VILLAGE OF ST. PIERRE-JOLYS

SERVICING STANDARDS FOR DESIGN AND CONSTRUCTION

Project No: 171-10649-00

August, 2017

Revised: August 30, 2017

TABLE OF CONTENTS

Page No.

1.0 GENERAL

1.1 Applicable Specifications

(a) The City of Winnipeg Standard Construction Specifications, latest edition. These specifications are available on line at www.winnipeg.ca/matmgt/spec/default.stm.

(b) Manitoba Water Services Board (MWSB) Standard Construction specifications, latest edition. A copy of this document is available on line at www.mbwaterservicesboard.ca/standard-construction-specs.html

Note that the MWSB does not provide financial or technical assistance for projects that are not directly under their jurisdiction.

(c) Manitoba Infrastructure (Highways), latest edition. These specifications are available on line at www.gov.mb.ca/ia/mwsb/pubs/standard-construction-specifications.pdf.

1.2 Applicable Standards

AWWA – American Water Works Association
6666 West Quincy Avenue, Denver, Colorado

CSA International
178 Rexdale Boulevard
Toronto, Ontario M9W 1R3

ASTM – American Society for Testing Materials
100 Barr Harbor Drive
West Conshohocken PA 19428-2959 USA

CGSB – Canadian Government Specifications Board
Ottawa, Ontario K1A 0S5

WCU – Western Canadian Underwriters

The Standards referred to shall be the most recent edition.

2.0 WATERWORKS

2.1 Building Services

(d) General

Supply of potable water for each lot shall be the responsibility of each lot owner. If a shared well is to be utilized, the maximum number of lot connections per well shall not exceed 14 connections. Shared wells shall meet all the requirements of a semi-public water system, in accordance with the Manitoba Office of Drinking Water.

No wells or water service lines shall be installed on the public right-of-way.

3 .0 WASTEWATER SEWERS

3.1 Approved Materials for Wastewater Sewers

(a) General

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

All materials and specifications indicated in this section shall apply to all subdivisions, condominium developments, apartments, and mobile home parks that connect to the Village's infrastructure.

(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

Service tees shall be used in new installations, and saddles in existing installations only.

Gravity sewer service tees shall be injection moulded or fabricated and FRP reinforced. Acceptable models shall be Ipex – Ring Tite, or Royal Pipe Systems.

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, sulphate resistant. Units shall have cast-in-aluminum MSU Daymond manhole ladder rungs at 12 inch (305 mm) spacing. Standard base and riser sections shall be 48 inch (1200 mm) diameter, with a flat top reducer. 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).

(g) Sewermain Couplings

Couplings shall be flexible transition sewer coupling, c/w stainless steel straps and shear rings. Acceptable model shall be Mission Rubber Co. – Flex Seal.

3.2 Design and Construction

(a) General

Installation of all underground utilities (gas, hydro, telephone, cable) under proposed or existing roadways shall be by trenchless methods. No open cut excavation of roadways shall be permitted. However, open cut excavation with granular backfill will be permitted to install a sewer through a cul-de-sac, rather than around the outside of the bulb. This is to allow for future watermain installation.

(b) Bury Depth

The minimum depth of gravity sewers shall be 8.0 feet (2.4 metres) measured from finished street centre line to pipe invert. Council approval required for cover less than the minimum bury depth criteria.

(c) 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:

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

(d) Installation

Pipe bedding, joining and backfilling 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 or existing roadways, shall be tunnelled (open trench is not permitted, other than on cul-de-sacs).

(e) 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 recommended linear spacing between manholes does not exceed 500 feet (150 m).

(f) Location of Sewers

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

(g) Minimum Sewer Main size

Gravity sewermains 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.

(h) 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)
Commercial establishment	6 inch (150 mm)
Other commercial as determined by Engineer according to individual requirements	

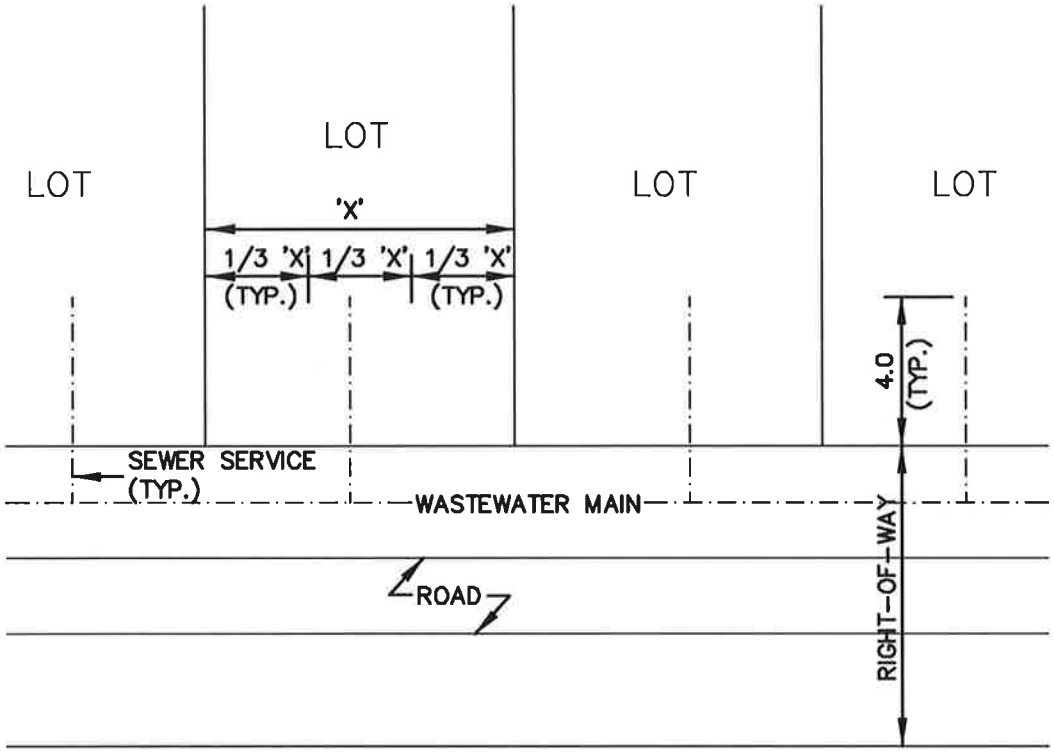
(i) Minimum Sewer Service Slope

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.

