

KSC STANDARD DRAWING SCHEDULE - WATER ASD 400 SERIES

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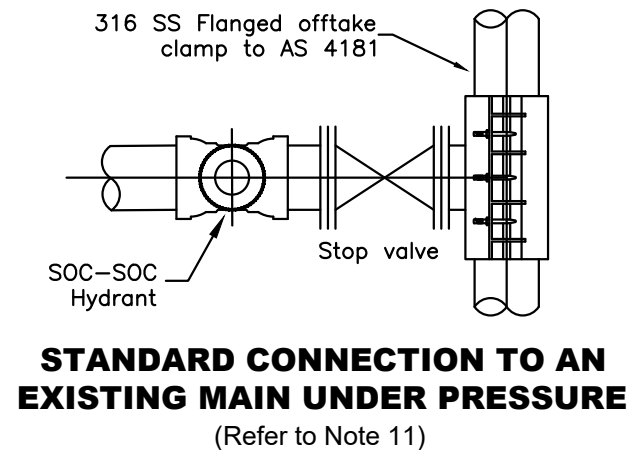
REVISION	DESCRIPTION	INITIAL	DATE
REV 3	ISSUED FOR USE FOLLOWING INDUSTRY FEEDBACK	RT	13/01/2025
REV 2	ISSUED FOR ADOPTION	RT	14/05/2024
REV 1	DRAFT		10/10/2023



KSC STANDARD DRAWING
WATER - ASD 400 SERIES
DRAWING SCHEDULE

NOT TO SCALE
BASED ON WSA 03 WATER CODE AND KSC REQUIREMENTS

ASD 400



ONLY DI FITTINGS
TO BE USED
WITH DI PIPE

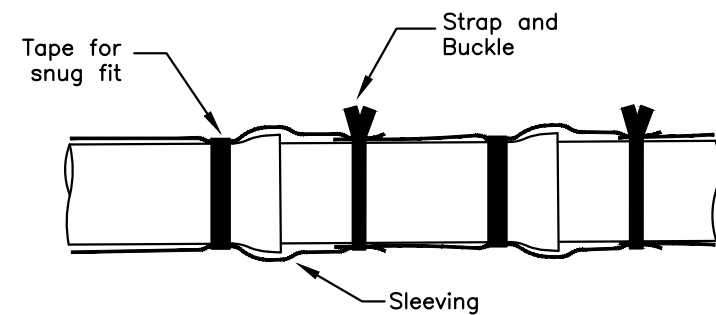
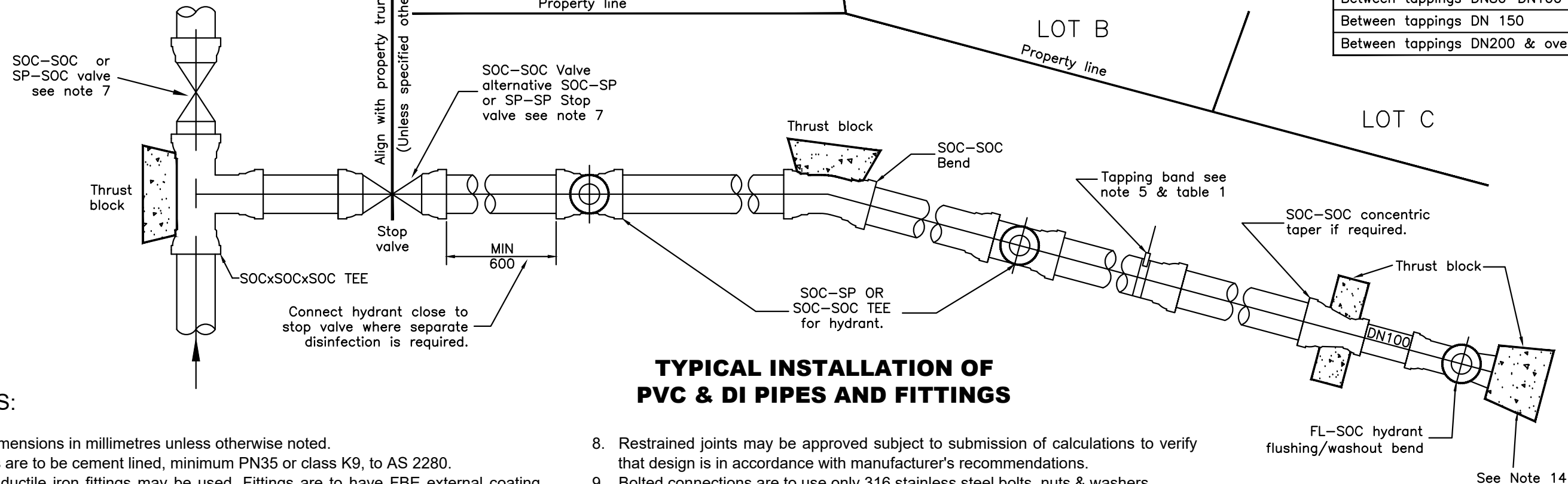


TABLE 1

DICL MIN. TAPPING SPACINGS	
From spigot end of pipe	600
Between tappings DN80–DN100	600
Between tappings DN 150	600
Between tappings DN200 & over	600

TABLE 2

PVC MIN. TAPPING SPACINGS	
From spigot end of pipe	600
Between tappings DN80–DN100	600
Between tappings DN 150	900
Between tappings DN200 & over	1200



NOTES:

1. All dimensions in millimetres unless otherwise noted.
2. Pipes are to be cement lined, minimum PN35 or class K9, to AS 2280.
3. Only ductile iron fittings may be used. Fittings are to have FBE external coating and be FBE lined.
4. PE sleeving is required on all bituminous coated ductile iron pipe in accordance with AS 3680 & AS 3681 extra thickness is required between fittings and thrust blocks. Damaged sleeving is to be reinstated in accordance with manufacturers specifications.
5. Full circle gunmetal tapping bands shall be used for property service connections to all existing and new mains. Direct tapping of mains is not permitted. Refer to ASD 450, ASD 451 & ASD 452.
6. Pipework is generally to be layed parallel to and 1.0 metre behind the kerb, or as shown on the plans.
7. Thrust blocks for valves and fittings are to be provided in accordance with ASD 433. In special circumstances, the use of lock-rings with "Tyton" sockets may be permitted by the Water & Sewer Planning Manager.

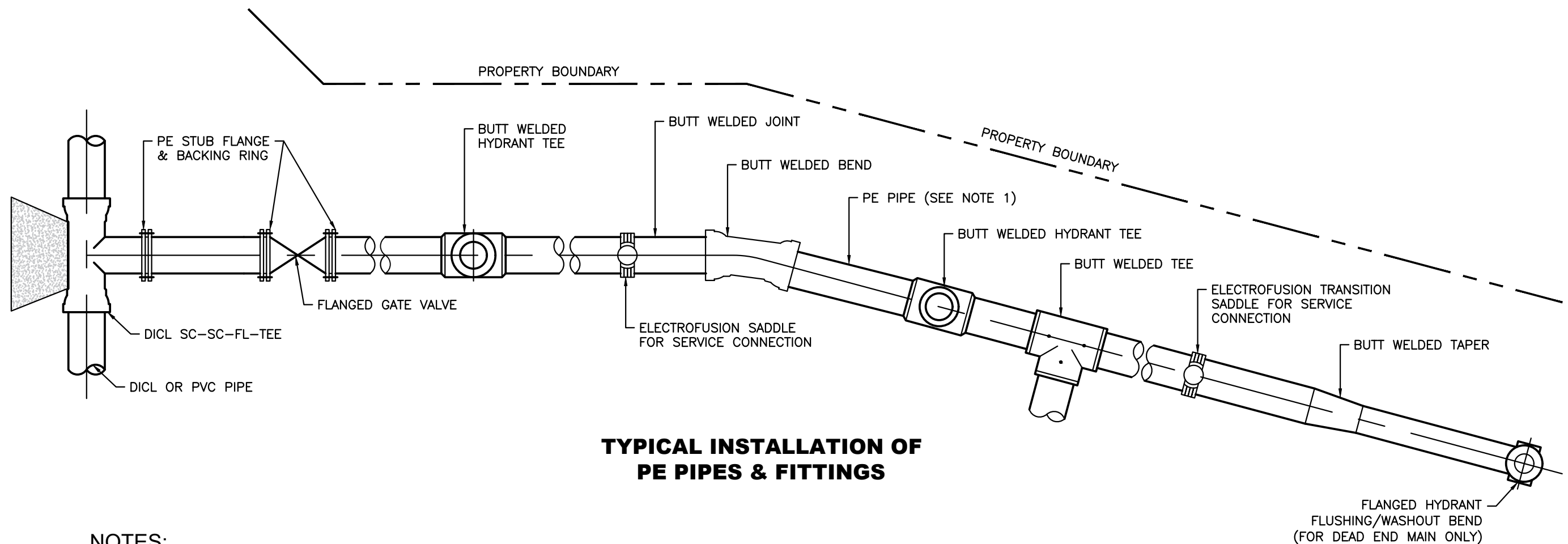
8. Restrained joints may be approved subject to submission of calculations to verify that design is in accordance with manufacturer's recommendations.
9. Bolted connections are to use only 316 stainless steel bolts, nuts & washers.
10. For pipe support and trench fill details refer to ASD 430 AND ASD 431. For hydrant details refer to ASD440, for stop valve details refer to ASD 441 and for various marking requirements, refer to ASD 460, ASD 461 and ASD 462.
11. Connections to existing mains must be supervised by KSC at the applicant's expense and will normally require shut down of the water supply. For Under Pressure Connections to an existing live water main, connections can only be carried out by KSC at the applicant's expense. The Contractor is to provide KSC with a proposed works program and construction methodology for all connections as outlined in KSC Supplement to WSAA 03 Water Supply Code CI 11.2(e).
12. PVC pipes are to be minimum PN16 to AS1477 series 2.
13. Maximum joint deflection as per Manufacturer's requirements for the specified pipe material to be clearly shown on design plans.
14. Minimise the use of dead-end mains wherever feasible during the design phase. Prioritize the incorporation of looped water mains to avoid the creation of dead-end mains.

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**KSC STANDARD DRAWING
MAINLAYING - PVC & DICL PIPES UP TO DN 600**
BASED ON WSA 03 WATER CODE AND KSC REQUIREMENTS
NOT TO SCALE

ASD 401



**TYPICAL INSTALLATION OF
PE PIPES & FITTINGS**

NOTES:

1. PE pipe may be cold bent to minimum radius of $25 \times (0d)$, stakes or other sources of point loads shall not be used to assist in bending the pipe.
2. Make allowance during construction for expansion and contraction of PE pipe due to temperature changes.
3. Butt welding in accordance with WSA-01 (polyethylene code). Butt welding in trenches is not permitted.
4. Concrete restraining blocks to be placed at start/end points and every 200m with the use of PE pipe or at the discretion of the Community Utilities Design & Development Manager. Location details to be provided on design plans for review (Refer to ASD 403).
5. The use of PE pipes for reticulation water mains must be approved by KSC prior to any commencement of work on site - preferably at the design stage. The pipe material for the connection between the PE and the existing main must be the same material. (eg. PE to DICL (existing main) use DICL for connection works, PE to PVC (existing main) use PVC for connection works).
6. Connections to existing mains by Contractors must be supervised by KSC at the applicant's expense and will normally require a shut down of the service. The Contractor is to provide KSC with a proposed works program and construction methodology as outlined in KSC Supplement to WSAA 03 Water Supply Code Clause 11.2 (e).
7. Prior to pressure testing, a foam pig or swab to be pushed through underbored sections of PE main to remove sediment collected during installation process. Refer to Clause 18.2 of WSAA 03-2022-3.1 Water Supply Code of Australia. Swabbing/Pigging to be witnessed by KSC Water and Sewer representative.
8. Electrofusion fittings are accepted for use for PE diameters up to DN250. A high rate of incomplete electrofusion welds have been experienced for larger diameter PE pipes due to ovality.

