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<tr>
<th>DRAWING No.</th>
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<tbody>
<tr>
<td>WM-200.01</td>
<td>May 2013</td>
<td>Bedding &amp; Backfill for Concrete &amp; PVC Watermains and Water Services</td>
</tr>
<tr>
<td>WM-200.02</td>
<td>November 2005</td>
<td>Bedding &amp; Backfill for Ductile Iron Watermains and Water Services</td>
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<td>WM-201.01</td>
<td>June 2017</td>
<td>1200mm Dia. Precast Valve Chamber for 300mm Dia. Watermains &amp; Smaller</td>
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<td>WM-201.02</td>
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<td>Tapping Valve Installation for D.I. Watermain 300mm Dia. and Smaller</td>
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<td>WM-201.03</td>
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<td>Level Valve Chamber – 150mm Dia. to 300mm Dia. Watermains</td>
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<td>WM-201.04</td>
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<td>Air Valve Snorkel</td>
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<td>Check Valve and Chamber - 150mm Dia. to 300mm Dia. Watermains</td>
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<td>WM-202</td>
<td>June 2017</td>
<td>Valve Box Installation For 100mm to 400mm Dia. Watermains</td>
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<td>Hydrant Installation</td>
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<td>WM-203.02</td>
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<td>Hydrant Installation using Anchor Tee</td>
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<td>WM-203.03</td>
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<td>Relocation of Ditches at Hydrants</td>
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<td>WM-203.04</td>
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<td>Operating Nut Adaptor for Use on Open Right (Clockwise) Valves</td>
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<td>WM-204.01</td>
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<td>Concrete Anchor Blocks For 300mm Dia. Watermains And Smaller</td>
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<td>WM-204.02</td>
<td>January 2011</td>
<td>11-1/4° &amp; 22-1/2° Angle Anchor Block Details for 400mm to 600mm Dia. D.I. Watermains</td>
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<td>WM-204.03</td>
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<td>45° Angle Anchor Block Details for 400mm to 600mm Dia. D.I. Watermains</td>
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<tr>
<td>WM-204.04</td>
<td>January 2011</td>
<td>45° Angle Anchor Block with Leg for 400mm to 600mm Dia. D.I. Watermains</td>
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<td>WM-204.05</td>
<td>January 2011</td>
<td>90° Angle Anchor Block Details for 400mm to 600mm Dia. D.I. Watermains</td>
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<td>WM-204.06</td>
<td>January 2011</td>
<td>90° Angle Anchor Block with Leg for 400mm to 600mm Dia. DI Watermains</td>
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<td>WM-204.07</td>
<td>January 2011</td>
<td>Tee Anchor Block Details for 400mm to 600mm Dia. D.I. Watermain Branches</td>
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*24” x 36” size drawings are not bound in this document*
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<td>January 2011</td>
<td>Tee Anchor Block with Leg for 400mm to 600mm Dia. D.I. Branch Watermains</td>
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<td>WM-204.09</td>
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<td>Concrete Thrust Block for 400mm to 600mm Dia. D.I. Watermains</td>
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<td>WM-204.10</td>
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<td>Concrete Anchor Blocks for 100mm to 300mm Dia. D.I. Watermains at 11 1/4o &amp; 22 1/2o Vertical Bends</td>
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<td>January 2011</td>
<td>Concrete Anchor Blocks for 100mm to 300mm Dia. D.I. Watermains at 45 o Vertical Bend</td>
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<td>WM-204.12</td>
<td>January 2011</td>
<td>Vertical Bend Anchor Block 7 1/2o to 22 1/2o for 400mm Dia. D.I. Watermain</td>
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<td>WM-204.13</td>
<td>November 2018</td>
<td>Concrete Anchor Block for 100mm to 300mm Dia. Watermain Lowering</td>
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<td>January 2011</td>
<td>Concrete Anchor Block for 100mm to 300mm Dia. Watermain Lowering</td>
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<td>WM-204.14</td>
<td>November 2018</td>
<td>Vertical Bend Anchor Block 45o for 400mm Dia. D.I. Watermain</td>
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<td>WM-205.01</td>
<td>March 2008</td>
<td>50mm Dia. Watermain Looping in Cul De Sacs (20.0 m R.O.W.)</td>
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<tr>
<td>WM-205.02</td>
<td>March 2008</td>
<td>50mm Dia. Watermain Looping in Cul De Sacs (18.0 m R.O.W.)</td>
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<tr>
<td>WM-206</td>
<td>November 2005</td>
<td>50mm Dia. Dead End Blow-Off</td>
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<td>WM-207.01</td>
<td>November 2005</td>
<td>Piping Arrangement for 19-25mm Dia. Water Service Connection and Yard Service</td>
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<tr>
<td>WM-207.02</td>
<td>November 2005</td>
<td>Piping Arrangement for 19-25mm Dia. Water Service Connections in a Common Trench</td>
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<tr>
<td>WM-207.03</td>
<td>November 2005</td>
<td>Insulation Details for Water Services at Gooseneck</td>
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<td>WM-207.04</td>
<td>January 2020</td>
<td>Piping for 100mm to 300mm Dia. Water Service Connection &amp; Yard Service to Meter with Cut in Tee &amp; Sleeve</td>
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<tr>
<td>WM-207.05</td>
<td>January 2020</td>
<td>Piping for 100mm to 300mm Dia. Water Service Connection &amp; Yard Service to Meter using Tapping Sleeve &amp; Valve</td>
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<tr>
<td>WM-207.06</td>
<td>January 2020</td>
<td>Piping Arrangement for 50mm Dia. Water Service Connection and Yard Service</td>
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<tr>
<td>WM-208</td>
<td>November 2005</td>
<td>Remote Receptacle Installation for Meter Chambers</td>
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<tr>
<td>WM-209.01</td>
<td>January 2020</td>
<td>Piping and Chamber for Residential 16mm to 50mm Dia. Meter Installation</td>
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<tr>
<td>WM-209.02</td>
<td>January 2020</td>
<td>Piping and Chamber for Multi-Unit Residential (3 Storeys and Above) or ICI Moderate Hazard 16mm to 50mm Dia. Meter Installation</td>
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<tr>
<td>WM-209.03</td>
<td>January 2020</td>
<td>Piping and Chamber for ICI High Hazard 16mm to 50mm Dia. Meter Installation</td>
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<tr>
<td>WM-210.01</td>
<td>June 2019</td>
<td>Piping for Multi-Unit Residential (3 Storeys and Above) or ICI Moderate Hazard 16mm to 50mm Dia. Meter for Internal Installation</td>
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<td>WM-210.02</td>
<td>June 2019</td>
<td>Piping for Multi-Unit Residential (3 Storeys and Above) or ICI Moderate Hazard 100mm to 250mm Dia. Meters for Internal Meter Installation</td>
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<tr>
<td>WM-210.03</td>
<td>June 2019</td>
<td>Piping for ICI, High Hazard 16mm to 50mm Dia. Meter for Internal Installation</td>
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<td>WM-210.04</td>
<td>June 2019</td>
<td>Piping for ICI, High Hazard 100mm to 250mm Dia. Meter for Internal Installation</td>
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<tr>
<td>WM-211.01</td>
<td>November 2005</td>
<td>Standard Remote Installation for 16-25mm Dia. Meters</td>
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<tr>
<td>WM-211.02</td>
<td>November 2005</td>
<td>Alterations of Existing 16-25mm Dia. Piping Prior to Meter Installation</td>
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<tr>
<td>WM-211.03</td>
<td>June 2019</td>
<td>Piping for Residential 16mm to 50mm Dia. Meter for Internal Installation</td>
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<tr>
<td>WM-211.04</td>
<td>November 2005</td>
<td>Meter Pipe Spacer Installation</td>
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<td>WM-211.05</td>
<td>June 2019</td>
<td>Satellite Meter Installation for 16mm to 25mm Dia. Services</td>
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<td>WM-212.03</td>
<td>November 2005</td>
<td>Valve Key Frame &amp; Cover</td>
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<td>WM-213</td>
<td>November 2005</td>
<td>Chamber End Plates for 100mm Dia. to 300mm Dia. Watermains</td>
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<td>WM-214</td>
<td>November 2005</td>
<td>Removable Slab Lifting Hole Details &amp; Lifting Hook Detail for Chambers</td>
</tr>
<tr>
<td>WM-215.01</td>
<td>November 2005</td>
<td>Valve Support</td>
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<tr>
<td>WM-215.02</td>
<td>November 2005</td>
<td>Pipe &amp; Valve Support</td>
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<td>WM-215.03</td>
<td>November 2018</td>
<td>Concrete Pipe Support Details for 750mm to 1200mm Dia. Watermains</td>
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<tr>
<td>WM-216</td>
<td>November 2005</td>
<td>Blow-Off Connection at Access Chamber</td>
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<tr>
<td>WM-217</td>
<td>November 2005</td>
<td>Pitometer Connection for Steel &amp; Concrete Pipe</td>
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<tr>
<td>WM-230</td>
<td>June 2019</td>
<td>2400mm Precast Valve chamber for 400mm Dia. Concrete or Ductile Iron Pipe with 50mm Air Valve &amp; 100mm Blow-Off. *(24” x 36”)</td>
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<tr>
<td>WM-231</td>
<td>June 2019</td>
<td>Precast Valve Chamber for 450mm, 500mm and 600mm Dia. Concrete Pipe or Ductile Iron Pipe *(Size 24” x 36”)</td>
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<tr>
<td>WM-232</td>
<td>June 2019</td>
<td>1800mm Precast Valve Chamber for 400mm to 500mm Dia. Concrete or Ductile Iron Pipe with 50mm Air Valve &amp; 100mm Blow-Off *(Size 24” x 36”)</td>
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<tr>
<td>WM-233</td>
<td>June 2019</td>
<td>1800mm x 3000mm Precast Valve Chamber for 400mm Dia. Concrete or Ductile Iron Pipe with 100mm to 300mm Dia. Branch *(Size 24” x 36”)</td>
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<tr>
<td>WM-234.01</td>
<td>June 2019</td>
<td>Piping and Chamber for Multi-Unit Residential 100mm to 250mm Dia. Meter Installation (1800mm X 2400mm/3000mm/3500mm Precast Meter Chambers) *(Size 24” x 36”)</td>
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<tr>
<td>WM-234.02</td>
<td>June 2019</td>
<td>Piping and Chamber for Multi-Unit Residential (3 Storeys and Above) or ICI Moderate Hazard 100mm to 250mm Dia. Meter Installation (1800 X 2400mm and 1800mm X 3000mm Precast Meter Chambers) *(Size 24” x 36”)</td>
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<tr>
<td>WM-234.03</td>
<td>June 2019</td>
<td>Piping and Chamber for ICI, High Hazard 100mm to 250mm Dia. Meter Installation (1800mm X 2400mm and 1800mm X 3000mm Precast Meter Chambers) *(Size 24” x 36”)</td>
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<tr>
<td>WM-235</td>
<td>November 2005</td>
<td>1800mm x 2400mm Precast Tapping Valve Chamber for 100mm to 300mm Dia. D.I. Pipe Tapping off 400mm to 600mm Dia. Watermain *(Size 24” x 36”)</td>
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<tr>
<td>WM-236.01</td>
<td>June 2019</td>
<td>3400mm x 4700mm Precast Valve Chamber for 750mm and 900mm Dia. Concrete Pressure Pipe with Butterfly Valve, 100mm Dia. Air Release Valve and 150mm Dia. Blow Off Valves *(Size 24” x 36”)</td>
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<tr>
<td>WM-236.02</td>
<td>June 2019</td>
<td>3400mm x 4700mm Precast Valve Chamber for 1050mm and 1200mm Dia. Concrete Pressure Pipe with Butterfly Valve, 100mm Dia. Air Release Valve and 150mm Dia. Blow Off Valves *(Size 24” x 36”)</td>
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*24” x 36” size drawings are not bound in this document*
CONCRETE & PVC WATERMAIN
BEDDING & BACKFILL