(j) Service Connections

All sewer service lines shall be installed 13 feet (4.0 metres) inside the property line and plugged. The lines shall enter the lot in the centre one-third of the front property line. The end of each installed service line shall be marked with a 50 x 100 x 2400 mm pressure treated construction

grade fir wooden marker, driven into the ground, with the top 1000 mm above ground and painted blue. A 3 foot (1.0 m) length of 20 mm rebar is to be placed next to the wooden marker, with the top being flush with the ground surface.



TYPICAL FRONT LOT SERVICING LAYOUT

NOTE:
SERVICES TO BE LOCATED IN THE CENTRE 1/3 OF THE LOT, AS SHOWN

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PROJECT: VILLAGE OF ST. PIERRE-JOLYS SERVICING STANDARDS		SUPPLEMENTAL: ADDENDUM: ADD_#☒ DIRECTIVE: DIR_#☒ CHANGE ORDER: CHG_#☒
TITLE: TYPICAL LOT SERVICING LAYOUT		REVISION: REV_#
DRAWN BY: A.L.M.	SCALE: N.T.S.	DATE: 2017/09/01
CHECKED BY: M.P.M.	PROJECT NO: 171-10649-00	SUPPLEMENTAL NO: G01

4 .0 LOW PRESSURE SEWERS

4.1 Materials

(a) General

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

All materials and specifications indicated in this section shall apply to all subdivisions, condominium developments, apartments, and mobile home parks that connect to the Village's infrastructure.

(b) Sewermain Pipe

Low Pressure Sewer (LPS) mains shall be high density Polyethylene (HDPE) DR 21.

(c) Fittings

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

(d) Valves and Boxes

For 3 inch (75mm) and larger, gate valves shall be AWWA C509 Resilient Seat type with O-ring stem seals, non-rising spindle, left hand opening, with flanged connection (when used with HDPE pipe). 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 "S"

cast in. The lower section shall be PVC (DR 18 type). Each box shall have an extension spindle with a stone disc and 25 mm operating nut no more than one metre below proposed ground level.

(e) Service Pipe

LPS service pipe shall be 1 1/4 inch (32 mm) HDPE DR 17.

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

Curb stops shall be bronze, ball-type, non-draining, with compression type joints, or I.P. thread, or approved equal. Curb boxes shall be cast or black iron, galvanized or steel, with an arch type polymer plastic boot, and a 2 to 3 metre adjustable depth, (no nuts on sliding portions) with an iron ribbed lid, with the word "sewage" cast in, five sided nut, 22 mm flat-to-point, 16 mm stainless steel rod, yoke to fit curb stops, and a brass cotter pin centred on the yoke.

(g) Service Saddles

Service connection saddle/clamp assemblies shall be compression type with a rubber gasket that fully contacts the pipe surface, and a threaded outlet. Saddles shall be wide band stainless steel. Electrofusion tapping sleeves will be acceptable on P.E. mains.

(h) Cleanouts

Unless otherwise approved by the Village, cleanout assemblies shall be offline and include an isolation valve. All vertical piping and 90° bends shall be HDPE or PVC Schedule 80. The cleanout size and diameter shall

match main line piping. The pipe, valve and fittings shall conform to the relevant section of this specification. Cleanouts shall include a blind flange.

All cleanouts installed shall consist of the riser pipe terminating 100 mm below finished ground. A standard manhole frame and cover and concrete riser section shall be installed over the cleanout, with a gravel sump.

(i) Couplings

P.E. fittings shall be of same quality and pressure rating as pipe. Injection moulded or fabricated with FRP reinforcement for both thermal butt fusion and socket fusion application.

4.2 Design and Construction

(a) Bury Depth

All low pressure sewer mains shall be provided with a minimum cover over the crown of the pipe as follows:

- 2.5 metres under deep, narrow ditches
- 2.75 metres under boulevards, or shallow or wide ditches
- 3.0 metres under roads

All low pressure sewer service piping shall be provided with a minimum cover over the crown of the pipe, of at least 2.3 metres from finished ground, but shall not be deeper than 3.00 metres, unless otherwise approved by the Village.

(b) Installation

Pipe bedding, joining and backfilling 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 or existing roadways, shall be tunnelled (open trench is not permitted). All piping installed under existing driveways shall be tunnelled, or backfilled with compacted granular material.

(c) Thrust Blocks

Thrust blocking shall be of concrete construction conforming to MWSB standards. Thrust blocks are required for installation on polyethylene low pressure sewer mains.

(d) 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. tees and crosses).

(e) 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).

(f) Location of Low Pressure Sewers

Low pressure sewer mains shall be installed (generally), 3.0 metres off the property line.

(g) Cleanouts

Cleanouts should be provided where there is a change in pipe diameter, and 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. Cleanouts should be provided along LPS mains where significant low points occur (i.e. river crossings). Maximum spacing between cleanout locations shall be 500 metres.

(h) 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:

Main size	Max. No. of Services
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 Little Giant

