

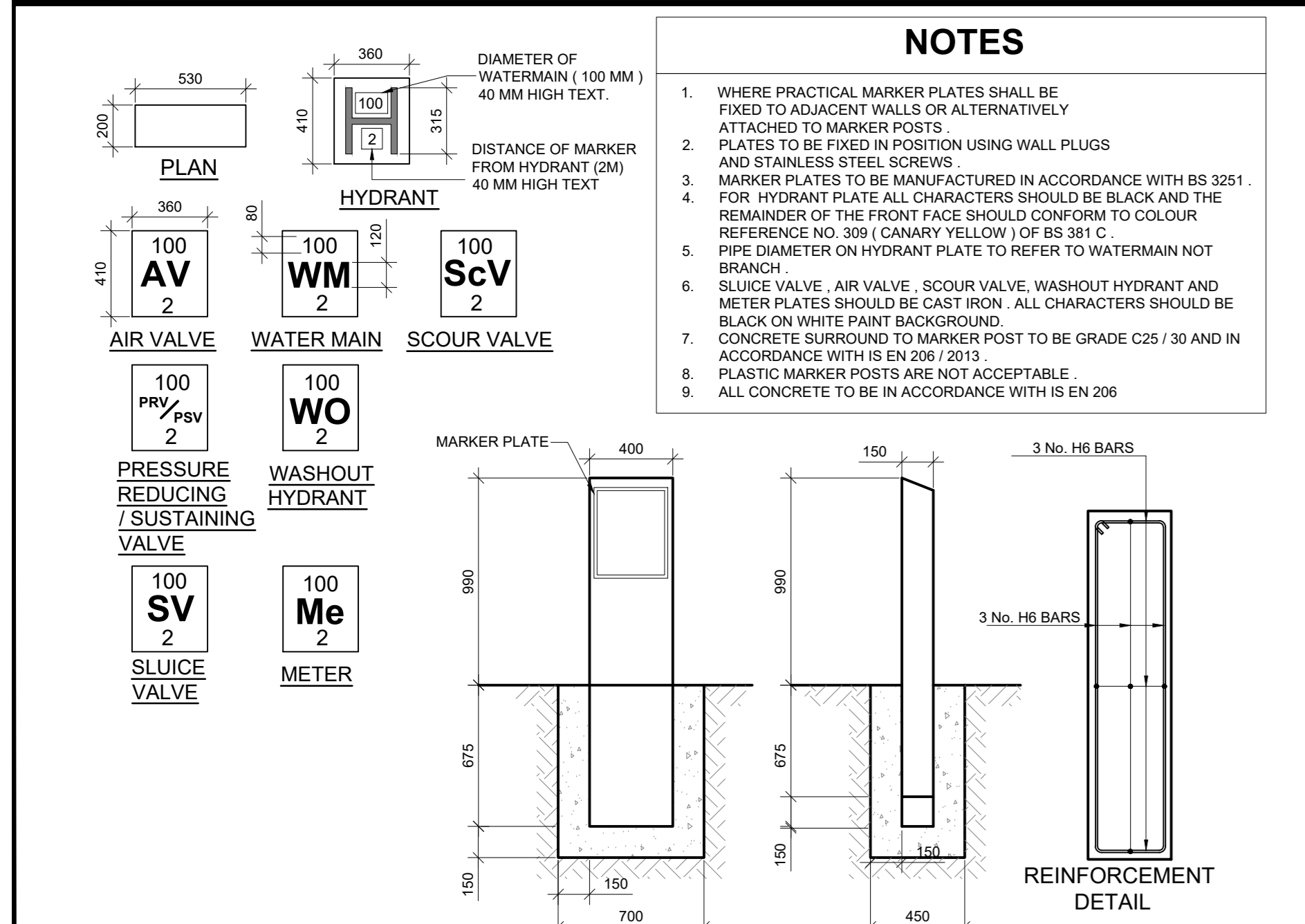
**NOTES**

- ALL DIMENSIONS ARE IN MILLIMETERS (MM) UNLESS NOTED OTHERWISE. THE MINIMUM DEPTH OF COVER FROM THE FINISHED GROUND LEVEL TO THE EXTERNAL CROWN OF THE PIPE SHALL BE 750mm FOR SERVICE CONNECTIONS. 900mm FOR WATER MAINS. GREATER DEPTHS OF COVER AND/OR PIPE STRENGTH OF OR A HIGHER CLASS OF BEDDING MATERIAL MAY BE REQUIRED WHERE HIGH TRAFFIC LOADINGS ARE ANTICIPATED. THE MARKING COVER SHOULD NOT EXCEED 1200mm WHERE PRACTICABLE.
- CONCRETE BEDDING SHALL BE IN ACCORDANCE WITH THE T1 SPECIFICATION FOR ROAD WORKS IS TO BE USED AS BACKFILL MATERIAL WHERE THE WATER MAIN IS LOCATED IN ROAD FOOTPATHS OR WHEN THE NEAREST PART OF THE TRENCH IS WITHIN 1m OF THE PAVED EDGE OF THE ROADWAY. CLASS B88 IS TO BE COMPACTED AS PER CLAUSE 802 OF THE T1 SPECIFICATION FOR ROAD WORKS.
- SELECTED EXCAVATED MATERIAL MAY BE USED IN GREEN-FIELD AREAS ABOVE GRANULAR PIPE SURROUNDING MATERIAL. SUBJECT TO THE APPROVAL OF THE EMPLOYER REPRESENTATIVE.
- PIPE BEDDING SHALL COMPLY WITH WS 4-86-02 AND IGDN 4-85-01 GRANULAR MATERIAL SHALL BE 14mm TO 5mm GRADED AGGREGATE OR 10mm SINGLE SIZED AGGREGATE TO BS EN 12002.
- IN SOFT GROUND CONDITIONS (CBR < 5) THE MATERIAL SHOULD BE EXCAVATED OUT AND REPLACED WITH MATERIAL IN ACCORDANCE WITH THE NATIONAL ROADS AUTHORITY SPECIFICATION FOR ROAD WORKS. SHALL REPLACE THE EXCAVATED MATERIAL WRAPPED IN GEO-TEXTILE WRAPPING. ALTERNATIVELY SPECIAL PIPE SUPPORT ARRANGEMENTS INCLUDING PLUG LIFT MAY BE REQUIRED WHERE THE DEPTH OF SOFT MATERIAL IS EXCESSIVE. SUCH ARRANGEMENTS SHALL BE SUBJECT TO APPROVAL BY EMPLOYER REPRESENTATIVE BEFORE ADVANCING WITH THE WORK.
- PIPES SHALL NOT BE SUPPORTED ON STONES OR ROCKS, OR ANY HARD OBJECT AT ANY POINT ALONG THE TRENCH. ROCK SHALL BE EXCAVATED TO A DEPTH OF 150mm BELOW THE ACTUAL DEPTH OF THE TRENCH WITH THE VOID FILLED WITH CLASS B88 MATERIAL IN ACCORDANCE WITH THE T1 SPECIFICATION FOR ROAD WORKS. THE GRANULAR MATERIAL SHALL BE LAID ABOVE THIS VOID BACKFILL MATERIAL.
- SHOULD MINIMUM COVER NOT BE ACHIEVABLE, CONCRETE GRADE C8/10 SHALL BE USED AS BACKFILL MATERIAL.
- MARKER TAPE TO BE 200mm WIDE BLUE POLYETHYLENE MATERIAL IN ACCORDANCE WITH EN 12633. PLASTIC PIPES SHALL HAVE WARNING TAPE INCORPORATING REFLECTIVE BAND BARRING. SERVICE PIPES SHALL HAVE 200mm WIDE MESH TAPE. MARKER TAPE TO BE LAID AT TOP OF PIPE BEDDING LAYER.
- TRENCH WIDTHS FOR PIPE SIZES <math>\le 80\text{mm}</math> MAY BE <math>< 500\text{mm}</math> SUBJECT TO CONSIDERATION BEING GIVEN TO THE TRENCH DEPTH, HEALTH & SAFETY & CONSTRUCTION ACCESS REQUIREMENTS.