REFER TO SPECIFICATIONS AND PLANS
FOR BEDDING AND BACKFILL MATERIALS

<table>
<thead>
<tr>
<th>DIM</th>
<th>300mm DIA WATERMAINS AND SMALLER</th>
<th>350mm DIA WATERMAINS AND LARGER</th>
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<tr>
<td>A</td>
<td>FOR RESTORATION SEE RD-100.01 &amp; RD-100.02</td>
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<tr>
<td>B</td>
<td>750 (Min.)</td>
<td>800 (Min.)</td>
</tr>
<tr>
<td>C</td>
<td>300 (Min.)</td>
<td>450 (Min.)</td>
</tr>
<tr>
<td>D</td>
<td>C.D. OF PIPE</td>
<td>O.D. OF PIPE</td>
</tr>
<tr>
<td>E</td>
<td>150 (Min.)</td>
<td>225 (Min.)</td>
</tr>
<tr>
<td>F</td>
<td>D + 45 (Min.)</td>
<td>D + 675 (Min.)</td>
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<tr>
<td>G</td>
<td>225 (Min.)</td>
<td>225 (Min.)</td>
</tr>
<tr>
<td>W</td>
<td>D + 450 (Min.)</td>
<td>D + 450 (Min.)</td>
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COPPER WATERMAIN
& WATER SERVICE
BEDDING & BACKFILL

NOTES:
1. WATER SERVICES WILL BE NORMALLY LOCATED
1000mm TO THE LEFT OF THE C.C. OF THE LOT & MINIMUM
2500mm CLEARANCE FROM A SEWER SERVICE.
2. FINAL LOCATION TO BE DETERMINED BY THE PROJECT MANAGER.

City of Hamilton
Public Works Department

BEDDING & BACKFILL FOR CONCRETE AND
PVC WATERMAINS AND WATER SERVICES

DIMENSIONS SHOWN ARE IN MILLIMETRES
UNLESS OTHERWISE NOTED (N.T.S.)

DATE
May 2013

REV No
1

FORMERLY: RWS 500(1)

HAMILTON STD No
WM-200.01
INSTALLATION IN EARTH

INSTALLATION IN ROCK

NOTE: REFER TO SPECIFICATIONS AND PLANS FOR BEDDING AND BACKFILL MATERIALS.

<table>
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<tr>
<th>DIAM</th>
<th>300mm DIA WATERMANS AND SMALLER</th>
<th>350mm DIA WATERMANS AND LARGER</th>
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<tr>
<td>A</td>
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<tr>
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<td>750 (Min.)</td>
<td>800 (Min.)</td>
</tr>
<tr>
<td>C</td>
<td>350 (Min.)</td>
<td>450 (Min.)</td>
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<tr>
<td>D</td>
<td>150 (Min.)</td>
<td>225 (Min.)</td>
</tr>
<tr>
<td>E</td>
<td>225 (Min.)</td>
<td>225 (Min.)</td>
</tr>
<tr>
<td>W</td>
<td>O.D. PIPE + 400 (Min.)</td>
<td>O.D. PIPE + 400 (Min.)</td>
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</tbody>
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City of Hamilton
Public Works Department

BEDDING & BACKFILL FOR DUCTILE IRON WATERMANS & WATER SERVICES

DIMENSIONS SHOWN ARE IN MILLIMETRES UNLESS OTHERWISE NOTED (N.T.S.)

DATE: November 2006

REV No.

FORMERLY: RAMS 60002

HAMPTON STD No: WM-200.02
NOTES:
1. PRECAST SECTIONS TO BE MANUFACTURED TO ASTM C-491 AND CSA SPECIFICATIONS.
2. FILL ALL JOINTS AND LIFTING HOLES (INSIDE & OUT) 15mm THICK WITH 1:3 NON-SHRINK MORTAR MIX.
3. ALL ADJUSTMENTS TO CHAMBER AND KEY COVERS SHALL BE MADE WITH Poured CONCRETE.
4. ALL CONCRETE TO BE 30 MPa, TYPE 50 CEMENT.
5. ALL REINFORCING TO BE HIGH BOND STRUCTURAL GRADE.
6. FASTEN INSULATION TO CEILING WITH 50mm 0'WASHERS (GALVANIZED) & 8mm O TAPCON CONCRETE ANCHORS @ 450mm CENTRES.
7. DOGHOUSE OPENING TO BE CUT OUT MIN. 50mm LARGER THAN O.D. OF WATERMAIN, PIPE TO BE WRAPPED WITH MIN. 50mm THICK OF PLAST MASTIC MATERIAL, REMAINING CAVITY TO BE GROUTED, (SEE DOGHOUSE DETAIL).
8. ALL METAL COMPONENTS INSIDE VALVE CHAMBER, INCLUDING STAINLESS STEEL NUTS AND BOLTS, SHALL HAVE A PROTECTIVE CORROSION TAPE COATING SYSTEM (PRIMER, MASTIC AND TAPE). PROTECTIVE CORROSION TAPE COATING (PRIMER, MASTIC AND TAPE) IS NOT REQUIRED ON VALVE BODIES.

City of Hamilton
Public Works Department

1200mm DIA. PRECAST VALVE CHAMBER FOR
300mm DIA. WATERMAINS AND SMALLER
NOTES:
1. PRECAST SECTIONS TO BE MANUFACTURED TO ASTM C-478 AND CSA SPECIFICATIONS.
2. FILL ALL JOINTS AND LIFTING HOLES (INSIDE & OUT) 15mm THICK WITH 1:3 NON-SHrink MORTAR MIX.
3. ALL ADJUSTMENTS TO CHAMBER AND KEY COVERS SHALL BE MADE WITH Poured CONCRETE.
4. ALL CONCRETE TO BE 30 MPa, TYPE 50 CEMENT.
5. ALL REINFORCING STEEL TO BE HIGH BOND STRUCTURAL GRADE MIN. 50mm OF CONCRETE COVER OVER REINFORCING.
6. D.O.G. OPENING TO BE CUT OUT MIN. 50mm LARGER THAN O.D. OF WATERMAIN. PIPE TO BE WRAPPED WITH MIN. 50mm THICK OF PLASTIC Mastic MATERIAL, REMAINING CAVITY TO BE GRouted. SEE DOGHOUSE DETAIL.
7. ALL FLANGES TO BE IN ACCORDANCE WITH ANSI/AWWA.
8. ALL METAL COMPONENTS INSIDE VALVE CHAMBER, INCLUDING STAINLESS STEEL NUTS AND BOLTS, SHALL HAVE A PROTECTIVE CORROSION TAPE COATING SYSTEM (PRIMER, MASTIC AND TAPE). PROTECTIVE CORROSION TAPE COATING (PRIMER, MASTIC AND TAPE) IS NOT RECOMMENDED ON VALVE BODIES.
9. WALL THICKNESS FOR PRECAST CHAMBER SHALL BE 200mm MIN. CAP AND BASE TO BE 200mm MIN.

