



**CITY OF MAPLE RIDGE**

**DESIGN AND CONSTRUCTION DOCUMENTS**

**PART 5**

**WATER METER MATERIAL SPECIFICATIONS  
&  
DESIGN GUIDELINES**

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## 1. INTRODUCTION

### 1.1 Preamble

This document outlines the *City's* requirements for the installation of cold-water meters on municipal water services, pursuant to Council Policy.

### 1.2 Content and Intent

This document is divided into four separate parts:

Introduction – which outlines the purpose of this document, defines key terms, and outlines the responsibilities of each party.

Material Specifications – which are intended to provide direction to the *Applicant* and *Applicant's Engineer* regarding approved products, materials, and other specifications that must be incorporated into the design of the new water service and water meter.

Design Guidelines – which are intended to provide direction to the *Applicant* and *Applicant's Engineer* on the elements that need to be considered in the design of new water meter installations.

Appendices – which provide reference material including a water meter sizing calculation sheet and sample water meter installation drawings.

### 1.3 Definitions

<b><i>Applicant</i></b>	means a property <i>Owner</i> or their authorized agent including the developer of the property or the builder of premises on the property, who makes an application for a water service connection or a re-connection to an existing water service.
<b><i>Applicant's Engineer</i></b>	means a professional engineer engaged by the <i>Applicant</i> to design the water service connection and water meter.
<b><i>ASTM</i></b>	stands for the American Society for Testing and Materials.
<b><i>AWWA</i></b>	stands for the American Water Works Association.
<b><i>City</i></b>	refers to the City of Maple Ridge.
<b><i>CSA</i></b>	stands for the Canadian Standards Association.
<b><i>FM</i></b>	stands for Factory Mutual.
<b><i>NFPA</i></b>	stands for National Fire Protection Association.
<b><i>Owner</i></b>	with respect to real-estate, has the same meaning as defined in the British Columbia Community Charter.

*ULC*

stands for Underwriters Laboratory of Canada.

#### **1.4 Responsibilities**

The *City* of Maple Ridge By-Law No. 6002-2001 outlines metering requirements for specific property types and land uses.

The *Applicant* or *Applicant's Engineer* is responsible for determination of the appropriate size and type of water meter as well as the design of the complete meter installation. The water meter design must be reviewed and accepted by the *City* prior to initiation of any on-site works associated with the water meter installation.

For all new water services where the meter is located on private property, the *Applicant* is responsible for the supply and installation of the meter and all associated components.

Metering requirements and designs for all water services intended for fire-fighting uses (dedicated fire lines and combined domestic/fire lines) shall be reviewed and accepted by the *City*. The *Applicant* is responsible for the supply and installation of the meter and all associated components for all fire service installations.

## 2. MATERIAL SPECIFICATIONS

### 2.1 Water Meters

2.1.1 The following meters are acceptable for use in the *City*:

**Table 1 – Accepted Water Meters**

Manufacturer	Model	Type
Neptune	T-10	Positive Displacement
	TRU/FLO	Compound
	HP Protectus III	Fire Service
Sensus	SR II	Positive Displacement
	OMNI C2	Compound
	OMNI F2	Fire Service

For specific circumstances involving irrigation or bulk water supply, the *City* may accept the use of a turbine meter.

2.1.2 Water meters shall meet the following AWWA standards:

- Positive displacement meters must conform to AWWA C700.
- Turbine meters must conform to AWWA C701.
- Compound meters must conform to AWWA C702.
- Fire service meters must conform to AWWA C703.

2.1.3 For all meters with base plates, the base plate shall be cast iron for outside installations and bronze for inside installations. Plastic base plates are not acceptable.

2.1.4 All 38mm and 50mm diameter meters shall have oval two-bolt flanges.

2.1.5 All meters must be new. Used or refurbished meters are not acceptable.

### 2.2 Registers

2.2.1 Registers shall be absolute encoder-type remote-registration conforming to AWWA C707. Registers utilizing generator pulses, low voltage conversions, or with internal battery power are not accepted by the *City*. Power necessary for data transmission must be supplied by an interrogation device. Registers must be compatible with Neptune walk-by, mobile, and R900 Gateway interrogation systems.

2.2.2 The register must provide at least six-digit visual registration at the meter with the capability to simultaneously encode (in digital format) at least six-digits of the meter reading for transmission through the remotely located receptacle. Each reading encoded electronically must include the meter identification number and record the read to the nearest cubic metre (m<sup>3</sup>).

2.2.3 Registers must have visual display capabilities for leak detection by means of a full test sweep hand/dial or an electronic flow indicating display.

- 2.2.4 Registers utilizing number wheels must be provided with spring type or magnetic sensing type contacts to ensure a high probability of data transmission.
- 2.2.5 All registers must be programmed with a multiplier of 1.0 and shall record measurement units in cubic metres (m<sup>3</sup>). The unit of measurement, month and year of manufacture, and other identification information must be clearly printed on the face of the register.
- 2.2.6 All registers must be factory sealed to prevent tampering and to provide protection for internal components suitable for operation in humid or submerged conditions. Registers must be removable from the meter without disassembling the meter body, and must permit field installation or removal without taking the meter out of service.
- 2.2.7 All registers for meters 75mm diameter and larger must have data logging capabilities and able to store a minimum of 35 days of hourly data. Battery life must be guaranteed for a minimum of 10 years.
- 2.2.8 Registers must be new. Used or refurbished registers are not acceptable.

### 2.3 Remote Receptacles

- 2.3.1 Neptune E-Coder R900i radios shall be installed for all Neptune meter installations and Neptune R900 MIU radios shall be installed for all Sensus meter installations.
- 2.3.2 Remote receptacles must be either wall mount or pit mount style. Remote receptacles must not include a remote display or data storage.
- 2.3.3 The materials employed must be resistant to corrosion, ultraviolet degradation, rain, condensation, and suitable for rugged service for the duration of their expected life.
- 2.3.4 The unit must provide for mechanical and electrical connection between the receptacle and interrogation equipment. Interrogation must be achieved by inductive coupling without physical connection of the reading device.
- 2.3.5 Colour coded (red, green, black), 22 gauge, three-wire terminals must be provided. Excess wire must be looped and fastened to the building wall or chamber lid.
- 2.3.6 For wall mounted receptacles, the receptacle shall be sealed with the terminal screws concealed by the receptacle.
- 2.3.7 The receptacle construction must incorporate the function of a cable clamp or strain relief coupling.
- 2.3.8 The receptacle shall be mounted such that it is free and accessible by the meter reader or *City* staff.

### 2.4 Valves

- 2.4.1 Valves up to 50mm diameter must meet AWWA C800 and must have bronze case with National Pipe Threaded (NPT), soldered, compression type, or flange connections.



Valves may be ball or cylinder type using rubber o-ring seals. Activation shall be via curb-stop style operating nut.

**2.4.2** All bypass valves must be equipped with a lock wing on both the operating nut and case.

**2.4.3** Valves over 50mm diameter must be ductile iron, resilient seat, with non-rising stem (NRS), gate valves with flanged ends and must meet AWWA C509. Stem seal to be o-ring type. For valves accessible from the surface, activation shall be via standard 50mm square operating nut. For valves that are inaccessible from the surface (located within a chamber) shall be activated via hand wheel. In all possible and appropriate instances, a Maple Ridge style valve box must be installed over buried valves.

**2.4.4** All valves on fire service lines must comply with NFPA and British Columbia Fire Code requirements.

## **2.5 Pipe and Fittings**

**2.5.1** All water service connections 75mm diameter or larger must be restrained to the *City* watermain.

**2.5.2** All pipes, pipe fittings, and jointing methods for installation of meters 100mm diameter or larger shall comply with the latest stipulations within the *City's* Design Criteria Manual and Supplementary Specifications.

**2.5.3** All pipes, pipe fittings, and jointing methods for installation of meters 75mm diameter or smaller shall comply with the latest requirements of the British Columbia Plumbing Code and AWWA standards.

## **2.6 Flange Adapters**

**2.6.1** Flange adapters for sizes 38mm to 200mm diameter shall conform to AWWA C219.

## **2.7 Bolts and Nuts**

**2.7.1** Bolts and nuts shall be stainless steel. Bolts shall conform to ASTM F599 or ASTM F731. Heavy hex nuts shall conform to ASTM F574 or ASTM F836. Threads, fit, and dimension must conform to AWWA C111.