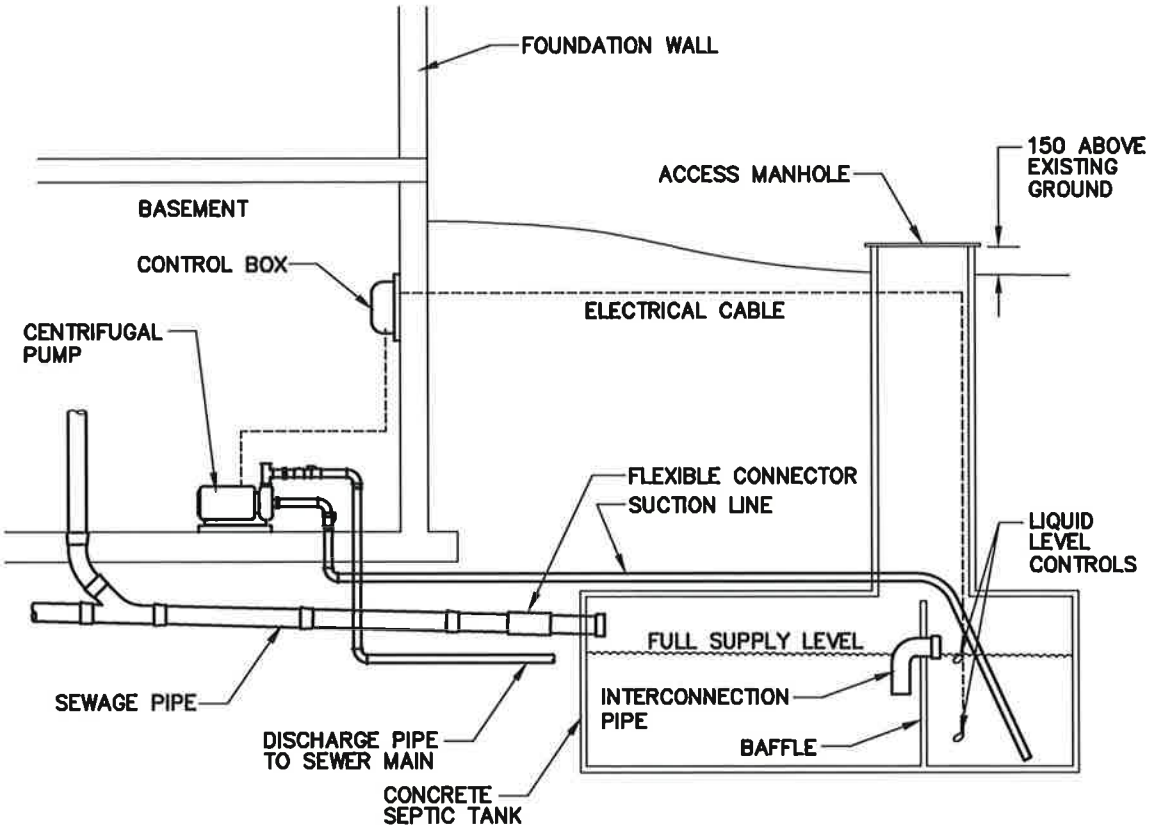
model WS50M (submersible) shall be used. "Wastewater production" rates shall be as per Section 3.2(g).

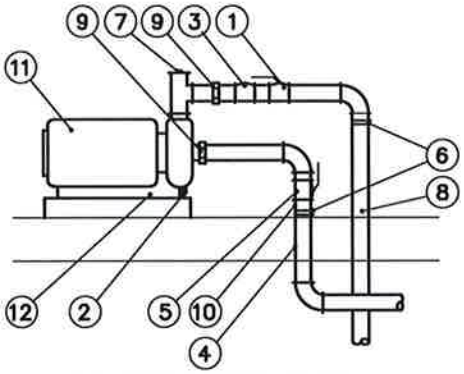
(f) Testing

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

(g) Service Connections

All rural and urban low pressure sewer service lines shall be installed 13 feet (4.0 metres) inside the property line. The service line shall enter the lot in the centre one-third of the front property line. The end of the low pressure sewer line and curb stop box shall be marked as per section 3.2 (j).





CENTRIFUGAL PUMP DETAIL

1. 32mm BALL VALVE ON DISCHARGE LINE.
2. DRAIN COCK INSTALLED WITH PIPE LUBRICANT.
3. 32mm BALL TYPE CHECK VALVE.
4. 32mm ø POLTETHYLENE SUCTION LINE.
5. 32mm BALL VALVE ON SUCTION LINE IF PUMP IS LOWER THAN LIQUID LEVEL IN SEPTIC TANK.
6. 32mm ø ALL STAINLESS STEEL CLAMPS.
7. PVC PRIMING PLUG INSTALLED WITH PIPE LUBRICANT c/w GALVANIZED TEE AND GALVANIZED NIPPLE.
8. 32mm ø POLYETHYLENE DISCHARGE LINE c/w ALL STAINLESS STEEL CLAMPS.
9. GALVANIZED UNIONS c/w GALVANIZED NIPPLES.
10. GALVANIZED MALE INSERT ADAPTER (TYP).
11. 1/2 HP ABOVE GROUND SEMI-OPEN IMPELLOR CENTRIFUGAL PUMP.
12. BOLT PUMP TO 75mm x 450mm x 300mm PRECAST CONCRETE BLOCK OR STEEL SUPPORT OR WALL BRACKET. ENSURE THAT PUMP IS FASTENED SECURELY. NEOPRENE RUBBER GASKET BETWEEN PUMP AND SUPPORT.