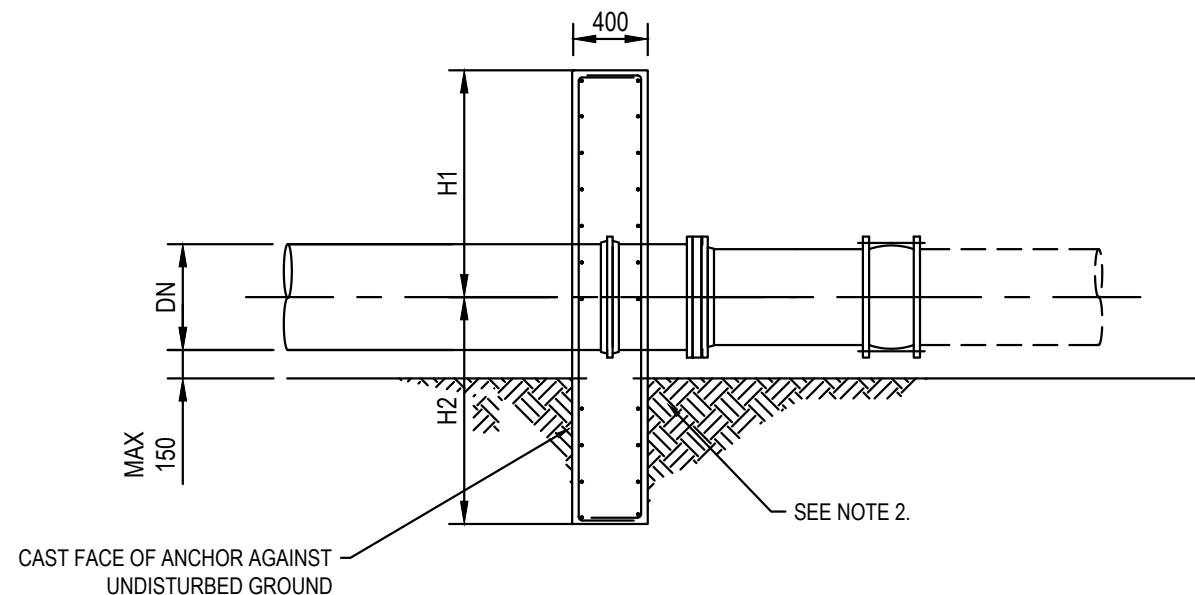
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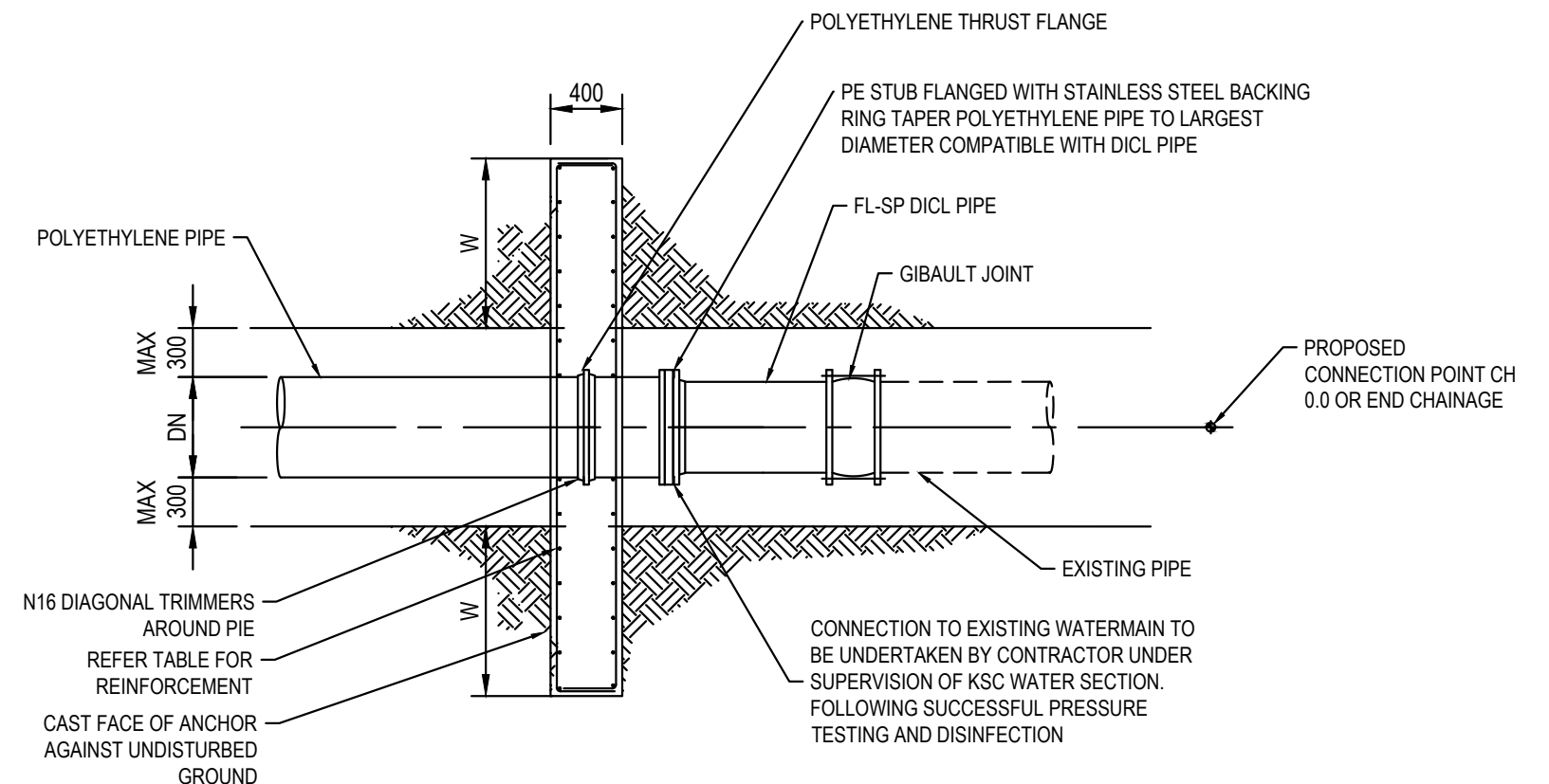
**KSC STANDARD DRAWING
MAINLAYING - PE PIPES**

BASED ON WSA 03 WATER CODE AND KSC REQUIREMENTS
NOT TO SCALE

ASD 402



**ELEVATION -
REINFORCED CONCRETE ANCHOR WALL AT END OF PE PIPELINE**



**PLAN -
REINFORCED CONCRETE ANCHOR WALL AT END OF PE PIPELINE**

RESTRAINT DETAIL NOTES:

1. Refer to ASD 433 for thrust block notes.
2. Level / grade of proposed connection point to be confirmed by contractor prior to commencement to ensure proposed main alignment matches existing main.
3. Flange joint to be protected with polyethylene wrap.
4. Thrust blocks designed for an allowable horizontal bearing pressure of 40kPa and a system test pressure of 1300kPa (130m).

ANCHOR DIMENSIONS					
PE PIPE DN	DICL PIPE DN	W (mm)	H1 (mm)	H2 (mm)	REINFORCEMENT
560	450	1000	1000	1100	N16-200 EW
500	375	1000	800	900	N16-200 EW
400	300	800	700	700	N12-200 EW
250	200	500	500	500	N12-200 EW
200	150	400	400	400	N12-200 EW
125	100	300	270	270	N12-200 EW

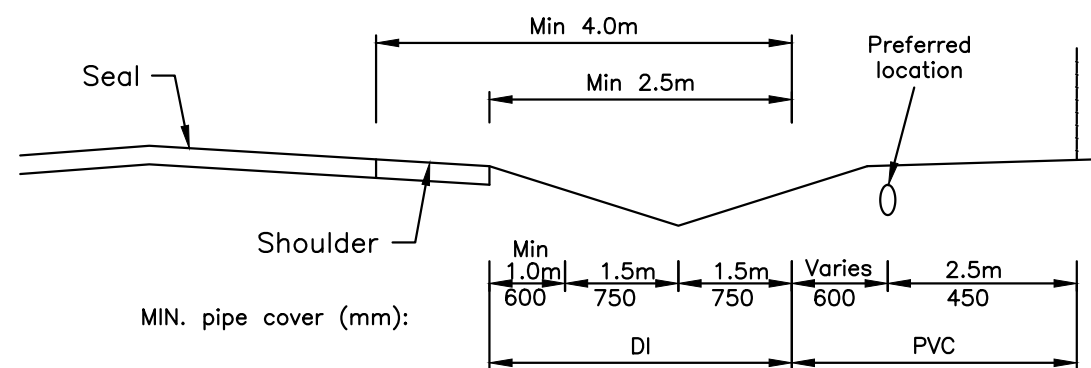
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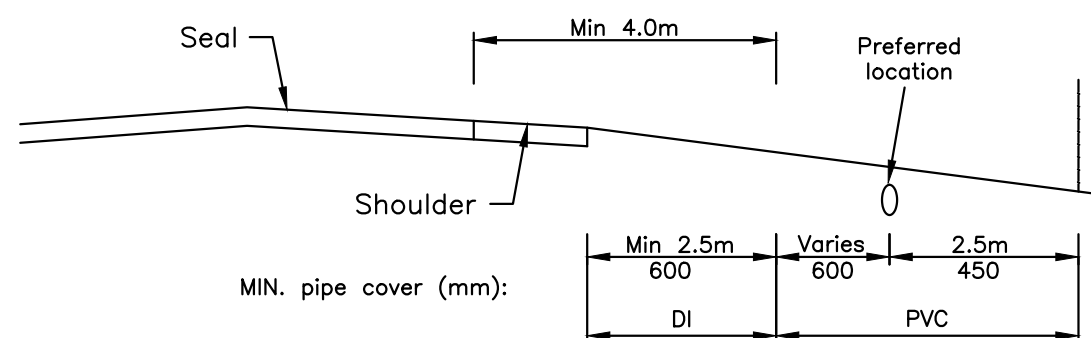
KSC STANDARD DRAWING PE PIPE RESTRAINT

BASED ON WSA 03 WATER CODE AND KSC REQUIREMENTS
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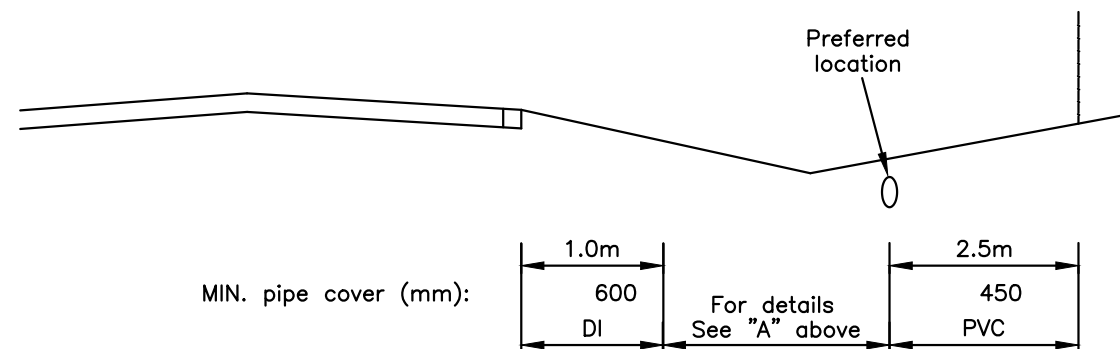
ASD 403



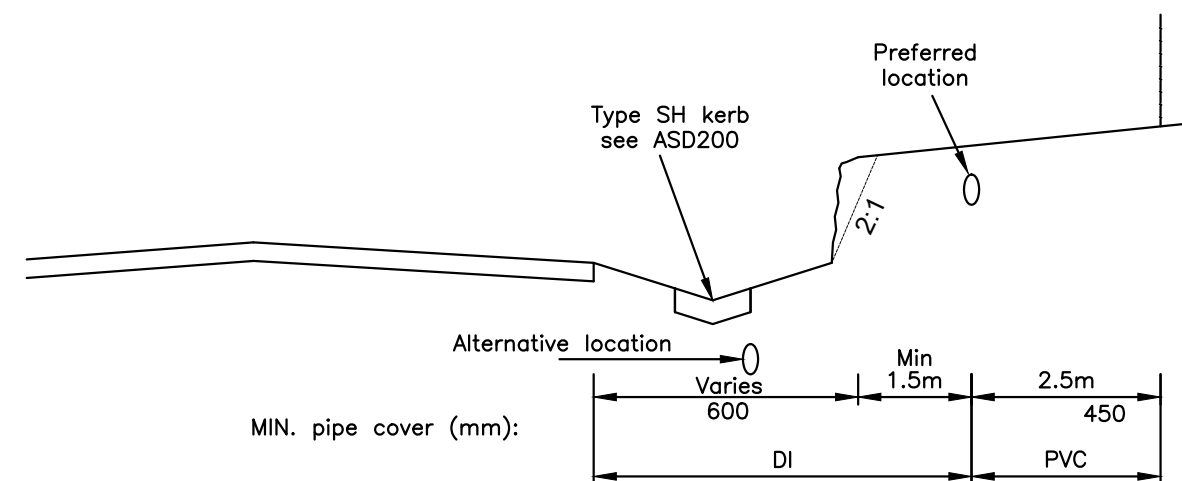
TYPE A - RURAL ROAD WITH TABLE DRAIN



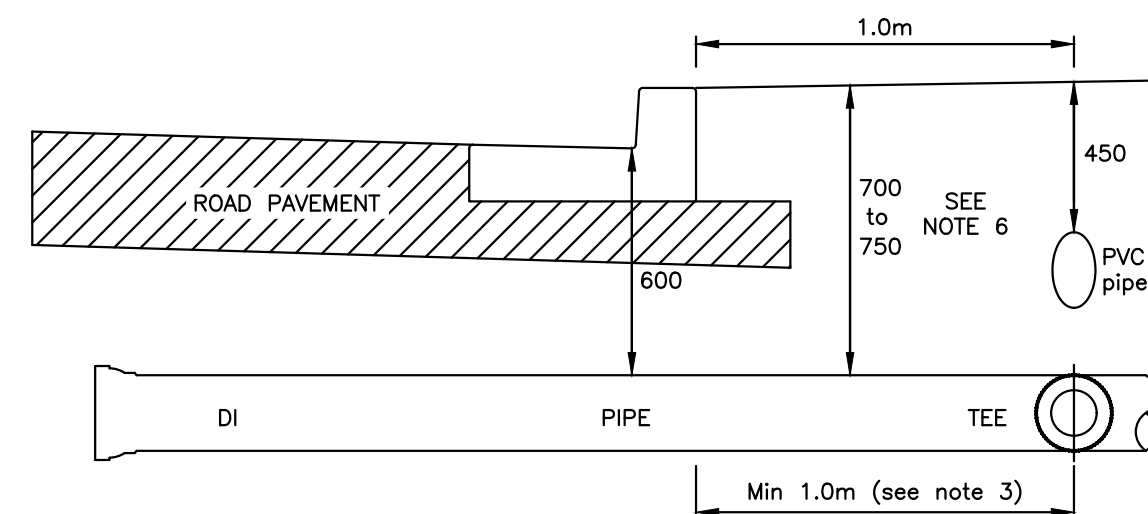
TYPE B - RURAL ROAD WITH NO TABLE DRAIN



TYPE C - RURAL RESIDENTIAL ROAD WITH EDGE STRIP



TYPE D - RURAL ROAD WITH EMBANKMENT



URBAN AND KERBED RURAL ROAD CROSSING AND FOOTPATH PIPE LOCATIONS

NOTES:

1. Approval from the Water & Sewer Planning Manager is required to exceed maximum cover depth of 1000mm to water main.
2. Preferred water main alignment is 2.5 metres from property boundary where there is no kerb.
3. Ductile iron pipe is to extend minimum 1.0m behind the kerb or to the next fitting.
4. Use the latest standard road pavement and shoulder widths for the particular road.
5. All dimensions are in millimetres unless otherwise noted.
6. Cover in footpath is to increase to 700-750mm to accommodate a road crossing.

