

**CITY OF RICHMOND  
INVITATION TO TENDER**

**Contract T.3534**

**Contract: City Centre / Bennett West Sanitary Upgrades**

The City of Richmond invites tenders for construction work at the above-mentioned locations. Work under the Contract generally comprises:

- The installation of a Sanitary Pump Station at 8520 Anderson Road and the removal of an existing pump station.
- Temporary pumping during pump station work from two separate manholes
- The supply and installation of approximately 105 lineal meters of 525mm dia. sanitary gravity main with all associated appurtenances and tie-ins.
- The supply and installation of approximately 5m of 250 mm dia. Gravity sanitary pipe north of pump station with all associated appurtenances and tie-ins.
- The supply and installation of approximately 1250 lineal meters of sanitary forcemain (various sizes from 200mm dia. to 600mm dia.) with all associated appurtenances and tie-ins.
- Road, drainage, curb and sidewalk remediation on Eckersley Road and Anderson Road, including new storm drainage manhole and headwall relocation beside pump station

The *Contract Documents* are available on or after August 18, 2009 during normal business hours at Front of House of the Richmond City Hall at:

6911 No. 3 Road, Richmond, BC, V6Y 2C1

on payment of a **non-refundable** amount of \$50.00 including GST payable to:

**City of Richmond**

*Tenderers* are responsible for arranging their own Couriers for picking up copies of the documents. All Couriers must come with the required cheque/cash and be prepared to complete the Tender Document form with Company Name, Contact information, Telephone Number, Fax and E-mail address.

The *Contract Documents* are available for viewing at:

Front of House, Richmond City Hall, 6911 No. 3 Road, Richmond and Vancouver Regional Construction Association, 3636 East 4th Avenue, Vancouver.

**Tenders are scheduled to close at:**

**Tender Closing Time:** 3:00 PM local time

**Tender Closing Date:** September 10, 2009 and will be opened publicly immediately thereafter in Richmond City Hall

**Tender Submission Address:** Manager – Purchasing & Risk  
Front of House, Richmond City Hall  
6911 No. 3 Road, Richmond, BC, V6Y 2C1

A tender consists of a submission delivered on time complete with the required Bid Bond, Undertaking of Surety and Undertaking of Liability Insurance.

The lowest or any tender will not necessarily be accepted.

**Manager – Purchasing & Risk**



# City of Richmond

6911 No.3 Road  
Richmond, BC V6Y 2C1  
www.richmond.ca

**Business & Financial Services  
Department**  
Telephone: 604-276-4219  
Fax: 604-276-4162

September 3, 2009

File:

TO THOSE WHO HAVE RECEIVED COPIES OF T.3534

Dear Sir/Madam:

**Re: Contract T.3534  
Addendum No. 1  
City Centre/ Bennett West Sanitary Upgrades**

This addendum forms part of the Contract Documents and shall be read, interpreted and coordinated with all other parts. The costs of all work contained herein shall be included in the Contract Price. The following revisions supersede the information contained in the original Contract Document to the extent referenced and shall become part thereof.

Drawings replacements associated with addendum No.1 will be sent to the Contractors referenced on the tender distribution list to the contact name and address noted.

Tenderers shall acknowledge receipt of this addendum by inserting its number and date where provided for on the Form of Tender.

## **ITEM 1 – BIDDER QUESTIONS AND ANSWERS**

**Questions** The pipe & spool materials for the tie-in at Blundell Rd & St Albans seem too conflict – the drawing on sheet 1 of 6 and detail A/5 indicate the materials are PVC, while the detail E/6 indicate the material is epoxy coated & lined steel pipe. Which is correct? Also what is the correct chainage for the 500mm pipe?

**Answer** From the 500x600mm reducer STA 13.65 through to the tie-in at Blundell should be all lined and coated steel pipe including the pigging detail and the piping around the manual air valve.

**Questions** What is required for the manual air valve at the above location – is the valve attached to a saddle or is the spool piece a DI tee or manufactured steel fitting?

**Answer** The manual air valve is off the steel pipe, as above, and is to be on a steel tee.

**Questions** How many and what size are anodes required for this project?

**Answer** Corrosion Protection - Steel pipe pigging assemblies to have three (3) – eight kg anodes each placed as shown on the drawings. 300mm gate valves and metal fittings to have 1- 4 kg anode each (thrust restraints can be bonded back to metal fittings). Larger diameter valves and metal fittings to have 1 – 8 kg anode each. Where metal fittings are in a group they are

to be bonded to each other.

**Questions** What is the make & model of the proposed 300mm flow meters, also what if any electrical work/design installation that maybe required? (i.e. 50mm rpv conduit)

**Answer** Flow meters are supplied by Richmond – installation and electrical connection is what is required (1- 50mm rpv ducts – as shown on dwg 0946-08-OC 2 of 12)

Please find specifications for flow meters attached to addendum.

**Questions** Is the City supplying the concrete pad for the pump station kiosk and if not what is the structural construction design?

**Answer** Contractor to supply and install, length and width as shown on 0946-08-OC 2 of 12 (for tender purposes – actual dimensions to be confirmed). 300mm thick pad; 2 mats of 15M bars at 250mm spacing; chamber all edges.

**Questions** The drawing construction details for the intersection tie-ins indicate some form of pipe restrainers for the fittings, what is required and if required what model type is to be used for the pvc fittings?

**Answer** Any restrainers that meet the MMCD and Richmond specifications. Suppliers should be aware of which meet the specs .

**Questions** The road works and storm drawings for tender items C2 & C3 are missing from our tender package, can you provide these?

**Answer** Please find drawings attached to addendum.

**Questions** SSP-18 clearly indicates the construction hours without traffic restrictions, is this correct?

**Answer** Traffic restriction requirements can be found in SSP 28

**Questions** The tender document are clear that the contractor is not to leave equipment or materials on the roads at days end, is the City going to provide a compound or designated staging area?

**Answer** Staging area is to be the responsibility of the contractor.

**Questions** Tender item B-12 indicates there are four 1200mm sanitary manholes; however, manhole MH4 is designed as a 1050mm manhole, are we to allow for a 1200mm for this manhole?

**Answer** Correct manhole 4 is 1050mm. Please refer to revised Schedule of Quantities and Payment

**Questions** Tender item B-11 is for 250mm sewer; however, the drawing indicates 200mm pipe, which is correct?

**Answer** Please refer to revised Schedule of Quantities and Payment

**Questions** Drawing No. 0946-08-OD, sheet 2 of 3, note 'EX 150dia SAN. FM to be abandoned at manhole', where is this and are we required to do this work, and if required, what is required?

