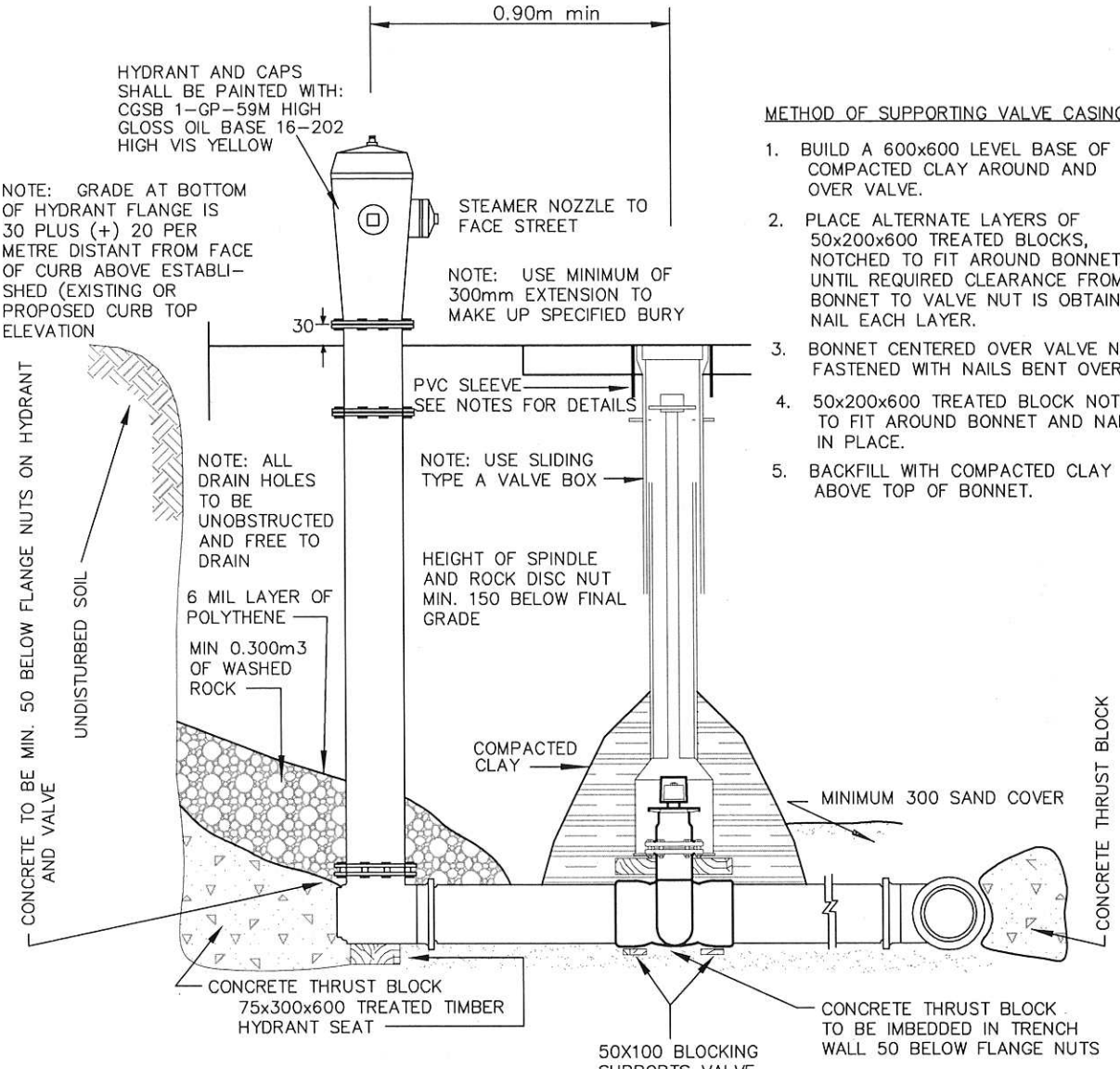

METHOD OF SUPPORTING VALVE CASING

1. BUILD A 600x600 LEVEL BASE OF COMPACTED CLAY AROUND AND OVER VALVE.
2. PLACE ALTERNATE LAYERS OF 50x200x600 TREATED BLOCKS, NOTCHED TO FIT AROUND BONNET, UNTIL REQUIRED CLEARANCE FROM BONNET TO VALVE NUT IS OBTAINED. NAIL EACH LAYER.
3. BONNET CENTERED OVER VALVE NUT FASTENED WITH NAILS BENT OVER.
4. 50x200x600 TREATED BLOCK NOTCHED TO FIT AROUND BONNET AND NAILED IN PLACE.
5. BACKFILL WITH COMPACTED CLAY TO ABOVE TOP OF BONNET.

NOTES:

1. HYDRANTS ARE TO BE McAVITY OR CANADA VALVE.
2. HYDRANTS TO BE EQUIPPED WITH A 100mm STORZ INTERNAL LUG QUICK CONNECTION NOZZLE OR EQUIVALENT
3. HYDRANT DRAIN HOLES TO BE PLUGGED IN AREAS OF HIGH GROUND WATER .
4. ALL BOLTS TO BE STAINLESS STEEL, WRAPPED WITH DENSO MASTIC AND DENSO TAPE
5. PVC SLEEVE TO BE USED WHEN VALVE IS INCORPORATED WITHIN CONCRETE
6. CATHODIC PROTECTION REQUIRED. REFER TO DRAWINGS WR-07 & WR-08.
7. HYDRANTS TO BE PLUGGED WHEN INSTALLED IN AREAS WITH HIGH GROUND WATER TABLE.