METRIC

WHOLE NUMBERS INDICATE MILLIMETRES
DECIMALIZED NUMBERS INIDICATE METRES

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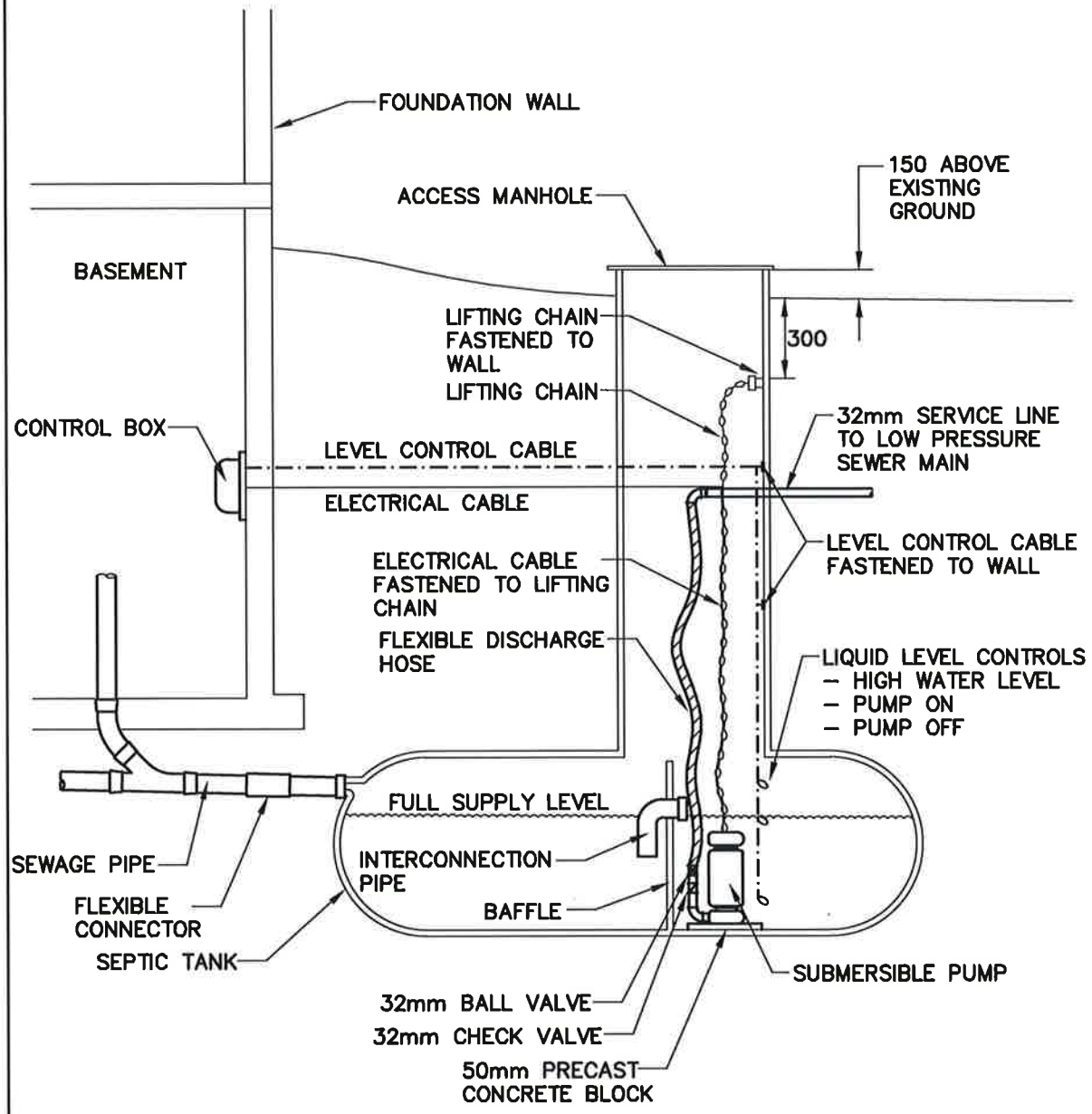
PROJECT:	VILLAGE OF ST. PIERRE-JOLYS SERVICING STANDARDS
TITLE:	TYPICAL LOW PRESSURE SEWER / SEPTIC TANK INSTALLATION - CENTRIFUGAL PUMP
DRAWN BY:	A.L.M.
SCALE:	N.T.S.
CHECKED BY:	M.P.M.
PROJECT NO:	171-10649-00

SUPPLEMENTAL:	
ADDENDUM:	ADD_#☒
DIRECTIVE:	DIR_#☒
CHANGE ORDER:	CHG_#☒
REVISION:	REV_#
DATE:	2017/09/01
SUPPLEMENTAL NO:	G02



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PROJECT: VILLAGE OF ST. PIERRE–JOLYS SERVICING STANDARDS		SUPPLEMENTAL: ADDENDUM: ADD_# ☒ DIRECTIVE: DIR_# ☒ CHANGE ORDER: CHG_# ☒
TITLE: TYPICAL LOW PRESSURE SEWER / SEPTIC TANK INSTALLATION – SUBMERSIBLE PUMP		REVISION: REV_#
DRAWN BY: A.L.M.	SCALE: N.T.S.	DATE: 2017/09/01
CHECKED BY: M.P.M.	PROJECT NO: 171-10649-00	SUPPLEMENTAL NO: G03

5.0 DRAINAGE CRITERIA

5.1 Approved Materials For Drainage Installations

(a) General

All materials and specifications indicated in this section shall apply to all subdivisions, condominium developments, apartments, and mobile home parks that connect to the Village's infrastructure.

(b) Culverts

Drainage culverts shall be corrugated HDPE (Boss 2000), minimum 210 kPa pipe stiffness, joined with external split couplers. Minimum size shall be 12 inch (300 mm) diameter.

(c) Storm Sewer Piping

Storm sewer pipe shall be:

- Corrugated HDPE (Boss 2000) to CSA B182.8, minimum 210 kPa storm sewer.
- PVC SDR 35 (ASTM D3034 or F679).

(d) Manhole and Catch Basin

Storm sewer manholes and catch basins shall be precast reinforced concrete (ASTM C76 Class II). Manhole sections shall have flexible bituminous gaskets between sections. Cement shall be CSA A5M, sulphate resistant. Units shall have cast-in-place aluminum or galvanized

steel ladder rungs at 12 inch (305 mm) spacings. Standard manhole base and riser sections shall be 48 inch (1200 mm) diameter, with a flat top reducer. Catch basins shall be 36 inch (900 mm) diameter and have 24 inch (600 mm) sumps and hinged cast iron or PVC hoods.

(e) Manhole and Catch Basin Covers/Inlets

Catch basin and storm sewer manhole framing and cover units shall be cast grey iron, true to the required pattern, free of cracks, gas holes, flaws, and excessive roughness. Minimum frame weight shall be 103 kg and minimum cover weight shall be 76 kg. Patterns shall be Titan TF101M, TF 102 (rolled curb unit), as required, or approved equal. Cover openings shall be herring-bone or "V" style so as to be compatible with bicycle traffic.

5.2 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 reviewed by the Village of St. Pierre-Jolys.

Storm water retention for all urban subdivisions shall be in accordance with the requirements of Manitoba Sustainable Development – Water

Stewardship Division. Generally all urban developments, ten lots or larger, and when using a 1 in 5 year design storm, development storm water runoff rates are to be equal or less than predevelopment runoff rates. Retention can typically be accomplished through retention ponds or internal storage via ditches and drainage patterns. The site must be able to store, up to an including a 1 in 25 year design storm event. If discharge from a development will be into the drainage system of a Provincial Trunk Highway (PTH) or Provincial Road (PR), the drainage requirements of Manitoba Infrastructure (MI) shall also apply.

Engineered drainage reports for all developments greater that 10 lots, shall be submitted for review and approval to Manitoba Sustainable Development, and Manitoba Infrastructure (if required), along with the application for a Water Rights Licence.