**Answer** Note should have been removed. Forcemain will be abandoned at the new Forcemain tie-in as per the detail.

**Questions** What type of pipe is the existing 150mm forcemain at Eckersley 'B' tie-in?

**Answer** PVC

**Questions** What DR spec. are the 525mm gravity main & 300mm sanitary forcemain on Eckersley Rd & Cook Rd.?

**Answer** All Forcemain is DR 25. The 525mm gravity main is to be DR35.

**Questions** Where in the tender form should we put the 200mm gravity pipe between MH3 and MH4?

**Answer** Please refer to revised Schedule of Quantities and Payment.

**Questions** Where in the tender form should we put the 1050 manhole (MH4)

**Answer** Please refer to revised Schedule of Quantities and Payment.

- Questions** What fittings are to be used if C110 CI is not available for larger sized fittings? Is C153 Ductile Iron acceptable?
- Answer** C153 DI fittings are acceptable only if C110 CI fittings are not available for larger sized fittings.
- Questions** Are there any shop drawings that need to be prepared by the general contractor or their subcontractors?
- Answer** No
- Questions** Are there available details for the flow meter electrical connection at Eckersley B pump station? How is it to be connected to the kiosk?
- Answer** Flow meter tube (supplied by Richmond) and manhole to be installed at Eckersley B (Detail A sheet 3 project 0946-08-OD) as shown on drawing. 50mm conduit to be laid back to Eckersley B PS tie-in point and capped. Electrical connection of the flow meter will be by others in the future.
- Questions** Are there any further concrete pad details, in particular details on how the incoming pipes and conduits are to be arranged/laid out before the pour?
- Answer** Details on incoming pipe and conduit layouts for concrete pad are to be provided in Kiosk shop drawings to successful proponent.
- Questions** Can the concrete lid be prefabricated offsite?
- Answer** Yes, the concrete lid may be prefabricated offsite.
- Questions** What is temporary trench restoration is required after the end of each work day?
- Answer** Temporary trench restoration at the end of each day will be either asphalt paving or steel plate cover.  
If steel plates are to be used:
- Plates must be pinned to the road and asphalt ramped for smooth transition to existing road surface
  - Traffic management in roadways that have plates must be reviewed by the City Traffic department prior to their use and implementation of traffic management plan.
- Questions** There appears to a conflict with drawing details for all the intersections on St. Albans with regards to the tie-ins, please clarify the materials and locations for installation.
- Answer** Materials and locations for tie-in works are to be dictated by the Tie-In Details.

## ITEM 2 – SCOPE CHANGE

- (a) Please remove the storm drainage manhole installation and head wall relocation beside the existing Eckersley sanitary pump station from the scope of work.
- (b) Include as part of the sanitary sewer works the re-connection of the existing sanitary service at 6860 Eckersley Road to the proposed 525mm diameter sanitary gravity main along Anderson Road. Location of existing sanitary service is shown on *Drawing 381142-07-08 – 6860 Eckersley Road Sanitary Sewer*.

**Please Note:** The proposed works in *drawing 381142-07-08 – 6860 Eckersley Road Sanitary Sewer* are not a part of this contract. The drawing is used simply as a reference for the location of the 150mm diameter sanitary service.

Connection of existing sanitary service to the proposed 525mm diameter sanitary gravity main is to be completed in accordance with MMCD and the City of Richmond's Supplementary Specifications and Detailed Drawings June 2005.

- (c) In **SECTION D – Project Specifications** under **01100 Measurement and Payment – 2.0** Description of Payment Items please add:

**GENERAL**

Any work called for in the Specifications, or shown or implied on the drawings or necessary for the completion of the work called for in the Specifications, which is not specifically listed as a separate item in the Schedule, will be deemed incidental to the general purpose of the Contract and no separate payment will be made on account of any such work, but the cost of any such work will be included in the tendered unit prices or lump sum prices for the various items of work appearing in the Schedule.

- (d) In **SECTION D – Project Specifications** under **01100 Measurement and Payment** please remove from **Item C-3 Storm works (6860 Eckersley Road)** (Page D-34 and 35) the following:

**b) Relocate existing headwall**

Payment for this item will be made at the lump sum price tendered in the *Schedule of Quantities and Prices*. This item includes all the *Contractor's* costs for labour, material and equipment associated with the relocation of the existing headwall to the proposed location specified in the detailed design – STORM SEWER 6860 Eckersley Road drawing no. 381142-07-07.

The lump sum price tendered shall include but not be limited to survey layout, excavation where required, relocation of headwall, and tie-in to proposed 600mm dia. storm sewer.

**c) Supply and install 1200mm dia. manhole**

Payment for this item will be made at the lump sum price tendered in the *Schedule of Quantities and Prices*. This item includes all the *Contractor's* costs for labour, material and equipment associated with the supply and installation of a 1200mm dia. manhole as specified in the detailed design – STORM SEWER 6860 Eckersley Road drawing no. 381142-07-07.

The lump sum price tendered shall include but not be limited to survey layout, excavation where required, supply and installation of 1200mm dia. manhole, backfill and restoration, and all storm sewer pipe necessary to complete the tie-ins to the existing 375mm dia. and 600mm dia. storm sewers, and the newly relocated headwall.

- (e) In **SECTION D – Project Specifications** under **01100 Measurement and Payment** please add to **Section B – Sanitary Sewer Items** the following:

**Item B-14 – Supply and Installation of new 1050mm dia. Sanitary Manhole and Associated Connections**

Payment for this item will be made at the unit price tendered for the supply and installation of a new proposed 1050mm diameter manhole as shown on the drawings.

The unit price tendered shall include all excavation; survey layout; traffic control; the disposal of all excavated materials; the supply and installation of the new benched manholes; imported backfill; bypass set-up where required; any dewatering and shoring required; compaction and surface restoration (except final mill and overlay).

The unit price tendered shall also include the supply and connection of the required length of 200mm diameter PVC main to the proposed 1200mm diameter sanitary manhole and existing 200mm diameter sanitary main.

Final mill and overlay asphalt surface restoration is covered under separate pay item.

**Item B-15 – New 150mm Diameter Lateral Connection to Existing Sanitary Service at 6860 Eckersley Road**

Payment for this item will be made at the lump sum price tendered for the supply and installation of the required length of 150mm diameter PVC sanitary lateral to the existing sanitary service for 6860 Eckersley Road.

The lump sum price tendered shall include all excavation; survey layout; traffic control; the disposal of all excavated materials; the supply and installation of the pipe; imported backfill; bypass set-up where required; connection to existing sanitary service; compaction and surface restoration (except final mill and overlay), all in accordance with MMCD and the City of Richmond's Supplementary Specifications and Detailed Drawings June 2005.

The unit price tendered shall also include any dewatering and shoring required.

Final mill and overlay asphalt surface restoration is covered under separate pay item.

(f) In **SECTION C – AGREEMENT** under **Schedule 2 List of Drawings**, please include:

SANITARY SEWER – 6860 Eckersley Road 381142-07-08, July 10 2008, Revision 3

(g) In **SECTION B – TENDER SUBMISSION DOCUMENTS**, under **Form of Tender**, remove **Appendix 1 – Schedule of Quantities and Prices** and use the following revised **Appendix 1 – Schedule of Quantities and Prices**:

## FORM OF TENDER

### Appendix 1

#### SCHEDULE OF QUANTITIES AND PRICES (See paragraph 5.3.1 of the Instructions to Tenderers - Part II)

(All prices and Quotations including the *Contract Price* shall include all *Taxes*, but shall not include *GST*.)

#### TENDER SUMMARY

##### 1. GENERAL

The undersigned Tenderer, hereinafter referred to as the Tenderer, hereby agrees that the Tendered amounts were completed, signed, sealed and submitted to the Owner by the Tenderer as part of his Tender and further, that he has satisfied himself with and agrees to the contents of the Tender as submitted to the Owner.