SECTION A-A

SECTION B-B

SECTION C-C

City of Hamilton
Public Works Department

TAPPING VALVE INSTALLATION FOR
D.I. WATERMAINS 300mm DIA. AND SMALLER

DIMENSIONS SHOWN ARE IN MILLIMETRES UNLESS OTHERWISE NOTED (I.T.S.)

DATE       REV No       FORMERLY: RWS-392
June 2017   1

HAMLTON STD No

WM-201.02
**SECTION B-B DOGHOUSE DETAIL**

**NOTES:**
1. PRECAST Chambers AND Sections SHALL be MANUFACTURED TO ASTM C-496, CSA, MEET H-20 S16 LOADING REQUIREMENTS AND IN ACCORDANCE WITH THE APPROVED PRODUCTS LIST.
2. Fill All JointS And Lifting HOLES (INSIDE & OUT) 15mm Thick With 1:3 Non-Shrink Mortar Mix.
3. All Adjustments TO Chamber And Key Covers SHALL be MADE WITH Poured Concrete.
4. All CONCRETE TO BE 52 MPa, Type 50 cement.
5. Fasten Insulation TO Ceiling WITH 50mm Dia. Washers (Galvanized) & 6mm Dia. Tapcon Concrete Anchors @ 450mm Centres.
6. Doghouse Opening TO be Cut Out Min. 50mm Larger THAN O.D. Of Proposed Watermain. Pipe TO be Wrapped With Min. 50mm Thick Of Plast mastic Material, Remaining Cavity TO be Grouted.
7. All Flanges TO be in Accordance With ANSI / AWWA.
8. All metal Components in Valve Chambers, Including Stainless Steel Nuts and Bolts, SHALL have A Protective Corrosion Tape Coating System (Primer, Mastic and Tape). Protective corrosion tape coating is NOT REQUIRED on Valve bodies.
9. Chamber Piping SHALL be Ductile Iron Class 54.
10. Waterproof Membrane SHALL be applied to ALL Chamber walls prior to backfilling.
11. Approved Restrained Coupling SHALL be in Accordance WITH the APPROVED PRODUCTS LIST.

**SECTION A-A**

- **Valve Chamber Frame & Cover O.502.011** To be Plumbed FROM Valve Spindle
- **Valve Support WMA-215.02**
- **Gate Valve TO be Left in Closed Position**
- **Approved Mechanical Joint Restraint Coupling**
- **Valve Support WMA-215.02**
- **75mm Compacted Granular 'A'**

**CHAMBER COVER INSULATION DETAIL PLAN VIEW**

- **50 x 50mm Galvanized Angle Bolted To Top Of Chimney OR Opening In Roof**
- **6mm Dia. Bolt and Anchor**
- **50mm Dia. Lifting Holes**
- **50mm Styrofoam H-100 Insulation**

**SECTION C-C**

**LEVEL VALVE CHAMBER**

150mm Dia. To 300mm Dia. Watermains

**City of Hamilton**
**Public Works Department**

**LEVEL VALVE CHAMBER**

150mm Dia. To 300mm Dia. Watermains
NOTES:

1. AIR VALVE SNORKEL SYSTEM REQUIRED ONLY WHEN A CHAMBER FLOOR DRAIN CANNOT BE INSTALLED.

2. AIR VALVE SNORKEL VENTING SYSTEM SHALL BE CONSTRUCTED WITH PVC WATER PIPE MATERIAL.

3. SNORKEL PVC PIPE, FITTINGS AND SOLVENT CEMENT SHALL BE CERTIFIED TO CAN/CSA-B137.3, "RIGID POLYVINYL CHLORIDE (PVC) PIPE FOR PRESSURE APPLICATIONS" OR CAN/CSA-B137.2, "POLYVINYL CHLORIDE (PVC) INJECTION-MOULDED GASKETED FITTINGS FOR PRESSURE APPLICATIONS", AND HAVE MINIMUM PRESSURE RATING OF 1100 KPA.

4. FOR AIR VALVE SIZES GREATER THAN 50mm, ALL NIPPLES AND CONNECTIONS (EXCEPT VENT PIPING) TO BE FLANGE.

5. CHAMBER WALLS, ROOF, COVER (SEE DETAIL) AND CHAMBER ACCESS OPENING SHALL BE INSULATED WITH 50mm STYROFOAM H-I-100 INSULATION TO A MINIMUM DEPTH OF 1200mm BELOW TOP OF CHAMBER.

City of Hamilton
Public Works Department

AIR VALVE SNORKEL

DIMENSIONS SHOWN ARE IN MILLIMETRES UNLESS OTHERWISE NOTED (N.T.S.)

DATE: June 2019

WATER DISTRIBUTION SECTION USE ONLY

HAMILTON STD No: WM-201.04
NOTES:

1. PRECAST CHAMBERS AND SECTIONS SHALL BE MANUFACTURED TO ASTM C-478, CSA, MEET H-20 S16 LOADING REQUIREMENTS AND IN ACCORDANCE WITH THE APPROVED PRODUCTS LIST.
2. FILL ALL JOINTS AND LIFTING HOLES INSIDE & OUT & 15 mm THICK WITH 1/3 NON-SHRINK MORTAR MIX.
3. ALL ADJUSTMENTS TO CHAMBER AND KEY COVERS SHALL BE MADE WITH Poured CEMENT.
4. ALL CONCRETE TO BE 32 MPa, TYPE 50 CEMENT.
5. FASTEN INSULATION TO CEILING WITH 50 mm DIA. WASHERS (GALVANIZED) & 8 mm DIA. TAPE CON Concrete anchors @ 450 mm CENTRES.
6. DOGHOUSE OPENING TO BE CUT OUT MIN. 50 mm LARGER THAN O.D. OF PROPOSED WATERMAIN.
7. PIPE TO BE WRAPPED WITH 20 mm THICK OF PLAST Mastic MATERIAL, REMAINING CAVITY TO BE GROUTED.
8. ALL METAL COMPONENTS IN VALVE CHAMBERS, INCLUDING STAINLESS STEEL NUTS AND BOLTS, SHALL HAVE A PROTECTIVE CORROSION TAPE COATING SYSTEM (PRIMER, MASTIC AND TAPE). PROTECTIVE CORROSION TAPE COATING IS NOT REQUIRED ON VALVE BODIES.
9. CHAMBER PIPING SHALL BE DUCTILE IRON CLASS 54.
10. WATERPROOF MEMBRANE SHALL BE APPLIED TO ALL CHAMBER WALLS PRIOR TO BACKFILLING.
11. APPROVED RESTRAINED COUPLING SHALL BE IN ACCORDANCE WITH THE APPROVED PRODUCTS LIST.

City of Hamilton
Public Works Department

CHECK VALVE AND CHAMBER
150mm DIA. TO 300mm DIA. WATERMAINS

<table>
<thead>
<tr>
<th>CHAMBER SIZE TABLE</th>
<th>VALVE SIZE</th>
<th>CHAMBER SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>150mm</td>
<td>1500mm Ø</td>
<td></td>
</tr>
<tr>
<td>200mm</td>
<td>1500mm Ø</td>
<td></td>
</tr>
<tr>
<td>300mm</td>
<td>1500mm Ø</td>
<td></td>
</tr>
</tbody>
</table>

DIMENSIONS SHOWN ARE IN MILLIMETRES
UNLESS OTHERWISE NOTED (IN. / FT.)

DATE: February 2021
REV No: FORMERLY:

HAMILTON STD No: WM-201.05
NOTES:
1. HYDRANT TO BE INSTALLED WITH A MIN. 1200mm RADIUS LEVEL AREA TO MATCH HYDRANT GROUND LINE.
2. BEDDING & BACKFILL FOR HYDRANT CONNECTIONS (WM-900.01 & WM-200.02)
3. COVER STONES WITH FILTER FABRIC TERRAFLEX 270/41 NON-WOVEN OR APPROVED EQUALLY.
4. [ ] DENOTES UNDISTURBED GROUND.
5. [ ] DENOTES BACKFILL.
City of Hamilton
Public Works Department

PLAN VIEW

SECTION A-A
HYDRANT INSTALLATION (MAGZ101)

RELOCATION OF DITCHES AT HYDRANTS

DIMENSIONS SHOWN ARE IN MILLIMETRES UNLESS OTHERWISE NOTED (N.T.S.)

DATE
November 2006

REVISION NO.

FORMERLY: RWS-823

HAMPTON STD NO. WM-203.03
OPERATING NUT ADAPTOR
FOR USE ON OPEN CLOCKWISE (RIGHT) VALVES

City of Hamilton
Public Works Department

DIMENSIONS SHOWN ARE IN MILLIMETRES UNLESS OTHERWISE NOTED (A.T.S.)