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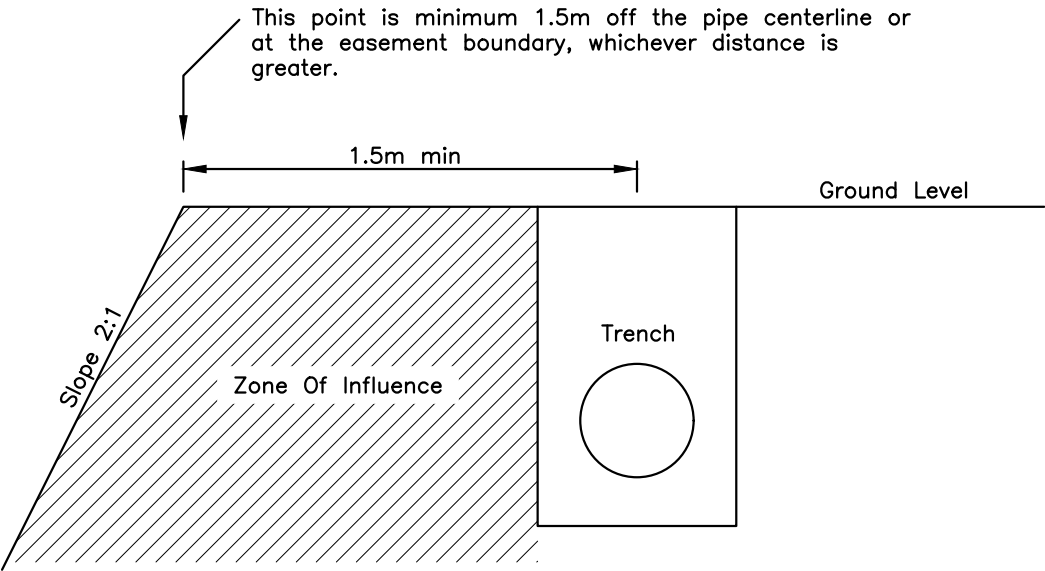
**KSC STANDARD DRAWING
LOCATION & COVER REQUIREMENTS
URBAN & RURAL ROADS**

NOT TO SCALE
BASED ON WSA 03 WATER CODE AND KSC REQUIREMENTS

ASD 405

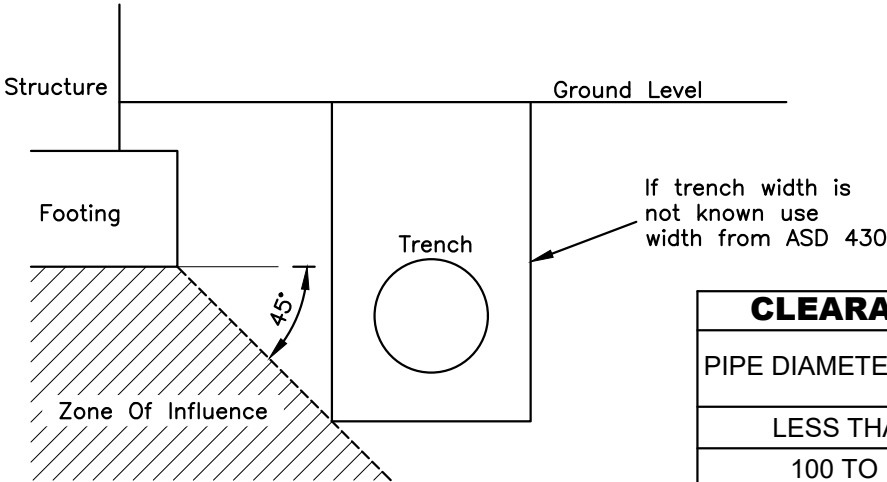
CLEARANCES FOR UNDERGROUND SERVICES

EXISTING UTILITY SERVICE	MINIMUM CLEARANCE (in millimetres)		
	HORIZONTAL		VERTICAL
	WATER MAIN/ RECYCLED WATER MAIN 100 to 300	WATER MAIN/ RECYCLED WATER MAIN 375 and greater	ALL SITUATIONS
Water mains/Recycled Water main DN 375 and greater	600	1000	150
Water mains/Recycled Water main DN 100 to 300	300 (c)	600	150
Gas mains	300 (c)	1000	150
Telecommunication conduits and cables	300 (c)	1000	150
Electricity conduits and cables	500	1000	150
Stormwater Drains	300 (c)	1000	150
Sewers Gravity	500/1000 (a)	500/1000 (a)	150 (d)
Kerbs and fence footings	300	450/600 (b)	-
Sewer - Pressure Mains	500	1000	150 (d)



EXCAVATION OR EMBANKMENTS NEAR WATER MAINS

- When the sewer is up to 500mm below the water main, maintain 1,000 mm horizontal clearance. When the sewer is more than 500mm below the main, maintain 500mm horizontal clearance.
- The larger the size, the greater clearance is required for operation and maintenance. Clearance from kerbs shall be measured from the nearest point of the kerb.
- Clearances can be further reduced to 150mm for distances up to 2 metres when passing installations such as poles, pits and small structures, providing the structure is not destabilized.
- Water mains should always cross over sewers. For cases where there is no alternative and the water main must cross under the sewer, construction shall be in accordance with ASD 422. Clearance to encasing should be 150 mm minimum.



CLEARANCE FROM STRUCTURES	
PIPE DIAMETER DN (mm)	MINIMUM CLEARANCE TO WALL OR BUILDING
LESS THAN 100	600
100 TO 150	1 000
200 TO 300	1 500
375 and greater	2 000

CLEARANCE FOR STRUCTURES

For water mains located close to existing structures such as foundations for buildings and retaining walls, the ongoing stability of the structure needs to be maintained. The location shall be clear of the "zone of influence" of the structure foundations to ensure the stability of the structure is maintained and that excessive loads are not imposed on the water main.

NOTES:

- The minimum clearance requirements from underground services are shown in the table above. Services should cross at 90 degrees if possible but not less than 45 degrees
- Clearances from other service utility assets should be maximized wherever possible
- Water mains constructed from metallic materials shall not be located within 30m (measured horizontally) of overhead electricity transmission towers or poles with voltage 66kV or higher
- Where possible watermains to be placed on the high side of the road.
- Individual water services to have clearances in line with AS3500 requirements.

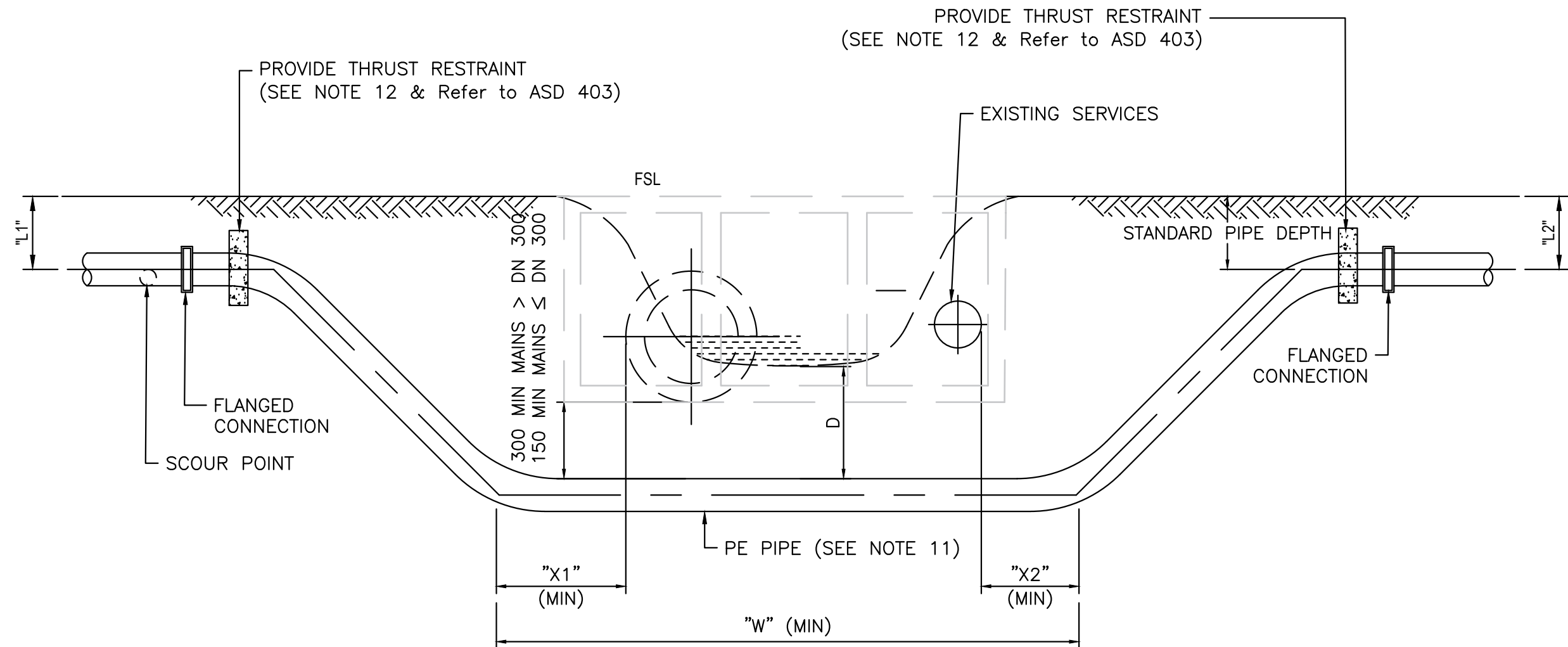
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KSC STANDARD DRAWING WATER MAIN CLEARANCE REQUIREMENTS URBAN AND RURAL ROADS

NOT TO SCALE
BASED ON WSA 03 WATER CODE AND KSC REQUIREMENTS

ASD 406



CREEK, STORM WATER PIPES, CULVERTS & BURIED SERVICES CROSSING WHERE PIPELINE ≤ DN 450

NOTES:

- Dimensions D, L1, L2, W, X1 and X2 shall be as shown on the design drawings.
- Where required, Scour Point shall be provided as detailed on the design drawings
- 450mm minimum cover (Dimension "D") shall apply for open cut excavation of minor streams. A 1000mm minimum cover (Dimension "D") is required for major stream crossings, where conditions such as dredging or navigation requirements might apply or where under-boring is being carried out. For such situations, the increased depth of cover shall be decided after consultation with Community Utilities and or the authority responsible for the waterway.
- Air relief and isolation valves to be installed where shown on design drawings.
- All dimensions are in millimetres unless otherwise noted.
- For crossing that where an enveloper pipe is required, material for the enveloper pipe may be any structurally suitable pipe material e.g PE, DICL, GRP, unlined MS.
- No joins permitted in the pipe section under the obstruction.
- Provide thrust restraints where PE pipework is connected to RRJ pipework.
- Where pipeline crosses under a service larger than 350mm dia, an Engineering certified bridging structure is to be constructed to ensure no additional loads are exerted on the pipeline.

