

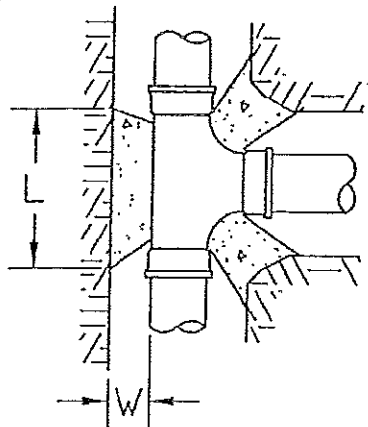


SCHEDULE B

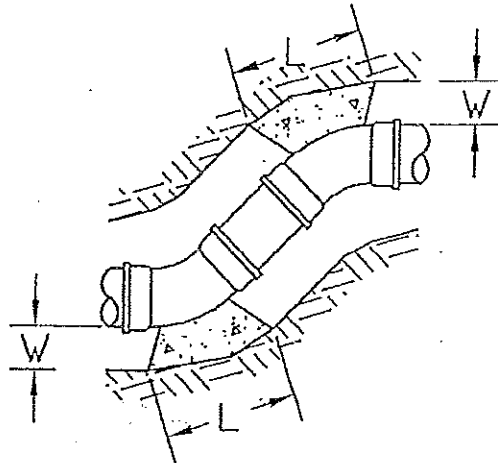
Glenmore-Ellison Improvement District Water System Construction & Design Standards

All construction and design works are to be completed in accordance with current Standards as prescribed in the Master Municipal Construction Document (MMCD) and the City of Kelowna Subdivision, Development and Servicing Bylaw. In addition to these Standards, the District also requires all construction and design works to meet the following Standards as outlined in the attached drawings and specifications:

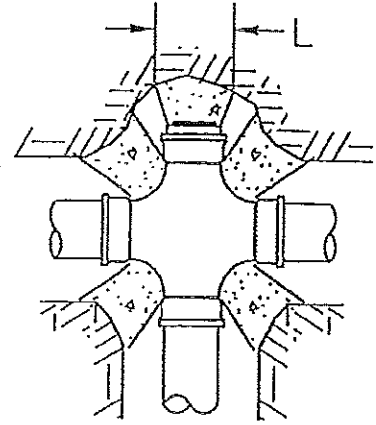
W1	Drawing	Thrust Block Standards for Fittings without Valves
W2	Drawing	Thrust Block Dimensions for Fittings without Valves
W3	Drawing	Thrust Block Standards for Fittings with Valves
W4	Drawing	Tracer Wire Installation for PVC Watermain
W5	Specifications	Cathodic Protection
W6	Drawing	Cathodic Protection Details – Line Valves
W7	Drawing	Cathodic Protection Details – Hydrants
W8	Drawing	Cathodic Protection Details – Water Servicing



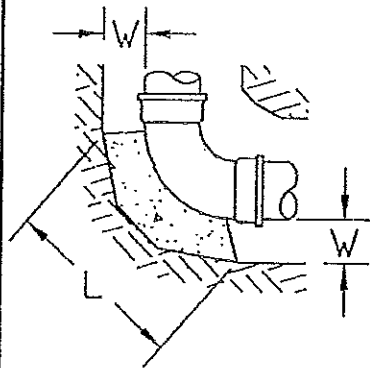
TEE



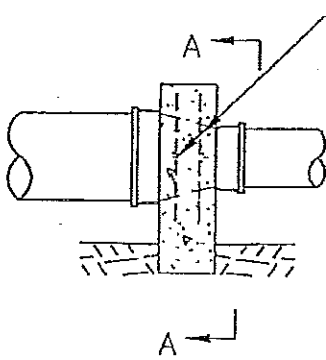
11 1/4°, 22 1/2°, 45° HORIZ. BEND



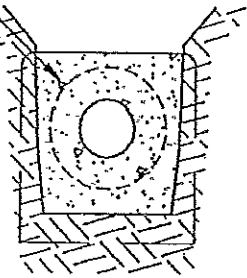
CROSS w/PLUG



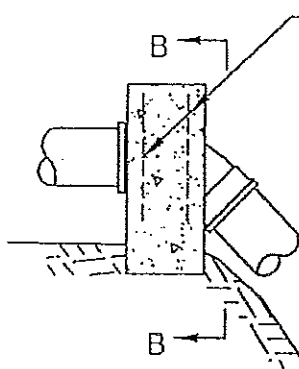
90° HORIZ. BEND



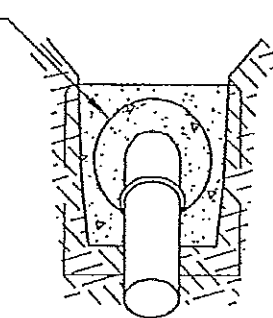
REDUCER



SECTION 'A-A'