## **2.8 Strainers**

**2.8.1** Strainers must be straight type and of the same size as the meter.

**2.8.2** Strainer mesh material shall be corrosion resistant (such as stainless steel).

## **2.9 Double Check Valve Assembly**

**2.9.1** Backflow prevention devices shall be as per the *City of Maple Ridge* By-Law No. 6002-2001.

## **2.10 Meter Chambers**

- 2.10.1** Below-grade meter boxes and vaults shall be pre-cast concrete. The only exception is for installations with #37 meter boxes where the upper sections shall be cast iron as indicated on the Sample Meter Installation Drawings.
- 2.10.2** Lids must be capable of withstanding H-20 dynamic loading in travelled surfaces and H-20 static loading in all other areas. Lids must have two pre-drilled 45mm diameter holes to facilitate mounting of a remote receptacle. These holes must remain plugged until the receptacle is installed.
- 2.10.3** Lids shall be cast iron or steel checker plate for meter boxes and aluminum or galvanized steel, spring assisted hatches for meter vaults. Manhole type lids are not acceptable.
- 2.10.4** Access lids, latches, and ladders must comply with the most current WorkSafeBC requirements.
- 2.10.5** All chambers must be damp-proofed by applying grout and a black and white asphalt emulsion coating to all exterior surfaces. Construction joints must be made water-tight with an appropriate water-stop sealant. All pipe penetrations through the chamber must be sealed using grommets or link seals.

### 3. DESIGN AND INSTALLATION GUIDELINES

#### 3.1 Meter Sizing

For all existing single family residential homes without fire sprinklers, the water meter size shall be 19mm diameter, unless the *Applicant's Engineer* can demonstrate the need for a larger meter. In all other cases, the meter shall be sized in accordance with *AWWA Manual of Water Supply Practices M22 Sizing Water Service Lines and Meters* taking into account specific requirements outlined in the meter sizing calculation sheet included in **Appendix A**. To be clear, this sizing methodology is based on the *AWWA fixture value* method, and not the *fixture unit* method employed in the BC Building Code for piping within buildings.

The maximum operating range for a water meter shall not be greater than 90% of the maximum instantaneous flow capacity as outlined by the manufacturer, with a maximum pressure loss of 48 kPa (7 psi) at the design flow rate. The meter size selection should not compromise the operating range or the long term life of the meter and must ensure that pressures supplied to the property are appropriate for the intended use. In this same regard, the analysis should be sufficiently thorough to avoid unnecessarily over-sizing the meter. In some instances, this may result in a smaller meter than the water service size.

Table 2 is provided as a guide for various meter types and sizes for a range of uses and flows. The values presented in this table are based on AWWA standards and do not necessarily reflect manufacturer data. Accordingly, the *Applicant's Engineer* shall confirm that the manufacturer's performance data for the recommended meter size and type satisfies the design requirements for the given application.

**Table 2 – Meter Selection Guide**

Water Use	Land Use	Meter Size (mm)	Meter Type	Flow Rates (L/s)		
				Operating Range	Normal Continuous Flow	Maximum Flow
Domestic	Residential	16	PD	0.016 – 1.26	0.63	1.26
		19	PD	0.032 – 1.89	0.95	1.89
		25	PD	0.047 – 3.15	1.58	3.15
		38	PD	0.095 – 6.31	3.15	6.31
	Industrial Commercial Institutional	50	PD	0.126 – 10.09	5.05	10.09
		50	Compound	0.016 – 10.09	5.05	10.09
		75	Compound	0.032 – 20.19	10.09	20.19
		100	Compound	0.047 – 31.55	15.77	31.55
		150	Compound	0.095 – 63.09	31.55	63.09
Irrigation  Bulk Water Supply	Agricultural Golf Courses Parks Industrial	38	Turbine	0.25 – 7.57	5.05	7.57
		50	Turbine	0.25 – 10.09	6.31	10.09
		75	Turbine	0.50 – 22.08	15.14	22.08
		100	Turbine	0.95 – 39.75	26.50	39.75
		150	Turbine	1.89 – 88.32	58.04	88.32
		200	Turbine	3.15 – 151.42	100.95	151.42

Fire service meters shall be sized based on Fire Underwriters Survey requirements for on-site hydrants and NFPA standards for sprinkler systems.

### 3.2 Meter Selection

#### Domestic Services

Water meters that are accepted by the *City* are listed in Table 1 of Section 2.1.1. Meter selection requirements regarding sizing are discussed in Section 3.1.

Unless accepted by the *City*, a single domestic meter is to be installed per property. The only exception is duplex units where two separate domestic meters are to be installed.

#### Dedicated Fire Services

With the exception of single family and duplex dwellings, all dedicated fire services must be equipped with a FM approved/ULC listed double check detector valve assembly to detect unauthorized water use. The receptacle for the tattle tale meter must be mounted such that it is accessible for the meter reader and *City* staff. A weather-resistant tag indicating "Tattle Tale Meter" must be attached to the receptacle.

All double check detector valve assemblies shall be factory supplied and installed as a complete unit.

#### Combined Fire/Domestic Services

Where the *Applicant* proposes a combined fire and domestic service, a FM approved/ULC listed water meter and backflow prevention device assembly shall be installed. Fire service meters that are reviewed and accepted by the *City* are listed in Table 1 of Section 2.1.1.

### 3.3 Meter Location

Unless otherwise accepted by the *City*, all meters shall be installed outside in a box or vault adjacent to the property line.

For single family detached homes, the meter box shall be located within the *City* right-of-way, 300mm from the property line. For all other cases, the meter box/chamber shall be located within private property, 300mm from the property line. If the *City* watermain is within a right-of-way on private property, the meter box/chamber should be located outside of the right-of-way.

For all outside meter installations, an area of at least 1 metre horizontal and 2 metres vertical around the meter box/chamber must be free of major landscaping or obstructions to provide access for *City* staff. Whenever possible, locating meter boxes/chambers within driveways or parking areas should be avoided.

If an inside meter installation is approved, the meter must be located such that is accessible for maintenance, reading, and inspection by *City* staff. Meters installed in a utility room, or elsewhere inside a building, shall be within reasonable distance of a floor drain. Meters are not to be installed in bedrooms or bathrooms. An area of at least 1 metre horizontal and 2 metres vertical from the meter shall remain free of obstruction to provide access for *City* staff. No electronic, electrical, mechanical, or other water sensitive equipment or machinery should be placed or installed under the meter installation, or in an area where splash or flow from the meter assembly could occur during servicing of the meter.

### 3.4 Meter Configuration

Meters shall be installed horizontally with register faces oriented vertically.

Straight pipe lengths upstream and downstream of the meter (including the presence of bypass tees, isolation valves, reducers, and any other fittings) shall comply with manufacturer's recommendations for optimal meter accuracy.

Meters, strainers, valves, bypasses and associated piping or fittings shall be supported by appropriate steel pipe stands.

For all meters 50mm diameter or larger, except when installed on a setter, a coupling must be installed on the downstream side of the meter to provide flexibility if the meter needs to be removed.

Table 3 below summarizes general installation components of various meter types and sizes. This table is not inclusive of all elements that need to be considered to satisfy the City's metering requirements. It is provided solely for reference.

**Table 3 – Meter Installation Guide**

Meter Size (mm)	Meter Type	Bypass Required	Strainer Required	Setter Required
16	PD	No	No	Yes
19	PD	No	No	Yes
25	PD	No	No	Yes
38	PD	Yes	No	Yes
50	PD	Yes	No	Yes
50	Compound	Yes	Yes	*
75	Compound	Yes	Yes	No
100	Compound	Yes	Yes	No
150	Compound	Yes	Yes	No
200	Compound	Yes	Yes	No

\* Setter installation acceptable for 50mm Sensus OMNI C2 meters.

#### 3.4.1. Isolation Valves

Isolation valves must be provided upstream and downstream of the meter assembly to facilitate the removal of the water meter and strainer. Valves shall comply with the requirements stated in Section 2.4.

Isolation valves shall be located inside the chamber and operated by a handwheel.

#### 3.4.2. Bypasses

Bypasses are to be installed as indicated in Table 3.

For domestic services, the bypass shall be no less than half the size of the meter setter or service connection. For fire services, a full size bypass shall be provided.

As per Section 2.4.2, all bypass valves must be equipped with a lock wing on both the operating nut and case. After testing the installation, the bypass valve shall be closed and sealed by the installer.

#### **3.4.3. Setters**

All positive displacement meters located in exterior meter boxes shall be installed on a setter. Re-setters shall only be installed when approved by the *City*.

38mm and 50mm diameter Sensus OMNI C2 meters may be installed on a setter, provided that the setter is equipped with a high bypass and flanged inlet/outlet connections.

All setters shall include full port inlet ball valves.

#### **3.4.4. Strainers**

Where required, as stated in Table 3, strainers shall be installed immediately upstream of the meter using flanged connections. For meters not supplied inclusive of a strainer, the strainer shall be installed as per manufacturer's specifications.

Sufficient area must be provided within the chamber to drain, inspect, and clean the strainer.

#### **3.4.5. Test Ports**

Test ports must be provided for all meters 50mm and larger in diameter. In the absence of a test port on the meter case, a test tee must be installed with a 50mm threaded lateral and plug at a distance of three pipe diameters downstream of the meter.

