SECTION 1.0 GENERAL INTRODUCTION	
LIST OF CHANGES Spelling & grammar errors and minor wording changes have not been included.	
EXISTING	PROPOSED CHANGES
1.0 <u>Intention</u> 1.0.2 These specifications do not cover the design or installation of power, telephone, cablevision or gas services, except for their standard locations within road right-of-ways, and the avoidance of their conflict with other services; however this bylaw does require that all existing or proposed hydro, telephone, and cablevision services be installed by underground facilities along property frontages. Details of these utility works shall be identified on all key plans and records of these works are to be provided on all as-built drawings. A copy of the BC Hydro underground electrical plan for the downtown core has been attached in Schedule A for reference.	**1.01 <u>Intent</u>** 1.01 These Standards and Specifications do not cover the design or installation of power, telephone, cablevision, gas or postal services, except for locations within road right-of-ways, and off-sets from other services. These utilities shall be shown on the key plans and on all record drawings.
<u>Rationale:</u> It is proposed to no longer require undergrounding of existing hydro, Telus and cable along property frontages except in the downtown core and mixed use edge land use zones. Note that it will be required to install new infrastructure underground and also new underground connections.	
2.0 <u>Detailed Specifications and Conditions</u> 2.0.1 All services shall be designed and installed as detailed in the foregoing specifications and conditions.	**1.02 <u>Detailed Specifications and Conditions</u>** 1.02 All services shall be designed and installed as detailed in these Standards and Specifications, and good engineering practice shall be applied.

EXISTING	PROPOSED CHANGES
4.0 <u>Right-of-Way or Easement Documents</u> 4.0.1 The Applicant shall prepare all right-of-way documents for sewer, drain and water where the Municipality shall assume responsibility for maintenance. These documents shall be City of Parksville Standard Documents (if available) and reviewed by the Approving Officer before final registration. a) Right-of-Way documents for easements outside of the subdivision shall be returned to the Applicant for registration prior to design approval. b) A right-of-way plan, reference plan, or metes and bounds description acceptable to the Land Titles Office must be submitted in sufficient time prior to anticipated registration to allow time for document preparation. A current copy of the State of Title Certificate is also required.	**1.04 <u>Right-of-Way or Easement Documents</u>** The Applicant shall arrange the preparation of all required right-of-way documents. These documents shall be per City of Parksville standard documents (if available) and must be reviewed and submitted to the City Engineer by the Consultant together with his/her recommendations to execute the documents. The Consultant must ensure the documents are appropriate for the intended use. • The right-of-way documents within a proposed subdivision shall be registered at the Land Title and Survey Authority (LTSA) Office concurrent with subdivision approval.
<u>Rationale</u>: This section has been updated to reflect current conditions such as Land Title and Survey Authority rather than Land Titles Office	
4.0 <u>Right-of-Way or Easement Documents</u> 4.0.3 Where a single storm drain, sanitary sewer or water right-of-way is required, the minimum acceptable width is 3.0 metres. 4.0.4 Where more than one service is installed in a right-of-way, the width of the right-of-way must be increased sufficiently to accommodate the pipe sizes required, together with no less than 1.2 metres of clearance between pipes and edge of right-of-way. The minimum acceptable width is 4.6 metres.	
<u>Rationale</u>: These sections have been placed in applicable sections pertaining to storm, sanitary, and water, specifically Location / Corridors sections.	

EXISTING	PROPOSED CHANGES
5.0 <u>Engineering Supervision</u> 5.0.3 In addition to the Consultant carrying out supervision, the Works Inspector will periodically inspect the work and assist in coordinating development construction with any related Municipal works. The Works Inspector shall bring to the attention of the Consultant the use of unacceptable materials or practices. If remedial action is not taken to the satisfaction of the Municipal Engineer, he may issue instructions to the Consultant to cease construction until remedial action is taken.	**1.05 <u>Engineering Field Reviews</u>** In addition to the Consultant carrying out field reviews, the Works Inspector may periodically conduct field reviews. If the Works Inspector notes unacceptable material or practices, or deviations from the drawings, the Consultant shall take remedial action to the satisfaction of the City Engineer. Under no circumstances shall the Consultant rely on the Works Inspector for field reviews.
<u>Rationale</u>: The Engineering Consultant is responsible for field reviews, not supervision of the Contractor. The current acceptable term is “field review” not “inspection”, per the Engineers and Geoscientists of BC (EGBC).	
7.0 <u>Rectification, Repair and Warranty</u> 7.0.1 The Owner/Applicant shall be responsible for and at his own expense shall execute all work, repair, alteration, reconstruction or replacement required to remedy any defect, fault or deficiency in or developing in the completed work, not only up to the receipt and approval of the Consultant's as-built drawing, but also during a period of warranty herein referred to as the "Maintenance Period" of twelve (12) months after the date of Substantial Completion.	**1.07 <u>Rectification, Repair and Warranty</u>** At his own expense, the Applicant shall execute, repair, alter, reconstruct or replace all work required to remedy any defect, fault or deficiency in the completed work. The Applicant’s responsibility shall not only be up to the acceptance of the Consultant's record drawings, but also during a period of warranty herein referred to as the maintenance period of a minimum of twelve months after the date of Substantial Completion, i.e., until final acceptance of works and services.
7.0.2 All such works of rectification, repair and warranty shall, during this Maintenance Period, be executed as the need for them becomes apparent, or upon the written request of the Municipal Engineer. Should the Applicant neglect or fail to commence the execution of such works within seven (7) days from the date of written request for their performance, the Municipality shall be entitled to obtain the remedy using the warranty security held under Section 8.0.	During the maintenance period, all works of rectification, repair and warranty shall be executed as the need for them becomes apparent, or upon the written request of the City Engineer. Should the Applicant neglect or fail to commence the execution of such works within seven days (or less, depending on the scenario) from the date of the written request, the Municipality is entitled to remedy the work using the warranty security held under Section 1.08.

EXISTING	PROPOSED CHANGES
8.0 <u>Security for Required Servicing Works</u> 8.01 The Applicant will be required to provide security for required servicing works prior to the final issuance of the Building Permit, Subdivision Approval or Rezoning approval.	**1.08 <u>Security for Required Servicing Works</u>** the Applicant will be required to construct works or provide security for the works prior to issuance of a building permit or subdivision approval.
<u>Rationale:</u> The change in this section brings the Bylaw into conformance with the *Local Government Act* Section 940 that states in part that the Applicant must install works prior to issuance of a Building Permit or approval of the subdivision, unless security is provided and a Servicing Agreement entered into, i.e., works or security, not works and security must be provided.	
9.0.5 Deposits may be released as follows: Partial release of securities shall be permitted during the course of the project prior to the release granted at substantial completion. The term and minimum amount of the partial release shall be once per month and a minimum of $10,000. A sealed letter from the Consultant detailing the works completed to that point, along with an estimate of the cost of those works less applicable holdbacks, will be required for the application to release securities. The said estimate of works completed shall be submitted using the City's standard form as detailed in Schedule "A" of this manual.	**1.08 <u>Security for Required Works and Services</u>** Partial release of securities shall be permitted during the course of the project prior to the release granted at substantial completion. A sealed letter from the Consultant detailing the works completed to that point, along with an estimate of the cost of those works less applicable holdbacks, will be required to release security. The cost estimate of completed works shall be submitted using the City's standard form.
<u>Rationale</u>: The stipulation that "the term and minimum amount of the partial release shall be once per month and a minimum of $10,000" has been deleted to conform to practice in the City of Parksville Engineering and Finance Departments.	

EXISTING	PROPOSED CHANGES
9.0 Municipal Acceptance 9.0.1 Upon the authorization of the Municipal Engineer, Substantial Completion will be awarded, the constructed works will enter the one year Maintenance Period, and the Security Deposit held will be reduced to a minimum holdback of $5,000.00 or 5% of the completed works, whichever is greater.	**1.09 City Acceptance** Prior to receiving substantial completion, the Consultant shall submit a report summarizing the scope of work of the project, all testing results and any deficiencies to the City Engineer. The constructed works will then enter the one year maintenance period, and the security deposit will be reduced to a minimum holdback of $5,000.00 or 5% of the cost of the accepted completed works and 100% of the cost of any deficiencies, whichever is greater. Note that street trees, if not planted, will be considered deficiencies. If no security deposit has been provided, the Applicant shall enter into a maintenance agreement with the City and provide the City with security of $5,000 or 5% of the cost of the works as outlined in the paragraph above, whichever is greater, prior to substantial completion.
Rationale: This section requires the submission of an engineering report as a condition of substantial completion. The requirements of the second paragraph are applicable to the case in which no security had been provided for construction. Regardless, security is required for the maintenance period.	
10.0 Building Permits 10.0.1 No building permits shall be issued until the subdivision plan is registered and all services (water, storm and sanitary system, lot grading, roadwork) are provided and record asbuilts drawings have been approved, as required under current Municipal Bylaws.	**1.10 Building Permits** No building permit shall be issued until • a certificate of substantial completion of the works has been issued by the City Engineer; or, alternatively, • design, security and a Servicing Agreement for the works have been provided.
Rationale: See new section 1.08 above for the rationale for this new section 1.10.	
11.0 Approved Products List 11.01 A compilation of approved products …. is attached as Schedule “B” to this manual.	**1.11 Approved Products List** The City has a policy of maintaining an approved products list.

Rationale: The Approved Products List is no longer bound into the Bylaw, allowing frequent updates without the approval of Council. However, the List is referenced in the Bylaw with the above section 1.11, making it obligatory for contractors to use the List.

SECTION 2.0 DESIGN SUBMISSION	
LIST OF CHANGES Spelling & grammar errors and minor wording changes have not been included.	
EXISTING	PROPOSED CHANGES
2.0 <u>Survey Information</u> 2.0.5 In urban areas the chainage shall be as given by the City Engineering and Operations Department, or if acceptable, as established by a previous engineering design. Generally, chainage shall increase from left to right and from bottom to top on a drawing. North should be at the top or right side of a drawing.	**2.02 <u>Survey Information</u>** 2.02.5 Chainage shall increase from left to right and from bottom to top on a drawing. North should be at the top or right side of a drawing.
3.0 <u>Drawing Standards</u> 3.0.2 All drawings, except for the street tree and boulevard planting plan, shall be signed and sealed by a Professional Engineer registered in British Columbia.	*For clarity, this section has been incorporated into Section 2.04 Design Submissions.*
3.0.3 The Engineering and Operations Department will supply to the Owner's Engineer, for a nominal charge, a 3.5" computer disk containing the AutoCAD files for the Municipality's standard title block and general notes sheet.	2.03.2 The Engineering Department will supply the Consultant with the Autocad files for the City's standard title block and general notes sheet, which shall be used to generate all design drawings.
3.0.4 Lettering shall be upper case and shall have a minimum font size of 2.5 mm.	2.03.3 Lettering shall be upper case and shall have a minimum font size of 2.5 mm for proposed and 2.0 mm for existing.
<u>Rationale:</u> This added font size allows for distinguishing between proposed and existing works.	
4.0 <u>Design Submissions</u> The Consultant Engineer's seal and signature shall be noted on all sheets of all design submissions except for the street tree and boulevard planting plan. Failure to do so will result in the plans being returned without comment. The Consultant Engineer's seal and signature shall infer that all works as proposed are structurally sound and comply with the applicable design criteria of this manual, and good Engineering practice.	**2.04 <u>Design Submission</u>** The Consultant shall seal all sheets of design submissions, except for the street tree, boulevard planting and irrigation plans. Failure to do so will result in the plans being returned without comment. The Consultant's seal shall infer that all works as proposed are structurally sound, and comply with the applicable design criteria of this manual and good engineering practice. The landscaping/irrigation drawings must clearly note the designer's name, address, etc. See Section 9 *Street Tree, Boulevard Plantings and Irrigation Design Criteria* for further requirements.