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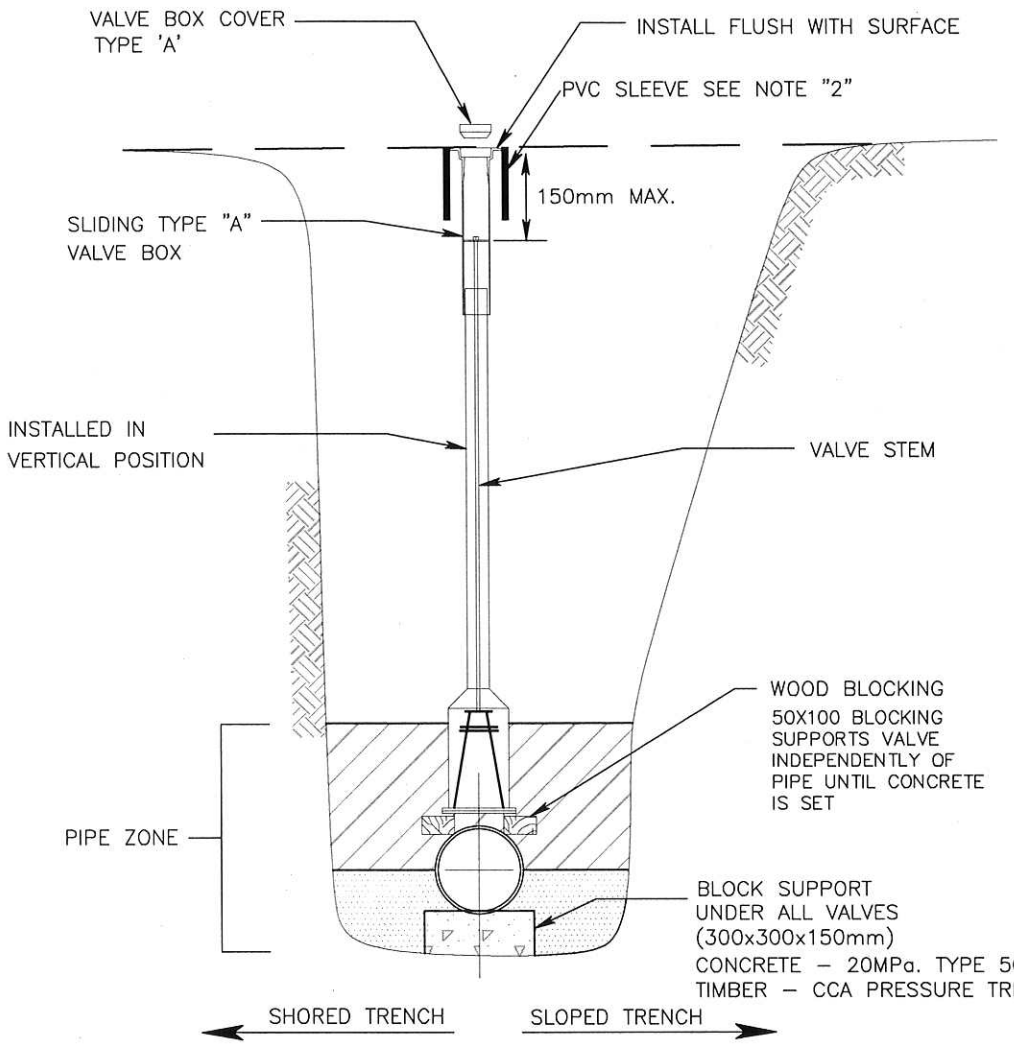
THE CITY OF SPRUCE GROVE

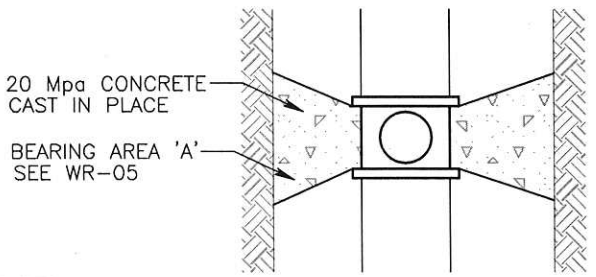
PLANNING AND INFRASTRUCTURE

REVISIONS		
DATE	DETAILS	DRAWN
04/12	CHANGES TO NOTES	RP
04/15	CHANGES TO NOTES	RP

HYDRANT AND VALVE

DRAWN:	T. CRAWFORD	DATE:	MARCH 6, 2006
CHECKED:	J. MUSTARD	SCALE:	NOT TO SCALE
APPROVED:	J. MUSTARD	DRAWING No.:	WR-01





THRUST BLOCK DETAIL

NOTES:

1. ALL BOLTS TO BE STAINLESS STEEL WRAPPED WITH DENSO MASTIC AND DENSO TAPE.
2. PVC SLEEVE TO BE USED WHEN VALVE IS INCORPORATED WITHIN CONCRETE.
3. CATHODIC PROTECTION REQUIRED. REFER TO DRAWINGS WR-07 & WR-08.

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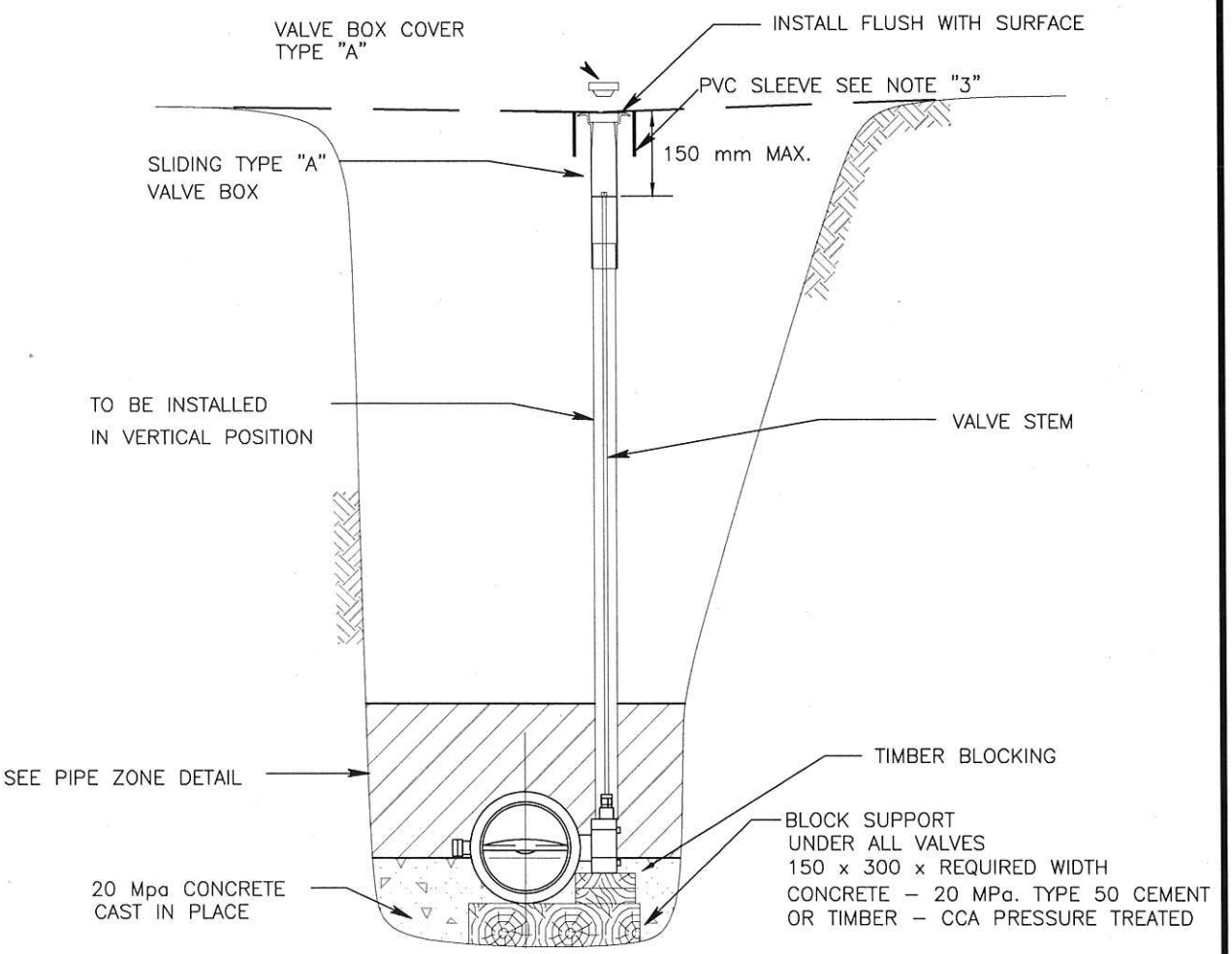
THE CITY OF SPRUCE GROVE

