City of Campbell River

BYLAWS

WORKS AND SERVICES

BYLAW 3948, 2024

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WORKS AND SERVICES

Bylaw No. 3948, 2024

ADOPTED June 4, 2024

PURPOSE

This bylaw sets out to provide standards and regulations for the provision of works and services required for subdivision and building permit development.

CONTENTS

The Council of the City of Campbell River enacts as follows:

PART 1: Title

1.1 This bylaw may be cited for all purposes as "**Works and Services Bylaw 3948, 2024"**.

PART 2: Definitions

2.1 Unless otherwise defined herein, all words or expressions in this Bylaw shall have the same meaning as any similar words or expressions contained in the *Land Title Act*, the *Community Charter*, the *Local Government Act* and the *Strata Property Act;* or if not referenced therein, then all words or phrases shall have their common dictionary definition.

2.2 In this bylaw

Approving Officer means the person appointed by the *City Council* as *Approving Officer* pursuant to the *Land Title Act*.

Building Permit means a permit issued under the Building Bylaw No. 3899, as amended or superseded.

City means the City of Campbell River.

Contractor means a person engaged by an *Owner* or the *City* to construct *Works and Services* required by this Bylaw.

Council means the elected council of the *City*.

Development includes the construction of any structure requiring a *Building Permit,* the *subdivision* of lands, and any land improvement requiring the installation of *Works and Services*.

Development Engineering Manager means the person who is responsible to approve works and servicing requirements.

Final Acceptance means the acceptance of *Works and Services* as certified by the *Development Engineering Manager*, which may only be given once the Maintenance Period is over and the *Works and Services* are performing as originally intended.

Frontage means a parcel boundary, or any portion of a parcel boundary, that abuts a *Highway*.

Highway means a roadway, pathway, walkway, trail, lane, bridge, road, thoroughfare, and any other public way but excludes private easements, and access routes as defined in *Strata Property Regulations*.

Lot Line Adjustment means the repositioning of parcel boundaries between two or more parcels where no new parcels are created.

Maintenance Period means the one-year period during which a maintenance agreement remains in force during which the Owner is required to make repairs to any Works and Services that fail to perform as intended.

MMCD or Master Municipal Construction Documents means the most recent version of the documents referenced within this bylaw that are issued by the Master Municipal Construction Documents Association including any revisions issued by the Association, specifically the MMCD Design Guidelines and MMCD Standards and Specifications

Owner means the registered *owner* of land on which the construction works are undertaken and includes the *owner's* agent and *contractor*.

Panhandle means a parcel that utilizes a narrow piece of land to provide principle access and servicing to the site. The minimum width of the *panhandle* portion of a lot shall be 6.0 meters.

Qualified Professional Engineer means a person who is registered or licensed to practice professional engineering in British Columbia under the provisions of the *Professional Governance Act* with the Engineers and Geoscientists of BC – who is responsible for the design and construction supervision and certification of all required *Works and Services*.

***Dwelling Unit** is* as defined in the Zoning Bylaw 3250, 2006 as amended or superseded.

Security means either cash or a clean, unconditional and irrevocable stand-by letter-of-credit that provides for automatic renewals, drawn in favor of the *City* on a Canadian chartered bank or other institution acceptable to the *City*, and in the form acceptable to the *City*.

Subdivision is as defined in the Land Title Act, and also includes a Lot Line Adjustment.

Works and Services means the *works and services* an *owner* of lands is required to provide under this Bylaw, including all design, construction, installation and certification.

Works and Services Agreement means an agreement between the *Owner* and the *City* for the construction and installation of *Works and Services* that are required under this bylaw and pursuant to the *Local Government Act*.

PART 3: Applicability

3.1 As a condition of the approval of a *subdivision* or issuance of a *building permit* the *owner* of the land shall provide the *Works and Services* required by this bylaw to the satisfaction of the *Development Engineering Manager.*

3.2 When any *owner* of land requests to install any new or modified *Works and Services,* they shall be provided to the standards required by this bylaw to the satisfaction of the *Development Engineering Manager.*

3.3 An *Owner* is not required to provide *Works and Services* in the case of:

a. a *Lot Line Adjustment*;

b. Where existing *Works and Services* have been previously constructed and maintained to a condition reasonably consistent with the requirements of this Bylaw – however *Works and Services* that are identified as being in poor condition in a *City* Asset Management registry shall be required to be modified and/or replaced to standards consistent with this bylaw;

c. Development authorized by a *Building Permit* that meets either of the following conditions:

i. *The permit* will result in two or less dwelling units on the same parcel– with the exception of meeting water meter requirements as specified in the *City* Water Bylaw.

ii. The permit does not increase the gross floor area of an existing building.

3.4 The *Approving Officer*, in their sole discretion, may determine that *Works and Services* required by this bylaw can be deferred to a future date. In such cases, the *Approving Officer* may require the registration of a restrictive covenant under Section 219 of the *Land Title Act* restricting further *development* on the lands until the *works and services* are complete.

3.5 In lieu of constructing or altering *Works and Services* required by this bylaw, the *Development Engineering Manager* may require an *Owner* to pay cash-in-lieu if the *City* determines on the basis of sound civil engineering practice or cost considerations that the works should be constructed or altered at a later time. The amount shall be 125% of the cost of constructing or altering the Works and Services as of the time of subdivision approval or issuance of building permit and shall be based on a Qualified Professional Engineer's Class B cost estimate (as defined in the current edition of the 'Budget Guidelines for Consulting Engineering Services' by Engineers and Geoscientist BC (current edition).

PART 4: Authorizations

4.1 *Council* delegates to the *Approving Officer Council's* powers, duties, and functions to:

a. determine the extent of *works and services* to be provided as a condition of *subdivision* or issuance of a *building permit*, on that portion of a *highway* immediately adjacent to the site being *subdivided* or developed, up to the centre line of the *highway.*

b. require excess or extended services under section 507 of the Local Government Act.

c. execute *Works and Services Agreements* and latecomer agreements on behalf of the City.

d. exempt a parcel(s) from the statutory minimum *highway frontage* required in section 512(1) of the *Local Government Act* or *the City's Zoning Bylaw.*

4.2 *Council* delegates to the *Development Engineering Manager* the authority to:

a. update the *City* of Campbell River Approved Products List outlining materials and products acceptable for *Owners* to use in construction.

b. update the *City* of Campbell River Data Standards Document outlining the required types and format of data the *Qualified Professional Engineer* is required to submit for new and/or modified infrastructure for purposes of asset management and documentation.

c. create and modify application forms and schedules required for *subdivision* and *development* approval under this bylaw.

PART 5: Works and Services

5.1 The *works and services* include but are not limited to:

a. *highways* and lanes, boulevards including, without limitation, street trees, boulevard landscaping, irrigation, culverts, transit bays, sidewalks, walkways and pathways, cycling facilities, fences, bridges, retaining walls, curbs and gutters, traffic signs and signals, street lighting and conduit and vaults for underground wiring;

b. waterworks systems connected to the *City's* water distribution system including, without limitation, pipes, service connections, fire hydrant systems, valves and valve chambers, meters and meter chambers, pump stations and reservoirs;

c. sewage collection systems connected to the *City's* sewage collection system including, without limitation, pipes, service connections, inspection chambers, lift stations, manholes and sewage holding facilities;

d. drainage systems connected to the *City's* drainage collection system including, without limitation, pipes, service connections, inspection chambers, catch basins, manholes, ditches, flow control systems, stormwater retention and detention facilities, and environmental control facilities.

e. the undergrounding of all wiring for all new *highways* and for all *Development* with existing overhead wiring on any *frontage* it has with Island Highway and Island Highway South from St. Ann's Road to Colorado Drive.

5.2 The *Works and Services* required by this bylaw shall:

a. be designed by a *Qualified Professional Engineer* in accordance with this Bylaw and

b. adhere to all other *City* Bylaws, Provincial and Federal Requirements. A *Qualified Professional Engineer* is required to provide engineering services during construction, including but not limited to field inspection and preparing and certifying record drawings.

c. be designed and constructed at the cost of the *Owner* to the standards set out in Appendix A.

d. have data and documentation provided to the *City* as described in the City of Campbell River Data Standards Document.

5.3 The works and services required by this bylaw shall be located in dedicated highways, except as might otherwise be authorized by the Approving Officer or Development Engineering Manager, in which case the works and services shall be located within a statutory right of way of sufficient width and on terms satisfactory to the Approving Officer or Development Engineering Manager, acting reasonably.

5.4 The *Owner* shall grant to the *City* all necessary Statutory Rights of Way, covenants and any other legal charges and shall pay for the cost of the legal surveys, legal fees, and registration of all documents a may be required by the *Approving Officer* or *Development Engineering Manager.* For boulevard street trees required by this Bylaw, the *Owner* may choose to pay to the *City*, in lieu of installing and maintaining the street trees, a fee in the amount of $1500 per tree prior to final approval that the *City* will apply towards undertaking the street tree installation and maintenance at a future date.

PART 6: Construction Process

6.1 The *Owner,* in association with a *Qualified Professional Engineer,* is responsible for providing all reports, designs, specifications and supporting documentation related to the supply of all required *Works and Services* for any *subdivision* or *building permit* and for coordinating design and construction work with all *works and services* provided by other required 3rd party utilities (gas / electrical / telecommunications), all in consultation with the *City. City* review of design shall not relieve the *Owner* from obtaining such other permits as may be required by other statute, regulation or Bylaw.

6.2 Following approval of submitted design documentation and prior to construction schedule a pre-construction meeting with *City* staff.

6.3 Following construction of required *Works and Services* the *Qualified Professional Engineer* shall perform a completion walkthrough with the *City* and provide to the *City* an Infrastructure Acceptance Submission that includes submittals as outlined in the *City* of Campbell River Data Standards Document.

6.4 Securities for all outstanding or deficient *Works and Services* will be required prior to final *subdivision* approval and/or prior to issuance of any *building permits*. The security is to include the preparation of record drawings or documentation and shall be in the amount of 125% of the cost of the outstanding or deficient *Works and Services (*as estimated and signed off on by the *Qualified Professional Engineer* and accepted by the *Development Engineering Manager).*

6.5 Securities are required for the repair of or remedying during the *Maintenance Period* of deficiencies for all *Works and Services* completed by a *Development* in accordance with this bylaw, in the amount of the greater of $3,000 or 5% of the estimated total construction cost of the *Works and Services (*as estimated and signed off on by the *Qualified Professional Engineer* and accepted by the *Development Engineering Manager).*

6.6 The *Development Engineering Manager* may issue a Certificate of Completion or Certificate of Partial Completion where deficiencies are identified, upon receipt of a request from a *Qualified Professional Engineer* certifying that the construction, installation, and inspection of all *Works and Services* is completed.

6.7 The *Owner* shall enter into a Maintenance Agreement with the *City* for a period of one year.

a. The warranty period for *Works and Services* located on newly dedicated *Highways* shall commence on the date of registration at Land Titles. The warranty period for *Works and Services* located on existing *Highways* shall commence once the *Qualified Professional Engineer* has undertaken a completion walkthrough with *City* staff and the works have been verified to be substantially complete.

b. An acceptance walkthrough shall be scheduled with *City* staff no less than one month prior to the end of the maintenance period. All infrastructure is required to be visible for inspection.

c. Following an acceptance walkthrough at the end of the maintenance period, the *Qualified Professional Engineer* shall provide a signed letter to the *City* confirming that the *Works and Services* substantially meets *City* standards and specifications, and that no deficiencies remain. Should there be deficiencies, the *Qualified Professional Engineer* shall state when they will be corrected and notify the *City* upon their rectification.

d. The *Security or* balance thereof shall be returned to the *Security* provider upon satisfactory Completion of the Maintenance Period.

e. The *City* retains the right to extend the maintenance period for an additional year for any *Works and Services* that are completed, altered or otherwise modified during and following the Maintenance Period.

PART 7: Appendices

7.1 The following appendices are attached to and form part of this bylaw.

a. Appendix A – City of Campbell River MMCD Supplemental Design Guidelines

PART 8: Severability

8.1 The provisions of this bylaw are intended to be severable. If any section, subsection, paragraph, clause, phrase or word within this bylaw is for any reason held to be invalid by the decision of a court or competent jurisdiction that finding should not be construed as affecting the validity of any other part of the bylaw.

PART 9: Repeal

9.1 "Subdivision and Development Servicing Bylaw 3419, 2010 as amended, is hereby repealed.

READ THE FIRST TIME this 23 day of May, 2024

READ THE SECOND TIME this 23 day of May, 2024

READ THE THIRD TIME this 23 day of May, 2024

ADOPTED this 4 day of June, 2024

Signed by the Mayor and Corporate Officer this 4 day of June, 2024

Kermit Dahl, MAYOR

Sheila Girvin, CORPORATE OFFICER

Appendix “A” City of Campbell River MMCD Supplemental

The standards of this Bylaw are per the MMCD consisting of the Design Guidelines (current edition) and Volume II – General Conditions, Specification and Standard Detail Drawings (2019 MMCD Edition or current edition as applicable), subject any specifically enumerated exceptions in the following supplementals.

SUPPLEMENTARY DESIGN GUIDELINES
GENERAL DESIGN CONSIDERATIONS

1.0 GENERAL DESIGN CONSIDERATIONS

1.4 Utility Rights- Of-Way — Add to Section

Manholes, mains, and other Public Works structures must be installed in a designated Right-of-Way and not on private land. Under special circumstances, the City may approve a structure to be installed on private land if all other options have been demonstrably exhausted.

When located outside of the public Road Right-of-Way, any new municipally maintained sanitary or stormwater manhole, inlet, sediment sump, outlet, emergency overflow, and any other related infrastructure requiring maintenance is required to meet the following parameters for access:

- A minimum 4.0 m wide vehicle access shall be constructed. The access road is required to end no further than 1.0 m from the infrastructure.
- The maximum grade of the access shall be 8%.
- The access road shall have no horizontal bends exceeding a 12.0 m horizontal radius from centreline.
- Crossfall of the access road should be 2%
- The access road shall be capable of supporting a tandem axle 60,000 lb flush track and be finished with gravel, geogrid, or other material suitable for all weather access.

Maintenance vehicles for which access is intended includes tandem-axle service trucks.

SUPPLEMENTARY DESIGN GUIDELINES
WATER DISTRIBUTION

2.0 WATER DISTRIBUTION

2.2 Metering

Replace Section

The water meter setter size shall be 19mm for all single-family residential homes without fire sprinklers unless there is a demonstrated need for a larger meter. All other meters must be sized in accordance with AWWA M22 and form contained in Appendix A. It should be noted that this methodology is based on the fixture value method and not the fixture unit method employed in the BC Building Code for piping within buildings.

The maximum operating range for a water meter shall be less than 80% of the maximum instantaneous flow capacity as outlined by the meter manufacturer, with a maximum pressure loss of 48 kPa at the design flow rate. The size selection must not compromise the operating range or the long-term life of the meter and must ensure that pressures supplied to property are appropriate for the intended use.

For developments that are proposed to be phased, the meter chamber and piping must be sized for the meter required for the ultimate buildout of the development. However, the initial meter installed must also be sized to accurately capture the range of flows for the first phase.

The Qualified Professional Engineer must ensure the meter selection and installation requirements are appropriate for the designed application.

Private fire suppression systems should be protected by DCDA (Double Check Detector Assembly) complete with meter per the City's Approved Products List.

Water service meters shall be located within the Public Road Right of Way and should be located 300mm off the property line on the public side. Where there is insufficient space available within the public road right-of-way, the meter and chamber may be partly or entirely located on private property, but shall be placed as close to the property line as possible.

Water meters may alternatively be placed within a building mechanical room if all the following conditions are met:

1. Provide verification via a signed and sealed memo from a Qualified Professional Engineer that sizing information for the meter and cross connection control is based on the building's actual design flows.
2. No water lines (excluding dedicated fire flow lines) are teed off the service before the domestic backflow prevention.
3. The development site does not have existing or proposed on-site private fire hydrants.
4. The civil design drawings include a note stating that meter and backflow prevention are located inside the building and to refer to mechanical drawings.
5. An acceptable mechanical room schematic is provided that allocates sufficient room and access for the water meter.
6. The water meter signal must be sufficiently strong to be remotely read by City staff from the road frontage. If required, an external antenna is to be provided and installed on the building exterior that is connected to the radio read meter(s).

Water service installations are to follow typical installation requirements noted in the Supplemental Detail Drawings CR-W2a, CR-W2e, and CR-W2f as applicable. A 19mm meter setter may be utilized on a 25mm service.

Rigid insulation meeting an R value of 5 is required on the underside of the water meter lid.

2.3 **Per Capita Demand** Replace Section

In the absence of reliable water consumption records, the following per capita demands shall be applied to future residential development.

- Average annual daily demand (ADD) – 400 L/c/d
- Maximum day demand (MDD) – 2100 L/c/d
- Peak hour demand (PHD) – 3000 L/c/d

2.4 **Non-Residential Demand** Replace Section

Commercial, industrial and institutional demands should be determined using specific data related to the development or zoning. In the absence of such data, or

municipal regulations, use the following for maximum day demands:

- Commercial/Institutional: 22,500 litres per hectare per day
- Industrial: 100,000 litres per hectare per day

Note that the above rates do not include outdoor irrigation and assume that all connections are metered.

2.7 Water Pressure — Replace Section

Maximum allowable pressure	850 kPa (123 psi)
Minimum pressure at Peak Hour Demand (PHD)	300 kPa (44 psi)
Minimum pressure in system during design Maximum Day Demand plus Fire Flow (MDD+FF)	150 kPa (22psi)

Where the maximum pressure exceeds 515 kPa (75psi), service connections must be individually protected by pressure reducing valves located at the buildings being served. Designers to note properties on service cards and record drawings where pressure exceeds 515 kPa (75 psi).

Determination of pressure limits should include consideration of property elevation relative to street level.

2.8 Hydraulic Design — Add

The Engineer of Records shall apply the results from the water model into their design accordingly.

2.9 Minimum Pipe Diameter — Delete

Service connections: 19mm

- With fire sprinklers: 37mm (single family residential)
- With fire sprinklers: 50mm (other than single family residential)

Add

Service connections: 25mm minimum

Service diameter for buildings with fire sprinklers to be determined on a case by case basis based on fire flow demand.

2.11 Minimum Depth of Cover — Add

Conduits of non-ferrous material and ductile iron buried underground shall have tracing wire buried in

			the trench. Tracing wire shall be taped directly on the pipe in a manner that a continuous tract results.
2.13	**Corrosion Protection**	Replace Section	Cathodic protection is required for any metal pipes or appurtenance unless soil analysis provided by a Qualified Professional Engineer proves that the soil is non-corrosive.
2.14	**Valves**	Replace Section	In general, valves should be located as follows: • In intersections in a cluster at the pipe intersection, directly attached to fittings on the downstream sides ▪ Minimum three valves at 'X' intersections ▪ Minimum two valves at 'T' intersections • Not more than 20 service connections isolated • Not more than 200 m apart (except on feeder mains where spacing can be increased to 800 m) • Not more than 1 hydrant isolated. All valves shall be gate valves of the same size as the main - however if the Qualified Engineering Professional verifies that flow is unaffected the following consideration may optionally be utilized: • The main line valves on mains 350 mm and 400 mm may be smaller by one size with the use of proper reducers. • The main line valves on mains 450 mm diameter and larger may be smaller by two sizes with the use of proper reducers.
2.15	**Hydrants**	Add Bullet	• At least 1.0 m side clearance and 1.5 m front clearance from any driveways. • Located a minimum of 60 meters from the end of cul-de-sacs/dead end roads.
2.16	**Blow Offs and Blow Downs**	Add	Provide a valve box per detail CR-W2e and as identified in detail CR-W8.
2.19	**Thrust Restraint**	Add	Precast thrust blocks are not permitted except in combination with joint restraints and as approved by the City.

2.21	**Service Connections**	Replace Section	Service connection with water meters shall be installed to all new parcels of the development including public irrigation systems. Size should be calculated on the basis of the designated land use including sprinkler systems, public irrigation and/or on-site hydrants, where applicable. Sizing to take into account the full development potential of the land. The minimum size is outlined in 2.9 – Minimum Pipe Diameter. Service connections must be installed perpendicular to the water main without horizontal bends. Service connections at cul-de-sacs are required to cross the property line at 90 degrees, but may have bends in the service when required. Only one service connection and consumption meter is allowed per lot. Water meters shall be included on each service and be as outlined in 2.2. Private fire suppression systems should be protected by DCDA and complete with meters as outlined in 2.2. Service connections that are decommissioned shall be disconnected at the main.
2.22	**Alignments and Corridors**	Replace Section	On straight roads, water mains should have straight alignments with uniform offsets between intersections. For curved roads and alignments, design joint deflections shall be limited to half the maximum deflection specified by the pipe manufacturer. Pipe alignment to be at a parallel offset with an established road right-of-way or property line. Mains on new roads must be located as indicated in the applicable Standard Detail Drawings CR-R101, CR-R102, CR-R103, CR-R104 and CR-R105.
2.23	**Reservoirs**	Add to Section	In addition to these minimum standards further design considerations are to be determined on a case by case basis with City staff.
2.24	**Pump Stations**	Add to Section	In addition to these minimum standards further design considerations are to be determined on a case by case basis with City staff.

2.25	**Pressure Reducing Valve (PRV) Stations**	Add to Section	In addition to these minimum standards further design considerations are to be determined on a case by case basis with City staff.
2.26	**Abandonment**	Add Section	When 150 mm or greater AC (Asbestos Cement) mains are to be abandoned as part of the works, fitting shall be removed and the mains shall be filled with grout or CDF (Controlled Density Fill).
2.27	**Cross Connection Control**	Add Section	There shall be no connection between a public water system and private water system permitted without an approved cross connection control device between the systems. All backflow protection assemblies shall be manufactured in accordance with the American Waterworks Standards AWWA/ANSI C510-92 Standard for Double Check Valve Backflow Prevention Assemblies, AWWA/ANSI C511-92 Standard For Reduced Pressure Principle Backflow Prevention Assemblies, and AWWA/ANSI Standard for Dual Check Backflow Prevention Assemblies. Double Check and Reduced Pressure Principle Backflow Prevention Assemblies shall have isolation valves with ports suitable to allow testing.
2.28	**Facility Site Requirements**	Add Section	Paved vehicular access must be provided to all reservoirs and pump stations. The minimum standard must be for an emergency access road as show in the Standard Drawings, with drainage provisions as may be required. Provisions shall be made for vehicle turn-around and crane access. Provide site grading and landscape plans that identify drainage issues, retaining walls, and site safety issues.

SUPPLEMENTARY DESIGN GUIDELINES
SANITARY SEWERS

3.0 SANITARY SEWERS

3.1	**General**	Add	In absence of a City sanitary sewer model, a downstream capacity analysis will be required to assess the impact of sewage discharge on the downstream system to the nearest downstream lift station for any new development where design Peak Wet Weather Flows are greater than 0.75 l/s. Where City sanitary modeling is available, all development is required to verify the impact of new sewage discharge via modeling analysis.
3.10	**Minimum Pipe Diameter**	Delete	Collector sewers should be designed flowing 80% full (d/D=0.8). The exception to this is trunk sewers where specific requirements should be conformed with the local authority.
		Replace with	New or upgraded sewers must be designed to satisfy the following parameters: ▪ 200mm diameter: d/D < 0.5. ▪ 250mm diameter: d/D < 0.6. ▪ 300mm diameter and greater: d/D < 0.7.
		Add	Where confirmed by the City's sanitary modeling, a proposed development will trigger a downstream / offsite sanitary pipe upgrade where the model identifies that the pipe is full flow (q/Qfull is greater than 1.0) and there is surcharging at the upstream end of the pipe. A Qualified Engineering Professional may alter the upgrade requirement(s) if they provide a substantiated analysis (complete with flow monitoring) showing the identified conditions are incorrect and capacity exists for the development.
		Delete Condition	Collector sewers: 200 mm except for the upstream section of a residential sewer where future extension is not possible, in which case 150 mm is acceptable.
		Replace with	Gravity sewers: 200 mm minimum diameter.
3.11	**Minimum Grade**	Replace Section	The minimum grade shall be that which will result in a minimum velocity of 0.60 metres/second flowing full or half full. For sections of the sanitary sewer that serve a design population of 25 people or less the minimum grade shall be 0.75 %.

		Minimum velocities need to be met for both buildout scenarios and interim scenarios.
3.12 Curved Sewers	Delete	Joint deflection not to exceed 75% of maximum recommended by pipe manufacturer.
	Replace with	Joint deflection not to exceed 60% of maximum recommended by pipe manufacturer.
	Add	Only one curve, vertical or horizontal, shall be permitted between adjacent manholes. Vertical curves should be avoided.
3.14.1 Locations	Delete Bullet	▪ 150 m maximum spacing
	Replace with	▪ 125 m maximum spacing
3.14.2 Hydraulic Details	Add bullet	• 1200mm manholes to be used in all instances • Deflections within manholes should not exceed 90 degrees, and shall in no case exceed 110 degrees.
	Table 3.14 Delete	*Inside drop may be used if specifically approved by the local authority
	Replace with	Inside drops are not permitted.
3.16 Service Connections	Delete	Every legal lot and each unit of a residential duplex should be provided with a separate service connection.
	Add	Every legal lot should be provided with a separate service connection. The same service connection can service a residential duplex or carriage house on the property. Concrete Brooks Box with Cast Iron Traffic Cover to be installed on all services. Owner to install temporary plug on all sewer services. City to remove at time of connection.
3.16.4 Details	Add bullet	• Services that are decommissioned shall be disconnected at the main. If the service disconnection is temporary and will be reused with a pending development then

			it may be disconnected at the property line.
3.18	**Pump Stations**	Add to Section	In addition to these minimum standards further design considerations are to be determined on a case by case basis with City staff.