DATE: January 2011

REV No: 1

FORMERLY: RMS 801

HAMILTON STD No: WM-203.04
TEES
SECTION A-A

11½° - 22½° - 45° & 90° BENDS
SECTION B-B

PLUGS - TEMPORARY
SIDE VIEW

INSTALL 20mm MAIN STOP WHERE SPECIFIED

TO SUIT

TIMBER BLOCKINGS 100x100mm (Min.)

WEDGES

PLUGS - PERMANENT
SIDE VIEW

NOTES:
1. ABOVE ANCHOR BLOCKS TO BE USED ON MECHANICAL JOINT AND TYTON JOINT FITTINGS.
2. DENOTES UNDISTURBED GROUND.
3. ALL CONCRETE TO BE 28 MPa.

City of Hamilton
Public Works Department

CONCRETE ANCHOR BLOCKS FOR
300mm DIA. WATERMAINS AND SMALLER

DIMENSIONS SHOWN ARE IN MILLIMETRES UNLESS OTHERWISE NOTED (M.T.S.)

DATE
January 2011

REV No
1

FORMERLY: RWS-400

HAMilton Std No
WM-204.01
NOTES:
1. [Shaded area] denotes undisturbed ground.
2. All concrete to be 30 MPa.

SECTION A-A

<table>
<thead>
<tr>
<th>PIPE DIA [mm]</th>
<th>400</th>
<th>450</th>
<th>600</th>
<th>650</th>
<th>750</th>
<th>800</th>
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</thead>
<tbody>
<tr>
<td><strong>A</strong></td>
<td>700</td>
<td>700</td>
<td>750</td>
<td>750</td>
<td>900</td>
<td>1200</td>
</tr>
<tr>
<td><strong>B</strong></td>
<td>760</td>
<td>750</td>
<td>800</td>
<td>900</td>
<td>1050</td>
<td>1200</td>
</tr>
<tr>
<td><strong>C</strong></td>
<td>760</td>
<td>760</td>
<td>800</td>
<td>900</td>
<td>1200</td>
<td>1200</td>
</tr>
</tbody>
</table>

City of Hamilton
Public Works Department

11-7/8" & 22-1/2° ANGLE ANCHOR BLOCK DETAILS
FOR 400mm TO 900mm DIA. D.I. WATERMAINS

Dimensions shown are in millimetres unless otherwise noted (A.T.S.)
Date: January 2011
Revision No: 1
Formerly: RAS-401
Hamilton STD No: WM-204.02
NOTES:
1.  DENOTES UNDISTURBED GROUND.
2.  ALL CONCRETE TO BE 20 MPa.
3.  MINIMUM COVER OF CONCRETE OVER REINFORCING TO BE 75mm.
4.  ALL REINFORCING STEEL TO BE GRADE 400.
5.  JOINT BOLTS TO BE PLACED PRIOR TO POURING CONCRETE.

45° ANGLE ANCHOR BLOCK DETAILS FOR 400mm TO 900mm DIA. D.I. WATERMAINS
NOTES:

1. XX Denotes Undisturbed Ground.
2. All Concrete to be 30 MPa.
3. Minimum Cover of Concrete Over Reinforcing to be 75mm.
4. All Reinforcing Steel to be Grade 400.
5. Joint Bolts to be placed prior to Pouring Concrete.
SECTION A-A

NOTES:
1. **DENOTES UNDISTURBED GROUND**.
2. ALL CONCRETE TO BE 30 MPa.
3. MINIMUM COVER OF CONCRETE OVER REINFORCING TO BE 75mm.
4. ALL REINFORCING STEEL TO BE GRADE 400.
5. JOINT BOLTS TO BE PLACED PRIOR TO POURING CONCRETE.

City of Hamilton
Public Works Department

90° ANGLE ANCHOR BLOCK DETAILS FOR
400mm TO 900mm DIA. D.I. WATERMAINS

DIMENSIONS SHOWN ARE IN MILLIOMETERS UNLESS OTHERWISE NOTED (A.T.S.)
DATE: January 2011
REV No: 1
FORMERLY: RM5-403
HAMLFON STD No: WM-204.05
PLAN VIEW

SECTION A-A

NOTES:
1. **DENOTES UNDISTURBED GROUND.**
2. ALL CONCRETE TO BE 30 MPA.
3. MINIMUM COVER OF CONCRETE OVER REINFORCING TO BE 75 mm.
4. ALL REINFORCING STEEL TO BE GRADE 400.
5. JOINT BOLTS TO BE PLACED PRIOR TO POURING CONCRETE.

City of Hamilton
Public Works Department

TEE ANCHOR BLOCK DETAILS FOR
400mm TO 900mm DIA D.I. WATERMAIN BRANCHES

DIMENSIONS SHOWN ARE IN MILLIMETRES UNLESS OTHERWISE NOTED (A.T.S.)
DATE January 2011
REV No 1
FORMERLY: RMS-404

HAMMONT ONO No WM-204.07
SECTION A-A

NOTES:
1. [Diagram] denotes undisturbed ground.
2. All concrete to be 80 MPa.
3. Minimum cover of concrete over reinforcing to be 75 mm.
4. All reinforcing steel to be Grade 40.
5. Joint bolts to be placed prior to pouring concrete.

City of Hamilton
Public Works Department

TEE ANCHOR BLOCK WITH LEG FOR
400mm TO 900mm DIA. D.I. BRANCH WATERMAINS

DIMENSIONS SHOWN ARE IN MILLIMETRES UNLESS OTHERWISE NOTED (N.T.S.)
DATE: January 2011
REV No: 1
FORMERLY: RMS-107
HAMILTON STD No: WM-204.08
NOTES:

1. [Shaded area] denotes undisturbed ground.
2. All concrete to be 80 MPa.
3. Minimum cover of concrete over reinforcing to be 75mm.
4. All reinforcing steel to be grade 400.

<table>
<thead>
<tr>
<th>PIPE DIA. (mm)</th>
<th>400</th>
<th>460</th>
<th>580</th>
<th>680</th>
<th>780</th>
<th>880</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>600</td>
<td>1000</td>
<td>1160</td>
<td>1400</td>
<td>1850</td>
<td>2000</td>
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</table>

City of Hamilton
Public Works Department

CONCRETE THRUST BLOCK
FOR 400mm TO 900mm DIA. D.I. WATERMAINS

DIMENSIONS SHOWN ARE IN MILLIMETRES UNLESS OTHERWISE NOTED (A.T.S.)

DATE: January 2011
REV No: 1
FORMERLY: RMS-411

HAMILTON STD No: WM-204.09
City of Hamilton
Public Works Department

CONCRETE ANCHOR BLOCK FOR
100mm TO 300mm DIA. D.I. WATERMAIN @ 11-\frac{1}{16}° & 22-\frac{1}{4}° VERTICAL BENDS

NOTES:
1. [ ] DENOTES UNDISTURBED GROUND.
2. ALL CONCRETE TO BE 30 MPa.
3. MINIMUM COVER OF CONCRETE OVER REINFORCING TO BE 75mm.
4. ALL REINFORCING STEEL TO BE GRADE 400.
5. FLANGE BOLTS TO BE PLACED PRIOR TO POURING CONCRETE.

100  | 150  | 200  | 250  | 300
---|---|---|---|---|
A | 900 | 600 | 1600 | 1200 | 1650
B | 800 | 850 | 1000 | 1200 | 1350
C | 660 | 600 | 750 | 750 | 1025
D | 160 | 160 | 200 | 200 | 300
E | 900 | 300 | 400 | 650 | 600

DIMENSIONS SHOWN ARE IN MILLIMETRES UNLESS OTHERWISE NOTED (A.T.S.)

DATE: January 2011
REV No: 1
FORMERLY: RMS-408
HAMILTON STD NO: WM-204.10
CONCRETE ANCHOR BLOCK FOR
100mm TO 300mm DIA. D.I. WATERMAIN @ 45° VERTICAL BEND

NOTES:
1. ** DENOTES UNDISTURBED GROUND.
2. ALL CONCRETE TO BE 30 MPa.
3. MINIMUM COVER OF CONCRETE OVER REINFORCING TO BE 75mm.
4. ALL REINFORCING STEEL TO BE GRADE 400.
5. FLANGE BOLTS TO BE PLACED PRIOR TO POURING CONCRETE.
FOR UPWARD THRUST

FOR DOWNWARD THRUST

NOTES:
1. □□□ DENOTES UNDISTURBED GROUND.
2. ALL CONCRETE TO BE 50 MPa.
3. MINIMUM COVER OF CONCRETE OVER REINFORCING TO BE 75mm.
4. ALL REINFORCING STEEL TO BE GRADE 400.