**TABLE A**

PIPE DIAMETER 'X' (mm)	WIDTH OF TRENCH 'W' (mm)	PIPE DIAMETER 'X' (mm)	DEPTH OF BEDDING 'C' (mm)
60	SEE NOTE 10	< 200	150
100	500	> 250	200
150	600		
200	700		
250	750		
300	750		
350	750		
400	900		
450	900		

**A TYPICAL TRENCH BACKFILL & BEDDING DETAILS**

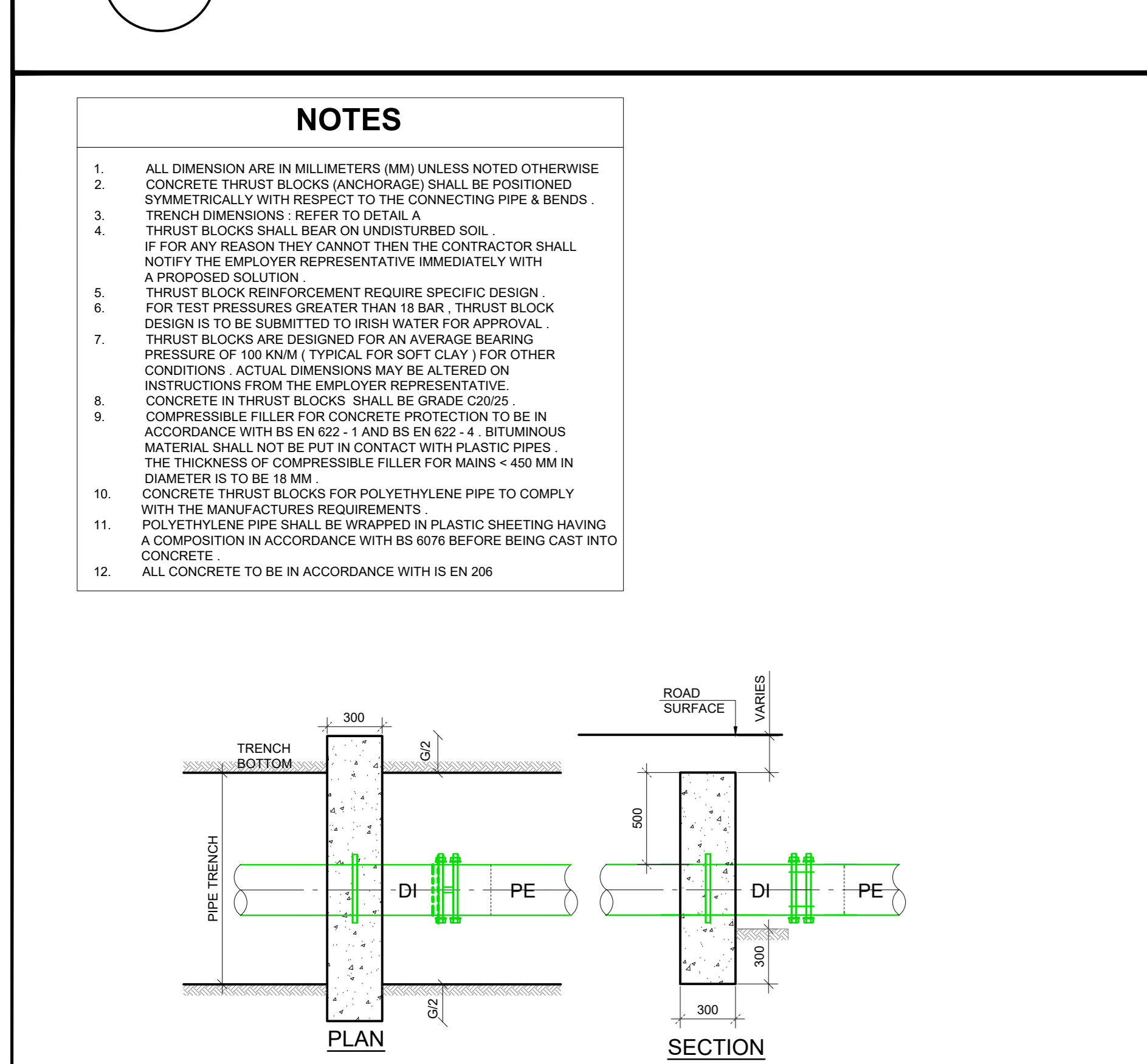


**NOTES**

- WHERE PRACTICAL, MARKER PLATES SHALL BE FIXED TO ADJACENT WALLS OR ALTERNATIVELY ATTACHED TO MARKER POSTS.
- PLATES TO BE FIXED IN POSITION USING WALL PLUGS AND STAINLESS STEEL SCREWS.
- MARKER PLATES TO BE MANUFACTURED IN ACCORDANCE WITH BS 3281.
- FOR HYDRANT PLATE ALL CHARACTERS SHOULD BE BLACK AND THE REMAINDER OF THE FRONT FACE SHOULD CONFORM TO COLOUR REFERENCE NO. 209 (CANARY YELLOW) OF BS 381 C.
- PIPE DIAMETER ON HYDRANT PLATE TO REFER TO WATERMAIN NOT BRANCH.
- SLUICE VALVE, AIR VALVE, SCOUR VALVE, WASHOUT HYDRANT AND METER PLATES SHOULD BE CAST IRON. ALL CHARACTERS SHOULD BE BLACK ON WHITE PAINT BACKGROUND.
- CONCRETE SURROUND TO MARKER POST TO BE GRADE C25/30 AND IN ACCORDANCE WITH BS EN 206:2013.
- PLASTIC MARKER POSTS ARE NOT ACCEPTABLE.
- ALL CONCRETE TO BE IN ACCORDANCE WITH BS EN 206.