SUPPLEMENTARY DESIGN GUIDELINES
STORMWATER MANAGEMENT

4.0 STORMWATER MANAGEMENT

4.2 Integrated Stormwater Management Plan (ISMP)	Delete	Designers should consult with the approving authorities to determine the specific requirements that will govern design of the stormwater controls for their project.
	Replace with	Designers should utilize the requirements within the City of Campbell River's ISMP's in conjunction with these guidelines. Requirements noted in applicable ISMPs that are dated after the date of this Bylaw shall take precedence over requirements noted in this Bylaw.
4.3.1 Applicable Regulatory Policies and Guidelines	Add to Section	▪ City of Campbell River Environmental Protection Bylaw. ▪ City of Campbell River Storm Drain Systems Connection Bylaw. ▪ BC Water Quality Guidelines ▪ Canada Environmental Quality Guidelines
4.3.2.1 Flood Risk Management	<u>Minor System</u> Delete and replace with	Consists of storm sewers, gutters, catch basins, driveways and local road culverts and local roadside ditches, to be designed to capture, convey, treat, or modify flows up to the 1:5 year return period storm event.
	<u>Major System</u> Delete and replace with	Consists of surface flood paths, roadways, trunk storm sewers and culvert crossings under collector roads, arterial roads and provincial highways, watercourse and bypass structures for onsite and offsite stormwater management facilities, to be designed to safely convey design flows up to and including the 1:100 year return period storm event. Confirmation is required that the depth and velocity along the major system flow path can be accommodated without negatively impacting downstream properties. Alternatively with City approval a Development may optionally design the stormwater facility to limit post-development peak runoff to the 100 year pre-development for the 24-hour storm.

If required to accommodate low building elevations, and if approved, a piped minor system may be enlarged or supplemented to accommodate major flows.

4.3.2.2 Stormwater Detention and Flow Rate Control Add

All stormwater facilities shall be designed to limit post-development peak runoff (for all design storm durations) to 50% of the pre-development peak runoff for the 24-hour Mean Annual Rainfall (MAR) (1/2 of 60mm, or 30mm in 24 hours), and to not exceed the 5-year recurrence Pre-Development Peak Runoff for the 24-hour storm. Pre-Development Peak Runoff is defined as the runoff leaving the site based on the land use with the highest permeability over the previous 5 years.

- Capture 50% of the 24-hour Mean Annual Rainfall (MAR) (1/2 of 60mm, or 30mm in 24 hours) for infiltration, evaporation, or re-use.
- Pre-development flows for disturbed areas shall be based on the land's natural state. This is typically defined as forested, unless it can be shown that another condition is applicable.

For new developments and re-developments that eventually discharge into a creek, river, or wetland system, runoff volume controls are required to prevent erosion and shall recognize both peak flow rates and the duration of the peak flows.

Preferably, post-development 5 year peak flows shall be controlled to the 5 year pre-development level such that the post-development hydrographs emulates the pre-development hydrographs for the 5 year return period. At a minimum, the post-development hydrograph shall show that:

(a) The peak flow does not exceed the pre-development peak flow.
(b) The duration of the peak flow does not exceed the duration of the pre-development peak flow.

Overland escape routes must be provided to account for storms up to 1 in 100 year return period in a manner that does not result in negative downstream impact. Alternatively with City approval a Development may optionally design the stormwater

facility to limit post-development peak runoff to the 100 year pre-development for the 24-hour storm.

Discharge at the downstream watercourse shall comply with the City's Environmental Protection Bylaw and the BC Water Quality Guidelines regarding watercourses and storm drainage systems, and shall be done to prevent erosion to streambeds and streambanks. New flows from development entering natural systems shall be confirmed to not increase flood risk to downstream properties or adversely affect the receiving ditch or channel.

4.3.2.3 Stormwater Quantity and Quality Control

Delete Section and Replace with the Following:

Stormwater Management Systems are to be used to capture rainfall on development lots and roadways. Captured rainfall volume should be infiltrated, evapotranspired, and/or re-used at the source. This is to promote the natural water balance and hydrology Designs shall incorporate infiltration such that the following is achieved:

- No *direct runoff* from impervious surface areas for storm events with rainfall depths up to one half the 24-hour *Mean Annual Rainfall* (MAR) (1/2 of 60mm, or 30mm in 24 hours).

In Steep Slope Development Permit areas, drainage shall be directly discharged into piped storm systems.

The infiltration potential is not consistent across the City, therefore infrastructure will need to be sized to suit local conditions. It is understood that in some cases 30 mm of infiltration may not be achievable in 24 hours. In such cases, management systems shall be sized to temporarily store the 30 mm, maximize infiltration and evapotranspiration potential, and allow some extent of discharge provided it's in the form of seepage and not *direct* runoff ('seepage' meaning the flow of water in a permeable medium and 'direct runoff' meaning stormwater drainage that is collected and conveyed away from the development). This could include but not be limited to planting areas, topsoiled areas, and other impervious surfaces.

4.4	**Stormwater Management Plan**	Add bullet	▪ Show that major storm systems do not negatively impact any properties downstream.
		Modify Bullet	▪ Existing watercourse features, including environmental classifications and applicable setbacks as determined by a Qualified Professional Engineer.
4.10	**Hydrograph Method**		
4.10.1	**Model Selection**	Delete	The local approval authority should be consulted before selecting a particular software program.
		Replace with	The City of Campbell River shall be consulted before selecting a model not SWMM-based.
4.11.3	**Flow Velocities**	Modify Bullet	▪ Minimum – 0.75 m/s
4.11.7	**Minimum Pipe Diameter**	Delete bullet	▪ Service Connections • Residential 100 mm • Commercial 150 mm
		Replace with	▪ Service Connections 150 mm
4.11.12	**Manholes**	Delete bullets	• 150 m maximum spacing for pipes smaller than 900 mm diameter • 250 m maximum spacing for pipes 900 mm diameter and larger.
		Replace with	• 125 m maximum spacing for all pipes.
		Add	• Manholes shall be sized in accordance with MMCD Standard Detail Drawing S1. Manholes with depths of 3 meters or greater shall have a minimum inside diameter of 1200 mm.
		Table 4.9.12 Delete	*Inside drop may be used if specifically approved by the local authority.
		Replace with	Inside drops are not permitted. Vertical drops of 0.25 m to 0.60 m should be avoided by adjusting sewer gradients.

4.11.13	**Catch Basins**	Delete	As a general rule, space catch basins to drain maximum paved areas of: • 500 m^2 on roads with grades up to 3% • 350 m^2 on roads with grades greater than 3%
		Replace with	As a general rule, space catch basins to drain maximum paved areas of: • 500 m^2 on roads with grades up to 2% • 350 m^2 on roads with grades greater than 2%
		Add to Section	Lawn basins and subdrains may be accepted within boulevard where subgrade seepage is encountered. Subdrain system shall be designed with a minimum pipe size of 100 mm, including cleanouts every 30 m (maximum) and be connected to a lawn basin that is directly connected to the storm sewer as per the requirements of this section.
4.11.14	**Service Connections**	Delete	Minimum pipe sizes are as indicated in Section 4.11.5, Minimum Pipe Diameter
		Replace with	Minimum service connection size is 150 mm diameter.
		Add	Service that are decommissioned shall be disconnected and capped at the property line. Inspection chambers per MMCD Drawing S9 and S10 are required. • Service connections shall be connected to the main with a wye connection. Tapping saddles are permitted on existing mains and on mains 375 mm and larger.
4.14	**Dike Protection**	Add to Section	Dikes within the Public Road Right of Way are not permitted.
4.15	**Best Management Practices (BMPs) for Runoff Control**		
4.15.1	**General**	Add to Section	The application of Best Management Practices is encouraged on individual properties and will be

			considered on a case by case basis for installation on City land where practical and supported by the City's capacity for maintenance and operations. All stormwater facilities intended to be maintained and operated by the City requires the Qualified Professional Engineer to provide a maintenance manual that includes operating, maintenance, and monitoring procedures, as well as the following information where applicable: ▪ Record drawings of the completed facility. ▪ A description of the facility operation including design flows, design depths, and schematic diagrams of the inlet and outlet structures, connections, controls, valves, bypass, overflows, etc. ▪ Applicable vegetation maintenance. ▪ Applicable environmental regulations and best management practices. ▪ Recommended monitoring and inspection schedule, including a list of manufacturer's operation, service, and repair instruction and parts list. ▪ Calculations for sediment yield / discharge.
4.15.3	**Source Controls**	Add to Section	Wherever viable, provide Stormwater Source Control measures designed by a Qualified Professional Engineer and incorporate into the development to meet the requirements of the Integrated Stormwater Management Plans for the applicable watershed area. Cross reference with Section 4.3.2.3 where an Integrated Stormwater Management Plan does not apply.
4.15.7	**Pre-Treatment Controls**	Delete Mechanical Separators and replace with the following	Mechanical Separators are the most commonly applied and are generally suitable for treating flows from paved parking areas as an alternate to landscape based BMP's. Where required to be installed by the City's Environmental Protection Bylaw (or other City Bylaws), the installation of Oil / Grit Separators shall meet the following criteria (or equivalent per manufacturer specifications): ▪ Treat 50% of the mean annual rainfall volume (30 mm over 24 hours). ▪ Provide an internal high flow bypass that regulates the flow rate into the treatment

chamber and conveys high flows (10% or less of the annual runoff volume) directly to the outlet such that scour and re-suspension of material previously collected does not occur.
- Be capable of removing 80% of the total suspended sediment load (TSS), for particles 50 microns and larger and associated pollutants attached to those sediments, including low levels of petroleum hydrocarbons (oil, grease, and polycyclic aromatic hydrocarbons (PAHs)).
- Be capable of removing 95% of the floatable free oil.
- Design calculations for sizing the structure shall be based on the drainage area, historic rainfall data.
- Maintenance access both to and within the structure shall be provided so that accumulated oils and sediments can be readily removed with a vacuum truck.
- The Oil/Grit separator shall be enclosed in a concrete manhole or vault structure. The structure and lid shall meet H20 loading. Concrete joints shall be oil resistant and water tight.

4.15.9	**End-of-Pipe Measures**	Add to Section	The use of end of pipe measures shall be minimized by documenting that the development has explored the implementation of source, on-site, and conveyance controls.
		Add to Dry and Wet Detention Ponds	▪ Ponds to be operated by the City shall be located on public property and shall encompass the entirety of the pond structures as well as the maintenance access roads. ▪ The emergency spillway shall be designed to accommodate the post-development run-off generated by a 1:100 year storm event. The discharge path from the wet detention pond to the receiving environment shall be adequately protected from erosion. ▪ For wet detention ponds, the depth of the permanent low level pool shall be maintained between 0.6 m and 1.2 m. The maximum depth of water during storm events shall not exceed 2.5 m. ▪ A minimum freeboard of 0.3 m shall be provided above the designed maximum water

level with activation of the emergency spillway.

- Each pond shall have a sediment forebay immediately downstream of the inlet. The forebay shall consist of a separate cell, formed by an acceptable barrier, upstream of the low flow channel and be designed to remove sediment for up to a 1:2 year event. The forebay shall have a maximum depth of 1.2 m and be designed with a non-erosive outlet.
- The wet detention pond shape combined with meandering channels in the permanent low level pool shall maximize the distance between the inlet and the outlet.
- The wet detention pond walls shall be constructed with an interior side slope of 7 (horizontal) to 1 (vertical) for highwater level down to a depth of 0.43 m, with the remaining side slope of 4 (horizontal) to 1 (vertical). The exterior side slope shall be constructed with minimum slope of 3 (horizontal) to 1 (vertical).
- The top of the detention pond bank should be a minimum width of 4.0 m.
- A pretreatment sump is to be provided at the inlet to the wet detention pond.
- An oil/water separator structure or equivalent source control treatment set of BMPs such as infiltration swales, pervious pavements, or rain gardens is to be installed upstream of the pond inlet.
- The flow control structure is to be constructed with a removable orifice plate sized to restrict flows to the pre-development 1:5 year storm event, and a riser sized to handle the post-development 1:100 year storm event.
- The flow control structure shall be located within a lockable manhole positioned within the embankment for purpose of maintenance, access, safety and aesthetics.
- The design of the outfall structure shall be determined based on the exit velocity of stormwater runoff from the wet detention pond.
- Safety is to be provided by managing the contours of the wet detention pond to eliminate drop-offs and other hazards

- The safety bench, located at the toe of the side-slopes leading to the permanent low level pool, is to be 2 m wide with a maximum slope of 3% and is required around the entire perimeter of the wet detention pond. Where safety benches cannot be accommodated, fencing may be considered, subject to the approval of the City.
- Signs required at all entrances to the pond and at any other critical points to read: "Danger! Water levels are subject to sudden change.

  Please keep out.

  For information, call the City of Campbell River Operations Department. 286-4033"

  Maximum spacing between the signs is 200m.
- A buffer strip of at least 7.5 m measured from the inside of the top bank is to be provided around the entire perimeter of the wet detention pond, and be suitable for service vehicle traffic.
- Landscape planting is required within ponds per applicable zones as prescribed in the Approved Products List. Landscaping is to be established for a minimum of 1 year for warranty purposes.
- A minimum distance of 12 m shall be maintained between the inside of the top bank and any structure.
- All RAPR required setbacks and buffers shall be incorporated into the design. All efforts to avoid design of stormwater systems that require WSA and/or Fisheries Act for future maintenance work to the City must be taken.
- If opportunity presents preferred alignment of stormwater ponds is east / west so as to increase shading for water quality purposes.

4.16 Specialized Structures

4.16.3	**Ditch Enclosure**	Add to Section	Any infill of watercourse features shall be evaluated by a Qualified Environmental Professional to determine if authorization from Fisheries and Oceans Canada and/or the BC Water Sustainability Act are required.

4.17	**Erosion and Sediment Control (ESC)**	Add to Section	Project specific ESC plans shall be in accordance with the "Erosion and Sediment Control Joint Professional Practice Guidelines" (EGBC, BC Institute of Agrologists & College of Applied Biologists) and be prepared by a Qualified ESC Professional (as defined within those guidelines). The ESC Plans are required to be included with engineering drawing submissions or prior to land disturbance. The Qualified ESC Professional is required to approve major changes to the plan. An ESC Monitor (as defined with the Erosion and Sediment Professional Practice Guidelines) shall confirm that the ESC plan is property implemented and will monitor the works through construction and/or any land disturbance. ESC plans shall include a multi-stage plan that shows the measures ESC control during clearing and grubbing, service installation, and final works to be completed during the maintenance period. The ESC plan must include, at a minimum: ▪ Project area including property lines, easements, SRW's, existing drainage infrastructure, buildings etc. ▪ All environmentally sensitive areas and their associated setbacks as determined by a Qualified Environmental Professional (QEP). ▪ Proposed ESC installations including detail drawings, materials and installation requirements. ▪ Proposed construction access locations. ▪ Recommended mitigation measures and monitoring process. ▪ If turbid water will be pumped to ground to infiltrate, show the proposed location on the ESC site plan. ▪ Verification that at the point(s) of discharge from the development site stormwater runoff shall not exceed turbidity levels of 25 Nephelometric Turbidity Units (NTU) during dry conditions and 100 NTU during wet weather conditions. ▪ All Water quality monitoring stations. ▪ Verification that the stormwater runoff shall not, at any time, increase turbidity levels

above background levels of the receiving water.

The ESC plan must include notes to provide guidance for the contractor performing the work including:

- A requirement that ESC works be installed and approved by the Qualified Professional Engineer before land disturbance begins.
- A description of ESC phasing, inspection and documentation requirements
- Include a schedule of the maintenance and final decommissioning of ESC facilities, ponds, and source controls for each of the phases.
- Re-vegetation and stabilization measures for restoring disturbed or exposed soil areas.
- Specify environmental monitoring required to inspect at least once a day during construction in the wet season (October 15 – May 15), at least once a day during or within 48 hours after a significant rainfall event (>25mm rainfall per day or 10mm rainfall per hour), and once a week during the dry season (May 16 – October 14) and to carry out alterations if necessary.
- Provide a copy of all Environmental Monitoring Reporting to the City.
- The applicant and related contractor(s) shall comply with the requirements of the Environmental Monitoring report within 48 hours of the field review time, or such other time as listed in the Environmental Monitoring report.

Prior to construction or land disturbance, provide a pre-construction inspection report noting the name and emergency contacts of the Qualified ESC Professional, the Designated ESC Monitor, and the contractor as well as the site conditions, and any environmentally sensitive areas.

During construction the Qualified ESC Professional shall submit weekly inspection reports to the City documenting compliance with ESC measures and all turbidity water quality readings.

			Following construction, the Designated ESC Monitor shall confirm that the final decommissioning of ESC measures is completed and outline any required maintenance. This includes confirming any applicable re-vegetation or stabilization measures for restoring disturbed or exposed soil areas.
4.17.1	**Erosion Control**	Add to Section	Products with biodegradable plastics are not to be used.
4.17.2	**Sediment Control**	Delete third bullet and replace with the following:	Gravel berms are more effective within flow paths to slow water and promote trapping of coarse sediment. They are less effective for fine sediment. The City of Campbell River does not permit the use of straw bales within flow paths. Sediment fences are not to be used in long straight lines as perimeter fencing where there is no risk of sedimentation.
		Add to Section	Public Roads are to be kept clear of debris through appropriate ESC measures that may include the following: ▪ Wheel wash facilities are required for during the wet season (October 15 – May 15) ▪ Roadways fronting the disturbed area are to be swept free and cleaned on a regular basis (once a day or more frequently during rain events). Flushing of the roadway is prohibited. ▪ Excavated/imported soils are not to be stockpiled or unloaded on road allowances, curbs, or sidewalks. Concrete truck wash and construction wash of exposed aggregate surfaces is not to be directed into any watercourse feature, any storm drain system or catch basin. All waters captured within foundations, sediment ponds, or when flushing sediment facilities and controls, shall be removed by appropriate sediment and stormwater management controls or by pumper trucks to ensure surface runoff and sediment discharge levels do not exceed NTU guidelines.

			Temporary graded areas should be protected from erosion through the use of straw, mulch and/or polyethylene tarps in non traffic areas and a gravel cap in zones of construction traffic.
4.18	**Drainage Pump Stations**	Add to Section	Public Stormwater drainage pump stations are to be compatible with the City's central monitoring / SCADA system and capable of communicating remotely. Prior to beginning design, contact Development Services to obtain parameters and features for the most currently implemented SCADA system that new or modified drainage pumping stations will be required to align with.

Figure 4.4: Intensity Duration Frequency Curves Campbell River Airport–BCHP ID: 1021261
Includes 15% increase from Historical Intensities (mm/hr)
Years of Record: 1970-2002 (21 Years)

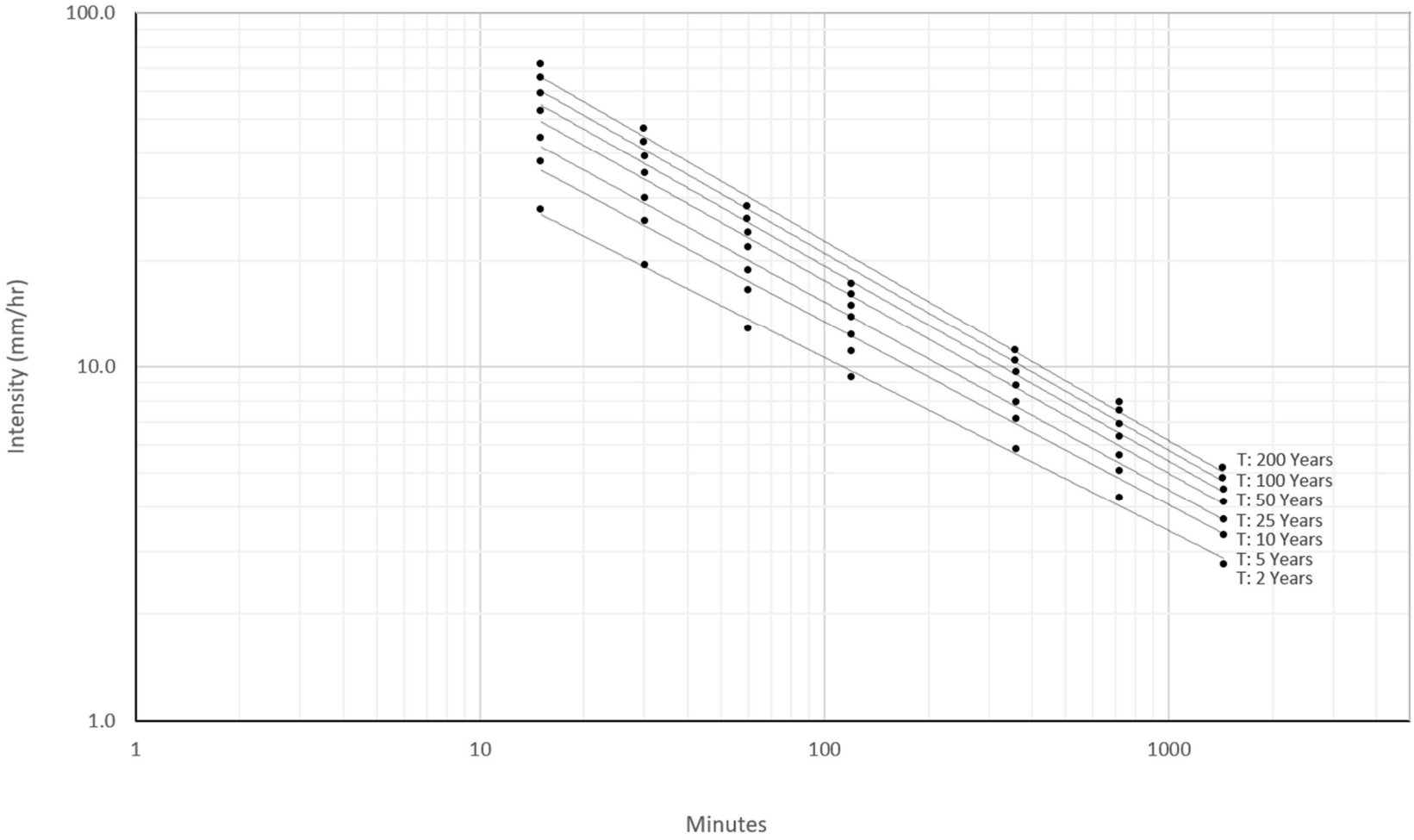


Table 4.4.1: IDF Curve Intensity Summary Table
Campbell River Airport ID 1021261
Includes 15% Increase from Historical Intensities (mm/hr)

Time		Return Frequency						
Minutes	**Hours**	**2 Years**	**5 Years**	**10 Years**	**25 Years**	**50 Years**	**100 Years**	**200 Years (Extrapolated)**
15	0.25	27.7	37.8	44.5	52.9	59.2	65.4	71.6
30	0.5	19.4	25.8	29.9	35.2	39.2	43.0	46.9
60	1	12.9	16.4	18.7	21.7	23.9	26.0	28.3
120	2	9.3	11.0	12.3	13.8	15.0	16.0	17.2
360	6	5.9	7.1	7.9	8.9	9.7	10.4	11.1
720	12	4.3	5.1	5.6	6.3	6.9	7.5	7.9
1440	24	2.8	3.3	3.7	4.1	4.5	4.8	5.2

Table 4.4.2: Interpolation Equation of IDF Curve – Historical Data for Campbell River Airport ID 1021261
$R = A * T^B$ where: R = Rainfall (mm/hr), A and B = Coefficients, based on return period

Parameters	Return Frequency						
	2 Years	**5 Years**	**10 Years**	**25 Years**	**50 Years**	**100 Years**	**200 Years**
A	12.0	15.5	17.7	20.6	22.7	24.7	27.1
B	-0.499	-0.529	-0.543	-0.556	-0.563	-0.569	-0.566

Note: Coefficients are based on historical data – When using this table, 15% must be added to resulting intensities

SUPPLEMENTARY DESIGN GUIDELINES
ROADS

6.0 ROADS

6.1	**Road Classification**	Add to Section	Streets within the City of Campbell River shall be designated as Local, Rural, Industrial, Collector, or Arterial, in accordance with the Master Transportation Plan.
6.3	**Cross-Section Elements**	Delete Table 6.1, Table 6.2 a d Table 6.3	Replace Table 6.1, 6.2 and 6.3 with Table 6.1 noted below.

Table 6.1: Minimum Requirements

Classification	ROW Width	Pavement Configuration	Sidewalk	Parking
Local	20	- Barrier Curbs - Two 3.0m travel lanes - 2.4m parking lane on alternating sides	- Required on one side – except on two sides in and within 400 meters of downtown, village centres, neighbourhood centres as well as adjacent to and within 400 meters of schools. - Width per adjacent land use. Single Family = 1.8m Multi Family = 2.1m Commercial/Industrial =2.4m	2.4m parking on alternating sides
Collector	23	- Barrier Curbs - Two 3.0m travel lanes - Two 1.8m bike lane with 0.6m buffer - 2.4m parking lane on alternating sides	- Required on Both Sides - Width per adjacent land use. Single Family = 1.8m Multi Family = 2.4m Commercial/Industrial =2.4m	2.4m parking on alternating sides
Arterial	25	- Barrier Curbs - Two 3.5m travel lanes - One 4.0m centre turn lane	1 Side with 2.4m Sidewalk 1 Side with 4.0m Multi-Use Pathway	None
Rural	20	- Two 2.0m paved shoulders - Two 3.0m travel lanes	None	None
Industrial	20	- Barrier Curbs - Two 3.0m travel lanes - Two 2.0m parking lanes	2.1m Sidewalk on both sides (optional)	2.0m parking on both sides (optional)

*Reference Details: CR-R9, CR-R10, CR-R11, CR-R12 and CR-R13

*Lanes to consist of a 6 meter wide ROW, 5.4 meter pavement width and rollover curbs.

6.4 Alignments Delete Table 6.4 – Alignment Standards Replace as follow:

Table 6.4: Alignment Standards

Classification	Design Speed (km/h)	Min. Radius (m)	Grade (%)		K-Value	
					Crest Curve	Sag Curve
			Min	Max	Min.	Min.
Arterial	50	TAC*	0.5	8	TAC*	TAC*
Collector	40	TAC*	0.5	10	TAC*	TAC*
Local Road Section	30	35	0.5	12	7	11
Rural	60	120	0.5	12	13	20
Industrial	40	35	0.5	12	7	11
Lane	30	25	1.0	12	4	7
Driveway Multi-Family	-	-	0.5	12	-	-
Driveway Single Family	-	-	0.5	15	-	-

*Note: Minimum Sight Distance is per TAC

6.4.2 Vertical Curves Add Vertical curves may be omitted if the algebraic difference in grades does not exceed 1.0%.

6.9 Cul-De-Sac Delete The maximum road length for a cul-de-sac, as measured from the edge of the intersecting through road to the centre of the cul-de-sac bulb, is 200m

Add Temporary cul-de-sacs that are more than 150m long and are to be extended in the future shall be designed with an asphalt apron beyond the right-of-way dedication and a turn around shall be provided in accordance with Drawing CR-R120.

