Coquitlam

Supplementary Specifications
Master Municipal Construction Documents

MARCH 2022

The City of Coquitlam "Supplementary Specifications" are supplemental specifications to the **Master Municipal Construction Document – 2009 Edition (Platinum Book)** and take precedence over the MMCD Specifications.

Left Blank Intentionally

TABLE OF CONTENTS

This concordance relates the 2022 Supplementary Specification numbers to the 2000 Supplementary Specification numbers for reference.

Division		Section Information		
		Reference		Title
		2009	2000	
SUPPLEMENTARY SPECIFICATIONS				
01	**GENERAL REQUIREMENTS**	01 33 01S	01721	Project Record Documents
		01 55 00S	01570	Traffic Control, Vehicle Access and Parking
		01 57 01S	01561	Environmental Protection
03	**CONCRETE**	03 30 20S	02523	Concrete Walks, Curbs and Gutters
26	**ELECTRICAL**	26 56 01S		Roadway Lighting
31	**EARTHWORKS**	31 05 17S	02226	Aggregates and Granular Materials
		31 11 41S	02104	Shrub and Tree Preservation
		31 23 01S	02223	Excavating, Trenching and Backfilling
		31 23 17S		Rock Removal
		31 24 13S	02224	Roadway Excavation, Embankment and Compaction
32	**ROADS AND SITE IMPROVEMENTS**	32 11 16.1S	02234	Granular Subbase
		32 11 23S	02233	Granular Base
		32 12 13.1S	02547	Asphalt Tack Coat
		32 12 16S	02512	Hot-Mix Asphalt Concrete Paving
		32 12 17S		Superpave Hot Mix Asphalt Concrete Paving
		32 14 01S	02515	Unit Paving
		32 17 23S	02580	Painted Pavement Marking
		32 31 13S	02831	Chain Fences ad Gates
		32 91 21S	02921	Topsoil and Finish Grading
		32 92 19S	02934	Hydraulic Seeding
		32 92 20S	02933	Seeding
		32 92 23S	02938	Sodding
		32 93 01S	02950	Planting of Trees, Shrubs and Ground Covers
33	**UTILITIES**	33 01 30.1S		CCTV Inspection of Pipelines
		33 11 01S	02666	Waterworks
		33 30 01S	02731	Sanitary Sewers
		33 34 01S	02732	Sewage Force Mains
		33 40 01S	02721	Storm Sewers
		33 42 13S	02723	Pipe Culverts
		33 44 01S	02725	Manholes and Catchbasins
34	**TRANSPORTATION**	34 41 13S		Traffic Signals

SUPPLEMENTARY SPECIFICATIONS
DIVISION 01 – GENERAL REQUIREMENTS

MMCD Section 01 33 01S Project Record Documents

1.0 GENERAL

1.3	**Submission**	Delete 1.3.2 and replace with the following	Submit one copy of accurate project record documents in final form prior to applying for Substantial Performance including all video and material testing reports. Substantial Performance will not be issued until record documents have been submitted and accepted by the *Contract Administrator* and the City.

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

1.0	**GENERAL**	Add 1.0.6	The *Contractor* is responsible for all temporary traffic control on the streets required for completion of the work. The *Contractor* will be responsible to provide a Traffic Management Plan (TMP) for approval (5) five working days prior to any lane closures taking place. TMP is to be prepared by a professional certified by the American Traffic Safety Services Association. The TMP shall outline the approach to traffic management, show recognition and minimization of risks indicates signing locations, identify Traffic Control Persons (TCP) stations, show lane shifting and proposed closures. The Contractor shall ensure safe passage of vehicles, cyclists and pedestrian through the work zone.
		Add 1.0.7	A Road and Sidewalk Closure Permit is required from Coquitlam for all work affecting pedestrian and traffic flow related to construction. A permit is required for each specific construction interference with pedestrian and traffic flow. The road and sidewalk closure permit form can be obtained for use from the City's website at http://www.coquitlam.ca. The Contractor must follow the approved TMP. Any changes to this TMP must be submitted to City's Traffic Operations for approval.
		Add 1.0.8	Refer to Appendix A – Traffic Management Detail Specifications.
1.4	**Traffic Control**	Delete 1.4.1 and replace with the following	The Contractor shall conduct his operations so as to cause the minimum obstruction and inconvenience to traffic and to places of business and residences adjacent to the Place of Work. No greater quantity of work shall be undertaken at any one time than can be properly conducted with due regard to the rights and interests of the public as may be determined by the Contract Administrator. The Contractor is to provide at all times safe and convenient means of approach and entrance to adjoining lanes, driveways, buildings and property both for vehicles and pedestrians to the satisfaction of the Contract Administrator. For this purpose, he shall construct and maintain suitable and safe platforms, approaches, structures, bridges, diversions or other works.

Where traffic must cross open trenches, the Contractor shall provide suitable bridges. Where trenches have been backfilled or where road improvements are incomplete the Contractor shall take any steps necessary to prevent potholes or other traffic hazards. Where the Contract Administrator so instructs or where Contract Specifications so require, the Contractor shall provide temporary asphalt patching of such hazards.

Add 1.4.9.3.1

The *Contractor,* as required by the *Contract Administrator* and the City, is to supply Construction Zone information signs (stationary), refer to MMCD 01 58 01 for the required identification signage.

The *Contractor* is responsible for the removal of the signs at the completion of the work.

Delete 1.4.10.1.3 and replace with the following

When workmen or equipment are employed over travelled way over brow of hills, around sharp curves or at other locations where oncoming traffic would not otherwise have adequate warning.

MMCD Section 01 57 01S Environmental Protection

1.0 GENERAL

1.0.3	**Erosion and Sediment Control Supervisor**	Add 1.0.3	The Erosion and Sediment Control (ESC) Supervisor is the Qualified Professional who is experienced in implementing ESC Plans and who is responsible for the inspection and monitoring of ESC Facilities to ensure these are installed and maintained in accordance with the ESC Plan, and if necessary, are modified during construction to ensure compliance with the Stream and Drainage System Protection Bylaw No. 4403, 2013.
1.2	**Temporary Erosion and Sediment Controls**	Delete 1.2.1.1 and replace with the following	Properly drain all portions of the site. Protect the site and the watercourses to which it drains, directly or indirectly, against erosion and siltation in accordance with a Sediment Control Plan under the City of Coquitlam Stream and Drainage System Protection Bylaw No. 4403, 2013 during construction and until the maintenance period is completed. Ensure no silt, gravel, debris or other deleterious substance resulting from construction activity discharges into existing drainage systems or watercourses or onto highways or adjacent property. The *Contractor* is responsible for all damage that may be caused by water backing up or flowing over, through, from or along any part of the work or otherwise resulting from his operations. Keep existing culverts, drains, ditches and watercourses affected by the work clear of excavated material at all times. When it is necessary to remove or alter any existing drainage structure, provide suitable alternative measures for handling the drainage. Adequately support culverts and drainpipes across trenches to prevent displacement and interference with the proper flow of water due to trench settlement. Sweep streets, and clean catch basins, manhole sumps, detention tanks, and maintain siltation controls as often as the *Contract Administrator* and the City deems necessary.
		Delete 1.2.2.2 and replace with the following	Do not operate construction equipment in watercourses.
		Add 1.2.2.9	All work must be carried out during favorable and low water conditions.

		Add 1.2.2.10	Any fill used on this project shall be certified inert and from a source which is confirmed to be free of contaminants.
		Add 1.2.2.11	All work within a watercourse must be undertaken and completed in isolation of all flowing water to maintain downstream water quality and unrestricted flows.
1.4	**Environmental Protection**	Add 1.4.3.5	Immediately contain and clean up any leaks and spills of prohibited materials at the *Place of Work*.
		Add 1.4.3.6	Ensure that a well-stocked spill kit is on-site at all times and that the *Contractor*'s employees are familiar with appropriate spill response techniques. Any spill of reportable quantities must be immediately reported to the Provincial Emergency Program's 24 hour phone line at 1-800-663-3456.
		Add 1.4.3.7	Immediately notify the *Contract Administrator* and the City of any leaks or spills of prohibited materials that occur at the *Place of Work*.
		Add 1.4.3.8	Ensure that any fuel stored on-site is located at least 15 metres from the nearest stream, and is placed within a bermed and lined area, in order to prevent leaks or spills into the environment.
		Add 1.4.3.9	All equipment and machinery must be in good working condition (power washed), free of leaks or excess oil and grease. No equipment refueling or servicing shall be undertaken within a minimum of 15 metres of any watercourse or surface water drainage.
1.8	**Clean Up**	Add 1.8.2	The work will include cleaning of all catch basins within the work area, or nearby location as affected by the Work and all manholes and/or sewers affected by work done under this contract. All cleaning is to be performed by vacuum truck to the satisfaction of the Contract Administrator and will include off-site disposal of waste material.
1.9	**Archaeological / Historical Resources**	Add 1.9	Immediately cease work and inform the *Contract Administrator* and the City, if any archaeological or historical resources are encountered during construction. Leave these resources in place and do not disturb them in any way.

END OF SECTION

SUPPLEMENTARY SPECIFICATIONS
DIVISION 03 – CONCRETE

MMCD Section 03 30 20S Concrete Walks, Curbs and Gutter

2.0 PRODUCTS

2.1	**Materials**	Delete 2.1.5.1 and replace with the following	Hand-formed and hand-placed concrete: Slump: 80 mm Air entrainment: 5 to 8%. Maximum aggregate size: 20 mm. Miminum cement content: 335 kg/m3. Minimum 28 day compressive strength: 32 MPa.
		Add 2.1.7	Tactile warning surface tile shall be replaceable cast-in-place style. Truncated domes shall be in square grid pattern with a 5 mm nominal raised height, base diameter of 23 mm and top diameter of 11.5 mm. Dome spacing range shall be between 40 mm – 60 mm. Color of the panel shall be Federal Yellow (Y) per US Federal Standard 595B Table IV, Color No. 335. Minimum size of the panel shall be 600 mm by 1200 mm.

3.0 EXECUTION

3.5	**Concrete Placement**	Delete 3.5.9 and replace with the following	The *Contractor* is responsible for adjusting all utility manhole frames and valve boxes, belonging to Coquitlam and/or other agencies that are affected by the road works. All adjustments to utilities must be completed to the satisfaction of the utility owner. Riser rings will not be accepted. The *Contractor* should note that certain utility owners may decide to complete their own adjustments. The *Contractor* will be required to cooperate with any utility company providing their own adjustments. The *Contractor* shall be responsible to contact the appropriate utility company within a minimum of seventy two (72) hours of the work. No adjustment shall be made without the written approval of the utility company. All manholes must be vertically adjusted a minimum of twenty four (24) hours prior to concrete placement.
3.9	**Expansion Joints**	Delete 3.9.1 and replace with the following	Form transverse expansion joints at both ends of curb returns and at maximum spacing of 9.0 m for sidewalks, 30.0 m of curb and gutter, at each end of driveway crossing, at tangent point of circular work, and on either side of catch basins.

SUPPLEMENTARY SPECIFICATIONS
DIVISION 26 – ELECTRICAL

MMCD Section 26 56 01S Roadway Lighting

1.0 GENERAL

1.3	**Shop Drawings**	Delete 1.3.4 and replace with the following	Shop drawings for pole structures, where required, to be sealed by a Professional Engineer registered in British Columbia.
1.4	**Electrical Energy Supply**	Add 1.4.4	The Electrical *Contractor* shall process a letter of application to the City of Coquitlam for the Utility Company and attain all required permits.
1.5	**Contractor Qualifications**	Add 1.5.3	All roadway lighting installations shall be under the responsibility of a primary journeyman electrician with IMSA Level 1 Roadway Lighting Certification and have a minimum of three (3) years experience maintaining and installing street lighting systems. This primary journeyman electrician is expected to be on the work site and report work progress to City of Coquitlam's Traffic Operations staff, in addition to reporting to the *Contract Administrator*.
1.6	**Permits and Tests**	Add 1.6.4	*Contractor* shall provide the BC Safety Electrical Permit, and arrange all inspections with the City. The inspection entails, but not limited to, Coquitlam's Street Lighting Inspection Report, which can be obtained from Coquitlam's Traffic Operations staff.
		Add 1.6.5	*Contractor* to obtain approval of all buried portions of the installation from the City Inspector before any backfill is commenced.

2.0 PRODUCTS

2.1	**General**	Delete 2.1.2 and replace with the following	All products supplied to be new, in accordance with *Contract Documents*. All products are to meet Canadian Electrical Code requirements and be certified by either CSA, UL©, or Intertek Testing Systems (Warnock Hersey) and be supplied with the certifier's label.
		Delete 2.1.3 and replace with the following	All products shall be in accordance with the City of Coquitlam's List of Approved Materials and Products List. Any products not listed with in the Approved List shall default to the current BCMOTI specification.

		Delete 2.1.5 and replace with the following	Equipment models listed within the City of Coquitlam's List of Approved Materials and Products shall be confirmed with the City immediately prior to their order to ensure that they are current. Cut-sheets, equipment make, model and serial number list to be provided to the City by the *Contractor*.
2.2	**Conduit**	Add 2.2.1.3	All exposed metallic surfaces to be hot dip galvanized.
2.3	**Trench marker Tape**	Add 2.3.2	Detectable (Magnetic) marker tape shall be used in all trenches containing interconnection (communications) conduit.
2.6	**Concrete Bases**	Add 2.6.2	Maximum of four (4) conduits shall enter the base of a luminaire pole, however more than four (4) may enter a service base.
2.8	**Conductors and Cables**	Add 2.8.5	.1 Minimum conductor size to be as follows, unless specified otherwise on *Contract Drawing*: .1 No 6 AWG for feeder conductors in conduit. .2 No 8 AWG for bond conductors in conduit. .3 No 12 AWG for luminaire conductors in poles.
2.9	**Conductor Tags**	Delete 2.9 and replace with the following	Refer to the City of Coquitlam's List of Approved Materials and Products.
2.11	**Fuses and Fuse Holders**	Delete 2.11 and replace with the following	Refer to the City of Coquitlam's List of Approved Materials and Products.
2.13	**Receptacles**	Add 2.13.3	Receptacles shall have a spring loaded cast aluminum covers.
		Add 2.13.4	Refer to the City of Coquitlam's List of Approved Materials and Products.
2.14	**Luminaires**	Add 2.14.6	Refer to the City of Coquitlam's List of Approved Materials and Products.
2.19	**Service Panels**	Add 2.19.1	Type 40A 120/240V, 60A 120/240V roadway lighting and 100A 120/240V combination roadway lighting / traffic signal, per *Contract Drawing* to include items listed within the 2009 MMCD Section 34 41 13 - Traffic Signals - 2.11.2
		Add 2.19.2	Refer to the City of Coquitlam's List of Approved Materials and Products.

2.20	**Wire Anti-Theft Devices**	Add 2.20.1	Handhole access shall utilize security covers with reinforced backing bars.
3.0	**EXECUTION**		
3.1	**General**	Add 3.1.5	During the installation of the lighting system, maintain the existing system as noted on the *Contract Drawing*. If temporary or permanent relocations of related lighting equipment are required, such equipment shall be reinstated as required under the *Contract Documents* or as directed by the *Contract Administrator*.
3.3	**Concrete Bases**	Add 3.3.7	Concrete service bases detailed on Standard Detail Drawings CE1.3 and CE1.4, Type C1 and C3 service bases shall have five (5) conduits. See Coquitlam Standard Detail Drawing SS-E7.3.
		Add 3.3.8	All concrete bases shall be pre-cast concrete only, unless noted on *Contract Drawing* or directed by the *Contract Administrator*.
3.4	**Junction Boxes and Vaults**	Delete 3.4.1 and replace with the following	Install junction boxes as shown on Standard Detail Drawings E2.2 to E2.4. Install vaults as shown on Coquitlam Standard Detail Drawing SS-E2.5.
		Add 3.4.5	Bell end fittings shall be installed in all conduits entering junction boxes or vaults.
		Add 3.4.6	All junction boxes shall be provided with RPVC bars to support electrical connections and fuse holders. The RPVC bars shall be attached into the junction box side walls with the electrical connections/fuse holders tie-wrapped in place and installed in the up-right position.
		Add 3.4.7	Junction boxes requiring 3 or more sections must be approved by the City of Coquitlam's Traffic Operations staff.
3.5	**Underground Conduit**	Delete 3.5.2 and replace with the following	Minimum cover over conduits to be 600 mm in boulevard areas and 900 mm in roadway areas.
		Delete 3.5.3 and replace with the following	Place trench marker tape 300 mm above installed conduit in trench. Trench marker tape not required for conduits installed via trenchless technology.
		Delete 3.5.5 and replace with the following	Empty conduits shall have a No. 8 HB Yellow/Green Mk pull string and capped at both ends.

		Add 3.5.6	Conduit run shall contain no more than the equivalent of 4 – 90 degree bends.
		Add 3.5.7	Conduits shall be blown out with compressed air, from both ends if necessary, then swabbed out to remove stones, dirt, water and other material which may have entered during installation.
		Add 3.5.8	All conduits entering poles and cabinets shall be sealed with "Duct Seal".
		Add 3.5.9	Conduit depth of bury to be recorded when a trenchless technology method is used.
		Add 3.5.10	Conduit shall not be bent in the field. Only factory bends will be accepted.
3.7	**Electrical**	Delete 3.7.2 and replace with the following	Mount electrical service panels in service base or on poles as shown on Standard Detail Drawings E7.2, E7.6 to E7.9, as well as Coquitlam Standard Detail Drawings SS-E7.3 to SS-E7.5.
3.8	**Wiring**	Delete 3.8.3 and replace with the following	Make conductor splices in handholes. See Standard Detail Drawing E7.11 for splice details.
		Delete 3.8.6 and replace with the following	Wire each luminaire and receptacle separately from the base of pole.
		Delete 3.8.7 and replace with the following	Neatly arrange and bundle wiring in junction boxes, pole handholes and service panels. Conductor connections in all access points to be installed in the up-right position, allowing for easy access
		Delete 3.8.11 and replace with the following	Bond all luminaires and receptacles with No. 12 RW90 green conductor, and steel junction box lids with No. 8 RW90 green conductor.
3.9	**Pole Mounted Receptacle**	Delete 3.9.1 and replace with the following	Pole mounted receptacles to be installed as detailed on the *Contract Drawing* and Coquitlam Standard Detail Drawings SS-E7.19 to SS-E7.23.
3.10	**Luminaires and Photocells**	Add 3.10.4	NEMA wattage label shall be visible at the bottom of the luminaire on all fixtures.
3.11	**Grounding & Bonding**	Add 3.11.5	Ground plates and grounding conductors are to have a minimum of 5 meters clearance between them and other utility grounding.

		Add 3.11.6	Remove all paint around bonding studs on inside of pole to expose the galvanized or metal surface prior to bonding equipment.
3.13	**Pole Finish Application**	Delete 3.13 and replace with the following	.1 Prior to producing a powder finish product the supplier must provide a Certificate of Compliance indicating that they have met or exceeded the following specifications. The supplier will name their independent testing agency and this information will be submitted to the City for their files. .2 The application process will be as follows: .1 The pole or product will be hot dip galvanized. .2 Powder will only be applied after the product is completely fabricated. No welding or bending will take place after the powder is applied. .3 The pole or product will be thoroughly cleaned by brush blasting in accordance with SSPC-SP7. The brush blast will maintain a minimum profile of 0.5 mils. If brush blasting is done off site then the product will be covered and shielded from any dirt or moisture during its return to the powder applicators facility. Where poles or products are not kept clean and dry or have any signs of flash rust they will be returned for further brush blasting. .4 Once at the applicators facility the pole or product will be thoroughly cleaned and dried with an air gun. All hand marks or grease spots will be cleaned with a mild solvent. .5 After brush blasting the entire pole or product will be pre-baked in an oven at 220 degrees C for at least 30 minutes to 1 hour, depending on steel thickness. The pre-baking must be done to prevent out-gassing during the curing cycle. .6 The base powder coat will then be applied electrostatically while the pole or product is cooling from the 220 degrees C pre-bake period to allow the powder to melt and fuse to the surface. The base coat will be a minimum of 3 mils in thickness. .7 After base coat is applied and set the topcoat will be applied to a thickness of 3 to 5 mils. The pole or product will be returned to the oven and heated to 190 to 220 degrees C (temperature will not exceed pre-bake) for a minimum of 25 minutes, depending on steel thickness. Thicker product material may require longer bake cycles

to fully cure. Upon removal of the pole or product from the oven it will be left to rest until the pole or product is cool enough to the touch.

.8 Once the topcoat has cured and the poles or product cooled, they will then be individually wrapped (min 4" overlapping method) with 1/8" foam wrap over the entire pole or product. The poles or product will be bundled together and separated with suitable wood dunnage to avoid contact between the poles, product or other bundles. All bundles themselves will be fully wrapped with foam and with stretch-wrap as noted above. The poles or products will be handled and shipped with great care to prevent damage; damaged product will be cause for rejection of the item(s).

.3 Testing process will be as follows:

.1 Each run of product in an oven will have at least one sample tested for:

.2 Adhesion – The finished powder surface will have minimum pull-off strength exceeding 1000 PSI as tested in accordance with ASTM D4541.

.3 Quality – The finished powder surface will be free from any holidays (skips or misses) as tested in accordance with ASTM D4541. The product will also be free from wrinkles, orange peel, cracking, pinholes, fish eyes, blisters, etc by visual inspection.

.4 Color – The color will be verified to be within 3 DE of specialized color.

.5 An independent firm such as CanSpec Testing who are qualified to test powder finish will do the testing at the supplier's expense. The result of tests must accompany the Certificate of Compliance and will be made available to the City or their representative upon request. A supplier who fails to test product as noted above will have their product rejected until the testing is completed and the product deemed acceptable by the testing agency.

.6 Where the tested product fails on a given production run then a minimum of 30 % of the entire production run will be tested. If no other failures are found then the individual failed product will be stripped, reapplied and re-tested until it passes. If any of the 30% of

product tested fails then the entire order will be stripped, reapplied and retested until it passes.

.4 Field repairs will be undertaken as required to fix any scratches or imperfections in the final finish. Field repairs will be done as follows:

.1 Feather the damaged area with sandpaper.

.2 Clean area with solvent.

.3 Let dry.

.4 Neatly brush on an application of Aliphatic Urethane Acrylic Semi-Gloss High Build applied at 2-4 mils DFT over the entire sanded and damaged area. The ambient conditions will be dry and over 10 degrees C when the paint is applied.

.5 The pole supplier will warranty the integrity of the surface for a minimum of 1 year from the date of installation. The warranty will include all labour and materials required to provide replacement product if required. The powder finish will be the responsibility of the pole supplier. The warranty will apply to fading, blistering, cracking or chipping of the surface.

SUPPLEMENTARY SPECIFICATIONS
DIVISION 31 – EARTHWORKS

MMCD Section 31 05 17S Aggregates and Granular Materials

2.0 PRODUCTS

2.3 Pit Run Gravel

Add to 2.3.2

The use of recycled concrete shall be approved by the *Contract Administrator* and the City prior to use.

Add 2.3.3

Asphalt millings free from contaminated and other extraneous material, conforming to the specified gradations may be used as pit run gravel. The use of asphalt millings shall be approved by the *Contract Administrator* and the City prior to use.

2.7 Granular Pipe Bedding and Surround Material

Add to 2.7.1

All recycled or other extraneous materials shall be approved by *Contract Administrator* and the City prior to use.

Add 2.7.3

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.

2.10 Granular Base

Delete 2.10.2

Add 2.10.3

All 25 mm minus granular base is to conform to the following gradation specifications for Collector / Arterial Roads:

Sieve Designation (mm)	Percent Passing (%)
25	100
19	80-100
12.5	75-90
9.5	50-85
4.75	35-70
2.36	25-50
1.18	15-35
0.30	5-20
0.075	0-5

		Add 2.10.4	The intention of the Gradation Chart is to identify the desired mix of size of aggregate in the granular base. The Target Percentage Passing is the middle of the shown Range. Tests that show sieve values of Percent Passing that are consistently low or consistently high in two (2) or more consecuitive tests will be considered to be non-conforming.
2.11	**Recycled Aggregate Material**	Delete 2.11.1 and replace with the following	Aggregates containing recycled material may be utilized if approved by the Contract Administrator and the City. In addition to meeting all other conditions of the specifications, recycled material should not reduce the quality of the construction achievable with quarried materials. Recycled material shall consist only of aggregates, crushed portland cement concrete, or asphalt that is free of impurities.

MMCD Section 31 11 41S Shrub and Tree Preservation

2.0 PRODUCTS

2.1 Materials

Add 2.1.10

Protective Fencing: Posts - Pressure treated wood 100 mm dia.; Post to be 1.8 m to 2.0m in height at 2.0 m O.C. Snow fence as per Coquitlam Approved Products List; Flagging Tape - 4" Orange glow - 'Tree Retention Area'.

3.0 EXECUTION

3.1 Existing Trees

Add 3.1.7

The *Contractor* is responsible to minimize damage to all trees which are to remain.

Add 3.1.8

The *Contractor* will be responsible for all claims and costs including the cost of examination by an Arborist, repair, removal and replacement of trees, as required by the Arborist, the *Contract Administrator* and the City for tree damage where proper notification was not received from the *Contractor*. Damage will be assessed based on the International Society of Arboriculture Guidelines. The term shall be for a period of one year following the date of Substantial Performance of the *Work*.

Add 3.1.9

Place protective fencing/barricades as detailed on Coquitlam Standard Detail Drawings COQ-R26, where shown on the contract drawings. *Contractor* shall maintain fence in good condition during construction.

Add 3.1.10

When work is to be performed inside fenced areas, *Contractor* shall take care to avoid damage to existing vegetation. Work to be done inside areas of existing vegetation to be retained includes:

.1 Removal of isolated trees as directed by the *Contract Administrator* and the City.

.2 Selective pruning and tree removal at edges to create tidy and well-shaped forest edge.

.3 Placing planting soil and planting of trees.

Add 3.1.11

Do not park, service or fuel vehicles within the vegetation retention areas.

3.4 Pruning

Add 3.4.2

Do not cut roots or branches of retained trees without approval of the *Contract Administrator* and the City.

MMCD Section 31 23 01S Excavating, Trenching and Backfilling

1.0 GENERAL

1.8	**Limitations of Open Trench**	1.8.1 Replace last sentence with the following	If circumstances do not permit complete backfilling of all trenches, and where permitted by the *Contract Administrator* and the City, adequately protect all open trenches or excavations with approved fencing or barricades and, where required, with flashing lights.

2.0 PRODUCTS

2.2	**Use of Specified Materials**	Delete 2.2.1.2	Delete Pit Run Sand
		Delete 2.2.3.3	Delete Pit Run Sand

3.0 EXECUTION

3.3	**Excavation**	Delete 3.3.1.2 and replace with the following	Connections to existing waterworks systems are to be made by the *Contractor* under the inspection / supervision of the *Contract Administrator* and the City.
3.6	**Surface Restoration**	Delete 3.6.2.4 and replace with the following	Restore lawns with approved topsoil and sod to match existing lawn.
		Delete 3.6.3.1 and replace with the following	Restore surface with a minimum 100 mm of 19 mm granular road base material.
		Delete 3.6.7.5 and replace with the following	Restore Pavement as detailed on Coquitlam Standard Detail Drawing COQ-G4. Temporary patch shall be a minimum thickness of 50 mm thickness. Permanent restoration to existing asphalt thickness (minimum of 75 mm) with a 35 mm key where existing thickness permits. A 50 mm key is required on Arterial and Collector Roadways. Dry if necessary and paint clean, dry edge with asphalt emulsion (tack coat).

MMCD Section 31 23 17S Rock Removal

1.0 GENERAL

1.7 Seismic Survey and Monitoring

Delete 1.7.1 and replace with the following

Contractor will arrange for assessment of adjacent buildings and structures to determine existing conditions and will provide building and structure owners with proposed blasting procedures and copies of assessment reports and seismic recording operations.

Delete 1.7.2 and replace with the following

Cost of professional seismic survey and monitoring reports will be paid by *Contractor*.

MMCD Section 31 24 13S Roadway Excavation, Embankment and Compaction

2.0 PRODUCTS

2.2 Specified Materials

Delete 2.2.1.3 Pit Run Sand

Delete 2.2.1.4 River Sand

Delete 2.2.2

SUPPLEMENTARY SPECIFICATIONS
DIVISION 32 – ROAD AND SITE IMPROVEMENTS

MMCD Section 32 11 16.1S Granular Subbase

2.0 PRODUCTS

2.1	**Specified Materials**	Delete	2.1.1.1: Select Granular Subbase 2.1.1.2: 75 mm Pit Run Gravel 2.1.1.4: Pit Run Sand 2.1.1.5: Approved Native Material 2.1.1.7: River Sand

MMCD Section 32 11 23S Granular Base

2.0 PRODUCTS

2.1 Granular Base

Add 2.1.1.3

25 mm minus crushed gravel conforming to the gradation specifications for Collector/Arterial Roads under Section 31 05 17S – 2.10.3.

3.0 EXECUTION

3.5 Proof Rolling

Delete 3.5.1 and replace with the following

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

Add 3.5.7

Prior to paving with asphalt concrete, the base surface shall be checked by the *Contract Administrator* and the City, for deflections utilizing a Benkelman Beam, in order to insure that the final rebound requirements can be obtained with the asphalt pavement. In the event that such deflection are in excess of those required to produce the final standards, than the base shall be adequately strengthened by additional gravel or asphalt concrete to insure that final deflections as follows are not exceeded.

The Benkelman spring rebound value of the completed pavement surface shall not at any point exceed 0.75 mm for arterial industrial roads and lanes, 1.15 mm for collector roads, and 1.5 mm for local roads and lanes as determined in the procedures outlined in the Transportation Association of Canada publication "Pavement Management Guide."

MMCD Section 32 12 13.1S Asphalt Tack Coat

3.0 EXECUTION

3.2	**Application**	Add to 3.2.3	Asphalt tack coat to be applied using a truck mounted spray bar unless otherwise approved by the *Contract Administrator* and the City. Contractor shall demonstrate, to the *Contract Administrator* and the City, prior to application that all spray nozzles are operational and providing a consistent application.

MMCD Section 32 12 16S Hot Mix Asphalt Concrete Paving

1.0 GENERAL

1.1	**Related Work**	Add 1.1.8	Manholes and Catchbasins Section 33 44 01
1.6	**Inspection and Testing**	Add 1.6.3	Test cores will be taken by the *Contract Administrator* in the areas of new paving and will include cores along construction joints to ensure compliance with the required design and compaction.

2.0 PRODUCTS

2.1	**Materials**	Add 2.1.2.1	Usage of recycled asphalt shingles will not be permitted.
		Add 2.1.2.2	Usage of softening agents, rejuvenators, or recycling agents will not be permitted.
2.2	**Mix Design**	Delete 2.2.2 and replace with the following	Mix may contain up to a maximum of 15 % by mass of RAP for Upper Course Asphalt and 20 % by mass of RAP for Lower Course Asphalt without a special mix design. The *Contract Administrator* and the City may approve higher proportion of RAP if *Contractor* demonstrates ability to produce mix meeting requirements of the specification.
		Delete 2.2.3.2 Marshall Stability and replace with the following	Marshall Stability at 60°C for both lower and upper courses to be 10 KN min.

3.0 EXECUTION

3.3	**Preparation**	Delete 3.3.3 and replace with the following	The *Contractor* is responsible for adjusting all utility manhole frames and valve boxes, belonging to Coquitlam and/or other agencies that are affected by the road works. All adjustments to utilities must be completed to the satisfaction of the utility owner. Utility adjustment within the paved surface will be considered incidental to the *Work* unless otherwise noted in the *Contract Documents*. The *Contractor* should note that certain utility owners may decide to complete their own adjustments. The *Contractor* will be required to cooperate with any utility company providing their own adjustments. The *Contractor* shall be responsible to contact the appropriate utility company with in minimum of seventy two (72) hours of the work. No adjustment shall be made without the written approval of the utility company.

			All manholes must be vertically adjusted a minimum of twenty four (24) hours prior to paving. The use of riser rings for adjusting manhole frames and value boxes will not be permitted.
3.7	**Joints**	Delete 3.7.5 and replace with the following	Construct butt joints at locations as shown on the *Contract Drawing* and as directed in the field by the *Contract Administrator* and the City.

MMCD Section 32 12 17S Superpave Hot Mix Asphalt Concrete Paving

1.0 GENERAL

1.1	**Related Work**	Add 1.1.13	Manholes and Catchbasins	Section 33 44 01

2.0 PRODUCTS

2.1	**Materials**	Delete 2.1.2 and replace with the following	Reclaimed asphalt pavement (RAP): Processing quality, and use to requirements of NCHRP report 452 and Table 1, with a RAP incorporation limit of 20 % in lower course superpave HMA and 15 % in upper course-superpave HMA.
		Add 2.1.2.1	Usage of recycled asphalt shingles will not be permitted.
		Add 2.1.2.2	Usage of softening agents, rejuvenators, or recycling agents will not be permitted.
		Add 2.1.5	Asphalt cement: for Superpave™ Volumetric mix design for Asphalt Cement shall meet or exceed performance grade PG 64-22. The asphalt supplier shall be required to submit test results conforming with the PG sepecifications. All documented technical data, including softening curves and the asphalt, must be supplied to the *Contract Administrator* and the City.

3.0 EXECUTION

3.3	**Preparation**	Delete 3.3.3 and replace with the following	The *Contractor* is responsible for adjusting all utility manhole frames and valve boxes, belonging to Coquitlam and/or other agencies that are affected by the road works. All adjustments to utilities must be completed to the satisfaction of the utility owner. Utility adjustment within the paved surface will be considered incidental to the *Work* unless otherwise noted in the *Contract Documents*. The *Contractor* should note that certain utility owners may decide to complete their own adjustments. The *Contractor* will be required to cooperate with any utility company providing their own adjustments. The *Contractor* shall be responsible to contact the appropriate utility company with in minimum of seventy two (72) hours of the work. No adjustment shall be made without the written approval of the utility company.

			All manholes must be vertically adjusted a minimum of twenty four (24) hours prior to paving. The use of riser rings for adjusting manhole frames and value boxes will not be permitted.
		Add 3.3.7	A pre-paving meeting shall be conducted on-site with the paving staff, the *Contract Administrator* and the City just prior to paving to provide instruction regarding the existing grading and requirements for the paving process and the end product. The *Contractor* must provide information to the *Contract Administrator* and the City, for review, regarding proposed paving elevation control method, mat thickness control method, and rolling patterns. It will be the responsibility of the *Superintendent* to ensure continuity between the base preparation and the paving process.
3.5	**Placing**	Add to 3.5.4.3	Minimum thickness for surface course shall not be less than 50 mm.
3.6	**Compaction**	Delete 3.6.1 and replace with the following	Roll asphalt continuously to a density >93 % of the Maximum Theoretical Density of the mix. A minimum of four (4) out of five (5) consecutive density test shall meet this criteria. No individual test shall be less than 92 %. A Quality Control Plan (QCP) shall be submitted to the *Contract Administrator* and the City prior to paving which shall include full details of the paving equipment, rate of placement, proposed rolling patterns for breakdown, intermediate and finishing rollers, in-sin densite testing during and after compaction and monitoring of temperature of the asphalt mix in the trucks.
3.7	**Joints**	Delete 3.7.5 and replace with the following	Construct butt joints as shown on *Contract Drawing* and as directed in the field by the *Contract Administrator* and the City.

MMCD Section 32 14 01S Unit Paving

1.0 GENERAL

1.1 Related Work — Add 1.1.7 — Geosynthetics — Section 31 32 19

1.3 Samples — Add 1.3.2 — The *Contractor* shall install a 2m x 2m trial area for approval prior to full installation.

Add 1.3.3 — The trial area shall be retained as the standard for the project. Surcharge of the bedding sand layer, joint sizes, line, laying pattern(s), color(s) and texture of the trial panel shall be consistent throughout the job.

Add 1.3.4 — The trial area may form part of the permanent surface if approved by the *Contract Administrator* and the City. Any trial area that is not part of the final product shall be removed and properly disposed of at the contractor's expense.

1.7 Inspection and Testing — Add 1.7.2 — *Contractor* shall provide an independent quality test to be completed during construction. Testing company shall be approved by the *Contract Administrator* and the City.

Add 1.7.3 — Geotechnical assessment of subgrade is required in order to assess soil conditions and design the road structural section. Design report shall be submitted to the *Contract Administartor* and the City for approval prior to commencing work.

2.0 PRODUCTS

2.1 Materials — Delete 2.1.4 and replace with the following — Bedding sand shall conform to the following gradation limits:

Sieve Size (mm)	Percent Passing (%)
9.52	100
4.75	95 – 100
2.35	80 – 100
1.18	50 - 85
0.60	25 - 60
0.30	10 - 30
0.15	5 – 15
0.075	0 - 10

Add 2.1.7 — Concrete pavers shall conform to ASTM C939 to C982, specifications for solid concrete interlocking paving units.

		Add 2.1.8	Paver type, size and colour, shall be as indicated on the *Contract Drawing*. Paver thickness shall vary. All pavers used in driveways shall be a minimum 80 mm thick. All pavers used for boulevard or sidewalk areas shall be a minimum 60 mm thick.
		Add 2.1.9	Pigmentation of concrete pavers shall be a solid colour throughout the unit.
		Add 2.1.10	Normal weight aggregate shall be used for the concrete mix.
		Add 2.1.11	Jointing sand shall consist of at least 30% of 1 mm sand particles and shall otherwise meet the requirements for bedding sand.
		Add 2.1.12	All concrete pavers shall be sealed.
3.0	**EXECUTION**		
3.2	**Granular Subbase and Base**	Add 3.2.5	Sand, when stock piled onsite, shall be protected against the rain.
3.5	**Unit Paving**	Delete 3.5 and replace with the following	.1 Concrete pavers shall be delivered and stored on-site in metal strapping or shrink wrapped PVC. .2 Prior to installation of concrete pavers all street signs shall be installed. .3 Sand bedding shall have moisture content not less than 6% and not more than 8% prior to compaction. .4 Sand bedding shall be spread evenly over an area not greater than required to receive concrete pavers in one day and shall be protected against accidental pre-compaction and rain. .1 This bedding shall have a minimum compacted thickness of 20 mm and a maximum compacted thickness of 40 mm, and shall be graded to meet crossfalls in boulevards, sidewalks and driveways. .5 Concrete pavers shall be laid in a pattern as indicated on the *Contract Drawing*. .1 Joints between units shall not exceed 3 mm. .2 Full units shall be installed first and edge pieces fitted subsequently.

.6 Edge restraint shall be as indicated on the *Contract Drawing*.

.7 Gaps at junctions between concrete pavers and edge restraints shall be filled with purpose made or cut edge pieces. Paver shall be cut to fit other conditions. All pavers shall be cut with an approved paver guillotine or masonry cut-off saw to neatly, and accurately fit without damaged edges.

.8 Pavers shall be vibrated to their final level by having not less than 3 passes of a vibrating plate compactor.
The compactor shall be a high frequency, low amplitude unit with plate size sufficient to cover a minimum 12 pavers.

.9 After placement, jointing sand shall be spread over the paver surface and vibrated to completely fill all joints. Jointing sand shall be reinstalled after the first heavy rainstorm.

3.6 Acceptance

Add 3.6.2 All pavers must drain freely with no ponding of water.

Add 3.6.3 Defective, chipped or poorly cut pavers shall be replaced.

Add 3.6.4 Surfaces shall abut flush with adjacent materials. Surface of finished pavement shall be free from depressions exceeding 3 mm as measured with 3m straight edge.

MMCD Section 32 17 23S Painted Pavement Markings

1.0 GENERAL

1.2 Scope

Delete 1.2.1 and replace with the following

Pavement Markings: Miscellaneous taped temporary and permanent pavement paint markings including pedestrian crosswalk, merge and diverge markings, stop lines, solid and broken line road lane markings including edge lines of merge and diverge markings, bike symbols, etc. to be provided as shown on the *Contract Drawing*.

Add 1.2.2

All permanent paint markings shall be marked with thermoplastic.

2.0 PRODUCTS

2.1 Materials

Delete 2.1.1 and replace with the following

All permanent paint markings shall be marked with thermoplastic manufactured by Lafrentz Road Markings. HITEX North America (HiBrite Extrude Thermoplastic), or ENNIS-FLINT (extruded Thermoplastic).

Delete 2.1.6 and replace with the following

Pavement Markings:

Delete 2.1.7 and replace with the following

Thermoplastic material:

.1 Material composition shall be at the discretion of the manufacturer subject to the approval of the Contract Administrator and the City. Each formulation shall be identified by a code number.

.2 No retained water when tested by ASTM D-570.

.3 Specific gravity of the supplied product shall be within 3 % of that specified for the selected formulation.

.4 Material shall not deteriorate upon contact with deicing chemicals, gasoline, diesel fuel or grease dropped by traffic.

.5 Material shall not break down, deteriorate, scorch or discolour, if held within the application temperature range specified by the manufacturer for a period of four hours and it must be able to be reheated from room temperature to the application temperature four (4) times without showing any of these detrimental effects.

.6 When applied at the temperature recommended by the manufacturer and at a film thickness of 2 to

4 mm, the material shall set solid and show no tracking under traffic after elapsed times as follows:

.1 Two (2) minutes at an air temperature of 10° C, relative humidity less than 75 %, and road surface temperature from 10° C to 20° C.

.2 Five (5) minutes at an air temperature of 32° C, relative humidity less than 75 %, and road surface temperature from 35° C to 50° C.

.3 The drying time under conditions intermediate between te two air temperatures shall be interpolated using a straight line model.

.7 The quantity, type, and gradation of the component reflecting glass spheres premixed in the thermoplastic material shall be at the discretion of the manufacturer, but shall provide retroreflection levels specified below.

3.0 EXECUTION

3.3	**Application**	Add to 3.3.1.3	Temporary raised pavement markings (TRPMs) are to be provided on all multi lane roadways as directed by the *Contract Administrator* and the City.
		Delete 3.3.3.3 and replace with the following	Thermoplastic material shall be heated in the melter to a temperature of 382 °F.

MMCD Section 32 31 13S Chain Link Fences and Gates

1.0 GENERAL

1.2	**References**	Add 1.2.2	CAN/CGSB-138.1-M80, Fence, Chain Link Fabric
		Add 1.2.3	CAN/CGSB-138.2-M80, Fence, Chain Link, Framework, Zinc-Coated, Steel.
		Add 1.2.4	CAN/CGSB-138.3-M80, Fence, Chain Link Installation.
		Add 1.2.5	CAN/CGSB-138.4-M82, Fence, Chain Link, Gates.
		Add 1.2.6	CSA G164-M1981, Hot Dip Galvanizing of Irregularly Shaped Articles.
		Add 1.2.7	ASTM A90-81, Test Method for Weight of Coating on Zinc-Coated (Galvanized) Iron or Steel Articles.
		Add 1.2.8	ASTM A53-88a, Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
		Add 1.2.9	CGSB 1-GP-181M-77, Coating, Zinc-Rich, Organic, Ready Mixed.
1.4	**Samples**	Delete 1.4.1 and replace with the following	Prior to the start of the work, submit a 300 mm long powder-coated pipe sample that will be representative of the quality of the powder-coating for all powder-coated fencing materials installed as part of the *Work*.
1.6	**Inspection and Testing**	Add 1.6.2	The surface of the posts and rails will be scratch tested to ensure the finish does not flake. Finishes that flake when scratched will be rejected.
1.7	**Qualifications**	Add 1.7.1	Execute work in this Section only by a *Contractor* who has adequate equipment, skilled tradesmen, and materials to perform the work expeditiously and to the contract specifications.

2.0 PRODUCTS

2.1	**Materials**	Delete 2.1.1 and replace with the following	Fencing, posts, rails, and fabric shall be constructed as shown on the *Contract Drawing* and Specifications herein.
		Delete 2.1.3 and replace with the following	Chain-link fence fabric: to CAN/CGSB-138.1. 1. All chain link fabric shall be galvanized, vinyl coated, black, commercial and heavy grade with 50 mm openings. The widest rolls of fabric shall be employed in the construction of the appropriate fence type (i.e. 1200 mm wide rolls for 1200 mm high fencing and 2400 mm wide rolls for 2400 mm high fencing, etc.). 2. Fabric gauges, fabric opening sizes, fence heights, and post spacing shall be as follows: .1 For passive and low activity City and Park areas the chain link fence shall be: .1 1200 mm high with the post spacing 3000 mm o.c. and,

.2 Chain link fabric shall be 9 gauge (3.55 mm diameter) galvanized, vinyl coated, black, commercial grade with 50 mm openings.

.2 For high activity City and Park areas the chain link fence shall be:
- .1 1200 mm high with the post spacing 2400 mm o.c. and,
- .2 Chain link fabric shall be 6 gauge (4.50 mm) galvanized, vinyl coated, black, commercial and heavy grade with 50 mm openings

.3 For the baseball diamond backstop the chain link fence shall be:
- .1 4600 mm and higher with the post spacing 2400 mm o.c and,
- .2 Chain link fabric shall be 6 gauge (4.50 mm) galvanized, vinyl coated, black, commercial and heavy grade with 38mm openings.

.4 For the soccer playing field backstop fences the chain link fence shall be:
- .1 6000 mm and higher with the post spacing 2400 mm o.c and,
- .2 Chain link fabric shall be 6 gauge (4.50 mm) 6 gauge galvanized, vinyl coated, black, commercial and heavy grade with 38 mm openings.

Delete 2.1.4 and replace with the following

Posts and rails for all fencing locations are to CAN/CGSB-138.2, schedule 40 galvanized steel pipe and shall be powder-coated black steel pipe. No short lengths, tubing, conduit or open seam material will be permitted.

.1 Post and rail sizes shall be as follows:
- .1 For passive/active public/non-public areas which are 1200 mm or 2400 mm and higher:
  - .1 Corner and gate posts shall be 75 mm nominal outside diameter, standard continuous weld Schedule 40 powder-coated black steel pipe.
  - .2 Line posts shall be 60 mm nominal outside diameter, standard continuous weld Schedule 40 powder-coated black steel pipe.
  - .3 Top and bottom rails and horizontal braces shall be 48 mm nominal outside diameter, plain ends, continuous lengths, standard continuous weld Schedule 40 powder-coated black steel pipe.
- .2 Baseball diamond backstop which are 4600 mm and higher:

.1 Corner and line posts shall be 114 mm nominal outside diameter, standard continuous weld Schedule 40 powder-coated black steel pipe.

.2 Top, bottom, and horizontal bracing rails shall be 48 mm nominal outside diameter, plain ends, continuous lengths, standard continuous weld Schedule 40 powder-coated black steel pipe.

.3 Post extensions for the overhang shall be 75 mm nominal outside diameter, standard continuous weld Schedule 40 powder-coated black steel pipe. At connection install welded 13 mm plate steel gussets as per the drawings herein. Overhang horizontal rails and bracing shall be 48 mm nominal outside diameter, plain ends, continuous lengths, standard continuous weld Schedule 40 powder-coated black steel pipe.

.3 Soccer playing field backstop which are 6000 mm and higher:

.1 Corner and line posts shall be 89 mm nominal outside diameter, standard continuous weld Schedule 40 powder-coated black steel pipe.

.2 Top, bottom, and horizontal bracing rails shall be 48 mm nominal outside diameter, plain ends, continuous lengths, standard continuous weld Schedule 40 powder-coated black steel pipe.

Delete 2.1.5 and replace with the following	Bottom tension wire: single strand, black vinyl gated galvanized steel wire, 6 gauge (4.5mm Diameter).
Delete 2.1.6 and replace with the following	Tie wire fasteners shall be single strand, black vinyl coated galvanized aluminium or steel wire conforming to requirements of fence fabric.
Delete 2.1.7 and replace with the following	Tension bars: 4.76 x 19 mm minimum galvanized black power coated steel.
Delete 2.1.8 and replace with the following	Tension bar bands: 3 x 20 mm galvanized black powder coated steel or 5x20 mm minimum black powder coated aluminium.
Delete 2.1.9 and replace with the following	Install the chain link fence person gates and vehicle gates as shown on the *Contract Drawing*. .1 Chain Link Vehicle Gates.

.1 The vehicle gates shall not be used as a centre post. The closure device shall be operated by securing the gates together when in the closed position. The closure device shall be be operated independent of the locking pins. Closure device must accept a standard padlock.

.2 The vehicle gate is to have locking pins with locking pin aluminum sleeves recessed 25 mm into the concrete walkway to secure the gates in the open and closed positions. The top of the sleeve shall be flused with the surrounding concrete surface. The locking pin rod shall be spring-loaded so that the pin is always in the raised position unless pushed and turn locked into place, as per the drawings herein.

.3 The vehicle gate shall be to the full height of the fence and shall not be bridged with a top rail over it as to eliminate any restrictions on the height of objects passing through the gate.

.4 The vehicle gate is to operate on wheels which fully support the weight of the gate. The wheels must be suitable for use on concrete surfaces and must not mark the concrete surface.

.5 Vehicle gates shall not have signage inserts.

.6 All hinges shall be welded into place.

.2 Chain Link Person Gates.

.1 The person gates are to have clear openings of 1219 mm.

.2 The person gates shall be used as a closure device to operate by securing the gate to the gate post when in the closed position. The closure devices shall be operated independent of the locking pins. Closure device must accept a standard padlock.

.3 The person gates shall have locking pins with locking pin aluminum sleeves recessed 25 mm into the concrete walkway to secure the gates in the open and closed positions. The top of the sleeve shall be flushed with the surrounding concrete surface. The locking pin rod shall be spring-loaded so that the pin is always in the raised position unless pushed and turn locked into place, as per the drawings herein.

.4 For soccer playing field entry gates, the gates shall not have locking pins for the open positions. Field entry gates shall be able to swing 180 degrees wide and lock open by attaching to main fence line.

.5 The person gates shall be to the full height of the fence and shall not be bridged with a top rail over them as to eliminate any restrictions on the height of objects passing through the gate.

.6 All hinges shall be welded into place.

Delete 2.1.10 and replace with the following

All fastenings and fittings shall be hot dip galvanized. All caps shall be powder coated black and welded in place.

2.2 Finishes

Add 2.2.4

Powdercoating:

.1 Powdercoat all exposed surfaces. Powder coating to use powdercoat paint on acid washed surfaces. Wash and coating shall be completed on a conveyor system. Dipping is not acceptable. Finish must be baked dry. Colour shall be black except for backstop signage and signage inserts which are to have *Owner* selected custom colours.

.2 The powder-coat finish must not crack or chip when scratched tested.

Add 2.2.5

Organic zinc rich Galvicon paint coating: to CGSB 1_GP-181M shall be applied to all joints, welds and damaged areas. Two coats are required. Paint to have a high gloss finish. Use black or a custom colour as necessary to match the surrounding powder-coating.

3.0 EXECUTION

3.1 Grading

Delete 3.1 and replace with the following

.1 Remove debris and correct ground undulations along fence line to obtain smooth uniform gradient between posts.

.2 Accurately survey and layout the specified work as shown on the *Contract Drawing.*

.3 The installation procedures for all materials must be in strict accordance with the manufacturer's specifications and provide for a long-term successful installation of all materials.

3.2 Installation of Fence

Delete 3.2 and replace with the following

.1 Erect fences along lines as shown on the *Contract Drawing* and in accordance with CAN/CGSB-138.3.

.2 Space straining posts at equal intervals not exceeding 150 metres if distance between end or corner posts on straight continuous lengths of fence over reasonably smooth grade is greater than 150 metres.

.3 Install end posts at end of fence and at changes in fence alignment. Install gate posts on both sides of gate openings.

.4 Embed posts into concrete to depths indicated. Brace to hold posts in plumb position and true to alignment and elevation until concrete has set.

.5 Do not install fence fabric or pickets until concrete has cured a minimum of 5 days.

.6 Install intermediate rail between end and gate posts and nearest line post, placed in centre of panel and parallel to ground surface. Install intermediate rails on both sides of corner and straining posts in similar manner.

.7 Install and weld overhang tops and caps.

.8 Install rails between posts and weld securely to terminal posts and secure waterproof caps and overhang tops.

.9 Lay out fence fabric. Stretch tightly to tension recommended by manufacturer and fasten to end, corner, gate and straining posts with tension bar secured to post with tension bar bands spaced at 300 mm intervals. Knuckled selvedge at bottom. Twisted selvedge at top.

.10 For sport activity fencing provide clearance between bottom of fence and concrete curb neither less than 15 mm nor more than 40mm. In other areas provide 50 to 75 mm clearance between the bottom of the fence and the ground. The clearance under all rails shall be consistent.

.11 Secure fabric to rails and posts with tie wires as follows. Give tie wires a minimum of two twists.
- .1 At every knuckle for 50 mm opening mesh.
- .2 At every second knuckle for 38 mm opening mesh.
- .3 At every fourth knuckle for 25 mm opening mesh.

3.3 Removal and Re-use of Usable Existing Chainlink Fabric Add 3.3

.1 Cut tie wires and remove existing fabric. Take care not to stretch or otherwise damage the fabric. Do not re-use damage portions of existing fabric.

.2 Cut fabric to length and height as required. Ensure cut edges are properly and securely tied. Attach fabric as per the specifications herein.

.3 All surplus fabric shall be rolled up into roll sizes that are manageable by one person and handed over to the City if, requested to do so. Damaged fabric shall be disposed of off-site.

3.4 Removal and Re-use of Usable Existing Chainlink Posts and Rails Add 3.4

.1 Cut existing posts and rails taking care to maximize the usable length of the existing post or rail. Do not re-use damage posts or rails.

.2 Cut posts and rails as required. Prepare surfaces and powder-coat as per the specifications herein. Install posts and rails as per the specifications

herein. 2400 mm post spacing can be adjusted to accommodate re-used rails. Ensure that where spacing is adjusted it is consistent and in one section of fence.

.3 Dispose of damaged or surplus posts, rails, and mesh off-site.

3.5 Touch Ups Add 3.5

.1 Clean damaged surfaces with wire brush removing loose and cracked coatings. Apply two coats of black high gloss organic zinc-rich Galvicon paint to damaged areas, allowing the manufacturer's recommended drying time between coats. Pre-treat damaged surfaces according to manufacturers' instructions for zinc-rich paint.

.2 Wire brush, clean, and paint all welds with two coats of high gloss zinc rich Galvicon paint, allowing the manufacturer's recommended drying time between coats. Use paint colour that matches surrounding powder-coated surfaces.

3.6 Site clean-Up Add 3.6

Upon completion of the work remove all containers, surplus materials, and installation debris, etc. Project area must be left in a clean and orderly condition.

3.7 Maintenance Supplies Add 3.7

Upon completion of the work, the *Contractor* shall provide the *City* with maintenance materials consisting of the following.

.1 Two (2) 500 ml cans of black high gloss organic zinc-rich paint.

.2 One (1) 500 ml can of high gloss organic zinc-rich paint of each custom colour.

.3 Four (4) packages of 50 tie wires.

3.8 Protection Add 3.8

.1 The *Contractor* is responsible for the protection of all new and existing facilities from damage and/or disfiguration from the processes of the Work and from vandalism. Any damage or disfiguration must be repaired promptly and to the original condition of the facility prior to the damage.

.2 Acceptance of the repair work is at the sole discretion of the *Contract Administrator* and the City. All repairs must be completed and accepted prior to *Total Performance* of the Work being granted.

MMCD Section 32 91 21S Topsoil and Finish Grading

1.0 GENERAL

1.0 General Requirements

Delete 1.0.1 and replace with the following

.1 Section 32 91 21 refers to those portions of the *Works* that are unique to the supply, placement and finish grading of *Growing Medium*. This section must be referenced to and interpreted simultaneously with all other sections pertinent to the *Works* described herein.

For the purpose of this specification, the term *"Growing Medium"* shall mean a soil produced offsite by homogeneous blending of mineral particulates, micro organisms and organic matter which provides suitable medium for supporting intended plant growth and the term *"Topsoil"* shall mean on-site native or surface soil material which may be used as *Growing Medium* provided it meets standards set for imported material *Growing Medium* and can be modified to meet the requirements set out for specified *Growing Medium*.

Add 1.0.3

.3 For the purpose of this specification, the term *'Soil-Testing Laboratory'* shall mean an independent laboratory, recognized by the landscape nursery industry, with the experience and capability to conduct the testing indicated and that specializes in types of tests to be performed.

1.5 Inspection and Testing

Delete 1.5 and replace with the following

.1 The *Contractor* is responsible for testing imported *Growing Medium* and all related cost incurred. Testing shall be carried out by an approved *Soil Testing Laboratory*.

.2 The sample analysis shall be of tests done on the proposed *Growing Medium* from samples taken at the supply source within a minimum of 14 days in advance of *Growing Medium* placement. Allow 7 days for soil testing by the laboratory for each sample. The sample shall be picked up by the *Soil Testing Laboratory* from the supply source. The *Growing Medium* sample shall be a composite of at least three (3) samplings for the proposed source and shall be at least one (1) litre in volume.

.3 Forward a copy of all test results directly to the *Contract Administrator* and the City for review. The analysis shall outline the testing laboratory's required amendments such as sand, organic matter, fertilizers and lime to achieve adequate growing conditions.

.4 The *Contractor* shall not deliver any *Growing Medium* to the site until the test results have been reviewed and approved by the *Contract Administrator* and the City.

.5 All submitted soil analysis must be dated and include supplier name and phone number, project location and submitted to *Contract Administrator* and the City for approval prior to commencing work. Soil analysis shall include measurements of:

.1 Percent sand, fines, silt and clay
.2 Organic matter to 100%
.3 pH, acidifying additive required to achieve noted herein
.4 Water soluble salts
.5 Total carbon to nitrogen ration
.6 Total nitrogen and available levels of phosphorus, potassium, calcium & magnesium

.6 At the discretion of the *Contract Administrator* and the City submit up to two (2) additional samples, at intervals outlined by the *Contract Administrator* and the City, of *Growing Medium* taken from material delivered to the site. Samples shall be taken form a minimum of three (3) random locations and mixed to create a single uniform sample of testing. Results of these tests shall be forwarded to the *Contract Administrator* and the City for review.

.7 The *Contractor* is responsible for soil analysis and requirements for amendments to supply *Growing Medium* as specified. Failure to satisfy these contractual requirements could result in the *Contractor* being required to remove unacceptable *Growing Medium* at their expense.

.8 Notify the Contract Administrator at least forty-eight (48) hours prior to Growing Medium placement for inspection.

.9 Refer to General Conditions, Clause 4.12 Tests and Inspections.

1.6 Product Handling Add 1.6

.1 All materials to be handled and adequately protected to prevent damage. Do not handle *Growing Medium* in an excessively wet, extremely dry, frozen condition or in any manner in which structure may be adversely affected. *Growing Medium* whose structure has been damaged by handling under these conditions shall be rejected and shall be replaced by the *Contractor* at their expense.

.2 Stockpile materials in bulk form in paved areas or in pre-approved areas of the site. Provide additional protection of storage under roof or tarpaulins.

.3 Take all precautions to prevent contamination of *Growing Medium* and amendments from wind blown soil particles, weed seeds and from insects. Contamination of the *Growing Medium* and amendments may result in their rejection for use.

.4 Store fertilizer and chemical amendments in the manufacturer's original containers.

.5 All *Growing Medium* shall be delivered to site premixed from a recognized *Growing Medium* source ensuring consistency throughout the mix.

2.0 PRODUCTS Delete 2.0 and replace with the following

2.1 Materials

.1 *Growing Medium* Preparation

.1 Shall be prepared from Compost Material with Sand and other Soil Amendments as required to meet the specifications herein.

.2 Ensure commercial processing and mixing of *Growing Medium* components are done thoroughly by a mechanized screening process. Do not mix the components by hand. Ensure the resulting product is a homogeneous mixture having the required properties throughout free of stones 25 mm or larger in any dimension, woody plant parts, toxic materials, foreign object and other extraneous materials harmful to plant growth. Provide composted soil free from crabgrass, couch grass, equisetum, convolvulus, or other noxious weeds or seed or parts thereof.

.2 Inorganic Soil Amendments

.1 Sand: Imported pit sand or river pump sand, free of impurities, chemicals, horsetails, and other noxious weeds. The saturation extract electrical conductivity of salinity shall not be greater than 3.0 millimhos/cm at 25 degrees C.

Sieve Size (mm)	Percent passing (%)
4.75	95-100
0.50	0-40
0.050	0-5

.2 Fertilizers: Uniform in composition, free flowing and dry, granular, pill form, or pelleted commercial product with 50% of total nitrogen

(if applicable) derived from natural organic material in a slowly available form delivered in unopened water proof containers with the manufacturer's guaranteed N-P-K analysis, type and trade name attached to each container. The planting soil test results will specify a formulation and application rate to achieve the levels of nitrogen, phosphorous and potassium required. Fertilizer to meet the requirements of the Canada Fertilizer Act.

.1 Lime: ASTM C 602, agricultural limestone containing a minimum 80 percent calcium carbonate equivalent and as follows:

.1 Class: Class T, with a minimum 99 percent passing through No. 8 (2.36 mm) sieve and a minimum 75 percent passing through No. 60 (0.25 mm) sieve.

.2 Provide lime in form of dolomitic limestone.

.3 Perlite: Horticultural perlite, soil amendment grade.

.3 Organic Soil Amendments

.1 Compost: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through 25 mm sieve; soluble salt content of 5 to 10 decisiemens/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings; and as follows:

.1 Organic Matter Content: 50 to 60 percent of dry weight containing no cedar, redwood, wood or bark.

.2 Colour: dark brown to black in colour.

.2 Peat:

.1 Finely divided or granular texture, with a pH range of 6 to 7.5, containing partially decomposed moss peat, native peat, or reed-sedge peat and having a water-absorbing capacity of 1100 to 2000 percent.

.3 Wood Residual

.1 Content of wood residuals such as Fir or Hemlock sawdust present in the *Growing Medium* shall not cause the total carbon to total Nitrogen ration to exceed 40:1.

.2 Cedar or redwood sawdust shall not be present in *Growing Medium*.

.4 Manure

.1 Well-rotted, unleached, stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials; free of toxic substances, stones, sticks, soil, weed seed, and material harmful to plant growth and free from salt or other harmful chemicals, such as any used to artificially hasten decomposition.

.2 All particles in manure to pass a 6.35 mmm sieve.

.3 Salt content shall give a reading of less than 0.5 millimhos/cm at 25 degrees C.

2.2 Nutrient Requirements

.1 Nutrient requirements shall meet the BCSLA/BCNTA Landscape Standard *Growing Medium* requirements for nitrogen, phosphorus, potassium, calcium, magnesium, boron, sodium cation exchange capacity, carbon to nitrogen ratio.

.1 Boron: not to exceed 1.0ppm

.2 Sodium: Sodium absorption ratio(SAR) not to exceed 8.0

.3 Total Nitrogen: to be 0.2-0.4% by weight

.4 Available Phosphorous: to be 50-100 ppm

.5 Available Potassium: to be 50-70 ppm

.6 Cation Exchange Capacity: to be 30 to 50 meq.

.7 Carbon to nitrogen ratio: Maximum 40:1.

2.3 Salinity

.1 The electrical conductivity of the liquid taken from the soil pH evaluation shall not exceed 3.0 millimhos/cm at 25 degrees C before additions of fertilizers and/or liming agents.

2.4 Drainage Rate

.1 Percolation shall be such that mixing, handling and placement to be done in such a manner that the minimum saturated hydraulic conductivity show on Table – *'Growing Medium Properties for Different Applications'* (found herein these specifications) is achieved and no standing water is visible 60 minutes after at least 10 minutes of moderate to heavy rain or irrigation.

2.5 Growing Medium Source

.1 Import planting medium or manufactured planting medium from off-site sources. Do not obtain from agricultural land, bogs or marshes.

.2 Supplier of Growing Medium shall be as per the Coquitlam Approved Products List.

2.6 Bark Mulch

.1 Mulch backfilled surfaces of planting beds and other areas indicated on drawings.

.1 Organic Mulch: Apply 50 mm average thickness of organic mulch, and finish level with adjacent *Finish Grades*. Do not place mulch against plant stems.

.2 Supplier of Bark Mulch shall be as per the Coquitlam Approved Products List.

.3 Dark brown in colour and free of all soil, stones, roots or other extraneous matter, and free of weeds, seeds and spores.

2.7 Growing Medium Properties for Different Applications

Properties	Low Traffic Lawn Areas, Trees and Large Shrubs	High Traffic Lawn Areas	Planting Areas, Planters Shrubs & Groundcover
Texture: Particle size classes by Canadian System of Soil Classification	Percent of Dry Weight Mineral Fraction (%)		
Gravel (greater than 2 mm less than 75 mm)	0-10	0	0
Sand (greater than 0.05 mm and less than 2 mm)	50-70	80-90	50-70
Silt (larger than 0.002 mm and less than 0.5 mm)	10-30	5-20	10-30
Clay (less than 0.002 mm)	7-20	2-5	7-20
Organic Content Percent of Dry Weight	5-10	3-5	25-30
Drainage Minimum saturated hydraulic conductivity (cm/hr) in place	2.0	7.0	2.0
Acidity (pH)	6.0-6.5	6.0-6.5	5.0-6.0

2.8 Miscellaneous Products

.1 Root Barrier: 400x610 mm linear root barrier, copolymer polypropylene, 50% recycled plastic, black in colour. Supplier of Root Barrier shall be as per the Coquitlam Approved Products List.

.2 Construction Adhesive shall be as per the Coquitlam Approved Products List.

.3 Drain Mat: Light duty, uv stable, impermeable cuspated core bonded to a layer of non-woven filter fabric with the following minimum properties:

.1 Compressive Strength -718 kN/m2 as per ASTM D-1621

.2 Flow Rate – 188 l/min/Metre as per ASTM D-4716
.3 Approximate profile thickness of 10 mm.
.4 Supplier of Drain Mat shall be as per the Coquitlam Approved Products List.

.4 Filter Fabric: Install root barriers in accordance with manufacturer's reviewed installation instructions where indicated on reviewed drawings with vertical root directing ribs facing inwards towards trees or plants; connect panels together as required.
1. Supplier of Filter Fabric shall be as per the Coquitlam Approved Products List.

.5 Drain Rock: Shall consist of clean round stone or crushed rock. Acceptable material includes 19 mm drain rock or torpedo gravel conforming to the following gradations.

	Percent Passing	
Sieve Designation	Coarse	Fine (Torpedo gravel)
25 mm	100	
19 mm	0-100	
9.5 mm	0-5	100
4.75 mm	0	50-100
2.36 mm		10-35
1.18 mm		5-15
0.60 mm		0-8
0.30 mm		0-5
0.15 mm		0-2

2.9 Structural Soil

.1 Soil stabilizer shall be friable, containing a minimum of 4% and maximum of 6% organic matter by dry weight, free from stones and debris over 30 mm. Acidity (ph) shall be in the range 5.5-7.5. Carbon to nitrogen ratio shall not exceed 40:1, and salinity shall not exceed 3.0 milliohms at 25 deg C. Gravel greater than 2 mm shall not exceed 10% of total weight.

.2 Supplier of Structural Soil shall be as per the Coquitlam Approved Products List.

.3 *Growing Medium* to be a gap-graded mixture.

.4

Texture of Growing Media	Percentage of mixture
Gravel: greater than 2 mm-less than 75 mm	0%
Sand: greater than 0.0 5mm-less than 2 mm	max 60%
Silt: greater than 0.002-less than 0.0 5mm	max 35%
Clay: less than 0.002mm	max 15%
Clay and silt combined	max 40%
Acidity (pH)	6.0-7.0
Drainage: minimum saturated hydraulic Conductivity (cm/hr) in place	3.0
Salinity: saturated extract conductivity shall not exceed	3.0 milliohms/cm at 25 degC
Organic content: percent of dry weight	8-12%

5 Stone ballast: Clean inert stone of high angularity is preferred over washed gravel. Stone dimension

aspect ratio should be 1:1:1 with a maximum 2:1:1 length:width:depth. Single size stone, 60 mm-75 mm clear sieve designation: Blasted Quarry Rock. Aggregate to be used for structural soil shall be free of any foreign elements or material.

.6 Structural Geotextile
Shall be installed as a structural filter layer directly above the compacted structural soil mixture. Do not install fabric until adequate compaction of the structural soil mixture has been confirmed. Filter fabric shall be selected and deigned to withstand wear and tear during construction without deterioration of its strength and filtering properties.
.1 Supplier of Geotextile shall be as per the Coquitlam Approved Products List.

.7 Ground dolomite limestone containing no less than 85% of its total weight as calcium carbonate and magnesium carbonate shall be used to control ph level. The degree of grind for the limestone shall allow 100% of the total weight to pass a #10 (2 mm) sieve, 90% to pass a #18 (1 mm) sieve and 20% to pass a #40 (0.105 mm) sieve. Spread-easy fertilizer shall be used as a slow release fertilizer source of calcium and magnesium.

.8 Mixing of structural soil:
Blend as per following ratios:
.1 5 metric tones (MT) of aggregate
.2 1 cubic meter of growing media
.3 2 kg soil stabilizer

.9 Moisten mixture with fine spray of clean potable water while mixing to activate soil stabilizer product. Do not over mix. Place mixture in 300 mm lifts through entire area of structural soil mixture. Compact each lift to 95% MPD prior to placement of next lift. Install filter fabric such to ensure a minimum of 60 cm overlap of all fabric seams and beyond edge of structural soil.

3.0 EXECUTION

3.2	**Preparation of Subgrade**	Delete 3.2.4 and replace with the following	Remove debris, roots, branches, stones in excess of 50 mm diameter and other deleterious materials, soil contaminated with calcium chloride, toxic materials and petroleum products, and debris which protrudes more than 25 mm above the surface. Dispose of all removed material off site to approved offsite disposal area at no additional cost to the *Owner*.

		Delete 3.2.5 and replace with the following	Course cultivate entire area which is to receive *Growing Medium* to depth of 250mm. Cross cultivate those areas where equipment used for hauling and spreading has compacted soil.
		Add 3.2.6	Grade transitions shall be smooth and even and shall blend into surrounding areas as determined by the *Contract Administrator* and the City.
		Add 3.2.7	Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.
3.3	**Processing Growing Medium**	Add 3.3.4	*Growing Medium* shall be imported and stockpiled on site in a location approved by the *Contract Administrator* and the City. .1 Carry out stock piling operation such that the *Growing Medium* structure is not compromised through compaction, vibration or other actions. .2 Stock piled *Growing Medium* shall be protected from rain, drying and contaminants. .3 *Growing Medium* shall be free of subsoil, pests, roots, wood, construction debris, undesirable grasses including crabgrass or couch grass, noxious or weeds and weed seeds or parts thereof foreign objects and toxic materials. Presence of these contaminates shall be grounds for rejection of *Growing Medium* and replacement at no cost to the *Owner*.
3.4	**Placing Growing Medium**	Delete 3.4.2 and replace with the following	Place *Growing Medium* to the required finished grades with adequate moisture, in uniform lifts of 100 mm to 150 mm compacted to 85 MPD during dry weather, over dry, unfrozen *Sub Grade* where planting is indicated free of any standing water.
		Delete 3.4.5 and replace with the following	Minimum depths after settlement and 80% compaction: .1 Trees pits: 900 mm .2 Shrub beds: 450 mm .3 Ground cover areas: 300 mm .4 Lawn areas: 300 mm .5 Blvd. areas: 150 mm
		Add 3.4.6	Increase sand content to 90% in the planting soil below lawns where heavy wear by pedestrians or maintenance equipment is anticipated. Increase sand content in a 1.5m wide strip at the bottom of swales, banks or other wet areas and as directed by the Landscape Architect. On steep south or west facing banks, reduce sand content in lawns and planting beds to 50 - 60% for better moisture retention.

3.5	**Applying Fertilizers**	Delete 3.5 and replace with the following	.1 Addition of amendment components shall be at the rates indicated in the *Growing Medium* analysis recommendations via the following methods: .1 Lime: Applied with mechanical spreaders over entire planting areas and contained planters. .1 Do not apply by hand. .2 Mix thoroughly into the top 100 mm of *Growing Medium*. .3 Do not allow lime to come into direct contact with nitrogen - phosphate - potash fertilizers. .2 Fertilizer: Applied with mechanical spreaders over entire planting areas and contained planters. Do not apply by hand. Do not mix into *Growing Medium*.
3.6	**Finish Grading**	Delete 3.6.1 and replace with the following	Manually fine grade *Growing Medium* installation to contours and elevations shown on drawings or as directed by *Contract Administrator* and the City. Eliminate rough spots and low areas to ensure positive drainage.
		Add 3.6.3	*Finish Grade* of *Growing Medium* shall be 25 mm from finished elevation of adjacent curb or planter wall unless otherwise noted on drawings.
3.9	**Clean-up**	Delete 3.9 and add the following	.1 Ensure all paved areas, tops of planters, adjacent surfaces have been thoroughly cleaned. Ensure all discoloration of adjacent surfaces as a result of *Growing Medium* installation have been removed. .2 Dispose of materials not required and repair any damage to adjacent surfaces (as determined by the *Contract Administrator* and the City) off site at no additional cost to the *Owner*.
3.10	**Weed Control**	Add 3.10	.1 Ensure all weeds and weed roots that have germinated during the course of work of this section have been eliminated from Growing Medium. .2 Provide the City Representative and Consultant with a written outline of weed removal methodology seven (7) days prior to starting weed removal operations.
3.11	**Structural Soil**	Add 3.11	.1 Refer to 2.9 in this specification and as shown on the Contract Drawings.

MMCD Section 32 92 19S Hydraulic Seeding

1.0 GENERAL

1.3	**Scheduling**	Delete 1.3 and replace with the following	.1 Schedule all operations to ensure optimum environmental protection, grading, *growing medium* placement, planting, seeding or sodding operations as outlined in the specifications. .2 Schedule seeding to coincide with preparation of soil surface. .3 Organize scheduling to ensure a minimum of on-site storage of seed and fertilizer material, minimum movement and compaction of *growing medium*, and prompt watering operations. Coordinate work schedule with scheduling of other trades on site. .4 Plan, schedule and execute the work to ensure a supply of water for landscape purposes in adequate amounts and at adequate pressures for satisfactory irrigation of all seeded areas.
1.4	**Handling and Storage**	Add 1.4.2	Protect existing Site features against damage or contamination due to Work of this Section. Make good all damage or contamination which occurs to the satisfaction of the *Contract Administrator* and the City.
		Add 1.4.3	Deliver seeds, mulch, fertilizers, tackifier and other products to the Site in manufacturer's original containers, clearly identified. Do not remove or deface labels or other identification.
1.5	**Drainage Control**	Delete 1.5 and replace with the following	Provide for proper water management and drainage of site during work of this section. Water management shall include silt traps, erosion control measures, temporary water collection ditches, as well as their adequate maintenance to ensure that storm water which may become laden with soil or growing medium or hydraulic seed is detained and cleaned prior to discharge from site.
1.6	**Samples**	Add to 1.6.1	The *Contract Administrator* and the City may test for purity and germination.
1.7	**Site Examination**	Delete 1.7.1 and replace with the following	Examine site prior to the commencement of work to verify surface preparation is complete and has been accepted by the *Contract Administrator* and the City.

1.10 Quality Assurance

Add 1.10

.1 *Contractor* to provide seed analysis that will include but is not limited to:

- .1 Name and address of supplier
- .2 Analysis of seed mixture
- .3 Percentage of pure seed
- .4 Year of production
- .5 Date and location of bagging
- .6 Percentage germination

.2 The sample accepted by the review will form the standard by which the project will be supplied.

.3 Should the *Contractor* require the source of seed supply to change during the construction a written request must be provided to the *Contract Administrator* and the City 48 hours in advance. The request shall be followed up by submission of proposed seed supplier and substitution seed analysis for *Contract Administrator* and the City review prior to the start of supply to the site.

.4 All seed shall be delivered and stored in original containers in enclosed storage facility protected from the damage, weather, insects and rodents.

2.0 PRODUCTS

2.1 Grass Seed

Delete 2.1 and replace with the following

.1 Grass Seed shall be mixed and supplied by a recognized seed house and delivered in original containers, in accordance with Federal and Provincial seed laws having a minimum germination of 75% and minimum purity of 97%, and meet the requirements of the Government of Canada Seed Act for Canada No. 1 seed.

.2 Seed mixtures to be approved by the *Contract Administrator* in the original packaging. The seed mixture for boulevards and landscaped areas shall be made up from a minimum of three (3) varieties of Perennial Rye, one (1) of Kentucky Bluegrass and three (3) varieties of Fescue from Coquitlam Approved Products List.

- .1 Seed Mix shall be 50% Perennial Rye, 35% Fescues, 15% Kentucky Bluegrass.
- .2 Seed Rate shall be 50g per square metre.

.3 Table Guideline of Approved Seed Mix Ratios.

% Seed Count	% Weight	Seed Varieties
15%	25%	All-Star Perennial Rye Grass
5%	15%	Elka II Perennial Rye Grass
20%	15%	Cindy Creeping Red Fescue
15%	15%	Shamrock Kentuck Bluegrass
20%	10%	Cindy Lou Creeping Red Fescue
15%	10%	Longfellow II Chewing Fescue
10%	10%	Gator 3 Perennial Rye Grass
Acceptable products shall be an all purpose sun / shade mix' conforming to the above mix ratios		

2.2 Hydraulic Mulch

Delete 2.2 and replace with the following

.1 Provide hydraulic seeding solution containing a mulch of wood cellulose fibre specifically designed for hydraulic seeding containing no growth or germination inhibiting factors, and dyed green for visual metering during application.

.2 Hydraulic mulch to be capable of dispersing rapidly in water to form a homogeneous slurry and remaining in such a state when agitated or mixed with other specified materials. When applied, hydraulic mulch is to be capable of forming absorptive mat, which will allow moisture to percolate into the underlying soil and to contain no growth or germination inhibiting factors.

.3 Mulch is to be dry and free of weeds, weed seeds and other foreign material, and to be supplied in packages bearing manufacturer's label clearly indicating the weight and product name.

.4 Mulch shall contain a colloidal polythacuride (or equivalent) tackifier which is to be adhered to mulch to prevent separation during shipment and to avoid chemical agglomeration during mixing in hydraulic mulching equipment. It shall be 'M-Binder' or approved alternative.

2.3 Water

Delete 2.3.1 and replace with the following

Water shall be potable, free of impurities that would inhibit sod growth. *Contractor* to ensure adequate water is available to maintain seeded areas during germination and in a vigorously growing, healthy state until *Total Performance* of work of this section.

2.5	**Dolomite Lime**	Add 2.5	.1 Dolomite lime shall be finely ground, containing not less than 90% calcium carbonate.
2.6	**Wood Posts**	Add 2.6	.1 Wood posts shall be 38 mm x 38 mm x 1.5 m No. 1 Grade or better Hem/Fir, untreated wood.
2.7	**Binder Twine**	Add 2.7	.1 Bidner Twine shall be hemp based multiple strand string.
2.8	**Flagging Tape**	Add 2.8	.1 Flagging tape shall be 30 mm wide, biodegradable ribbon tape made of non woven cellulosic material, colour: red, or an approved equal.
3.0	**EXECUTION**		
3.1	**Finish Grade Preparation**	Delete 3.1.2 and replace with the following	Prior to the broadcast of seed *Contract Administrator* and the City to review and direct minor adjustments and refinements of finish grades prior to the *Contractor* proceeding. Review includes grades, *Growing Medium* depth and condition of finished surface. Subsequent to the *Contract Administrator* and the City review the *Contractor* shall re-grade, add *Growing Medium* and make adjustments as directed by *Contract Administrator* and the City.
		Delete 3.1.5 and replace with the following	Finish grade smooth to extent required for class of seeding to be carried out, firm against footprints, lose textured and free of all stones, roots, branches, etc. larger than 25 mm or required for removal for class of seeding to be carried out.
3.2	**Seeding-General**	Delete 3.2.1 and replace with the following	Carry out hydraulic seeding during periods which are most favourable for the establishment of a health stand of grass within the following calendar seasons: .1 Spring (April 1st to June 15th) .2 Fall (August 15th to September 30th). .3 Hydraulic seeding shall not take place during periods of rain, freezing and/or abnormally hot and dry weather.
3.4	**Protection**	Add 3.4.4	Protect all seeded areas against trespassing and from damage at all times clearly marked, staked, string and flagging tape.
		Add 3.4.5	Perimeter Protection: All seeded areas shall be surrounded by a 900 mm high barrier made up of the following components: .1 Wood posts placed at 1.8 metres on centre. .2 Wood Posts to be driven to a depth of 300 mm .3 String two (2) strands of hemp based binder twine (or equal product) between posts. Insure one full wrap of twine around each post.

.4 Tie 300 mm strands of 'red' flagging tape at 450 mm intervals along the entire length of both strands of twine.

.5 Maintain perimeter protection until *Total Performance* issued for seeded area. Upon acceptance remove perimeter fence and dispose of off site.

Add 3.4.6

Hydraulic seeded areas that have been damaged by construction operation, construction/ site personnel or construction traffic shall be replaced at no cost to the *Owners*. Replacement shall include removal of *Growing Medium*, regarding of subgrade, replacing *Growing Medium* and reseeding as required.

3.5 Application for Hydraulic Seeding

Delete 3.5 and replace with the following

.1 Thoroughly mix seed, fertilizer and hydraulic mulch in water slurry and distribute uniformly over surface with an approved hydraulic mulcher.

.2 All seeding is to be done during calm weather and on soil that is free of frost, snow, and standing water. Do not perform the work when wind exceeds 10 km/hr or when the soil is excessively dry.

.3 Measure quantities of each material to be charged into hydraulic seeder/mulcher tank accurately either in mass or by commonly accepted system of mass-calibrated volume measurements. Add materials to tank while it is being filled with water and in following sequence:

.1 Seed
.2 Fertilizer
.3 Mulch
.4 Tackifier

.4 Thoroughly mix materials into a homogeneous water based slurry and distribute uniformly over the area and, all disturbed areas, to be hydraulically seeded.

.5 Seeding Rate:

.1 Apply at 435 kg/ha or, as recommended by supplier and approved by the *Contract Administrator* and the City.
.2 Fertilizer at the following rate: Evergrow 28-3-8 @ 29g/m2
.3 Fibre Mulch at the following rate: 15kg/m2
.4 Tackifier at the following rate: 45 kg/ha.

.6 Carry out hydraulic seeding with care to ensure homogeneous slurry does not come in contact with foliage of trees, shrubs or other susceptible vegetation.

.7 Do not spray homogeneous slurry on objects not expected to grow grass.

.8 Promptly rectify any overspray or damage that occurs during hydraulic seeding.

.9 Do not leave seed, fertilize, mulch and water slurry in tank for mire than 4 hours. Slurry left in tank over maximum allowed time shall not be used for seeding and shall be disposed offsite.

.10 Follow up seeding with all maintenance procedures required to maintain the approved grades and obtain uniform germination. The *Contractor* is to carry out at no cost to the Owner, reseed operations at two (2) week intervals where germination has failed or wash outs have occurred.

3.7 Clean-up

Add 3.7.2

Flush all walks and paved areas clean to the satisfaction of the *Contract Administrator* and the City.

3.8 Grass Maintenance

Delete 3.8 and replace with the following

.1 Maintenance of hydraulic seeded areas shall begin immediately after hydraulic seeding operation and shall continue until all deficiencies noted in the *Substantial Performance* review have been rectified to the satisfaction of the *Contract Administrator* and the City and conditions for *Total Performance* been achieved. The *Contractor* is to notify the *Contract Administrator* and the City in writing forty eight hours (48) prior to stopping maintenance operations.

.2 Grass Cutting: After the 'first' cut of hydraulic seeded areas grass cutting operations shall be carried out on a weekly (seven day) basis until *Total Performance* by *Contract Administrator* and the City:

.1 First cut of seeded areas shall occur when a uniform grass height of 75 mm has been attained. First cut shall be to a height of 65 mm.

.2 Continue regular weekly cutting at a height of 50 mm until *Total Performance*.

.3 Cutting operations shall be such that each cut is at right angles to the previous cut.

.4 *Contractor* to remove grass clippings after each cut and dispose of off site.

.5 Roll when required to remove any minor depressions or irregularities.

.6 Immediately repair seeded areas that show deterioration or bare spots. Top-dress all areas showing shrinkage due to lack of watering and seed with seed mix that matches the original seed mix.

.3 Fertilizer analysis shall conform to recommendations provided with *Growing Medium* analysis. Application of fertilizer shall follow manufacturers' recommendations noting that after October 1 lawn areas shall not be fertilized until April 15th of the following spring.

.4 Hydraulic seeded lawn areas to be kept free of invasive and/or noxious broadleaf weeds, grasses including but not limited to poa annua, disease, fungi, detrimental nematodes and detrimental insects.

3.9 Conditions for Total Performance

Delete 3.9 and replace with the following

.1 Conditions for *Total Performance* of Hydraulic Seeded areas:

- .1 Hydraulic seeded areas are vigorously growing, well established with a thick, dense and healthy green appearance.
- .2 Hydraulic seeded areas shall not have any eroded or wash out areas, bare or dead spots and are free of invasive and/or noxious broadleaf weeds and grasses.
- .3 No surface *Growing Medium* is visible when established hydraulic seeded areas have been cut to height of 38 mm
- .4 Hydraulic seeded areas have been cut at least two (2) times, to a height of 38 mm a minimum of (7) days apart.
- .5 Grass is free of grass varieties other than those specified.
- .6 Grass is sufficiently established that its roots are growing into underlying *Growing Medium*.
- .7 Specified maintenance procedures have been carried out.

.2 Areas hydraulic seeded after September 30th will not be reviewed for *Total Performance* until April 30th the next year.

MMCD Section 32 92 20S Seeding

1.0 GENERAL

1.5 Drainage Control — Delete 1.5.1 and replace with the following

Provide for proper water management and drainage at *Place of Work*. Water management shall include silt traps, erosion control measures, temporary water collection ditches, as well as their adequate maintenance to ensure that storm water which may become laden with soil or growing medium is detained and cleaned prior to discharge from *Place of Work*.

1.7 Site Examation — Delete 1.7.1 and replace with the following

Examine *Place of Work* prior to the commencement of work to verify surface preparation is complete and has been accepted by the *Contract Administrator* and the City.

1.10 Quality Assurance — Add 1.10

.1 *Contractor* to provide seed analysis that will include but is not limited to:
- .1 Name and address of supplier
- .2 Analysis of seed mixture
- .3 Percentage of pure seed
- .4 Year of production
- .5 Date and location of bagging
- .6 Percentage germination

.2 The sample accepted by the review will form the standard by which the project will be supplied.

.3 Should the *Contractor* require the source of seed supply to change during the construction a written request must be provided to the *Contract Administrator* and the City 48 hours in advance. The request shall be followed up by submission of proposed seed supplier and substitution seed analyses for *Contract Administrator* and the City review prior to the delivery.

.4 All seed shall be delivered and stored in original containers in enclosed storage facility protected from the damage, weather, insects and rodents.

2.0 PRODUCTS

2.1 Grass Seed — Delete 2.1 and replace with the following

.1 Grass seed shall be Certified Canada No. 1 Grade to Government of Canada, Seeds Regulations and having minimum germination of 75% and minimum purity of 95%.

.2 Seed mixtures shall be approved by the *Contract Administrator* and the City in the original packaging. The Seed mixture for boulevards and landscaped areas shall be made up from a minimum of three (3) varieties of Perennial Rye, one (1) of Kentucky Bluegrass and three (3) varieties of Fescue from the list of approved varieties shown below:

.1 Seed Mix shall comprise of:

50% Perennial Rye: Elka II, Gator 3, Top Hat, Charismatic, All Star, Derby Supreme

35% Fescues: Cindy, Longfellow II, Cindy Lou, Quatro, Shademaster II

15%Kentucky Bluegrass: Shamrock, Broadway, Midnight, Julius, Allure

.3 Table Guideline of Approved Seed Mix Ratios

% Seed Count	% Weight	
15%	25%	All-Star Perennial Rye Grass
5%	15%	Elka II Perennial Rye Grass
20%	15%	Cindy Creeping Red Fescue
15%	15%	Shamrock Kentuck Bluegrass
20%	10%	Cindy Lou Creeping Red Fescue
15%	10%	Longfellow II Chewing Fescue
10%	10%	Gator 3 Perennial Rye Grass
Seed Rate: 50g per square metre		
Acceptable products shall be an all purpose sun / shade mix conforming to the above mix ratios		

2.2 Water — Delete 2.2.1 and replace with the following

Water shall be potable, free of impurities that would inhibit sod growth. *Contractor* to ensure adequate water is available to maintain seeded areas during germination and in a vigorously growing, healthy state until *Total Performance* of work of this section.

