THE DISTRICT OF HOPE

SUBDIVISION AND DEVELOPMENT SERVICING DESIGN CRITERIA MANUAL

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G1 INTRODUCTION

This section outlines the minimum standards and requirements the *Municipality* will accept in the Design and Record Drawing submissions for *Engineering* w*orks and services.*

Whenever Engineering w*orks and services* are required or proposed, the *Developer's Engineer* shall arrange for a pre-design meeting with the *Municipal* Engineering Department to ensure compliance with the latest *Municipal* standards, specifications and policies.

Incomplete or substandard submissions will be returned to the *Developer's Engineer* without comment on the drawings. A subsequent re-submission which remains incomplete or sub-standard will result in a request from the *Municipal* Engineering Department to meet with the *Developer's Engineer* and the *Developer*.

All submissions shall comply with the following:

1. All applicable requirements of this Schedule.

2. All applicable requirements of the District of Hope Bylaws as amended or replaced from time to time, including, but not limited to:

    a. The Subdivision and Development Servicing Bylaw
    b. The Zoning Bylaw(s)
    c. The Building Bylaw

G2 SURVEY INFORMATION

All surveys shall be conducted safely with minimal nuisance to traffic or the public at large. The *Developer* must obtain permission from the registered owners before entering private property.

All elevations shall be from geodetic datum. Information regarding the location and elevation of existing benchmarks or monuments may be obtained from the *Engineer*ing Department.

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Originating benchmarks and survey monuments shall be noted on all applicable plans. Survey monuments are required in those subdivisions which are outside a 300 meter radius of existing benchmarks.

Copies of legible field notes shall be made available to the *Municipality* upon request.

Centre lines (or offset lines) are to be marked and referenced in the field and all chainages shall be keyed to the legal posting.

All existing items such as monuments, manholes, catchbasins, fire hydrants, poles, existing dwellings, bus stops, fences, trees, hedges and unusual ground shall be noted.

Information surveyed for *development* of existing road cross-sections shall include locations and elevations of:

(a) centreline of pavement;
(b) edge of pavement, or gutter line;
(c) back of sidewalk;
(d) edge of shoulder;
(e) ditch invert;
(f) top of banks;
(g) property line; and
(h) existing ground elevation five (5.0) meters inside each property.

In urban areas the chainage shall be as given by the *Municipal* Engineering Department. In rural areas station 0 + 00 shall be at the nearest 1/2 section line and shall run south to north or west to east.

Chainage shall increase from left to right on a drawing. North shall be at the top or right side of a drawing. All drawings shall be oriented to view the plan northward or west to east.

G3 DRAWINGS

All drawings shall be prepared in accordance with the following requirements and all other applicable requirements of this schedule.

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The *Municipal* Project Number must be noted in the lower right-hand corner of all drawings.

All drawings shall be prepared by use of computer aided drafting compatible to AutoCAD, Release 14. All drawings shall clearly identify the w*orks and services* in sufficient detail for layout and construction. Road cross-sections may be hand-drawn, provided they are of good quality and clarity.

All drawings, except the street tree and boulevard planting plan (when required), shall be signed and sealed by a Professional *Engineer* registered in BC. The street tree and boulevard planting plan (when required) shall be sealed and signed by a Landscape Architect registered in BC, or a Landscape Designer.

All new *works and services* are to be drafted in bold lines.

Notes pertaining to the construction of *works and services* are to be shown on that service drawing or on a title page.

Baselines and chainages are to be referenced to a legal posting on each sheet. Chainages are to be shown on profile in even 20 m intervals.

Off-sets are to be shown to one side of the road allowance with the road allowance width annotated.

G3.1 Drawing Information

Information on plans shall include:

(a) the legal layout of roads and properties;
(b) all legal descriptions, lots and plan numbers;
(c) dimensions to the nearest 0.01 m;
(d) existing house numbers; and
(e) all registered statutory *rights-of-wa*y and easements.

G3.2 Design Drawings

A complete set of Engineering Design drawings shall include, in the following sequence:

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1. **Cover Sheet** - Noting:

   (a) the *Engineer's* name, address, phone number, and fax number;

   (b) the *Municipal* Project Number;

   (c) the *Developer*'s name, address, phone number, and fax number;

   (d) the Surveyor's name, address, number, and fax number;

   (e) the legal description of the lands involved;

   (f) a site location plan at 1:5000 scale showing all proposed roads and the compatibility of the proposed subdivision layout to the existing road system;

   (g) an index; and

   (h) general notes.