VERTICAL BEND



SECTION 'B-B'

NOTES:

1. PLACE 6 mil POLYETHELENE ON INTERFACE BETWEEN CONCRETE AND FITTING
2. PLACE 20 MPa CONCRETE AGAINST UNDISTURBED GROUND. KEEP CONCRETE CLEAR OF BOLTS & NUTS
3. REFER TO CONTRACT DRAWINGS AND MMCD SECTIONS 02666 AND 03300 FOR DETAILED SPECIFICATIONS
4. REFER TO GEID DRAWINGS W2 & W3 FOR DIMENSIONS



THRUST BLOCK STANDARDS
FOR FITTINGS WITHOUT
VALVES

GEID SCHEDULE B - W1

MINIMUM THRUST AREAS FOR FITTINGS AT 1035 kPa (150 psi) PRESSURE
 AND FOR SOILS WITH MINIMUM BEARING OF 96 kPa (2,000 psf).
 NOT TO BE USED FOR SOFT CLAY, MUCK, ETC.

TYPE OF FITTING	SIZE D	W	L	H
90° BEND	150	300	900	450
	200	350	1050	600
	250	375	1425	750
	300	400	1625	900
45° BEND	150	300	450	450
	200	350	600	600
	250	375	750	750
	300	400	900	900
22 1/2° BEND	150	300	450	175
	200	350	600	300
	250	375	825	450
	300	400	900	450
TEE	150	300	600	450
	200	350	750	600
	250	375	975	750
	300	400	1200	900
CROSS	150	300	600	450
	200	350	750	600
	250	375	975	750
	300	400	1200	900
CAPS & PLUGS	150	300	450	450
	200	350	600	600
	250	375	750	750
	300	400	900	900

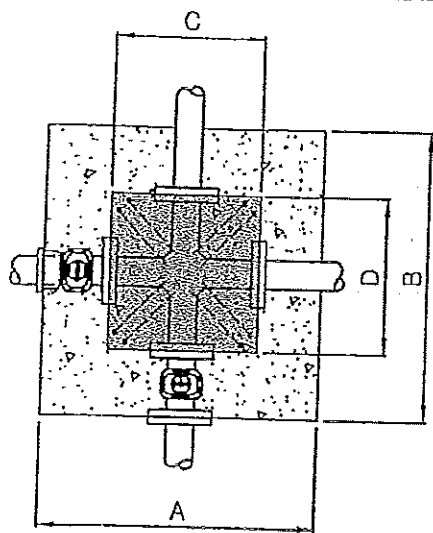
- D = LARGEST PIPE DIAMETER END OF FITTING
- W = RECOMMENDED DISTANCE TRENCH WALL TO FITTING
- L = HORIZONTAL LENGTH OF THRUST BLOCKS
- H = VERTICAL HEIGHT OF THRUST BLOCKS

- NOTES: 1. REFER TO GEID DRAWING W1 FOR DETAILS
 2. THRUST BLOCK DIMENSIONS FOR VERTICAL BENDS & REDUCERS TO BE SPECIFIED BY ENGINEER