##### 2. TENDERED AMOUNTS

The tendered amounts carried over from items in the schedule are summarized as follows:

ITEM NO.	DESCRIPTION	TENDERED AMOUNT
A	PUMP STATION ITEMS	
B	SANITARY SEWER ITEMS	
C	RESTORATION ITEMS	
	<b>TENDER PRICE (GST excluded)</b> (Carried Forward to Form of Tender)	

<b>T.3534 – City Centre / Bennett West Sanitary Upgrades</b>					
<b>SCHEDULE OF QUANTITIES AND PRICES</b>					
<b>ITEM NO.</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>EST. QTYS.</b>	<b>UNIT PRICE (\$)</b>	<b>TOTAL AMT. (\$)</b>
<b>A</b>	<b>PUMP STATION ITEMS</b>				
A-1	Temporary Pumping		Lump Sum		
A-2	Wet Well Installation		Lump Sum		
A-3	Kiosk Installation & Electrical Work		Lump Sum		
A-4	Miscellaneous Pump Station Items		Lump Sum		
<b>TOTAL FOR PUMP STATION ITEMS – ITEM A            (Carry forward to Tender Summary)</b>					<b>\$</b>



**T.3534 - City Centre / Bennett West Sanitary Upgrades  
 SCHEDULE OF QUANTITIES AND PRICES**

ITEM NO.	DESCRIPTION	UNIT	EST. QTYS.	UNIT PRICE (\$)	TOTAL AMT. (\$)
<b>B</b>	<b>SANITARY SEWER ITEMS</b>				
B-1	Supply and Installation of PVC Class 150 (DR 25) Sanitary Forcemain				
	a) 200mm	Lin. m.	10		
	b) 300mm	Lin. m.	290		
	c) 200mm	Lin. m.	340		
	d) 500mm	Lin. m.	400		
	e) 600mm	Lin. m.	190		
B-2	Installation of Flow Meters	Each	2		
B-3	Connection to existing 300mm dia. sanitary forcemain at Eckersley Road and Anderson Road			Lump Sum	
B-4	Connection to existing 300mm dia. sanitary forcemain at 6580 Eckersley Road			Lump Sum	
B-5	Connection to existing 200mm dia. sanitary forcemain at Jones Road and St. Albans Road			Lump Sum	
B-6	Connection to existing 200mm dia. sanitary forcemain at Bennett Road and St. Albans Road	Each	2		
B-7	Connection to existing Metro Vancouver Sanitary Forcemain at Blundell Road and St. Albans Road			Lump Sum	
B-8	Complete Forcemain Tie-in to existing Sanitary Pump Station (Eckersley B)			Lump Sum	
B-9	Complete Forcemain Tie-in of new Forcemain to Existing at Eckersley A			Lump Sum	
B-10	Supply and Installation of 525mm dia. Sanitary Gravity main	Lin. m.	105		
B-11	Supply and Installation of 250mm dia. Sanitary Gravity main	Lin. m.	5		
B-12	Supply and Installation of new 1200mm dia. Sanitary Manhole	Each	4		
B-13	Supply and Installation of new sanitary pigging chamber (including fittings, valves and chamber)				
	a) Two-way chamber at Granville and St. Albans			Lump Sum	
	b) Two-way chamber at General Currie and St. Albans			Lump Sum	
	c) One-way chamber at Blundell and St. Albans			Lump Sum	
B-14	Supply and Installation of new 1050mm dia. Sanitary Manhole	Each	1		
B-15	New 150mm dia. lateral connection to existing sanitary service at 6860 Eckersley Road			Lump Sum	

City of Richmond  
Contract T.3534  
City Centre / Bennett West Sanitary Upgrades

B-11  
R-1

**T.3534 - City Centre / Bennett West Sanitary Upgrades  
SCHEDULE OF QUANTITIES AND PRICES**

ITEM NO.	DESCRIPTION	UNIT	EST. QTYS.	UNIT PRICE (\$)	TOTAL AMT. (\$)
	TOTAL FOR PUMP STATION ITEMS - ITEM B (Carry forward to Tender Summary)				\$

**T.3534 - City Centre / Bennett West Sanitary Upgrades  
 SCHEDULE OF QUANTITIES AND PRICES**

ITEM NO.	DESCRIPTION	UNIT	EST. QTYS.	UNIT PRICE(\$)	TOTAL AMT. (\$)
<b>C</b>	<b>RESTORATION ITEMS</b>				
C-1	Supply & Install Final Asphalt Overlay			Lump Sum	
C-2	Road works (6860 Eckersley Road)				
	a) Supply and install concrete curb and gutter	Lin. m.	35		
	b) Supply and install concrete wheel chair ramp			Lump Sum	
	c) Supply and install concrete driveway entrance			Lump Sum	
	d) Boulevard and landscaping adjustments as required			Lump Sum	
	e) Supply and install remaining sidewalk to property line of 8520 Anderson Road			Lump Sum	
C-3	Storm works (6860 Eckersley Road)				
	a) Supply and install pan catch-basin	Ea.	2		
<b>TOTAL RESTORATION ITEMS – ITEM C  (Carry forward to Tender Summary)</b>					<b>\$</b>

**ITEM 3 – TENDER CLOSING EXTENSION**

In **INSTRUCTIONS TO TENDERERS (IT) – PART 1**, under **Submission of Tenders 3.1**, please remove the following:

Tender Closing Date: Thursday September 10, 2009

And replace with the following:

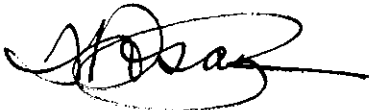
Tender Closing Date: Tuesday September 22, 2009

**ITEM 4 – ADDITIONAL DRAWINGS and SPECIFICATIONS**

Please find included with this addendum the following additional drawings and specifications:

- ROADWORKS – 6860 Eckersley Road, 381142-07-05 (Sheet 1 to 2), Nov 25, 2008, Rev 4
- STORM SEWER – 6860 Eckersley Road, 381142-07-07, July 10 2008, Rev 3
- SANITARY SEWER – 6860 Eckersley Road, 381142-07-08, July 10, 2008, Rev 3
- Flow Meter Supplier Specifications

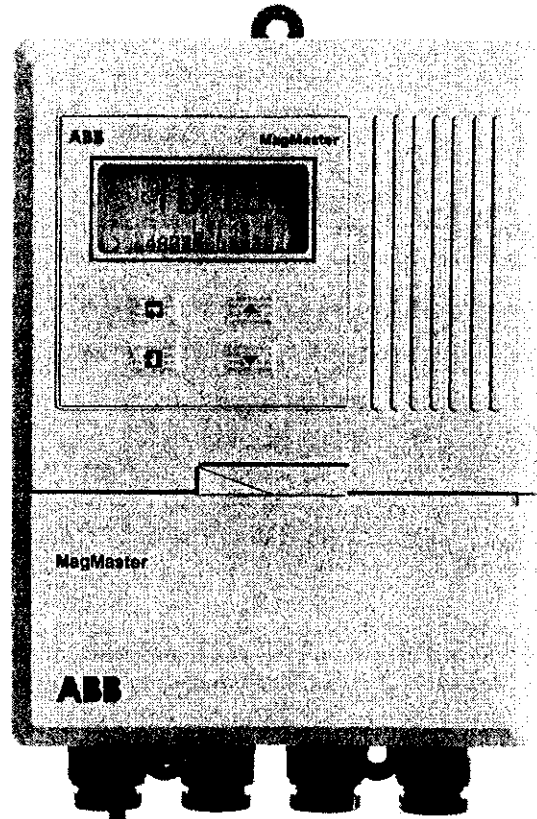
Regards,



Sumita Dosanjh  
Buyer II – Contracting Specialist

Field<sup>IT</sup>  
Electro-Magnetic Flowmeters  
Converters  
MagMaster

- **Pulsed DC technology incorporates benefits of AC systems**
- **Keypad configurable**
  - A choice of engineering parameters in engineering units e.g. flowrate, flow units, all outputs
- **Empty pipe detection**
  - Ensures units read zero on empty pipe
- **Interchangeable**
  - Converter/sensor can be changed without affecting performance
- **Advanced switching power supply**
  - 95 to 240V ac and 11 to 40V dc
- **Test mode and Self diagnostics**
  - provides powerful start up tool. Exercises all outputs and displays, even without a sensor connected
- **Multi-lingual**
  - English, Spanish, plus others upon request
- **Three internal totalizers: forward, reverse, net; Forward and reverse flowrates and comprehensive range of outputs : current, pulse, data, HART**
  - single package satisfying all user display requirements
  - insures compatibility with user's control system requirements
- **Two-Year Warranty**
- **FM / CSA Approved**
- **CalMaster enabled**



MagMaster Converters

## SPECIFICATIONS

### Configuration:

Converter may be integral with sensor for sizes 1/2 to 16-inches (400mm) or remote from sensor for all sizes.