PLANNING AND INFRASTRUCTURE

REVISIONS		
DATE	DETAILS	DRAWN
04/12	WOOD BLOCKING DETAIL	RP

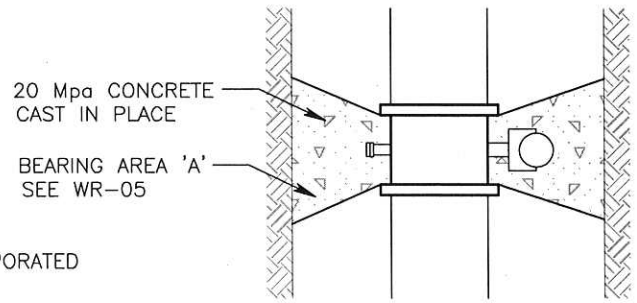
VALVE INSTALLATION (300mm)

DRAWN:	T. CRAWFORD	DATE:	MARCH 6, 2006
CHECKED:	J. MUSTARD	SCALE:	NOT TO SCALE
APPROVED:	J. MUSTARD	DRAWING No.:	WR-02



NOTES:

1. PAINT TOP OF INTERIOR BOX BRIGHT RED AND STAMP CAP 'BV'
2. ALL BOLTS TO BE STAINLESS STEEL WRAPPED WITH DENSO MASTIC AND TAPE.
3. PVC SLEEVE TO BE USED WHEN VALVE IS INCORPORATED WITHIN CONCRETE.
4. CATHODIC PROTECTION REQUIRED. REFER TO DRAWINGS WR–07 & WR–08.



THRUST BLOCK DETAIL

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THE CITY OF SPRUCE GROVE

PLANNING AND INFRASTRUCTURE

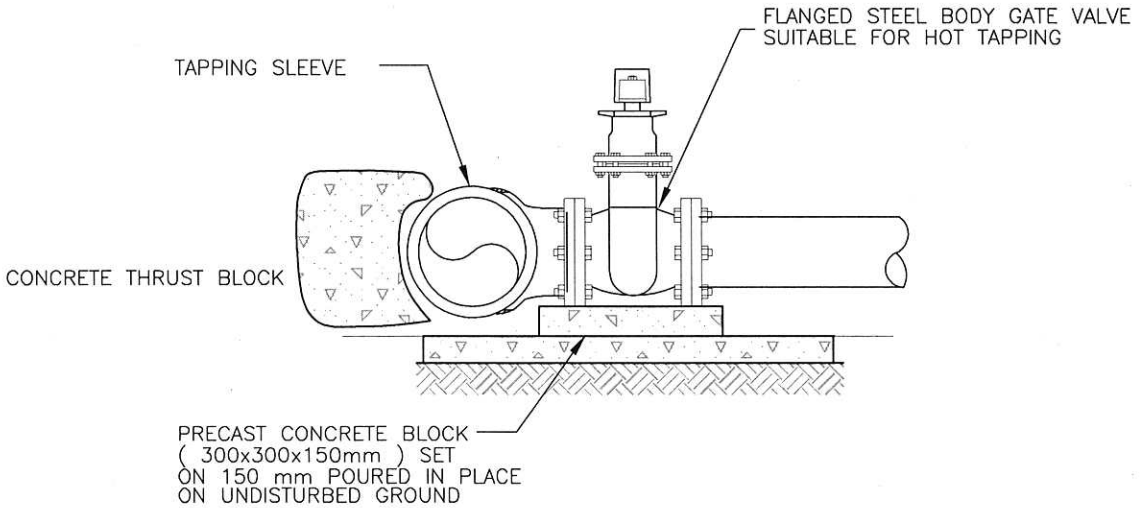
REVISIONS		
DATE	DETAILS	DRAWN

BUTTERFLY VALVE (<300mm)

DRAWN:	T. CRAWFORD	DATE:	MARCH 6, 2006
CHECKED:	J. MUSTARD	SCALE:	NOT TO SCALE
APPROVED:	J. MUSTARD	DRAWING No.:	WR–03

NOTES:

1. ALL BOLTS TO BE STAINLESS STEEL WRAPPED WITH DENSO MASTIC AND DENSO TAPE.
2. CATHODIC PROTECTION REQUIRED. REFER TO DRAWINGS WR–07 & WR–08.
3. VALVE CASING AND OPERATING ROD FOR A HOT TAP VALVE SHOULD NOT BE INSTALLED.
4. THE LOCATION OF THE HOT TAP VALVE SHALL BE IDENTIFIED ON THE AS–BUILT DRAWINGS.



THE CITY OF SPRUCE GROVE

PLANNING AND INFRASTRUCTURE

REVISIONS		
DATE	DETAILS	DRAWN
02/14	REMOVED VALVE CASING/ROD	RP
02/14	ADDITIONAL NOTES	RP

HOT TAP

DRAWN:	T. CRAWFORD	DATE:	MARCH 6, 2006
CHECKED:	J. MUSTARD	SCALE:	NOT TO SCALE
APPROVED:	J. MUSTARD	DRAWING No.:	WR–04

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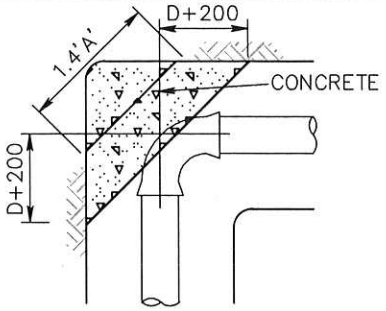
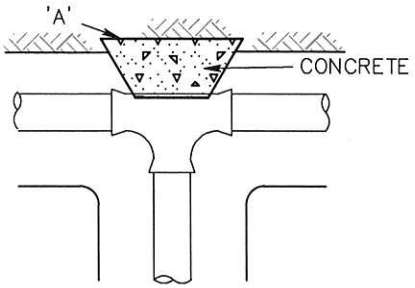
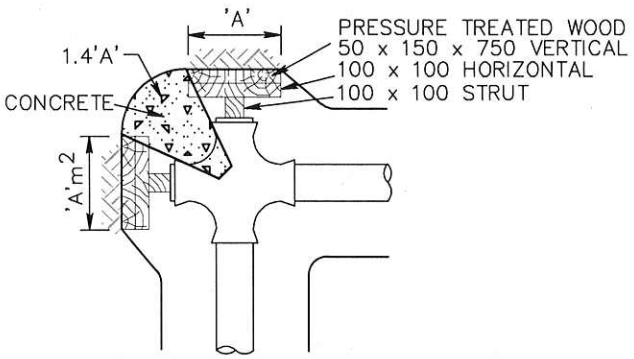
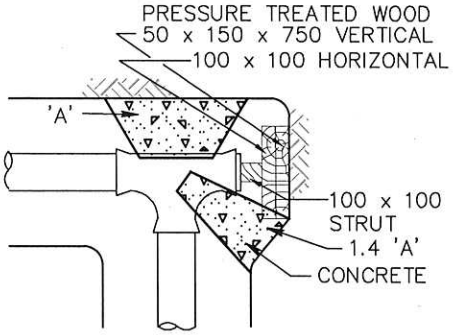
BEND DEFLECTION