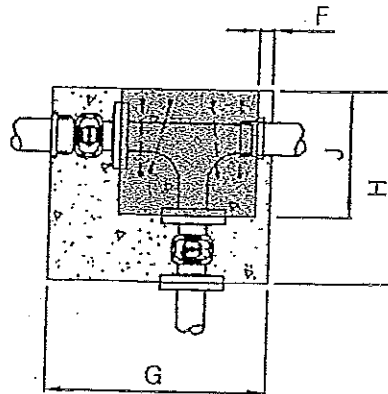


THRUST BLOCK DIMENSIONS FOR FITTINGS WITHOUT VALVES

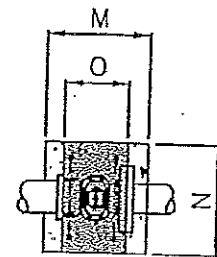
GEID SCHEDULE B - W2



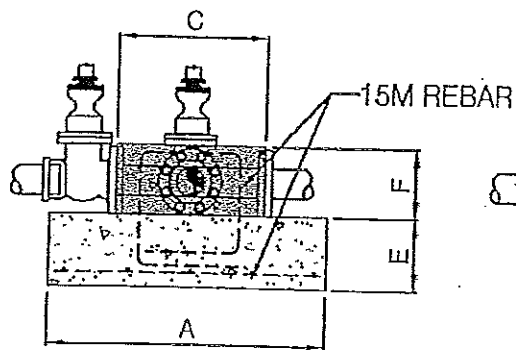
PLAN VIEW



PLAN VIEW

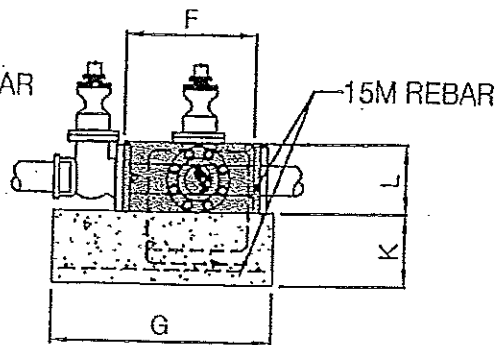


PLAN VIEW



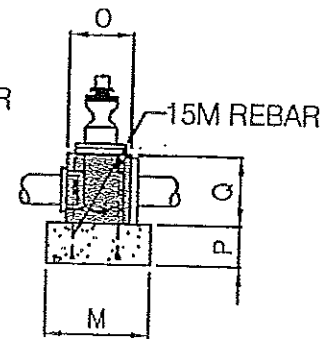
ELEVATION

CROSS WITH VALVES



ELEVATION

TEE WITH VALVES



ELEVATION

LINE VALVE

NOTES:

1. THRUST BLOCK DIMENSIONS ARE RATED FOR 1035 kPa (150 psi.) PRESSURE
2. PLACE 6 mil POLYETHYLENE ON INTERFACE BETWEEN CONCRETE AND FITTING
3. REFER TO CONTRACT DRAWINGS AND MMCD SECTIONS 02666 AND 03300 FOR DETAILED SPECIFICATIONS

THRUST BLOCK DIMENSIONS (mm)

PIPE SIZE	CROSS WITH VALVES						TEE WITH VALVES						LINE VALVE				
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
100mm	800	800	320	320	200	300	600	600	320	300	200	300	300	400	300	250	300
150mm	1000	1000	400	400	200	350	700	700	400	400	300	350	400	600	300	350	350
200mm	1100	1100	450	450	300	400	800	800	450	450	400	400	500	800	320	400	400
250mm	1300	1300	550	550	400	450	1000	1000	550	500	500	450	500	1000	350	500	450
300mm	1400	1400	600	600	500	50	1200	1200	550	550	500	500	500	1400	400	500	520



THRUST BLOCK STANDARDS
FOR FITTINGS WITH VALVES

GEID SCHEDULE B - W3



CATHODIC PROTECTION SPECIFICATIONS

GEID SCHEDULE B – W5

PART 1: GENERAL

Background

- a) This specification refers to those portions of the work that are unique to the supply and installation of galvanic anode cathodic protection system for the exterior corrosion protection of hydrants, valves, fittings, and other specials. This specification must be referenced to and interpreted simultaneously with all other sections of the Master Municipal Specifications and the City of Kelowna Subdivision, Development and Servicing Bylaw Standards, pertinent to the works described herein.

Material Certification

- a) Materials must comply with applicable ASTM, CAS, or NACE Standards, where applicable.

Specifications

- a) The contractor and his sub-contractors must maintain a complete set of project specifications and product data sheets on site and at their respective shops.

PART 2: PRODUCTS

General

- a) The Contractor shall supply all materials necessary for the satisfactory completion of cathodic protection requirements herein.
- b) All materials supplied must be shipped to the job site in their original packaging material or identified by the manufacturer's labels, where possible.
- c) All materials are subject to approval by the District and must be accessible for inspection.
- d) No substitutions will be permitted without approval by the District.
- e) All materials must be stored in a waterproof enclosure.

Valves and Hydrants

- a) All valves and hydrants installed shall be protected from corrosion by way of sacrificial anodes as shown on Cathodic Protection Detail Drawings W6 and W7.

- b) All robar couplings shall be protected from corrosion by polyethylene encasement conforming to AWWA C105.

Metallic Fittings

- a) All metallic fittings shall be field coated with a petrolatum tape/paste (Denso) or approved alternate. The fitting surfaces and coating application shall be as recommended by the manufacturer and/or to the following specifications:
 - ANSI AWWA C217 (Petrolatum Tape/Wax)

Nuts and Bolts

- a) All flanges, valves, hydrants and robar couplings installed shall have stainless steel bolts and nuts.

Water Service Connections

- a) All copper water service connections shall be protected from corrosion by installing sacrificial anodes as shown on Drawings W6, W7 and W8.
- b) All curb stop rods shall be stainless steel.

