

Rural Municipality of Whitemouth

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RURAL MUNICIPALITY OF  
WHITEMOUTH  
STANDARDS FOR DESIGN AND  
CONSTRUCTION OF  
PUBLIC WORKS

Prepared by: Cochrane Engineering Ltd.

Project No: WE 05 089 00 WE

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## 1.0 WATERWORKS

### 1.1 Approved Materials for Water Installations

#### (a) General

All materials shall conform to the relevant Standard Approval Listings of the Manitoba Water Services Board, most recent edition, with any exceptions being specifically outlined herein.

#### (b) Watermain Pipe

Watermain shall be PVC Series 160 SDR 26 (CSA B.137.3) or HDPE Series 100, DR 17.

#### (c) Fittings

Watermain fittings (crosses, tees, elbows, reducers, caps) shall be PVC Series 160 SDR 26 (CSA B.137.3) for use with PVC pipe. Polyethylene fittings shall be used with HDPE pipe, and shall be series 100, DR 17. All fittings shall be injection moulded for pipes 300 mm diameter or less.

#### (d) Valves

Gate valves shall be AWWA C509 Resilient Seat type with O-ring stem seals, non-rising spindle, left hand opening, with push-on joints suitable for IPS dimension pipe (Mueller, resilient wedge gate valve A2360 Series, or approved equal).

(e) Valve Boxes

Gate valve boxes shall be telescoping type adjustable for bury depth. The upper section shall be ductile iron with a hinged cover with the mark "W" cast in. The lower section shall be PVC (DR 18 type). Each box shall have an extension spindle with a stone disc and two inch (50 mm) operating nut no more than three feet (one metre) below proposed ground level.

(f) Hydrants

Hydrants shall be AWWA C502 type, with dry top bonnet, compression type main valve no less than five inches (125 mm) diameter, left hand opening, for off line service with a six inch (150 mm) push-on joint suitable for cast iron pipe, bronze-to-bronze seat ring, non-draining barrel no less than seven inches (175 mm) in diameter, two hose and one pumper nozzle, all with caps and chains, Western Canadian/Manitoba Standard operating nuts and cap threads, a "break-away" ground line flange, and flat surfaces on the bottom and back of the boot. Hydrants shall be painted "Chinese Red" with black caps. Acceptable model shall be Mueller "Modern Centurion".

(g) Service Pipe

Residential water service pipe shall be 1¼" (32 mm) LDPE Series 100.

(h) Corporation Stops

Corporation stops shall be bronze, ball-type, with standard tapered threaded inlet suitable for tapping via service saddle to watermains, with a compression type outlet. Corporation stops may be deleted, if approved by Council.

(i) Curb Stops

Curb stops shall be bronze, ball-type, non-draining, with bronze inserts and threaded type joints (Mueller H-10283). Mueller H-15209 with compression joints may be used, if approved by Council.

(j) Curb Boxes

Curb boxes shall be PVC Schedule 40 (CSA B137.3) 9 foot (2 to 3 metre) depth, with a ribbed lid, with the word "water" cast in, five sided nut (7/8 inch or 22 mm flat-to-point), 5/8 inch (16 mm) stainless steel rod, polymer plastic boot to fit curb stops, and a brass cotter pin centred on the yoke. (WDVB or approved equal).

Curb boxes shall be located 12 inches (300 mm) from the front property line, and 5 feet (1.52 m) from the side lot line. Typical lot servicing layout is shown at the end of this section.

(k) Service Saddles

Saddles shall be wide band type with minimum 3/8 inch (10 mm) bolt, constructed of passivated 304 SS or 316 SS, with a rubber compression gasket and threaded outlet. For HDPE mains, a B-62 bronze insert and type 304 SS clamp combination shall be used.

(l) Couplings (mains)

Couplings shall be either double bell PVC (Series 160, CSA B.137.3) or metal (all 304 SS or 316 SS) with virgin rubber (ASTM D2000 SBR) gaskets. For HDPE mains, pipe lengths shall be joined using the thermal

butt fusion method. Connections to appurtenances shall utilise flanged connections.

(m) Couplings (services)

All underground fittings (adaptors, couplings, etc.) shall be brass or stainless steel. Connections between residential meters and valves shall be brass or HD plastic.

(n) Meters

Residential meters shall be Neptune, 5/8" – T10, registered in Imperial gallons.

(o) Residential Dual Check Valves

Backflow valves on residential service lines shall be Conbraco series 40-3A4-4A.

(p) Residential Flow Control

Flow regulators shall be Dole model 4GC (31~~6~~ IGPM) for urban installations, and 6GC (5 IGPM) for rural installations.

## 1.2 Design and Construction

(a) General

All design and construction shall conform generally to the Standard Specifications of the Manitoba Water Services Board, with any exceptions being specifically outlined herein.

(b) Bury Depth

All water piping shall be provided with a minimum cover over the crown of the pipe, as follows:

- 8.0 feet (2.5 metres) under deep, narrow ditches
- 9.0 feet (2.75 metres) under prairie, or shallow or wide ditches
- 10.0 feet (3.0 metres) under roads

(c) Installation

Pipe bedding, joining and filling shall conform to the recommendations of the manufacturer, and shall conform to recognized Engineering practice. Bedding shall be tamped Class "B" (sand bedding) and backfill shall be compacted to a density equivalent to insitu material. All piping installed under proposed roadways, shall be tunnelled. All piping installed under other existing roadways or driveways shall be tunnelled, or backfilled with compacted granular material, if approved by Council.