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KSC STANDARD DRAWING UNDER CREEK CULVERT CROSSING TYPICAL ARRANGEMENT

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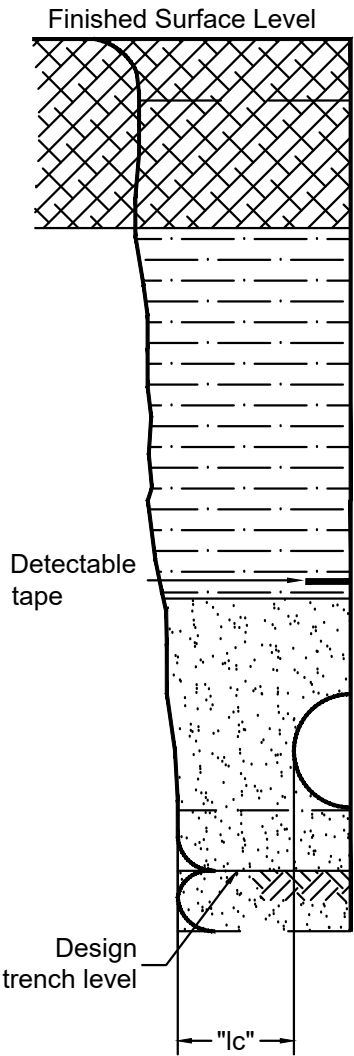
ASD 422

MATERIAL		ZONE	
UNDER ROAD	UNDER FOOTPATH		
ROAD SURFACE LAYER SEE NOTE 7	TO MATCH EXISTING SEE NOTE 9	SURFACE TREATMENT	
DGB 20 REFER TO NOTE 6		ROAD PAVEMENT	
TRENCH FILL NON-COHOESIVE GRANULAR FILL MATERIAL WITH MAXIMUM STONE SIZE OF 75mm. SEE NOTE 4		TRENCH FILL	
		TRENCH FILL INORGANIC FILL MATERIAL WITH MAXIMUM STONE SIZE OF 75mm. SEE NOTE 4	
SAND EMBEDMENT MATERIAL SEE NOTE 3 			

VEHICULAR LOADING

NOTES:

- All dimensions in millimetres
- Working platform, only where required, is to be made of 300mm depth of 40mm crushed rock wrapped in geotextile fabric. This will usually be required in cases of soft or expansive clay, loose natural soil, uncompacted fill or refuse, or trenches with groundwater problems
- Sand bedding, side support and overlay shall be non-cohesive granular quartz sand ("washed river sand")
 - salinity is to be <0.4 mS/cm (Hunter Water Corporation STS 101)
 - for particle size grading, refer to KSC WSAA Water Supplement CI16.2
 - under footpaths is to be compacted to 70% density index
 - under road pavements is to be compacted to 80% density index
- Trench fill - 150 mm Layers
 - under road pavements is to be compacted to 100% std.
 - under footpaths is to be compacted to 95% std.
 - under areas of non vehicular loading is to be compacted to 95% std
- Existing driveway finishes other than plain concrete require full replacement over footpath reserve width
- For surfaces other than road pavements the finishing is to either match the existing improved surface or be finished in a minimum of 150mm of topsoil if the surface is to be grassed.
- For pipe gradients steeper than 10%, provide trench stops in accordance with ASD 431.



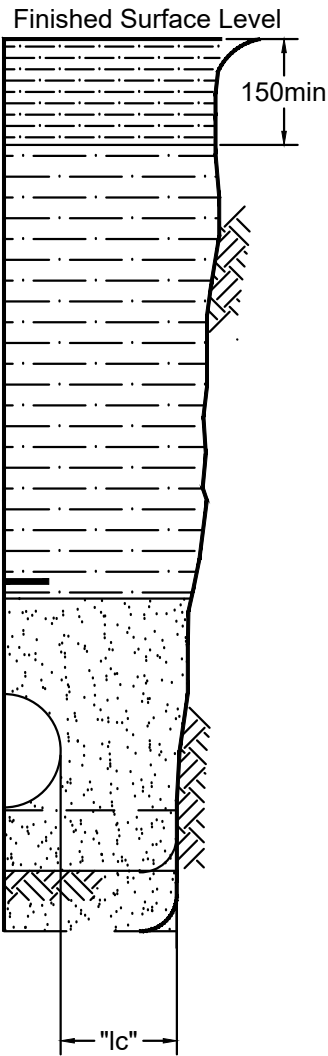
MINIMUM COVER TO AS/NZS 2566	
LOCATION	MINIMUM COVER * #
NON ROADWAYS – GENERAL – INDUSTRIAL/COMMERCIAL	450 600
SEALED ROADWAYS	600
MAJOR ROADWAYS/ EMBANKMENTS	750

* Valve spindle top shall be 150mm minimum to 450mm maximum below finished surface.

Specified by the designer on design drawings.

TRENCH WIDTH	
NOMINAL DIAMETER DN (mm)	MINIMUM TRENCH SIDE CLEARANCE "Ic" to AS/NZS 2566
UP TO 150	100
200-450	150
500-600	175

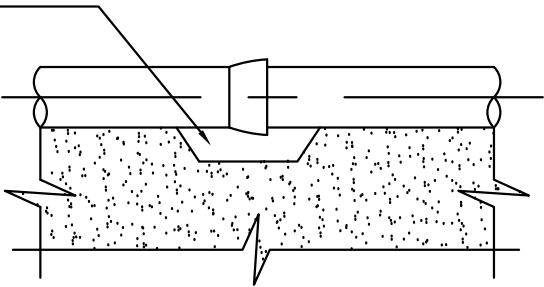
The trench width shall be the minimum necessary to adequately and safely lay the pipe and to compact the side support zone. Trench widths for pvc pipes 200 and over may be reduced by 50mm



ZONE		MATERIAL
TOPSOIL		ORIGINAL MATERIAL OR IMPORTED MATERIAL OF EQUAL QUALITY SEE NOTE 7
TRENCH FILL		INORGANIC FILL MATERIAL WITH MAXIMUM STONE SIZE OF 75mm. SEE NOTE 4
EMBEDMENT	OVERLAY	SAND EMBEDMENT MATERIAL SEE NOTE 3
	SIDE SUPPORT	NOTE: BEDDING MAY BE OMITTED IF TRENCH BASE IS GRANULAR SAND
	BEDDING	
WORKING PLATFORM		REFER TO NOTE 2

NO VEHICULAR LOADING

Provide pockets in bedding, at joints prior to laying pipes. Fill void during placement of embedment.



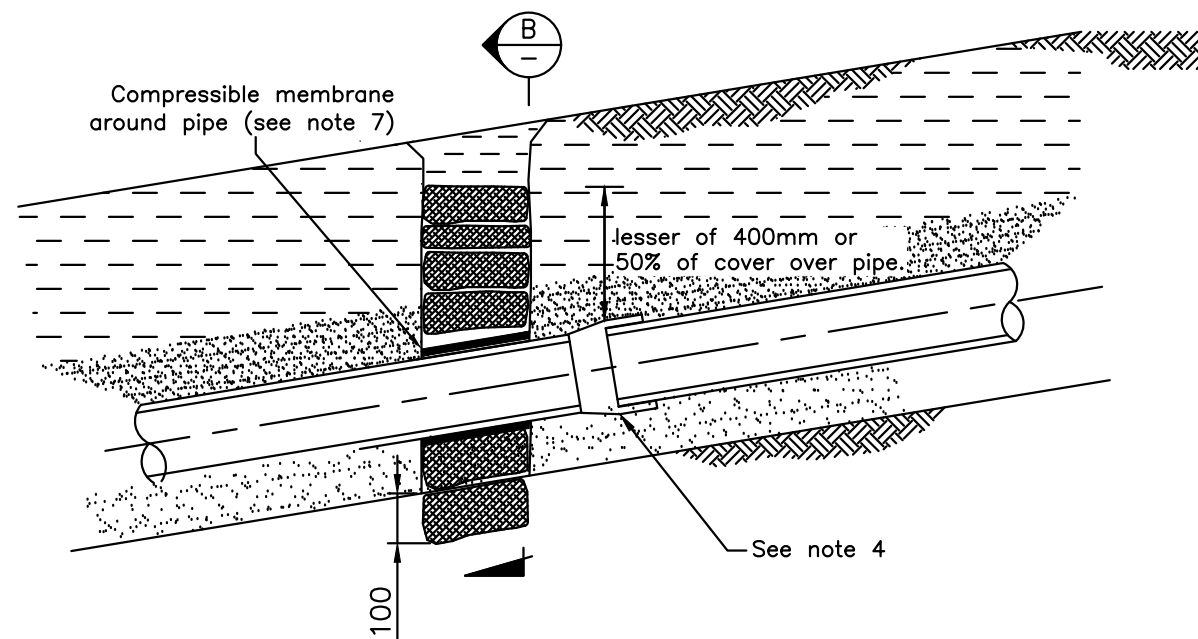
PIPE SOCKET BEDDING POCKETS

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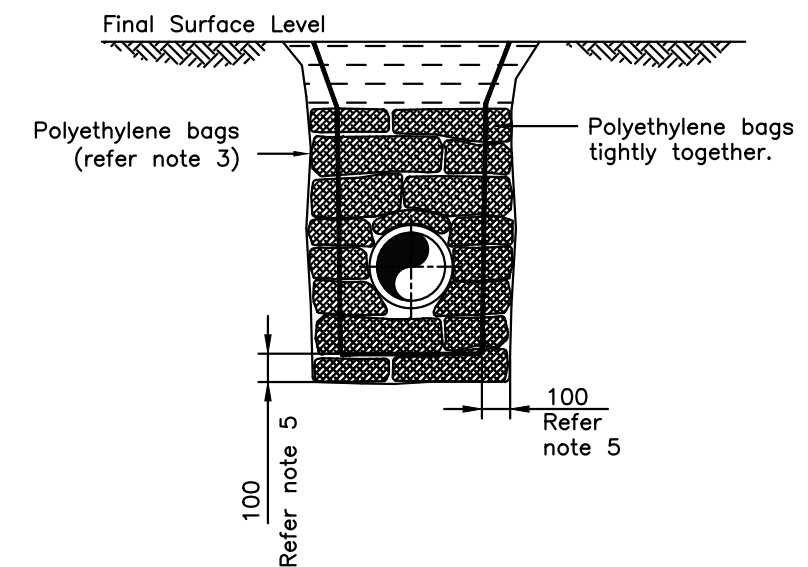


KSC STANDARD DRAWING
TRENCH BACKFILL
TYPICAL ARRANGEMENT

NOT TO SCALE
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TRENCH STOP



SECTION B
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NOTES:

1. All dimensions are in millimetres.
2. Trench stops required when grade of rising / gravity main is greater than 10% and less than 15%.
3. Woven Polyethylene bags of minimum thickness 0.25mm filled with sand or other approved material to be sealed to prevent leakage of contained material.
4. Trench stop to be located at socket side of pipe joint nearest to dimension calculated for spacing of trench stop.
5. A recess 100mm deep to suit the width of the bag shall be excavated into the bottom of the trench across its full width and into both sidewalls to a level at least 300mm above the top of the pipe.
6. Bags to be placed to provide close contact with the pipe and fill entire space between excavated recess and pipe. Bags not to be placed on sand bedding.
7. Compressible membrane around pipe to be min 3mm thick rubber.

CRITERIA FOR INSTALLATION OF TRENCH STOPS

SLOPE %	SPACING BETWEEN TRENCH STOPS.
10 – 15 %	SPACING (m) = $\frac{100}{\text{GRADE}(\%)}$

NOTE: For grades in excess of 15%, bulkhead installation required. (Refer to ASD 432)