EXISTING	PROPOSED CHANGES
Rationale: This revised section makes reference to the Section in the Bylaw where standards for street trees, boulevard plantings and irrigation are contained.	
4.1.3 <u>Storm Water Management / Lot Grading Plan</u>	*This section is separated into two sections.* **2.04.3 <u>Storm Water Management Plan</u>** and **2.04.4 <u>Lot Grading Plan</u>**
4.1.8 <u>Underground Hydro, Telephone, Cablevision and Gas Utilities</u> No overhead hydro, telephone or cablevision plant and services will be permitted under this bylaw. Also note in section 11.1 GENERAL REQUIREMENTS of the Bylaw (a) (vii) owner may be required to underground existing overhead wiring.	**2.04.9 <u>Hydro, Telephone, Cablevision and Gas Utilities (HTCG)</u>** No new overhead hydro, telephone or cablevision plant and services will be permitted under this bylaw. Existing overhead hydro, telephone or cablevision lines shall be placed underground in the Official Community Plan land use area designations 4 (downtown core) and 6.1 (mixed use edge).
Rationale: The current Bylaw requires all overhead hydro, telephone, and cable to be placed underground, including existing overhead utilities. The new proposed Bylaw requires new hydro, telephone and cable to be constructed underground, and that existing overhead utilities in the downtown and mixed use edge areas be placed underground. However, the requirement that existing overhead utilities in other zones, other than the downtown and mixed use edge, be installed underground has been deleted. The reason is the prohibitively high cost of undergrounding existing overhead utilities.	
	2.04.10 <u>Postal Service</u> The developer shall provide evidence that satisfactory arrangements have been made with Canada Post Corporation for the installation of a Community Mail Box(es) (CMB) as required by Canada Post Corporation. The CMB shall be as shown on the approved drawings.
Rationale: This section titled *Postal Service* is a new section, and conforms to requirements of Canada Post for new developments.	

EXISTING	PROPOSED CHANGES
5.0 <u>Drawing Submission – Procedure</u> 5.0.1 <u>Pre-Design Submission</u>	**2.05 <u>Drawing Submission – Procedure</u>** 2.05.0.1 <u>Preliminary Design Submission</u> *The following clauses have been added:* • Typical road cross-sections (based on standard drawings); • Storm Water Management (SWM)/lot grading plan.
5.0.2 <u>Full Design Submission</u> • proof of application to outside agencies (i.e. Ministry of Environment, Ministry of Transportation and Highways, Public Health Department etc.); and • Completed hydro, telephone, cable and gas servicing designs.	**2.05.0.2 <u>Full Design Submission</u>** *Add:* • key plan; • proof of application/referrals to and all required approvals from outside agencies (e.g., Ministry of Environment, Island Health Authority, etc.); • Completed hydro, telephone, cable and gas servicing designs (design drawings prepared by utilities); and • Tree planting and Irrigation plan if required
6.0 <u>Construction Cost Estimate</u> The Applicant will be required to pay, upon execution of the Servicing Agreement, an administration fee to cover the cost of processing the proposed development application. This administration fee will be calculated as a percentage of the construction estimate as submitted by the Consultant.	**2.07 <u>Administration Fee</u>** The Applicant will be required to pay an administration fee to cover the cost of processing the proposed development application. This administration fee will be calculated as a percentage of the construction cost that was estimated by the Consultant. The administration fee is required for all developments, with or without a Servicing Agreement.
<u>Rationale:</u> The administration fee is due and payable regardless of whether or not the Applicant enters into a Servicing Agreement.	

SECTION 3.0 RECORD DRAWINGS	
LIST OF CHANGES Spelling & grammar errors and minor wording changes have not been included.	
EXISTING	PROPOSED CHANGES
	3.01 <u>Scope</u> Add: Record drawings are required within 30 days after issuance of substantial completion. Section 2.0 provides drawing requirements for record drawings.
<u>Rationale</u>: A specific time frame for the submission of record drawings has been included.	
	3.01 <u>Scope</u> Add: Service record cards for all lots are required as part of the record drawing submission. Service record cards are to indicate clearly and accurately the location, depth and size of each City utility connection both at property line and at the City main. The City project number is required on all cards.
<u>Rationale:</u> Service record cards for each newly created lot are to be submitted as part of the record drawing package.	
1.0.2 Procedure for Submission of As-Builts The Consultant shall submit two complete sets of sealed paper prints to the City for approval. Once received, the City will review the submission for completeness. The City will then send the Consultant one set of paper prints, marked either “approved” or “resubmit with the following additional information.” Once the submission is approved, the Consultant shall submit three sealed paper prints, one complete set of the originals photocopied onto mylar, and the AutoCAD drawing file or DXF file.	**3.02 Procedure for Submission of Record Drawings** The Consultant shall submit one complete set of sealed paper prints for approval. Once received, the City will review the submission for completeness. The City will then send the Consultant one red-lined set of the paper prints, marked either "approved" or "resubmit with the following additional information." If there are numerous amendments, the Consultant shall resubmit one set of revised drawings. Once the submission is approved, the Consultant shall submit one complete set of sealed paper prints. Two electronic submissions are required as well, one in AutoCAD (.dwg) format and one in Adobe Acrobat (.pdf) format.

EXISTING	PROPOSED CHANGES
Rationale: The number of paper prints has been reduced to one initial submission and one final submission from two and three, respectively. The electronic submission has been increased to include not only AutoCAD, but also .pdf format. The Engineering Department now maintains records in digital format, for the most part, rather than paper. The requirement for a mylar submission has been deleted.	
2.0 General Delete: 2.0.3 Building permit applications will not be accepted until as-built drawings have been approved by the Municipal Engineer.	
Rationale: The new requirement for submission of record drawings is 30 days after issuance of substantial completion. Developers are allowed to provide security, obtain subdivision approval, and sell lots prior to construction of works and services.	
Delete Section **3.0 Tolerances**	
Rationale: Accuracy is required. However, specifying precise tolerances is difficult to enforce, for example, "Water vertical measurements shall be to the nearest 10 mm". Due diligence by the Consultant is expected in this matter.	

SECTION 4.0 STORM DRAINAGE SYSTEM	
LIST OF MAJOR CHANGES	
EXISTING	PROPOSED CHANGES
	4.01 <u>Introduction</u> **Add:** The City will conduct a modelling analysis using the City's network model at the expense of the developer. The analysis will review the design for conformance to City specifications and guidelines, and assess downstream capacity of the storm sewer network to the outfall. Upon request, the Consultant shall submit parameters for input into the model including design flows, and lengths, diameters and grades of all new pipes.
Rationale: The City requires analysis of proposed sanitary and water works through the use of the City's models, but not storm drainage. Adding this clause will enable the City to additionally check the storm drainage model for downstream impacts from all proposed developments.	
SECTION D-1	**Add: 4.03 <u>Open Channels</u>** The design of open channels to carry minor or major flows shall be restricted to the following maximum velocities: Unlined channel: 1.5 m/s Suitably lined channel: 3.0 m/s If the mean velocity exceeds that permissible for the particular kind of soil or is greater than 1.5 meters per second, the channel shall be suitably lined to protect it from erosion. The maximum depth of flow shall not exceed 300 mm with a freeboard of 150 mm. The side slopes on channels shall not exceed 3 horizontal to 1 vertical.
Rationale: This section adds design criteria for open channels (ditches).	

EXISTING	PROPOSED CHANGES
3.0 <u>Drainage Design Methods and Flows</u>	**4.04 <u>Drainage Design Methods and Flows</u>** **Add:** Pipes shall be designed to flow at a maximum of 80% of full capacity.
Rationale: The City of Parksville Storm Drainage Master Plan states in Section 12, item 16 that "given the uncertainty in the change of future extreme rainfall intensities, drainage system resilience could be improved through the use of a percentage full limit for pipe design". The Master Plan recommends 80%.	
Section 3.0 ii) Hydrograph Methods *Delete this section.*	
Rationale: The new Section 4.04 a) allows for the use of hydrographs. However, references to specific programs have been deleted to avoid references to programs that may become out-dated.	
7.0 <u>Site and Lot Grading</u> sub-section c)	**4.08 <u>Site and Lot Grading</u>** Sub-section c) Add: Storm water drainage easements at the back of the property shall be avoided.
Rationale: Solving storm water drainage problems through the use of drainage easements is not the best solution. Grading lots towards the road is the better solution.	
11.0 <u>Flow Capacities</u>	**4.12 <u>Pipe Capacities</u>** **Add:** Pipes shall be designed to flow at a maximum of 80% of full capacity.
Rationale: Designing the storm water drain system with resiliency is required per the Storm Drainage Master Plan. This provides a factor of safety for the effects of climate change. This statement is a repetition of the same statement in Section 4.04 (see above).	

EXISTING	PROPOSED CHANGES
Section 12.0 <u>Sewer Location / Corridors</u> …….the right-of-way required shall be a minimum of 3.0 metres wide. Where both a storm drain and a sanitary sewer are in one right-of-way, the width shall be a minimum of 4.6 metres wide. Refer to W-1, Section 8.0 for clearance with water mains.	**Add** the following to **Section 4.13 <u>Storm Drain Location / Corridors</u>** ….the required right-of-way shall be a minimum 4.0 metres wide. Where both a storm drain and a sanitary sewer are in one right-of-way, the width shall be a minimum 5.6 metres wide. All storm sewer mains shall be installed at a minimum clear horizontal distance of 3.0 metres, and a vertical distance of 0.5 metres from any water main, with the water main on top. If the minimum horizontal clearance cannot be obtained then the water main shall be protected to the satisfaction of the Regional Public Health Engineer. If a minimum clear vertical separation of 0.5 m cannot be established, then the water main is to be fully concrete encased or wrapped with petrolatum tape at all joints within 3.0 metres of either side of the crossover point.
Rationale: These requirements for the location of storm sewers in relation to water mains are from Island Health Water Supply System Construction Permit Guidelines. It is appropriate to include these requirements as storm drainage and sanitary sewer criteria in addition to criteria for water (Section 6.08).	
SECTION D-2, 5.0 <u>Materials</u>, subsection 5.02 250 – 600 mm concrete – non-reinforced Greater than 600 Concrete – reinforced 150 mm – PVC 150 – 675 – PVC	**4.14 <u>Minimum Pipe Sizes and Materials</u>** This section specifies the material for storm drain pipes in tabular format, and has been moved from the Construction section of the Bylaw to the Design section. 150 mm dia – PVC service connection 200 – 450 PVC Greater than 450 – reinforced concrete
Rationale: Non-reinforced concrete pipe is not readily available and will not be allowed.	

<table>
<tr><th>EXISTING</th><th>PROPOSED CHANGES</th></tr>
<tr><td>D-1, 14.0 <u>Minimum Depth of Cover</u>

The minimum depth of cover shall be 1.5 metres for storm sewers.</td><td>4.15 <u>Minimum Depth of Cover</u>

The minimum depth of cover shall be 1.2 metres for storm drain pipes.</td></tr>
<tr><td colspan="2">Rationale: Frost depth in the City of Parksville is less than 1.2 m. Traffic loading on PVC & concrete pipe is acceptable with 1.2 m of cover.</td></tr>
<tr><td>16.0 <u>Curvilinear Sewers</u></td><td>4.17 <u>Curvilinear Storm Drains</u>

Add: Horizontal curves will require a constant offset and/or shall be uniform throughout the curve.

