

**CITY OF WHITEHORSE SERVICING STANDARDS MANUAL
SECTION 2 - CONSTRUCTION DESIGN CRITERIA
SUB-SECTION 2.2 - PREPARATION OF ENGINEERING DRAWINGS**

Table of Contents

2.2.1	Scope	2.2 - 2
2.2.2	Drawing Size, Material, and Basic Layout	2.2 - 2
2.2.3	Scales	2.2 - 2
2.2.4	Drawing Techniques	2.2 - 2
2.2.5	General Requirements for all Drawings	2.2 - 3
2.2.6	Overall Plans	2.2 - 3
2.2.6.1	Cover Sheet	2.2 - 3
2.2.6.2	Index Plan	2.2 - 3
2.2.6.3	Overall Road, Sidewalk, and Walkway Plan	2.2 - 3
2.2.6.4	Drainage Plan	2.2 - 4
2.2.6.5	Overall Sanitary Sewer, Storm Sewer, and Watermain Plan	2.2 - 4
2.2.6.6	Power, Telephone, and Cablevision Plan	2.2 - 4
2.2.6.7	Planting/Landscaping Plan	2.2 - 4
2.2.7	Detailed Plan/Profile	2.2 - 4
2.2.7.1	Requirements for Roads	2.2 - 4
2.2.7.2	Requirements for Sanitary, Storm, and Water Mains	2.2 - 5
2.2.7.3	Requirements for Shallow Utilities	2.2 - 6
2.2.8	Legend Sheet	2.2 - 6
2.2.9	Detail Sheet	2.2 - 6
2.2.10	Record Drawings	2.2 - 6

CITY OF WHITEHORSE SERVICING STANDARDS MANUAL
SECTION 2 - CONSTRUCTION DESIGN CRITERIA
SUB-SECTION 2.2 - PREPARATION OF ENGINEERING DRAWINGS

2.2.1 SCOPE

The following specifications shall govern the preparation of engineering drawings, as detailed in Appendix 2.A, for all municipal improvements.

2.2.2 DRAWING SIZE, MATERIAL AND BASIC LAYOUT

The standard drawing size of A1 (594 mm x 841 mm) will be used.

Originals for design approval shall be prepared in ink on reproducible base.

Use plan profile sheets with the plan at the top of the sheet. The title block, Signature Block, and legend shall be located on the right-hand side.

The plan shall not extend onto the profile section of the drawing. All profiles must be on the profile section of the drawing.

2.2.3 SCALES

The following scales shall be used in urban settings:

- Overall Plans 1:1000 preferred. Smaller will be accepted to suit the project;
- Plan/Profile horizontal 1:500 vertical 1:50;
- Cross-Sections horizontal 1:100 vertical scale to suit

The following scales shall be used in rural settings:

- Overall Plans 1:1000 preferred. Smaller will be accepted to suit the project;
- Plan/Profile horizontal 1:1000 vertical 1:100;
- Cross-Sections horizontal 1:1000 vertical 1:100

Symbols are to be scaled to the size specified in the Whitehorse AutoCAD Symbols library in Appendix 2B at a scale of 1:500. Symbols are to be scaled accordingly for other drawing scales. Care shall be exercised to ensure balanced distribution of detail throughout the drawing.

2.2.4 DRAWING TECHNIQUES

Letters and figures shall be clearly legible, and in accordance with the Whitehorse AutoCAD Symbols library in Section 4. Lines are to be continual and snapped together.

Line types shall be in accordance with Section 4.

Dimensions on a drawing are extremely important and should be such that there can be no misinterpretation. Dimensions should be given from an iron pin, lot line, chainage station, a centre line, or any other reference that can be readily established. All dimensions shall be in the SI system.

CITY OF WHITEHORSE SERVICING STANDARDS MANUAL
SECTION 2 - CONSTRUCTION DESIGN CRITERIA
SUB-SECTION 2.2 - PREPARATION OF ENGINEERING DRAWINGS

All drawings must be prepared in accordance with the latest revision of the City of Whitehorse plan/profile guideline drawing (see copy of guideline drawing in Section 4). Upon receipt of a approved digital media the City of Whitehorse will make the Legend Sheet information available in digital form, see Section 4.

2.2.5 GENERAL REQUIREMENTS FOR ALL DRAWINGS

Elevations shall be relative to the Geodetic Survey of Canada datum. Benchmark numbers, locations, and elevations can be obtained from the City of Whitehorse Engineering Department. The reference benchmark and elevation shall be shown on the design drawing.