Add Vehicle Barricades and appropriate signage must be located at the ends of the temporary cul-de-sacs where required for safety or where physical access to the future road is possible. Where there is no other access to the subdivision a “No Thru Road” sign shall be placed at the entrance

6.11.1 Sidewalks Modify Bullet

- Cross-slope: 2%. At driveways and wheelchair ramps, cross slopes of between

0.6% and 5%, and up to 8% across short driveways are acceptable.

Add to Section

Sidewalks should be at least 1.8m wide in single family residential areas, at least 1.8m wide in multi-family residential areas, and at least 2.4m wide in commercial areas. Sidewalks in all other land uses should be at least 1.8m wide. Where railings are required, the sidewalk may be required to be widened to retain 1.8m width

6.12.3 Walkways, Greenways, Trails & Bikeways

Add Section

Walkways, greenways, trails and bikeways shall comply with the standards set out in Table 6.12.3 below:

Table 6.12.3: Walkway, greenway, trail & bikeway requirements

Trail Type	Use/Users	Width	Surface	Grades		
				Optimum Grade	Max Sustained Grade	Max Short Distance Grade*
Walkways	Generally, for short urban connections; barrier free design, for pedestrians, cyclists and wheelchair access	Min. 3.0m	Concrete or asphalt	0-5 %	8 %	15 %
Multi-Use Trail	Longer connector trails; multiple simultaneous users (pedestrians and cyclists)	Min. 2m Max.3m	Gravel (not barrier-free) Asphalt (barrier-free)	0-5 %	8 %	15 %

* Note: “Max Short Distance Grade” distance to be determined by qualified engineering professional based on good design practices for accessibility.

Add

- Where required, walkways, greenways, trails, and bikeways shall be dedicated to the City with a minimum width of 3.0m.
- Concrete public walkways between lots shall conform to MMCD Standard Drawing C10 and will be constructed of Portland cement concrete.

			• Unless provisions for controlled infiltration of runoff water are provided, a curb shall be constructed along the low side of any concrete or asphalt walkway which has a cross fall. Catch basins as required shall be located to intercept the water flowing in the centre valley or adjacent to the curbs of a walkway. • Root barriers should be installed for asphalt walkways in areas where they are within 3 meters of a tree.
6.14.2	**Number of Driveways**	Add bullet to Urban Residential Zones	• Driveway access to a secondary residence must be shared with the access to the principal residence, except for : (a) Where access to the secondary residence can be provided from a rear lane or a joint access easement with an adjacent property, or (b) For corner lots with two accesses on separate roads.
6.14.3	**Driveway Location and Width**	Delete	• Residential Zones: Driveways located on corner lots should be at least 6.0 m from the lot corner nearest the intersection – as measured by radius from the corner. Provision of adequate sight distance should be considered in accordance with TAC Geometric Design Guidelines. • Minimum and maximum widths of urban residential driveways are 4 m and 7.5 m respectively.
		Replace with	• Driveways located on corner lots should be at least 6 m from the lot corner nearest the intersection. Provision of adequate sight distance should be considered in accordance with TAC Geometric Design Guidelines.
		Add	Driveway width for a single-family house shall not exceed 9.0 m for the portion of the driveway that is situated within the public right-of-way.
6.14.6	**Access Management**	Add	Driveway access means the portion of land providing vehicular access to or from a property up to the curb, edge of pavement or travel surface from servicing ROW.

Access to an arterial road will be considered for approval only if an alternative access is not physically possible.

Hammerhead turnaround facilities on private driveways shall extend perpendicularly a minimum of 20 m beyond the centre of the driveway to accommodate the turning movements of emergency vehicles. Provide "No Parking" signs.

6.15.4 Trees Replace Section

All landscaping, irrigation, and street trees within the road right of way shall conform to the Canadian Landscape Standard by the Canadian Society of Landscape Architects and Canadian Nursery Landscape Association, Current Edition. New development should vegetate boulevard areas within the road right of way with fine grass sod or seeded fine grass in accordance with these standards.

New development shall design and provide street trees. Street trees are required for local roads as well as other road classifications per the road cross sectional drawings in this Bylaw.

A development is required to undertake tree planting per the provisions described in this section. The Owner will be required to provide security to the City which will be released following successful completion of a 2-year warranty period. During the warranty period the development is responsible to provide maintenance including irrigation / watering, weeding, supplemental fertilization and any other measures recommended by the Qualified Professional Engineer. Any trees that need to be replaced during this period shall continue to be secured for a further 2-year period after replanting. City recommends that street trees are planted at the same time as landscaping.

Optionally, the development may provide a fee whereby the City will undertake the works associated with the street tree(s). The fee is $1,500 per street tree identified in the development's street tree layout drawings and is required to be paid at time of subdivision approval or building permit issuance. This charge includes the material costs (tree, growing medium, root barriers (where necessary) etc.), cost of installation, cost of any construction protection measures, maintenance through the 2-year establishment period as well as replacement

of trees that do not survive. Irrigation is not required to be installed by the Development if the City undertakes street tree installation.

The required number of street trees is dependent on the parcel use and the mature tree height as follows.

- Residential Lots (Up to four units) – 1 Street tree per road frontage (2 Street trees for corner lots)
- Multi-Family (greater than 4 units) or commercial:
  - Large trees (>12 meters height or canopy diameter) –every 15 meters.
  - Medium trees (8-12 meters height or canopy diameter) – every 10 meters.
  - Small trees (<8 meters height) – every 6 meters

If a development provides verification that existing infrastructure conflicts with there being enough space for a street tree the number required may be reduced.

The location of all street trees shall be shown on a street tree layout drawing signed by a Qualified Professional Engineer. Street trees should be placed between the curb and sidewalk wherever there is a minimum of 2.0 meters separation and no utility conflictions. Where this cannot be achieved the street trees shall be placed within the boulevard area of the Road ROW outside of the curb and/or sidewalk. A Street tree layout drawing is required to show the street trees as well as the location of all driveways, municipal and 3rd party utilities and any other infrastructure affected by the following setback parameters:

Table 6.15.3.1 Tree Setbacks

Setback Trees From:	Distance
Underground street light conduit or irrigation main	0.6m
Other underground utilities	1.2m
Lamp standards	6.0m
Steel and wooden utility poles	3.0m

Driveways	1.5m
Catch basins	1.5m
Manholes, valve boxes, services	1.2m
Sewer service boxes	1.5m
Fire hydrants	2.0m
Road intersection	7.0m
Curb face	1.0m
Sidewalk	0.85m
Buildings - fastigiate (columnar) tree	2.0m
Buildings - regular crown tree	3.0-5.0m

The following provisions apply where the development installs the street trees and does not opt to provide a fee for the City to undertake the work:

1. The species of street tree selected shall be shown on the street tree layout drawing. Species selection is site specific and will be recommended by the City's arborist. Contact Development Services to have a site evaluation initiated and receive an assessment on the required species type.
2. Growing medium must be native or introduced soil that tree roots have the ability to grow in. Growing medium cannot be road base or compacted soil. A Qualified Professional Engineer is required to verify that the growing medium is installed per City Detail CR-L106 and with the following parameters:
   - All growing medium is to conform with either:
     i. Being listed on the City's Approved Products list or,
     ii. Meet the Canadian Landscape Standards for a Level 2P Planting Area per Table T-5.3.5.3
   - The minimum growing medium volume required to be placed for each tree is:

i. 4 m3 for a small tree (<8 meters height)
ii. 6 m3 for a medium tree (8-12 meters height or canopy diameter)
iii. 9 m3 for a large sized tree (>12 meters height or canopy diameter)

- The minimum depth of the growing medium shall be just beyond the root ball.
- On-site native growing medium (A and B Horizon) may be reused.
- Per City Detail CR-L106 provide structural topsoil under the sidewalk to connect to the neighboring landscape area.

3. An irrigation system shall be constructed for all new street trees. A certified irrigation technician (through the Irrigation Industry Association of BC) is required to design an irrigation system the meets the following parameters.
   - An automatic deep root watering system shall be provided complete with a water meter, backflow prevention, flow sensors, automatic shut off devices. Water supply and irrigation controller(s) shall be provided in central location with valve, distribution piping, electrical supply, points of connection and cross connection control winterization provisions and water conservation provisions.
   - Irrigation systems should be programmed to irrigate early in the morning or late at night and should be programmed with a minimum 4 (four) season schedule for street tree establishment.
   - The street tree layout design drawing shall include provisions for irrigation sleeves under sidewalks, driveways, or other paved areas to facilitate installation and maintenance without having to remove pavement / concrete.
4. Once the street trees have been planted provide a copy of a letter from a Qualified Professional Engineer stating that the trees, required topsoil etc. has been installed in accordance with these bylaw requirements as well as noting any applicable maintenance considerations.

6.16	**Underground Utility Locations**	Delete Bullets	• Water mains under a sidewalk • Sanitary sewers at pavement centre line • Storm sewer 1.2 m from sanitary sewer.
		Add	Water mains, sanitary sewers, and storm sewers shall be located per the City's Road Cross Section Details CR-R101, CR-R102, CR-R103, CR-R104 and CR-R105.
6.17	**Pavement Structures**		
6.17.1	**General**	Add	All visible cracks, gaps and defects located on joints between new and existing pavement shall be filled with crack sealer.
6.17.3	**Pavement Alternatives**	Delete Table 6.17.3.1 – Minimum Pavement Structure for Asphaltic Concrete (A.C.) Pavement	Replace as follow:

Table 6.17.3.1: Roadway Base Design

Classification	Minimum Thickness
Walkways	50 mm A.C. surface course
	100 mm base course
	-
Lanes	50 mm A.C. surface course
	100 mm base course
	250 mm subbase
Local / Rural	50 mm A.C. surface course
	130 mm base course
	230 mm subbase
Industrial / Collector	35 mm A.C surface course
	40 mm A.C. lower course
	150 mm base course
	300 mm subbase
Arterial	40 mm A.C surface course
	60 mm A.C. lower course
	150 mm base course
	300 mm subbase

6.19.2	**Hillside Emergency Access**	Delete	Maximum grade: 18%. Note: This does not apply in cold climates, where the recommended maximum grade is 10%.
		Replace with	Proposed exceedances from maximum emergency access grade requirements shall be reviewed on a case by case basis.
6.22	**Signage and Lane Markings**	Add new section.	All signage and lane markings installed are to conform to Ministry of Transportation or TAC Standards. And are to be installed with knock off bases as specified in the City of Campbell River Approved Products List. Street name signs are to be black lettering on reflectorized while blades, except at traffic light-controlled intersections where street name signs shall be blue blade with reflectorized white lettering. All signs are to be installed with knock off bases as specified in the Approved Products List.
6.23	**Community Mail Centres**	Add new section.	The location of Community Mail Centres (CMC) shall be shown on the Overall Development Plan. Canada Post must be contacted with regards to the location, however, in general the following procedures must be adhered and to the BC Supplement to TAC Geometric Design Guide and the following: • CMC shall not be located at roadways with 4 or more travelled lanes, including roads which will have 4 or more travelled lanes in the future. • At major intersections which are controlled by traffic signals, including pedestrian signals, they are not to be located within 100m of the intersection. • At major intersections where the minor roadway is controlled by a stop sign, the CMC may be placed on the minor leg only, at a minimum distance of 30m for the corner truncation. • At minor intersections the CMC must be placed a minimum of 15m from the beginning of the curb radii. • CMC shall not be located at the brow of hills, corners or bends which would inhibit the safe flow of traffic,

- The CMC must be placed a minimum of 30m from and on the far side of marked crosswalks, unless a pull-out and /or curb bulges are available.
- The CMC must be situated at least 20 m from major driveways, e.g. to schools, commercial developments, institutional developments, etc. The CMC are not permitted in areas with “No Stopping Signs.”

SUPPLEMENTARY DESIGN GUIDELINES
ROADWAY LIGHTING

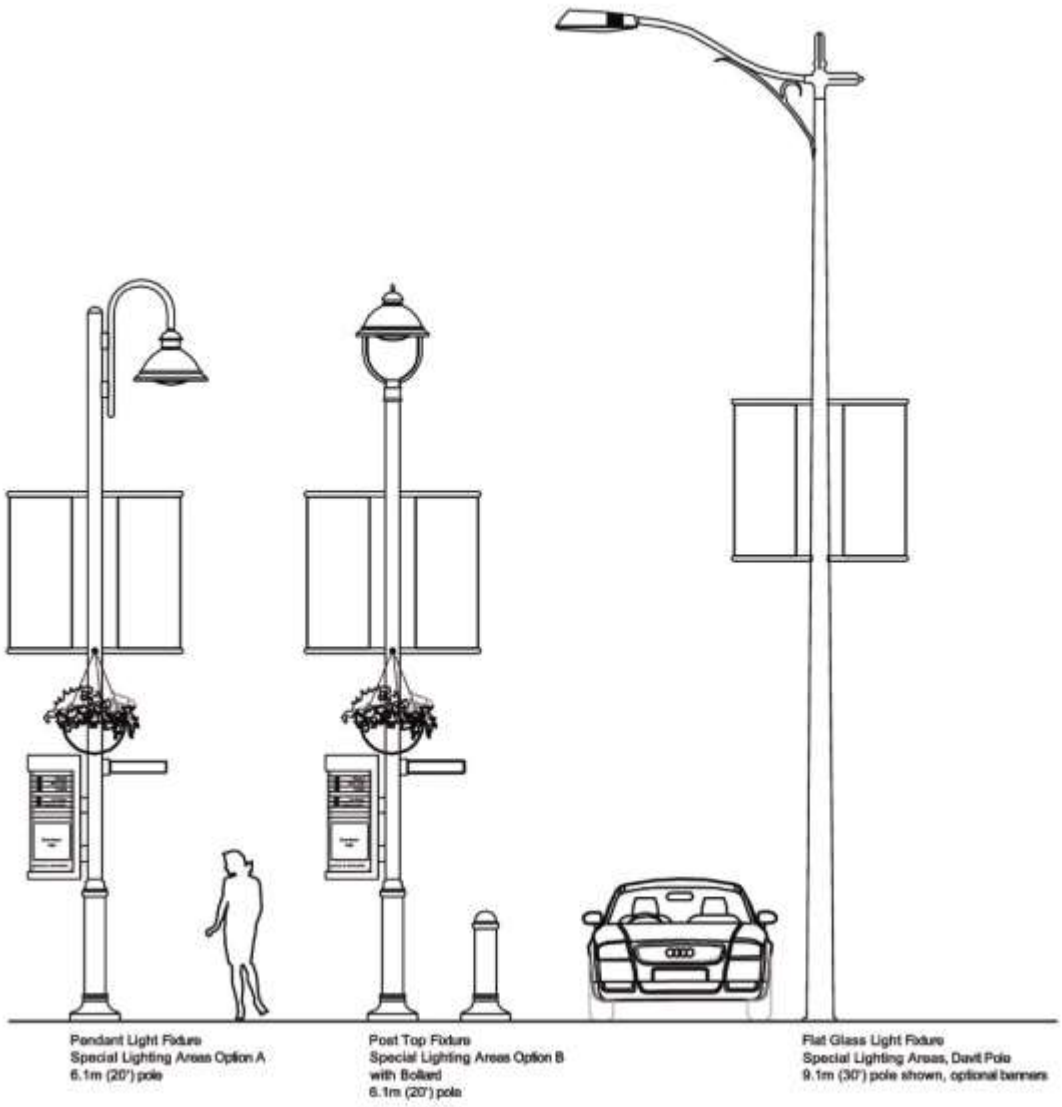
7.0 ROADWAY LIGHTING

7.1	**General**	Add to Section	Relevant publications of the Illuminating Society of North America (IESNA) including RP-8-14
7.5.1	**Light Sources and Luminaires**	Delete	Common light sources are LED, High Pressure Sodium (HPS) and Metal Halide (MH) however LED have the best efficacy and overall life cycle and are most commonly used.
		Replace with	Light sources shall be LED. The selection process shall be done in consultation with the City of Campbell River and will only include luminaire manufacturers listed in the most current version of the City's Approved Product List.
7.13	**Poles**	Delete Paragraph	Poles shall be davit type unless otherwise defined by the local authority. Standard davit pole height are to be 7.5m, 9.0m and 11.0. In general, the taller the pole the wider the pole spacing. Generally, 7.5m high pole are used on local residential roads or where maintaining clearances from overhead power lines require a shorter pole. 9.0m and 11m poles are typically used on roads 9m or wider. Double davit poles may be used in medians 1.2m or wider. Pedestrian scale lighting (also referred to as post-top lighting) poles are typically 4.0m, 6.0m or 7.5m high. This lighting is generally suitable for roadways not exceeding 11m width.
		Replace with	Poles shall be post top or davit style suited to the roadway classification and the lighting design. Pole heights should allow for the following luminaire mounting heights: • Decorative Post Top – 5.0m • Standard Post Top – 5.5m • Davit Pole – 9.1m
7.15.1	**Special Lighting Areas**	Add Section	Map A indicates areas of Campbell River where special lighting is required. In these mixed use and commercial areas, lighting designers must meet the following guidelines, to the approval of the City: • Refer to Figure 7.15.1 for illustration of the fixtures to be used in Special Lighting Areas • Davit fixture shall be on 9.0m poles with ornamental brackets and banners.

- Post top fixtures shall be one of Option A or Option B, complete with banners, hanging basket brackets, electrical outlets and information and street identification signage in selected locations.
- Pedestrian level lighting is encouraged in commercial areas.
- Lighting fixtures, poles and brackets shall be powder coated aluminium.
- Lighting fixture and colour choice shall be coordinated to create a unified appearance within a given block or district, to the satisfaction of the City of Campbell River.
- All selected lighting fixtures to be as per the City's Approved Products List.

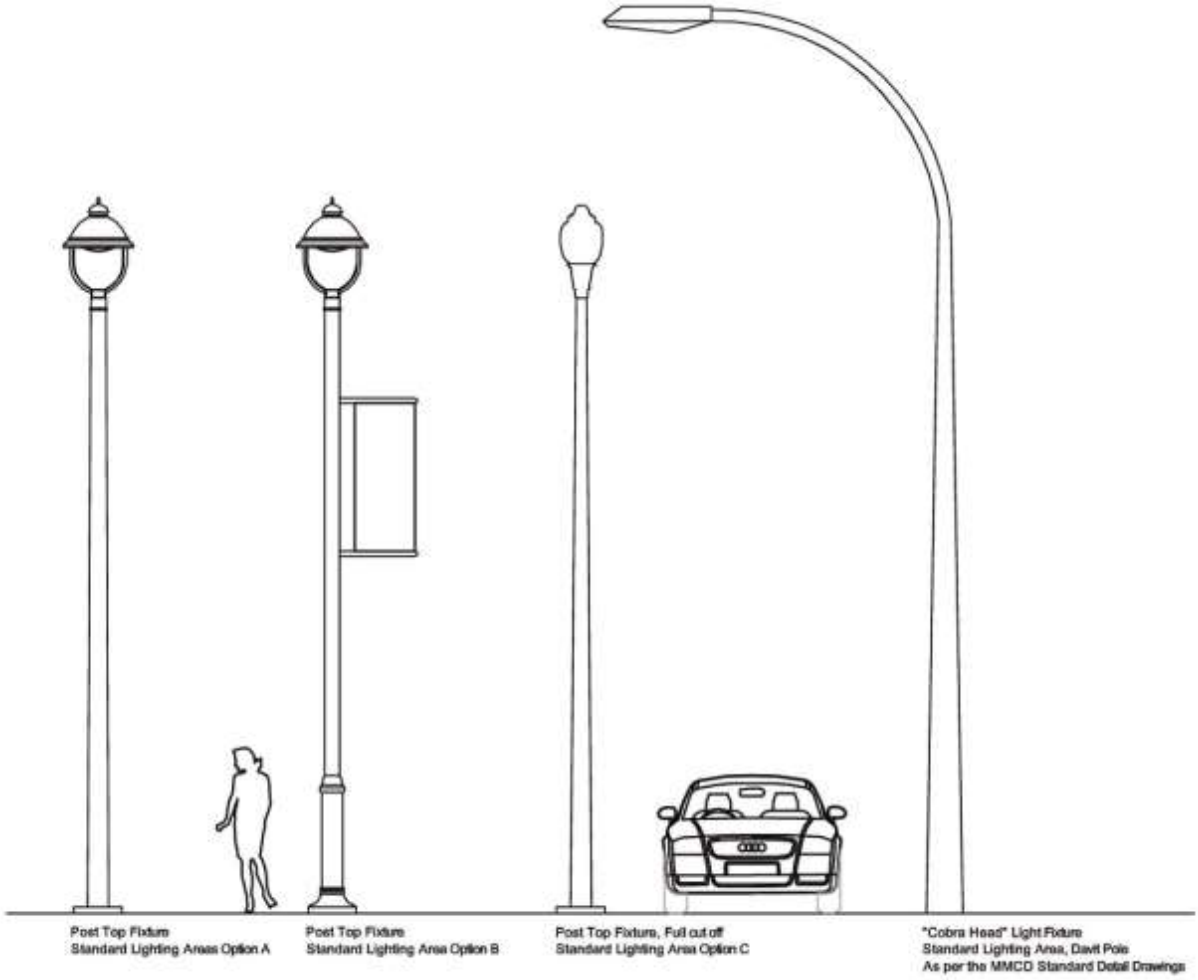
7.15.1 Special Lighting Areas Add Figure7.15.1

Figure 7.15.1: Guidelines for Special Lighting Area Fixtures



7.15.1 Special Lighting Areas Add Figure7.15.2

Figure 7.15.2: Guidelines for Standard Lighting Area Fixtures



SCHEDULE 2

SUPPLEMENTARY CONSTRUCTION SPECIFICATIONS

CONSTRUCTION SUPPLEMENTARY SPECIFICATIONS

This schedule contains supplementary specifications to be applied in conjunction with the Specification of the Master Municipal Construction Documents, dated 2019, both of which shall apply to all Works and Services constructed within the City of Campbell River.

Supplementary Specifications contained within this Schedule supplement or supersede the Master Municipal Construction Document (MMCD). Where the City of Campbell River Supplementary Specifications conflict with the MMCD, the City of Campbell River Supplementary Specifications shall take precedence.

Section number and clause numbers in the City of Campbell River Supplementary Specifications coincide with the MMCD numbering protocol.

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SECTION

MMCD Section 01 55 00S TRAFFIC CONTROL, VEHICLE ACCESS AND PARKING

1.0	**General**	Delete Subsection 1.0.4 and replace with the following	Give minimum 48h notice or as otherwise required by local bylaws to local police, fire departments, emergency services, BC Transit, and municipal works authorities prior to beginning construction and comply in all respects with their requirements.
		Add Subsection 1.0.7 as follows	Works on City Lands and Infrastructure Permit from the City is required prior to any full or partial sidewalk or walkway closure.
1.4	**Traffic Management**	Add Subsection 1.4.10(6)	Any signs placed on site shall adhere to the current City of Campbell River Sign By-Law
		Add Subsection 1.4.10(7)	Traffic control and warning devices shall be in accordance with the most recent Province of British Columbia Ministry of Transportation "Standard Specifications for Highway Construction"

MMCD Section 01 57 01S ENVIRONMENTAL PROTECTION

1.0 GENERAL

1.2	**Temporary Erosion and Sediment Controls**	Subsection 1.2.2(1) amend to read	Work around watercourses shall be done in accordance with the most recent version of the “Land Development Guidelines” published by the Provincial Ministry of Environment, and the BC Water Quality Guidelines.
1.4	**Environmental Protection**	Subsection 1.4.1 amend to read	Fires and burning rubbish shall only be in accordance with current Provincial and Municipal regulations and by-laws.
1.4	**Environmental Protection**	Subsection 1.4.2 add	Work around watercourses shall be done in accordance with the "Land Development Guidelines", published by the Ministry of Environment, Lands, and Parks, with the Riparian Areas Protection Regulations and the City of Campbell River Minor Development Permit.

MMCD Section 03 30 20S CONCRETE WALKS, CURBS AND GUTTERS

2.0 PRODUCTS

2.1 Materials Subsection 2.1.7 Add

Use narrow base curbs as shown in Standard Detail Drawing C4.

3.0 EXECUTION

3.12 Finishing Delete Subsection 3.12.3

3.19 Testing Add new Subsection 3.19 Testing as Follows

3.19.1 Portland Cement concrete shall be tested for slump, compressive strength and air content.

3.19.2 The first set of tests each day or each project shall be made on samples from the first load of concrete delivered to the site. Thereafter for every 150 metres of curb or sidewalk the Consultant shall take at least one set of tests. Each set of tests shall consist of a slump test, an air test and casting of at least three cylinders for a compressive strength test. There shall be at least three such tests each with a minimum of three cylinders for each project with 300 metres of curb and/or 150 metres of sidewalk. For all other projects there shall be a minimum of one set of tests with a minimum of three cylinders cast per 100 m^3 poured of a specified strength. Samples shall be obtained, handled and tested in accordance with CSA-CAN3-A23.2.

3.19.3 For extruded curbing installed by a slip-form curbing machine using a no-slump mix design, the slump test is not required.

3.19.4 Should a measured slump or air content test fall outside the specified limits, (as stated in section 2.1.5 Materials) the test shall be repeated immediately. In the event of a

second failure, the concrete shall be considered to have failed.

3.19.5 A compression test is the average of at least two cylinders from the same or adjacent samples of concrete. The minimum compressive strength specified shall be as in paragraph 2.1.5 Materials.

1. The average of all concrete cylinder compression tests for the particular phase of subdivision under construction shall equal or exceed the specified strength.

2. Not more than 15% of all cylinders tested shall fall below the specified strength.

3. No single test shall fall below 80% of the specified strength.

4. No three consecutive tests (based on time of pouring) shall fall below the specified strength.

If concrete fails to meet the minimum requirements of sub-paragraphs .1 and .2, the entire project shall be deemed to be unacceptable. Should it fail to meet .3 or .4, the portion of the project represented by those tests shall be unacceptable. Additional testing of unacceptable portions of curb and/or gutter may be ordered by the Consultant. Should such additional tests also prove unsatisfactory, the unacceptable concrete shall be removed and replaced.