(d) Valves

A gate valve shall be provided for each fire hydrant at the end of each block; at Provincial Trunk Highway, railway and river crossings (both sides if pipeline can flow in both directions); at watermain tees (at least two gate valves); and at watermain cross (at least three). Main line gate valves shall be installed in line with intersecting street right-of-way lines, or property lot lines, wherever possible.



(e) Offset Lines

Watermains shall be installed (generally) 10 feet (3 metres) off the property line.

(f) Hydrants

Hydrants shall be installed "off-line" at an offset of 3 feet (1 metre) off the property line if no sidewalks are to be installed, and at 6.5 feet (2 metres) off the property line if sidewalks are to be installed. Hydrants shall be located no more than 500 feet (150 m) apart, in residential areas. In business districts (as specified by Council), 330 foot (100 metre) maximum spacing shall prevail. Preference shall be given for hydrants to be installed at road intersections, and when at an intersection, for the hydrant to be set on the least busy street, where possible. Where hydrants are located away from intersections, they shall be positioned between lots (i.e. opposite the lot line). Hydrant groundline flanges shall be between 2" and 6" (50 mm and 150 mm) above finished ground grade. Pumper nozzles shall face the nearest roadway.

(g) Service Connections

Water service connection boxes shall be supplied (not installed) for new subdivision developments. They shall be delivered to the Public Works Yard in Whitemouth. The location of each service shall be marked with a 4" x 4" x 144 inch long (100 x 100 x 3600 mm) pressure treated construction grade fir wooden marker, driven in to the ground to full service depth, with top painted red. A 3 foot (1.0 metre) length of 3/4" (20 mm) rebar is to be placed next to the wooden marker, with the top being flush with the ground surface.

(h) Water Main Design criteria

For domestic flow calculations, average per capita consumption of 66 l.g. (300 L) per day multiplied by the appropriate Harmon peaking factor shall be used to determine peak hour rates. Watermains shall be looped where possible to provide better pressure and eliminate stagnant water at "dead- ends". Where a main line is installed as a dead- end, a hydrant or a post hydrant shall be installed. Watermains shall be designed so as to provide at a minimum the following distribution residual water pressures, when pumping station output pressure is 60 psi (415 kPa):

- domestic (community) -40 psi (275 kPa)
- fireflow (Class 1 for under 300 population communities) -265 IGPM @ 20 psi (20 L/s @ 140 kPa)
- fireflow (Class 2 for over 300 population community) -400 IGPM @ 20 psi (30 L/s @ 140 kPa)

(i) Minimum Service Size

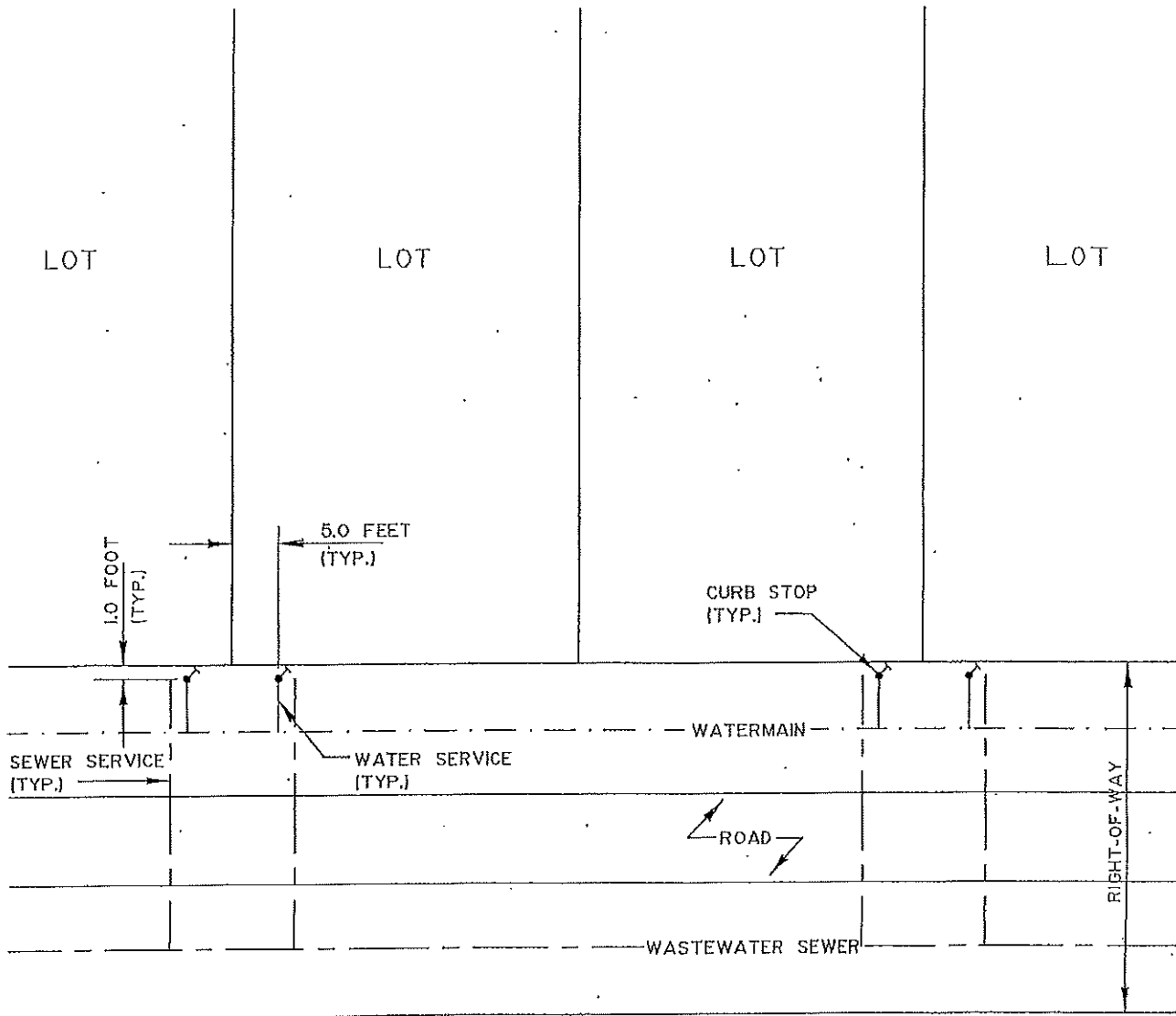
Water service lines in communities shall be no smaller than:

Single family homes	1¼ inch (32 mm)
Duplex	1¼ inch (32 mm)
Other - As determined by engineer according to individual requirements.	

(j) Testing and Disinfection

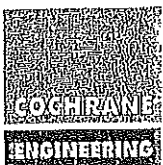
All completed works shall be tested, flushed, disinfected and refushed to the appropriate MWSB Standards. Water service lines shall be flushed at full operating capacity to achieve three water changes, if the lines are brought into buildings. Unless otherwise approved by Council, watermains

and pipelines shall be "polypigged" (i.e. swabbed) as part of the preliminary flushing process, to ensure full removal of sediment.



## TYPICAL LOT SERVICING LAYOUT

AUGUST 26, 2005



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TITLE R.M. OF WHITEMOUTH  
TYPICAL LOT SERVICING LAYOUT

DATE 05/08/26 DWG No. WE05089 G01

ACAD No. 05089G01

## 2.0 WASTEWATER SEWERS

### 2.1 Approved Materials for Wastewater Sewers

#### (a) General

All materials shall conform to the relevant standard Approval Listings of the MWSB, most recent edition, with any exceptions being specifically outlined herein.

#### (b) Sewermain Pipe

Gravity sewer pipe shall be PVC -SDR 35 (ASTM D2241, CSA B.182.2).

#### (c) Service Pipe

Gravity sewer service pipe, 4 and 6 inch (100 and 150 mm) shall be PVC SDR 28 (ASTM D2241, CSA B.182.1).

#### (d) Saddles

Gravity sewer service saddles shall be PVC (ASTM D2241, CSA B.182), compatible with the type of sewermain being used. Straps shall be stainless steel.

#### (e) Manholes

Manholes shall be precast reinforced concrete (ASTM C76 Class II) with flexible plastic gaskets between sections. Cement shall be CSA A-5M Type 50, sulphate resistant. Units shall have cast-in-aluminum MSU

Daymond manhole ladder rungs at 12 inch (305 mm) spacing. Standard base sections shall be 48 inch (1200 mm) diameter, with 48 x 36 inch (1200 x 1050 mm) conical reducers and 30 inch (1050 mm) riser diameter. Larger base sections required for influent / effluent piping greater than 21 inches (525 mm).

(f) Frame & Covers

Manholes on a gravity sewer line shall be complete with a cast grey iron frame and cover, true to the required pattern, free of cracks, gas holes, flaws, excessive shrinkage, and roughness. Frames shall weigh 225 lb. (103 kg) and covers 167 lb. (76 kg).

Mating surfaces shall be machined for a close fit. Covers shall be solid, excepting two holes provided for lifting (Titan TF 101 M or approved equal).

## 2.2 Design and Construction

(a) Bury Depth

The minimum depth of gravity sewers shall be 6.5 feet (2.0 metres) measured from finished ground level to pipe invert. Council approval required for cover less than the minimum bury depth criteria.

(b) Minimum Slope

Sanitary sewers shall be designed to permit a full or half full scouring velocity of 2.0 ft/sec. (0.60 m/sec). Typical slopes required for Manning's Roughness Coefficient of  $n = 0.013$  are as follows:

8 inch/200 mm	0.35%
10 inch/25 mm	0.25%
12 inch/300 mm	0.20%

(c) Installation

Bedding, joining and backfilling shall be in accordance with manufacturer's recommendations and with recognized engineering practice, as per Section 1.2(c).

(d) Manholes

Manholes shall be located such that there is a manhole at every intersection between pipes 8 inches (200 mm) and larger, and such that the maximum linear spacing between manholes does not exceed 400 feet (120 metres).

(e) Location of Sewers

Sewer mains shall be installed (generally), 10 feet (3 metres) off the property line, on the opposite side of the street to the watermain.

(f) Minimum Sewer Main size

Gravity sewer mains shall have a minimum inside diameter of 8 inches (200 mm). Sewers shall be designed to convey the peak hour wastewater flow, as computed by use of an average daily per capita consumption of 66 IG (300 L) multiplied by the appropriate Harmon peaking factor, plus allowable infiltration and extraneous flows. Note that for all new developments, weeping tiles shall not be connected to sanitary sewers.