**B TYPICAL SLUICE VALVE DETAILS FOR A POLYETHYLENE (PE) PIPE**

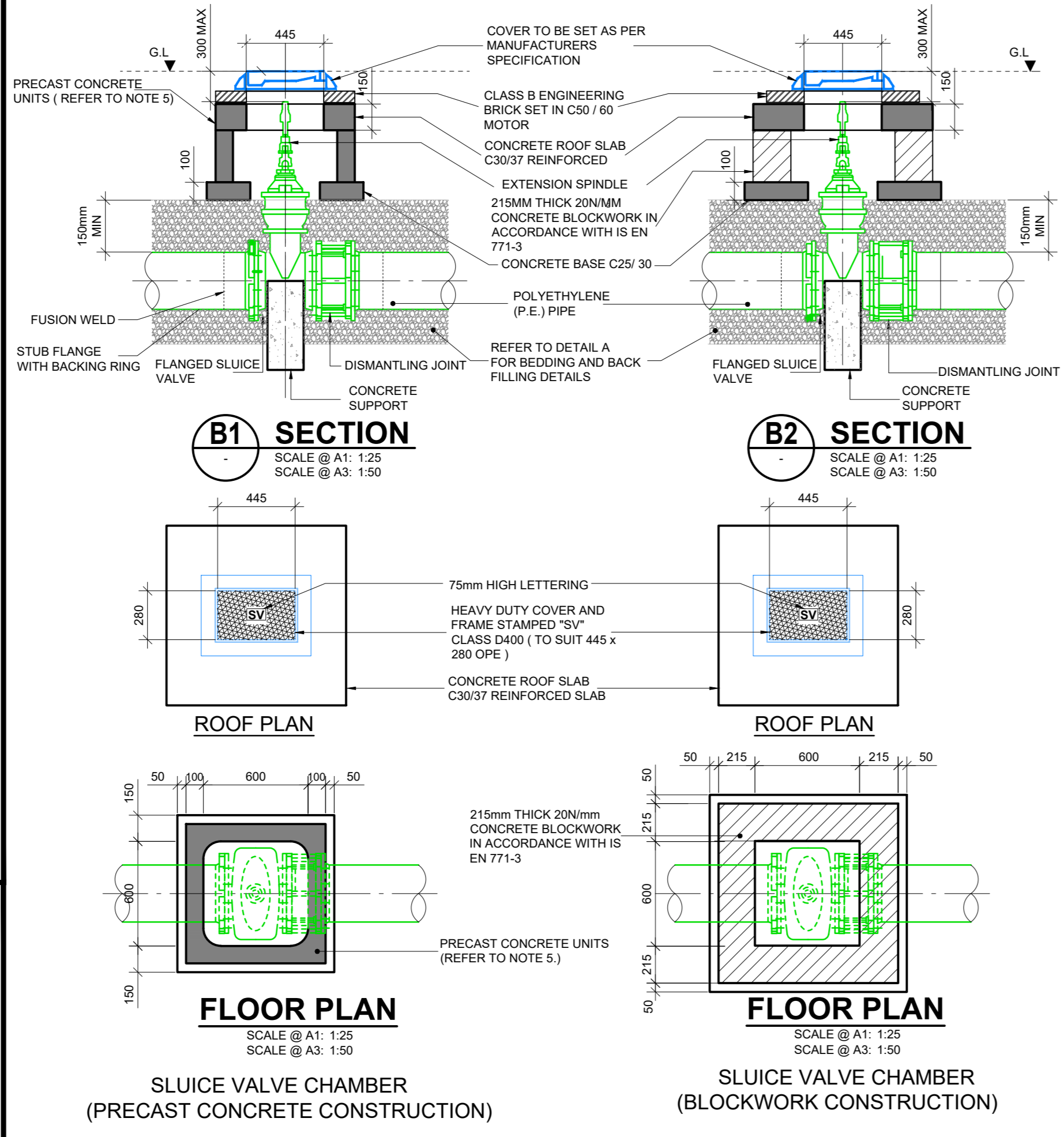
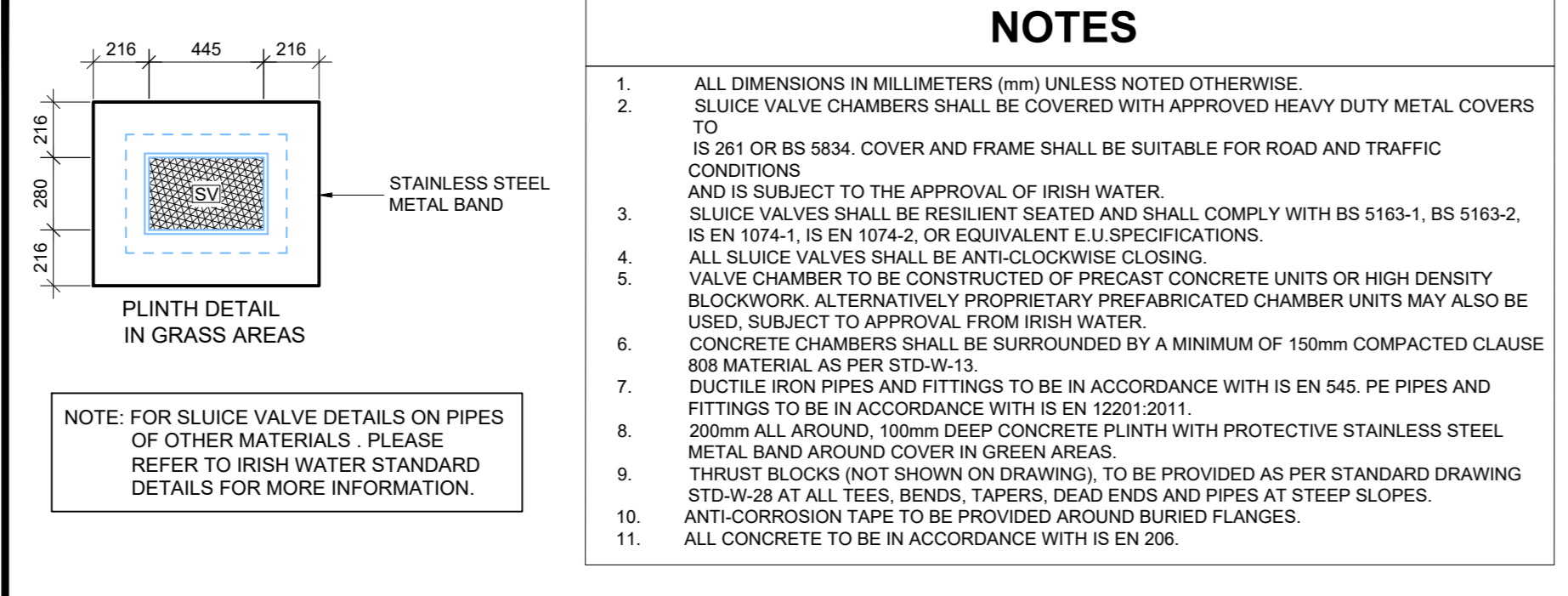
**E TYPICAL MARKER POST / PLATE DETAILS**