3.19.6 Should any of the concrete be found to be unacceptable a report by a Professional Engineer shall be submitted to the City for approval detailing the extent of the work required to remove and replace the unacceptable concrete or recommendations for acceptance of the work.

MMCD Section 31 11 01S CLEARING AND GRUBBING

3.0 EXECUTION

3.5	**Removal and disposal**	Delete 3.5.3 and replace with the following	Fires and burning of rubbish on site shall only be carried out in accordance with Provincial and Municipal Regulations and By-Laws.

MMCD Section 31 23 23S CONTROLLED DENSITY FILL

3.0 EXECUTION

3.4	**Placing**	Delete subsection 3.4.3 and replace with the following	Do not place controlled density fill around pipe. Fill may be placed from 300mm above crown of pipe, on top of approved pipe bedding, to the full remaining depth.

MMCD Section 32 11 16.1S GRANULAR SUBBASE

2.0 PRODUCTS

2.1	**Specified materials**	Add to Subsection 2.1.1	(9) 150mm minus pit run gravel

MMCD Section 32 12 16S HOT-MIX ASPHALT CONCRETE PAVING

3.0 EXECUTION

3.5 Placing

Add Subsection 3.5.8 as Follows

All placements shall be done with the paving machine in constant forward motion. There shall be no stops for refilling the hopper with material, the dump must move at the same rate with the paving machine. The temperature of the mix as measured behind the paving machine screed shall not be more than 15°C lower than the mixing temperature.

3.6 Compaction

Replace Subsection 3.6.1 with the following

The minimum average density of compacted asphalt pavement shall be 97% of 75 blow Marshall Density where the average density falls below 96% of 75 blow Marshall Density the Contractor shall remove and replace the affected area of the previously placed mix. Prior to any remedial work being carried out the method of investigation and extent of remedial work must be approved by the City

3.13 Testing

Add new Subsection 3.13 Testing as follows

3.13.1 For a paving project of 99 tonnes or less lots the 75 blow Marshall Density maybe obtained by averaging the results from briquettes made from materials from the same source using the same mix design.

3.13.2 At least three core samples are required for the average from any single paving project of a size of 100 tonnes or more. In addition, 1 core sample must be taken for each additional 100 tonnes. Sampling must be representative of the total area paved. For projects that are over 1000 tonnes in size, or for work on arterial roads, a Materials Testing Consultant shall be retained to prepare for the approval of the City an asphalt pavement design and construction approval procedure.

3.13.3 Field density tests using a non-destructive testing device may be taken frequently

during the beginning of each project to verify that the rolling procedure is providing the required compaction.

MMCD Section 32 13 13S PORTLAND CEMENT CONCRETE PAVING

2.0 PRODUCTS

2.1	**Materials**	Delete Subsection 2.1.4 and replace with the Following	Concrete mixes and materials: to Section 03 30 53 – Cast-in-Place Concrete meeting CSA A223.1. Exposure Class C2. The average 28-day compressive strength shall be in accordance with the specification and/or Standard Detail Drawing for the intended use. Concrete shall be a special design with a flexural strength of not less than 4.0 MPa when tested in accordance with CSA CAN 3-A23.2.

MMCD Section 32 93 01S PLANTING OF TREES, SHRUBS, AND GROUND COVER

2.0 PRODUCTS

2.6	**Guying collar**	Delete Subsection 2.6.1 and replace with the following	Structures to stabilize trees to follow Canadian Landscape Standards Section 6.3.10.
2.13	**Root barrier**	Add Subsection 2.13.1	Root Barrier shall be a poly, ribbed device designed specifically for root barrier purposes (e.g. Deep Root Barrier or equal).
2.14	**Structural soils**	Add Subsection 2.14.1 as follows	Structural soils to follow Canadian Landscape Standards Section 5.2.9 for Engineered Soil.
2.15	**Tree gate and frame**	Add Subsection 2.15.1 as follows	Tree grates and frames shall be subject to approval of the City, based on shop drawings provided at the time of design submission.

3.0 EXECUTION

3.11	**Guarantee / Maintenance**	Delete Subsection 3.11.1 and replace with the following	A two year maintenance period will apply for landscape work. Contractor to guarantee all materials and workmanship for a period of two full years from date of Total Performance, unless specified otherwise in Contract Documents.

MMCD Section 33 11 01S WATERWORKS

1.0 GENERAL

1.7	**Scheduling of work**	Add Subsection 1.7.6	Request a Permit to Work on City Lands and Infrastructure from Development Services a minimum 3 business days in advance. Once permit has been approved the contractor is responsible for contacting the City Operations Department and the Engineer of Record to schedule the work. The contractor is responsible to notify any affected residences and businesses, and other affected parties with 2 days advance notice of when the water service will be disrupted and re-notify the same parties when the service is returned to normal operating conditions. Note that there may be time restrictions for water service disruptions depending on the affected parties.

2.0 PRODUCTS

2.3	**Valves and Valve Boxes**	Add Subsection 2.3.1.5	For pipe under 375mm diameter use gate valves. For pipe 375mm and larger use butterfly valves, unless specified otherwise in Contract Drawings.
		Add Subsection 2.3.9 - Water Meters	Installed in a location approved by the Contract Administrator and according to design standards, manufacturers recommendations and Standard Detail Drawing CR-W11.

3.0 EXECUTION

3.5	**Granular Bedding**	Add the following to Subsection 3.5.6	Where native materials are used without granular bedding, marker tape is to be placed 300-450mm above the pipe along the length of the of the trench line.
3.15	**Pipe Surround**	Delete Subsection 3.15.4 and replace with the following	Install concrete encasement where shown on Contract Drawings or as directed by Contract Administrator. For PVC mainline or service pipe install high deflection PVC coupling 0.3m minimum to 0.5m maximum from end of encasement. For ductile iron pipes, where native bedding material is used, warning tape shall be laid 300mm to 450mm above the pipe along the length of the of the trench line.

3.19 Testing Procedure

Subsection 3.19.7 add

The proving of valves and leakage tests are required for new water mains. The leakage test shall be performed in accordance with the respective standards and manufacturer's recommendations detailed in section 3.19. Care shall be taken not to exceed the allowable pressure on any main or appurtenance, especially if some parts of the system are much lower than others. In particular, all resilient-seated gate valves and butterfly valves shall not be subjected to pressures in excess of their rated pressures. Subject to those precautions, the hydrostatic pressure for testing shall be as required by the respective standard or manufacturer's recommendation for the pipe under test.

1. The proving of valves shall commence with the new mains isolated from the existing system, full of water, with an independent source of water and pump available to raise and maintain pressure in the new mains. All valves not required to be closed shall be open. Hydrant isolating valves shall be open. Pressure shall be raised to the design operating pressure. Each line valve shall be closed, one valve at a time, the downstream main depressurized and the valve proved. (Hydrant isolating valves will be proved later.) The owner may manipulate any valve under test to obtain a tight seal. Any valve which fails to hold pressure shall be repaired or replaced and be retested until a successful test is achieved.

2. The maximum length of pipe for each leakage test shall not exceed 300 m. The leakage test shall be carried out in accordance with the standard for the pipe being tested, the test duration shall be at least one hour. The test will not be accepted if the leakage exceeds the quantity determined by the following formula.:

$$L = \frac{ND\sqrt{P}}{130{,}400}$$

L = Allowable leakage (L/hr)
N = Number of joints
D = Nominal diameter of the pipe (mm)
P = The average test pressure (kPa)

3. The number of joints shall be one joint per length of pipe plus one joint per valve, two per tee and three per cross, based on the design drawings. Any additional joints introduced by the Owner for purpose of convenience of construction or repair shall not be included in the count.

3.21	**Disinfection and Flushing Procedures**	Subsection 3.21.2 add	All new waterworks materials shall be cleaned, installed and the mains and appurtenances constructed and disinfected in accordance with AWWA C651. The requirements for flushing apply, insofar as practicable, to repairs or subsequent work performed in pipes that were previously chlorinated. Those mains previously flushed, disinfected and approved shall remain isolated from other new mains not yet approved.
		Add Subsection 3.21.10	The Owner shall notify the Health Inspector of the Provincial Health Department of any intended chlorination test. Copies of test results shall be submitted to the Contract Administrator.

MMCD Section 33 30 01S SANITARY SEWERS

2.0	**PRODUCTS**		
2.3	**Service Connection**	Delete Subsection 2.3.8 (2) and Replace with the following	For connections that are more than two sizes smaller than mainline pipe, use protrusion saddles. Wyes shall be used on all new lines and wherever possible. Connections to ribbed PVC pipe to be made with preformed wye fitting.
3.0	**EXECUTION**		
3.10	**Service connections**	Add the following to Subsection 3.10.2	Marker to be set so that top protrudes between, 300mm to 600mm above existing grade
3.18	**Video Inspection**	Subsection 3.18.1 amend to read	Prior to completing paving works and again prior to the expiry of the maintenance period, the Contractor shall video inspect all sewer mains including those that are existing that service connections are inserted. The video inspection report shall be in the form specified by the Contact Administrator. Copies of the video and written reports shall be forwarded to the Contact Administrator when available. Deficiencies found to be promptly remedied.

MMCD Section 33 40 01S STORM SEWERS

3.0 EXECUTION

3.8	**Connections to existing mainline pipes**	Delete Subsection 3.8.4 and Replace with the following	For new connections to existing profile PVC, open profile HDPE or profile PP mainline sewers, use preformed tee or wye fitting when connection is up to two sizes smaller than mainline pipe. For these pipes during in-situ installation of tees or wyes, cutting across pipe ribs is not permitted.
3.10	**Service connections - Installations**	Delete Subsection 3.10.2 and Replace with the following	Install 40 x 90 mm marker stake at service terminus so that top protrudes between 300 - 600 mm above existing grade. Paint and mark as shown on Standard Detail CR-S8.
3.11	**Cleaning and flushing**	Add to Subsection 3.11.5	All flushing to be done in accordance with Provincial and Municipal environmental regulations and bylaws.
3.12	**Inspection and Testing**	Subsection 3.12.1 amend to read	Prior to completing paving works and again prior to the expiry of the maintenance period, all storm sewers including those that are existing that service connections are inserted are to be video inspected. Deficiencies found are to be promptly remedied in accordance with 3.13.

MMCD Section 33 44 01S **MANHOLES AND CATCHBASINS**

2.0 PRODUCTS

2.1	**Materials**	Add to Subsection 2.1.7	and Standard Detail Drawing S5.
		Add Subsection 2.1.7(4)	Denso manhole sealing grease or equivalent must be installed on the cover and frame lip surfaces of all manholes.

3.0 EXECUTION

3.3	**Manhole installation**	Add to Subsection 3.3.10	No pipe sections are to be left in the manhole channel.
		Add Subsection 3.3.19	Manhole bolts are required to be installed on sanitary manhole covers per the following: (1) 2 units consisting of 3" long, 5/8" carriage bolts with 1 nut and 1 washer each. (2) The first unit is tightened with the washer on the nut side. (3) The second unit is threaded such that only 2-3 threads are visible beyond the nut. The threads are to be preened over to prevent losing the nut.

SCHEDULE 3

SUPPLEMENTARY STANDARD DETAIL DRAWINGS

CONSTRUCTION SUPPLEMENTARY SPECIFICATIONS

This schedule contains supplementary standard detail drawings to be applied in conjunction with the Standard Detail Drawings of the Master Municipal Construction Documents, dated 2019, both of which shall apply to all Works and Services constructed within the City of Campbell River.

Supplementary Standard Detail Drawings contained within this Schedule supplement or supersede the Master Municipal Construction Document (MMCD). Where the City of Campbell River Supplementary Standard Detail Drawings are in conflict with the MMCD, the City of Campbell River Supplementary Standard Detail Drawings shall take precedence.

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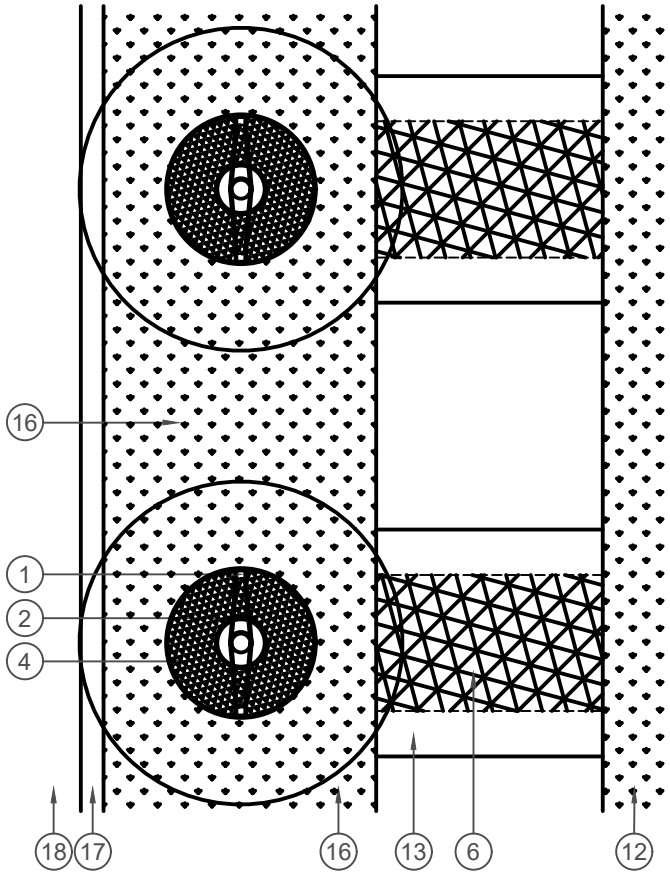
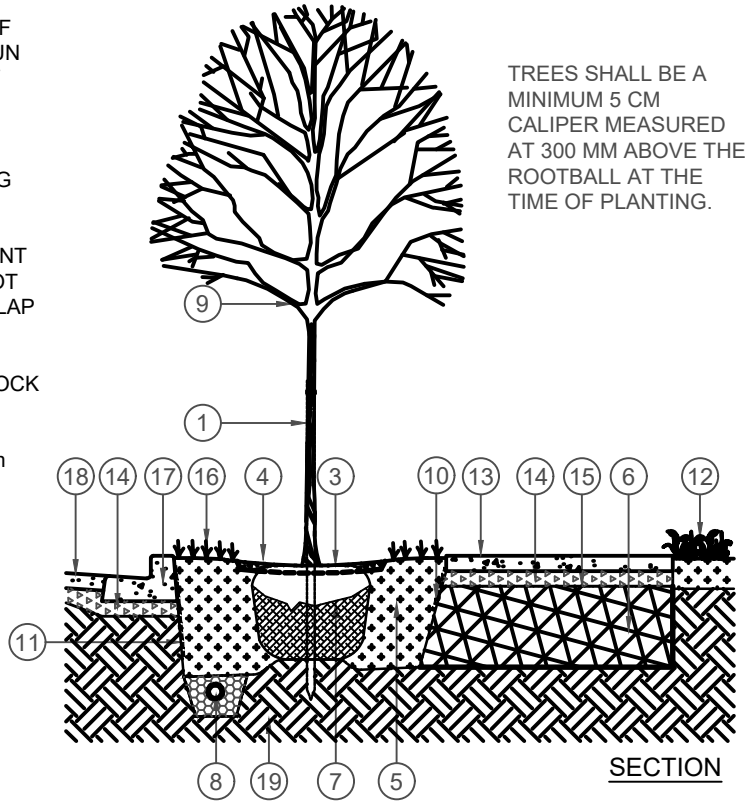
Drawing

NOTES:
THIS TREE PLANTING DETAIL IS FOR LINEAR BOULEVARD PLANTING BETWEEN THE CURB AND SIDEWALK WHERE ADJACENT LANDSCAPE AREAS OCCUR ON FAR SIDE OF SIDEWALK.
ALL PLANTS & PLANTING ARE TO CONFORM TO THE B.C. LANDSCAPE STANDARD.
STRUCTURAL SOIL MATERIALS AND INSTALLATION MUST CONFORM TO MUNICIPAL STANDARDS AND PROJECT SPECIFICATIONS.
PROTECT TREE FROM DAMAGE DURING TRANSPORT AND PLANTING. TREE ROOTS NOT TO BE EXPOSED TO SUN OR FROST.
CONFIRM TREE LOCATION AGAINST ALL REQUIRED OFFSETS.
CONFIRM LOCATION OF UTILITIES; IT IS RECOMMENDED THAT STREET TREE PLANTING PITS BE DUG BY HAND AS UNDERGROUND SERVICES MAY EXIST.
CONFIRM FREE DRAINING SUBSOIL. CONTACT THE CITY IF DRAINAGE PROBLEMS ARE PRESENT.
PROVIDE IRRIGATION TO CITY OF CAMPBELL RIVER REQUIREMENTS.



PLAN



SECTION

TREES SHALL BE A MINIMUM 5 CM CALIPER MEASURED AT 300 MM ABOVE THE ROOTBALL AT THE TIME OF PLANTING.

1. 50mmX50mm PRESSURE TREATED STAKES DRIVEN INTO UNDISTURBED SOIL OUTSIDE ROOT BALL. REMOVE STAKES AFTER ONE YEAR.
2. TWO OPPOSING, FLEXIBLE TIES
3. TOP OF THE ROOT BALL TO BE FLUSH WITH SURROUNDING GRADE, CREATE A Ø1.2m FLUSH-EDGED WELL FOR FIRST YEAR WATERING
4. 50mm DEPTH OF MULCH OVER PLANTING WELL. KEEP MULCH BACK 0.1m MIN FROM TRUNK
5. PLANTING CHANNEL TO BE CONTINUOUS DEPTH OF STRUCTURAL SOIL GROWING MEDIUM. DO NOT RUN CHANNEL UNDER DRIVEWAYS. PROVIDE SHALLOW ANGLED 600mm SETBACK FROM ENCUMBRANCES.
6. 600mm MIN DEEP STRUCTURAL SOIL BREAKOUT UNDER SIDEWALK TO CONNECT TO NEIGHBOURING LANDSCAPE AREA
7. SET ROOT BALL ON UNDISTURBED SOIL TO PREVENT SETTLING. REMOVE STRAPPING, BASKETS OR ROOT BAGS, CUT ALL BINDING MATERIAL AND FOLD BURLAP INTO HOLE PRIOR TO BACKFILLING
8. OPTIONAL Ø100mm PERFORATED PIPE IN DRAIN ROCK TRENCH WITH GEOTEXTILE ALONG ALL SIDES
9. PRUNE FOR CLEARANCE: 2m ALONG SIDEWALK, 5m ALONG ROADWAY. DO NOT CUT LEADER.
10. ROOT BARRIER, 300mm DEPTH (OPTIONAL)
11. ROOT BARRIER, 600mm DEPTH (OPTIONAL)
12. NEIGHBOURING LANDSCAPE AREA
13. SIDEWALK
14. GRANULAR BASE
15. GEOTEXTILE
16. TURF
17. CURB
18. ROAD
19. UNDISTURBED NATIVE SOIL

City of Campbell River

SCALE:	N.T.S.
APPROVED:	CCR
DATE:	MAY 2023

STREET TREE BY STRUCTURAL SOIL BREAKOUT

DRAWING NO.	CR-L1
DISK REF.	
SHEET	OF
REV.	1

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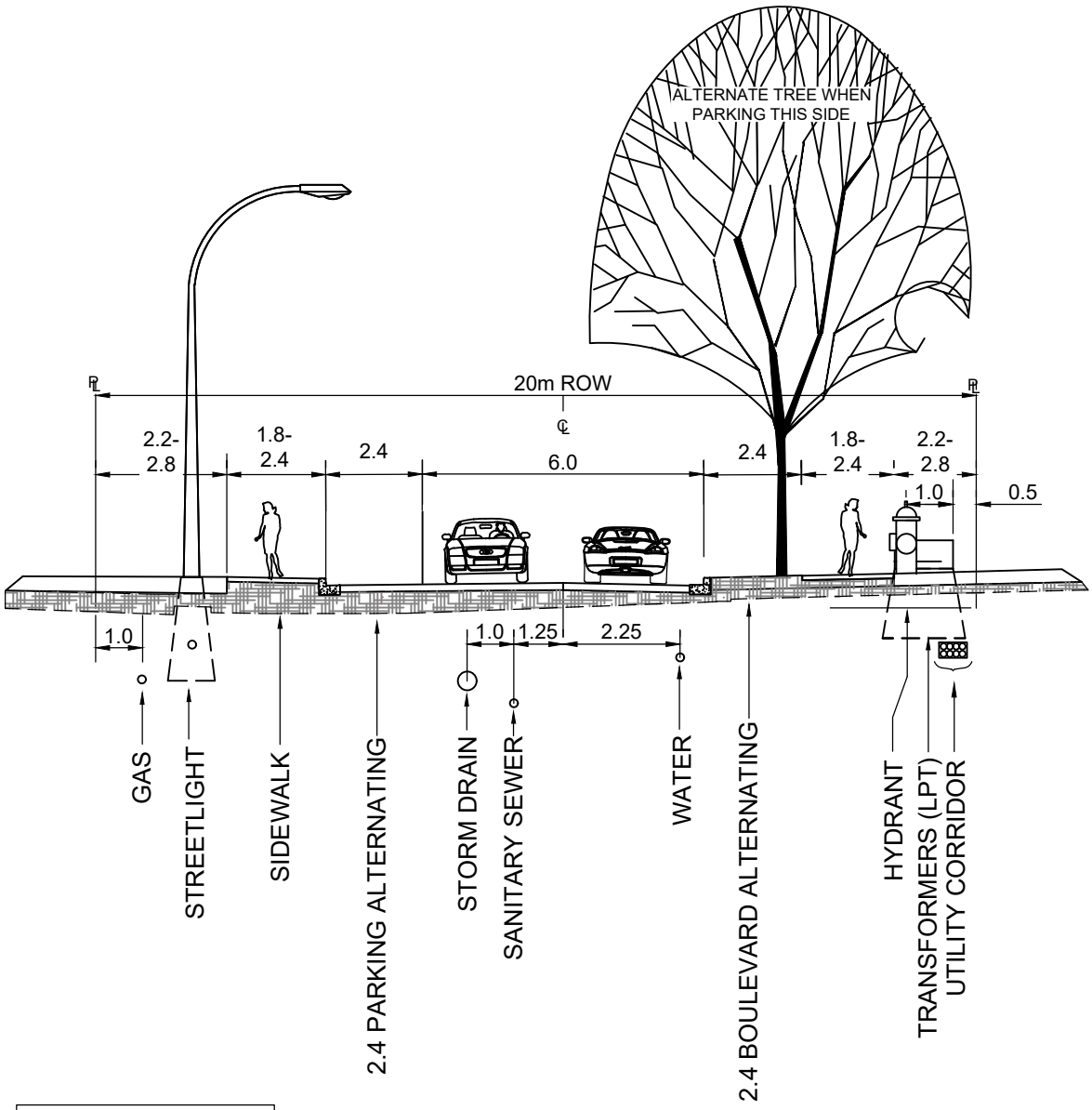
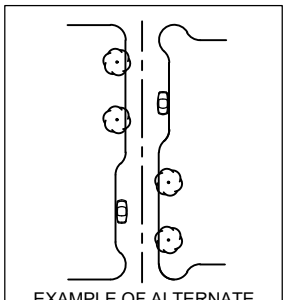




EXAMPLE OF ALTERNATE PARKING BAY ONE SIDE ONLY WITH TREE PLACEMENTS

NOTE:
SIDEWALKS LOCATED ON ONE SIDE - EXCEPT ON TWO SIDES IN AND WITHIN 400 METERS OF DOWNTOWN, VILLAGE CENTRES, NEIGHBOURHOOD CENTRES AS WELL AS ADJACENT TO AND WITHIN 400 METERS OF SCHOOLS.