2.3 Fertilizer — Delete 2.3.1 and replace with the following

Fertilize shall be complete synthetic slow release fertilizer. Type and application shall be as required by the growing medium analysis report.

2.4 Wooden Posts — Add 2.4

.1 Wooden Posts shall be 38 mm x38 mm x 1500 mm long No. 1 grade or better Hem/fir, untreated wood.

2.5 Binder Twine — Add 2.5

.1 Binder Twine shall be hemp based multiple strand string.

2.6 Flagging Tape — Add 2.6

.1 Flagging Tape shall be 30 mm wide, biodegradable ribbon tape made of non woven cellulosic material, and red color, or an approved equivalent.

3.0 EXECUTION

3.1	**Finish Grade Preparation** **Add 3.2.3.1**	Delete 3.1.2 and replace with the following	Prior to the broadcast of seed *Contract Administrator* and the City to review fine grading of growing medium. Review includes grades, growing medium depth and condition of finished surface. Subsequent to the *Contract Administrator* and the City review the *Contractor* shall re-grade, add growing medium and make adjustments as directed by *Contract Administrator* and the City.
		Delete 3.1.5 and replace with the following	Finish grade smooth to extent required for class of seeding carried out, firm against footprints, textured and free loose of all stones, roads, branches, etc. larger than 25 mm or required for removal for class of seeding to be carried out.
3.2	**Seeding - General**	Delete 3.2.1 and replace with the following	Seeding operations shall be carried out in the following calendar seasons; .1 Spring (April 1st to June 15th) .2 Fall (August 15th to September 30th) .3 Seeding shall not take place during periods of rain, freezing and/or abnormally hot and dry weather.
		Delete 3.2.2 and replace with the following	Application Methods: Apply seed by Method A – Mechanical Dry Seeding or Method B – Hydraulic Seeding unless otherwise specified. Ensure Hydraulic Seeding in accordance with Section 32 92 19 – Hydraulic Seeding. Hand seeding is not recommended. Hand seed only when site conditions preclude above two methods. Do not use hand seed method unless approved by the *Contract Administrator*.
		Delete 3.2.3 and replace with the following	Seed Application: Seed rates as per seed manufacturers' recommendations and table 2.1.3. .1 Sow seed during calm weather with wind speeds less than 8 kph, using wheeled or hand held rotary broadcaster. .2 Sow half of required amount of seed in one direction and remainder at right angles. .3 Carefully incorporate seed into top of growing medium with light chain harrow or wire rakes to a minimum depth of 6 mm as seeding operation progresses or within one (1) hour after seeding. .4 Immediately after seed application roll seeded area with 90kg water ballast type lawn or agricultural roller. If seeded area becomes wet due to rain suspend rolling operations until area has dried to the point where growing medium will not adhere to the surface of the roller.
		Add 3.2.4	Watering Operation: Apply water with fine spray to avoid seed wash out. Watering procedure shall ensure

penetration of minimum 50mm into growing medium and be at sufficient duration and intervals to keep growing medium evenly moist during germination and grow in period.

Add 3.2.5

The *Contractor* shall carry out at no cost to the *Owner*, reseed operations at two (2) week intervals where germination has failed or wash outs have occurred.

Add 3.2.6

Perimeter Protection: All seeded areas shall be surrounded by a 900 mm high barrier made up of the following components:

.1 Wood posts placed at 1.8 metres on centre.
.2 Wood Posts shall be driven to a depth of 300mm
.3 String two (2) strands of hemp based binder twine (or equal product) between posts. Insure one full wrap of twine around each post.
.4 Tie 300 mm strands of 'red' flagging tape at 450 mm intervals along the entire length of both strands of twine.
.5 Maintain perimeter protection until issued *Total Performance* of seeded area by *Contract Administrator*. Upon acceptance remove perimeter fence and dispose of off site.

Add 3.2.7

Seeded areas that have been damaged by construction operation, construction/ site personnel or construction traffic shall be replaced at no cost to the *Owners*. Replacement shall include removal of growing medium, regarding of sub grade, replacing growing medium and reseeding as required.

3.6 Grass Maintenace

Delete 3.6 and replace with the following

.1 Maintenance of seeded areas shall begin immediately after seeding operation and shall continue until all deficiencies noted in the *Substantial Performance* review have been rectified to the satisfaction of the *Contract Administrator* and the City and conditions for *Total Performance* been achieved. The *Contractor* shall notify the *Contract Administrator* and the City in writing forty eight hours (48) prior to stopping maintenance operations.

.2 Maintenance shall follow the BC Landscape Standard, current edition, Level 2 'Groomed'. Over and above this maintenance protocol the *Contractor* shall monitor the application of water to the seeded areas and ensure that watering procedures are continuous.

.1 Apply water with fine spray to avoid seed wash out. Watering procedure shall ensure penetration of minimum 50mm into growing medium and be at sufficient duration and

intervals to keep growing medium evenly moist during germination and grow in period.

.2 Monitor watering on a regular interval to ensure that watering operations are not causing wash out of seeded area. Should wash outs occur as a result of watering or rain fall related wash out, reseed and continue maintenance and watering procedures.

.3 Grass Cutting: After the 'first' cut of seeded areas grass cutting operations shall be carried out on a weekly (seven day) basis until *Total Performance* by *Contract Administrator* and the City.

.1 First cut of seeded areas shall occur when a uniform grass height of 75 mm has been attained. First cut shall be to a height of 64 mm

.2 Continue regular weekly cutting at a height of 50 mm until *Total Performance*.

.3 Cutting operations shall be such that each cut is at right angles to the previous cut.

.4 *Contractor* to remove grass clippings after each cut and dispose of off site.

.5 Roll when required to remove any minor depressions or irregularities.

.6 Immediately repair seeded areas that show deterioration or bare spots. Top-dress all areas showing shrinkage due to lack of watering and seed with seed mix that matches the original seed mix.

.4 Fertilizer analysis shall conform to recommendations provided with growing medium analysis. Application of fertilizer shall follow manufacturers' recommendations noting that after October 1 lawn areas shall not be fertilized until April 15th of the following spring.

.5 Seeded lawn areas shall be kept free of invasive and/or noxious broadleaf weeds, grasses including but not limited to poa annua, disease, fungi, detrimental nematodes and detrimental insects.

3.7 Conditions for Total Performance

Delete 3.7 and replace with the following

.1 Conditions for *Total Performance* of Seeded areas:

.1 Seeded areas are vigorously growing, well established with a thick, dense and healthy green appearance.

.2 Seeded areas shall not have any eroded or wash out areas, bare or dead spots and are free of invasive and/or noxious broadleaf weeds and grasses.

.3 No surface growing medium is visible when established seeded areas have been cut to height of 38 mm

.4 Seeded areas have been cut at least two (2) times, to a height of 38 mm a minimum of (7) days apart.

.5 Grass shall be free of grass varieties other than those specified.

.6 Grass shall be sufficiently established that its roots are growing into underlying growing medium.

.7 Specified maintenance procedures have been carried out.

.8 Areas seeded after September 30th will be not be reviewed for *Total Performance* until April 30th the following year.

MMCD Section 32 92 23S Sodding

1.0	**GENERAL**	Delete 1.0.2 and replace with the following	This section is based on the "British Columbia Landscape Standards and the B.C. Nursery Trades Association. This standard is intended to set a level of quality which is equaled or bettered in the construction documents.
1.4	**Handling and Storage**	Delete 1.4.3 and replace with the following	Schedule sod deliveries such that sod installation occurs within twenty-four (24) hours of being lifted from the source sod farm.
		Delete 1.4.4 and replace with the following	Sod shall be neatly stacked or rolled at the source sod farm, delivered and unloaded on sturdy pallets which are no more than 3 pallets high.
1.5	**Drainage Control**	Delete 1.5.1 and replace with the following	Provide for proper water management and drainage of site during work of this section. Water management shall include silt traps, erosion control measures, temporary water collection ditches, as well as their adequate maintenance to ensure that storm water which may become laden with soil, growing medium or hydraulic seed is detained and cleaned prior to discharge from *Place of Work*.
1.6	**Samples**	Add 1.6.2	Submit one (1) square metre of sod to the *Contract Administrator* and the City for review. Ensure sample is complete with name of sod farm, base soil type, seed mix percentage.
		Add 1.6.3	*Contract Administrator* and the City shall review sod sample for approval prior to installation. The sample accepted by the review will form the standard by which the project will be supplied.
		Add 1.6.4	Should the *Contractor* require the source of sod supply to change during the construction a written request must be provided to the *Contract Administrator* and the City 48 hours in advance. The request shall be followed up by submission of proposed sod substitution sample and include the name of sod farm, base soil type, seed mix percentage for *Contract Administrator* and the City review prior to the delivery.

2.0 PRODUCTS

2.1 Sod

Delete 2.1.1 and replace with the following

Sod to be approved by the *Contract Adinistrator* and the City and to be nursery grown, true to type, conforming to standards of nursery Sod Growers' Association and their Nursery Sod Specifications. Sod to be quality, cultured turf grass grown from seed approved by Canada Department of Agriculture, free of disease, clovers, stones, pests and debris.

Add 2.1.1.1

Nursery sod:

.1 Shall be No. 1 Premium grade and contain only species of grass indicated on the supplier's certificate.

.2 Sod shall be 'non-netted'

Add 2.1.1.2

Table Guideline of Approved Sod Mix Ratios

Supreme Soil Base Sod	
(Elka II) Perennial Ryegrass	40%
(Shamrock) Kentucky Bluegrass	30%
(Cindy) Chewing Red Fescue	30%
Seed Rate: 50g per square metre	

Add 2.1.8

All sod shall be completely free of invasive and/or noxious broadleaf weeds, grasses including but not limited to poa annua, disease, fungi, detrimental nematodes and detrimental insects.

2.2 Water

Delete 2.2.1 and replace with the following

Potable, free of impurities that would inhibit seed germination. *Contractor* to ensure adequate water is available to maintain seeded areas during germination and in a vigorously growing, healthy state until *Total Performance* of work of this section.

2.3 Fertilizer

Add 2.3.2

Fertilizer shall be complete synthetic slow release fertilizer. Type and application shall be as required by the growing medium analysis report.

2.4 Wooden Pegs

Add 2.4

.1 Wooden Pegs shall be 19 mm x 19 mm x 150 mm long No. 1 grade or better Hem/fir.

2.5 Binder Twine

Add 2.5

.1 Binder Twine shall be hemp based multiple strand string.

2.6 Flagging Tape

Add 2.6

.1 Flagging Tape shall be 30 mm wide, biodegradable ribbon tape made of non woven cellulosic material, and red color, or an approved equivalent.

3.0 EXECUTION

3.1 Finish Grade Preparation

Delete 3.1.2 and replace with the following

Prior to the placement of sod *Contract Administrator* and the City to review and direct minor adjustments and refinements of finish grades prior to the *Contractor* proceeding. Review includes grades, growing medium depth and condition of finished surface. Subsequent to the *Contract Administrator* and the City review the *Contractor* shall re-grade, add growing medium and make adjustments as directed by *Contract Administrator* and the City.

Delete 3.1.5 and replace with the following

Fine grade growing medium to lines and levels shown on Contract Drawings. Ensure that all low spots, humps and irregularities are eliminated prior to review by *Contract Administrator* and the City.

3.2 Sodding

Delete 3.2 and replace with the following

.1 Sod shall not be placed during hot dry summer periods, at freezing temperatures, or over frozen growing medium.

.2 Allow sod to dry sufficiently during wet weather to prevent tearing during lifting and handling.

.3 Handle sod carefully to minimize tearing and dropping of soil.

.4 Placement of Sod:

- .1 Lay sod in rows smooth and flush to adjoining grass areas and paving and top surfaces of curbs unless shown otherwise on *Contract Drawing*. Ensure there is a full roll width between the new sod and any adjoining surfaces. Small cut pieces from a full roll will not be accepted.
- .2 Stagger joints and ensure that sod sections are butted closely together without overlapping or leaving gaps between sections.
- .3 Cut out irregular or thin sections with a sharp knife.
- .4 Cut sod to fit tight around landscape elements.
- .5 Cut sod to create clean, smooth lines along all plant beds.

.5 Placement of Sod on Slopes:

- .1 Lay sod with the length of each sod section parallel to slope taking extra care to ensure that sod sections are butt tight and each sod section is set in a staggered formation.
- .2 On slopes exceeding 3:1 gradient ensure sod is secured with wooden pegs at intervals of not more that 450 mm along the center of each

section. Ensure wooden pegs are driven flush with the sod.

.3 Prior to acceptance of sod areas that have been secured with wooden pegs either remove the wooden pegs or drive each wooden peg at least 50 mm below finished grade.

.4 Where required, place erosion control mesh or netting and secure with stakes or staples sunk firmly into ground to a minimum depth of 150 mm at maximum intervals of 4 meters along pitch of slope. Place stakes or staples horizontally across slope at intervals equal to width of mesh or netting minus 150 mm and drive flush with top of sod.

.6 Use a light roller to ensure that there is full, close contact between sod and growing medium. Use of a heavy roller to correct irregularities in grade is not permitted.

.7 Ensure all sodded areas are watered immediately after installation. Verify that water applied to has penetrated through sod into top 100 mm of growing medium. Continue watering operations as needed to ensure that adequate moisture content is maintain to encourage deep root growth and healthy, vigorous leaf growth.

.8 Protect newly placed sod from heavy foot traffic during installation and until acceptance by the *Contract Administrator* and the City. Protection shall include but is not limited to placement of wood planks or plywood of sufficient thickness to bear the imposed weight and prevent damage to sod or displacement and/or compaction of sod/growing medium.

.9 Sod that has been damaged by construction operation, construction / site personnel or construction traffic shall be replaced at no cost to the *Owner*. Replacement shall include removal of growing medium, regarding of sub grade, replacing growing medium and sod as required.

.10 Water sod area immediately with sufficient amounts to saturate sod and upper 100 mm of growing medium. Do not allow the sod to dry out so that the joints become visible.

3.4	**Grass Maintenance**	Delete 3.4 and replace with the following	.1 Maintenance of sodded areas shall begin immediately after sodded operation and shall continue until all deficiencies noted in the *Substantial Performance* review have been rectified to the satisfaction of the *Contract Administrator* and the City and conditions for *Total Performance* have been achieved. The *Contractor* is to notify the *Contract Administrator* and the City in writing forty eight hours (48) prior to stopping maintenance operations. .2 Sod Cutting: After the 'first' cut of sodded lawn areas cutting operations shall be carried out on a weekly (seven day) basis until *Total Performance* by *Contract Administrator* and the City: .1 First cut of sodded lawn areas shall occur when a uniform grass height of 75 mm has been attained. First cut shall be to a height of 65 mm. .2 Continue regular weekly cutting at a height of 65 mm until *Total Performance*. .3 Cutting operations shall be such that each cut is at right angles to the previous cut. .4 *Contractor* to remove grass clippings after each cut and dispose of off site. .5 Roll when required to remove any minor depressions or irregularities. .6 Immediately repair seeded areas that show deterioration or bare spots. Top-dress all areas showing shrinkage due to lack of watering and seed with seed mix that matches the original seed mix. .3 Fertilizer analysis shall conform to recommendations provided with growing medium analysis. Application of fertilizer shall follow manufacturers' recommendations noting that after October 1 lawn areas shall not be fertilized until April 15th of the following spring. .4 Sodded lawn areas shall be kept free of invasive and/or noxious broadleaf weeds, grasses including but not limited to poa annua, disease, fungi, detrimental nematodes and detrimental insects. .5 All maintenance equipment and practices are to conform to the BC Landscape Standard Level 2 'Groomed'. .6 Protect all sodded areas against trespassing and from damage at all times clearly marked, staked, string and flagging tape.

.1 Perimeter Protection: Where directed by the *Contract Adinistrator* and the City, sodded areas shall be surrounded by a 900 mm high barrier made up of the following components:
- .1 Wood posts placed at 1.8 metres on centre.
- .2 Wood Posts to be driven to a depth of 300mm.
- .3 String two (2) strands of hemp based binder twine (or equal product) between posts. Insure one full wrap of twine around each post.
- .4 Tie 300 mm strands of 'red' flagging tape at 450 mm intervals along the entire length of both strands of twine.
- .5 Maintain perimeter protection until *Total Performance* issued. Upon acceptance by *Contract Administrator* and the City, remove perimeter fence and dispose of off site.

3.5	**Condition for Total Performance**	Delete 3.5.1 and replace with the following	Conditions for *Total Performance* of Sodded areas: .1 Sodded areas exhibit fully established root systems. .2 No seams are visible between sod sections. .3 Sod areas are smooth and evenly graded. No depressions, foot marks or vehicle tracks. .4 Sod is free of bare and dead spots and does not have any broadleaf weeds, noxious grasses including but not limited to poa annua. .5 No surface growing medium is visible when grass has been cut to height of 65 mm. .6 Sodded areas have been cut a minimum of two (2) times, at seven (7) day intervals. .7 Sodded areas are a uniform green colour with no discoloured sections or patches. .8 Sodded areas exhibit a thick, dense, uniform and healthy appearance.
		Add 3.5.2	Lawns sodded after September 30th will be not be reviewed for *Total Performance* until April 30th the next year.
3.6	**Guarantee / Maintenance**	Delete 3.6.1 and replace with the following	The *Contractor* hereby guarantees that the sod will remain free of weeds and defects for a period of one (1) year from the date of *Substantial Performance*. The *Contractor* shall make all corrections, adjustments and replacements required as a result of failure of all products in this section. During the *Maintenance Period*, the *Contractor* will replace sodded areas, determined by

	Contract Administrator and the City, to be dead or failing at the end of the *Maintenance Period*. Replacements to be made at next appropriate season and, conditions of guarantee will apply to all replacement seeding for one full growing season.
Delete 3.6.2 and replace with the following	The Owner reserves the right to extend the *Contractor*'s *Maintenance Period* and responsibilities for one (1) additional year if, at end of the initial guarantee period, the development and growth of the sod is not sufficient to ensure future survival.

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

1.0	**GENERAL**	Delete 1.0.1 and replace with the following	Section 32 93 01 refers to those portions of the Work that are unique to the sourcing, supplying, placing and maintaining the plant material indicated on the *Contract Drawing* and the Plant List(s). This section must be referenced to and interpreted simultaneously with all other sections pertinent to the Work described herein.
1.2	**References**	Delete 1.2.2 and replace with the following	Canadian Nursery & Landscape Association (CNLA) Standard for Nursery Stock (current edition).
		Add 1.2.4	The British Columbia Landscape & Nursery Association (BCLNA).
		Add 1.2.5	ANSI A-300 Tree Pruning Guidelines
1.3	**Source Quality Control**	Delete 1.3 and replace with the following	.1 Seven (7) days prior to the *Contract Administrator* and the City review of plant material at source the *Contractor* shall confirm in writing availability of plant material noted on plant list. .2 Plant material will be supplied from nurseries who are certified by the Clean Plants program, Canadian Nursery Certification Institute (CNCI), current certification standard http://cleanplants.ca/. The certification shall include but is not limited to the requirements of the current active module(s), e.g. P. Ramorum module. The certification must extend to all fields and allied nursery operations where plant material is sourced. Only nurseries, fields and allied nursery operations that are certified will be permitted to supply plant material for this project. .1 Prior to the review of plant material by the *Contract Administrator* and the City the *Contractor* shall submit written documentation with CNCI certification stamp stating that the nursery has undergone all components of a certification program and has been audited to verify that all components are properly implemented. .2 The documentation submitted shall include but is not limited to the nurseries CNCI Clean Plants certification number.

.3 Plant Material Review at the source nursery.
- .1 *Contractor* shall request for review of the plant material at source nursery to be a minimum of seven (7) days prior to scheduled review.
- .2 Shipping of plant material to the *Place of Work* shall not proceed until *Contract Administrator* has reviewed the plant material at the source nursery.
- .3 *Contract Administrator* and the City shall make one (1) visit to source nursery for review of plant material for entire project.
- .4 All plant material, including substitutions shall be gathered at one location for review.
- .5 *Contractor* shall accompany *Contract Administrator* during plant material review at the source nursery.

.4 Plant Material Review at the *Place of Work*
- .1 All plant material shall be reviewed at the *Place of Work* by the *Contract Administrator* and the City prior to planting.
- .2 Plant material that is rejected by the *Contract Administrator* shall be immediately removed from the *Place of Work* and replaced at the *Contractor`s* expense.

.5 Imported Plant Material
- .1 Plant material imported from out of province and out of country shall be accompanied with necessary federal and provincial permits and import licenses.
- .2 The *Contractor* shall conform to all federal and provincial laws and regulations with regard to horticultural inspection of domestic and imported plant material.

.6 Condition of Plant Material
- .1 Plant rootballs and containers shall be completely free of noxious weeds and volunteer plants including Horsetail and Morning Glory.
- .2 Plant materials grown or supplied in Fabric Containers are not acceptable.

.7 All materials and execution to conform to the latest edition of the BCNTA Guide Specifications for Nursery Stock and the BCNTA Guide Specifications for Landscape Construction.

1.4 Submittals and Scheduling

Delete 1.4 and replace with the following

.1 Submit inspection certificates as required by law for each shipment of plant material.

.2 *Contractor* shall provide in writing to the *Contract Administrator* and the City a minimum of seven (7) days prior to review of plant material at the source nursery a plant list confirming the quantity, botanical name, common name and size of plants specified.

.3 Substitutions

- .1 *Contractor* shall provide in writing to the *Contract Administrator* and the City a minimum of seven (7) days prior to review of plant material at the source nursery a list of proposed substitutions for review.
- .2 Plant substitutions shall be of similar genus and species and of equal or greater size as those originally specified. The list shall contain the following information:
  - .1 Botanical name, common name of the specified plant
  - .2 Botanical name, common name of the proposed substitute plant
  - .3 Pot size and plant size in the nursery

.4 Planting Schedule

- .1 *Contractor* shall provide in writing to the *Contract Administrator* and the City upon award of the *Contract* a detailed Planting Schedule outlining dates and duration of planting operations.
- .2 Revisions to the Planting Schedule as a result of delays of any kind shall be submitted to the *Contract Administrator* and the City in a timely manner prior to the start of planting operations.
- .3 Schedule all planting to ensure optimum environmental protection, grading, growing medium placement, planting, seeding, or sodding operations as outlined in these Specifications. Organize scheduling to ensure a minimum duration of on-site storage of plant material, minimum movement and compaction of growing medium, and prompt mulching and watering operations. Coordinate Work schedule with schedule of other trades on-site.
- .4 Coordinate and schedule plating such that no damage occurs to plant material before and after placement. In particular, meet requirements of living plant material.

.5 Product Data

.1 *Contractor* to submit a one (1) litre sample of Composted Mulch to the *Contract Administrator* and the City for review prior to delivery.

.2 *Contractor* to submit a one (1) litre sample of the Prepared Growing Medium to the *Contract Administrator* and the City for review prior to delivery.

.3 *Contractor* to submit three (3) copies of the anti-desiccant manufacturer product data and specification for *Contract Administrator* and the City review.

.4 *Contractor* to submit three (3) copies of the fertilizer manufacturer product data and specification for *Contract Administrator* and the City review.

.5 *Contractor* to submit three (3) copies of the Guying assembly including clamps, collar, guying wire, anchors and wire tighteners manufacturer product data and specifications for *Contract Administrator* and the City review.

1.5 Handling and Storage

Delete 1.5 and replace with the following

.1 Coordinate shipping of plant material and excavation of planting pits to ensure minimum time lapse between nursery digging and on site planting.

.2 Ensure branches of trees and shrubs are bound securely into a confined mass during handling and transport.

.3 Do not bind planting stock with rope or wire that would damage bark, break or damage branches or damage the natural shape of the plant.

.4 Protect plant material against abrasion, and exposure to extreme temperature change during transit.

.5 Cover plant foliage and branches with tarpaulin to prevent loss of moisture during transit.

.6 Fully support root ball of large trees during all lifting operations.

.7 Do not lift trees or shrub by the trunk or branches. Plant material to be moved by lifting the root ball or container.

.8 Remove broken and damaged roots with clean cuts using sharp pruning shears.

.9 Temporary Storage/ Heel-In of Plant Material onsite

.1 Temporarily store trees, shrubs and miscellaneous plant material that can not be planted immediately by heeling-in. Acceptable heel-in material include approved growing medium or sawdust.

.2 Ensure temporary storage/heel-in area is shaded and protected from the wind.

.3 Provide sufficient water at regular intervals to ensure health of plant material in the temporary storage/heel-in area.

.4 Plant material that has not been properly maintained in the storage/heel-in area and illustrates signs of degradation or stress will be rejected by the *Contract Administrator* and the City. Rejected plant material shall be replaced by the *Contractor*.

1.11 Substitutions Add 1.11

.1 If it is impossible to obtain the particular plant material listed on the Landscape Drawing, the *Contractor* may be permitted to suggest substitutions with types and variations possessing the same characteristics. The *Contractor* must request any substitutions of trees in writing at least one (1) month and shrubs and groundcover at least one (1) month prior to planting. Substitutions must be approved by the *Contract Administrator* and the City.

1.12 Plant Material Supply and Search Area Add 1.12

.1 Before substitutions of plant material are proposed, documented proof that materials are not available through search on the west coast of Canada and United States must be provided. Area of supply shall include, but not be limited to, all of Western North America.

1.13 Plant Material Identificaton Add 1.13

.1 Plant material that has been located by the *Contract Administrator* and the City and tagged for the project is to have the identification tags removed only after inspection and instruction by the *Contract Administrator* and the City after delivery to the *Place of Work*.

1.14 Plant Material Replacement Add 1.14

1. The *Contractor* shall remove from the *Place of Work* and immediately replace any plant material that has been determined by the *Contract Administrator* and the City to have died or failed to grow in a satisfactory manner during the guarantee or maintenance period.

.2 The *Contractor* shall extend the guarantee on this replacement plant material for one (1) year from the date of replacement.

.3 The *Contractor* shall continue such replacement and guarantee of plant material until the *Contract Administrator* and the City has determined that the *Conditions for Total Perfomance* have been met.

.4 All required replacements shall be plants of the same size and species as specified on the plant list and shall be supplied and planted in accordance with the drawings, specifications and change orders thereto.

.5 The cost of replacements resulting from theft, accidental damage, vandalism, carelessness, neglect on the part of others, shall be borne by the *Contractor* until the date of *Substantial Performance*.

2.0 PRODUCTS

2.1 Plant Material — Delete 2.1 and replace with the following

.1 Plant Material Size
- .1 Overall plant spread to be measured when branches are in their natural position.
- .2 Height and spread dimensions refer to main body of plant and not from branch tip to branch tip.

.2 Grade of plant material to be No. 1 grade or better.

.3 Plant material obtained from areas with milder climatic conditions from those of the *Place of Work* is acceptable provided:
- .1 Plant material is moved to the *Place of Work* prior to the breaking of buds at their original climatic zone.
- .2 Plant material is heeled-in at a protected area until the climatic conditions are suitable for planting.

.4 Plant material shall have structurally sound, strong fibrous root system free of disease, insects, defects or injuries. All plants, typical of their species or variety, have a normal habit of growth and shall be first quality, sound, healthy, vigorous, well branched, and densely foliated, free of disease, insect pests, eggs or larvae.

.5 Root Pruning at Source Nursery
- .1 Plant material shall have been root pruned on a regular basis at the source nursery.

.2 Plant material shall be root pruned at least one growing season prior to delivery.

.3 Large trees shall be half root pruned during each of two successive growing seasons. The second root pruning shall have carried out a minimum of one growing season prior to delivery.

.6 Shade, Ornamental and Evergreen Trees:

.1 Trees shall have straight trunks and a well-formed branch system which is characteristic of the species

.2 Trees shall exhibit clear signs of vigorous growth.

.3 Trees shall have good twig extension growth, branch spacing and trunk taper.

.4 Tree foliage shall be evenly distributed on upper 2/3 of the tree.

.5 Trees shall not have upright branches other than leaders.

.6 Trees shall have spreading branches with a single trunk and a single leader and, unless otherwise noted on plans or plant list.

.7 Tree trunks and branches shall not have any mechanical damage.

.8 Trees shall be in good health with no presence of insects or disease.

.9 Trees shall not have been 'headed back'.

.10 Tree root balls shall be solid, kept moist at all times and/or protected from drying.

.11 Trees shall not exhibit symptoms of root circling or girdling.

.7 Container Grown Plant Material:

.1 Root ball to container relationship shall be of sufficient ratio to ensure room for healthy, vigorous root development.

.2 Plant material shall have been container grown for a minimum of one (1) growing season but not longer than two (2) growing seasons.

.3 The plant root systems that do not have the ability to "hold" growing medium when removed from the container will be rejected.

.4 Root bound plant material will be rejected.

.8 Balled and Burlapped Plant Material:

.1 Coniferous and broadleafed evergreens over 2.4 metre tall shall be dug with firm soil root ball.

.2 Deciduous trees in excess of 3.0 metre height shall be dug with firm soil root ball.
.3 Root ball diameter shall be a minimum of 230 mm (for each 25 mm caliper size.
.4 Secure root-balls with burlap, heavy twine and rope.
.5 Large tree root balls shall be double layer burlap wrapped. Burlap to be secured with drum laces made up of 10 mm (minimum) diameter rope.

.9 Tree Spade Dug Plant Material
.1 Plant material shall be dug with mechanized hydraulic spade or clamshell type digging equipment.
.2 Root ball diameter shall be a minimum of 230 mm for each 25 mm caliper size.
.3 Wire basket shall be lined with burlap. Root ball shall be laced and tied to wire basket with heavy rope.
.4 Ensure trunk of tree is not damaged by wire basket, ties or rope.

2.2	**Water**	Delete 2.2.1 and replace with the following	Potable and free of minerals and impurities which are detrimental to plant growth.
2.3	**Fertilizer**	Add 2.3.2	Fertilizer shall be prolonged-release fertilizer tablets containing a minimum of 20% nitrogen, 10% phosphoric acid, and 5% potash (20-10-5) as per Approved Products List. Store in weatherproof storage space.
2.4	**Mulch**	Delete 2.4.1 and replace with the following	Composed mulch shall be 9 mm black/brown in colour with no cedar or redwood bark or wood material as per Approved Products List.
2.5	**Stakes**	Delete 2.5.1 and replace with the following	Stakes shall be prressure treated Hem/Fir, 75 mm dia. round, 2500 mm long. Stake fasteners shall be hot dipped galvanized or stainless steel.
2.8	**Guying Wire**	Delete 2.8.1 and replace with the following	Guyingwire shall be direct burial or screw type disc guy anchor and guy system as per Approved Products List.
2.11	**Anti-Desiccant**	Delete 2.11.1 and replace with the following	Anti-Desiccant shall be wax-like emulsion, as per Approved Products List, that will provide a transpiration reducing film over the plant surface.

2.12	**Flagging Tape**	Delete 2.12.1 and replace with the following	Flagging tape shall be 30mm wide 'Red' PVC flagging tape as per Approved Products List.	
2.13	**Tree Trunk Protection**	Add 2.13	.1	Tree trunk protection shall be extrusion mold process, polyethylene with UV protectors as per Approved Products List.
2.14	**Burlap**	Add 2.14	.1	Burlap shall be untreated, free from toxic contaminants and of sufficient strength to hold the rootball in a compact, stable mass that does not move relative to the main stem(s) of the tree or shrub.
2.15	**Wire Baskets**	Add 2.15	.1	Wire baskets shall be non-galvanized metal basket designed and manufactured for the purpose of tree moving. Basket shall be shaped to ensure that the root ball will allow a stable planting condition in accordance with standards noted.
2.16	**Tree Ties**	Add 2.16	.1	Tree ties shall be Flat woven polypropylene material. 20 mm wide, 544 Kg, break strength. extrusion mold process, polyethylene with UV protectors as per Approved Products List.
3.0	**EXECUTION**			
3.1	**Pre-Planting Operations**	Delete 3.1 and replace with the following	.1	Place stakes on site to identify location trees, shrubs and plant beds in accordance to the Landscape Plans.
			.2	*Contract Administrator* and the City to review all tree locations and plant bed layout prior to start of plant bed preparation and planting operation.
			.3	Anti-desiccant shall be applied only as directed by the *Contract Administrator* and the City. Application of anti-desiccant shall be in accordance with manufacturer's instructions.
			.4	Coordinate planting operations with other trades and project schedule.
			.5	All planting operations shall be done in a timely manner in accordance to the Planting Schedule.
			.6	Planting Schedule shall be updated as required by the *Contractor* to coincide with status of site and coordination with other trades. Provide the *Contract Administrator* and the City with updates to the schedule as required throughout the planting process.

3.2	**Subgrade Preparation**	Delete 3.2 and replace with the following	.1 The *Contractor* is responsible for confirming the location and extent of existing utilities prior to the start of all planting operations. All attempts should be made to ensure that utility services are maintained to all on and off site parties through out the entire planting operation. 2. Tree Pits .1 Tree Pit Depth 900 mm minimum. .2 Width of tree pit shall be a minimum of 450 mm to 600 mm greater than diameter of the root ball. .3 Prior to the placement of growing medium scarify the sides and bottom of tree pits created with a tree spade to eliminate glazed surface. .3 Ensure tree pits dug in heavy or compacted soils exhibit the ability to drain freely by filling each tree pit with a minimum of 20 litres of water. Water should freely drain through subsoil within ten (10) minutes. .1 Notify *Contract Administrator* and the City if tree pits in any soil condition do not drain freely or if tree pit fills with ground water. .2 There shall be no standing water in the bottom of tree pit at time of planting. .4 Protect bottom of tree pit(s) against freezing. .5 Ensure tree pits and plant beds are kept well drained and free of contaminants and construction debris. .6 Planting Areas shall be excavated to the following depths: .1 Shrub beds, perennials, ornamental grasses shall be 450 mm. .2 Ground covers and annual flowers shall be 300 mm. .3 Trees shall be 900 mm.
3.3	**Planting**	Delete 3.3 and replace with the following	.1 Planting operations shall be carried out under conditions that are conducive to healthy, vigorous growth of plant material. .2 Plant material shall be planted vertical, straight and plumb at locations staked in field and or noted on landscape plans.

.3 Ensure orientation of plant material will give best appearance in relation to views from adjacent buildings, roads, walks or use areas.

.4 Ensure planting depth of root ball is equal to the depth of root ball originally established in the nursery. The top of root ball shall be level with adjacent growing medium.

.5 Ball and Burlap Plant Material: After plant has been lowered into plant bed or tree pit cut away all root ball ties from around trunk. Loosen burlap from around trunk and cut away minimum top 1/3 without disturbing root ball.

.6 Container Grown Plant Material: Remove entire container (including biodegradable containers) without disturbing root ball. Score root ball vertically at six (6) locations evenly spaced around entire root ball to minimize girdling of roots.

.7 Tree Spade Dug Root Balls: Cut wire basket around entire perimeter of root ball. Bend down top 2/3 of wire basket without disturbing root ball. Cut away all root ball ties from around trunk. Loosen burlap from around trunk and cut away minimum top 1/3 without disturbing root ball.

.8 Backfill planting areas in 150 mm lifts to 2/3 of the depth tamping each lift of growing medium around root system to eliminate air voids. Do not use frozen or saturated growing medium for backfill operation.

.9 Prior to placing remaining growing medium, thoroughly water planting areas, fill tree pits with water. Complete backfill operation only after water has completely penetrated into growing medium.

.10 Build 100 mm high by 150 mm wide (4" high by 6" wide) saucer around outer edge of tree pit to assist with maintenance watering.

.11 Tree Stabilization

- .1 Guy or stake trees as directed by *Contract Administrator* and the City.
- .2 Ensure guy pins and stakes are not placed through the root ball.
- .3 Trees that have had root balls penetrated by guy pins and stakes will be rejected.
- .4 Tie one (1) to two (2) flagging tape flags to all guy wires at a height that is clearly visible.

.12 Place tree trunk protection around base of tree trunk as per manufacturer instructions.
- .1 Trees 100mm caliper or less shall have one protector. Do not interlock ends of tree protector.
- .2 Trees greater than 100mm caliper shall have a minimum of two interlocked protectors. Do not interlock outside ends.

.13 Fertilize as per recommendations based on soil testing and place planting tablets at the following rates in prepared planting holes. Spread the tablets in each hole before planting.

	Plant/Container Size	Table Size	Tablets per Plant
.1	Trees	21g	1 per every 1.25mm of trunk caliper
.2	#15/ 45 cm tub	21g	3
.3	#7/ 35 cm tub	21g	3
.4	#5/ 30 cm pot	21g	2
.5	#3/ 27 cm pot	21g	2
.6	#2/ 21 cm pot	21g	1
.7	#1/ 15 cm pot	21g	1

3.4 Tree Support

Delete 3.4 and replace with the following

.1 Guy and stake all trees immediately after planting. Plant material not guyed or staked immediately shall be replaced if damaged.

.2 Drive one (1) stake per tree vertically into the ground to a depth of 750 – 1000 mm, in such a manner so as not to injure the root or root ball.

.3 Fasten tree to the crotch and midway between the crotch and the ground with galvanized wire protected by hose.

.4 Trees to stand plumb upon completion of this operation.

3.6 Pruning

Delete 3.6 and replace with the following

.1 All pruning cuts shall be made with pruning saws or hook and blade pruning tools designed and manufactured for pruning operations. Anvil-type pruning tools shall not be used in any pruning operations.

.2 Prune trees and shrubs after planting operation as directed by *Contract Administrator* and the City.

.3 Prune each tree and shrub planted to preserve the natural character of the plant and in a manner appropriate to its particular requirement in the landscape design. Pruning in general shall be heavier on collected than on nursery-grown plants. Remove all soft wood sucker growth and all broken or badly bruised branches with a clean cut.

.4 Employ clean sharp tools and make cuts without damaging the branch collar.

.5 Do not damage the leader or lead branches. Plants which have had the main leader or lead branches damaged or removed will be rejected and replaced by the *Contractor* at no cost to the *Owner*.

.6 Do not remove minor twig branches along the main structural branches.

3.7 Mulching

Delete 3.7 and replace with the following

1. Prior to the application of composted mulch;
   - .1 Manually remove all weeds and weed roots from root balls and adjacent growing medium.
   - .2 Remove all deleterious material and debris from planting areas.
   - .3 All fine grading shall be completed, the growing medium shall be loose and friable.
   - .4 The *Contract Administrator* and the City has reviewed of all planting areas.

.2 Spread composted mulch to minimum depth of 50 mm.

- .1 Ensure finish composted mulch layer is a minimum of 12 mm below adjacent hard landscape surfaces and edges.
- .2 Ensure mulch is kept 125 mm away from tree trunks and 75 mm away from stems of shrubs.

3.8 Clean-up

Delete 3.8 and replace with the following

.1 Growing medium spilled onto pavement and growing medium stains on pavement or adjacent hard surfaces shall be cleaned up immediately.

.2 Remove from the site all pots, cans, surplus materials, and other debris resulting from planting operations.

.3 Ensure complete removal of planting tags, labels, strings, or other materials prior to substantial completion.

.4 Neatly dress and finish all planting areas and flush all walks and paved areas clean to the satisfaction of the Consultant and *Owner*.

3.9 Maintenance

Delete 3.9 and replace with the following

.1 Maintenance of plants shall begin immediately after planting operation and shall continue in an uninterrupted fashion until all deficiencies noted in the *Substantial Performance* review have been rectified and the *Contract Administrator* and the City has provided to the *Contractor* written confirmation of the date of *Total Performance*.

.2 If for any reason the *Contractor* elects, on his own without the written consent of the *Contract Administrator* and the City to suspend maintenance operations, the *Contractor* shall provide the *Contract Administrator* and the City written notice of such action. Any damages or requirement for the replacement of plant material that as a result of the suspension of maintenance operations shall be the borne by the *Contractor* at no cost to the *Owner*.

.3 Maintenance of plant material includes but is not limited to watering at intervals sufficient to maintain healthy, vigorous growth, weeding of plant beds and tree pits, cultivating of growing medium, pruning, treatment of insects, molds, fungi or disease to the Level 2 "Groomed' as per the BCNLA Landscape Standard, Current Edition or as directed by consultant.

.4 Plant material shall be deep watered at least once per day when temperatures exceed 25 degrees Celsius.

.5 Water sufficiently to maintain soil moisture conditions for optimum establishment, growth and health of plant material without causing erosion.

.6 Supply equipment such as pumps, portable sprinklers systems, tank trucks, hose and sprinklers required for watering operations. Water trucks, if used for watering operations, must service the site from adjacent roads until irrigation system is operational.

.7 *Contractor* to ensure adequate moisture in plant root zone prior to winter freeze-up.

.8 Reset all plants that have settled to plant depths approved by the *Contract Administrator* and the City prior to the placement of composted mulch.

.9 Ensure tree guards, stakes, flagging tape on tree guy wire and tree ties are kept secure, taught and in proper repair.

3.10 Conditions for Total Performance

Delete 3.10 and and replace with the following

.1 Conditions for *Total Performance*:

.1 *Substantial Performance* shall have been granted by the *Contract Administrator* and the City and, Final Inspection at the end of the guarantee/warranty period.

.2 All plant material is healthy; exhibiting signs of vigorous growth and meets the requirements of this specification.

.3 Plant material installed less than ninety (90) days prior to frost will be accepted in following spring, thirty (30) days after start of growing season provided that final acceptance conditions are fulfilled.

.4 Unless otherwise indicated in the *Contract Drawing* the original shape and form of the plant as reviewed by the *Contract Administrator* and the City has been maintained, leaders are in tact, there are no wounds or abrasions on trunks or branches.

.5 Mulch has been maintained to specified depths.

.6 All planting areas continue to be free draining with no signs of standing water.

.7 All plant beds are completely free of weeds and noxious grasses.

.2 The *Contractor* shall continue to maintain the work of this section until the *Contract Administrator* and the City provides written confirmation that *Total Performance* conditions have been met.

SUPPLEMENTARY SPECIFICATIONS
DIVISION 33 – UTILITIES

MMCD Section 33 01 30.1S CCTV Inspection of Pipelines

1.0	**GENERAL**		
1.2	**References**	Delete 1.2.2.1 and replace with the following	National Association of Sewer Service Companies' (NASSCO's) Pipeline Assessment and Certification Program, version 6.x including addendums, or latest version.
1.3	**Submission of Certification**	Delete 1.3.1 and replace with the following	Submit copy of the CCTV operator's current NAASCO certification certificate to the Contract Administrator at least one week prior to the start of the CCTV inspection operations.
2.0	**PRODUCTS**		
2.1	**Equipment**	Delete 2.1.4 and replace with the following	The individual digital video playback files to be of MPEG file format.
		Add 2.1.5	The digital data file delivered to the City to be in PACP standard database file format version 6.x or latest.
3.0	**EXECUTION**		
3.1	**CCTV Inspection**	Delete 3.1.1 and replace with the following	CCTV operator to be certified by NASSCO (PACP/MACP/LACP).
		Delete 3.1.2 and replace with the following	NASSCO certified software must be used to produce inspection report and the data will be submitted in the PACP standardized database format. The review of this statement will be part of the evaluation of the tender. Submission to satisfy all of the specifications and report submissions per NASSCO's PACP (MACP/LACP) will be used as a benchmark for subsequent inspection report submission.
		Delete 3.1.4 and replace with the following	Flow in the pipeline not to exceed approximately ¼ of the pipe diameter. Notify Contract Administrator or excessive flows, video using flow reduction method per 3.11 of this Section.
		Delete 3.1.11 and replace with the following	Note condition of pipe joints at manhole walls at the beginning and end of each pipeline; At the beginning of each pipeline or where surface wear of the pipe changes, pan to the invert and any direction as needed to report and record surface wear condition of the pipe using PACP (MACP/LACP) codes; Fill under remarks the observations if no surface wear observed due to good condition of pipe or unable to determine stating reason.

		Delete 3.1.14 and replace with the following	Stop camera at each defect, change of condition of pipe and service connection to record defect in accordance with PACP (MACP/LACP) codes.
		Delete 3.1.15 and replace with the following	Add PACP (MAC/LACP) code overlay to digital video at defects or connections in addition to continuously displayed data.
		Add 3.1.19	The inspection measurement and reporting units must be in metric system.
3.3	**Site Coding Sheets**	Delete 3.3.1 and replace with the following	Each pipeline length to be recorded according to the PACP. Any variation from the manual to be noted in the survey report.
		Delete 3.3.2 and replace with the following	Use standard coding form and standards of PACP:
		Delete 3.3.2.1	
		Delete 3.3.2.2	
		Delete 3.3.2.3 and replace with the following	Note observations as to condition of service connections beyond mainline in remarks column using standards codes as per PACP.
3.7	**Photographs and /or Digital Images**	Delete 3.7.1 and replace with the following	Photograph all major defects as defined by condition codes in PACP: B, CC, CL, CM, TFD, TBD, TSD, TRD, D, FC, FL, FM, H, IR, IG, JO, OB, JS, RM, RB, RT, and X.
		Delete 3.7.2.5 and replace with the following	PACP/MACP/LACP Condition Defect Code.
3.8	**Inspection Reporting Hard Copies & Digital Format**	Delete 3.8.2 and replace with the following	Present machine printed (hardcopy) and computer generated data base reports according to the PACP format.
		Delete 3.8.2.2 and replace with the following	Hardcopy reports to be presented in PACP standard format.
3.10	**Root cutting & Removal**	Delete 3.10.1 and replace with the following	Remove roots for condition codes RT, RM, and RB.
3.12	**Coding Accuracy**	Delete 3.12.1.2 and replace with the following	Detail accuracy 90%

Delete 3.12.4 and replace with the following	An operator failing to meet the accuracy requirements on two occasions will not be permitted to code on the remainder of the project until they have successfully re-attended an Operator's Certification course, re-write and pass the NASSCO Pipeline Assessment Certification Program.

MMCD Section 33 11 01S Waterworks

2.0 PRODUCTS

2.2 Mainline Pipes, Joints and Fittings

Add to 2.2.1.1

Pipe: to AWWA C151, and shall meet the following Pressure Class or Thickness Class:

.1 100 mm – 350 mm – Thickness Class 50
.2 400 mm & greater – PC 350

Add 2.2.1.3

Encasement: All watermains, valves, fittings and hydrant assembly (including laterals, valves and stand pipe) must be encased in V-Bio Enhanced Polyethelyne.

Delete 2.2.2.2 and replace with the following

Joints: It is mandatory that the push-on integrally thickened bell and spigot type conform to ASTM D3139 Clause 6.2 with single elastomeric gasket to ASTM F477.

Delete 2.2.4.13 and replace with the following

Joint Restrain Devices: General Requirements:

.1 Ductil iron castings to ASTM A536.
.2 Anti-corrosion coating of ductile iron castings to AWWA C219, AWWA C210, AWWA C213 or AWWA C550.
.3 Bolts and nuts high strength low alloy steel to AWWA C111 or as specified in Contract Documents, stainless steel to ASTM F593 or ASTM F738 for bolts and ASTM F594 or ASTM F836 for heavy hex nuts. Rolled threads, fit and dimensions to AWWA C111.
.4 Tie rods to 2.2.3.8 of this Section
.5 Restrainers for ductile iron pipe shall be mechanical joint fittings or push-on joint fittings with tie rod.
.6 Restrainers for PVC pipe shall be mechanical joint fittings or push-on joint fittings with tie rod lugs.
.7 Restrained harnesses or integral restrain systems manufactures as part of the pipe joint.
.8 All joint restraint systems for PVC pipe be approved by the specific PVC pipe manufacturer, and that they do not derate the pipe manufacturer's recommended working pressures.
.9 Restrainers for PVCO pipe shall be mechanical joint fittings or push-on joint fittings with tie rod lugs.
.10 All joint restraint systems for PVCO pipe be approved by the specific PVCO pipe manufacturer, and that they do not derate the pipe manufacturer's recommended working pressures.

		Add 2.2.7	Oriented Polyvinyl (PVC) Pressure Pipe: .1 Pipe: .1 Pipe to be manufactured to specifications for pipe size ranges as follows: .1 Pipes 100 to 600 mm diameter – AWWA C909. .2 Pipes to be certified by Canadian Standards Association for pipe size ranges 100 mm to 600 mm dia. – CSA B137.3.1. .2 Cast iron pipe equivalent outside diameter. .3 To be compatible with specified mechanical joint and push-on joint fittings and valves without use of apecial adapters. .2 Joints: Push-on integrally thickened bell and spigot type to AWWA C909 Clause 4.3.3.2 (a.) with single elastomeric gasket to ASTM F477.
2.3	**Valves and Valve Boxes**	Delete 2.3.1.3 and replace with the following	Valves 400 mm and larger shall be butterfly valves.
		Delete 2.3.1.4	
		Delete 2.3.4 and replace with the following	Blow-Down or Blow-Off Valves: 50 mm to 300 mm as specified for mainline gate valves.
		Delete 2.3.6.1.1	
		Delete 2.3.6.1.2 and replace with the following	Circular type valve box shall be Nelson style cast iron.
		Delete 2.3.7.1 and replace with the following	Curb stop valve boxes on 19 mm dia. to 38 mm dia. shall be as shown on Coquitlam Standard Detail Drawings COQ-W2b-1, COQ-W2b-2, COQ-W2d, COQ-W2j and COQ-W2m.
		Delete 2.3.7.2	
		Delete 2.3.7.3 and replace with the following	Curb stop valve boxes (300 mm from property line) alternative on 19 mm dia. to 38 mm dia. services without operating rods to be assembled as specified for Mainline Valve Boxes 2.3.6.1.2, and shown on Coquitlam Standard Detail Drawings COQ-W2b-1, COQ-W2b-2, COQ-W2d, COQ-W2j and COQ-W2m. Service boxes may be Nelson style PVC, except when located in driveways.

		Delete 2.3.7.5 and replace with the following	Corporation stop valve boxes (at mainline tees or tappings) on services 50 mm dia. and larger as specified for Mainline Valve Boxes per Coquitlam Standard Detail Drawings COQ-W2e, COQ-W2f.
2.5	**Service Connections, Pipes, Joints and Fittings**	Delete 2.5.1 and replace with the following	Pipe diameter 19 mm to 75 mm to be Type K annealed copper to ASTM B88M or Municipex Cross-linked Polyethylene to AWWA 904 and to SDR9 Copper Tube Sizes (CTS), certified to CSA B137.5.
2.6	**Hydrants**	Delete 2.6.1.6 and replace with the following	Pump nozzle shall be "quick connect" STORZ type. STORZ type nozzle must be painted gloss black.
		Delete 2.6.2 and replace with the following	Colour: Tremclad Rust Paint Body – Fire Red Hose Caps and Bonnet – Bright Yellow
2.8	**Granular Pipe Bedding and Surround Material**	Add 2.8.3	Bedding and surround material shall be Type 1 under Section 31 05 17 – 2.7 or 19 mm minus clear crushed gravel.
		Add 2.8.4	Polyethylene encased watermain shall be bedded in washed coarse sand per Section 31 05 17 Clause 2.7.3.
3.0	**EXECUTION**		
3.6	**Pipe Installation**	Add 3.6.15	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: .1 ANSI/AWWA C214 (factory applied) .2 ANSI/AWWA C209 (field applied) .3 ANSI/AWWA C217-90 (petrolatum tape) .4 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 3.6.16	For ductile iron pipe encase in V-Bio Enhanced Polyethelyne and install in accordance with Method A (Polyethelyne Tube) under AWWA C105/A21.5.

3.10	**Service Connection Installation**	Delete 3.10.1 and replace with the following	Install service connections to 3.6 of this section, as shown on Supplementary Detail Drawings COQ-W2b-1, COQ-W2b-2, COQ-W2d, COQ-W2j and COQ-W2m, and as directed by the Contract Administrator.
		Delete 3.10.4	
		Delete 3.10.5 and replace with the following	Tappings in cast iron or ductile iron mains to AWWA CISI pipe to be made using double strap saddles specified in 2.5.3 of this Section.
		Add 3.10.13	Water service connections (19 mm and 25 mm) must be installed as one continuous length of pipe.
3.18	**Cleaning and Preliminary Flushing**	Add 3.18.5	Water mains 400 mm and larger shall be swabbed as per the following procedure:

1. Purpose and Scope
   - .1 To remove any possible contaminants introduced into the water main through pipe storage or installation activities.

2. Swab Requirements
   - .1 Swabs are to be of a polyurethane foam construction, minimum 2 lb/ft3 density
   - .2 Swabs are to be new. Used swabs will not be accepted.
   - .3 Swab outside diameter must be minimum 1 nominal size larger than the largest diameter main to be swabbed (eg. 150 mm main requires minimum 200 mm diameter swabs)
   - .4 Swab length must be minimum 1.5 times the outside diameter.

3. Swab Entry Point
   - .1 2 swabs are to be inserted into the beginning of the first length of water main installed into the trench. Swabs are to have a minimum of 1 meter separation between them.
   - .2 Minimum 300 grams of calcium hypochlorite granules are to be installed in between the 2 swabs.

4. Swab Discharge Point
   - .1 Swabs are to be discharged from the water main at the end of the installation (ie- permanent or temporary dead end)
   - .2 A temporary connection for a discharge assembly of minimum 150 mm (100 mm is acceptable for 100 mm water main only) is to

be made to the end of the new water main pipe (connection to a blow off assembly is not acceptable).

.3 The discharge assembly must consist of a 90 degree elbow and appropriate fittings to adapt to 150 mm "camlock" style layflat hose. The assembly must have adequate thrust protection to avoid blowing off during the swabbing procedure.

.4 The 150 mm layflat hose must extend above the surface of the existing ground.

5. General Swabbing Requirements

.1 Swabbing to be performed after the satisfactory completion of all pipe work (as determined by the city inspector), and prior to flushing, pressure testing, and chlorination of the new water main.

.2 Swabbing of the water main is to be witnessed by the City of Coquitlam.

.3 Although a minimum of 2 swabs must be used for each run, additional swabs may be required depending on the time required for the water to run clear after swab discharge. This determination will be made by the City of Coquitlam.

.4 Swabs are to be used once only. Additional new swabs will be required for additional swab runs if deemed necessary by the city.

.5 Swabs must be stored and handled hygienically.

.6 The contractor must provide all labour and materials required to carry out the swabbing procedure.

.7 Swabbing should be completed from a low point to a high point where possible.

.8 A plan to complete the swabbing must be submitted to the City of Coquitlam prior to the work taking place for approval.

.9 The contractor must take all necessary action to prevent flooding of the discharge area.

6. Swabbing Procedure

.1 The length of main within the swabbing run must have all connections larger than 25 mm isolated by closing appropriate valves.

.2 The new main is to be filled and swabs propelled via a certified backflow prevention device (double check valve assembly) and

water meter from the existing system. The connection to the existing system will form part of the plan submitted to the city for approval.

.3 Appropriate flow is to be used to propel the swabs at approximately .75 meter per second velocity. See following list for appropriate flow:

Main diameter (mm)	Approximate flow required to produce 0.75 m/s velocity (l/s)
100	6.3
150	12.6
200	25.2
250	37.9
300	56.8
600	227.2

.4 Upon discharge of the swabs, the main must be flushed until the water runs clear.

.5 The supply point can then be slowly closed.

.6 Additional swabs must be run through the water main if excessive debris is noted to be discharged from the main or there is excessive clean up time after the swabs are discharged.

3.23 Connection to Existing Mains

Delete 3.23.1 and replace with the following

Connections to existing waterworks systems will be made by the Contractor under the supervision of the Contract Administrator. Make all necessary arrangements with the Contract Administrator and the City to schedule work to prevent construction delays.

Add 3.23.2

Provide written notification to all affected residents a minimum 48 hours prior to service interruption.

Add 3.23.3

Arrange shutdown of the existing valves by the City. *Contractor* shall not operate any valves without prior approval of the *Contract Administrator* and the City.

Add 3.23.4

Provide temporary water service while existing service is interrupted as detailed in *Contract Drawing* or Project Specific Specifications.

Add 3.23.5

Fittings used for tie ins should be cleaned of all foreign material and sprayed with a 1% hypochlorite solution prior to assembly. Disinfect all pipes and fittings installed at the connection.

Add 3.23.6

Contractor shall be responsible for the costs for the City to flush and purge all air from existing mains and services in the area affected by the water service interruption.

Add 3.23.7

Procedures for Bateriological Tests shall be as described in AWWA C651-99.No connection to existing watermains will be authorized until final results of coliform bacterial testing have been received and reviewed by the Water Superintendant.

All samples shall be taken by the City Water Utility.

All valve operation shall be handled by the City Water crews.

The *Contractor* shall provide sampling points, one every 366m plus the end of each main segment. The *Contractor* shall provide all labour to temporarily connect and disconnect the new main in order to properly acquire test samples.

Initial flushing, testing and chlorination will be undertaken by the *Contractor* from a water source approved by the Water *Superintendent*.

Coordination for the bacterial testing and tie in shall be coordinated by the project Engineering Inspector and the Water *Superintendent* prior to final flushing.

The *Contract Administrator* shall review with the Water *Superintendent* and the *Contractor* sampling locations and appurtenances.

The *Contract Administrator* shall check and record chlorine residual prior to final flushing.

After final flushing the City Water crew will collect two sets of samples 24 hours apart. Samples will be taken at least every 366m of the new main as well as the terminus and all branches.

Test results will be delivered to the Water Superintendant who will provide a copy to the Contract Administrator.

The Water *Superintendent* will judge the adequacy of the test results and issue an authorization to connect.

City Water crews will provide shutdown and flushing as required.

3.25	**Permanent Capping of Existing Water Service Connections**	Add 3.25	Permanent capping of existing water service connections to be completed as per Coquitlam standard Detail Drawings COQ-W2g, COQ-W2h, COQ-W2i.

MMCD Section 33 30 01S Sanitary Sewers

2.0	**PRODUCTS**		
2.1	**Concrete**	Add to 2.1.1 and 2.1.2	Prior approval from Contract Administrator and the City for use of concrete pipe in a sanitary sewer installation.
		Delete 2.1.3.4 and replace with the following	Lift insert opening not required to be grouted provided it does not extend beyond the depth of the engineered design.
2.3	**Service Connections**	Delete 2.3.8.1	
		Delete 2.3.8.2 and replace with the following	Connections to mainline PVC pipe to be made with a manufactured wye fitting when mainline pipe is 250 mm and smaller. For new connections to existing mainline greater than 250 mm use of insertable tee will be permitted
		Add 2.3.8.3	Insertable tee fitting shall have a rubber collar which inserts into the mainline pipe to form a tight seal and shall have stainless steel band to secure the tee insert. The tee insert shall be a standard bell end with depth control lugs. The joint shall provide a minimum seal of 90 kPa on concrete and polyethylene pipe, and 190 kPa on PVC pipe.
		Add 2.3.8.4	Rubber couplings for gravity sewers shall have stainless steel shear bands along the body of the coupling.
2.5	**Granular Pipe Bedding and Surround Material**	Add 2.5.3	Pipe bedding shall be 19 mm clear crushed rock or as approved by the *Contract Administrator* and the City.
3.0	**EXECUTION**		
3.8	**Connections to Existing Mainline Pipe**	Delete 3.8.3 and replace with the following	For new connections to existing PVC mainlines 250 mm and smaller shall be made by removal of the section of the main and replacement with a preformed extrusion molded PVC wye fittings complete with stubs and double hub PVC couplings for PVC mains and approved shear band couplings for other mainline materials. For new connections to existing mainline greater than 250 mm use of insertable tee will be permitted.

3.10	**Service Connection Installation**	Delete 3.10.3 and replace with the following	Inspection chambers shall be provided on all sanitary service connections as per Standard Detail Drawing S7. If inspection chamber is located in driveway, lane, or paved surface, Series 37 concrete box with lid shall be installed as per Standard Detail Drawing S9.
3.18	**Video Inspection**	Delete 3.18.1 and replace with the following	The contractor shall video inspect completed sanitary sewers under 900 mm in diameter and all service connections following completion of the installation. The video inspection report shall be in a form specified by the Contract Administrator and the City. Copies of the video DVD and written report shall be forwarded to the Contract Administator and the City. Refer to Section 33 01 30.1 and 33 01 30.1S CCTV Inspection of Pipelines.
3.21	**Permanent Capping of Service Connections**	Add 3.21.1	Permanent capping of existing sanitary service connections to be completed as per Coquitlam Standard Detail Drawing COQ-S18.
		Add 3.21.2	A trenchless method of permanently capping a service may be required on an arterial road or on a road which has been paved within 5 years, as directed by the Manager. The trenchless technology used to cap the service must be approved by the Manager.

MMCD Section 33 34 01S Sewage Force Mains

2.0	**PRODUCTS**		
2.3	**Valves and Valve Boxes**	Delete 2.3.5.1.1	
2.5	**Granular Pipe Bedding and Surround Material**	Delete 2.5.1 and replace with the following	Pipe bedding and surrounding material shall be Type 1 as specified in Section 31 05 17 – Aggregates and Granular Materials.
3.0	**EXECUTION**		
3.15	**Pressure Testing Procedure**	Delete 3.15.2 and replace with the following	Pipeline to be submitted to a test of 1.5 x *Work*ing pressure applied at highest elevation in each section minimum 700 kPa. At no time shall test pressure exceed pipe or thrust restraint design pressures. Maximum allowable leakage rate at test pressure to not exceed 1.25 litres per millimetre diameter of pipe per kilometre per 24 hour period. Minimum duration of test period to be 2 hours.

MMCD Section 33 40 01S Storm Sewers

2.0	**PRODUCTS**		
2.2	**PVC Pipe, Mainline Smooth Wall**	Delete 2.2.1 pipe size ranges and replace with the following	200 mm dia. – 375 mm dia. to ASTM D3034 450 mm dia. – 1,200 mm dia. to ASTM F679
2.3	**PVC Pipe, Mainline Profile**	Delete 2.3	
2.6	**Service Connections**	Delete 2.6.1 and replace with the following	Storm service connectons to be PVC DR 28 150 mm diameter minimum or as specified on *Contract Drawings*.
		Delete 2.6.8.1	
		Delete 2.6.8.2 and replace with the following	Connections to PVC pipe to be made with a performed wye fitting where mainline pipe is 300 mm diameter or smaller. For connections to PVC mainline pipe larger than 300 mm diameter an insertable tee for PVC pipe is permitted.
		Add 2.6.8.3	Insertable tee fitting shall have a rubber collar which inserts into the mainline pipe to form a tight seal and shall have stainless steel band to secure the tee insert. The tee insert shall be a standard bell end with depth control lugs. The joint shall provide a minimum seal of 90 kPa on concrete and polyethylene pipe, and 190 kPa on PVC pipe.
2.9	**Granular Pipe Bedding and Surround Material**	Delete 2.9.3	Pipe bedding shall be 19 mm clear crushed rock or as approved by the *Contract Administrator* and the City.
3.0	**EXECUTION**		
3.8	**Connections to Existing Mainline Pipe**	Delete 3.8.3 and replace with the following	For new connections to existing, smooth wall or profile, mainline sewers 300 mm and smaller, shall be made by removal of the section of the main and replacement with a preformed PVC wye fitting complete with stubs and double hub PVC couplings for PVC mains and approved shear band couplings for other mainline materials. For new connections to existing mainline greater than 300 mm, use of insertable tee will be permitted.

3.10	**Service Connection Installation**	Delete 3.10.3 replace with the following	Inspection chambers shall be provided on all storm service connections as per Standard Detail Drawing S7. If inspection chamber is located in driveway, lane, or paved surface, Series 37 Brooks concrete box with lid shall be installed as per Standard Detail Drawing S9.
3.12	**Inspection and Testing**	Delete 3.12.1 replace with the following	The contractor shall video inspect completed storm sewers under 900 mm in diameter and all service connections following completion of the installation. The video inspection report shall be in a form specified by the Contract Administrator and the City. Copies of the video DVD and written report shall be forwarded to the Contract Administator and the City. Refer to Section 33 01 30.1 and 33 01 30.1S CCTV Inspection of Pipelines.
3.16	**Permanent Capping of Service Connections**	Add 3.16.1	Permanent capping of existing storm sewer connections to be completed as per Coquitlam Standard Detail Drawing COQ-S18.
		Add 3.16.2	A trenchless method of permanently capping a service may be required on an arterial road or on a road which has been paved within 5 years, as directed by the Manager. The trenchless technology used to cap the service must be approved by the Manager.

MMCD Section 33 42 13S Pipe Culverts

3.0 EXECUTION

3.10	**Endwalls**	Delete 3.10 and replace with the following	Construct endwalls as shown on Standard Detail Drawings S14, S15, Coquitlam Standard Detail Drawing COQ-S15A or as shown otherwise on contract drawings.

MMCD Section 33 44 01S Manholes and Catchbasins

1.0 GENERAL

1.1	**Related Work**	Add 1.1.6	Hot Mix Asphalt Concrete Pavement	Section 32 12 16
		Add 1.1.7	Portland Cement Concrete Paving	Section 32 13 13

2.0 PRODUCTS

2.1	**Materials**	Add 2.1.7.3	Any frame and cover assembly creating a point load on the concrete riser rings will not be permitted.
		Delete 2.1.7 and replace with the following	Cast iron frame: as shown on Standard Detail Drawing S1, Coquitlam Standard Detail Drawing COQ-S16 and as specificed in Municipal Supplementary Specifications.
		Delete 2.1.12 and replace with the following	Catchbasin lids manufactured to ASTM C478M
		Delete 2.1.16.2	
		Delete 2.1.17	

3.0 EXECUTION

3.1	**Excavation and Backfill**	Add 3.1.2	For manholes, when base gravels are complete, excavate for grade rings and manhole frame assembly. Do not disturb the compacted road base beyond the excavation requirement.
3.3	**Manhole Installation**	Delete 3.3.12.2 and replace with the following	Allowable products are precast concrete risers and cast-in-place form system. Individual riser heights shall be 50mm, 75mm, or 100mm.
		Delete 3.3.12.5 and replace with the following	Proper layer of grout between the spacers, covering the entire surface of the rings, should be utilized.
		Delete 3.3.15 and replace with the following	Install drop structures as shown on the contract drawings to Coquitlam Standard Detail Drawing COQ-S4 and Standard Detail Drawing S3. Maximum allowable inside ramp shall be 250 mm invert to invert.

		Delete 3.3.17 and replace with the following	Ensure frames conform to design contour of pavement or existing surface. Manhole lids left raised in preparation for overlay paving shall have a rubberized protector ring or asphalt ramp. The use of riser rings for adjusting manhole frames will not be permitted.
3.5	**Catchbasin Installation**	Delete 3.5.1 and replace with the following	Install catchbasins as shown on Coquitlam Standard Detail Drawings COQ-S11A, COQ-S11B and Standard Detail Drawing S11, to general standards and installation procedures described under 3.3 of this Section.

SUPPLEMENTARY SPECIFICATIONS
DIVISION 34 – TRANSPORTATION

MMCD Section 34 41 13S Traffic Signals

1.0 GENERAL

1.3 Shop Drawings — Delete 1.3.4 and replace with the following

Shop drawings for pole structures, where required, to be sealed by a Professional Engineer registered in British Columbia.

1.4 Electrical Energy Supply — Add 1.4.4

The Electrical *Contractor* will process a letter of application to the City of Coquitlam for the Utility Company and attain all required permits.

1.5 Contractor Qualifications — Add 1.5.3

All on-site traffic signal installations shall be under the responsibility of a primary journeyman electrician with IMSA Level 2 Signal Certification and have successfully completed at least five (5) traffic signal system installations. This primary journeyman electrician is expected to have to be at the *Place of Work* and report work progress to City of Coquitlam's Traffic Operations staff, in addition to reporting to the *Contract Administrator*.

Add 1.5.4

Fibre Optic Cable:

.1 All fibre optic cable installations workmanship, material and/or installation practices and activity will be equal to or better than the standards established by the CAN/CSA T529-530-M90 Standards and the Canadian Electrical Code.

.2 Those retained to complete the work must be authorized, trained and certified by the manufacturers they represent. They must have a minimum of two (2) years experience installing and testing multimode and single mode cables of all types as well as experience with LC and SC connectors.

.3 Those retained to complete the work must have experience installing cabling for FDDI (Distribution System Data Interface) compliant 100 Mbit/sec, SONET, ATM, Token Ring or Ethernet networks using industry accepted systems and practices. Experience with leading manufactures fiber products and systems would be beneficial.

.4 Those retained to complete the work must be prepared, trained and equipped to properly test the fibre cabling system, including the fibre transmission media and connectors. Each optical fibre of each section of cable will be tested using an "Optical Time Domain Reflectometer" (OTDR) and will meet the specifications before installation. After installation an

			"Optical Light-loss Testing Sets" (OLTS) will be mandatory to determine cable length, locate any fibre breaks or anomalies, measure attenuation of fibre's, connectors and assess fibre uniformity. Those retained to complete the work will provide a report showing all values measured during these tests.
1.6	**Permits and Tests**	Add 1.6.5	*Contractor* shall provide the BC Safety Electrical Permit, and arrange all inspections with the City. The inspection entails, but not limited to, Coquitlam's "Intersection and Cabinet Start-up Checklist", which can be obtained from Coquitlam's Traffic Operations staff.
1.8	**Record Drawings**	Add 1.8.2	Final payment(s) will be withheld until record drawings are received.
2.0	**PRODUCTS**		
2.1	**General**	Delete 2.1.2 and replace with the following	All products supplied to be new, in accordance with *Contract Documents*. All products are to meet Canadian Electrical Code requirements and be certified by either CSA, UL©, or Intertek Testing Systems (Warnock Hersey) and be supplied with the certifier's label.
		Delete 2.1.3 and replace with the following	All products shall be in accordance with the City of Coquitlam's List of Approved Materials and Products List. Any products not listed with in the Approved List shall default to the current BCMOTI specification.
		Delete 2.1.5 and replace with the following	Equipment models listed within the City of Coquitlam's List of Approved Materials and Products shall be confirmed with the City immediately prior to their order to ensure that they are current. Cut-sheets, equipment make, model and serial number list to be provided to the City by the *Contractor* for each traffic signal location. Material supplied by City of Coquitlam and installed by *Contractor*, shall be shown in the *Contract Documents*.
2.2	**Conduit**	Add 2.2.1.3	All exposed metallic surfaces to be hot dip galvanized.
2.3	**Trench marker Tape**	Add 2.3.2	Detectable (manetic) market tape shall be used in all trenches containing interconnecton (communications) conduit.
2.5	**Concrete Junction Boxes**	Delete 2.5 and replace with the following	Refer to the City of Coquitlam's List of Approved Materials and Products. For Concrete Vaults: Refer to Coquitlam Standard Detail Drawing SS-E2.5.
2.8	**Conductor Tags**	Delete 2.8 and replace with the following	Refer to the City of Coquitlam's List of Approved Materials and Products.

2.10	**Fuse and Fuse Holders**	Delete 2.10 and replace with the following	Refer to the City of Coquitlam's List of Approved Materials and Products.
2.11	**Service Panels**	Add 2.11.5	Refer to the City of Coquitlam's List of Approved Materials and Products.
2.16	**Traffic and Pedestrian Signals**	Delete 2.16.1 and replace with the following	Traffic signal heads to be yellow polycarbonate with 300 mm round signal indications, and conform to Section 601 Signal and Pedestrian Heads BCMOTI E&SMS V1. All primary and secondary signal heads shall have yellow aluminum backboards with 75 mm border of yellow prismatic retro-reflective sheeting (3M™ Scotchlite™ Diamond Grade™ VIP Reflective Sheeting Series 3990 or approved alternate).
		Delete 2.16.2 and replace with the following	Fire signal head assembly as per Coquitlam Standard Detail Drawing SS-E5.19.
		Add 2.16.3	Signal head backboards with plumbizer gaps or knock out sections will not be accepted for adjustable bracket signal head mounting method.
2.17	**LED Signal Modules**	Delete 2.17 and replace with the following	Refer to the City of Coquitlam's List of Approved Materials and Products.
2.19	**Signal Mounting Hardware**	Add 2.19.8	Primary signal head safety cable to be 3/32" galvanized steel aircraft cable.
		Add 2.19.9	Refer to the City of Coquitlam's List of Approved Materials and Products.
2.20	**Audible Signals**	Delete 2.20 and replace with the following	Refer to the City of Coquitlam's List of Approved Materials and Products.
2.21	**Pedestrian /Cyclist Pushbuttons**	Delete 2.21 and replace with the following	Refer to the City of Coquitlam's List of Approved Materials and Products.
2.22	**Luminaires**	Add 2.22.6	Refer to the City of Coquitlam's List of Approved Materials and Products.
2.29	**Illuminated Crosswalk Signs**	Delete 2.29 and replace with the following	Refer to the City of Coquitlam's List of Approved Materials and Products. Illuminated sign safety cable to be 3/32" galvanized steel aircraft cable.

3.0 EXECUTION

3.1	**General**	Add 3.1.5	During the installation of the traffic signal system, maintain the existing traffic signal and/or signs as noted on the *Contract Drawing*. If temporary or permanent relocations of related traffic signal equipment or signs are required, such equipment shall be reinstated as required under the *Contract Documents* or as directed by the *Contract Administrator*.
3.3	**Concrete Bases**	Add 3.3.7	Concrete service bases detailed on Standard Detail Drawings CE1.3 and CE1.4, Type C1 and C3 service bases shall have five (5) conduits. See Coquitlam Standard Detail Drawing SS-E7.3.
		Add 3.3.8	Lifting cables on concrete controller bases shall be removed after base installation.
		Add 3.3.9	All concrete bases shall be pre-cast concrete only, unless noted on *Contract Drawing* or directed by the *Contract Administrator*.
3.4	**Junction Boxes and Vaults**	Delete 3.4.1 and replace with the following	Install junction boxes as shown on Standard Detail Drawings E2.2 to E2.4. Install vaults as shown on Coquitlam Standard Detail Drawing SS-E2.5.
		Add 3.4.5	Bell end fittings shall be installed in all conduits entering junction boxes or vaults.
		Add 3.4.6	Junction boxes requiring 3 or more sections must be approved by the City of Coquitlam's Traffic Operations staff.
		Add 3.4.7	All junction boxes shall be provided with RPVC bars to support electrical connections and fuse holders. The RPVC bars shall be attached into the junction box side walls with the electrical connections/fuse holders tie-wrapped in place and installed in the up-right position.
3.5	**Underground Conduit**	Delete 3.5.2 and replace with the following	Minimum cover over conduits to be 600 mm in boulevard areas and 900 mm in roadway areas.

		Delete 3.5.3 and replace with the following	Place trench marker tape 300 mm above installed conduit in trench. Trench marker tape not required for conduits installed via trenchless technology.
		Delete 3.5.5 and replace with the following	Empty conduits shall have a No. 8 HB Yellow/Green Mk pull string and capped at both ends.
		Add 3.5.6	Conduit run shall contain no more than the equivalent of 4 – 90 degree bends.
		Add 3.5.7	Conduits shall be blown out with compressed air, from both ends if necessary, then swabbed out to remove stones, dirt, water and other material which may have entered during installation.
		Add 3.5.8	All conduits entering poles and cabinets shall be sealed with "Duct Seal".
		Add 3.5.9	Conduit depth of bury to be recorded when a trenchless technology method is used.
		Add 3.5.10	Traffic signal communications conduit shall enter and leave junction boxes through bell end fittings in the horizontal position (no bends) and shall run straight through the junction box unless a change in alignment occurs, or as otherwise specified on the *Contract Drawing*.
		Add 3.5.11	Conduit shall not be bent in the field. Only factory bends will be accepted.
3.7	**Traffic Signal and Pedestrian Head Mounting**	Delete 3.7.1 and replace with the following	Install traffic signal and pedestrian signal heads as shown and Standard Detail Drawings E5.2 and E5.9 only. Banding straps shall be used for primary signal heads.
		Add 3.7.5	Primary traffic signal heads shall be safety cabled to the traffic signal pole arm using 3/32" galvanized steel aircraft cable looped through the traffic signal backboard and fastened with a rope clip.
3.8	**Audible Signals**	Delete 3.8.1 and replace with the following	Install audible signal in accordance with Coquitlam Standard Detail Drawing SS-E5.12.
3.10	**Luminaires and Photocells**	Add 3.10.4	NEMA wattage label shall be visible at the bottom of the luminaire on all fixtures.

3.13	**Electrical Service Panels**	Delete 3.13.1 and replace with the following	Mount electrical service panels in service base or on poles as shown on Standard Detail Drawings E7.2, E7.6 to E7.9, as well as Coquitlam Standard Detail Drawings SS-E7.3 to SS-E7.5.
3.14	**Wiring**	Delete 3.14.3 and replace with the following	With the exception of conductor spliced of detector loop wires to shield cables, make conductor splice in pole handholes. Make splices of detector loop wires to shielded cable in junction boxes.
		Delete 3.14.13 and replace with the following	Bond all signal heads and luminaires with No. 12 RW90 green conductor, and steel junction box lids with No. 8 RW90 green conductor.
		Add 3.14.14	Detector loop cable splices shall be soldered with rosin core solder (no acid core or acid flux) then cap with waterproof gel filled wire nut and tape with vinyl di-electric tape. Suspend and ty-wrap splices at top of junction box with open end of wire nut pointing down. Loop shield drain conductor shall cut and be isolated from the system ground. See Coquitlam Standard Detail Drawing SS-E8.4.
3.16	**Traffic Controller**	Add 3.16.8	Silicone sealant shall be applied to both sides of the rubber gasket, which is placed between the traffic signal cabinet and the concrete base to ensure a weather tight seal.
		Add 3.16.9	Traffic cabinet interior shall be kept dry during inclement weather.
3.17	**Detector Loops**	Delete 3.17.1 and replace with the following	Detector loops are to be round type or as specified on the *Contract Drawing* and approved by the City of Coquitlam's Traffic Operations staff. Install in accordance with Standard Detail Drawings E8.1, E8.3 and Coquitlam Standard Detail Drawings SS-E8.2 and SS-E8.4.
		Add 3.17.3	Loops in adjacent lanes shall be wound in opposite directions, i.e.; clockwise, counter clockwise, clockwise, etc.
		Add 3.17.4	Detector loops should be installed in the base lift of asphalt, unless otherwise specified by the Contract Administrator.
3.19	**Advance Warning Signs**	Add 3.19.2	Contrary to Standard Detail Drawing E10.3, Item A shall be a 300 mm signal head section with LED display.

		Add 3.19.3	Advance warning signs shall have yellow prismatic retro-reflective sheeting (3M™ Scotchlite™ Diamond Grade™ VIP Reflective Sheeting Series 3990 or approved alternate).
3.20	**Grounding & Bonding**	Add 3.20.5	Ground plates and grounding conductors are to have a minimum of 5 meters clearance between them and other utility grounding.
		Add 3.20.6	Grounding rod or plate electrodes shall not be installed inside the traffic signal cabinet base.
		Add 3.20.7	Remove all paint around bonding studs on inside of pole to expose the galvanized or metal surface prior to bonding equipment.
3.22	**Pole Finish Application**	Delete 3.22 and replace with the following	.1 Prior to producing a powder finish product the supplier must provide a Certificate of Compliance indicating that they have met or exceeded the following specifications. The supplier will name their independent testing agency and this information will be submitted to the City for their files. .2 The application process will be as follows: .1 The pole or product will be hot dip galvanized. .2 Powder will only be applied after the product is completely fabricated. No welding or bending will take place after the powder is applied. .3 The pole or product will be thoroughly cleaned by brush blasting in accordance with SSPC-SP7. The brush blast will maintain a minimum profile of 0.5 mils. If brush blasting is done off site then the product will be covered and shielded from any dirt or moisture during its return to the powder applicators facility. Where poles or products are not kept clean and dry or have any signs of flash rust they will be returned for further brush blasting. .4 Once at the applicators facility the pole or product will be thoroughly cleaned and dried with an air gun. All hand marks or grease spots will be cleaned with a mild solvent. .5 After brush blasting the entire pole or product will be pre-baked in an oven at 220 degrees C for at least 30 minutes to 1 hour, depending on steel thickness. The pre-baking must be done to prevent out-gassing during the curing cycle. .6 The base powder coat will then be applied electrostatically while the pole or product is cooling from the 220 degrees C pre-bake period to allow the powder to melt and fuse to the

surface. The base coat will be a minimum of 3 mils in thickness.

.7 After base coat is applied and set the topcoat will be applied to a thickness of 3 to 5 mils. The pole or product will be returned to the oven and heated to 190 to 220 degrees C (temperature will not exceed pre-bake) for a minimum of 25 minutes, depending on steel thickness. Thicker product material may require longer bake cycles to fully cure. Upon removal of the pole or product from the oven it will be left to rest until the pole or product is cool enough to the touch.

.8 Once the topcoat has cured and the poles or product cooled, they will then be individually wrapped (min 4" overlapping method) with 1/8" foam wrap over the entire pole or product. The poles or product will be bundled together and separated with suitable wood dunnage to avoid contact between the poles, product or other bundles. All bundles themselves will be fully wrapped with foam and with stretch-wrap as noted above. The poles or products will be handled and shipped with great care to prevent damage; damaged product will be cause for rejection of the item(s).

.3 Testing process will be as follows:

.1 Each run of product in an oven will have at least one sample tested for:

.2 Adhesion – The finished powder surface will have minimum pull-off strength exceeding 1000 PSI as tested in accordance with ASTM D4541.

.3 Quality – The finished powder surface will be free from any holidays (skips or misses) as tested in accordance with ASTM D4541. The product will also be free from wrinkles, orange peel, cracking, pinholes, fish eyes, blisters, etc by visual inspection.

.4 Color – The color will be verified to be within 3 DE of specialized color.

.5 An independent firm such as CanSpec Testing who are qualified to test powder finish will do the testing at the supplier's expense. The result of tests must accompany the Certificate of Compliance and will be made available to the City or their representative upon request. A supplier who fails to test product as noted above will have their product rejected until the testing

is completed and the product deemed acceptable by the testing agency.

.6 Where the tested product fails on a given production run then a minimum of 30 % of the entire production run will be tested. If no other failures are found then the individual failed product will be stripped, reapplied and re-tested until it passes. If any of the 30% of product tested fails then the entire order will be stripped, reapplied and retested until it passes.

.4 Field repairs will be undertaken as required to fix any scratches or imperfections in the final finish. Field repairs will be done as follows:

.1 Feather the damaged area with sandpaper.

.2 Clean area with solvent.

.3 Let dry.

.4 Neatly brush on an application of Aliphatic Urethane Acrylic Semi-Gloss High Build applied at 2-4 mils DFT over the entire sanded and damaged area. The ambient conditions will be dry and over 10 degrees C when the paint is applied.

.5 The pole supplier will warranty the integrity of the surface for a minimum of 1 year from the date of installation. The warranty will include all labour and materials required to provide replacement product if required. The powder finish will be the responsibility of the pole supplier. The warranty will apply to fading, blistering, cracking or chipping of the surface.

3.26 Uninterruptable Power Supply — Add 3.26.2

Uninterruptable power supply/cabinet to be installed on the side of the traffic controller cabinet as detailed on the *Contract Drawing* and Coquitlam Standard Detail Drawing SS-E7.24.

3.28 Illuminated Street Name Signs — Add 3.28.1

Install illuminated street name signs as detailed on the *Contract Drawing* and Coquitlam Standard Detail Drawing SS-E5.18

		Add 3.28.2	Illuminated street name signs shall be safety cabled to the traffic signal pole arm using 3/32" galvanized steel aircraft cable.
3.29	**Emergency Vehicle Pre-emption**	Add 3.29.1	Emergency vehicle pre-emption system to be installed as detailed on the *Contract Drawing* and Coquitlam Standard Detail Drawing SS-E5.16.
		Add 3.29.2	Cable shall be continuous with a minimum of 2m of cable slack to be provided at each end, with no splices. Cabinet termination to be completed by City.
3.30	**PTZ/CCTV Cameras**	Add 3.30.1	PTZ/CCTV cameras to be installed as detailed on the *Contract Drawing*. Contact the City of Coquitlam's Traffic Operations staff prior to installation.
		Add 3.30.2	Cable shall be continuous with a minimum of 2m of cable slack to be provided at each end, with no splices. Cabinet termination to be completed by City.
3.31	**Radio Communications Equipment**	Add 3.31.1	Radio communications equipment to be installed as detailed on the *Contract Drawing*. Contact the City of Coquitlam's Traffic Operations staff prior to installation.
		Add 3.31.2	Cable shall be continuous with a minimum of 2m of cable slack to be provided at each end, and with no splices. Cabinet termination to be completed by City.
3.32	**Owner Supplied Materials**	Add 3.32.1	Those retained to complete the work must notify the City in writing (seven) 7 days prior to the time materials are required.
		Add 3.32.2	Unless otherwise noted, those retained to complete the work will make all necessary arrangements and pay all costs for the collection of the materials and for delivery to the *Place of Work*. They will assume responsibility for materials at the time they are picked up.
		Add 3.32.3	Owner supplied materials generally consist of the following: .1 Traffic controller equipment and cabinet. .2 Uninterruptable power supply equipment and cabinet. .3 Emergency pre-emption equipment. The exact list of materials supplied by the Owner to be confirmed with the City of Coquitlam Traffic Operations staff and *Contract Administrator*. In the case of private development projects requiring City supplied materials, the cost for supply and installation of these materials will be borne by the Developer.

3.33 Fibre Optic Cable Add 3.33

.1 Fibre optic cables will be terminated to a twelve (12) port LC coupler panel.

.2 When installing Fibre Optic Communications Conduit, Fibre optic warning tape (150 mm wide orange plastic tape labelled "WARNING FIBRE OPTIC COMMUNICATIONS CABLE") and Detectable (Magnetic) marker tape is to be placed over all conduits containing fibre optic cable.

.3 During installation of new boxes or with all existing boxes ensure that they have been cleared of any soil, sand or gravel and other materials that have accumulated in the base of the junction box. Ensure that all empty conduits have a proper RPVC coupling and cap inserted (friction fit - DO NOT GLUE) into each duct. Once the conduit is populated, replace cap with bell coupling and glue in place.

.4 All communication conduits will be flushed with water and dried with compressed air. This process will be followed by pulling through a suitable size Blowing Mouse, a clean soft cloth and new No. 8 HB Yellow/Green Mk pull string

.5 Perform a visual inspection of the proposed cable route and be aware of any potential problem areas. Locations in which cables will be terminated must be inspected and plans made for hardware and cable slack storage. Space and access for termination of the cable should be considered prior to starting the job. Develop a cable placement plan based upon the cable route survey and your available equipment and personnel resources. Submit a plan to the City for acceptance prior to starting work.

.6 Be aware that any damage due to excessive pulling, bending, or crushing, may alter the cable's transmission characteristics to the extent that the cable section will have to be replaced at the Project's expense.

.7 Fibre optic cables will be installed in continuous runs in conduit between the traffic signal controller cabinets (no splices are allowed).

.8 DO NOT EXCEED THE MINIMUM BEND RADIUS OF THE FIBRE. During installation do not exceed the minimum bend radius as specified by the manufacture.

.9 DO NOT IMPROPERLY PULL OR EXCEED THE CABLE'S RATED PULLING TENSION as specified by the cable

manufacturer. Excess pulling may not actually break the fibre, but it can cause the fibre attenuation to increase so that the installed system may not operate within the specified requirements.

.10 DO NOT EXCEED THE VERTICAL RISE SPECIFICATION as specified by the cable manufacturer unless intermediate tension relief is used. Secure the cable to new or existing supports wherever possible.

.11 Take precautions to protect reeled and unreeled cable from any source of damage, whether attended or unattended. Be particularly careful with pre-connected sections of cable produced to meet specific length requirements as any damage to the cable may require replacement of the entire section.

.12 If the cable must be unreeled during installation, the "figure--eight" configuration should be used to prevent kinking or twisting. Do not coil the cable in a continuous direction except for lengths of 30 meters or less. The preferred size of the "figure-eight" is about 4.5 meters in length, with each loop about 1.5 meters to 2.4 meters in diameter.

.13 If a cable puller is used, ensure that the recommended pulling tension of the cable is not exceeded. Do not pull through junction boxes, especially 90-degree conduit fittings, unless precautions are taken to maintain the minimum bend radius.