#### **3.4.6. Chambers**

The *Applicant* is responsible for selecting the appropriate chamber for a given application that satisfies the *City's* requirements, including specifications noted in Section 2.10.

Chamber lids/hatches shall be large enough to facilitate service or replacement of the complete meter assembly including the meter, strainer, and isolation valves.

The minimum distance between the inside chamber walls and outside edges of pipe shall be 300mm to provide sufficient space for maintenance. At least 600mm separation shall be provided between the water service line and bypass.

All below-grade chambers shall include a drain connected to the *City's* stormwater collection system. Where a gravity connection is not available, the *City* may accept a hydraulic eductor assembly or electric sump pump.

#### 3.4.7. Receptacles/Radios

For outside meters installed at the property line, remote register receptacles must be mounted to the meter box/chamber lid according to the manufacturer's instructions. Receptacles must be provided with at least 1.8 metres of 22 gauge, three-colour (red, green, black) wire connected and sealed at the receptacle without terminal exposure. Remote wiring connections must be either factory or field sealed to ensure that the connection is waterproof.

Wall mounted remote receptacles must be mounted approximately 1.2 metres above-grade and easily accessible for reading. The wire from the meter to the receptacle must be installed in accordance with the manufacturer's instructions and must not exceed 30 metres in length. The cable must run neatly in horizontal or vertical directions only, in an approved casing or duct. Buried casings or ducts should be at least 600mm deep. Any penetrations through the building wall to facilitate remote receptacle mounting shall be sealed with sealing compound.

Compound meters with two registers must have a separate remote receptacle mounted to the box/chamber lid or wall for each register.

### 3.5 Applicant Submissions

An *Applicant's* submission of an Application for Water Service to the *City* shall include sufficient detail to support the proposed water meter installation including:

- Size of the water service connection;
- Meter size supported by water demand calculations as per Appendix A for all meters 50mm diameter or larger;
- Meter type, manufacturer, and model;
- Meter location relevant to property line and building footprint depicted on a site plan (1:500 scale);
- Meter chamber layout depicted on a detail drawing (1:250 scale);
- Discharge location for chamber drain;
- Land use(s);
- Presence of on-site fire hydrants or fire sprinklers;
- Presence of irrigation systems;
- Future development phases for the property; and
- Any other relevant information regarding the proposed meter installation.

For all meters 50mm diameter or larger, the *Applicant* must submit drawings and calculations sealed by the *Applicant's Engineer* to support the proposed meter size, type, configuration, and installation plan.

Submissions not in substantial conformity to the *City Water Meter Material Specifications & Design Guidelines* and the BC Plumbing Code will be rejected by the *City*. The *Applicant* shall not proceed with the water meter installation without the prior acceptance of the *City*.

### 3.6 Sample Meter Installation Drawings

Sample meter installation drawings are provided in **Appendix B**. These drawings are provided as a guide for the *Applicant* and *Applicant's Engineer* and are intended to illustrate some of the common meter installation scenarios in the *City*. The *Applicant* and *Applicant's Engineer* are responsible for the property specific water meter design.



## APPENDIX A

### Water Meter Sizing Calculation Sheet

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## Water Meter Sizing Calculation Sheet

AWWA M22 Fixture Value Methodology

### General Information

Customer Name \_\_\_\_\_  
Address \_\_\_\_\_  
PID Number \_\_\_\_\_

Occupancy Type:                      Multifamily \_\_\_\_\_ Institutional \_\_\_\_\_ Commercial \_\_\_\_\_  
   Industrial \_\_\_\_\_ Agricultural \_\_\_\_\_ Other \_\_\_\_\_

### Step 1: Calculate Customer Total Fixture Value

Fixture	AWWA Fixture Value (GPM @ 60 psi)		No. of Fixtures		Fixture Value
Bathtub	8	x	_____	=	_____
Bedpan Washers	10	x	_____	=	_____
Bidet	2	x	_____	=	_____
Dental Unit	2	x	_____	=	_____
Dishwasher	2	x	_____	=	_____
Drinking Fountain - Public	2	x	_____	=	_____
Hose Bibs (c/w 50 ft wash down):					
- 1/2 inch	5	x	_____	=	_____
- 5/8 inch	9	x	_____	=	_____
- 3/4 inch	12	x	_____	=	_____
Kitchen Sink	2.2	x	_____	=	_____
Lavatory	1.5	x	_____	=	_____
Showerhead (Shower only)	2.5	x	_____	=	_____
Service Sink	4	x	_____	=	_____
Toilet:					
- Flush Valve	35	x	_____	=	_____
- Tank Type	4	x	_____	=	_____
Urinal:					
- Pedestal Flush Valve	35	x	_____	=	_____
- Wall Flush Valve	16	x	_____	=	_____
Wash Sink (Each Set of Faucets)	4	x	_____	=	_____
Washing Machine	6	x	_____	=	_____
Other:					
_____		x	_____	=	_____
_____		x	_____	=	_____
_____		x	_____	=	_____
Combined Fixture Value Total				=	_____ GPM (A)

### Step 2: Calculate Customer Probable Peak Demand

Refer to Figure 4-2 or 4-3                      Customer Peak Demand = \_\_\_\_\_ GPM (B)

### Step 3: Apply Pressure Adjustment Factor

City water system pressure = \_\_\_\_\_ psi  
Pressure factor from Table 4-1 = \_\_\_\_\_ (C)  
Customer Adjusted Peak Demand (B x C) = \_\_\_\_\_ GPM (D)

### Step 4: Calculate Irrigation Demand

Underground Sprinklers:

		No. of Sections *		
- Spray System	1.16	x	_____	= _____
- Rotary System	0.4	x	_____	= _____

\* 100 ft<sup>2</sup> Irrigation Area = 1 Section

Total Irrigation Demand = \_\_\_\_\_ GPM (E)

### Step 5: Calculate Total Peak Fixed Demand

		% at Peak Demand		
Domestic Demand from Step 3 (D)	_____	x	_____	= _____
Irrigation Demand from Step 4 (E)	_____	x	_____	= _____

Total Peak Fixed Demand = \_\_\_\_\_ GPM (F)

### Step 6: Select Water Meter

Water Meter Make / Model: = \_\_\_\_\_  
Water Meter Size \* = \_\_\_\_\_ inches  
Water Service Connection Size = \_\_\_\_\_ inches  
Meter Location (outside / inside) = \_\_\_\_\_

\* Total Peak Fixed Demand (F) not to exceed 90% of Meter Rated Peak Instantaneous Flow  
\* Pressure Loss at Total Peak Fixed Demand (F) not to exceed 7 psi

### Professional Certification (Applicant's Engineer)

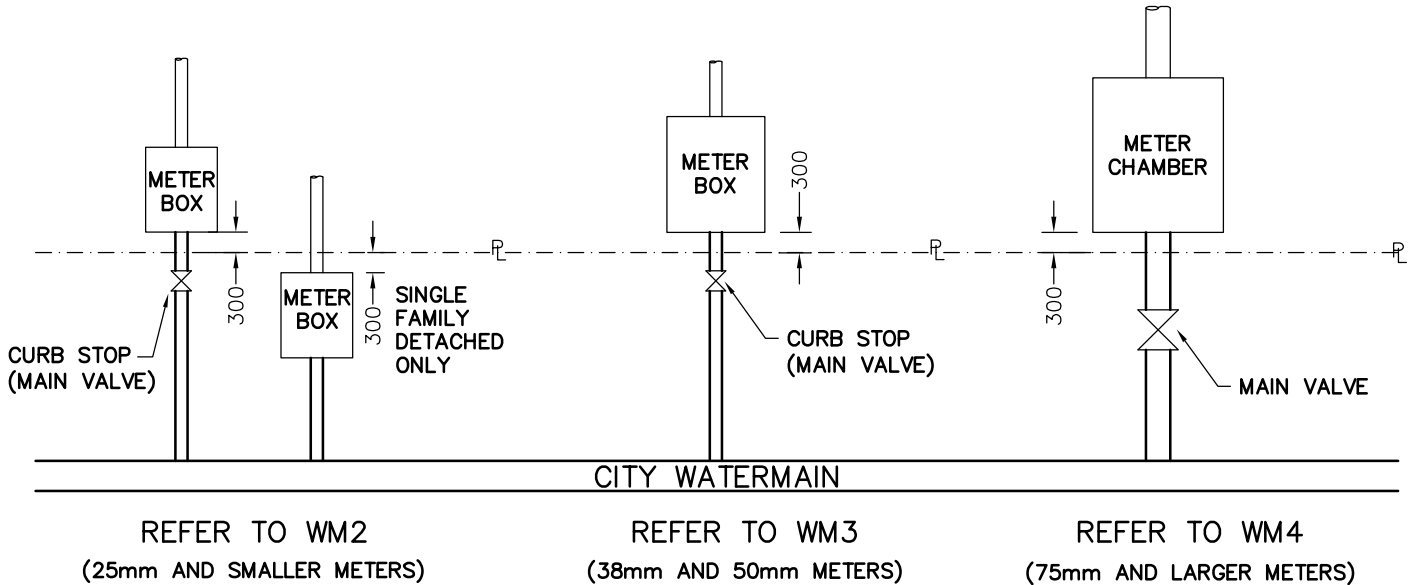
Name: \_\_\_\_\_  
Company: \_\_\_\_\_  
Date: \_\_\_\_\_  
Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
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\_\_\_\_\_  
\_\_\_\_\_