(b) Storm Sewers

- Storm sewers to be designed to accommodate a 5 year return design rainfall.
- Storm sewers to accommodate estimated peak flows under surcharged conditions and as identified within section (a) above.
- Under design conditions, the maximum permissible surcharge level shall be the gutter elevation within the drainage basin.
- Storm sewers shall have a minimum diameter of 15 inches (375 mm). Catchbasin lead piping shall have a minimum diameter of 10 inches (250 mm).
- Storm sewers shall be designed with a slope to provide minimum velocities when flowing full of 3 feet (0.9 metres) per second.

- Minimum depth of cover shall be as per the manufacturer's recommendations for the type of pipe being installed and loading requirements.

(c) 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 Village of St. Pierre-Jolys. Ditch bottoms shall be at least 24 inches (600 mm) wide. "V" ditches shall not be accepted. Ditches, which includes the entire area between the edge of the road and the property line, shall be seeded with grass.

6.0 ROADWAYS

6.1 General

Roadways identified in these specifications shall be classified as residential for new developments.

All roadway construction shall conform to the appropriate Municipal Standards and the Manitoba Department of Highways. Compaction requirements shall be based on Standard Proctor Dry Density (ASTM D698) at 90-130% of optimum moisture content.

All materials and specifications indicated in this section shall apply to all subdivisions, condominium developments, apartments, and mobile home parks that connect to the Village of St. Pierre's infrastructure.

All private developments, such as condominiums, apartments, and mobile home parks, shall have driveway access off internal roads, and not municipal roads.

6.2 Pavement Design Criteria

(a) Gutter Grade

Where gutters are provided, they shall be graded at a minimum slope of 0.4% except that a lesser grade may be used with prior written consent of the Village of St. Pierre-Jolys on specific projects where the 0.4% minimum may be unfeasible due to topography.

Maximum length of gutter that can drain without discharging into a ditch or land drainage sewer is 500 feet (150 metres).

(b) Crossfall

The highpoint of the pavement shall be the centre-line of the road (crown). The crossfall between crown and gutter shall be graded at 3%.

(c) Width

Residential roadways shall be 24 feet (7.5 metres) wide, as measured from the inside edge of the curbs (asphalt width) or as indicated in the development agreement. Corners shall be minimum 24 foot (7.5 metre) radius.

Where there is a right-of-way widening on curves, the outside road radius shall be the stipulated inside corner radius, plus the width of the road, plus 6 feet (2.0 metres). The radius point for the outside of the road shall be the same as the radius point for the inside corner. Transition from the outside radius shall be made with 62 foot (19.0 metre) radius curves.

Developers shall ensure that right-of-way widths are adequate to accommodate the appropriate utilities, infrastructure piping, road width, and drainage requirements stipulated in these standards. However, minimum right-of-way widths shall be 60 feet (18.288 metres) for urban residential developments.

6.3 Subgrade

(a) 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 Department of Highways practice. This generally consists of removing a six inch (150 mm) layer of subgrade (under bottom subbase course level) and recompacting 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.

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

6.4 Granular Courses

Granular pavement section shall consist of a minimum subbase and base course thickness as indicated for rural and urban roadways:

a) Residential
   - Six inches (150 mm) base course
   - Eight inches (200 mm) sub base

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 aggregate to meet Department of Highways "C" and "A" standard, respectively.

6.5 Geotextile Fabric

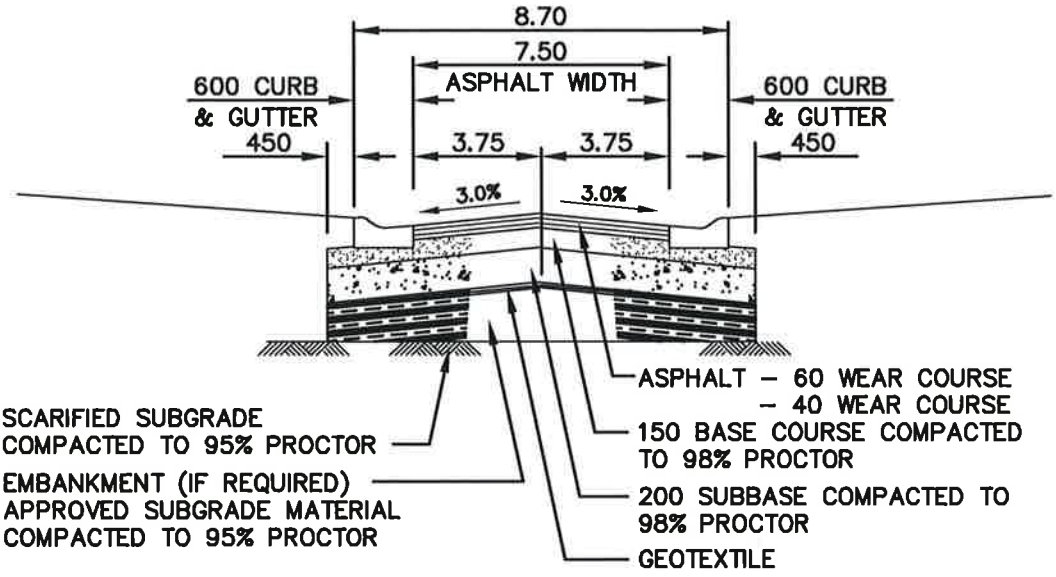
.1 A separation / reinforcement geotextile fabric shall be placed between the sub-grade and sub-base materials for residential, collector, and commercial (light duty) roads, and shall be a woven fabric.

.2 All physical property requirements are minimum average roll values determined according to ASTM D4759. The separation / reinforcement geotextile fabric shall meet or exceed the standards identified as follows:

Property	Standard	Test Method
Grab Tensile Strength	1400 N – minimum	ASTM D4632
Puncture Strength	530 N – minimum	ASTM D4833
Trapezoid Tear	500 N – minimum	ASTM D4522
Apparent Opening Size	0.430 mm – maximum	ASTM D4751
Permittivity	0.06 sec – 1 – maximum	ASTM D4491
UV Resistance	70% per 500 hrs - minimum	ASTM D4355

.3 All joints shall be overlapped a minimum of three feet (1.0 m) in the direction of the sub-base placement.

.4 Standard of acceptance: Propex 315 ST, or approved equal.