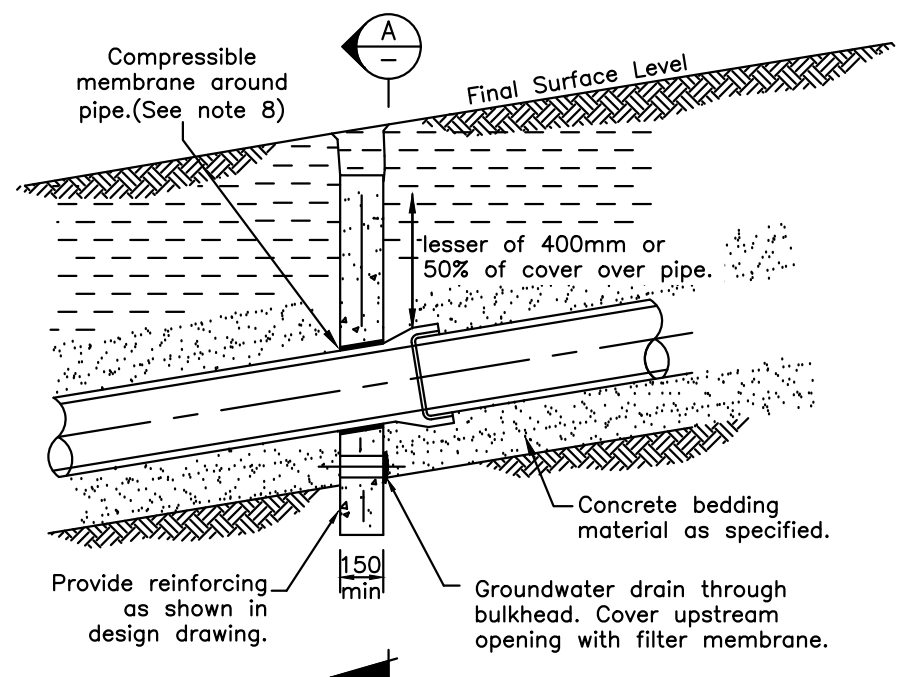
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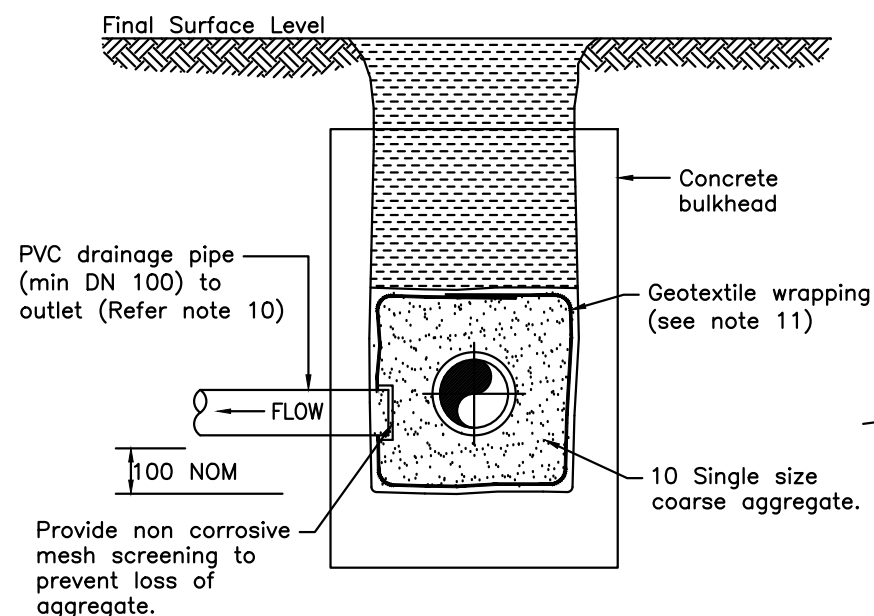
**KSC STANDARD DRAWING
TRENCH STOP INSTALLATION**

BASED ON WSA 03 WATER CODE AND KSC REQUIREMENTS
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ASD 431



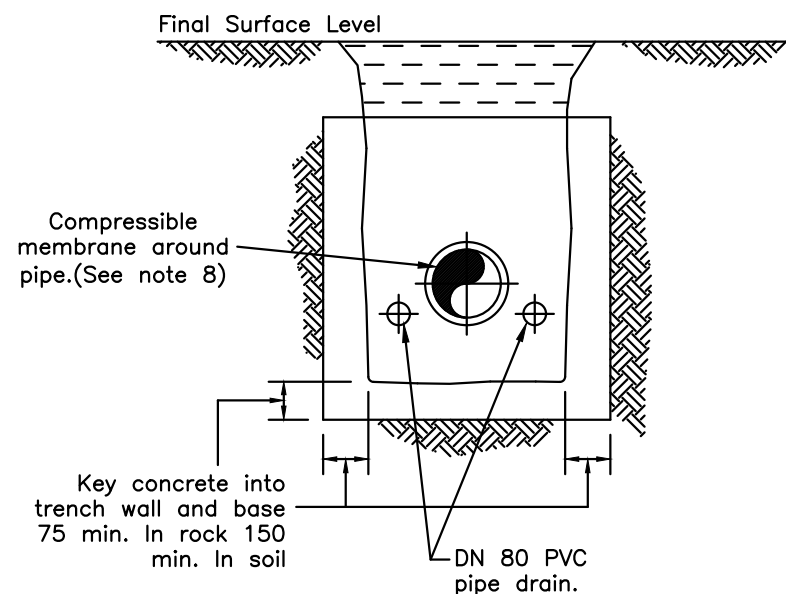
1 CONCRETE BULKHEAD DETAIL



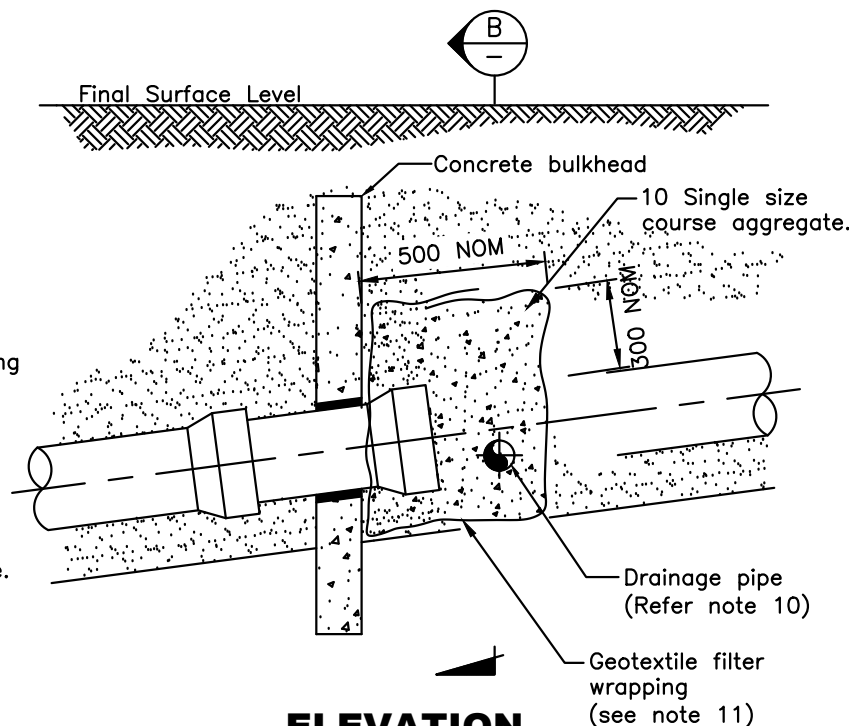
SECTION B

2 CONCRETE BULKHEAD DETAILS

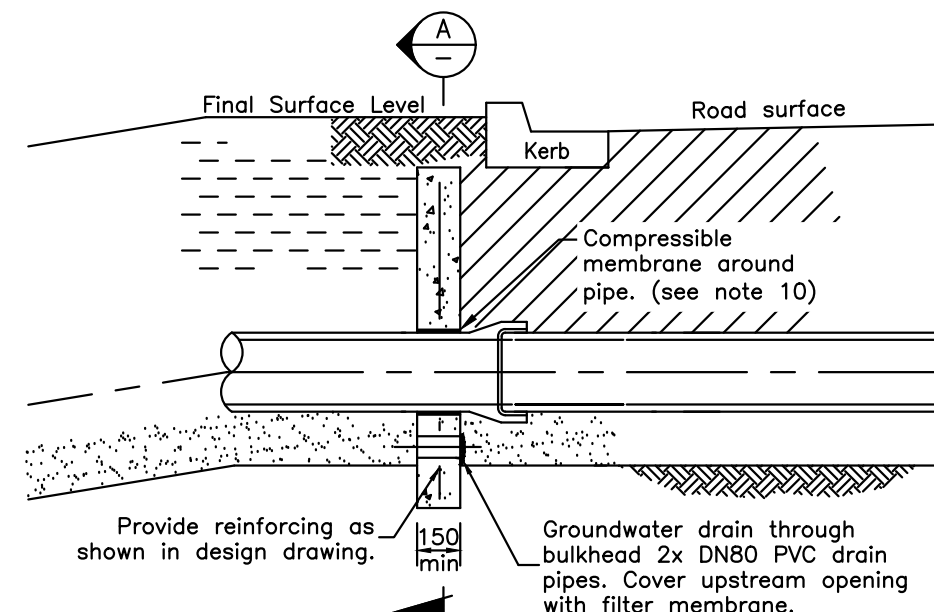
(Where discharge location is available)



SECTION A



ELEVATION



TYPICAL ROAD CROSSING BULKHEAD

NOTES:

- All dimensions are in millimetres
- Construct concrete bulkheads at locations specified in design drawings
- Construct bulkhead adjacent to kerb and gutter shoulder of sealed roads
- Key concrete bulkheads into sides and bottom of trench against a bearing surface of undisturbed soil
- Concrete to be class N25
- Do not deform pipes during placement of concrete
- Provide continuous drainage path
 - Through bulkheads
 - Around manholes
 - In trench excavations across roadways
- Trench drainage to be in accordance with ASD 515.
- Compressible membrane around pipe to be 10mm thick polystyrene for bulkheads adjacent to kerbs and 3mm min thick rubber for bulkheads on slopes
- Where pipe is concrete encased, joint to be wrapped with geotextile fabric to prevent damage to RRJ
- Drainage pipes to discharge into authorised water discharge areas as detailed in design drawings
- Lay geotextile filter fabric in trench to fully encapsulate the drainage material (coarse aggregate). Provide minimum 250mm lap at all filter fabric joints
- Concrete encasement to be provided with control crack at each joint

GRADE %	ADDITIONAL REQUIREMENTS
15-30% (1:6 - 1:35)	CONCRETE BULKHEADS $\text{SPACING (m)} = \frac{100}{\text{GRADE}(\%)}$ CONCRETE BEDDING (CONTINUOUS) REQUIRED
>30-50% (1:3.3 - 1:2)	CONCRETE ENCASEMENT (CONTINUOUS) AND CONCRETE BULKHEADS $\text{SPACING (m)} = \frac{100}{\text{GRADE}(\%)}$
> 50%	PROJECT SPECIFIC