Add: The design velocity shall exceed 0.91 m/s and the minimum grade shall be 1.0%. Each joint shall be located by survey prior to covering the pipe.</td></tr>
<tr><td colspan="2">Rationale: Curved storm drain pipes must be designed and installed in such a manner as to ensure pipe longevity and integrity.</td></tr>
<tr><td>17.0 <u>Manholes</u>

Manholes are required at:
every 125 m for pipes less than 375 mm diameter
every 155 m for pipes between 400 mm diameter and 750 mm diameter inclusive
every 185 m for pipes larger than 900 mm</td><td>4.18 <u>Manholes</u>

Manholes are required at:
all changes in grade
every 120 m for pipes less than 375 mm diameter
every 150 m for pipes between 400 mm diameter and 750 mm diameter inclusive
every 180 m for pipes larger than 900 mm</td></tr>
<tr><td colspan="2">Rationale: This reduced manhole spacing brings manhole spacing into conformance with other municipalities.</td></tr>
</table>

EXISTING	PROPOSED CHANGES
18.0 <u>Hydraulic Losses in Manholes</u>	**4.19 <u>Hydraulic Losses in Manholes</u>** **b) i)** Add: minimum of 0.5% slope required Add: **d)** Inside ramps will be permitted up to 450 mm from invert to channel bed.
13.0 <u>Minimum Size of Pipe Diameters</u> Service connections shall be a minimum 100 mm diameter (residential) and 150 mm diameter (industrial / commercial).	**4.21 <u>Service Connections</u>** **In a) add:** An inspection chamber shall be installed at the property line complete with a concrete service box. **In d) add:** have a minimum diameter of minimum 150 mm for residential and 200 mm for industrial/commercial.
Rationale: All inspection chambers must be enclosed in a concrete service box for ease of locating IC's and to protect IC's from damage. An increase in storm service connection size is reflective of increased impervious areas and increased rainfall, and to bring storm service diameters into conformance with other municipalities.	
20.0 <u>Catch Basins</u> Catch basins shall not be located in front of sidewalk letdowns at pedestrian crossings.	**4.22 <u>Catch Basins</u>** Catch basins shall be located just upstream of sidewalk letdowns, and at pedestrian and driveway crossings to intercept any runoff prior to the crossing.
Rationale: Detail has been added to this requirement for catch basins.	
	4.23 <u>Oil/Silt Separators</u> This new section has been added stating requirements for oil / silt separators where applicable.

EXISTING	PROPOSED CHANGES
Rationale: A new section has been added requiring an oil / silt separator for properties with potential oil discharges and parking lots larger than 1000 square metres.	
21.0 <u>Swales</u> Remove: Swales required for lot grading conformity shall be located on a 3.0 m easement where accepting drainage of adjacent lots.	**4.24 <u>Swales</u>** Add: maximum wall slope of 3:1 Add: Swales must be directed to lawn basins on each lot.
Rationale: Swales should handle only the storm water on one lot before being directed to a lawn basin.	
25.0 <u>Siltation Controls</u>	**4.28 <u>Erosion and Sediment Control</u>** Add: An erosion and sediment control plan sealed by a Professional Engineer or Geoscientist is required.
Rationale: The name has changed because "sediment" incorporates a larger range of grain sizes than "silt". The requirement for an erosion and sediment control plan will ensure clear direction is provided to the Contractor. Design and field reviews of erosion and sediment control works will form part of the commitment of the Consultant.	
D-2, 3.0 <u>Excavation</u>	**4.31 <u>Excavation</u>** **Section 4.31.3:** Requirements for precutting paved surfaces moved here (originally from section 8.0.6 in existing Bylaw) **Add Section 4.31.6:** If, in the opinion of the City Engineer, trench width exceeds the maximum allowable for pipe support, the Contractor shall provide a higher class of bedding, a pipe with a higher strength class or concrete encasement.

EXISTING	PROPOSED CHANGES
4.0 <u>Bedding</u> Sub-section 4.0.2 Gradation Limits	**4.32 <u>Bedding</u>, Section 4.32.1** proposes revised gradation limits for bedding material. **Section 4.32.6 Add:** Alternate bedding materials may be proposed for use only where approved by a geotechnical engineer. Alternated material will require approval by the City Engineer (subject to sieve analysis at the cost of the proponent).
<u>Rationale</u>: Gradation limits for bedding material have been changed to match the City of Nanaimo's, because of the availability of material in the Nanaimo – Parksville – Qualicum area. Gravel pits manufacture product to conform to City of Nanaimo specifications. The extra cost to manufacture product to conform specifically to City of Parksville current specifications is an unnecessary extra expense for Contractors, without any benefit. This new bedding specification has been approved by a geotechnical engineer.	
	<u>4.33 Materials</u> Add: Corrugated steel pipe will not be permitted for use under any circumstance.
Rationale: Corrugated steel pipe lacks longevity and strength, and hence is unsuitable.	
6.0 <u>Installation</u> **6.0.4 Remove:** Service connections over 26 metres in length shall be provided with a buried cleanout every 26 metres. In addition, a buried cleanout must be provided when the service crosses a property line.	**4.34 <u>Installation</u>** **Add 4.34.5:** Service connections shall be installed perpendicular to the main unless otherwise approved by the Engineer.
Rationale: Installing service connections perpendicular to the main ensures consistency, rather than introducing uncertainty into the location and configuration of connections**.**	

EXISTING	PROPOSED CHANGES
7.0 <u>Manhole, Cleanout, Silt Trap, and Catch Basin Construction</u> **7.0.3 a)** Concrete shall attain minimum strength of 20 MPa at 28 days. **7.0.10 Remove:** The ditch sides and bottom shall be rip-rapped for a minimum of 1.5 metres.	**4.35 <u>Manhole, Cleanout, Silt Trap, Catch Basin, and Oil/Silt Separator Construction</u>** **4.35.3 a)** Concrete shall attain a minimum strength of 28 MPa at 28 days **Add 4.35.11:** Oil/silt separators shall be installed so that all parts are easily accessible for inspection, maintenance and sampling. Installation shall be per the approved plans and the manufacturer's recommendations.
Rationale: The strength requirement of 28 MPa brings cast in place manholes into conformance with pre-cast manholes.	
9.0 <u>Cleanup</u> **9.0.2** The Contractor shall remove excess materials and clean up the area of construction within two weeks of installation.	**4.38 <u>Clean Up</u>** **4.38.2** The Contractor shall remove excess materials and clean up the construction area immediately in order to maintain site safety. **Add 4.38.3** The Contractor shall restore all disturbed surfaces to a condition equal to or better than the condition that existed prior to construction, to the satisfaction of the Municipal Works Inspector.
Rationale: Site clean-up needs to be immediate rather than 2 weeks after construction end.	
D-2, 10.0.2 <u>Video Inspection Test</u> A televised inspection of the storm drainage system will be required for all gravity sewer mainlines	**4.39.2 <u>Video Inspection Test</u>** A camera video of the storm drain system is required for all gravity mainlines, service connections and laterals such as catch basin leads.
Rationale: The video inspection must include connections and catch basin leads.	

SECTION 5.0 SANITARY SEWER SYSTEM	
LIST OF MAJOR CHANGES	
EXISTING	PROPOSED CHANGES
1.0 <u>Sanitary Sewer Systems</u> A map showing the City's sanitary sewer system, catchment boundaries, and future trunk sewer improvements has been developed as part of the Sanitary Sewer Study Update dated September 1996 by Koers & Associates Engineering Ltd., and shall form part of this bylaw.	**5.01 <u>Introduction</u>** The City Sanitary Sewer Master Plan shall be used as a reference in the design of individual sewer networks.
Rationale: The wording change is necessary because the Sanitary Sewer Master Plan was updated in 2015.	
2.0 <u>Design Flows</u> Residential/Institutional flows 410 l/c/d Peak flows shall be 5 times the average daily flow for contributing areas with populations less than 1,000; and 4 times the average daily flow for contributing areas with populations between 1,000 and 3,000. An infiltration rate of 0.1 litres/s/ha shall be added to the above flows.	**5.02.1 <u>Design Flow</u>** Residential/Institutional 300 l/c/d Add: Hotel 300 l/d/patron Add: Motel 500 l/d/patron Peak flow shall be $6.75P^{-0.11}$ An Infiltration rate of 12,500 litres/day/ha shall be added to the peak flow to obtain the design flow.
Rationale: Revisions to flow criteria were developed in the Koers 2015 Sanitary Sewer Master Plan and reflect actual flows based on monitoring results.	
	5.03 <u>Pipe Capacity</u> **Add:** Gravity sanitary sewers shall be sized for a maximum of 70% of full capacity.

EXISTING	PROPOSED CHANGES
Rationale: Sizing the pipes for a maximum of 70% of full capacity will provide system resilience to buffer the effects of climate change on I&I, per the 2015 Koers Sanitary Sewer Master Plan.	
12.0 <u>Sewer Location / Corridors</u> When the utility is required to cross private land(s), the right-of-way shall be a minimum of 3.0 metres wide. Where both storm and sanitary sewers are in one right-of-way, the width shall be a minimum 4.6 metres wide.	**5.04 Sanitary Sewer Location/Corridors** If the utility crosses private land, the required right-of-way shall be a minimum of 4.0 metres wide. Where both a storm drain and a sanitary sewer are in one right-of-way, the width shall be a minimum 5.6 metres. **Add:** All sanitary sewer mains shall be installed at a minimum clear horizontal distance of 3.0 metres, and a vertical distance of 0.5 metres from any waterman, with the waterman on top. If the minimum horizontal clearance cannot be obtained, then the waterman shall be protected to the satisfaction of the Regional Public Health Engineer. If a minimum clear vertical separation of 0.5 m cannot be established, then the waterman is to be fully concrete encased or wrapped with petrolatum tape at all joints within 3 metres of either side of the crossover point.
Rationale: Right-of-way widths have been increased for ease of maintenance and to bring the requirements for right-of-way widths into conformance with the City of Nanaimo. The requirements for the location of sanitary sewers in relation to water mains are from Island Health Water Supply System Construction Permit Guidelines. It is appropriate to include these requirements as sanitary sewer criteria in addition to criteria for water (Section 6.08).	

EXISTING	PROPOSED CHANGES
7.0 <u>Minimum Pipe Diameter</u>	**5.05 <u>Minimum Pipe Sizes and Materials</u>** Requirements for pipe material have been moved from the old Bylaw construction section S-2, 5.0 to the new Bylaw design section 5.05. Material requirement summary: • 100 – 150 mm (service connections): SDR 28 PVC • 200 – 675 mm (mains / larger service connections): SDR 35 PVC • Greater than 675 mm (mains): reinforced concrete • Forcemains (all sizes): High Density Polyethylene
Rationale: Pipe materials no longer include non-reinforced concrete.	
10.0 <u>Minimum Depth of Cover</u> The minimum cover over any main shall be 1.5 metre.	**5.06 <u>Minimum Depth of Cover</u>** The minimum cover over any main shall be 1.2 metres. Add: The class and type of pipe and fittings, together with required class of bedding and trench widths, shall be such that the pipe will support the anticipated earth and any surface dead and live loads, with a safety factor of 1.5 for rigid and 1.9 for non-rigid pipe. (moved from existing Bylaw section S-2, 6.0.1)
Rationale: Frost depth in Parksville does not exceed 1.2 m.	
4.0 <u>Manholes</u> Manholes are required at: • All terminal sections • Every 120 m for pipes between 150 and 375 mm diameter • Every 180 m for pipes between 450 mm diameter and 1200 mm diameter inclusive	**5.10 <u>Manholes</u>** Manholes are required at: • all terminal sections unless a cleanout is permitted • Every 120 m for pipes less than or equal to 375 mm in diameter • every 150 m for pipes between 400 mm diameter and 750 mm diameter inclusive • every 180 m for pipes equal to or greater than 900 mm

EXISTING	PROPOSED CHANGES
5.0 <u>Hydraulic Losses across Manholes</u> **5.0 a)** The springline of the downstream pipe shall not be higher than that of the upstream pipe. **5.0 c)** A drop pipe shall be installed when the drop between inverts exceeds 0.6 metres.	**5.11 <u>Hydraulic Losses across Manholes</u>** **5.11 a)** Generally the crown of the downstream pipe shall not be higher than the crown of the upstream pipe. **5.11 b) i) Add:** minimum of 0.5% slope required **5.11 c)** Outside drop manholes shall be provided wherever the drop exceeds 0.6 metres.
Rationale: It is proposed to make the wording of these sections clearer and more specific.	
S-2, 3.0 <u>Excavation</u>	**5.18 <u>Excavation</u>** **5.18.3:** Requirements for precutting paved surfaces moved here. **Add 5.18.6:** If, in the opinion of the City Engineer, trench width exceeds the maximum allowable for pipe support, the Contractor shall provide a higher class of bedding, a pipe with a higher strength class or concrete encasement.
Rationale: This section 5.18.6 ensures pipes are provided with appropriate support.	
4.0 <u>Bedding</u> All excavation works shall be in conformance with the details of Section D2, Storm Sewers, Item 4.0.	**5.19 <u>Bedding</u>** **5.19.1** contains proposed revised gradation limits for bedding material **5.19.6:** Alternate bedding materials may be proposed for use only where approved by a geotechnical engineer. Alternate material will require approval by the City Engineer (subject to sieve analysis at the cost of the proponent).
Rationale: Gradation limits for bedding material have been changed to match the City of Nanaimo's specifications, because of the availability of material in the Nanaimo – Parksville – Qualicum area. Gravel pits manufacture product to conform to City of Nanaimo specifications. The extra cost to manufacture product to conform specifically to City of Parksville current specifications is an unnecessary extra expense for Contractors, without any benefit.	