2. **Key Plan** – May be at 1:1000 scale, but should typically be at a 1:500 scale noting:

   (a) all proposed road and services works, including street lighting, post boxes, gas, electrical, telephone, cable TV, sewer, water, drainage lot connections;

   (b) road and *right-of-way* widths and the off-sets to services from one side of the *highway* allowance;

   (c) if more than one sheet is required, note the westerly or southerly portion first and identify as Key Plan "A" with additional plans noting "B" and "C", etc.; and

   (d) the development site is to be outlined with a bold line.

3. ***Stormwater Management Plan*** – May be at 1:1000 scale, but should typically be at 1:500 scale and identified as per key plan system if more than one sheet is required. The *Stormwater Management Plan* shall note:

(a) the post-development contour lines at maximum 1 m intervals. These contour lines shall match to the pre-development contour lines at the *development* boundary, or as designed by the *Engineer*. The existing topographic information shall extend a minimum 30 m outside the development site;

(b) all existing corner lot elevations (uncircled);

(c) all proposed corner lot elevations (circled);

(d) the proposed building envelope on each lot with the Minimum Basement Elevation (M.B.E.) noted. All M.B.E.'s are to be set a minimum of 200mm above the major one hundred (100-year return) storm hydraulic grade line;

(e) the slope of the lot (directional arrow), noting a minimum one percent (1%) grade on each lot;

(f) the minor (10-year return) storm sewer system with the flows noted per section and the accumulated flows from all upstream sections. Provision must be made for upstream development potential where applicable;

(g) the major (100-year return) storm system with the flows noted per section and the accumulated flows from all upstream sections. The *Engineer* shall note wherever the major system is not in the pipe or on the roadway, showing the routing, flows and velocities, etc. Overland flows shall be identified with a wide directional arrow. Provision must be made for upstream *development* potential where applicable;

(h) all swales proposed to effect the submitted *Stormwater Management Plan*. An easement is required over any lot accepting drainage by sheet flow or swale from more than one up-stream lot. In addition, when a swale is proposed over more than one lot, a lawn drain/basin, connected to a *storm sewer system*, is to be provided at every third lot;

(i) an inspection chamber at property line for each lawn drain/basin connecting to a storm sewer;

(j) how the *development* proposal will affect adjacent lands. The volume of surface drainage proposed to flow off-site over adjacent lands shall not exceed the *pre-development* flows for all rainfall intensities. The pattern of flows to adjacent lands shall not be changed. The perimeter of the site shall be made to "meet" existing elevations along the *development* boundary;

(k) a legend noting all items proposed in the *Stormwater Management Plan*. Applicable "General Notes" should also be included; and

(l) a site plan showing the catchment area(s) involved. This generally can be at a scale of 1:5000 and set as an insert on the sheet. Where this is not physically possible, it is suggested that the catchment area(s) be noted on a separate sheet. Size of catchment areas in hectares and runoff coefficients are to be noted.

4. **Road and Water** - Plan and profile drawings providing both road and water details shall be to minimum scales of 1:500 horizontal for plan and 1:50 vertical for profile. Larger scale plans may be required in some cases to show detail. The drawings shall show:

(a) road information including:

- vertical and horizontal curve design data including the elevations and stations of the beginning and ends of curves and the tangent points of intersection;
- intersection and *cul-de-sac* curb returns shall be detailed in plan and profile at a scale of 1:250, or larger, horizontal and 1:25, or larger, vertical. Elevations shall be shown at the beginning and ends of curb returns and at quarter points;
- original ground profiles at road centreline and at property lines;
- catch basin locations by road chainage and elevations;
- sidewalk locations and widths;
- curb types;
- wheelchair letdown locations;
- all proposed road centreline elevations at 10 m intervals plus at the centre of all intersections; and
- The centre line location of all connecting streets by road station in profile.

Note: At the discretion of the *Approving Officer*, sidewalks may not be required. Where the locations of future sidewalks are known the drawings shall show *sidewalks* "to be constructed by others".

(b) *water system* information including:

- the full pipe shall be shown on the profile;
- all crossover points with sewers shall be noted and the location of the sewer shown. Where the invert of the water main is less than 0.3 m above the top of any sewer, protection in accordance with Ministry of Health requirements shall be noted and detailed;
- the size, class, type, length and slope of each continuous water pipe section;
- the size, type, elevation and invert of each appurtenance;
- each appurtenance is to be itemized on plan with its road stationing location shown; and
- the location of each water service at the property line.