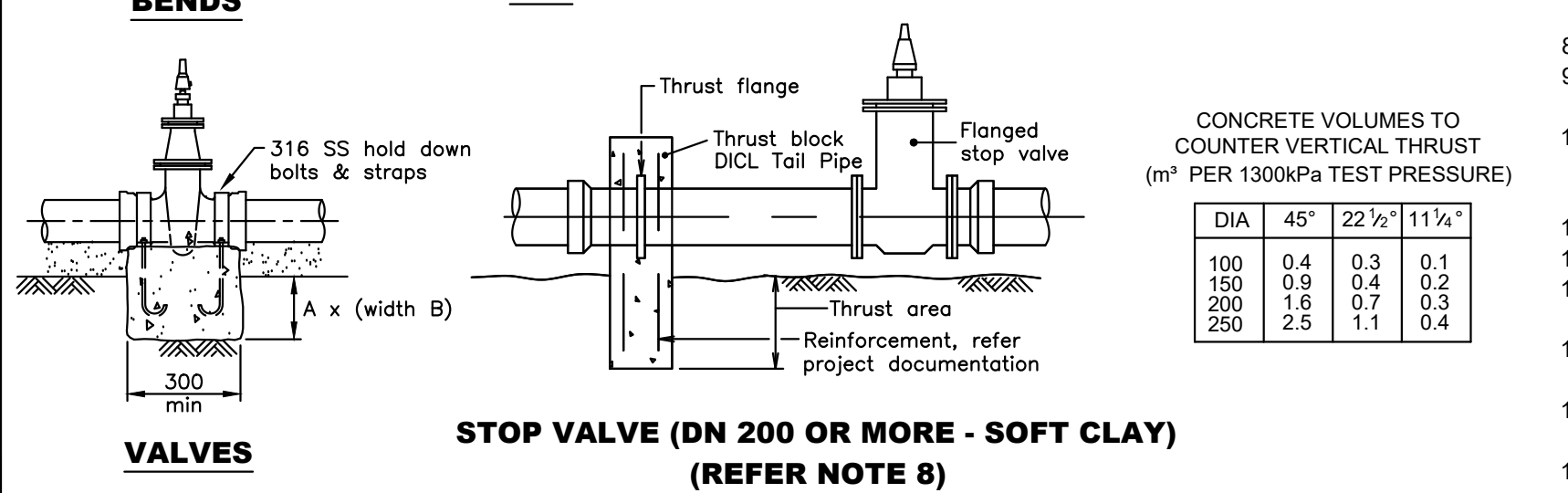
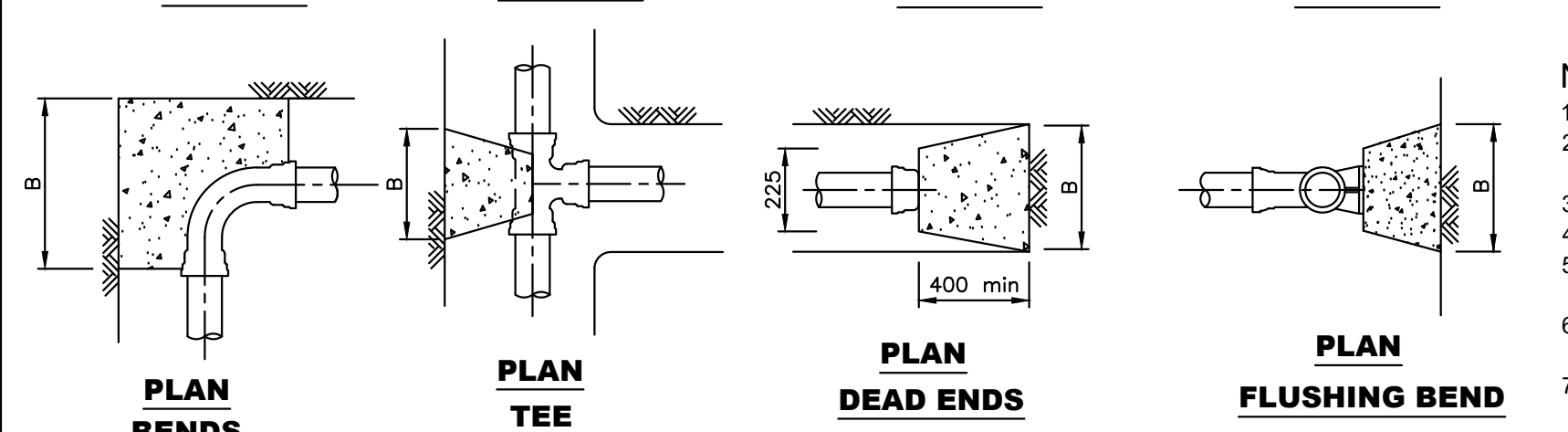
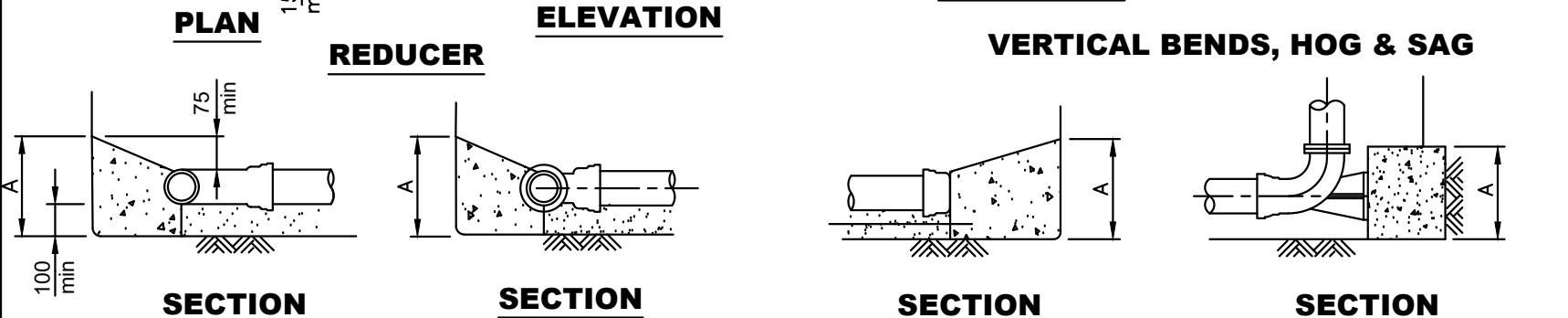
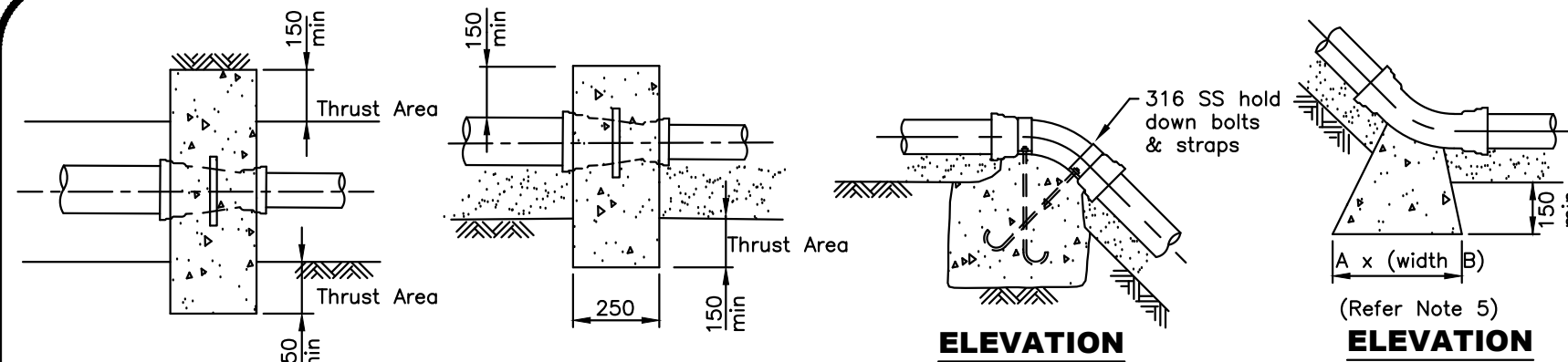
REVISION	DESCRIPTION	INITIAL	DATE
REV 3	ISSUED FOR USE FOLLOWING INDUSTRY FEEDBACK	RT	13/01/2025
REV 2	ISSUED FOR ADOPTION	RT	14/05/2024
REV 1	DRAFT		10/10/2023



KSC STANDARD DRAWING CONCRETE BULKHEAD INSTALLATION

BASED ON WSA 03 WATER CODE AND KSC REQUIREMENTS
NOT TO SCALE

ASD 432



CONCRETE VOLUMES TO COUNTER VERTICAL THRUST (m³ PER 1300kPa TEST PRESSURE)

DIA	45°	22 1/2°	11 1/4°
100	0.4	0.3	0.1
150	0.9	0.4	0.2
200	1.6	0.7	0.3
250	2.5	1.1	0.4

ALLOWABLE HORIZONTAL BEARING PRESSURE OF GROUND.
DIAMETER OF FITTING
FOR HORIZONTAL THRUST ON TRENCH WALLS WHERE THE COVER OVER PIPES IS 450 OR GREATER

MINIMUM THRUST AREA (A x B) IN SQUARE METRES WITH DESIGN PRESSURE 1300 kPa (NOM. 130 m HEAD)

		90° & 60° HORIZONTAL BENDS			45° & 30° HORIZONTAL BENDS			22 1/2° HORIZONTAL BENDS			11 1/4° HORIZONTAL BENDS			TEES AND DEAD ENDS		
		STIFF CLAY MEDIUM-DENSE CLEAN SAND		HARD CLAY SOUND ROCK	STIFF CLAY MEDIUM-DENSE CLEAN SAND		HARD CLAY SOUND ROCK	STIFF CLAY MEDIUM-DENSE CLEAN SAND		HARD CLAY SOUND ROCK	STIFF CLAY MEDIUM-DENSE CLEAN SAND		HARD CLAY SOUND ROCK	STIFF CLAY MEDIUM-DENSE CLEAN SAND		HARD CLAY SOUND ROCK
		50 kPa	100 kPa	200 kPa	50 kPa	100 kPa	200 kPa	50 kPa	100 kPa	200 kPa	50 kPa	100 kPa	200 kPa	50 kPa	100 kPa	200 kPa
100	0.44	0.22	0.11	0.23	0.12	N	0.13	N	N	N	N	N	0.31	0.16	N	
150	0.91	0.46	0.23	0.49	0.25	0.12	0.26	0.13	N	0.13	N	N	0.65	0.33	0.16	
200	1.56	0.78	0.39	0.83	0.42	0.21	0.44	0.22	0.11	0.21	0.10	N	1.09	0.55	0.27	
250	2.37	1.18	0.59	1.27	0.64	0.32	0.65	0.33	0.16	0.34	0.17	N	1.66	0.83	0.42	
300	3.46	1.73	0.86	1.87	0.94	0.47	0.96	0.48	0.24	0.47	0.23	0.12	2.44	1.22	0.61	
375	5.25	2.63	1.31	2.83	1.42	0.71	1.46	0.73	0.36	0.73	0.36	0.18	3.72	1.86	0.93	
450	7.44	3.72	1.86	4.03	2.02	1.01	2.05	1.03	0.51	1.04	0.52	0.26	5.25	2.63	1.31	
500	9.07	4.54	2.27	4.91	2.46	1.23	2.50	1.25	0.62	1.25	0.62	0.31	6.42	3.21	1.61	
600	12.84	6.42	3.21	6.94	3.47	1.74	3.54	1.77	0.88	1.77	0.88	0.44	9.10	4.55	2.28	
750	19.71	9.85	4.93	10.66	5.33	2.67	5.43	2.72	1.36	2.73	1.37	0.68	13.94	6.97	3.48	

'N' DENOTES NOMINAL THRUST AREA - (SEE NOTE 11)

NOTES:

- All dimensions are in millimetres
- All fittings are to be ductile iron with FBE lining and external coating. Two layers of polyethylene sleeving are to be provided between the fitting and the thrust block concrete
- Concrete for thrust blocks to be N20 in accordance with AS3179 & AS3600 & poured against undisturbed soil
- Reducers to have a minimum thrust area equal to the difference in thrust area for corresponding dead ends
- For vertical bends in sag, the safe bearing loads of the various soils may be taken as twice those for horizontal thrust
- Thrust blocks are required for valves > DN 200 and all valves in soft clay thrust area shall be equal to that for a dead end
- Hold down bolts to be M12 stainless steel, minimum embedment length 300 plus 75 hook and 50 x 50 x 6 washer. Straps to be 40 x 6 stainless steel flat bar bent to suit. 3mm x 100mm wide insertion rubber is to be used between the pipe and other materials.
- Thrust block for materials with safe bearing load < 25 kPa are to be detailed with engineering design
- Nominal thrust area 'N' shall be effected by class N20 concrete over full length of fitting and extending in depth from the bottom of the trench at least 100mm above the top of the fitting
- Tabulated 'minimum thrust area' applies for test pressure of 1300kPa. Area shall be adjusted prorata for other specified test pressures except that nominal thrust areas 'N' shall be calculated for test pressures over 1300 kPa and thrust areas shall be not less than 'N'
- Shape & dimensions of concrete blocks shown are diagrammatic only
- When placing concrete maximum encasement shall be 180 degrees
- When placing a uPVC pipe in concrete a membrane of polythene, PVC or felt shall surround the pipe and fitting to permit movement in that concrete
- Thrust blocks are to be adequately cured before pressure testing (normally 7 days) as per Appendix M AS2566.2 Buried Flexible Pipelines
- Designers are to consider constructability/space-proofing for thrust blocks to ensure that thrust blocks do not conflict with adjacent services and site constraints
- Where combined thrust blocks are required for multiple mains running in parallel (e.g potable and recycled water), the combined thrust block shall be designed for all design force combinations and detailed on the design plans.