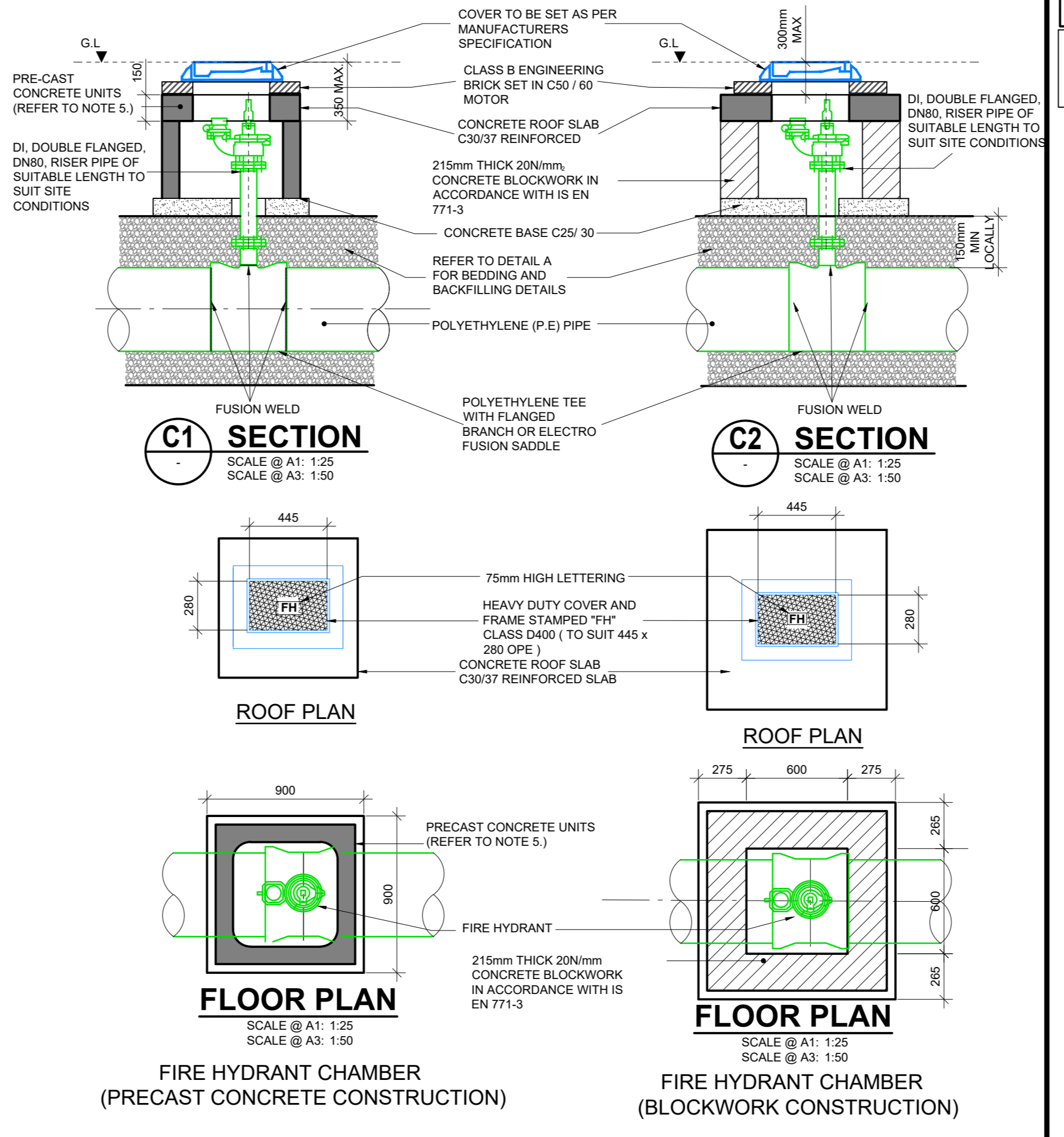
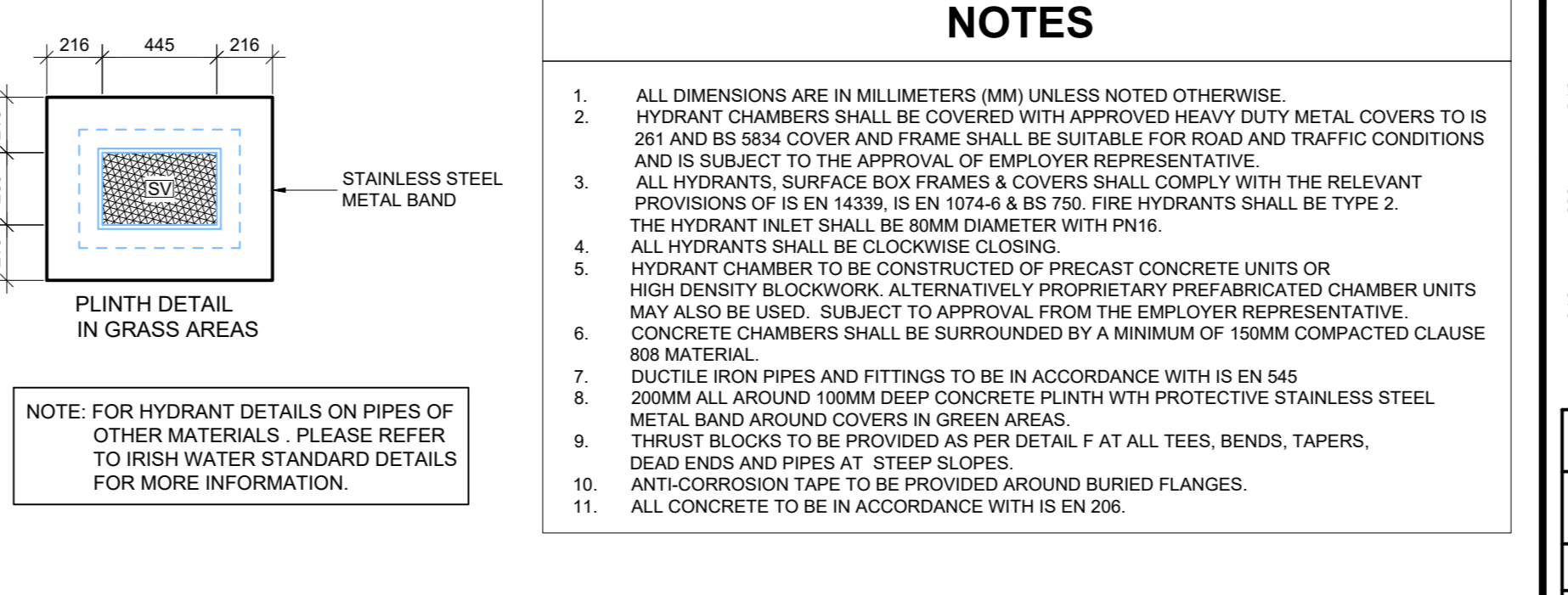
**NOTES**