5. **Storm and Sanitary Sewers** - Plan and profile drawings shall be to minimum scales of 1:500 horizontal for plan and 1:50 vertical for profile. Larger scale plans may be required in some cases to show detail. The drawings shall show:

(a) grades, inverts, manholes, catch basins, etc.;

(b) symbols to denote the service connection elevations at the property line shall be shown on the profile;

(c) the minor and major system hydraulic grade lines (HGL) on the profile. Where the HGL is within the pipe it shall be noted;

(d) the full pipe flow capacity, the minor storm flow, and the major storm flow for each pipe section;

(e) the full pipe shall be shown on the profile;

(f) rim elevations for all manholes;

(g) the size, class, type, length and slope of each continuous pipe section;

(h) chainage and invert of each appurtenance shall be shown on profile;

(i) storm detention system, information calculations and construction details; and

(j) the location and elevation of each storm and sanitary service at the property line shall be shown on the plan.

6. **Road Cross-Sections** - These drawings may be hand drawn provided they are of good quality and clarity. They shall be scaled at 1:100 horizontal and 1:50 vertical and shall show:

   (a) existing ground elevations to 5.0 m into adjacent properties and, the proposed elevations of the road centreline, the curb and gutter (or road edge) and property lines and the extent of cut or fill into the adjacent properties;

   (b) cross-sections every 20 m intervals; and

   (c) additional sections may be required or requested where excessive cuts or fills are involved.

7. **Street Lighting Plan** - shall be to a scale of 1:500, and:

   (a) shall be signed and sealed by a Professional Electrical *Engineer*;

   (b) shall include General Notes and a legend;

   (c) the legend shall include:

   - make, model and type of light standard to be used

- mounting height
- make, model, wattage and type of luminary;

(d) shall show photometric calculations in table form on the plan;

(e) proposed location of service base and hydro power service box;

(f) off-set and chainage of each pole; and

(g) street lights shall be located in conformance to Section E – Electrical.

8. **Construction Details** - Shall show all proposals for construction which are not covered or specifically detailed in the Construction Specifications and Standard Drawings. Where there is a *Municipal* standard, refer to the standard drawing number. It is not necessary to include or provide detail when there is a standard drawing.

9. **Landscaping Plan** – If required by the *Approving Officer*, it shall be at a scale of 1:500. It shall show all proposed street trees and boulevard plantings in relation to the works shown on the Key Plan. The *Engineer* or Landscape Architect shall obtain acceptance of the outside utility agencies, where applicable. The Landscape Architect shall confirm locations of all existing and proposed *rights-of-way.*

Note: For small projects the Key Plan and Landscaping Plan drawings may be combined at the discretion of the *Approving Officer*, provided they are of good quality and clarity.

G4 GENERAL INFORMATION

The following additional information is to be noted in design submissions:

(a) all existing underground facilities complete with size, type of material inverts, off-sets and notes detailing connections and tie-ins, by whom, how, and at whose expense;

(b) the clearance between mains at all cross-over points;

(c) all existing structures that may be impacted by the *development*, including houses, sheds, fences, poles, anchors, encroachments, wells, septic tanks and fields, shall be shown on the appropriate drawing(s) with annotation indicating their fate (i.e., to be removed, filled, etc.);

(d) in semi-rural subdivisions, with an open ditch drainage system, note the size of (future) driveway culverts required to conform to the design;

(e) survey monument locations and indication as to which ones are to be relocated or re-established and by who;

(f) the *Engineer* shall submit application to the Ministry of Health for approval of the *water system*;

(g) where applicable, the consultant shall submit applications to the BC Ministry of the Environment, Lands and Parks and to the Federal Department of Fisheries and Oceans for approval of the *storm drainage system*; and

(h) the location, elevation at ground, size at 1.2 m above ground, and the type of each existing tree that is to be preserved.

G5 SUBMISSIONS

The first complete design submission shall consist of:

(a) two complete sets of drawings;

(b) geotechnical report confirming suitability of the site for lot development and verifying the road structure design and any special considerations that should be addressed in the design or construction of the w*orks and services*; and

(c) all applicable utility calculations (water, sanitary, storm sewer, street lighting).

