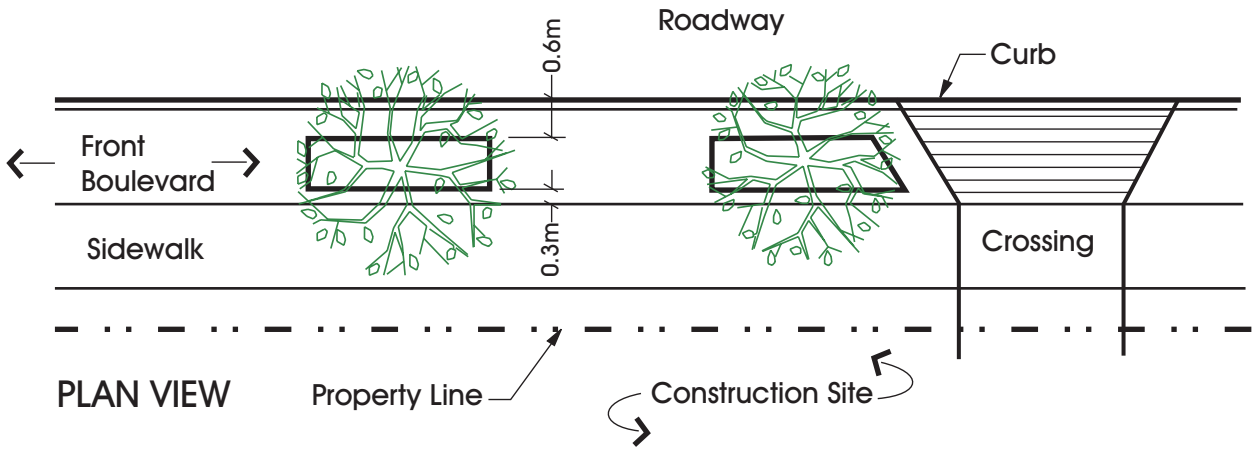
BOULEVARD TREE PLANTING DETAIL FOR HARDSCAPES: SINGLE PIT 6 CM CALIPER SPECIMEN SHADE TREE

DRAWN BY: H. D.	SCALE: N.T.S.	BBY - L102
APPV'D BY: B.R.	DATE: 20-02-14	

TYPICAL BOULEVARD
(not to scale)



ELEVATION VIEW



PLAN VIEW

BOULEVARD TREE PROTECTION REQUIREMENTS

All trees on public land adjacent to demolition/ construction sites must be protected from root, stem and crown damage.

Protection fencing must be:

1) heavy gauge orange "see through" snow fence
2) securely attached to 75mm diameter round wood stakes which should be separated by no more than 2m and extend to above the height of the snow fence
3) extent from ground level to 1.3m above ground level
4) extend to the drip-line of the tree canopy with the following exceptions:
   - be 0.6m from road curb
   - be 0.3m from edge of sidewalk
5) installed **prior to** demolition/ construction activity
6) must be retained in good condition for the full term of construction activity
7) must remain free of construction materials/debris

NO.	DATE	REVISION	APP'D	BY

City of Burnaby
Parks, Recreation & Cultural Services

BOULEVARD TREE PROTECTION

DRAWN BY: H. D.	SCALE: N.T.S.	BBY - L103
APPV'D BY: B.R.	DATE: 2000-04-14	

D:Data/details/tree L103.cdr