## APPENDIX B

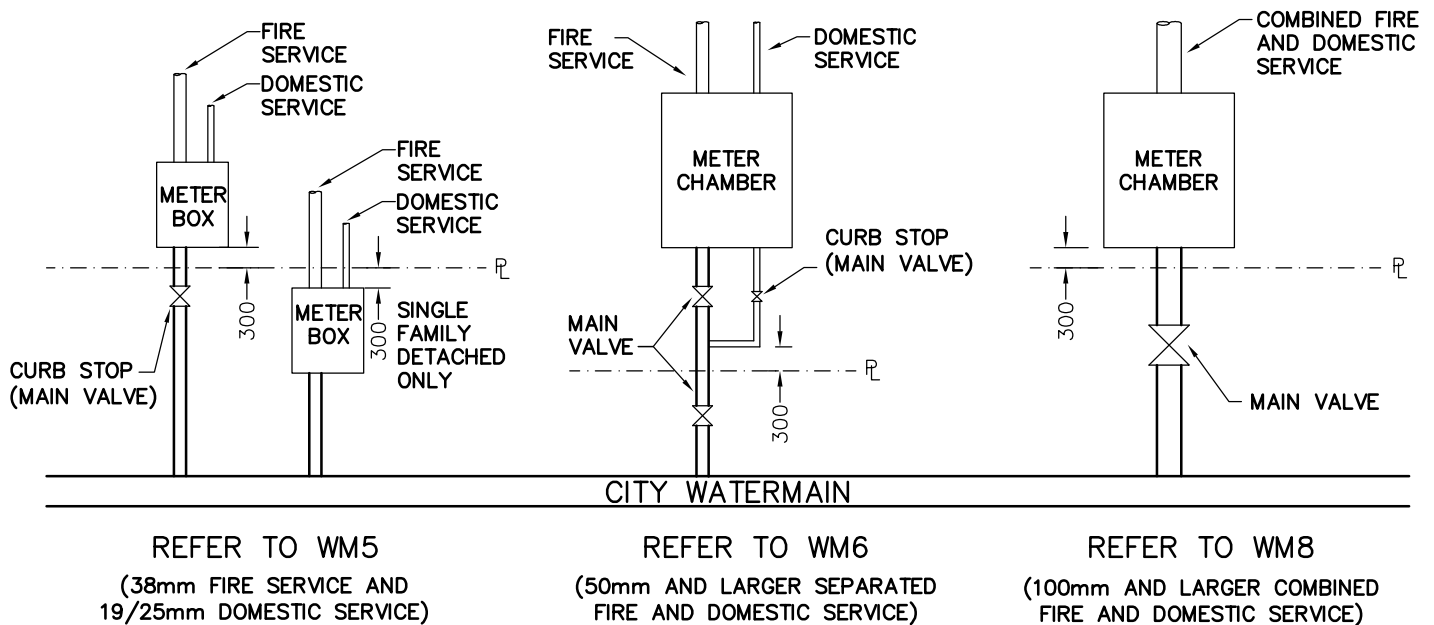
### Supplementary Standard Detail Drawings - Water Meter Installation

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# DOMESTIC SERVICE CONNECTION



# DOMESTIC AND FIRE SERVICE CONNECTION



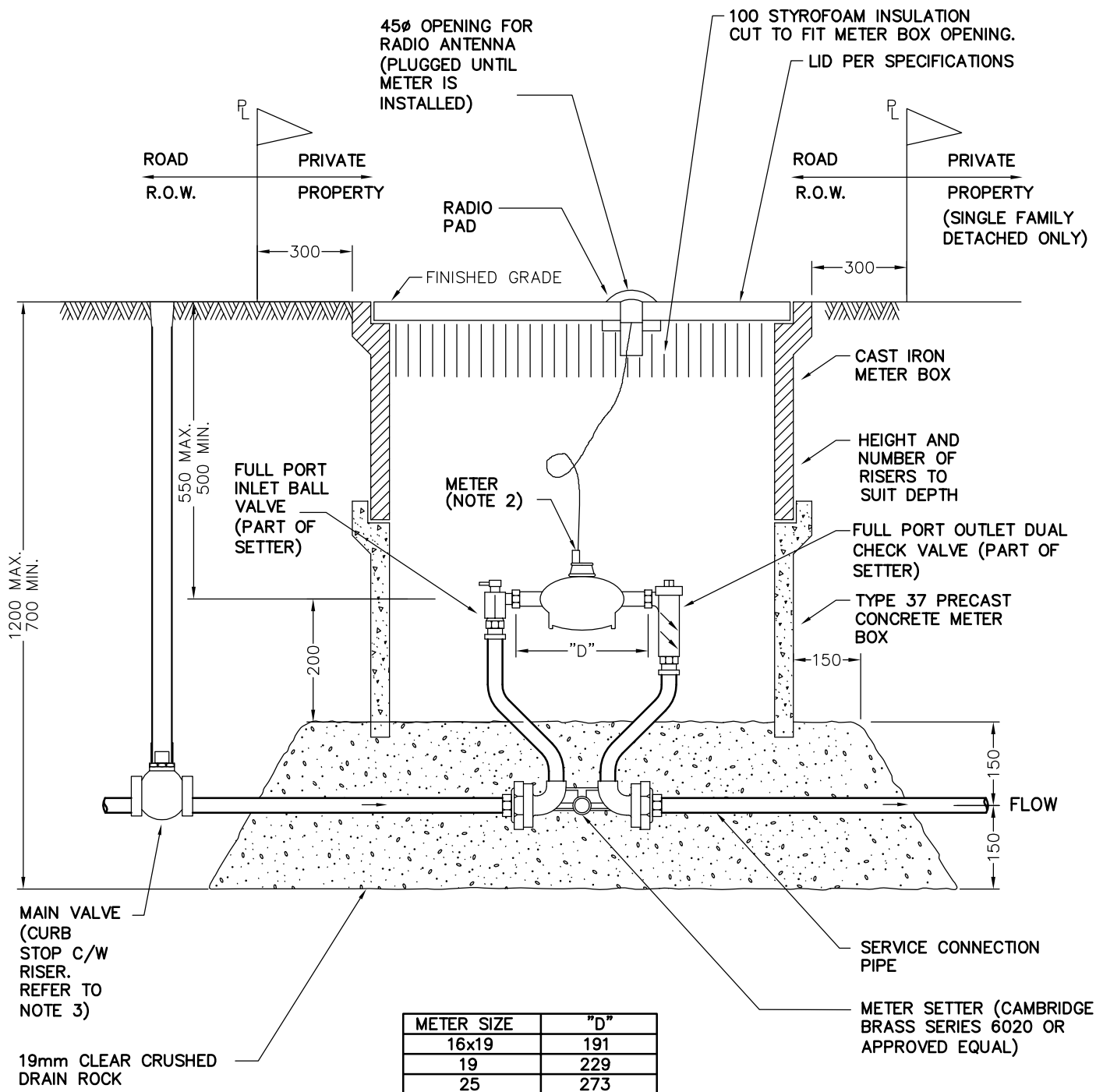
\* NOTE: ALL DIMENSIONS IN MILLIMETRES

## GENERAL LAYOUT WATER METER INSTALLATION AT PROPERTY LINE



CITY OF MAPLE RIDGE  
ENGINEERING DEPARTMENT  
SUPPLEMENTARY STANDARD DETAIL DRAWINGS

NO.	DATE	REVISION	DWG No.
DESIGN:	DATE: FEB. 2015	DRAWN: GI SCALE: NTS	WM1



NOTES:

- THIS DRAWING SHOULD BE REVIEWED IN CONJUNCTION WITH THE DOCUMENT, "WATER METER MATERIAL SPECIFICATIONS AND DESIGN GUIDELINES"
- WATER METERS APPROVED FOR USE IN THE CITY OF MAPLE RIDGE ARE LISTED IN TABLE 1 OF THE "WATER METER MATERIAL SPECIFICATIONS AND DESIGN GUIDELINES"
- CURB STOP ONLY TO BE INSTALLED FOR METER BOXES LOCATED ON PRIVATE PROPERTY