- ALL DIMENSIONS ARE IN MILLIMETERS (MM) UNLESS NOTED OTHERWISE.
- CONCRETE THRUST BLOCKS (ANCHORAGE) SHALL BE POSITIONED SYMMETRICALLY WITH RESPECT TO THE CONNECTING PIPE & BENDS.
- THRUST DIMENSIONS SHALL REFER TO DETAIL F.
- IF FOR ANY REASON THEY CANNOT THEN THE CONTRACTOR SHALL NOTIFY THE EMPLOYER REPRESENTATIVE IMMEDIATELY WITH A PROPOSED SOLUTION.
- THRUST BLOCK REINFORCEMENT REQUIRE SPECIFIC DESIGN FOR TEST PRESSURES GREATER THAN 18 BAR. THRUST BLOCK DESIGN IS TO BE SUBMITTED TO IRISH WATER FOR APPROVAL.
- THRUST BLOCKS ARE DESIGNED FOR AN AVERAGE BEARING PRESSURE OF 100 kN/m<sup>2</sup> TYPICAL FOR SOFT CLAY FOR OTHER CONDITIONS. ACTUAL DIMENSIONS MAY BE ALTERED ON INSTRUCTIONS FROM THE EMPLOYER REPRESENTATIVE.
- CONCRETE IN THRUST BLOCKS SHALL BE GRADE C25/30 COMPRESSIBLE FILLER FOR CONCRETE PROTECTION TO BE IN ACCORDANCE WITH BS EN 622-1 AND BS EN 622-4. BITUMINOUS MATERIAL SHALL NOT BE PUT IN CONTACT WITH PLASTIC PIPES. THE THICKNESS OF COMPRESSIBLE FILLER FOR MANS = 450mm IN DIAMETER IS TO BE 18mm.
- CONCRETE THRUST BLOCKS FOR POLYETHYLENE PIPE TO COMPLY WITH THE MANUFACTURERS REQUIREMENTS.
- POLYETHYLENE PIPE SHALL BE WRAPPED IN PLASTIC SHEETING HAVING A COMPOSITION IN ACCORDANCE WITH BS 6076 BEFORE BEING CAST INTO CONCRETE.
- ALL CONCRETE TO BE IN ACCORDANCE WITH BS EN 206.

