

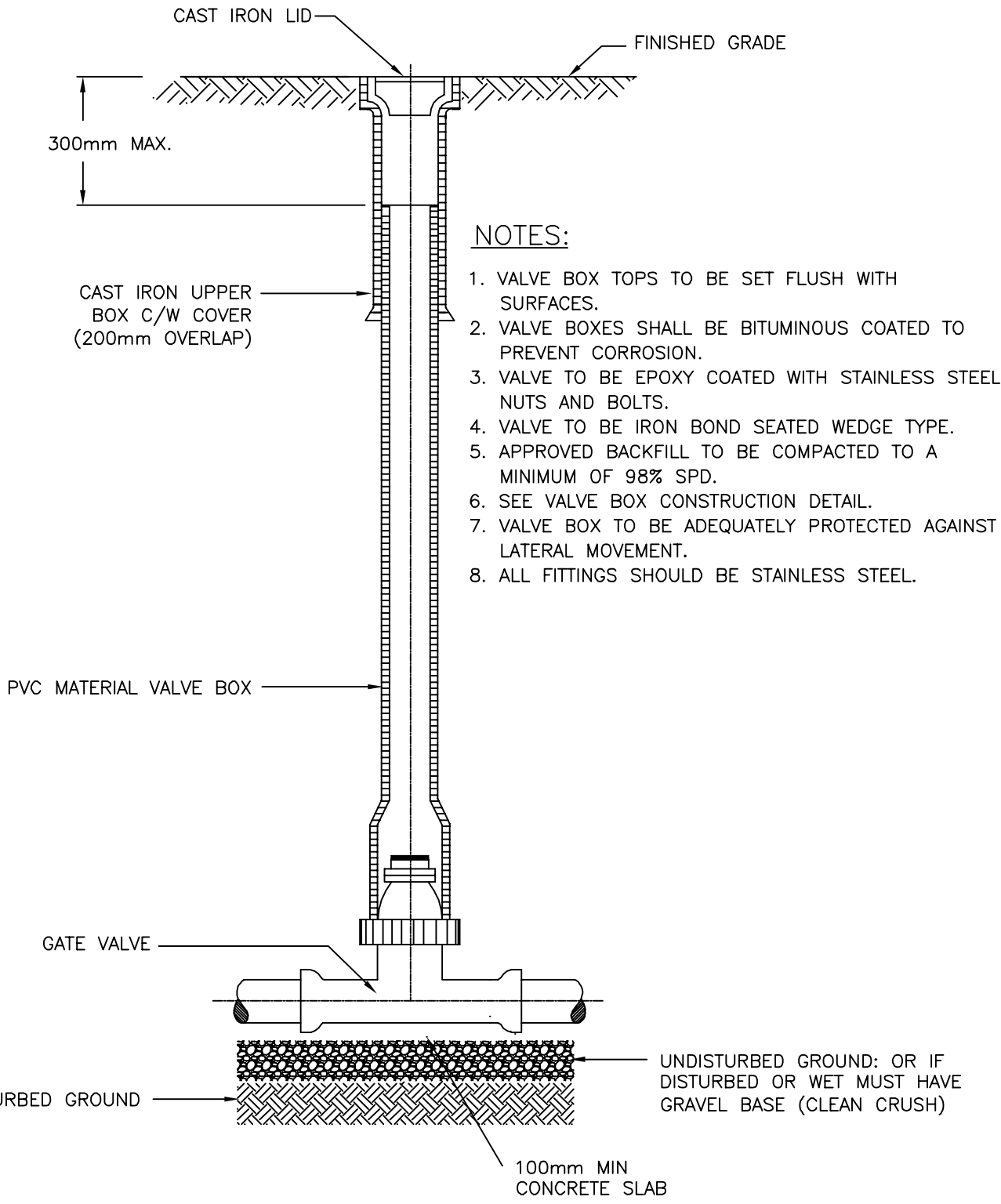
NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE STATED.
2. CONCRETE TO BE 20MPa @ 28 DAYS.
3. HYDRANTS SHALL BE MCAVITY BRIGADIER M-67 COMPLETE WITH STAINLESS STEEL BOLTS AND ASPHALTIC COATED HYDRANT COMPONENTS.
4. PROVIDE CATHODIC PROTECTION AS SHOWN ON STD. DWG.
5. THRUST BLOCKS TO BE PLACED AGAINST UNDISTURBED GROUND HAVING A MINIMUM BEARING OF 7300kg/m²
6. CONCRETE TO BE POURED CLEAR OF ALL FLANGES, JOINTS, AND HYDRANT DRAIN.
7. APPROVED BACKFILL TO BE COMPACTED TO A MINIMUM OF 98% SPD.
8. DO NOT ALLOW PONDING OR STANDING WATER AROUND HYDRANT.
9. PLACEMENT OF HYDRANT AND ORIENTATION OF PUMPER NOZZLE TO BE APPROVED.
10. HYDRANT TO BE DRAINING UNLESS OTHERWISE SPECIFIED.