\* NOTE: ALL DIMENSIONS IN MILLIMETRES

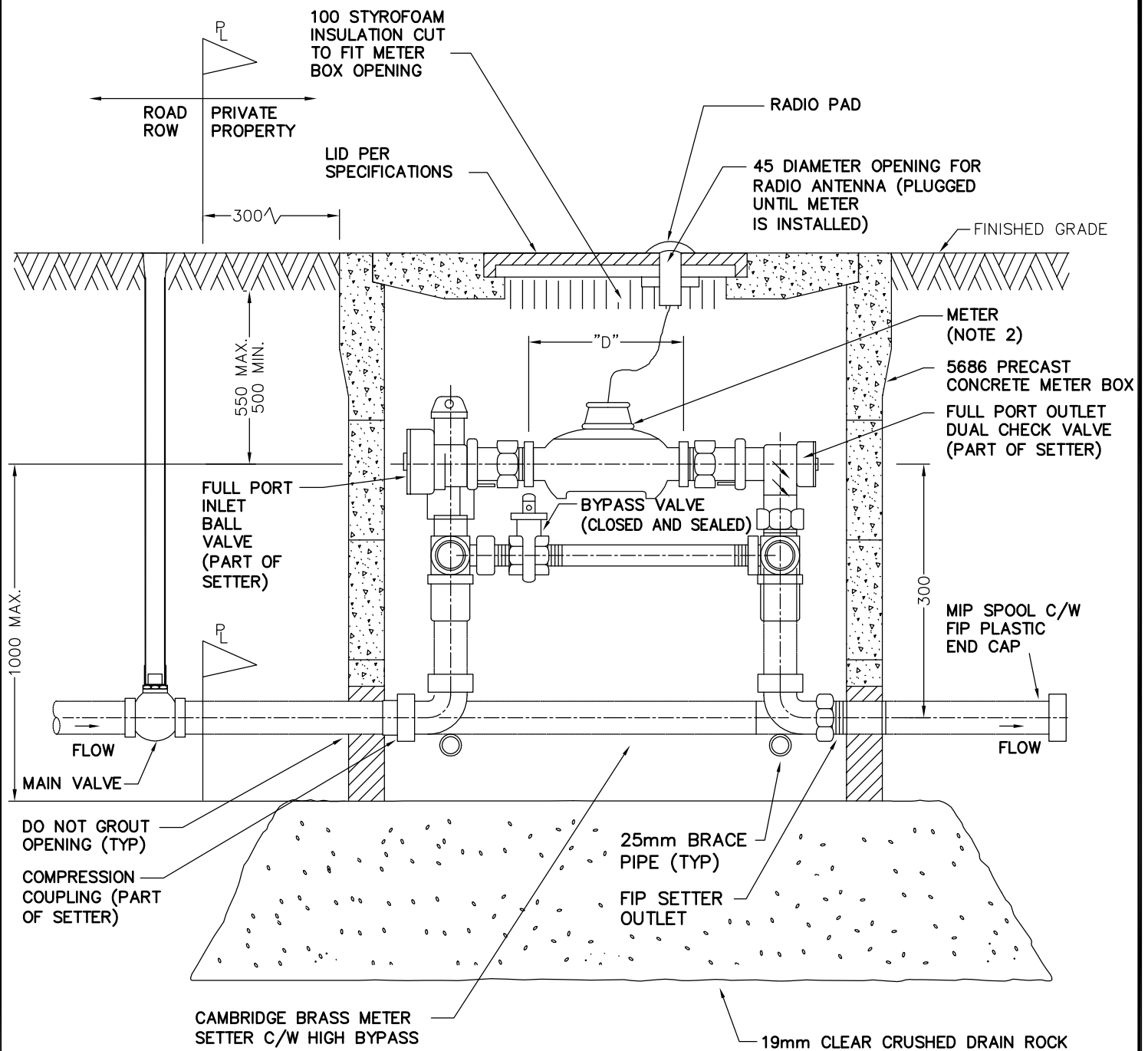
## METER CHAMBER INSTALLATION FOR METERS 25mm AND SMALLER



CITY OF MAPLE RIDGE  
ENGINEERING DEPARTMENT  
SUPPLEMENTARY STANDARD DETAIL DRAWINGS

NO.	DATE	REVISION		DWG No.
DESIGN:		DRAWN:	GI	WM2
DATE:	FEB 2015	SCALE:	NTS	





METER SIZE	' D '
38	330
50	432

**NOTES:**

- ① THIS DRAWING SHOULD BE REVIEWED IN CONJUNCTION WITH THE DOCUMENT, "WATER METER MATERIAL SPECIFICATIONS AND DESIGN GUIDELINES"
- ② WATER METERS APPROVED FOR USE IN THE CITY OF MAPLE RIDGE ARE LISTED IN TABLE 1 OF THE "WATER METER MATERIAL SPECIFICATIONS AND DESIGN GUIDELINES"