All drawings shall be signed & sealed by a Professional Engineer authorized to practice in the Yukon in accordance with the Revised Statutes of the Yukon 2002, Chapter 75 - Engineering Profession Act, section 13.(1) to 13.(3). In addition, the individual(s) who drafted and who checked each drawing should be shown. Include a signature block and changes made block. The changes made block consists of a block with columns for changes to both the reproducible base and digital forms of drawings with a space provided for a signature of each change made

A north arrow, lot numbers, plan numbers, civic addresses, and street names and the legal description of the parcel shall be shown on the drawing. In general, the north arrows should be oriented towards the top of the plan.

2.2.6 OVERALL PLANS

The following overall plans shall form a part of the whole design drawing set.

2.2.6.1 COVER SHEET

The cover sheet shall show the name of the project, stage of development, year of construction, and names of the Developer and Consultant.

2.2.6.2 INDEX PLAN

The index plan shall be prepared on a scale of 1:1000 or a reduction thereof to fit the standard size sheet, and shall indicate that portion of the sheet, which relates to the particular plan/profile sheet. The index plan may also contain the legend and a key plan.

2.2.6.3 OVERALL ROAD, SIDEWALK AND WALKWAY PLAN

The road, sidewalk and walkway plan shall be drawn to a scale of 1:1000 or a reduction thereof to fit the standard size sheet, and shall indicate all locations and widths of roads, sidewalks and walkways and the locations of catch basins, bus routes, bollards, barricades, guard rails, design speed, traffic control signs and street identification signs. The Consultant shall have the flexibility to combine the Overall Road, Sidewalk, and Walkway Plan with the Storm Sewer Plan for unserviced rural developments.

CITY OF WHITEHORSE SERVICING STANDARDS MANUAL
SECTION 2 - CONSTRUCTION DESIGN CRITERIA
SUB-SECTION 2.2 - PREPARATION OF ENGINEERING DRAWINGS

2.2.6.4 DRAINAGE PLAN

The drainage plan shall be drawn to a scale of 1:1000 or a reduction thereof to fit the standard size sheet. It shall indicate the following items as applicable: the original ground contours, existing elevations on adjacent properties, proposed finished lot corner elevations on urban subdivisions only, proposed lot grade, escarpment set back lines, sewer connection inverts, directions of surface drainage flows in accordance with the 100 year floods, drainage areas, surface drainage structures, retention structures, outfall structures including drainage destination and erosion control, and easements

2.2.6.5 OVERALL SANITARY SEWER, STORM SEWER AND WATERMAIN PLAN

The sanitary sewer, storm sewer and watermain overall plan shall be drawn to a scale of 1:1000 or a reduction thereof to fit the standard size sheet. The plan shall indicate the alignment, location, and size of mains, requirements for pressure reducing valves, any lots that have dual services, pipe material, direction of flow, and location and number of appurtenances as assigned by the City of Whitehorse Engineering Department. The Consultant shall have the flexibility to combine sanitary, storm and water on one drawing or to separate by contract, as described in Section 1 - Development Agreement Procedures.

2.2.6.6 POWER, TELEPHONE AND CABLEVISION PLAN

The power, telephone, and cablevision plan shall indicate the alignments of power, telephone, and cablevision, and shall be drawn to the same scale as the index plan. Overall underground drawings are to be referenced and cross checked for possible conflicts between shallow and deep utilities. Utilities Companies will be responsible for ensuring no conflicts occur. All surface appurtenances are to be shown on this plan. These drawings are to be included with the drawing package submitted to the City by the Developer.

2.2.6.7 PLANTING / LANDSCAPING PLAN

The planting/landscaping plan, if required, shall indicate planting and landscaping details.

2.2.7 DETAILED PLAN / PROFILE

The surface works shall be shown on one drawing, while the sanitary, storm, watermains, and shallow utilities shall be submitted on a separate drawing, on a scale of 1:500 horizontal and 1:50 vertical. The following information shall be included on the detailed plan/profile drawings.

2.2.7.1 REQUIREMENTS FOR ROADS

The following information shall be shown on the profile:

- Original ground elevations (xx.xx) for the right property line, left property line and the roadway centre line.
- Lip of gutter or edge of travelling lane for rural roads elevations at grade change points.
- Percent grade to two decimal places
- The chainage (x+xxx.xxx) and elevations (xx.xxx) of beginning of vertical curve, end of vertical curve, point of vertical intersection and intersections;

CITY OF WHITEHORSE SERVICING STANDARDS MANUAL
SECTION 2 - CONSTRUCTION DESIGN CRITERIA
SUB-SECTION 2.2 - PREPARATION OF ENGINEERING DRAWINGS

- Degree of curve, k;
- The length of vertical curve;
- The elevations and chainage of the low spot of sag curves or the high spot of crest curves.