.14 When installing cable in conduits, ensure the conduit does not exceed the minimum bend radius. Avoid pull boxes unless the maximum bend radius can be maintained. In controller cabinets, fibre optic cables will be tied together with ty-wraps. Each cable will be labelled within 10 cm of the terminated ends with a tag and text stating the street intersection of the opposite cable end. Cables will be tagged in the controller cabinet and all other access points with "CAUTION, FIBRE OPTIC CABLE" tags. Leave enough cable slack at termination points to allow the cable to be routed through the termination hardware to a polishing/splicing table, plus a minimum of 3 meters additional slack. Cable slack will be coiled and secured with Velcro ties for breakaway protection. Cable to termination panel will be secured to cabinet with ty-wraps

.15 If cable lubricants are necessary, ensure that they are compatible with the cable's outer sheath. Refer

to the lubricant specification sheet to ensure compatibility. In all cases avoid the use of detergent-based lubricants, as these types of lubricants promote stress cracks.

.16 Excess cable inside pull boxes will be coiled and mechanically secured in place with Velcro straps such that the minimum bend radius is not exceeded and the cable is suspended above the pull box. The Velcro straps are to provide `breakaway' protection in the event of an accidental dig-up between pull boxes.

.17 Adhesive warning labels 3M – 5016 – FO type or accepted alternate will be affixed to each fibre optic cable in each access point. Access points include pull boxes and traffic signal controller cabinets. Decal strip holders, 3M – 5012 or accepted alternate, will be used and will be secured in place using cable ties. Warning labels will be oriented so they are visible and are not blocked by other cables or equipment.

.18 After installation, each segment of each fibre will be tested using an Optical Time Domain Reflectometer (OTDR) and power meter equipment. Testing will be done in each direction on each fibre and at both 1310nm and 1550nm wavelengths. Launch cable will be used as per the OTDR manufacturer's specifications. Those retained to complete the work will provide a report detailing the results of each test including OTDR test results in graphical format, cable length, any fibre breaks or anomalies, attenuation of fibre's, connectors and fibre uniformity.

.19 Final testing and inspection of the cable installation will be conducted with the City on-site.

Standard Detail Drawings

General Details	
Trench Details For Standard Section	COQ-G4
Storm and Sanitary Sewers	
Inside Drop Manhole	COQ-S4
Storm Sewer Service Connection Within Ravine	COQ-S8A
Side Inlet Catch Basin Assembly	COQ-S11A
Typical Top Inlet Catch Basin With Offset Sump	COQ-S11B
Storm Sewer Ditch Inlet	COQ-S13A
Driveway Culvert With Concrete Block Endwalls	COQ-S15A
Manhole Cover & Frame	COQ-S16
Forcemain Service Connection Detail	COQ-S17
Permanent Cap For Sanitary And Storm Services	COQ-S18
Sanitary Forcemain Flushout Detail	COQ-S19
Waterworks	
Water Service Connection 19 to 38mm Diameter	COQ-W2b-1
Water Service Connection 19 to 38mm Diameter (Municipex Pipe)	COQ-W2b-2
16mm – 25mm Meter Setter Installation	COQ-W2c
Water Service Connection 19mm Diameter (Municipex Pipe)	COQ-W2d
Water Service Connection 50mm Diameter	COQ-W2e
Typical Water Service Connection 100mm Diameter and Greater	COQ-W2f
Permanent Cap For Water Services 19mm to 25mm Only	COQ-W2g
Permanent Cap For Water Services 19mm to 50mm with Gate Valve At Main	COQ-W2h
Permanent Cap For Water Service 100mm & Larger with Gate Valve At Main	COQ-W2i
Water Service Connection Replacement (Re-Use Ex. Corporation Stop)	COQ-W2j
25mm Double Acting Air Release Valve	COQ-W6
Typical Watermain Blow-Off Assembly	COQ-W8
Transportation	
Arterial Streets	COQ-R2A
Collector Streets	COQ-R2B
Local Streets	COQ-R2C
25.2m R.O.W. Higher Density Community Collector With Cycle Track	COQ-R3
Arterial, Collector & Local Streets Boulevard	COQ-R4
Hillside Local Streets Boulevards	COQ-R5
Hillside Local Streets	COQ-R6
Narrow Street	COQ-R7
Rural Street	COQ-R8
Standard Lane (New) Construction	COQ-R9
Primary Access Lane 8.0m Right-of-Way	COQ-R10
Standard Lane Construction (Existing)	COQ-R11
25.2m Community – 20.0m Collector Intersection	COQ-R12
25.2m Community – 17.4m Local Intersection	COQ-R13
20.m Collector – 17.4m Local Intersection	COQ-R14
17.4m Local Street Intersection (Low Density)	COQ-R15
20.0m Collector Street and Industrial /Service Commercial 4-Way Intersection	COQ-R16
20.0m Standard Collector Street 3-Way Intersection	COQ-R17
Collector or Higher Density Local 4-Way Intersection w/ Curb Extensions	COQ-R18
Collector or Higher Density Local 3-Way Intersection	COQ-R19
Curb Extensions And On-Street Parking Bay	COQ-R20

High Density Urban Walkway Greenway or Cycle Route 6.0m Row	COQ-R21
Urban Walkway Non-Cycling Route 3.0m Row	COQ-R22
Walkway Details	COQ-R23
Lane Turn Around	COQ-R24
Pre-Cast Reinforced Concrete 'No-Post' Barrier	COQ-R25
Tree Protection Fence	COQ-R26
Typical X-Sections Frontage Works Program	COQ-R27A
Typical X-Sections Frontage Works Program	COQ-R27B
Lane Intersections and Lane Bends	COQ-R28
Concrete and Miscellaneous Details	
Boulevard – Sidewalk Utility Strip	COQ-C1
Curb On Gravel Base	COQ-C6
Local, Collector Driveway Crossing Of Curb, Gutter And Sidewalk	COQ-C7
Industrial, Commercial Driveway Crossing Of Curb, Gutter And Sidewalk	COQ-C7A
Typical Curb/Sidewalk Driveway Letdown- Separated Sidewalk	COQ-C7B
Monolithic Sidewalk	COQ-C8
Split Letdown At Intersection With Boulevard	COQ-C9A
Single Letdown At Intersection With Boulevard	COQ-C9B
Single Curb Ramp Letdown	COQ-C9C
Parallel Curb Ramp – Single Letdown Without Boulevard	COQ-C9D
Parallel Curb Ramp – Combined Letdown Without Boulevard	COQ-C9E
Stairway Details	COQ-C15
Typical Handrail Details For Stairs With Bicycle Ramp	COQ-C16
Stormwater Management	
Perforated Pipe Subdrain	COQ-SW1
Curb Cut	COQ-SW2
Boulevard Retention Trench (Low Side Of The Road)	COQ-SW3
Boulevard Retention Trench (High Side Of Road)	COQ-SW4
Boulevard Lawn Basin With Retention Trench	COQ-SW5
Curb Bulge Rain Garden	COQ-SW6
Permeable Pavement With Exfiltration To Soil Subgrade	COQ-SW7
Green Lane Standard	COQ-SW8
Green Lane Standard Plan and Profile	COQ-SW9
Irrigation	
Double Check Assembly (Model: Watt 007QT)	COQ-I1
Electrical	
Concrete Vault	SS-E2.5
Audible Signals	SS-E5.12
Emtrac Antenna Mounting Details	SS-E5.16
UPS ("On Battery") Indicator Light Detail	SS-E5.17
Illuminated Street Name Sign Mounting Details	SS-E5.18
Fire Signal Head Mounting Details	SS-E5.19
Service Panel In Service Base (Mounting Details)	SS-E7.2
Service Panel In Service Base (Mounting Details)	SS-E7.3
Service Panel In Service Base (Panel Details)	SS-E7.4
40A & 60A (120/240V) Street Lighting Service Panel In Service (Wiring Diagram)	SS-E7.5
100A (120/240V) Traffic Signal/Street Lighting Service Panel In Service (Wiring Diagram)	SS-E7.6
Typical Street Tree Lighting Receptacle Detail (New Installations)	SS-E7.19
Typical Post Mounted Tree Receptacle Detail	SS-E7.20
Street Lighting and Tree Receptacle Service Panel Detail (In Service Base)	SS-E7.21

Street Tree Lighting Installations Details (For 'Short' Pedestrian Scale Poles)	SS-E7.22
Street Tree Lighting Installations Details (For 'Tall' Roadway Poles)	SS-E7.23
UPS Field Wiring Diagram	SS-E7.24
Detector Loops	SS-E8.2
Detector Loop to Shielded Cable Splices	SS-E8.4
Round Steel Sign Post Installations Details	SS-E11.1
Trapezoidal Concrete Base For Round Steel Sign Post (Precast)	SS-E11.2
Landscaping	
Street Tree – Metal Grate In Hard Service	COQ-L1A
Street Tree – Metal Grate In Hard Service	COQ-L1B
Boulevard Tree Planting Without Swale	COQ-L2A
Boulevard Tree Planting With Swale	COQ-L2B
Boulevard Tree Planting Behind Sidewalk	COQ-L2C
Median Type 1 Trees, Shrubs With Apron	COQ-L3A
Median Type 2 Trees With Lawn	COQ-L3B
Shrub Planting	COQ-L4
Fence Type 1 Single Rail Trail Fence	COQ-L5A
Fence Type 2 Double Rail Trail Fence	COQ-L5B
Trail Marker Trail Entry And Park Fence	COQ-L6
Aggregate Trail	COQ-L7
Removable Steel Bollard	COQ-L8

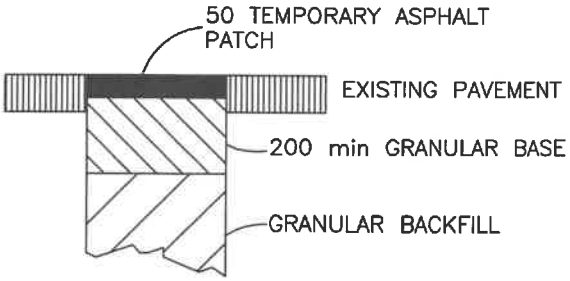
Coquitlam

STANDARD DETAIL DRAWINGS

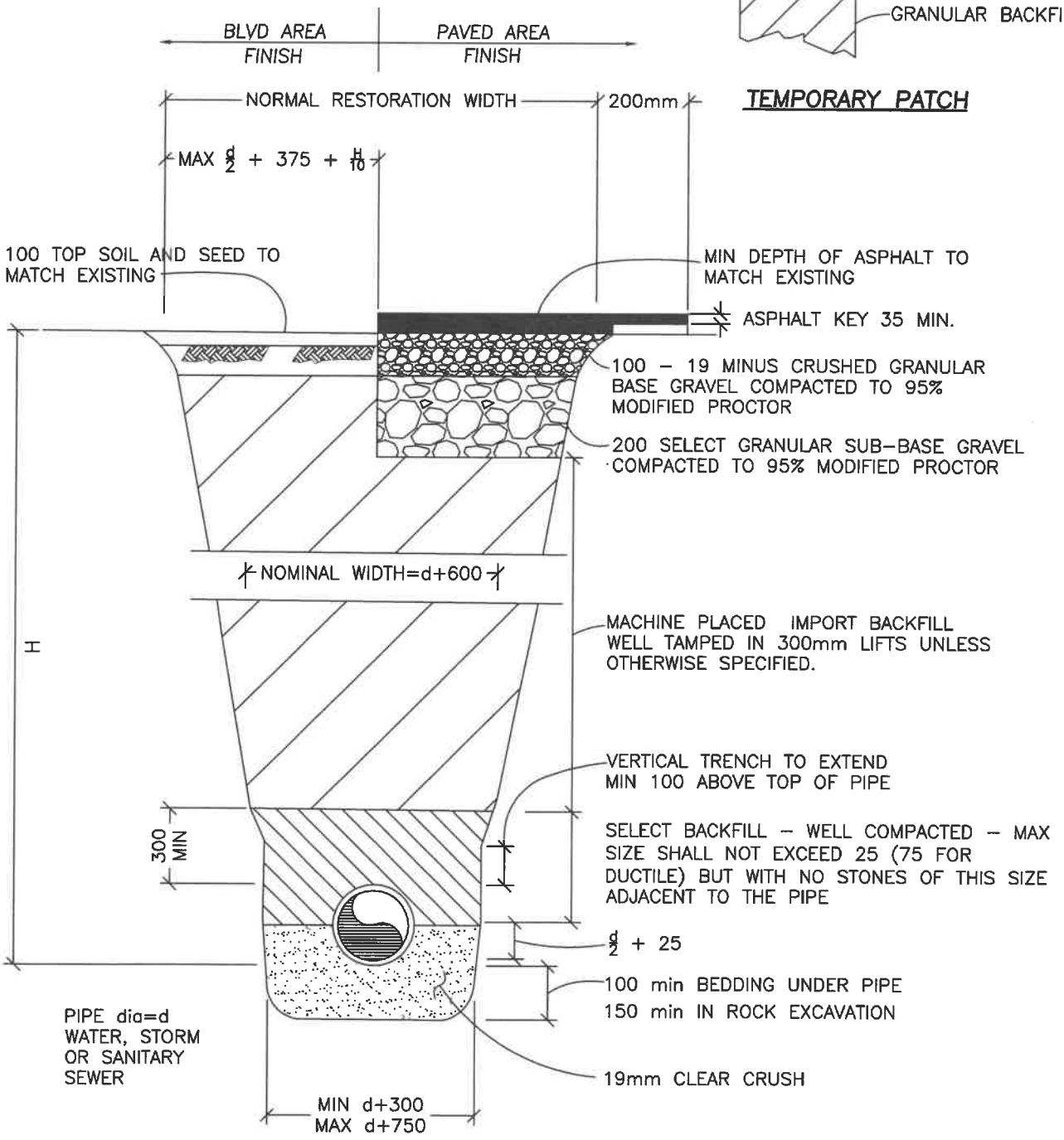
ALL DIMENSIONS IN MILLIMETRES

d = PIPE DIA IN mm

H = TRENCH DEPTH IN mm



TEMPORARY PATCH

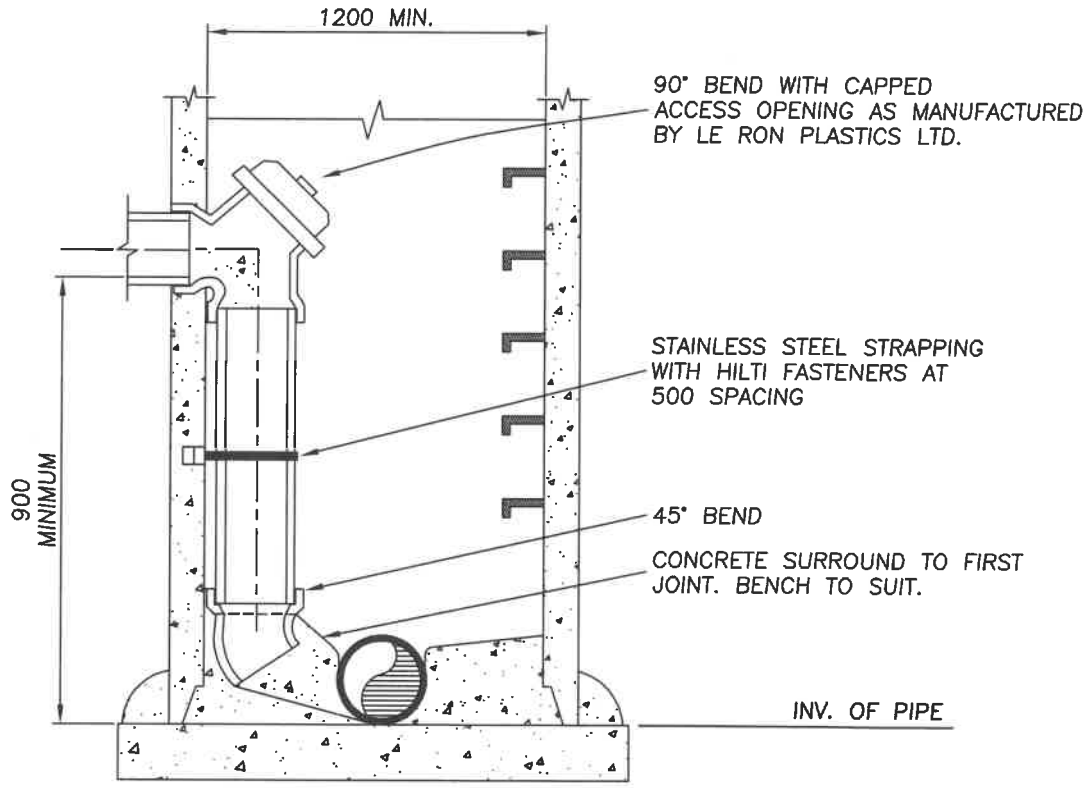


PLOTTED: 20–Sep–21

TRENCH DETAILS FOR STANDARD SECTION	DATE: AUG/2021	DRAWING NUMBER: COQ-G4
	DRAWN: REY	
	SCALE: N.T.S.	

Coquitlam

STANDARD DETAIL DRAWINGS



INSIDE DROP TYPE

NOTE:

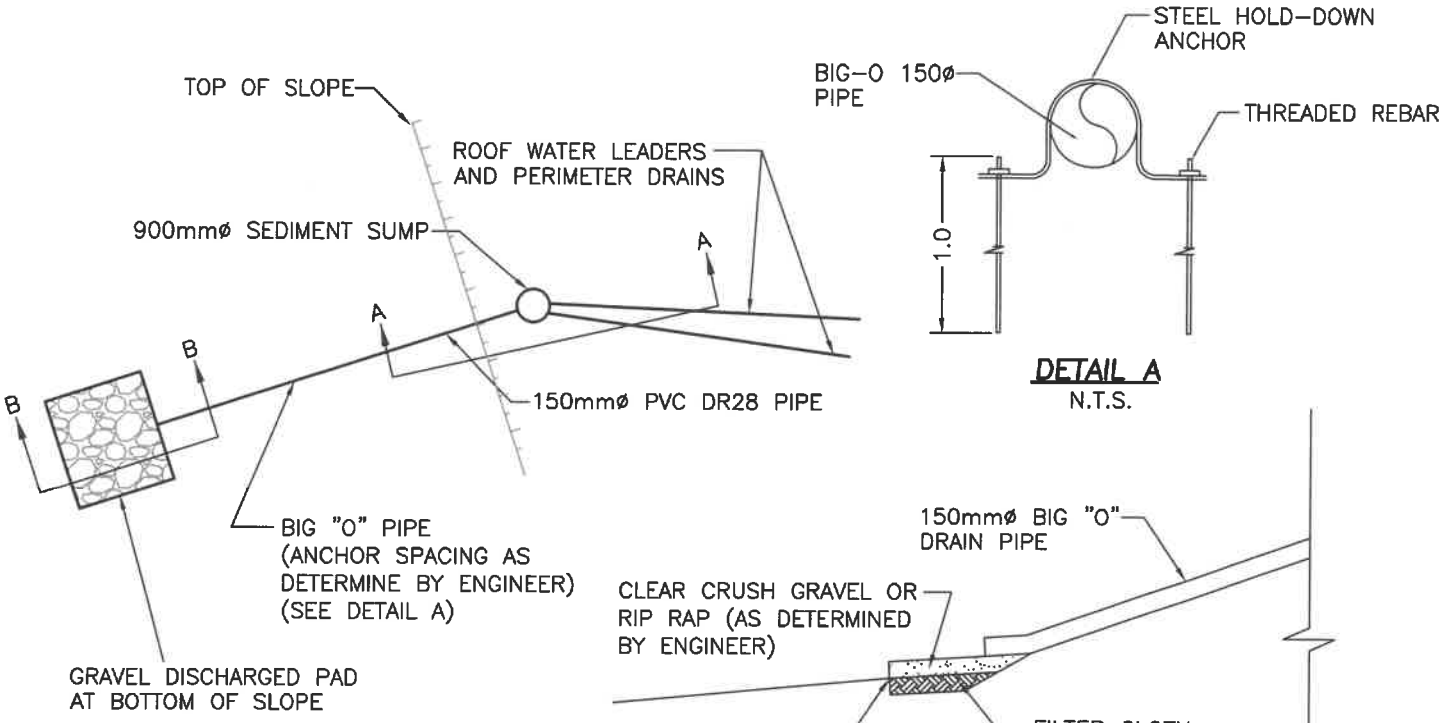
1. INSIDE DROP TO BE USED ONLY WHERE SPECIFIED BY CONTRACT ADMINISTRATOR.
2. ALL INSIDE PIPE AND FITTINGS PVC DR 28/35.
3. THIS DRAWING SHOWS INSIDE DROP ONLY. SEE STANDARD DETAIL DRAWING FOR ALL OTHER DETAILS PERTAINING TO MANHOLE REQUIREMENTS.
4. REFER TO CONTRACT DRAWINGS AND SECTION 33 44 01 FOR DETAILED SPECIFICATIONS.

PLOTTED: 4-Sep-14

INSIDE DROP MANHOLE	DATE:	AUGUST/2014	DRAWING NUMBER:
	DRAWN:	REY	COQ-S4
	SCALE:	N.T.S.	

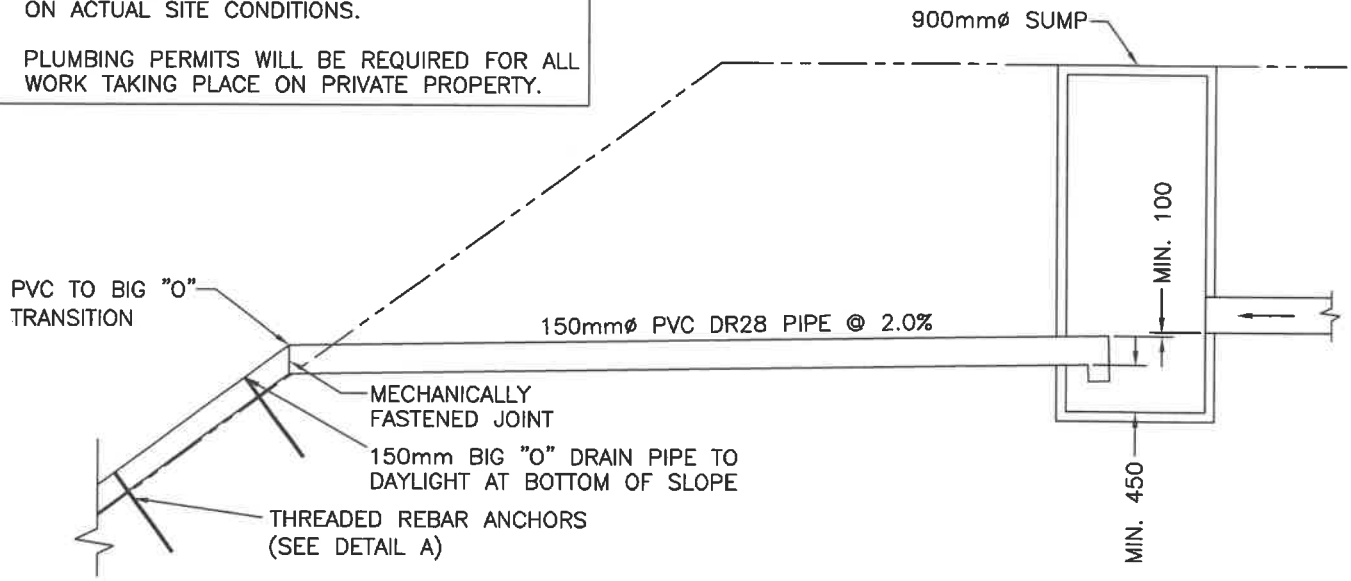
Coquitlam

STANDARD DETAIL DRAWINGS



NOTES:

1. GEOTECHNICAL ENGINEER TO DETERMINE ANCHOR DETAILS AND DISCHARGE POINT BASED ON ACTUAL SITE CONDITIONS.
2. PLUMBING PERMITS WILL BE REQUIRED FOR ALL WORK TAKING PLACE ON PRIVATE PROPERTY.



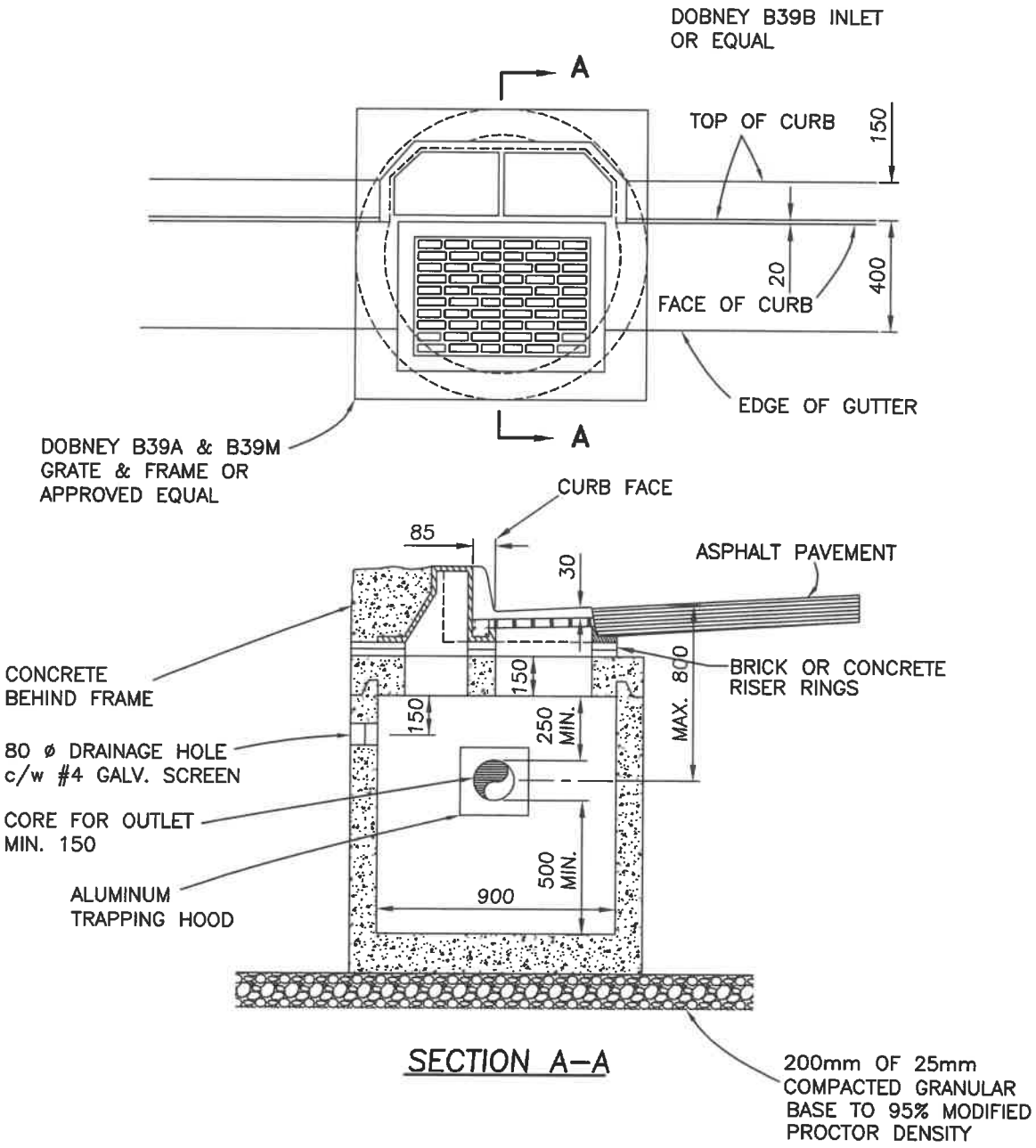
PLOTTED: 20-Sep-21

STORM SEWER SERVICE CONNECTION WITHIN RAVINE

DATE:	AUG/2021
DRAWN:	REY
SCALE:	N.T.S.

DRAWING NUMBER:

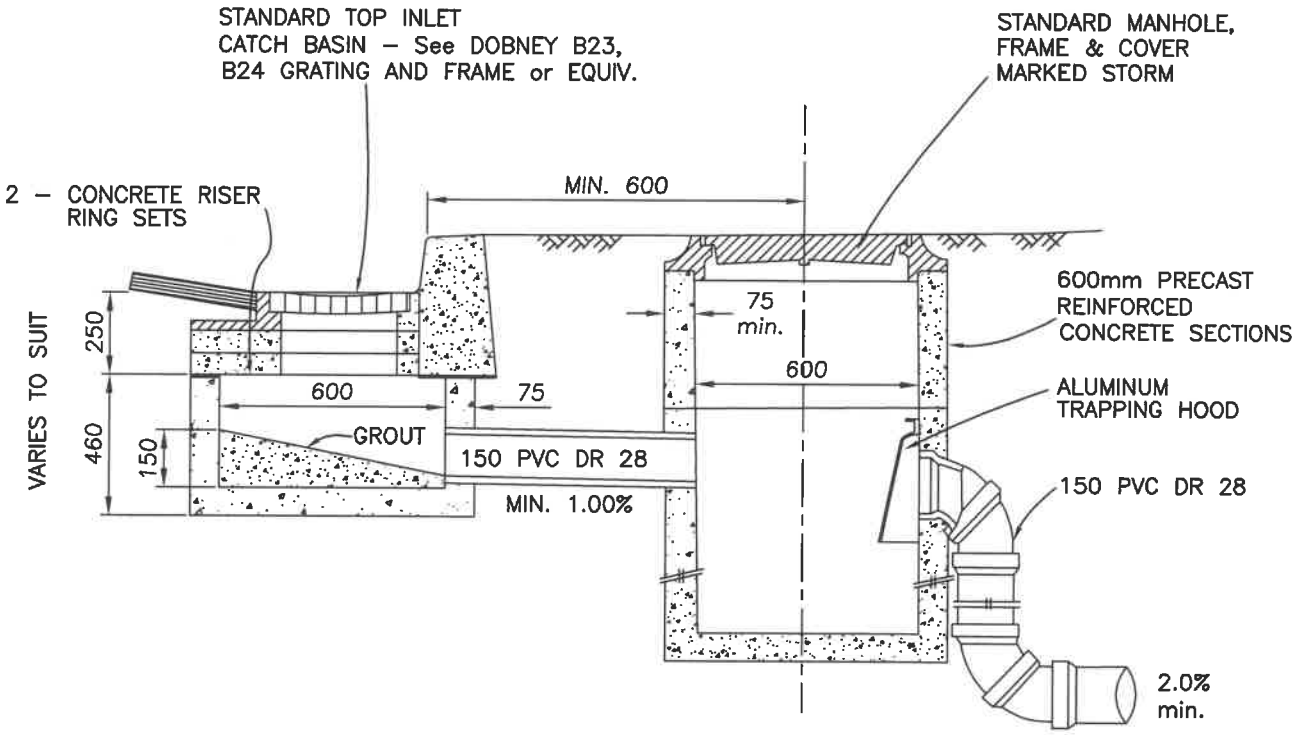
COQ-S8A



NOTES:
1. *REFER TO CONTRACT DRAWINGS, SECTION 33 44 01 FOR DETAILED SPECIFICATIONS.*
2. *PLACE 0.05 cu m DRAIN ROCK ADJACENT TO DRAINAGE HOLE WHEN BACKFILLING.*

PLOTTED: 19–Nov–18

SIDE INLET CATCH BASIN ASSEMBLY	DATE: AUGUST/2014 DRAWN: REY SCALE: N.T.S.	DRAWING NUMBER: COQ-S11A



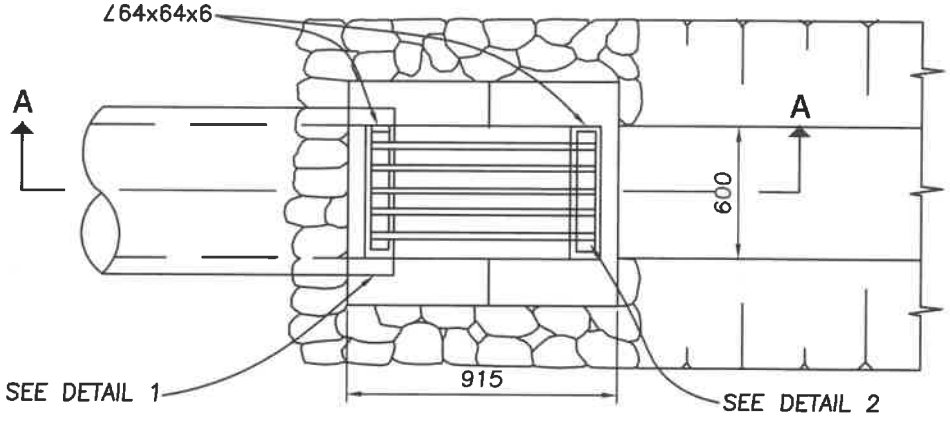
NOTE: 1. REFER TO CONTRACT DRAWINGS, SECTION 33 44 01 FOR DETAILED SPECIFICATIONS.

PLOTTED: 4–Sep–14

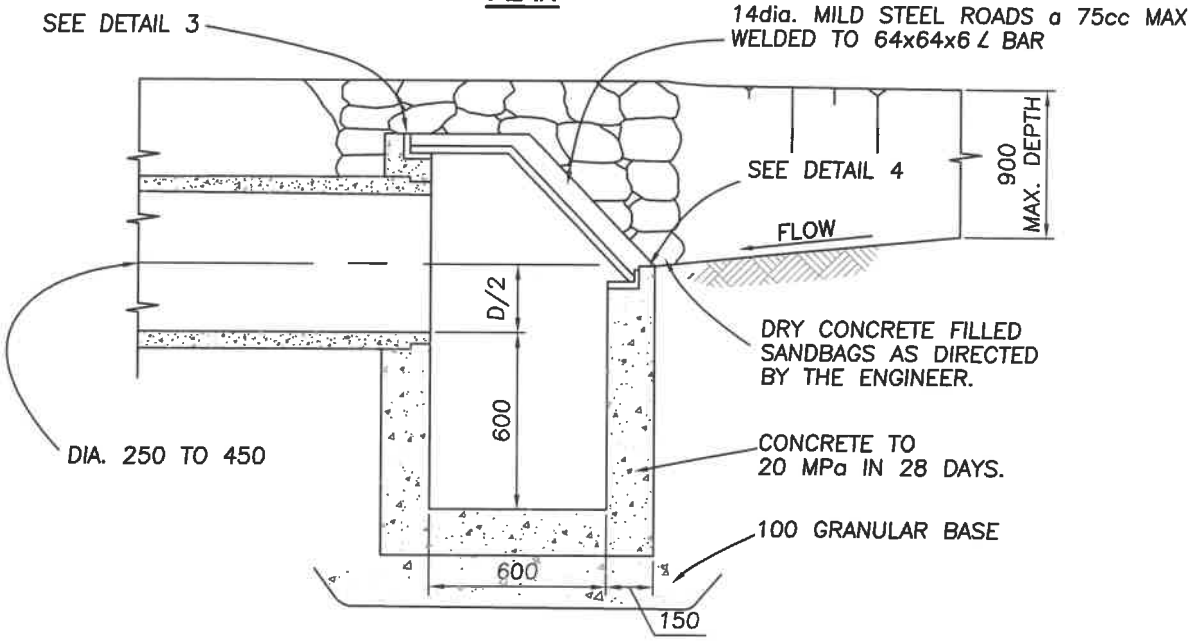
TYPICAL TOP INLET CATCH BASIN WITH OFFSET SUMP	DATE: AUGUST/2014	DRAWING NUMBER: COQ-S11B
	DRAWN: REY	
	SCALE: N.T.S.	

Coquitlam

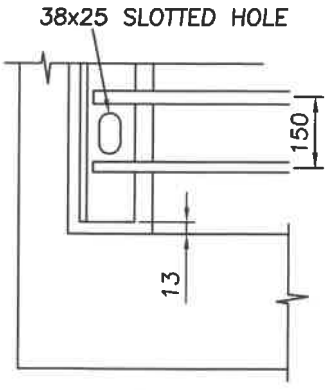
STANDARD DETAIL DRAWINGS



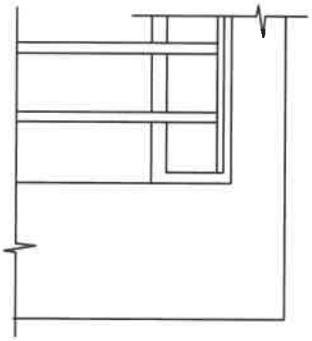
PLAN



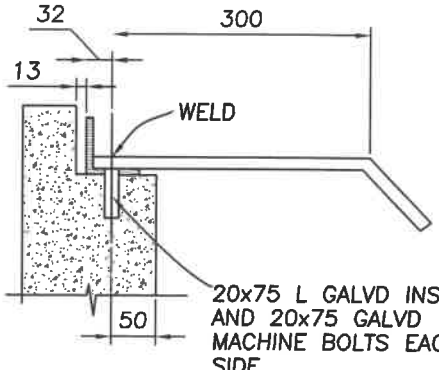
SECTION A-A



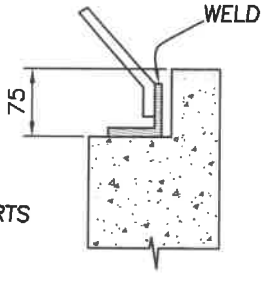
DETAIL 1



DETAIL 2



DETAIL 3



DETAIL 4

PLOTTED: 9-Dec-15

ALL DIMENSIONS IN METRES.

STORM SEWER DITCH INLET

FOR USE IN DRAINAGE DITCHES WITH
INLET PIPE DIAMETER FROM 250mm TO 450mm

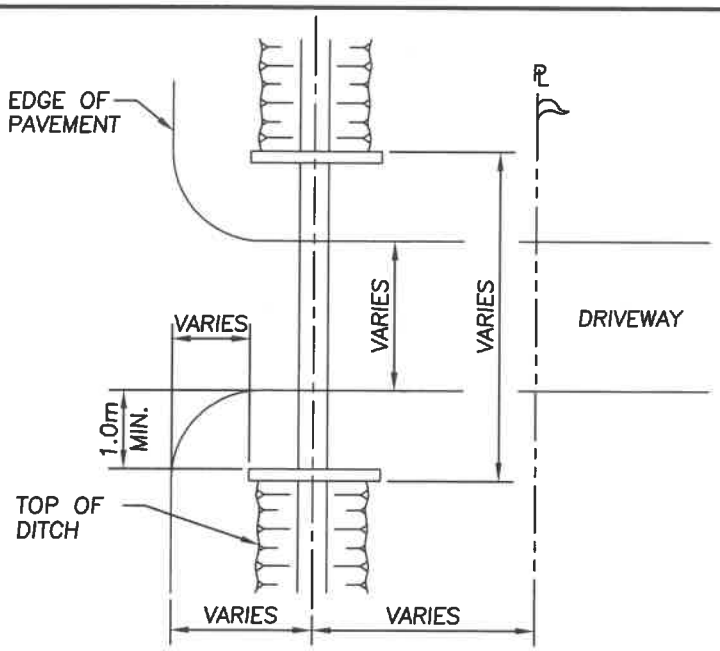
DATE:	DEC/2015
DRAWN:	REY
SCALE:	N.T.S.

DRAWING NUMBER:

COQ-S13A

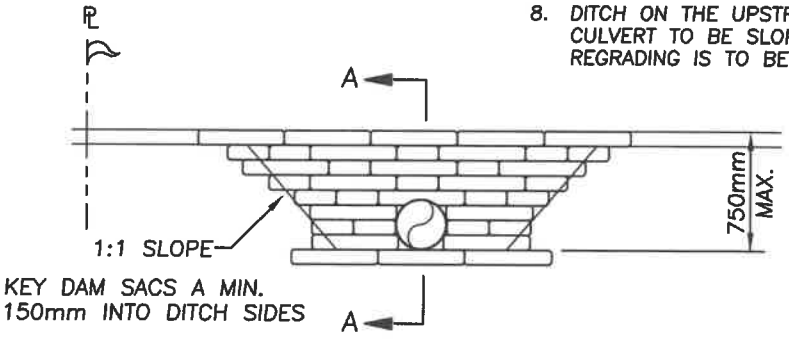
Coquitlam

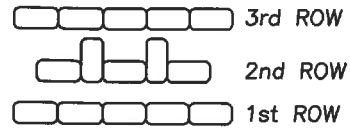
STANDARD DETAIL DRAWINGS



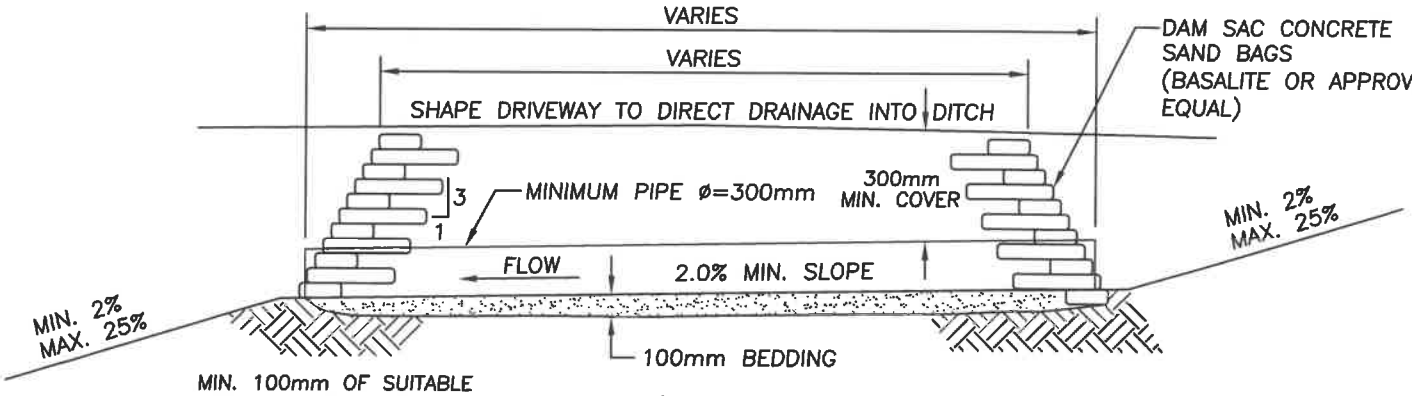
NOTE:

1. FILL BETWEEN ENDWALLS TO BE IMPORTED GRANULAR BACKFILL OR APPROVED NATIVE BACKFILL WITH 150mm GRANULAR BASE SURFACE.
2. SPIGOT END OF PIPE (WHERE APPLICABLE) TO FACE DOWNSTREAM AND TO BE CLEAR OF ENDWALLS.
3. REMOVE ALL ORGANIC MATERIAL FROM UNDER CULVERT.
4. REFER TO SECTIONS 33 42 13 AND 03 30 53 FOR DETAILED SPECIFICATIONS.
5. DELTALOK WALLS MUST BE USED FOR INSTALLATIONS WITHIN ENVIRONMENTALLY SENSITIVE WATERCOURSES. FOLLOW MANUFACTURER'S SPECS.
6. PIPE MATERIAL TO BE PVC SDR35 UNLESS OTHERWISE APPROVED BY THE GENERAL MANAGER ENGINEERING AND PUBLIC WORKS.
7. IF 300mm MINIMUM COVER CANNOT BE ACHIEVED, A BETTER AND STRONGER PIPE MATERIAL IS REQUIRED UNLESS OTHERWISE APPROVED BY THE GENERAL MANAGER ENGINEERING AND PUBLIC WORKS.
8. DITCH ON THE UPSTREAM AND DOWNSTREAM OF THE CULVERT TO BE SLOPE TO MAXIMUM 1:4. EXTENT OF REGRADING IS TO BE DETERMINED BY CITY INSPECTOR.





TYPICAL INSTALLATION



SECTION A–A

MIN. 100mm OF SUITABLE BEDDING MATL. REQ'D UNDER CULVERT.

MECHANICALLY COMPACT THE BEDDING MATL. AROUND THE CULVERT IN MAXIMUM 150mm LIFTS.

GENERAL NOTES:

1. REMOVE ALL ORGANIC MATERIAL FORM UNDER CULVERT.
2. USE IMPORTED GRANULAR FILL BETWEEN HEADWALLS.
3. USE 19mm MINUS GRAVEL FOR SHOULDER SURFACE (50mm MIN. DEPTH)
4. RIP–RAP OR MORTAR AT INLET AND OUTLET MAY BE REQUIRED BY THE GENERAL MANAGER ENGINEERING AND PUBLIC WORKS.

PLOTTED: 4–Feb–16

DRIVEWAY CULVERT WITH CONCRETE BLOCK ENDWALLS

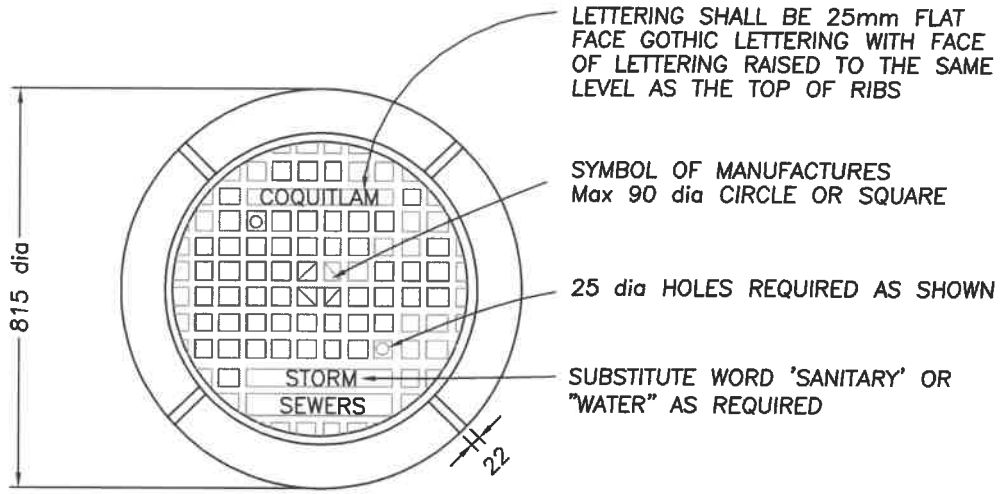
DATE:	AUG/2015
DRAWN:	REY
SCALE:	N.T.S.

DRAWING NUMBER:

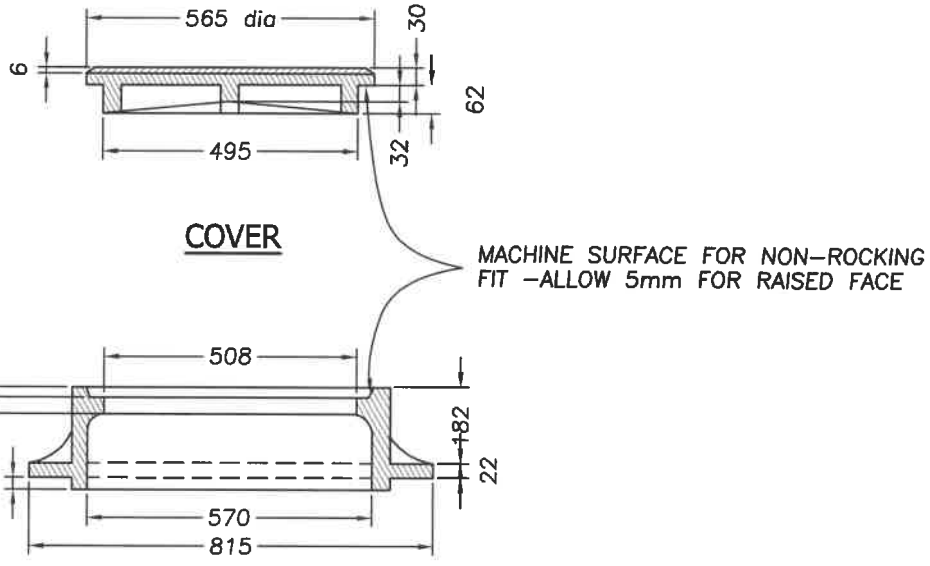
COQ-S15A

Coquitlam

STANDARD DETAIL DRAWINGS



PLAN



COVER

FRAME

APPROX. WEIGHT

COVER 60–65 kg

FRAME 100–110 kg

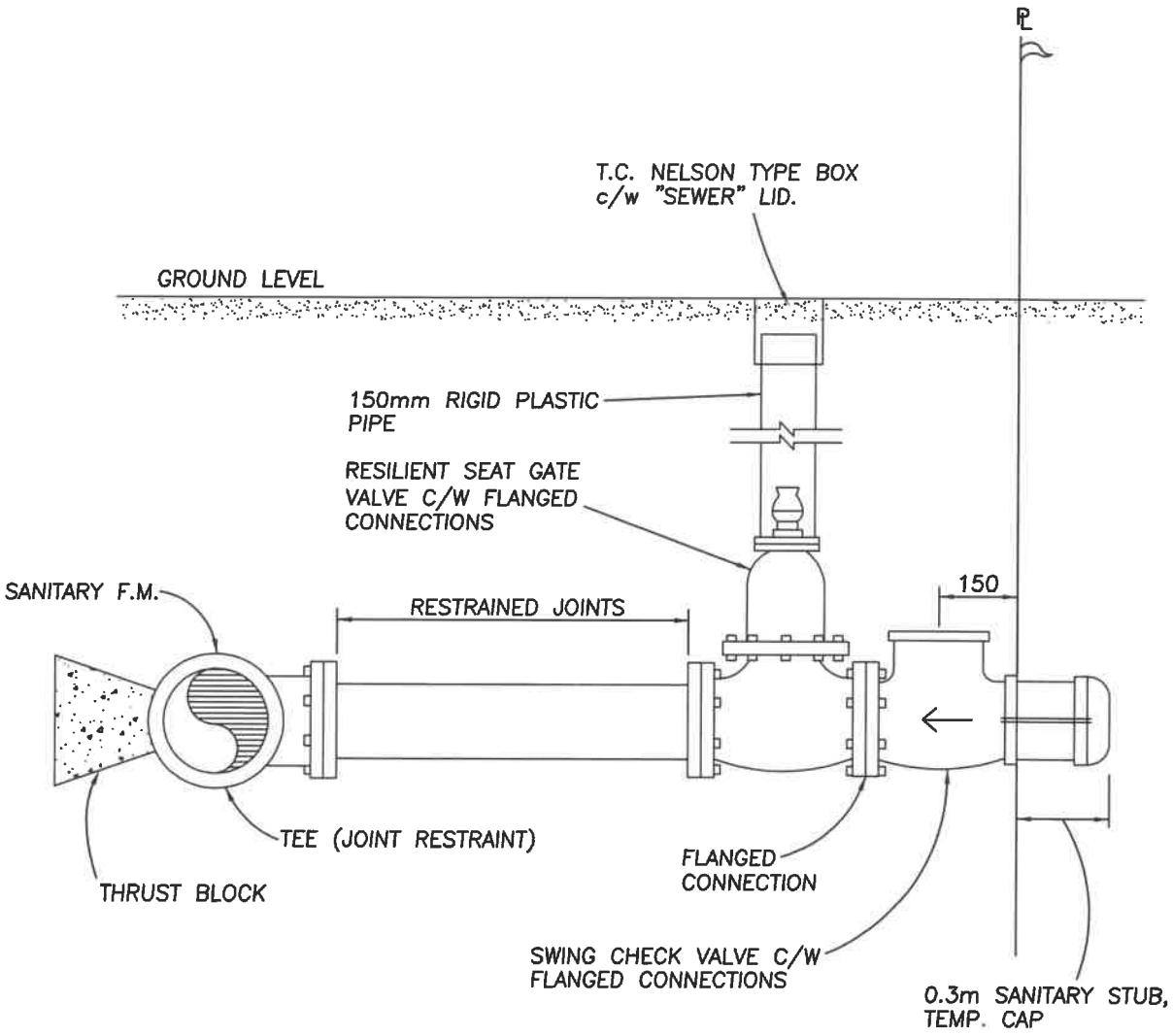
PLOTTED: 9–Dec–15

ALL DIMENSIONS IN METRES.

MANHOLE COVER & FRAME	DATE:	DEC/2015	DRAWING NUMBER:
	DRAWN:	REY	COQ-S16
	SCALE:	N.T.S.	

Coquitlam

STANDARD DETAIL DRAWINGS



PLOTTED: 20–Jan–16

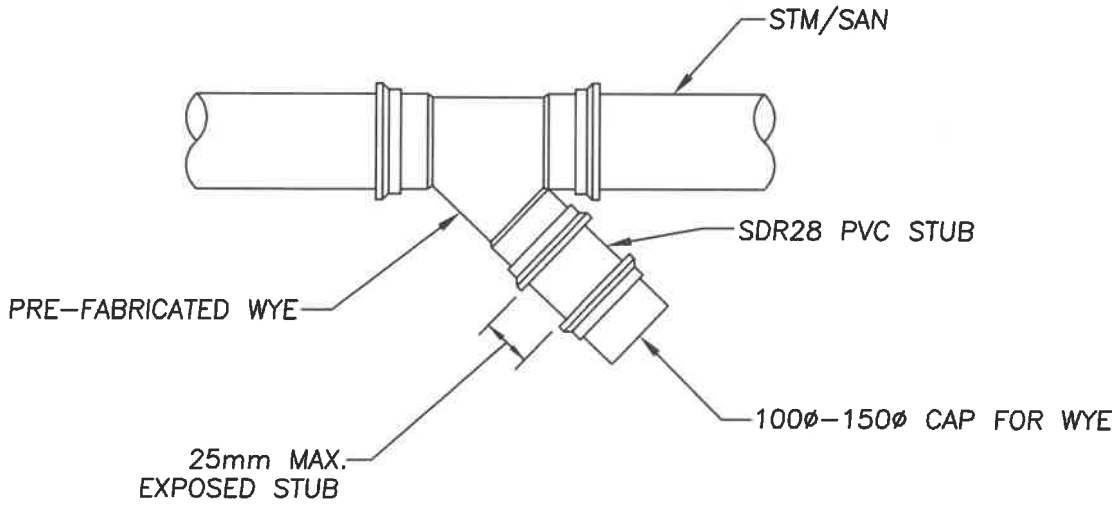
FORCEMAIN
SERVICE CONNECTION DETAIL

DATE:	JUNE/2014
DRAWN:	REY
SCALE:	N.T.S.

DRAWING NUMBER:

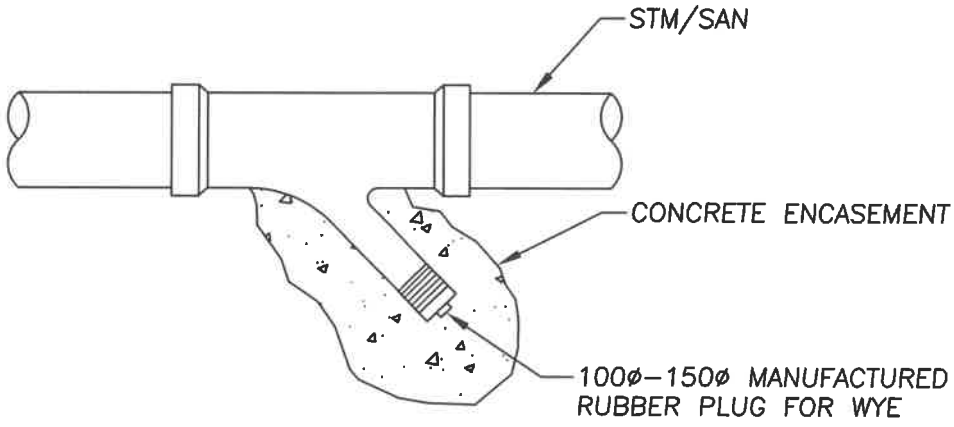
COQ-S17

PLASTIC PIPE CONNECTIONS



(1) 100ø OR 150ø GASKETED PLASTIC CAP PLACED AT WYE. SAME PROCESS FOR ALL WYE SIZES.

ALL OTHER PIPE MATERIAL



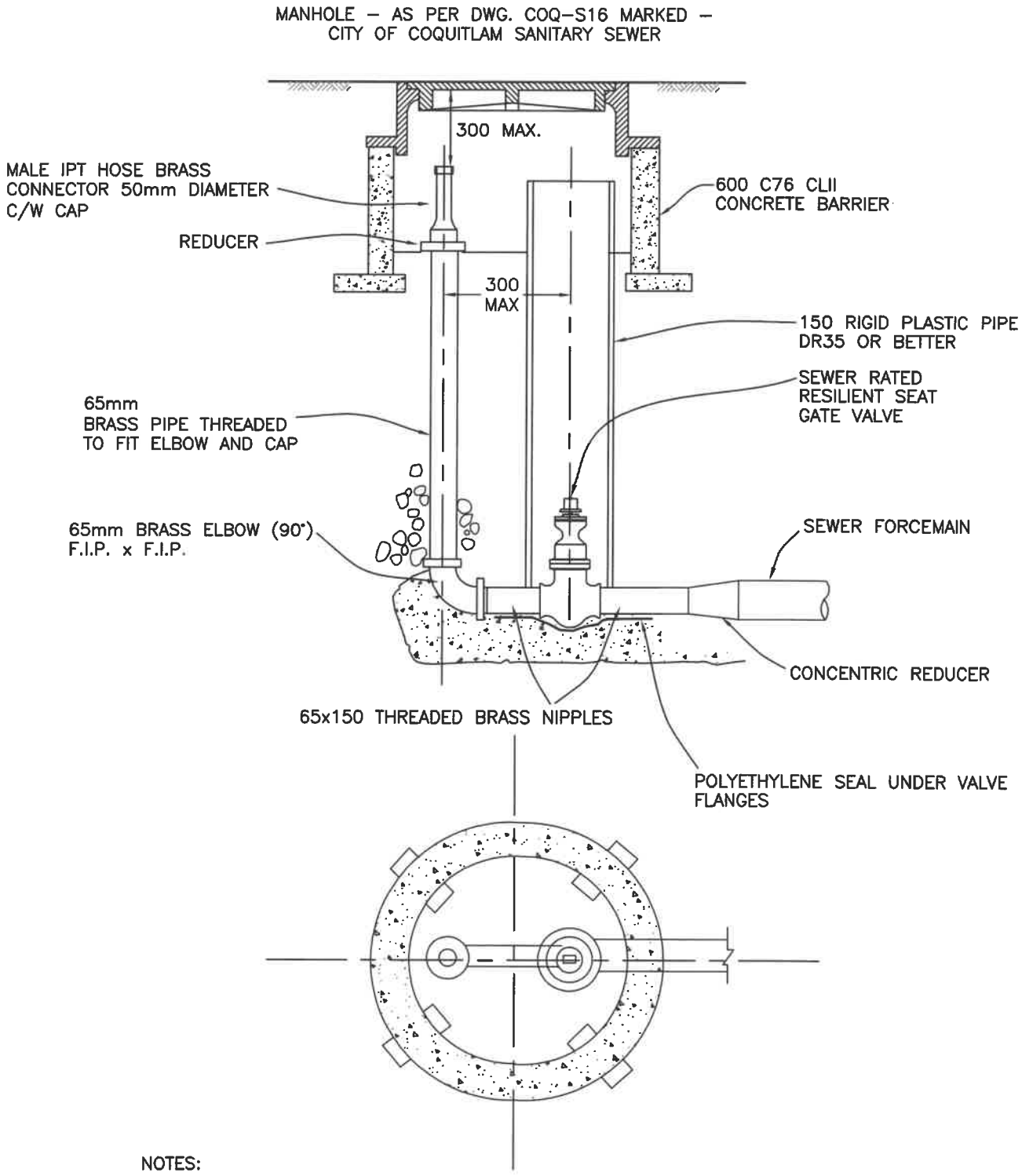
(2) 100ø OR 150ø RUBBER EXPANDIBLE PLUG-PLASTIC INSERT FOR EXPANSION WITH OPERATING NUT AND CONCRETE ENCASEMENT.

PLOTTED: 20-Jan-16

PERMANENT CAP FOR SANITARY AND STORM SERVICES	DATE: DEC/2015	DRAWING NUMBER: COQ-S18
	DRAWN: REY	
	SCALE: N.T.S.	

Coquitlam

STANDARD DETAIL DRAWINGS

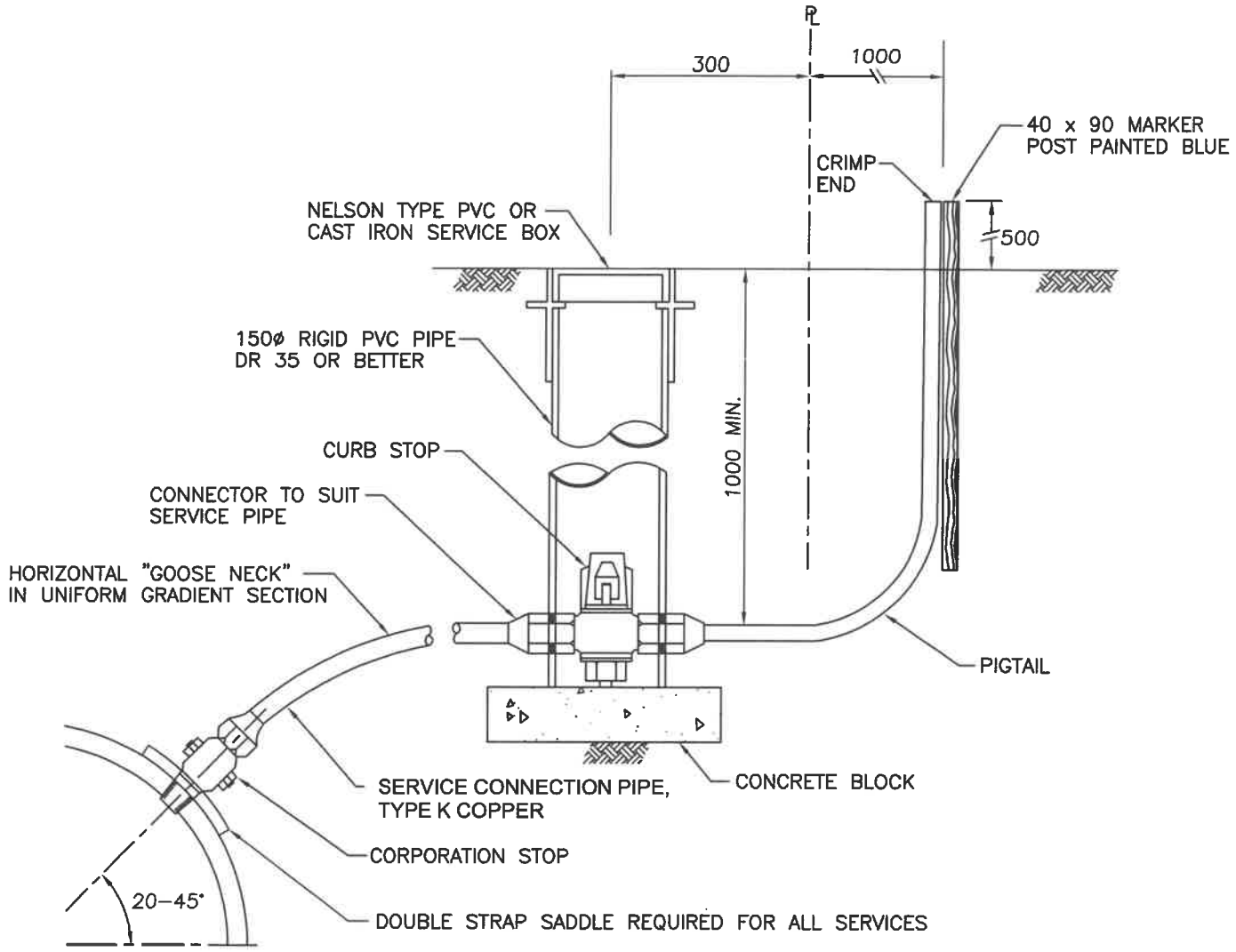


NOTES:

1. REFER TO CONTRACT DRAWINGS AND SECTION 33 34 01 FOR DETAILED SPECIFICATIONS.
2. LARGER DIAMETER FLUSHOUT INSTALLATIONS SUBJECT TO APPROVED DESIGN.

PLOTTED: 21–Sep–21

SANITARY FORCEMAIN FLUSHOUT DETAIL	DATE: AUG/2021 DRAWN: RD SCALE: N.T.S.	DRAWING NUMBER: COQ-S19



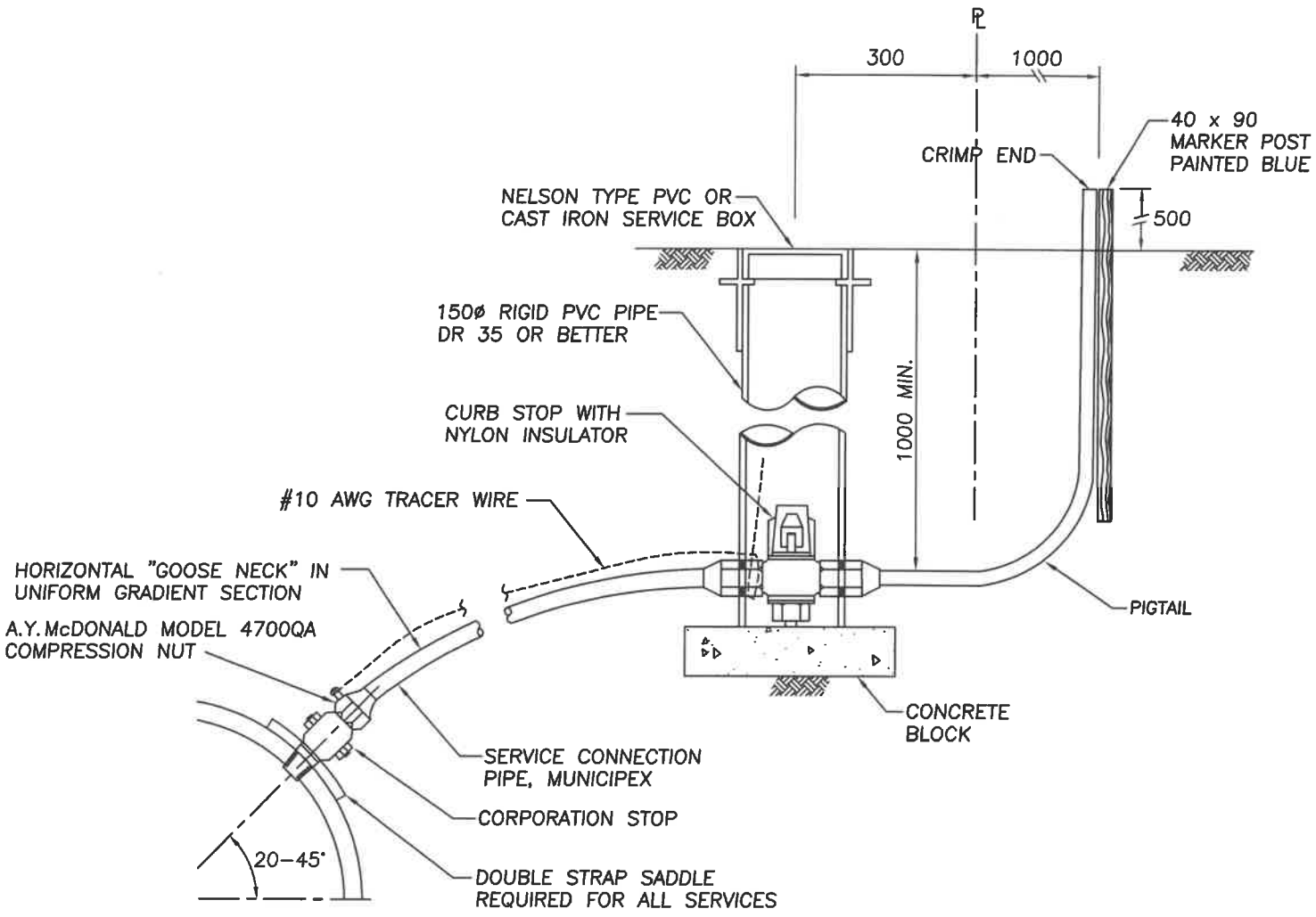
NOTE:
1. THIS DETAIL FOR SERVICES 19 TO 38mm ONLY.
2. SERVICE SADDLES TO SECTION 33 11 01.
3. INSTALL SERVICE PIPE WITH "GOOSE NECK" IN HORIZONTAL POSITION.
4. WHEN CURB STOP INSTALLED IN DRIVEWAY A CAST IRON VALVE BOX MUST BE USED.
5. CORPORATION STOPS ARE TO BE POSITIONED UPRIGHT TO ALLOW OPERATION FROM THE SURFACE.
6. REFER TO CONTRACT DRAWINGS AND SECTION 33 11 01 FOR DETAILED SPECIFICATIONS.
7. SEE STANDARD DRAWING COQ–W2c FOR METER SETTER DETAILS.

PLOTTED: 8–Feb–22

WATER SERVICE CONNECTION 19 TO 38mm DIAMETER	DATE: FEBRUARY/2022	DRAWING NUMBER: COQ-W2b-1
	DRAWN: REY	
	SCALE: N.T.S.	

Coquitlam

STANDARD DETAIL DRAWINGS



NOTE:

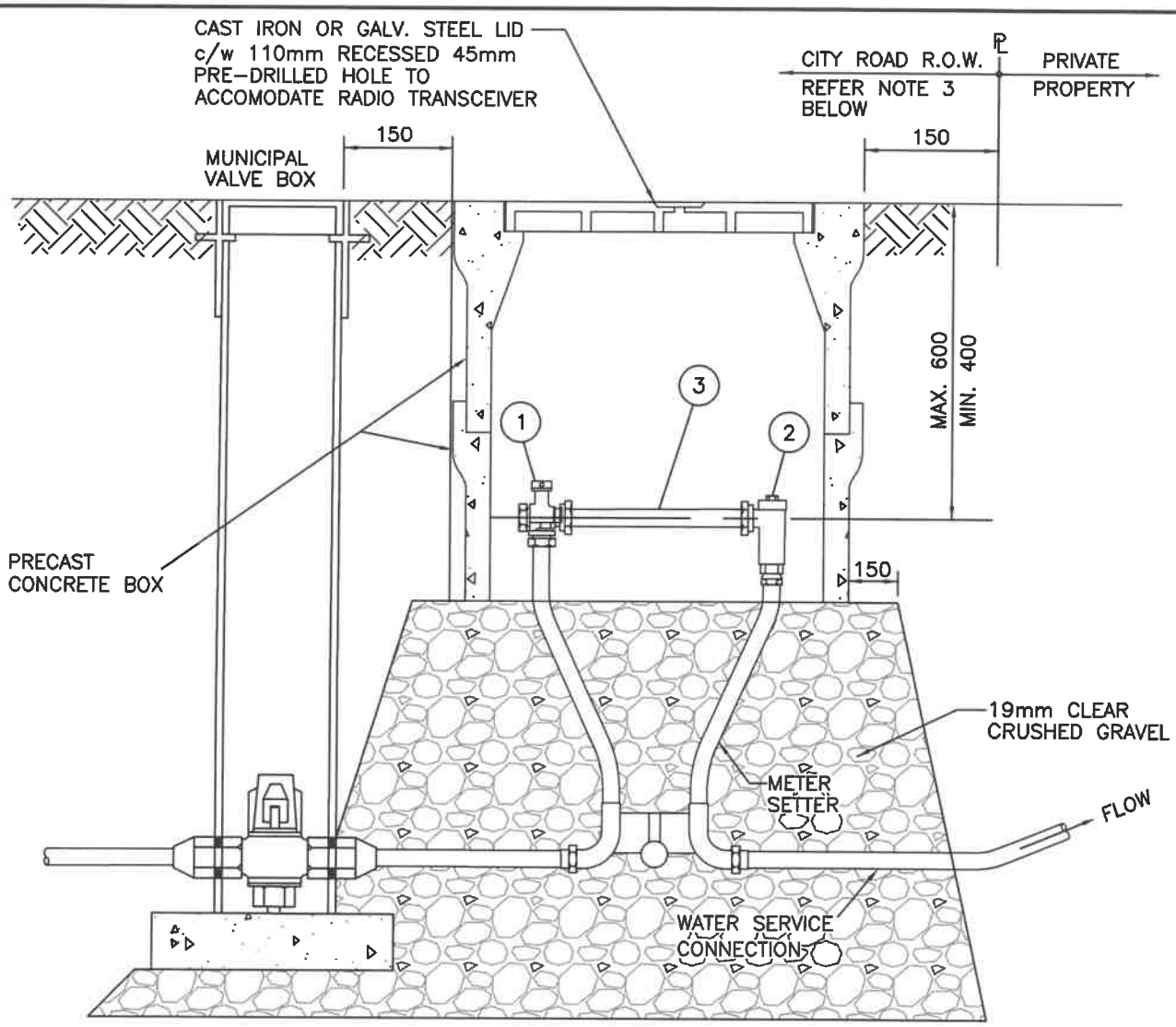
1. THIS DETAIL FOR SERVICES 19 TO 38mm ONLY.
2. SERVICE SADDLES TO SECTION 33 11 01.
3. INSTALL #10 AWG TRACER WIRE FROM CORPORATION STOP TO CURB STOP/SERVICE BOX. TRACER WIRE TO BE FASTENED TO TOP OF PIPE USING ELECTRICAL TAPE AT 1.0m INCREMENTS. TRACER WIRE WITHIN SERVICE BOX, TO BE EXTENDED A MIN. OF 200mm TOWARDS SURFACE.
4. NYLON INSULATOR ON CURB STOP SHALL BE INSTALLED ON THE PROPERTY SIDE OF VALVE.
5. WHEN CURB STOP INSTALLED IN DRIVEWAY A CAST IRON VALVE BOX MUST BE USED.
6. CORPORATION STOPS ARE TO BE POSITIONED UPRIGHT TO ALLOW OPERATION FROM THE SURFACE.
7. REFER TO CONTRACT DRAWINGS AND SECTION 33 11 01 FOR DETAILED SPECIFICATIONS.
8. SEE STANDARD DRAWING COQ–W2c FOR METER SETTER DETAILS.

PLOTTED: 8–Feb–22

WATER SERVICE CONNECTION 19 TO 38mm DIAMETER (MUNICIPEX PIPE)	DATE: FEBRUARY/2022 DRAWN: REY SCALE: N.T.S.	DRAWING NUMBER: COQ-W2b-2

Coquitlam

STANDARD DETAIL DRAWINGS



SECTION

METER BOXES			
16 mm	METER	–	BROOKS 37
16x19 mm	METER	–	BROOKS 37
19 mm	METER	–	BROOKS 37
25 mm	METER	–	BROOKS 66

No.	DESCRIPTION
1	INLET BALL VALVE (FULL PORT)
2	DUAL CHECK VALVE (IN SETTER)
3	TYPE K COPPER SPOOL PIECE IN PLACE OF METER

NOTES:

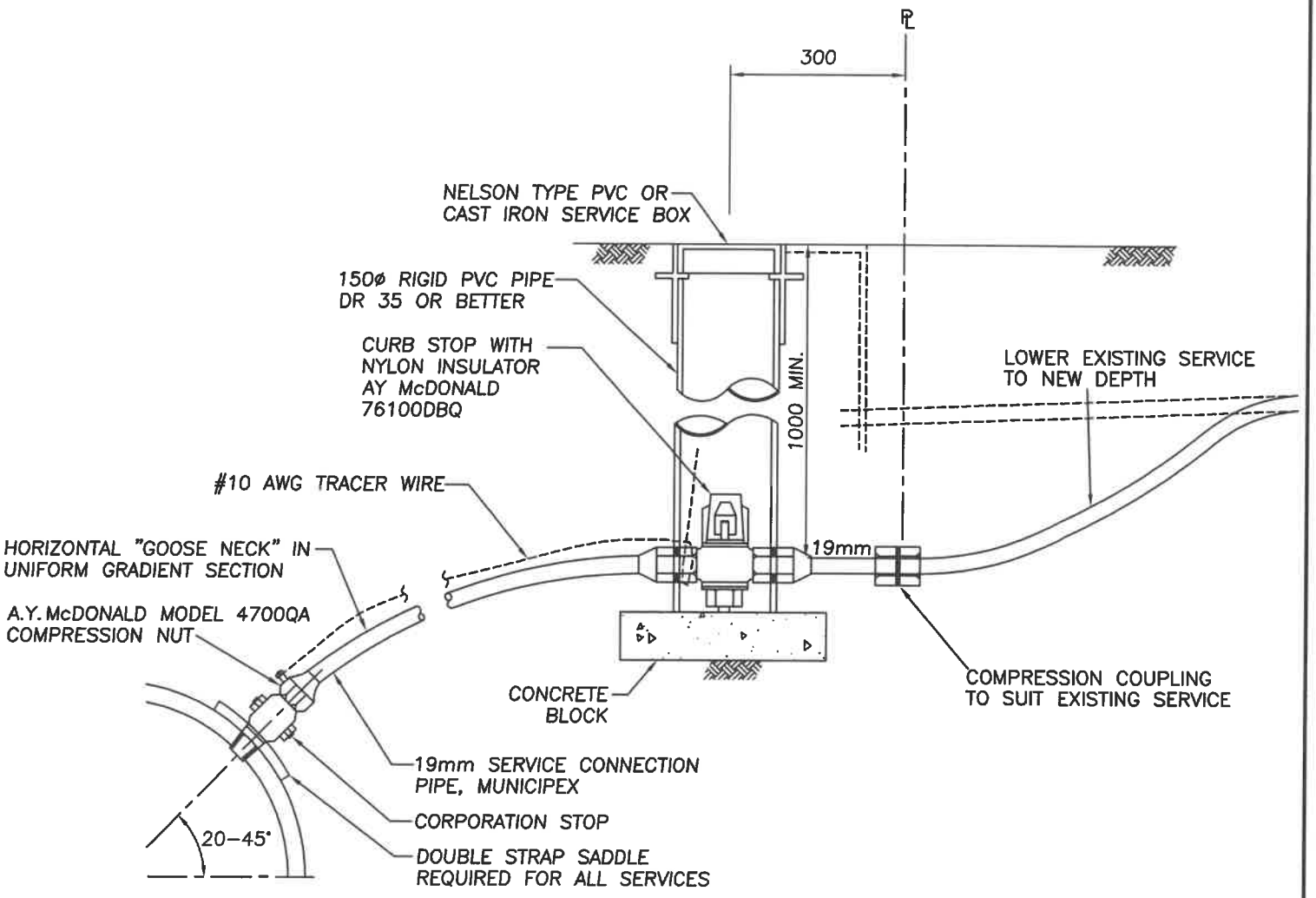
1. THIS DRAWING SHOULD BE REVIEWED WITH WATER METER SPECIFICATIONS DOCUMENT.
2. REFER TO SECTION 33 11 01 FOR DETAILED SPECIFICATIONS.
3. METER SETTER TO BE LOCATED ON PRIVATE PROPERTY (300mm FROM PROPERTY LINE) IF BEING INSTALLED AS PART OF A DEVELOPMENT.

16mmø - 25mmø METER SETTER INSTALLATION

DATE:	01 DEC/2021
DRAWN:	REY
SCALE:	N.T.S.

DRAWING NUMBER:

COQ-W2c



NOTE:

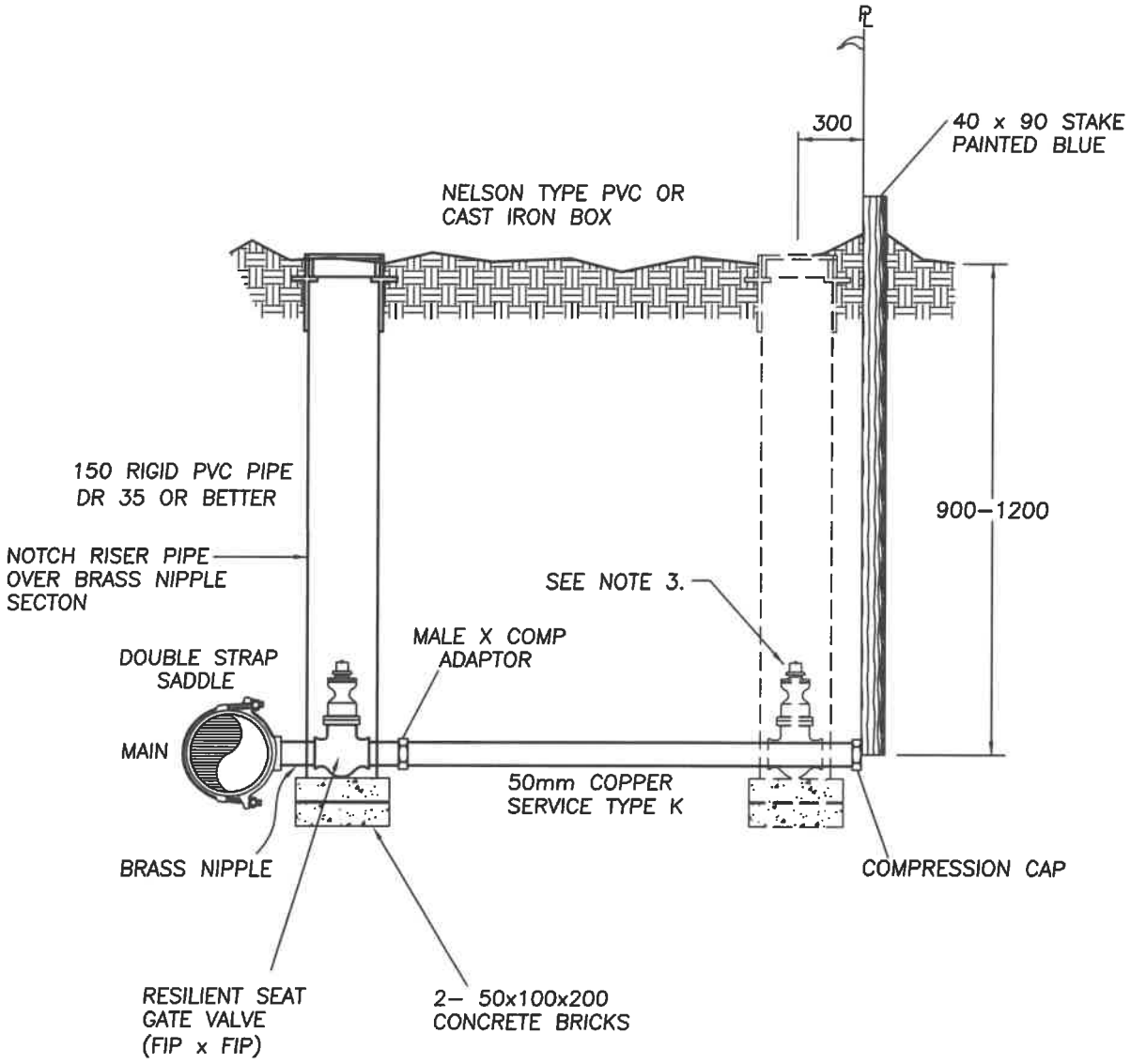
1. THIS DETAIL FOR SERVICES 19mm ONLY.
2. SERVICE SADDLES TO SECTION 33 11 01.
3. INSTALL #10 AWG TRACER WIRE FROM CORPORATION STOP TO CURB STOP/SERVICE BOX. TRACER WIRE TO BE FASTENED TO TOP OF PIPE USING ELECTRICAL TAPE AT 1.0m INCREMENTS. TRACER WIRE WITHIN SERVICE BOX, TO BE EXTENDED A MIN. OF 200mm TOWARDS SURFACE.
4. NYLON INSULATOR ON CURB STOP SHALL BE INSTALLED ON THE PROPERTY SIDE OF VALVE.
5. WHEN CURB STOP INSTALLED IN DRIVEWAY A CAST IRON VALVE BOX MUST BE USED.
6. CORPORATION STOPS ARE TO BE POSITIONED UPRIGHT TO ALLOW OPERATION FROM THE SURFACE.
7. REFER TO CONTRACT DRAWINGS AND SECTION 33 11 01 FOR DETAILED SPECIFICATIONS.
8. SEE STANDARD DRAWING COQ–W2c FOR METER SETTER DETAILS.

PLOTTED: 8–Feb–22

WATER SERVICE CONNECTION 19mm DIAMETER (MUNICIPEX PIPE)	DATE: JANUARY/2021	DRAWING NUMBER: COQ-W2d
	DRAWN: REY	
	SCALE: N.T.S.	

Coquitlam

STANDARD DETAIL DRAWINGS

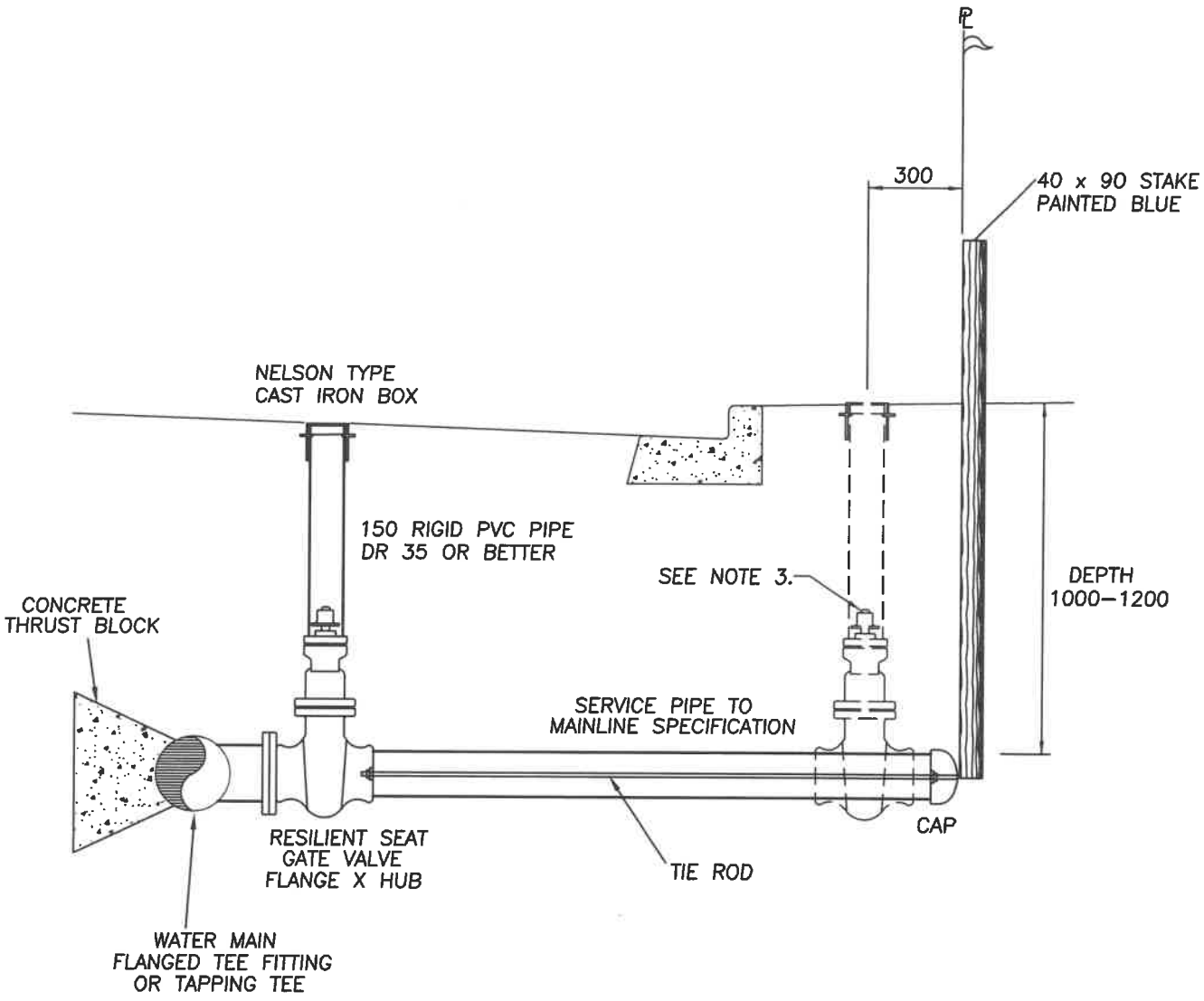


NOTE:

1. THIS DETAIL IS FOR 50mm SERVICES ONLY.
2. WHEN SERVICE VALVE IS INSTALLED IN ROADWAY OR DRIVEWAY A CAST IRON BOX MUST BE USED.
3. AN ADDITIONAL GATE VALVE MAY BE REQUIRED AT PROPERTY LINE FOR LONG SIDE SERVICE, AS DIRECTED BY THE MANAGER.
4. REFER TO CONTRACT DRAWINGS AND SECTION 33 11 01 FOR DETAILED SPECIFICATIONS.

PLOTTED: 17–Feb–16

WATER SERVICE CONNECTION 50mm DIAMETER	DATE: JUNE/2014	DRAWING NUMBER: COQ-W2e
	DRAWN: REY	
	SCALE: N.T.S.	