### Separation (remote transmitters):

The maximum cable length is 330 feet (100m) or 15 x the conductivity ( $\mu\text{S}/\text{cm}$ ). Longer lengths are special order.

### Accuracy (under reference conditions):

See separate specifications for MagMaster sensors.

### Display, Serial comms, Frequency output:

with MFE Series Sensors:  $\pm 0.2\%$  of reading  
with MFF Series Sensors:  $\pm 0.15\%$  of reading  
or  $\pm 0.003$  ft/sec (0.001m/s) (whichever is greater) up to a maximum velocity of  $>49$  ft/sec (15m/s).

### Analog output:

As Frequency output plus  $\pm 0.008\text{mA}$ .

### Temperature effect:

Converter: Display, frequency output, Serial comms  $<\pm 0.08\%$  of reading per  $10^\circ\text{C}$ .

Analog output – as frequency plus  $<\pm 0.08\%$  of reading per  $10^\circ\text{C}$ .

### Repeatability & Reproducibility:

$\pm 0.05\%$  or  $\pm 0.0008\text{ft/s}$  ( $\pm 0.25\text{mm/s}$ ), whichever is greater.

### Power Supply Variation:

Negligible effect— within published specification.

### Conductivity:

Liquids and slurries having a minimum conductivity of  $5\mu\text{S}/\text{cm}$  ( $5\mu\text{mho}/\text{cm}$ ).

### Power consumption:

Less than 20VA.

### Warm-up Time:

1 minute.

### Calibration:

3 point, 8 point, witnessed, NIST/UKAS (8- to 66-inch only), slurry calibration options.

### Prime cable connection:

1/2 inch NPT--single opening. A single cable is available that provides for the coil drive and electrode signals.

### Hazardous Area Certification (Remote mount only):

FM approved and CSA certified for Class I, Div. 2, Groups A, B, C, D hazardous locations, 1/2-24 inches (15-600 mm).

NOTE: FM approved sensors for hazardous locations include an intrinsic safety shunt circuit for the electrodes allowing for a Div. 1 rating inside the pipe. The circuit is located in the larger than standard terminal box housing. CSA certified sensors for hazardous locations may or may not include the circuit, depending on the rating inside the pipe. **Appropriate approved sensor must be selected.**

### Meets:

Electrical safety: BS4743 Class 1. (IEC 348).  
Vibration specification: BS2011 : Part 2.1Fc : 1983.

### Configuration Methods:

All configurations are user defined and password protected. The configuration is stored in non-volatile memory with a 10 year retention. The transmitter is fully programmed before shipping. Reprogramming can be easily done on site using the following methods:

**Keypad** - can be used to access and change all menu parameters using four membrane keys and 3-line display.

**HART Communications** - see separate description.

**Note:** HART not available with keypad display

### Displays:

**Keypad:** 3-Line, 16 character, backlit display with large 1/2" numerals for flowrate and two lines for engineering units, totalizers, alarm status, velocity and percent of range.

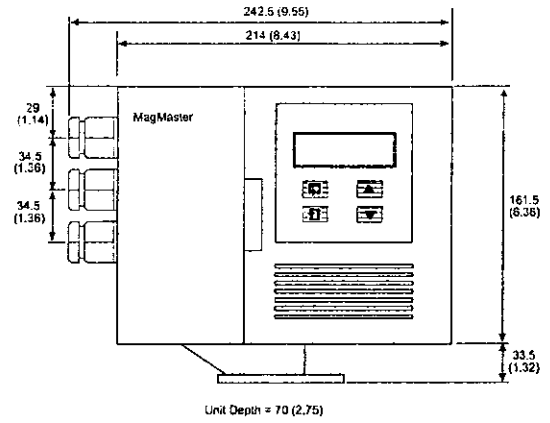
**2-Line:** 16-character, read only display for flowrate (in a choice of engineering units and % of range), totalized flow, forward, reverse and net totals, alarm conditions, flow velocity, and percent of range. Display is scrolled and reset by magnetic reed switches actuated by a magnetic wand.

**Blind:** no display, but data can be read through serial communications or HART.

### Internal Totalizer:

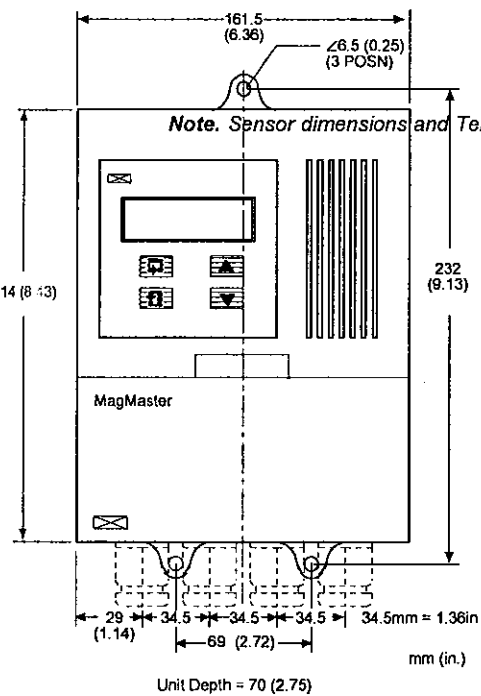
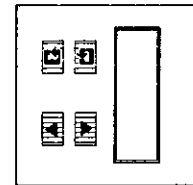
Resettable 9-digit totalizers for forward, reverse and net totals. Can be programmed to reset via external input.

### TRANSMITTER DIMENSIONS

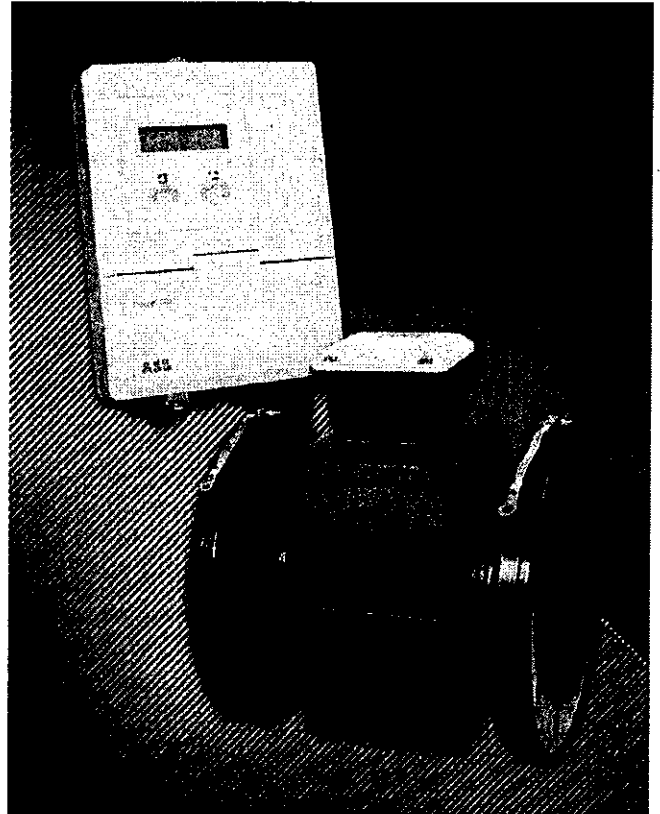


9-pin D connector under sliding cover

90° CW Rotation



- **Industry-specific design**
  - suitable for all applications found in the water and waste water industries
- **Widest flow range, highest accuracy**
  - diameters from 15mm to 2200mm (0.5 to 84 in.)
- **Submersible sensor**
  - suitable for flooded chambers and pits
- **Buriable sensor**
  - eliminates chambers and ensures fast, low-cost installation
- **Hazardous area approvals**
  - FM, CSA, ATEX
  - ideal for waste water treatment works
- **Built-in earthing (grounding) electrode**
  - eliminates the need for earthing (grounding) flanges
- **2-year warranty as standard**
  - high-quality product guarantees reliable maintenance-free operation
- **CalMaster compatible**
  - in situ verification of flow meter calibration
- **Remote communications**
  - including Profibus DP v0