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REV 1	DRAFT		10/10/2023



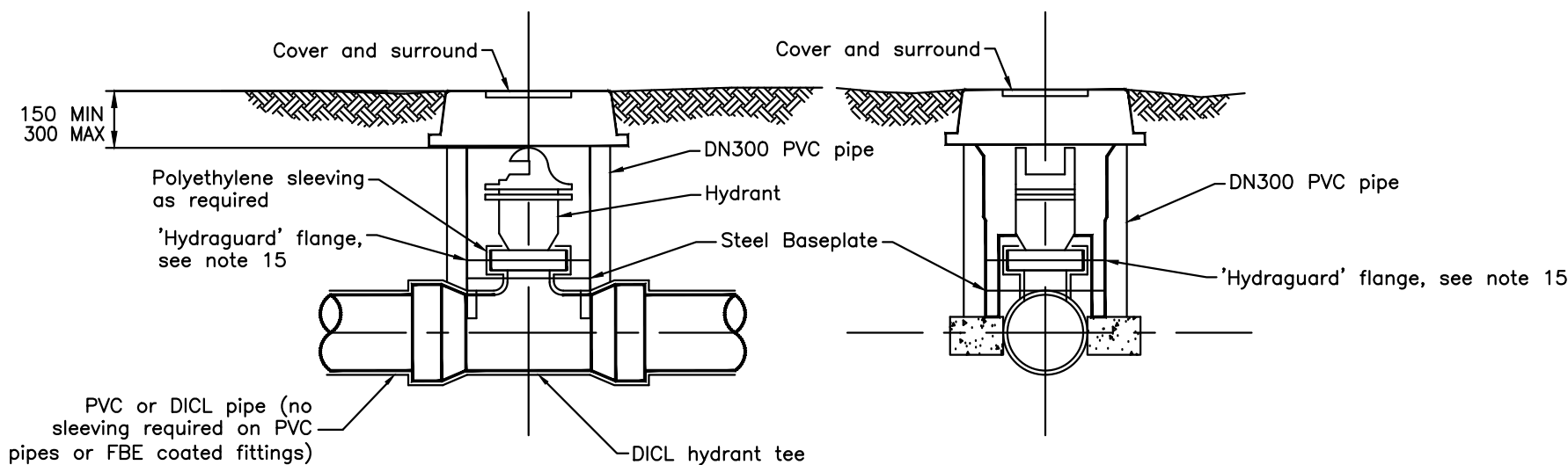
KSC STANDARD DRAWING WATER MAIN THRUST BLOCK DETAILS

BASED ON WSA 03 WATER CODE AND KSC REQUIREMENTS
NOT TO SCALE

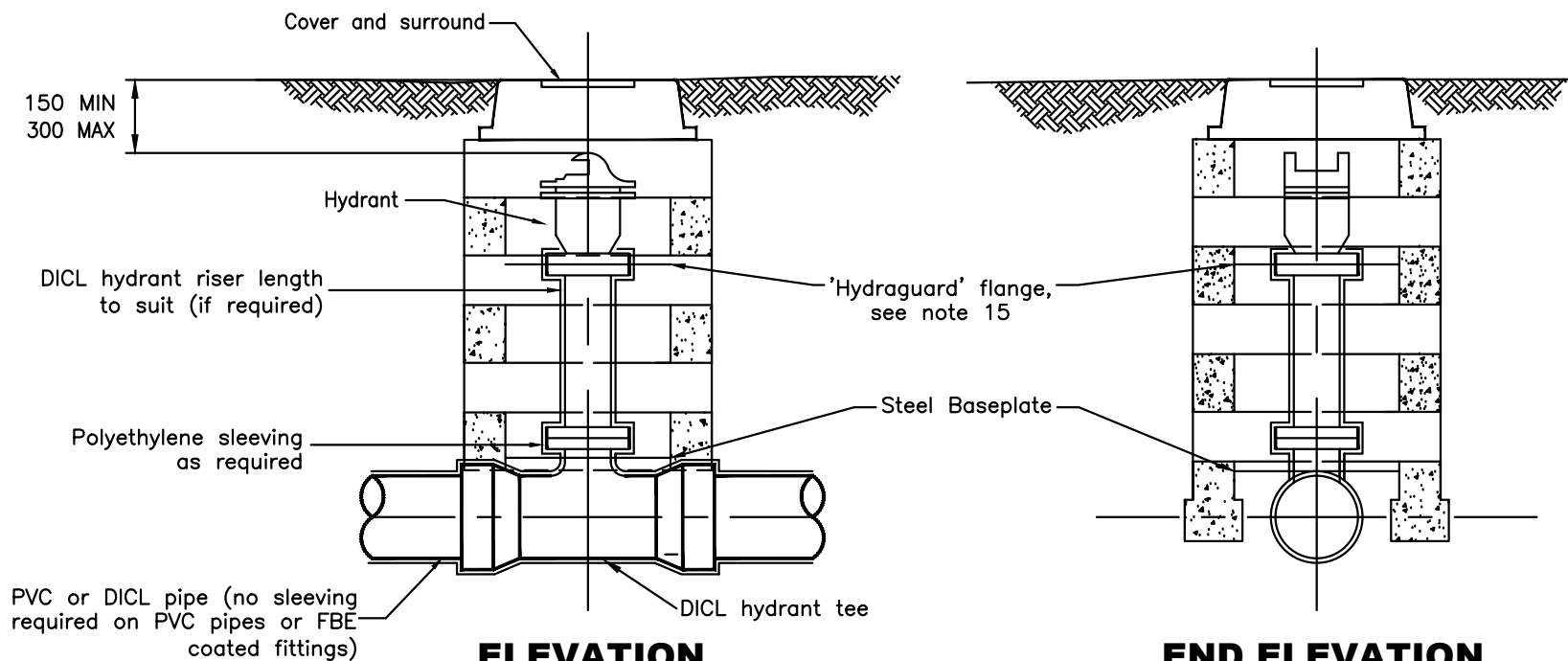
ASD 433

NOTES:

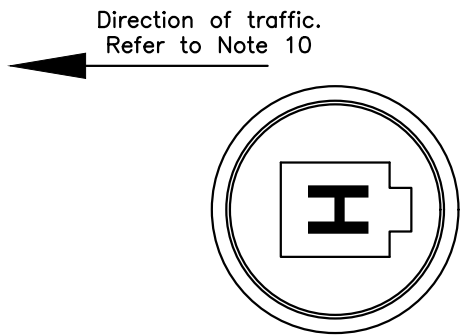
1. All dimensions are in millimetres
2. Hydrants are to be located in the centre third of allotment frontages if not at an intersection. Hydrant spacing in urban areas is not to exceed 60m. Hydrants are to be provided at all high and low points in the reticulation
3. Care is to be taken in locating hydrants with respect to stop valves and future main extensions for disinfection purposes
4. Hydrant riser length is to be selected to ensure correct location of hydrant
5. Only DN 80 hydrants and risers to be used
6. Hydrant fittings are to be manufactured to AS3952 with approved thermal bonded coating to AS4158.
7. Hydrant covers and chambers shall be:
 - For hydrants on recycled water mains a lilac cover and spring hydrant is to be used
 - For hydrants in road pavements, cast iron hydrant cover in yellow concrete surrounds
 - For hydrants in footpath area, cover to be part No. 57719 cadia or equivalent
 - For recycled water hydrants in footpath area, cover to be part No. 44652 from cadia or equivalent
 - Chambers to be 300mm dia PVC pipe cut to suit required height
8. Cover opening is to be centred over the hydrant outlet
9. Cover and surround is to be set to match finished level or slope of road or footpath
10. Cover orientation is to indicate main direction except when located in road pavements where it is to line up with traffic flow
11. Solid concrete blocks used to support chambers shall be bedded to ensure that no direct loading is applied to the hydrant or pipe
12. Polyethylene sleeving (where required) is to extend into the cover chamber and be sealed off using an approved strapping system
13. Bolted connections are to use only stainless steel bolts
14. Any watermain fittings (hydrants, stop valves, etc) shall be moved clear of driveways if required at no cost to Council.
15. 'Hydraguard' Flange or equivalent to be affixed using supplied M16 bolts, 75mm long.



ELEVATION **END ELEVATION**
HYDRANT - FOOTPATH AREA



ELEVATION **END ELEVATION**
HYDRANT - ROAD PAVEMENT



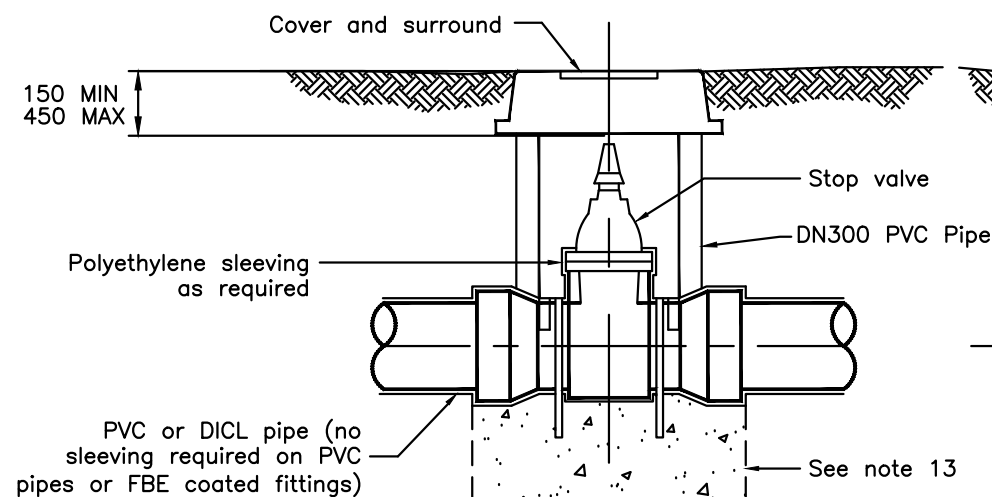
REVISION	DESCRIPTION	INITIAL	DATE
REV 3	ISSUED FOR USE FOLLOWING INDUSTRY FEEDBACK	RT	13/01/2025
REV 2	ISSUED FOR ADOPTION	RT	14/05/2024
REV 1	DRAFT		10/10/2023



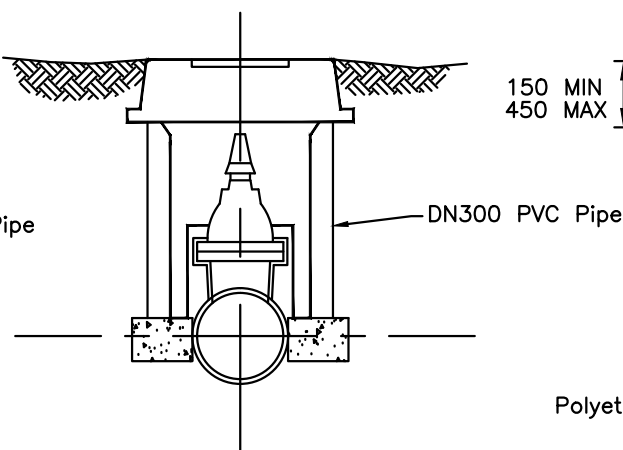
KSC STANDARD DRAWING
HYDRANTS - TYPICAL INSTALLATION

BASED ON WSA 03 WATER CODE AND KSC REQUIREMENTS
NOT TO SCALE

ASD 440



ELEVATION

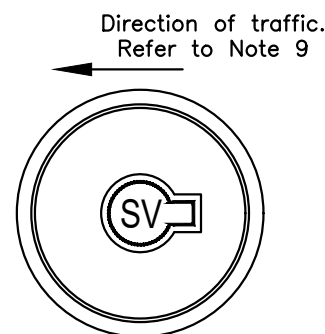


END ELEVATION

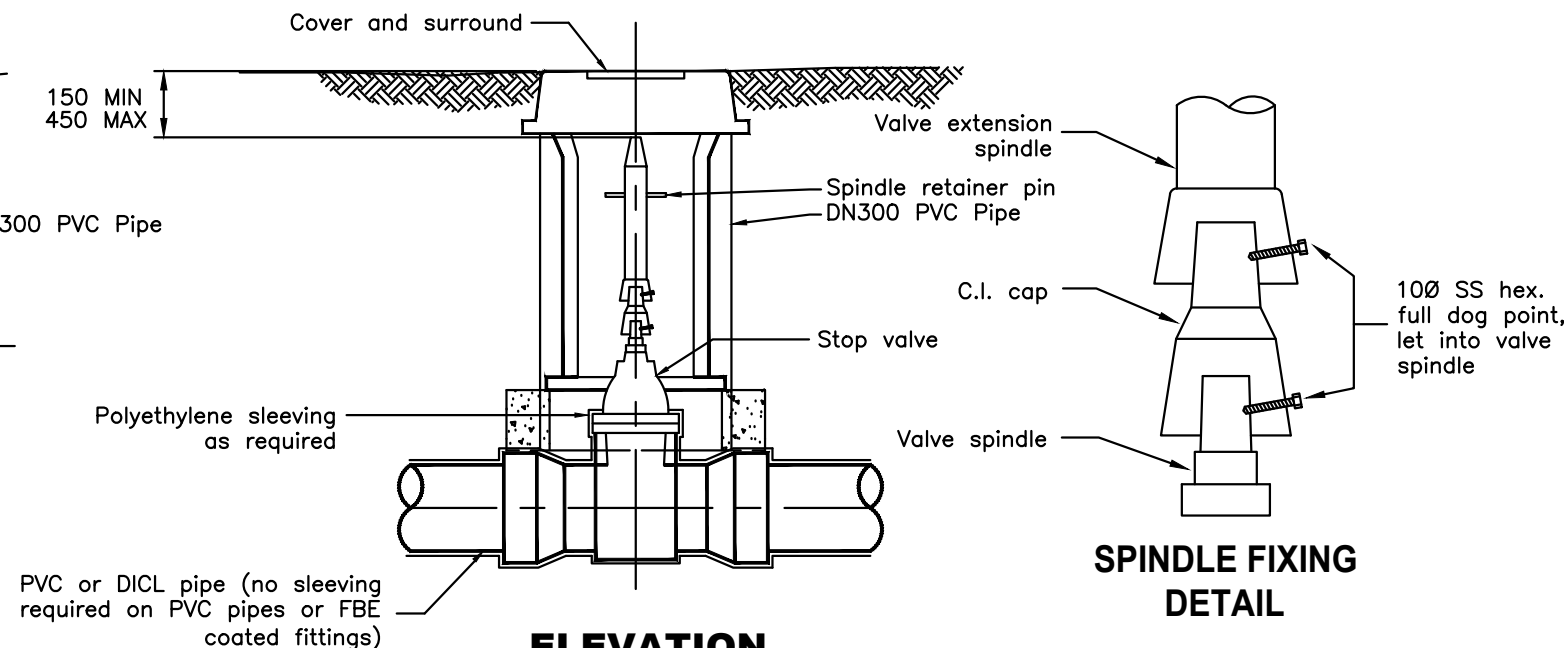
STOP VALVE - FOOTPATH AREA

NOTES:

1. All dimensions are in millimetres.
2. Stop valves are to be located in the centre third of allotment frontages if not at an intersection. Location is to allow isolation of 20 to 40 dwellings.
3. Care is to be taken in locating stop valves with respect to hydrants and future main extensions for disinfection purposes.
4. Stop valves are to be manufactured to AS2638 with approved thermal bonded coating to AS4158.
5. Stop valves are to have resilient seating and be clockwise closing.
6. Stop valves covers and chambers shall be:
 - For stop valves in road pavements, cast iron stopvalve cover in white concrete surrounds
 - For stop valves normally closed, a red cover is to be used
 - For stop valves on recycled water mains a lilac cover is to be used
 - For stop valves on footpath area, cover to be part No. 59366 from cadia or equivalent
 - For recycled water stop valves in footpath area, cover to be part No. 44622 from cadia or equivalent
 - Chambers to be 300mm dia PVC pipe cut to suit required height
7. Cover opening is to be centred over the stop valve spindle.
8. Cover and surround is to be set to match finished level or slope of road or footpath.
9. Cover orientation is to indicate main direction except when located in road pavements where it is to line up with traffic flow.
10. Solid concrete blocks used to support chambers shall be bedded to ensure that no direct loading is applied to the hydrant or pipe.
11. Polyethylene sleeving (where required) is to extend into the cover chamber and be sealed off using an approved strapping system.
12. Bolted connections are to use only stainless steel bolts.
13. Provide concrete support with hold-down straps for stop valves greater than 200mm diameter, in accordance with standard drawing ASD 433.
14. Any watermain fittings (hydrants, stop valves, etc) shall be moved clear of driveways if required at no cost to Council.
15. Refer to KSC Supplements to WSA for maximum spacing for location of hydrant/valve/hydrant for the purposes of icepigging.