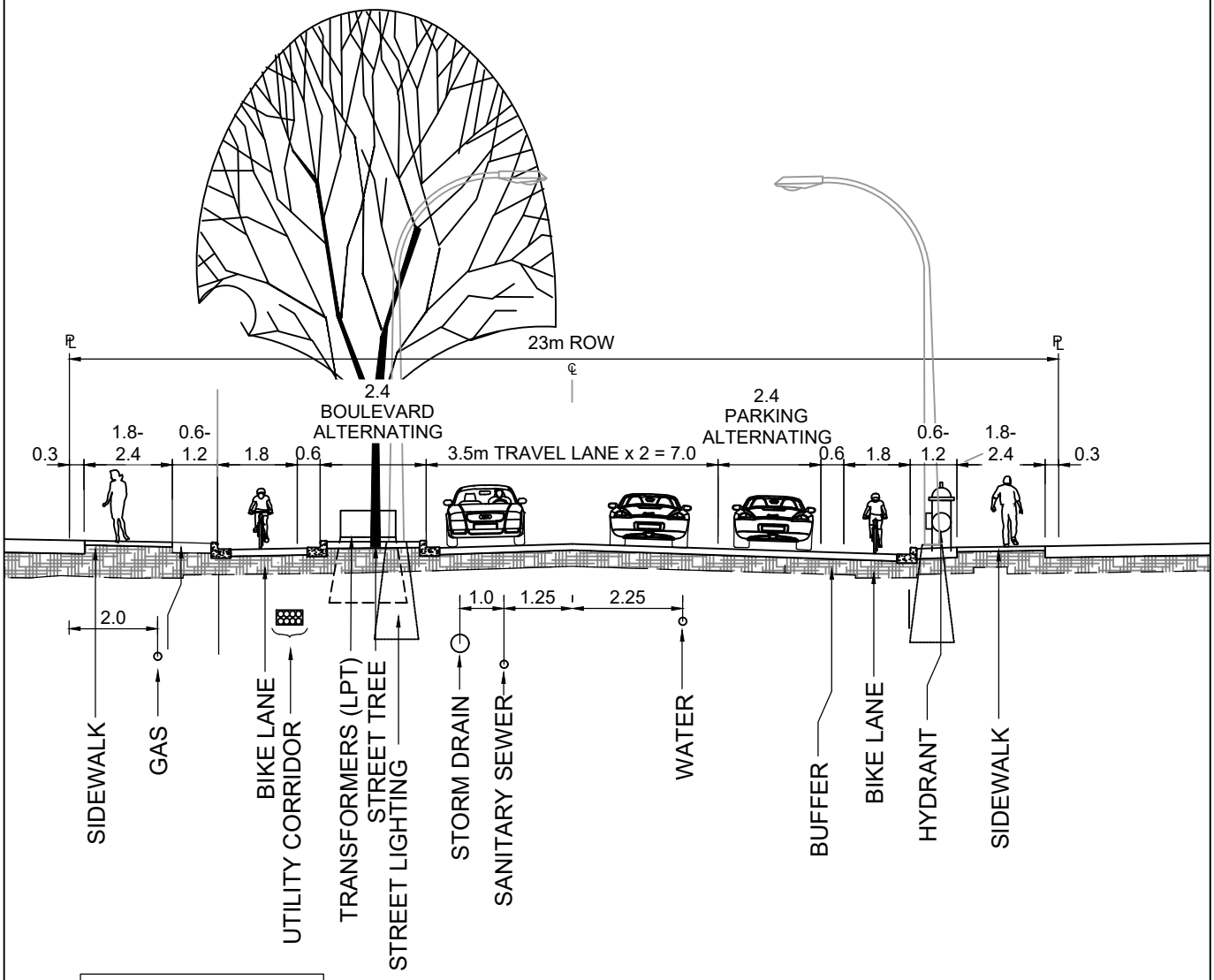
ALL DIMENSIONS IN METRES UNLESS NOTED OTHERWISE

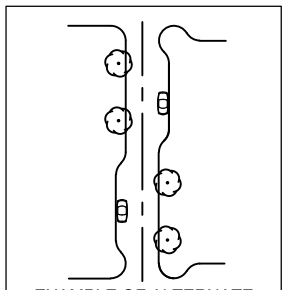
City of Campbell River

SCALE:	N.T.S.
APPROVED:	CCR
DATE:	DECEMBER 2023

LOCAL ROAD CROSS SECTION

DRAWING NO.	CR-R9
DISK REF.	
SHEET	OF
REV.	1





EXAMPLE OF ALTERNATE
PARKING BAY ONE SIDE ONLY
WITH TREE PLACEMENTS

ALL DIMENSIONS IN METRES UNLESS NOTED OTHERWISE

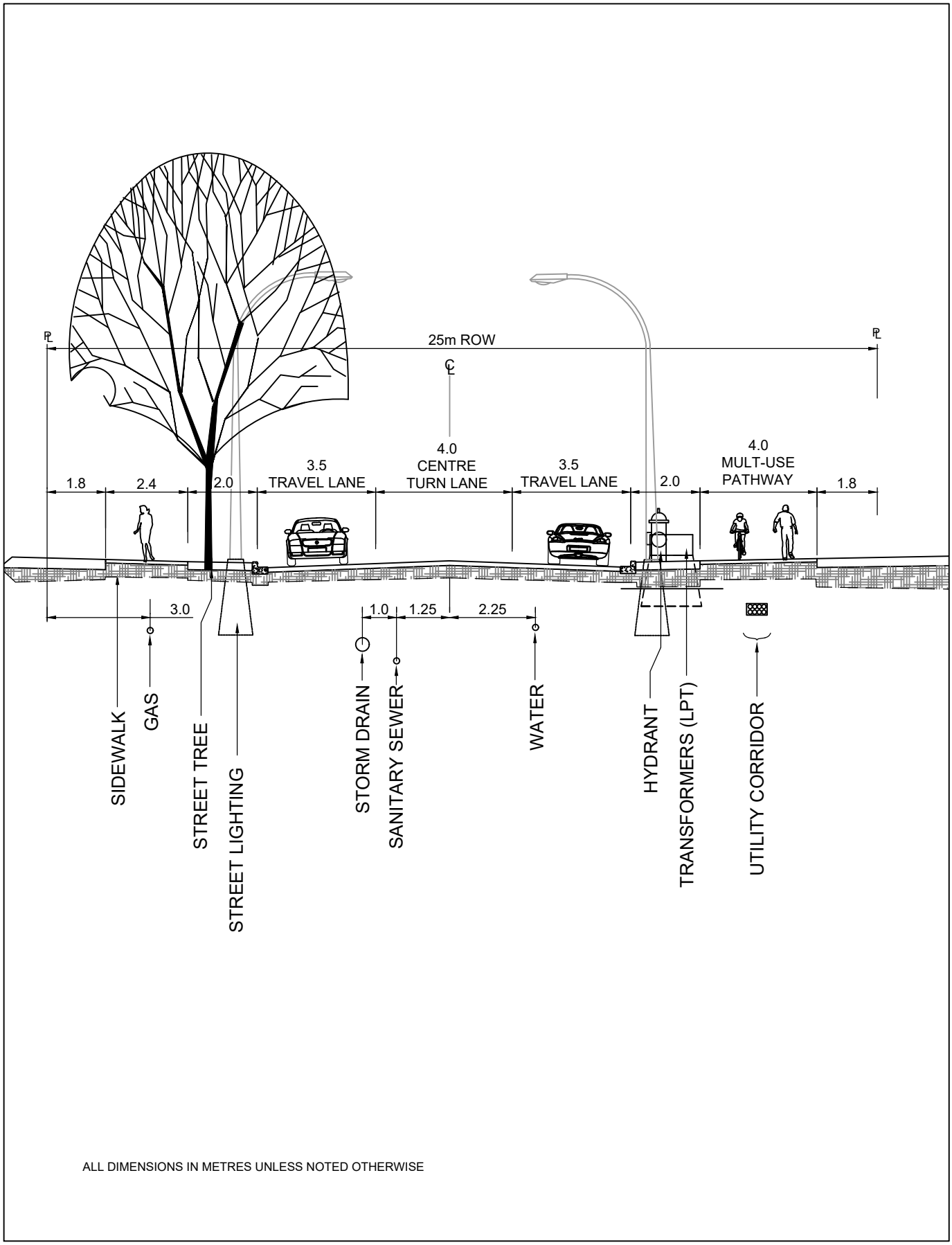
City of Campbell River

SCALE:	N.T.S.
APPROVED:	CCR
DATE:	DECEMBER 2023

COLLECTOR ROAD CROSS SECTION

DRAWING NO.	CR-R10
DISK REF.	
SHEET	OF
REV.	1

U:\Projects_CITY\1479\0044\01\R-Reports-Studies-Documents\R1-Reports\Updated Drawings\Updated CR drawings CAD Files\CR-R102 - Collector Cross Section.dwg Dec 22, 2023 9:54:23am



ALL DIMENSIONS IN METRES UNLESS NOTED OTHERWISE

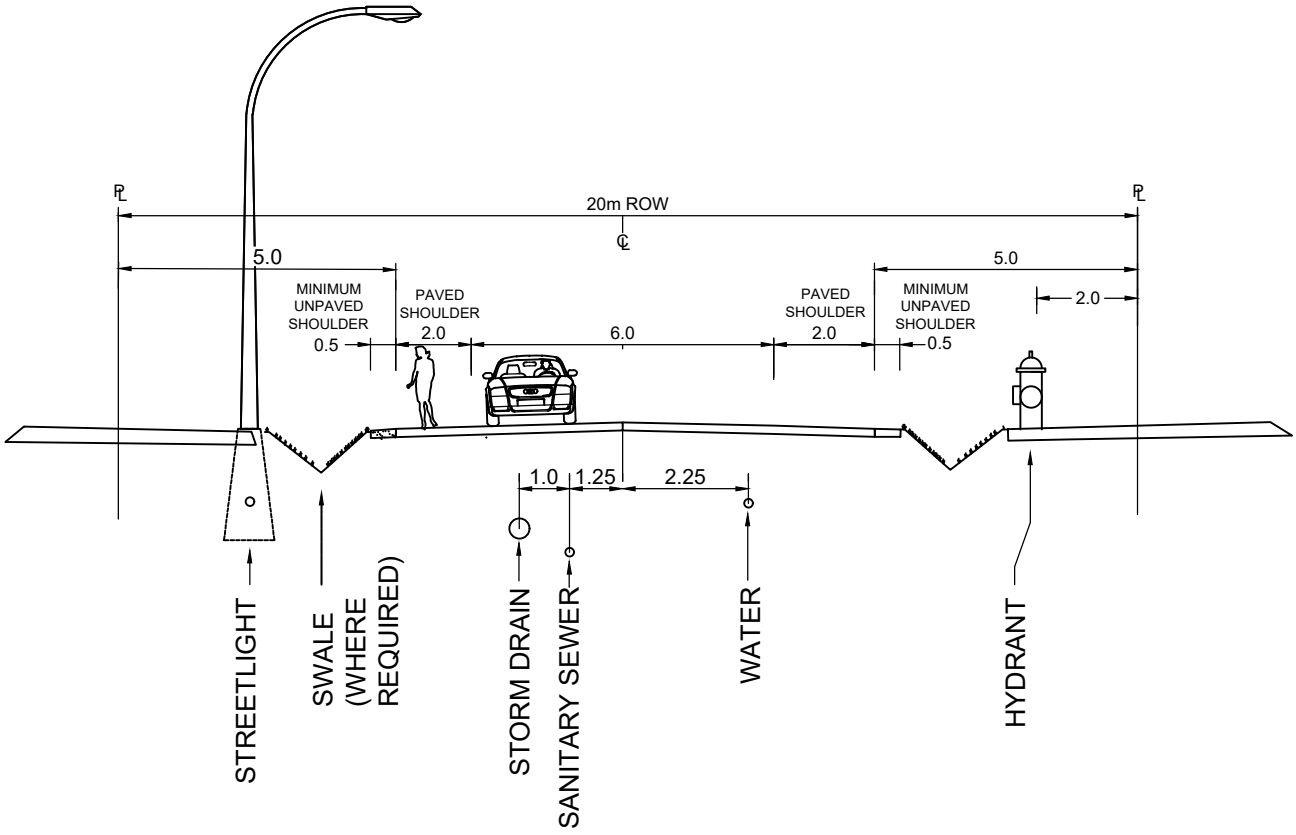
City of Campbell River

SCALE:	N.T.S.
APPROVED:	CCR
DATE:	DECEMBER 2023

ARTERIAL ROAD CROSS SECTION

DRAWING NO.	CR-R11
DISK REF.	
SHEET	OF
REV.	1

U:\Projects_CITY\1479\0044\01\R-Reports-Studies-Documents\R1-Reports\Updated Drawings\Updated CR drawings CAD Files\CR-R103 - Arterial Cross Section.dwg Apr 17, 2024 2:41:01pm



NOTE:
1. BOULEVARD MUST BE GRADED @ 2% TO 1.0m BEYOND ANY KIOSK, VAULT OR HYDRANT.

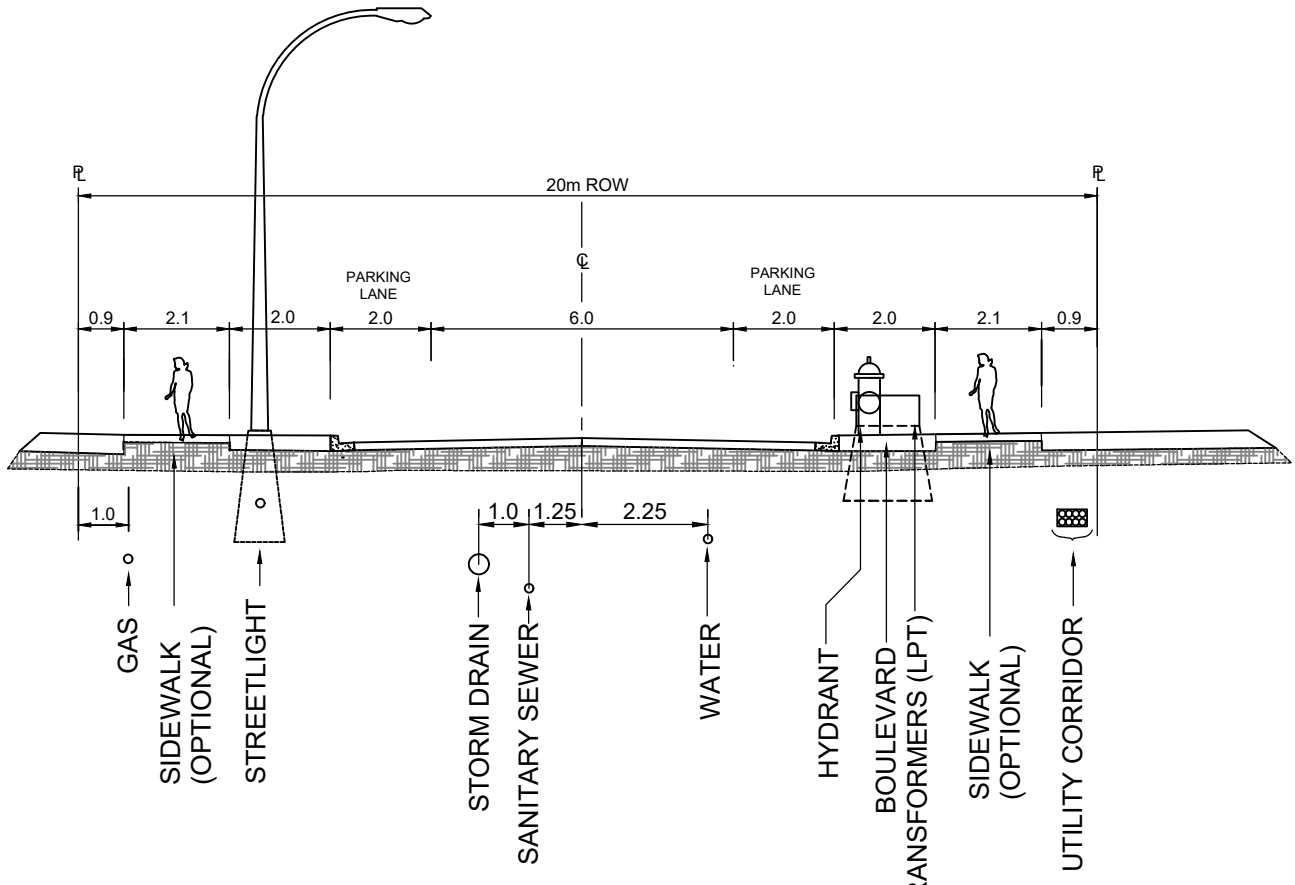
ALL DIMENSIONS IN METRES UNLESS NOTED OTHERWISE

City of Campbell River

SCALE:	N.T.S.
APPROVED:	CCR
DATE:	DECEMBER 2023

RURAL ROAD CROSS SECTION

DRAWING NO.	CR-R12
DISK REF.	
SHEET	OF
REV.	1



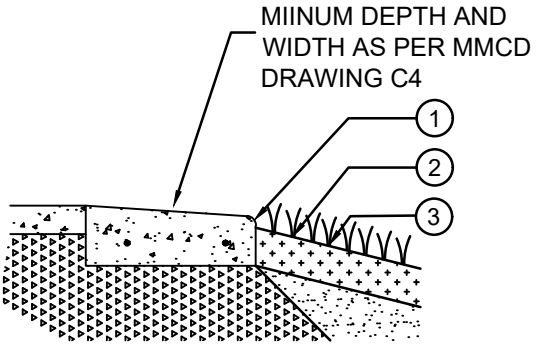
ALL DIMENSIONS IN METRES UNLESS NOTED OTHERWISE

City of Campbell River

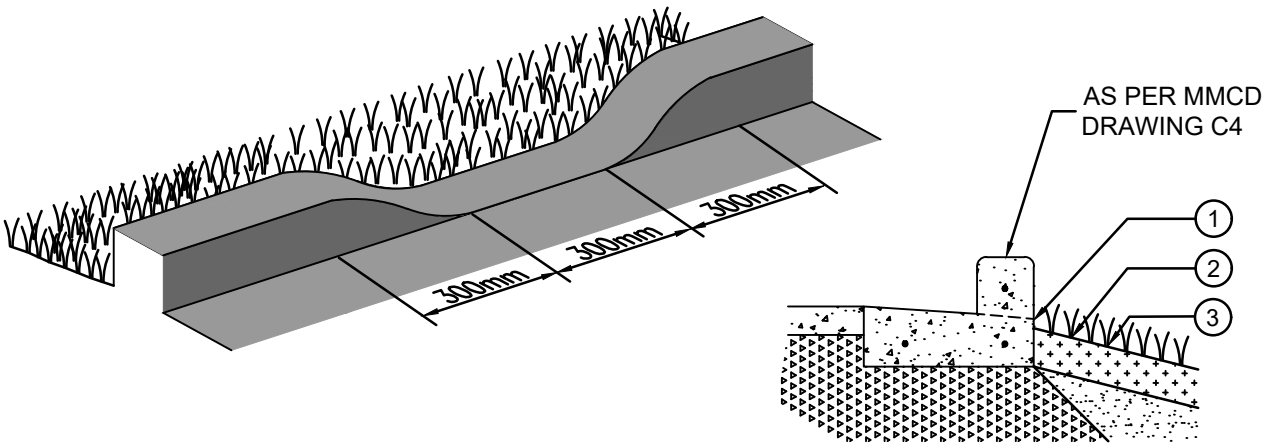
SCALE:	N.T.S.
APPROVED:	CCR
DATE:	DECEMBER 2023

INDUSTRIAL ROAD CROSS SECTION

DRAWING NO.	CR-R13
DISK REF.	
SHEET	OF
REV.	1



FLUSH CURB



DROP CURB

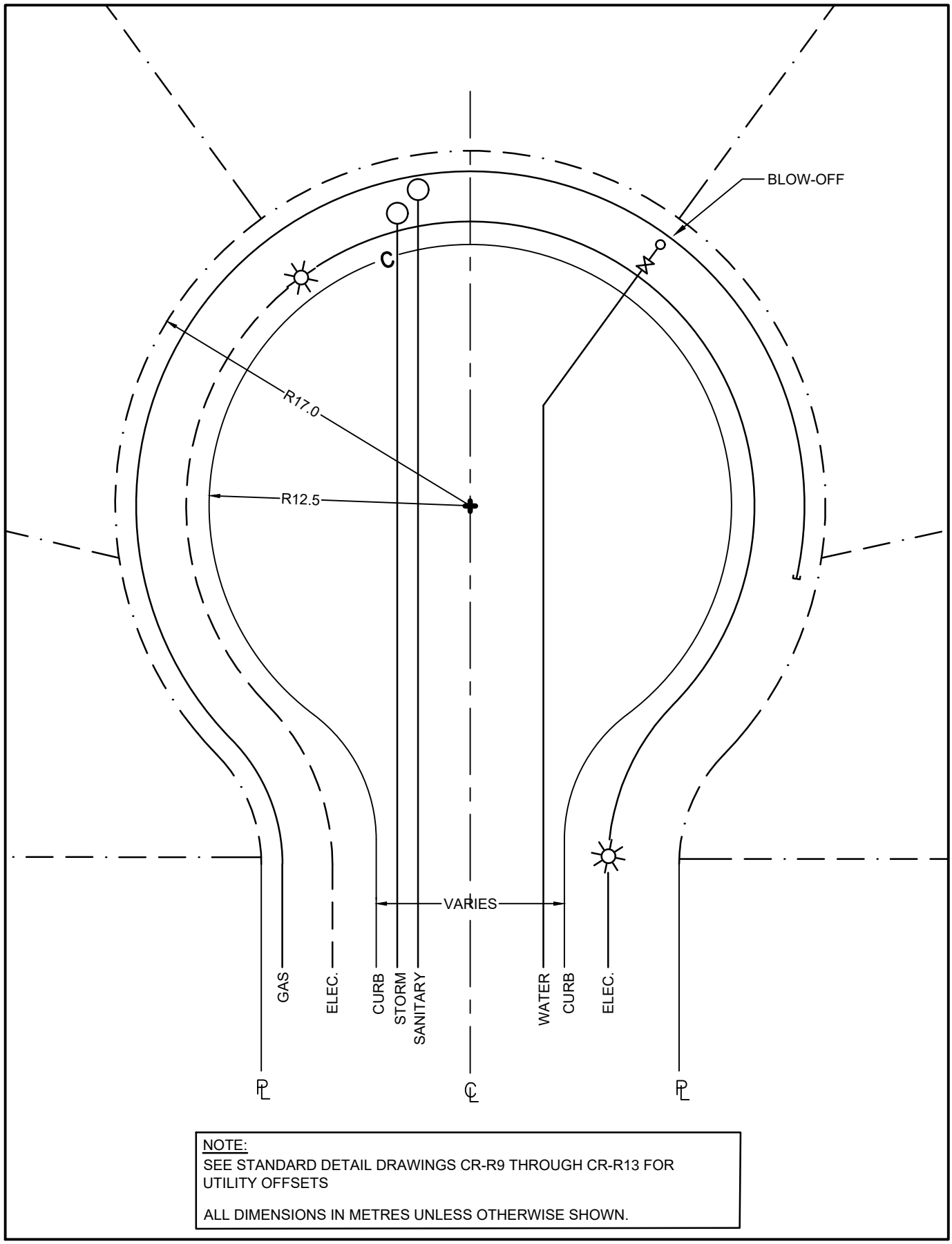
1. 0.025m VERTICAL DROP (TYP).
2. 4:1 MAX. SLOPE FOR FIRST 0.5m (TYP.)
3. FINISHED WITH EROSION RESISTANT TREATMENT (EG. SODDED GRASS OR EROSION CONTROL FABRIC) TYP.

City of Campbell River

SCALE:	N.T.S.
APPROVED:	CCR
DATE:	DECEMBER 2023

CURBING OPTIONS AS INFILTRATION SWALES

DRAWING NO.	CR-R14
DISK REF.	
SHEET	OF
REV.	1



NOTE:
SEE STANDARD DETAIL DRAWINGS CR-R9 THROUGH CR-R13 FOR UTILITY OFFSETS

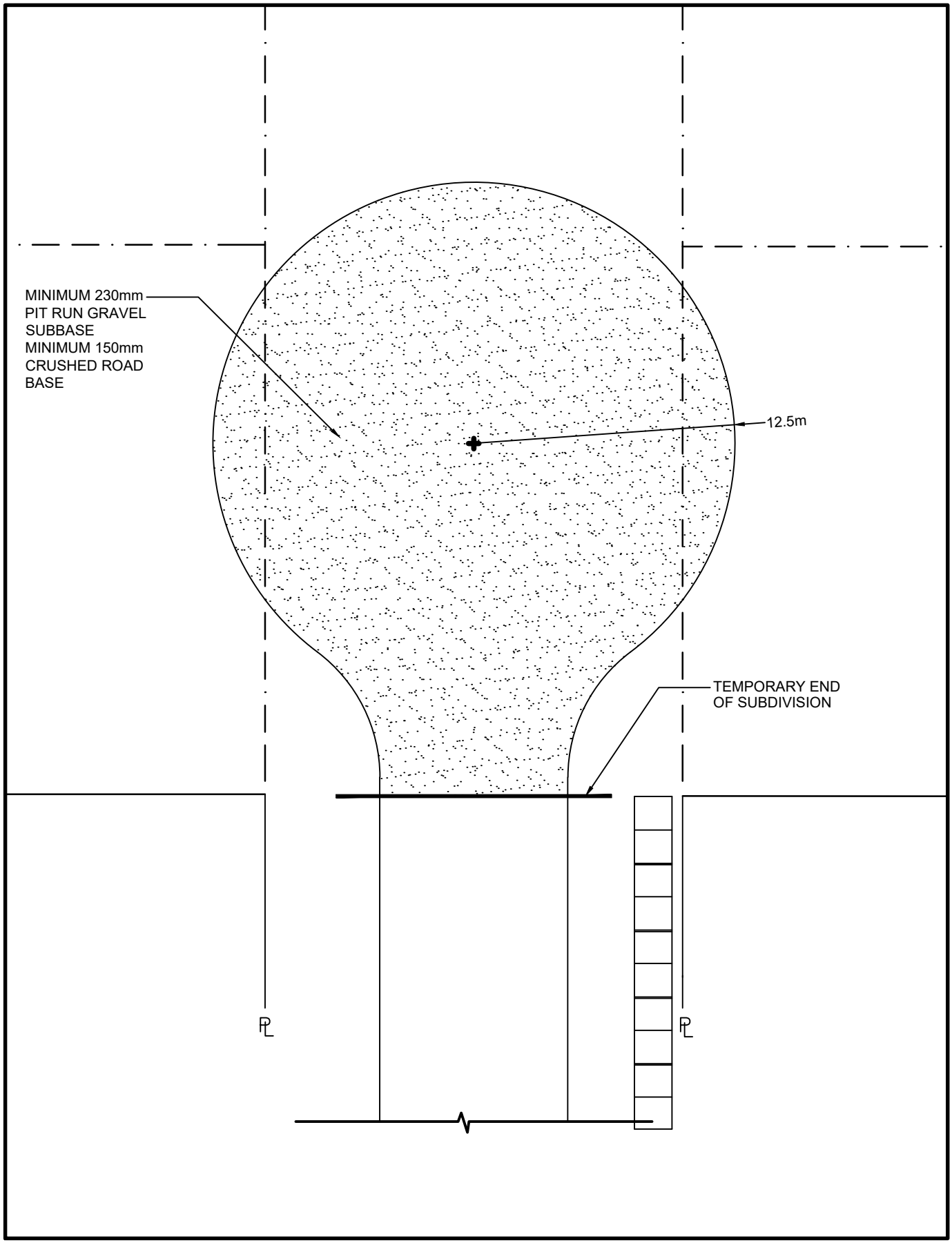
ALL DIMENSIONS IN METRES UNLESS OTHERWISE SHOWN.