<table>
<thead>
<tr>
<th>PIPE DIA. (mm)</th>
<th>400</th>
<th>500</th>
<th>600</th>
<th>750</th>
<th>900</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.5° to 10°</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>1200</td>
<td>1600</td>
<td>1800</td>
<td>1800</td>
<td>2000</td>
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<tr>
<td>B</td>
<td>1200</td>
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<td>1500</td>
<td>1600</td>
<td>2100</td>
</tr>
<tr>
<td>C</td>
<td>450</td>
<td>500</td>
<td>600</td>
<td>750</td>
<td>900</td>
</tr>
<tr>
<td>11.5° to 22.5°</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>1600</td>
<td>1600</td>
<td>1800</td>
<td>2400</td>
<td>2700</td>
</tr>
<tr>
<td>B</td>
<td>1200</td>
<td>1500</td>
<td>1800</td>
<td>2100</td>
<td>2400</td>
</tr>
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<td>750</td>
<td>750</td>
<td>750</td>
<td>900</td>
<td>1050</td>
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</table>

City of Hamilton
Public Works Department

VERTICAL BEND ANCHOR BLOCK
7-1/2° TO 22-1/2° FOR 400mm TO 900mm DIA D.I. WATERMAIN

DIMENSIONS SHOWN ARE IN MILLIMETRES UNLESS OTHERWISE NOTED (A.T.S.)
DATE	January 2011
REV No	1
FORMERLY: RMS-412
HAMILTON STD No	WM-204.12
POUR CLASS 30 MPa CONCRETE BASE
2 DAYS BEFORE INSTALLING WATERMAIN

SEWER OR
WATERMAIN

MIN. DIMENSION (mm)

<table>
<thead>
<tr>
<th>SEWER</th>
<th>WATERMAIN</th>
</tr>
</thead>
<tbody>
<tr>
<td>500</td>
<td>250</td>
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</table>

EXIST. WATERMAIN

PROPOSED SLEEVE

PROJECTED 22° OR 45° ELBOW.
REFER TO PLAN & PROFILE

SIDE VIEW

DENOTES UNDISTURBED GROUND

DETAIL A

SECTION A-A

CONCRETE ANCHOR BLOCK FOR
100mm TO 300mm DIA. WATERMAIN LOWERING

City of Hamilton
Public Works Department

DIMENSIONS SHOWN ARE IN MILLIMETRES
UNLESS OTHERWISE NOTED (N.T.S.)

DATE: November 2018
REV No: 1
FORMERLY: RWS-413(1)

HAMILTON STD No: 1 OF 2

WM-204.13
STEEL STRAPPING DETAILS

NOTES:
1. ___________ DENOTES UNDISTURBED GROUND.
2. ALL CONCRETE TO BE 30 MPa.
3. MINIMUM COVER OF CONCRETE OVER REINFORCING TO BE 75mm.
4. ALL REINFORCING STEEL TO BE GRADE 400.

MIN. DIMENSION (mm)

<table>
<thead>
<tr>
<th>PIPE DIA. (mm)</th>
<th>22.5° BEND</th>
<th>45° BEND</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>150</td>
<td>800</td>
<td>460</td>
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<tr>
<td>300</td>
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<tr>
<td>450</td>
<td>1100</td>
<td>850</td>
</tr>
<tr>
<td>600</td>
<td>1350</td>
<td>780</td>
</tr>
</tbody>
</table>

City of Hamilton
Public Works Department

CONCRETE ANCHOR BLOCK FOR
100mm TO 300mm DIA. WATERMAIN LOWERING
NOTES:

1. **DENOTES UNDISTURBED GROUND.**

2. **ALL CONCRETE TO BE 40 MPA.**

3. **MINIMUM COVER OF CONCRETE OVER REINFORCING TO BE 75mm.**

4. **ALL REINFORCING STEEL TO BE GRADE 400.**

---

**City of Hamilton**  
**Public Works Department**

**VERTICAL BEND ANCHOR BLOCK**  
**45° FOR 400mm DIA WATERMAIN**

---

**DIMENSIONS SHOWN ARE IN MILLIMETRES**  
**DATE: DRAFT NOVEMBER 2018**  
**REV No**  
**HAMILTON STD No WM-204.14**
NOTE: LAST SECTION OF WATERMAIN TO BE 600mm MIN. IN LENGTH.

PLAN VIEW

SIDE VIEW

1. MAIN STOP A.W.W.A. TAPER THREAD TO M.I.P.
2. BRASS 90° ELBOW - F.I.P. BOTH ENDS
3. COUPLING - M.I.P.
4. CURB STOP & DRUM, "ORNAMENTAL" HUBBELL No. 1022S STOP & DRUM
   COMPRESSION ENDS ON EMCO No. 17012 CENTURY BALL VALVE.
5. BOTTOM BOARD - 80 x 250 x 250mm HARDWOOD
6. STAINLESS STEEL PIN
7. STAINLESS STEEL ROD
8. EXTENSION BARREL - 2 PIECES
9. ENCASED PLUG
10. PIPE TYPE "B" SOFT COPPER
11. CORPORATION SERVICE ELBOW - BRASS COMMON ELBOW - F.I.P. BOTH
    ENDS - CAKE - M.I.P. TO G.F. COUPLINGS
12. COUPLING - C.F. TO M.I.P.
13. COUPLING - F.I.P. BOTH ENDS.
14. PLUG - BOLTED BRASS

NOTES:
1. ALL FITTINGS TO CONFORM TO CITY STANDARDS.
2. BEDDING FOR 50mm BLOW-OFF (WM-200.01)
3. APPROVED PIPE JOINT COMPOUND TO BE USED ON ALL THREADED JOINTS.
4. COVER STONES WITH FILTER FABRIC FILTER TERRY RX 200R, NON-WOVEN OR EQUIVALENT

City of Hamilton
Public Works Department

50mm DIA. DEAD END BLOW-OFF

DIMENSIONS SHOWN ARE IN MILLIMETRES
UNLESS OTHERWISE NOTED (N.T.S.)

DATE
November 2006

REVISION
Formerly: RMS.711

HAMilton.Std no
WM-206
NOTES:
1. BEDDING DETAILS (WA-200.01 & WA-200.02)
2. INSTALLATION DETAILS (WA-207.02)
3. ALL FITTINGS TO CONFORM TO CITY STANDARDS
4. CATHODIC PROTECTION IS REQUIRED FOR COPPER WATER SERVICES CONNECTING TO PVC
5. WHERE SIDEWALK EXTENDS TO STREET LINE, CURB STOP TO BE INSTALLED WITH 200mm CLEARANCE FROM STREET LINE TO CENTRE OF CURB STOP.

1. MAIN STOP - A.W.W.A. TAPER THREAD TO C.F.
2. BOTTOM BOARD - 60 x 280 x 350mm HARDWOOD
3. CURB STOP - INVERTED KEY TYPE - C.F. BOTH ENDS (TO BE CLOSED)
4. EXTENSION BARREL - 2 PIECES
5. BRONZE PLUG
6. STAINLESS STEEL ROD
7. STAINLESS STEEL PIN
8. END TO BE CLAMPED CLOSED (FOR STUB ONLY)
9. METER LOCATION

City of Hamilton
Public Works Department

PIPING ARRANGEMENT FOR 19mm TO 25mm DIA. WATER SERVICE CONNECTION AND YARD SERVICE

DIMENSIONS SHOWN ARE IN MILLIMETRES UNLESS OTHERWISE NOTED (N.T.S.)

DATE
November 2006

REV

FORMERLY: RWS 700 (Sheet 1 & 10)

HAMILTON STD No
WM-207.01
NOTES:
1. MINIMUM DEPTH OF BURY 1500mm.
2. BEDDING DETAILS (WM-200.01 & WM-800.02)
3. INSTALLATION DETAILS (WM-807.01)

1. MAIN STOP
2. CURB STOP

City of Hamilton
Public Works Department

PIPING ARRANGEMENT FOR 19mm OR 25mm DIA. WATER SERVICE
CONNECTIONS IN A COMMON TRENCH

DIMENSIONS SHOWN ARE IN MILLIMETRES UNLESS OTHERWISE NOTED (N.T.B.)
DATE November 2006
REVI No
FORMERLY: RMS 702
HAMiLTON STNo WM-207.02
PLAN VIEW

SIDE VIEW

NOTE:
INSULATE UNTIL WATER SERVICE HAS A MINIMUM OF 1000MM COVER OR AS DIRECTED

City of Hamilton
Public Works Department

INSULATION DETAILS FOR WATER SERVICES AT GOOSENECK

DIMENSIONS SHOWN ARE IN MILLIMETRES UNLESS OTHERWISE NOTED (N.T.S.)

DATE: November 2006
REVISION: FORMERLY: RMS 718

HAMPTON STD No: WM-207.03
1. MECHANICAL JOINT TEE
2. MECHANICAL JOINT SLEEVE
3. GATE VALVE - MECHANICAL JOINT COMPLETE WITH VALVE BOX (WM-202)
4. 4:20 mm DIA. GALVANIZED OR STAINLESS STEEL TIE RODS WITH NUTS, WASHERS AND PLATES
5. FLANGED END (ABOVE FLOORS ONLY)

NOTES:
1. PIPE TO BE DUCTILE IRON CEMENT LINED, WITH CAST IRON CEMENT LINED FITTINGS OR PVC IN ACCORDANCE WITH CITY STANDARDS.
2. BEDDING AND BACKFILL REQUIREMENTS (WM-200.01 OR WM-200.02).
3. ANNULAR SPACE AROUND PIPING THROUGH WALL TO BE FILLED WITH APPROVED WATERPROOF SEALANT.
4. PIPING ENTERING VERTICALLY THROUGH FLOORS TO BE SECURED WITH VERTICAL TIE RODS AND CONCRETE ANCHOR BLOCK.
1. TAPPING SLEEVE - MECHANICAL JOINT
2. GATE VALVE - MECHANICAL JOINT COMPLETE WITH VALVE BOX (WM-202)
3. 42.0mm DIA GALVANIZED OR STAINLESS STEEL TIE RODS WITH NUTS, WASHERS AND PLATES
4. FLANGED END (ABOVE FLOORS ONLY)

NOTES:
1. PIPE TO BE DUCTILE IRON CEMENT LINED, WITH CAST IRON CEMENT LINED FITTINGS OR PVC IN ACCORDANCE WITH CITY STANDARDS
2. BEDDING AND BACKFILL REQUIREMENTS (WM-200.01 OR WM-200.02)
3. ANNULAR SPACE AROUND PIPING THROUGH WALL TO BE FILLED WITH AN APPROVED WATERPROOF SEALANT.
4. PIPING ENTERING VERTICALLY THROUGH FLOORS TO BE SECURED WITH VERTICAL TIE RODS AND CONCRETE ANCHOR BLOCK.