The following information shall be shown in plan view:

- Road width, the curb offsets and the centre line offsets measured from the property line to the lip of gutter
- Flow arrows along gutter line.
- Chainages of the beginning and end of horizontal curve, delta angle, radius, tangent length, and arc length for each curb or centre line.
- Lip of gutter elevation for B.C., E.C., and mid-point on all curves and grade change points

The following additional information shall also be shown on an appropriate part of the drawing:

- Reference to legal boundaries in such a manner that the design may easily be laid out in the field.
- The profile shall be shown at true centre line length and projected below the plan in as close a relationship as possible.

2.2.7.2 REQUIREMENTS FOR SANITARY, STORM AND WATER MAINS

The following information shall be shown on the profile:

- Size and length as well as insulation if applicable;
- Water and Sewer profiles, showing horizontal length measured from centre of manhole to centre of manhole and percent grades between manholes;
- Invert elevations at both inlet(s) and outlet(s) of existing and proposed manholes;
- Rim elevations.
- Profiles of existing and proposed watermains are required, showing invert elevations at all grade changes, hydrants and bends.

The following information shall be shown in plan view:

- Reference location of manholes, cleanouts and other appurtenances to property lines or centre line chainages;
- Pipe offsets from property line;
- The location of sewer and water services tied to property lines;
- Size and type of pipe as well as insulation if applicable.

The following additional information shall also be shown on an appropriate part of the drawing:

CITY OF WHITEHORSE SERVICING STANDARDS MANUAL
SECTION 2 - CONSTRUCTION DESIGN CRITERIA
SUB-SECTION 2.2 - PREPARATION OF ENGINEERING DRAWINGS

- Manholes, catch basins, valves, and hydrants shall be numbered as assigned by the City of Whitehorse Engineering Department;
- All catch basins and leads between the catch basin and the main shall be shown using road chainage.
- Where the sanitary sewer or water and storm drain are to be installed in a common trench, detail a typical cross-section showing distance between pipes and class of pipe.
- Show the offset of the main from the property line.
- Indicate the extent of work required in making the connection to the existing watermain, show boundary valves.
- Show elevation of hydrant flange
- Provide a materials list for all connection points

2.2.7.3 REQUIREMENTS FOR SHALLOW UTILITIES

Shallow Utility drawings (Electrical, Cable T.V., and Telephone) will be produced by the Utility to their standards. Shallow Utility drawings shall show all appurtenances so as to avoid conflicts.

2.2.8 LEGEND SHEET

All sets of project drawings shall include a legend sheet. The legend sheets shall describe all the lines and symbols used in the drawings in conformance with Drawing F1.0 and F1.1, Section 4. The consultant shall have the flexibility, should the legend be small enough, to locate it on each overall and plan profile sheet.

2.2.9 DETAIL SHEET

All sets of project drawings shall contain detail plans at the end of the drawing set. The detail plans shall include all of the pertinent details of the project: for example, trench and roadway sections, typical culvert installations, manhole, valve, and service connection details, etc. Details shall conform to those listed in Section 4. Upon receipt of approved digital media, the City of Whitehorse will provide the Standard details from this manual available in digital form.

2.2.10 RECORD DRAWINGS

The procedure described pertains to record drawings of the following structures: storm sewers, sanitary sewers, watermains and their services; and roads, curbs, sidewalks, culverts, shallow utilities and other miscellaneous permanent structures. Any field changes made must be noted along with the following information:

- Dimension horizontal location of all hydrants, control valves, tees, bends, valves, reducers and plugs from property lines
- Type and class of all pipes

CITY OF WHITEHORSE SERVICING STANDARDS MANUAL
SECTION 2 - CONSTRUCTION DESIGN CRITERIA
SUB-SECTION 2.2 - PREPARATION OF ENGINEERING DRAWINGS

- Service test points
- All abandoned sewer and water mains shall be marked as such;
- All sewer and water mains removed during construction are to be deleted from plan and profile Record Drawings;
- Manhole locations are to be dimensioned from property lines in two directions;
- Revision of typical cross-section

Road information that was shown as existing on the design drawings and removed during construction shall be removed from the Record Drawings. On record drawings submitted to the engineer, the date of completion, the date on which "Record" details were added and the Consultants initials shall be included on each drawing. Each drawing shall be marked "Record Drawing".

The record drawings are to be submitted to the Engineer prior to application for an FAC.

A service connection record shall be contained in a separate booklet, giving horizontal sketches and a description of the information with respect to service connection for water, sewer, valves and hydrants as described in Section 1, Appendices 1.A through 1.G.