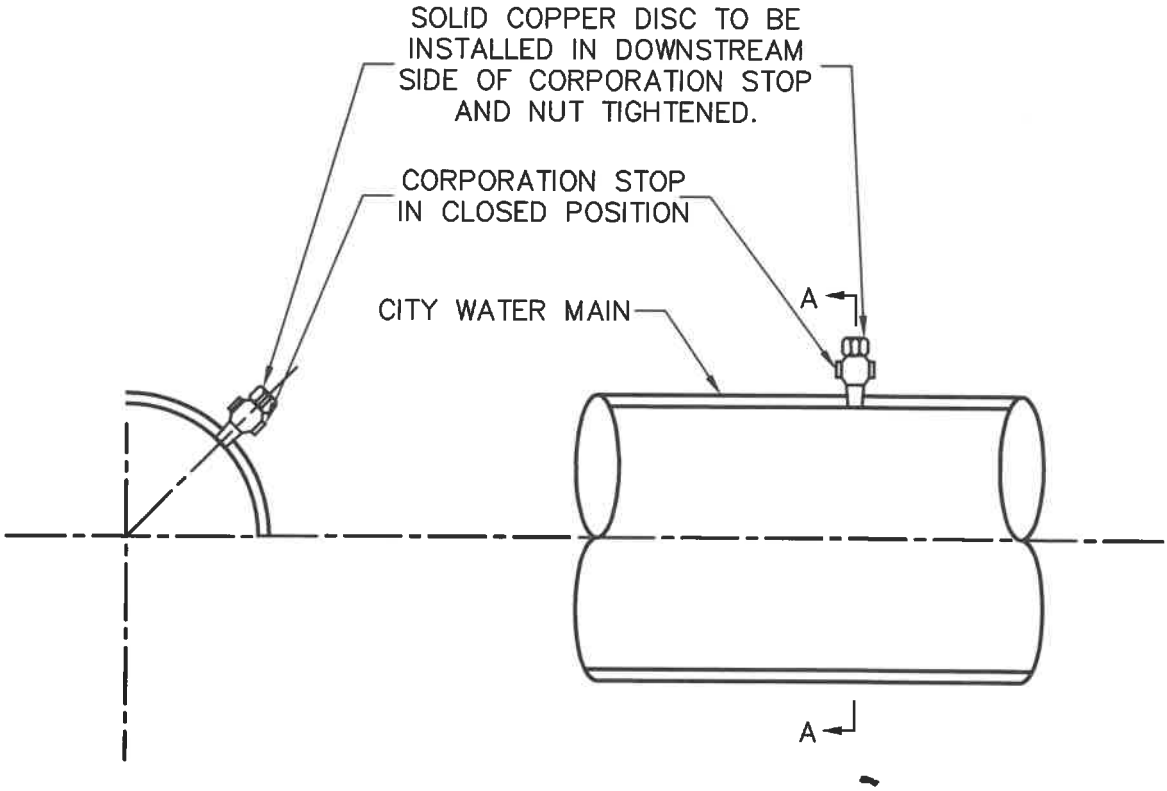


NOTE:

1. THIS DETAIL IS FOR SERVICES 100mm OR LARGER ONLY.
2. WHEN SERVICE VALVE IS INSTALLED IN ROADWAY OR DRIVEWAY A CAST IRON BOX MUST BE USED.
3. AN ADDITIONAL GATE VALVE MAY BE REQUIRED AT PROPERTY LINE FOR LONG SIDE SERVICES, AS DIRECTED BY THE MANAGER.
4. REFER TO CONTRACT DRAWINGS AND SECTION 33 11 01 FOR DETAILED SPECIFICATIONS.

PLOTTED: 19–Feb–16

TYPICAL WATER SERVICE CONNECTION 100mm DIAMETER AND GREATER	DATE: JUNE/2014	DRAWING NUMBER: COQ-W2f
	DRAWN: REY	
	SCALE: N.T.S.	



A–A SECTION

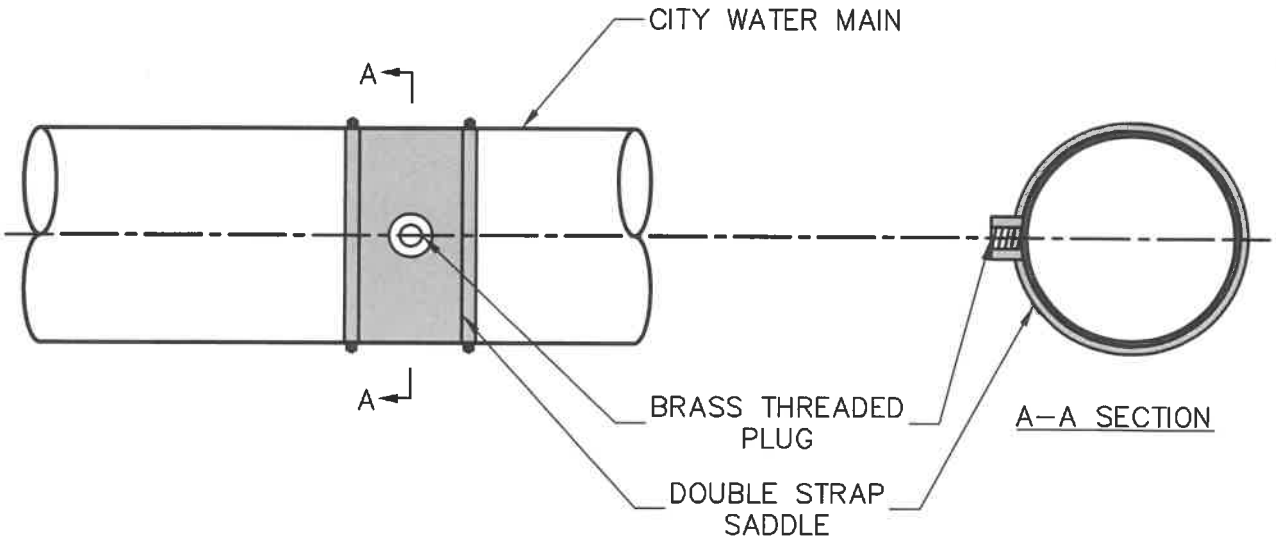
NOTES:

1. EXISTING CORPORATION STOP MUST BE FIRMLY THREADED INTO PIPE OR EXISTING VALVE MUST BE REMOVED AND A STAINLESS STEEL MAIN REPAIR CLAMP INSTALLED.

2. REFER TO CONTRACT DRAWINGS AND SECTION 33 11 01 FOR DETAILED SPECIFICATIONS.

PLOTTED: 20–Jan–16

PERMANENT CAP FOR WATER SERVICES 19mm TO 25mm ONLY	DATE: JUNE/2015	DRAWING NUMBER: COQ-W2g
	DRAWN: REY	
	SCALE: N.T.S.	



NOTES:

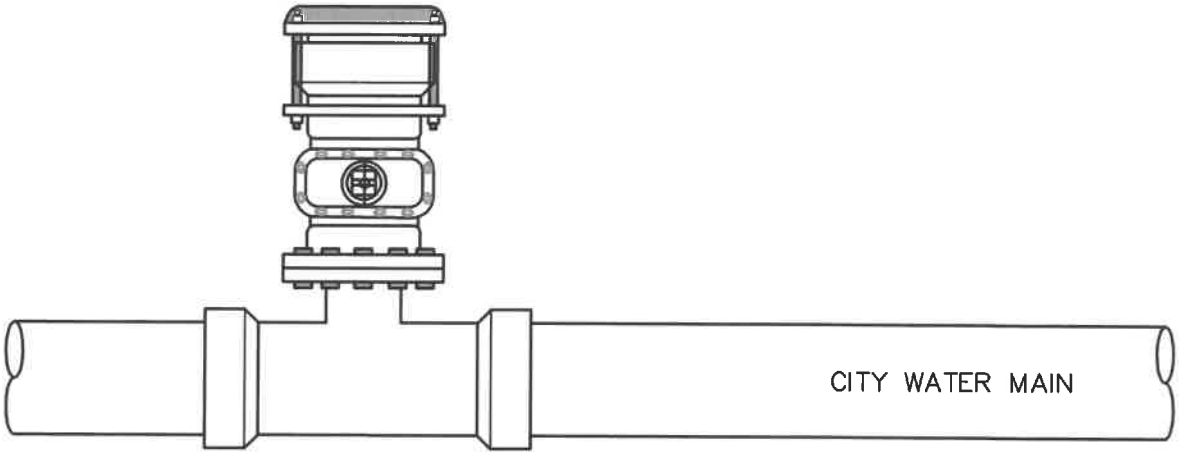
1. SADDLE MUST BE DOUBLE STRAP IN GOOD CONDITION. IF NOT, REMOVE SADDLE AND INSTALL STAINLESS STEEL MAIN REPAIR CLAMP.
2. WATER MAIN MUST BE ISOLATED AND REINSTATED BY CITY CREWS AT DEVELOPERS EXPENSE.
3. EXISTING VALVE MUST BE REMOVED AND BRASS THREADED PLUG INSTALLED.
4. REFER TO CONTRACT DRAWINGS AND SECTION 33 11 01 FOR DETAILED SPECIFICATIONS.

PLOTTED: 20–Jan–16

PERMANENT CAP FOR WATER SERVICES 19mm TO 50mm WITH GATE VALVE AT MAIN	DATE: JUNE/2015 DRAWN: REY SCALE: N.T.S.	DRAWING NUMBER: COQ-W2h

Coquitlam

STANDARD DETAIL DRAWINGS



NOTES:

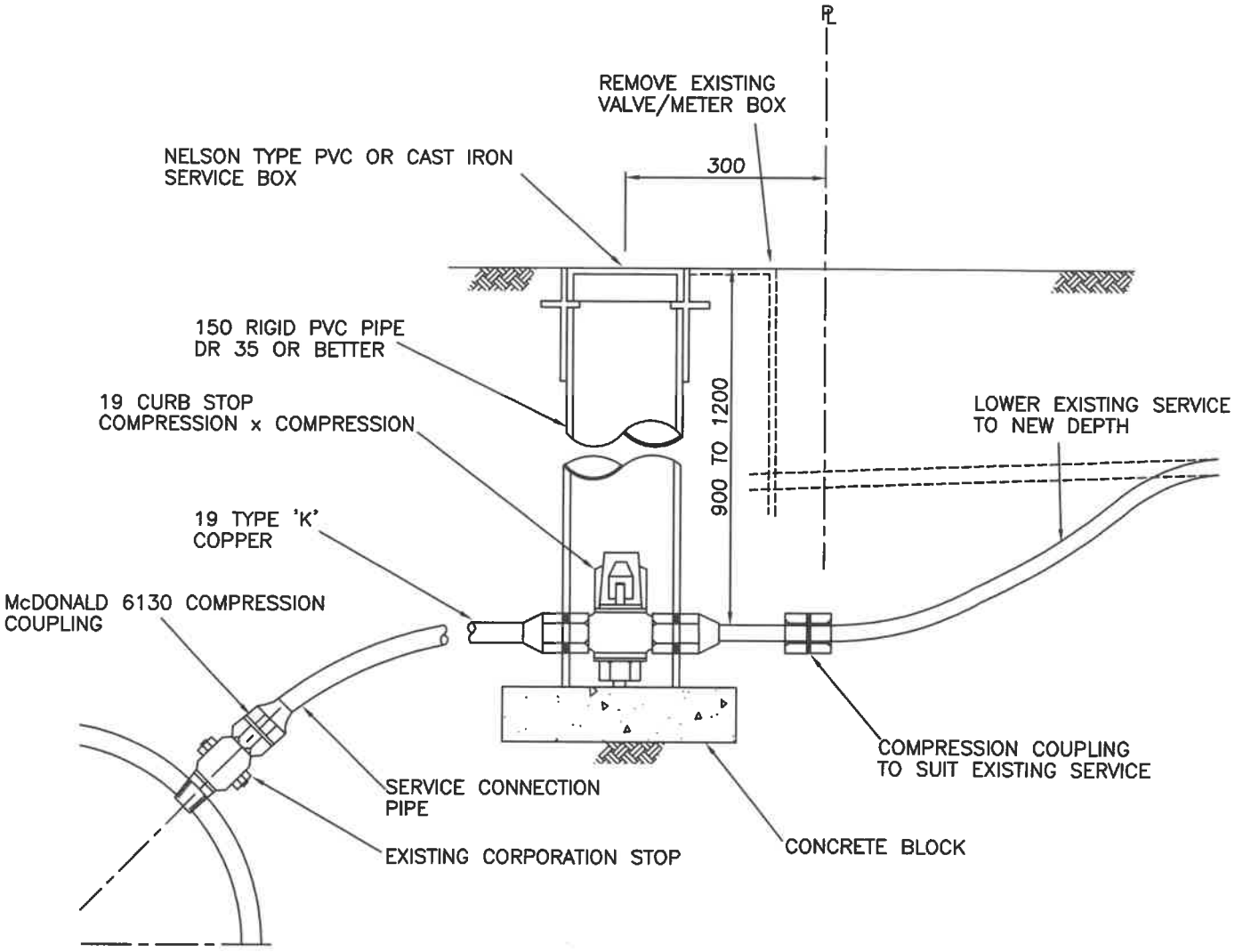
1. MUST ENSURE VALVE IS FLANGED TO TEE OR OTHERWISE TIED BACK TO TEE.
2. VALVE BOX AND RISER TO BE REMOVED.
3. REFER TO CONTRACT DRAWINGS AND SECTION 33 11 01 FOR DETAILED SPECIFICATIONS.

PLOTTED: 20-Jan-16

PERMANENT CAP FOR WATER SERVICE 100mm & LARGER WITH GATE VALVE AT MAIN	DATE:	OCT/2015	DRAWING NUMBER: COQ-W2i
	DRAWN:	REY	
	SCALE:	N.T.S.	

Coquitlam

STANDARD DETAIL DRAWINGS



NOTES:

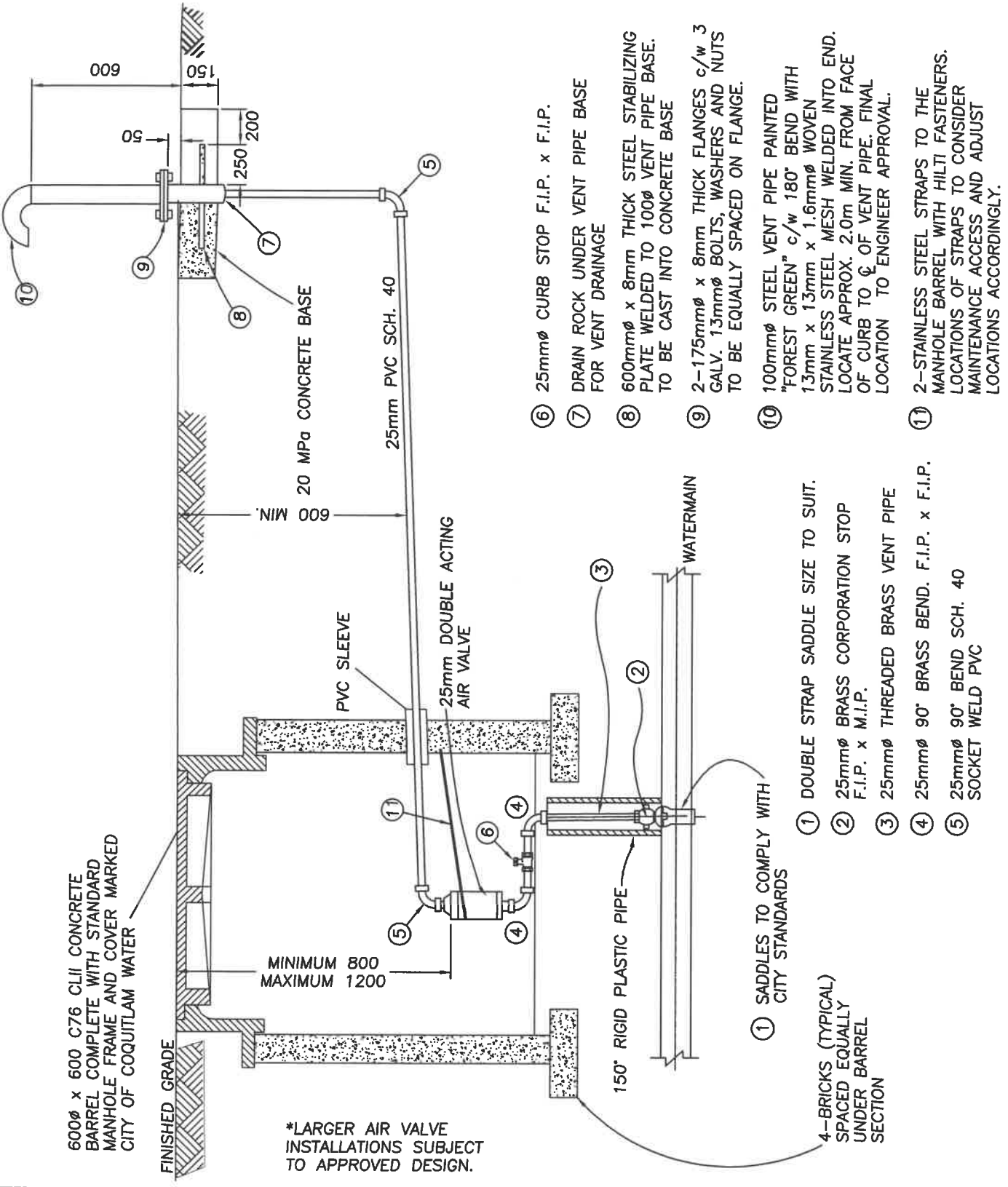
1. *THIS DETAIL FOR SERVICES 19 TO 38mm ONLY.*
2. *INSTALL SERVICE PIPE WITH "GOOSE NECK" IN HORIZONTAL POSITION.*
3. *EXISTING CORPORATION STOP MUST BE ADJUSTED OR REPLACED IF NOT OPERABLE FROM THE SURFACE.*
4. *REFER TO CONTRACT DRAWINGS AND SECTION 33 11 01 FOR DETAILED SPECIFICATION.*
5. *SEE STANDARD DRAWING COQ–W2c FOR METER SETTER DETAILS.*

PLOTTED: 8–Feb–22

WATER SERVICE CONNECTION REPLACEMENT (RE-USE EX. CORPORATION STOP)	DATE:	FEBRUARY/2022	DRAWING NUMBER: COQ-W2j
	DRAWN:	REY	
	SCALE:	N.T.S.	

Coquitlam

STANDARD DETAIL DRAWINGS



PLOTTED: 5-Jan-22

25mm DOUBLE ACTING AIR RELEASE VALVE

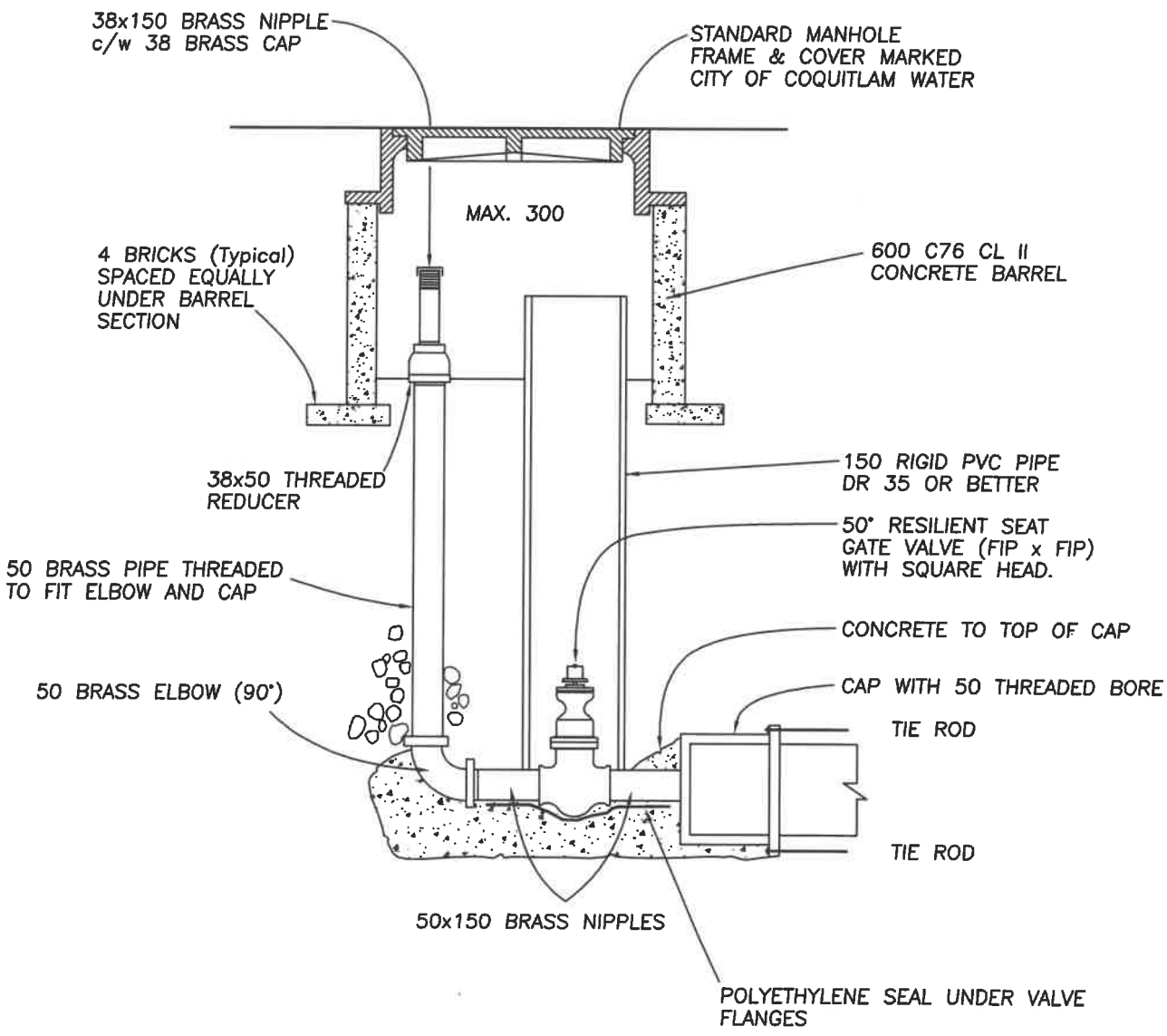
DATE:	JUNE/2014
DRAWN:	REY
SCALE:	N.T.S.

DRAWING NUMBER:

COQ-W6

Coquitlam

STANDARD DETAIL DRAWINGS



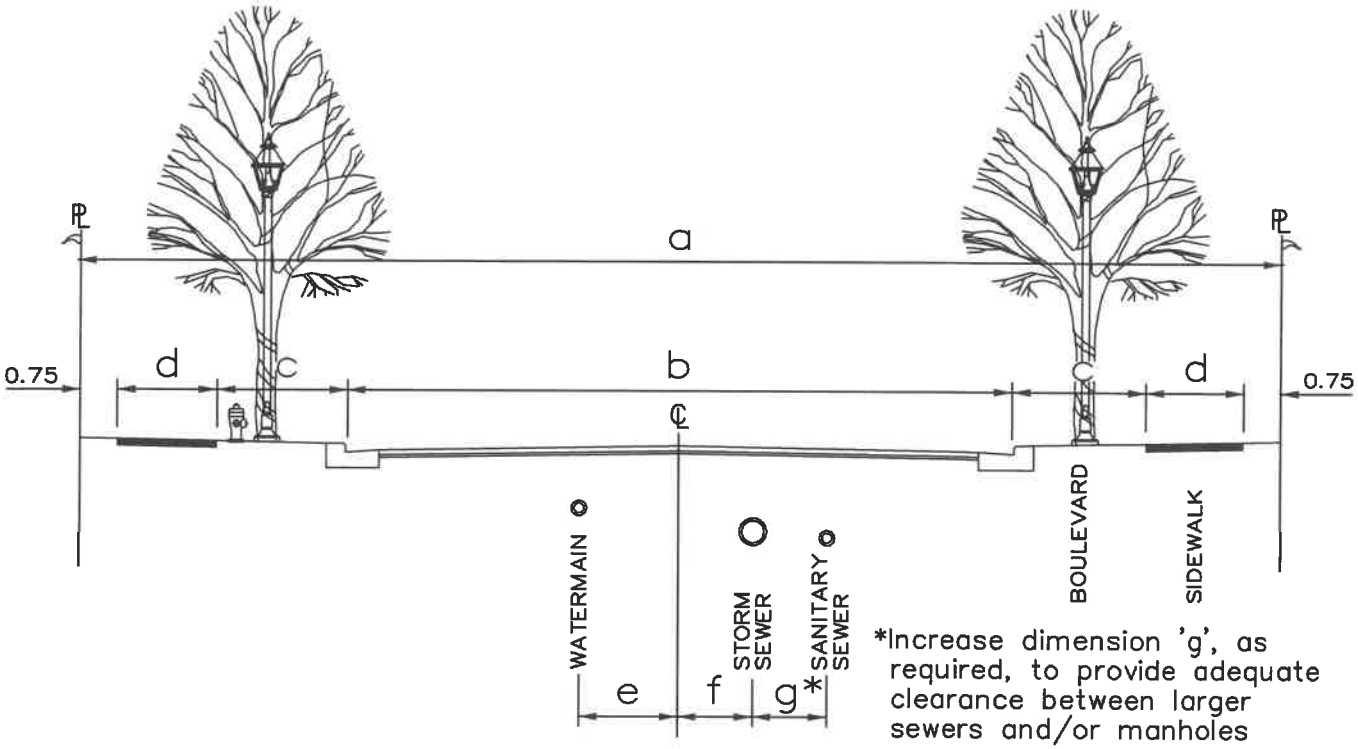
NOTE: REFER TO CONTRACT DRAWINGS AND SECTION 33 11 01 FOR DETAILED SPECIFICATIONS.

PLOTTED: 6-Oct-15

TYPICAL WATERMAIN BLOW-OFF ASSEMBLY	DATE: JUNE/2014 DRAWN: REY SCALE: N.T.S.	DRAWING NUMBER: COQ-W8

Coquitlam

STANDARD DETAIL DRAWINGS



ROAD, SIDEWALK AND BOULEVARD DIMENSIONS

Street type	RoW width a	Curb to Curb width[1] b	Vehicle lanes	Bike facility[2]	Vehicle Volume	Parking[3]	Boulevard c	Sidewalk[4] d	e	f	g*
City Arterial/MRN (with Bike Route)	27.0m	14.0 – 16.1m	varies	separate or MUP	>15,000	not desirable OR pocket in blvd (2x2.7m)	2x2.7	2x2.0	5.25	4.75	1.0
City Arterial/MRN (w/o Bike Route)	27.0m	14.0m+	4x3.5	n/a	>15,000	not desirable	2x2.7	2x2.0	5.25	4.75	1.0
						OR pocket in blvd (2x2.7m)	2x4.2	2x2.0	5.25	4.75	1.0

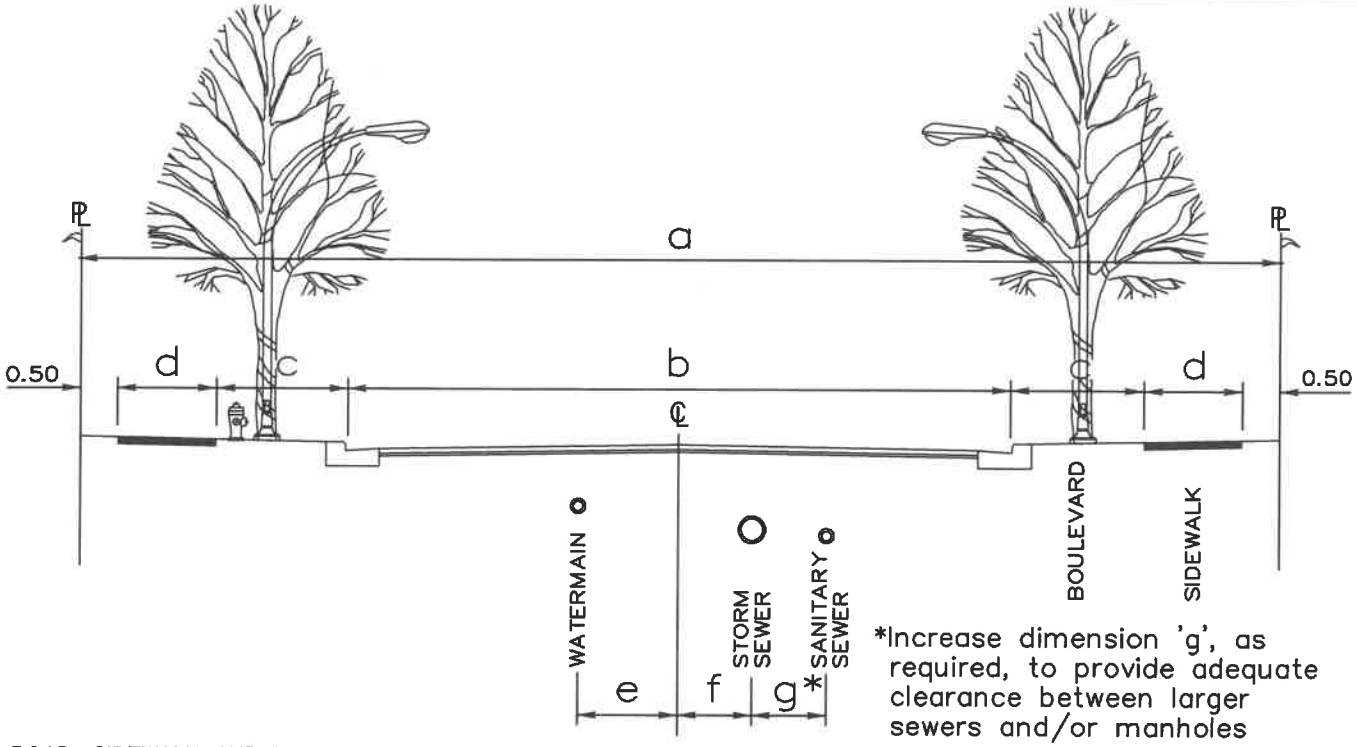
1. Representative of mid–block sections, auxiliary lane(s) at intersections are not included. Up to 5.0m of additional ROW may be required.
2. Bicycle facilities are to be implemented on designated routes in accordance with the Strategic Transportation Plan and OCP/Neighborhood Plans (as amended).
3. Parking is for general guidance and in commercial retail areas only. Parking may be restricted on one or both sides of the street for all periods or certain periods of the day at the discretion of the City.
4. Utility corridor varies between sidewalk/multi use pathway and property line. Utility corridors are located under sidewalks fronting urban commercial uses.

PLOTTED: 29–Jun–18

ARTERIAL STREETS	DATE: JAN/2015	DRAWING NUMBER: COQ-R2A
	DRAWN: REY	
	SCALE: N.T.S.	

Coquitlam

STANDARD DETAIL DRAWINGS



ROAD, SIDEWALK AND BOULEVARD DIMENSIONS

Street type	RoW width a	Curb to Curb width[1] b	Vehicle lanes	Bike facility[2]	Parking[3]	Boulevard c	Sidewalk[4] d	e	f	g*
Community Collector (Urban/Higher Density)	25.2m	13.4m	2x4.3	shared wide curb lane	both sides	2x2.9	2x2.5	1.9	1.1	1.0
		11.0m	2x3.3	separate (1.8m) in boulevard	both sides	2x4.6	2x2.2	1.9	1.1	1.0
City Collector with on-street bike route	23.0m	14.0m	2x3.3	2x1.5 bike lanes	both sides	2x2.20	2x1.8	1.9	1.1	1.0
City Collector w/ Bike Route	20.9m	12.0m	2x3.3	2x1.5 bike lanes	one side	2x2.15	2x1.8	1.9	1.1	1.0
City Collector (w/o Bike Route)	20.0m	11.0m	2x3.3	n/a	both sides	2x2.20	2x1.8	1.9	1.1	1.0
Community Collector (Lower Density)	20.0m	11.0m	2x5.5	shared bikeway	both sides	2x2.20	2x1.8	1.9	1.1	1.0
Industrial/Service Commercial Collector/Local	20.0m	11.0m	2x4.3	shared wide curb lane	one side	2x2.20	2x1.8	1.9	1.1	1.0

1. Representative of mid-block sections, auxiliary lane(s) at intersections are not included. Up to 5.0m of additional ROW may be required.
2. Bicycle facilities are to be implemented on designated routes in accordance with the Strategic Transportation Plan and OCP/Neighborhood Plans (as amended).
3. Parking is for general guidance only. Parking may be restricted on one or both sides of the street for all periods or certain periods of the day at the discretion of the City.
4. Utility corridor varies between sidewalk/multi use pathway and property line. Utility corridors are located under sidewalks fronting urban commercial uses.

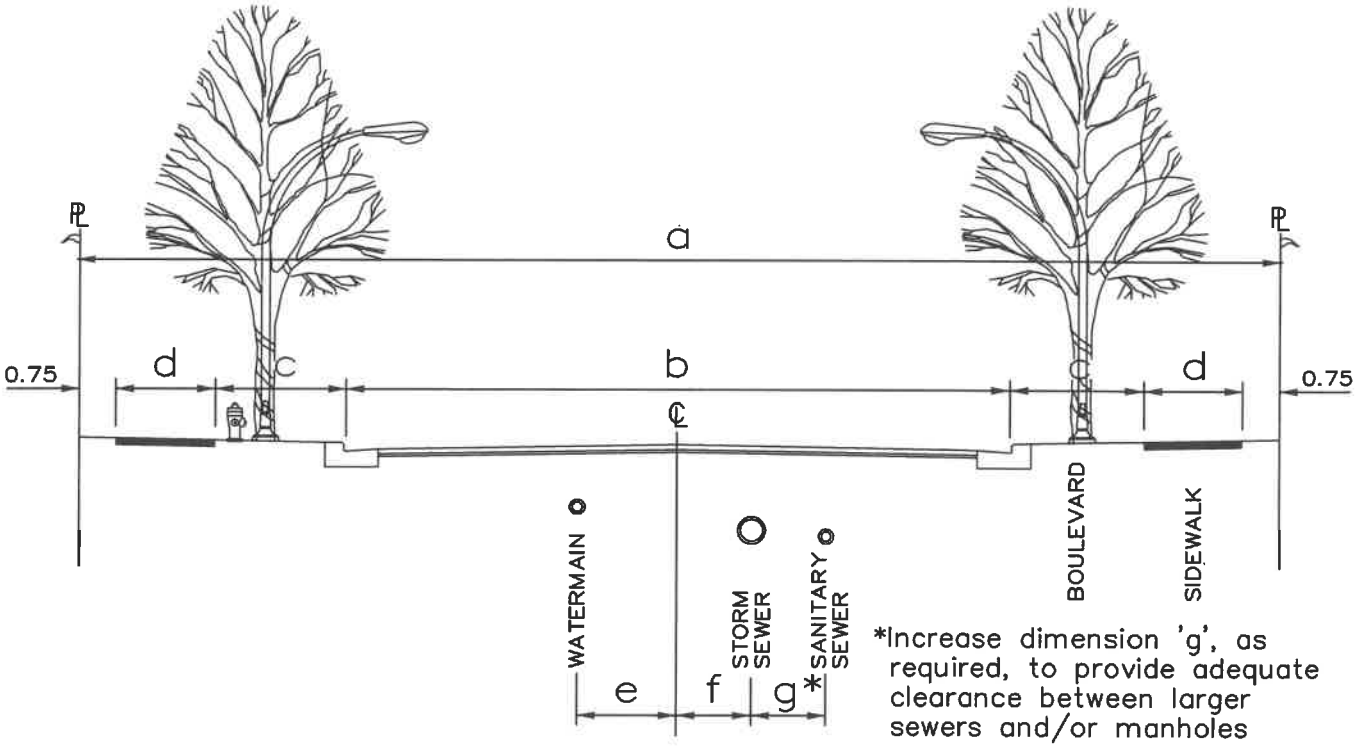
PLOTTED: 26-Oct-21

COLLECTOR STREETS

DATE:	AUG/2021
DRAWN:	REY
SCALE:	N.T.S.

DRAWING NUMBER:

COQ-R2B



ROAD, SIDEWALK AND BOULEVARD DIMENSIONS

Street type	RoW width a	Curb to Curb width[1] b	Vehicle lanes	Bike facility[2]	Parking[3]	Boulevard c	Sidewalk d	e	f	g*
Local – Higher Density	20.0m	10.5m	1x6	shared bikeway	both sides	2x2.20	2x1.8	2.7	0.3	1.0
Local – Low Density	17.4m	8.5m	1x4.1	shared bikeway	both sides	2x2.20	2x1.5	2.7	0.3	1.0

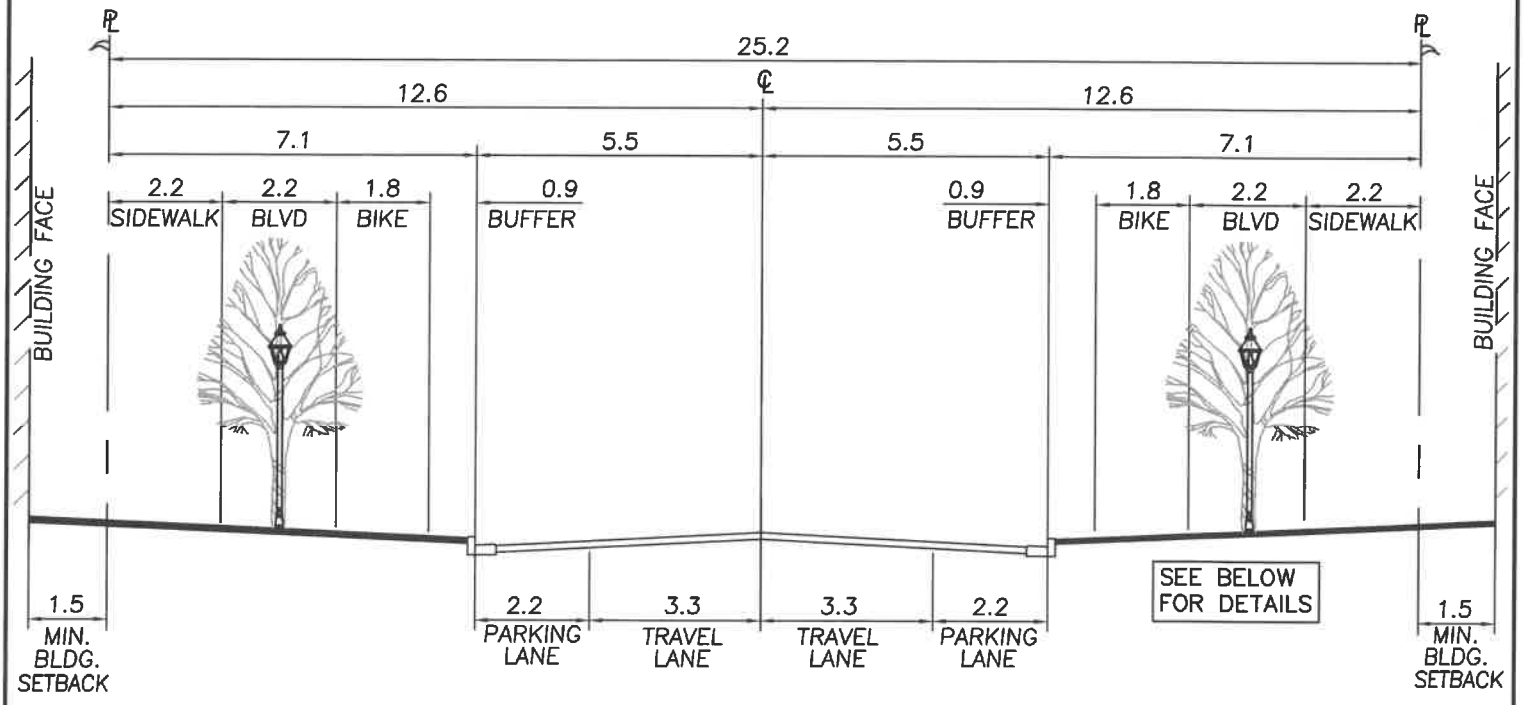
1. Representative of mid–block sections, auxiliary lane(s) at intersections are not included. Up to 5.0m of additional ROW may be required.
2. Bicycle facilities are to be implemented on designated routes in accordance with the Strategic Transportation Plan and OCP/Neighborhood Plans (as amended).
3. Parking is for general guidance only. Parking may be restricted on one or both sides of the street for all periods or certain periods of the day at the discretion of the City.

PLOTTED: 20–Sep–21

LOCAL STREETS	DATE: AUG/2021	DRAWING NUMBER: COQ-R2C
	DRAWN: REY	
	SCALE: N.T.S.	

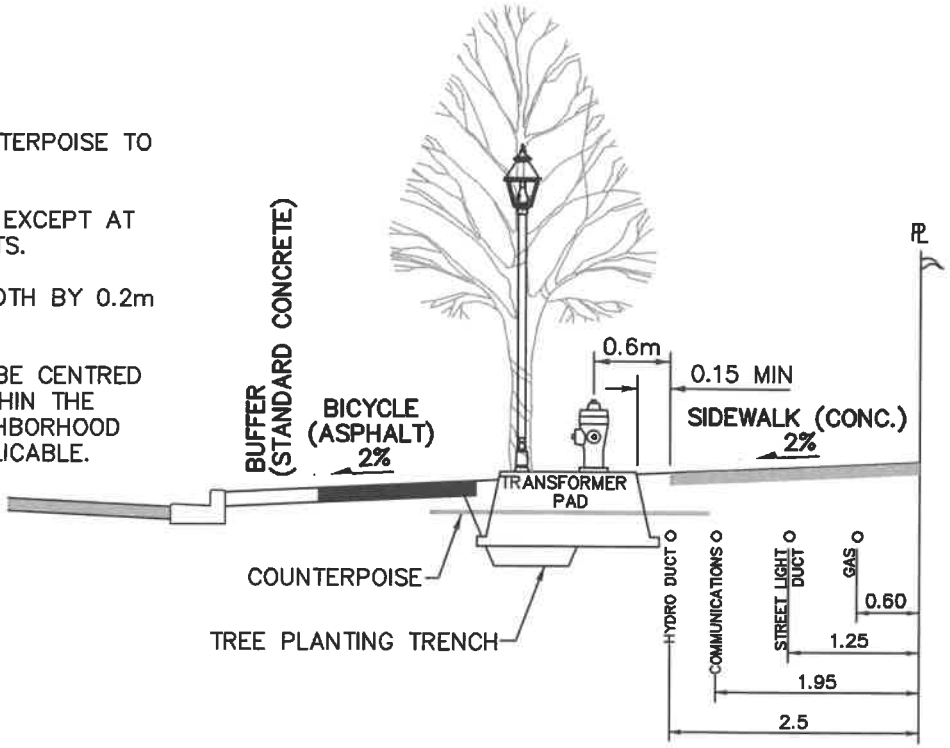
Coquitlam

STANDARD DETAIL DRAWINGS



NOTES:

1. UTILITIES WITHIN 2.5m OF COUNTERPOISE TO BE IN PLASTIC SLEEVE.
2. PLANTING TRENCH CONTINUOUS EXCEPT AT TRANSFORMERS & STREET LIGHTS.
3. SIDEWALK TO HAVE NARROW WIDTH BY 0.2m AT TRANSFORMER.
4. TREES AND STREET LIGHTS TO BE CENTRED IN BOULEVARD OR LOCATED WITHIN THE FURNISHING ZONE AS PER NEIGHBORHOOD DESIGN GUIDELINES WHERE APPLICABLE.



PLOTTED: 26-Oct-21

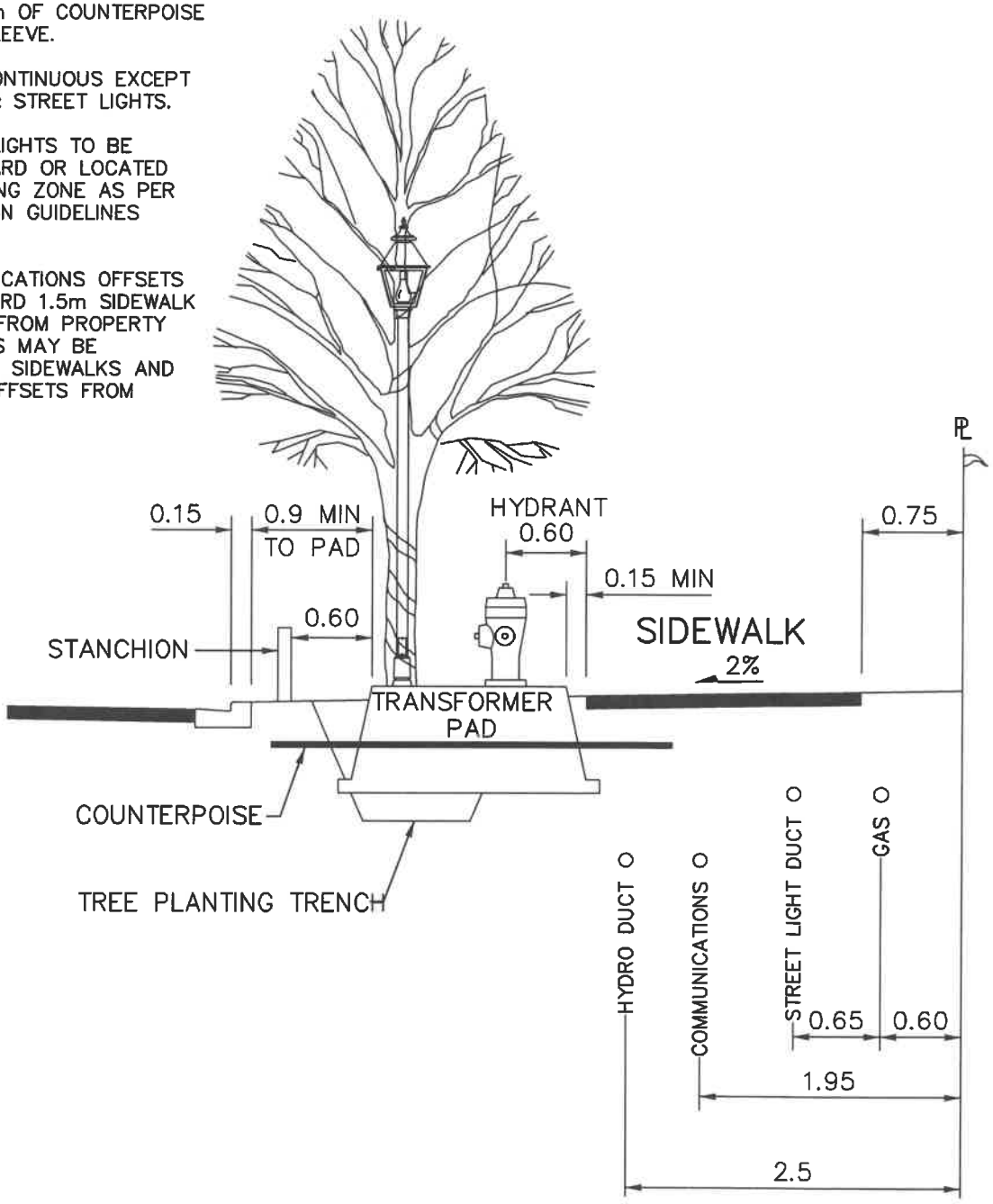
25.2m R.O.W. HIGHER DENSITY COMMUNITY COLLECTOR WITH CYCLE TRACK	DATE:	JAN/2015	DRAWING NUMBER: COQ-R3
	DRAWN:	REY	
	SCALE:	N.T.S.	

Coquitlam

STANDARD DETAIL DRAWINGS

NOTES:

1. UTILITIES WITHIN 2.5m OF COUNTERPOISE TO BE IN PLASTIC SLEEVE.
2. PLANTING TRENCH CONTINUOUS EXCEPT AT TRANSFORMERS & STREET LIGHTS.
3. TREES AND STREET LIGHTS TO BE CENTRED IN BOULEVARD OR LOCATED WITHIN THE FURNISHING ZONE AS PER NEIGHBORHOOD DESIGN GUIDELINES WHERE APPLICABLE.
4. HYDRO AND COMMUNICATIONS OFFSETS BASED ON A STANDARD 1.5m SIDEWALK WITH 0.75m OFFSET FROM PROPERTY LINE. UTILITY OFFSETS MAY BE ADJUSTED FOR WIDER SIDEWALKS AND VARYING SIDEWALK OFFSETS FROM PROPERTY LINE.



*FOR HIGHER DENSITY COMMUNITY COLLECTOR WITH CYCLE TRACK SEE COQ-R3

PLOTTED: 5-Jun-18

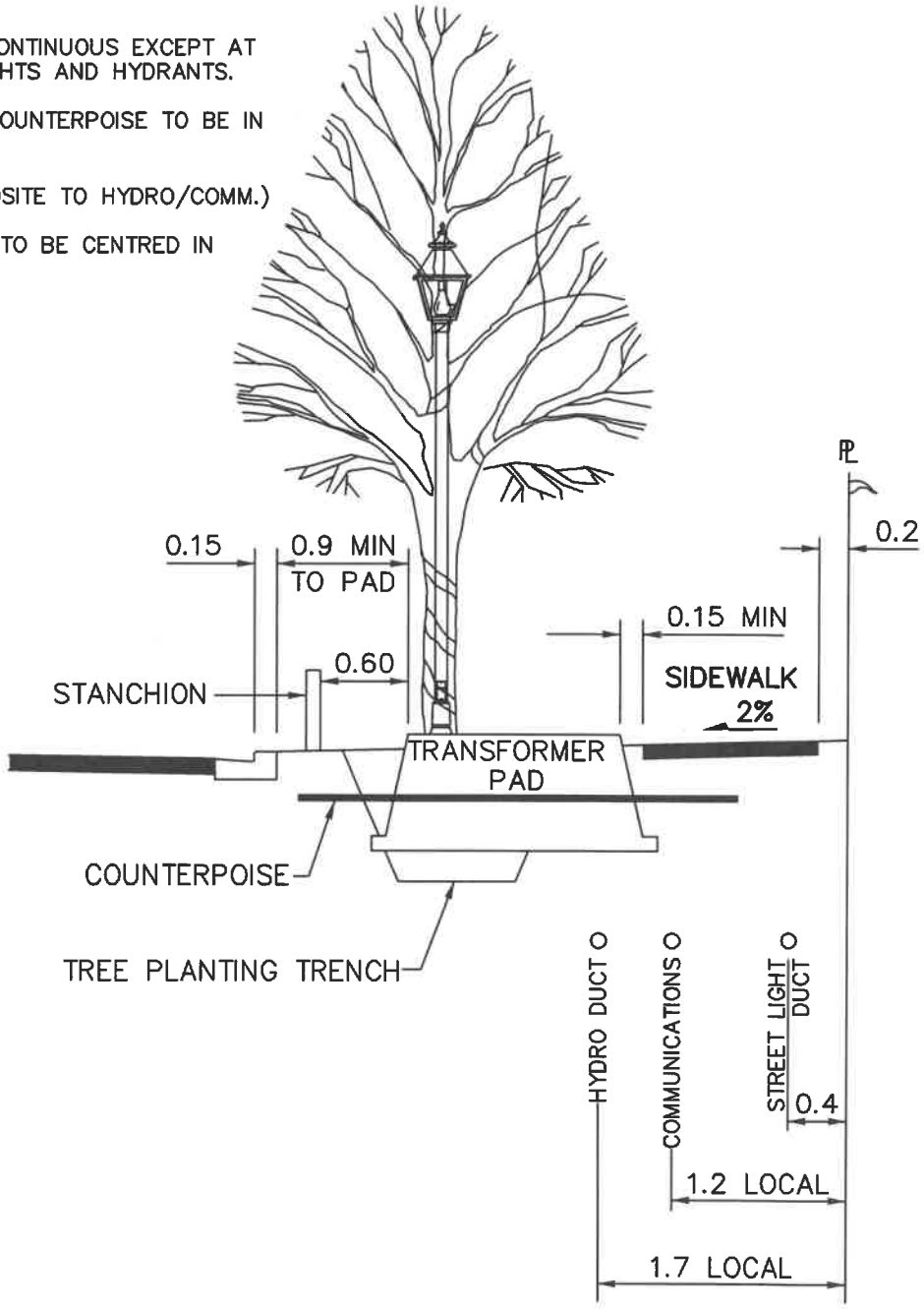
ARTERIAL, COLLECTOR & LOCAL STREETS BOULEVARD	DATE: JAN/2015 DRAWN: REY SCALE: N.T.S.	DRAWING NUMBER: COQ-R4

Coquitlam

STANDARD DETAIL DRAWINGS

NOTES:

1. UNDERGROUND WIRING IN BOULEVARD OF ALL HILLSIDE STREETS.
2. PLANTING TRENCH TO BE CONTINUOUS EXCEPT AT TRANSFORMERS, STREET LIGHTS AND HYDRANTS.
3. UTILITIES WITHIN 2.5m OF COUNTERPOISE TO BE IN PLASTIC SLEEVE.
4. GAS ONE SIDE ONLY. (OPPOSITE TO HYDRO/COMM.)
5. TREES AND STREET LIGHTS TO BE CENTRED IN BOULEVARD.

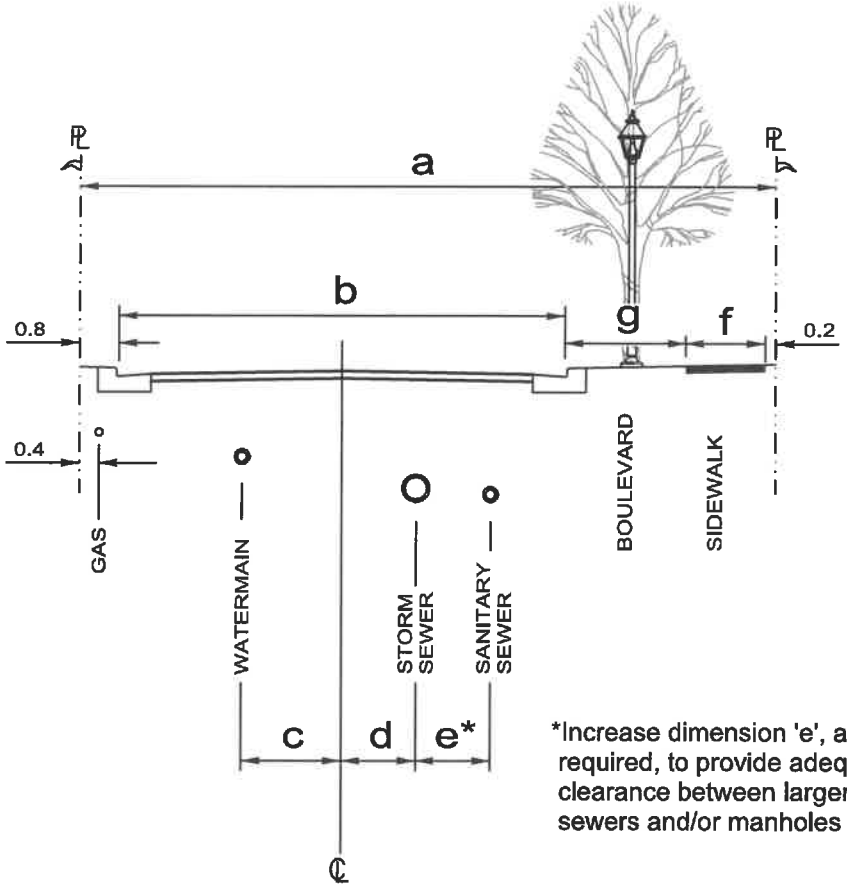


PLOTTED: 22-Jan-15

HILLSIDE LOCAL STREETS BOULEVARD	DATE: JAN/2015 DRAWN: REY SCALE: N.T.S.	DRAWING NUMBER: COQ-R5

Coquitlam

STANDARD DETAIL DRAWINGS



*Increase dimension 'e', as required, to provide adequate clearance between larger sewers and/or manholes

ROAD AND RIGHT-OF-WAY DIMENSIONS

Street Section	a	b	c	d	e*	f	g
Hillside Local	13.2	8.5	2.7	0.3	1.0	1.5	2.20

PLOTTED: 17–Feb–16

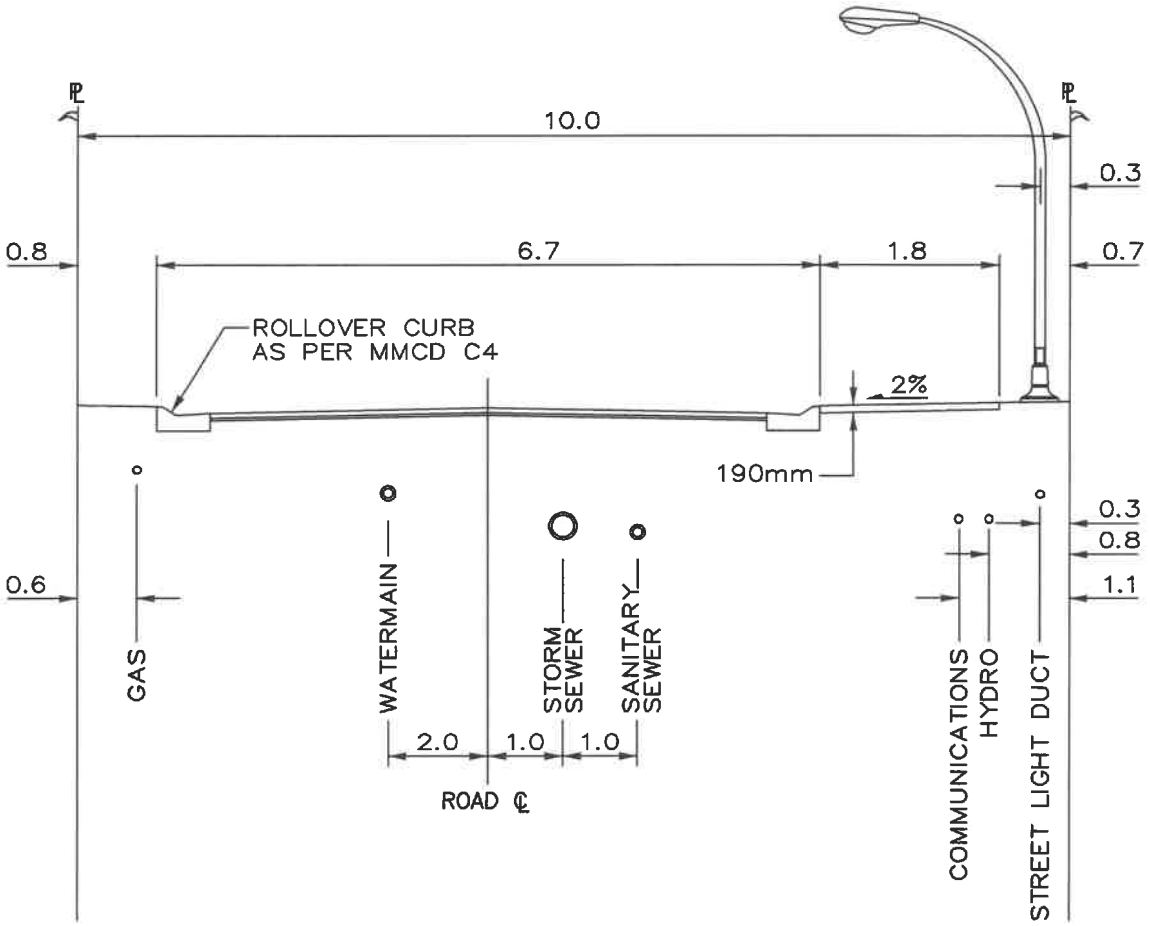
HILLSIDE LOCAL STREETS	DATE: JAN/2015	DRAWING NUMBER: COQ-R6
	DRAWN: REY	
	SCALE: N.T.S.	

Coquitlam

STANDARD DETAIL DRAWINGS

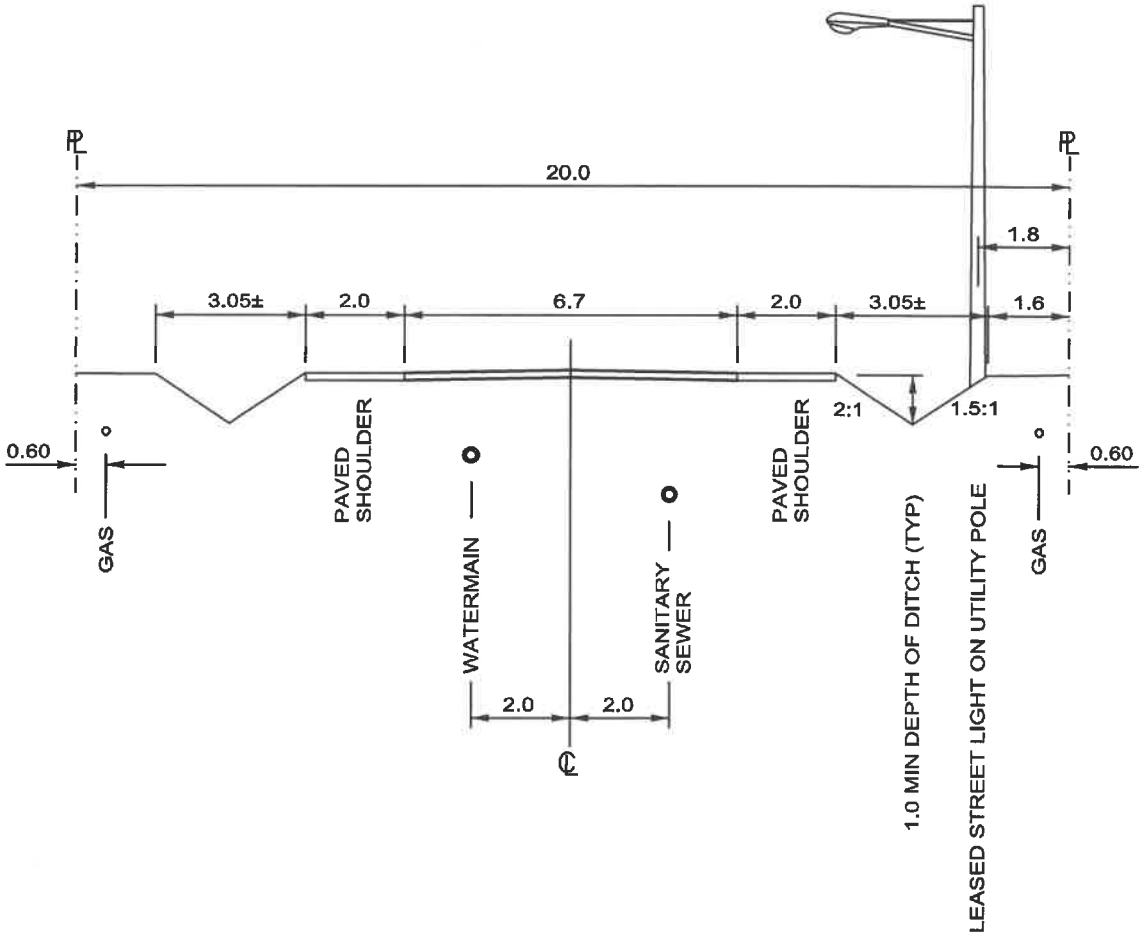
NOTE:

1. SUBJECT TO APPROVAL OF MANAGER OF DEVELOPMENT SERVICES. PARKING RESTRICTIONS WILL APPLY.
2. PROPERTY DEDICATION REQUIRED FOR HYDRO LPT.
3. WHERE A SIDEWALK IS REQUIRED ON BOTH SIDES, AN ADDITIONAL 1.5m OF DEDICATION REQUIRED.



PLOTTED: 20-Sep-21

NARROW STREET	DATE:	AUG/2021	DRAWING NUMBER: COQ-R7
	DRAWN:	REY	
	SCALE:	N.T.S.	



NOTE:

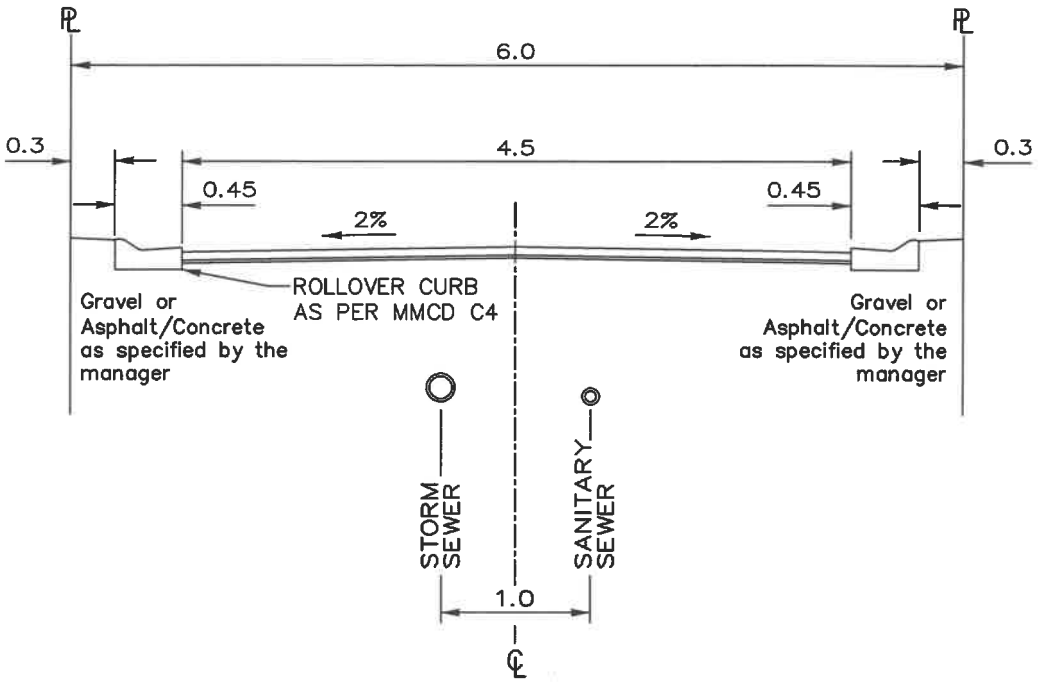
1. LINE PAINTING TO BE PROVIDED BETWEEN ROAD AND 2.0m PAVED SHOULDER.
2. 50mm x 150mm ASPHALT DRAINAGE CURB TO BE PROVIDED AT EDGE OF PAVEMENT WITH CURB CUTS AND ASPHALT DRAINAGE FLUME PROVIDED INTO DITCH ON ALL ROAD GRADES IN EXCESS OF 5%.

PLOTTED: 17-Feb-16

RURAL STREET	DATE: JAN/2015	DRAWING NUMBER: COQ-R8
	DRAWN: REY	
	SCALE: N.T.S.	

Coquitlam

STANDARD DETAIL DRAWINGS

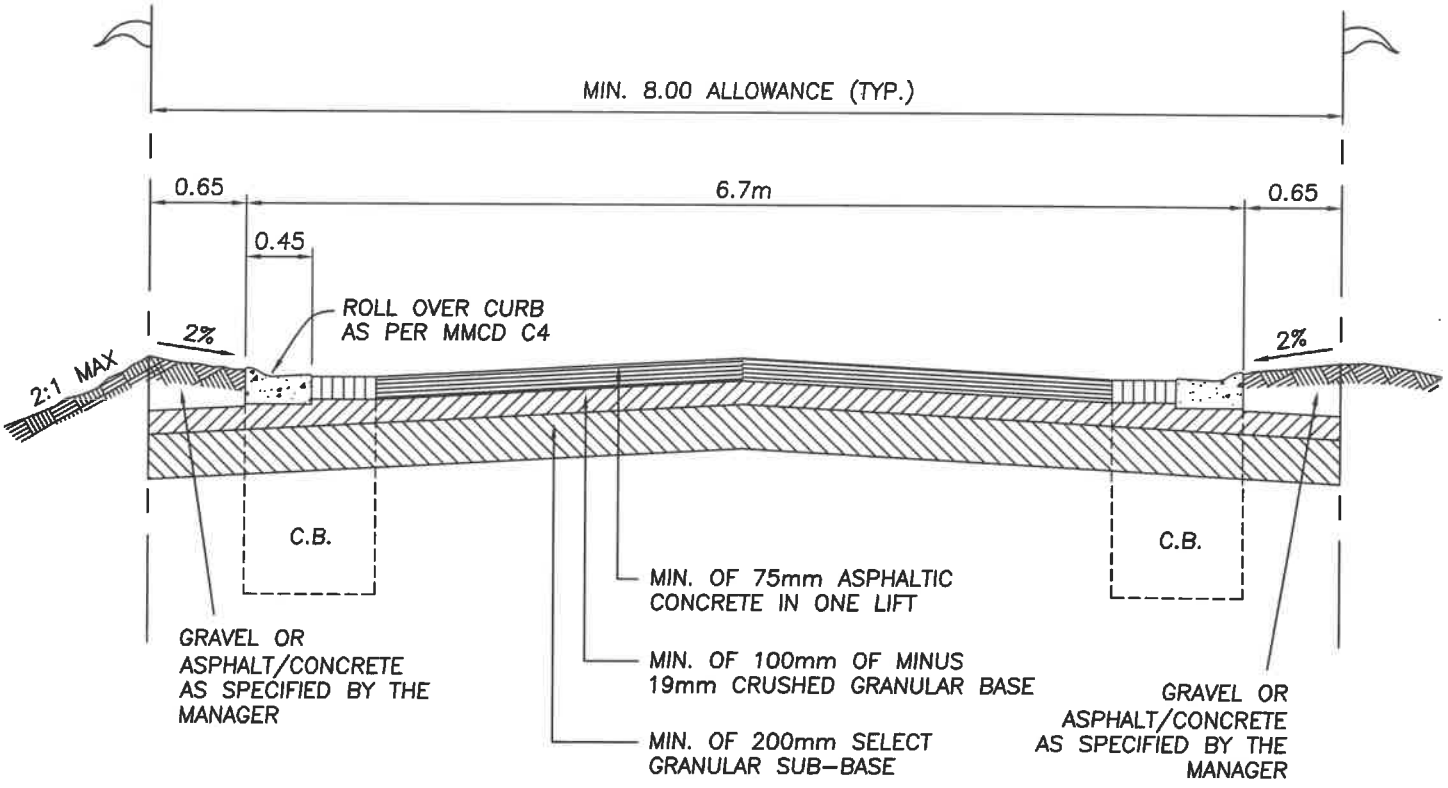


PLOTTED: 20–Sep–21

STANDARD LANE (NEW) CONSTRUCTION	DATE:	AUG/2021	DRAWING NUMBER:
	DRAWN:	REY	COQ-R9
	SCALE:	N.T.S.	

Coquitlam

STANDARD DETAIL DRAWINGS



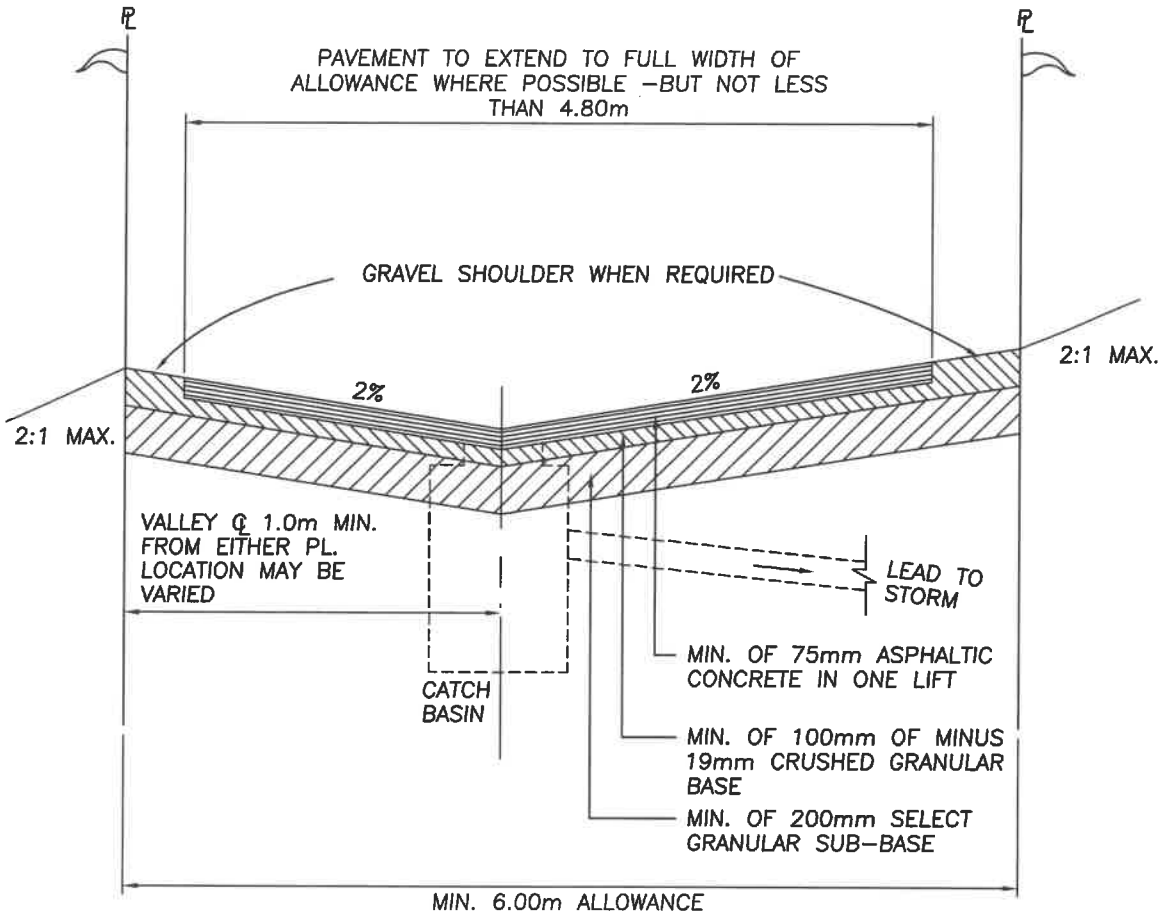
NOTE:

LANES MAY BE ONE WAY CROSS-FALL DEPENDING ON TOPOGRAPHY AND DRAINAGE.

CATCH BASIN TO BE LOCATED AT LOW POINTS AND CONNECTED TO STORM SEWER AS LONGITUDINAL PROFILE REQUIRES AT LEAST ONE PER BLOCK AT LOW END AT CROSS STREET PL.

PLOTTED: 20-Sep-21

PRIMARY ACCESS LANE 8.0m RIGHT-OF-WAY	DATE: AUG/2021 DRAWN: REY SCALE: N.T.S.	DRAWING NUMBER: COQ-R10



NOTE:
CATCH BASINS TO BE LOCATED AT LOW POINTS AND CONNECTED TO STORM SEWER AS LONGITUDINAL PROFILE REQUIRES AT LEAST ONE PER BLOCK AT LOW END AT CROSS STREET PL.

CURB ON GRAVEL BASE AS PER MMCD C4 MAY BE USED BY THE DESIGNER WHERE SPECIAL DRAINAGE AND/OR GRADE PROBLEMS REQUIRE AND WHERE DICTATED BY THE MANAGER.

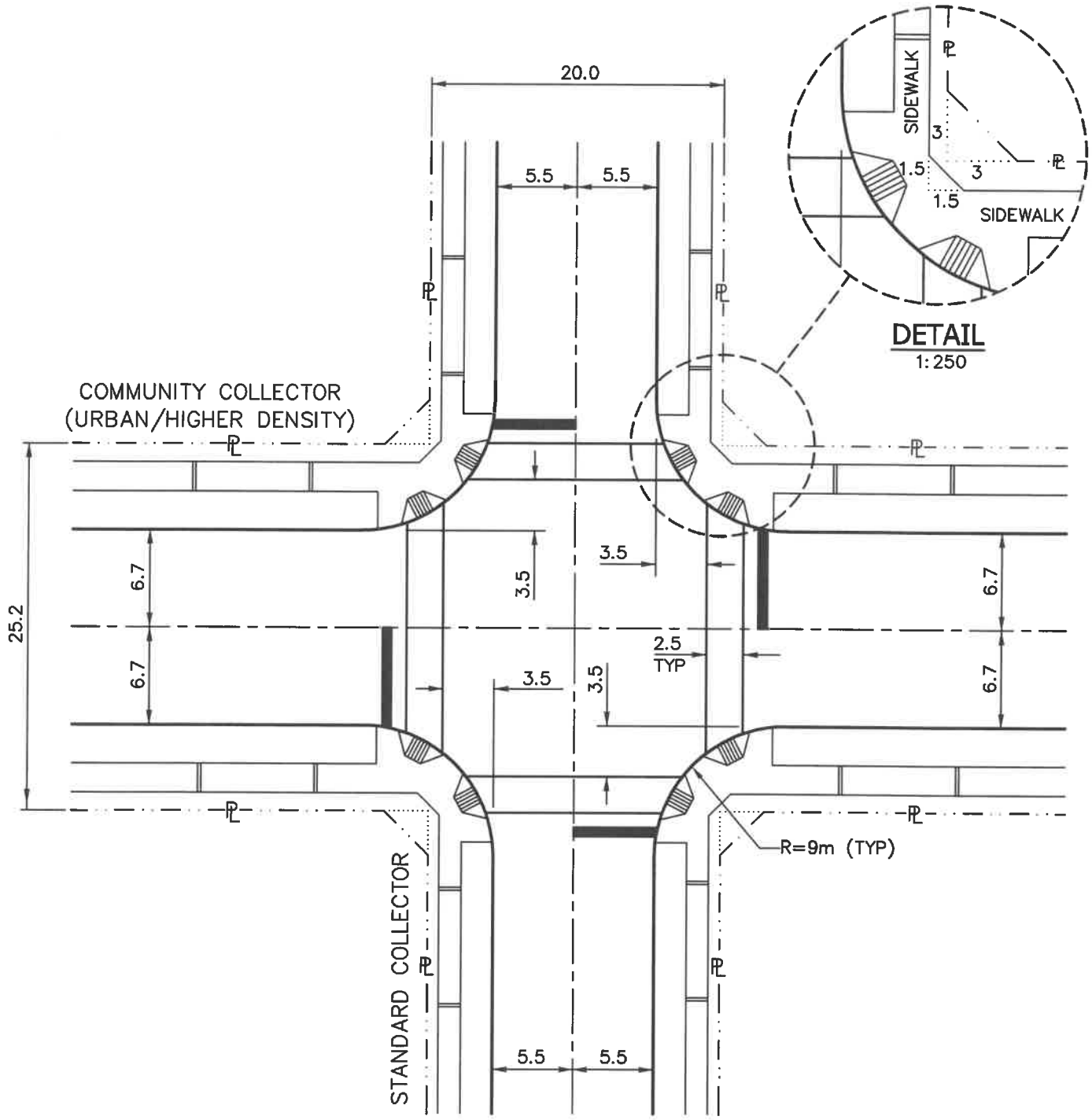
ALGEBRAIC DIFFERENCE IN CROSSFALL GRADE SHALL NOT EXCEED 6%.

PLOTTED: 22–Feb–16

STANDARD LANE CONSTRUCTION (EXISTING)	DATE: JAN/2015	DRAWING NUMBER: COQ-R11
	DRAWN: REY	
	SCALE: N.T.S.	