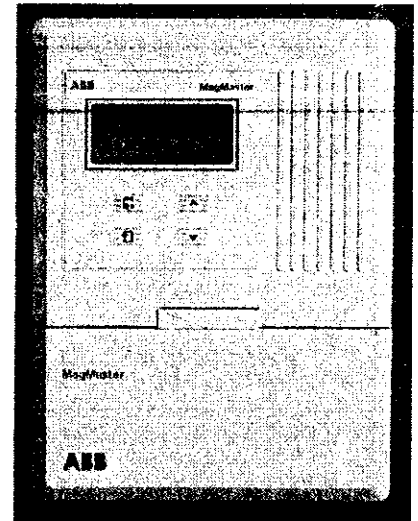
**MagMaster – bringing unsurpassed flowmetering performance to the Water and Waste Water industries**



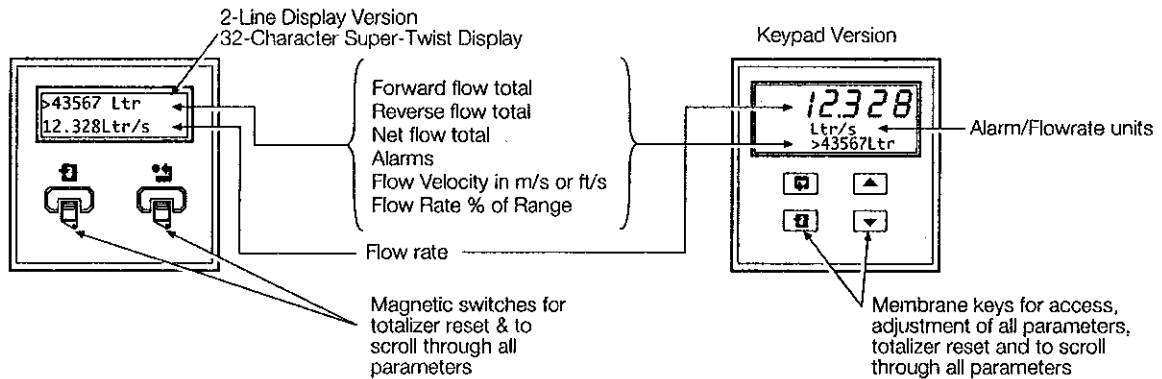
## Electronic Display Unit

- Comprehensive display
- Forward, reverse and net totals
- 4 digital outputs: forward pulse, reverse pulse, alarm 1 and alarm 2
- 2 analog outputs (output 2 optional)
- Communications: serial data (RS232), HART and Profibus DP v0

MagMaster is available with integral or remote transmitters, configuration is achieved either with a configurator or via the optional integral keypad. The software features multi-level password protection to prevent unauthorized configuration changes. In the 2-line display only variant, display data can only be changed using a magnetic wand, no operational parameters can be changed without the use of a configurator and appropriate passwords.



Wallmount Version



## Programming Options

- Local hand-held configurator (for example Psion Workabout)
- Integral keypad
- HART
- Personal computer

## Specification

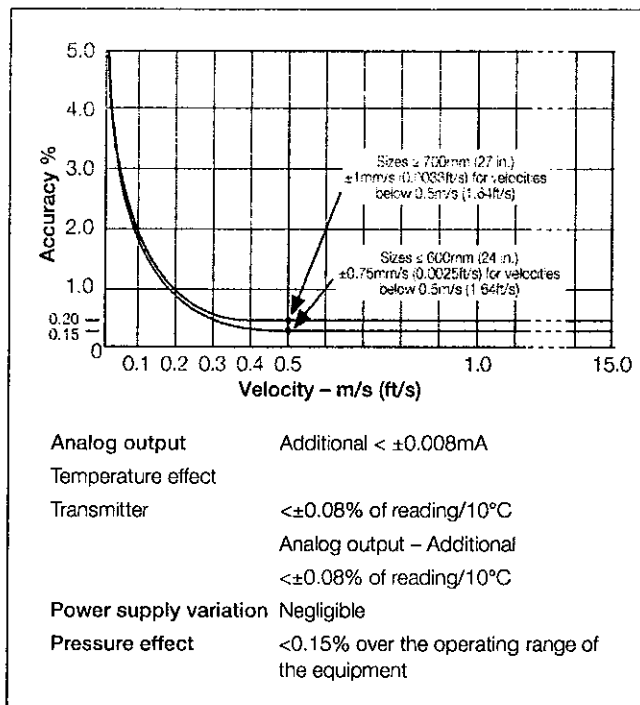
### Sensor

#### Sizes

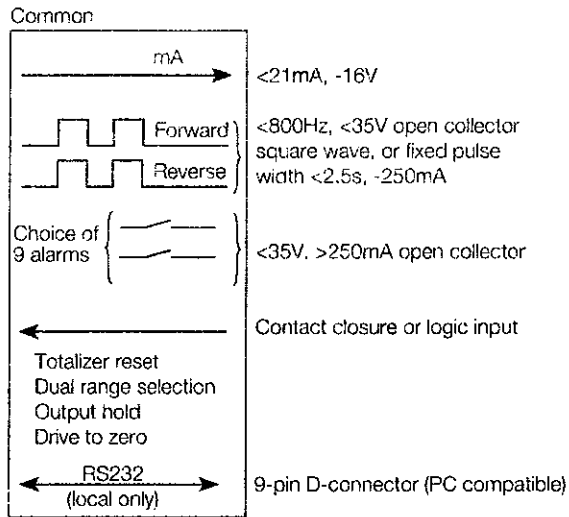
Sizes mm (in.)	Flow Range	
	Minimum	Maximum*
	m <sup>3</sup> /h (US g/min)	m <sup>3</sup> /h (US g/min)
15 (0.6)	0.005 (0.021)	6 (28)
20 (0.8)	0.009 (0.038)	11 (50)
25 (1)	0.014 (0.059)	17 (77)
40 (1.6)	0.035 (0.15)	45 (197)
50 (2)	0.053 (0.23)	71 (311)
65 (2.5)	0.089 (0.40)	119 (525)
80 (3)	0.136 (0.59)	181 (796)
100 (4)	0.21 (0.94)	283 (1243)
150 (6)	0.47 (2.10)	640 (2797)
200 (8)	0.84 (3.73)	1130 (4974)
250 (10)	1.32 (5.83)	1770 (7771)
300 (12)	1.91 (8.4)	2540 (11190)
350 (14)	2.60 (11)	3460 (15230)
400 (16)	3.39 (15)	4520 (19890)
450 (18)	4.29 (19)	5730 (25180)
500 (20)	5.3 (23)	7070 (31090)
600 (24)	7.6 (33)	10180 (44760)
700 (28)	14 (46)	13850 (60920)
760 (30)	16 (52)	15900 (69930)
800 (31)	18 (60)	18100 (79560)
900 (35)	23 (75)	22900 (100700)
1000 (39)	28 (93)	28300 (124300)
1050 (41)	31 (112)	34200 (150400)
1200 (47)	41 (134)	40700 (179000)
1400 (55)	55 (182)	55400 (243700)
1500 (59)	64 (208)	63600 (279700)
1600 (63)	72 (238)	72400 (318300)
1800 (71)	92 (302)	91600 (402800)
2000 (79)	113 (372)	113100 (497400)
2200 (87)	136 (451)	137000 (602000)