EXISTING	PROPOSED CHANGES
5.0 <u>Materials</u> The requirements of existing Bylaw Section S-2, 5.0 have been moved to new proposed Bylaw Section 5.05.	
S-2, 8.0 <u>Manhole and Cleanout Construction</u> Concrete shall attain a minimum strength of 20 MPa at 28 days.	**5.23 <u>Manhole and Cleanout Construction</u>** **5.23.3 a)** Concrete shall attain a minimum strength of 28 MPa at 28 days.
Rationale: Manufacturers of pre-cast manholes require a concrete strength of 28 MPa.	
9.0 <u>Backfill</u> Requirements for precutting paved surfaces moved from the Backfill section to Section 5.18.3 Excavation.	
Rationale: Precutting paved surfaces fits better into the Excavation section.	
10.0 <u>Cleanup</u> **10.0.2** The Contractor shall remove excess materials and clean up the area of construction within two weeks of installation.	**5.26 <u>Clean Up</u>** **5.26.2** The Contractor shall remove excess materials, and clean up the construction area immediately, in order to maintain site safety. **Add 5.26.3** The Contractor shall restore all disturbed surfaces to a condition equal to or better than the condition that existed prior to construction, to the satisfaction of the Municipal Works Inspector.
Rationale: The time frame of 2 weeks for clean-up has been eliminated and replaced with "immediately". A clause requiring restoration of the site has been added.	

EXISTING	PROPOSED CHANGES
11.0 <u>Cleaning, Flushing, and Testing</u> **Remove 11.0.4:** Infiltration test for gravity mains	**5.27 <u>Cleaning, Flushing, and Testing</u>** **5.27.5 <u>Video Inspection Test</u>** **Add:** All pipe video inspection including methods of cleaning, equipment and rates of camera travel, shall be in accordance with the UK Water Research Centres (WRc), Sewage Rehabilitation Manual, most current Edition.
Rationale: Infiltration test for gravity mains is rarely if ever used. The video methodology has been specified.	
S-2, 11.0.6 <u>Video Inspection Test</u> A televised inspection of the sanitary sewer system will be required for all gravity sewer mainlines and recorded on VHS format.	**5.27.5 <u>Video Inspection Test</u>** A televised inspection of the sanitary sewer system is required for all gravity sewer mainlines, and connections, in accordance with WRC (Water Research Council) procedures.
Rationale: In addition to videoing the mainlines, the connections require videoing.	

SECTION 6.0 WATER DISTRIBUTION SYSTEM

LIST OF MAJOR CHANGES

EXISTING	PROPOSED CHANGES
1.0 <u>Community Water Supply</u> **Remove**: A map showing the City's water supply system has been developed as part of the Water Distribution System Review dated May 1996 by Koers & Associates Engineering Ltd., and shall form part of this bylaw.	**6.01 <u>Community Water Supply</u>** The City's most current Water Master Plan shall be used as a reference in the design of individual water networks. The City will conduct a modelling analysis using the City's network model at the expense of the developer.
Rationale: This re-wording ensures the current Master Plan is referenced, and authorizes a run of the water model by the City at the developer's expense.	
2.0 <u>Per Capita Demand</u> Average daily demand: 570 L/cap/day Maximum daily demand: 1364 L/cap/day Peak hour demand: 1700 L/cap/day	**6.02 <u>Per Capita Demand</u>** Average daily demand: 518 L/cap/day Maximum daily demand: 1319 L/cap/day Peak hour demand: 1910 L/cap/day
Rationale: New per capita demands now conform with the City's current water model and the 2014 Kerr Wood Liedal report for the ERWS water intake, treatment plant and supply mains.	
3.0 <u>Fire Flow Demand</u> Minimum fire flow for Single Family Residential: 75 l/s Institutional 150 l/s Commercial 150 l/s or as specified by the FUS calculations	**6.03 <u>Fire Flow</u>** Minimum Fire Flow: Single Family Residential 75 litres/s Multi Family Residential 150 litres/s Commercial 250 litres/s Resort / Recreational 250 litres/s Institutional 250 litres/s Industrial 200 litres/s
Rationale: The fire flow has been modified to bring it into conformance with the Water Study Update June 2005, the current water model, and the 2014 Kerr Wood Liedal reports.	

EXISTING	PROPOSED CHANGES
9.0 <u>Valving</u> **9.0 b)** Valves not more than 200 m apart for single family residential	**6.09 <u>Valving</u>** d) Spacing shall be not more than 150 metres.
Rationale: This brings valve spacing into conformance with the City of Nanaimo.	
11.0 <u>Air Valves</u>	**6.11 <u>Air Valves</u>** **Add:** Designs shall minimize high points where air release is required.
Rationale: Design should minimize City infrastructure that requires maintenance & replacement.	
12.0 <u>Blow-Offs</u>	**6.12 <u>Flushouts</u>** **Add:** A hydrant can be a substitute for a flushout.
Rationale: A hydrant can be used to flush a water main.	
13.0 <u>Thrust Blocking</u> Concrete thrust blocking shall be provided at bends, tees, wyes, reducers, plugs, caps, and blow-offs. All other proposed forms of thrust restraint shall be forwarded to the Municipal Engineer for review and consideration.	**6.13 <u>Joint Restraints and Thrust Blocking</u>** Mechanical joint restraints shall be provided for all fittings requiring thrust restraint. The Consultant shall show calculations and the number of joint restraints required to resist the thrust at the fittings. Where approved by the Engineer, the Consultant's design may utilize concrete thrust blocks. Thrust block design calculations and soil bearing pressures must be shown on the design drawings.

EXISTING	PROPOSED CHANGES
Rationale: Mechanical joint restraints are engineered to protect pressurized pipes and fittings. Joint restraints will provide the City with a higher degree of assurance than with concrete thrust blocks that the water system is adequately restrained against thrust forces.	
15.0 <u>Service Connections</u> Minimum 20 mm diameter connections shall be required for all lots.	**6.15 <u>Service Connections</u>** Minimum 25 mm diameter Type K annealed copper service connections to ASTM B88M are required for all lots, except in corrosive soils in which case the connections shall be 38 mm polyethylene pipe to AWWA C901-08 complete with tracer wire.
Rationale: A 25 mm diameter connection can generally accommodate house sprinklers. Copper is preferable to polyethylene due to simplicity and consistency of fittings for installation and maintenance by the Operations staff.	
	Add: 6.16 <u>Water Location / Corridors</u> Where a right-of-way over a water line is required, the minimum acceptable width is four metres.
Rationale: This increases required right-of-way widths from 3 to 4 metres to allow easier maintenance and repair.	
	6.18 <u>General</u> **6.18.3 Add:** Testing of the soil adjacent to the proposed water main alignment shall be conducted for all new or replacement mains during design stage by a geotechnical engineer. Soil analysis shall be conducted in accordance with a standardized evaluation procedure. A copy of the corrosion analysis report and recommendations shall be provided to the City. The main and appurtenances shall be of a suitable material and thickness, or supplemented by a corrosion mitigation technique to ensure at least 50 years of service prior to a leak or failure. If ductile iron pipe is installed than an approved means of conductance for each joint is required.

EXISTING	PROPOSED CHANGES
Rationale: The requirement for soil testing for new water mains is as a result of on-going failure of water appurtenances before their anticipated life in areas of the City with corrosive soils.	
	6.18.9 Add: The minimum distance of tapping from a pipe end or joint shall be 1.0 m, or 2.0 m from a pipe end equipped with a flushout.
W-2, 2.0.11 Where new mains pass under existing asbestos cement (AC) mains, the existing piping must be removed 300 mm past the trench wall on both sides, and replaced with PVC piping complete with approved couplers.	**6.18.10:** Where new mains pass under existing asbestos cement (AC) mains, the existing piping must be removed 600 mm past the trench wall on both sides, and replaced with PVC piping complete with approved couplers.
Rationale: Added requirements for tapping clarify distances to pipe ends and joints. The requirement for replacing AC has an increased distance from 300 to 600 mm, for safety.	
W-2, 4.0 <u>Excavation</u> All excavation works shall be in conformance with the details of Section D2 "Storm Sewers", sub-section 3.0.	**6.20 <u>Excavation</u>** **6.20** Requirements for excavation have been reproduced here from Section D2, sub-section 3 "Storm Sewers". **Add 6.20.6:** If, in the opinion of the City Engineer, trench width exceeds the maximum allowable for pipe support, the Contractor shall provide a higher class of bedding, a pipe with a higher strength class or concrete encasement.
Rationale: The section titled "Excavation" has been duplicated in the Water, in addition to the Storm and Sanitary sections, for clarity. A requirement applicable to trench width has been added to ensure adequate pipe support.	

EXISTING	PROPOSED CHANGES
W-2, 5.0 <u>Bedding</u> All pipe bedding shall be in conformance with the details of Section D2 "Storm Sewers", sub-section 4.0.	**6.21.1 <u>Bedding</u>** Bedding requirements have been reproduced in the Water section, in addition to being in the Storm and Sanitary sections. **Add 6.21.6:** Alternate bedding materials may be proposed for use only where approved by a geotechnical engineer. Alternate material will require approval by the City Engineer (subject to sieve analysis at the cost of the proponent).
Rationale: The bedding requirements have been reproduced in the Water section for clarity. Alternate materials used for bedding must be approved by a geotechnical engineer.	
W-2, 6.0 <u>Materials</u> **6.0.2:** PVC pipes 300 mm and smaller shall be PR 235, dimension ratio (DR) of 18 maximum with cast iron equivalent outside diameter and integral bell gasketted joint. **6.0.3 Remove:** Gray-iron (cast iron) fittings shall conform to AWWA C110 and shall have a minimum pressure rating of 1035 kPa or higher. **6.0.3** Ductile iron fittings shall conform to AWWA C110 and shall have a minimum pressure rating of 2415 kPa, and be cement mortar lined in accordance with AWWA C104. All ductile iron fittings shall be treated with an anti-corrosive coating. Asphalt coated ductile iron compact fittings manufactured to AWWA C153, designed for a minimum working pressure of 22415 (sic) kPa, and cement mortar lined to AWWA C104.	**6.22 <u>Materials</u>** **6.22.2:** PVC pipes 300 mm and smaller shall be Class 235 DR 18 maximum with ductile iron fittings. **6.22.3:** Ductile iron fittings shall conform to AWWA C153, have a minimum pressure rating of 2415 kPa, and be cement mortar lined in accordance with AWWA C104. Ductile iron compact fittings shall be treated with an anti-corrosive coating: asphalt, thermal plastic or epoxy coating in accordance with AWWA C104.