TITLE: STANDARD DETAILS	
SCALE: N.T.S.	
DATE: MARCH 2015	
STD. DWG NO.	A-100

TYPICAL VALVE AND HYDRANT
DETAIL





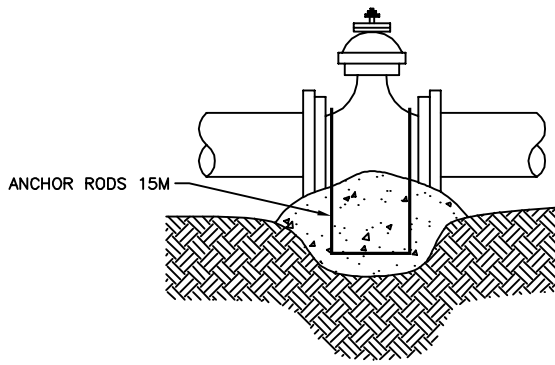
NOTES:

1. VALVE BOX TOPS TO BE SET FLUSH WITH SURFACES.
2. VALVE BOXES SHALL BE BITUMINOUS COATED TO PREVENT CORROSION.
3. VALVE TO BE EPOXY COATED WITH STAINLESS STEEL NUTS AND BOLTS.
4. VALVE TO BE IRON BOND SEATED WEDGE TYPE.
5. APPROVED BACKFILL TO BE COMPACTED TO A MINIMUM OF 98% SPD.
6. SEE VALVE BOX CONSTRUCTION DETAIL.
7. VALVE BOX TO BE ADEQUATELY PROTECTED AGAINST LATERAL MOVEMENT.
8. ALL FITTINGS SHOULD BE STAINLESS STEEL.