TYPICAL CURB & GUTTER ROAD CROSS SECTION

GENERAL NOTES & ROAD SPECIFICATIONS

- REMOVE ALL TOPSOIL, SILT, ORGANICS AND UNSUITABLE MATERIAL (MINIMUM 150 DEPTH)
- WHERE SITE CONDITIONS, TRAFFIC PATTERNS OR LOADING VARY FROM THE TYPICAL DESIGN CRITERIA FOR THE MUNICIPAL MINIMUM STANDARD, THE VILLAGE MAY REQUIRE MORE STRINGENT ROAD CONSTRUCTION STANDARDS. INDIVIDUALS THAT ANTICIPATE NON-RESIDENTIAL TRAFFIC SHOULD CONTACT THE MANAGER OF PUBLIC WORKS FOR MORE INFORMATION.

METRIC

WHOLE NUMBERS INDICATE MILLIMETRES
DECIMALIZED NUMBERS INIDICATE METRES

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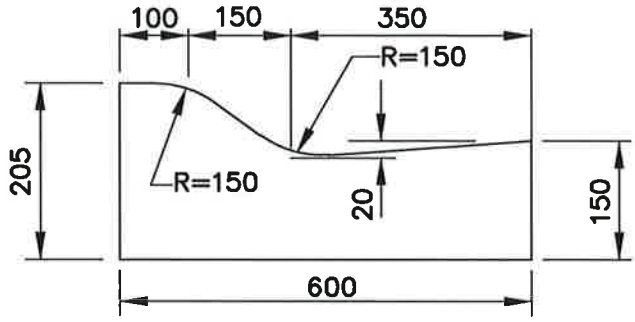
PROJECT: VILLAGE OF ST. PIERRE-JOLYS SERVICING STANDARDS		SUPPLEMENTAL: ADDENDUM: ADD_#☒ DIRECTIVE: DIR_#☒ CHANGE ORDER: CHG_#☒
TITLE: TYPICAL RESIDENTIAL ROAD CROSS-SECTION		REVISION: REV_#
DRAWN BY: A.L.M.	SCALE: N.T.S.	DATE: 2017/09/01
CHECKED BY: M.P.M.	PROJECT NO: 171-10649-00	SUPPLEMENTAL NO: G04



MOUNTABLE CURB & GUTTER DETAIL

N.T.S.

METRIC

WHOLE NUMBERS INDICATE MILLIMETRES
DECIMALIZED NUMBERS INIDICATE METRES

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PROJECT: VILLAGE OF ST. PIERRE-JOLYS SERVICING STANDARDS		SUPPLEMENTAL: ADDENDUM: ADD_#☒ DIRECTIVE: DIR_#☒ CHANGE ORDER: CHG_#☒
TITLE: TYPICAL CURB DETAILS		REVISION: REV_#
DRAWN BY: A.L.M.	SCALE: N.T.S.	DATE: 2017/09/01
CHECKED BY: M.P.M.	PROJECT NO: 171-10649-00	SUPPLEMENTAL NO: G05

6.6 Surface

The following specifications are provided as information. Unless otherwise stipulated in a development agreement, hard surface paving is normally part of development servicing.

(a) 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 four inches (100 mm) on residential roads (placed in two lifts) after compaction. Both lifts of asphalt shall be placed concurrently.

(b) Curb and Gutter

All roadways shall be designed with concrete curb and gutter drainage (with storm sewers as required), unless otherwise permitted in writing by the development agreement. Where curbs and gutters are stipulated, residential roadways shall have a rolled (lip) style curb and gutter. Typical gutter shall be 18 inches (450 mm) wide, for a total width of 24 inches (600 mm) from back of curb to front of gutter. The curb and gutter shall be slip formed concrete, with the gutter being 6 inches thick (150 mm).

(c) Concrete Carry Through

Where required, a 36" (900 mm) wide concrete carry through shall be constructed with reinforced concrete. A concrete carry through shall only be constructed at an intersection, and only along the gutter that is perpendicular to the road that would have a stop sign. A typical concrete carry-through detail is shown at the end of this section, as drawing G06.

6.7 Road Construction Staging

Asphalt pavement and concrete curb and gutter may be installed during the same construction year as the underground services. If only the sub-base is installed for over a winter season, adjustments to catch basins will be required to allow entry of surface water during the temporary road use period.

6.8 Driveways

Maximum driveway top width on the right-of-way shall be 20 feet (6.0 metres) on residential roads, and minimum top width shall be 12 feet (3.7 metres). A minimum 15 foot (4.8 metre) radius shall be maintained at approaches onto the main thoroughfare. On paved roads, a minimum 2% grade shall be maintained from the property line to the gutter. No driveway shall fall within 25 feet (7.5 m) (as measured edge to edge) of an intersection.

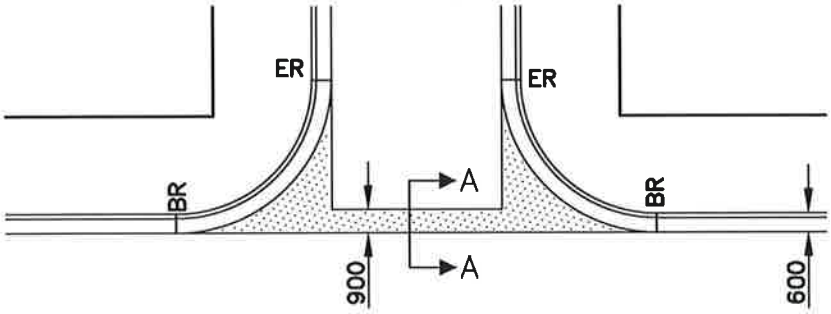
6.9 Cul-de-sac

Road Classification	Right-of-Way Requirements	Road Surface Requirement
Rural	160 feet (48.5 metre) diameter	125 feet (38.1 metre) diameter
Urban	125 feet (38.1 metre) diameter	85 feet (25.9 metre) diameter
Commercial	*160 feet (48.5 metre) diameter	*125 feet (38.1 metre) diameter

* Unless otherwise indicated by the development agreement

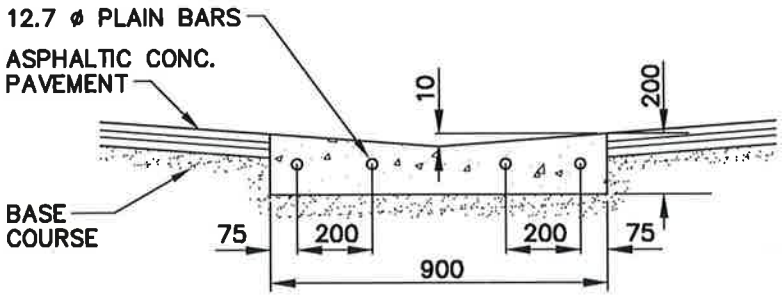
6.10 Road Grade

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%.