(g) Minimum Sewer Service Size

Gravity sewer services lines shall be no smaller than:

Single family home or duplex	4 inch (100 mm)
------------------------------	-----------------

Small to medium apartment block (up to 12 units)	6 inch (150 mm)
---	-----------------

Small commercial establishment	4 inch (100 mm)
--------------------------------	-----------------

Other -as determined by Engineer  
according to individual requirements

(h) Minimum Sewer Service Slope

The minimum slope for a 4 inch (100 mm) PVC Sewer Service shall be 1.00%, and 0.50% for a 6 inch (150 mm) service.



### 3.0 LOW PRESSURE SEWERS

*minimum size septic tank  
750 gallon  
as per Roy May 16/13*

#### 3.1 Materials

##### (a) General

All materials shall conform to the relevant Approval Listings of the MWSB.

##### (b) Sewermain Pipe

Low Pressure Sewer (LPS) mains shall be high density Polyethylene (HDPE) Series 80 DR 21 (Series 100 DR 17 for smaller than 3 inch).

##### (c) Fittings

LPS fittings shall be made of the same material and to the same specifications as the sewermain pipe.

##### (d) Valves and Boxes

3 inch (75 mm) and larger - (See 1.1(d) and (e)). Iron hinged box covers shall be cast with the mark "S".

##### (e) Service Pipe

LPS service pipe shall be 1 1/4 inch (32 mm) low density PE Series 75 (CSA B.137.1).

(f) Curb Stops and Boxes (and 2 inch (50 mm) valves)

(See Section 1.1(i) and (j)). The work "sewage" shall be cast into the iron box lid.

(g) Service Saddles

(See Section 1.1 (k)).

(h) Cleanouts

Cleanout assemblies shall consist of a 2 inch (50 mm) valve and riser PVC pipe to the surface, with a threaded cap. The pipe, valve and fittings shall conform to the relevant section of this specification.

(i) Couplings

(See Section 1.1(l)).

### 3.2 Design and Construction

(a) General

Subsections (a), (b), (c) and (e) of Section 1.2 shall apply:

(b) Valves

Valves shall be provided where branch mains connect to a main collector. Main collectors shall be provided with a valve and box upon entering a sewage pumping station, or a stabilization pond; at Provincial Trunk

Highway, railway and river crossings; and at significant points (i.e. where main collectors join together).

(c) Discharge

A low pressure sewermain shall only discharge to the following:

- another low pressure sewermain with sufficient capacity
- sewage pumping station
- stabilization pond
- gravity sewer manhole, providing all downstream piping is PVC (no concrete).

(d) Cleanouts

Cleanouts should be provided at the end of branch lines, but may be omitted if the branch line will serve no more than three houses or if the branch line is certain to be extended within three years, as determined by Council. Cleanouts should be provided along LPS mains where significant low points occur (i.e. river crossings).

(e) LPS Main Design criteria

While sophisticated pressure analysis models may be employed to determine precisely the anticipated flows/pressure losses for line sizing, the minimum size, in relation to the maximum potential number of service connections, is as follows:

<u>Main size</u>	<u>Max. No. of Services</u>
2 inch (50 mm)	40
3 inch ( 75 mm)	70
4 inch (100 mm)	120

These numbers assume no weeping tiles are connected. For pressure loss/flow calculations, the performance characteristics of the Monarch BE-S50 pump shall be used. "Wastewater production" rates shall be as per Section 2.2(f).

(f) Testing

All completed works shall be tested to MWSB standards except that the test pressure shall be 75 psi (500 kPa).

## **4.0 DRAINAGE CRITERIA**

### **4.1 Approved Materials For Drainage Installations**

#### **(a) Culverts**

Drainage culverts shall be corrugated steel pipe, minimum 16 gauge (1.6mm total thickness), coated with 2 oz, zinc per square foot (610 grams per square metre), joined with annular corrugated couplers. Corrugated HDPE (Boss 2000) culverts may be allowed if approved by Council. Minimum size shall be 12 inch (300 mm) diameter. All culverts will require a municipal permit before installation.

### **4.2 Design Criteria**

#### **(a) System Capacity And Drainage Design**

Stormwater drainage works, including ditches, culverts, and storm sewers, shall be designed on the basis for rainfall intensity statistically equivalent to a five year return interval, with duration equivalent to the time of runoff concentration to any given point in the system. Based on this calculated intensity, the rate of storm runoff shall be determined by the Rational Formula for drainage areas less than 100 acres. For larger areas, or alternate means of calculating peak discharge, approval must be received from the R.M. of Whitemouth's designated representative.

(b) Drainage Ditches

Drainage ditches shall be graded at a longitudinal slope of 0.20% or greater. Typical side slopes shall be no steeper than 4:1 unless otherwise approved by the R.M. of Whitemouth's designated representative. Ditch bottoms shall be at least 3 feet (1.0 metre) wide. "V" ditches shall not be acceptable unless approved by the R.M. of Whitemouth's designated representative. Ditches, which includes the entire area between the edge of the road and the property line, shall be seeded with grass.

## **5.0 ROADWAYS**

### **5.1 General**

Roadways shall be classified as either residential or collector. All roadway construction shall conform to the appropriate Standards of the Manitoba Department of Transportation & Government Services ("Highways"). Compaction requirements shall be based on Standard Proctor Dry Density (ASTM D698) at 90-130% of optimum moisture content.