EXISTING	PROPOSED CHANGES
Rationale: The "gasketted joint" requirement is stated at the end of Section 6.22.2. Cast iron fittings are not used anymore. Thermal plastic and epoxy coatings are acceptable.	
6.0.4: Service pipe 19 mm to 50 mm shall be Type K annealed copper to ASTM B88M. Polyethylence pipe or PVC series pipe conforming to ASTM D2241, certified to CSA B137.3 may be used only in specific applications only as approved by the City Engineer.	**6.22.4:** Service pipe 25 mm shall be Type K annealed copper to ASTM B88M. Polyethylene pipe or PVC series pipe conforming to ASTM D2241, certified to CSA B137.3 may be used for service pipe 38 and 50 millimetres, and shall be used in corrosive soils or other specific applications as approved by the City Engineer.
Rationale: 25 mm diameter services are required to be copper, unless soils are corrosive.	
W-2, 9.0 <u>Valve Boxes/Markers</u> **Remove:** The use of valve box risers shall not be permitted in travelled areas.	**6.25 <u>Valve Boxes/Markers</u>**
Rationale: Valve box risers are acceptable in travelled areas.	
W-2, 13.0 <u>Thrust Blocking</u>	This section has been incorporated into Sections 6.12, 6.13 and 6.23..
Rationale: Specifications for joint restraints and thrust blocks are addressed in new Section 6.13, <u>Joint Restraints and Thrust Blocking</u>. Section 6.12 addresses flushouts. See Section 6.23 for gate valve specifications.	
W-2, 14.0 <u>Backfilling</u> All backfill materials and placement work shall be in conformance with the details of Section D2 "Storm Sewers", Item 8.0.	**6.29 <u>Backfill</u>** Backfill details from the Storm Drainage section have been reproduced here. **6.29.5 Add:** Replaced topsoil must be compacted.

<table>
<tr><th>EXISTING</th><th>PROPOSED CHANGES</th></tr>
<tr><td colspan="2">Rationale: The backfill section has been reproduced in whole in the water section for clarity.

For clarity, specifications for precutting paved surfaces have been moved to Section 6.20, “Excavation”, for clarity.</td></tr>
<tr><td>W-2, 15.0.1 <u>Water Meters</u>

Delete the sentence “All meters located within the downtown as defined by the Official Community Plan shall be fitted with RadioRead technology approved by the City Engineer.</td><td>6.30 <u>Water Meters</u>

6.30.1 RadioRead technology may be required at the discretion of the City Engineer.</td></tr>
<tr><td colspan="2">Rationale: The Operations Department does not own RadioRead technology.</td></tr>
<tr><td>W-2, 15.0.3 All fireline services shall be constructed in accordance with standard drawings WA13 and WA 14. The said meters shall be supplied and installed by the Contractor and shall be activated only by City forces.

W-2, 15.0.4 All meters used for fireline service shall be U.L. listed and FM approved, and shall meet the requirements of NFPA.</td><td>6.30.4 All meters used for fireline services shall be UL listed and FM approved, and shall meet the requirements of NFPA. All meters shall be Sensus meters and shall be sized by the Consultant. If there are hydrants or other items between the property line and the building that require isolation from City water, a Double Check Valve Assembly (DCVA) must be placed on private property in a separate vault from the meter, immediately upstream of the meter, complying with the City’s Cross Connection Control Program. The meter shall be supplied and installed by the Contractor and shall be activated only by City forces.</td></tr>
<tr><td colspan="2">Rationale: The requirement to isolate on-site fire hydrants with a double check valve is a requirement of the CSA standard for isolation devices. The CSA standard identifies “hose” connections as a moderate to severe hazard.</td></tr>
</table>

EXISTING	PROPOSED CHANGES
W-2, 16.0 <u>Water Meter Chambers</u> **16.0.1 Remove:** Chambers shall be precast reinforced concrete. **16.0.1:** clearances between the internal water works and walls and ladders shall be a minimum of 300 mm and 450 mm respectively **Remove 16.0.2:** O-ring rubber gaskets for manholes used as chambers shall conform to ASTM C443. **16.0.7 The following details have been removed:** (H-20 static if not in anticipated vehicular areas, otherwise H-20 dynamic loading). Covers must be A.E. Concrete SVTZ-5C series or approved equal…..and must provide a minimum through clearance of 950 mm by 950 mm (i.e. A.E. Concrete SVTZ-5C-1200 or approved equal)…. **The following statement has been changed:** For chambers that house compact fireline meter assemblies with UL/FM strainers (i.e. Standard Drawing WA14), they must be sized and located to permit vertical removal of the entire assembly with no horizontal movement required.	**6.31 <u>Water Meter Chambers</u>** **6.31.1** Chambers shall be precast or cast in place reinforced concrete. **6.31.1:** Chambers shall be sized such that clearances between the internal water works (e.g., pipes, fittings, devices, etc.) and walls and ladders shall be a minimum of 300 mm and 450 mm respectively, and clearances can accommodate the required access opening and cover. **6.31.7** Access openings must be fitted with square, lockable, galvanized, and double-hinged lift assist covers constructed to support H-20 loading. The access openings and covers must be sized so that the largest assembly can be removed with no horizontal movement required, and so maintenance workers have sufficient head room to stand on both sides of the assembly. The hinges must not be on the same side as the ladder or wall rungs.
Rationale: The wording that H-20 loading is required has been condensed. References to a specific product have been deleted. Clarification has been provided about sizing the access opening to accommodate maintenance workers standing on both sides of the assembly.	
W-2, 18.0 <u>Testing Procedure</u> **18.0.3 a):** After a satisfactory test has been achieved, the Contractor shall notify the Works Inspector of a final test. **18.0.3 a):** The duration of the test shall be a minimum of one hour.	**6.33 <u>Testing Procedure</u>** **6.33.3 a):** After a satisfactory test has been achieved, the Consultant shall notify the Works Inspector of a final test. **6.33.3 a):** The duration of the test shall be a minimum of two hours.

<table>
<tr><th>EXISTING</th><th>PROPOSED CHANGES</th></tr>
<tr><td colspan="2">Rationale: The Consultant needs to be satisfied that the water main can be tested, not the contractor.

The duration shall be 2 hours, bringing it into conformance with the AWWA standard.</td></tr>
<tr><td>W-2, 19.0 <u>Disinfection and Flushing Procedures</u>

19.0.7: After completion of chlorination, the chlorinated waters shall be flushed from the system, hydrants and services until chlorine concentration remaining in the line is less than 0.3 mg/L chlorine residual.</td><td>6.34 <u>Disinfection and Flushing Procedures</u>

6.34.7: After the completion of chlorination, the chlorinated waters shall be flushed from the system, hydrants and services until the chlorine concentration remaining in the line is less than 1.0 mg/L chlorine residual.</td></tr>
<tr><td colspan="2">Rationale: These changes and additions bring the Standards & Specifications into conformance with AWWA requirements.</td></tr>
</table>

SECTION 7.0 ROADS, CURBS, WALKWAYS, AND SIDEWALKS	
LIST OF MAJOR CHANGES	
EXISTING	PROPOSED CHANGES
R-1, 12.0 <u>Road Pavement Design</u> The layer thickness / rebound reading table has been modified to conform to City road classifications. Also, in that table values of the Benkleman Beam rebound readings have been modified slightly to make them more conservative. This table has been moved to section 7.25 <u>Sub-Base and Base Course Testing Procedure</u>. Section 12.0 references to the CBR asphalt paving design method have been deleted.	**7.01 <u>Introduction</u>** Three paragraphs from old Bylaw Section R-1, 12.0 have been moved to new Section 7.01 *Introduction,* as follows. The design of new roads shall be based on the contents of these standards and specifications and on the results of a geotechnical assessment of the proposed road site. Test holes and samples shall be undertaken by a qualified geotechnical company, and all reports shall be signed and sealed by a qualified geotechnical engineer. The geotechnical engineer shall be retained throughout the design and construction phases of the project. Road construction and asphalt overlay design for upgrading of existing roads shall be based on design standards for new roads contained in these standards and specifications and on the results of test holes carried out by a qualified geotechnical company and Benkleman Beam testing. Crack sealing and pavement patching may be required as part of the road upgrade. The pavement structure shall be appropriate for a road under the expected traffic conditions for the class of road.
Rationale: The reorganization of these paragraphs will add clarity to the Bylaw. The CBR asphalt pavement design method is a complex method that is not used at the municipal design level anymore.	

EXISTING	PROPOSED CHANGES

Rationale: The reorganization of these paragraphs will add clarity to the Bylaw. The CBR asphalt pavement design method is a complex method that is not used at the municipal design level anymore.

2.0 Classifications

Classification	Speed km/h	Width m	Dedication m
RC4 – Urban Arterial	**60**	16.5	25
RC5 – Rural Arterial	**80**	17.4	**Varies**
RC8 – Urban Lane	50	**5.4**	7

7.02 Classifications

Classification	Posted Speed km/h	Width m	Dedication m
RC4 – Urban Arterial	**50**	16.5	25
RC5 – Rural Arterial	**60**	17.4	**25**
RC8-Urban Lane	**20**	**6.0**	7

Rationale: Speed limits have been reduced to reflect posted speeds. The width of lane pavement now provides fire access.

3.0 Grades

Classification	Max. Grade
Residential	15.0%
Collector	12.0%
Residential approach to collector	15.0%
Residential/Collector approach to major	3.0%

7.03 Grades

Classification	Max. Grade
Local	12.0%
Collector & Arterial	8.0%
~~Residential approach to collector~~	~~15.0%~~
~~Residential/Collector approach to major~~	~~3.0%~~

Rationale: The allowable longitudinal grades have been reduced to bring them into conformance with other municipalities.

The approach grades are in Section 7.11 Intersections.

<table>
<tr><td>EXISTING</td><td>PROPOSED CHANGES</td></tr>
<tr><td>6.0 <u>Horizontal Curves</u>

<table>
<tr><th>Classification</th><th>Speed (km/h)</th><th>Min. CL radius</th><th>Max. super-elevation</th></tr>
<tr><td>Residential</td><td>50</td><td>50 m</td><td>Normal crown</td></tr>
<tr><td>Collector</td><td>50</td><td>100 m</td><td>0.06</td></tr>
<tr><td>Major</td><td colspan="3">Special Design</td></tr>
</table></td><td>7.06 <u>Horizontal Curves</u>

<table>
<tr><th>Classification</th><th>Speed (km/h)</th><th>Min. CL radius</th><th>Max. super-elevation</th></tr>
<tr><td>Local</td><td>50</td><td>50 m</td><td>Normal crown</td></tr>
<tr><td>Collector</td><td>50</td><td>100 m</td><td>Normal crown</td></tr>
<tr><td>Arterial</td><td>50 / 60</td><td>Refer to TAC</td><td>Special design</td></tr>
</table></td></tr>
<tr><td colspan="2">Rationale: Road design with super-elevation is unnecessary where the speed limit is 50 km/h.</td></tr>
<tr><td>8.0 <u>Cul-de-sacs & P-Loops</u>

Remove: Cul-de-sac islands are to be finished with exposed aggregate concrete and to be planted with two street trees. An additional bench for pedestrians may also be required as part of the design.</td><td>7.08 <u>Cul-de-sacs & P-Loops</u>

Add: A walkway shall be provided from the end of the cul-de-sac to the adjacent road, where feasible.</td></tr>
<tr><td colspan="2">Rationale: The Operations Department no longer wants islands in the middle of cul-de-sac turnarounds due to higher maintenance costs and problems with snow plows and street sweepers.