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MAIN VALVE CASING DETAIL



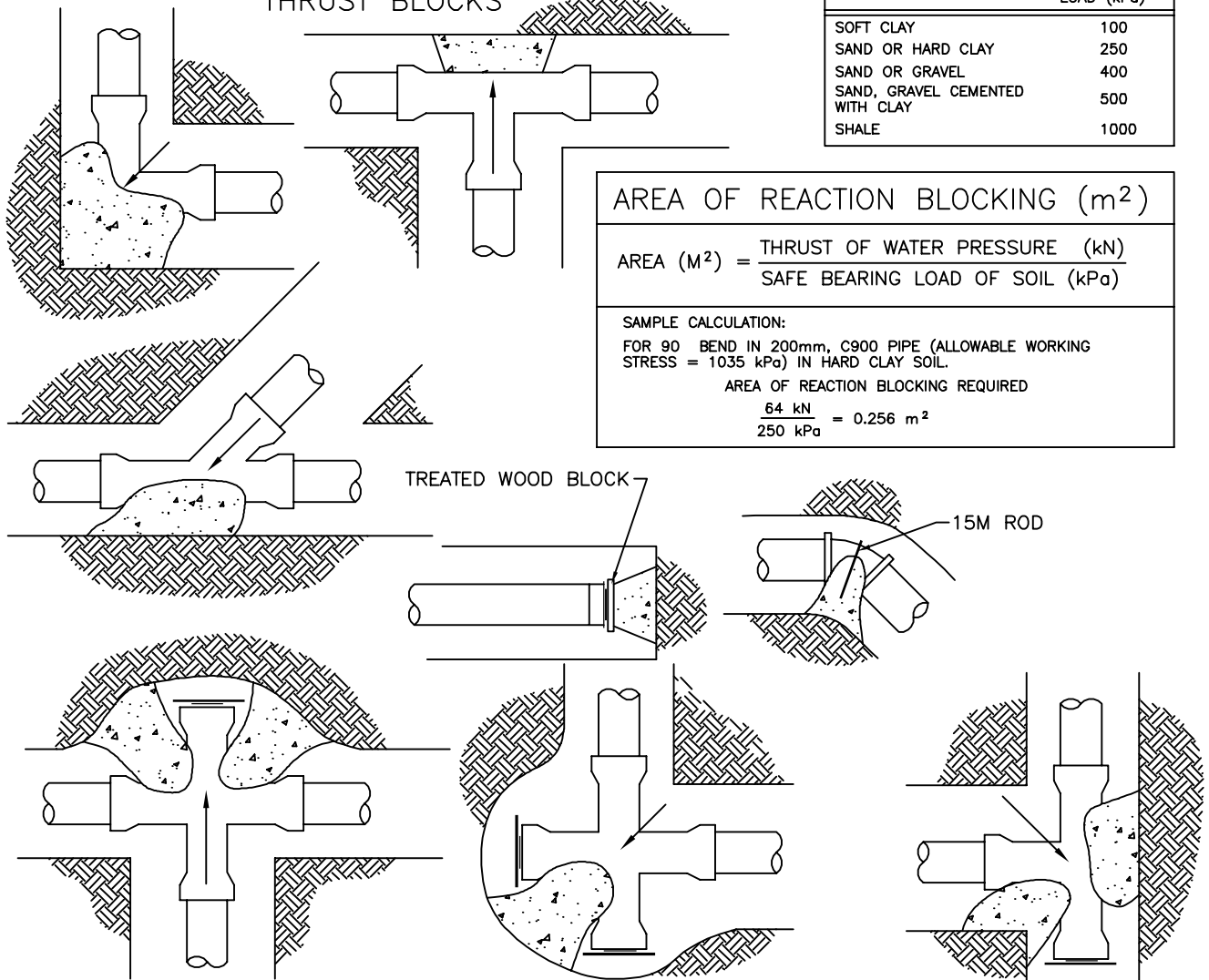


GATE VALVE ANCHORS

WORKING PRESSURE (kPa)	SIZE OF VALVE REQUIRING ANCHORAGE
345	345
690	690
1035	1035
	300mm AND UP
	200mm AND UP
	ALL SIZES

NOTE: PROVIDE 2 PLY 0.15mm POLYETHYLENE BETWEEN CONCRETE VALVES OR FITTINGS

THRUST BLOCKS



THRUST AT FITTINGS

THRUST OF WATER PRESSURE AT FITTINGS IN C900 WATER PIPE (kN)

PIPE SIZE (mm)	DEAD END PLUG OR TEE	90° BEND	45° BEND	22 1/2° BEND	11 1/4° BEND
100	12	19	10	5	2
150	26	37	20	10	5
200	46	64	34	18	10
250	73	104	56	29	14
300	104	146	80	40	22
350	140	197	109	55	27
400	180	257	140	70	35

NOTE: FOR PIPES WITH DIFFERENT ALLOWABLE WORKING PRESSURES MULTIPLY TABLE VALUES BY:

ALLOWABLE WORKING PRESURE (kPa)
1035 kPa

SAFE BEARING LOAD

SOIL TYPE	SAFE BEARING LOAD (kPa)
SOFT CLAY	100
SAND OR HARD CLAY	250
SAND OR GRAVEL	400
SAND, GRAVEL CEMENTED WITH CLAY	500
SHALE	1000

AREA OF REACTION BLOCKING (m²)

$$\text{AREA (M}^2\text{)} = \frac{\text{THRUST OF WATER PRESSURE (kN)}}{\text{SAFE BEARING LOAD OF SOIL (kPa)}}$$

SAMPLE CALCULATION:

FOR 90 BEND IN 200mm, C900 PIPE (ALLOWABLE WORKING STRESS = 1035 kPa) IN HARD CLAY SOIL.