### **5.2 Subgrade**

Excavations for roadways shall be, at minimum, three feet (0.9 metre) wider than the outside design width of the pavement. Excavation shall be sufficiently deep to permit the required subgrade preparation, base course and pavement thickness. Subgrade preparation shall conform to Manitoba Highways practice. This generally consists of removing a six inch (150 mm) layer of subgrade (under bottom subbase course level) and recompact it into place to minimum 95% density with a sheeps foot roller and/or vibrating compactor. Any unsuitable material (organics, silty soil, etc.) as may be exposed shall be excavated and removed, to a maximum depth of three feet (900 mm), and replaced with compacted clean clay, or other approved subbase material. If unsuitable material is still present at a depth of three feet (900 mm), or in lieu of excavation, alternatives shall be approved by a geotechnical engineer.

If peat moss is encountered in the subgrade, recommendations shall be required from a geotechnical engineer.

Where embankment is required for the road to meet the design grades, it shall be clean clay or other approved subbase material, placed in lifts and compacted as above.

### **5.3 Granular Courses**

Granular pavement section for residential roads shall consist of a minimum subbase and base course thickness of six inches (150 mm) each. For collector and commercial roads, a minimum subbase of 8" (200 mm) and a minimum base course thickness of 6" (150 mm) is required. Granular materials shall be placed and compacted in lifts to achieve a minimum 98% density throughout the subbase pavement structure. The subbase and base course materials shall be crushed gravel, with suitable fines added to meet Manitoba Highways "C" and "A" standard, respectively.

### **5.4 Pavement Design Criteria**

#### **(a) Crossfall**

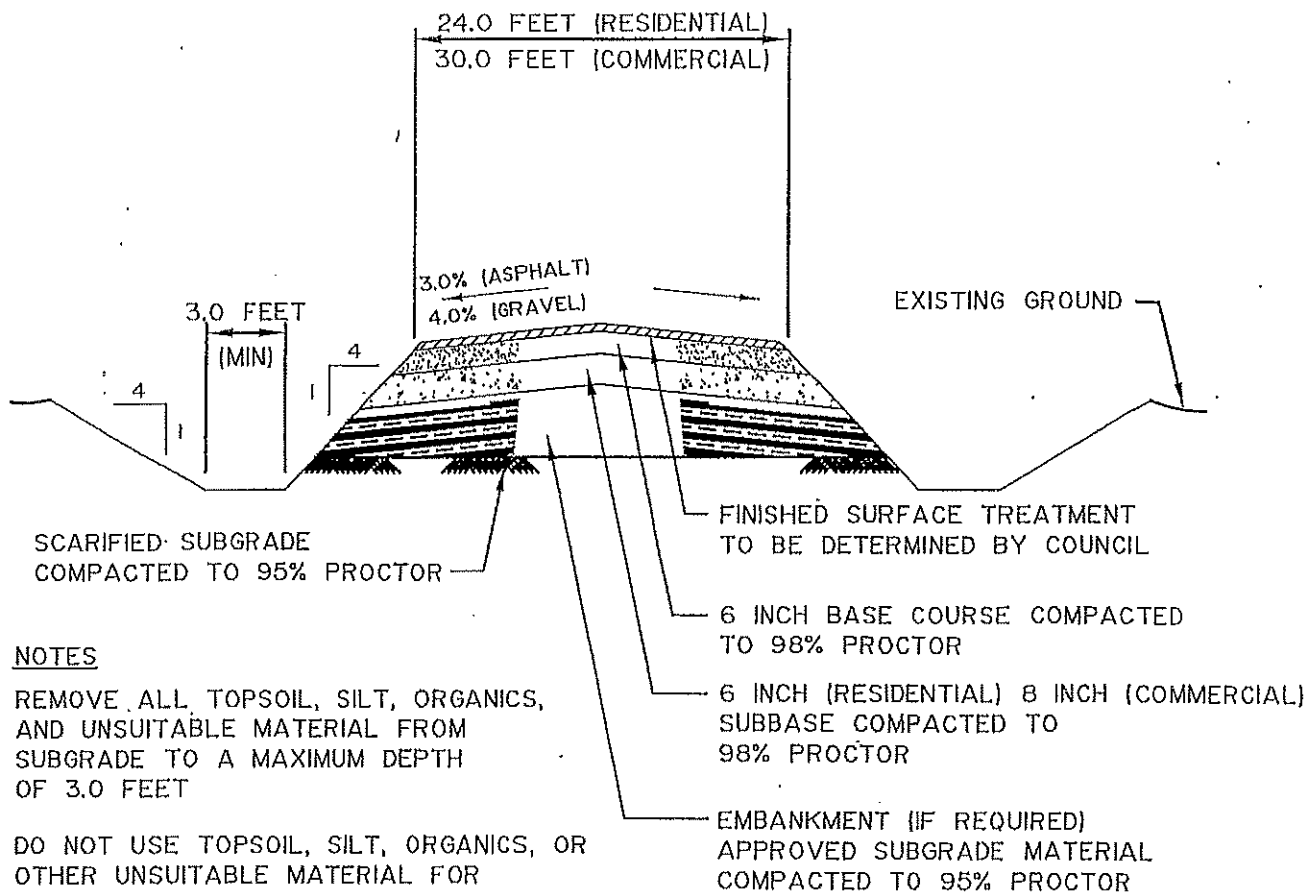
The highpoint of the pavement shall be the centre-line of the road (crown). The crossfall between crown and edge of road shall be graded at 3% for asphalt surfaces, and 4% for gravel surfaces.