A walkway to an adjacent street is a requirement where feasible for pedestrian and bicycle connectivity.</td></tr>
<tr><td>9.0 <u>Temporary Turnarounds</u></td><td>7.09 <u>Temporary Turnarounds</u>

Add: …..temporary paved turnarounds are required to accommodate a fire truck.</td></tr>
<tr><td colspan="2">Rationale: self-explanatory</td></tr>
</table>

<table>
<tr><th>EXISTING</th><th>PROPOSED CHANGES</th></tr>
<tr><td>11.0 <u>Cross Section Considerations</u>

The basic design road width and thickness, etc., shall be determined by:
a) the Standard Drawings applicable; and
b) the results of soils test and analysis of Benkleman Beam tests, or by the CBR asphalt pavement design method. (See also Section 12.0)

Max side slope: 2H:1V</td><td>7.12 <u>Cross Section Considerations</u>

The road width and pavement structure shall be determined by:
• the minimum specified on the applicable standard drawing; or
• per section 7.25 for reconstruction of existing roads; and
• per section 7.01.

Max side slope: 3H:1V (2H:1V where absolutely necessary)</td></tr>
<tr><td colspan="2">Rationale: Reference to the CBR asphalt pavement design method has been deleted because it is a complex method that is not used at the municipal design level anymore.

Side slopes have been specified as less steep for stability reasons.</td></tr>
<tr><td>15.0 <u>Emergency Accesses</u>

The travel surface shall be broom swept concrete and shall have either: a treated post and rail fence (see standard drawing R27) <u>or</u> chain link fencing on both sides, and bicycle baffles at each end.</td><td>7.14 <u>Emergency Accesses</u>

The full width of the right-of-way shall be broom-swept concrete and shall have wheel chair accessible bicycle baffles or bollards at each end.</td></tr>
<tr><td colspan="2">Rationale: Concrete shall cover the entire width of the access for better access by a fire truck. The requirements for a fence have been deleted. A bollard can replace the baffles, depending on the site.</td></tr>
<tr><td>16.0 <u>Boulevards</u>

All new boulevards created as a result of subdivision may remain unfinished for a period of six months.</td><td>7.15 <u>Boulevards</u>

All new boulevards created as a result of subdivision may remain unfinished until 80 percent of the houses have been finished.</td></tr>
<tr><td colspan="2">Rationale: Six months is too short a time for builders to complete their houses. Builders negatively impact newly established boulevards.</td></tr>
</table>

EXISTING	PROPOSED CHANGES
17.0 <u>Signs</u> All street signs and traffic advisory signs required for each project will be installed by the municipality at the Applicant's expense.	**7.16 <u>Signs and Street Markings</u>** Street name signs and traffic advisory signs will be supplied and installed by the City at the Applicant's expense, unless otherwise approved.
Rationale: Signs should be supplied and installed by the Operations Department to ensure uniformity and consistency with all signs in the City. Additional new specifications for signage and street markings have been added to this section.	
18.0 <u>Curbs and Gutters</u>	**7.17 <u>Sidewalks, Curbs, Gutters and Walkways</u>** Existing Bylaw Sections R-2, 8.01 and 8.02 have been moved here.
Rationale: Concrete mix design and materials specifications should be in the design section rather than the construction section.	
20.0 <u>Sidewalks and Walkways</u> **20.0 b)** Remove reference to "the Approving Officer".	**7.17 <u>Sidewalk, Curbs, Gutters and Walkways</u>** **7.17.2** Replace with **"**the City Engineer". **7.17.2 Add:** Walkways for pedestrian connectivity within a subdivision and walkways within a park shall be concrete.
Rationale: The Standards & Specifications should make reference to the City Engineer, not to the Approving Officer. Walkway material has been specified as concrete.	
R-2, 2.0 <u>Clearing</u> Sufficient topsoil must be retained on site for 200 mm of topsoil on the boulevard. Surplus topsoil which may have to be removed from an existing road allowance is the property of the Municipality and shall be deposited at a stockpile site approved by the Municipal Engineer.	**7.22 <u>Clearing</u>** Sufficient topsoil must be retained on site for topsoil replacement on the boulevard.

EXISTING	PROPOSED CHANGES
Rationale: Work within an existing road allowance rarely yields excess topsoil, and the logistics of the City stockpiling topsoil are complicated.	
R-2, 4.0 <u>Sub-grade Preparation/Import Fill Materials</u> **4.0.1** Import Fill Materials specifications have been moved to new Bylaw section 7.27.	
Rationale: Material specifications have been moved to the design section, rather than residing in the construction section.	
5.0 <u>Base Course and Sub-Base Preparation</u> Existing Bylaw sections **5.0.1, 5.0.2, 5.0.3** have been moved to new Bylaw section 7.28.	
Rationale: Material specifications have been moved to the design section.	
R-2, 6.0 <u>Construction Method</u> **6.0.5 d)** The Contractor is requested to approach the Public Works Department for permission prior to using any City hydrant as a water source.	**7.26 <u>Construction Methodology</u>** **7.26.5** The Contractor must have a Hydrant Use Permit to use any City hydrant as a water source.
Rationale: The wording has changed requiring a Hydrant Use Permit for water use.	
R-2, 5.0.3 <u>Base Course Materials</u> e) Maximum RAP content shall be 10% by volume of the finished product.	**7.28.3 <u>Base Course Materials</u>** Reclaimed Asphalt Product (RAP) may be used for all roads except arterials. Maximum RAP content shall be 15 percent by mass of the finished product.
Rationale: This revision to the allowable RAP use and content has been specified by WSP Canada Inc. in an analysis completed for the City of Parksville, dated April 13, 2017.	

EXISTING	PROPOSED CHANGES
	7.30 <u>Asphalt Concrete Paving</u> **7.30.1 <u>Placing and Compacting Pavement,</u>** <u>*Placing*</u> **Add:** Joints made from new to existing pavement are to be done at 45-75 degrees to the road rather than 90 degrees. This will help to reduce awareness of the joint by vehicles.
Rationale: self-explanatory	
R-2, 8.0 <u>Sidewalk, Curbs and Gutters</u> Sections 8.0.1 and 8.0.2 have been moved to new Bylaw section 7.31. **8.0.6 a) iv):** The finish grade surface of concrete sidewalks shall be 0 - 6 mm above the finished elevation of all valves, manholes, and service boxes.	**7.31 <u>Sidewalks, Curbs and Gutters</u>** **7.31.6:** The finished grade of concrete sidewalks shall be flush with the finished elevation of all valves, manholes, and service boxes.
Rationale: The finished surface of the sidewalk must meet the surface of valves, manholes and service boxes in the sidewalk to avoid trip hazards.	
R-2, 8.0.7 <u>Joints</u> <u>Control Joints</u> **Remove 8.0.7 b) iii):** Bond break compound may be used in lieu of expansion joint between sidewalk and abutting curb and gutter.	**7.31.7 <u>Joints</u>**
Rationale: Bond break compound should not be used in lieu of expansion joints.	

<table>
<tr><th>EXISTING</th><th>PROPOSED CHANGES</th></tr>
<tr><td>8.0.8 b): The membrane material shall be applied uniformly by an approved pressure distributor at an average of one litre per 5 square metres of surface.

Remove 8.0.8, c): Covering

Remove 8.0.8, d): Barricades

Remove 8.0.8,e): Pedestrian and Vehicular Access</td><td>7.31.8 <u>Protection of Work</u>
The membrane material shall be applied uniformly per the manufacturer’s recommendations.

7.31.8 Add: The Contractor shall ensure that the quality of the product remains intact and that the works are protected until substantial completion.</td></tr>
<tr><td colspan="2">Rationale: Requirements for membrane material application will change with time. A clause stating that it shall be applied per the manufacturer’s recommendations is more general and will survive changes.

Rather than specifying methodology for protection of works, it is simpler to include a clause that makes the Contractor responsible for his work until substantial completion.

Requirements for maintaining pedestrian access could better be handled through the Permit to Work on City Property.</td></tr>
<tr><td></td><td>Add 7.32 <u>Signs, Posts, and Line Painting</u></td></tr>
<tr><td colspan="2">Rationale: This new section will clarify requirements for signs, posts and line painting.</td></tr>
</table>

SECTION 8.0 ROADWAY LIGHTING AND TRAFFIC SIGNALS DESIGN CRITERIA	
LIST OF MAJOR CHANGES	
EXISTING	PROPOSED CHANGES
1.0 General	**8.1 General** **Add:** Design and field reviews…..shall be completed by a professional electrical consultant…… **Add:** Although these Standards and Specifications do not specifically provide for LED lighting, the use of LED lights is encouraged and may be required. Design and specification of LED lights shall be completed by a qualified electrical Consultant with expertise in roadway lighting. **Add:** Related Manuals: When preparing designs, designers must always comply with these specifications. However where details from these specifications are absent, the designer may utilize relevant sections in the most recent or revised editions of the following documents and manuals: • Illuminating Engineering Society of North America (IESNA) Lighting Manuals and Handbook Publications • Ministry of Transportation and Infrastructure (MOTI) Electrical and Traffic Engineering Design Guidelines - Section 400 - Signal Design • Master Municipal Specifications, latest edition (MMCD) – Division 26 - Electrical • The Canadian Electrical Code including BC Electrical Bulletins • The British Columbia Building Code • Worksafe BC Regulations • The British Columbia Motor Vehicle Act Where conflicting material is present between the above manuals and the City of Parksville specifications the City Specifications shall always take precedence.

<table>
<tr><th>EXISTING</th><th>PROPOSED CHANGES</th></tr>
<tr><td colspan="2">Rationale:
In the proposed new Bylaw, the electrical Consultant will be required to conduct field reviews. This is the responsibility of the electrical Consultant and not the civil Consultant.

The use of LED lighting is encouraged. However, the specifications change rapidly. Hence, designing and specifying LED lighting, if required, will be the responsibility of the electrical Consultant.

A list of manuals has been included to make it clear that the designer must comply with other agencies' criteria and specifications.</td></tr>
<tr><td>2.0 <u>Standard Drawings</u></td><td>8.2 <u>Standard Drawings</u>

Add: Where applicable standard drawings are not provided by this manual, standard drawings prepared by MOTI or MMCD may be submitted to the City Engineer for consideration.</td></tr>
<tr><td colspan="2">Rationale: These Standards and Specifications may not provide sufficiently extensive and detailed specifications. MOTI and MMCD specifications are acceptable in this case.</td></tr>
<tr><td>3.0 <u>Roadway Classification</u></td><td>8.3 <u>Roadway Classification</u>

Add 8.3 d): <u>Downtown</u> roadway</td></tr>
<tr><td colspan="2">Rationale: to conform with the standard road cross-sections</td></tr>
<tr><td>4.0 <u>Area Classification</u>

Remove section</td><td></td></tr>
<tr><td colspan="2">Rationale: This section is not required or applicable to these electrical specifications</td></tr>
</table>

<table>
<tr><th>EXISTING</th><th>PROPOSED CHANGES</th></tr>
<tr><td>5.0 <u>Lighting Pole Location</u>

governed by:
road width
road configuration
property lines
3 metre clearance from BC Hydro transformers</td><td>8.4 <u>Streetlight Pole Spacing and Location</u>

governed by:
road width
road configuration
property lines
luminaire photometrics
mounting heights
required illumination
BC Hydro line clearances (as per Electrical code, WorkSafe BC, BC Electrical Safety Act)</td></tr>
<tr><td colspan="2">Rationale: Additional criteria for streetlight poles locations have been added. Clearances from BC Hydro infrastructure are not restricted to transformers.