City of Campbell River

SCALE:	N.T.S.
APPROVED:	CCR
DATE:	DECEMBER 2023

CUL-DE-SAC
TYPICAL UTILITY LOCATIONS

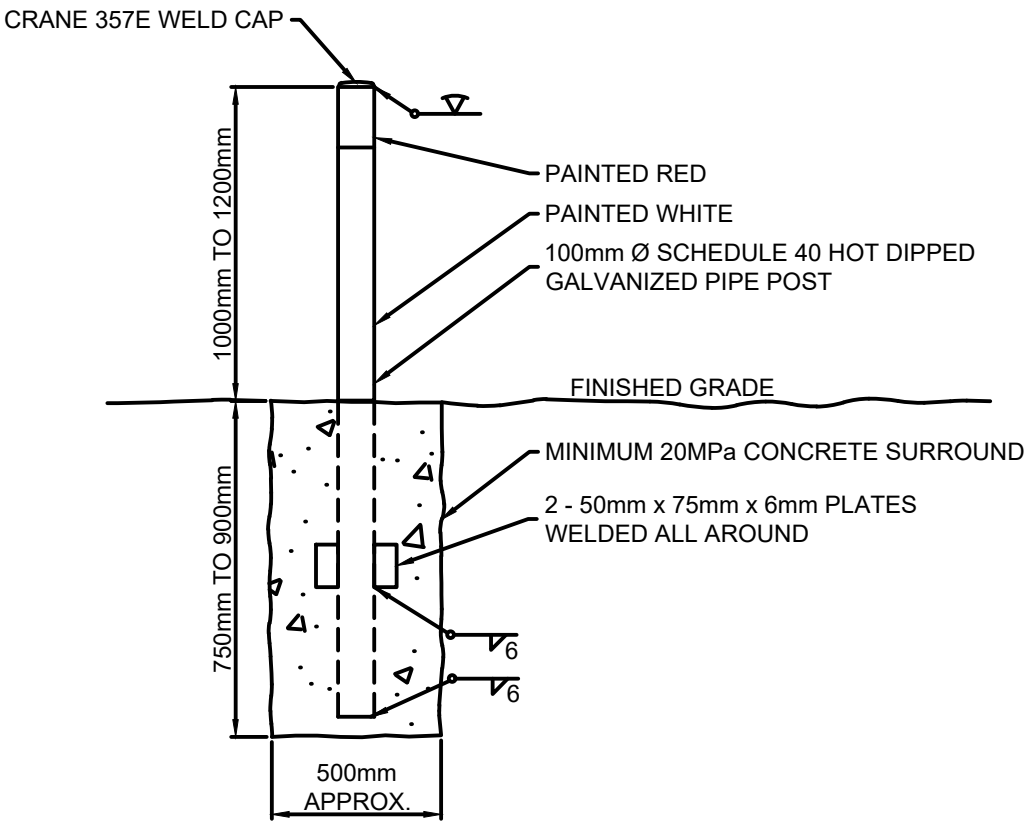
DRAWING NO.	CR-R15
DISK REF.	
SHEET	OF
REV.	1



City of Campbell River

TEMPORARY GRAVEL CUL-DE-SAC

SCALE:	N.T.S.
APPROVED:	CCR
DATE:	DECEMBER 2023
DRAWING NO.	CR-R16
DISK REF.	
SHEET	OF
REV.	1



RATIO OF 3/4 FOR BURY OF POST/EXPOSED POST

City of Campbell River

SCALE:	N.T.S.
APPROVED:	CCR
DATE:	DECEMBER 2023

FIXED RESTRICTION POST

DRAWING NO.	CR-R17
DISK REF.	
SHEET	OF
REV.	1

NOTES:
STREET SIGN PLATE GRAPHICS IN ACCORDANCE WITH EITHER THIS PLAN OR CR-G102 AS SUITABLE FOR THE APPLICATION.

STOP SIGN BLANK SHALL BE 12 ga. (O.081) 505H32 ALLOY ALUMINUM OR EQUAL.

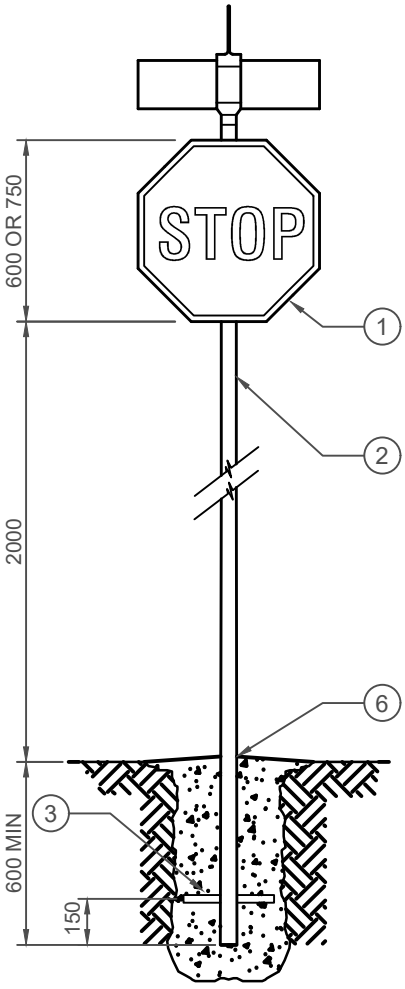
STOP SIGN TO BE 600 X 600 ON LOCAL ROADS AND 750 X 750 ON ARTERIAL AND COLLECTOR ROADS. STOP SIGN FACE SHALL BE DIAMOND GRADE REFLECTORIZED WHITE ON REFLECTORIZED RED.

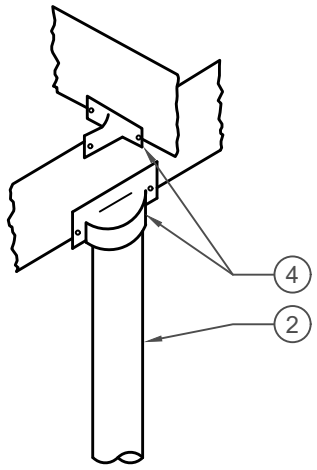
STREET SIGN BLANK SHALL BE ALCAN 6063-T6C ALUMINUM SIGN BLADE, SHAPE V15116, OR EQUAL.

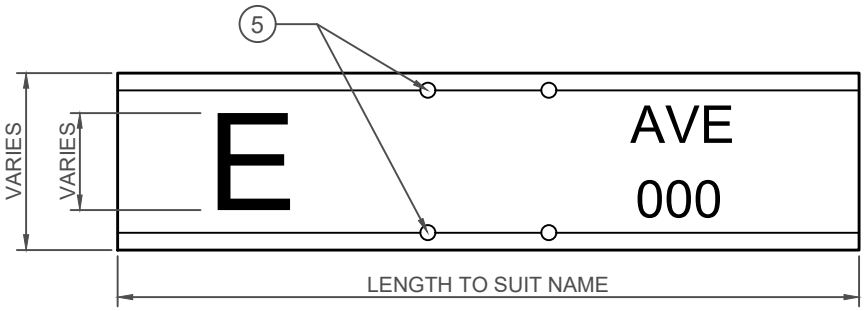
SIGN POSITION CONFORMING TO BC MoTI OR TAC STANDARDS.

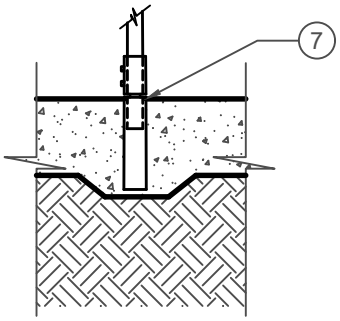
ALL OTHER REGULATORY SIGNS TO BE MOUNTED ON ROUND POSTS AND CONFORM TO MOT OR TAC STANDARDS.

1. STANDARD SIZE = 600 X 600. SIGNS AT COLLECTORS AND ARTERIALS TO BE 750 x 750
2. POST 65mmØ x 3.05m GALVANIZED SCHEDULE 40 PIPE
3. 15mm x 115mm ANCHOR
4. HEAVY DUTY CAST ALUMINUM FITTING
5. DRILLED TO SUIT
6. FOR PLACEMENT IN NATIVE MATERIAL.
7. FOR PLACEMENT IN PORTLAND OR ASPHALT CONCRETE SURFACE, USE APPROVED KNOCK OFF BASE.









ALL DIMENSIONS IN MILLIMETRES, UNLESS OTHERWISE SHOWN.

City of Campbell River

SCALE:	N.T.S.
APPROVED:	CCR
DATE:	MAY 2023

STREET NAME AND STOP SIGN

DRAWING NO.	CR-R18
DISK REF.	
SHEET	OF
REV.	1

SIGNALIZED INTERSECTION STREET SIGN FACE SHALL BE NON-REFLECTIVE COLOURED BACKGROUND WITH DIAMOND GRADE REFLECTORIZED WHITE CHARACTERS, BOTH SIDES.

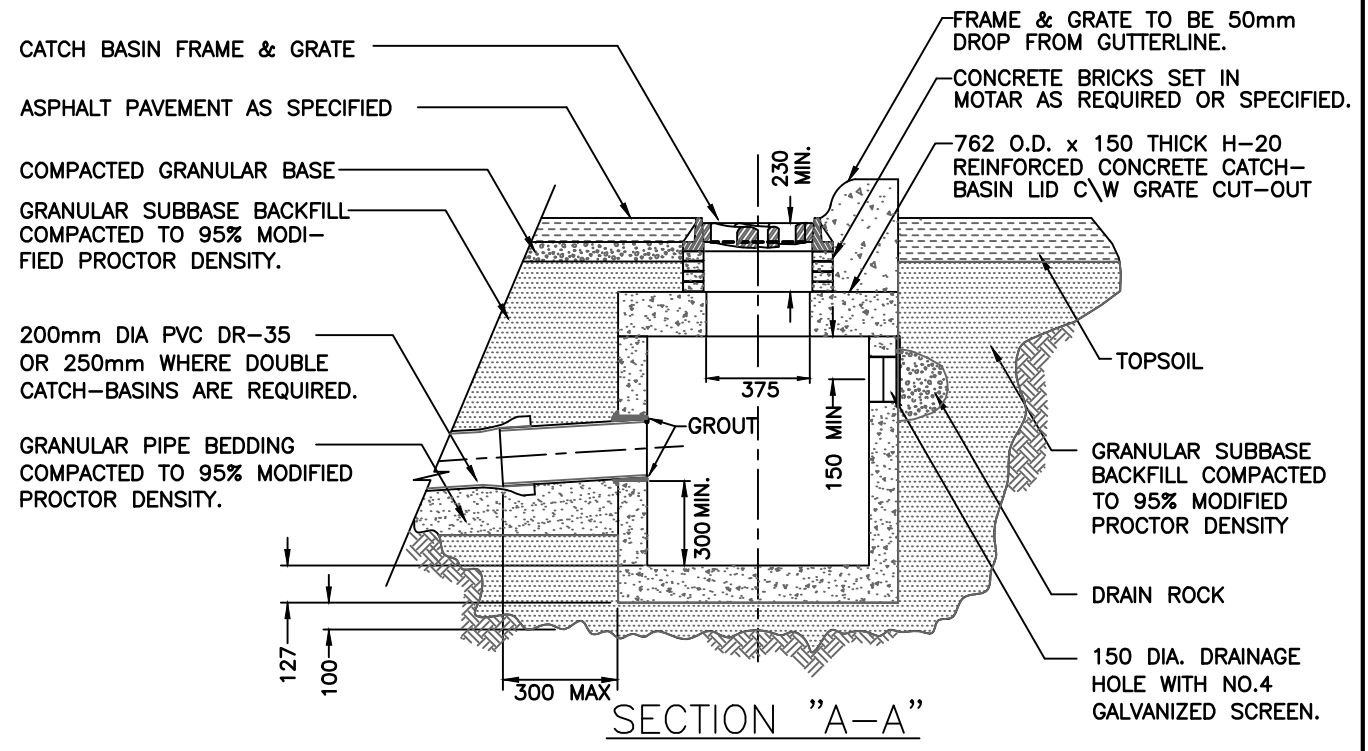
ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE.

City of Campbell River

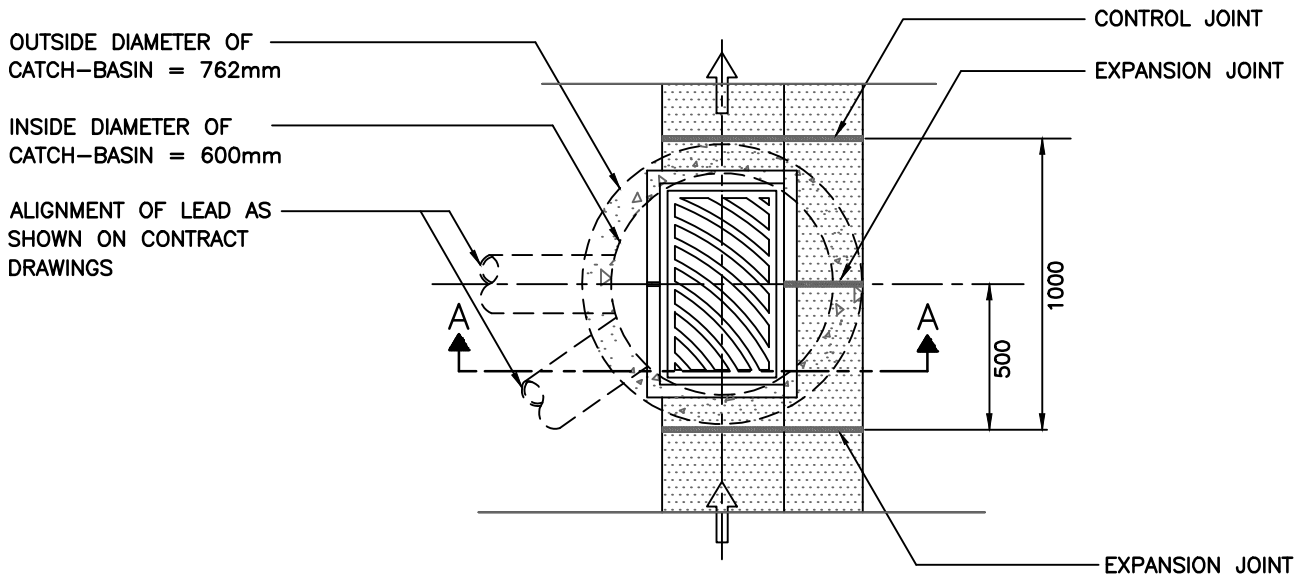
SCALE:	N.T.S.
APPROVED:	CCR
DATE:	MAY 2023

SIGNAGE FOR SIGNALIZED INTERSECTIONS

DRAWING NO.	CR-R19
DISK REF.	
SHEET	OF
REV.	1



SECTION "A-A"



PLAN VIEW

- DETAILS ARE DRAWN FOR PRECAST RISERS ON CAST-IN PLACE BASES. PRECAST UNITS C/W BASE APPROVED BY ENGINEER ARE ACCEPTABLE.
- REFER TO CONTRACT DRAWINGS AND MMCD SECTION 33 44 01 FOR DETAILED SPECIFICATIONS.
- GRATING SET IN ACCORDANCE WITH FLOW PATTERN OF RUNOFF IN THE GUTTER.
- ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE SHOWN.

City of Campbell River

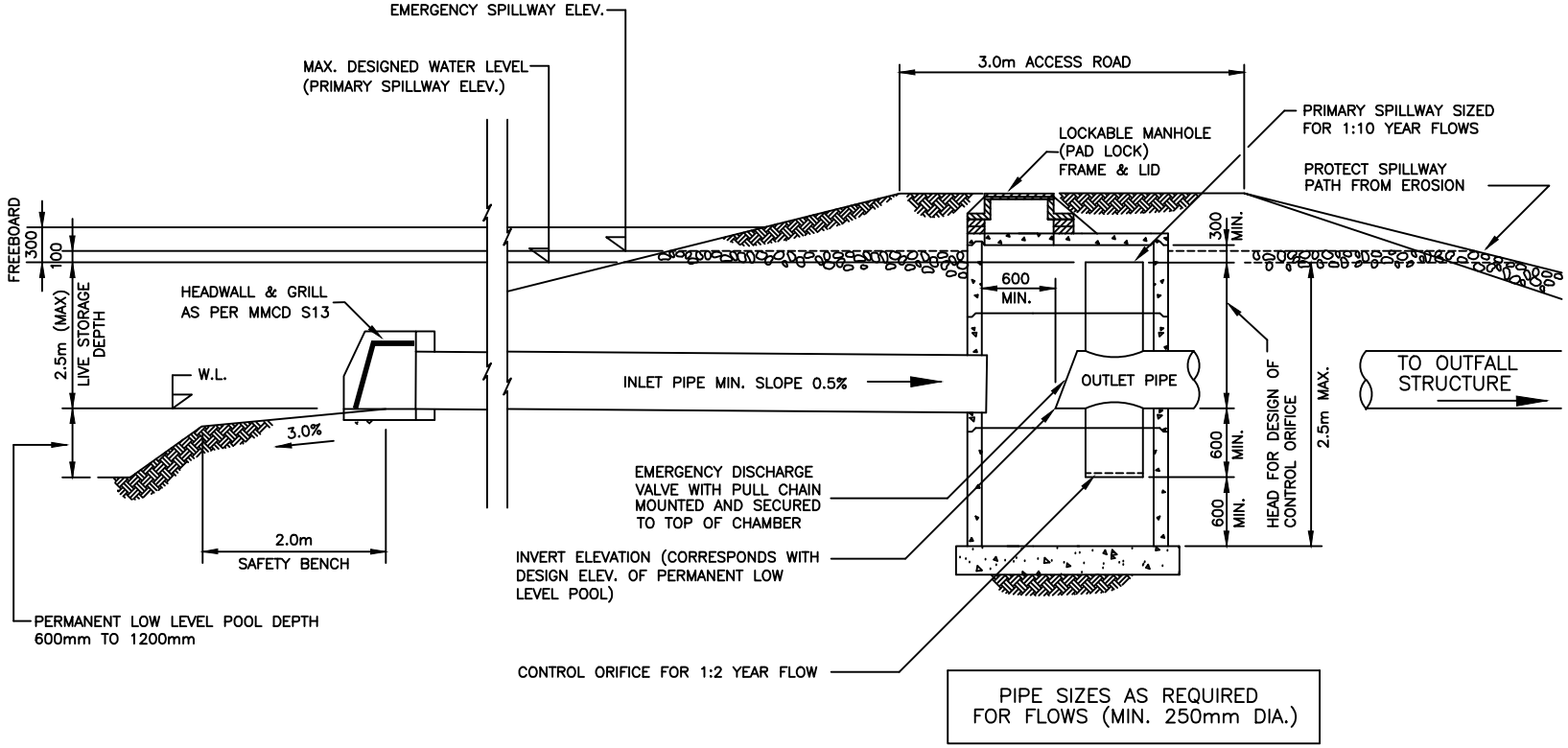
SCALE:	N.T.S.
APPROVED:	CCR
DATE:	DECEMBER 2023

CATCHBASIN

DRAWING NO.	CR-S11
DISK REF.	
SHEET	OF
REV.	1

City of Campbell River

STORM WATER MANAGEMENT
WET DETENTION POND
SECTION

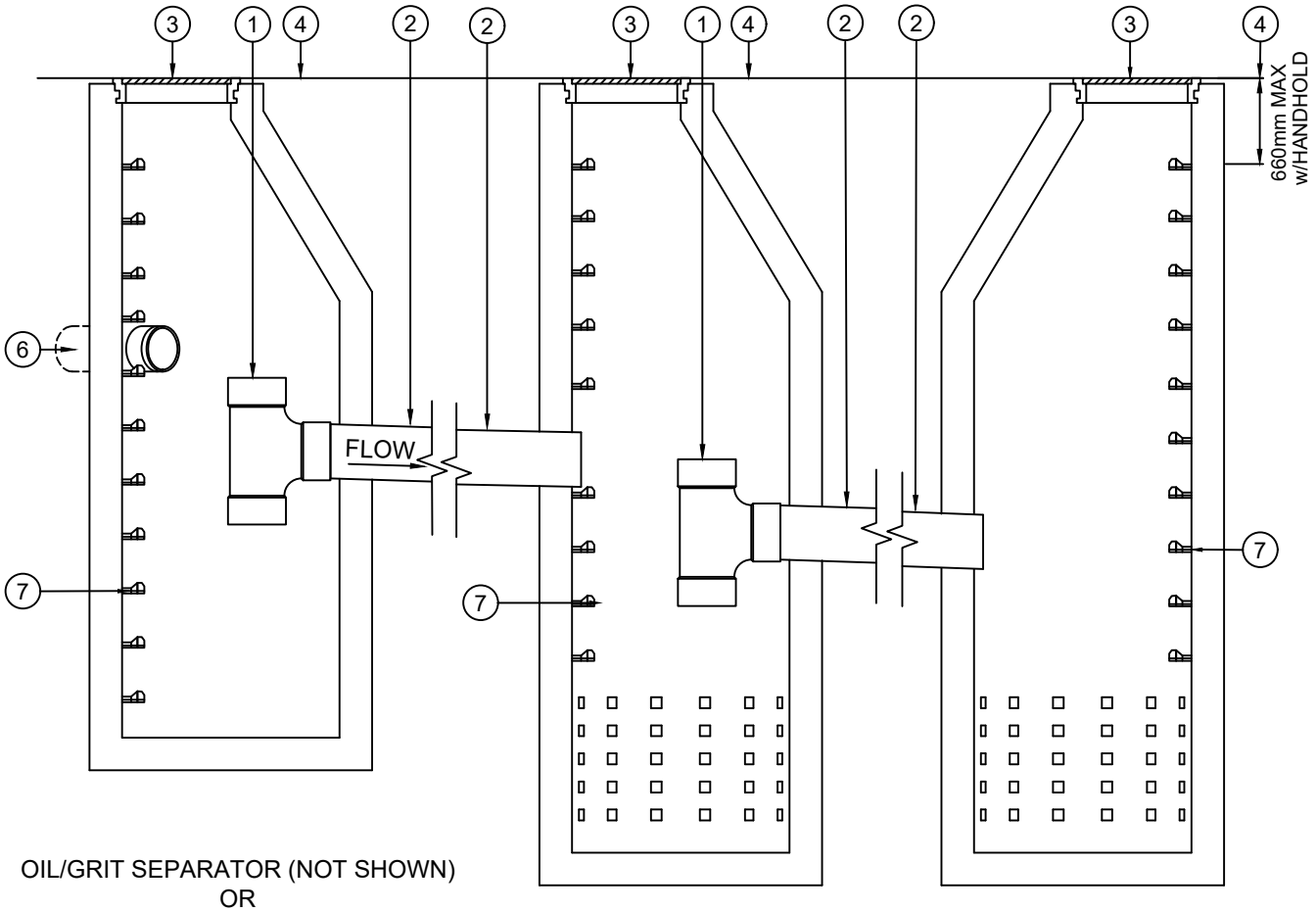


– ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE SHOWN.

SCALE: N.T.S.	APPROVED: CCR	DATE: MAY 2023

DRAWING NO. CR-S18	DISK REF.	SHEET OF	REV. 1

1. 100mm DIA PVC SOLID PIPE C/W OUTLET TEE
2. INTERCONNECTING PVC SOLID PIPE
3. STANDARD MANHOLE FRAME AND COVER
4. FINISH GRADE
5. SEAL JOINTS WITH CEMENT GROUT OR APPROVED MASTIC
6. STREET INLET CONNECTION
7. LADDER RUNG