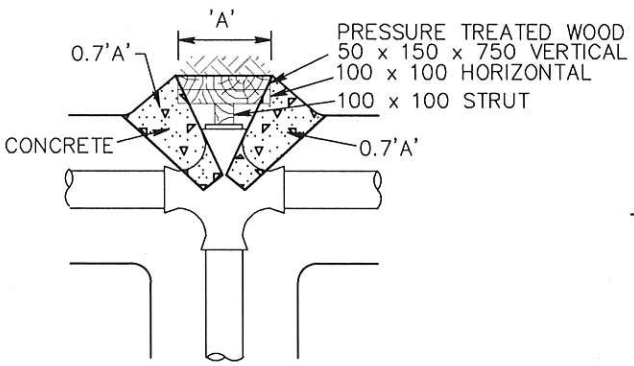
90°	1.4A
45°	0.7A
22 1/2°	0.35A
11 1/4°	0.18A

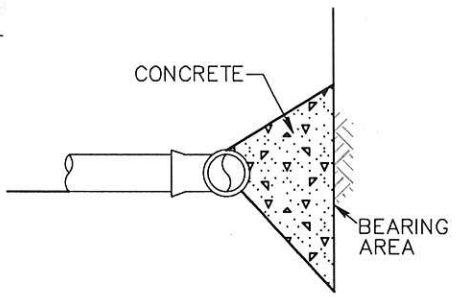


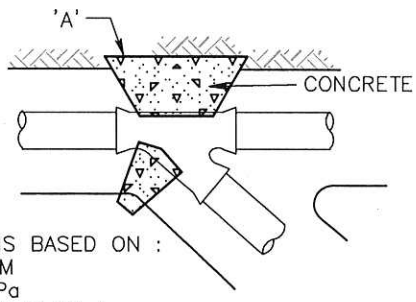


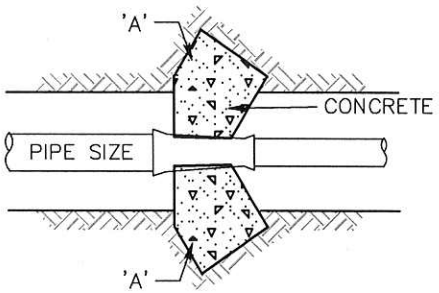












THRUST BLOCK DESIGN IS BASED ON :

1. 1050kPa MAX. SYSTEM PRESSURE OR 700kPa OPERATING PRESSURE PLUS A SURGE ALLOWANCE OF 345kPa (2fps SURGE ALLOWANCE AT 25psi/fps)
2. THRUST BLOCK DESIGN ASSUMES A MIN. VERTICAL SOIL BEARING OF 100kPa
3. THRUST BLOCK BEARING AREA BASED ON P.V.C. PIPE (AWWA C900 AND C905 DR18)
4. CONCRETE 20MPa TYPE 50 CEMENT.

TABLE – FOR CALCULATION OF BASIC THRUST BLOCK BEARING AREA 'A' (IN SQUARE METRES)

PIPE SIZE	150	200	250	300	350	400	450
'A'	0.40	0.68	1.06	1.54	2.08	2.72.	3.44

THE CITY OF SPRUCE GROVE

PLANNING AND INFRASTRUCTURE

REVISIONS		
DATE	DETAILS	DRAWN

THRUST BLOCK

DRAWN:	T. CRAWFORD	DATE:	MARCH 6, 2006
CHECKED:	J. MUSTARD	SCALE:	NOT TO SCALE
APPROVED:	J. MUSTARD	DRAWING No.:	WR – 05

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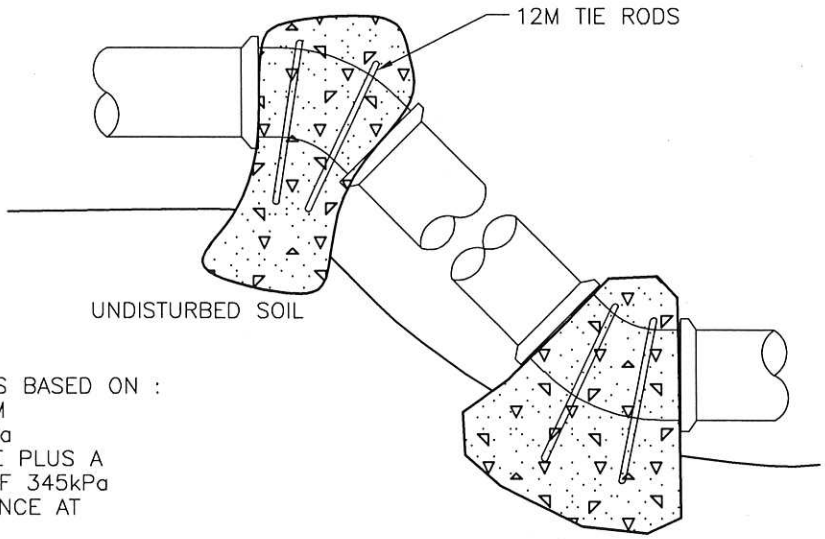

VERTICAL BEND

THRUST BLOCK DESIGN IS BASED ON :
1. 1050kPa MAX. SYSTEM PRESSURE OR 700kPa OPERATING PRESSURE PLUS A SURGE ALLOWANCE OF 345kPa (2fps SURGE ALLOWANCE AT 25psi/fps)
2. THRUST BLOCK DESIGN ASSUMES A MIN. VERTICAL SOIL BEARING OF 100kPa
3. THRUST BLOCK BEARING AREA BASED ON P.V.C. PIPE (AWWA C900 AND C905 DR18)
4. CONCRETE 20MPa TYPE 50 CEMENT.

UPWARD THRUST (GRAVITY)

TABLE – FOR CALCULATION OF BASIC THRUST BLOCK BEARING AREA (IN SQUARE METRES)
CONCRETE UNIT WEIGHT 2400Kg/cu.m

BEND \ PIPE SIZE	150	200	250	300	350	400	450
11.25°	0.16	0.28	0.45	0.64	0.87	1.14	1.44
22.50°	0.32	0.57	0.88	1.27	1.73	2.26	2.82
30°	0.42	0.75	1.17	1.69	2.30	3.00	3.80
45°	0.62	1.11	1.73	2.50	3.40	4.44	5.62

DOWNWARD THRUST

TABLE – FOR CALCULATION OF BASIC THRUST BLOCK BEARING AREA (IN SQUARE METRES)
CONCRETE UNIT WEIGHT 2400Kg/cu.m

BEND \ PIPE SIZE	150	200	250	300	350	400	450
11.25°	0.04	0.07	0.11	0.15	0.21	0.27	0.34
22.50°	0.08	0.13	0.21	0.30	0.41	0.53	0.67
30°	0.10	0.18	0.28	0.40	0.54	0.71	0.89
45°	0.15	0.26	0.41	0.59	0.80	1.05	1.32