#### **(b) Width**

Residential roadways shall be 24 feet (7.5 metres) wide, and collector and commercial roadways, 30 feet (9.0 metres) wide, as measured from the outside edge of the road or as designated by Council. Corners shall be minimum 24 foot (7.5 metre) radius for 24 foot (7.5 metre) roads, and 30 foot (9.0 metre) radius for 30 foot (9.0 metre) roads.



Developers shall ensure that right-of-way widths are adequate to accommodate the appropriate utilities, infrastructure piping, road width, and ditches stipulated in these standards. However, minimum right-of-way widths shall be 66 feet (20.0 metres) for urban residential, and 80 feet (24.0 metres) for urban collector and commercial, unless otherwise approved by Council.



#### NOTES

REMOVE ALL TOPSOIL, SILT, ORGANICS,  
AND UNSUITABLE MATERIAL FROM  
SUBGRADE TO A MAXIMUM DEPTH  
OF 3.0 FEET

DO NOT USE TOPSOIL, SILT, ORGANICS, OR  
OTHER UNSUITABLE MATERIAL FOR  
CONSTRUCTION OF SUBGRADE  
(EMBANKMENT)

## TYPICAL RESIDENTIAL ROAD CROSS SECTION

AUGUST 26/2005



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TITLE R.M. OF WHITEMOUTH  
TYPICAL ROAD CROSS SECTION

DATE 05/08/26 DWG No. WE05089 G02

ACAD No. 05089G02

## **5.5 Surface**

The following specifications are provided as information. Final surface treatment shall be as specified in the Development Agreement and may include the requirement for asphalt, seal coat, or limestone.

### **(a) Asphalt Pavement**

One quarter gallon per square yard (1.35 litres per square metre) of liquid asphalt MC-O prime coat shall be applied at a temperature of 90-155 degrees F (32-68 degrees C) to the compacted base course. A sufficient thickness of asphalt concrete (cement penetration 150/200), plant mixed and heated to 260-310 degrees F. (127-155 degrees C), shall be placed to permit a uniform minimum pavement thickness of three inches (75 mm) on residential roads, and four inches (100 mm) on collector roads, (placed in two lifts) after compaction.

## **5.6 Road Construction Staging**

Staging of the road construction may be required and will be as stipulated in the Development Agreement.

## **5.7 Driveways**

Minimum driveway width on the right-of-way shall be 18 feet (5.5 metres). A minimum 15 foot (4.8 metre) radius shall be maintained at approaches onto the main thoroughfare. Where open ditches prevail, a crown with 2% crossfall shall be provided and a culvert shall be installed under the driveway. Culvert size shall be as calculated by the Engineer as necessary for ditch design flows, but shall

not be less than stipulated in Section 4.1(a). Driveway side- slopes to ditch bottoms shall be graded no steeper than 4:1. No driveway shall fall within 25 feet (7.5 m) (as measured edge to edge) of an intersection between roadways.

The surface treatment for driveways shall, at a minimum, match the road surface on the right-of-way, unless otherwise approved by Council.

#### **5.8 Cul-de-sac**

Road right-of-way requirements is 160 foot (48.5 metre) diameter. Road traffic surface requirement to be a minimum of 125 foot (38.0 metre) diameter.

#### **5.9 Road Grade**

Maximum road grade to be 5%. Vertical curves are required if the difference in the algebraic sum between descending and ascending gradients is equal to, or greater than 2%.

## **6.0 OTHER UTILITIES**

### **6.1 Hydro and Telephone**

Manitoba Hydro and Manitoba Telephone services shall be underground type for all urban developments. Overhead Hydro lines may be considered, but must be approved by Council. Street lighting shall be high pressure sodium type luminaires, or ornamental, depending on Council's review. Linear spacing shall be no greater than 300 feet (90 metres) with the provision that there shall be a street lighting unit at each roadway intersection and at each road bend in excess of 45 degrees.

### **6.2 Road Signs**

The Developer shall supply and install all road signs (traffic control and street signs), in accordance with the Manitoba Transportation and Government Services requirements, and as authorized by the R.M. of Whitemouth. Unless otherwise specified by the R.M. of Whitemouth, all signs shall be mounted on a 4 inch by 4 inch (100 mm x 100 mm) pressure treated wood posts.