City of Hamilton
Public Works Department

PIPING FOR 100mm TO 300mm DIA. WATER SERVICE CONNECTION & YARD SERVICE TO METER USING TAPPING SLEEVE & VALVE

DIMENSIONS SHOWN ARE IN MILLIMETRES UNLESS OTHERWISE NOTED (N.T.S.)

DATE: January 2020
REV No: 1
FORMERLY: RWS 706

HAMONTL STD No: WM-207.05
NOTES:
A. ALL WATER SERVICES TO BE INSTALLED 90 TO THE LONGITUDINAL AXIS OF THE WATERMAIN.
B. BEDDING DETAILS (WM-200.01 & WM-200.02)
C. ALL FITTINGS TO CONFORM TO CITY STANDARDS
D. CATHODIC PROTECTION IS REQUIRED FOR COPPER WATER SERVICES CONNECTING TO PVC WM
E. WHERE SIDEWALK EXTENDS TO PROPERTY LINE, CURB STOP TO BE INSTALLED WITH 300MM CLEARANCE FROM PROPERTY LINE TO CENTRE OF CURB STOP.

1. APPROVED SERVICE SADDLE
2. MAIN STOP - A.W.W.A. TAPER THREAD TO C.F.
3. BOTTOM BOARD - 60 x 250 x 250mm HARDWOOD
4. CURB STOP
5. VALVE BOX WM - 202
6. METER LOCATION

City of Hamilton
Public Works Department

PIPING ARRANGEMENT FOR 50mm DIA. WATER SERVICE CONNECTION AND YARD SERVICE

DIMENSIONS SHOWN ARE IN MILLIMETRES UNLESS OTHERWISE NOTED (N.T.S.)
DATE: January 2020
REV No: FORMERLY: HAMILTON STD No WM-207.06
City of Hamilton
Public Works Department

REMOTE RECEPTACLE INSTALLATION
FOR METER CHAMBERS

NOTES:
1. ENCLOSURE TO BE A HOFFMAN NEHA 4X FIBRE GLASS.
   ENCLOSURE AVAILABLE AT NEXCO, 816 WILSON ST.
   HAMILTON, OR AN APPROVED EQUIVALENT.
2. PADLOCK TO BE SUPPLIED BY CITY.
3. 60mm DIA. HOLE TO BE DRILLED, CENTERED IN SIDEWALL.
4. FASTEN ENCLOSURE TO CONDUIT THROUGH
   SIDEWALL, WITH HINGES AT FRONT & BOTTOM.
5. FASTEN REMOTE TO METAL PLATE INSIDE ENCLOSURE,
   WITH SELF TAPPING SCREWS CLEAR OF EXTERIOR SHELL.

DIMENSIONS SHOWN ARE IN MILLIMETRES
UNLESS OTHERWISE NOTED (N.T.B.)

DATE       REVISIONS
November 2006    FORGERY, RPI-713

HAMILTON STD No
WM-208
NOTES:
1. CHAMBER DIA. TO BE 1000mm.
2. CHAMBER FRAME AND COVER (OPSD 402.010)
3. PRECAST CONCRETE SECTIONS TO CONFORM TO A.S.T.M. C-478.
4. ALL CONCRETE TO BE 50 MPa., 28 DAY STRENGTH, TYPE 50 CEMENT.
5. ALL ADJUSTMENTS TO CHAMBER COVERS SHALL BE MADE WITH Poured CONCRETE.
6. STEPS TO BE ALUMINUM PLACED AT 300mm C.C. AS PER OPSD 405.010.
7. METER SUPPLIED AND INSTALLED BY CITY.
8. CHAMBER TO BE LOCATED ON PRIVATE PROPERTY AT THE PROPERTY LINE AS NOTED
9. METER TO BE PLACED MIN 150mm FROM CHAMBER FLOOR.
10. ALL VALVES TO BE GATE VALVES.
11. METER COUPLINGS TO BE F.L.P. TO C.F.
12. COMPANION FLANGES FOR 38-50mm METER ONLY.

City of Hamilton
Public Works Department

PIPING AND CHAMBER FOR RESIDENTIAL
16mm TO 50mm DIA. METER INSTALLATION

MIN. DIMENSION A (mm)

<table>
<thead>
<tr>
<th>THREAD Fittings</th>
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<td>500</td>
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<tr>
<td>20</td>
<td>575</td>
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<td>25</td>
<td>600</td>
</tr>
<tr>
<td>38 - 50</td>
<td>750</td>
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</table>
NOTES:
1. CHAMBER FRAME AND COVER (OPS 402.010).
2. PRECAST CONCRETE SECTIONS TO CONFORM TO A.S.T.M. C-478.
3. ALL CONCRETE TO BE 30 MPa, 28 DAY STRENGTH. TYPE 50 CEMENT.
4. ALL ADJUSTMENTS TO CHAMBER COVERS SHALL BE MADE WITH POURING CONCRETE.
5. METER SUPPLIED AND INSTALLED BY CITY.
6. METER TO BE PLACED MIN 150mm FROM CHAMBER FLOOR.
7. CHAMBER TO BE LOCATED ON PRIMARY PROPERTY AT THE PROPERTY LINE.
8. APPLICABLE BACKFLOW PREVENTION ASSEMBLY TO BE PLACED NO MORE THAN 9.0m DOWNSTREAM OF THE METER/BYPASS ASSEMBLY.
9. WHERE UNABLE TO CONNECT TO STORM SEWER PLACE DOUBLE CHECK VALVE IN INSULATED ENCLOSURE AS PER WM-208.07.
10. ALL VALVES TO BE SILENT VALVES.
11. METER COUPLINGS TO BE F.I.P TO O.F.
12. COMPANION FLANGES FOR 38-50mm METER ONLY.

City of Hamilton
Public Works Department

PIPING AND CHAMBER FOR MULTI-UNIT RESIDENTIAL
(3 STOREYS AND ABOVE) OR ICI MODERATE HAZARD
16mm TO 50mm DIA. METER INSTALLATION

DIMENSIONS SHOWN ARE IN MILLIMETRES UNLESS OTHERWISE NOTED (N.T.S.)
DATE: JANUARY 2020
REV No: 1
FORMERLY: WM2000
HAMILTON STD No: WM-209.02
NOTES:
1. G.V. - GATE VALVE
2. ALL GATE VALVES TO BE INSTALLED WITH VALVE STEM IN HORIZONTAL POSITION
3. APPROVED PIPE JOINT COMPOUND TO BE USED ON ALL THREADED JOINTS
4. BY-PASS PIPING NOT REQUIRED FOR SINGLE FAMILY DWELLING
5. MIN. 4-13mm Dia.S.S. ANCHOR RODS, S.S. NUTS & S.S. WASHERS, OR S.S. FLANGE ADAPTER OR APPROVED EQUAL
6. BY-PASS REQUIRED FOR 50MM SERVICES AND LARGER
7. APPLICABLE BACKFLOW PREVENTION ASSEMBLY TO BE PLACED NO MORE THAN 3.0m DOWNSTREAM OF THE METER/BY-PASS ASSEMBLY AND KEPT A MINIMUM OF 750mm FROM FLOOR.