THE CITY OF SPRUCE GROVE

PLANNING AND INFRASTRUCTURE

REVISIONS		
DATE	DETAILS	DRAWN

VERTICAL THRUST BLOCK

DRAWN:	T. CRAWFORD	DATE:	MARCH 6, 2006
CHECKED:	J. MUSTARD	SCALE:	NOT TO SCALE
APPROVED:	J. MUSTARD	DRAWING No.:	WR–06

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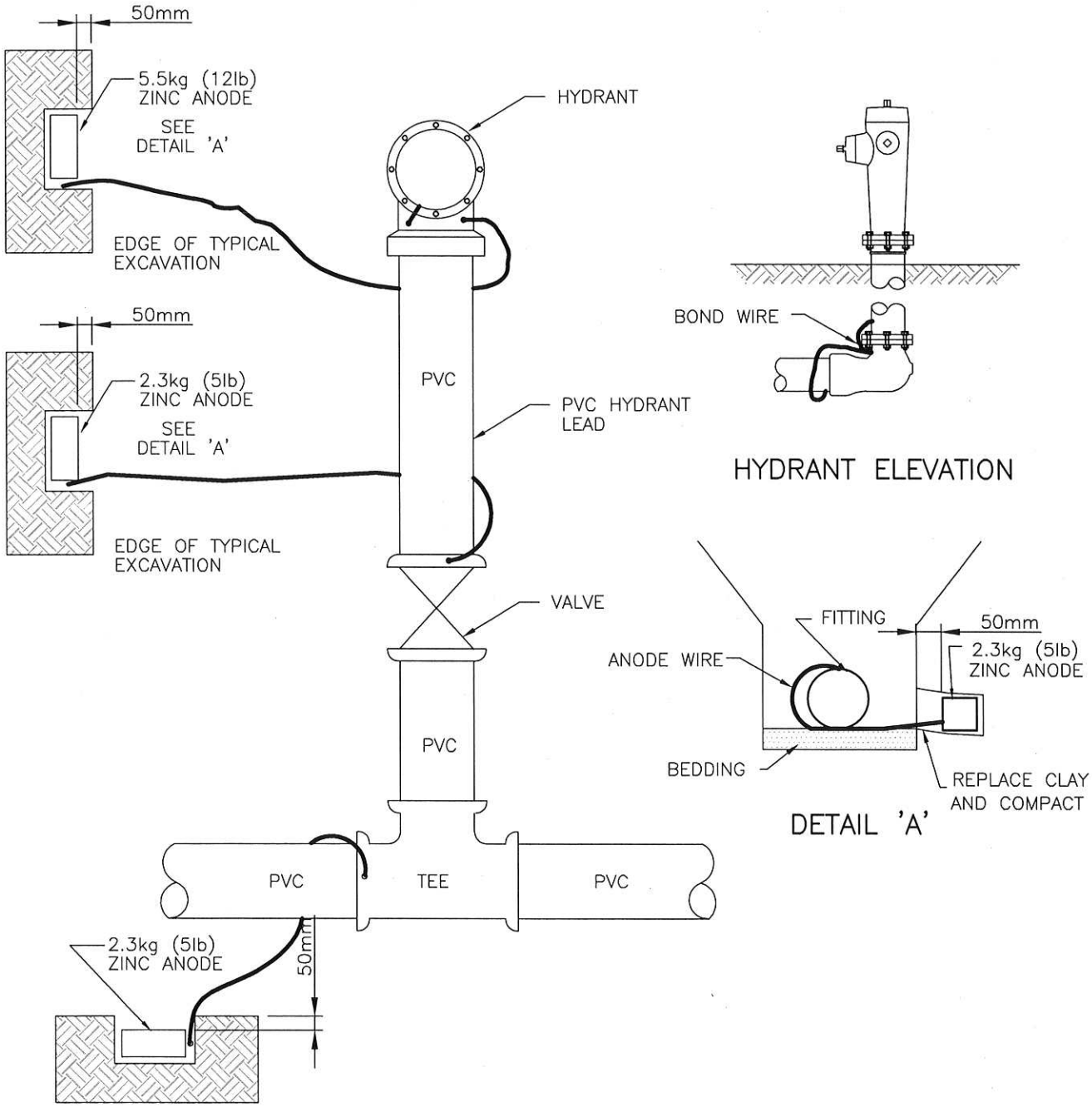

NOTES:

1. MINIMUM DISTANCE FROM ANODE TO PIPE, FITTING, VALVE, OR HYDRANT IS 150mm.
2. INSTALL ANODE AT APPROX. PIPE DEPTH IN NATIVE SOIL.
3. ZINC ANODES TO BE EMBEDDED INTO TRENCH WALL TO PROVIDE FOR A MINIMUM OF 50mm OF NATIVE CLAY COMPLETELY SURROUNDING THE ANODE.
4. ANODES TO BE AT LEAST 300mm CLEAR OF THRUST BLOCK.

THE CITY OF SPRUCE GROVE

PLANNING AND INFRASTRUCTURE

REVISIONS		
DATE	DETAILS	DRAWN
02/14	DRAWING NUMBER	RP

HYDRANT ANODE

DRAWN:	T. CRAWFORD	DATE:	MARCH 6, 2006
CHECKED:	J. MUSTARD	SCALE:	NOT TO SCALE
APPROVED:	J. MUSTARD	DRAWING No.:	WR–07

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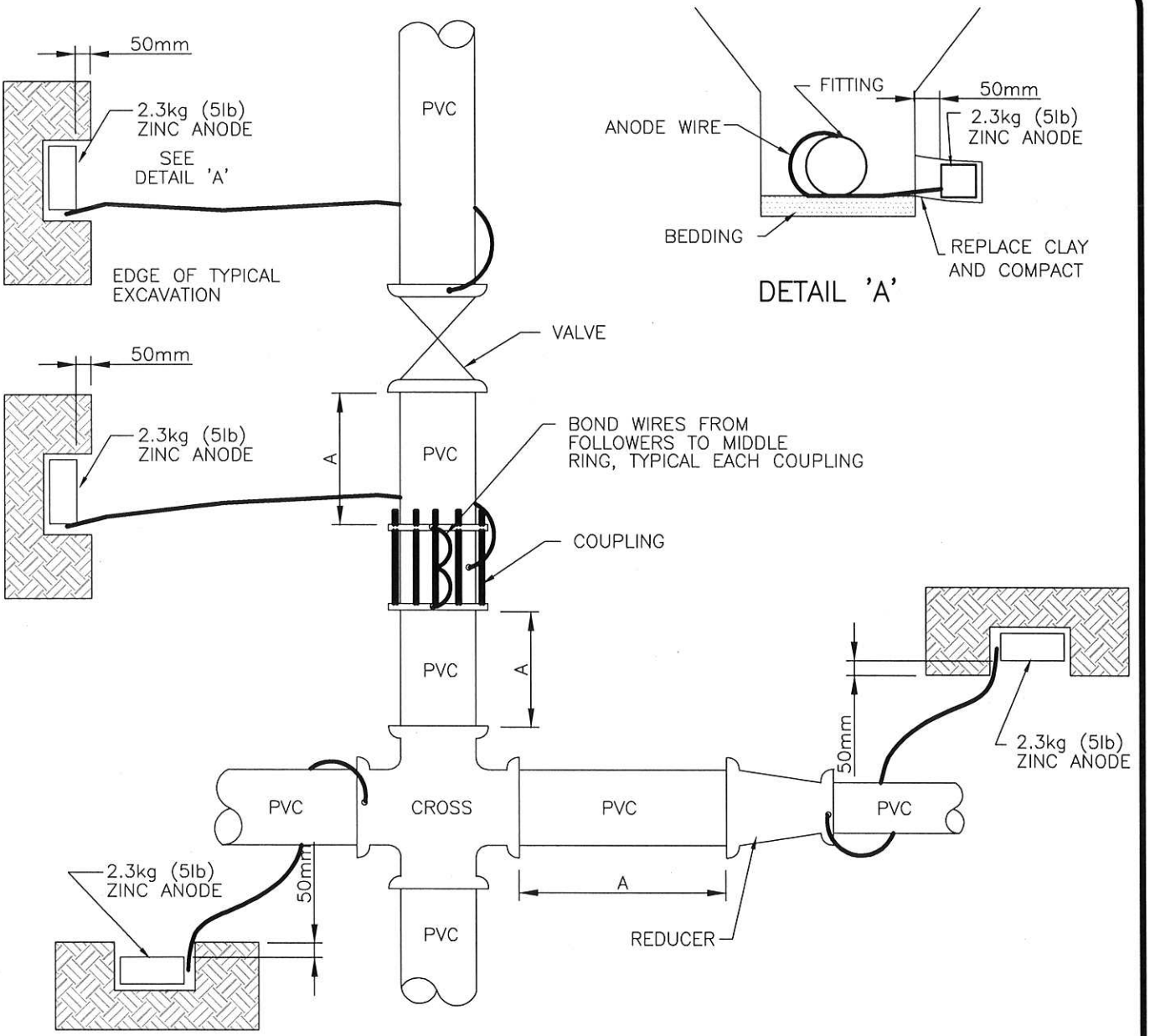