New Table 1 specifies “staggered”, “one-sided” or “no lighting” for all road classifications.</td></tr>
<tr><td>7.0 <u>Illumination Distribution Criteria</u>

Illumination level/Uniformity Ratio (U.R.) table:

<table><tr><th>Classification</th><th>Illumination</th><th>U.R.</th></tr><tr><td>Local</td><td>6 lux</td><td>6:1</td></tr><tr><td>Commercial / Industrial</td><td>12 lux</td><td>3:1</td></tr><tr><td>Collector</td><td>12 lux</td><td>3:1</td></tr><tr><td>Arterial</td><td>17 lux</td><td>3:1</td></tr></table>
Light Loss factor: 0.7</td><td>8.5 <u>Illumination Distribution Criteria</u>

Illumination level/Uniformity Ratio (U.R.) table modified as follows:

<table><tr><th>Classification</th><th>Illumination</th><th>U.R.</th></tr><tr><td>Local, Rural/Resort Collector</td><td>4 lux</td><td>6:1</td></tr><tr><td>Downtown</td><td>12 lux</td><td>3:1</td></tr><tr><td>Urban Collector & Industrial</td><td>12 lux</td><td>4:1</td></tr><tr><td>Arterial</td><td>17 lux</td><td>3:1</td></tr></table>
Light Loss Factor: 0.81</td></tr>
<tr><td colspan="2">Rationale: Illumination levels, average uniformity ratios and light loss factors have been revised per direction from David Moss, P.Eng of RB Engineering.</td></tr>
</table>

<table>
<tr><th>EXISTING</th><th>PROPOSED CHANGES</th></tr>
<tr><td>RL-2, 3.0.6 <u>Poles</u>

a) and g) of the existing Bylaw regarding pole design have been moved to Section 8.6 of the new Bylaw.

RL–2, 3.0.6. <u>Poles</u>

g) Poles and arms to be designed for 160 kph wind loading (+1.3 Gust Factor).

RL-1, 8.0 <u>Light Quality and Distribution</u>

Luminaire light distribution table in existing section 8.0 has been revised.</td><td><u>8.6 Street Light Poles, Pole Types, Luminaire Types, and Wattage</u>

Poles and arms shall be designed for the 25 year wind pressure (560 pascals).

Table 3 in new section 8.6 includes the following changes:

For Urban Arterial and Rural Arterial a column has been added for Davit Pole with Cobra Head Luminaire whereby the wattage is specified as 150 W. Additional road classifications have been included in Table 3, specifically: Resort Collector, Downtown Road, Industrial, and Modified Collector.</td></tr>
<tr><td colspan="2">Rationale: The wind pressure criterion has been revised per direction from David Moss, P.Eng. of RB Engineering.

Design criteria have been moved from the construction section of the existing Bylaw to the Design section of the new Bylaw.

Wattages have been modified per direction from David Moss, P.Eng., of RB Engineering.</td></tr>
<tr><td></td><td>The following sections are new:

8.7 Traffic Signals
8.10 Service Equipment and Controllers
8.13.8 Connectors
8.13.9 Conductor Tags
8.13.10 Fuse and Fuse Holders
8.13.11 Pedestrian Pushbuttons
8.13.14 Cold Galvanizing Compound
8.13.15 Traffic Controllers
8.13.16 Siren Pre-Emption Systems
8.14.9 Traffic and Pedestrian Signal Heads
8.14.10 Audible Signals
8.14.11 Pedestrian Push Buttons
8.14.13 Wiring
8.14.16 Overhead Signs</td></tr>
</table>

EXISTING	PROPOSED CHANGES
Rationale: Specifications have been added for the design of traffic signals, conduit, junction boxes, service equipment and controllers, and concrete bases per the City of Nanaimo criteria.	
RL-2, 2.0.3 b) Conductors Feeder #6R90 runs and ground 8TWH #6	**8.13.7 <u>Conductors</u>** Feeder #8
Rationale: This reflects current electrical requirements per David Moss, P.Eng. of RB Engineering.	
3.0.7 <u>Luminaires</u> Luminaires shall be high pressure sodium…..	**8.13.12 <u>Luminaires</u>** Luminaires shall be per the design drawings and the Approved Products List.
Rationale: This modified statement allows for the use of LED lights.	
1.0.9 <u>Certificate of Inspection</u> The Owner and/or Contractor shall submit to the Municipal Engineer, prior to requesting the final inspection, the Certificate of Inspection signed by the local Electrical Inspector.	**8.14.19 <u>Certificate of Inspection</u>** Upon completion of the works, the Contractor shall provide the electrical Consultant with a copy of the BC Safety Authority inspection request form. Upon certification by the electrical Consultant, the City will then arrange for connection or disconnection of BC Hydro services, though the BC Hydro Streetlight Information Management System (SLIM).
Rationale: The application for inspection from the BC Safety Authority is now on-line. The BC Safety Authority inspector inspects about 1 in 10 applications. The key is to ensure that the application is made. The electrical Consultant should be the professional responsible for ensuring this takes place prior to certifying the works.	

SECTION 9.0 STREET TREE, BOULEVARD PLANTINGS AND IRRIGATION	
LIST OF MAJOR CHANGES	
FROM	**TO**
L-1, 1.0 <u>General</u> Design of trees, boulevard plantings and irrigation shall be prepared by a Landscape Architect…or an approved landscape designer.	**9.01 <u>General</u>** a) <u>Street Tree and Boulevard Plantings</u> The design of boulevards including street tree selection and planting design shall be prepared by a Landscape Architect……..
Rationale: Design shall be by a Landscape Architect. Landscape designers are not included.	
L-1, 3.0 <u>Plant Spacing</u> Street trees shall be spaced 6 metres apart in the downtown core and 11 metres apart in all other areas.	**9.02 <u>Planting Requirements and Plant Spacing</u>** Street trees shall be generally evenly spaced 12 metres on-centre in the downtown area and 20 metres on-centre in all other areas.
Rationale: Increased spacing requirements are due to crowding of current trees.	
4.0 <u>Minimum Tree Planting Clearances</u> Lamp standards 3 m Hydrants 2 m Back of curb 0.6 m	**9.03 <u>Minimum Tree Planting Clearances</u>** Lamp standards 6 m Hydrants 3 m Back of curb 2 m Hydro / Tel kiosk 2 m (NEW)
Rationale: Clearances from the above items have been increased based on experience with actual installations and the need to reduce conflict between trees and infrastructure.	
5.0 <u>Species Selection</u> Per Schedule A	**9.05.2 <u>Tree Species</u>** Table 14 – 2 Part 1 – trees directly under Hydro Lines (5 cm caliper) Part 2 – trees beside hydro lines (6 cm caliper) Part 3 – trees for wide boulevards or wide medians (6 cm caliper)

FROM	TO
Rationale: Tree species have been classified according to criteria related to height and size.	
L-2, 2.0.1 <u>Sub-grade and Topsoil</u> Screened topsoil shall be used for ground cover and shrub areas.	**9.05 <u>Landscape Materials</u>** 9.05.1 <u>Soil</u> 20% organic amended soil for planting beds and trees 2 – 4% organic unamended soil for lawn, grass and wildflowers
Rationale: Specifications for topsoil have been expanded to differentiate between amended and unamended soils.	
	9.05.3 <u>Origin</u> Add: Where planting projects require more than 10 trees, the City of Parksville reserves the right to select and tag optimal specimens at the source or wholesale nursery.
Rationale: This clause allows the City more control over tree quality.	
L-2, 1.0.3 <u>Tree Dimensions</u> Minimum branch height shall be 1.8 m.	**9.05.4 <u>Tree Form</u>** The lowest branch shall be at least 2 m high on the stem.
Rationale: Minimum height of the lowest branch has increased to prevent interference with traffic and pedestrians.	

FROM	TO
	9.05.6 <u>Existing Trees</u> New: direction for excavating through trees
Rationale: This section provides requirements for excavation through trees.	
L-2, 1.0.5 <u>Condition</u> Tree inspection by and notification to the Works Inspector is required.	**9.05.7 <u>Condition</u>** Inspection by and notification to the Parks Foreman is required.
Rationale: The Parks Foreman will be responsible for inspecting tree health rather than the civil Works Inspector. See also new section 9.07.3.	
L-2, 2.0.6 <u>Planting Procedures – Trees in Sidewalks</u> Requirements are limited to a hole in the ground with a grate.	**9.05.8 <u>Urban Trees in Sidewalks</u>** Details on drawings by the landscape architect are required for planting urban trees in sidewalks.
Rationale: This section expands requirements for street trees in sidewalks to include more detail, such as root barriers and drainage structures if required, in order to ensure good quality of the finished product.	

FROM	TO
	9.05.9 <u>Street Trees in Boulevards</u>, section .5 Requirements to protect street trees during demolition, excavation or construction on a site are specified.
Rationale: This section ensures, for example, that house building does not impact newly planted street trees.	
	9.05.10 <u>Boulevard Trees</u> Conditions that would warrant an exemption from the requirement for street tree planting are listed that include for example no space or rock sub-grade.
Rationale: self-explanatory	
	9.06.1 <u>Plant Materials</u> New section
	9.06.2 <u>Sod</u> New section
	9.06.3 <u>Grass and Wildflower Seed Mixtures</u> New section
	9.06.4 Mulch New section

FROM	TO
	9.06.5 <u>Planting Accessories</u> New requirements for tree stakes, tensioning devices, and tree grates are specified.
Rationale: self-explanatory	
	9.06.6 <u>Replacements</u> New section
	9.07.3 <u>Pre-planting Inspection</u> Approval of plant material is required prior to planting by the Parks Foreman. An on-site inspection of marked locations for planting and an inspection of the sub-grade are required.
Rationale: The requirements for increased inspections is a need to ensure items such as plant material, locations and sub-grade are to our standards, prior to planting. See also new section 9.05.7.	
L-2, 2.0.3 <u>Location of Planting</u> Trees are to be planted 6 m apart downtown. Trees are to be planted 11 m in all other areas. This section repeats requirements in L-1, 3.0.	**9.07.5 <u>Location of Plantings</u>** Trees are to be planted 12 m apart downtown. Trees are to be planted 20 apart in all other areas. This section repeats requirements in section 9.02.

FROM	TO
Rationale: Conflict between trees and other municipal infrastructure, such as driveways and fire hydrants, increase if trees are planted too closely. Wider spacing will reduce these conflicts.	
	9.07.6 <u>Planting Procedures – Trees</u> Add e) ….place 75 mm of compost mulch over soil surface.
Rationale: self-explanatory	
	9.08 <u>Turf Installation</u> This section is new.
	9.11 <u>Irrigation</u> Irrigation design shall be by a certified irrigation designer or landscape architect. All irrigation shall be installed per IIABC standards.
Rationale: This section places requirements on who designs irrigation. It can no longer be by the civil engineer. The installation standard has been specified.	
L-1, 7.0 <u>Control Equipment</u> Control equipment shall operate under Eicon irrigation control system.	**9.12 <u>General Irrigation Design Requirements</u> and 9.14.3 <u>Irrigation Controller</u>** Sentinel custom control satellites are required on sites with 12 or more zones Sites with less than 12 zones can use CSA approved controllers with preference given to systems that connect to the Sentinel Central Control.

FROM	TO
Rationale: Sentinel Central Control is the City's irrigation operating system.	
	9.13 <u>Irrigation System Parameters</u> This section is new.
	9.14 <u>Irrigation Materials</u> This section is new.
L-2, 1.0.6 <u>Irrigation Backflow Prevention</u> All devices must be CSA and BCWWA approved	**9.14.1 <u>Irrigation Backflow</u>** Foundation for Cross-Connection Control and Hydraulic Research approved backflow prevention assemblies are required.
Rationale: The current standard for backflow prevention is the standard specified in new section 9.14.1.	
	9.14.2 <u>Low Voltage Field Wire</u> This section is new.
	9.14.3 <u>Irrigation Controller</u> Generally controllers shall be complete with rain sensors and they shall generally operate under the City's remote irrigation control system.