MIN. DIMENSIONS (mm)

<table>
<thead>
<tr>
<th>METER TYPE</th>
<th>METER SIZE</th>
<th>THREADED FITTINGS</th>
<th>SOLDERED FITTINGS</th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>PD</td>
<td>16</td>
<td>500</td>
<td>450</td>
<td>44</td>
<td>750</td>
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</tr>
<tr>
<td>PD</td>
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<td>750</td>
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<tr>
<td>PD</td>
<td>25</td>
<td>600</td>
<td>525</td>
<td>50</td>
<td>750</td>
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</tr>
<tr>
<td>CMP - PD</td>
<td>38 - 50</td>
<td>750</td>
<td>750</td>
<td>59</td>
<td>750</td>
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<tr>
<td>CMP - CMP</td>
<td>50</td>
<td>850</td>
<td>850</td>
<td>81</td>
<td>750</td>
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</tr>
</tbody>
</table>

City of Hamilton
Public Works Department

PIPING FOR MULTI-UNIT RESIDENTIAL (3 STOREYS AND ABOVE) OR ICI MODERATE HAZARD 16mm TO 50mm DIA. METER FOR INTERNAL INSTALLATION

DIMENSIONS SHOWN ARE IN MILLIMETRES UNLESS OTHERWISE NOTED (N.T.S.)}

PIPING FOR 100mm DIA. TO 250mm DIA. METER WITH BY-PASS USING DUCTILE IRON PIPE WITH 125 LB. FLANGES

NOTES:
1. F.A. - STYLE 912 FLANGED ADAPTER ROCKWELL OR UNI FLANGE ADAPTER (ANCHOR RODS NOT REQ'D WITH UNI FLANGE ADAPTERS)
2. ALL GATE VALVES TO BE INSTALLED WITH VALVE STEM IN HORIZONTAL POSITION
3. METER SUPPLIED AND INSTALLED BY CITY
4. DOUBLE CHECK VALVE BACKFLOW PREVENTER TO BE INSTALLED WHEN REQUIRED (SEE BACKFLOW BYLAW 10-103)
5. APPLICABLE BACKFLOW PREVENTION ASSEMBLY TO BE PLACED NO MORE THAN 3.0m DOWNSTREAM OF THE METER/BYPASS ASSEMBLY AND KEPT A MINIMUM OF 750mm FROM FLOOR

<table>
<thead>
<tr>
<th>METER SIZE (mm)</th>
<th>CMP METERS</th>
<th>FSC METER</th>
<th>MIN DIMENSION (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>750</td>
<td>850</td>
<td>850 1682</td>
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<tr>
<td>150</td>
<td>950</td>
<td>1150</td>
<td>875 2778</td>
</tr>
<tr>
<td>200</td>
<td>1700</td>
<td>1400</td>
<td>950 2210</td>
</tr>
<tr>
<td>250</td>
<td>N/A</td>
<td>1800</td>
<td>900 2778</td>
</tr>
</tbody>
</table>

CMP - COMPOUND METER
FSC - FIRE SERVICE COMPOUND METER

City of Hamilton
Public Works Department

PIPING FOR MULTI-UNIT RESIDENTIAL (3 STOREYS AND ABOVE) ORICI MODERATE HAZARD 100mm TO 250mm DIA. METERS FOR INTERNAL METER INSTALLATION

DIMENSIONS SHOWN ARE IN MILLIMETRES UNLESS OTHERWISE NOTED (N.T.S.)

DATE: JUNE 2019
REV No.
FORMERLY: WM-210

HAMILTON STD No. WM-210.02
PIPING FOR 16mm DIA. TO 50mm DIA. METER WITH BY-PASS USING RIGID COPPER PIPE (Soldered Fittings & Gate Valves)

PIPE SUPPORT

PIPING WITH 16mm DIA. TO 50mm DIA. METER WITH BY-PASS USING BRASS PIPE (F.I.P. Threaded Fittings & Gate Valves)

NOTES:
1. G.V. - Gate Valve
2. ALL GATE VALVES TO BE INSTALLED WITH VALVE STEM IN HORIZONTAL POSITION
3. METER SUPPLIED AND INSTALLED BY CITY
4. APPROVED PIPE JOINT COMPOUND TO BE USED ON ALL THREADED JOINTS
5. BY-PASS PIPING NOT REQUIRED FOR SINGLE FAMILY DWELLING
6. MIN. 4-13mm DIA S.S. ANCHOR RODS, S.S. NUTS & S.S. WASHERS, OR UNI FLANGE ADAPTER OR APPROVED EQUAL
7. APPLICATION BACKFLOW PREVENTION ASSEMBLY TO BE PLACED NO MORE THAN 3.0m DOWNSTREAM OF THE METER/BY-PASS ASSEMBLY, AND KEPT A MINIMUM OF 750mm FROM FLOOR.

MIN. DIMENSIONS (mm)

<table>
<thead>
<tr>
<th>METER SIZE</th>
<th>THREADED FITTINGS</th>
<th>Soldered FITTINGS</th>
</tr>
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<tbody>
<tr>
<td>16</td>
<td>500</td>
<td>450</td>
</tr>
<tr>
<td>20</td>
<td>575</td>
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<td>25</td>
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<td>595</td>
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<td>38-50</td>
<td>750</td>
<td>750</td>
</tr>
<tr>
<td>60</td>
<td>850</td>
<td>850</td>
</tr>
</tbody>
</table>

PD - Positive Displacement Meter
CMP - Compound Meter

City of Hamilton
Public Works Department

PIPING FOR ICI, HIGH HAZARD
16mm TO 50mm DIA. METER
FOR INTERNAL INSTALLATION

DIMENSIONS SHOWN ARE IN MILLIMETRES UNLESS OTHERWISE NOTED (N.T.S.)
NOTES:
1. F.A. - STYLE 912 FLANGED ADAPTER ROCKWELL OR UNI FLANGE ADAPTER (ANCHOR RODS NOT REQ'D WITH UNI FLANGE ADAPTERS)
2. ALL GATE VALVES TO BE INSTALLED WITH VALVE STEM IN HORIZONTAL POSITION
3. METER SUPPLIED AND INSTALLED BY CITY
4. DOUBLE CHECK VALVE BACKFLOW PREVENTER TO BE INSTALLED WHEN REQUIRED (SEE BACKFLOW BYLAW 10-103)
5. APPLICABLE BACKFLOW PREVENTION ASSEMBLY TO BE PLACED NO MORE THAN 3.0m DOWNSTREAM OF THE METER/BYPASS ASSEMBLY AND KEPT A MINIMUM OF 750mm FROM FLOOR.

PIPING FOR 100mm DIA. TO 250mm DIA. METER WITH BY-PASS USING DUCTILE IRON PIPE WITH 125 LB. FLANGES

<table>
<thead>
<tr>
<th>METER SIZE (mm)</th>
<th>CMP METERS</th>
<th>FSC METER</th>
<th>MIN DIMENSION (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>750</td>
<td>850</td>
<td>850 460 1862</td>
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<td>150</td>
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<td>950 820 2778</td>
</tr>
<tr>
<td>250</td>
<td>N/A</td>
<td>1800</td>
<td>900 1054 3184</td>
</tr>
</tbody>
</table>

CMP - COMPOUND METER
FSC - FIRE SERVICE COMPOUND METER
REMOTE INSTALLATION ON BUILDING

NOTES:
1. LOCATION OF REMOTE READING DEVICE SHALL BE TO THE SATISFACTION OF THE CITY.
2. REMOTE WIRE TO BE FASTENED EVERY 300mm ON EXTERIOR WALLS AND EVERY 1000mm ON INTERIOR WALLS.
3. REMOTE READING DEVICE INSTALLATION TO BE ON HYDRO MAST WHERE POSSIBLE.

City of Hamilton
Public Works Department

STANDARD REMOTE INSTALLATIONS FOR 16mm TO 25mm DIA. METERS

DIMENSIONS SHOWN ARE IN MILLIMETRES UNLESS OTHERWISE NOTED (N.T.B.)

DATE: November 2006
REVISION: FORMERLY: RMS 74
NOTES:
1. Q: METER TO FINISHED WALL MIN. 200mm
2. Q: METER TO UNFINISHED WALL MIN 300mm

COPPER PIPE WITH BRASS FITTINGS

ALTERNATE PIPE LOCATION

BUILDING CONTROL VALVE (GATE VALVE)

ISOLATING VALVE (GATE VALVE)

FINISHED OR FUTURE FINISHED SURFACE OR BASEMENT WALL

MINI DIMENSION A (mm)

<table>
<thead>
<tr>
<th>SIZES</th>
<th>THREADED FITTING</th>
<th>COMPRESSION FITTING</th>
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<tr>
<td>16</td>
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<td>675</td>
<td>475</td>
</tr>
<tr>
<td>25</td>
<td>800</td>
<td>630</td>
</tr>
</tbody>
</table>

City of Hamilton
Public Works Department

ALTERATIONS OF EXISTING 16mm TO 25mm DIA. PIPING
PRIOR TO METER INSTALLATION
PLAN VIEW - METER

SIDE VIEW

NOTES:
1. METER IS TO BE INSTALLED IN AN AREA SUITABLY HEATED TO PREVENT FREEZE-UPS.
2. THE PROPERTY OWNER SHALL PROVIDE CLEAR ACCESS TO METER AT ALL TIMES.
3. METER SUPPLIED AND INSTALLED BY CITY.
4. SPACER TO BE TEMPORARILY INSTALLED AND METER TO BE INSTALLED BY THE CITY AT A LATER TIME.

City of Hamilton
Public Works Department

PIPING FOR RESIDENTIAL 16mm TO 50mm DIA. METER
FOR INTERNAL INSTALLATION

DIMENSIONS SHOWN ARE IN MILLIMETRES UNLESS OTHERWISE NOTED (N.T.S.)
DATE: DRAFT JUNE 2019
REVISION NO. 1 FORMERLY: RWS 715
HAMILTON STD No. WM-211.03
NOTE:
METER PIPE SPACER AND METER COUPLINGS SUPPLIED BY CITY.
NOTES:
1. METER IS TO BE INSTALLED IN AN AREA SUITABLY HEATED TO PREVENT FREEZING.
2. METERS ARE NOT TO BE INSTALLED IN CEILING SPACES.
3. THE PROPERTY OWNER SHALL PROVIDE CLEAR ACCESS TO METER AT ALL TIMES.
4. METER TO BE INSTALLED IN HORIZONTAL POSITION.
5. REMOTE WIRING PER 211.01 TO BE INSTALLED BY THE CONTRACTOR.