NOTES:

1. MINIMUM DISTANCE FROM ANODE TO PIPE, FITTING, VALVE, OR HYDRANT IS 150mm.
2. INSTALL ANODE AT APPROX. PIPE DEPTH IN NATIVE SOIL.
3. BOND WIRES MAY BE USED TO PROTECT UP TO TWO FITTINGS WITH ONE ANODE WHEN DIMENSION 'A' DOES NOT EXCEED ONE (1) METER.
4. ALL ZINC ANODES ON FITTINGS AND VALVES ARE 2.3kg (5lb).
5. ZINC ANODES TO BE EMBEDDED INTO TRENCH WALL TO PROVIDE FOR A MINIMUM OF 50mm OF NATIVE CLAY COMPLETELY SURROUNDING THE ANODE.
6. ANODES TO BE AT LEAST 300mm CLEAR OF THRUST BLOCK.

THE CITY OF SPRUCE GROVE

PLANNING AND INFRASTRUCTURE

REVISIONS		
DATE	DETAILS	DRAWN
02/14	DRAWING NUMBER	RP

VALVE/FITTING ANODE

DRAWN:	T. CRAWFORD	DATE:	MARCH 6, 2006
CHECKED:	J. MUSTARD	SCALE:	NOT TO SCALE
APPROVED:	J. MUSTARD	DRAWING No.:	WR-08

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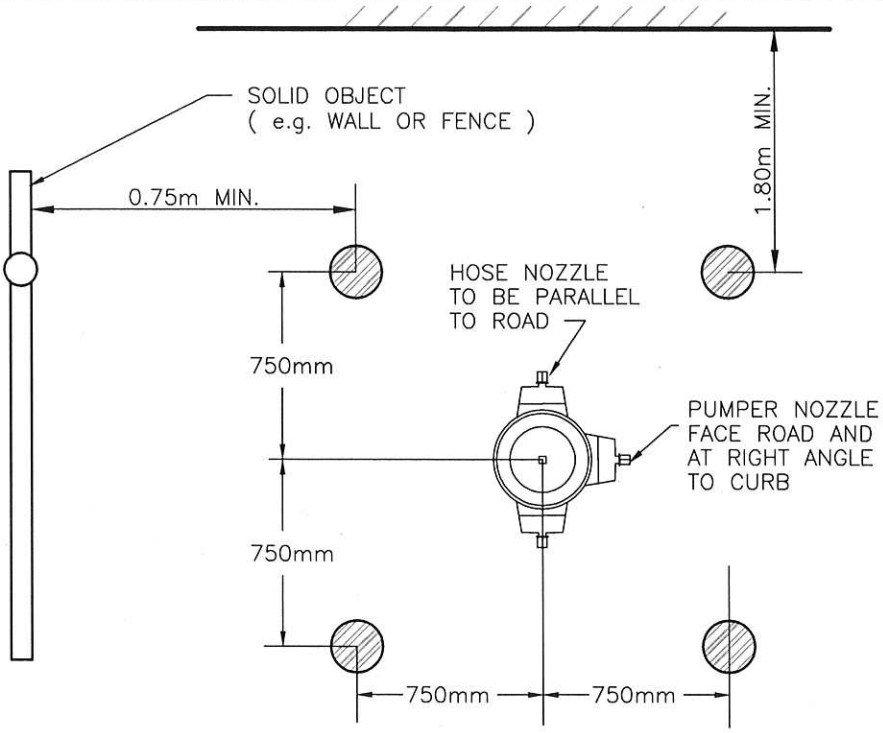