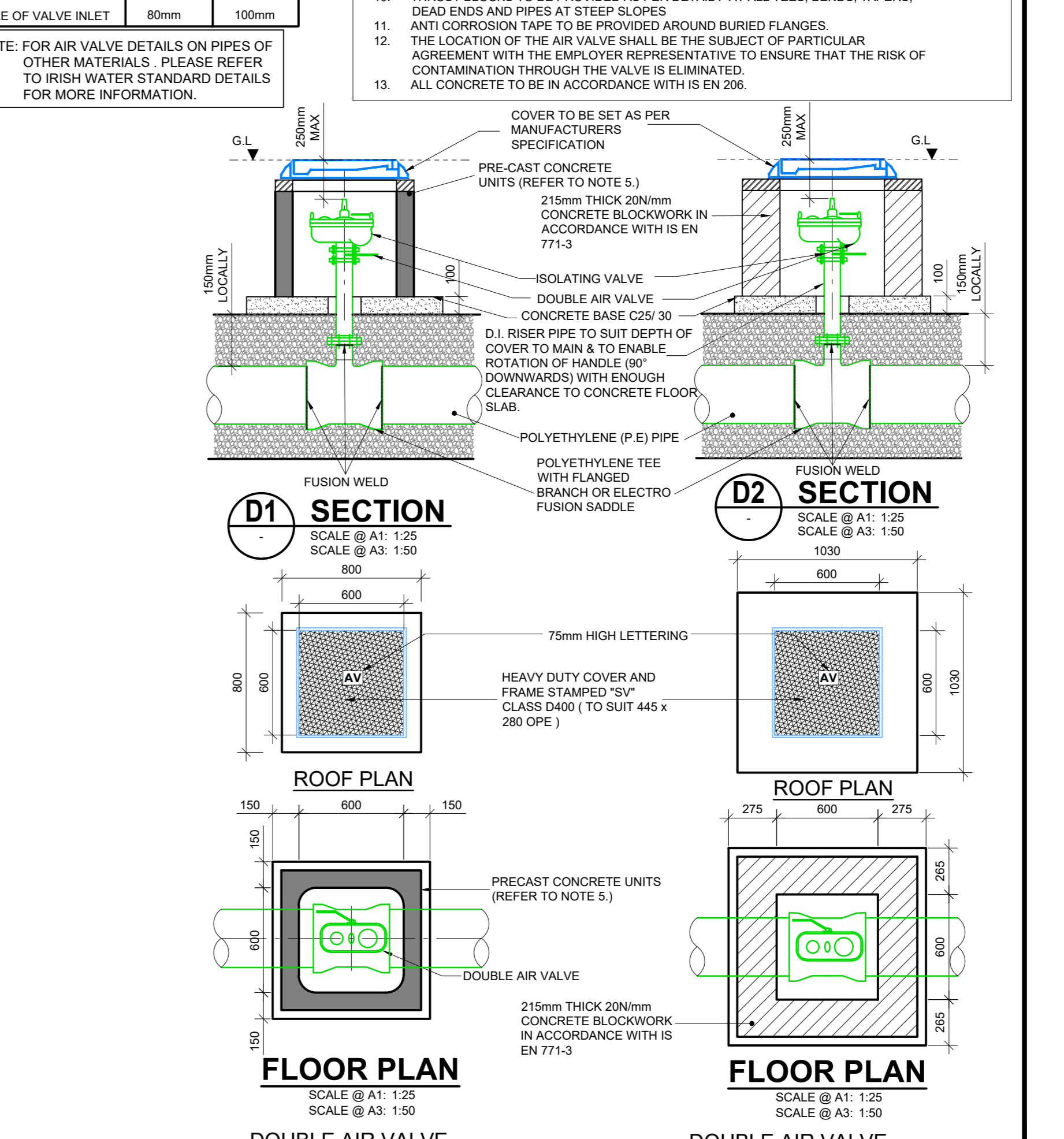
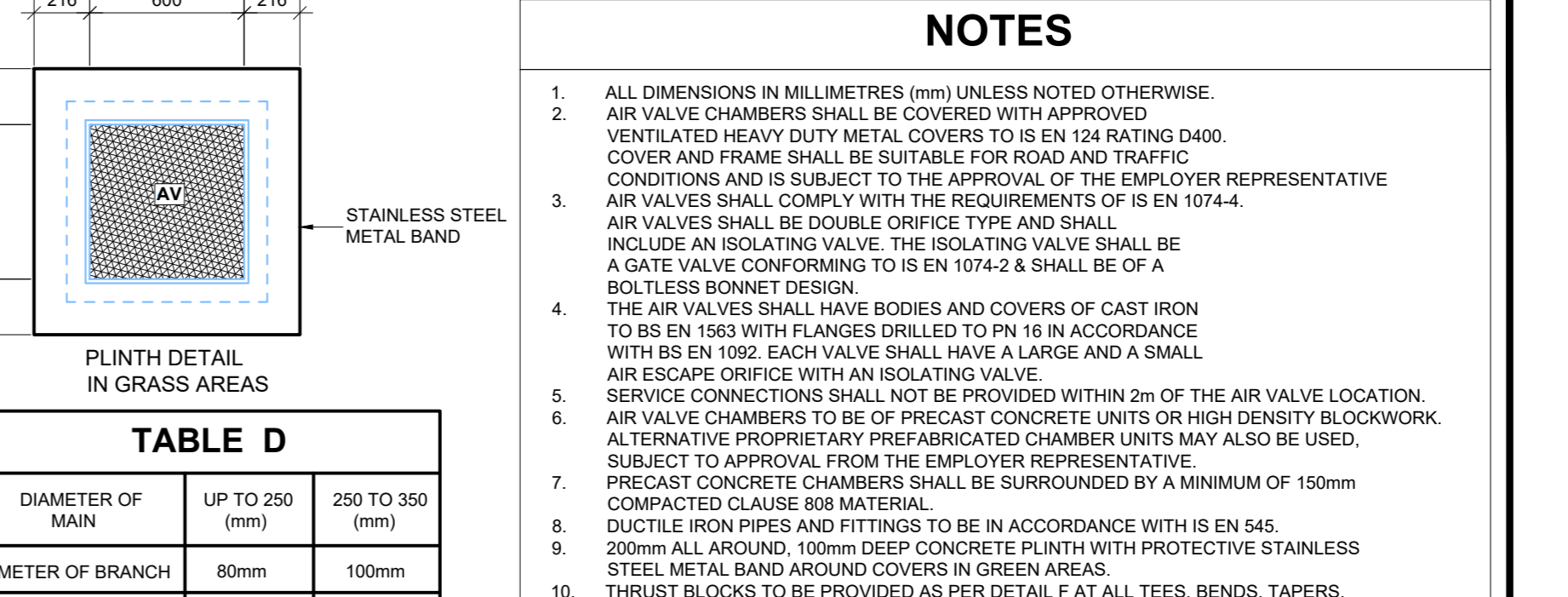
**F7 THRUST BLOCK FOR DUCTILE IRON TO POLETHLENE CHANGE OVER**