AREA OF REACTION BLOCKING REQUIRED

$$\frac{64 \text{ kN}}{250 \text{ kPa}} = 0.256 \text{ m}^2$$

STANDARD DETAILS

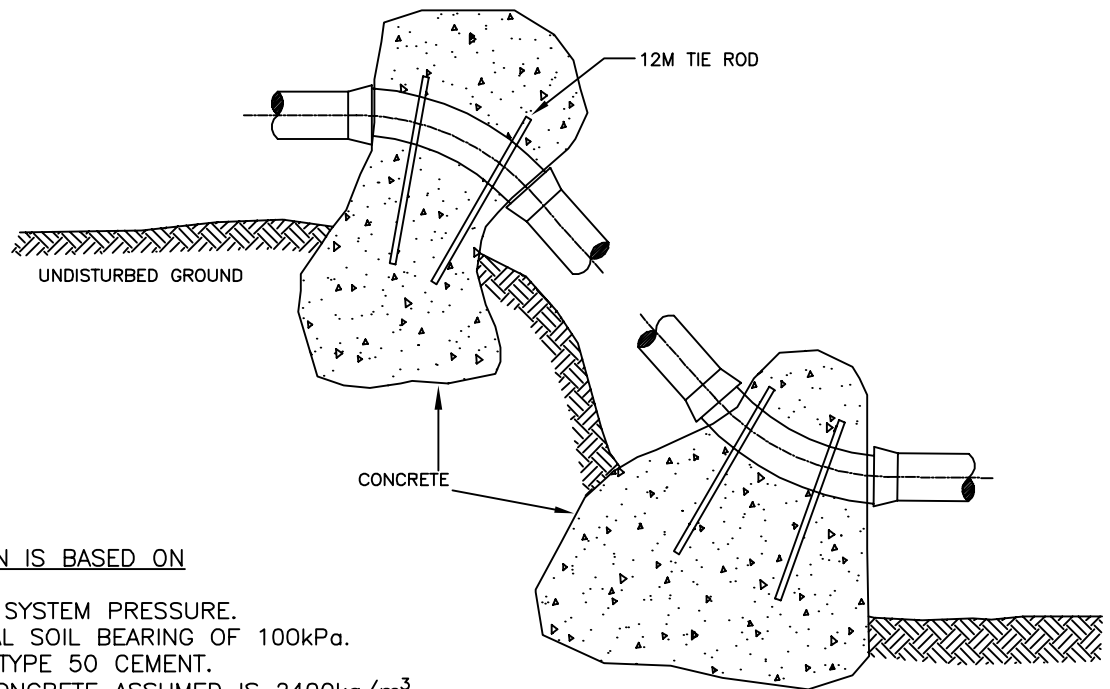
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BLOCKING AND ANCHORAGE





THRUST BLOCK DESIGN IS BASED ON

1. 1035kPa MAXIMUM SYSTEM PRESSURE.
2. A MINIMUM VERTICAL SOIL BEARING OF 100kPa.
3. CONCRETE 20MPa TYPE 50 CEMENT.
4. UNIT WEIGHT OF CONCRETE ASSUMED IS 2400kg/m³

UPWARD THRUST (GRAVITY) TABLE

FOR CALCULATION OF BASIC THRUST BEARING AREA (m²)

PIPE SIZE BEND	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	2.3	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 BEARING AREA (m²)