\* Based on 10ms<sup>-1</sup> (33ft/s<sup>-1</sup>), but instrument capability in excess of 15ms<sup>-1</sup> (50ft/s<sup>-1</sup>)

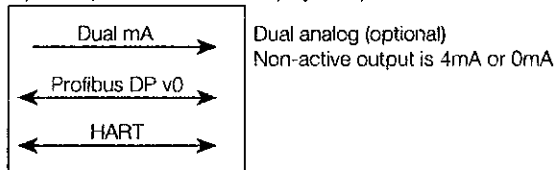
#### Accuracy (under forward flow reference conditions)



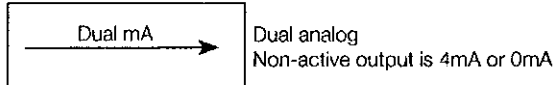
### Output/Inputs



#### Optional (For blind & 2-line display units)

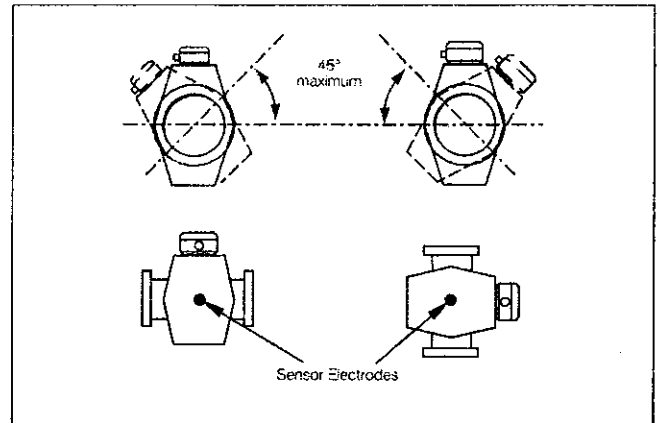


#### Optional (For keypad units)

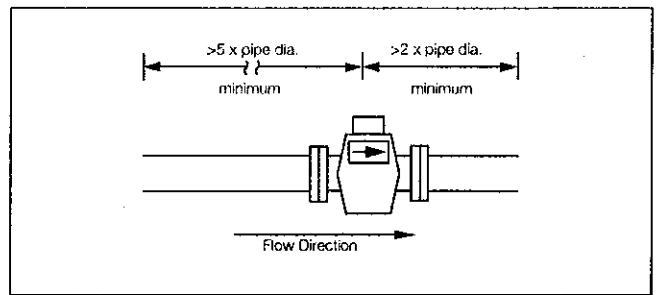


Galvanic isolation to 50V DC between analog pulse/alarm and earth/ground

### Mounting

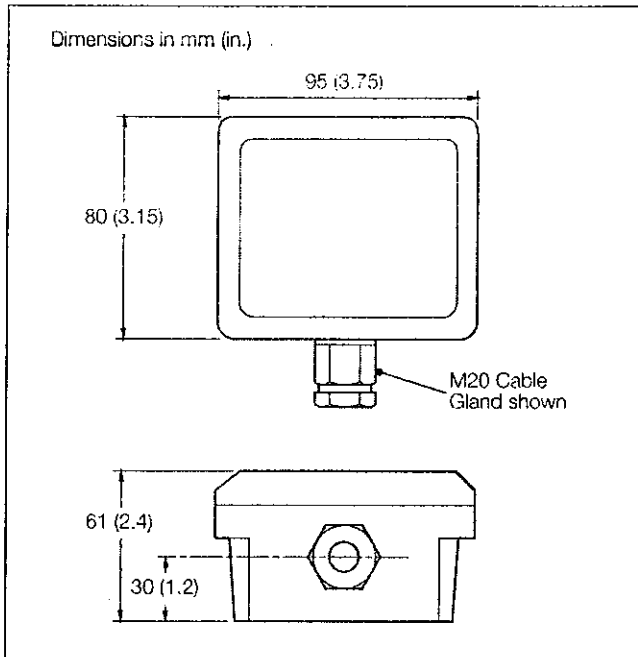


### Pipe Connections

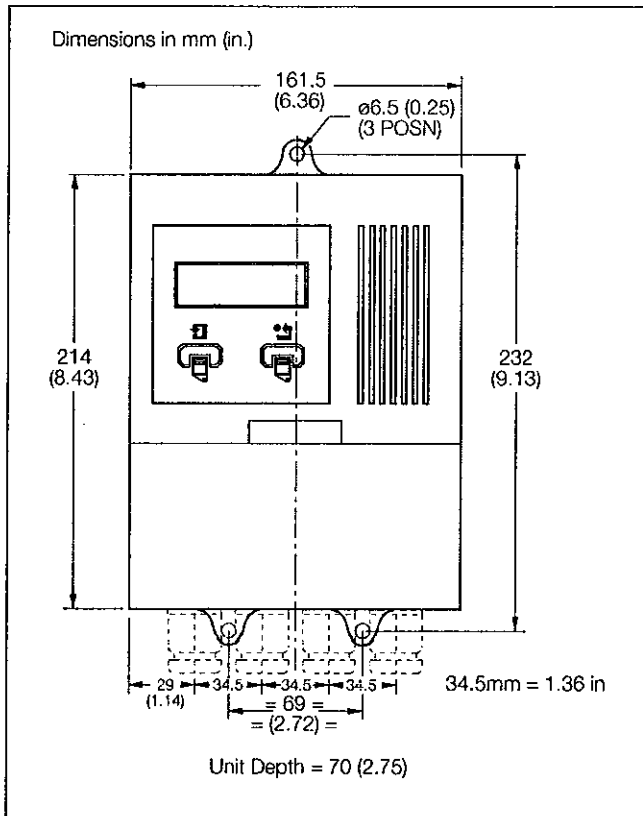


### Overall Dimensions

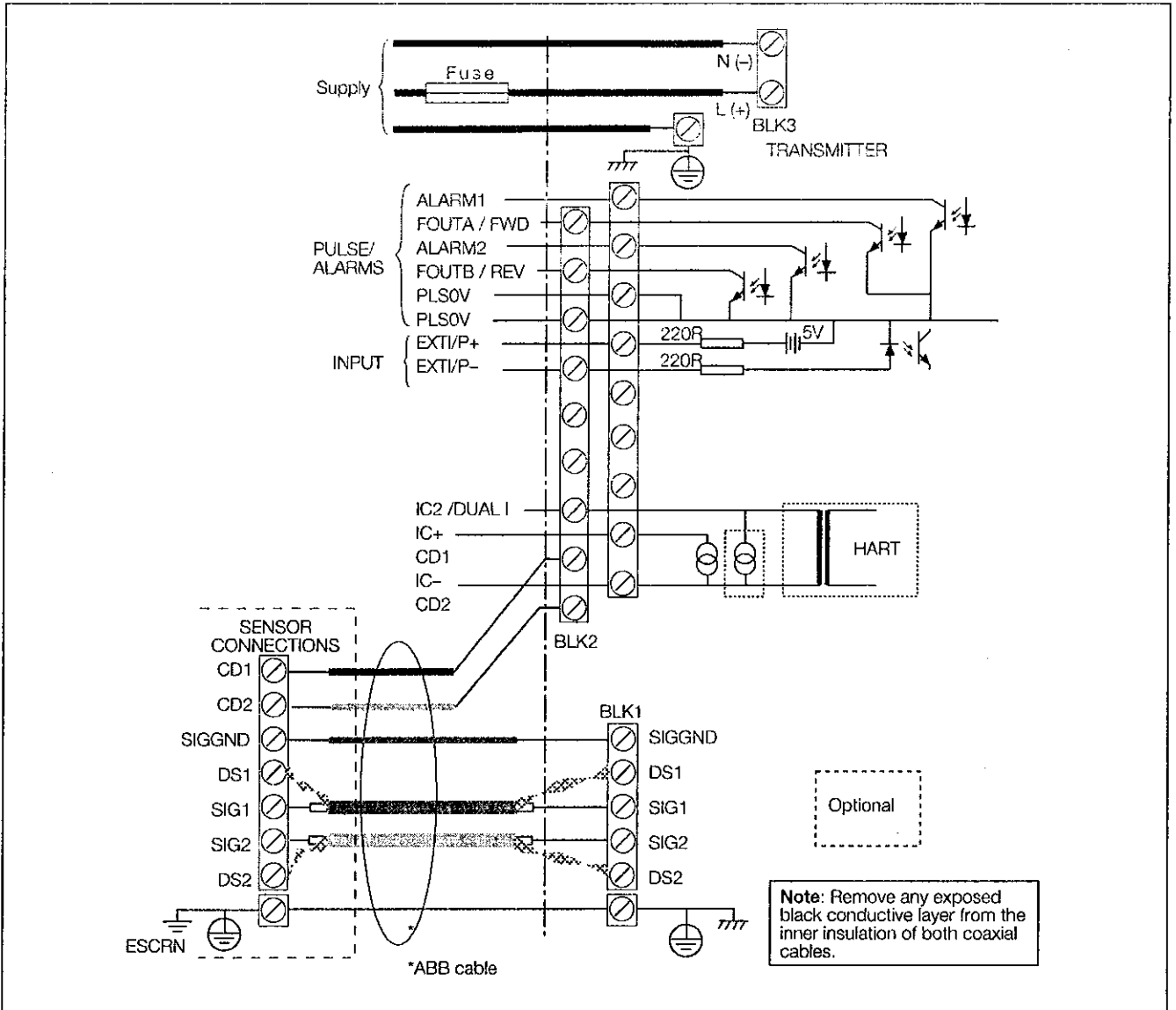
#### Terminal Box – Sensor Mounted



#### IP65/NEMA4 Remote Electronic Display Unit



Electrical Connections



Sensor Ordering Code	MF	XXXX	X	X	X	X	0	X	XX	X	XX
<b>Lining Material</b>											
None (Transmitter only)											0
Elastomer suitable for potable water and waste water – WRAS (UK) Listed											4
Elastomer suitable for potable water and waste water – ACS (France) Approved											F
Others on application											
<b>Electrodes</b>											
None (Transmitter only)											0
316 Stainless Steel (suitable for water and waste water)											1
Others on application											
<b>Sensor Build Standard</b>											
Transmitter only											0
General											1
FM/CSA – GENERAL											8
<b>Calibration</b>											
Transmitter only											0
Standard 3-point, with pressure test											1
8-point, with pressure test											2
UKAS, with pressure test											5
Standard 3-point, no pressure test											A
8-point, no pressure test											B
UKAS, no pressure test											D
Standard 3-point; CalMaster Fingerprint & disk; No pressure test											I
Standard 3-point; CalMaster Fingerprint & disk; With pressure test											J
<b>Cable Length – User-specified length in 10m increments (90m max.) (Must be '00' for glanding digit 4)</b>										XX	
<b>Glanding</b>											
None (Transmitter only)											0
20mm plastic gland (sensor cable fitted and potted)											1
Conduit entry: 1/2 in. NPT (Blanked) – all North American versions (cable length to be '00')											4
20mm plastic. Cable not fitted.											5