**B TYPICAL SLUICE VALVE DETAILS FOR A POLYETHYLENE (PE) PIPE**



**C TYPICAL ON-LINE HYDRANT DETAILS FOR A POLYETHYLENE (PE) PIPE**



**D TYPICAL ON-LINE AIR VALVE DETAILS FOR A POLYETHYLENE (PE) PIPE**

**THRUST BLOCK DIMENSIONS**

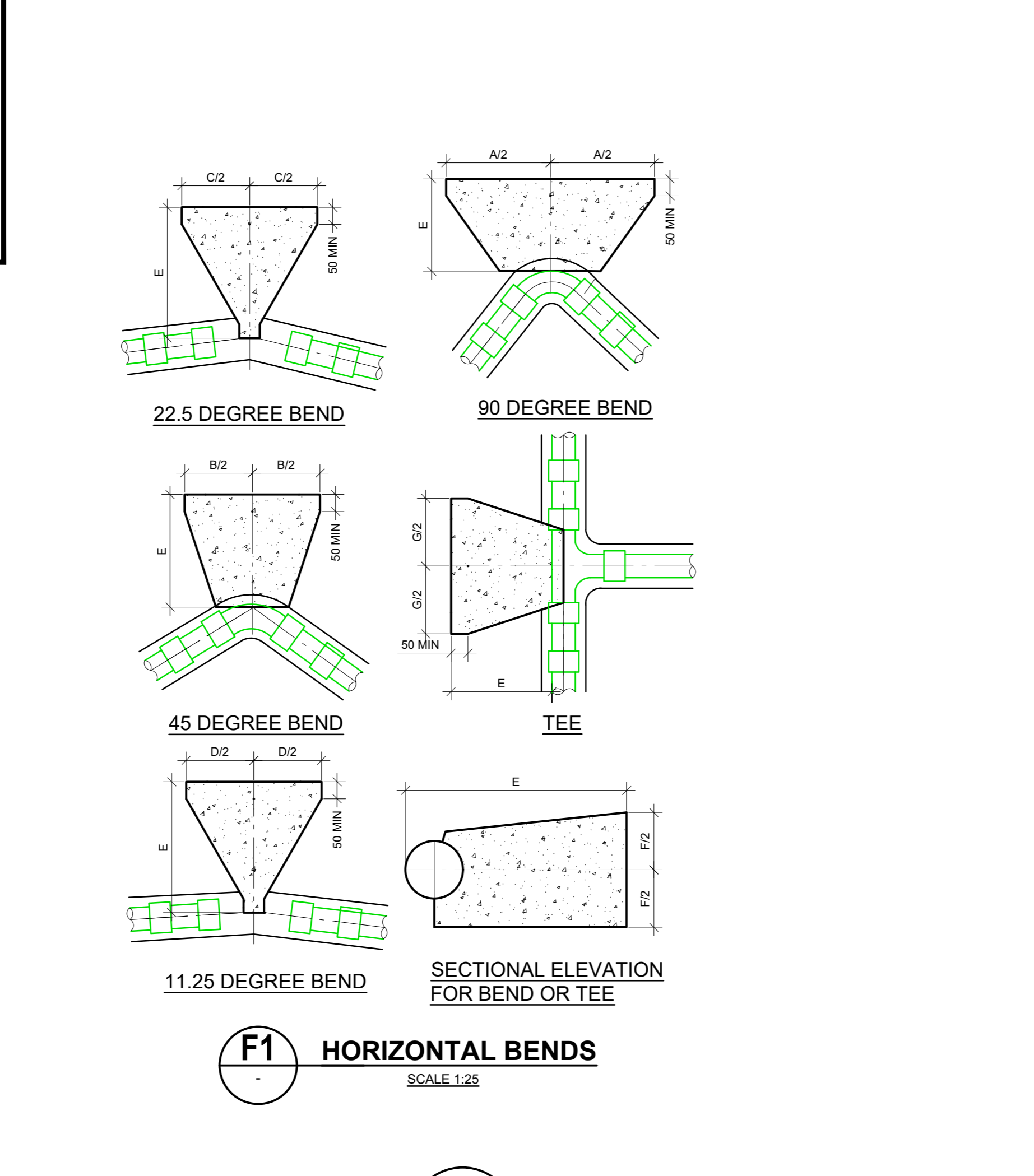
12 BAR TEST PRESSURE

NOM. DIA. (mm)	DIMENSIONS										
	A	B	C	D	E	F	G	H	J	K	L
100	600	330	160	80	200	550	390	700	600	400	400
150	950	510	260	130	275	450	680	900	750	600	600
200	1190	660	310	160	300	600	790	1050	900	700	700
250	1350	750	360	200	300	800	890	1200	1000	750	750
300	1580	850	400	220	320	950	1110	1300	1100	850	850
350	2100	1150	570	290	420	1000	1450	1550	1200	1000	1000
400	2350	1400	670	350	500	1050	1600	1700	1250	1050	1050
450	3000	1630	830	420	680	1100	2130	1800	1450	1150	1150
500	3890	1950	990	500	800	1200	2540	1950	1650	1250	1250
600	4100	2200	1100	630	850	1400	2880	2100	1700	1300	1300