<table>
<thead>
<tr>
<th>MEASUREMENT</th>
<th>MIN. DIMENSION A (mm)</th>
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<tbody>
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<td>THREADED FITTINGS</td>
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<td>SOLDIER FITTINGS</td>
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<td>16</td>
<td>500</td>
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<td>19</td>
<td>575</td>
</tr>
<tr>
<td>25</td>
<td>600</td>
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</table>

City of Hamilton
Public Works Department

SATELLITE WATER METER INSTALLATION FOR 16mm TO 25mm DIA. SERVICES
City of Hamilton
Public Works Department

CHAMBER END PLATES FOR
100mm TO 300mm DIA. WATERMAINS

NOTE: 4 END PLATES REQUIRED PER CHAMBER

DIMENSIONS SHOWN ARE IN MILLIMETRES UNLESS OTHERWISE NOTED (N.T.S.)
DATE November 2006

REV No

FORMERLY: PW-127

HAMILTON STD No WM-213
REMOVABLE ROOF SLAB

1.6mm RUBBER WASHER

150mm DIA. - CALCIUM PLATED WASHERS CAST IN SLAB, 2 REQUIRED PER HOLE

M30 BOLT & NUT CALCIUM PLATED LENGTH TO SLAB SLAB THICKNESS

42mm DIA. STD. GALVANIZED PIPE THIMBLE

REFER TO VALVE CHAMBER DRAWING FOR LOCATION & QUANTITY

LIFTING HOOK TO BELOCATED DIRECTLY ABOVE VALVES, ACCESS MAN-HOLES, ETC. AS INDICATED ON VALVE CHAMBER DRAWINGS

1.6 M GALVANIZED REINFORCING STEEL BAR

FACE OF CONC.

CHAMBER ROOF SLAB

City of Hamilton
Public Works Department

REMOVABLE SLAB LIFTING HOLE DETAILS & LIFTING HOOK DETAIL FOR CHAMBERS

DIMENSIONS SHOWN ARE IN MILLIMETRES UNLESS OTHERWISE NOTED (N.T.S.)
75 x 200 x 10mm STEEL PLATE. RADIUS TO SUIT DIA. OF VALVE FLANGES OR WATER PIPE

60mm DIA. EXTRA STRONG PIPE

50

75mm DIA. STANDARD PIPE

15mm DIA. ANCHOR BOLTS. Cinch Anchor (2 UNIT) TO CONCRETE. 2 BOLTS PER SUPPORT

160 x 160 x 10mm STEEL PLATE

15mm NON-SHRINK, NON-METALLIC GROUT

NOTE:
CONTRACTOR SHALL ADJUST HEIGHT OF PIPE SUPPORT & WELD AT JOINT A.
TIED SO THAT SUPPORT IS FIRMLY AGAINST VALVE OR WATER PIPE.
City of Hamilton
Public Works Department

PIPE & VALVE SUPPORT

Dimensions shown are in millimetres unless otherwise noted (N.T.S.)

DATE: November 2005
REVISION:
FORMERLY: RMS-208

HAMILTON STD No: WM-215.02
Concrete Pipe Support Details for 750mm to 1200mm Dia. Watermains

DIMENSIONS SHOWN ARE IN MILLIMETRES UNLESS OTHERWISE NOTED

DATE: November 2018

REV No

HAMILTON STD No
NEW DRAFT

WM-215.03
TYPICAL BLOW-OFF AT ACCESS MANHOLE

TYPICAL FLANGE SECTION

City of Hamilton
Public Works Department

BLOW-OFF CONNECTION AT ACCESS CHAMBER
NOTE:
IRON PIPE THREAD REQUIRED FOR PITOMETER CONNECTION

City of Hamilton
Public Works Department

PITOMETER CONNECTION FOR STEEL AND CONCRETE PIPE
CHAMBER PIPING SHALL BE CONCRETE OR DUCTILE IRON CLASS 54.

FOR 450mm, 500mm AND 600mm

CIRCULAR ALUMINUM LADDER

40 MPa CONCRETE SUPPORT

300 x 300 CONCRETE SUPPORT

4-15 M VERT. DOWELS

O.D. + 150mm

500 MAX.

E.W.   E.F.

500

E.W.   E.F.

20M BARS @ 300mm C.C.

SEE NOTE

SECTION X-X

SECTION E-E

SECTION Z-Z

SECTION D-D

SECTION C-C

SECTION A-A

SECTION B-B

CONCRETE PIPE

DUCTILE IRON PIPE - (CL54)

DUCTILE IRON PIPE - (CL54)

DUCTILE IRON FITTING FOR 100mm O.D. BLOW-OFF

REMOVAL CONCRETE SLAB

REMOVEABLE CONCRETE SLAB

REMOVAL CONCRETE SLAB

AIR VALVE INSTALLATION FOR DUCTILE IRON pipe

DOGHOUSE DETAIL

BACKWATER VALVE DETAIL

300 x 300 CONCRETE SUPPORT

100mm APPROVED INSULATION

TO ACCOMMODATE GAP AS REQUIRED

50mm APPROVED INSULATION

TO BE PLUMBED FROM VALVE SPINDLE (TYP.)

WATERPROOF ROOF

WATERMAIN

1:50

CONCRETE PIPE

AS SPEC'D

WATERPROOF ROOF

STAINLESS STEEL

50mm DIA. AIR VALVE,

BUTTERFLY VALVE)

(BOTh SIDES OF THE

100mm BLOW - OFF

VALVE DETAIL

SEE BACKWATER

20M BARS @ 300mm C.C.
PIPING AND CHAMBER DETAIL FOR AND AND 100mm TO 250mm DIA. METER INSTALLATION

(MIN. 500mm LARGER THAN O.D. OF PROPOSED WATERMAIN. PIPE TO BE WRAPPED)

TOP OF CONCRETE SUPPORT PAD

15 M BARS BOTH WAYS 200mm C.C.

749 x 1176mm OPENING IN ROOF SLAB FOR

VALVE CHAMBER FRAME & COVER

VALVE ASSEMBLY

DOUBLE CHECK FLOW

CONCRETE AS SHOWN

ENCASE PIPE IN

VALVE SUPPORT

MECH. ENDS

VALVE KEY FRAME AND COVER (WM-212.03)

3000

3000

1176

SECTION A-A

METER CHAMBER FRAME AND COVER

(OPSD 402.030)

CIRCULAR ALUMINUM LADDER RUNGS

RUNGS AT 300mm C.C.

LADDER

VALVE SUPPORT

SECTION B-B

100mm & 150mm DIA. WATER METER

SECTION C-C

100mm & 150mm DIA. WATER METER

SECTION D-D

100mm & 150mm DIA. WATER METER

BACKWATER VALVE DETAIL

DOGHOUSE DETAIL

DATE:
JUNE 2019

Public Works Department
City of Hamilton

DESIGNER:

REVISED DATE:

OPSD 402.011 (VENTED)

OPSD 405.010

PUBLIC WORKS DEPARTMENT

Sheet No. 1

Sheet No. 402

PROJECT NO.

DATE:

STANDARD OR ICI MODERATE HAZARD 100mm TO 250mm DIA. METER INSTALLATION

MIN.

600

MAX.

500

FLOW CYCLES:

1. 2.

3.

4.

5.

6.

7.

8.

9.

10.

12.

DIA.

100

150

200

250

300

1800

900

450

Top of Concrete

FLUSHING MAIN STOP

CONCRETE POURED IN PLACE

PRECAST SECTIONS TO BE MANUFACTURED TO ASTM C-478 AND CSA SPECIFICATIONS.

B 16.1, CLASS 125.

ALL FLANGES SHALL BE IN ACCORDANCE WITH ANSI / AWWA C 115 / A 21.15 DRILLED TO USAS STANDARD

MIN.

600

MAX.

500

protected corrosion tape coating system (PRIMER, MASTIC AND TAPE). Protective corrosion tape with min. 50mm thick of approved plastic mastic material. remaining cavity to be grouted. (see doghouse detail).

DOGHOUSE OPENING TO BE MIN. 50mm LARGER THAN O.D. OF PROPOSED WATERMAIN. PIPE TO BE WRAPPED

WALL THICKNESS FOR PRECAST CHAMBER SHALL BE 200mm MIN. CAP & BASE TO BE 250mm MIN.

ALL CONCRETE TO BE 40 MPa. STRENGTH, TYPE 50 CEMENT.

ALL ADJUSTMENTS TO CHAMBER AND KEY BOX COVERS SHALL BE MADE WITH POURED CONCRETE.

FILL ALL JOINTS AND LIFTING HOLES (INSIDE & OUT) 15mm THICK WITH 1:3 NON-SHRINK MORTAR MIX.

PRECAST SECTIONS TO BE MANUFACTURED TO ASTM C-478 AND CSA SPECIFICATIONS.

B 16.1, CLASS 125.

ALL FLANGES SHALL BE IN ACCORDANCE WITH ANSI / AWWA C 115 / A 21.15 DRILLED TO USAS STANDARD

MIN.

600

MAX.

500

protected corrosion tape coating system (PRIMER, MASTIC AND TAPE). Protective corrosion tape with min. 50mm thick of approved plastic mastic material. remaining cavity to be grouted. (see doghouse detail).