PIPE SIZE BEND	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

TITLE:
STANDARD DETAILS

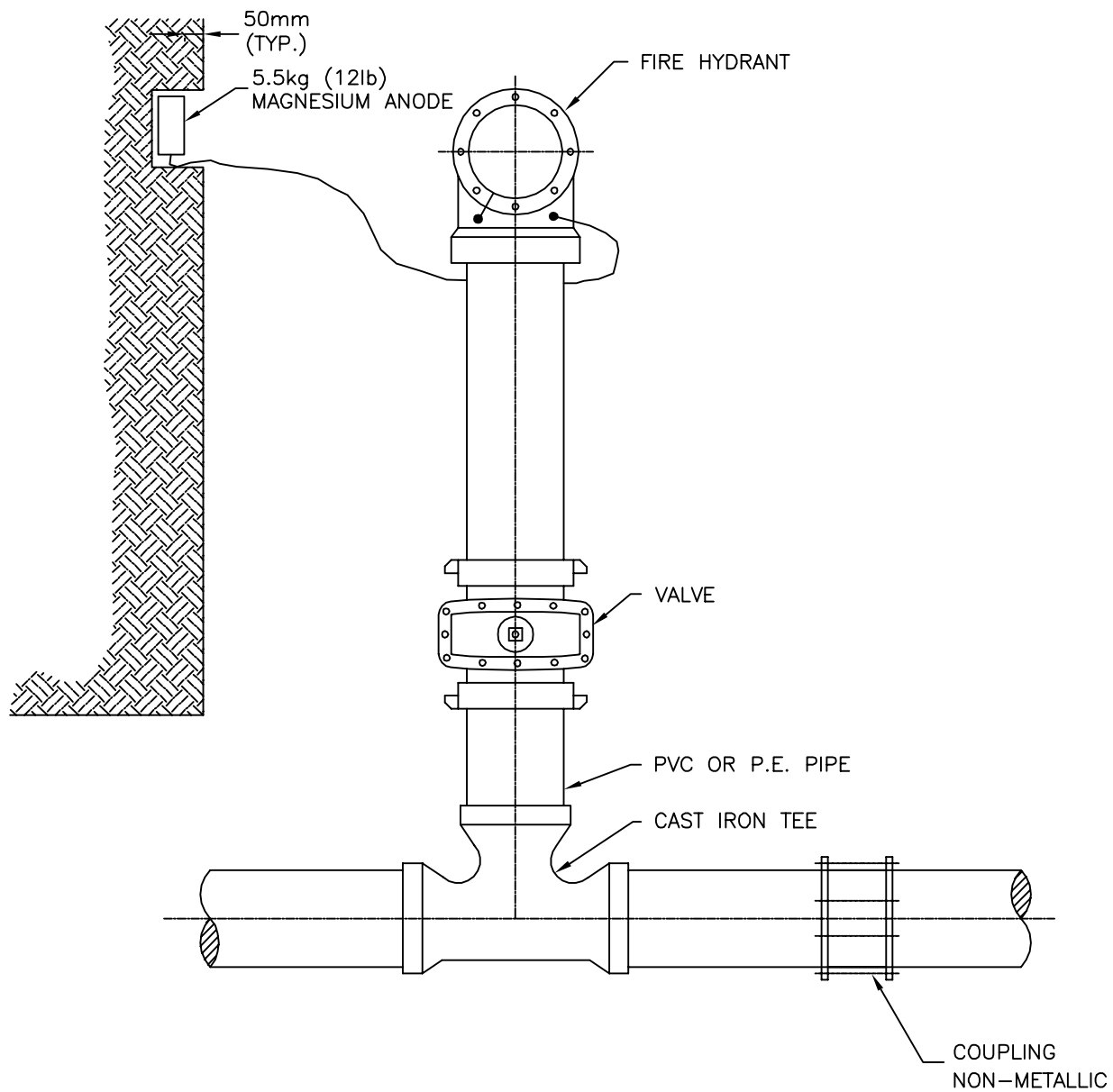
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VERTICAL BEND
THRUST BLOCK DETAIL