20mm armor. Cable not fitted.											7
<b>Transmitter</b>											
Sensor-mounted MagMaster Transmitter, ≤400mm (16 in.) only											EH
Remote MagMaster Transmitter											ER





SO # 339428

Magnetic Flowmeter Calibration Test Report

Serial No.:3K620000008461

Date :26 FEB 2009

Sales Order No.:22347

Line Item:10

Meter Size :8 inch(200mm)

Model No.:MFF2013E110A004ER

Max Flow: 600.000 GPM

Sp. Gr. : 1.000

Sensor Factor 1 : 1.4585

Sensor Factor 2 : +0.0

Sensor Factor 3 : 5

Sensor Factor 4 :1.0000

<u>Run #</u>	<u>Actual GPM</u>	<u>Indicated GPM</u>	<u>Error % Rate</u>
01	588.820	588.957	+ .023
02	288.697	288.704	+ .002
03	104.385	104.517	+ .127

All Flowmeters are hydraulically calibrated in accordance with ANSI/Z540 and are traceable to the NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY. The ABB Automation Inc., Instrumentation Division, Warminster facility is certified to ISO 9001.

This Calibration report may not be reproduced, except in full, without written permission.

Hydraulic test performed by:G. Slugg

Required Accuracy:0.15% of Rate

TEST EQUIPMENT USED :

- 222 VOLTMETER
- 074 6L FREQ. COUNTER
- 108 THERMISTOR
- 131 5,000 LB SCALE
- 096 6L 6 Inch Master

FLOW LOOPS REV 16-301006 10:42:53 0 46 14

ABB Inc.





SO # 339428

Magnetic Flowmeter Calibration Test Report

Serial No.:3K620000008460

Date :26 FEB 2009

Sales Order No.:22347

Line Item:10

Meter Size :8 inch(200mm)

Model No.:MFF2013E110A004ER

Max Flow: 600.000 GPM

Sp. Gr. : 1.000

Sensor Factor 1 : 1.4540

Sensor Factor 2 : +0.0

Sensor Factor 3 : 5

Sensor Factor 4 :1.0000

<u>Run #</u>	<u>Actual GPM</u>	<u>Indicated GPM</u>	<u>Error % Rate</u>
01	604.383	604.094	-.048
02	305.695	305.397	-.097
03	123.891	123.967	+.062

All Flowmeters are hydraulically calibrated in accordance with ANSI/Z540 and are traceable to the NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY. The ABB Automation Inc., Instrumentation Division, Warminster facility is certified to ISO 9001.

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Hydraulic test performed by:G. Slugg

Required Accuracy:0.15% of Rate

TEST EQUIPMENT USED :

- 22 VOLTMETER
- 74 8L FREQ. COUNTER
- 08 THERMISTOR
- 31 5,000 LB SCALE
- 96 8L 6 Inch Master

FLOW LOOPS REV 16-301006 08:55:22 0 14 16

ABB Inc.