OIL/GRIT SEPARATOR (NOT SHOWN)
OR
SEDIMENTATION MANHOLE
AS APPROVED BY CITY

INFILTRATION SHAFT

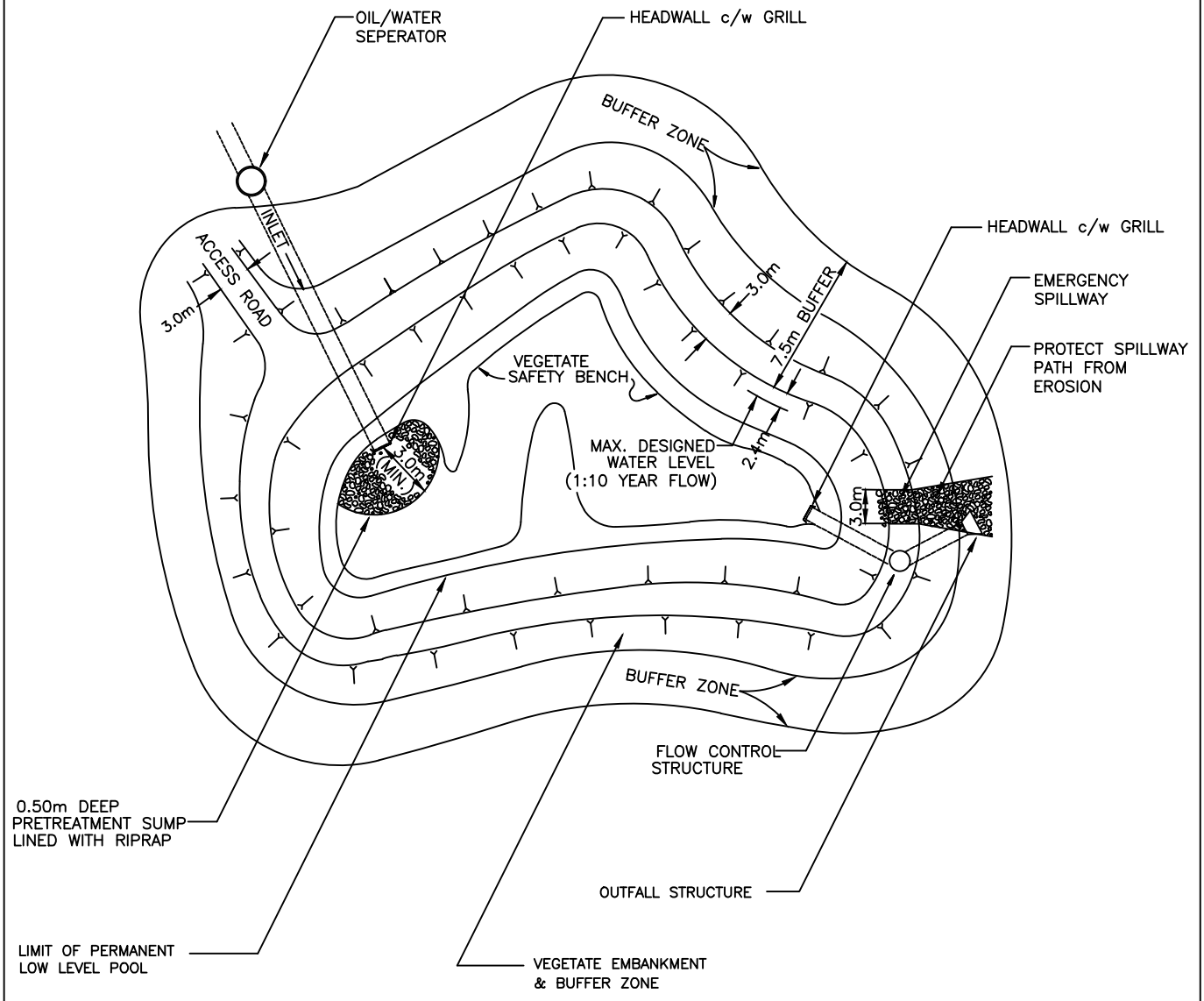
INFILTRATION SHAFT

City of Campbell River

SCALE:	N.T.S.
APPROVED:	CCR
DATE:	MAY 2023

DIAGRAM OF SEDIMENTATION MANHOLE AND INFILTRATION SHAFT

DRAWING NO.	CR-S19
DISK REF.	
SHEET	OF
REV.	1



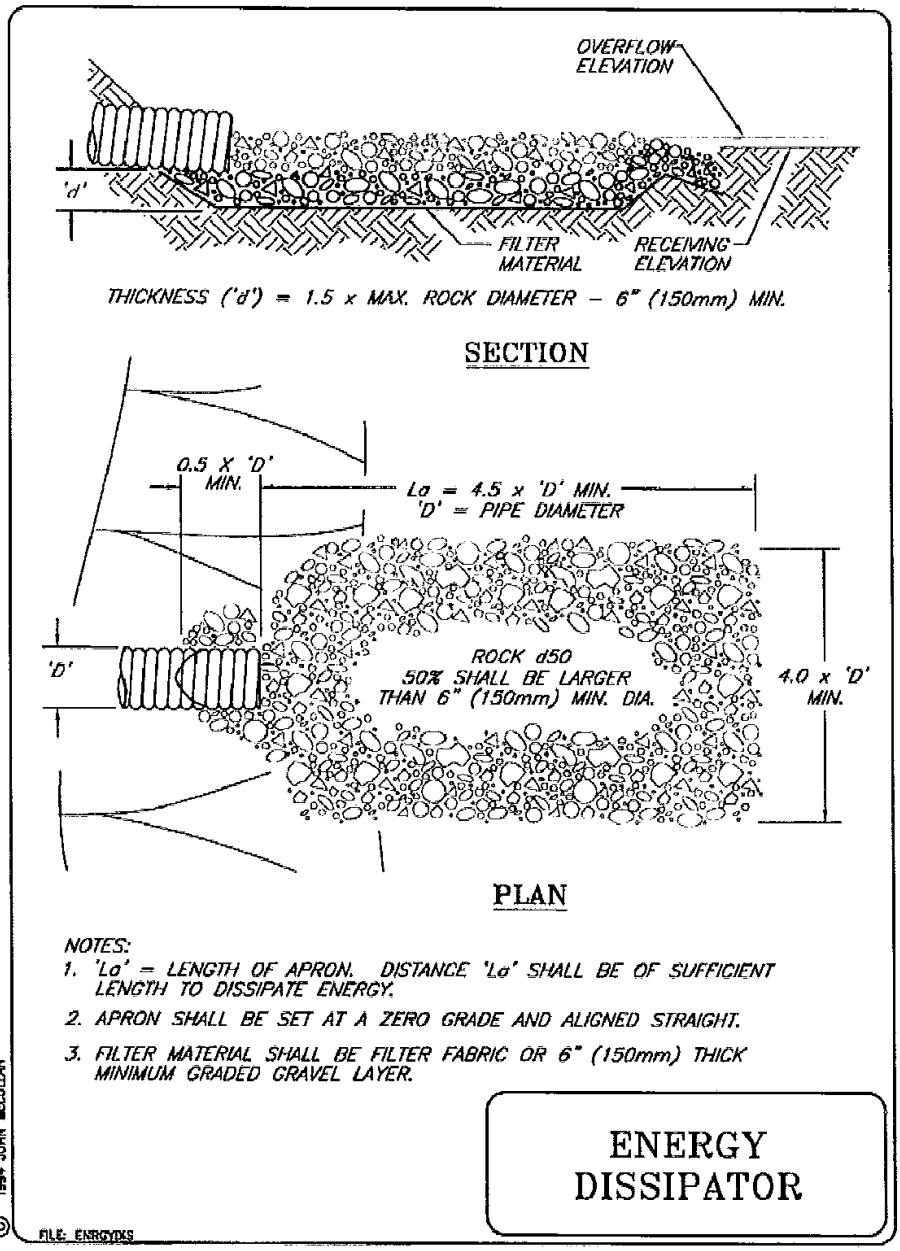
City of Campbell River

SCALE:	N.T.S.
APPROVED:	CCR
DATE:	MAY 2023

STORM WATER MANAGEMENT
WET DETENTION POND
PLAN VIEW

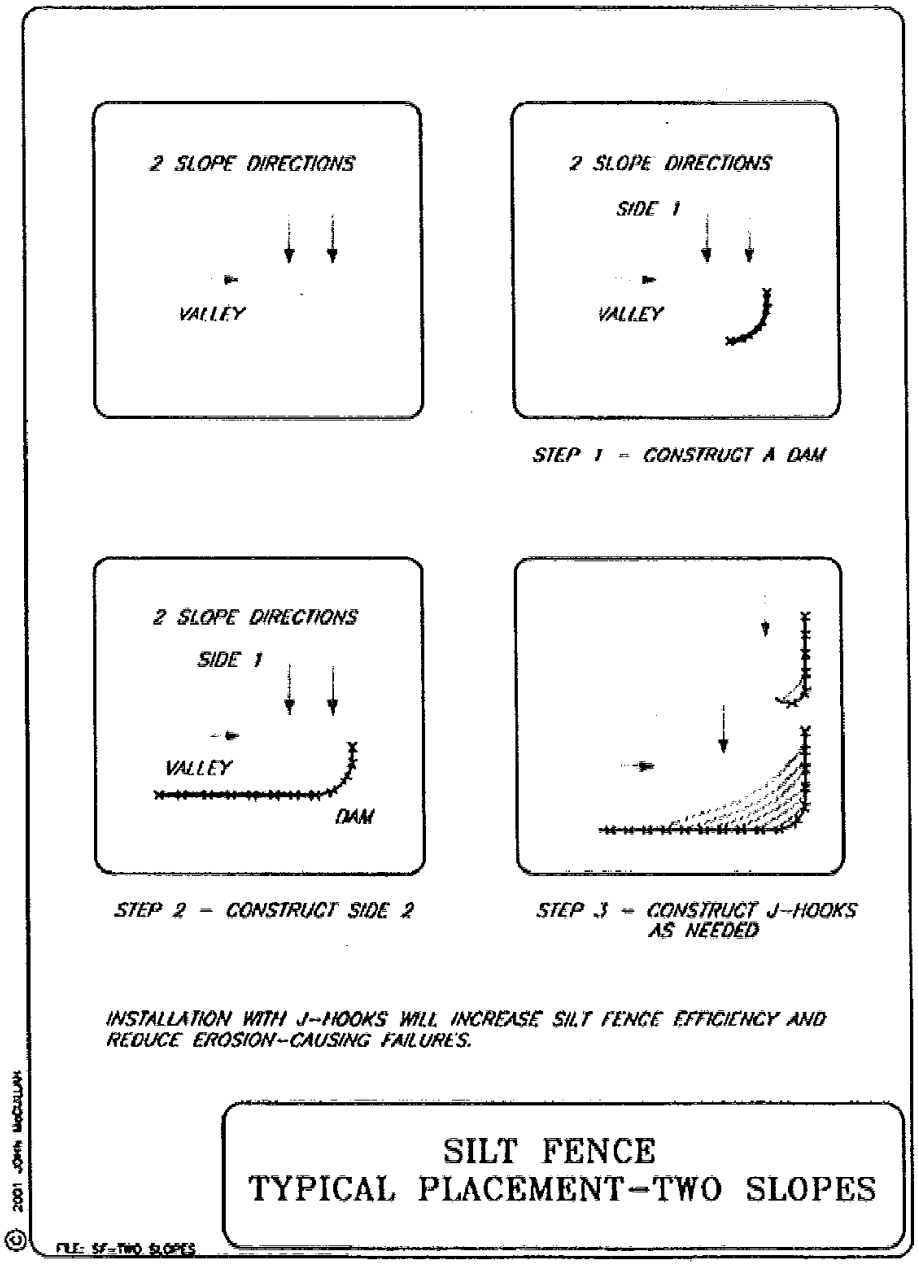
DRAWING NO.	CR-S20
DISK REF.	
SHEET	OF
REV.	1

Figure EC BMP #16.2. Energy Dissipater Typical Drawing



City of Campbell River	SCALE: N.T.S.	ENERGY DISSIPATOR	DRAWING NO. CR-S21	
	APPROVED: CCR		DISK REF.	
	DATE: APRIL 2010		SHEET OF	
			REV. 1	

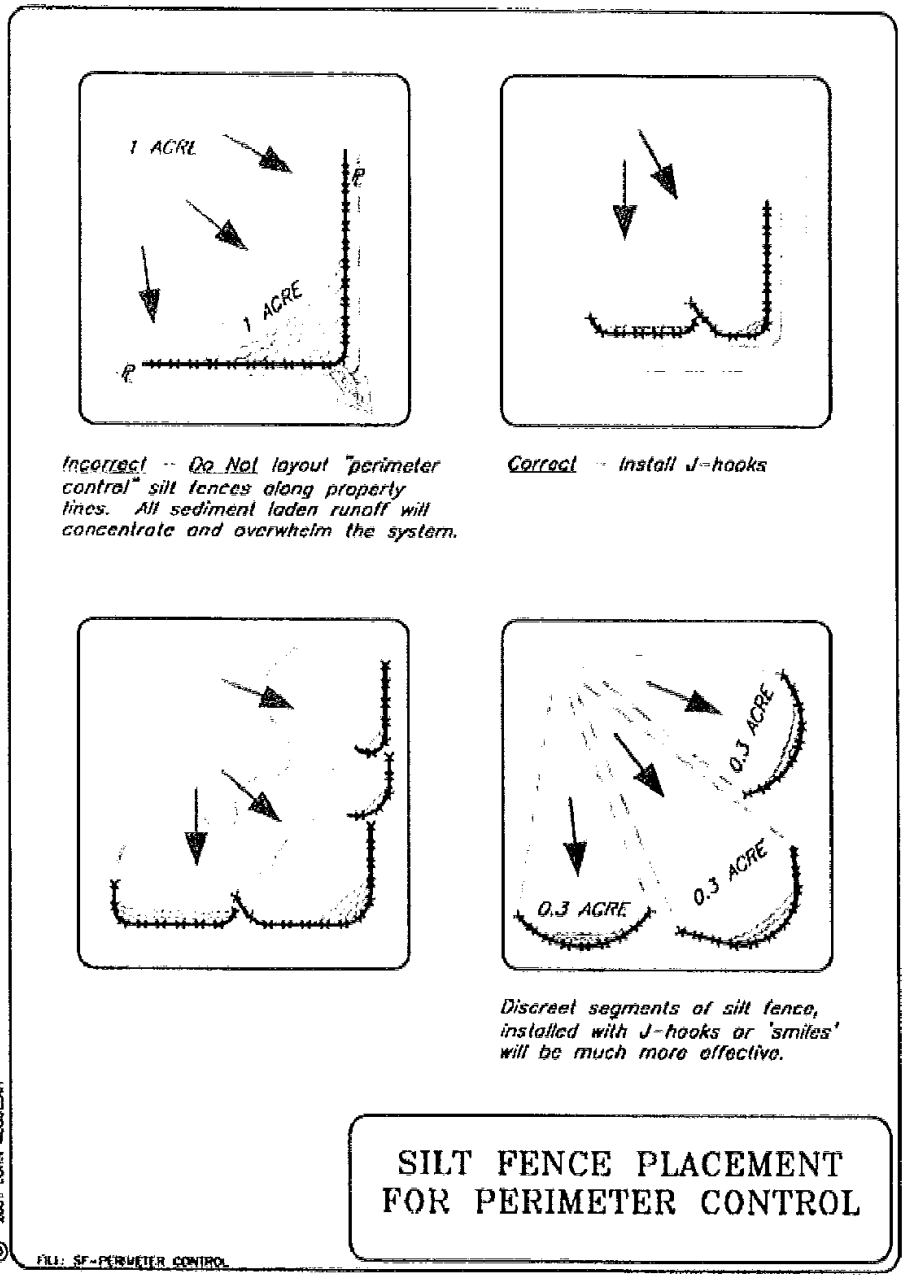
Figure SC BMP #1.4. Sediment Fence: Typical Placement for Two Slopes



City of Campbell River	SCALE: N.T.S.	SEDIMENT FENCE TYPICAL PLACEMENT - TWO SLOPES	DRAWING NO. CR-S22
	APPROVED: CCR		DISK REF.
	DATE: APRIL 2010		SHEET OF
			REV. 1

O:\CAD\5210-00-R393 Standards\Rev-DWGs\CR-ES115.dwg May 04, 2010 4:35:21pm

Figure SC BMP #1.5. Sediment Fence: Typical Placement for Perimeter Control



City of Campbell River

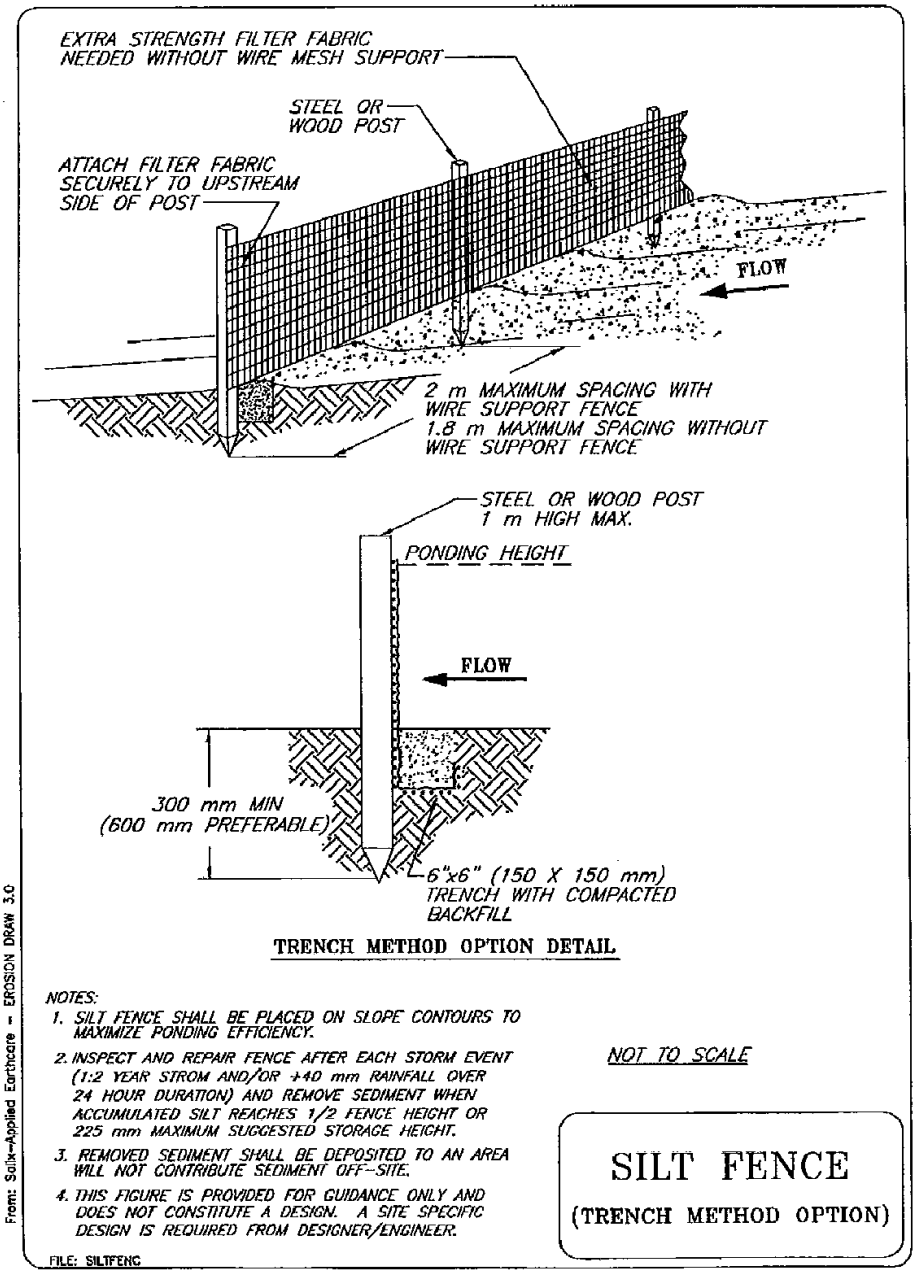
SCALE:	N.T.S.
APPROVED:	CCR
DATE:	APRIL 2010

SEDIMENT FENCE PLACEMENT FOR PERIMETER CONTROL

DRAWING NO.	CR-S23
DISK REF.	
SHEET	OF
REV.	1

O:\CAD\5210-00-R393 Standards\Rev-DWGs\CR-ES116.dwg May 04, 2010 4:36:29pm

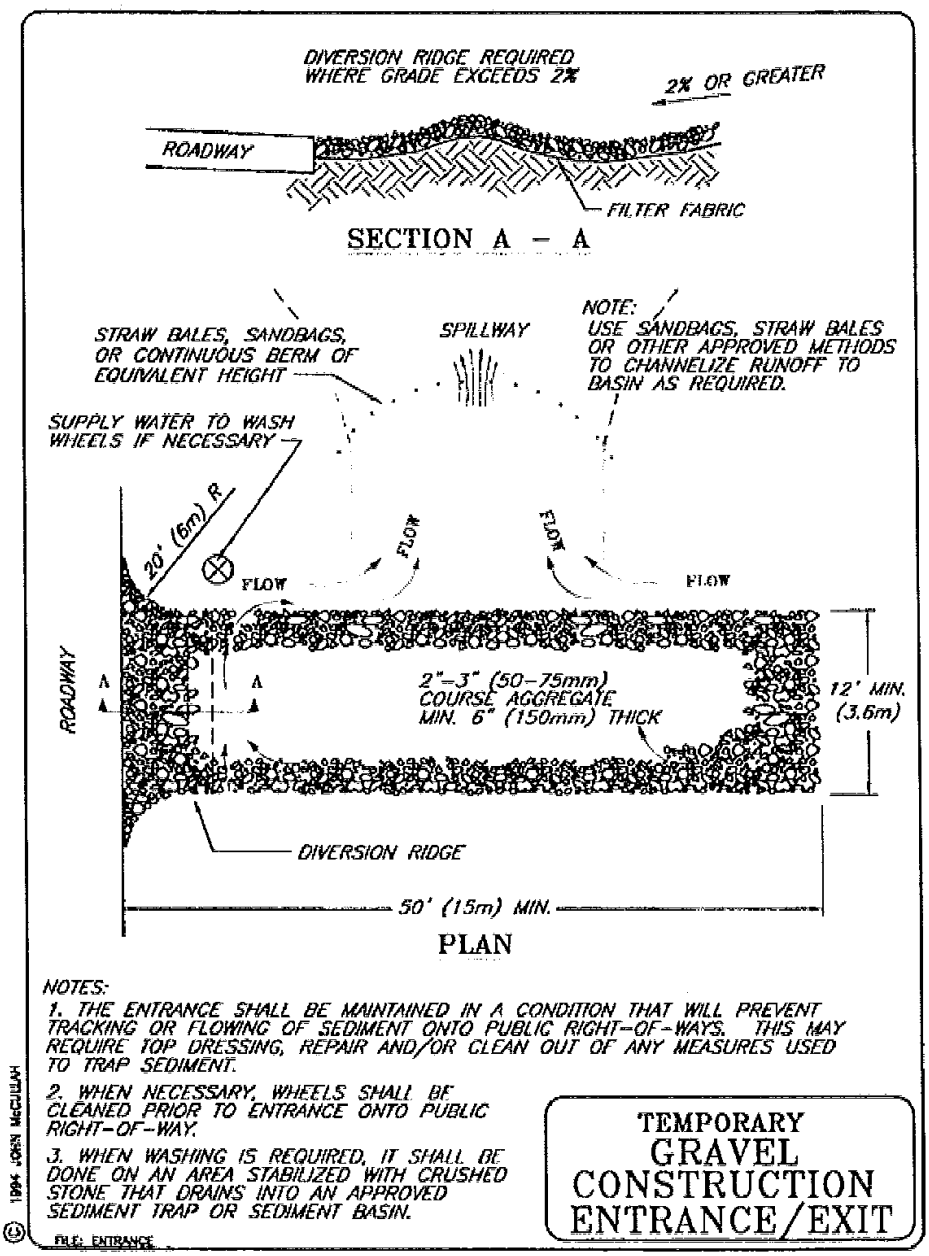
Figure SC BMP #1.6. Sediment Fence Installation – Trench Method Typical Drawing (Alberta Transport, 2003)



City of Campbell River	SCALE: N.T.S.	SEDIMENT FENCE TRENCH METHOD OPTION	DRAWING NO. CR-S24	
	APPROVED: CCR		DISK REF.	
	DATE: APRIL 2010		SHEET OF	
			REV. 1	

O:\CAD\5210-00-R393 Standards\Rev-DWGs\CR-ES117.dwg May 04, 2010 4:37:35pm

Figure SC BMP #5.2. Stabilized Worksite Entrance Typical Drawing



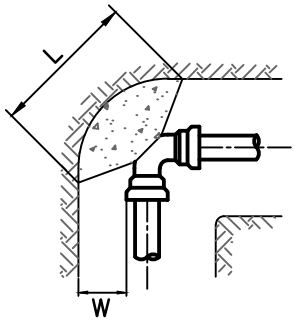
City of Campbell River

SCALE:	N.T.S.
APPROVED:	CCR
DATE:	APRIL 2010

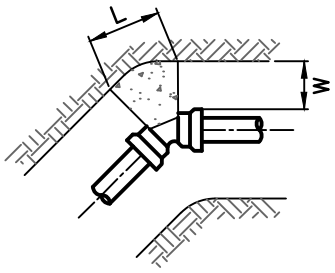
TEMPORARY GRAVEL CONSTRUCTION ENTRANCE/EXIT

DRAWING NO.	CR-S25
DISK REF.	
SHEET	OF
REV.	1

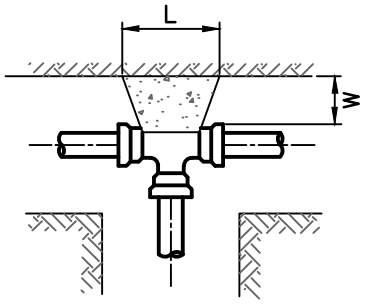
O:\CAD\5210-00-R393 Standards\Rev-DWGs\CR-ES119.dwg May 04, 2010 4:39:51pm



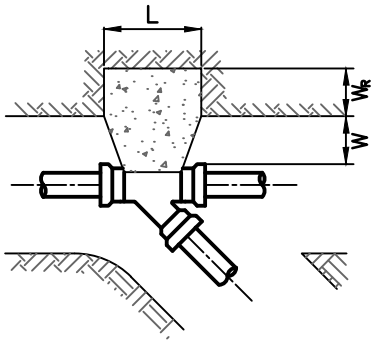
HORIZONTAL 90° BEND



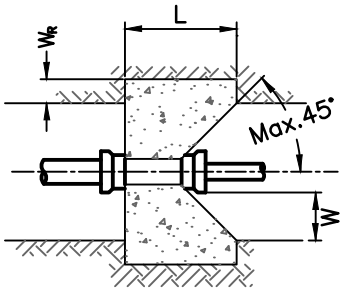
HORIZONTAL 45° BEND



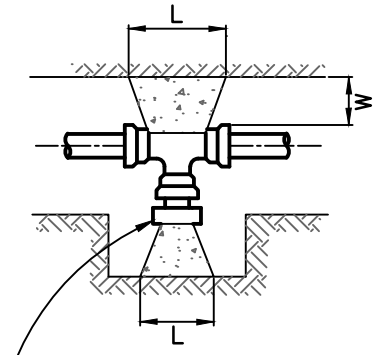
TEE



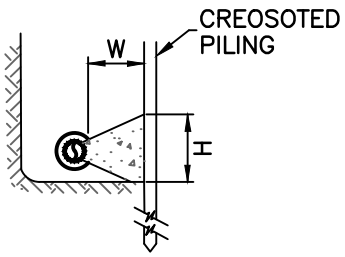
WYE



REDUCER

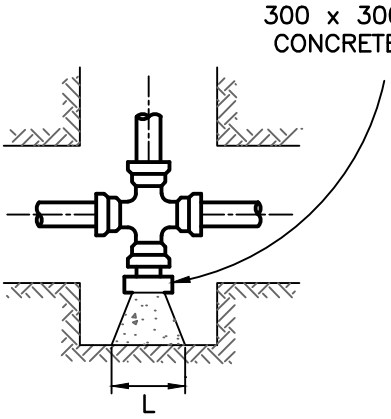


TEE WITH PLUG

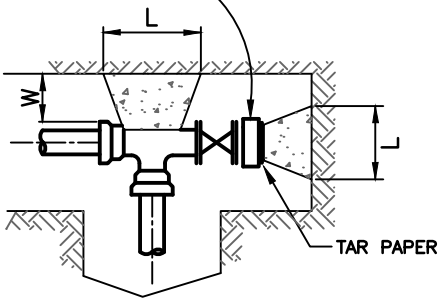


Note: WHERE GROUND CANNOT BE EXCAVATED TO FREE STANDING UNDISTURBED SOIL. SMALL PLANK SHEET PILING SHALL BE DRIVEN TO PROVIDE UNDISTURBED THRUST AREA. PILING TO BE DRIVEN PRIOR TO EXCAVATING FOR THRUST BLOCK. PILING SHOULD BE USED ONLY BELOW THE PERMANENT WATER TABLE.

BLOCK & PILING



CROSS WITH PLUG



TEE WITH VALVE

- CONCRETE TO HAVE A 28 DAY COMPRESSIVE STRENGTH OF 20 MPa.
- SEE DRAWING CR–W1A FOR DIMENSION VALUES L,W,H & W
- ALL DIMENSIONS IN MILLIMETRES, UNLESS OTHERWISE SHOWN.

City of Campbell River

SCALE:	N.T.S.
APPROVED:	CCR
DATE:	DECEMBER 2023

THRUST BLOCK ARRANGEM ENTS

DRAWING NO.	CR W1a
DISK REF.	
SHEET	OF
REV.	1

MINIMUM THRUST AREAS FOR FITTINGS AT 1030kPa PRESSURE AND FOR SOILS WITH MINIMUM BEARING PRESSURE OF 96kPa

(NOT TO BE USED FOR SOFT CLAY, MUCK, PEAT ETC.)