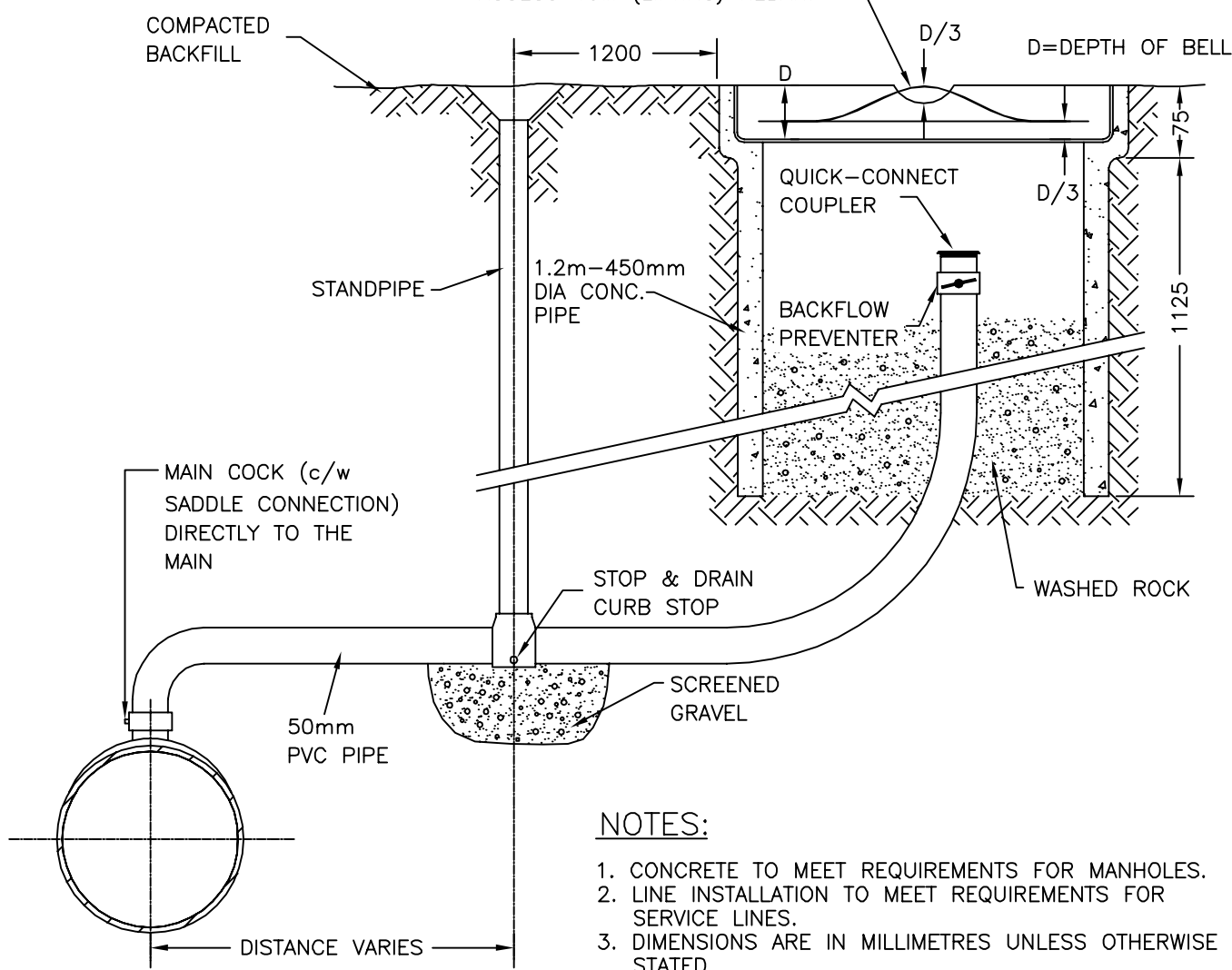
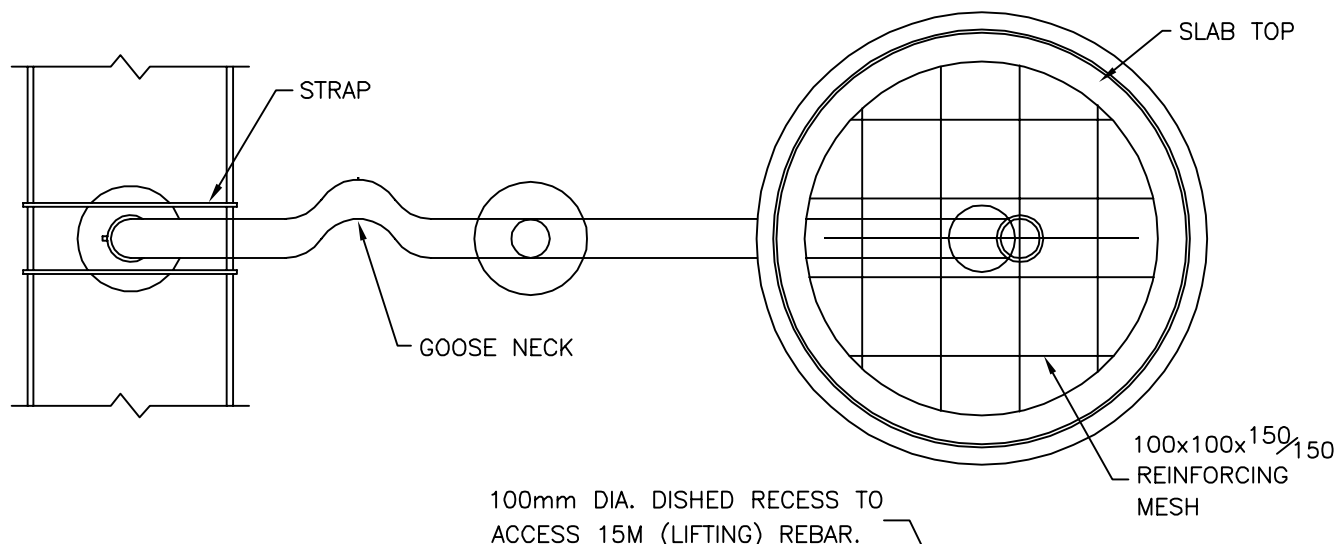
NOTES:

1. MIN DISTANCE FROM ANODE TO PIPE IS 150mm.
2. INSTALL ANODE AT APPROX. PIPE DEPTH IN NATIVE SOIL.
3. ALL ZINC ANODES ON HYDRANTS ARE 5.5kg (12lb).
4. ZINC ANODES TO BE EMBEDDED INTO TRENCH WALL TO PROVIDE FOR A MINIMUM OF 50mm OF NATIVE CLAY COMPLETELY SURROUNDING THE ANODE.
5. ANODES TO BE AT LEAST 300mm CLEAR OF THRUST BLOCK.
6. REPLACE CLAY OVER ANODES AND COMPACT.

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TYPICAL ANODE
INSTALLATION AT HYDRANTS





- NOTES:**
1. CONCRETE TO MEET REQUIREMENTS FOR MANHOLES.
 2. LINE INSTALLATION TO MEET REQUIREMENTS FOR SERVICE LINES.
 3. DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE STATED.

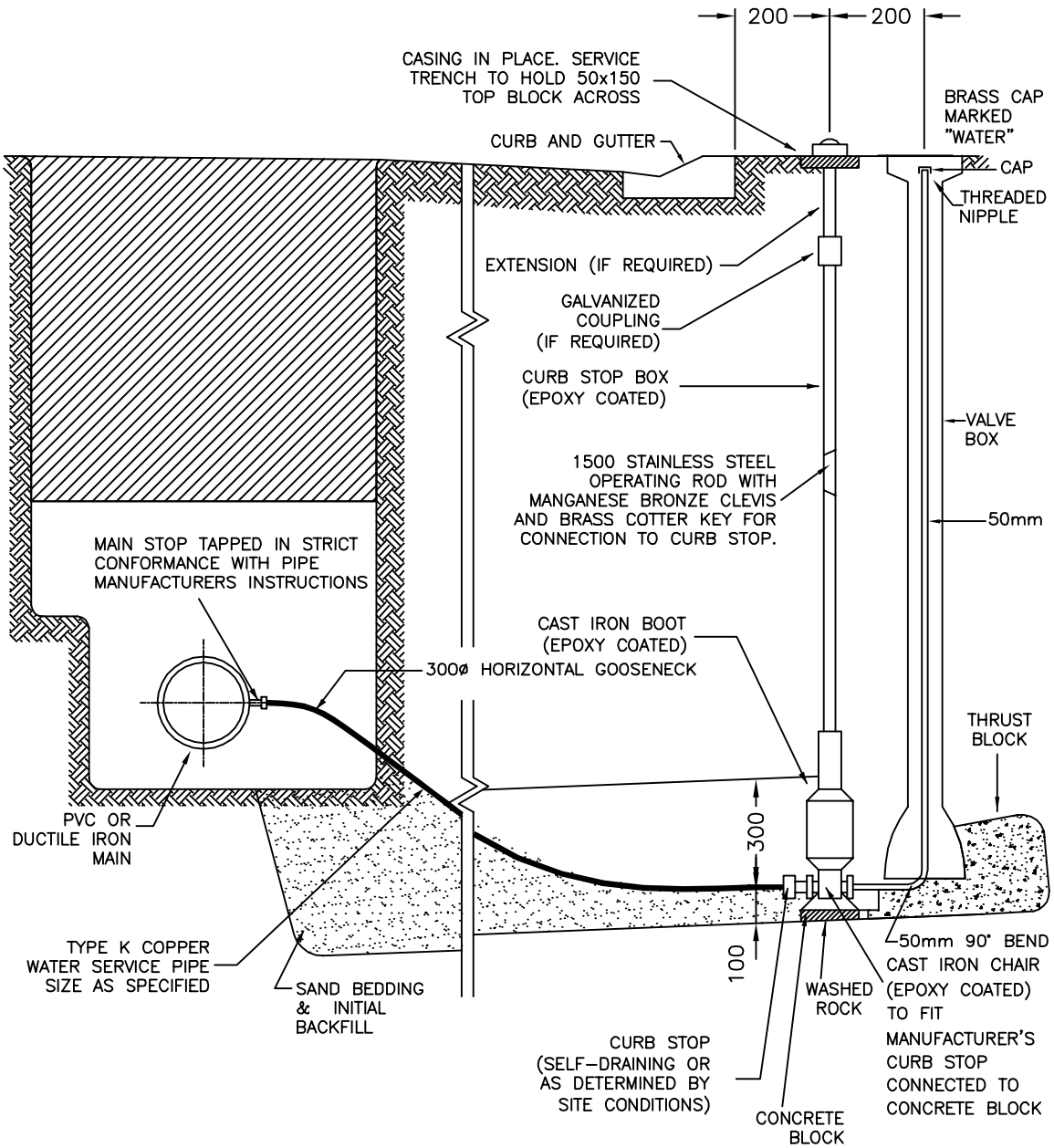
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AIR RELIEF VALVE AND
FLUSHING CHAMBER