Coquitlam

STANDARD DETAIL DRAWINGS

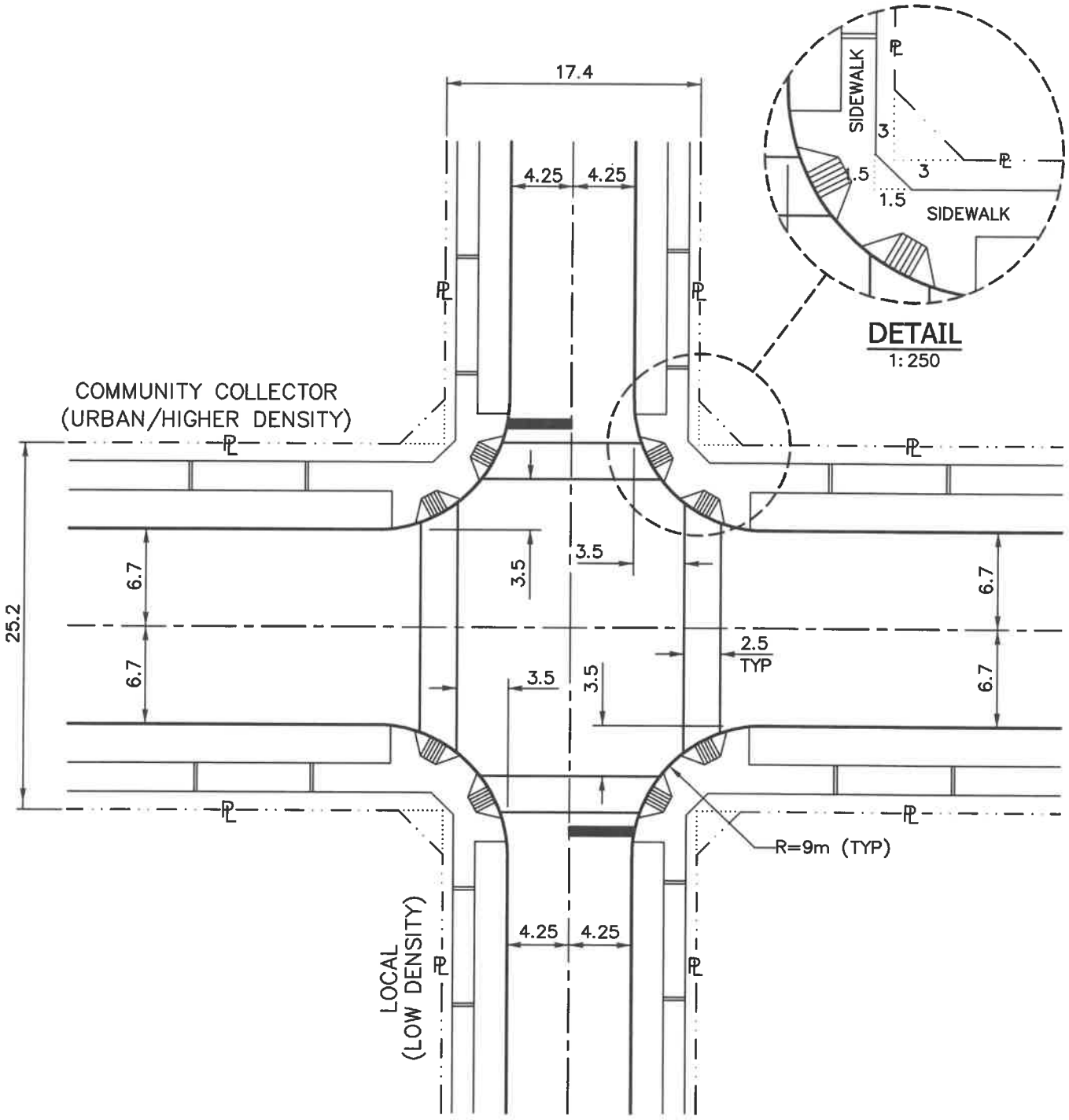


PLOTTED: 20-Sep-21

25.2m COMMUNITY - 20.0m COLLECTOR INTERSECTION	DATE:	AUG/2021	DRAWING NUMBER: COQ-R12
	DRAWN:	REY	
	SCALE:	1:400	

Coquitlam

STANDARD DETAIL DRAWINGS

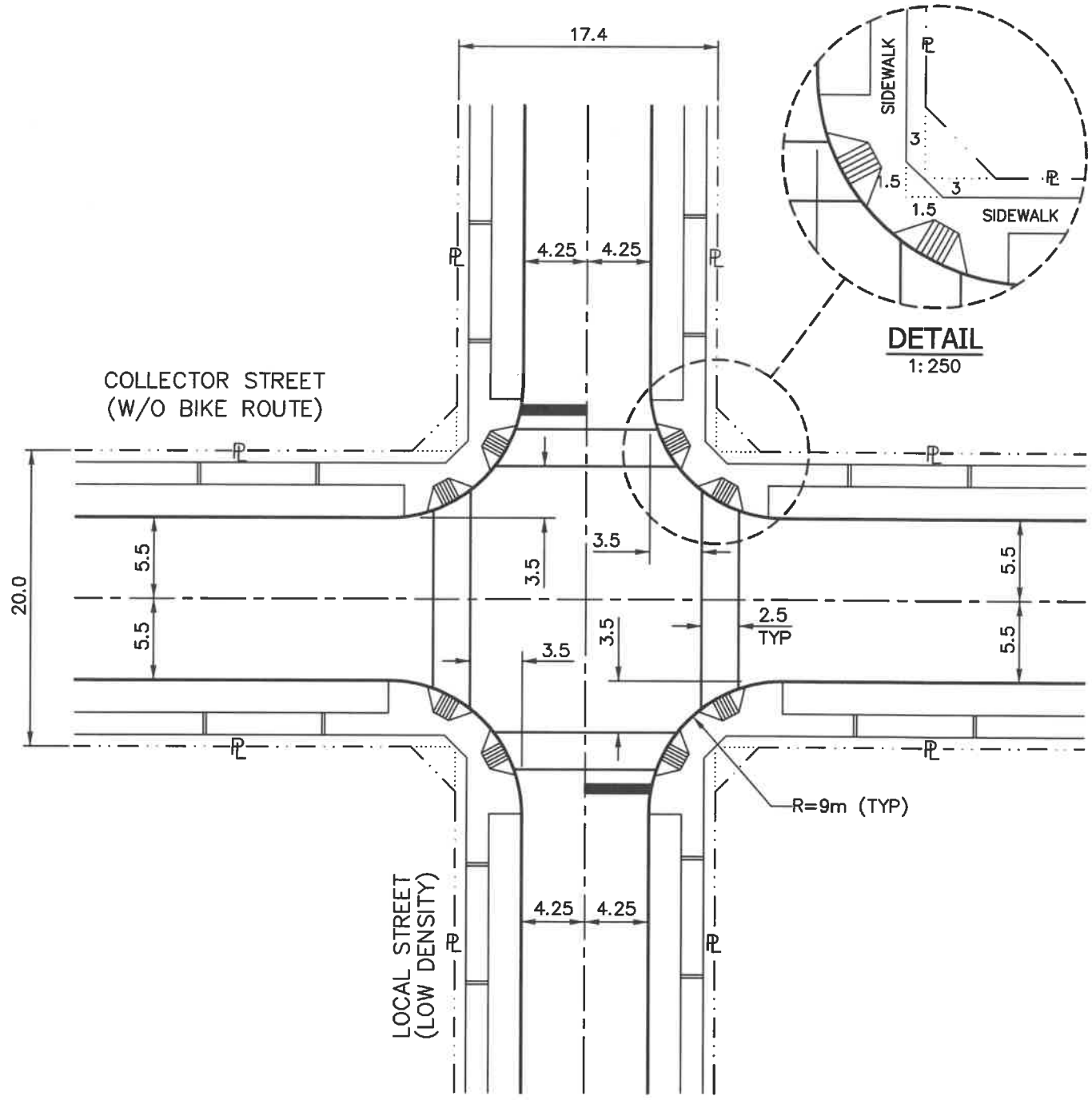


PLOTTED: 20-Sep-21

25.2m COMMUNITY - 17.4m LOCAL INTERSECTION	DATE: JAN/2015 DRAWN: REY SCALE: 1:400	DRAWING NUMBER: COQ-R13

Coquitlam

STANDARD DETAIL DRAWINGS

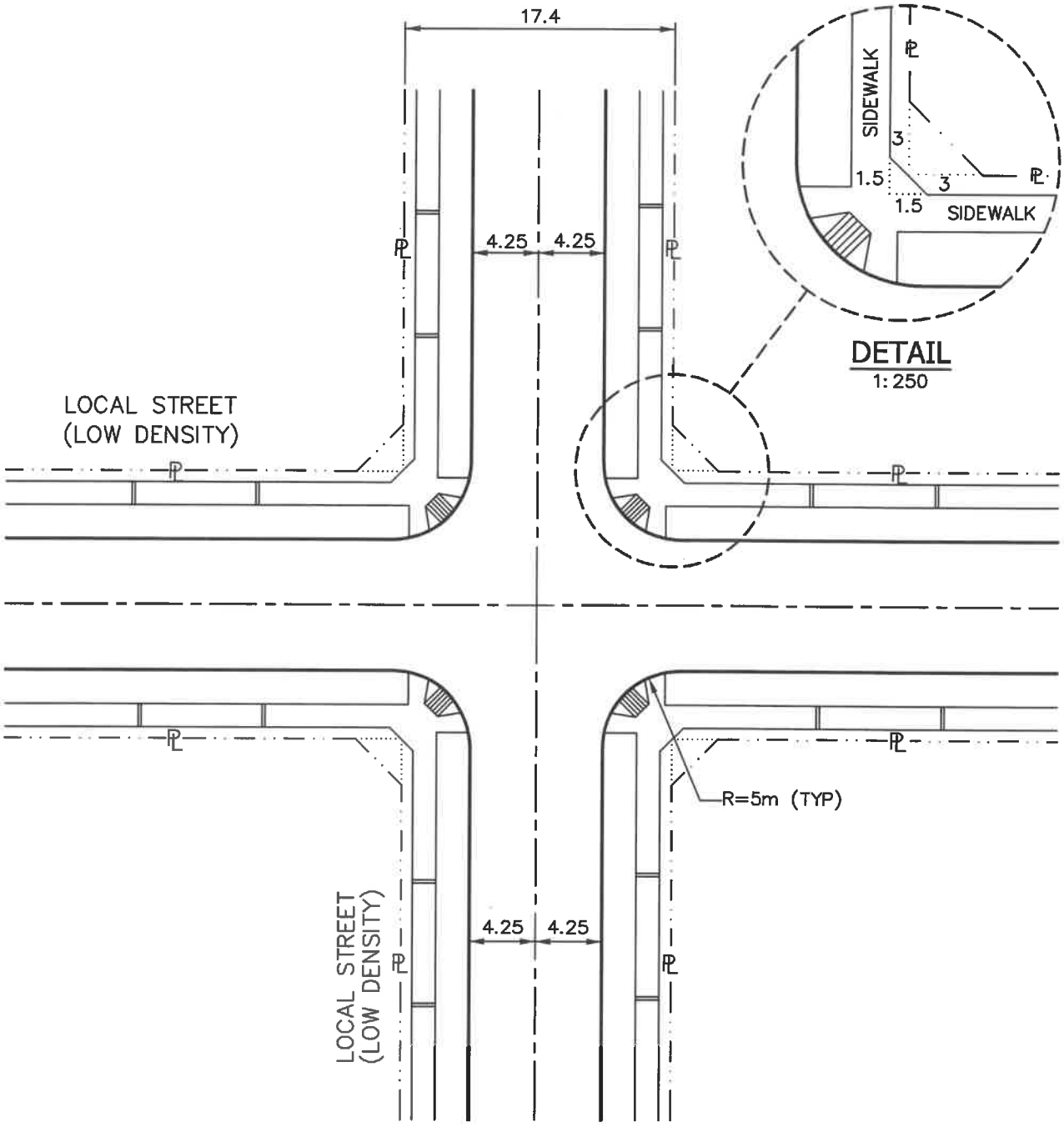


PLOTTED: 20-Sep-21

20.0m COLLECTOR - 17.4m LOCAL INTERSECTION	DATE:	AUG/2021	DRAWING NUMBER: COQ-R14
	DRAWN:	REY	
	SCALE:	1:400	

Coquitlam

STANDARD DETAIL DRAWINGS



PLOTTED: 20–Sep–21

17.4m LOCAL STREET INTERSECTION (LOW DENSITY)

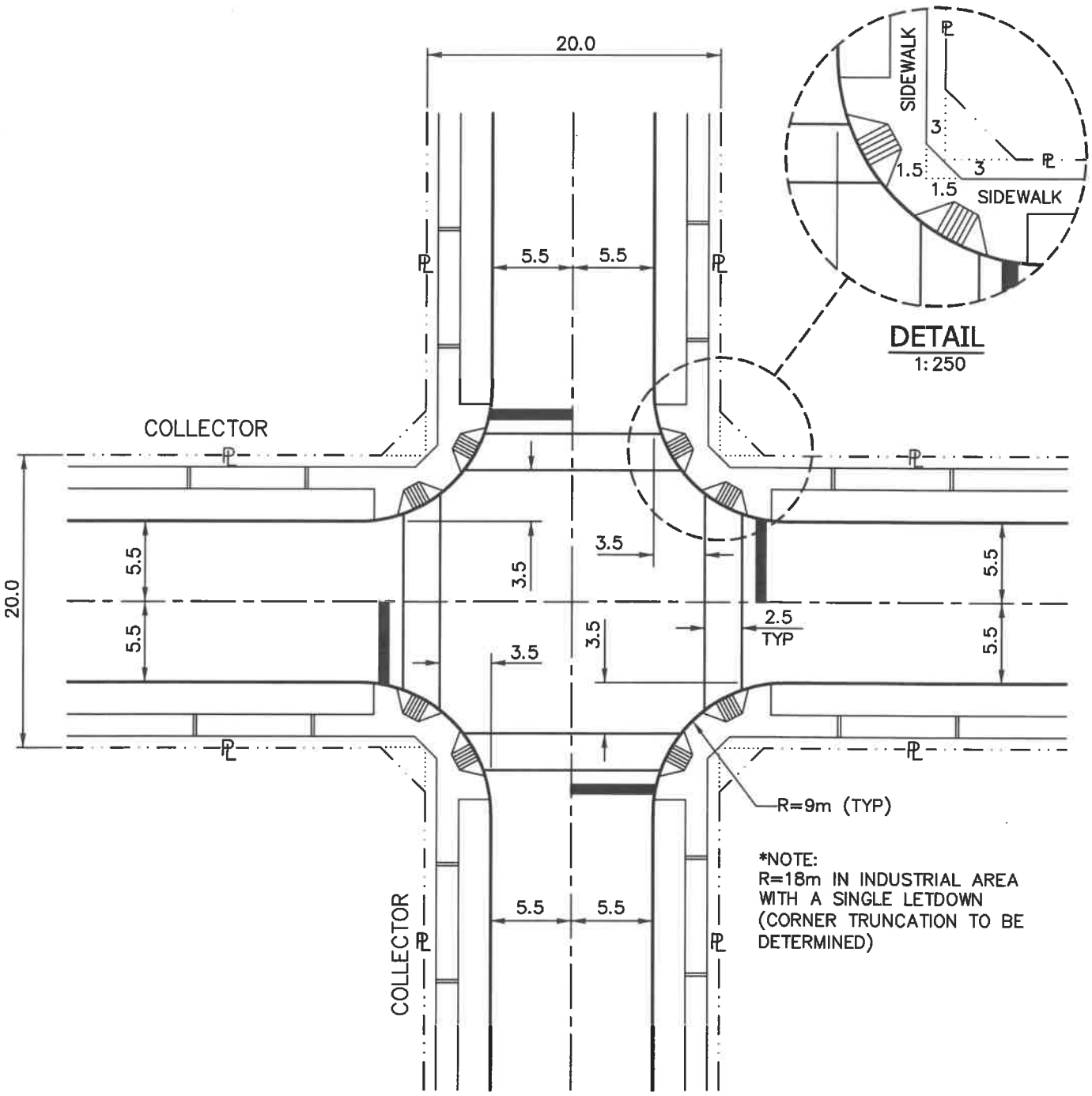
DATE:	AUG/2021
DRAWN:	REY
SCALE:	1:400

DRAWING NUMBER:

COQ-R15

Coquitlam

STANDARD DETAIL DRAWINGS

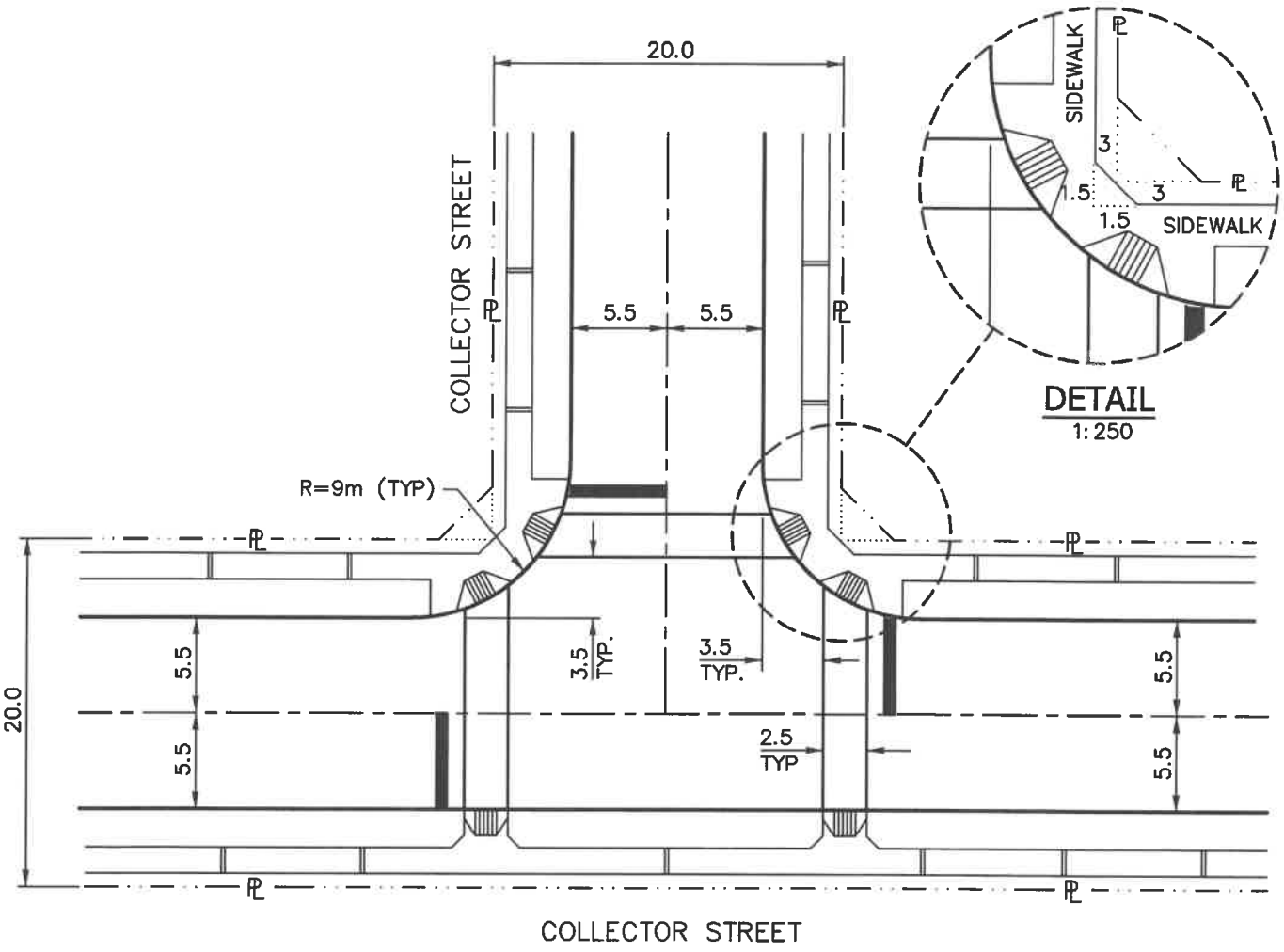


PLOTTED: 20–Sep–21

20.0m COLLECTOR STREET AND INDUSTRIAL/SERVICE COMMERCIAL 4-WAY INTERSECTION	DATE: AUG/2021	DRAWING NUMBER: COQ-R16
	DRAWN: REY	
	SCALE: 1:400	

Coquitlam

STANDARD DETAIL DRAWINGS



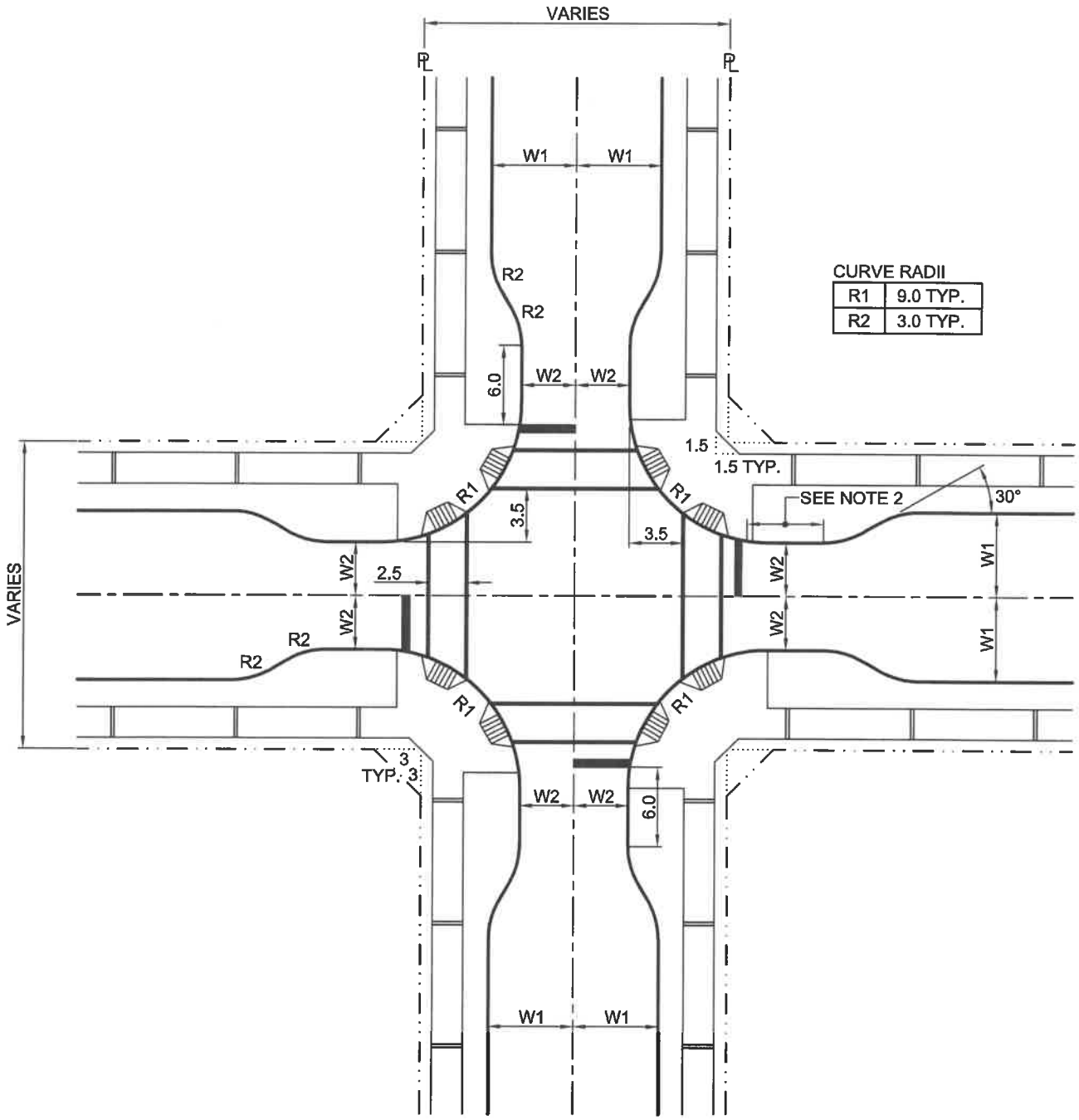
PLOTTED: 20-Sep-21

20.0m STANDARD COLLECTOR STREET 3-WAY INTERSECTION	DATE:	AUG/2021	DRAWING NUMBER: COQ-R17
	DRAWN:	REY	
	SCALE:	1:400	

Coquitlam

STANDARD DETAIL DRAWINGS

W1	W2	
5.25	3.25	FOR LOCAL HIGH DENSITY
5.5	3.5	FOR STANDARD COLLECTORS
6.7	4.7	FOR COMMUNITY COLLECTORS, URBAN HIGHER DENSITY



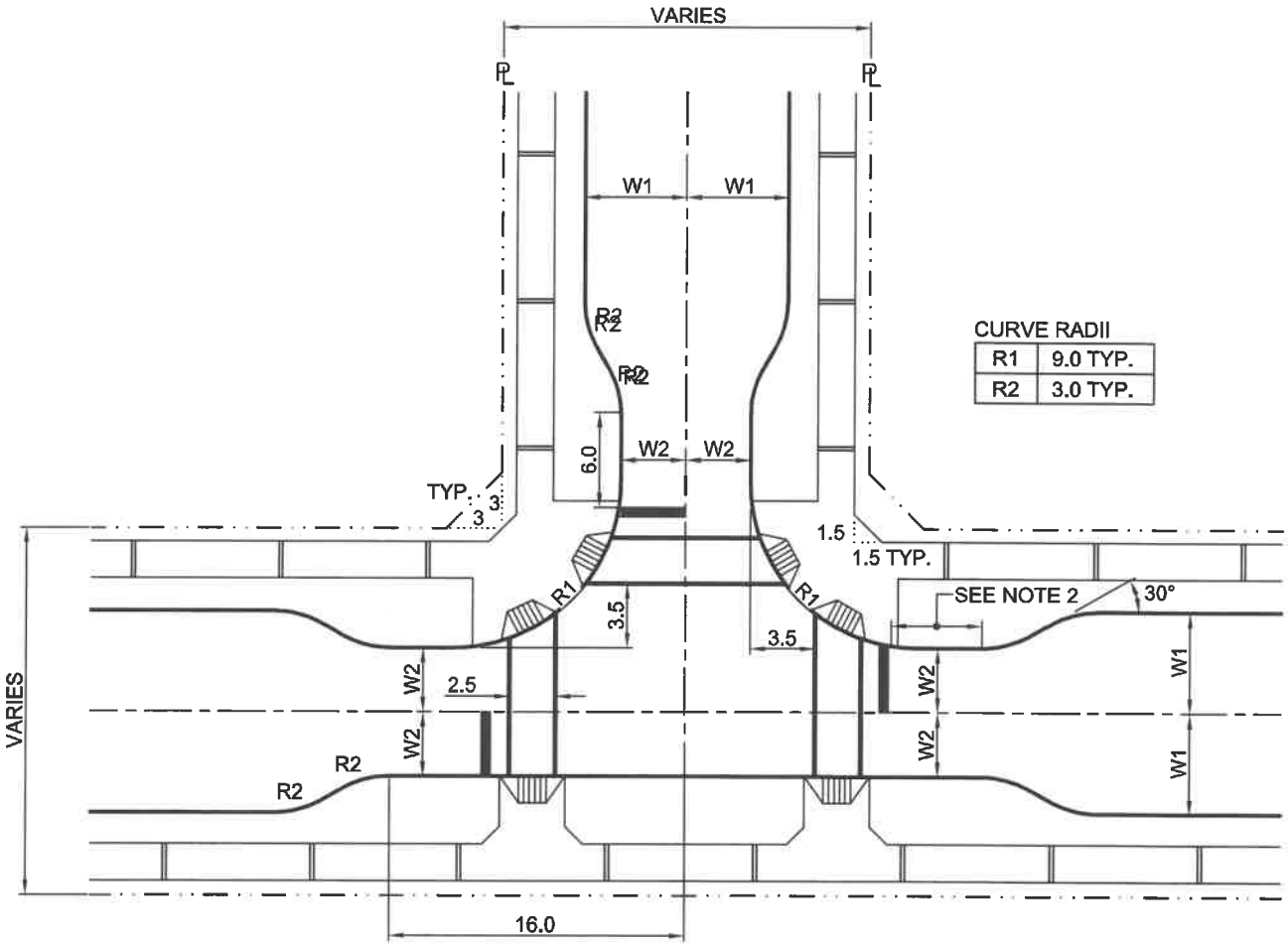
CURVE RADII

R1	9.0 TYP.
R2	3.0 TYP.

PLOTTED: 20-Sep-21

ALL DIMENSIONS IN METRES.

COLLECTOR OR HIGHER DENSITY LOCAL 4-WAY INTERSECTION W/ CURB EXTENSIONS	DATE: AUG/2021 DRAWN: REY SCALE: N.T.S.	DRAWING NUMBER: COQ-R18



CURVE RADII

R1	9.0 TYP.
R2	3.0 TYP.

W1	W2	
5.25	3.25	FOR LOCAL HIGH DENSITY
5.5	3.5	FOR STANDARD COLLECTORS
6.7	4.7	FOR COMMUNITY COLLECTORS, URBAN HIGHER DENSITY

PLOTTED: 20–Sep–21

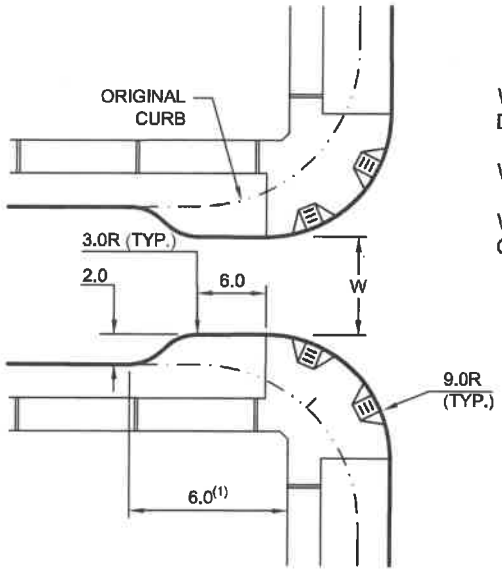
ALL DIMENSIONS IN METRES.

COLLECTOR OR HIGHER DENSITY LOCAL 3-WAY INTERSECTION

DATE:	NOV/2015
DRAWN:	
SCALE:	N.T.S.

DRAWING NUMBER:

COQ-R19

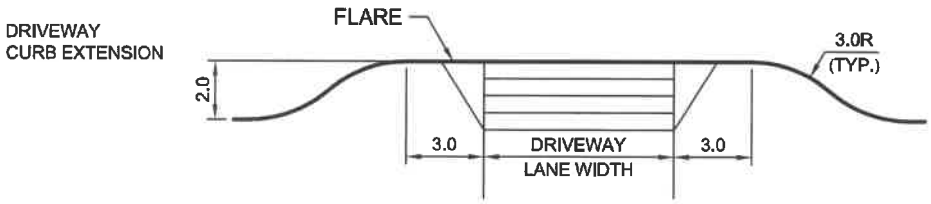


W= 6.5m FOR LOCAL HIGHER DENSITY

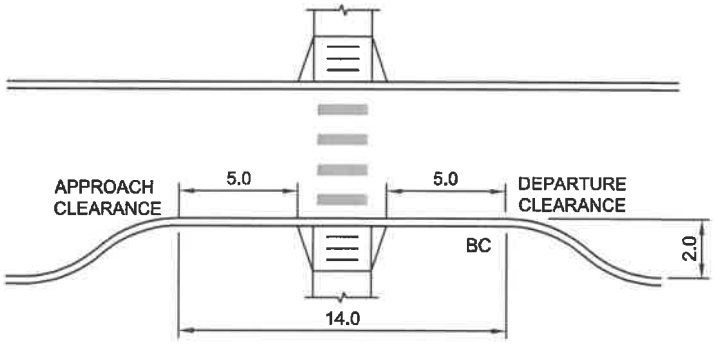
W= 7m FOR COLLECTOR

W= 9.4m FOR COMMUNITY COLLECTOR HIGH DENSITY

INTERSECTION CURB EXTENSION DETAILS



DRIVEWAY/LANE DETAIL



MIDBLOCK CROSSING DETAIL

NOTES:

1. VARY AS REQUIRED TO MEET STOPPING SIGHT DISTANCE AS DETERMINED BY THE MANAGER.
2. HYDRANTS SHOULD GENERALLY BE LOCATED WITHIN CURB EXTENSIONS. CURB EXTENSIONS MAY REQUIRE LENGTHENING TO RESTRICT PARKING WITHIN 5m OF HYDRANT.
3. CURB EXTENSIONS ARE NOT TO BE USED ON LOWER DENSITY LOCALS WITH 8.5m CURB TO CURB WIDTH.

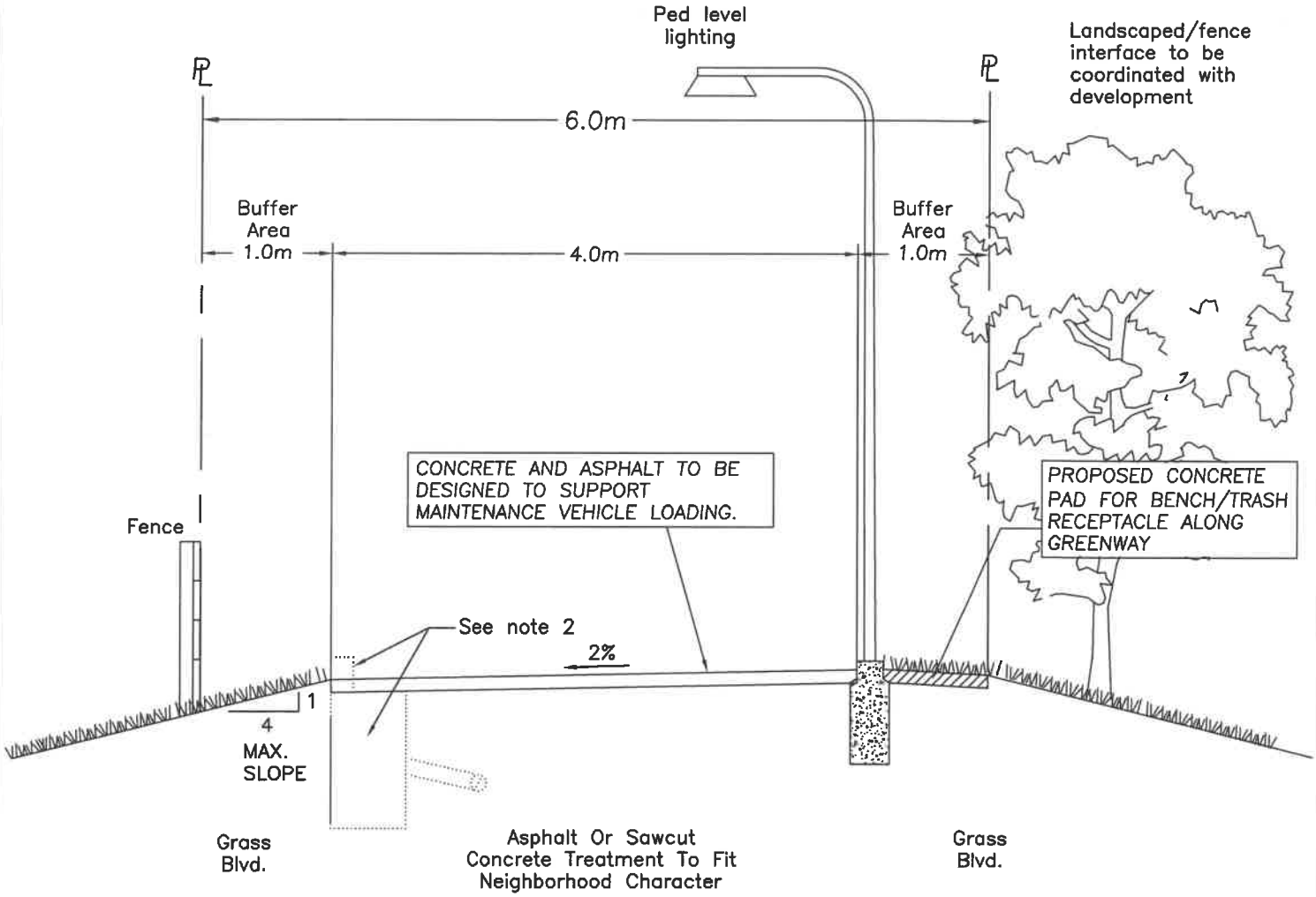
PLOTTED: 20–Sep–21

ALL DIMENSIONS IN METRES.

CURB EXTENSIONS AND ON-STREET PARKING BAY	DATE: AUG/2021	DRAWING NUMBER: COQ-R20
	DRAWN: R.D.	
	SCALE: N.T.S.	

Coquitlam

STANDARD DETAIL DRAWINGS



NOTE:

1. BUFFER AREA BETWEEN THE PATHWAY AND PROPERTY LINE MAY BE REDUCED FROM 1m TO 0.5m ON A CASE BY CASE BASIS.

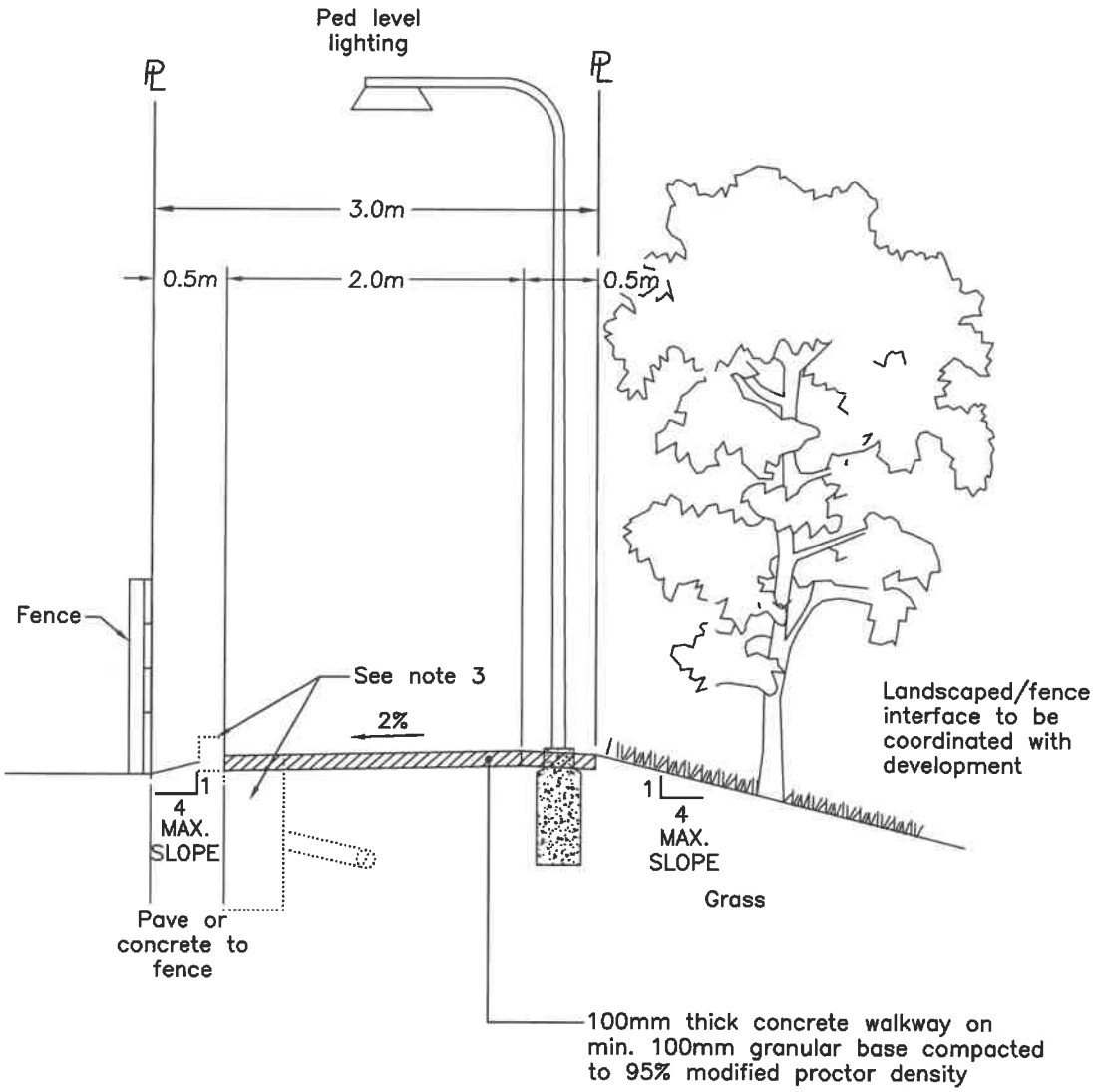
2. THE REQUIREMENTS FOR DRAINAGE CONTROLS AND SYSTEMS (CATCH BASINS, CURBING, STORM MAINS, SWALE, ETC.) TO BE REVIEWED AND DETERMINED AT DETAILED DESIGN TO THE SATISFACTION OF THE MANAGER.

PLOTTED: 20-Sep-21

HIGH DENSITY URBAN WALKWAY GREENWAY OR CYCLE ROUTE 6.0m ROW	DATE:	AUG/2021	DRAWING NUMBER: COQ-R21
	DRAWN:	REY	
	SCALE:	N.T.S.	

Coquitlam

STANDARD DETAIL DRAWINGS



NOTE:

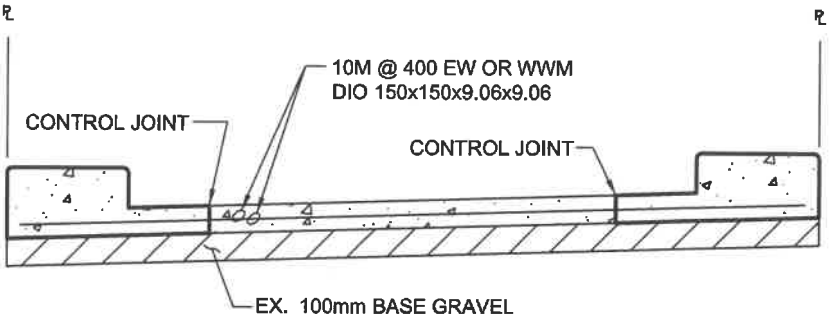
1. *FOR WALKWAYS GREATER THAN 50m IN LENGTH AN ADDITIONAL 1m OF PATHWAY WIDTH IS NEEDED.*
2. *THE REQUIREMENTS FOR DRAINAGE CONTROLS AND SYSTEMS (CATCH BASINS, CURBING, STORM MAINS, SWALE, ETC.) TO BE REVIEWED AND DETERMINED AT DETAILED DESIGN TO THE SATISFACTION OF THE MANAGER.*
3. *TO BE UTILIZED AS DESCRIBED IN THE APPROVED NEIGHBORHOOD PLAN.*

PLOTTED: 20-Sep-21

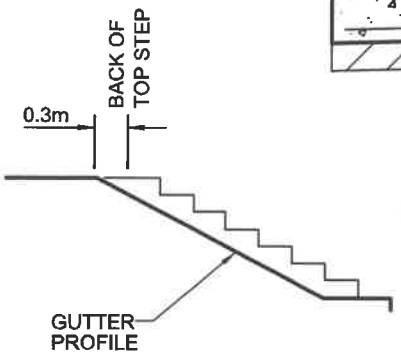
URBAN WALKWAY NON-CYCLING ROUTE 3.0m ROW	DATE: AUG/2021 DRAWN: REY SCALE: N.T.S.	DRAWING NUMBER: COQ-R22

Coquitlam

STANDARD DETAIL DRAWINGS

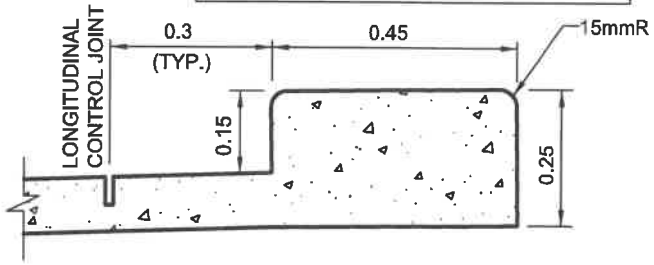


REINFORCING DETAIL



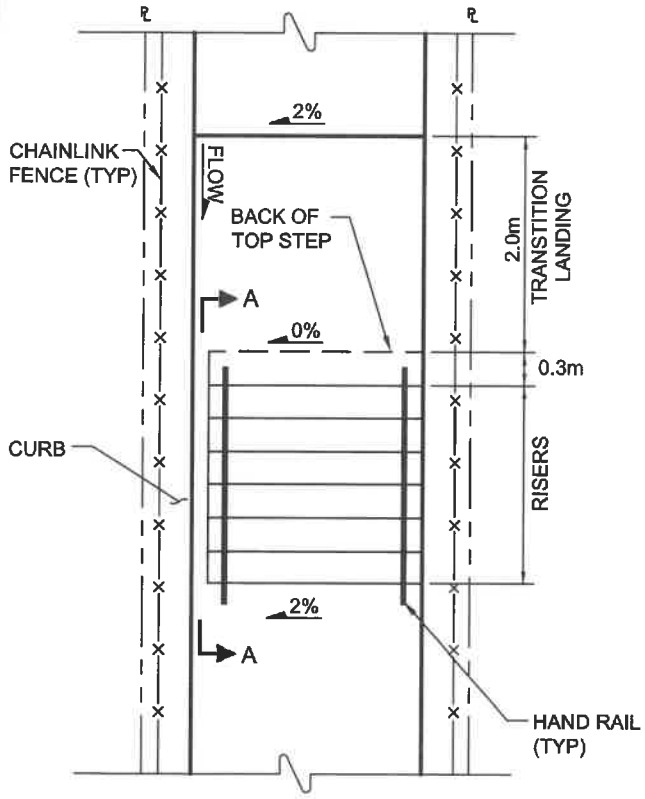
SECTION A

TRANSVERSE CONTROL JOINTS TO BE CONSTRUCTED AT 1.5m INTERVALS.



CURB DETAIL

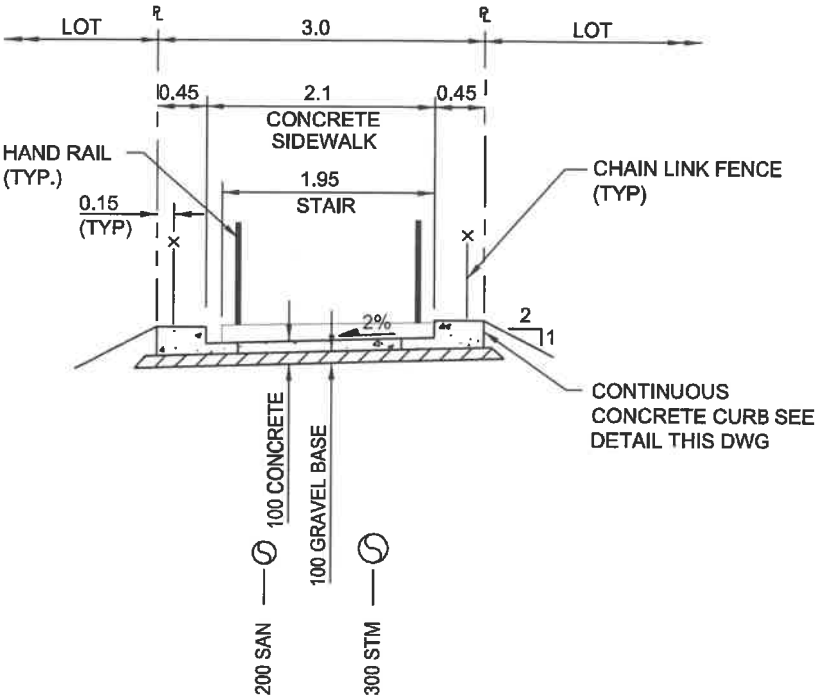
N.T.S.



PLAN

DRAINAGE DETAIL AT STAIRCASE

N.T.S.



TYPICAL SECTION

N.T.S.

WALKWAY

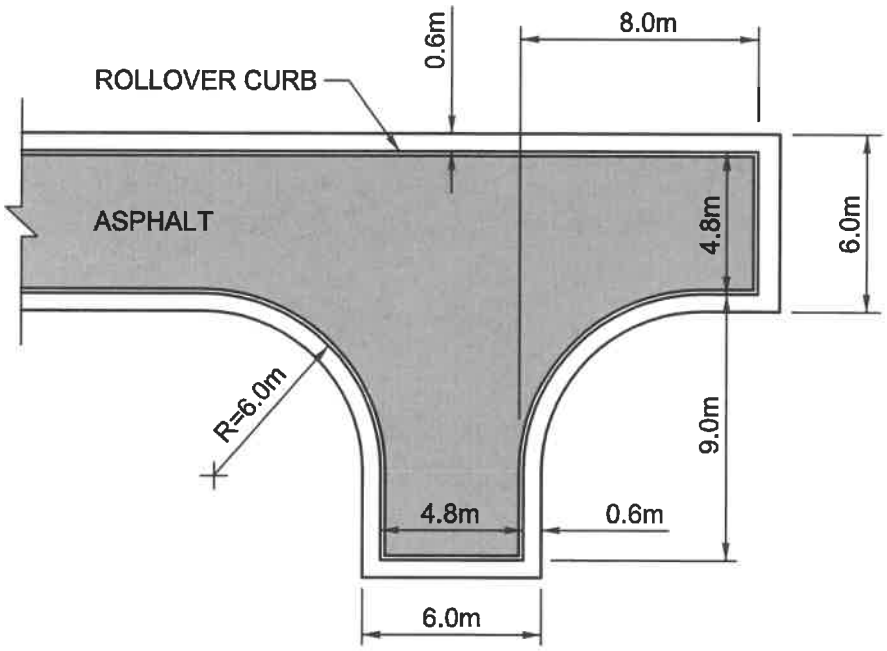
PLOTTED: 5–Jun–18

ALL DIMENSIONS IN METRES.

WALKWAY DETAILS	DATE:	JAN/2016	DRAWING NUMBER:
	DRAWN:	REY	COQ-R23
	SCALE:	N.T.S.	

Coquitlam

STANDARD DETAIL DRAWINGS



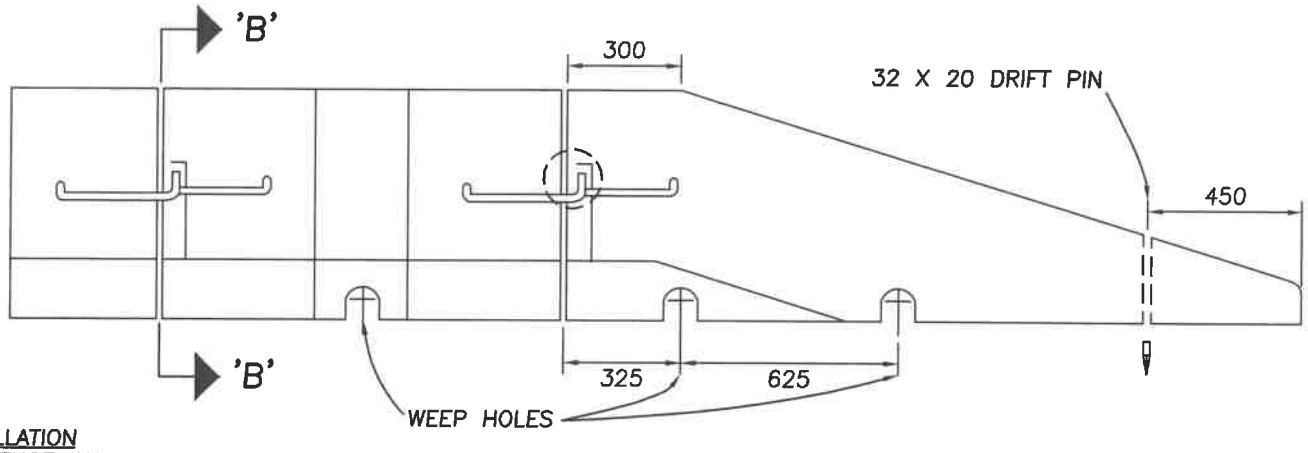
NOTES: PARKING WILL BE PROBIHITED IN THE TURN AROUND

PLOTTED: 19–Feb–16

LANE TURN AROUND	DATE: OCT/2015 DRAWN: REY SCALE: N.T.S.	DRAWING NUMBER: COQ-R24

Coquitlam

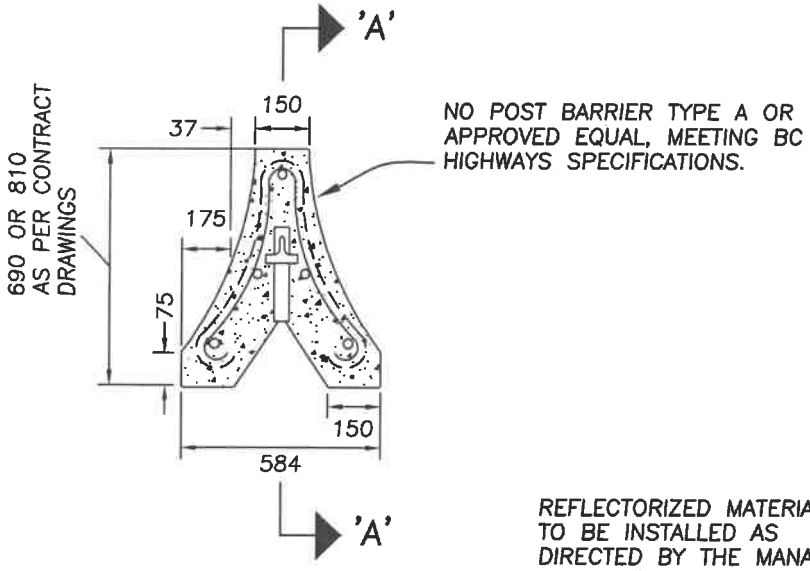
STANDARD DETAIL DRAWINGS

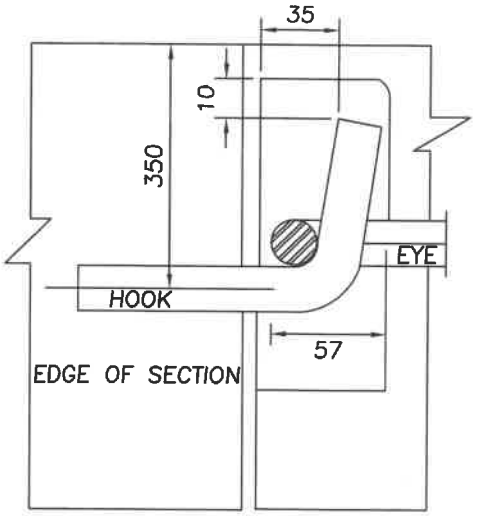


SECTION 'A-A'

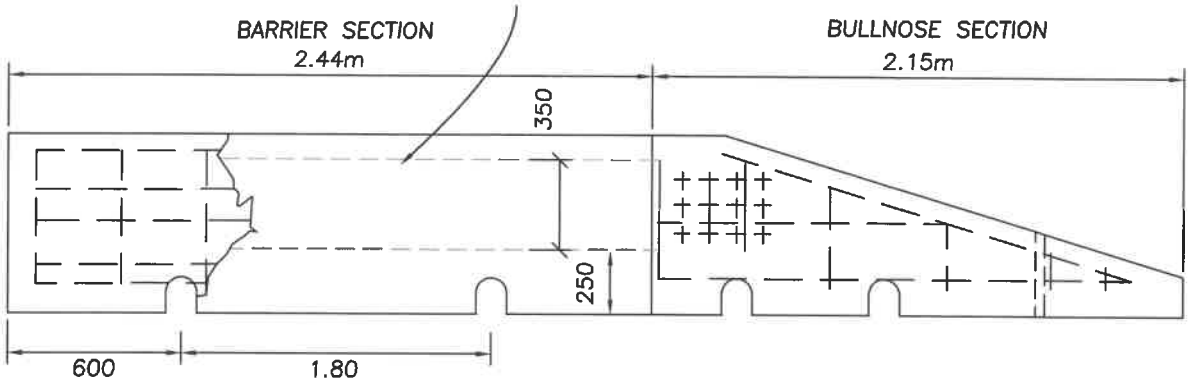
INSTALLATION

COMMENCE INSTALLATION WITH HOOK ON LEADING END, BULL NOSE SECTION TO BE PLACED FIRST. END OF BARRIER IS A BULLNOSE SECTION WITH EYE CONNECTOR.





DETAIL 1



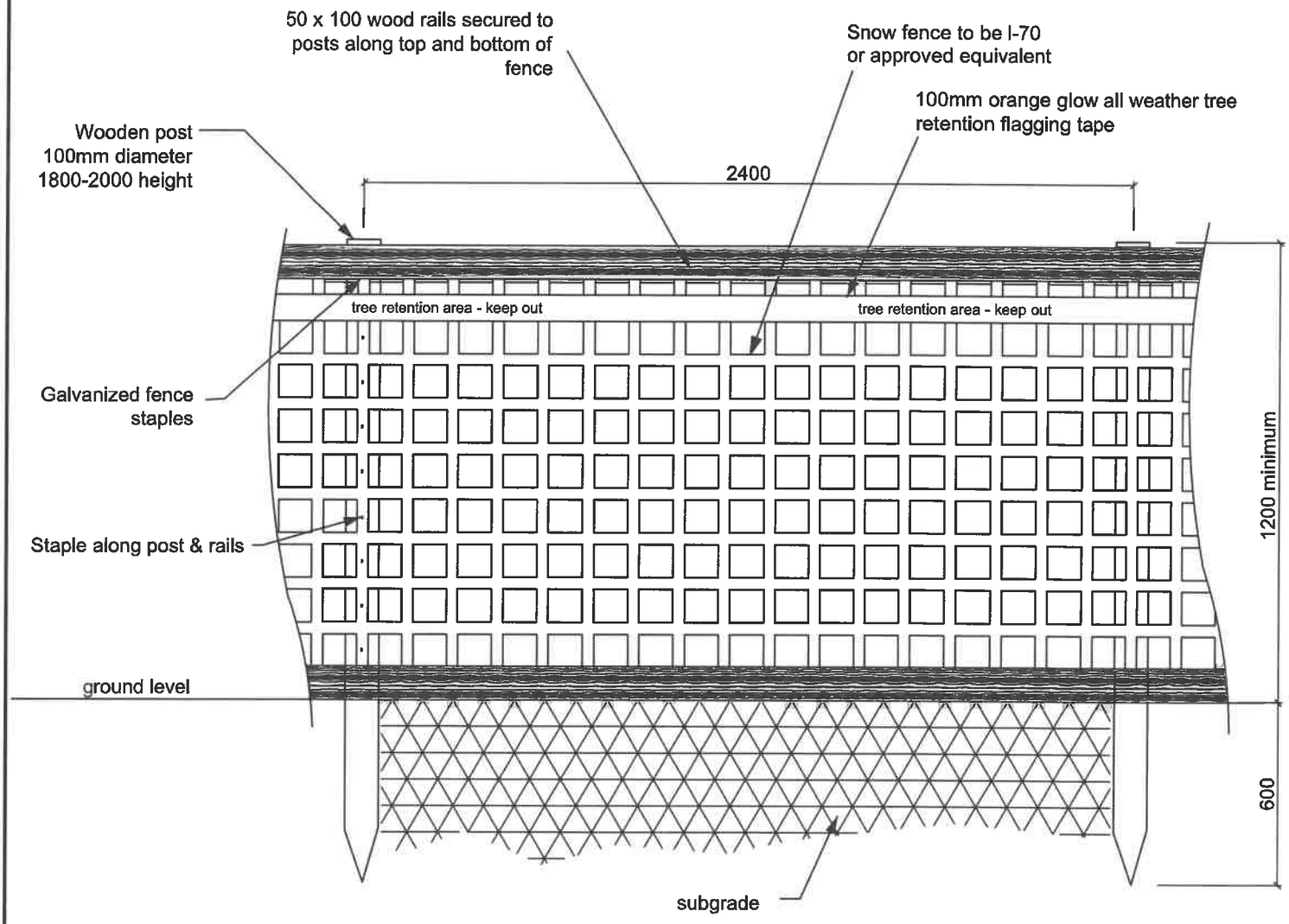
FRONT ELEVATION

PLOTTED: 26-Feb-16

PRE-CAST REINFORCED CONCRETE 'NO-POST' BARRIER	DATE:	DEC/2015	DRAWING NUMBER: COQ-R25
	DRAWN:	REY	
	SCALE:	N.T.S.	

Coquitlam

STANDARD DETAIL DRAWINGS



Protection fence to be located at crown dripline or adjacent to hard surface, which ever is greater.

Manually excavate and cut tree roots within 1.0m of tree protection fence.

Machinery and storage is not permitted within 1.0m of tree protection area.

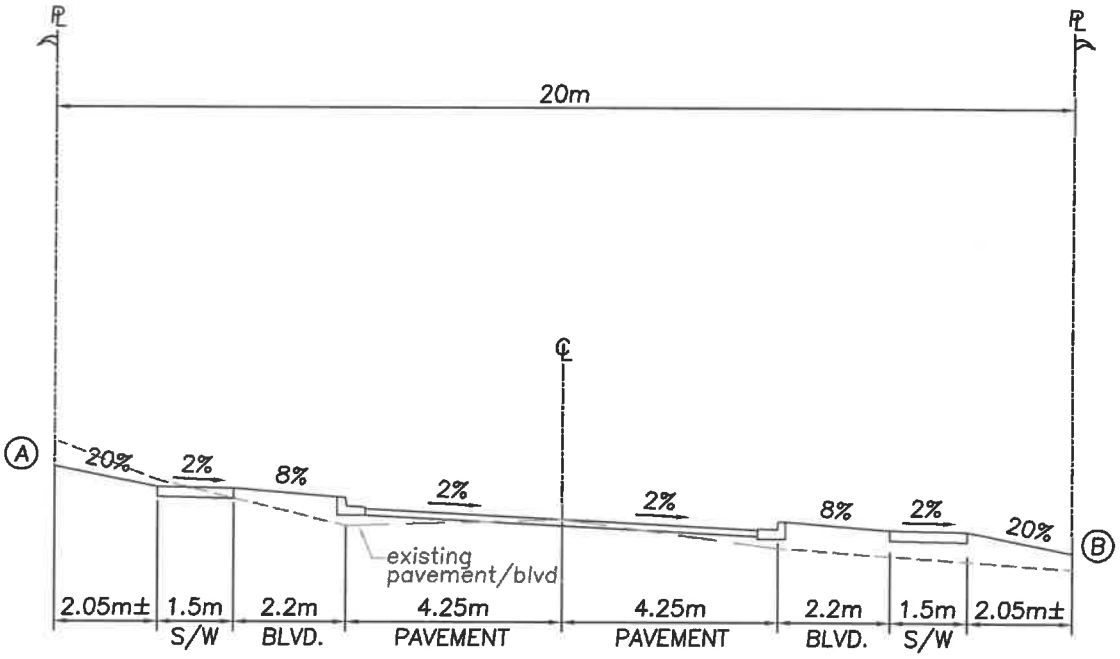
PLOTTED: 22–Feb–16

TREE PROTECTION FENCE	DATE: NOV/2014 DRAWN: AJM SCALE: N.T.S.	DRAWING NUMBER: COQ-R26

Coquitlam

STANDARD DETAIL DRAWINGS

EXAMPLE 1: 20m ROW, LOCAL ROAD, CROSS SLOPE



NOTES:

1. FOR AREAS WITH ROADWAYS THAT RUN ACROSS SLOPES OF 6% OR GREATER, AS CALCULATED FROM PL TO PL.
2. THE ELEVATION OF THE HIGH SIDE PROPERTY LINE (LINE A), SHALL BE SET 0.85 ± 0.15m ABOVE THE CENTRE LINE ELEVATION.
3. THE ELEVATION OF THE LOW SIDE PROPERTY LINE (LINE B), SHALL BE SET 0.55 ± 0.15m BELOW THE CENTRE LINE ELEVATION.
4. UTILITIES TO BE AS SHOWN ON STANDARD DETAIL DRAWING COQ–R4.

PLOTTED: 20–Sep–21

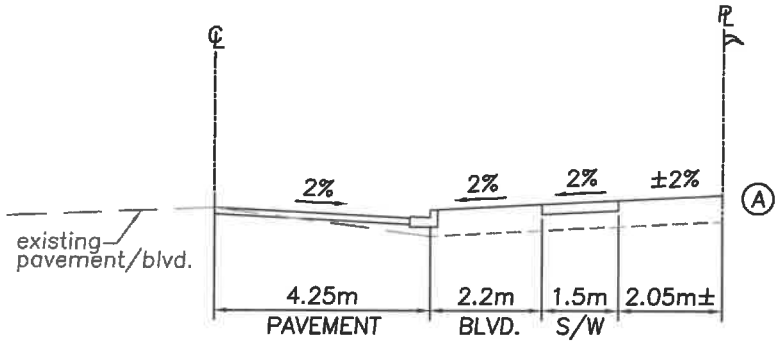
ALL DIMENSIONS IN METRES.

TYPICAL X-SECTIONS FRONTAGE WORKS PROGRAM	DATE:	18 DEC/2017	DRAWING NUMBER: COQ-R27A
	DRAWN:	R.D./M.Z.	
	SCALE:	N.T.S.	

Coquitlam

STANDARD DETAIL DRAWINGS

EXAMPLE 2: 20m ROW, LOCAL ROAD, CROWN



NOTES:

1. FOR AREAS WITH ROADWAYS THAT RUN ACROSS SLOPES THAT ARE LESS THAN 6%, AS CALCULATED FROM PL TO PL.
2. THE ELEVATION OF THE PROPERTY LINE (LINE A), SHALL BE SET AT 0.15m ABOVE THE ELEVATION OF THE CENTRE LINE ±0.15m.
3. NOTE 1 APPLIES TO BOTH SIDES OF THE ROADWAY.
4. UTILITIES TO BE AS SHOWN ON STANDARD DETAIL DRAWING COQ–R4.

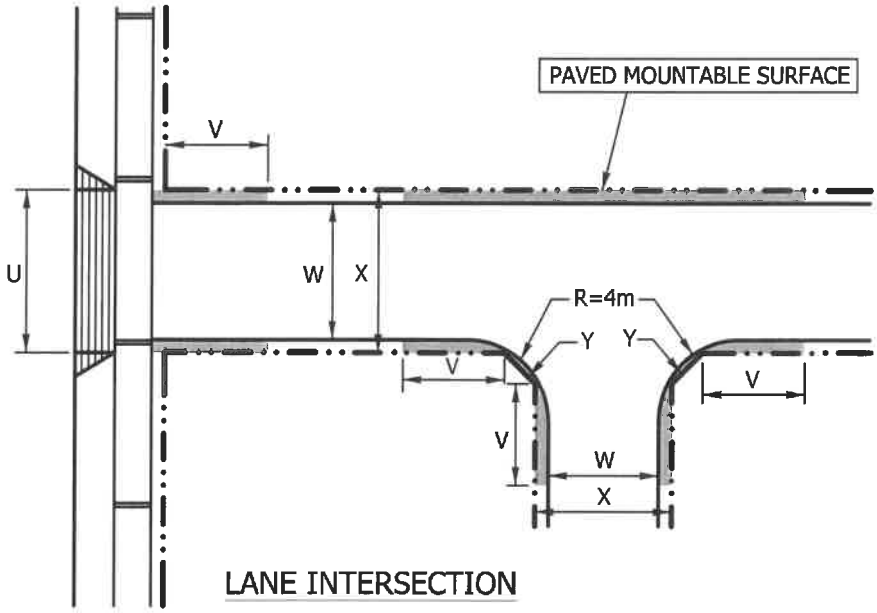
PLOTTED: 20–Sep–21

ALL DIMENSIONS IN METRES.

TYPICAL X-SECTIONS FRONTAGE WORKS PROGRAM	DATE:	18 DEC/2017	DRAWING NUMBER: COQ-R27B
	DRAWN:	R.D./M.Z.	
	SCALE:	N.T.S.	

Coquitlam

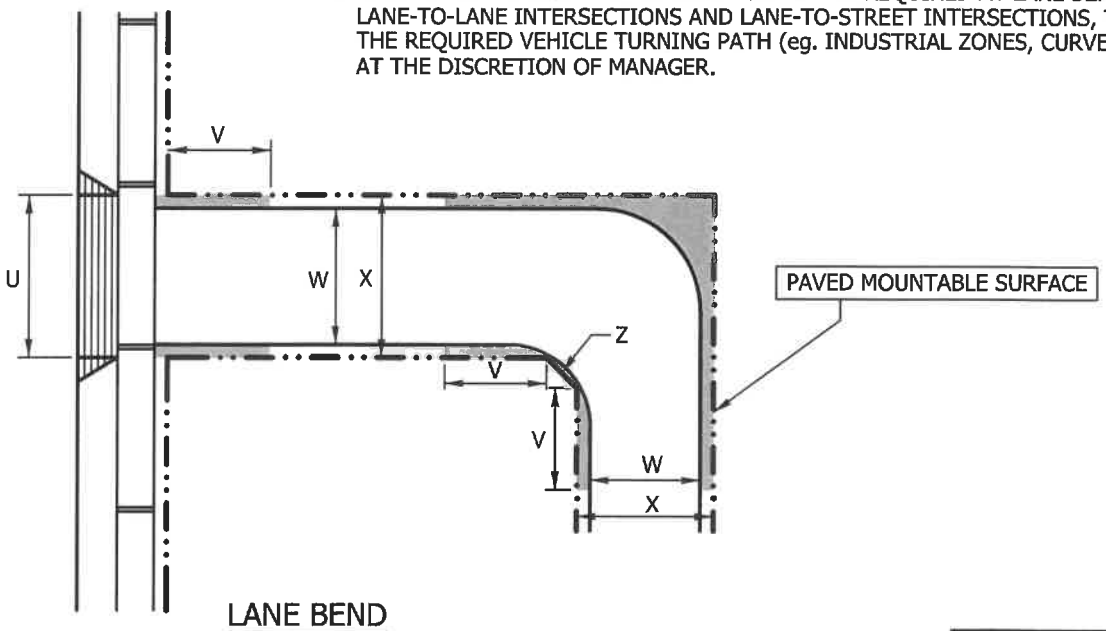
STANDARD DETAIL DRAWINGS



LANE INTERSECTION

	STANDARD LANE	PRIMARY ACCESS LANE
U (EXCLUDES FLARES)	MIN 6m[1]	MIN 8m[1]
V	MIN 5m[1]	MIN 5m[1]
W (INCLUDES ROLLOVER CURB)	5.4m	6.7m
X	6.0m	8.0m
Y	3m X 3m[2]	3m X 3m[2]
Z	4m X 4m[2]	4m X 4m[2]

1. ADDITIONAL WIDTH MAY BE REQUIRED, AT THE DISCRETION OF MANAGER
2. ADDITIONAL CORNER CUT DEDICATION MAY BE REQUIRED AT LANE BENDS, LANE-TO-LANE INTERSECTIONS AND LANE-TO-STREET INTERSECTIONS, TO ACCOMMODATE THE REQUIRED VEHICLE TURNING PATH (eg. INDUSTRIAL ZONES, CURVED ROADS), AT THE DISCRETION OF MANAGER.



LANE BEND

APPROVED BY:
G.M. ENGINEERING & PUBLIC WORKS
AUG. 2023

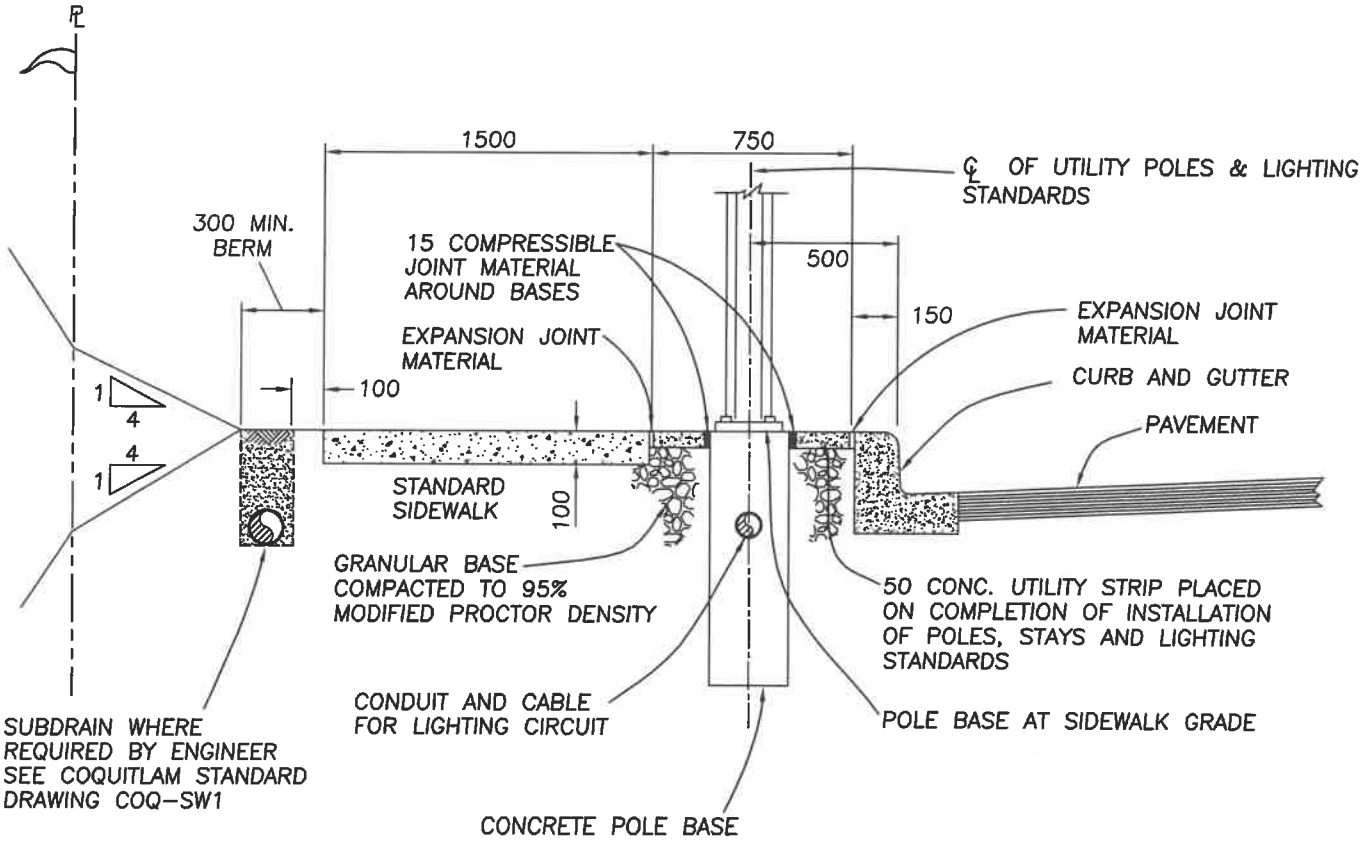
LANE INTERSECTIONS AND LANE BENDS

REVISION DATE: JUN/2023
DRAWN: REY
SCALE: N.T.S.

DRAWING NUMBER:
COQ-R28

Coquitlam

STANDARD DETAIL DRAWINGS

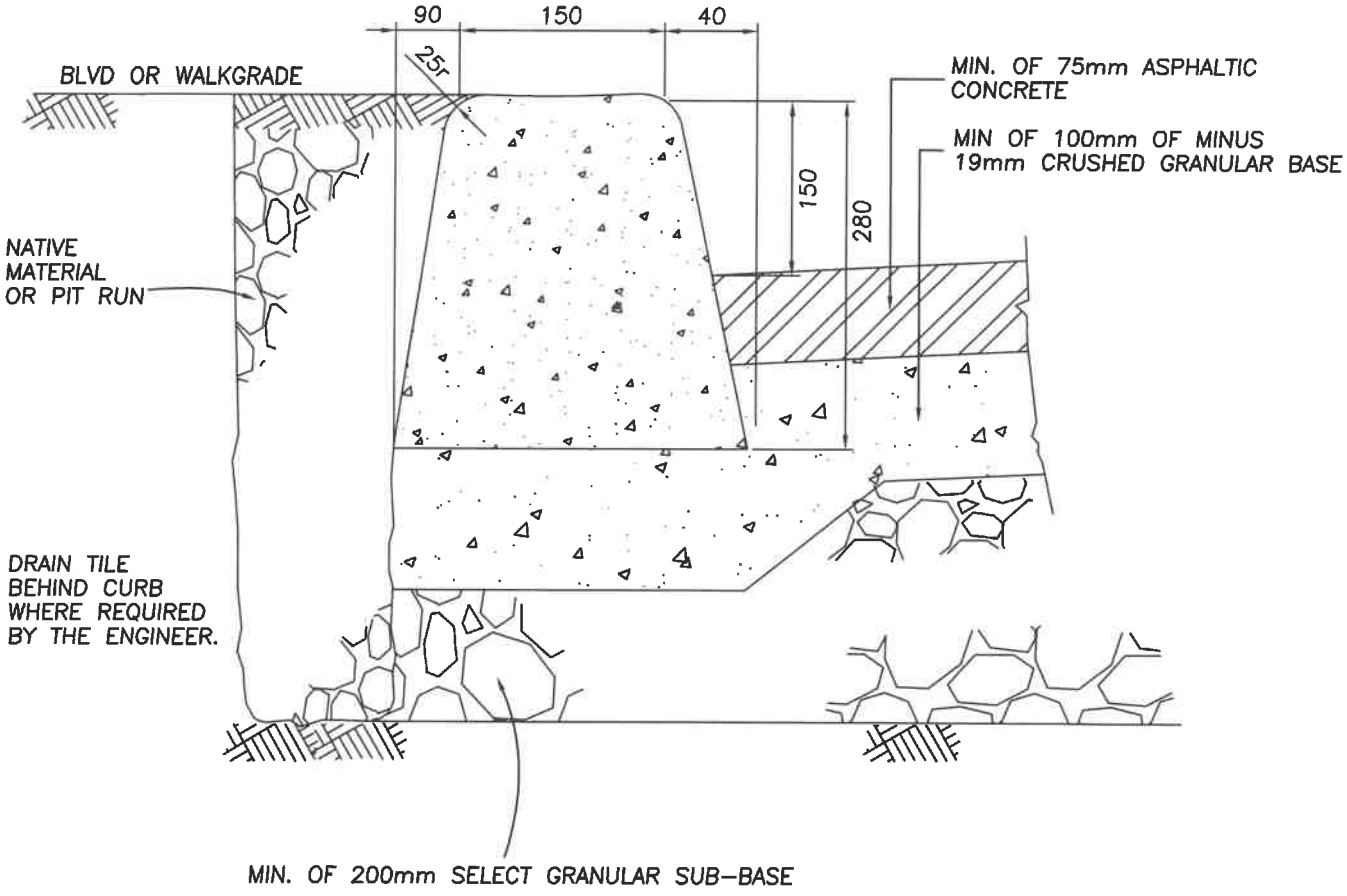


PLOTTED: 22-Feb-16

BOULEVARD - SIDEWALK UTILITY STRIP	DATE:	FEB/2016	DRAWING NUMBER:
	DRAWN:	REY	COQ-C1
	SCALE:	N.T.S.	

Coquitlam

STANDARD DETAIL DRAWINGS



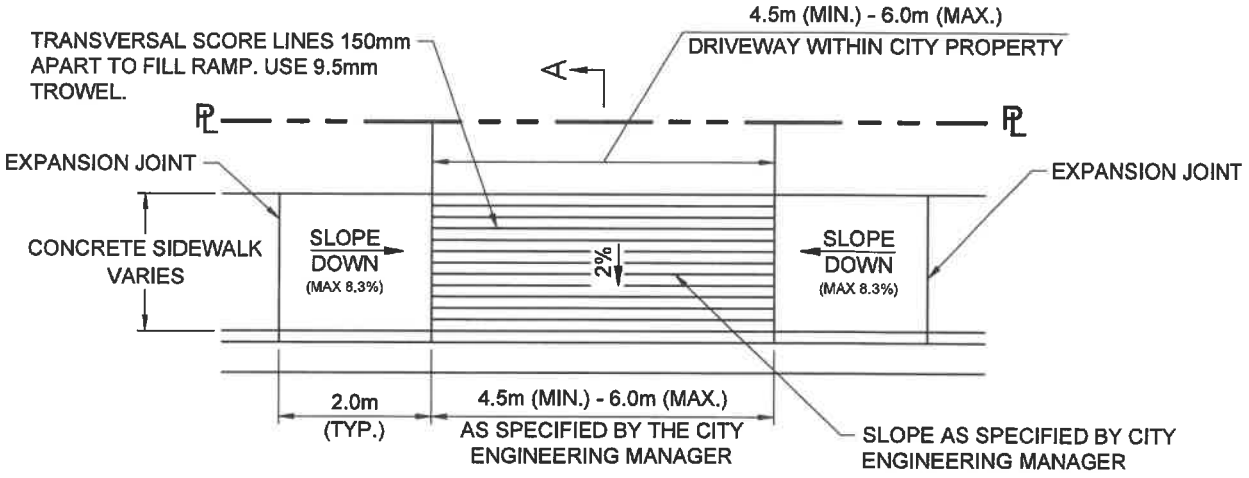
CURB ON GRAVEL BASE NO SIDEWALK

PLOTTED: 22-Feb-16

CURB ON GRAVEL BASE	DATE:	NOV/2015	DRAWING NUMBER:
	DRAWN:	REY	COQ-C6
	SCALE:	N.T.S.	

Coquitlam

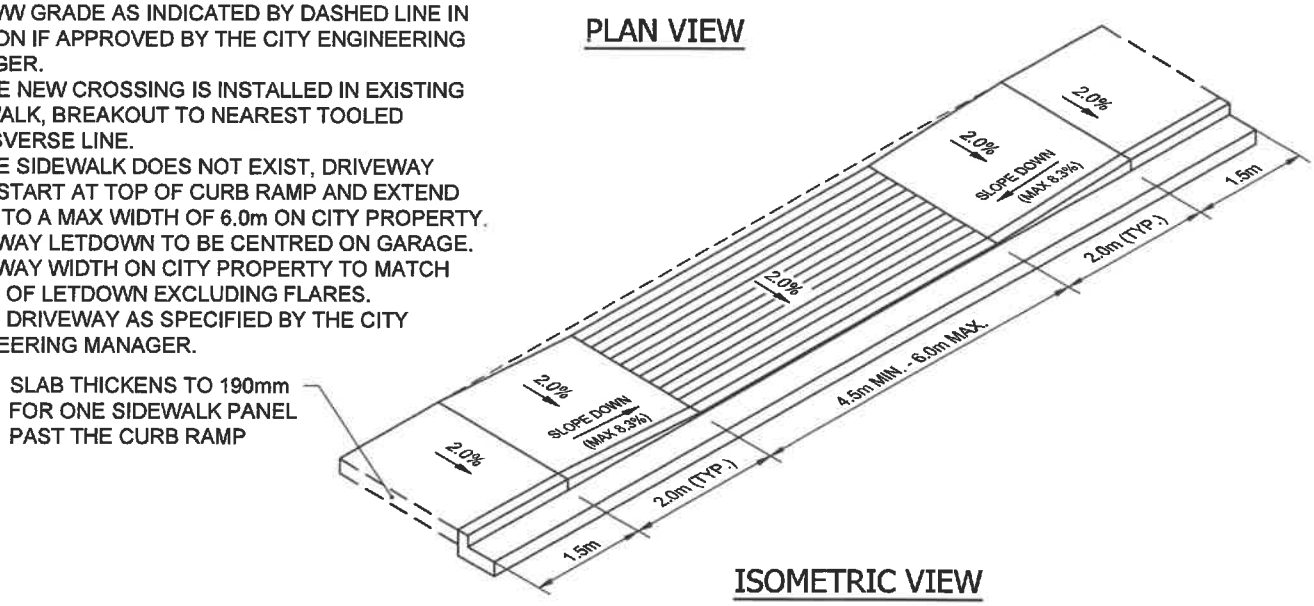
STANDARD DETAIL DRAWINGS



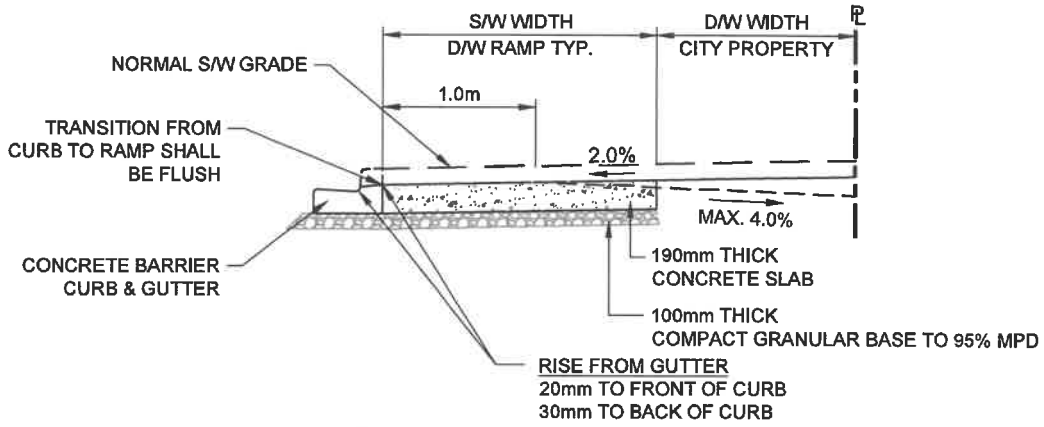
PLAN VIEW

NOTES:

1. WHERE DRIVEWAY IS AT LOWER GRADE THAN SIDEWALK, CROSSING SLOPES, BREAKOUT POINT AND D/W GRADE AS INDICATED BY DASHED LINE IN SECTION IF APPROVED BY THE CITY ENGINEERING MANAGER.
2. WHERE NEW CROSSING IS INSTALLED IN EXISTING SIDEWALK, BREAKOUT TO NEAREST TOOLED TRANSVERSE LINE.
3. WHERE SIDEWALK DOES NOT EXIST, DRIVEWAY MUST START AT TOP OF CURB RAMP AND EXTEND AT 45° TO A MAX WIDTH OF 6.0m ON CITY PROPERTY.
4. DRIVEWAY LETDOWN TO BE CENTRED ON GARAGE.
5. DRIVEWAY WIDTH ON CITY PROPERTY TO MATCH WIDTH OF LETDOWN EXCLUDING FLARES.
6. SLOPE DRIVEWAY AS SPECIFIED BY THE CITY ENGINEERING MANAGER.



ISOMETRIC VIEW



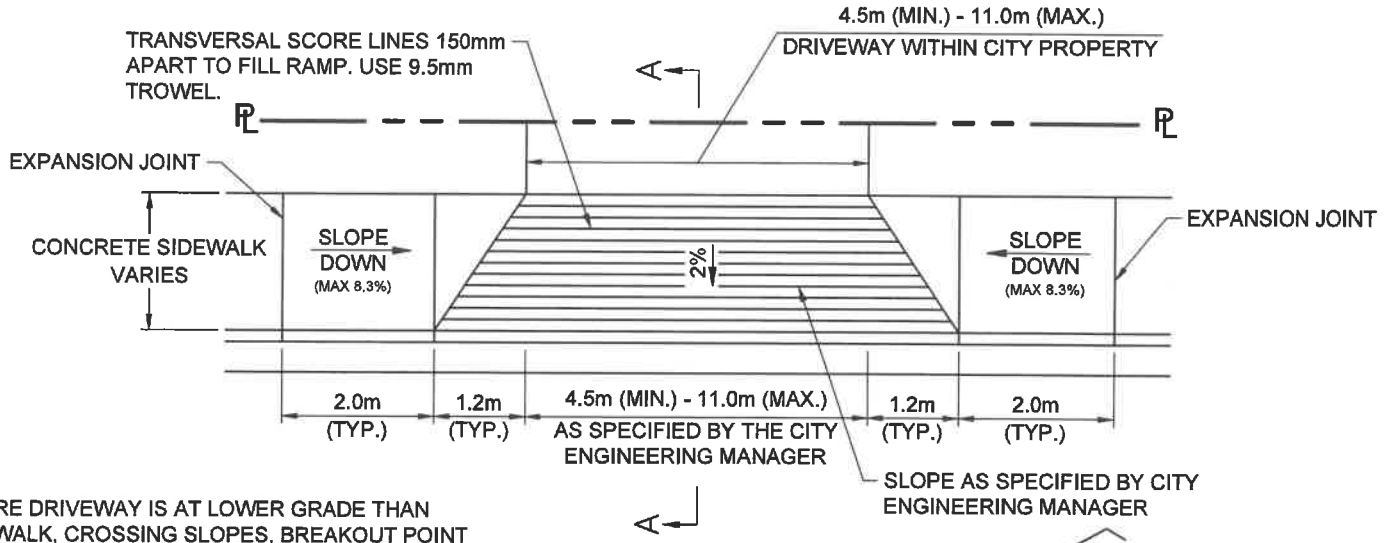
SECTION A-A CURB RAMP

PLOTTED: 19-NOV-20

LOCAL, COLLECTOR DRIVEWAY CROSSING OF CURB, GUTTER AND SIDEWALK	DATE:	NOV/2020	DRAWING NUMBER: COQ-C7
	DRAWN:	GA	
	SCALE:	N.T.S.	

Coquitlam

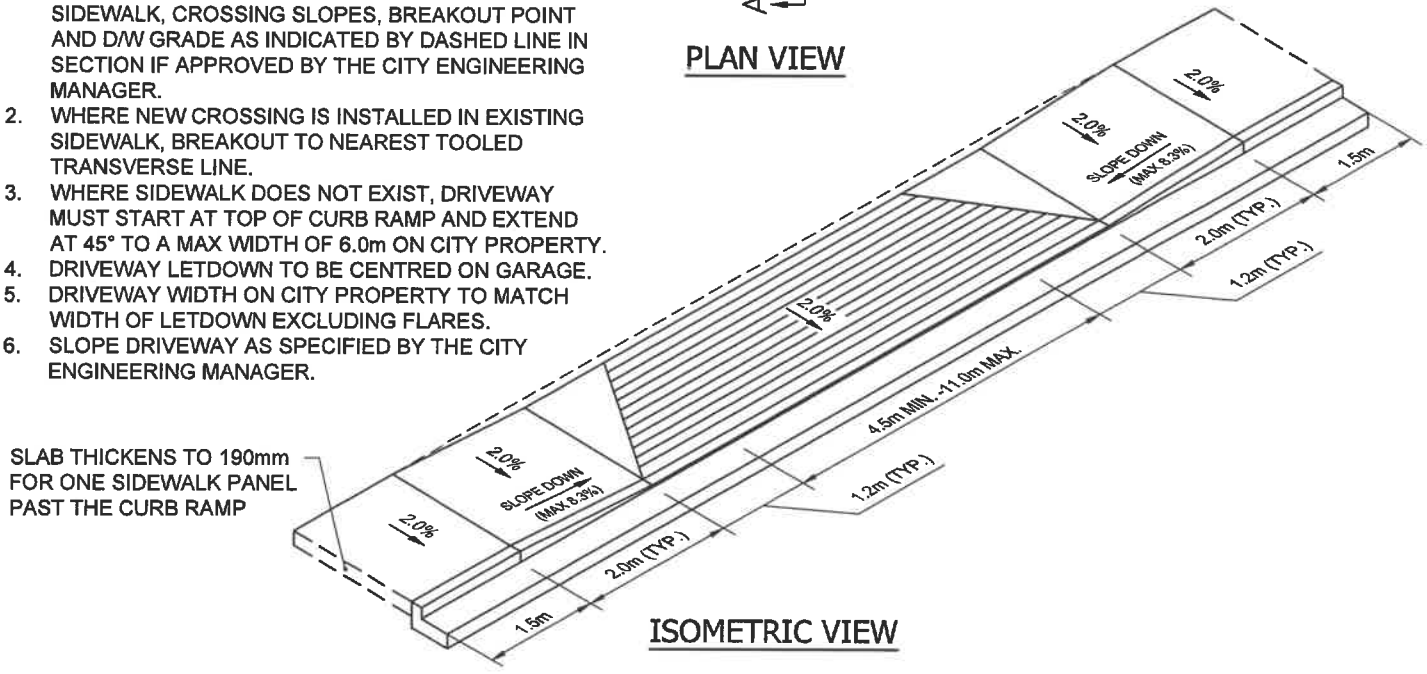
STANDARD DETAIL DRAWINGS



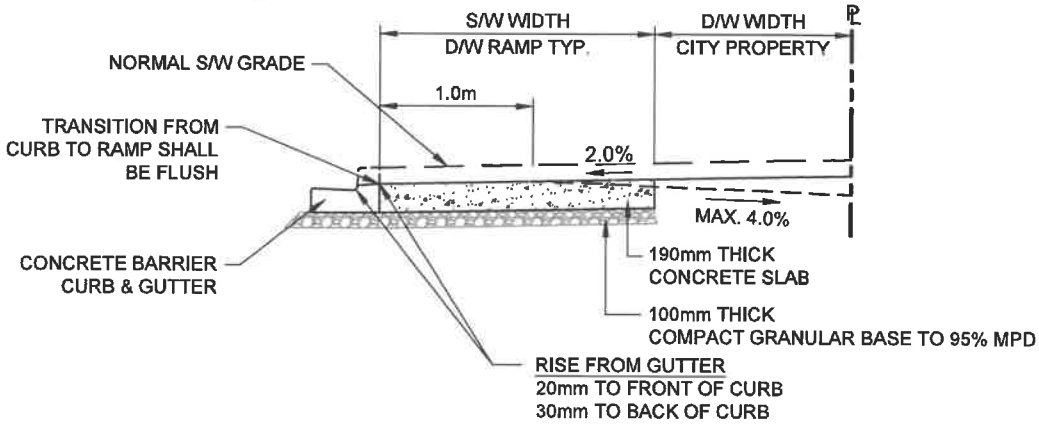
PLAN VIEW

NOTES:

1. WHERE DRIVEWAY IS AT LOWER GRADE THAN SIDEWALK, CROSSING SLOPES, BREAKOUT POINT AND D/W GRADE AS INDICATED BY DASHED LINE IN SECTION IF APPROVED BY THE CITY ENGINEERING MANAGER.
2. WHERE NEW CROSSING IS INSTALLED IN EXISTING SIDEWALK, BREAKOUT TO NEAREST TOOLED TRANSVERSE LINE.
3. WHERE SIDEWALK DOES NOT EXIST, DRIVEWAY MUST START AT TOP OF CURB RAMP AND EXTEND AT 45° TO A MAX WIDTH OF 6.0m ON CITY PROPERTY.
4. DRIVEWAY LETDOWN TO BE CENTRED ON GARAGE.
5. DRIVEWAY WIDTH ON CITY PROPERTY TO MATCH WIDTH OF LETDOWN EXCLUDING FLARES.
6. SLOPE DRIVEWAY AS SPECIFIED BY THE CITY ENGINEERING MANAGER.