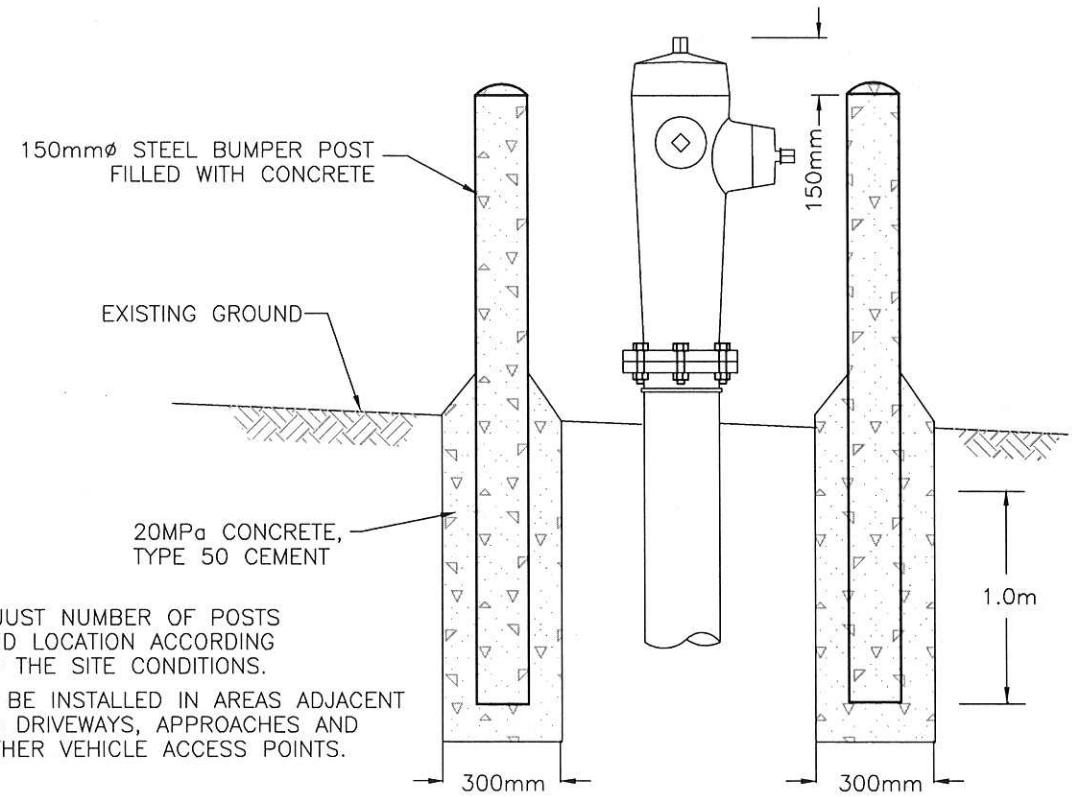

NOTE:
1. ADJUST NUMBER OF POSTS AND LOCATION ACCORDING TO THE SITE CONDITIONS.
2. TO BE INSTALLED IN AREAS ADJACENT TO DRIVEWAYS, APPROACHES AND OTHER VEHICLE ACCESS POINTS.

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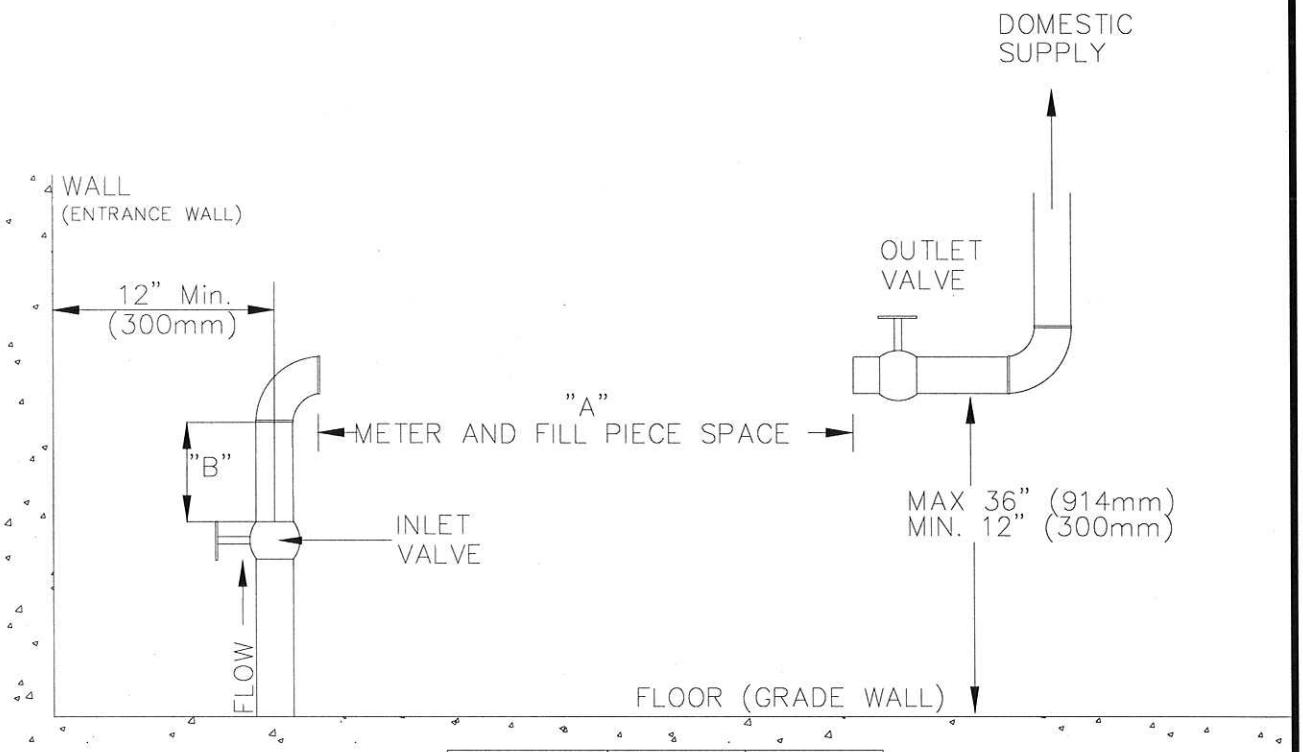
THE CITY OF SPRUCE GROVE

PLANNING AND INFRASTRUCTURE

REVISIONS		
DATE	DETAILS	DRAWN
02/14	DRAWING NUMBER	RP

HYDRANT BUMPER

DRAWN:	T. CRAWFORD	DATE:	MARCH 6, 2006
CHECKED:	J. MUSTARD	SCALE:	NOT TO SCALE
APPROVED:	J. MUSTARD	DRAWING No.:	WR-09



METER SIZE	"A"	"B" MAX
5/8"	12" (300mm)	1" (25mm)
3/4"	14" (356mm)	1" (25mm)
1"	16" (400mm)	2" (50mm)
1.5"	13" (330mm)	3" (75mm)
2"	17" (432mm)	3" (75mm)

* NOTE:
1.5" AND 2" METERS ARE FLANGED END

NOTE:

1. METER SETTING CONSTRUCTED USING PLASTIC PIPING ON OUTLET SIDE OF METER SHALL HAVE ADEQUATE ANCHORING CAPABLE OF KEEPING THE PIPE IN ALIGNMENT AND SUPPORTING THE WEIGHT OF THE METER, PIPE AND OTHER COMPONENTS.
2. MINIMUM DISTANCE OF CENTERLINE OF PIPING ADJACENT TO METER SETTINGS TO BE 12" (300mm) FROM ANY ENTRANCE, FOUNDATION WALL, INTERIOR WALL OR ANY OTHER POTENTIAL OBSTRUCTION.
3. VALVE IS REQUIRED ON THE INLET AND OUTLET SIDE OF METER SETTING ON ALL PIPE.
4. PIPING FOR "A" MUST BE IN A HORIZONTAL PLANE.
5. VALVES OR FITTINGS ON SIDES CONNECTING TO METER MUST BE 90° FEMALE THREADED IN 1/2" (13mm) FOR 5/8 METER, 3/4" (20mm) FOR 3/4" METER, AND 1" (25mm) FOR 1" METERS.
6. BUILDINGS WITH MORE THAN ONE METER MUST HAVE A METAL OR PLASTIC TAG SECURELY ATTACHED TO THE CONTROL VALVE HANDLE OF THE METER IT SERVES. THE TAG MUST HAVE THE SERVICE ADDRESS ENGRAVED ON IT IN LETTERS OR NUMBERS AT LEAST 5mm (3/16") IN HEIGHT.
7. METER LOCATION MUST REMAIN ACCESSIBLE FOR FUTURE MAINTENANCE OF METER, FITTINGS OR INSPECTION.
8. BACK FLOW PREVENTION DEVICES MAY BE REQUIRED, PHONE THE CITY OF SPRUCE GROVE AT (780) 962-2611.
9. NO BY-PASS ALLOWED UNLESS APPROVED BY THE CITY.