NOTES:

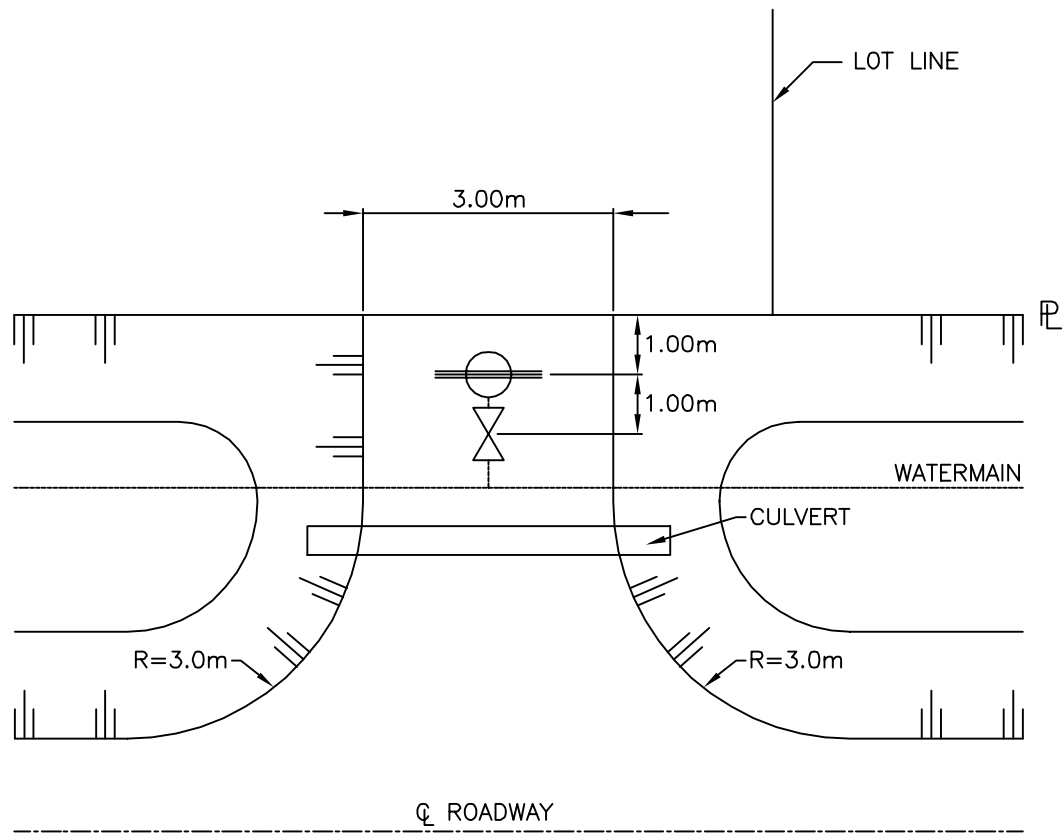
1. COPPER LINE SHALL BE ONE CONTINUOUS PIECE, UNLESS LENGTH EXCEEDS 30m MIN. AND ONLY THEN WILL A DOUBLE UNION BE ALLOWED.
2. INVERT ELEVATION SHALL BE 2.4m BELOW ESTABLISHED FINISHED GRADE UNLESS APPROVED BY THE CITY
3. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE NOTED.



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BLOW-OFF VALVE





NOTES:

1. WHEN CULVERTS ARE REQUIRED THEY MUST BE C.S.P. CULVERTS AND BE THE MIN. DIAMETER OF 500mm.
2. CULVERTS MUST BE SET BACK A MINIMUM OF 4m FROM SHOULDER OF ROAD.

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HYDRANT ACCESS LOCATION
OFF RURAL ROAD