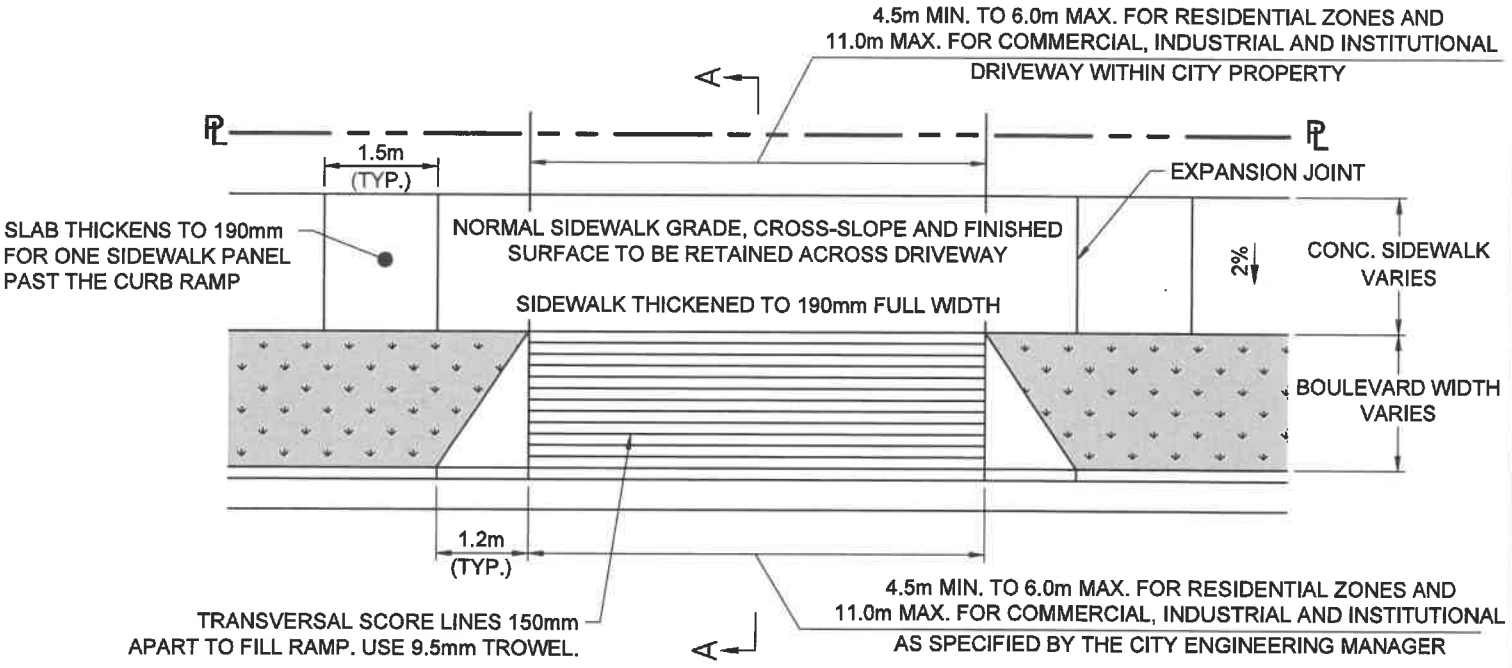
ISOMETRIC VIEW



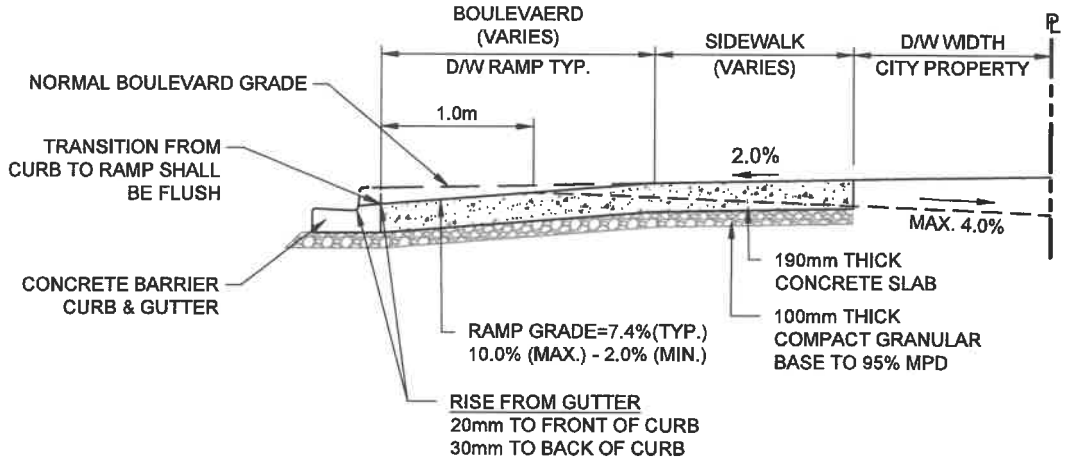
SECTION A-A CURB RAMP

PLOTTED: 19–NOV–20

INDUSTRIAL, COMMERCIAL DRIVEWAY CROSSING OF CURB, GUTTER AND SIDEWALK	DATE:	NOV/2020	DRAWING NUMBER: COQ-C7A
	DRAWN:	GA	
	SCALE:	N.T.S.	



PLAN VIEW



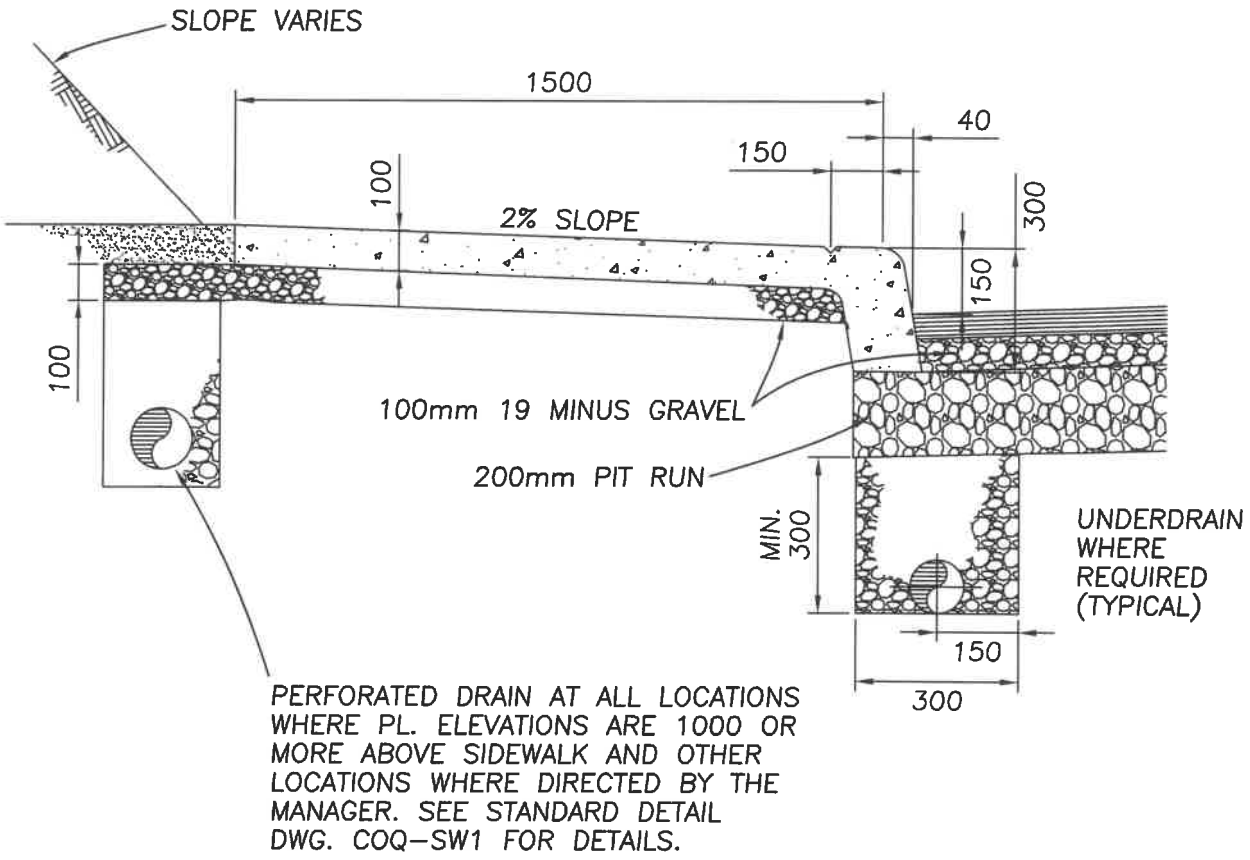
SECTION A-A CURB RAMP

NOTES:

1. DRIVEWAY LETDOWN TO BE CENTERED ON GARAGE.
2. DRIVEWAY WIDTH ON CITY PROPERTY TO MATCH WIDTH OF LETDOWN EXCLUDING THE FLARES.
3. WHERE DRIVEWAY IS AT LOWER GRADE THAN SIDEWALK, CROSSING SLOPES, BREAKOUT POINT AND D/W GRADE AS INDICATED BY DASHED LINE IN SECTION IF APPROVED BY THE CITY ENGINEERING MANAGER.

PLOTTED: 19–NOV–20

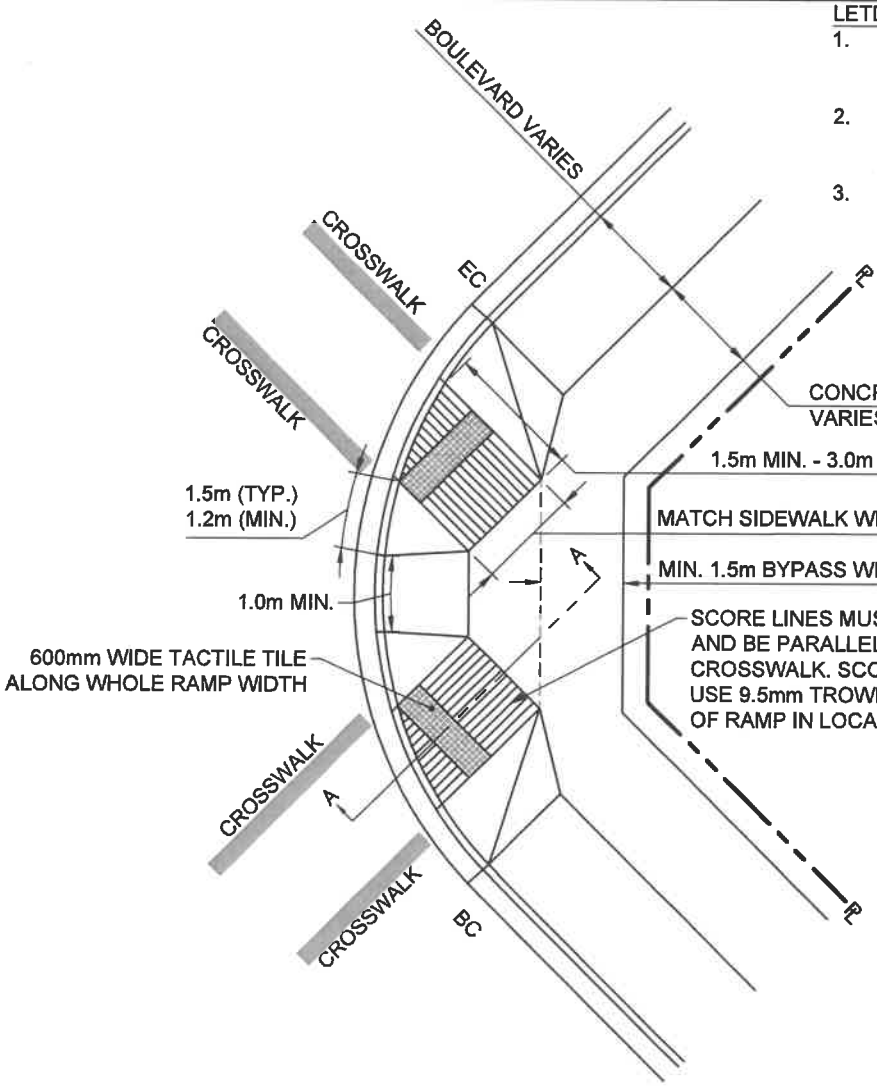
TYPICAL CURB/SIDEWALK DRIVEWAY LETDOWN - SEPARATED SIDEWALK	DATE: NOV/2020	DRAWING NUMBER: COQ-C7B
	DRAWN: GA	
	SCALE: N.T.S.	



MONOLITHIC CURB SIDEWALK

PLOTTED: 26–Feb–16

MONOLITHIC SIDEWALK	DATE:	NOV/2015	DRAWING NUMBER: COQ-C8
	DRAWN:	REY	
	SCALE:	N.T.S.	



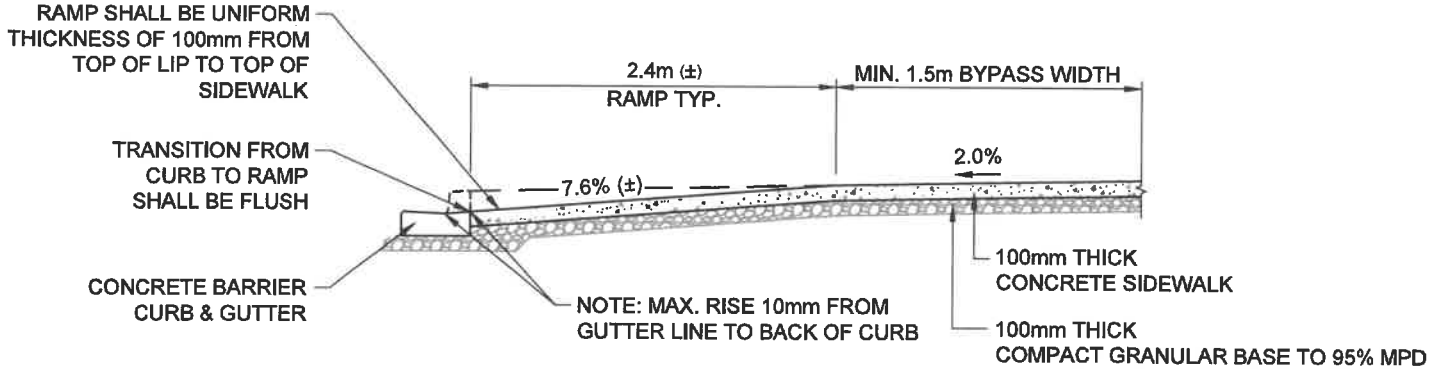
LETDOWN NOTES:

1. STANDARD RAMP LENGTH: 2.4m AT CENTRE OF RAMP. RECOMMENDED RAMP SLOPE: 7.6% (±) MAX. SLOPE 8.3% (1:12) WHERE TOPOGRAPHY PERMITS.
2. WHEN SITE CONDITIONS DO NOT PERMIT TYPICAL LAYOUT DESIGN TO BE APPROVED BY THE CITY ENGINEERING MANAGER.
3. IN CASE OF SINGLE CROSSING: REMOVE UNNECESSARY LETDOWN AND EXTEND BOULEVARD TO CURB RETURN.

TACTILE TILE NOTES:

1. TO BE INSTALLED ONLY WHEN PRESCRIBED BY THE MANAGER.
2. IN-LINE TRUNCATED DOME PATTERN 5.1mm IN HEIGHT, 22.9mm DIAMETER AT THE BASE AND 10.2mm DIAMETER AT THE TOP OF DOME SPACED 59.7mm NOMINAL DIAGONALLY AND 43.2mm NOMINAL SIDE BY SIDE EXCEPT FOR RADIUS TILE.
3. COLOUR: FEDERAL YELLOW PER U.S. FEDERAL STANDARD 595B, TABLE IV, COLOR NO.335.
4. WIDTH = 600mm, LENGTH = RAMP WIDTH
5. REFER TO COQUITLAM APPROVED PRODUCTS LIST FOR ACCEPTABLE SUPPLIERS.

SPLIT LETDOWN



SECTION A-A CURB RAMP

PLOTTED: 19–NOV–20

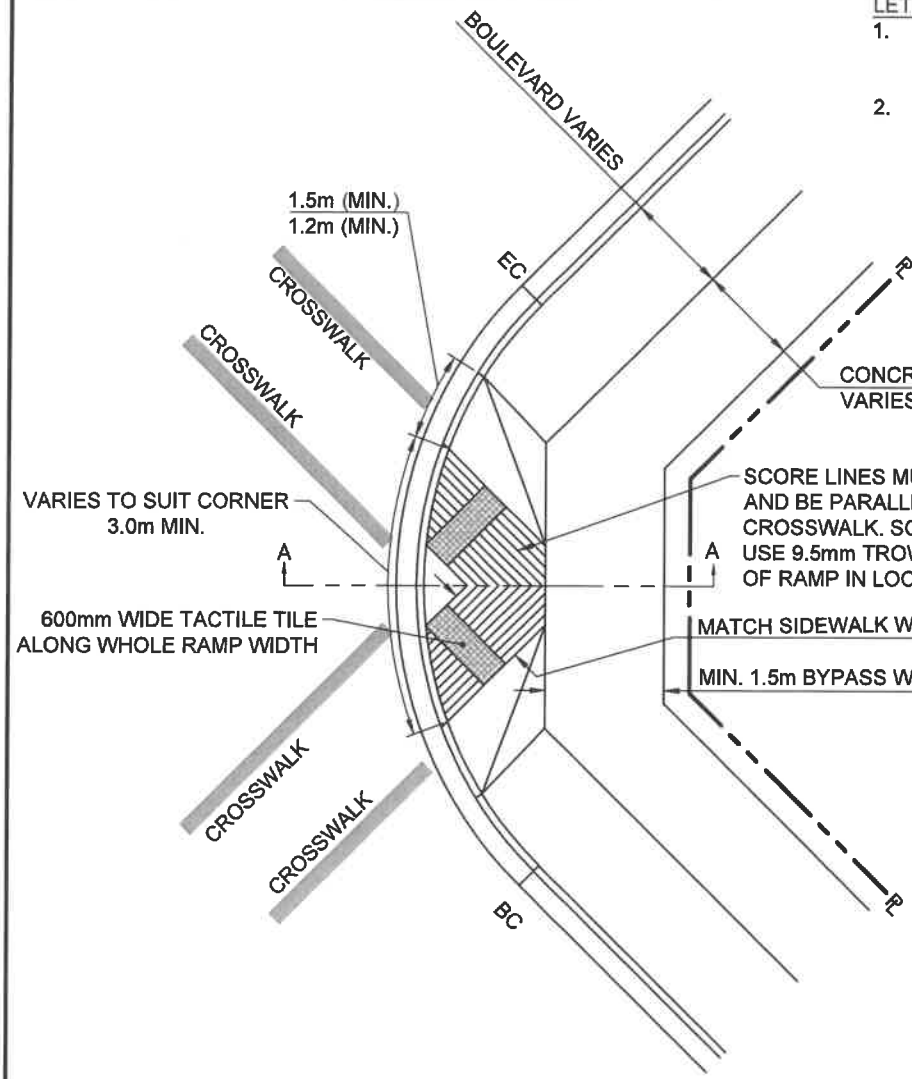
SPLIT LETDOWN AT INTERSECTION WITH BOULEVARD	DATE: NOV/2020	DRAWING NUMBER: COQ-C9A
	DRAWN: GA	
	SCALE: N.T.S.	

Coquitlam

STANDARD DETAIL DRAWINGS

LETDOWN NOTES:

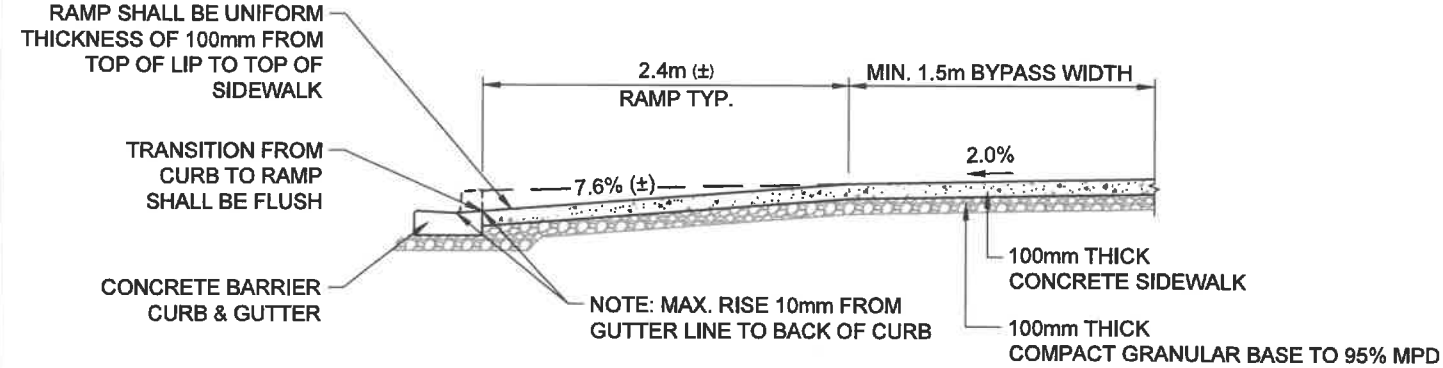
1. STANDARD RAMP LENGTH: 2.4m AT CENTRE OF RAMP. RECOMMENDED RAMP SLOPE: 7.6% (±) MAX. SLOPE 8.3% (1:12) WHERE TOPOGRAPHY PERMITS.
2. WHEN SITE CONDITIONS DO NOT PERMIT TYPICAL LAYOUT DESIGN TO BE APPROVED BY THE CITY ENGINEERING MANAGER.



TACTILE TILE NOTES:

1. TO BE INSTALLED ONLY WHEN PRESCRIBED BY THE CITY ENGINEERING MANAGER.
2. IN-LINE TRUNCATED DOME PATTERN 5.1mm IN HEIGHT, 22.9mm DIAMETER AT THE BASE AND 10.2mm DIAMETER AT THE TOP OF DOME SPACED 59.7mm NOMINAL DIAGONALLY AND 43.2mm NOMINAL SIDE BY SIDE EXCEPT FOR RADIUS TILE.
3. COLOUR: FEDERAL YELLOW PER U.S. FEDERAL STANDARD 595B, TABLE IV, COLOR NO.335.
4. WIDTH = 600mm, LENGTH = RAMP WIDTH
5. REFER TO COQUITLAM APPROVED PRODUCTS LIST FOR ACCEPTABLE SUPPLIERS.

SINGLE LETDOWN



SECTION A-A CURB RAMP

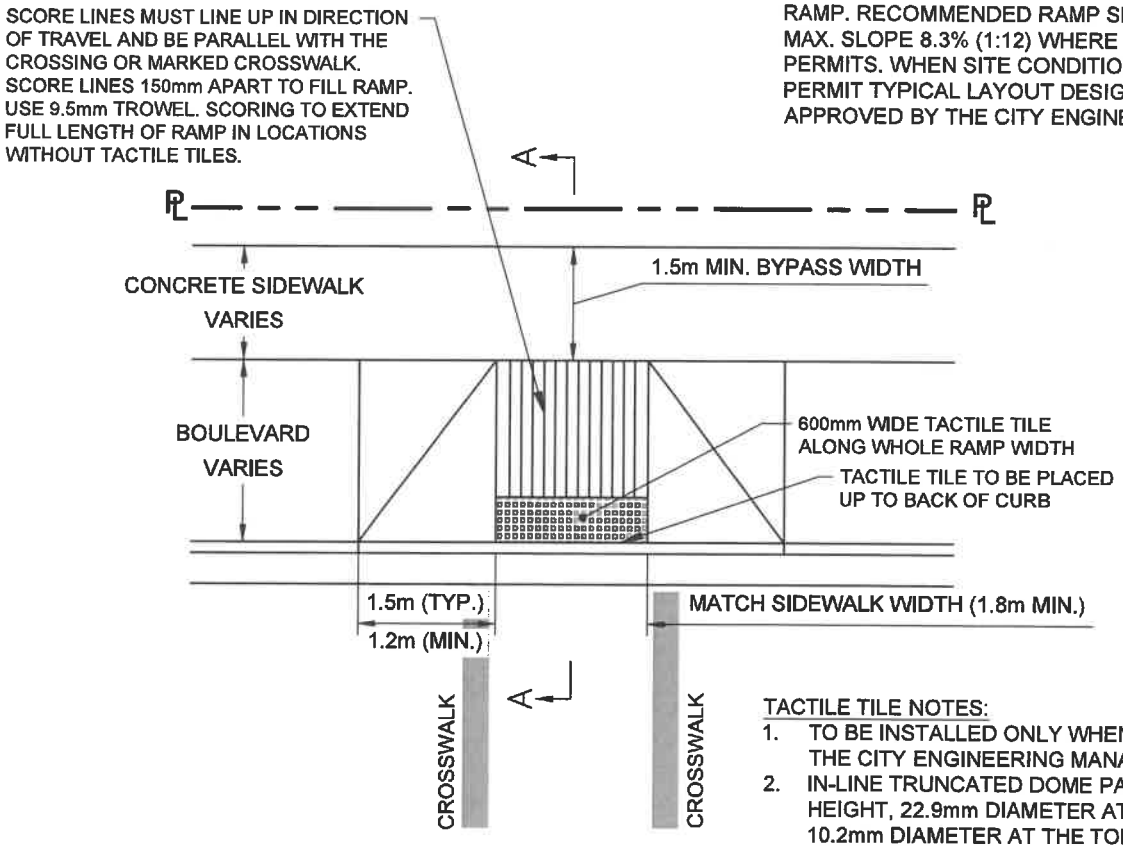
PLOTTED: 19-NOV-20

SINGLE LETDOWN AT INTERSECTION WITH BOULEVARD	DATE: NOV/2020	DRAWING NUMBER: COQ-C9B
	DRAWN: GA	
	SCALE: N.T.S.	

Coquitlam

STANDARD DETAIL DRAWINGS

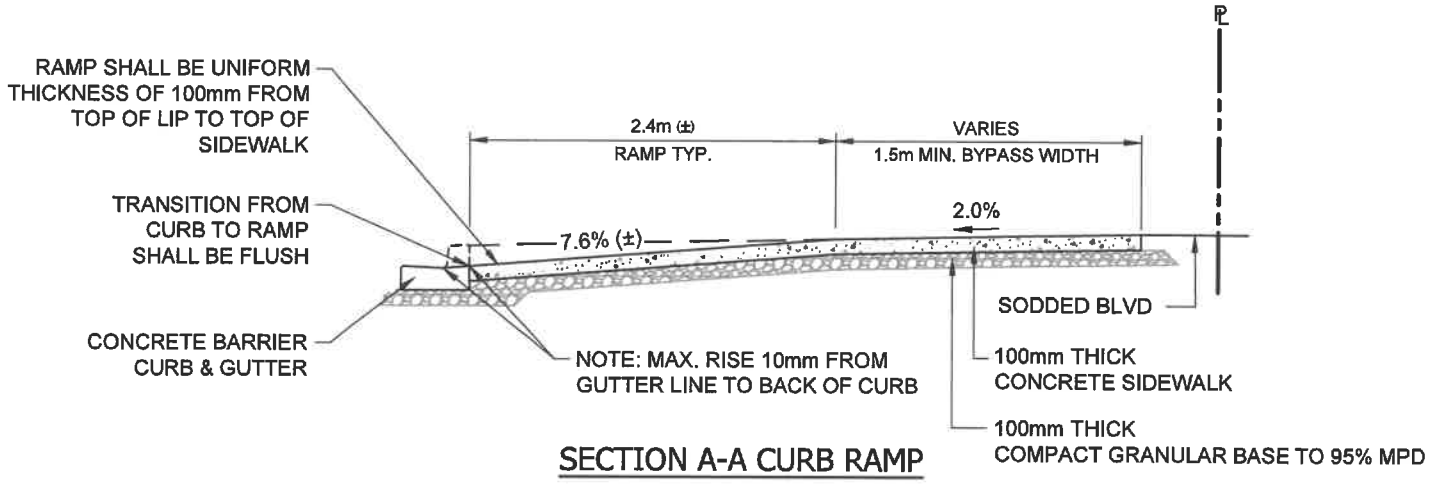
NOTE: STANDARD RAMP LENGTH: 2.4m AT CENTRE OF RAMP. RECOMMENDED RAMP SLOPE: 7.6% (±). MAX. SLOPE 8.3% (1:12) WHERE TOPOGRAPHY PERMITS. WHEN SITE CONDITIONS DO NOT PERMIT TYPICAL LAYOUT DESIGN TO BE APPROVED BY THE CITY ENGINEERING MANAGER.



SINGLE RAMP

TACTILE TILE NOTES:

1. TO BE INSTALLED ONLY WHEN PRESCRIBED BY THE CITY ENGINEERING MANAGER.
2. IN-LINE TRUNCATED DOME PATTERN 5.1mm IN HEIGHT, 22.9mm DIAMETER AT THE BASE AND 10.2mm DIAMETER AT THE TOP OF DOME SPACED 59.7mm NOMINAL DIAGONALLY AND 43.2mm NOMINAL SIDE BY SIDE EXCEPT FOR RADIUS TILE.
3. COLOUR: FEDERAL YELLOW PER U.S. FEDERAL STANDARD 595B, TABLE IV, COLOR NO.335.
4. WIDTH = 600mm, LENGTH = RAMP WIDTH
5. REFER TO COQUITLAM APPROVED PRODUCTS LIST FOR ACCEPTABLE SUPPLIERS.



SECTION A-A CURB RAMP

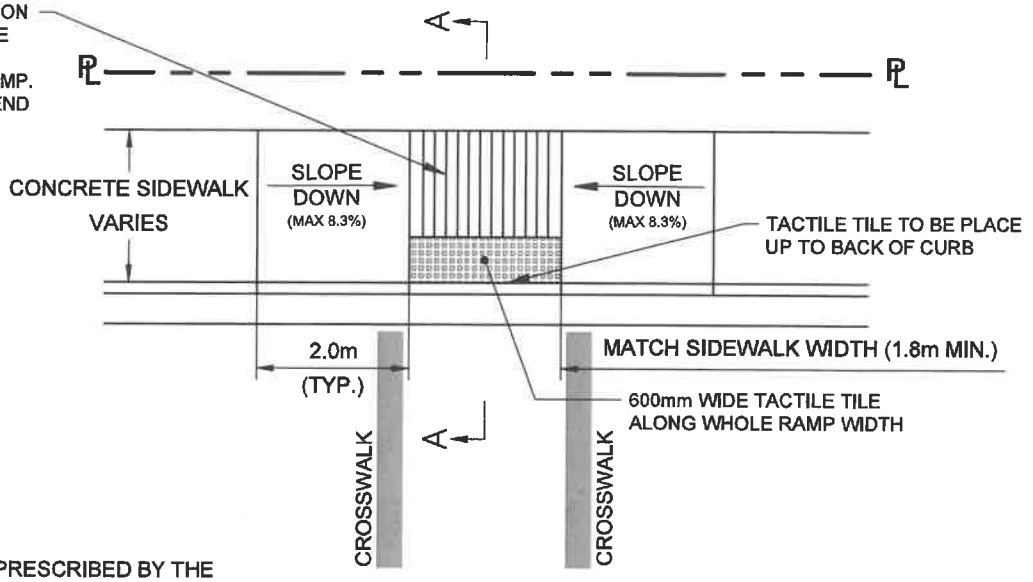
PLOTTED: 19–NOV–20

SINGLE CURB RAMP LETDOWN	DATE: NOV/2020 DRAWN: GA SCALE: N.T.S.	DRAWING NUMBER: COQ-C9C

Coquitlam

STANDARD DETAIL DRAWINGS

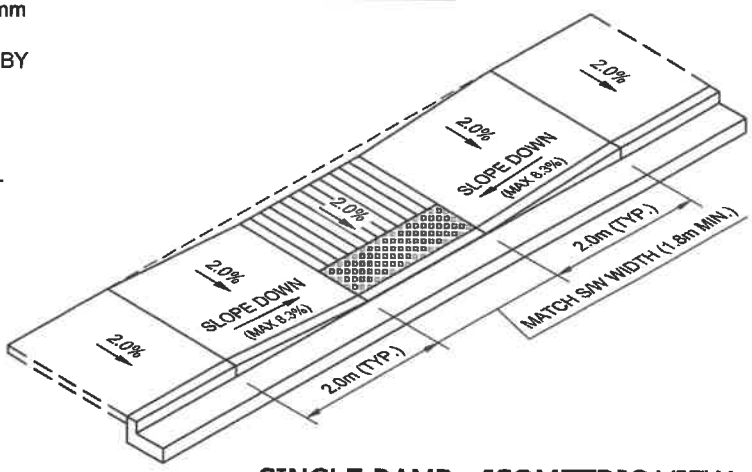
SCORE LINES MUST LINE UP IN DIRECTION OF TRAVEL AND BE PARALLEL WITH THE CROSSING OR MARKED CROSSWALK. SCORE LINES 150mm APART TO FILL RAMP. USE 9.5mm TROWEL. SCORING TO EXTEND FULL LENGTH OF RAMP IN LOCATIONS WITHOUT TACTILE TILES.



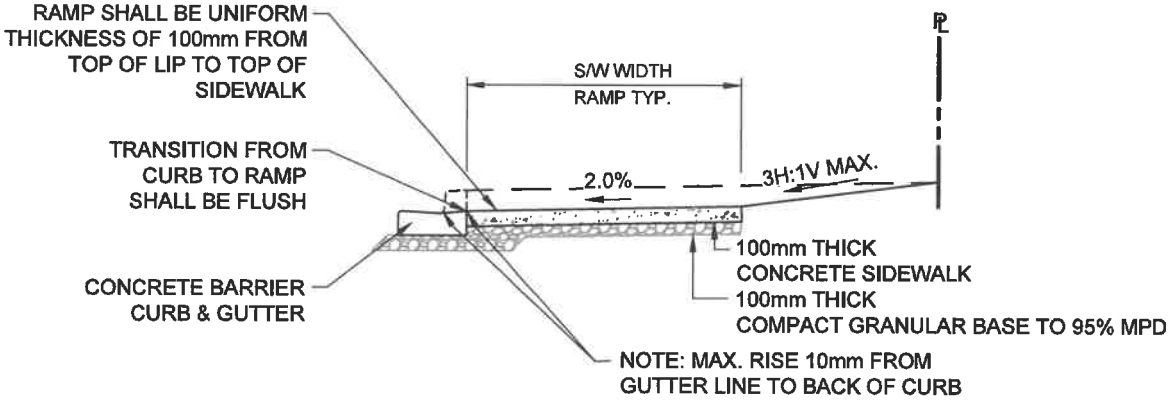
SINGLE RAMP - PLAN VIEW

TACTILE TILE NOTES:

1. TO BE INSTALLED ONLY WHEN PRESCRIBED BY THE CITY ENGINEERING MANAGER.
2. IN-LINE TRUNCATED DOME PATTERN 5.1mm IN HEIGHT, 22.9mm DIAMETER AT THE BASE AND 10.2mm DIAMETER AT THE TOP OF DOME SPACED 59.7mm NOMINAL DIAGONALLY AND 43.2mm NOMINAL SIDE BY SIDE EXCEPT FOR RADIUS TILE.
3. COLOUR: FEDERAL YELLOW PER U.S. FEDERAL STANDARD 595B, TABLE IV, COLOR NO.335.
4. WIDTH = 600mm, LENGTH = RAMP WIDTH
5. REFER TO COQUITLAM APPROVED PRODUCTS LIST FOR ACCEPTABLE SUPPLIERS.



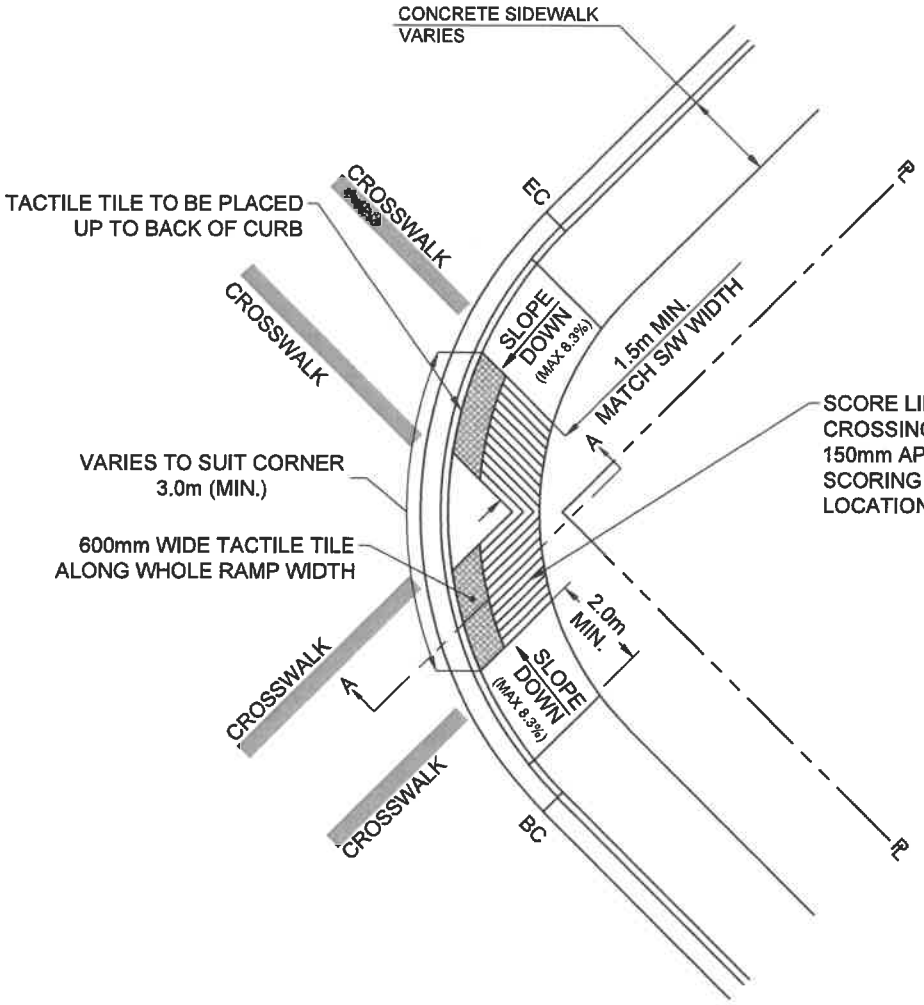
SINGLE RAMP - ISOMETRIC VIEW



SECTION A-A CURB RAMP

PLOTTED: 19–NOV–20

PARALLEL CURB RAMP - SINGLE LETDOWN WITHOUT BOULEVARD			
	DATE:	NOV/2020	DRAWING NUMBER:
	DRAWN:	GA	COQ-C9D
	SCALE:	N.T.S.	

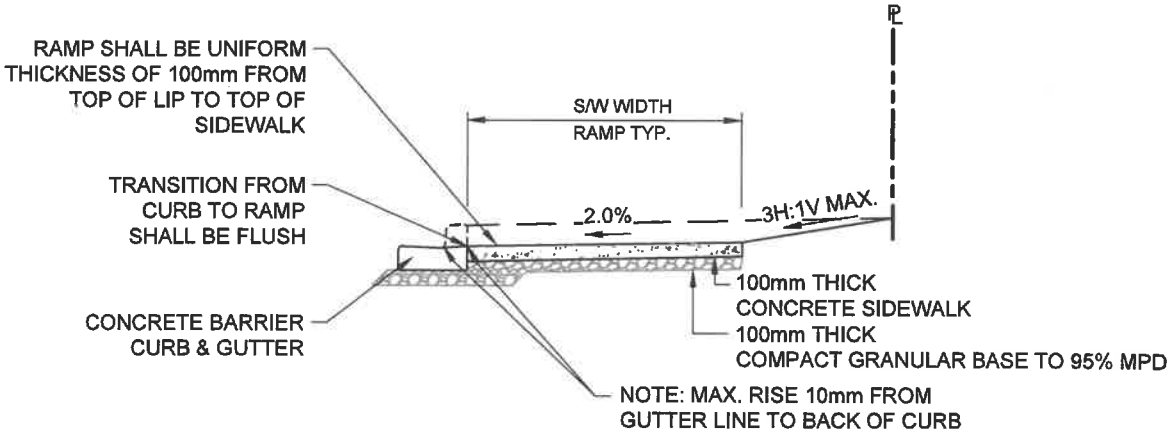


SCORE LINES MUST LINE UP IN DIRECTION OF ROAD CROSSING OR MARKED CROSSWALK. SCORE LINES 150mm APART TO FILL RAMP. USE 9.5mm TROWEL. SCORING TO EXTEND FULL LENGTH OF RAMP IN LOCATIONS WITHOUT TACTILE TILES.

TACTILE TILE NOTES:

1. TO BE INSTALLED ONLY WHEN PRESCRIBED BY THE CITY ENGINEERING MANAGER.
2. IN-LINE TRUNCATED DOME PATTERN 5.1mm IN HEIGHT, 22.9mm DIAMETER AT THE BASE AND 10.2mm DIAMETER AT THE TOP OF DOME SPACED 59.7mm NOMINAL DIAGONALLY AND 43.2mm NOMINAL SIDE BY SIDE EXCEPT FOR RADIUS TILE.
3. COLOUR: FEDERAL YELLOW PER U.S. FEDERAL STANDARD 595B, TABLE IV, COLOR NO.335.
4. WIDTH = 600mm, LENGTH = RAMP WIDTH
5. REFER TO COQUITLAM APPROVED PRODUCTS LIST FOR ACCEPTABLE SUPPLIERS.

COMBINED LETDOWN



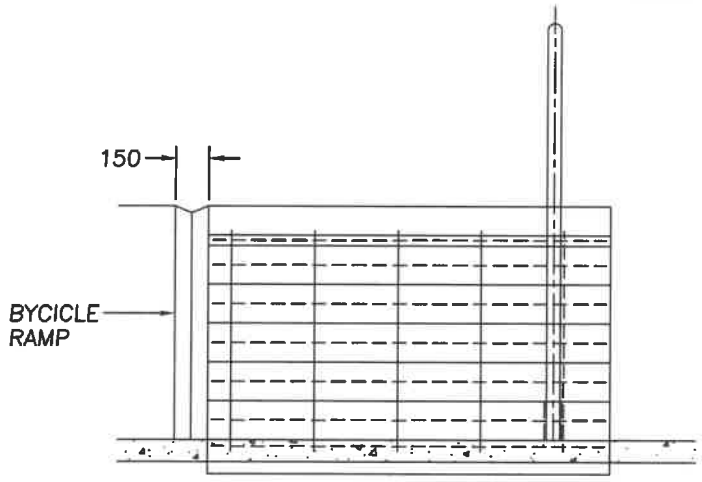
SECTION A-A CURB RAMP

PLOTTED: 19–NOV–20

PARALLEL CURB RAMP - COMBINED LETDOWN WITHOUT BOULEVARD	DATE: NOV/2020	DRAWING NUMBER: COQ-C9E
	DRAWN: GA	
	SCALE: N.T.S.	

Coquitlam

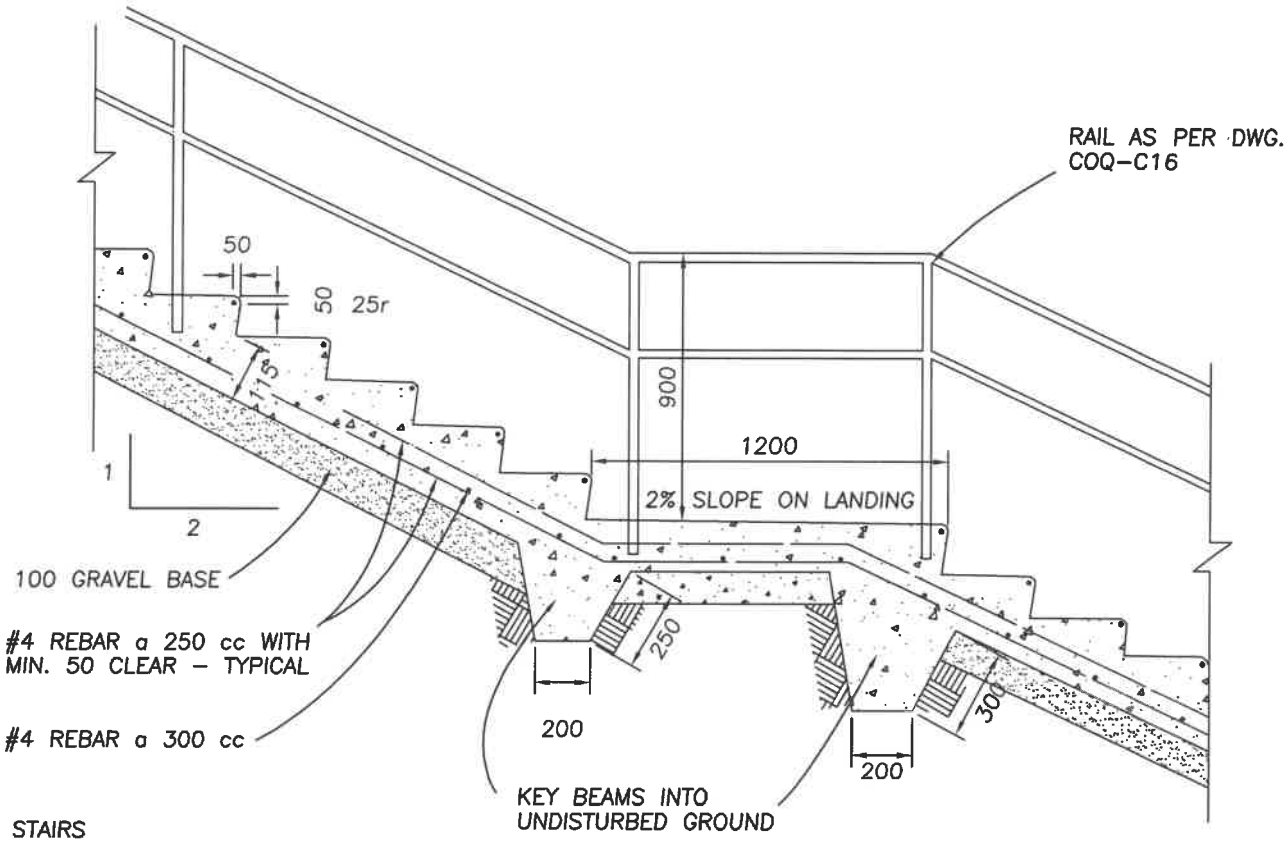
STANDARD DETAIL DRAWINGS



FRONT ELEVATION

NOTES:

1. MAX. WALKWAY GRADIENT – 10%
2. RAILING AS PER COQ–C16 REQUIRED ON STAIRWAY.
3. MAX. 12 RISERS PER FLIGHT BETWEEN LANDING.



STAIRS
RISE –175
RUN –300 2% SLOPE
1– #4 NOSE BAR –TYP.
MIN. 50 CLEAR

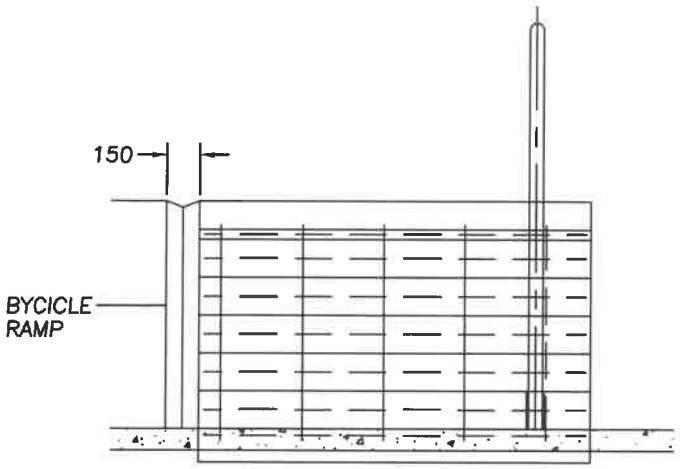
LANDING & STAIR DETAIL

PLOTTED: 5–Jun–18

STAIRWAY DETAILS	DATE: NOV/2015	DRAWING NUMBER: COQ-C15
	DRAWN: REY	
	SCALE: N.T.S.	

Coquitlam

STANDARD DETAIL DRAWINGS



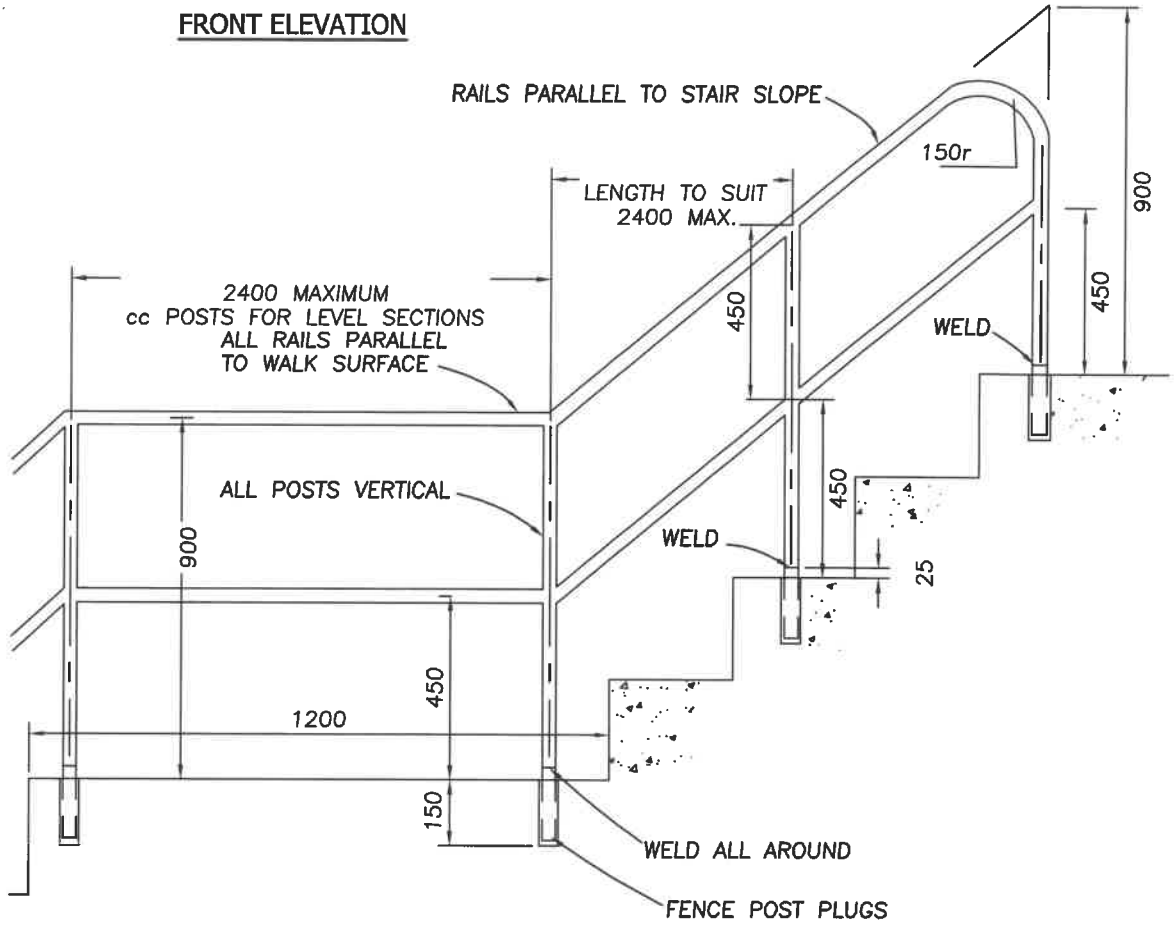
HANDRAILS SHALL BE FABRICATED FROM 42mm Dia x 3.56mm WALL STANDARD GALVD. STEEL PIPE.

ALL FIELD WELDS SHALL BE FILED SMOOTH.

ALL BENDS ARE SMOOTH CIRCULAR CURVES.

HANDRAILS REQUIRED ON BOTH SIDES OF STAIRS.

FRONT ELEVATION



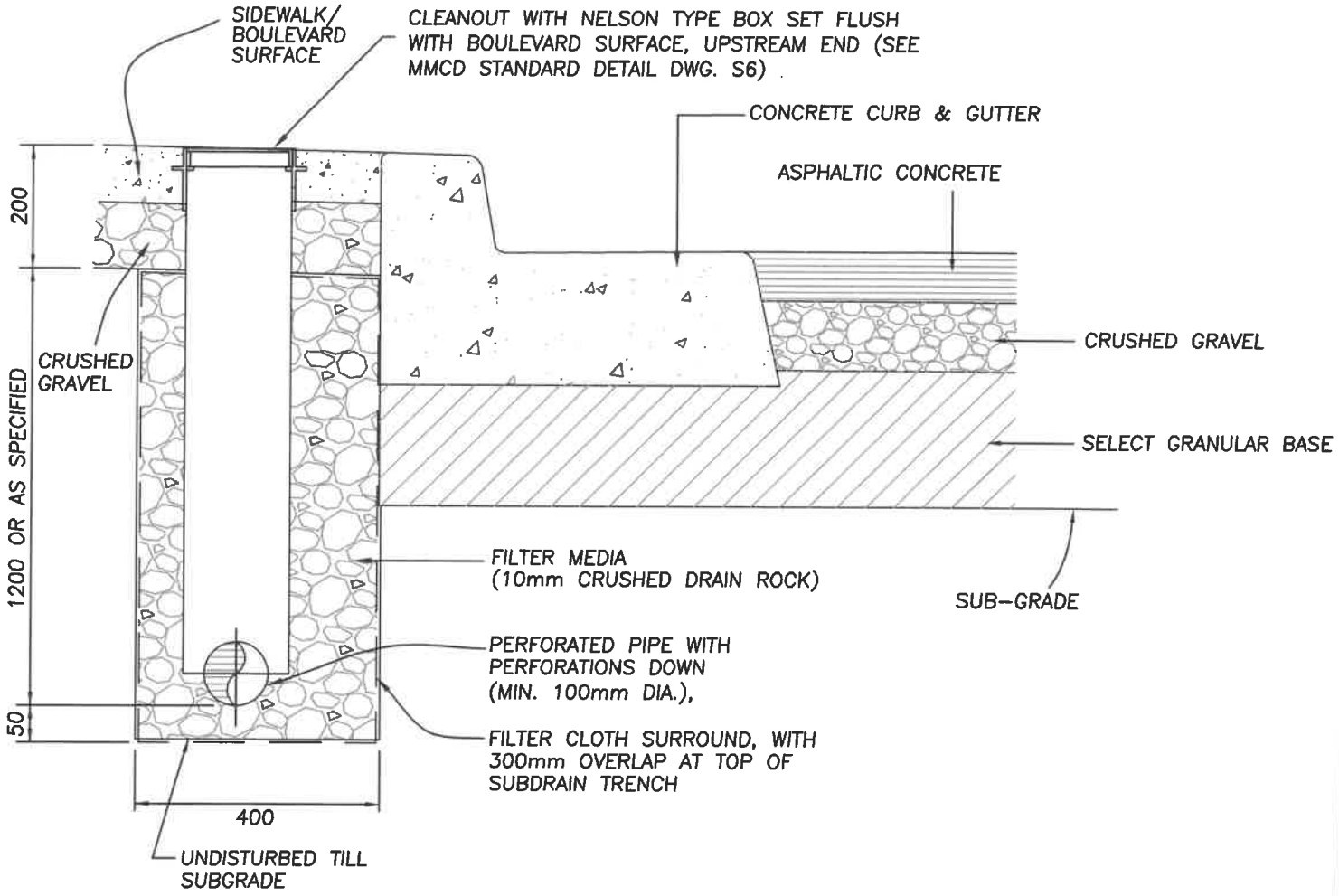
TYPICAL HANDRAIL

PLOTTED: 8-Dec-15

TYPICAL HANDRAIL DETAILS FOR STAIRS WITH BICYLE RAMP	DATE:	NOV/2015	DRAWING NUMBER: COQ-C16
	DRAWN:	REY	
	SCALE:	N.T.S.	

Coquitlam

STANDARD DETAIL DRAWINGS

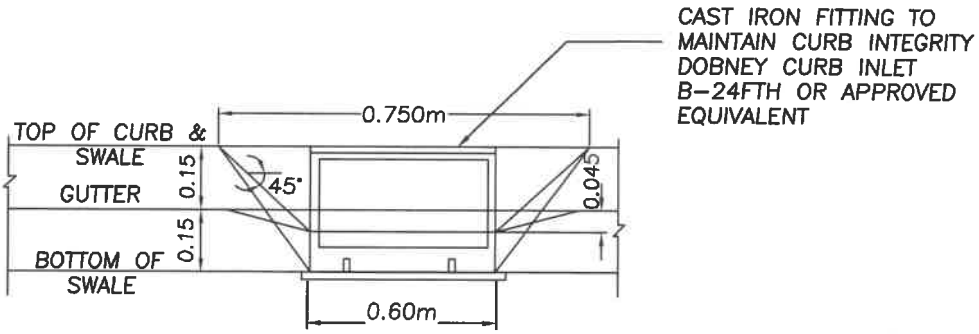


NOTES:

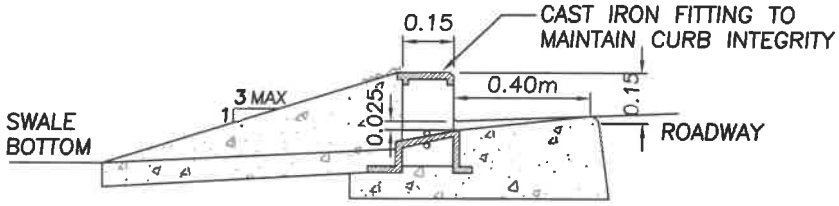
1. REFER TO CONSTRUCTION DRAWINGS FOR PROPOSED LOCATION AND DEPTH OF SUBDRAINS.
2. WHEN THE CENTRE LINE ROAD GRADE IS 2% OR GREATER, UNDERDRAINS SHALL ONLY BE REQUIRED FOR A LENGTH OF 6 METERS ON THE UPSTREAM SIDE OF THE CATCH BASIN.
3. ALL SUBDRAINS ARE TO BE CONNECTED TO CATCH BASINS OR THE STORM SEWER IF CATCH BASINS ARE NOT ACCESSIBLE.
4. IF THE SUB-GRADE IS SELF DRAINING IN THE OPINION OF THE GEOTECHNICAL ENGINEER, THE SUBDRAINS INSTALLATION MAY BE WAIVED.

PLOTTED: 26-Feb-16

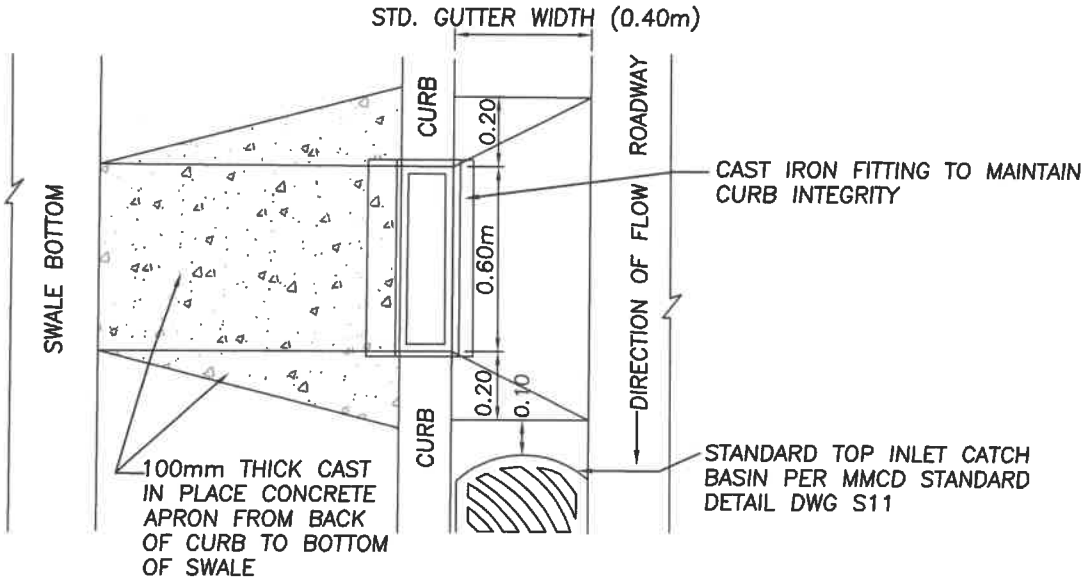
PERFORATED PIPE SUBDRAIN	DATE:	SEP/2014	DRAWING NUMBER:
	DRAWN:	REY	COQ-SW1
	SCALE:	N.T.S.	



SIDE VIEW



CROSS SECTION



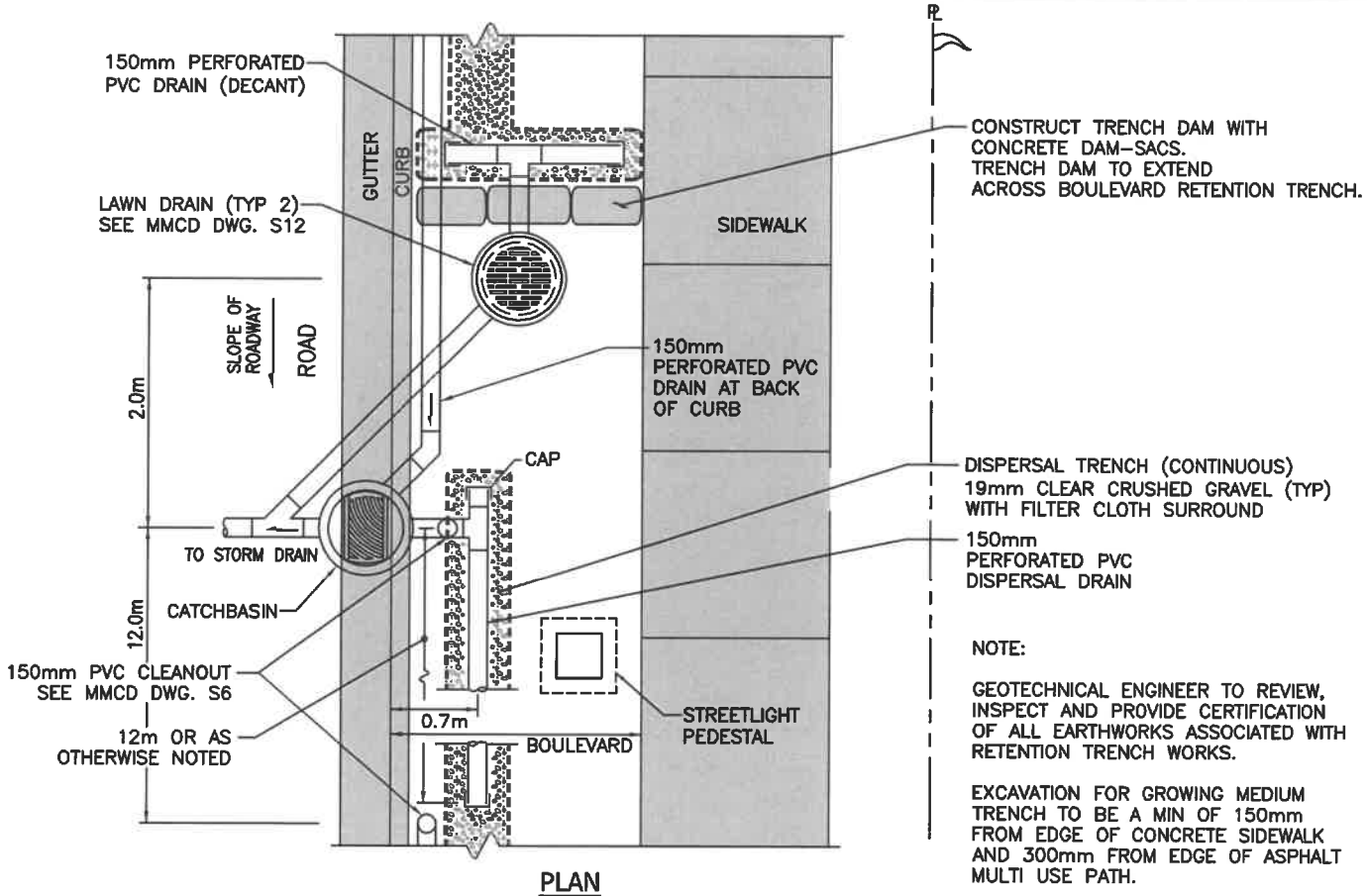
PLAN VIEW

PLOTTED: 22-Feb-16

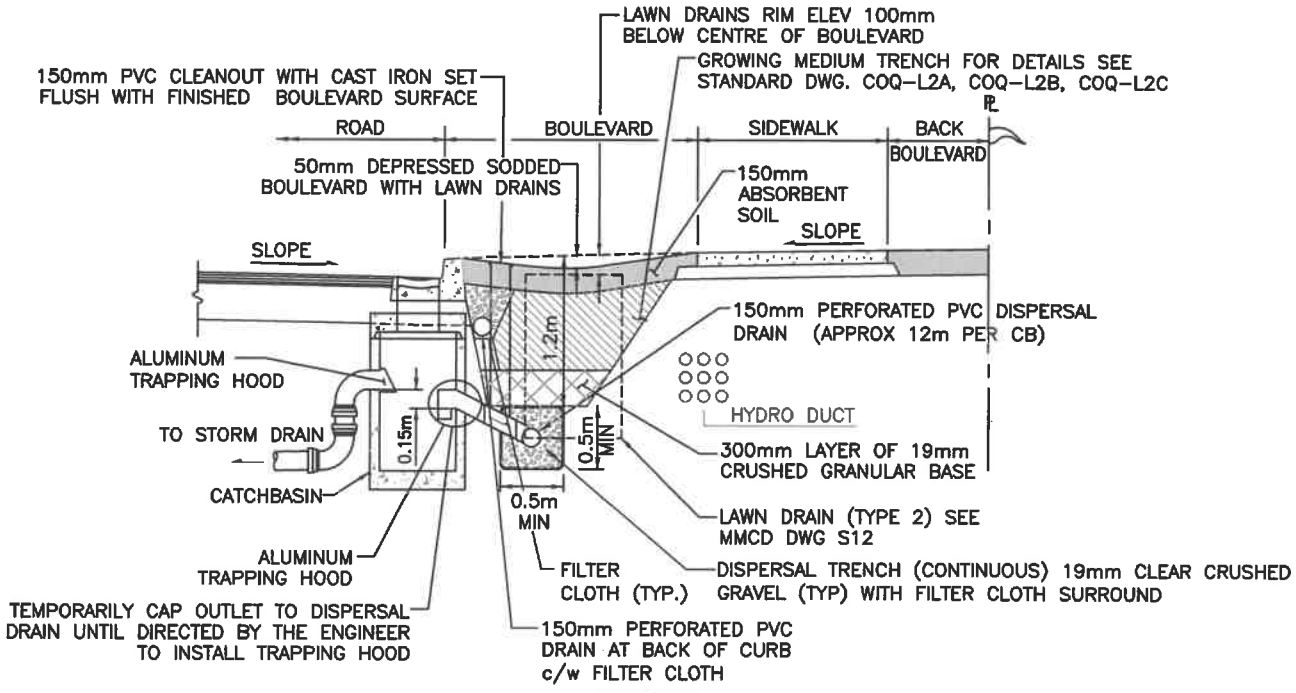
CURB CUT	DATE: NOV/2015 DRAWN: REY SCALE: N.T.S.	DRAWING NUMBER: COQ-SW2

Coquitlam

STANDARD DETAIL DRAWINGS



PLAN



SECTION

PLOTTED: 22-Feb-22

BOULEVARD RETENTION TRENCH (LOW SIDE OF THE ROAD)

DATE:	DEC/2015
DRAWN:	REY
SCALE:	N.T.S.

DRAWING NUMBER:

COQ-SW3

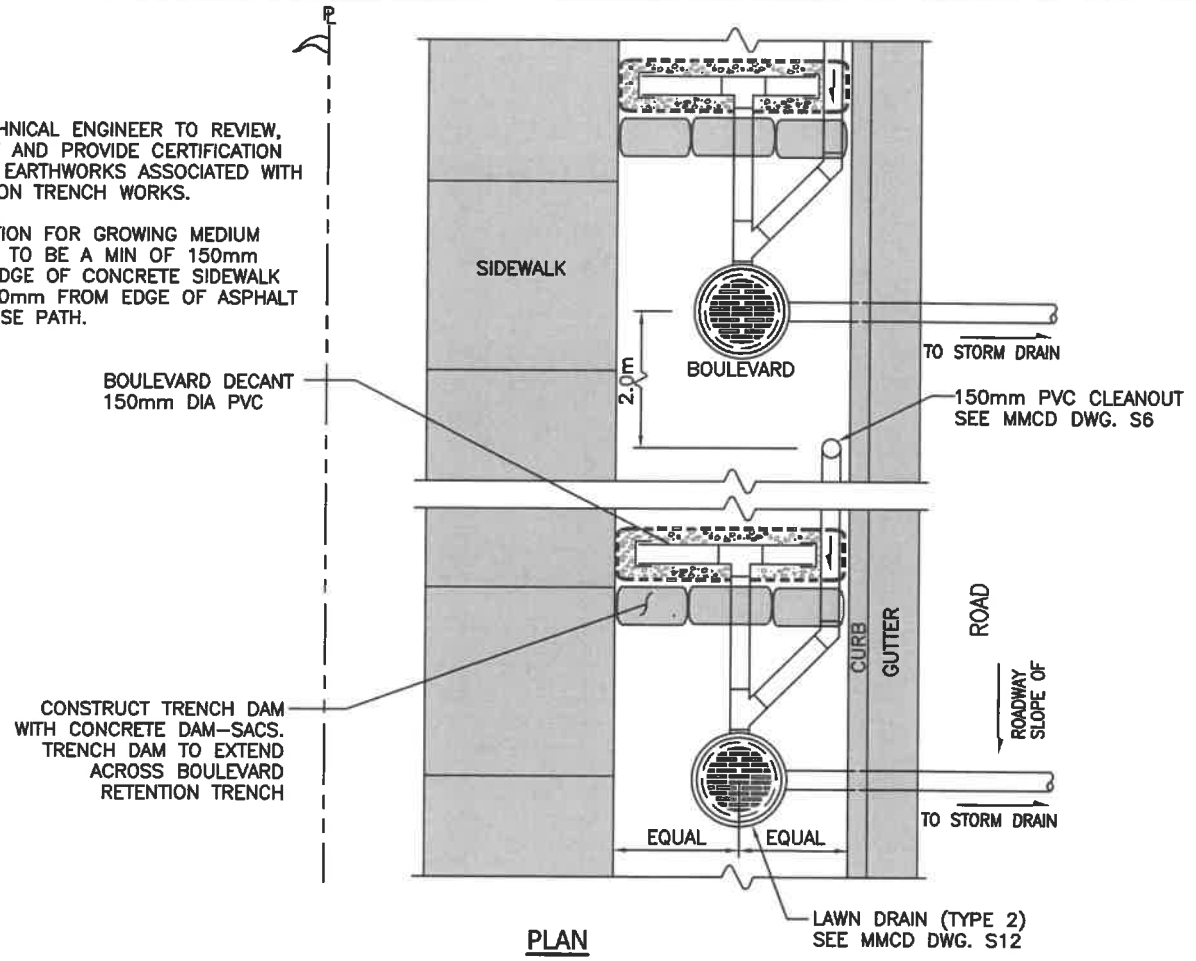
Coquitlam

STANDARD DETAIL DRAWINGS

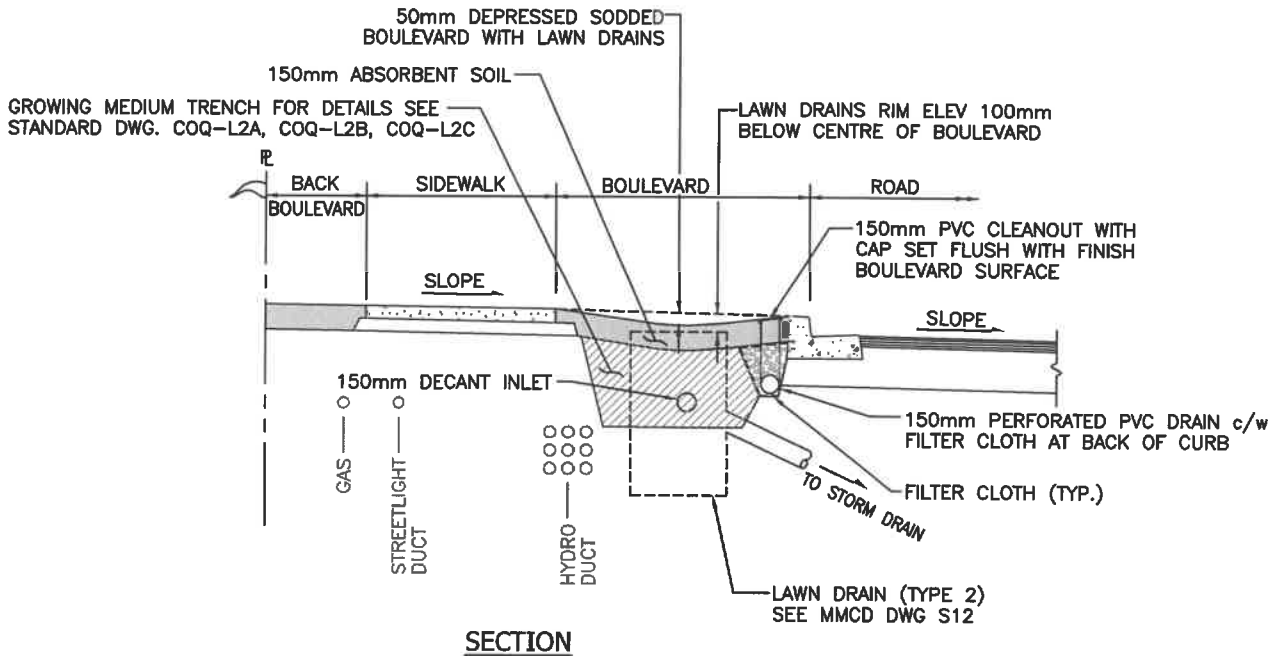
NOTE:

GEOTECHNICAL ENGINEER TO REVIEW, INSPECT AND PROVIDE CERTIFICATION OF ALL EARTHWORKS ASSOCIATED WITH RETENTION TRENCH WORKS.

EXCAVATION FOR GROWING MEDIUM TRENCH TO BE A MIN OF 150mm FROM EDGE OF CONCRETE SIDEWALK AND 300mm FROM EDGE OF ASPHALT MULTI USE PATH.



PLAN



SECTION

PLOTTED: 22-Feb-22

BOULEVARD RETENTION TRENCH (HIGH SIDE OF ROAD)

DATE:	DEC/2015
DRAWN:	REY
SCALE:	N.T.S.

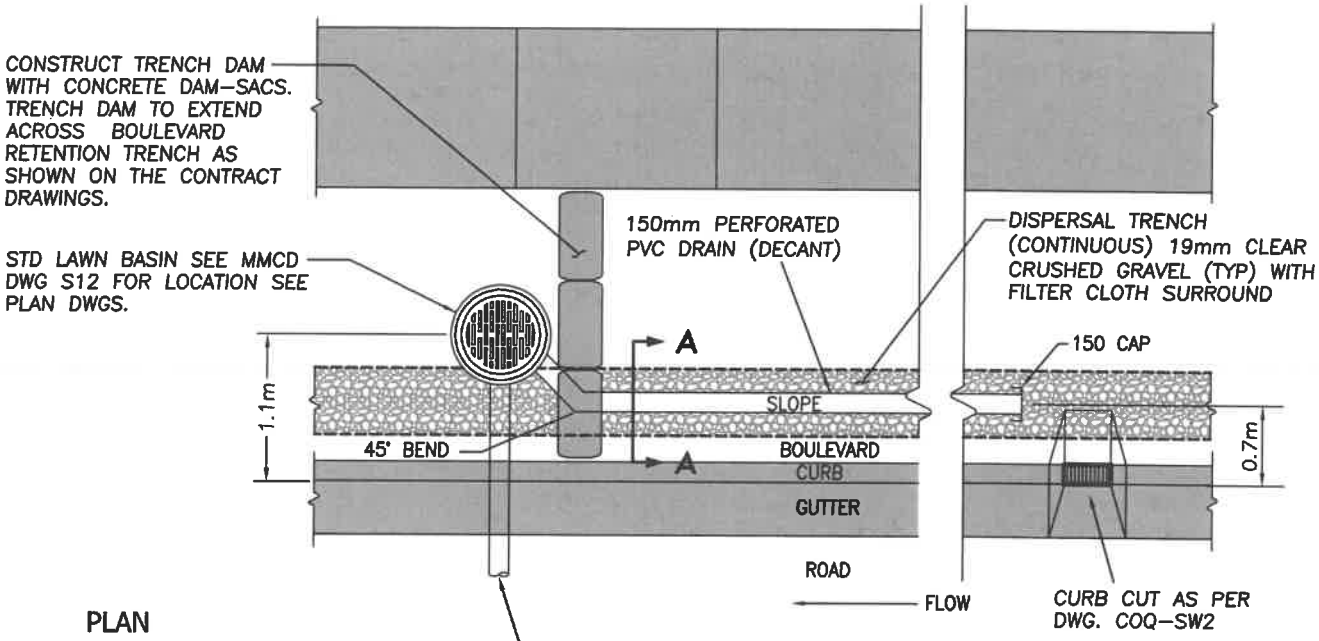
DRAWING NUMBER:

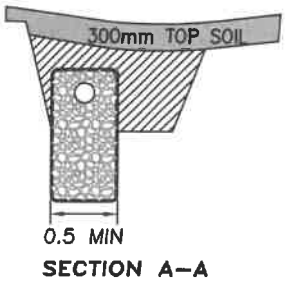
COQ-SW4

Coquitlam

STANDARD DETAIL DRAWINGS

NOTE:
GEOTECHNICAL ENGINEER TO REVIEW, INSPECT AND PROVIDE CERTIFICATION OF ALL EARTHWORKS ASSOCIATED WITH RETENTION TRENCH WORKS.





SECTION A-A

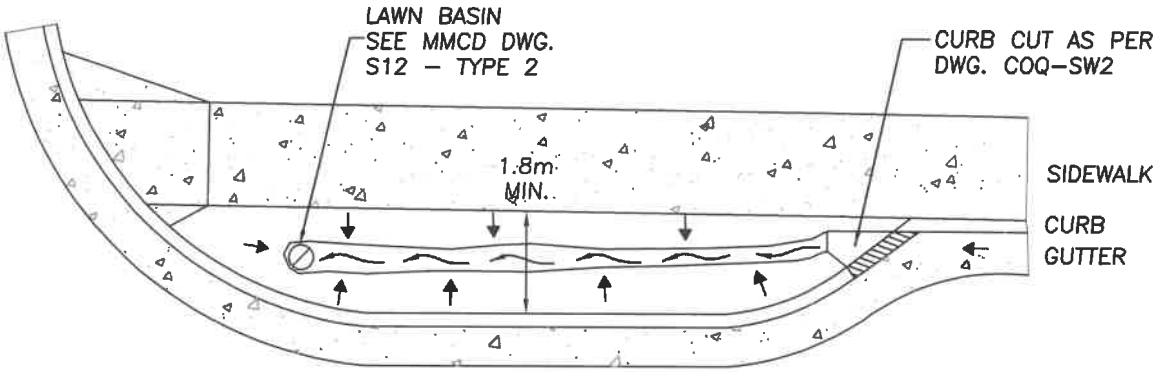
PLOTTED: 26-Feb-16

BOULEVARD LAWN BASIN WITH RETENTION TRENCH

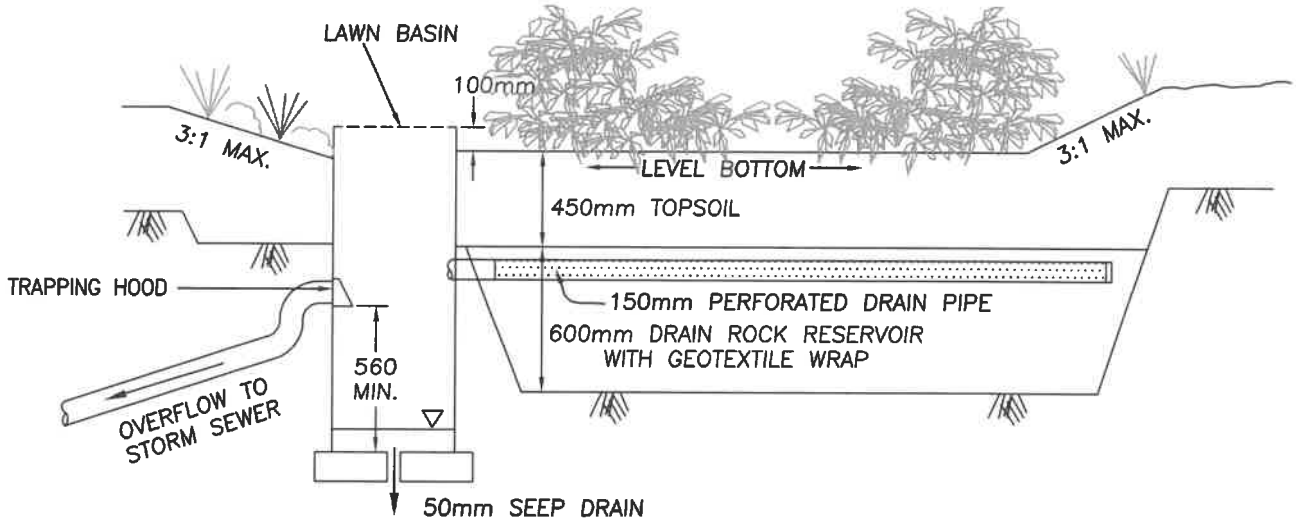
DATE:	NOV/2015
DRAWN:	REY
SCALE:	N.T.S.

DRAWING NUMBER:

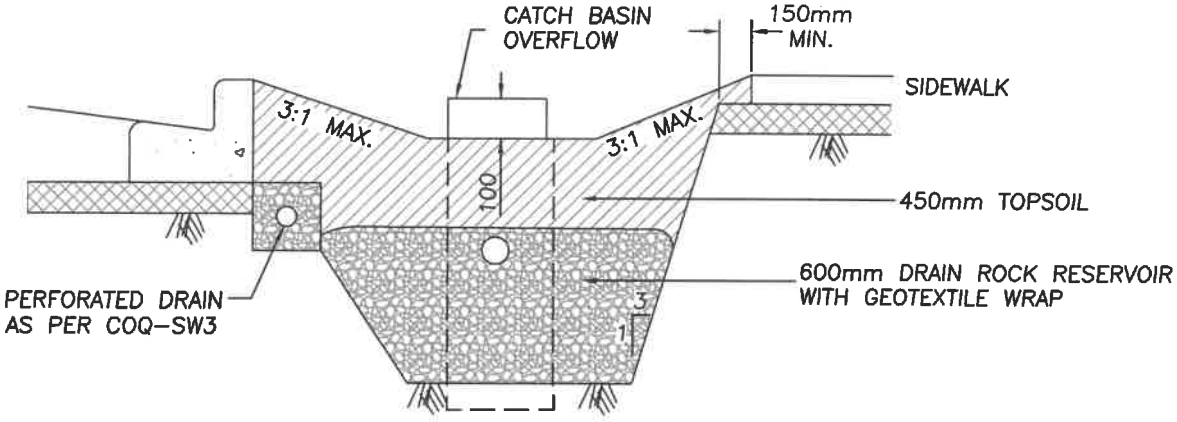
COQ-SW5



PLAN



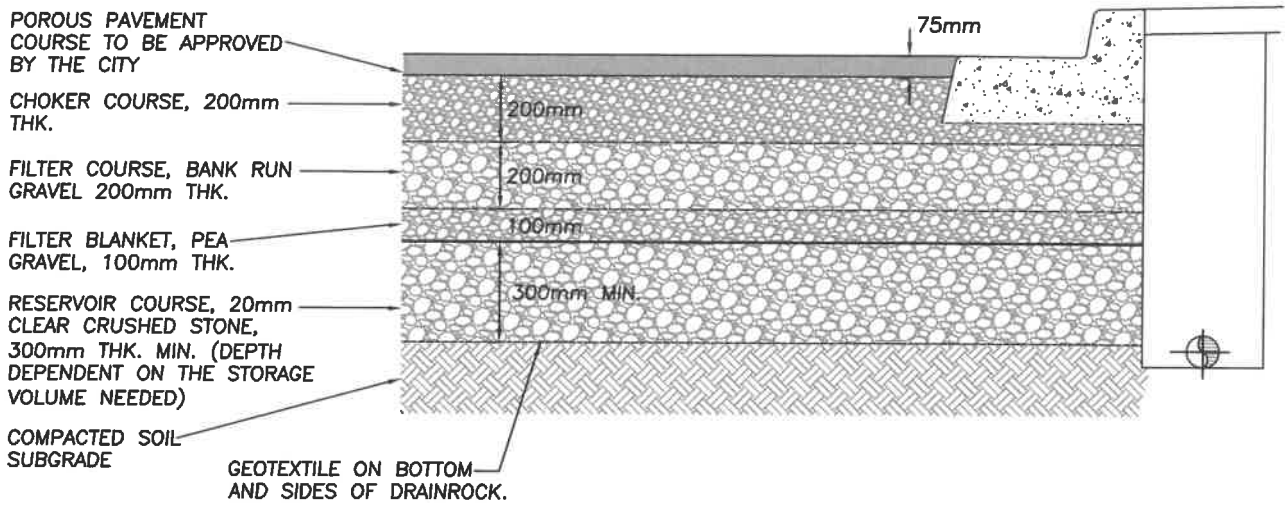
LONGITUDINAL SECTION
N.T.S



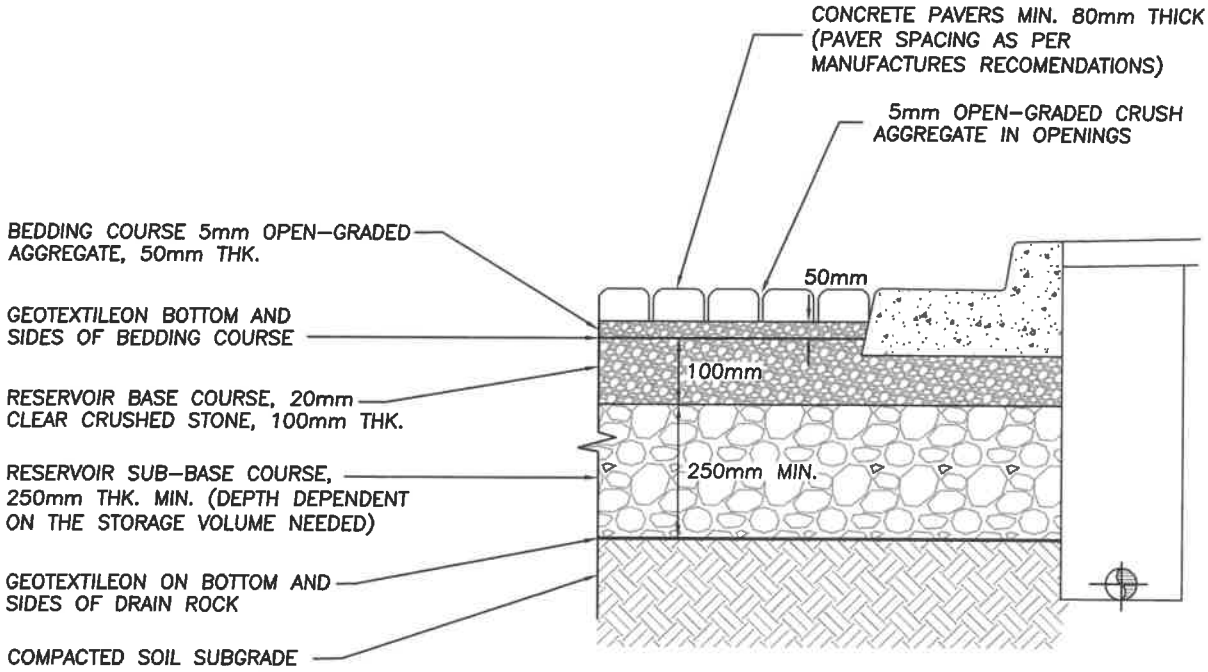
CROSS SECTION
N.T.S

PLOTTED: 26–Feb–16

CURB BULGE RAIN GARDEN	DATE:	NOV/2015	DRAWING NUMBER: COQ-SW6
	DRAWN:	REY	
	SCALE:	N.T.S.	



PERMEABLE PAVEMENT – TYPICAL CROSS SECTION



CONCRETE PAVERS – TYPICAL CROSS SECTION

NOTES:

1. PERFORATED SUBDRAINS TO BE PROVIDED AS SHOWN ON THE CONTRACT DRAWINGS.
2. GEOTECHNICAL ENGINEER TO REVIEW, INSPECT AND PROVIDE CERTIFICATION OF ALL EARTHWORKS ASSOCIATED WITH PERMEABLE PAVEMENTS.