CONCRETE CARRY–THROUGH

N.T.S.



SECTION A–A

1600 BUFFALO PLACE
WINNIPEG, MANITOBA
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PHONE: 204-477-6650 FAX : 204-474-2864
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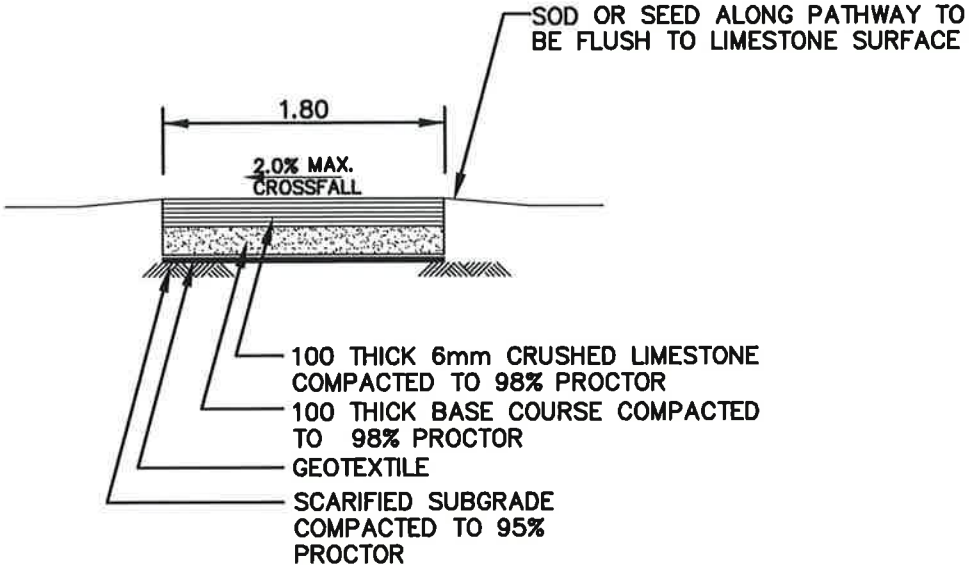
PROJECT: VILLAGE OF ST. PIERRE–JOLYS SERVICING STANDARDS		SUPPLEMENTAL: ADDENDUM: ADD_# ☒ DIRECTIVE: DIR_# ☒ CHANGE ORDER: CHG_# ☒
TITLE: TYPICAL CONCRETE CARRY–THROUGH		REVISION: REV_#
DRAWN BY: A.L.M.	SCALE: N.T.S.	DATE: 2017/09/01
CHECKED BY: M.P.M.	PROJECT NO: 171–10649–00	SUPPLEMENTAL NO: G06

7.0 PATHWAYS

7.1 Design

Where required by the development agreement, crushed limestone pathways shall be 6.0 feet wide (1.8 metres), and constructed with 4 inches (100mm) of crushed limestone over 4 inches (100mm) of compacted base course. Geotextile shall be installed between the subgrade and the compacted base course.



TYPICAL CRUSHED LIMESTONE PATHWAY

GENERAL NOTES

- REMOVE ALL TOPSOIL, SILT, ORGANICS AND UNSUITABLE MATERIAL (MINIMUM 150 DEPTH)
- GRADE PATHWAY TO DRAIN
- MAX. 5% LONGITUDINAL SLOPE

METRIC

WHOLE NUMBERS INDICATE MILLIMETRES
DECIMALIZED NUMBERS INIDICATE METRES

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TITLE: TYPICAL PATHWAY		REVISION: REV_#
DRAWN BY: A.L.M.	SCALE: N.T.S.	DATE: 2017/09/01
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8.0 OTHER UTILITIES

8.1 Hydro and Telephone

Manitoba Hydro and Manitoba Telephone services shall be underground type for all urban developments. Street lighting shall be ornamental with LED type luminaires, located at a linear spacing no greater than 200 feet (60 metres) in urban areas, 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.

Installation of all underground utilities (gas, hydro, telephone, cable) under proposed or existing roadways shall be by trenchless methods. No open cut excavation of roadways shall be permitted.

8.2 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 Village of St. Pierre-Jolys. Unless otherwise specified by the Village, all signs shall be mounted on a 2 inch (50 mm) diameter galvanized steel posts. Type of signs (i.e. stop signs, end of road signs, curve signs, etc.) and location to be determined by the Village of St. Pierre-Jolys.

9.0 BOULEVARD AND LOT GRADING

9.1 Boulevards

Boulevards shall be graded with positive slope from the front property line to the edge of road subsequent to utility and road construction (min. 2%, max 6% crossfall).