Anodes

- a) Corrosion protection on copper service connections, water valves, hydrants and ductile iron fittings shall be provided with anodes. 12 lb. packaged zinc anodes shall be used in dry soil areas and 17 lb. bare zinc anodes shall be used in high moisture soils.
- b) The anodes shall be packaged in cardboard tubes with backfill composed of 75% gypsum, 20% bentonite, 5% sodium sulphate. The anode wire shall be #10 AWG RWU (blue) insulated copper. The cable length shall be sized to reach test stations situated in the water valve nelson box.
- c) Install anodes on the side of the watermain as per Drawings W6, W7 and W8 or as specified in the field by the District.
- d) The quantity of anodes to be installed shall be as noted on Drawings W6 and W8.

Electrical Cable

- a) Use #10 AWG RWU (blue) insulated stranded copper cables and test cables.

Pipeline Tape

- a) Pipeline tape shall be Royston Roskote or Tek-Rap polyethylene pipeline tape or approved equivalent.

Coal Tar Mastic

- a) Coal tar mastic shall be Royston Roskote A-51 or approved equivalent.

PART 3: EXECUTION

General

- a) All valves, hydrants, fittings and other electrically connected metallic waterworks installed shall be cathodically protected except for piping and reinforcing steel in concrete chambers that is electrically isolated from the cathodically protected pipe.
- b) A lower level of cathodic protection may be approved by the District upon completion of a soil resistivity study in accordance with AWWA Standards.

Cable Connection

- a) All cables shall be fastened to the watermain as shown on Drawings W6, W7 and W8.