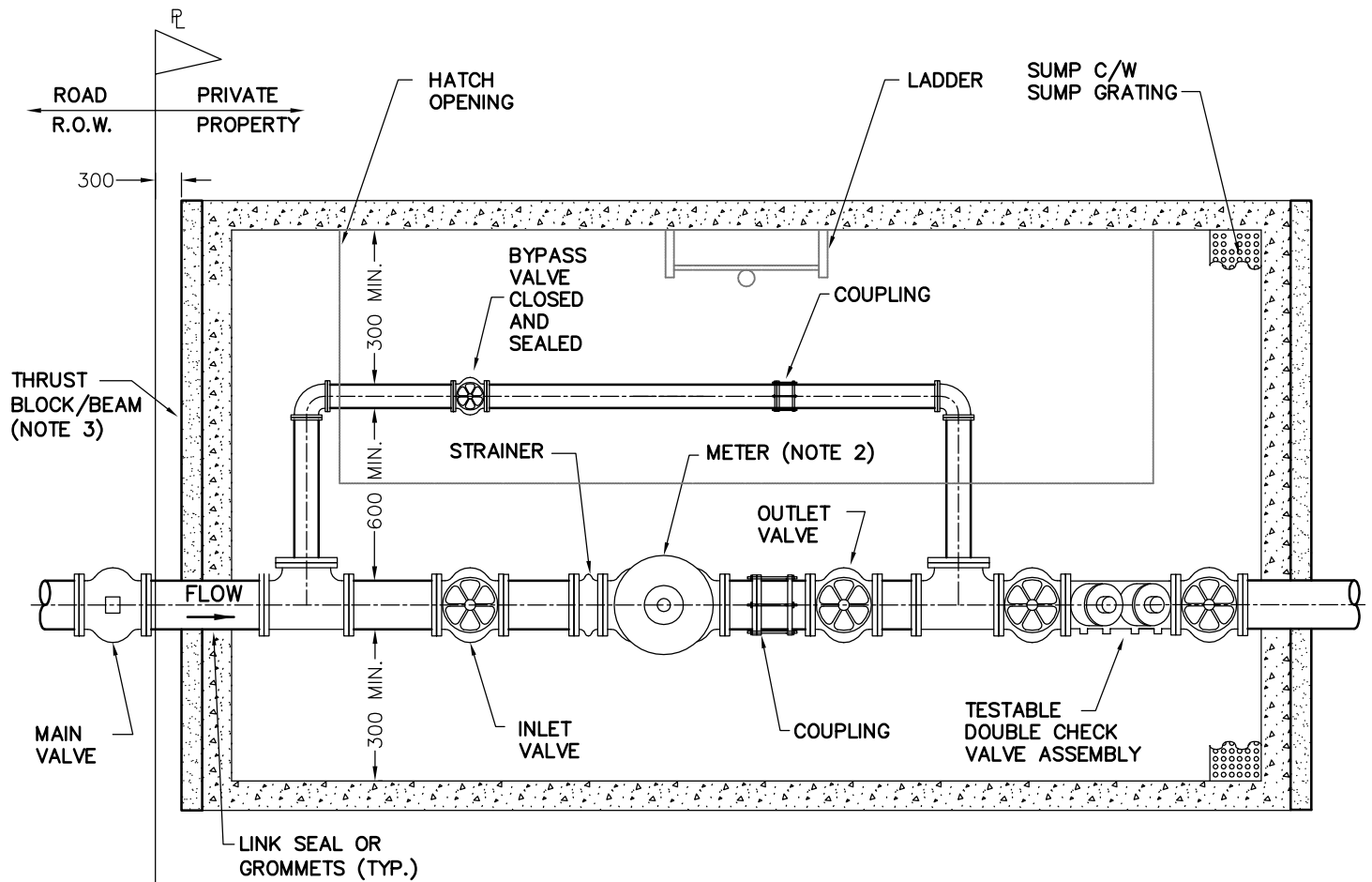
\* NOTE: ALL DIMENSIONS IN MILLIMETRES

## METER CHAMBER INSTALLATION FOR 38mm AND 50mm METERS



CITY OF MAPLE RIDGE  
ENGINEERING DEPARTMENT  
SUPPLEMENTARY STANDARD DETAIL DRAWINGS

1	Oct-15	REMOVE PRODUCT CODE		
NO.	DATE	REVISION		
DESIGN:		DRAWN:	GI	DWG No.
DATE:	FEB 2015	SCALE:	NTS	WM3



#### NOTES

- ① THIS DRAWING SHOULD BE REVIEWED IN CONJUNCTION WITH THE DOCUMENT, "WATER METER MATERIAL SPECIFICATIONS AND DESIGN GUIDELINES"
- ② WATER METERS APPROVED FOR USE IN THE CITY OF MAPLE RIDGE ARE LISTED IN TABLE 1 OF "WATER METER MATERIAL SPECIFICATIONS AND DESIGN GUIDELINES"
- ③ PIPE ANCHORING / RESTRAINT TO BE DESIGNED BY APPLICANT'S ENGINEER
- ④ STRAIGHT PIPE LENGTHS UPSTREAM AND DOWNSTREAM OF THE METER (INCLUDING THE PRESENCE OF BYPASS TEES, ISOLATION VALVES, AND ANY OTHER FITTINGS) TO BE IN ACCORDANCE WITH METER MANUFACTURER RECOMMENDATIONS
- ⑤ VERTICAL DISTANCE BETWEEN CHAMBER FLOOR AND BOTTOM OF MAIN LINE TO BE A MINIMUM OF 300mm
- ⑥ BYPASS SHALL BE NO LESS THAN HALF OF THE SIZE OF THE MAIN LINE

\* NOTE: ALL DIMENSIONS IN MILLIMETRES

## METER CHAMBER INSTALLATION FOR 75mm AND LARGER METERS (DOMESTIC SERVICE ONLY)



CITY OF MAPLE RIDGE  
ENGINEERING DEPARTMENT  
SUPPLEMENTARY STANDARD DETAIL DRAWINGS

NO. DATE

REVISION

DESIGN:

DRAWN:

GI

DWG No.

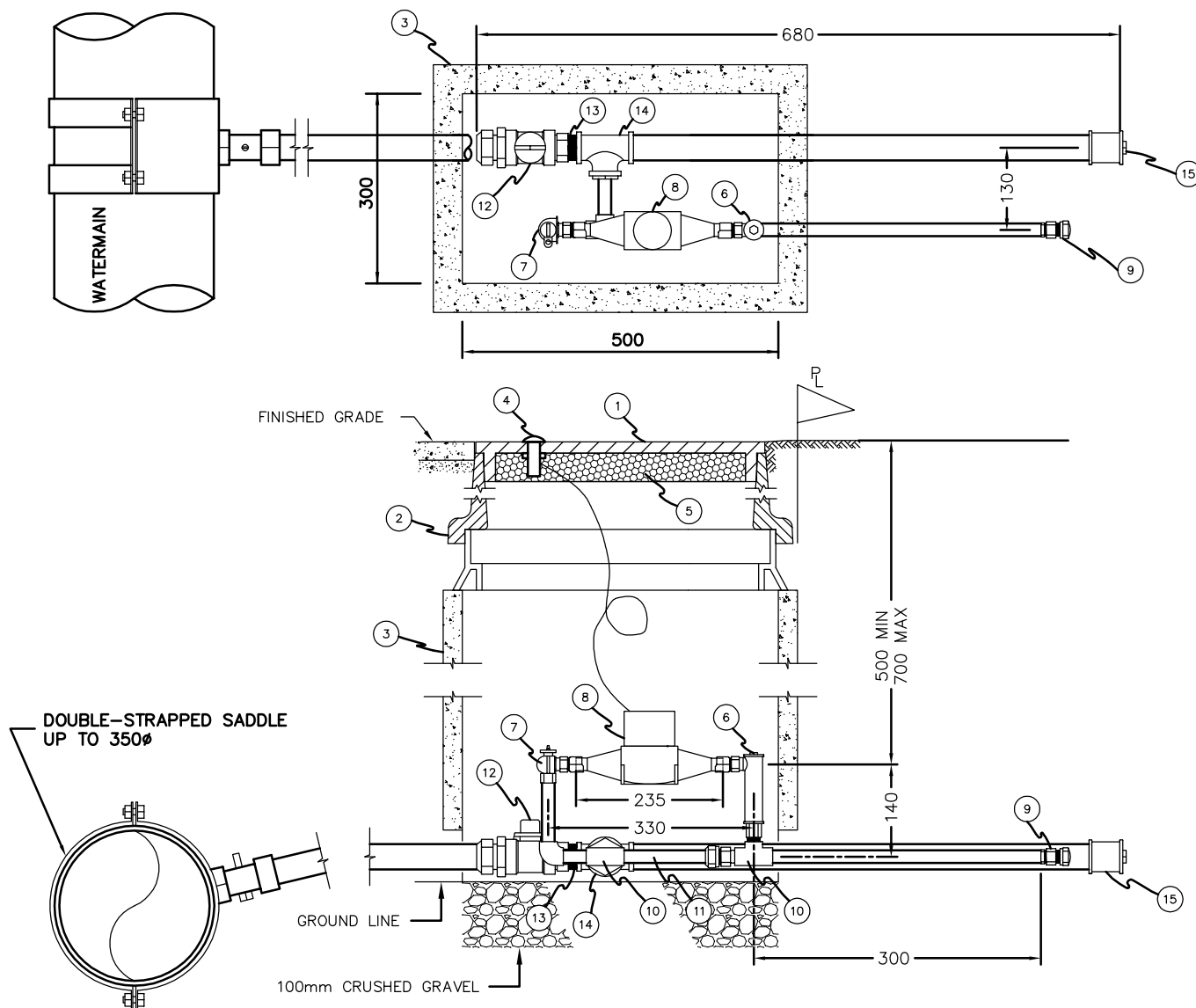
DATE:

FEB 2015

SCALE:

NTS

WM4



#### METER BOX

- ① T.C. DUCTILE IRON LID TO FIT EXTENSION PIECE OR APPROVED EQUAL
- ② T.C. DUCTILE IRON EXTENSION PIECES TO FIT BASE OR APPROVED EQUAL (MIN 2, MAX 3)
- ③ CONCRETE METER BOX (BROOKS 37)
- ④ 45mm $\varnothing$  OPENING FOR REMOTE METER SENSOR, PLUGGED UNTIL METER IS INSTALLED.
- ⑤ 100mm STYROFOAM INSULATION CUT TO FIT METER BOX OPENING.

#### NOTE:

-ALL DIMENSIONS IN MILLIMETRES  
-ALL PIPE MATERIALS ARE BRASS OR COPPER

#### 19mm $\varnothing$ METER

- ⑥ 19mm $\varnothing$  ANGLE DUAL CHECK VALVE (LOCK NUT x F.I.P. OUTLET)
- ⑦ 19mm $\varnothing$  ANGLE CURB STOP WITH LOCKING C/W SHUTOFF HANDLE
- ⑧ 19mm $\varnothing$  WATER METER (REFER TO WATER METER SPECIFICATION)
- ⑨ 25mm $\varnothing$  COMPRESSION COUPLING
- ⑩ 19mm x 19mm x 19mm TEE
- ⑪ 19mm SOLID BAR (BRASS)