PLOTTED: 26-Feb-16

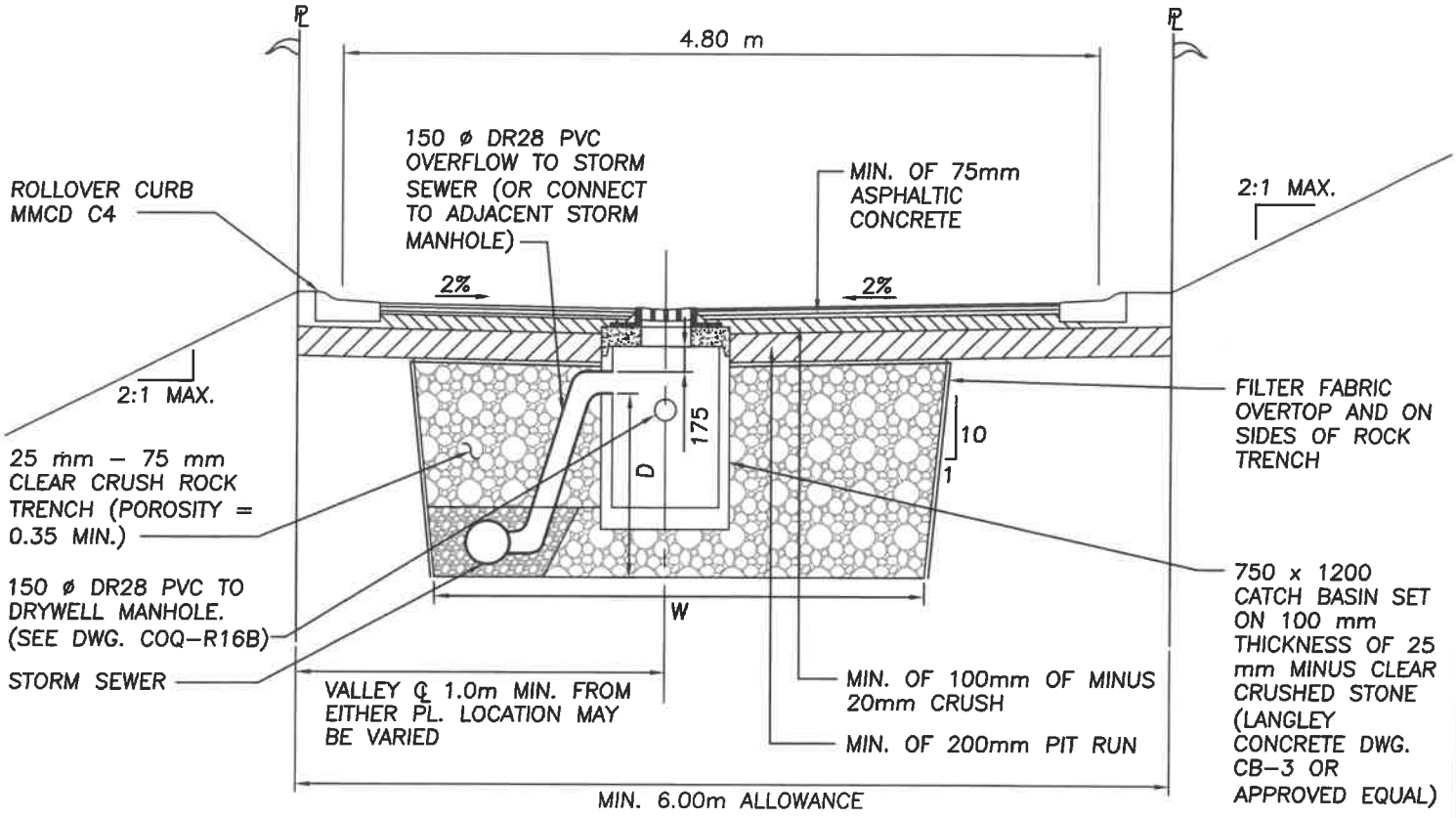
PERMEABLE PAVEMENT WITH EXFILTRATION TO SOIL SUBGRADE	DATE: NOV/2015	DRAWING NUMBER: COQ-SW7
	DRAWN: REY	
	SCALE: N.T.S.	

Coquitlam

STANDARD DETAIL DRAWINGS

NOTES:

1. CATCH BASINS TO BE LOCATED AT LOW POINTS AND CONNECTED TO STORM SEWER AS LONGITUDINAL PROFILE REQUIRES AT LEAST ONE PER BLOCK AT LOW END AT CROSS STREET PL.
2. ALGEBRAIC DIFFERENCE IN CROSSFALL GRADE SHALL NOT EXCEED 6%.
3. GEOTECHNICAL ENGINEER TO REVIEW, INSPECT AND PROVIDE CERTIFICATION OF ALL EARTHWORKS ASSOCIATED WITH GREEN LANE STANDARDS.



FOR AREA SOUTH OF BARNET HWY/LOUGHEED HWY

INFILTRATION RATE* (mm/hr)	TRENCH DEPTH 'D' (m)	TRENCH BOTTOM WIDTH 'W' (m)
1	2.0	3.0
2	1.5	3.0
3	1.0	3.0
4	1.0	2.6
5	1.0	2.4
10	0.5	2.3
20	0.5	1.6
30	0.5	1.2
40	0.5	1.0
50	0.3	1.0
100	0.3	1.0
200	0.3	1.0

* NATIVE SOIL INFILTRATION RATE AT BASE OF TRENCH

FOR AREA NORTH OF BARNET HWY/LOUGHEED HWY

INFILTRATION RATE* (mm/hr)	TRENCH DEPTH 'D' (m)	TRENCH BOTTOM WIDTH 'W' (m)
1	2.0	3.0
2	2.0	3.0
3	2.0	3.0
4	1.4	3.0
5	1.0	2.8
10	0.5	2.8
20	0.5	1.9
30	0.5	1.5
40	0.5	1.2
50	0.3	1.2
100	0.3	1.0
200	0.3	1.0

* NATIVE SOIL INFILTRATION RATE AT BASE OF TRENCH

PLOTTED: 22–Feb–16

ALL DIMENSIONS IN METRES.

GREEN LANE STANDARD

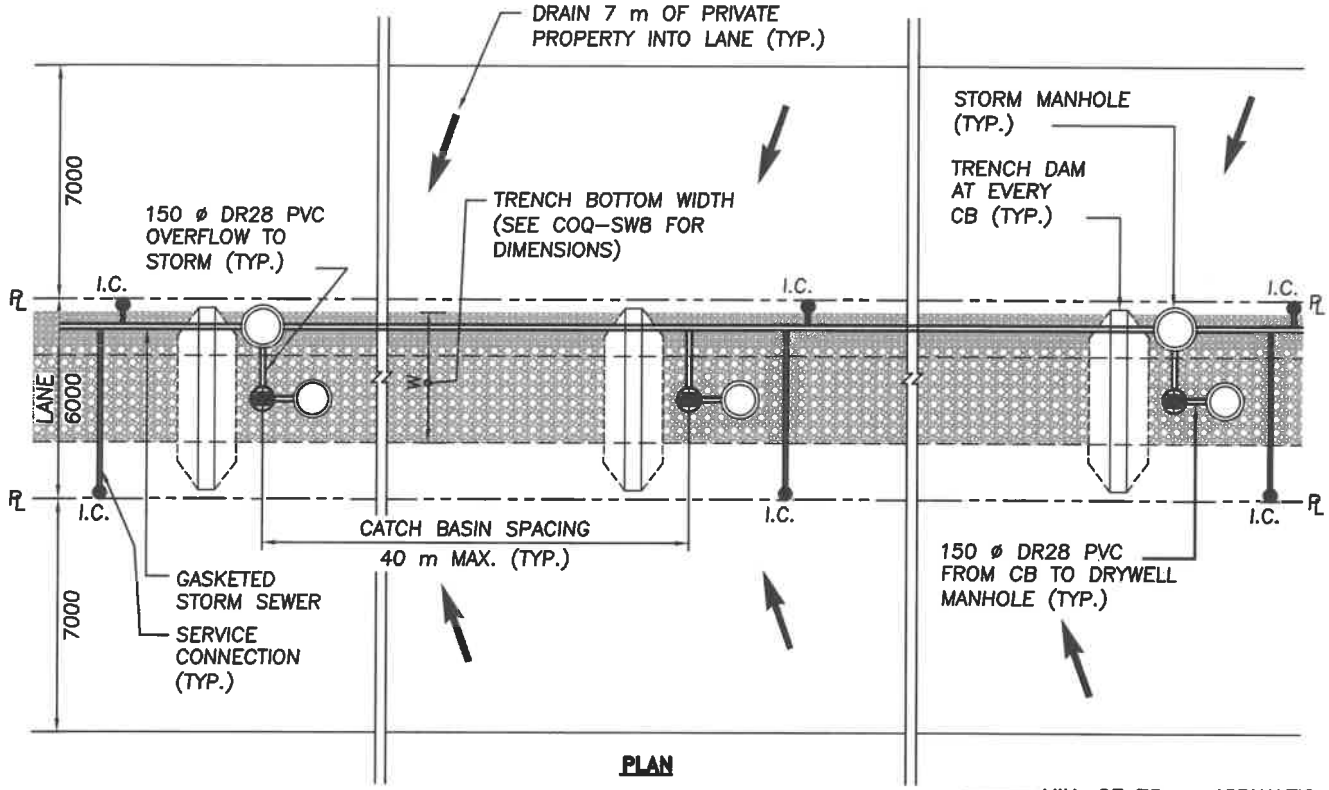
DATE:	NOV/2015
DRAWN:	REY
SCALE:	N.T.S.

DRAWING NUMBER:

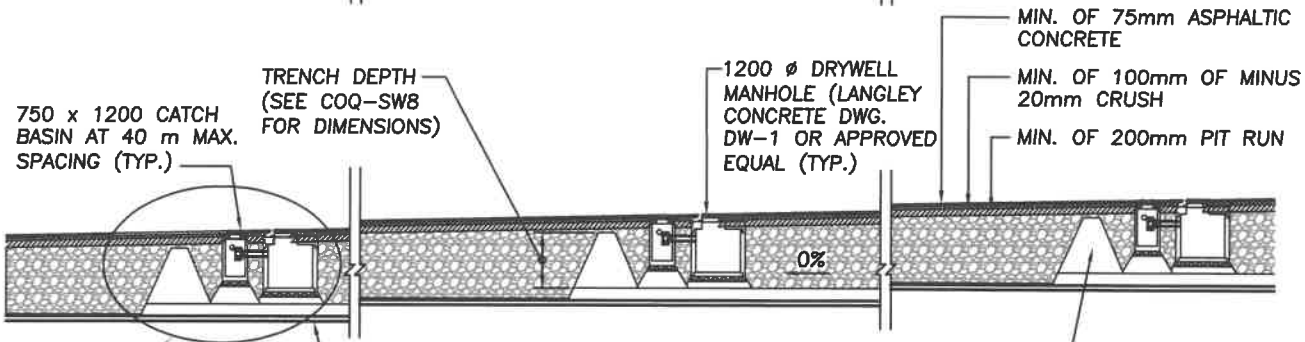
COQ-SW8

Coquitlam

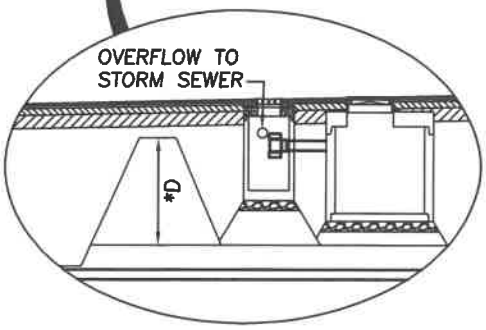
STANDARD DETAIL DRAWINGS



PLAN



PROFILE



*SEE COQUITLAM STANDARD DETAIL DWG. COQ-SW8 FOR TRENCH DEPTHS.

PLOTTED: 22-Feb-16

ALL DIMENSIONS IN METRES.

GREEN LANE STANDARD PLAN AND PROFILE

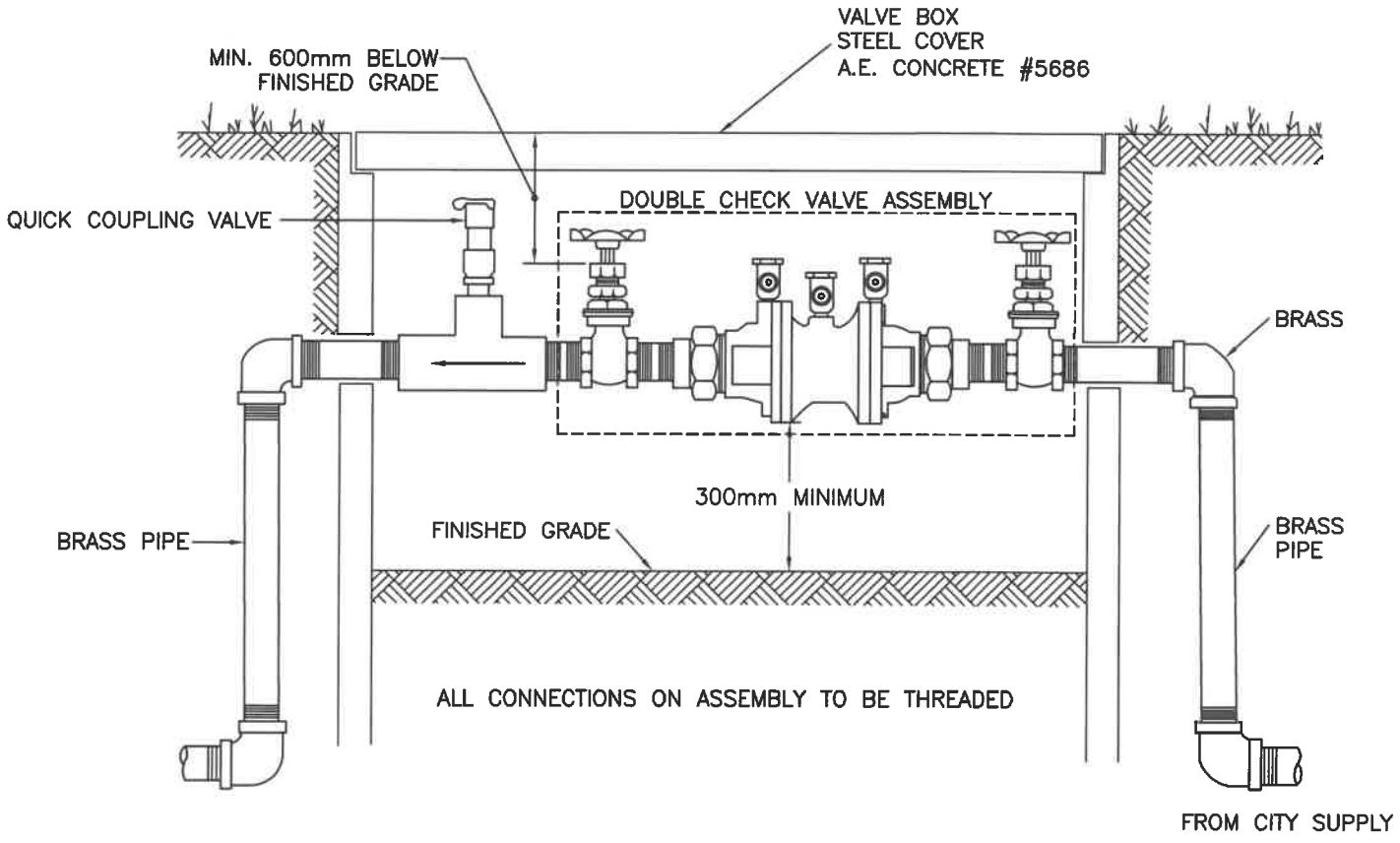
DATE:	NOV/2015
DRAWN:	REY
SCALE:	N.T.S.

DRAWING NUMBER:

COQ-SW9

Coquitlam

STANDARD DETAIL DRAWINGS

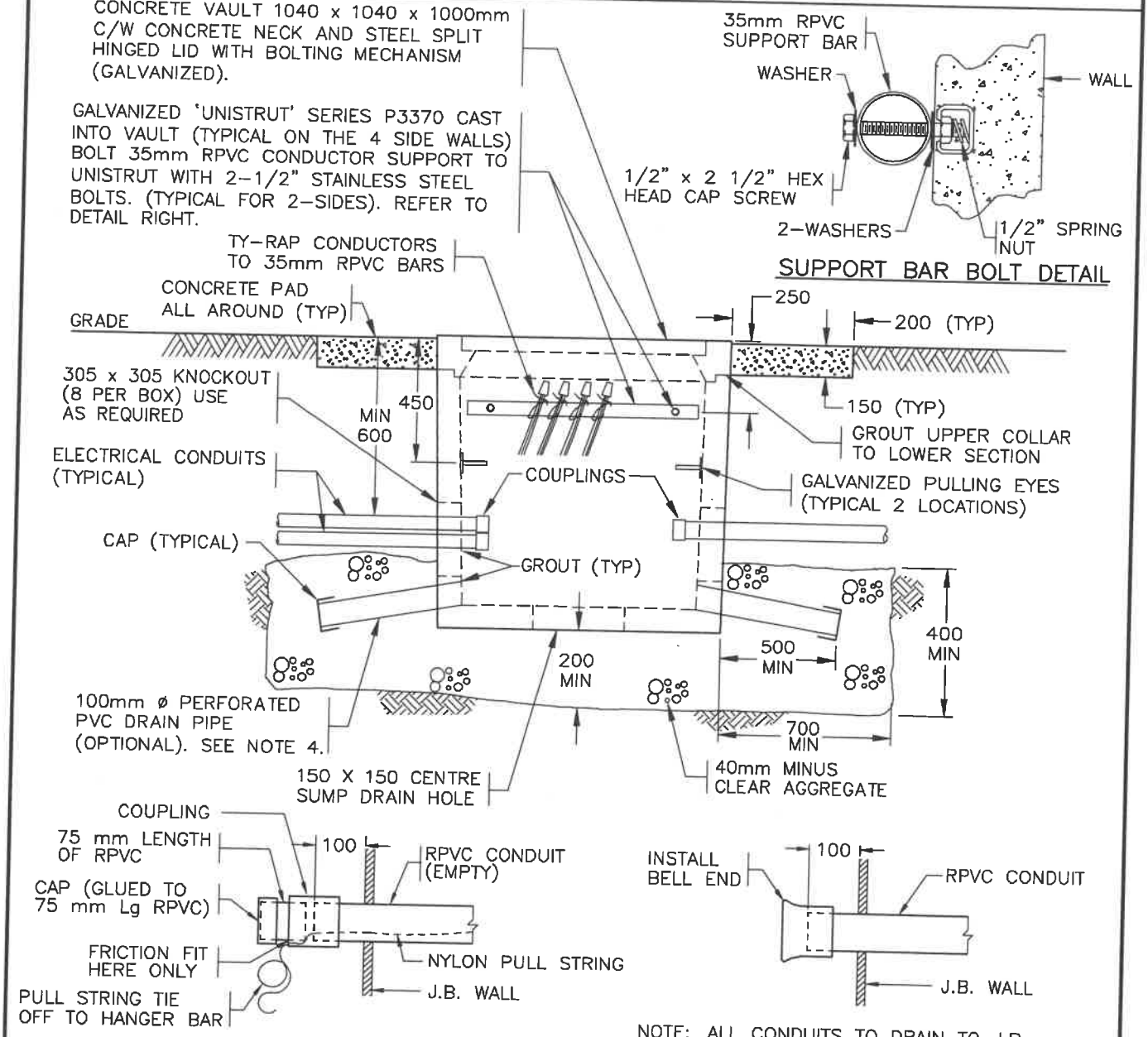


PLOTTED: 22-Feb-16

DOUBLE CHECK ASSEMBLY (MODEL: WATT 007QT)	DATE:	JUNE/2014	DRAWING NUMBER: COQ-I1
	DRAWN:	REY	
	SCALE:	N.T.S.	

City of Coquitlam

STANDARD DETAIL DRAWINGS



NOTES

1. REFER TO CONTRACT DRAWINGS AND SECTION 34 41 13 FOR DETAILED SPECIFICATIONS.
2. VAULT & LID RATED FOR H-20 STATIC LOADING WITHOUT IMPACT.
3. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE NOTED.
4. WHERE HIGH GROUND WATER OR DRAINAGE IS A PROBLEM, DRAIN VAULT TO STORM SEWER AS NOTED ON CONTRACT DRAWINGS.
5. BOND STEEL LIDS WITH No.8 RW90.
6. CONDUCTORS SHALL BE NEATLY ORGANIZED & GROUPED ON BARS AS DIRECTED BY THE CONTRACT ADMINISTRATOR ON SITE.

NOT TO SCALE

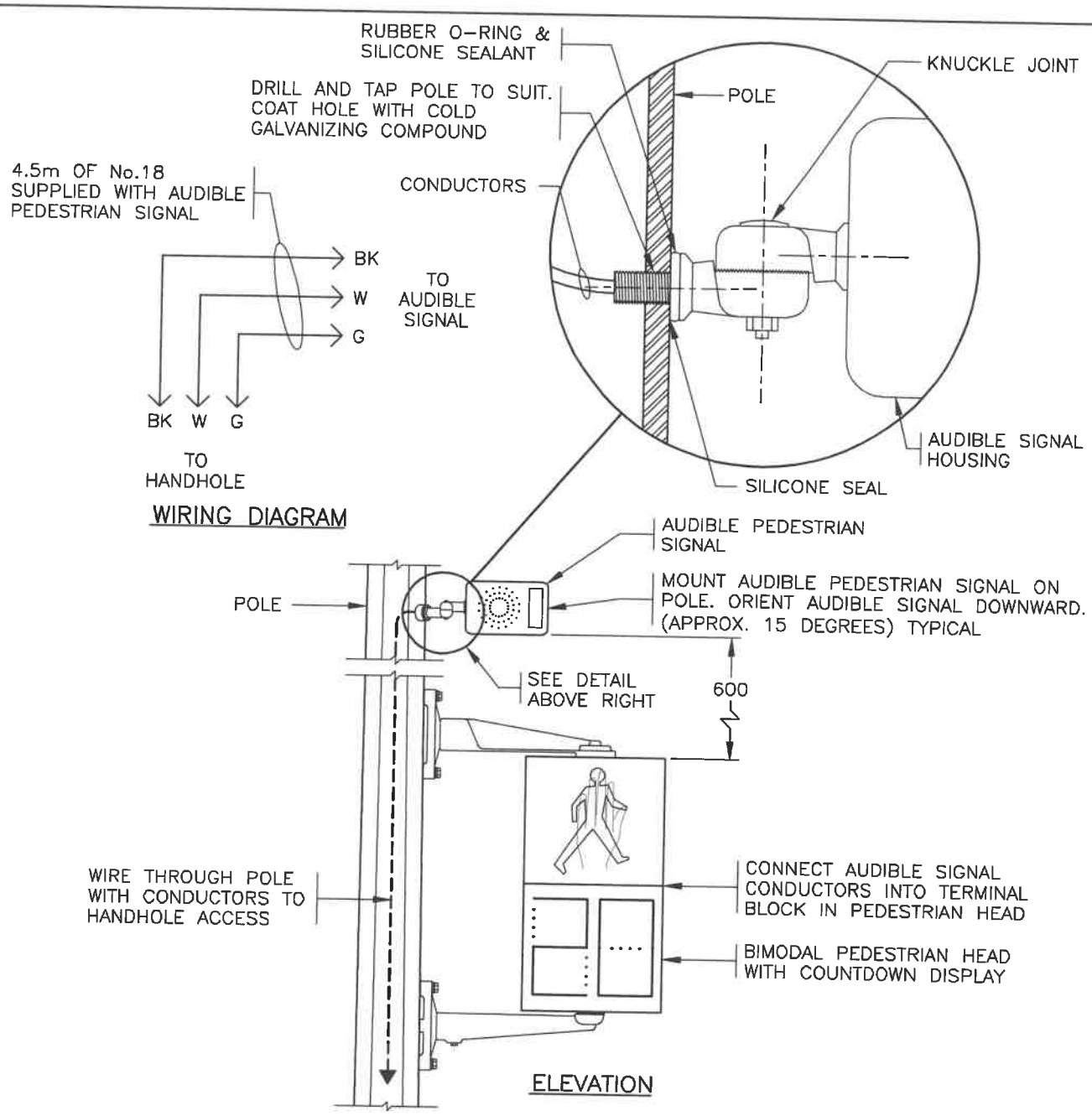
2008

CONCRETE VAULT

REV. NOV 2013

DRAWING NUMBER:

SS-E2.5



NOTES

1. REFER TO CONTRACT DRAWINGS AND SECTION 34 41 13 FOR DETAILED SPECIFICATIONS.
2. AIM, ADJUST AND CONNECT AUDIBLE SIGNAL AS PER MANUFACTURERS INSTRUCTIONS TO SATISFACTION OF CONTRACT ADMINISTRATOR.
3. AUDIBLE SIGNAL TO USE THE 'CHIRP' FOR EAST TO WEST CROSSINGS & 'CUCKOO' FOR NORTH TO SOUTH CROSSINGS. AT INTERSECTIONS WHERE NORTH/SOUTH AND EAST/WEST ARE NOT EASILY DEFINED CONTACT CONTRACT ADMINISTRATOR FOR DIRECTION.
4. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE NOTED.

NOT TO SCALE

2008

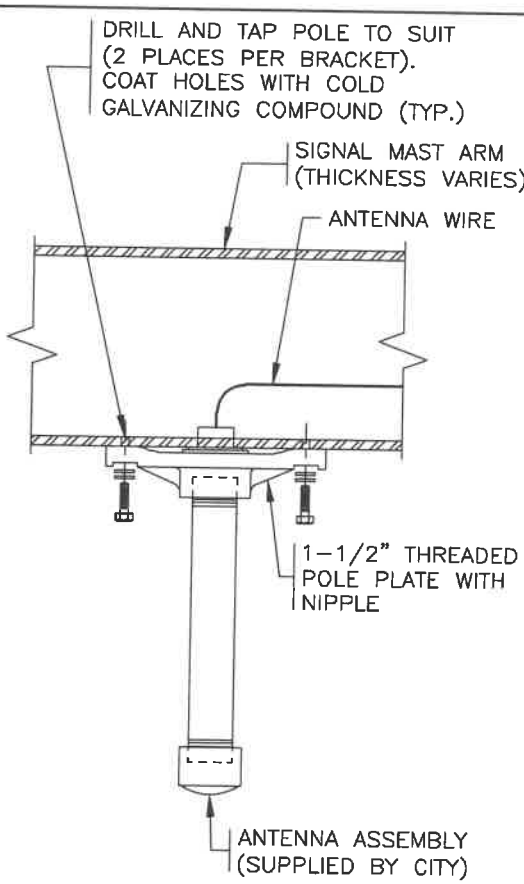
AUDIBLE SIGNALS

REV. NOV 2013

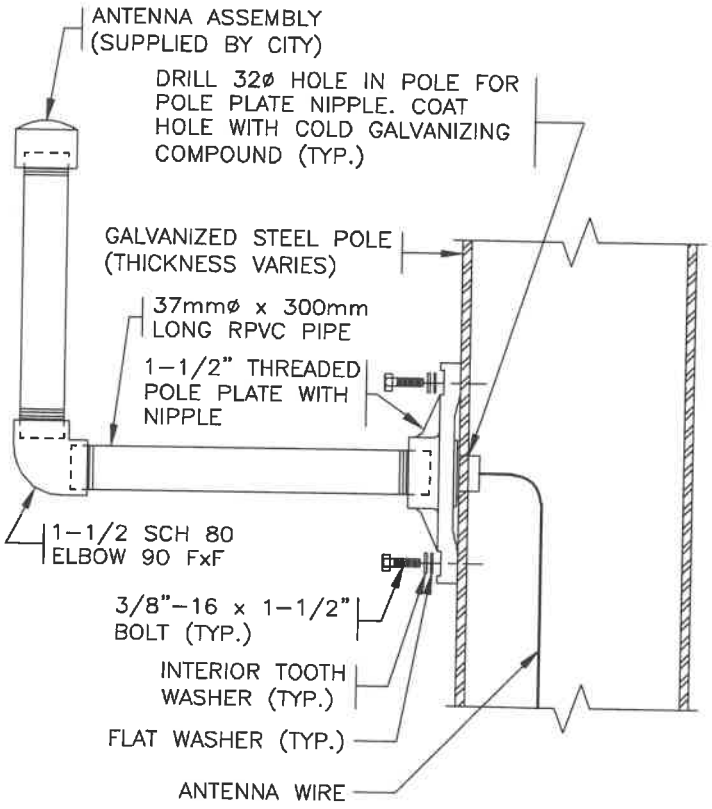
DRAWING NUMBER: SS-E5.12

City of Coquitlam

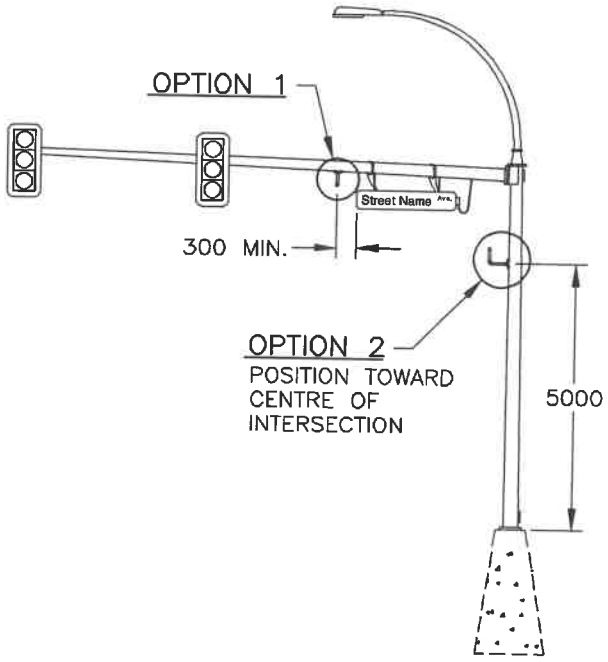
STANDARD DETAIL DRAWINGS



OPTION 1 – MAST ARM MOUNT



OPTION 2 – POLE SHAFT MOUNT



NOTES

1. REFER TO CONTRACT DRAWINGS AND SECTION 34 41 13 FOR DETAILED SPECIFICATIONS.
2. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE NOTED.

NOT TO SCALE

2008

EMTRAC ANTENNA MOUNTING DETAILS

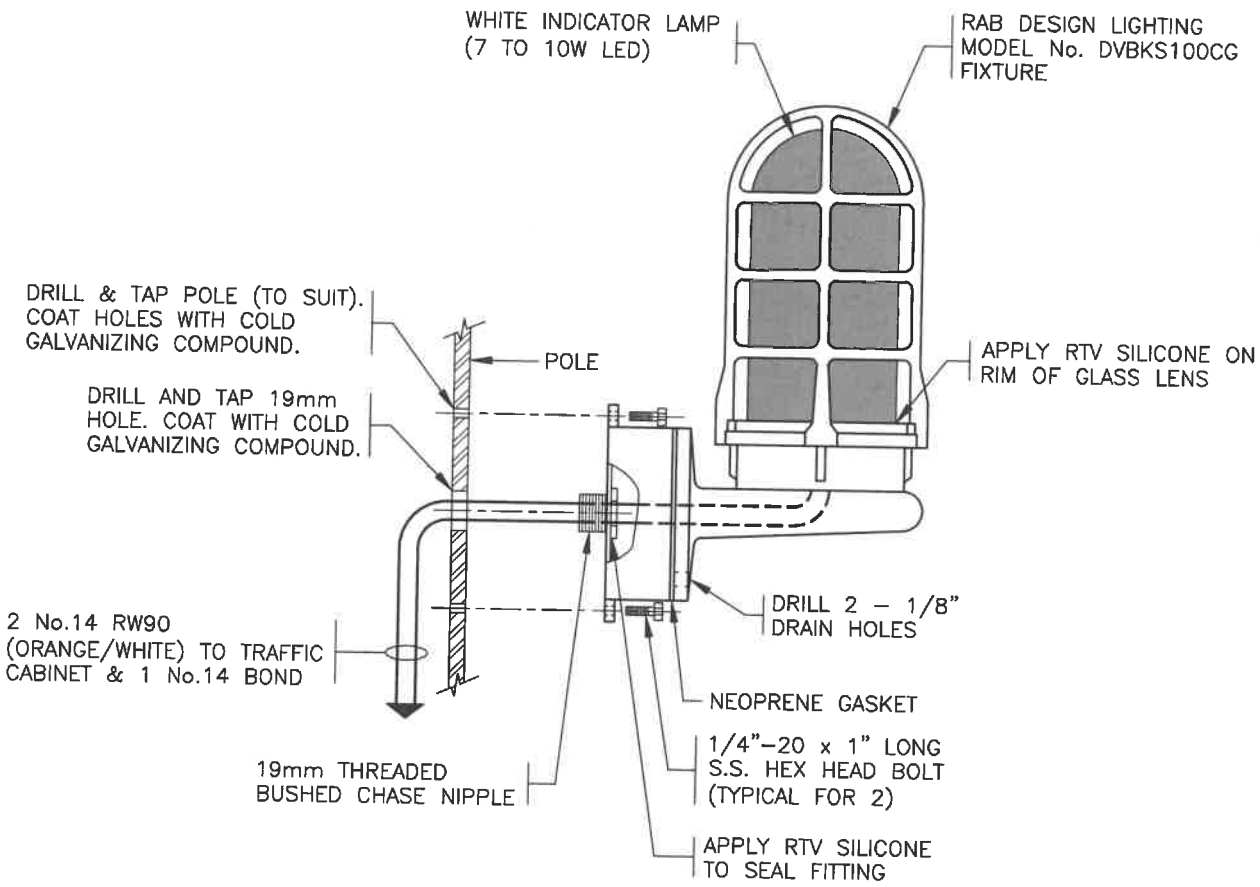
REV. NOV 2013

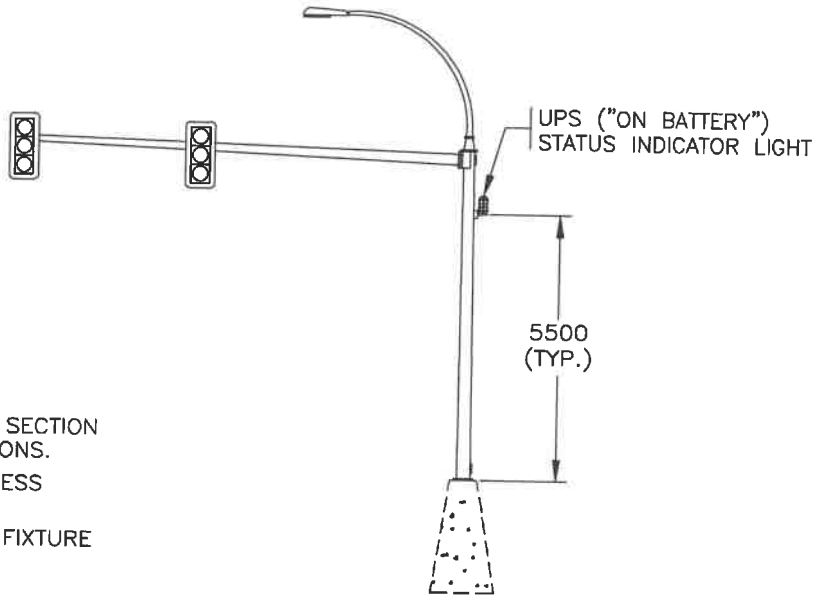
DRAWING NUMBER:

SS-E5.16

City of Coquitlam

STANDARD DETAIL DRAWINGS





NOTES

1. REFER TO CONTRACT DRAWINGS AND SECTION 34 41 13 FOR DETAILED SPECIFICATIONS.
2. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE NOTED.
3. SEAL ALL GAPS BETWEEN POLE AND FIXTURE WITH WATERPROOF SILICONE SEALANT.

NOT TO SCALE

2008

UPS ("ON BATTERY") INDICATOR LIGHT DETAIL

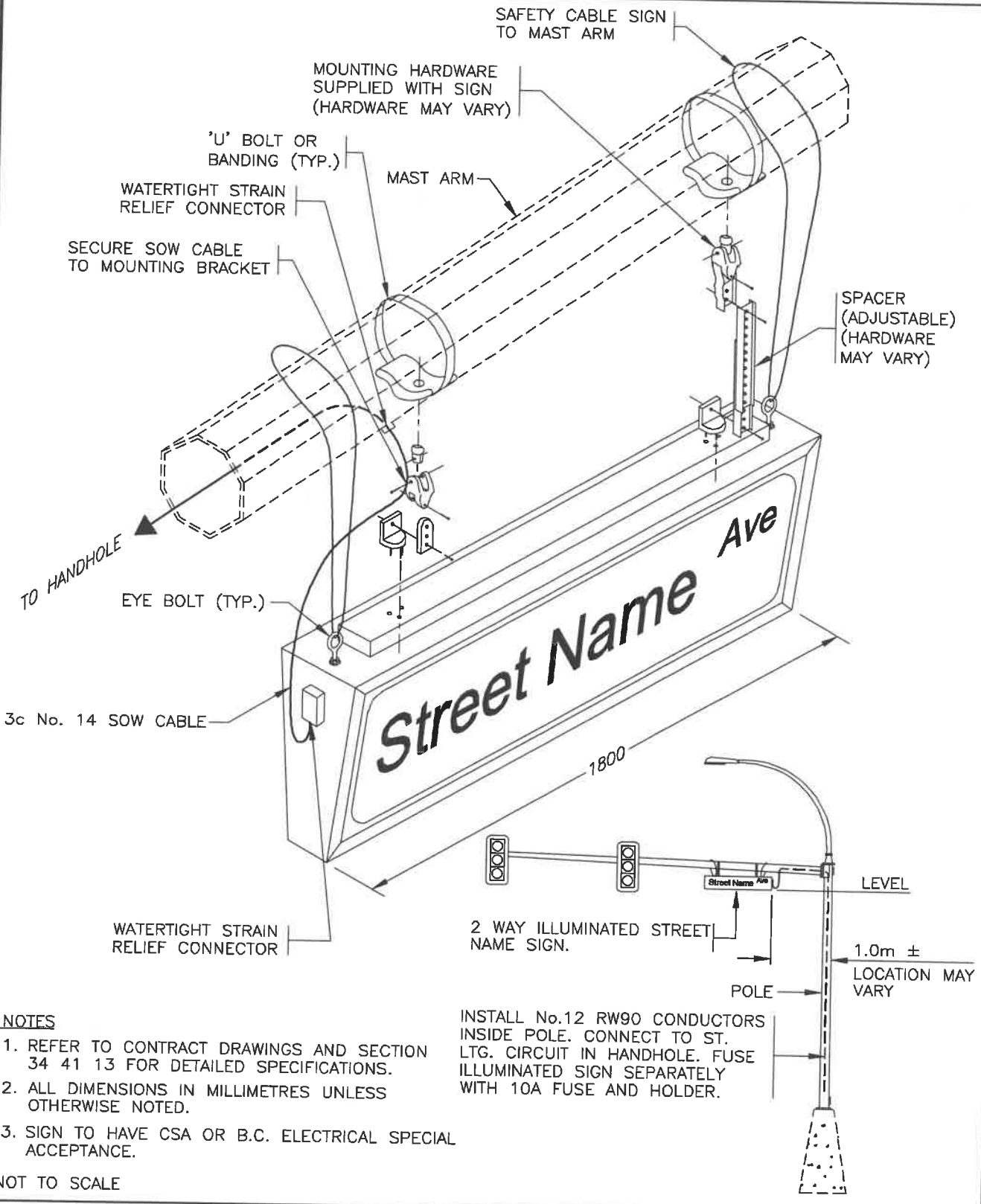
REV. NOV 2021

DRAWING NUMBER:

SS-E5.17

City of Coquitlam

STANDARD DETAIL DRAWINGS



NOTES

1. REFER TO CONTRACT DRAWINGS AND SECTION 34 41 13 FOR DETAILED SPECIFICATIONS.
2. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE NOTED.
3. SIGN TO HAVE CSA OR B.C. ELECTRICAL SPECIAL ACCEPTANCE.

NOT TO SCALE

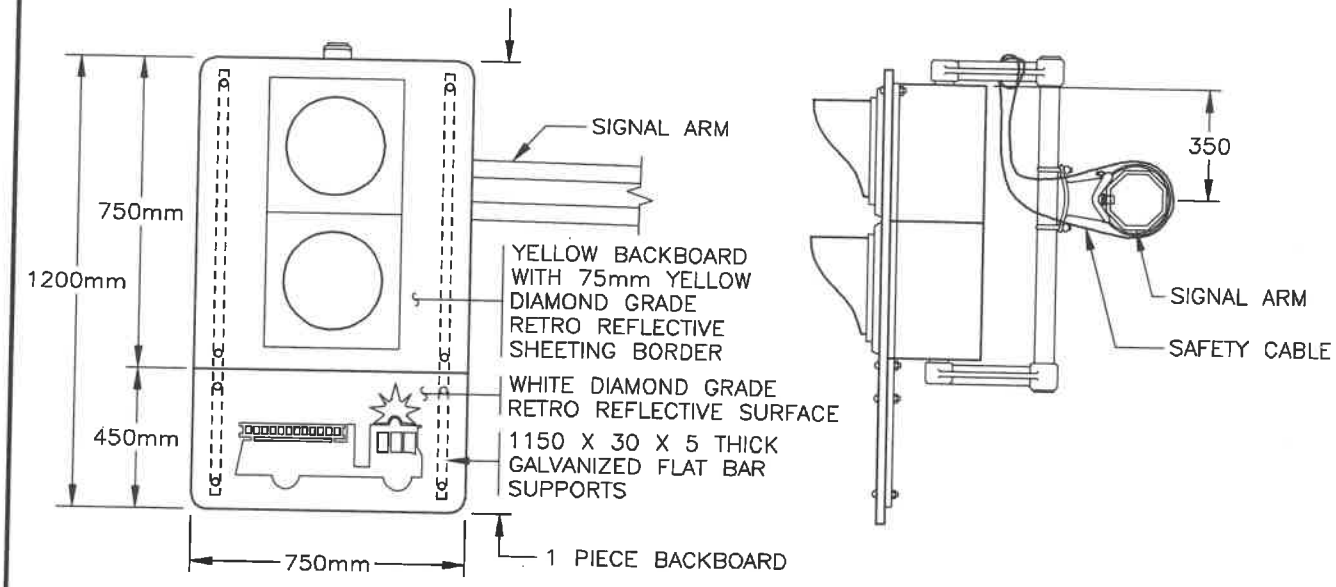
2008

ILLUMINATED STREET NAME SIGN MOUNTING DETAILS

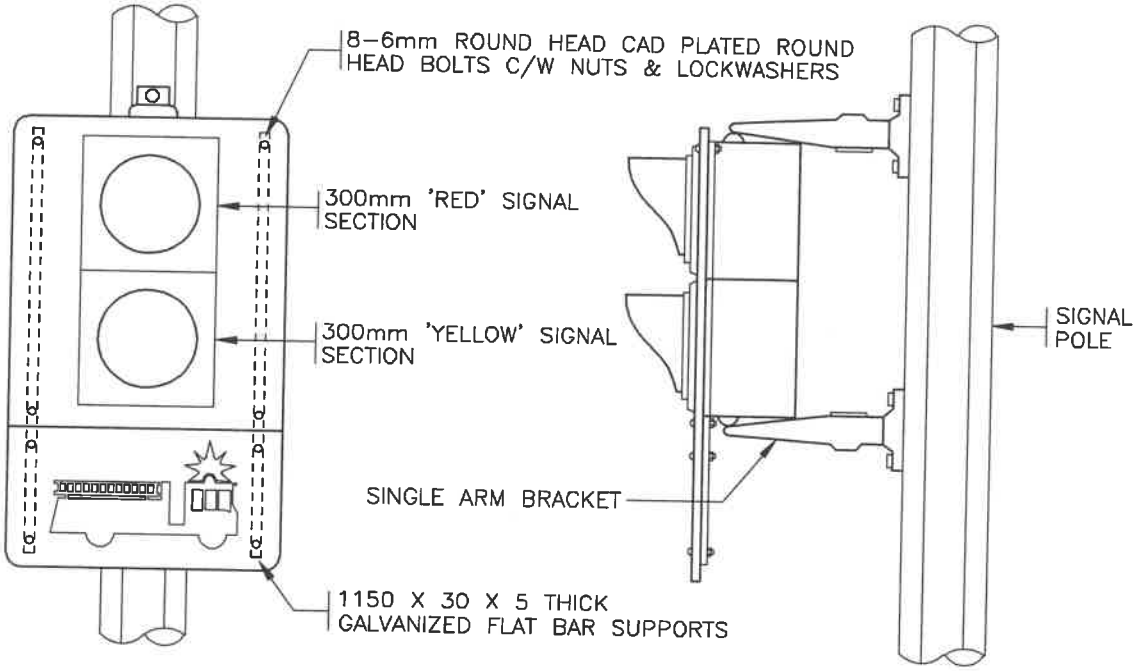
REV. NOV 2013

DRAWING NUMBER:

SS-E5.18



PRIMARY FIRE SIGNAL HEAD MOUNTING



SECONDARY FIRE SIGNAL HEAD MOUNTING

NOTES

1. REFER TO CONTRACT DRAWINGS AND SECTION 34 41 13 FOR DETAILED SPECIFICATIONS.
2. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE NOTED.

NOT TO SCALE

2008

FIRE SIGNAL HEAD MOUNTING DETAILS

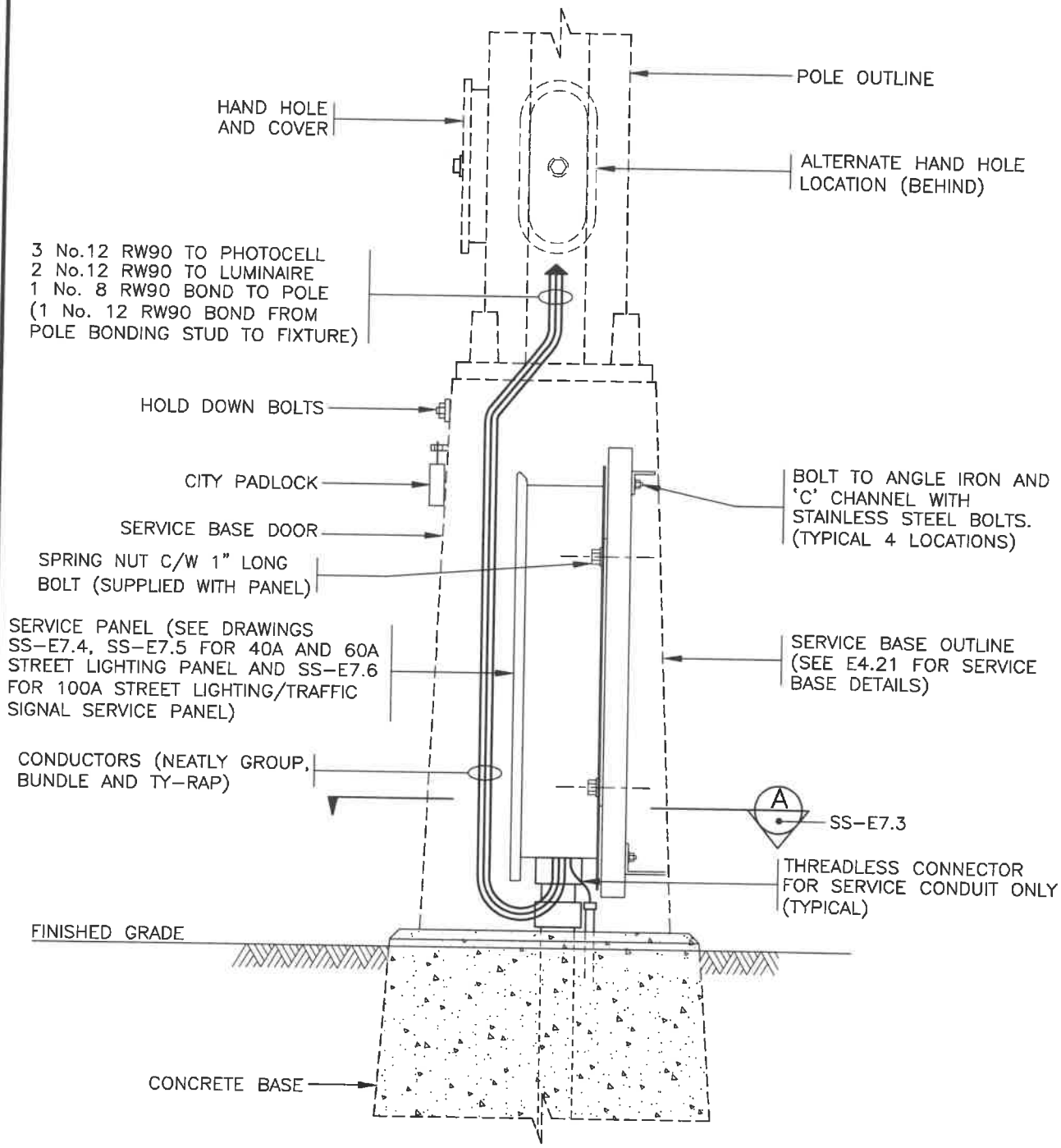
REV. NOVEMBER 2013

DRAWING NUMBER:

SS-E5.19

City of Coquitlam

STANDARD DETAIL DRAWINGS



NOTES

1. REFER TO CONTRACT DRAWINGS. SECTION 34 41 13 FOR DETAILED SPECIFICATIONS.

NOT TO SCALE

2021

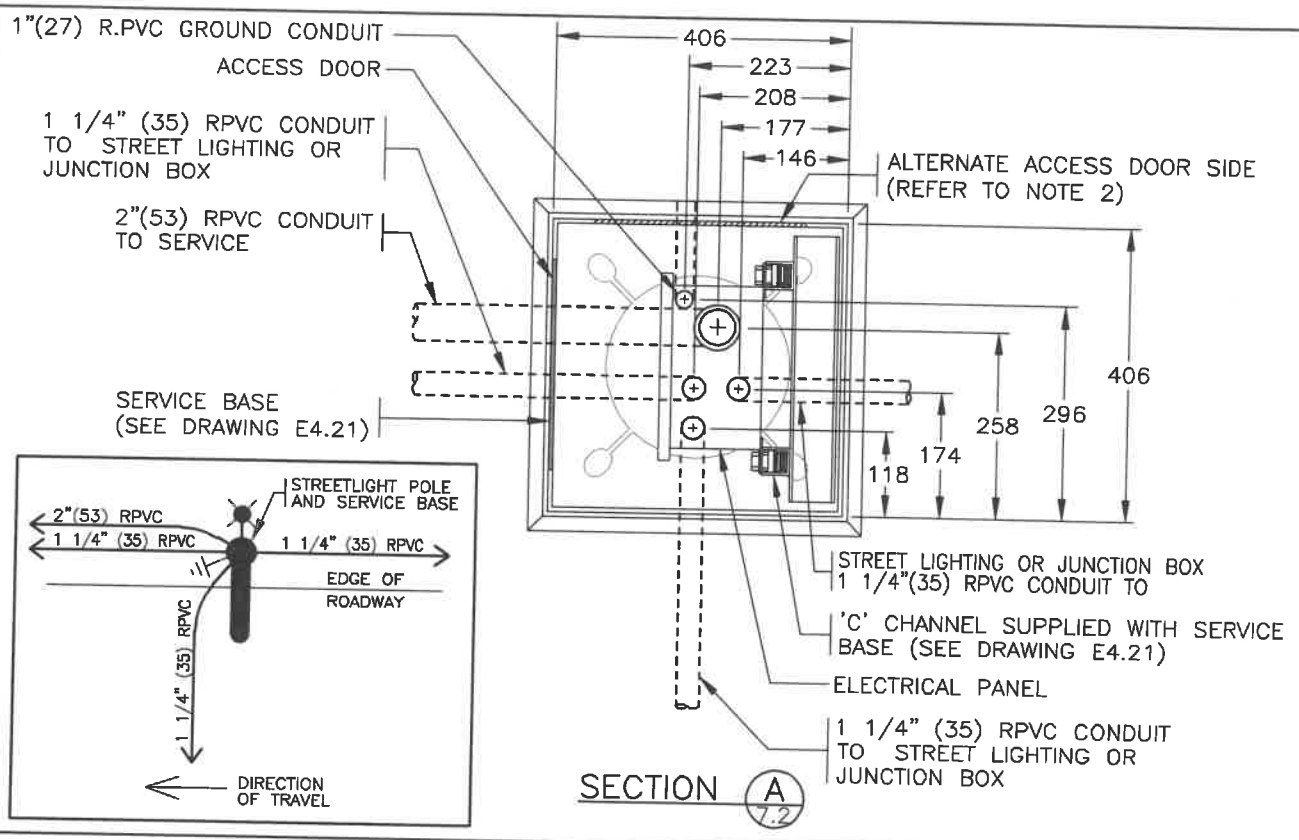
SERVICE PANEL IN SERVICE BASE (MOUNTING DETAILS)

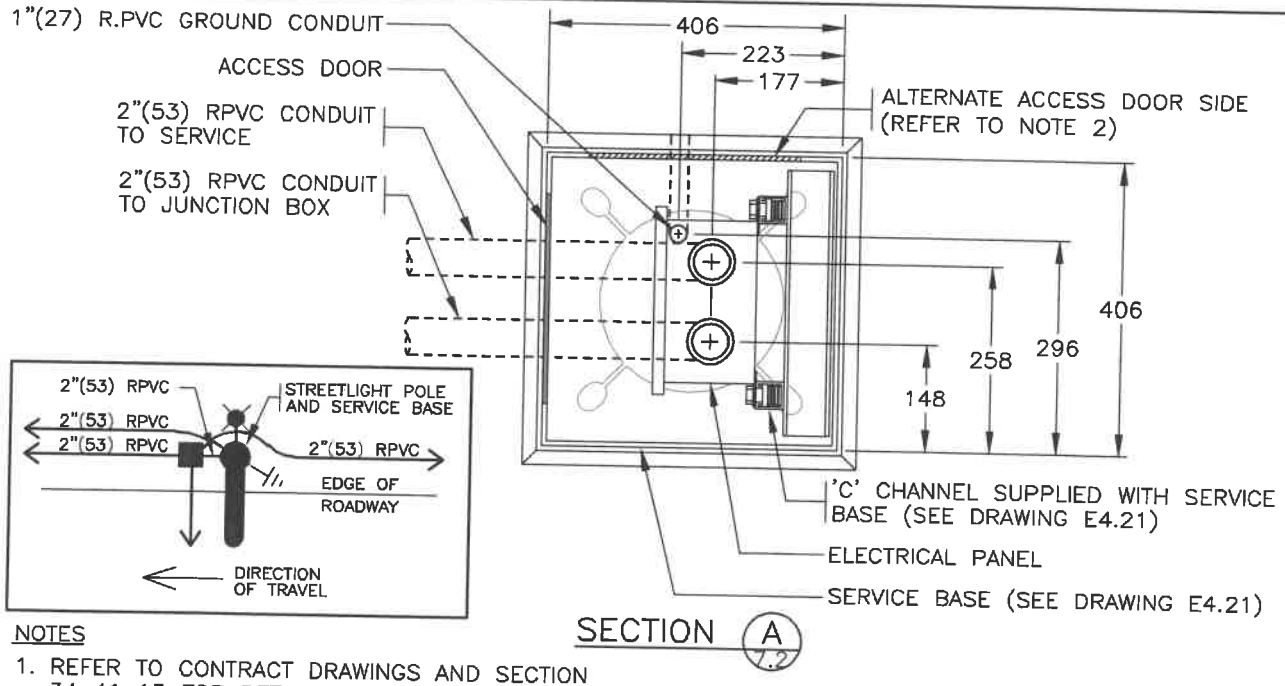
DRAWING NUMBER:

SS-E7.2

City of Coquitlam

STANDARD DETAIL DRAWINGS





NOTES

1. REFER TO CONTRACT DRAWINGS AND SECTION 34 41 13 FOR DETAILED SPECIFICATIONS.
2. TYPE C1 & C3 CONCRETE BASE MAY BE ROTATED 90° CLOCKWISE TO SUIT HYDRO SERVICE POINT.

SCALE 1:10

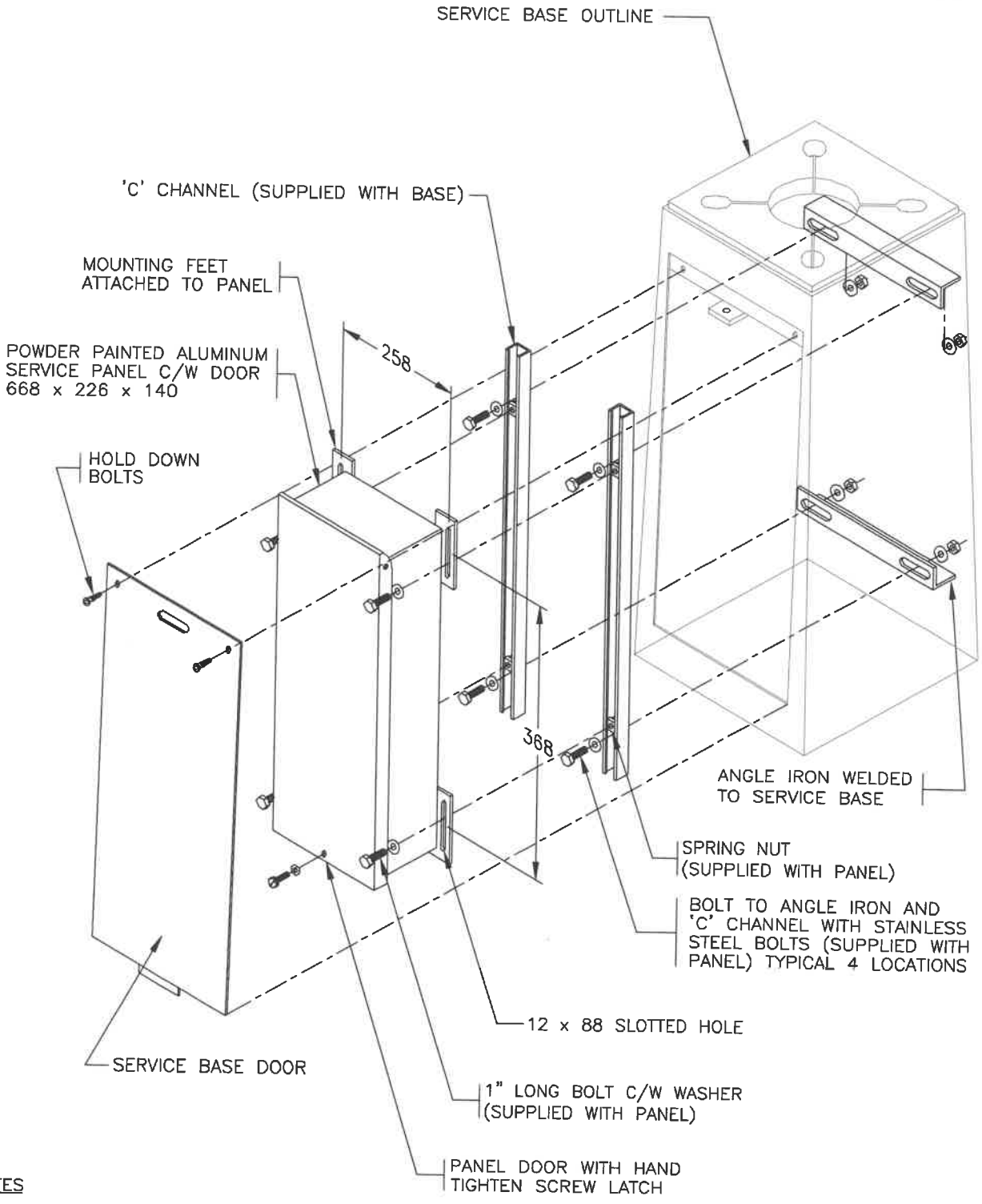
SERVICE PANEL IN SERVICE BASE (MOUNTING DETAILS)

REV. NOV 2013

DRAWING NUMBER:

SS-E7.3

2008



NOTES

1. REFER TO CONTRACT DRAWINGS AND SECTION 34 41 13 FOR DETAILED SPECIFICATIONS.

NOT TO SCALE

2008

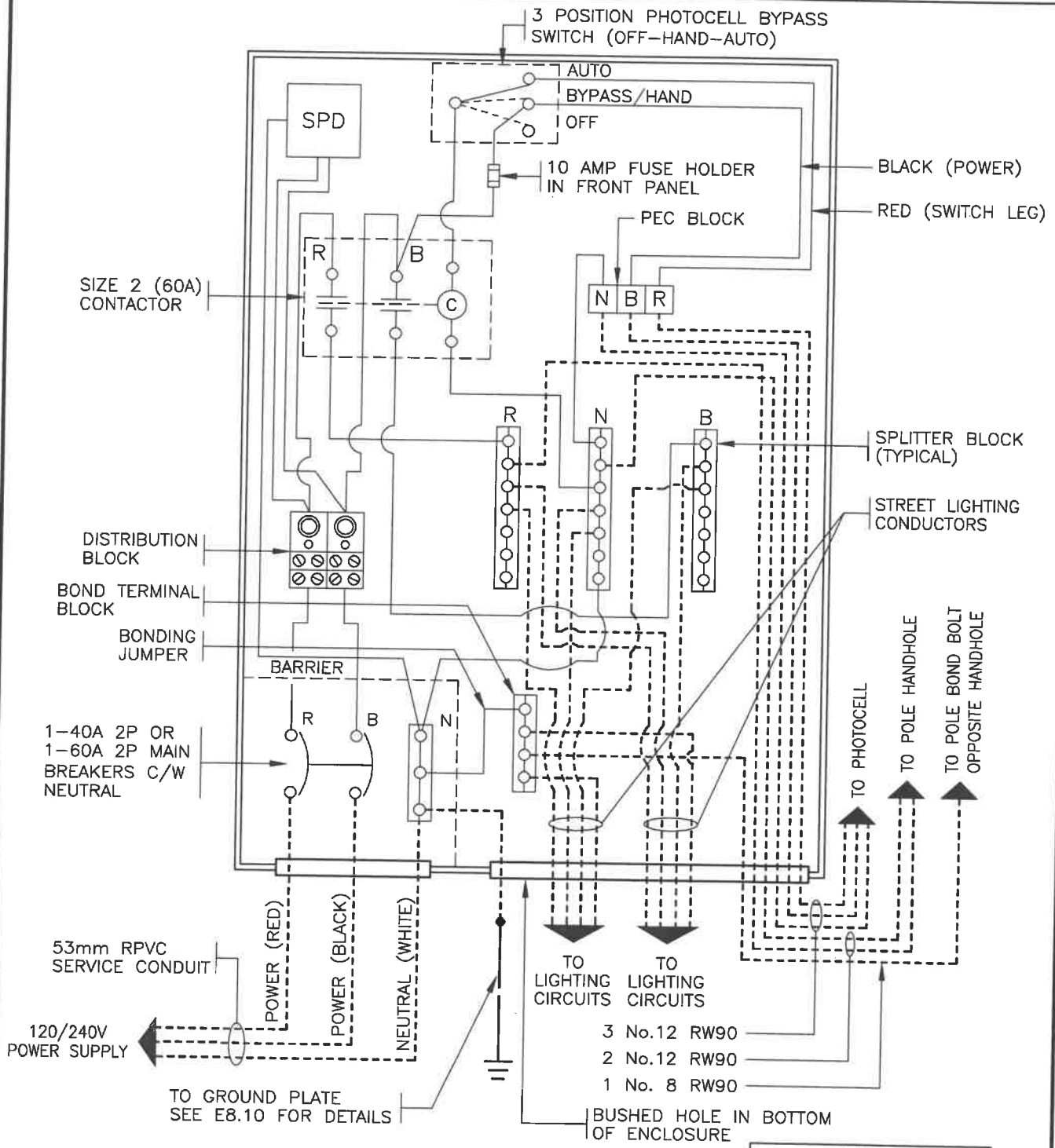
SERVICE PANEL IN SERVICE BASE (PANEL DETAILS)

REV. NOV 2013

DRAWING NUMBER: **SS-E7.4**

City of Coquitlam

STANDARD DETAIL DRAWINGS



WIRING DIAGRAM

N.T.S.

SPD = SURGE PROTECTION DEVICE

-------- FIELD WIRING

NOTES

1. REFER TO CONTRACT DRAWINGS AND SECTION 34 41 13 FOR DETAILED SPECIFICATIONS.

NOT TO SCALE

40A & 60A (120/240V) STREET LIGHTING SERVICE PANEL IN SERVICE BASE (WIRING DIAGRAM) REV. NOV 2021

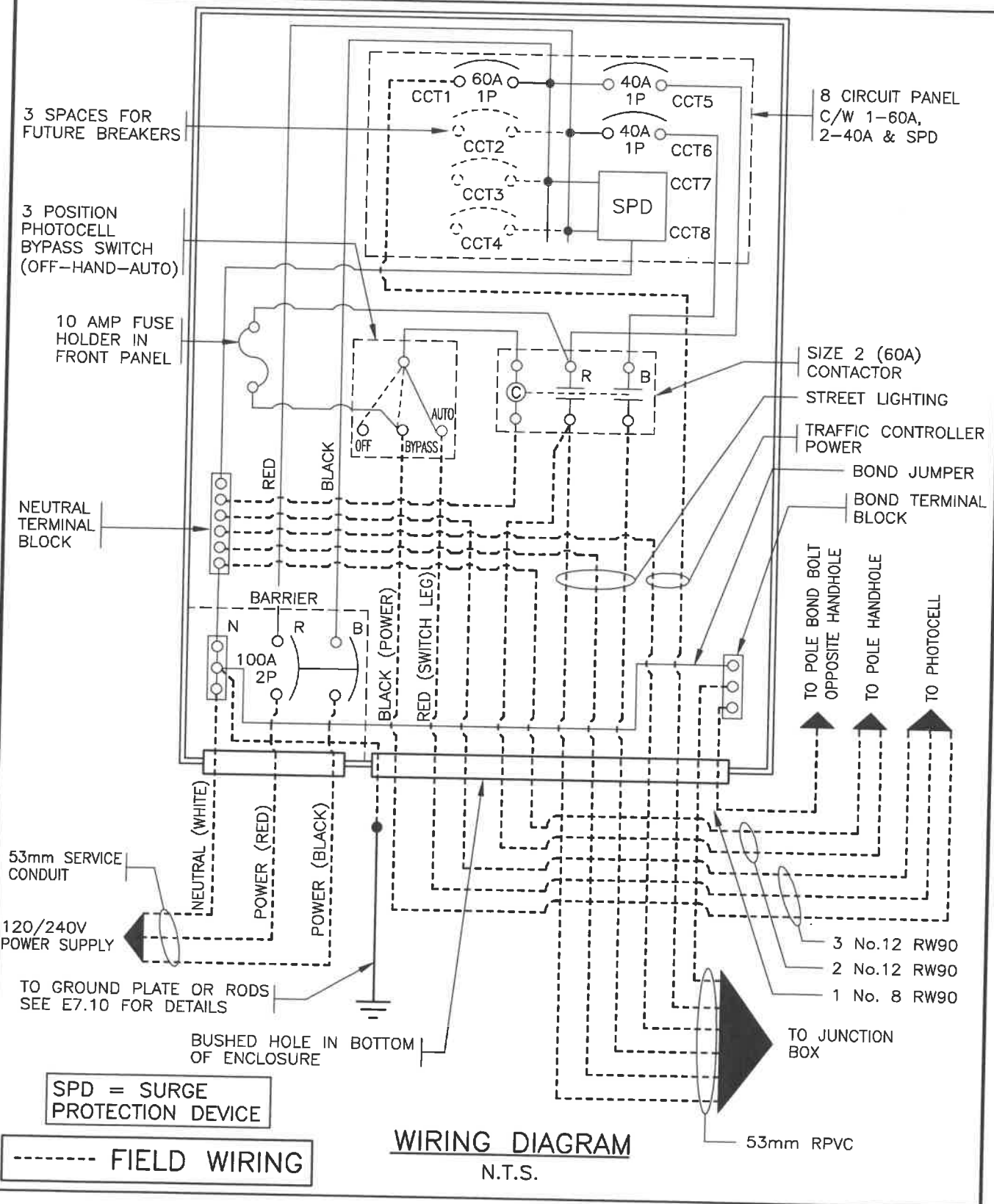
DRAWING NUMBER:

SS-E7.5

2008

City of Coquitlam

STANDARD DETAIL DRAWINGS



WIRING DIAGRAM

N.T.S.

2021

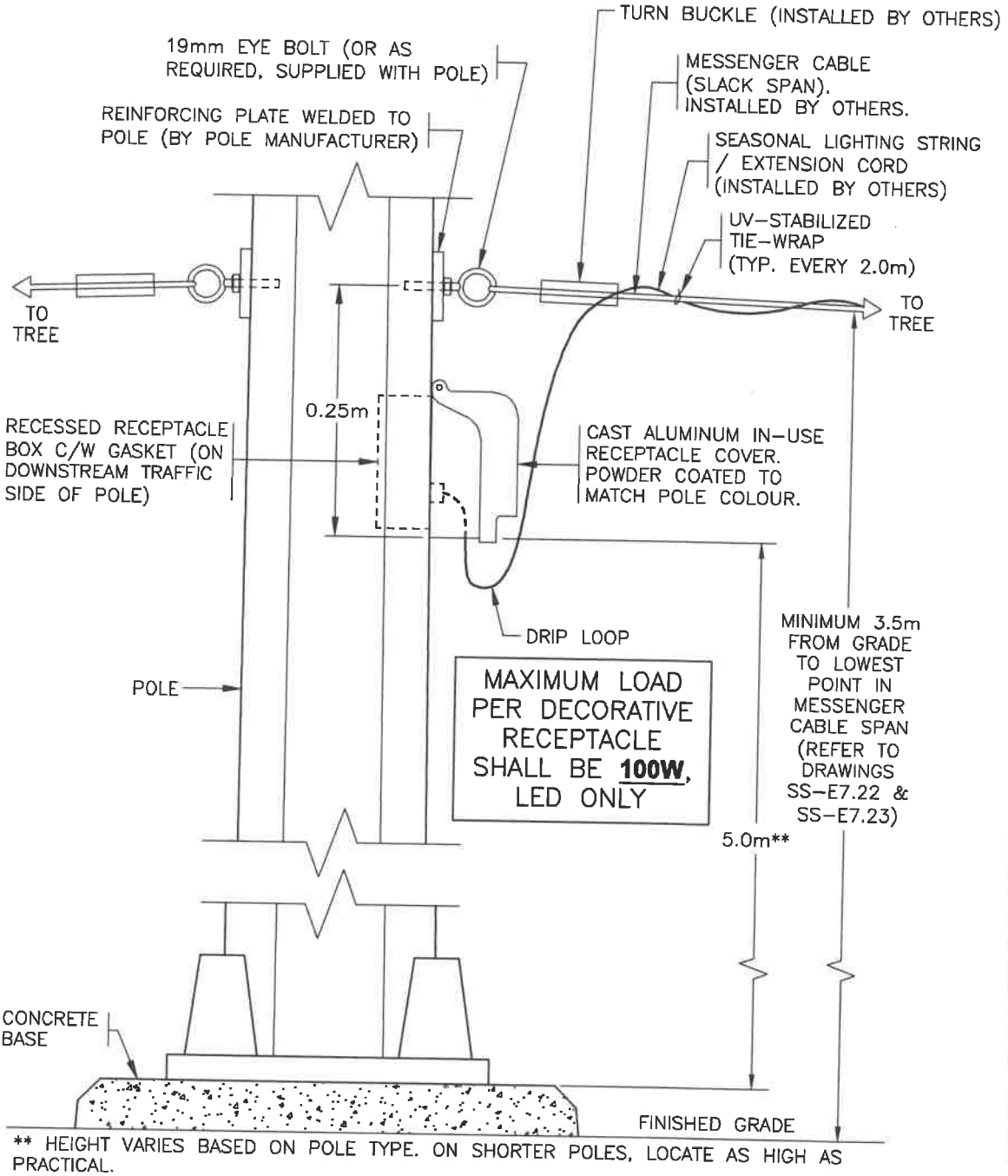
100A (120/240V) TRAFFIC SIGNAL/STREET LIGHTING SERVICE PANEL IN SERVICE BASE (WIRING DIAGRAM)

DRAWING NUMBER:

SS-E7.6

City of Coquitlam

STANDARD DETAIL DRAWINGS



** HEIGHT VARIES BASED ON POLE TYPE. ON SHORTER POLES, LOCATE AS HIGH AS PRACTICAL.

NOTES

1. REFER TO CONTRACT DRAWINGS AND SECTION 26 56 01 FOR DETAILED SPECIFICATIONS.
2. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE NOTED.
3. REFER TO DRAWING SS-E7.21 FOR ADDITIONAL NOTES.

NOT TO SCALE

2008

TYPICAL STREET TREE LIGHTING RECEPTACLE DETAIL (NEW INSTALLATIONS)

REV. NOV 2013

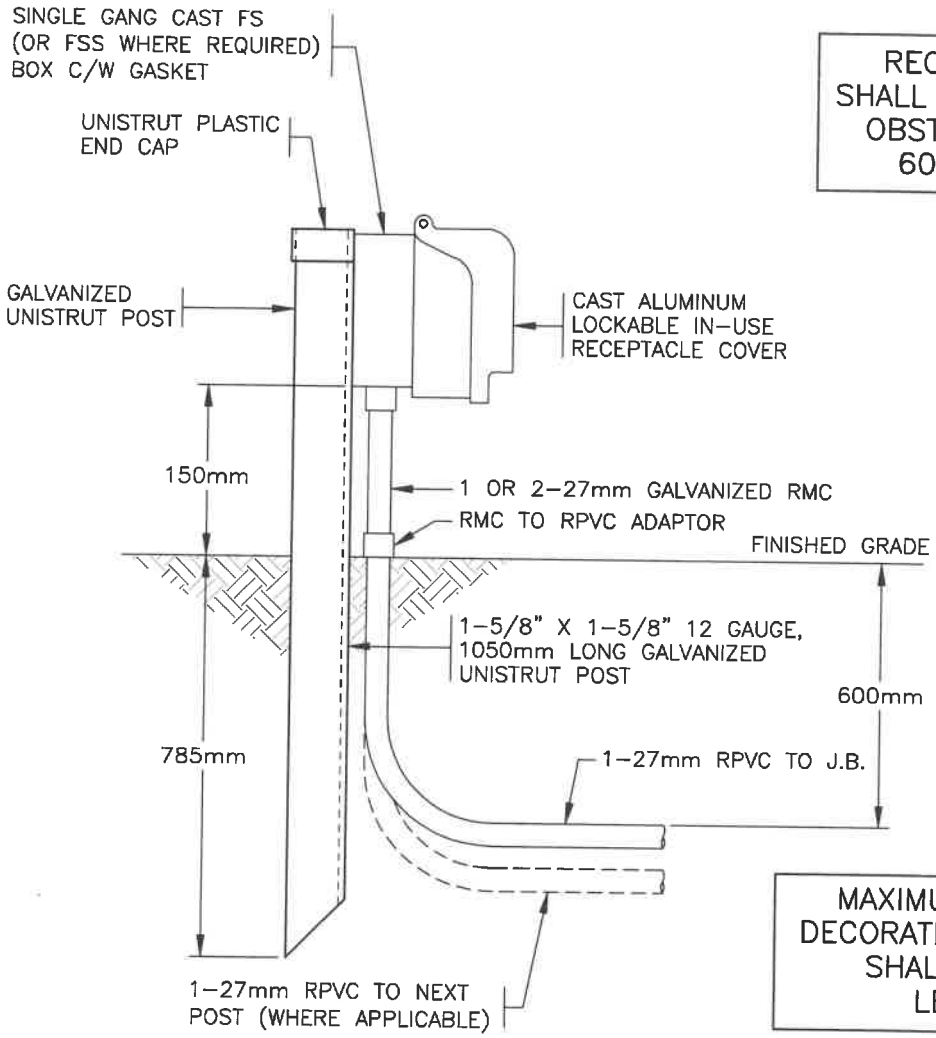
DRAWING NUMBER:

SS-E7.19

2/7/2014 2:47:07 PM, Plotted By: R.F.

City of Coquitlam

STANDARD DETAIL DRAWINGS



RECEPTACLE COVER SHALL BE CLEAR OF ANY OBSTRUCTIONS WITHIN 600mm OF POST

MAXIMUM LOAD PER DECORATIVE RECEPTACLE SHALL BE **100W**, LED ONLY

USE OF POST MOUNTED TREE RECEPTACLES MUST BE APPROVED BY THE CITY

NOTES

1. REFER TO CONTRACT DRAWINGS AND SECTION 26 56 01 FOR DETAILED SPECIFICATIONS.
2. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE NOTED.
3. REFER TO DRAWING SS-E7.21 FOR ADDITIONAL NOTES.

NOT TO SCALE

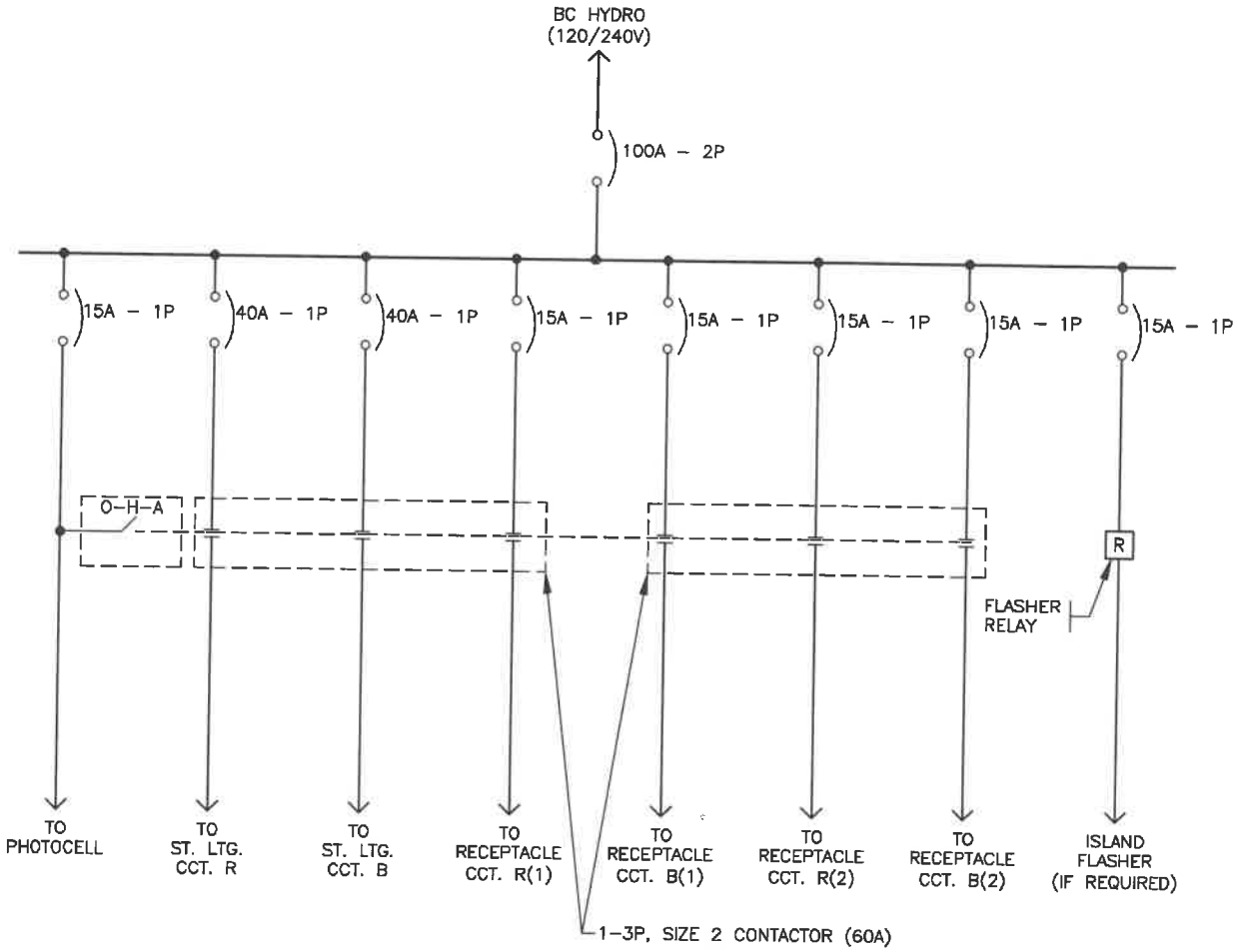
2008

TYPICAL POST MOUNTED TREE RECEPTACLE DETAIL

REV. NOV 2021

DRAWING NUMBER:

SS-E7.20



SINGLE LINE DIAGRAM

NOTES

1. ALL WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE 2009 PLATINUM EDITION OF THE MASTER MUNICIPAL CONSTRUCTION DOCUMENT AND THE CITY OF COQUITLAM SUPPLEMENTAL SPECIFICATIONS.
2. AERIAL EXTENSION CORDS MUST BE SUNLIGHT RESISTANT AND SHALL BE SPECIFICALLY APPROVED FOR THE PURPOSE AND BE SO MARKED.
3. IN–LINE FUSE ON LINE SIDE OF RECEPTACLE NOT REQUIRED WHEN 15A BREAKER FEEDS RECEPTACLE CONDUCTORS.
4. SEASONAL LIGHTING SHALL ONLY USE LED LIGHTING STRINGS. TOTAL MAXIMUM WATTAGE PER RECEPTACLE SHALL NOT EXCEED 100 WATTS.
5. BREAKERS FOR RECEPTACLE POWER IN SERVICE BASE/KIOSK TO BE SWITCHED 'OFF' WHEN NOT IN USE TO PREVENT MISUSE OF RECEPTACLES.
6. RECEPTACLES SHALL NOT BE LOCATED ON TRAFFIC SIGNAL POLES.
7. RECEPTACLES SHALL BE LEVITON SMARTLOCKPRO SLIM WEATHER–RESISTANT (WR) GFCI OR APPROVED ALTERNATE. IN ADDITION, ALL POST MOUNTED RECEPTACLES SHALL BE TAMPER RESISTANT (TR) VERSION.
8. MESSENGER CABLES SHALL NOT SPAN ACROSS DRIVABLE AREAS (I.E.: ROADS, LANES, DRIVEWAYS AND PATHWAYS)

NOT TO SCALE

2008

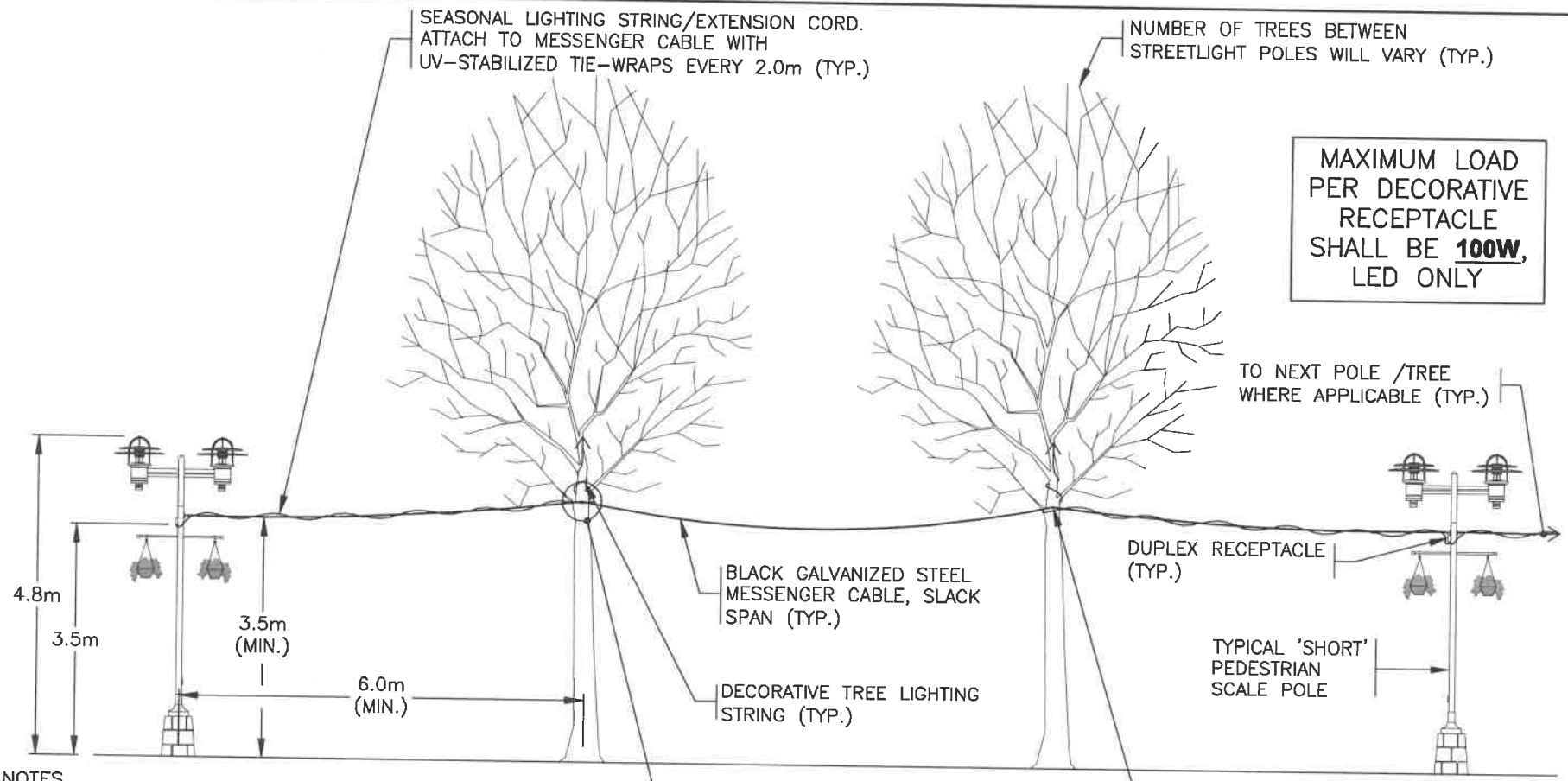
STREET LIGHTING AND TREE RECEPTACLE SERVICE PANEL DETAIL (IN SERVICE BASE)

REV. NOV 2013

DRAWING NUMBER: **SS-E7.21**

City of Coquitlam

STANDARD DETAIL DRAWINGS



NOTES

1. REFER TO CONTRACT DRAWINGS AND SECTION 26 56 01 FOR DETAILED SPECIFICATIONS.
2. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE NOTED.
3. REFER TO DRAWING SS-E7.21 FOR ADDITIONAL NOTES.

NOT TO SCALE

STREET TREE LIGHTING INSTALLATION DETAILS (FOR 'SHORT' PEDESTRIAN SCALE POLES)

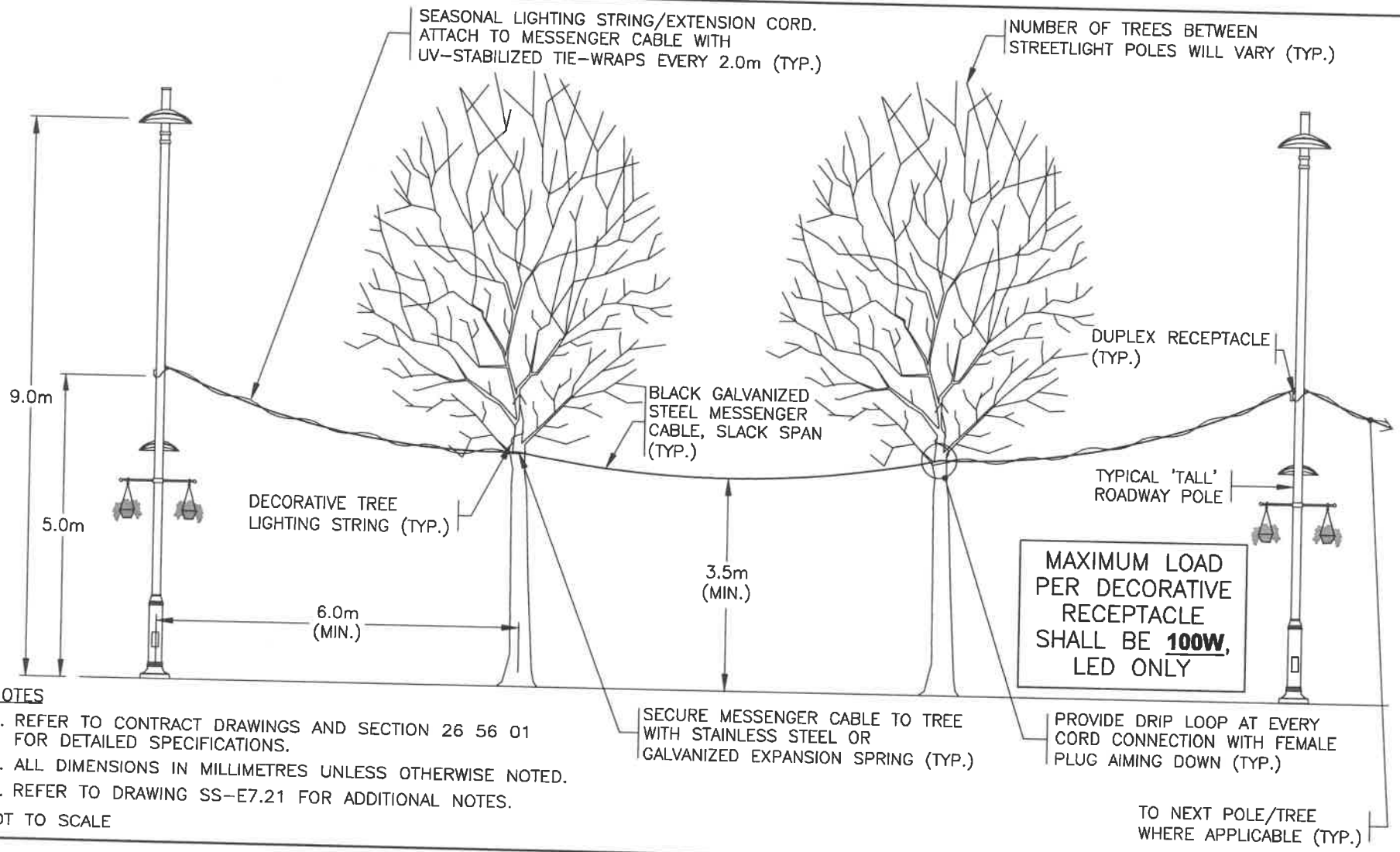
2008

REV. NOV 2013

DRAWING NUMBER: **SS-E7.22**

City of Coquitlam

STANDARD DETAIL DRAWINGS



NOTES

1. REFER TO CONTRACT DRAWINGS AND SECTION 26 56 01 FOR DETAILED SPECIFICATIONS.
2. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE NOTED.
3. REFER TO DRAWING SS-E7.21 FOR ADDITIONAL NOTES.