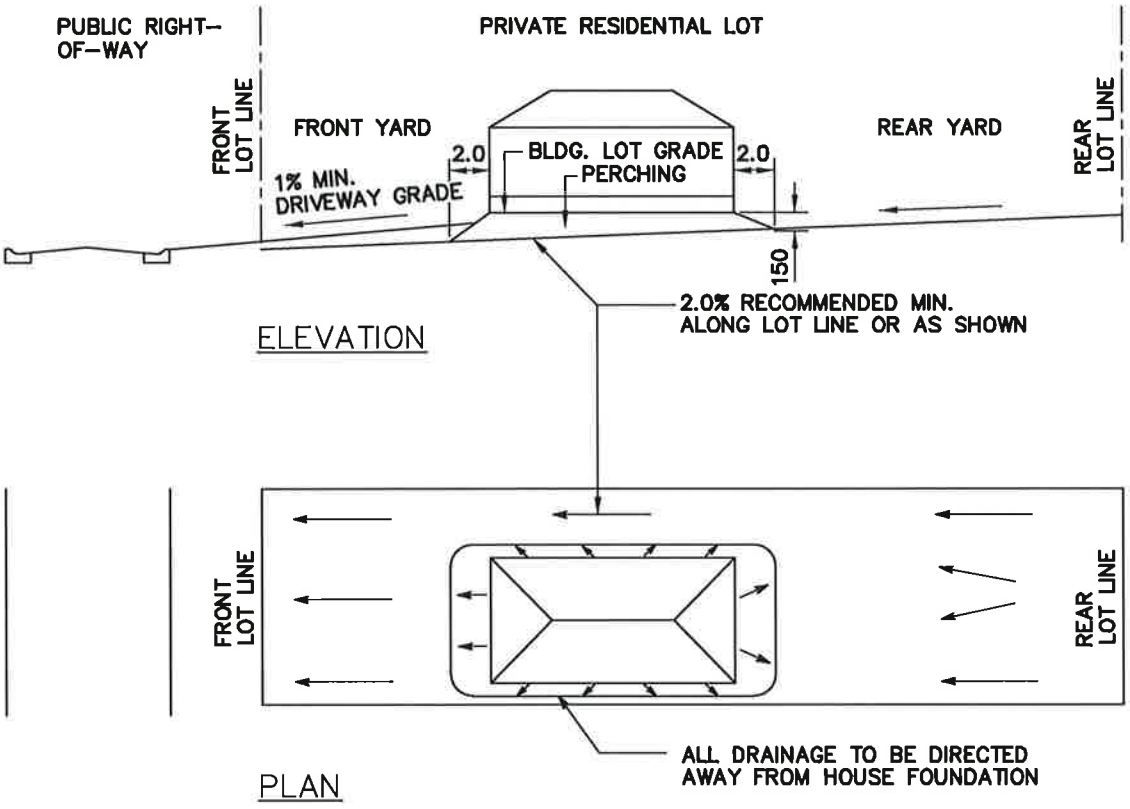
9.2 Lots

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 gutters, as applicable. 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.

9.2.1 Urban Lots

Houses shall be "perched" with a minimum 6 inch (150 mm) berm around the foundation, and 2% min., 4% max, grade along the lot line to the gutter. All lot grading shall be sloped back to front. No split lot drainage shall be permitted, unless approved by the Village of St. Pierre.



RESIDENTIAL BACK TO FRONT LOT DRAINAGE

NOTES:

1. BUILDING TO BE SURROUNDED WITH "PERCHING".
2. BUILDING LOT GRADE TO BE FINISHED LANDSCAPE ADJACENT TO BUILDING.
3. PERCHING TO EXTEND BEYOND BUILDING AS FOLLOWS:
   A) FRONT & REAR – 2.0 METRE (MIN.)
   B) SIDE – 1.0 METRE (MIN.)
4. SIDE YARD SLOPE ALONG LOT LINE – 2.0% RECOMMENDED (MIN.)

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TITLE: LOT GRADING CRITERIA		REVISION: REV_#
DRAWN BY: A.L.M.	SCALE: N.T.S.	DATE: 2017/09/01
CHECKED BY: M.P.M.	PROJECT NO: 171-10649-00	SUPPLEMENTAL NO: G08

10.0 PARKS

10.1 Greenspace / Public Reserve

10.1.1 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 as indicated in the development agreement.

All new subdivisions will be subject to policies adopted by Council regarding boulevard and green space horticulture, is indicated in the development agreement.

10.1.2 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 Village. No debris shall be buried on any public reserve, lot, or road right-of-way. In order to grant substantial completion for municipal surface works for a subdivision, topsoil (minimum 3 inches (75mm)) and seed shall be placed on all Public Reserves.

10.1.3 Weed Control

The Developer shall be responsible for weed control on all undeveloped lots in the subdivision. Weeds shall not exceed 6 inches (150mm) in height. If the weeds are not controlled, and the Village is required to provide any weed control, the cost shall be billed to the Developer.

11.0 CONCRETE

Concrete shall conform to the following:

	Curb & Gutter	Sidewalk
Compressive strength (28 day)	4640 psi (32 MPa)	4350 psi (30 MPa)
Minimum cement content	575 lb/cu.ft. (335 kg/m^3)	(same)
Maximum / water cement ratio	0.49:1	(same)
Maximum slump	3 - 1/6 in. (80 mm)	4 inch (100 mm)
Aggregate size (normal)	3/4 in. (20 mm)	(same)
Air content	5 - 7%	(same)
Cement type	CSA A5-M Type 10	(same)
Air entraining agent	CSA A266-1-M	(same)
Water reducing agent	CSA A266-2-M	(same)
Joint sealer	ASTM D1751	-
Reinforcing steel	CSA G30.12M	-
Reinforcing mat	Grade 40 bars	-
Curing compound	CGAB 90-GP-la	-

12.0 QUALITY ASSURANCE

12.1 Installation

All public works shall be installed to recognized engineering standards (MWSB, Department of 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, and all utilities shall be notified.

12.2 Testing

Gravity sewers shall be Mandrel Tested and closed circuit television tested with a digital copy of the testing, and a written report, being provided for review and acceptance by the Village of St. Pierre. Low pressure sewers shall be pressure tested to 75 psi (525 kPa). Pressure testing shall incorporate a certified recording chart system.

The roadway subgrade adequacy, sub-base and base course thickness and density (at maximum 330 feet (100 metre) spacing), asphalt thickness and quality, and concrete shall be checked and tested by the design Engineer or testing laboratory, as applicable.

To ensure quality, there shall be on the site, throughout the construction, the registered professional engineer who was responsible for the design, or an authorized representative of that engineer.

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 Village of St. Pierre.

No building permits shall be issued until substantial completion of underground and surface works have been achieved.

12.3 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.

13.0 PLANS

13.1 Preliminary Documents

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

- Proposed wastewater, and land drainage sewers, indicating size and location.
- 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 (diameters and lengths) 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.

13.2 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, including an electronic pdf copy, shall be submitted to the Village of St. Pierre upon substantial completion of the work.

13.3 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 Village of St. Pierre Public Works. The Village, or their designated representative, shall be the sole judge as to the nature and cause of any defect and shall stipulate appropriate means by which the Contractor or design engineer must remedy any defect.

Prior to the expiration of the warranty period, a final site review will be conducted with all above parties present. The warranty period will only be terminated if the Village of St. Pierre, or their designated representative, is satisfied that all deficiencies have been rectified.