* DIMENSIONS APPLY TO THE LARGER DIAMETER END OF FITTING

TYPE OF FITTING	FITTING SIZE	OUTSIDE OF FITTING TO BEARING PLACE	RECESS IN TRENCH WALL	LENGTH	HEIGHT
	D	W	W_R	L	H
90° BEND	150 200 250 300	300 350 380 400	/	920 1070 1450 1650	400 610 760 920
45° BEND	150 200 250 300	300 350 380 400	/	460 610 760 920	460 610 760 920
22.5° BEND	150 200 250 300	300 350 380 400	/	460 610 840 920	230 300 460 460
TEE	150 200 250 300	300 350 380 400	/	610 760 990 1220	460 610 760 920
CROSS	150 200 250 300	300 350 380 400	/	610 760 990 1220	460 610 760 920
45° WYE	150 200 250 300	300 350 380 400	300 400 500 600	460 610 760 920	460 610 760 920
REDUCER	150 200 250 300	300 350 380 400	150 200 250 300	460 610 760 920	460 610 760 920
CAPS&PLUGS (if not bolted)	150 200 250 300	300 350 380 400	/	460 610 760 920	460 610 760 920

City of Campbell River

SCALE: N.T.S.

APPROVED: CCR

DATE: DECEMBER 2023

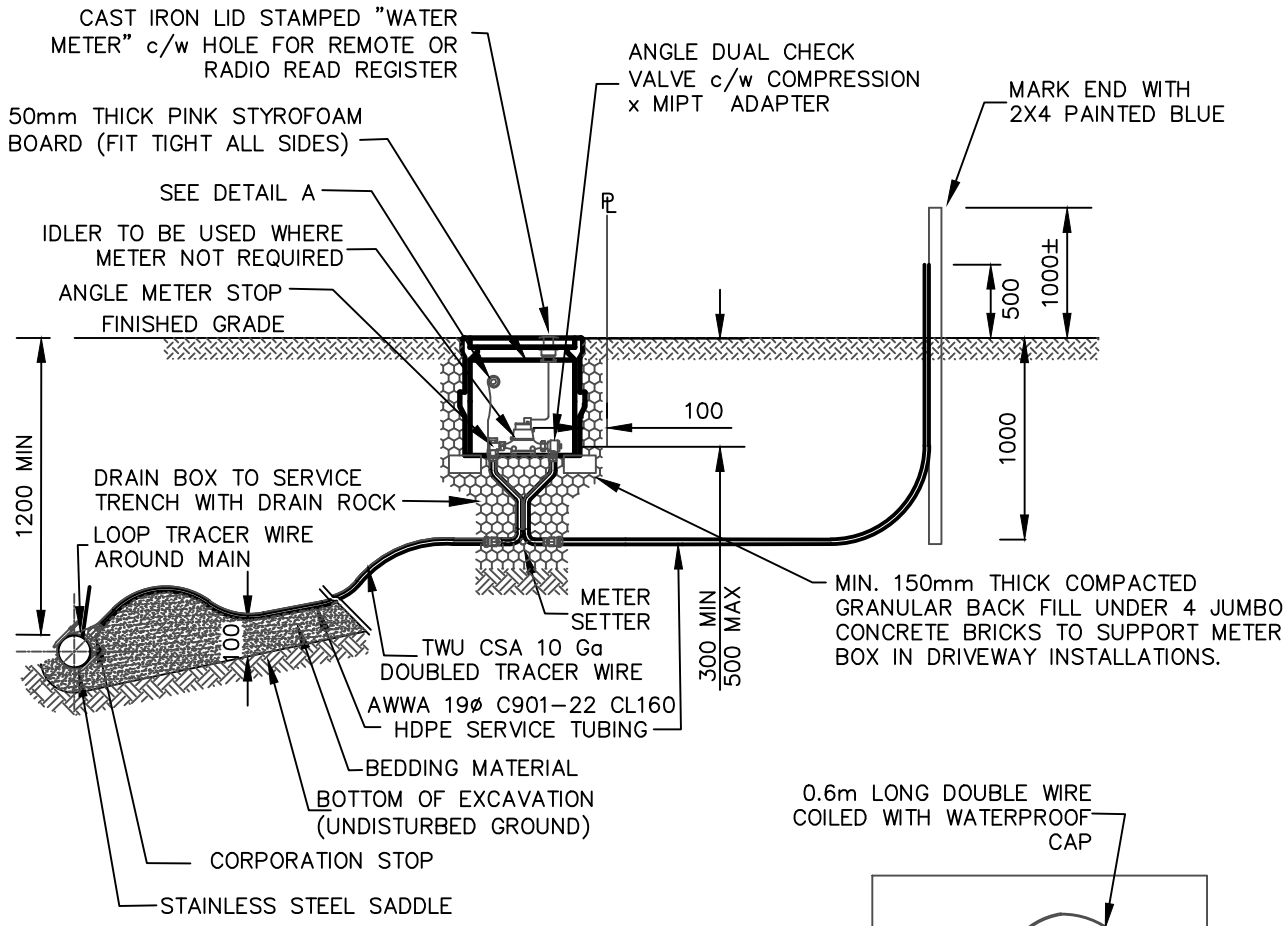
THRUST BLOCKING

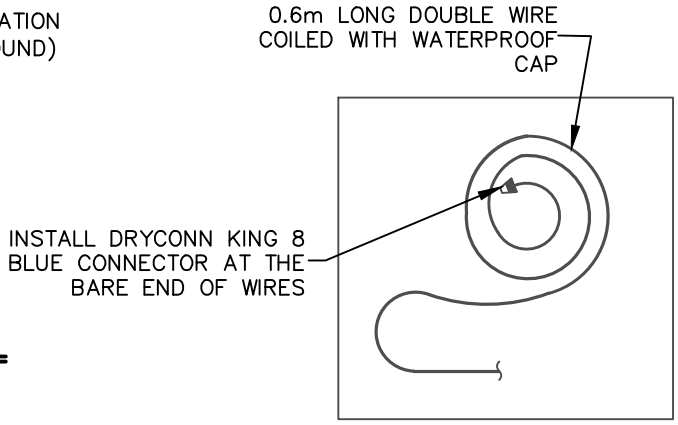
DRAWING NO. CR-W1b

DISK REF.

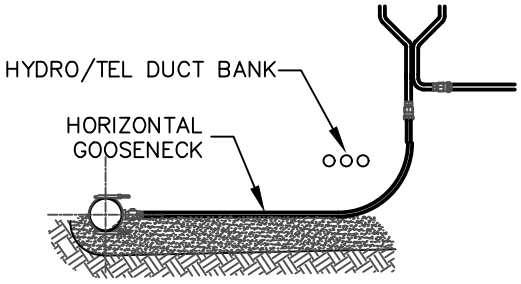
SHEET OF

REV. 1





DETAIL A–COILED WIRE ENDS



ALTERNATE FOR HYDRO/TEL SIDE

NOTES:

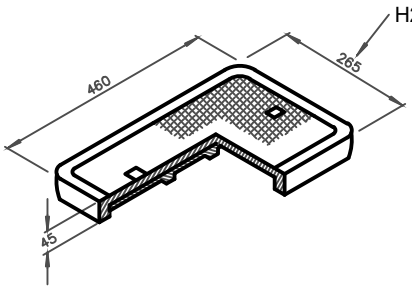
1. ALL MATERIALS MUST CONFORM TO CITY OF CAMPBELL RIVER APPROVED PRODUCTS.
2. CRIMP END OF TUBING WHEN BACTERIOLOGICAL TEST IS COMPLETE.
3. REFER TO SECTION 33 11 01 FOR DESIGN SPECIFICATIONS.
4. WHERE IDLER IS USED PLASTIC PLUG TO BE INSTALLED

City of Campbell River

SCALE:	N.T.S.
APPROVED:	CCR
DATE:	MAY 2023

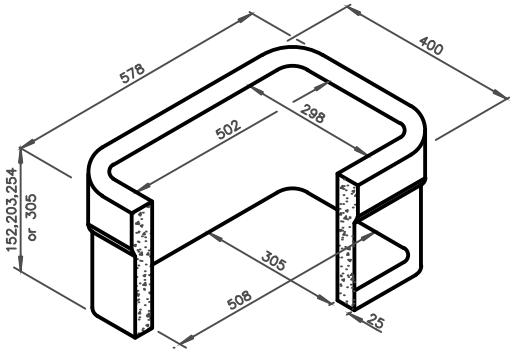
STANDARD WATER METER SERVICE (PROPERTY) BOX
c/w 16 - 19mm (5/8 - 3/4") SETTER
TYPICAL INSTALLATION

DRAWING NO.	CR-W2a
DISK REF.	
SHEET	OF
REV.	1

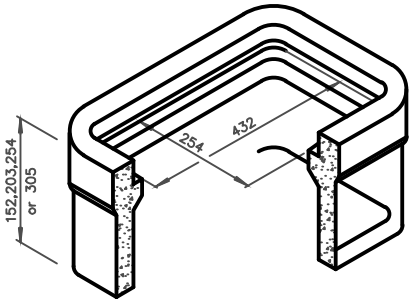


CAST IRON TRAFFIC COVER
MARKED WATER METER

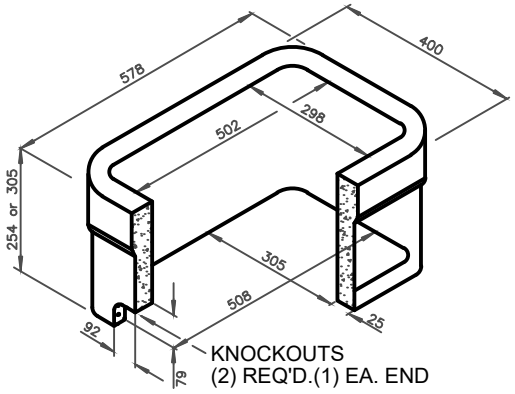
℄w 45mm Ø UN -RECESSED HOLE FOR TOUCH READ AND RADIO READ PIT LID ADAPTER (WITH PLUG)



EXTENSION



TOP



BOTTOM

NOTES:

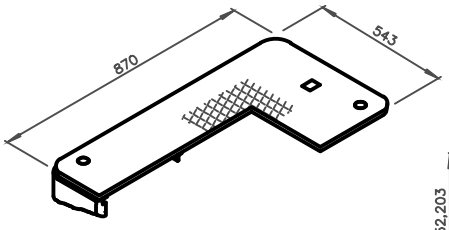
1. ALL DIMENSIONS IN MILLIMETRES UNLESS SHOWN OTHERWISE
2. ONLY PRODUCTS APPROVED BY THE CITY AND LISTED IN THE CITY OF CAMPBELL RIVER APPROVED PRODUCTS LIST WILL BE ACCEPTED FOR INSTALLATION.

City of Campbell River

SCALE:	N.T.S.
APPROVED:	CCR
DATE:	MAY 2023

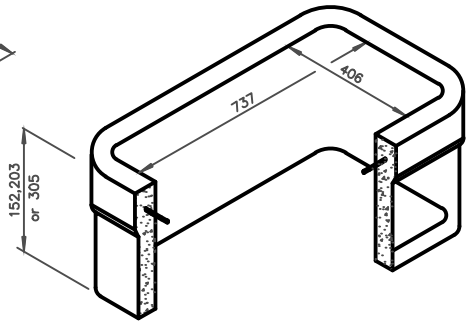
STANDARD CONCRETE
METER BOX
(FOR 25 mm METERS)

DRAWING NO.	CR-W2e
DISK REF.	
SHEET	OF
REV.	1

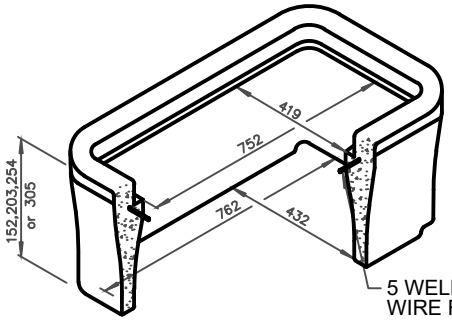


STEEL TRAFFIC COVER
MARKED WATER

C/W 45mm Ø UN-RECESSED HOLE FOR TOUCH READ AND RADIO READ PIT LID ADAPTER (WITH PLUG)

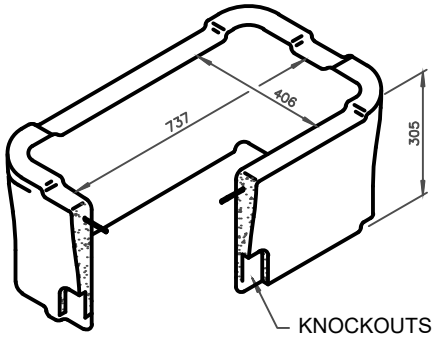


EXTENSION



5 WELDED WIRE FRAME

TOP



KNOCKOUTS (4) REQ'D.(1) EA. END

BOTTOM

NOTES:
1. ALL DIMENSIONS IN MILLIMETRES UNLESS SHOWN OTHERWISE
2. ONLY PRODUCTS APPROVED BY THE CITY AND LISTED IN THE CITY OF CAMPBELL RIVER APPROVED PRODUCTS LIST WILL BE ACCEPTED FOR INSTALLATION.

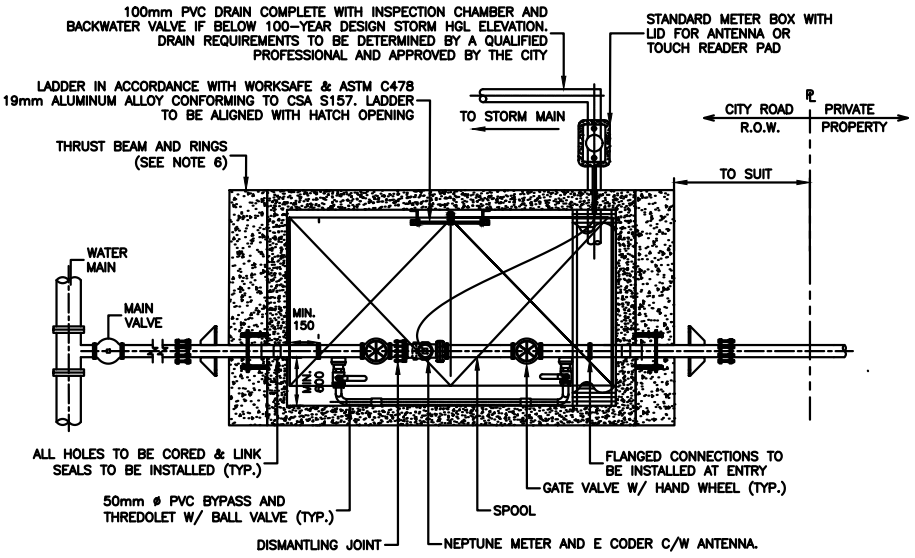
City of Campbell River

SCALE:	N.T.S.
APPROVED:	CCR
DATE:	MAY 2023

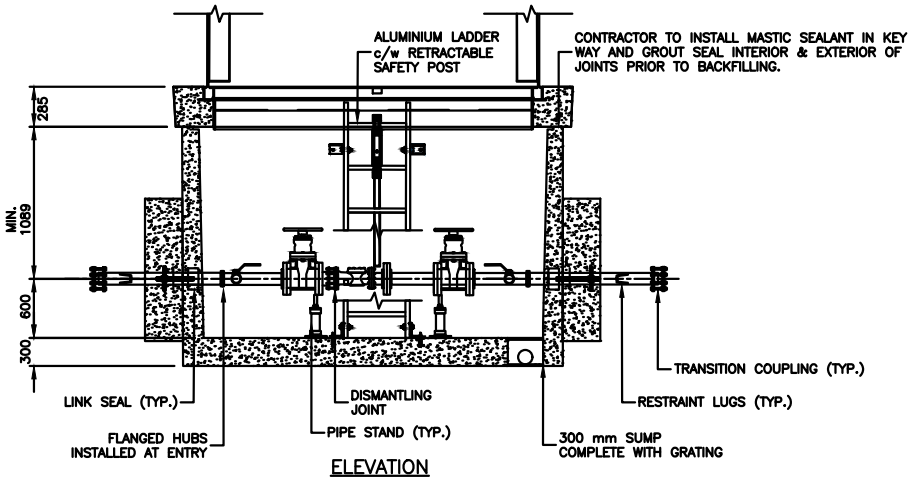
STANDARD CONCRETE METER BOX
(FOR 38-50 mm METERS)

DRAWING NO.	CR-W2f
DISK REF.	
SHEET	OF
REV.	1

U:\Projects_CTY\1479\0044\01\D - Design\CAD\Other CR Drawings\CR-W2f.dwg Dec 18, 2023 4:07:53pm



PLAN



ELEVATION

NOTES:

1. THIS DRAWING TO BE REVIEWED IN CONJUNCTION WITH THE CITY'S SUPPLEMENTARY DESIGN STANDARDS AND SUPPLEMENTARY SPECIFICATIONS.
2. ONLY PRODUCTS ON THE APPROVED PRODUCTS LIST WILL BE ACCEPTED.
3. METER CHAMBER TO BE WITHIN PUBLIC ROW UNLESS PERMITTED TO BE INSTALLED ON PRIVATE PROPERTY BY THE CITY ENGINEER WITHIN SROW.
4. HATCH COVER TO BE DUAL DOOR. H20 OCCASIONAL (STATIC LOADING – NOT FOR DYNAMIC TRAFFIC) LOAD RATED LOCKABLE ALUMINUM LID C/W SPRING ASSISTED HATCH AND LOCK OPEN DAVIT ARMS. HATCHES TO OPEN DIRECTLY OVER METER, BE THROUGH FRAME WITH DRAIN DIRECTED TO SUMP.
5. ALL CHAMBERS TO BE INSTALLED WITH DAVIT ARM BASE AS PER CITY OF CAMPBELL RIVER APPROVED PRODUCT LIST.
6. PIPE ANCHORING, THRUST AND RESTRAINT TO BE DESIGNED BY APPLICANT'S ENGINEER.
7. ALL DIMENSIONS ARE IN MILLIMETERS.
8. METER CHAMBER FLOOR TO SLOPE TOWARD DRAIN.
9. PROVIDE APPROVED BACKFLOW PREVENTION ASSEMBLY AFTER THE METER ON PRIVATE PROPERTY.
10. ALL PIPING TO BE SCH. 10 STAINLESS STEEL.

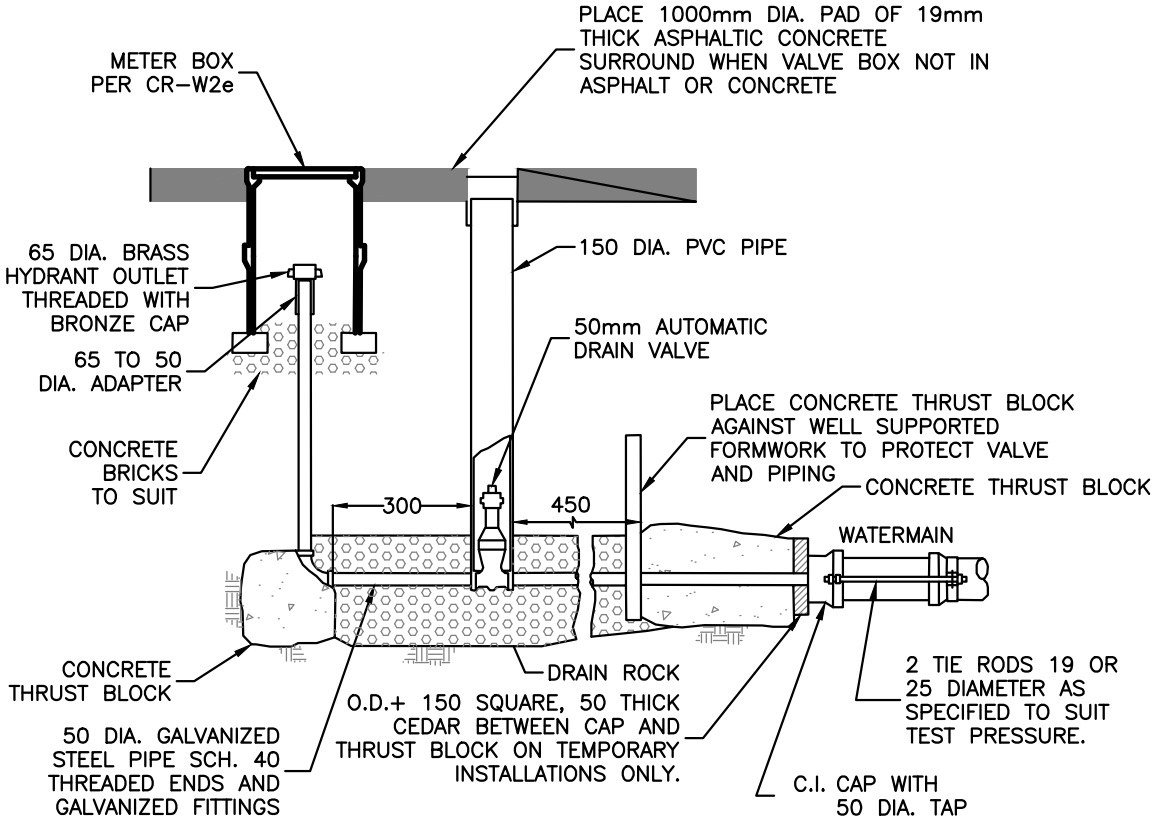
WATER METER CHAMBER DIMENSIONS (MIN.)		
DOMESTIC/FIRE METER	LENGTH	WIDTH
75–150Ø	2000	1200
200–250Ø	2600	1200

City of Campbell River

SCALE: N.T.S.
APPROVED: CCR
DATE: MARCH 2023

DOMESTIC/FIRE WATER METER INSTALLATION FOR GREATER THAN 50 mm SERVICE

DRAWING NO. CR–W2g
DISK REF.
SHEET 1 OF 1
REV.



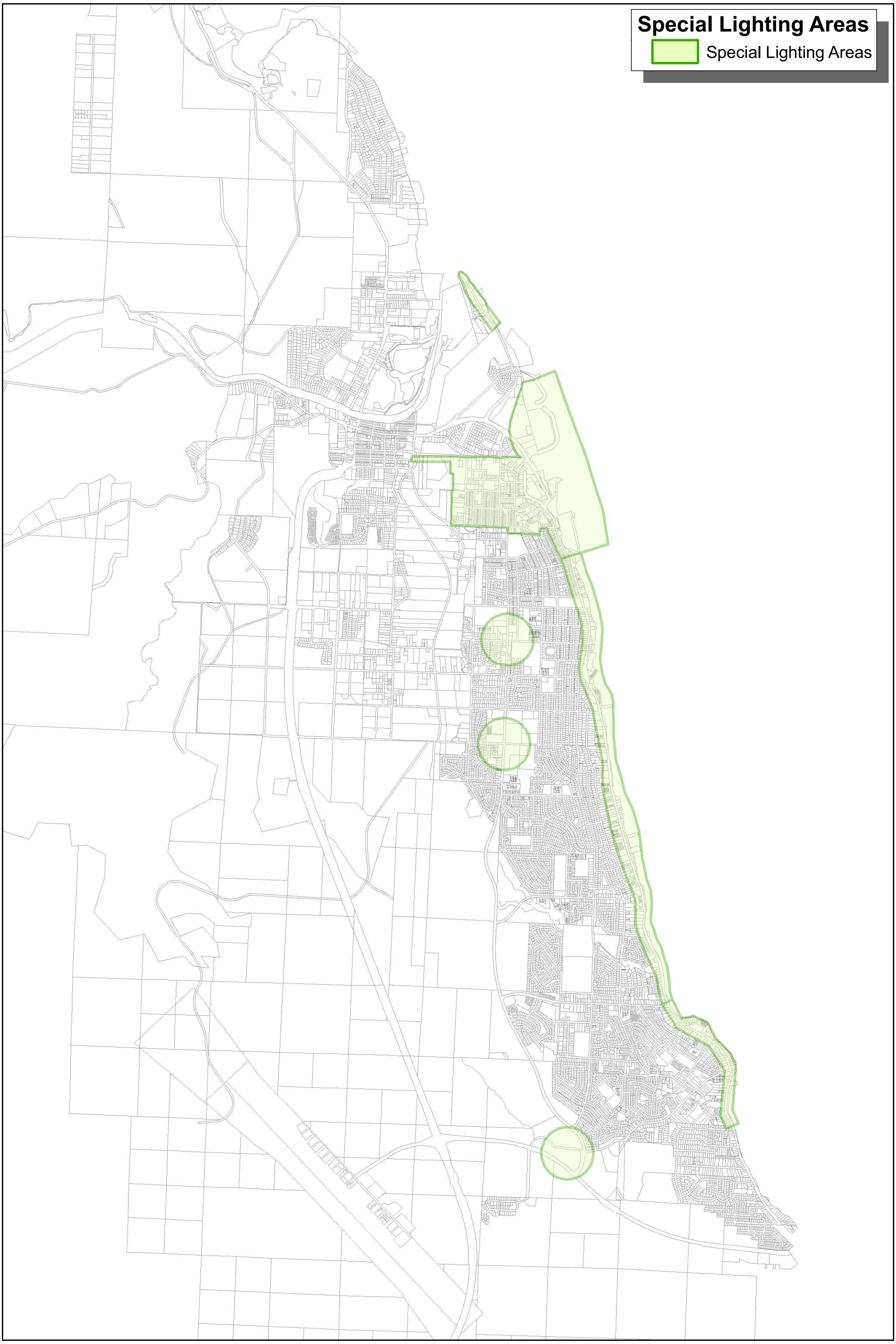
NOTE:
1. 20 MPa CONCRETE.
2. REFER TO CONTRACT DRAWINGS, SECTION 33 11 01 FOR DETAILED SPECIFICATIONS.
3. ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE NOTED.

City of Campbell River

SCALE:	N.T.S.
APPROVED:	CCR
DATE:	MAY 2023

BLOW-OFF FOR WATERMAIN

DRAWING NO.	CR-W8
DISK REF.	
SHEET	OF
REV.	1



CITY OF CAMPBELL RIVER

Land Use Department

Map A: Special Lighting Areas
2024 Design Standards

N

1:40,000

Projection: UTM Zone 10 Datum: NAD 83

Date: April 21, 2010

City of Campbell River

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Campbell River, BC V9W 4C7
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www.campbellriver.ca