September 16<sup>th</sup>, 2009  
File: 02-0775-50-3534/Vol 01

**Business & Financial Services Department**  
**Finance Division**  
Telephone: 604-276-4218  
Fax: 604-276-4162

**Attention: To All Tenderers**

Dear Sir/Madame:

**Re: Invitation to Tender T.3534 – City Centre/Bennett West Sanitary Upgrades – Addendum 2**

This addendum includes items of clarification, forms part of the Contract Documents and shall be read, interpreted and coordinated with all other parts. Please review and consider the following information in preparation of your Tenders:

**ITEM 1 – BIDDER QUESTIONS AND ANSWERS**

- Q.1 The forcemain plan/profile details on drawing 0946-08-OC sheet 2, and 0946-08-OD sheet 2 show the 300mm dia. pipe reducing to a 200mm dia. pipe through the flow meter. However the tie-in/flow meter details on 0946-08-OC sheet 3, and 0946-08-OD sheet 3 show the pipe as 300mm dia. through the flow meter. What is the correct size?
- A.1 The flow meters are 200mm in diameter (based on the pre-purchase form), the plan /profile drawings are correct.
- Q.2 On page D27, in A2 the Contractor is to supply concrete testing. This is contrary to Section 03310, 1.6.1b that states concrete testing is by the owner. Who is responsible for concrete testing?
- A.2 The Contractor is to supply concrete testing.
- Q.3 Please confirm that the Milltronics Multiranger, complete with the XPS 15 sensor is provided with the Kiosk from the City of Richmond.
- A.3 Yes the Milltronics Multiranger, complete with XPS 15 head is in the kiosk pre-purchase.
- Q.4 What level of restoration is required as per Bylaw 7869 if the forcemain trench is located along the centreline of the arterial road and/or is over two lanes of traffic?
- A.4 Road restoration would be for both lanes, as per Bylaw 7869.

**ITEM 2 – SCOPE CLARIFICATION**

In SECTION B – TENDER SUBMISSION DOCUMENTS, under Form of Tender, remove Appendix 1 – Schedule of Quantities and Prices and use the following revised Appendix 1 – Schedule of Quantities and Prices:

Yours truly,

A handwritten signature in black ink, appearing to be 'Kerry Lynne Gillis', written in a cursive style.

Kerry Lynne Gillis  
*Buyer II - Contracting Specialist*

KG:kg

pc: Anthony Fu, Project Manager

## FORM OF TENDER

### Appendix 1

#### SCHEDULE OF QUANTITIES AND PRICES (See paragraph 5.3.1 of the Instructions to Tenderers - Part II)

(All prices and Quotations including the *Contract Price* shall include all *Taxes*, but shall not include *GST*.)

#### TENDER SUMMARY

##### 1. GENERAL

The undersigned Tenderer, hereinafter referred to as the Tenderer, hereby agrees that the Tendered amounts were completed, signed, sealed and submitted to the Owner by the Tenderer as part of his Tender and further, that he has satisfied himself with and agrees to the contents of the Tender as submitted to the Owner.

##### 2. TENDERED AMOUNTS

The tendered amounts carried over from items in the schedule are summarized as follows:

ITEM NO.	DESCRIPTION	TENDERED AMOUNT
A	PUMP STATION ITEMS	
B	SANITARY SEWER ITEMS	
C	RESTORATION ITEMS	
	<b>TENDER PRICE (GST excluded)</b> (Carried Forward to Form of Tender)	

**T.3534 – City Centre / Bennett West Sanitary Upgrades  
 SCHEDULE OF QUANTITIES AND PRICES**

<b>ITEM NO.</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>EST. QTYS.</b>	<b>UNIT PRICE (\$)</b>	<b>TOTAL AMT. (\$)</b>
<b>A</b>	<b>PUMP STATION ITEMS</b>				
A-1	Temporary Pumping			Lump Sum	
A-2	Wet Well Installation			Lump Sum	
A-3	Kiosk Installation & Electrical Work			Lump Sum	
A-4	Miscellaneous Pump Station Items			Lump Sum	
<b>TOTAL FOR PUMP STATION ITEMS – ITEM A  (Carry forward to Tender Summary)</b>					<b>\$</b>

<b>T.3534 - City Centre / Bennett West Sanitary Upgrades</b>					
<b>SCHEDULE OF QUANTITIES AND PRICES</b>					
<b>ITEM NO.</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>EST. QTYS.</b>	<b>UNIT PRICE (\$)</b>	<b>TOTAL AMT. (\$)</b>
<b>B</b>	<b>SANITARY SEWER ITEMS</b>				
B-1	Supply and Installation of PVC Class 150 (DR 25) Sanitary Forcemain				
	a) 200mm	Lin. m.	10		
	b) 300mm	Lin. m.	290		
	c) 400mm	Lin. m.	340		
	d) 500mm	Lin. m.	400		
	e) 600mm	Lin. m.	190		
B-2	Installation of Flow Meters	Each	2		
B-3	Connection to existing 300mm dia. sanitary forcemain at Eckersley Road and Anderson Road			Lump Sum	
B-4	Connection to existing 300mm dia. sanitary forcemain at 6580 Eckersley Road			Lump Sum	
B-5	Connection to existing 200mm dia. sanitary forcemain at Jones Road and St. Albans Road			Lump Sum	
B-6	Connection to existing 200mm dia. sanitary forcemain at Bennett Road and St. Albans Road	Each	2		
B-7	Connection to existing Metro Vancouver Sanitary Forcemain at Blundell Road and St. Albans Road			Lump Sum	
B-8	Complete Forcemain Tie-in to existing Sanitary Pump Station (Eckersley B)			Lump Sum	
B-9	Complete Forcemain Tie-in of new Forcemain to Existing at Eckersley A			Lump Sum	
B-10	Supply and Installation of 525mm dia. Sanitary Gravity main	Lin. m.	105		
B-11	Supply and Installation of 250mm dia. Sanitary Gravity main	Lin. m.	5		
B-12	Supply and Installation of new 1200mm dia. Sanitary Manhole	Each	4		
B-13	Supply and Installation of new sanitary pigging chamber (including fittings, valves and chamber)				
	a) Two-way chamber at Granville and St. Albans			Lump Sum	
	b) Two-way chamber at General Currie and St. Albans			Lump Sum	
	c) One-way chamber at Blundell and St. Albans			Lump Sum	
B-14	Supply and Installation of new 1050mm dia. Sanitary Manhole	Each	1		
B-15	New 150mm dia. lateral connection to existing sanitary service at 6860 Eckersley Road			Lump Sum	
<b>TOTAL FOR PUMP STATION ITEMS - ITEM B (Carry forward to Tender Summary)</b>					<b>\$</b>

<b>T.3534 - City Centre / Bennett West Sanitary Upgrades</b>					
<b>SCHEDULE OF QUANTITIES AND PRICES</b>					
<b>ITEM NO.</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>EST. QTYS.</b>	<b>UNIT PRICE(\$)</b>	<b>TOTAL AMT. (\$)</b>
<b>C</b>	<b>RESTORATION ITEMS</b>				
C-1	Supply & Install Final Asphalt Overlay	Lump Sum			
C-2	Road works (6860 Eckersley Road)				
	a) Supply and install concrete curb and gutter	Lin. m.	35		
	b) Supply and install concrete wheel chair ramp	Lump Sum			
	c) Supply and install concrete driveway entrance	Lump Sum			
	d) Boulevard and landscaping adjustments as required	Lump Sum			
	e) Supply and install remaining sidewalk to property line of 8520 Anderson Road	Lump Sum			
C-3	Storm works (6860 Eckersley Road)				
	a) Supply and install pan catch-basin	Ea.	2		
<b>TOTAL RESTORATION ITEMS – ITEM C</b> <b>(Carry forward to Tender Summary)</b>					<b>\$</b>