FROM	TO
Rationale: The new requirements for irrigation controllers include rain sensors and operating within the City's Sentinel system.	
L-1, 6.0 <u>Sprinkler Heads</u>	**9.14.5 <u>Sprinkler Heads</u>** Teflon tape is required on the threaded fitting.
Rationale: Specification for Teflon tape has been added for sprinkler heads.	
	9.14.6 <u>Valve Boxes</u> Add: All solenoid valves must be installed in a minimum #1419 valve box.
Rationale: self-explanatory	
L-2, 1.0.11 <u>PVC Pipe and Fittings</u> Series pipe is allowed, e.g., Series 315 for ½ " pipe, Series 200 for ¾" and 1", and Series 160 for 1-1/4" pipe.	**9.14.7 <u>PVC Pipe and Fittings</u>** All PVC pipe shall be Schedule 40.
Rationale: Series pipe is not as strong as Schedule 40 and is too flexible.	
	9.14.9 <u>Solvent Cement and Thread Seal Tape</u> This is a new section.
	9.14.10 <u>Irrigation Casing Sleeves</u> This is a new section.

FROM	TO
	9.15.1 <u>Existing Conditions,</u> **9.15.2 <u>Deliver and Storage</u>** **9.15.3 <u>Workmanship</u>** These sections are new.
	9.15.4 <u>Backflow Prevention</u> The backflow preventer must be tested by a certified backflow assembly tester.
Rationale: The backflow prevention device must be tested after installation and prior to acceptance by the City.	
L-2, 3.0.4 <u>Excavation</u> For residential and small commercial installations, a minimum cover of 200 mm is acceptable.	**9.15.8 <u>Excavation and Trenching</u>** For residential and small commercial installations, a minimum cover of 300 millimetres is acceptable.
	9.15.5 Water and Electrical Service Connection **9.15.9 Pipe Line Assembly and Installation** **9.15.10 Flushing, Inspection and Testing** **9.15.11 Permits and Fees** **9.15.12 Standards** **9.16.13 End of Maintenance Period** **9.16.14 Reference Standards** These sections are new.

DOCUMENTATION OF DRAWING CHANGES

EXISTING STANDARDS & SPECIFICATIONS	*PROPOSED NEW STANDARDS & SPECIFICATIONS*
GENERAL	***GENERAL***
G1 - Standard Symbols and Abbreviations deleted	No general drawings in new Standards & Specifications. General drawings have been moved to storm and/or sanitary sections.
G2 - Standard Symbols and Abbreviations deleted	Service connections are now located in the middle of the lot
G3 - Typical Location of Service Connections to Residential Vacant Lots	This "Typical Location of Service Connections" drawing is now 3 drawings: D1, S1 and W1 Added to D1 and S1: "where sanitary sewers and storm drains are installed in a common trench, minimum 300 mm is required between walls of pipes and trench walls."
G4 - Standard Precast Manhole used to be "Mortar through."	This "Manhole" drawing is now 2 drawings: D10 and S5 Proposed change: "O-ring joints or rubber MH seal rings."
G5 - Drop Manhole Details for Sewers 600 mm Diameter or Less	This "Drop Manhole" drawing is now 2 drawings: D11 and S6
G6 - Manhole Base Details for Sewers Up to 750 mm Diameter	This "Manhole Base" drawing is now 2 drawings: D13 and S8
G7 - Precast Manholes Details for Sewers 900 mm and Over	This "Details for Sewers 900 mm and Over" drawing is now 2 drawings: D14 and S9
G8 - Manhole Cover and Frame	This "Manhole Cover and Frame" drawing is now 2 drawings: D12 and S7 Carriage bolt detail has been deleted off the storm drainage drawing

EXISTING STANDARDS & SPECIFICATIONS	*PROPOSED NEW STANDARDS & SPECIFICATIONS*
STORM DRAINAGE	***STORM DRAINAGE***
	D5 - Inlet Structure Max Pipe Size 1050 mm Dia. Note 9 has been added: "Handrails shall be installed for safety where the vertical drop from the top of the structure to the invert of the pipe is 1.2 m or greater."
D7 - Minimum Pipe Bedding Requirements	This "Minimum Bedding Requirements" drawing is now 3 drawings: D7 and S2 and W5 - Utility Trench Detail from MMCD
D5 - Intensity - Duration - Frequency Rainfall Curves	D17 - Intensity Duration Frequency Curves. These curves have been revised per Kerr Wood Leidal Appendix in the Storm Master Plan
D6 - Silt Trap. This drawing has been deleted.	
	D8 - Storm Drain Connection. Add note 4: "In finished areas, set IC 100 mm below finished ground."
D9 - Drainage System Design Calculation Sheet This sheet has been deleted.	NEW: D18 Drainage Drywell NEW: D19 Drainage Drywell Installation
SANITARY	***SANITARY***
	S3 - Sanitary Sewer Connection Add note 4: "In finished areas set IC 100 mm below finished ground."
WATER	***WATER***
W2 - Valve Marker This drawing has been deleted.	
WA9 - Typical Water Service Configurations	W8 - Typical Water Service Configurations includes schematic for separate fire and domestic service with DCDA inside building
WATER	

EXISTING STANDARDS & SPECIFICATIONS	*PROPOSED NEW STANDARDS & SPECIFICATIONS*
	WATER
WA10 - Water Service Connections (19 mm to 50 mm)	W9 - Water Service Connection (25 mm to 50 mm) Title changed from “19 mm” to “25 mm”
WA11 - Water Meter Setters / Boxes (19 mm and 25 mm)	W10 - Water Meter Boxes (25 mm) No base - now 4 bricks at corners Dimension has been specified to underside of box.
WA12 - Water Meter Setters / Boxes (38 mm and 50 mm) Note 2: "meter to be installed by COP"	W11 - Water Meter Boxes (38 mm and 50 mm) References to specific brands (Brooks) and models are deleted. Reference to Ford setters and type of meter are deleted. New note 2: "Meter to be installed by the contractor."
WA13 - Separate Fire & Domestic Services drawing deleted	W13 - Combined Fire / Domestic Water Service changed to reflect Fireline F2 meter Note added: "DCVA to be installed in separate chamber downstream."
ROADS, CURBS, WALKWAYS AND SIDEWALKS	***ROADS, CURBS, WALKWAYS AND SIDEWALKS***
	Gas: 1.0 m offset from PL, on one side of road only - all road cross-sections
	Streetlight duct: moved to behind sidewalk - All road cross-sections except RC6 & RC4
RC1 - Standard Road Cross Section Urban Local sidewalk 1.5 m wide	RC1 - Standard Road Cross Section Urban Local Roadway sidewalk 1.8 m wide Add "Non-mountable curb & gutter to be used along multi-family residential property frontages.” DELETE STREET TREES ($12,000 per year to maintain)
RC2 - Standard Road Cross Section Urban Collector	RC2 - Standard Road Cross Section Urban Collector Roadway Add " Bicycle pavement markings & signage may be required where a driving lane is intended, to be shared with a bicycle."
ROADS, CURBS, WALKWAYS AND SIDEWALKS	

EXISTING STANDARDS & SPECIFICATIONS	*PROPOSED NEW STANDARDS & SPECIFICATIONS*
RC3 - Standard Road Cross Section Resort Collector pavement width = 8.6 m	***ROADS, CURBS, WALKWAYS AND SIDEWALKS***
RC4 - Standard Road Cross Section Urban Arterial Boulevard width 1.9 m Lane widths - 4 lanes at 3.35 m each	RC3 - Standard Road Cross Section Resort / Rural Collector Roadway Mountable curb changed to concrete grade beam at edge of pavement. pavement width = 8.6 m
RC5 - Standard Road Cross Section Rural Arterial 1.5 m wide asphalt shoulder lane width - 4 lanes at 3.6 m each design speed 80 km /hr	RC4 - Standard Road Cross Section Urban Arterial Roadway Boulevard width 1.4 m on one side only Lane widths: 4 lanes at 3.3 each; 3.1 m median lane; 2 - 1.5 m wide bike lanes
RC 8 - Standard Road Cross Section Urban Lane asphalt width = 5.4 m	RC 5 - Standard Road Cross Section Rural Arterial Roadway 2.0 m wide paved shoulder lane width - 4 lanes at 3.6 m each design speed: 60 km/h
R11 - Cul-de-sac "Island may be required by Council"	RC 8 - Standard Road Cross Section Urban Lane asphalt width = 6 m
R12 - Cul-de-Sac Offset Type "Island may be required by Council"	R 9 - Cul-de-Sac no island; no sidewalk
	R10 - Cul-de-Sac Offset Type no island; no sidewalk
	NEW: R11 - Temporary Turn-Arounds - new drawing
R17 - Typical Driveway Grades - maximum 20%	NEW: R 16, R17 & R18 - Pedestrian Sidewalk Ramps and Driveway Crossings are now friendly for visually & mobility impaired
R23 - Emergency Access 4.0 m ROW	R 19 -Typical Driveway Grades - maximum 15%
R24 - Walkway Fence and Entrance Details	R20 - Emergency Access 4.0 m ROW - chainlink fence deleted
ROADS, CURBS, WALKWAYS AND SIDEWALKS	

EXISTING STANDARDS & SPECIFICATIONS	*PROPOSED NEW STANDARDS & SPECIFICATIONS*
	ROADS, CURBS, WALKWAYS AND SIDEWALKS
R25 - Walkway Treatments	R21 - Walkway - fence deleted R22 - Walkway Treatments - wood chip path deleted NEW: R25 - Signs on Perforated Steel Tubing NEW: R26 - Perforated Steel Base for Signs
ROADWAY LIGHTING AND TRAFFIC SIGNALS	***ROADWAY LIGHTING AND TRAFFIC SIGNALS***
E1 - Trenching Details for Electrical Conduit	Existing Drawing E1 has been divided into E1 for non-paved areas and E2 for paved areas E1 - Underground Streetlight Conduit in Non-Paved Areas E2 - Underground Streetlight Conduit in Paved Areas
E2 - Streetlight Luminaires drawing deleted	
E3 - Streetlight Base / Service Base	E3 Streetlight Base The 50 mm gap between grade and the top of the base has been eliminated. ADD: "With shoe box style lights MMCD Base Type C2 is acceptable without service base." ADD: "MMCD C3 is required with service base."
E4 - Streetlight Poles	Old drawing E4 has been divided into new E8 - Galvanized Davit Luminaire Poles and new E9 - One Piece Luminaire Pole (shoe box style)
E5 - Control Schematic & Wiring Diagram for Roadway Lighting - deleted	
E6 - Downtown Core Streetlight	E10 - Downtown Core Luminaire and Pole Luminaire changed from Domus 30 series to LUMEC DM S50 - 150WHPS - SC 3BM ADD: Davit arm to be LUMEC CN5-1A
ROADWAY LIGHTING AND TRAFFIC SIGNALS	

EXISTING STANDARDS & SPECIFICATIONS	*PROPOSED NEW STANDARDS & SPECIFICATIONS*
	ROADWAY LIGHTING AND TRAFFIC SIGNALS
	ADD: pole to be LUMEC SM8V -20 Glow ring has been deleted.
	NEW: E4 - Streetlight Plastic Round Junction Boxes NEW: E5 - MMCD Type Trapezoidal Shape Concrete Street Light Bases NEW: E6 - Modified MMCD Type "B" Sonotube Concrete Base for Downtown Streetlight NEW: E7 - Streetlight Pole Base Installation Details NEW: E11 - Minimum Clearances to Overhead Powerlines
STREET TREE, BOULEVARD PLANTINGS & IRRIGATION	***STREET TREE, BOULEVARD PLANTINGS & IRRIGATION***
L4 - Northwest Bay Road / Tuan Road Boulevard Landscaping Details - deleted	NEW: L4 - Sidewalk Tree Planting Detail NEW: L5 - Irrigation for Hanging Basket on Lamp Detail NEW: L6 - Irrigation Connection and Controls Detail NEW: L7 - Tree Proximity to Fire Hydrant NEW L8 - Connection Service Box and Drip Irrigation NEW L9 - Tree Bubbler NEW L10 – Irrigation Heads with Swing Joint