NOT TO SCALE

2008

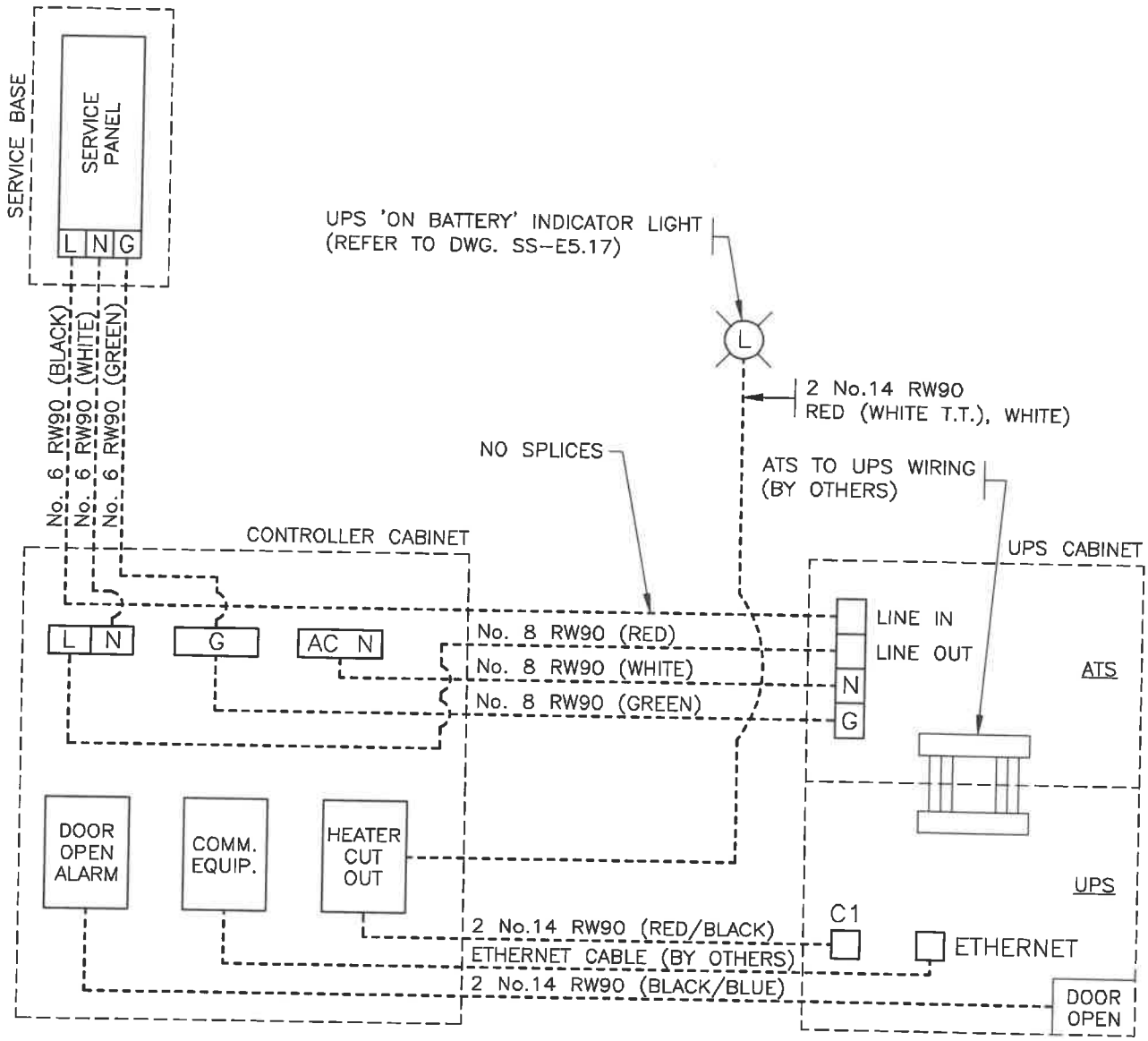
STREET TREE LIGHTING INSTALLATION DETAILS (FOR 'TALL' ROADWAY POLES)

REV. NOV 2013

DRAWING NUMBER:

SS-E7.23

City of Coquitlam STANDARD DETAIL DRAWINGS



NOTES

1. REFER TO CONTRACT DRAWINGS AND SECTION 34 41 13 FOR DETAILED SPECIFICATIONS.

NOT TO SCALE

-------- FIELD WIRING

2008

UPS FIELD WIRING DIAGRAM

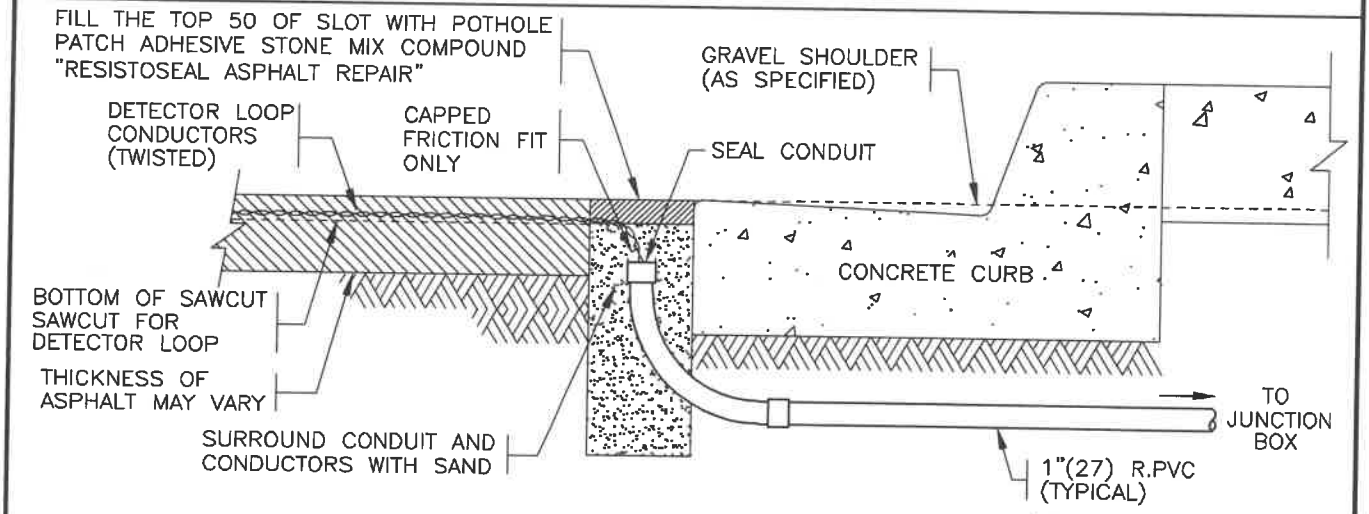
REV. NOV 2013

DRAWING NUMBER:

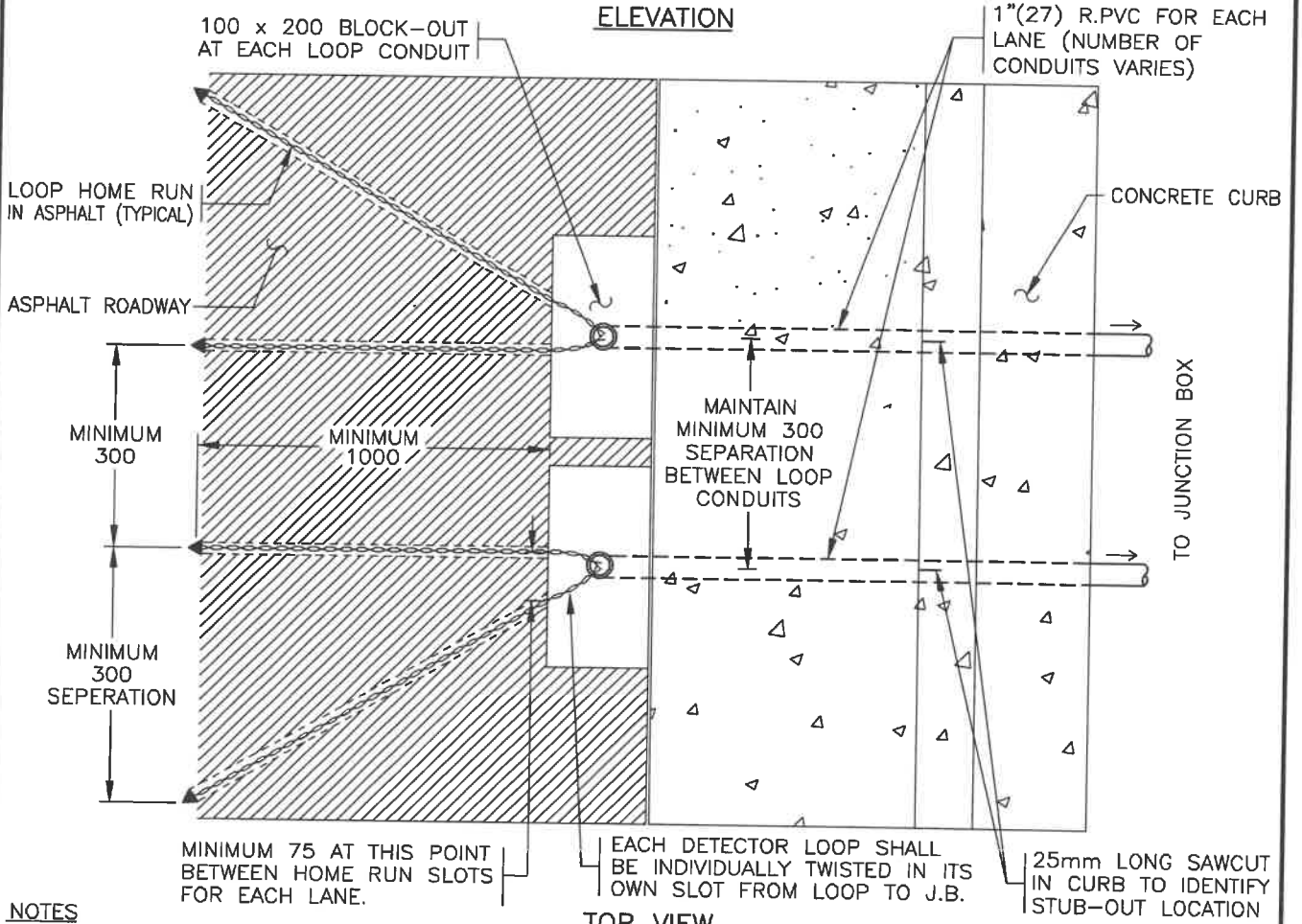
SS-E7.24

City of Coquitlam

STANDARD DETAIL DRAWINGS



ELEVATION



TOP VIEW

NOTES

1. REFER TO CONTRACT DRAWINGS AND SECTION 34 41 13 FOR DETAILED SPECIFICATIONS.
2. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE NOTED.

NOT TO SCALE

2008

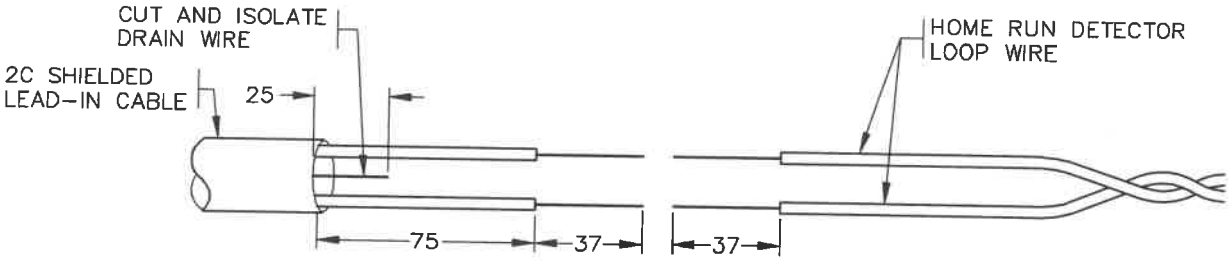
DETECTOR LOOPS

REV. NOV 2013

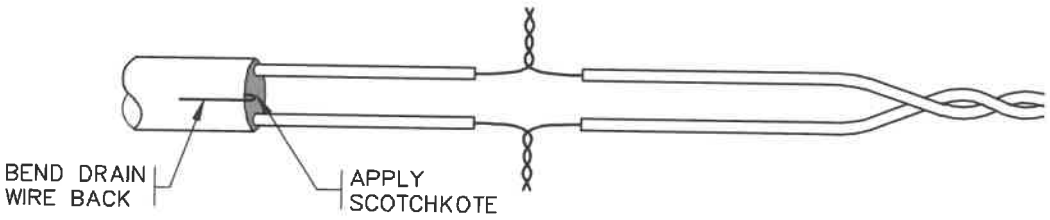
DRAWING NUMBER:

SS-E8.2

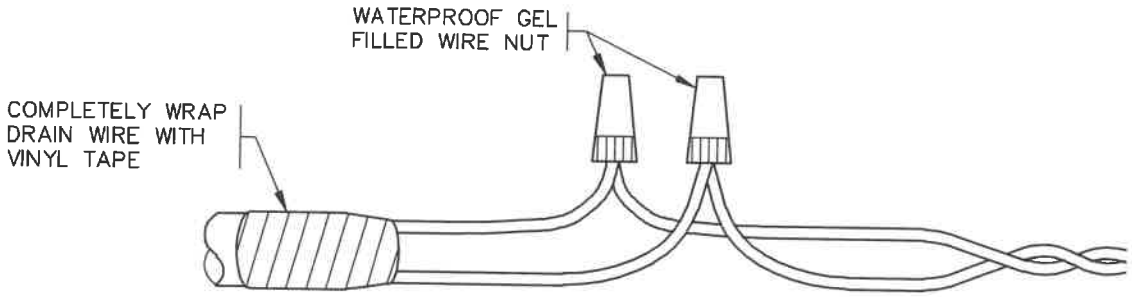
STEP 1. STRIP LOOP WIRES AND LEAD–IN CABLE



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



STEP 3. INSULATE EACH SOLDER JOINT SEPARATELY AND TY–RAP SPLICES FACING UP AT TOP OF JUNCTION BOX OR VAULT.



NOTES

1. REFER TO CONTRACT DRAWINGS AND SECTION 34 41 13 FOR DETAILED SPECIFICATIONS.
2. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE NOTED.

NOT TO SCALE

2008

DETECTOR LOOP TO SHIELDED CABLE SPLICES

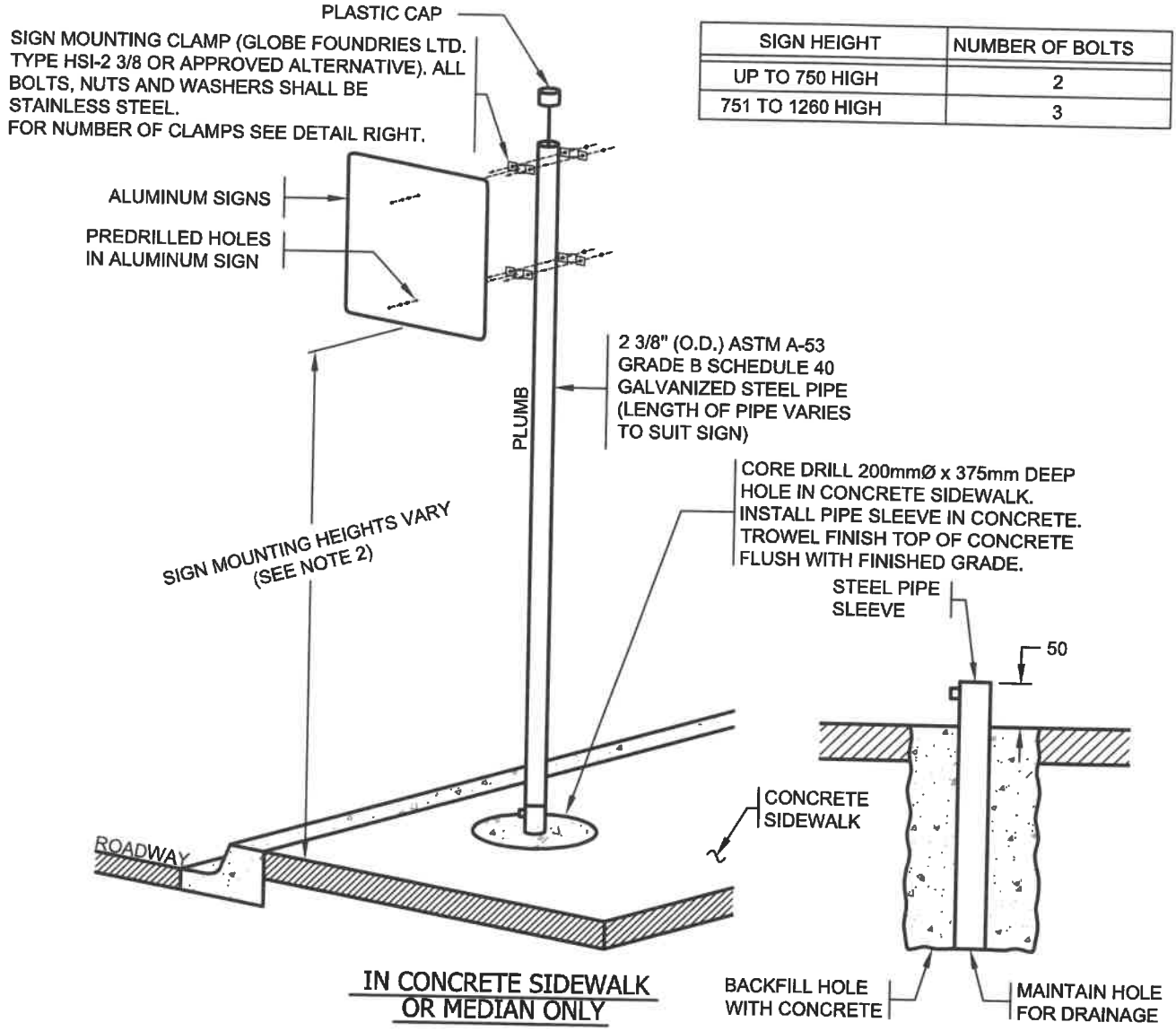
REV. NOV 2013

DRAWING NUMBER:

SS-E8.4

Coquitlam

STANDARD DETAIL DRAWINGS



IN CONCRETE SIDEWALK OR MEDIAN ONLY

SLEEVE INSTALLATION DETAIL

SIGN HEIGHT	NUMBER OF BOLTS
UP TO 750 HIGH	2
751 TO 1260 HIGH	3

NOTES

1. CONCRETE SHALL HAVE A MINIMUM STRENGTH OF 30 MPa PRIOR TO POST INSTALLATION.
2. SIGNS ARE TO BE MOUNTED AT A HEIGHT OF 2.2m FROM THE FINISHED SURFACE UNLESS OTHERWISE NOTED ON THE CONTRACT DRAWINGS.

WHERE INSTALLED IN GRAVEL SHOULDER OR ASPHALT ISLANDS, INSTALL POST ON CONCRETE BASE AS PER COQUITLAM STANDARD DETAIL DRAWING SS-E11.2

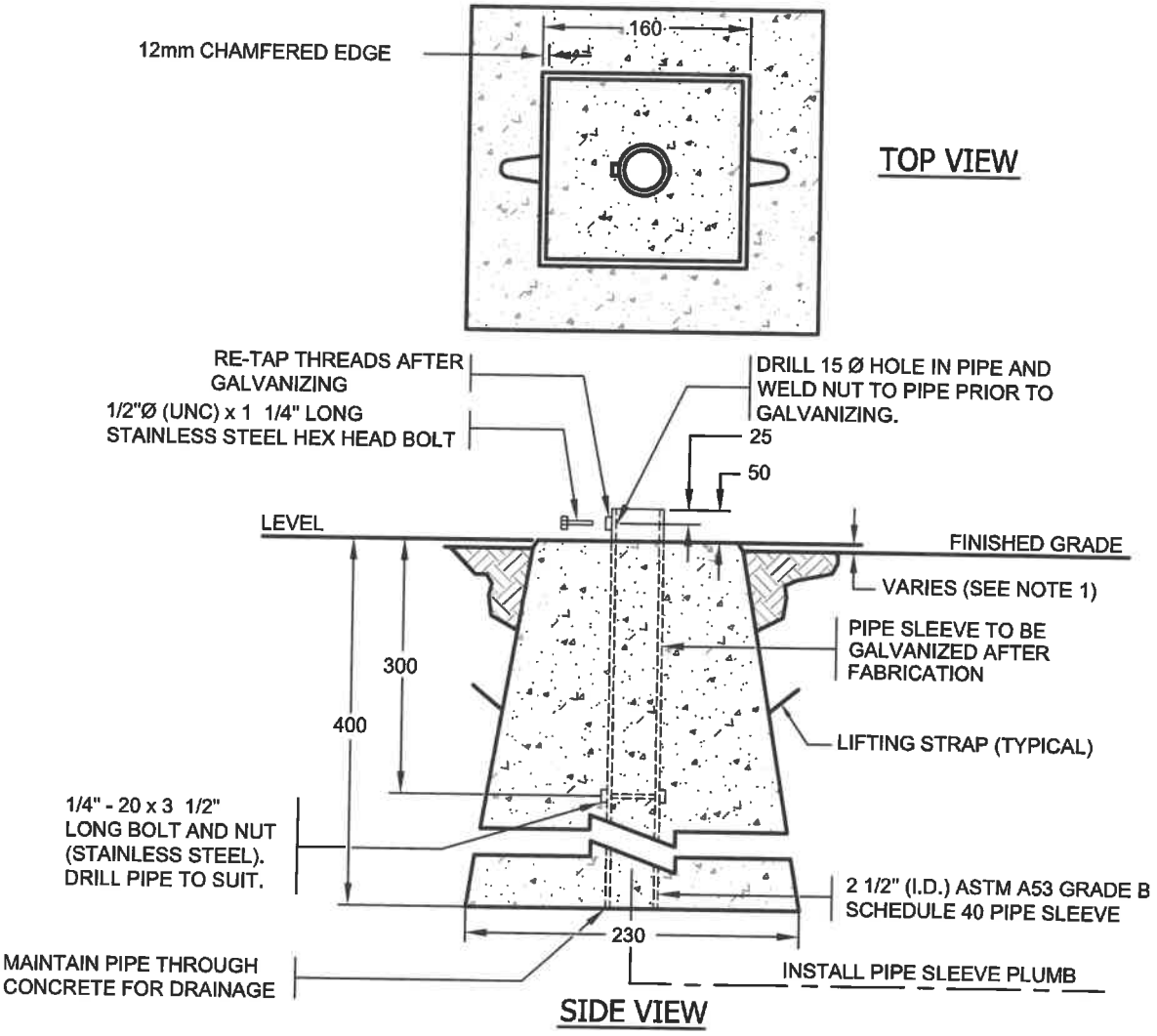
PLOTTED: 19–Feb–16

ALL DIMENSIONS IN METRES.

ROUND STEEL SIGN POST INSTALLATION DETAILS	DATE: NOV/2015 DRAWN: SCALE: N.T.S.	DRAWING NUMBER: SS-E11.1

Coquitlam

STANDARD DETAIL DRAWINGS



BASE TYPE	APPLICATION	APPROXIMATE MASS	VOLUME OF CONCRETE
a	SINGLE POST SIGNS IN PAVED ISLANDS OR CONCRETE SIDEWALKS	37 kg	0.015 m^3

NOTES

1. BASE SHALL BE INSTALLED 25mm ABOVE FINISHED GRADE EXCEPT WHERE INSTALLED IN SIDEWALK IT SHALL BE FLUSH WITH TOP OF SIDEWALK WITH NO CHAMFERED EDGE.

PLOTTED: 19–Feb–16

ALL DIMENSIONS IN METRES.

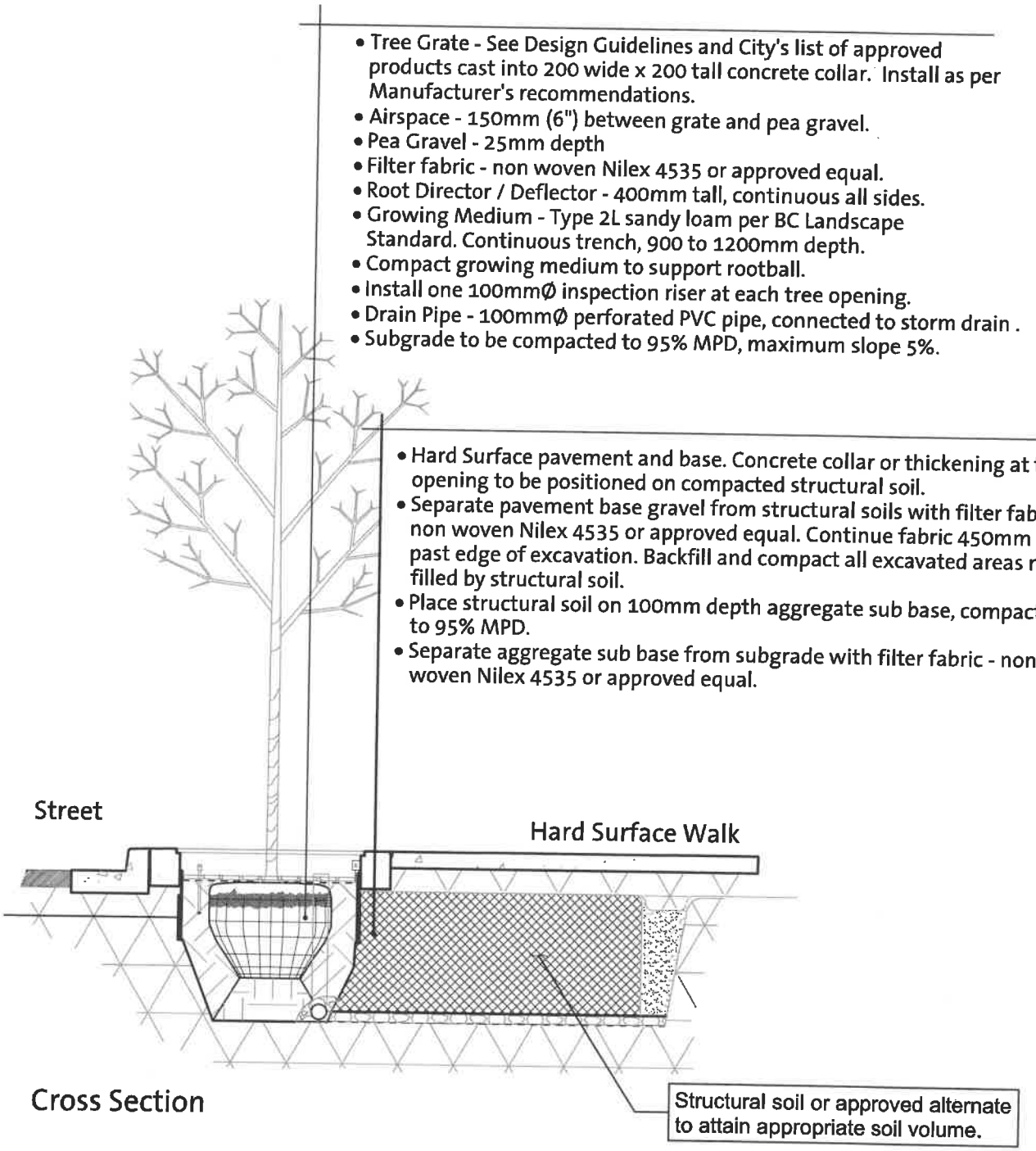
TRAPEZOIDAL CONCRETE BASE FOR ROUND STEEL SIGN POST (PRECAST)	DATE: NOV/2015	DRAWING NUMBER: SS-E11.2
	DRAWN:	
	SCALE: N.T.S.	

Coquitlam

STANDARD DETAIL DRAWINGS

Notes:

1. Provide growing medium volume as detailed on the contract drawings and as per City standards. Soil volume of structural soils to be void space of selected aggregate, with total volume adjusted to achieve minimum growing medium requirement.
2. Two flood bubblers required per tree, refer to the City's Irrigation System Specification.

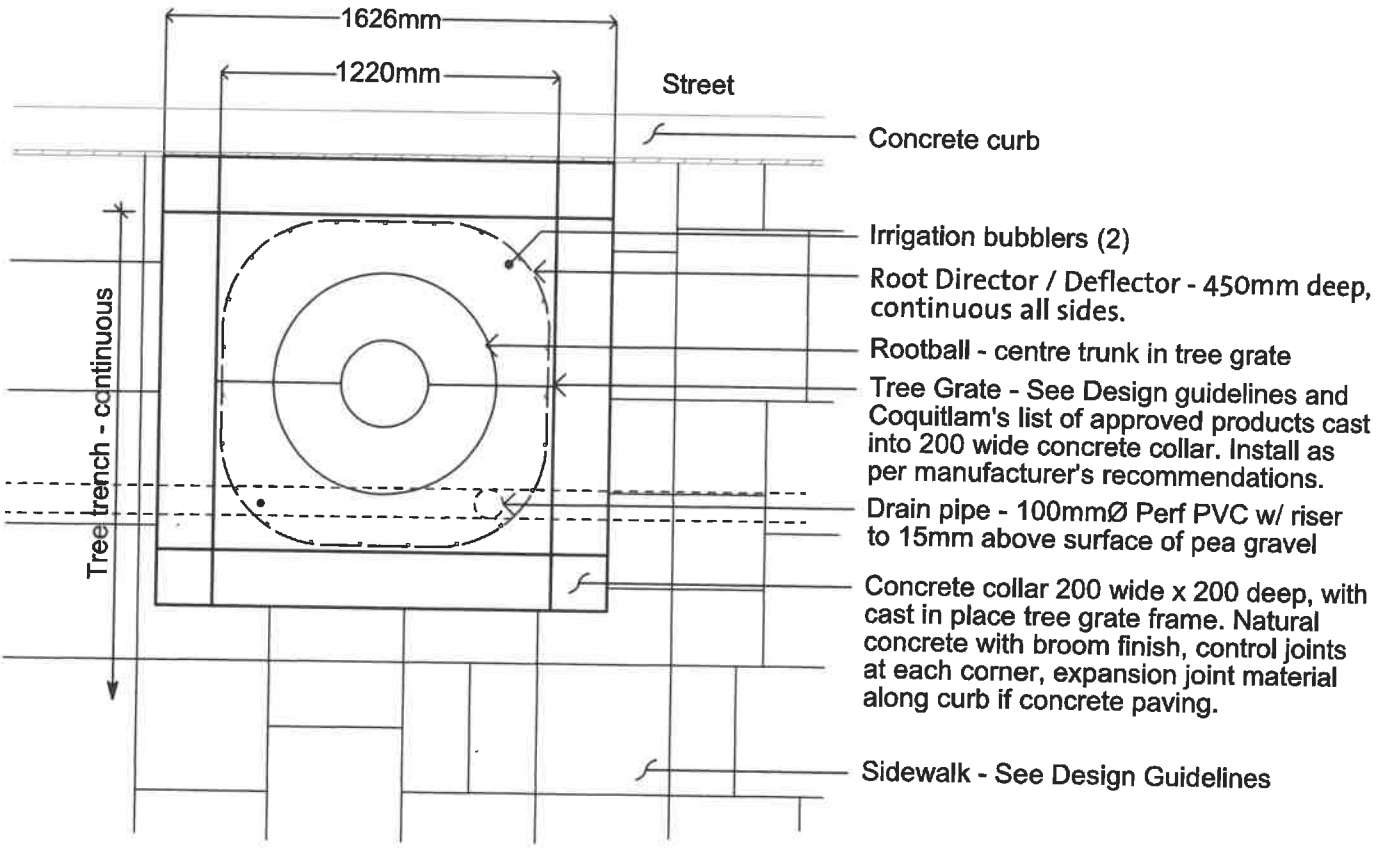


Cross Section

PLOTTED: 1–Mar–16

STREET TREE - METAL GRATE IN HARD SURFACE	DATE: DEC/2015	DRAWING NUMBER: COQ-L1A
	DRAWN: AJM	
	SCALE: N.T.S.	

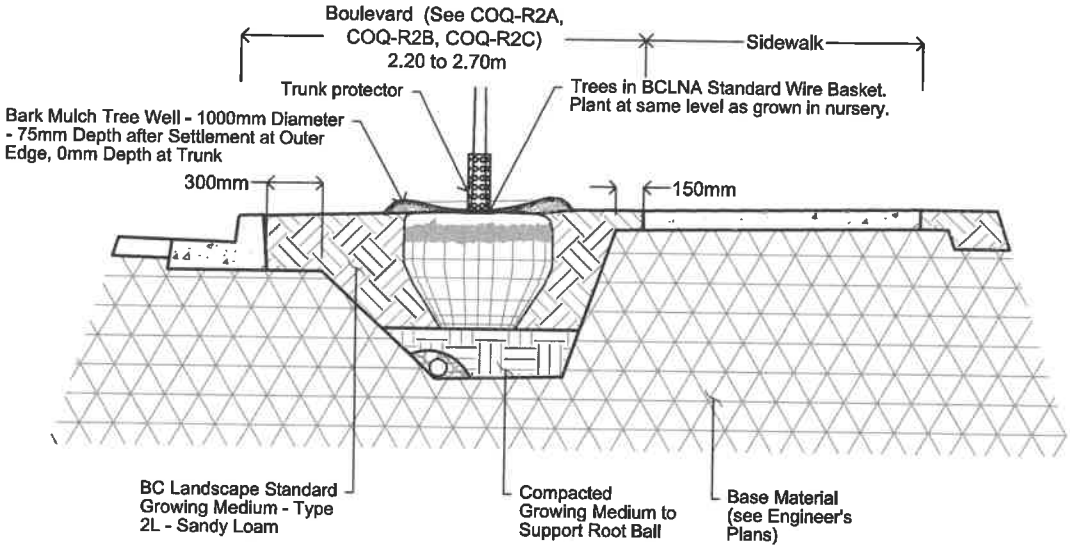
Note: Two flood bubblers required per tree, refer to City's Irrigation System Specification.



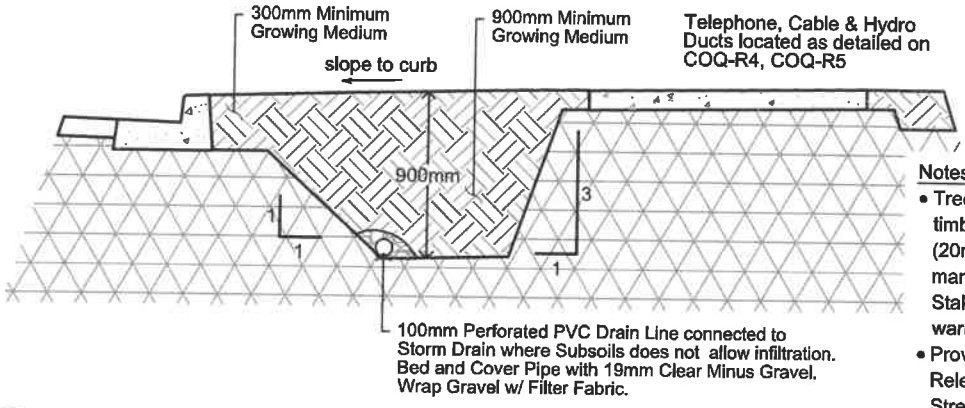
Plan View

PLOTTED: 1–Mar–16

STREET TREE - METAL GRATE IN HARD SURFACE	DATE: DEC/2015	DRAWING NUMBER: COQ-L1B
	DRAWN: AJM	
	SCALE: N.T.S.	



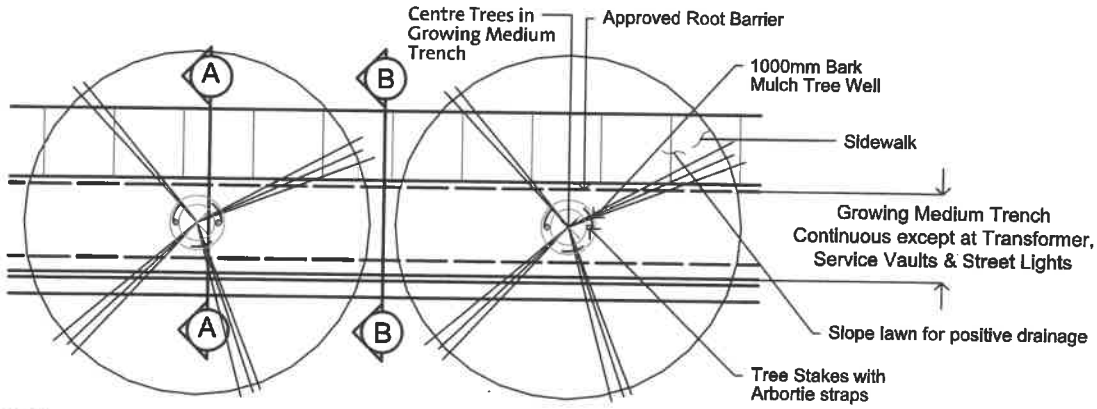
A Section Through Tree Location



Notes:

- Tree Stakes to be 2500 x 75Ø PT timber with two 20mm Arbortie (20mm) loops installed as per manufacturer's recommendations Stakes to be removed at end of warranty period;
- Provide One Treegator® Slow Release Watering Bag for each Street Tree.

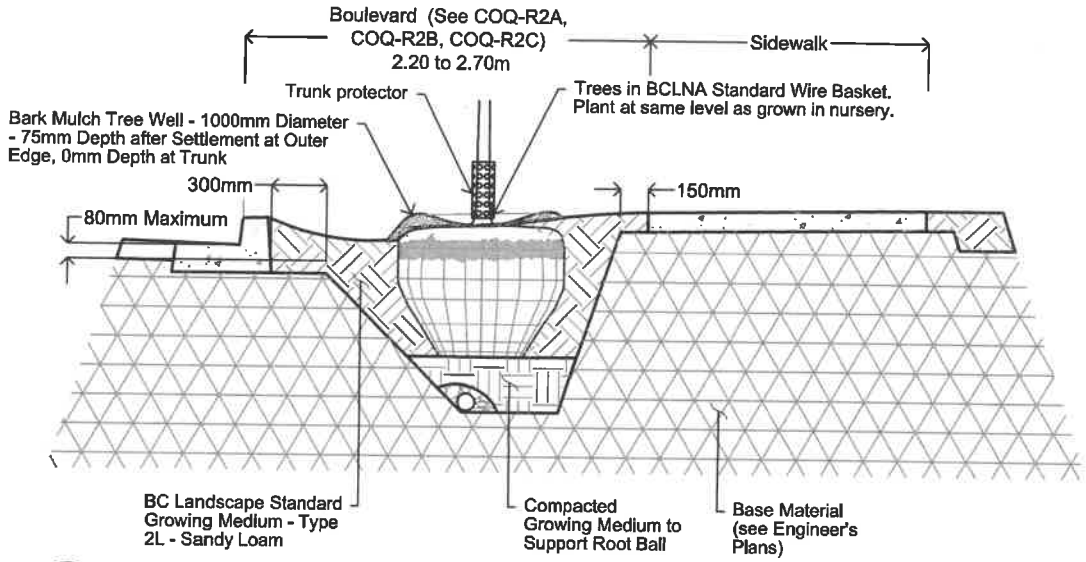
B Section Through Growing Medium Trench



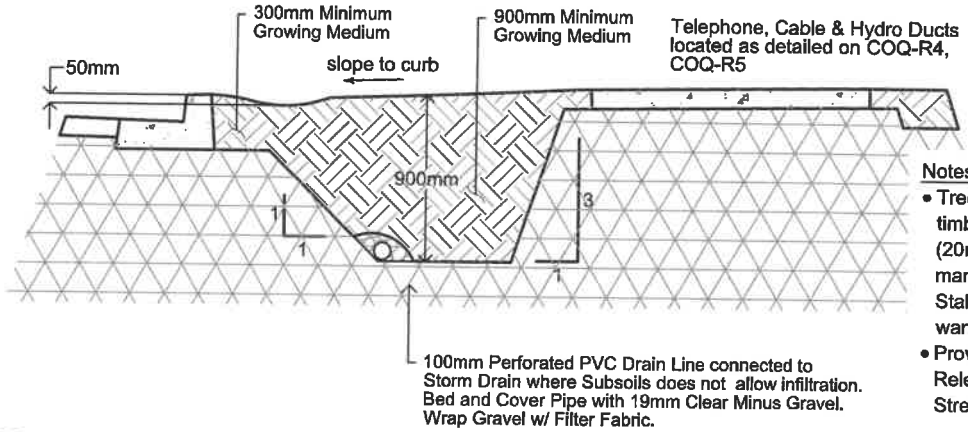
C Street Tree Plan

PLOTTED: 1–Mar–16

BOULEVARD TREE PLANTING WITHOUT SWALE	DATE: DEC/2015	DRAWING NUMBER: COQ-L2A
	DRAWN: AJM	
	SCALE: N.T.S.	



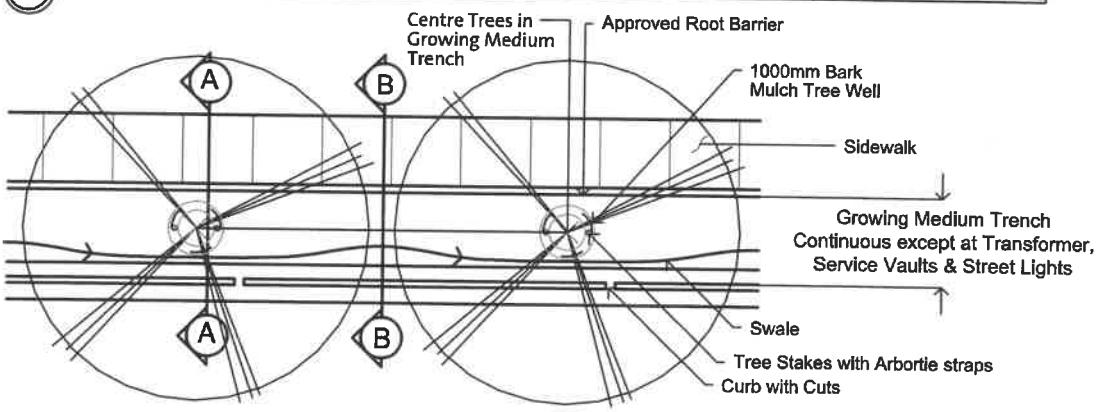
A **Section Through Tree Location**



Notes:

- Tree Stakes to be 2500 x 75Ø PT timber with two 20mm Arbortie (20mm) loops installed as per manufacturer's recommendations Stakes to be removed at end of warranty period;
- Provide One Treegator® Slow Release Watering Bag for each Street Tree.

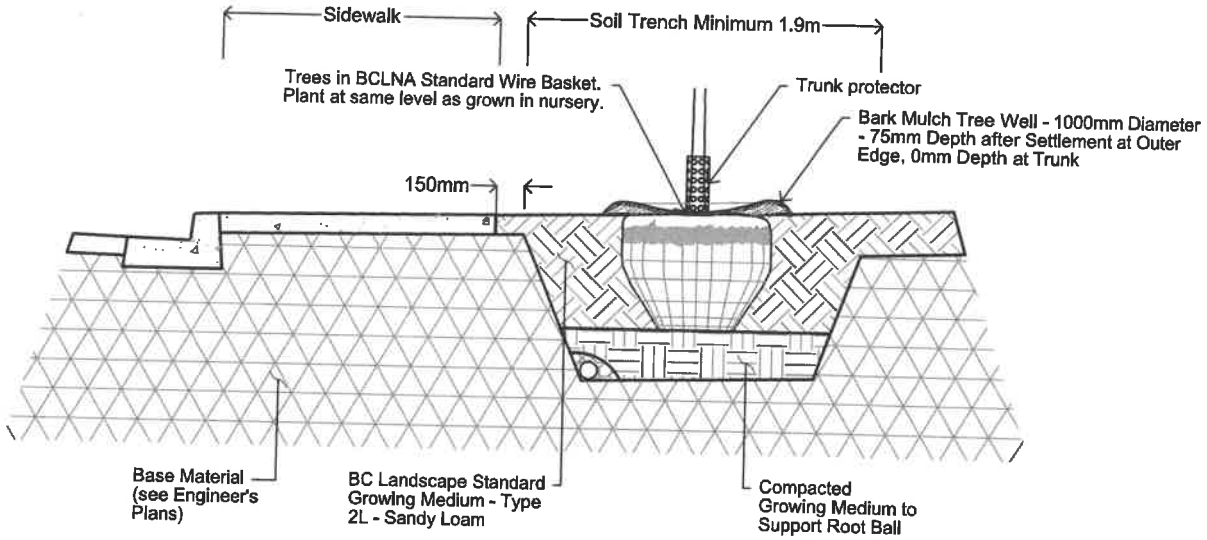
B **Section Through Growing Medium Trench**



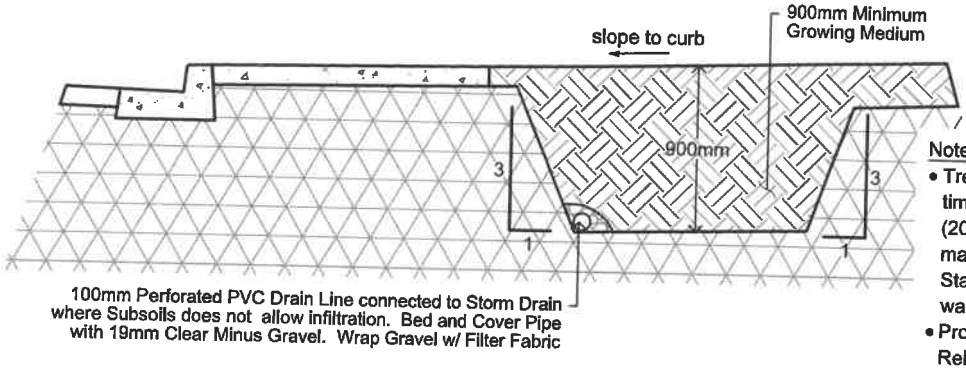
C **Street Tree Plan**

PLOTTED: 1–Mar–16

BOULEVARD TREE PLANTING WITH SWALE	DATE: DEC/2015	DRAWING NUMBER: COQ-L2B
	DRAWN: AJM	
	SCALE: N.T.S.	



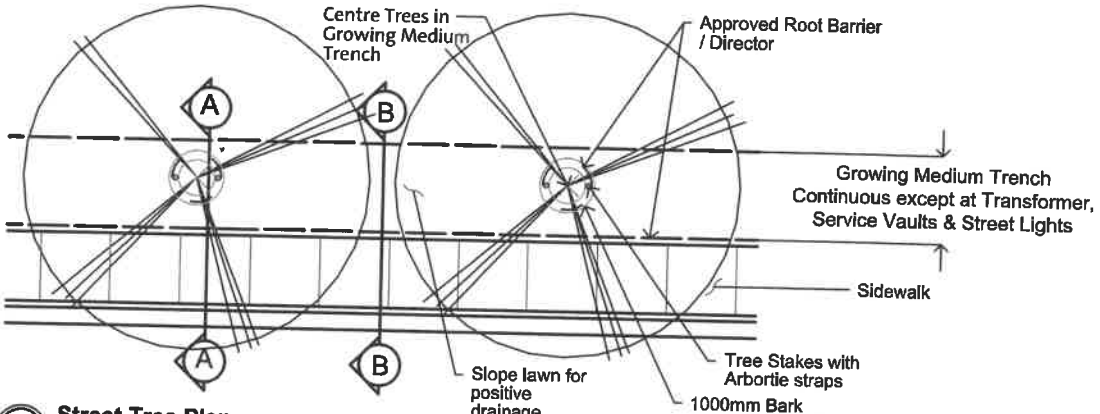
A Section Through Tree Location



Notes:

- Tree Stakes to be 2500 x 75Ø PT timber with two 20mm Arbortie (20mm) loops installed as per manufacturer's recommendations Stakes to be removed at end of warranty period;
- Provide One Treegator® Slow Release Watering Bag for each Street Tree.

B Section Through Growing Medium Trench



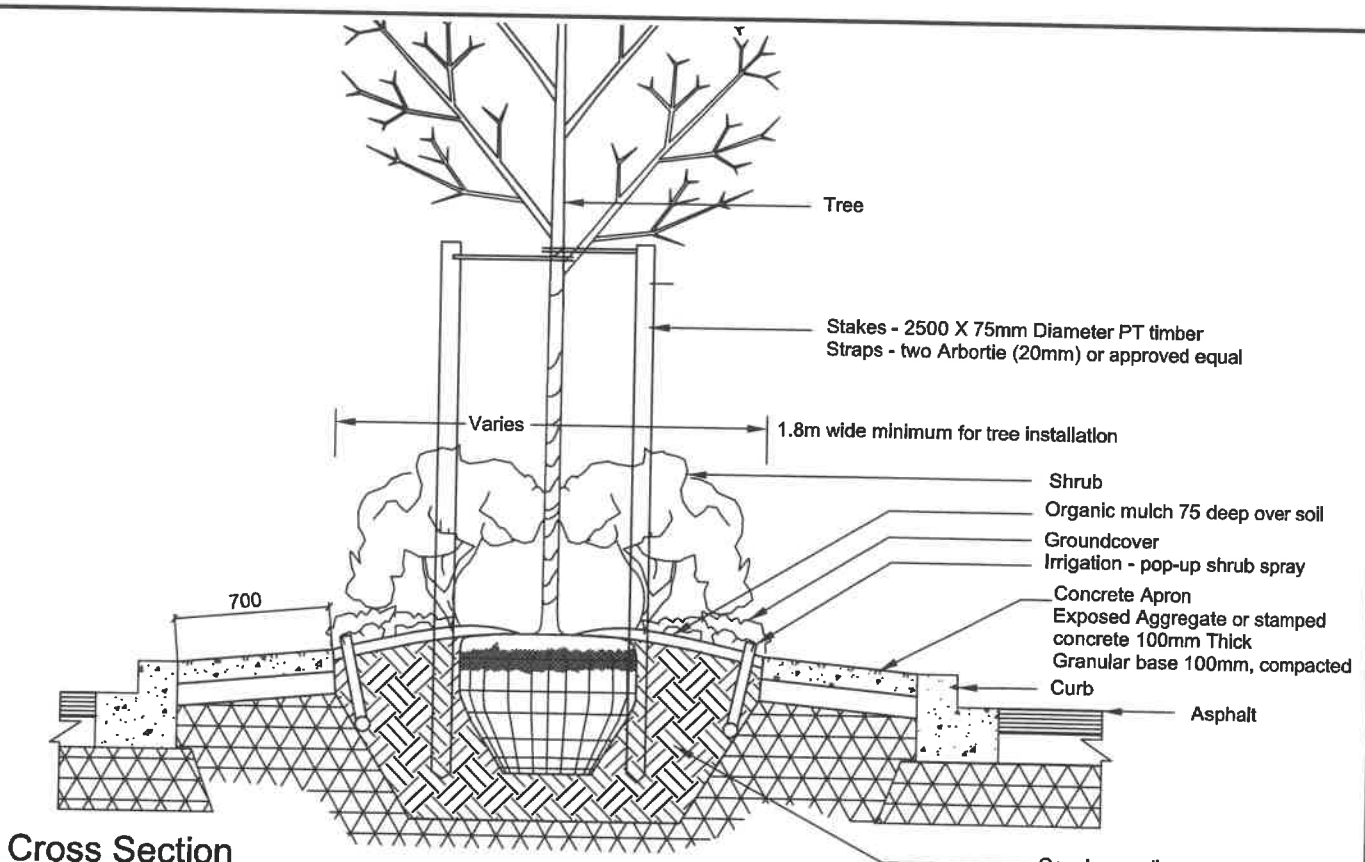
C Street Tree Plan

PLOTTED: 1–Mar–16

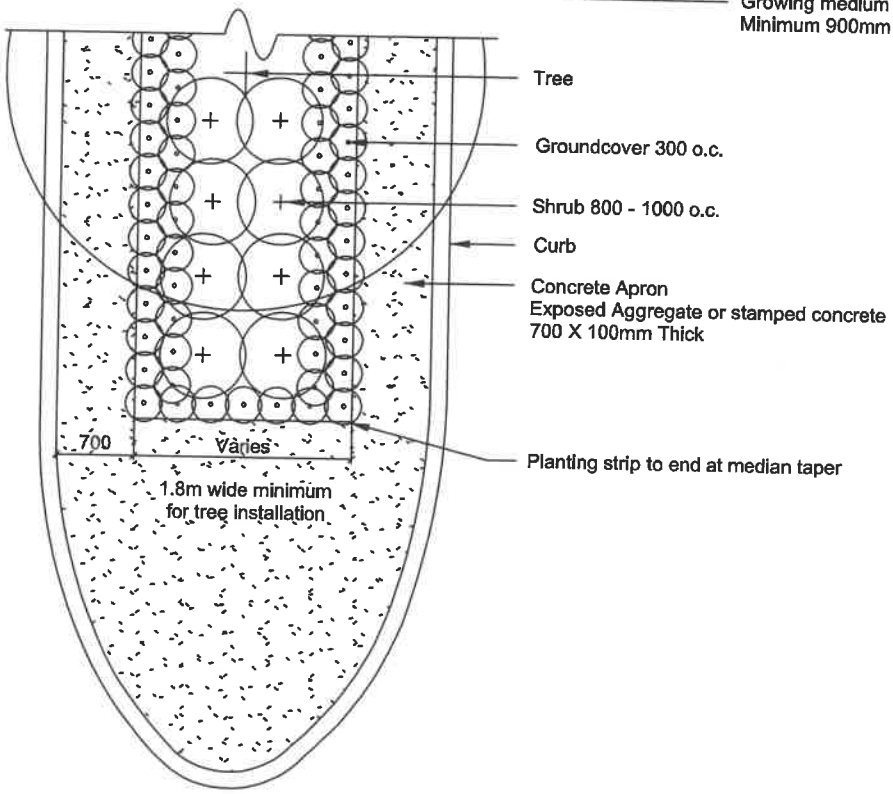
BOULEVARD TREE PLANTING BEHIND SIDEWALK	DATE: DEC/2015	DRAWING NUMBER: COQ-L2C
	DRAWN: AJM	
	SCALE: N.T.S.	

Coquitlam

STANDARD DETAIL DRAWINGS



Cross Section



PLOTTED: 26-Feb-16

MEDIAN TYPE 1
TREES, SHRUBS WITH APRON

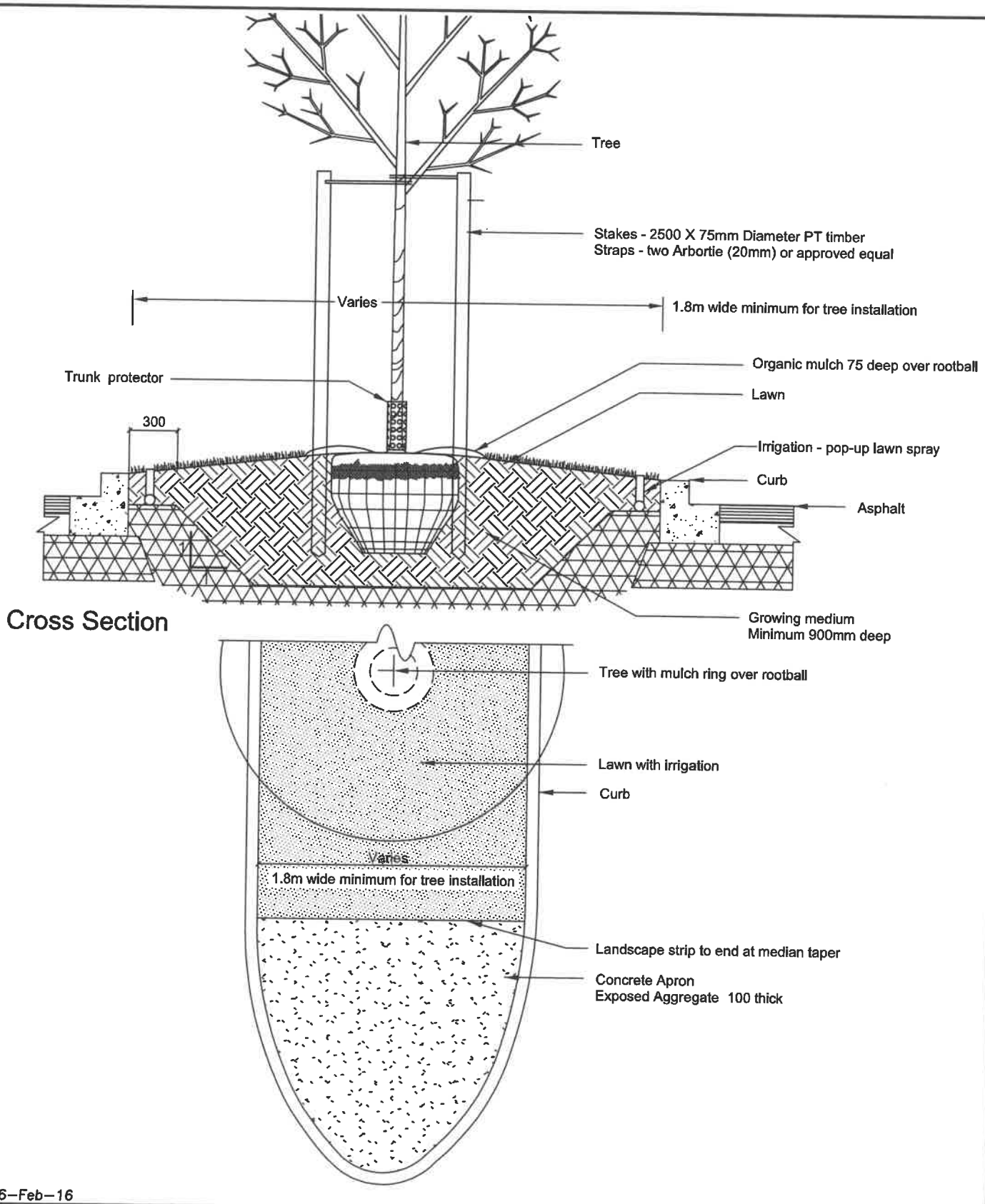
DATE:	NOV/2014
DRAWN:	AJM
SCALE:	N.T.S.

DRAWING NUMBER:

COQ-L3A

Coquitlam

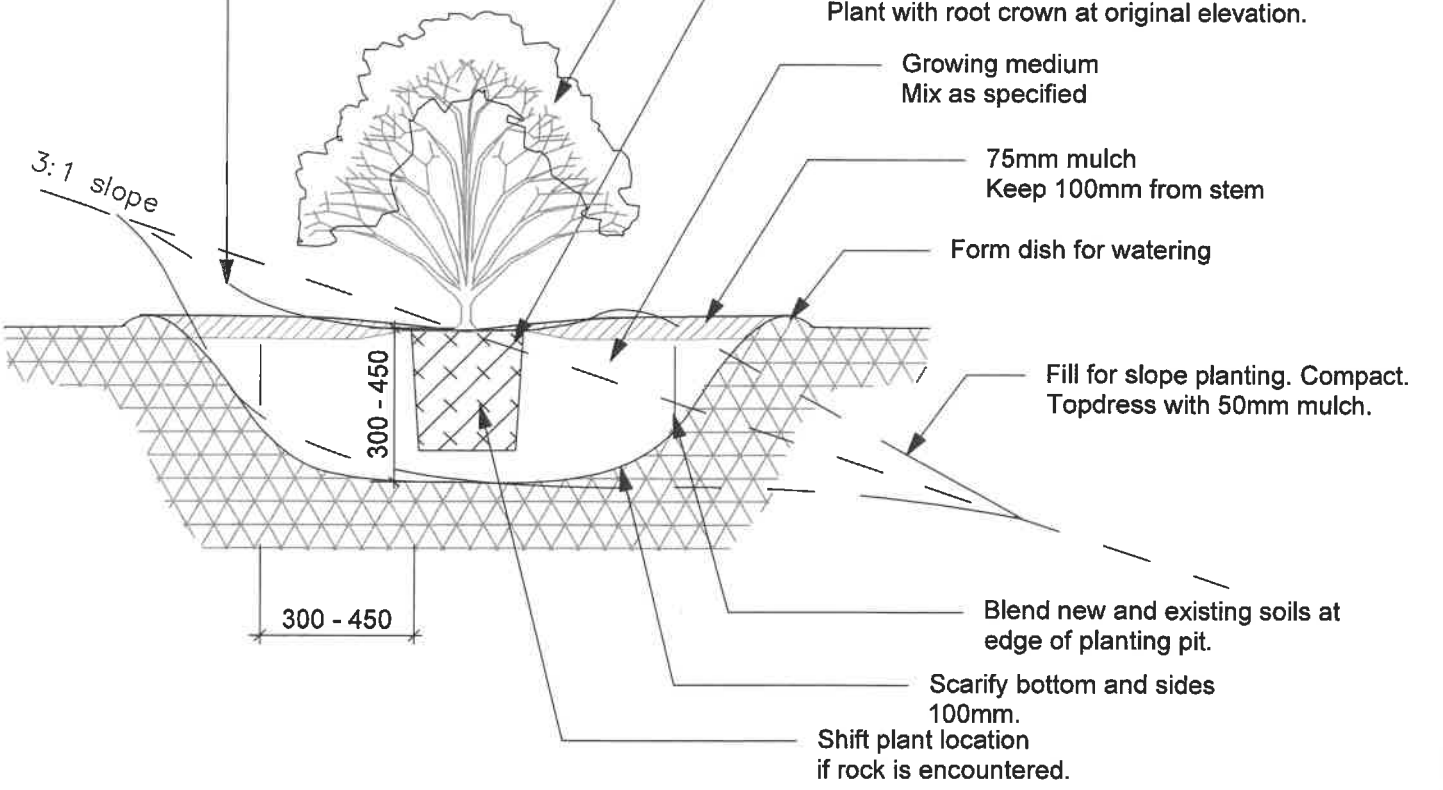
STANDARD DETAIL DRAWINGS



PLOTTED: 26–Feb–16

MEDIAN TYPE 2 TREES WITH LAWN	DATE: NOV/2014 DRAWN: AJM SCALE: N.T.S.	DRAWING NUMBER: COQ-L3B

Note:
1. Planting and plant material in accordance with latest Canadian Landscape Standard.
2. Soil depth small/medium shrubs: 300mm plus 300mm around all sides.
3. Soil depth large shrubs: 450mm depth plus 450mm around all sides.
4. Planting soil depth to be continuous in planting beds.



APPROVED BY: G.M. ENGINEERING & PUBLIC WORKS
AUG. 2023

SHRUB PLANTING

REVISION DATE:	APR/2023
DRAWN:	AJM
SCALE:	N.T.S.

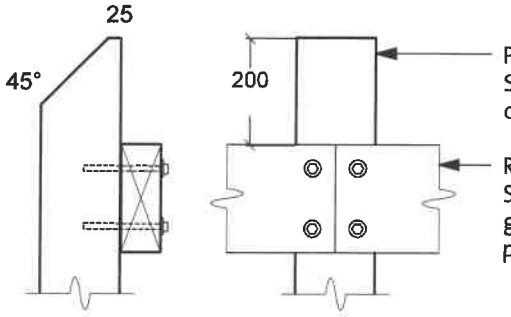
DRAWING NUMBER: COQ-L4

Coquitlam

STANDARD DETAIL DRAWINGS

Notes:

1. All wood to be #2 or better pressure treated S4S Douglas Fir.
2. All cuts to be treated with 2 coats wood preservative to match PT colour.
3. All metal hardware to be hot dip galvanized unless noted otherwise.
4. Sign at riparian area only: Sensitive Fish and Wildlife Habitat - No Disturbance Area (Section 219 Land Title Act).
5. Fencing (when prescribed by City of Coquitlam) - Black vinyl coated chain link mesh. Attach to timber posts and rails with heavy duty staples. Gap to ground varies with terrain - 150mm maximum to 50mm minimum. Do not extend mesh above top rail.

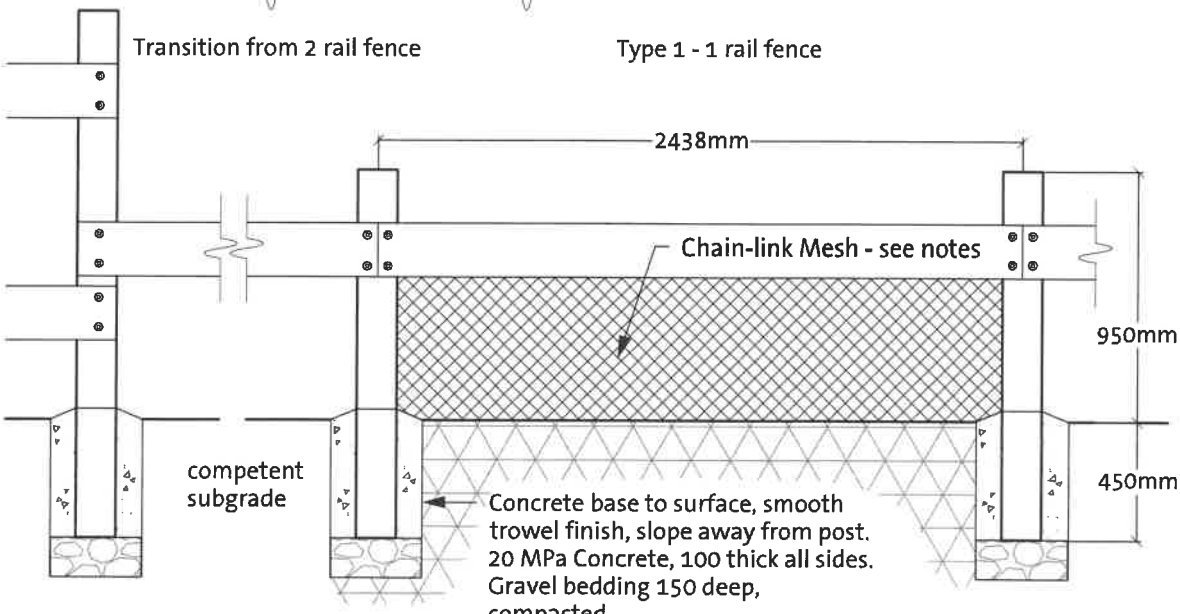


Post - 6" x 6" Chamfer cut top @ 45°. Sand smooth cut and edges, treat cut with preservative.

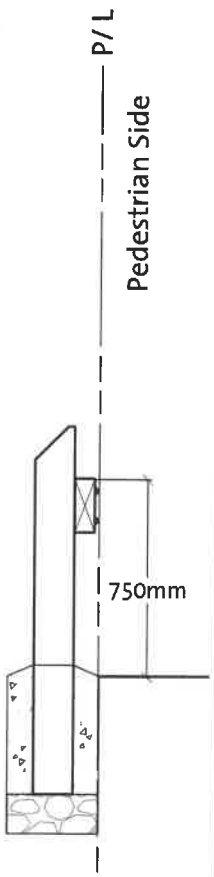
Rail - 3" x 8"
Secure with two 12mm x175 HD galvanized lag bolts with washer per post. Pre-drill holes.

Transition from 2 rail fence

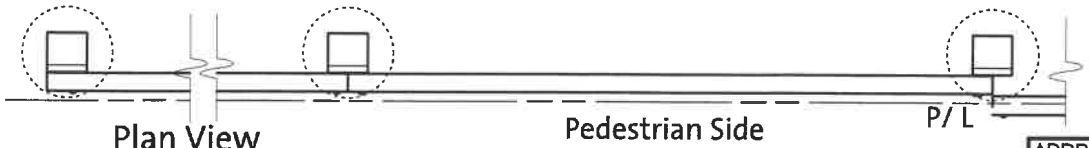
Type 1 - 1 rail fence



Front Elevation



End Elevation



Plan View

APPROVED BY: G.M. ENGINEERING & PUBLIC WORKS
AUG. 2023

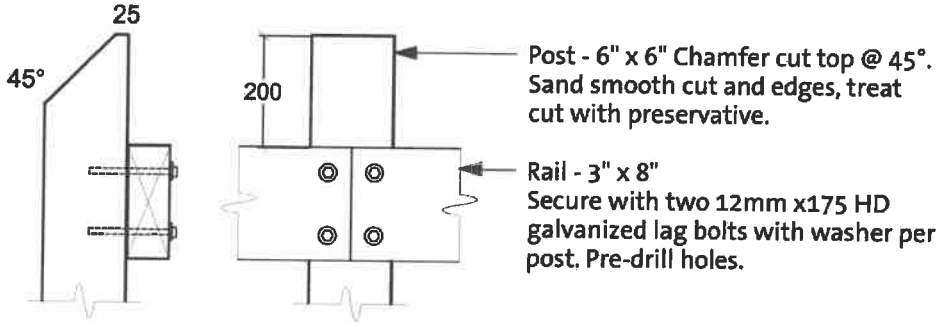
FENCE TYPE 1 SINGLE RAIL TRAIL FENCE	REVISION DATE: APR/2023 DRAWN: AJM SCALE: N.T.S.
	DRAWING NUMBER: COQ-L5A

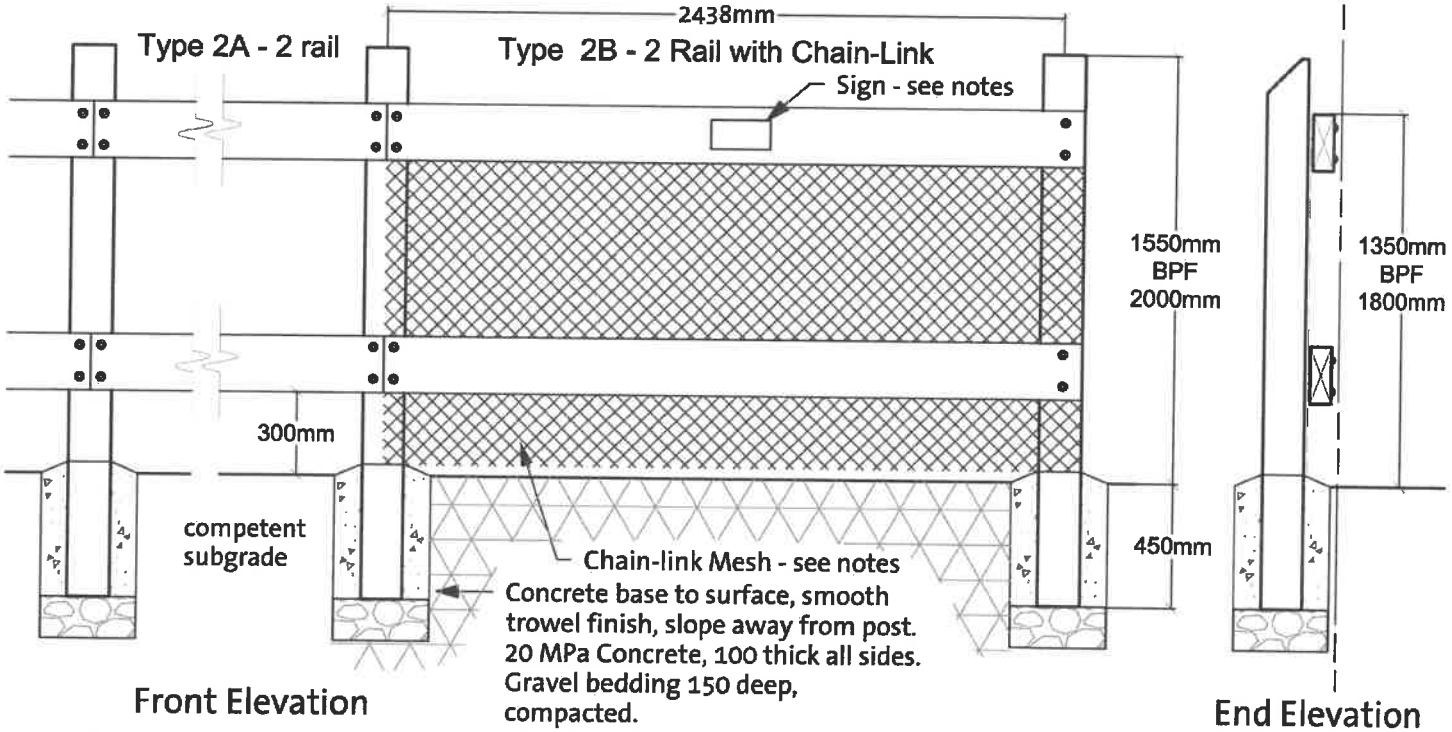
Coquitlam

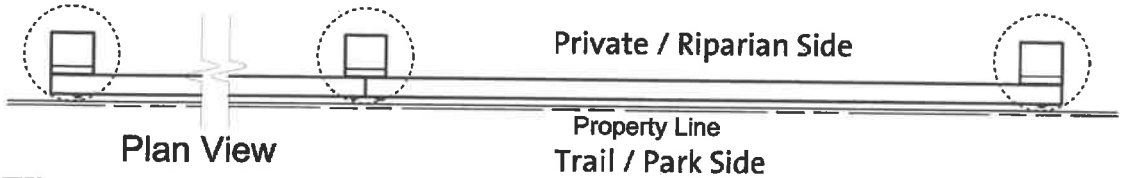
STANDARD DETAIL DRAWINGS

Notes:

1. All wood to be #2 or better pressure treated Douglas Fir.
2. All cuts to be treated with 2 coats wood preservative to match PT colour.
3. All metal hardware to be hot dip galvanized unless noted otherwise.
4. Sign at riparian area only: Sensitive Fish and Wildlife Habitat - No Disturbance Area (Section 219 Land Title Act).
5. Fencing - Black vinyl coated chain link mesh. Attach to timber posts and rails with heavy duty staples. Gap to ground varies with terrain - 150mm maximum to 50mm minimum. Do not extend mesh above top rail.
6. BPF - Bear & Predator resistant Fence dimensions.







Plan View

PLOTTED: 1-Mar-16

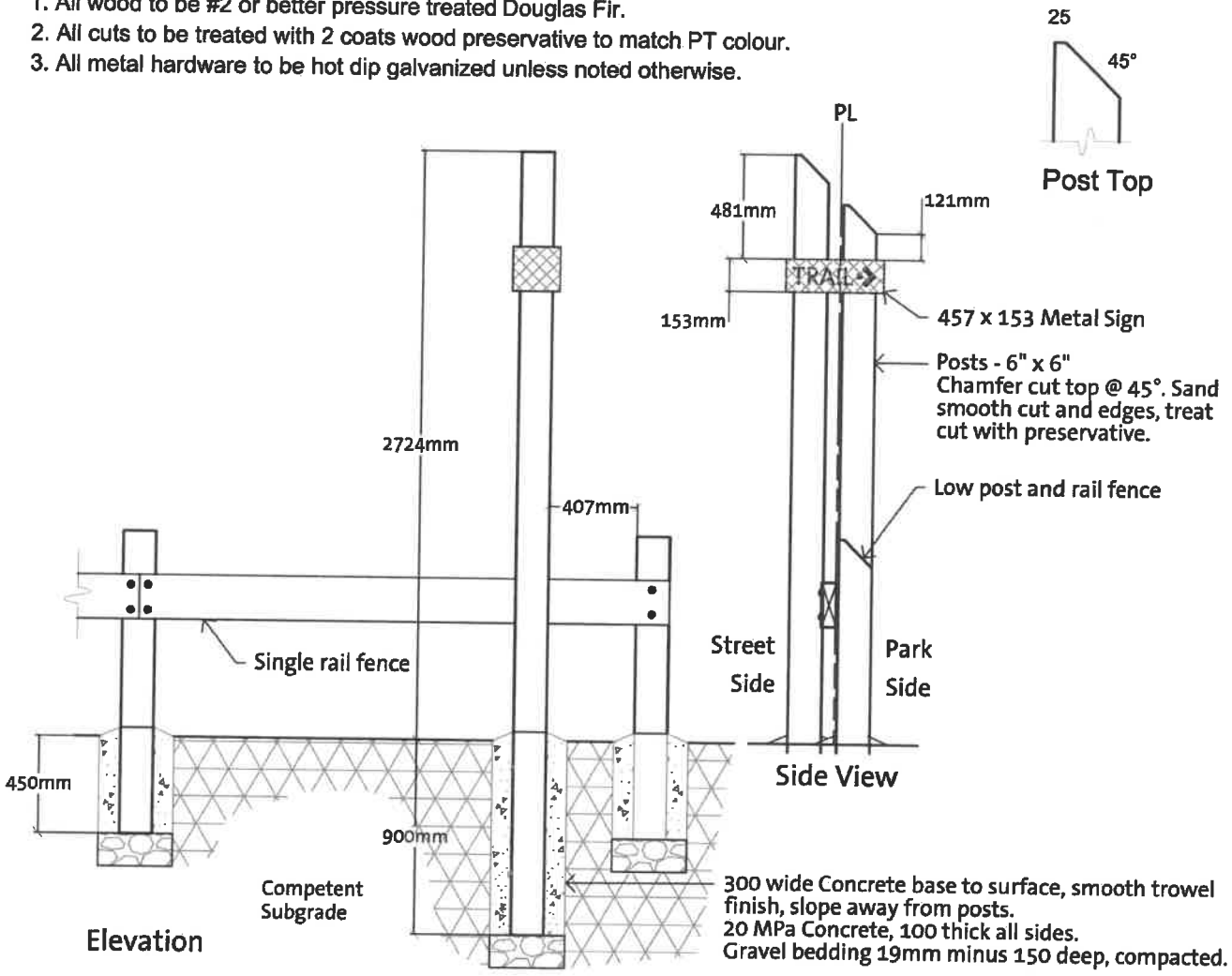
FENCE TYPE 2 DOUBLE RAIL TRAIL FENCE	DATE: FEB / 2019 DRAWN: AJM SCALE: N.T.S.	DRAWING NUMBER: COQ-L5B

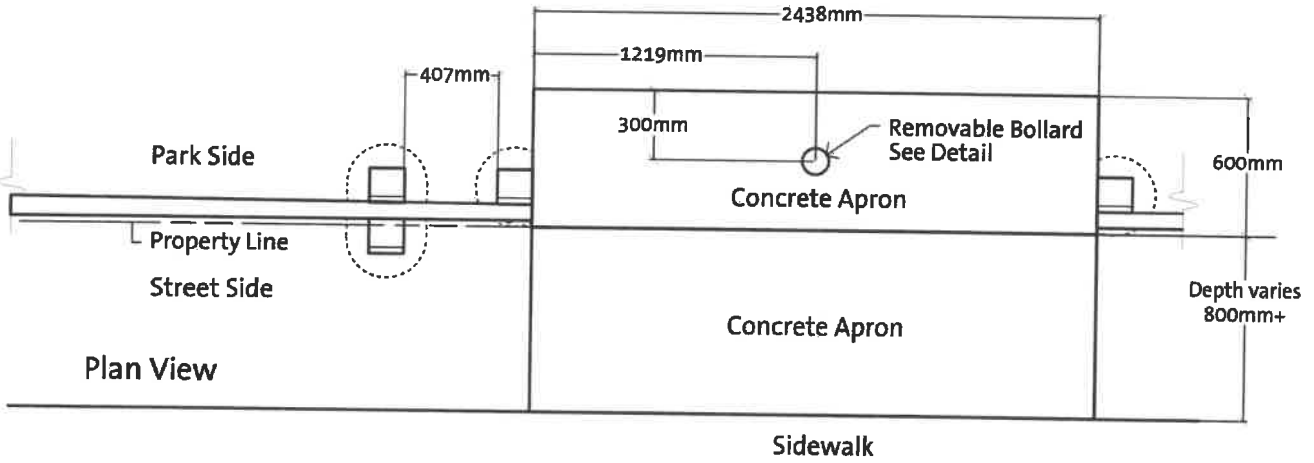
Coquitlam

STANDARD DETAIL DRAWINGS

Notes:

1. All wood to be #2 or better pressure treated Douglas Fir.
2. All cuts to be treated with 2 coats wood preservative to match PT colour.
3. All metal hardware to be hot dip galvanized unless noted otherwise.



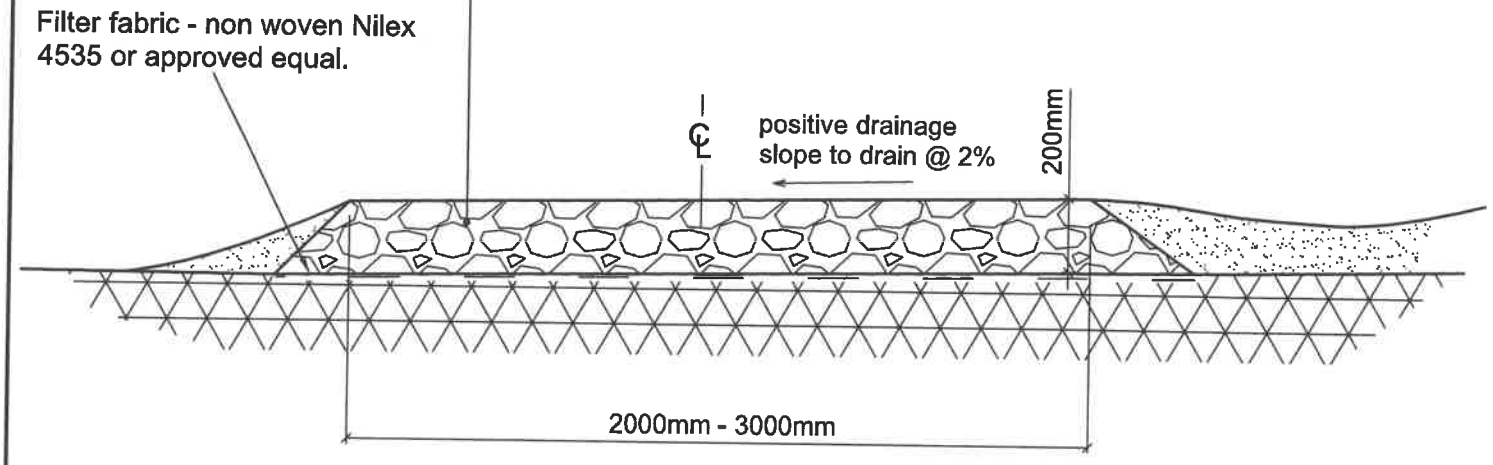


PLOTTED: 29-Feb-16

TRAIL MARKER TRAIL ENTRY AND PARK FENCE	DATE: FEB / 2019 DRAWN: AJM SCALE: N.T.S.	DRAWING NUMBER: COQ-L6

Notes:
1. Ensure unobstructed drainage pattern through length of swale running parallel to path.
2. If drainage is required to cross the path, pipe to be installed below trail so that no overland flow croses the path.

- Crushed 9 mm minus trail base see Coquitlam's list of approved products. Compact to 95% MPD, typical for all trail material. Slope finished grade to drain @ 2% minimum, cross slope or crown as determined by site conditions.
- Install 75mm minus structural fill in wet areas as directed. Separate from trail base with woven filter cloth.
- Subgrade to be competent. Excavate and dispose of unsuitable material. Backfill with approved aggregate and compact to 95% MPD.
- Reinstate path edge to blend with surrounding area.



PLOTTED: 29-Feb-16

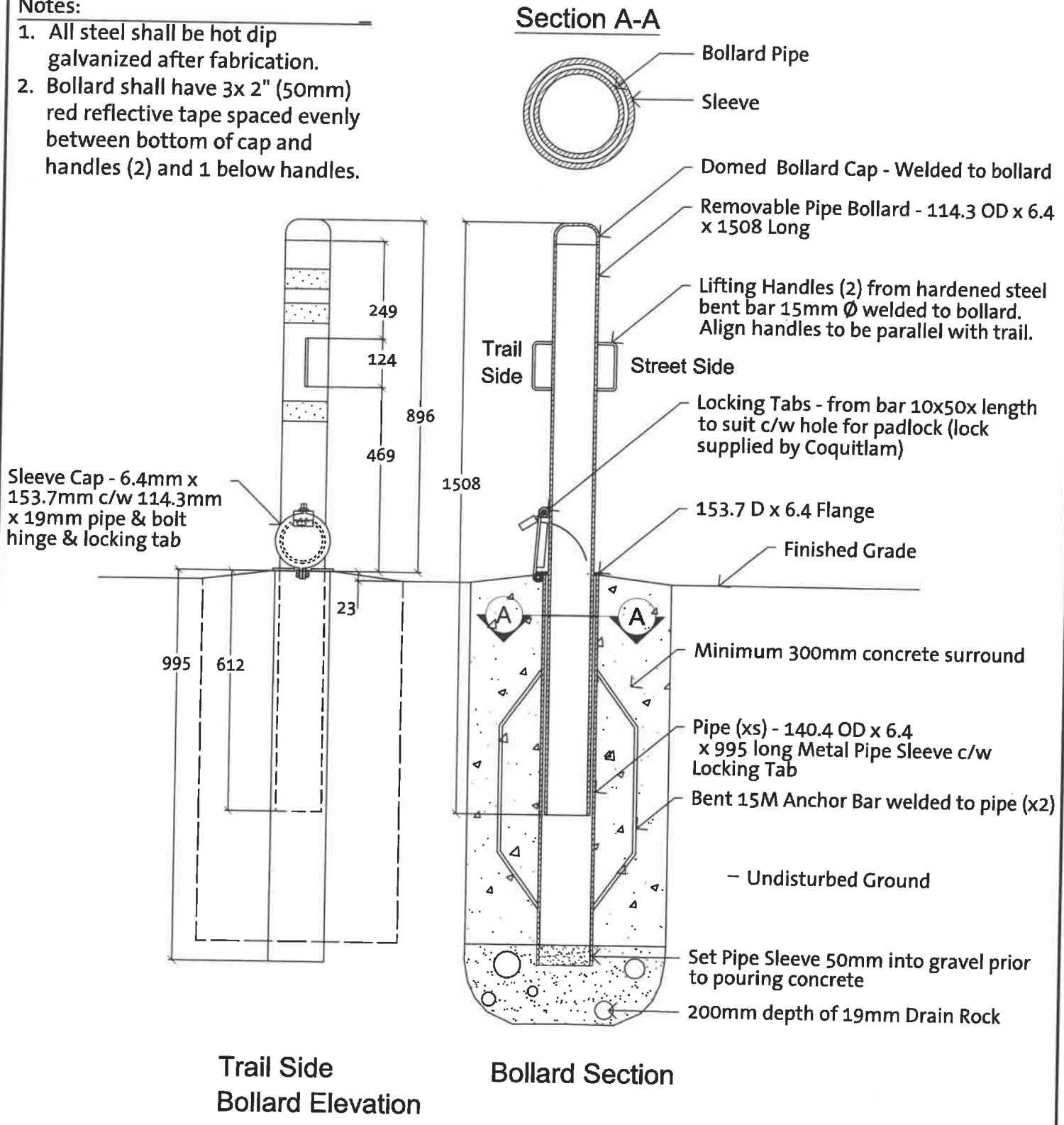
AGGREGATE TRAIL	DATE: NOV/2014	DRAWING NUMBER: COQ-L7
	DRAWN: AJM	
	SCALE: N.T.S.	

Coquitlam

STANDARD DETAIL DRAWINGS

Notes:

1. All steel shall be hot dip galvanized after fabrication.
2. Bollard shall have 3x 2" (50mm) red reflective tape spaced evenly between bottom of cap and handles (2) and 1 below handles.



PLOTTED: 29–Feb–16

REMOVABLE STEEL BOLLARD	DATE: DEC/2016 DRAWN: AJM SCALE: N.T.S.	DRAWING NUMBER: COQ-L8