## **7.0 BOULEVARD AND LOT GRADING**

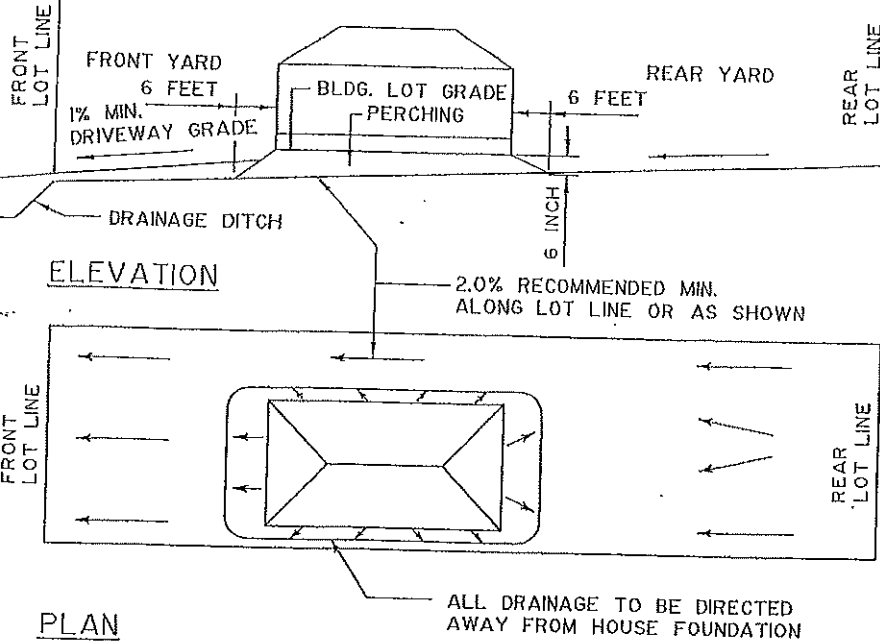
### **7.1 Lots**

Lots (meaning all properties beyond the road right-of-ways) shall be rough graded to within 12 inches (300 mm) of required finish elevations, as per the approved grading plan prepared by the Developer's Consultant.

Lot areas not conforming to the rough graded criteria are allowed to permit the deposition of basement excavation within the stipulated lot. The Developer shall provide documentation itemising rationale for any deviation from the rough graded criteria. Under no circumstances shall the lot be rough graded to permit the ponding of water within the residential lots. Fine grading shall be the responsibility of the homeowner / house builder. Finish elevations shall ensure adequate drainage away from buildings toward drainage ditches, or swales, as applicable. Houses shall be "perched" with a minimum 6 inch (150 mm) berm around the foundation, minimum 2% grade along the lot line to the ditch is required for the front yard, while a 1.5% min. grade is required for the rear yard. A max. 4% grade is permissible. The house grades shall be designed such that there is relative uniformity within the development, for aesthetic purposes. Storm runoff from a property shall not be permitted to enter, or cross, an adjacent property.

PUBLIC RIGHT-  
OF-WAY

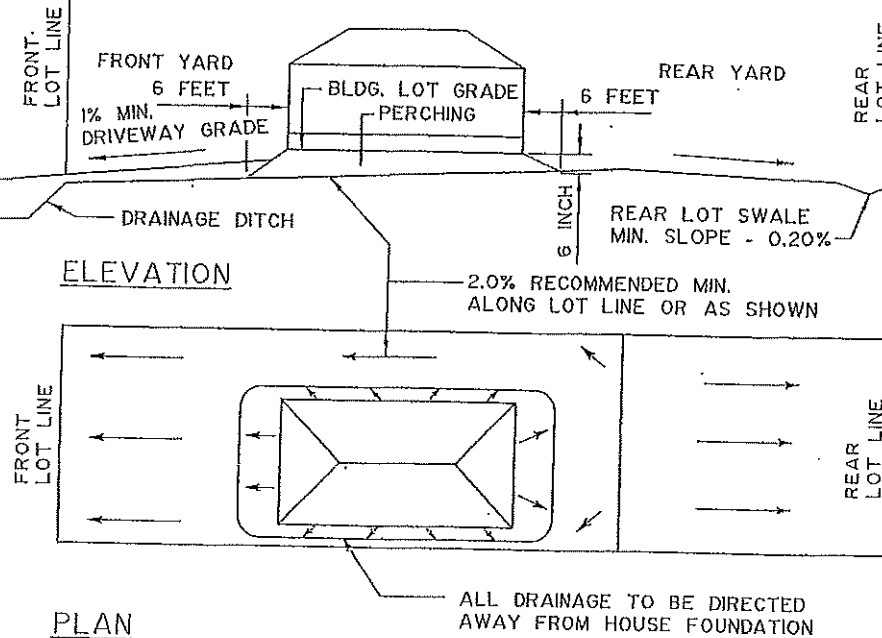
PRIVATE RESIDENTIAL LOT



## RESIDENTIAL BACK TO FRONT LOT DRAINAGE

PUBLIC RIGHT-  
OF-WAY

PRIVATE RESIDENTIAL LOT



## RESIDENTIAL SPLIT LOT DRAINAGE

### NOTES:

1. BUILDING TO BE SURROUNDED WITH "PERCHING".
2. BUILDING LOT GRADE TO BE FINISHED BUILDING LANDSCAPE ADJACENT TO BUILDING.
3. PERCHING TO EXTEND BEYOND BUILDING AS FOLLOWS :  
A) FRONT & REAR - 6.0 FEET (MIN.)  
B) SIDE - 3.0 FEET (MIN.)
4. SIDE YARD SLOPE ALONG LOT LINE :  
2.0% RECOMMENDED (MIN.) - FRONT YARD  
1.5% RECOMMENDED (MIN.) - REAR YARD

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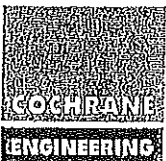
TITLE

R.M. WHITEMOUTH  
LOT GRADING CRITERIA

DATE

05/08/26 DWG No. WE05089 G03

ACAD No. 05089G03



## **8.0 PARKS**

### **8.1 Greenspace / Public Reserve**

#### **8.1.1 Urban Area Subdivisions**

Where the total development area encompasses an area equal to or greater than 10 acres (4.0 hectares), the Developer shall designate an area of no less than 10% of the total development area for recreational use, unless the development agreement requires the developer to designate a greater amount.