#### 38mm $\varnothing$ FIRE SERVICE

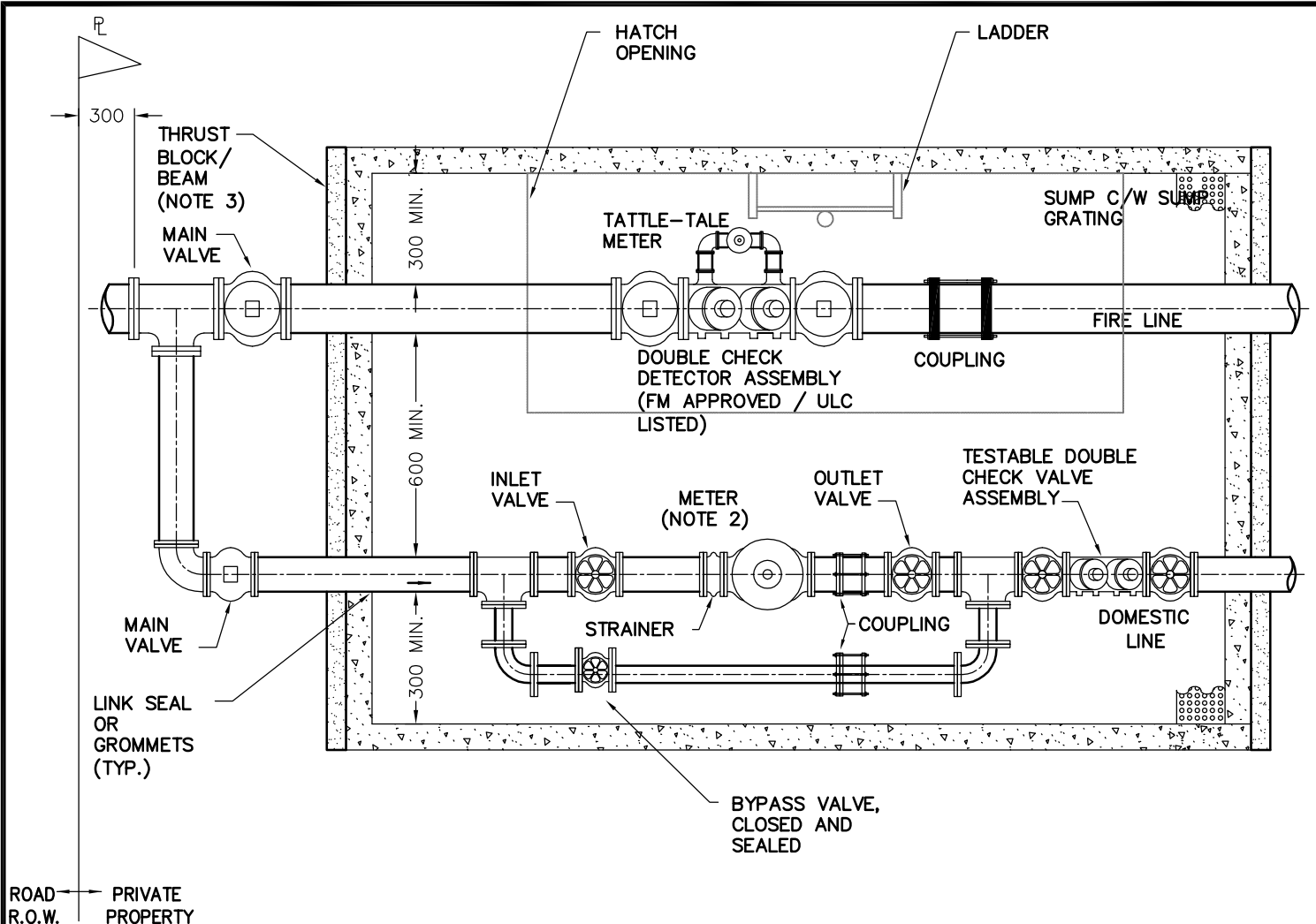
- ⑫ 38mm $\varnothing$  CURB STOP COMPRESSION x F.I.P.
- ⑬ 38mm $\varnothing$  THREADED PIPE NIPPLE (CLOSE)
- ⑭ 38mm $\varnothing$  x 38mm $\varnothing$  x 19mm $\varnothing$  TEE F.I.P.
- ⑮ 38mm $\varnothing$  MIP C/W FIP PLASTIC END CAP

## 19mm $\varnothing$ METERSETTER AND 38mm $\varnothing$ FIRE SERVICE



CITY OF MAPLE RIDGE  
ENGINEERING DEPARTMENT  
SUPPLEMENTARY STANDARD DETAIL DRAWINGS

1	OCT 2015	GENERAL REVISION
NO.	DATE	REVISION
DESIGN:	E.M.	DRAWN: G.I.
DATE:	FEB. 2015	SCALE: NTS
DWG No.	WM5	



#### NOTES

- ① THIS DRAWING SHOULD BE REVIEWED IN CONJUNCTION WITH THE DOCUMENT, "WATER METER MATERIAL SPECIFICATIONS AND DESIGN GUIDELINES"
- ② WATER METERS APPROVED FOR USE IN THE CITY OF MAPLE RIDGE ARE LISTED IN TABLE 1 OF THE "WATER METER MATERIAL SPECIFICATIONS AND DESIGN GUIDELINES"
- ③ PIPE ANCHORING / RESTRAINT TO BE DESIGNED BY APPLICANT'S ENGINEER
- ④ STRAIGHT PIPE LENGTHS UPSTREAM AND DOWNSTREAM OF THE METER (INCLUDING THE PRESENCE OF BYPASS TEES, ISOLATION VALVES, AND ANY OTHER FITTINGS) TO BE IN ACCORDANCE WITH METER MANUFACTURER RECOMMENDATIONS
- ⑤ VERTICAL DISTANCE BETWEEN CHAMBER FLOOR AND BOTTOM OF MAIN LINE TO BE A MINIMUM OF 300mm
- ⑥ BYPASS SHALL BE NO LESS THAN HALF OF THE SIZE OF THE MAIN LINE
- ⑦ CHAMBER DIMENSIONS TO BE CONFIRMED BY THE APPLICANT'S ENGINEER
- ⑧ CHAMBER HATCH—TWO/THREE DOOR GALVANIZED LID ASSEMBLY (H-20 STATIC/DYNAMIC LOADING) C/W DOOR PISTON CLOSER AND HOLE FOR RADIO PAD