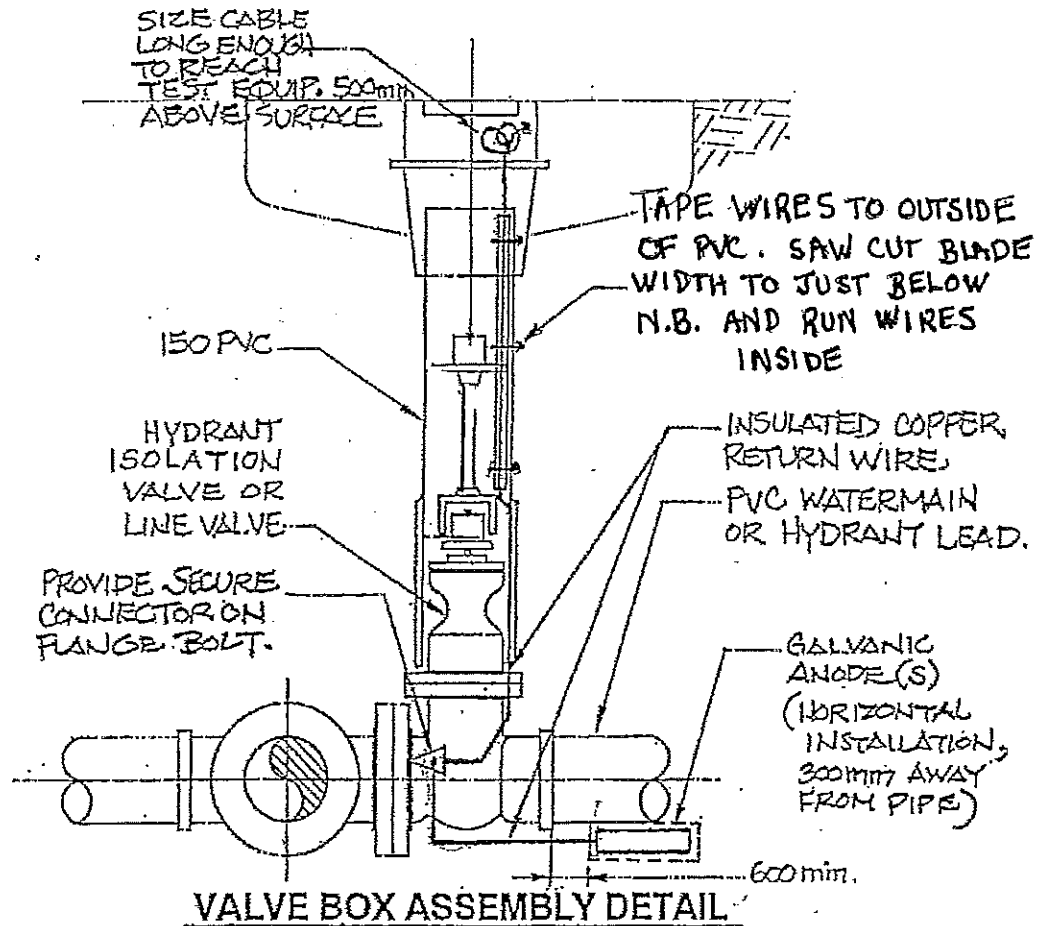
Cathodic Protection

- a) Anodes shall be installed at all locations noted on Drawings W6, W7 and W8.
- b) Anodes must be installed horizontally at pipe depth as shown on Drawings W6, W7 and W8.
- c) The anodes shall have the cardboard tube perforated and shall be thoroughly wetted, then immediately backfilled with fine grained loam with more than 50% passing 0.05 mm sieve unless otherwise specified. Loam backfill material to surround the anode with a minimum of 300 mm of material and be firmly compacted.
- d) #10 AWG RWU insulated stranded copper cable shall be fused for all magnesium anode cables and test cables.
- e) All #10 AWG cables shall be attached to the test stations as shown on Drawings W6, W7 and W8.
- f) Test cables shall be long enough to bring the terminal 500 mm above the surface for access for test measurements.
- g) All cables must be continuous from the valve, or anode to each connection point. Splices are not permitted.

PART 4: INSPECTION AND TESTING

General

- a) The Contractor shall supervise and inspect the installation.
- b) The Contractor shall provide initial resistivity readings, record and provide summary of results to the District including reading, location, date and time.
- c) Work will be rejected if the test or inspection reveals that any part of the work does not satisfy the specifications. Rejected material or work must be repaired at the Contractor's cost.



N.T.S.

NOTES:

1. REFER TO SUPPLEMENTAL SPECIFICATION 02669.
2. REFER TO CONTRACT DRAWINGS AND SPECIFICATIONS FOR VALVE INSTALLATION DETAILS.
3. INSTALL TWO GALVANIC ANODES AT VALVE CLUSTERS CONSISTING OF THREE OR MORE VALVES.

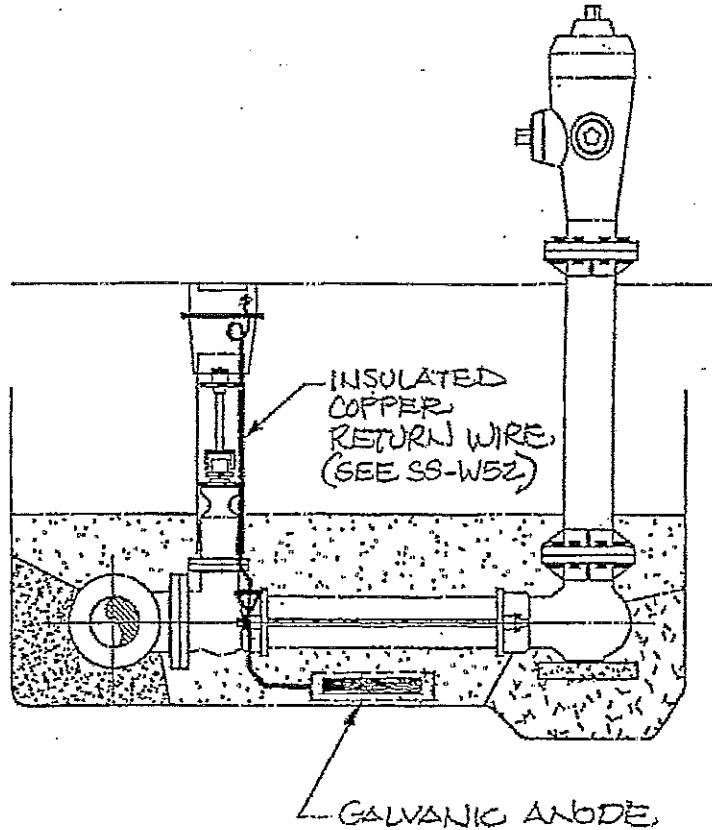


**CATHODIC PROTECTION DETAILS
LINE VALVES**

GEID SCHEDULE B - W6

NOTES:

1. REFER TO SUPPLEMENTAL SPECIFICATION 02669.
2. REFER TO CONTRACT DRAWINGS AND SPECIFICATIONS FOR HYDRANT INSTALLATION DETAILS.
3. IF NO TIE RODS EXIST, PROVIDE SEPARATE ANODE & SURFACE RETURN WIRE AT HYDRANT
4. REFER TO DWG. W6. FOR ADDITIONAL GALVANIC ANODE DETAILS.



HYDRANT CONNECTION DETAIL

N.T.S.



**CATHODIC PROTECTION DETAILS
HYDRANTS**

GEID SCHEDULE B - W7