Prior to the commencement of construction of each phase of the development, the designated area shall be approved by the R.M. of Whitemouth. The area shall be left rough graded, with final landscaping to be completed by the R.M. of Whitemouth.

#### **8.1.2 Public Reserves**

Public reserves shall be cleared of all debris resulting from construction projects. No earth borrow pits shall be excavated on a public reserve without the written permission from the Municipality. No debris shall be buried on any public reserve, lot, or road right-of-way.



## 9.0 SEWAGE PUMPING STATIONS

### 9.1 Materials

#### (a) General

All materials shall conform to the relevant standard Approval Listings for the Manitoba Water Services Board.

#### (b) Barrels

Precast concrete barrels shall conform to ASTM C76 Class II with reinforced top and floor slabs.

#### (c) Miscellaneous Metal

Rungs shall be MSU Daymond aluminum type. Frame and cover units shall be stainless steel.

#### (d) Pumps

Pumps shall be Flygt "N" type. Where conventional gravity sewers are used, impellers shall be capable of passing three inch (75 mm) solids, and the minimum acceptable motor power rating shall be 2.5 hp.

Pumps shall be complete with slide-away discharge elbows, guide rails and couplings.

(e) Valves

Each pump shall have an HDL ball check valve mounted directly on the discharge elbow. For conventional gravity sewer lift stations, each pump shall have a stainless steel knife gate valve mounted near the junction tee. For LPS systems, a Chemline PVC gate valve shall be used in place of the knife gate.

A C509 resilient seat gate valve and box shall be provided on each incoming sewer line to permit shutting off flow into the station.

## 9.2 Design and Construction

(a) General

All design and construction shall conform generally to the standard specifications of the Manitoba Water Services Board.

(b) Forcemains

Bury depth, installation, and alignment shall conform generally to Section 1.2. Forcemains may be installed in a common trench with sewer mains provided that a minimum one foot (0.3 metre) clearance be maintained between pipes and between appurtenances.

(c) Design Criteria

Design flows shall be calculated as per section 2.2(f) (gravity). Provision shall be made in the structure and piping to permit installing larger pumps capable of increasing net output capacity by 50% without structural or mechanical alterations.

(d) Testing

The completed facility shall be tested by the design engineer for proper operation, correct impeller rotation, amperage draw and specific pumping output (drawdown test).

## **10.0 QUALITY ASSURANCE**

### **10.1 Installation**

All public works shall be installed to recognized engineering standards (MWSB, Manitoba Highways, AWWA, AASHTO, etc. ) and to the recommendations of the respective manufacturer or supplier of materials. All piping works shall be bedded, laid, joined, and back- filled to such standards and recommendations. All workmanship shall be first class and all materials shall be new and of best quality. Excavation permits shall be obtained from all outside agencies, and all utilities shall be notified.

### **10.2 Testing**

Waterworks shall be flushed, disinfected and pressure tested for no less than two hours at 150 psi (1100 kPa), and leakage and pressure loss shall fall within allowable MWSB Limits. All valves and hydrants shall be tested for proper operation. Gravity sewers shall be Mandrel Tested and closed circuit television tested with a video cassette of the testing being provided for review by R.M. of Whitemouth representative. Low pressure sewers shall be tested as above, to 75 psi (525 kPa). All water used for aforementioned operations shall be metered and purchased from the R.M. of Whitemouth. Pressure testing shall incorporate a certified recording chart system.

The roadway subgrade adequacy, sub-base and base course thickness and density, asphalt thickness and quality, and concrete shall be checked and tested by the design Engineer or testing laboratory, as applicable.

To ensure quality during construction, the registered professional engineer who was responsible for the design, or an authorised representative of that Engineer, shall conduct, as a minimum, periodic site reviews.

The Engineer responsible for the design of the project shall certify at completion that all work has been done in conformance with the specifications, that all necessary tests have been done and that the results are adequate. Certification and all relevant documentation shall be provided to the R.M. of Whitemouth.

### **10.3 Restoration and Clean-up**

All existing works and properties affected by construction shall be restored to the condition in which they existed prior to commencement of construction. All areas affected by construction shall be cleaned up and all excess or unused material shall be hauled away.

## **11.0 PLANS**

### **11.1 Preliminary Documents**

The Developer shall supply a plan(s) completed by a professional engineer. Such plans shall indicate:

- Proposed road and drainage grades, grade direction and elevations.
- Where the subdivision drainage may affect other properties outside the subdivision a drainage impact study completed by a professional engineer shall be required.
- Culvert sizes for roads and approaches.
- All drainage ditches or swales must be within the road allowances or on registered easements.
- Developer must obtain applicable approvals from all regulatory agencies for all construction (i.e. water rights licence for drainage, etc.).
- Existing topography of area.

### **11.2 As-Constructed Plans**

After construction is complete, the Engineer responsible for the design of the project shall take such measurements and surveys as necessary; and shall prepare "as-constructed" plans to show the actual layout of all constructed works. Such plans will indicate the type of materials incorporated in the works. Three sets of such plans shall be submitted to Council upon substantial completion of the work.

### 11.3 Warranty Period

All Public Works, both above and below ground shall be warranted by the Contractor against defects in products incorporated in the Works and against defects in execution for a period of one year, extending from the date of substantial completion of the Work as certified by the design Engineer with the consent of the Council. If there are any defects, the contractor or design engineer shall submit to Council (or Council's designated representative) for review and approval, the nature, cause, and means to remedy the defect.