\* NOTE: ALL DIMENSIONS IN MILLIMETRES

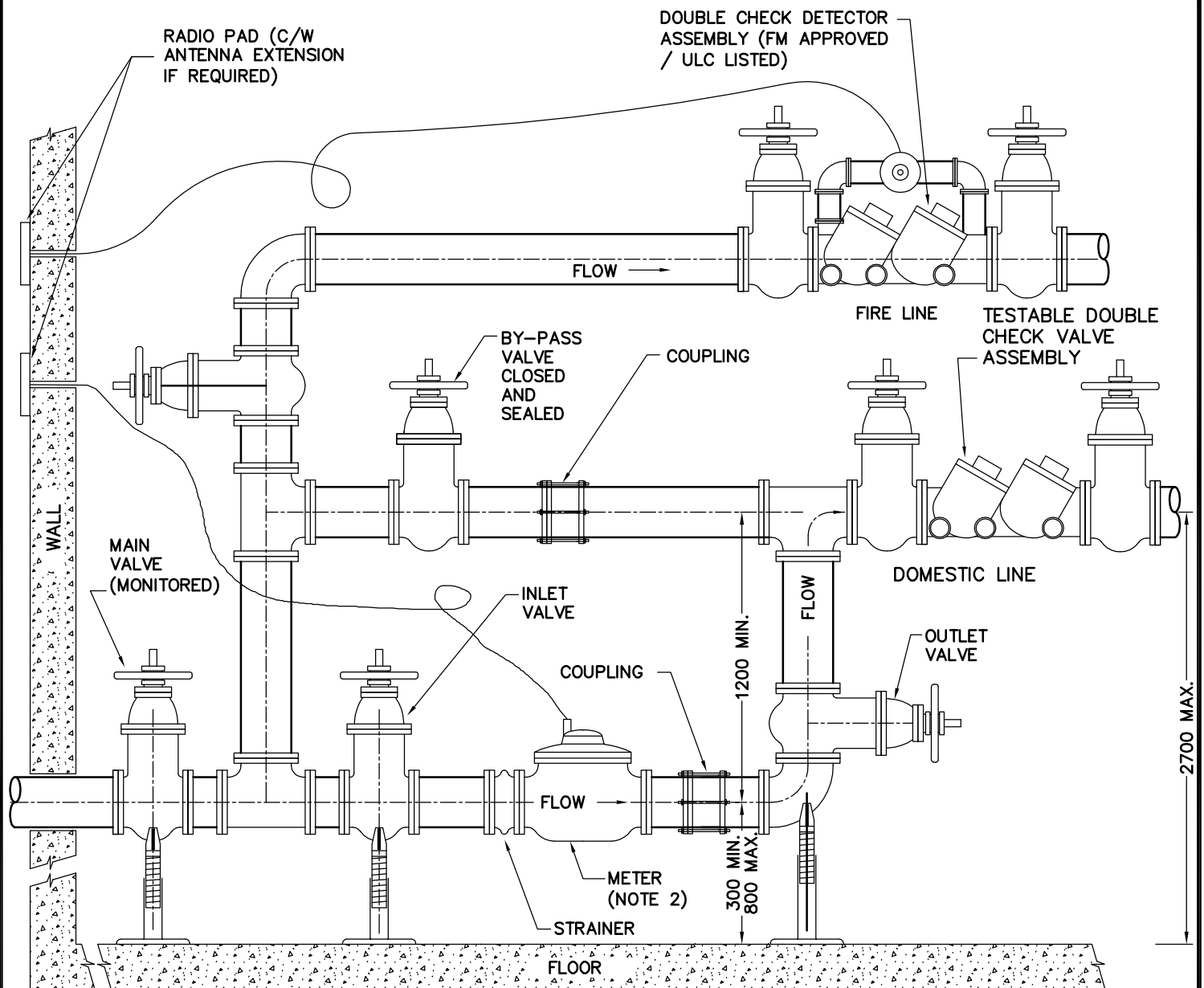
## METER CHAMBER INSTALLATION FOR 50mm AND LARGER DOMESTIC AND FIRE SERVICE



CITY OF MAPLE RIDGE  
ENGINEERING DEPARTMENT

SUPPLEMENTARY STANDARD DETAIL DRAWINGS

NO.	DATE	REVISION
DESIGN:	DRAWN: GI	DWG No.
DATE: FEB 2015	SCALE: NTS	WM6



#### NOTES

- ① THIS DRAWING SHOULD BE REVIEWED IN CONJUNCTION WITH THE DOCUMENT, "WATER METER MATERIAL SPECIFICATIONS AND DESIGN GUIDELINES"
- ② WATER METERS APPROVED FOR USE IN THE CITY OF MAPLE RIDGE ARE LISTED IN TABLE 1 OF THE "WATER METER MATERIAL SPECIFICATIONS AND DESIGN GUIDELINES"
- ③ BYPASS SHALL BE NO LESS THAN HALF OF THE SIZE OF THE MAIN LINE
- ④ STRAIGHT PIPE LENGTHS UPSTREAM AND DOWNSTREAM OF THE METER (INCLUDING THE PRESENCE OF BYPASS TEES, ISOLATION VALVES, AND ANY OTHER FITTINGS) TO BE IN ACCORDANCE WITH METER MANUFACTURER RECOMMENDATIONS

\* NOTE: ALL DIMENSIONS IN MILLIMETRES

## UTILITY ROOM INSTALLATION FOR METERS 50mm AND LARGER (DOMESTIC AND FIRE SERVICES)



CITY OF MAPLE RIDGE  
ENGINEERING DEPARTMENT

SUPPLEMENTARY STANDARD DETAIL DRAWINGS

NO. DATE

REVISION

DESIGN:

DRAWN: GI

DWG No.

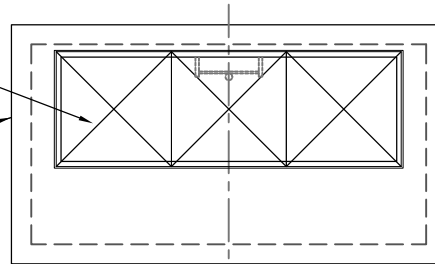
DATE: FEB 2015

SCALE: NTS

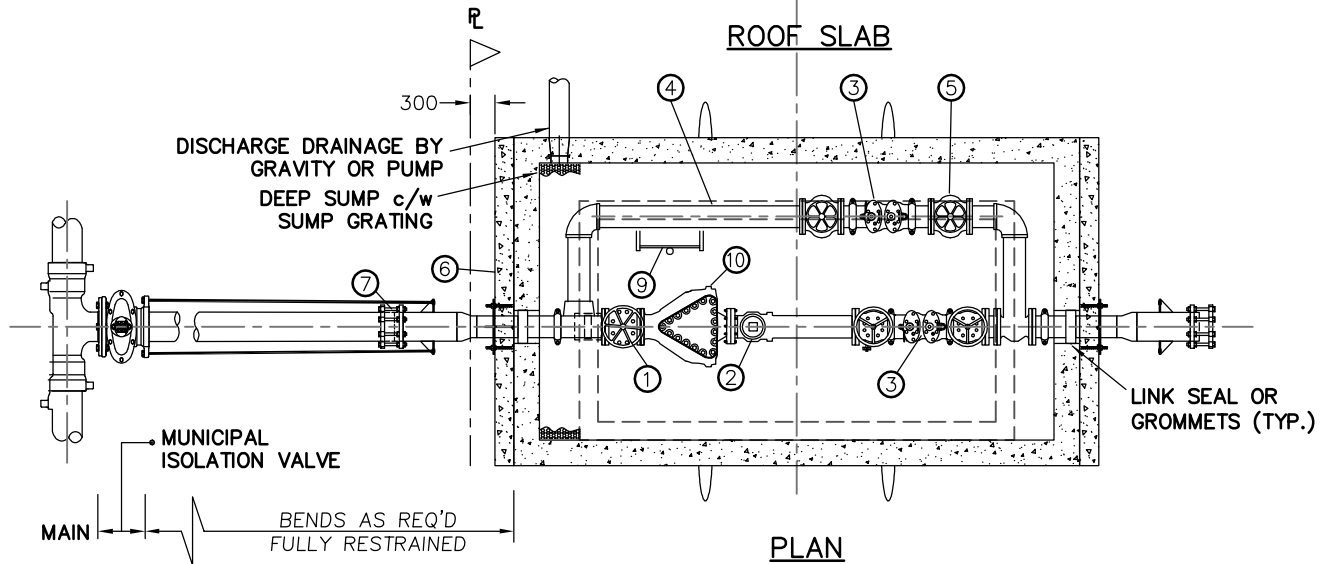
WM7

THREE DOOR GALVANIZED LID ASSEMBLY  
(H-20 STATIC /DYNAMIC LOADING) c/w DOOR  
PISTON CLOSER AND HOLE FOR RADIO PAD

CHAMBER ROOF  
SLAB

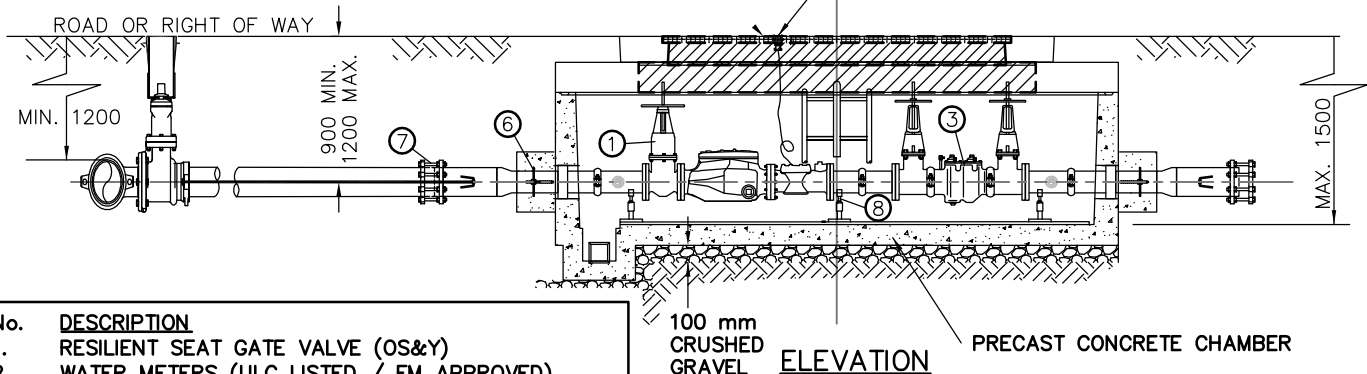


ROOF SLAB



PLAN

PIT PADS IN LID IN NON-TRAVELLED AREAS TO  
BE CLEARLY LABELLED WITH METER SIZE  
ENGRAVED IN ALUMINUM PLATE RIVETED TO LID



ELEVATION

- | No. | DESCRIPTION   |
|-----|---|
| 1.  | RESILIENT SEAT GATE VALVE (OS&Y)  |
| 2.  | WATER METERS (ULC LISTED / FM APPROVED)<br>REFER TO TABLE 1 OF THE "WATER METER<br>MATERIAL SPECIFICATIONS AND DESIGN GUIDELINES" |
| 3.  | DOUBLE CHECK ASSEMBLY VALVE c/w OS&Y GATE<br>VALVES (ULC LISTED / FM APPROVED)  |
| 4.  | BYPASS (SAME SIZE AS MAIN LINE)   |
| 5.  | BYPASS VALVE (LOCKABLE)   |
| 6.  | THRUST BLOCKS / BEAMS (TO BE DESIGNED BY<br>APPLICANT'S ENGINEER)   |
| 7.  | ROBAR TRANSITION COUPLING (OR APPROVED<br>EQUAL)  |
| 8.  | ADJUSTABLE PIPE STAND   |
| 9.  | ALUMINUM LADDER c/w SAFETY POST   |
| 10. | STRAINER  |

#### NOTES

1. CHAMBER DIMENSIONS TO BE CONFIRMED  
BY APPLICANT'S ENGINEER

\* NOTE: ALL DIMENSIONS IN MILLIMETRES

## METER CHAMBER INSTALLATION FOR 100mm AND LARGER COMBINED FIRE AND DOMESTIC SERVICES

NO. DATE

REVISION

DESIGN:

DRAWN: GI

DWG No.

DATE: FEB 2015

SCALE: NTS

WM8



CITY OF MAPLE RIDGE  
ENGINEERING DEPARTMENT

SUPPLEMENTARY STANDARD DETAIL DRAWINGS