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THE CITY OF SPRUCE GROVE

PLANNING AND INFRASTRUCTURE

REVISIONS		
DATE	DETAILS	DRAWN
02/14	DRAWING NUMBER	RP
03/15	CHANGES TO NOTES	RP

METER SETTING GUIDELINES

DRAWN: T. CRAWFORD	DATE: MARCH 6, 2006	
CHECKED: J. MUSTARD	SCALE: NOT TO SCALE	
APPROVED: J. MUSTARD	DRAWING No.: WR-10	

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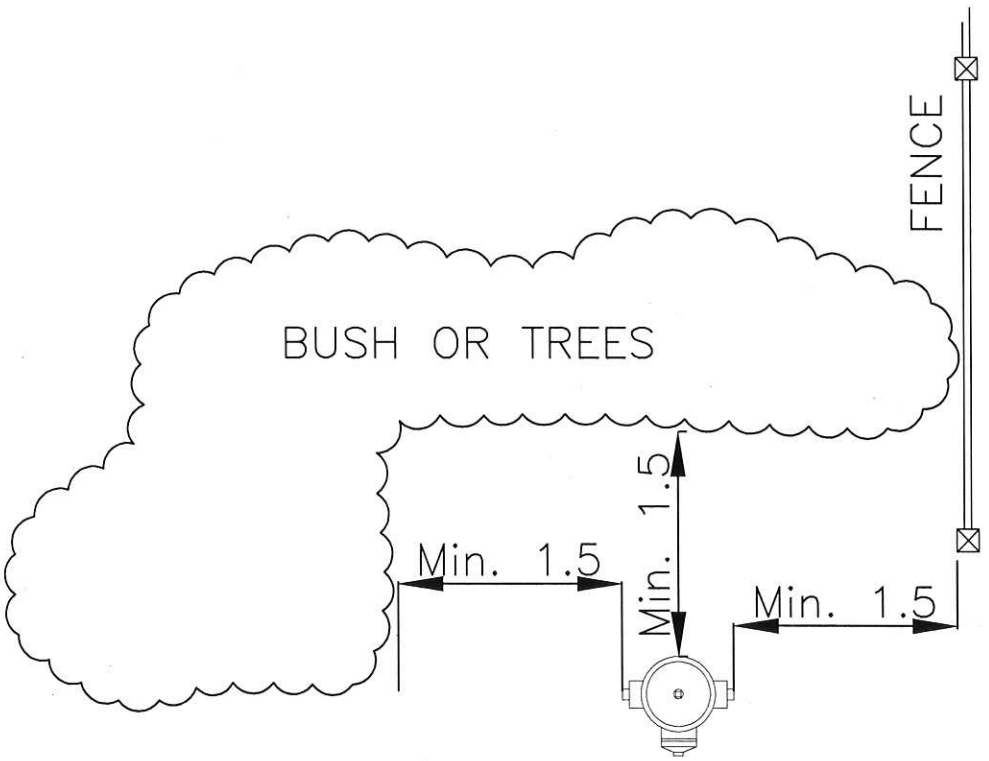

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THE CITY OF SPRUCE GROVE

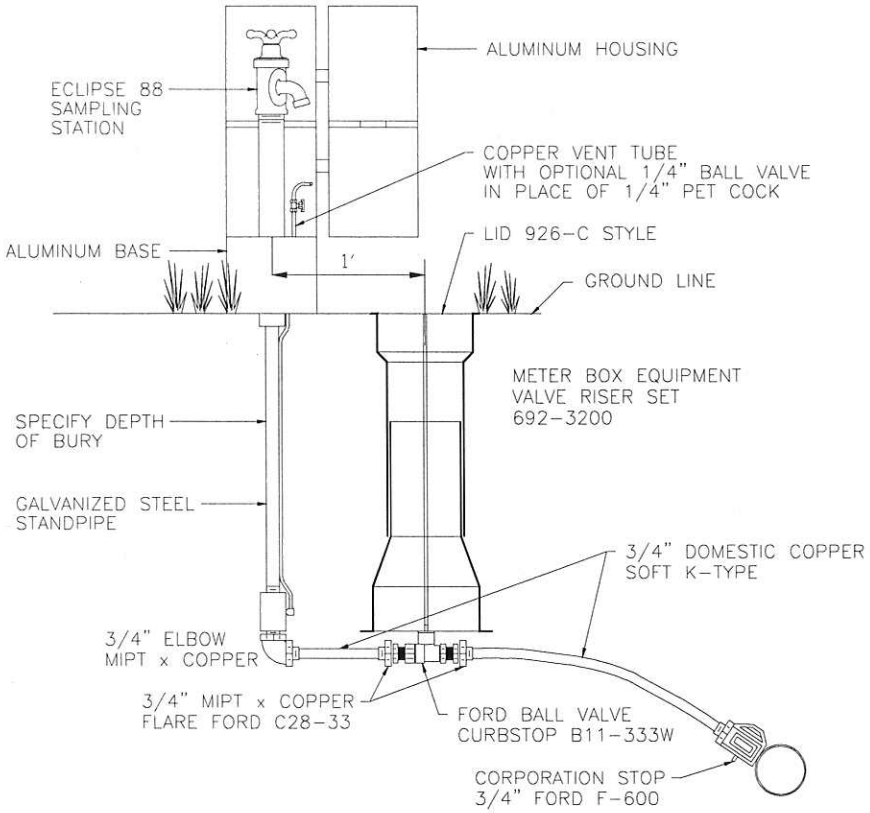
PLANNING AND INFRASTRUCTURE

REVISIONS		
DATE	DETAILS	DRAWN
02/14	DRAWING NUMBER	RP

FIRE HYDRANT CLEARANCE

DRAWN:	T. CRAWFORD	DATE:	MARCH 6, 2006
CHECKED:	J. MUSTARD	SCALE:	NOT TO SCALE
APPROVED:	J. MUSTARD	DRAWING No.:	WR-11

ECLIPSE NO. 88 SAMPLING STATION



Sampling Stations shall be 2.8m minimum bury, with a 3/4" FIP inlet, and a (3/4" hose or unthreaded) nozzle.

All stations shall be enclosed in a lockable, nonremovable, aluminum-cast housing.

When opened, the station shall require no key for operation, and the water will flow in an all brass waterway.

All working parts will also be of brass and be removable from above ground with no digging. Exterior piping shall be galvanized steel (brass pipe also available).

A copper vent tube will enable each station to be pumped free of standing water to prevent freezing and to minimize bacteria growth.

Eclipse No. 88 Sampling Station shall be manufactured by Kupferle Foundry, St. Louis, MO 63102.

ALL SAMPLING STATIONS ARE PROVIDED BY THE CITY OF SPRUCE GROVE BUT INSTALLED BY THE DEVELOPER.

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THE CITY OF SPRUCE GROVE

PLANNING AND INFRASTRUCTURE

REVISIONS		
DATE	DETAILS	DRAWN
04/12	CHG TO NOTES	RP
02/14	CHG TO NOTES	RP
02/14	DRAWING NUMBER	RP

WATER SAMPLING STATION

DRAWN:	T. CRAWFORD	DATE:	MARCH 6, 2006
CHECKED:	J. MUSTARD	SCALE:	NOT TO SCALE
APPROVED:	J. MUSTARD	DRAWING No.:	WR-12