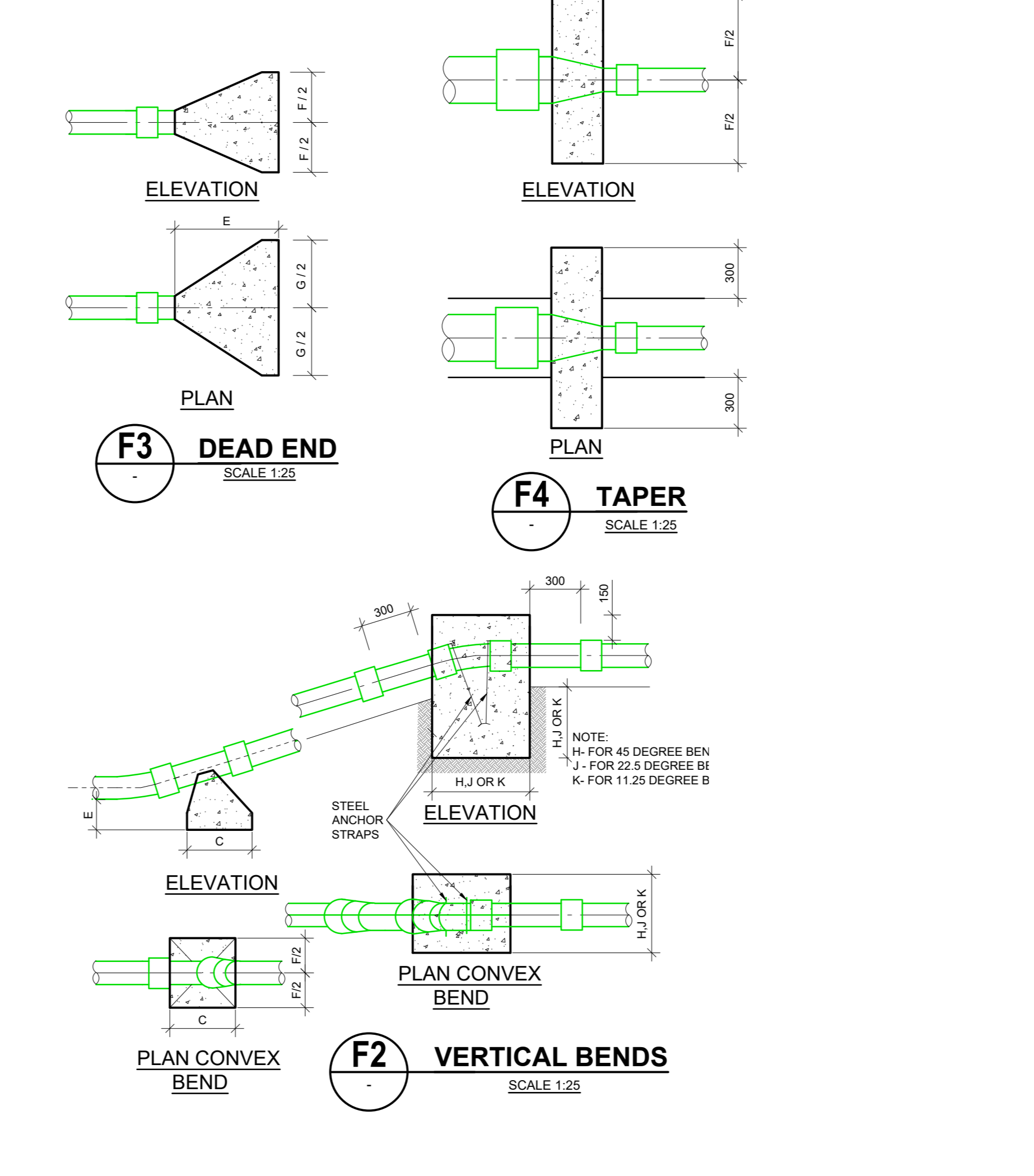
**THRUST BLOCK DIMENSIONS**

15 BAR TO 18 BAR TEST PRESSURE

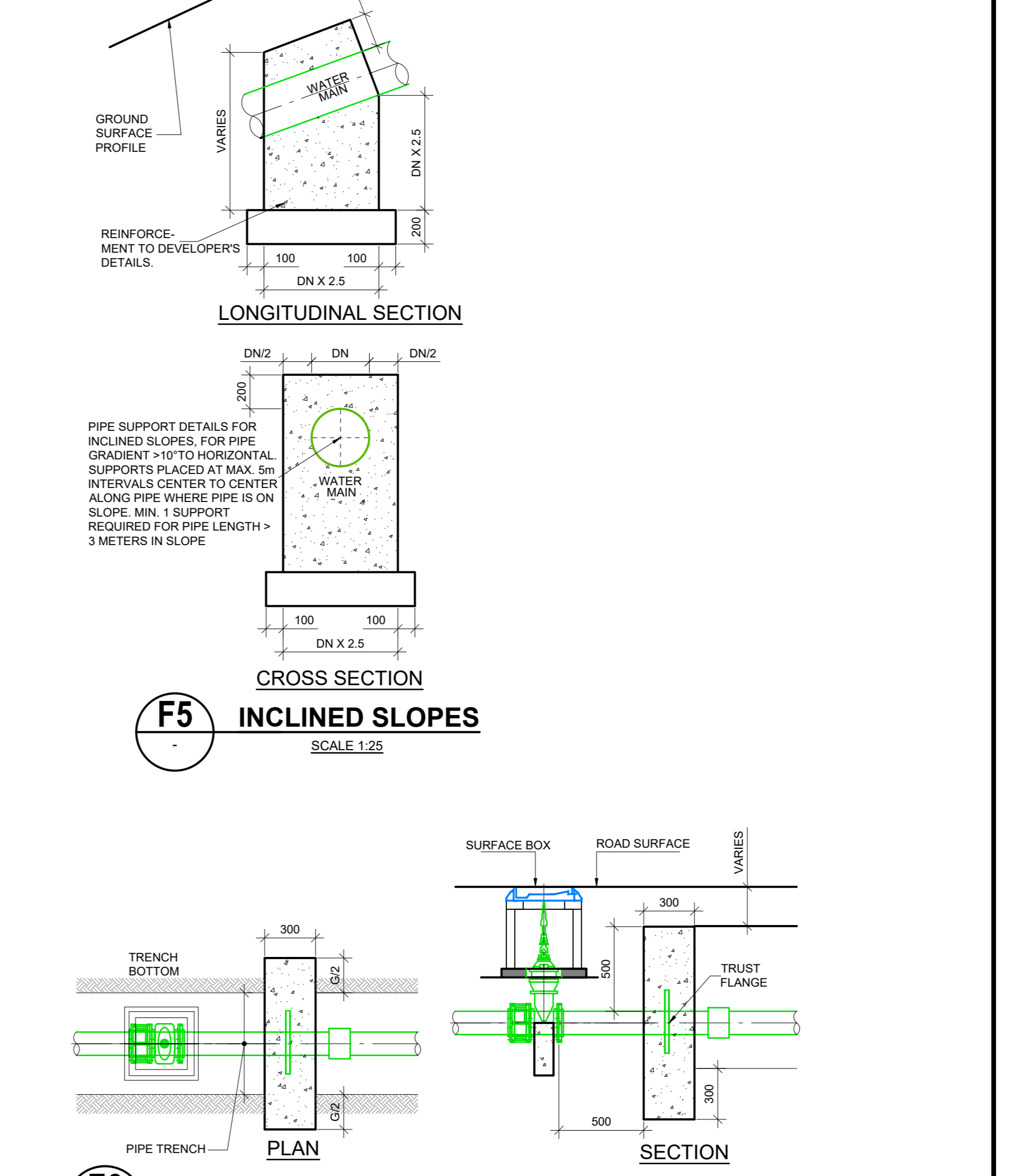
NOM. DIA. (mm)	DIMENSIONS										
	A	B	C	D	E	F	G	H	J	K	L
100	750	400	205	100	220	400	530	800	650	400	400
150	1250	700	350	150	250	500	800	1000	850	650	650
200	1650	850	450	200	300	700	1100	1250	1000	800	800
250	1900	1000	540	270	350	900	1370	1450	1150	900	900
300	2300	1200	640	330	500	1100	1630	1650	1300	1050	1050
350	2930	1580	850	410	750	1200	2070	1850	1500	1100	1100
400	3310	1900	970	190	1000	1300	2490	2000	1600	1200	1200
450	3810	2270	1160	590	1000	1350	2970	2150	1700	1300	1300
500	4340	2580	1270	610	1000	1480	3700	2250	1750	1400	1400
600	4970	3400	1760	800	1000	1550	4500	2450	2050	1600	1600



**F TYPICAL WATERMAINTHRUST AND SUPPORT BLOCK DETAILS**



**F TYPICAL WATERMAINTHRUST AND SUPPORT BLOCK DETAILS**



**D TYPICAL ON-LINE AIR VALVE DETAILS FOR A POLYETHYLENE (PE) PIPE**

**NOTES**

- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL ENGINEERS & ARCHITECTS DRAWINGS FIGURED CONNECTIONS ONLY (NOT SCALING) TO BE USED. WHERE A CONFLICT OF INFORMATION EXISTS OR IF IN ANY DOUBT - ASK.
- CONSULTANTS TO BE INFORMED IMMEDIATELY OF ANY DISCREPANCIES BEFORE WORK PROCEEDS.

PL2	0.06.2020	PLANNING ISSUE	AM
PL1	26.11.21	PLANNING ISSUE	MR
ISSUE	DATE	DESCRIPTION	BY
Project Engineer: BON		Project Director: MH	

**PLANNING**

**BM**

Dublin Office: 12 Mill Street, Dublin 2, Ireland. Tel: (01) 873 3500 Fax: (01) 873 3164  
 London Office: 12 Mill Street, London SE1 2AY, United Kingdom. Tel: (02044) 084 5413 2722

Consulting Engineers, Civil, Structural, Project Management & E-mail: bon@bm.ie Web: www.bm.ie

**ACEI**

**THE INSTITUTION OF STRUCTURAL ENGINEERS**

**CEMILL PROPERTY A TRI LTD.**

PROJECT TITLE: **SITE 10, NORTHERN CROSS, MALAHIDE RD., DUBLIN 17**

BM PROJECT No: **21.154**

DRAWING TITLE: **WATERMAIN DETAILS**

ISSUE	ISSUING REFERENCE	STATUS	REVISION
PL	BTNC-BMD-ZZ-ZZ-DR-C-1220	PL	2