Subsequent design submissions requiring changes to the previous submission shall consist of:

(a) two complete sets of drawings;

(b) a complete construction cost estimate;

(c) all submissions subsequent to first submission shall have highlighted with yellow any changes made by the *Engineer* which are in addition to "Red Line" changes required by the *Municipality*; and

(d) items "Red Lined" must be addressed by the *Engineer*. Failure to do so will result in submissions being returned.

The final submission for *Municipal* acceptance shall consist of four complete sets of drawings (one of which will be returned to the *Engineer*).

The *Engineer's* seal and signature shall be noted on all sheets of the final design submission. Failure to do so will result in the plans being returned without comment. The *Engineer's* seal and signature shall certify that all works, as proposed, are structurally sound, comply with the applicable Engineering Standards of this schedule, and good Engineering practice.

G6 CONSTRUCTION COST ESTIMATE CALCULATION

The construction cost estimate shall be inclusive of all *works and services* to be constructed, including civil works for power, telephone and cable TV installations, and shall be broken down in a format as directed by the *Approving Officer*. These items and costs will be reviewed and amended by the *Approving Officer* where, or if, necessary. The foregoing costs will be included in the calculation of the Administration Fee.

G7 SERVICE CONNECTION CARDS

The *Engineering* Department will provide, on request, a sufficient number of Service Connection Cards for each development. These cards shall indicate clearly and accurately, the location and size, etc. of each *Municipal* utility connection. The *Municipal* Project Number shall be shown on all cards. Service Connection Cards are considered part of the Record Drawing submission.

G8 RECORD DRAWING SUBMISSIONS

The following procedures shall be followed in the submission of Record Drawings for *Municipal* acceptance.

1. The *Engineer* shall submit two complete sets of paper prints and a complete set of connection cards for *Municipal* review. The submission shall include:

(a) detailed plan profile drawings for water, sanitary, storm. Elevations, inverts and off-sets to property lines to show the *works and services* as constructed. The profile drawings for the utilities shall state the pipe materials, and whether special bedding or backfill was used that does not meet the *Municipal* specifications for such work;

(b) where required in the design submission, the *Stormwater Management Plan*;

(c) the Lot Grading Plan shall show:

- final elevations at all lot corner pins
- lawn drain/basin, rim elevations and locations
- MBE for each lot
- location of and elevation of *Developer* swales, Builder swales, ridge lines and flow directions
- lots requiring "Engineered" foundations
- locations where fill exceeding 1.0 meter depth has been placed
- trees to be preserved
- locations of any statutory *rights-of-way*, or easements, and utilities running through the property
- overland flood routing
- locations and elevations of storm and sanitary lot services and location of the water service;

(d) Street Light Drawings showing make, model and type of luminarie unit; locations of service bases, photocells and hydro service entrance, and off-sets to property lines; and

(e) details for which there are no *Municipal* Standards (pump stations, etc.).

(f) operation and maintenance manuals for facilities such as pump stations that will require continued attention by the *Municipality*.

2. In all cases, notes with instructions to the contractor shall be removed or amended as necessary to clearly indicate the result(s) of construction. Previously existing *works and services* that have been deleted as a result of

construction, or reconstructed in accordance with design, shall be removed or amended to show *Works and Services* as constructed.

3. The Record Drawings shall show the w*orks and services* as they have been constructed in order to provide accurate and detailed information for future additions to, or maintenance of, the w*orks and services* shown on the plans.

4. One set will be returned to the *Engineer* with any revisions noted in red.

5. When the *Municipality* is satisfied with the Record Drawing submission, the *Engineer* will be requested to submit the following:

   (a) one set of mylar drawings identified in bold letters with the words "CERTIFIED RECORD DRAWING". Mylars shall not be spliced together. Where originals are spliced, every attempt should be made to match printing densities of the component parts. Mylars shall not be signed and sealed. One set of drawing files in AutoCAD release 14 format;

   (b) two sets of paper prints with the following certification:
   "I certify that to the best of my knowledge this drawing represents the *works and services* as designed, installed, and inspected under my supervision."

   The signature and seal shall be by the *Engineer* who <u>personally</u> performed, or was responsible for, the required inspections. One set will be returned to the *Engineer* upon acceptance by the *Municipality*;

   (c) One copy of the "Certificate of Inspection." This form is to be signed by the *Engineer*; and

   (d) One complete set of Service Connection Cards.

6. Once accepted by the *Municipality*, the *Approving Officer* will automatically authorize a reduction of the *Security Deposit*, to reflect the acceptance of the Record Drawings and the Service Record Cards.