**PLAN
STOP VALVE COVER**

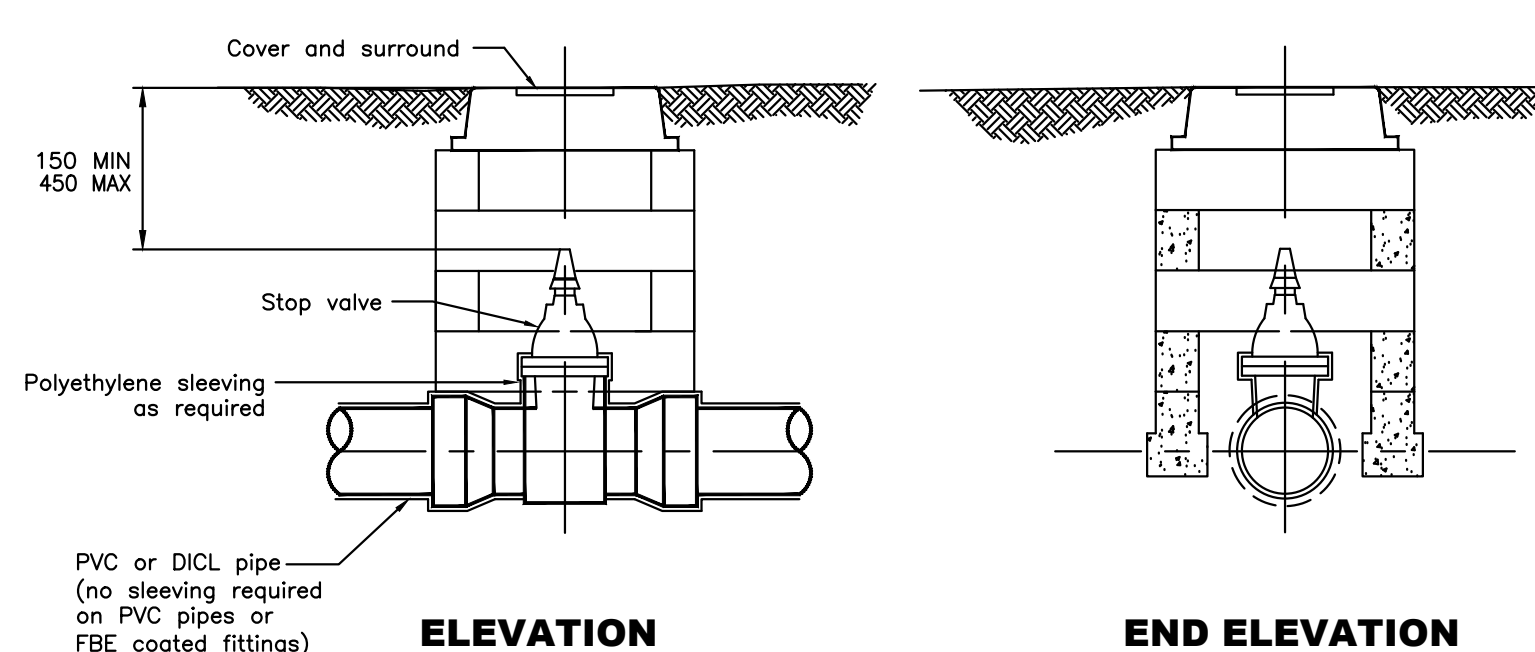


ELEVATION

**SPINDLE FIXING
DETAIL**

STOP VALVE - FOOTPATH AREA

(WITH EXTENSION SPINDLE)
(USE WHERE DEPTH TO SPINDLE TOP EXCEEDS 450mm)



ELEVATION

END ELEVATION

STOP VALVE - ROAD PAVEMENT

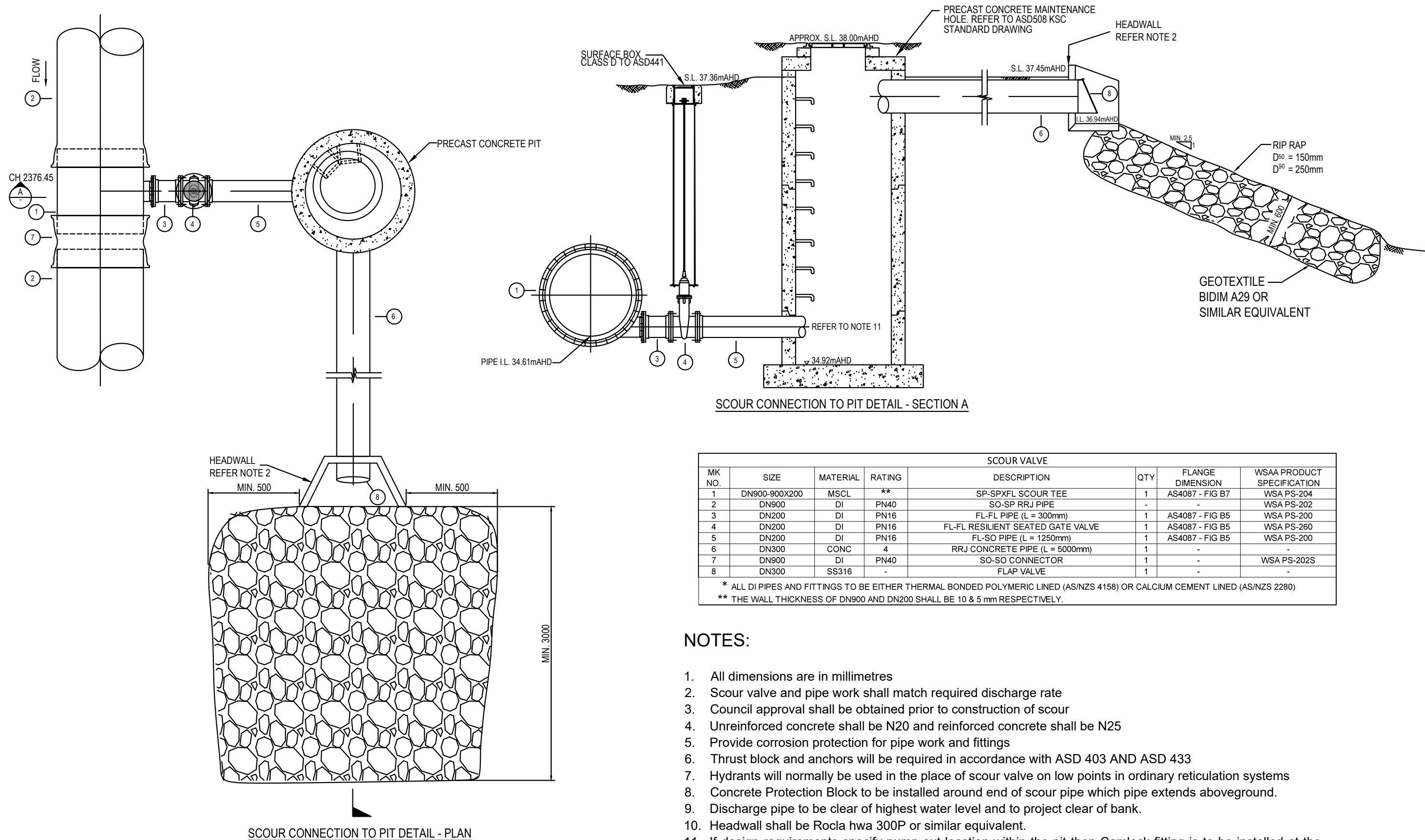
REVISION	DESCRIPTION	INITIAL	DATE
REV 3	ISSUED FOR USE FOLLOWING INDUSTRY FEEDBACK	RT	13/01/2025
REV 2	ISSUED FOR ADOPTION	RT	14/05/2024
REV 1	DRAFT		10/10/2023



**KSC STANDARD DRAWING
STOP VALVES - TYPICAL INSTALLATION**

BASED ON WSA 03 WATER CODE AND KSC REQUIREMENTS
NOT TO SCALE

ASD 441



NOTES:

- All dimensions are in millimetres
- Scour valve and pipe work shall match required discharge rate
- Council approval shall be obtained prior to construction of scour
- Unreinforced concrete shall be N20 and reinforced concrete shall be N25
- Provide corrosion protection for pipe work and fittings
- Thrust block and anchors will be required in accordance with ASD 403 AND ASD 433
- Hydrants will normally be used in the place of scour valve on low points in ordinary reticulation systems
- Concrete Protection Block to be installed around end of scour pipe which pipe extends aboveground.
- Discharge pipe to be clear of highest water level and to project clear of bank.
- Headwall shall be Rocla hwa 300P or similar equivalent.
- If design requirements specify pump-out location within the pit then Camlock fitting is to be installed at the end of Pipe no.5 above - refer to ASD 509 for Scour connection details.

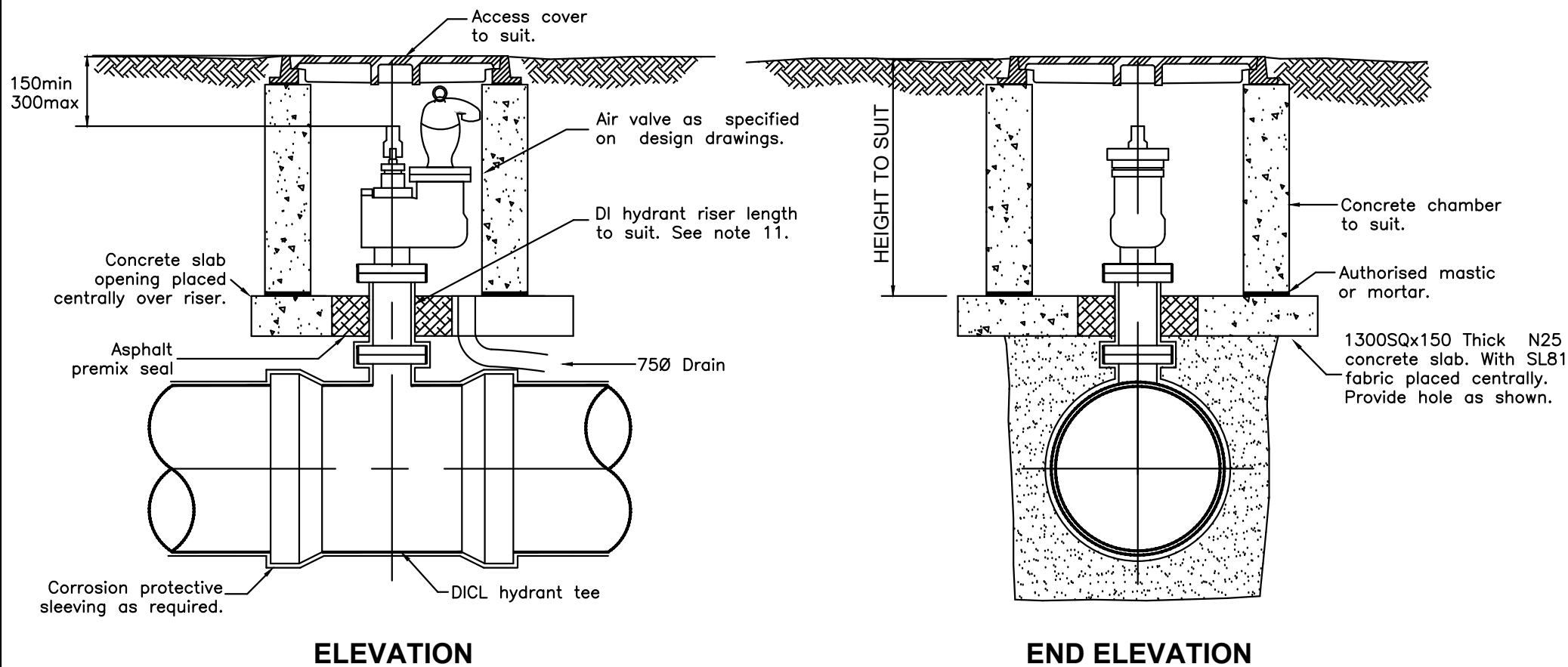
REVISION	DESCRIPTION	INITIAL	DATE
REV 3	ISSUED FOR USE FOLLOWING INDUSTRY FEEDBACK	RT	13/01/2025
REV 2	ISSUED FOR ADOPTION	RT	14/05/2024
REV 1	DRAFT		10/10/2023



KSC STANDARD DRAWING GRAVITY SCOUR TYPICAL ARRANGEMENT

BASED ON WSA 03 WATER CODE AND KSC REQUIREMENTS
NOT TO SCALE

ASD 442



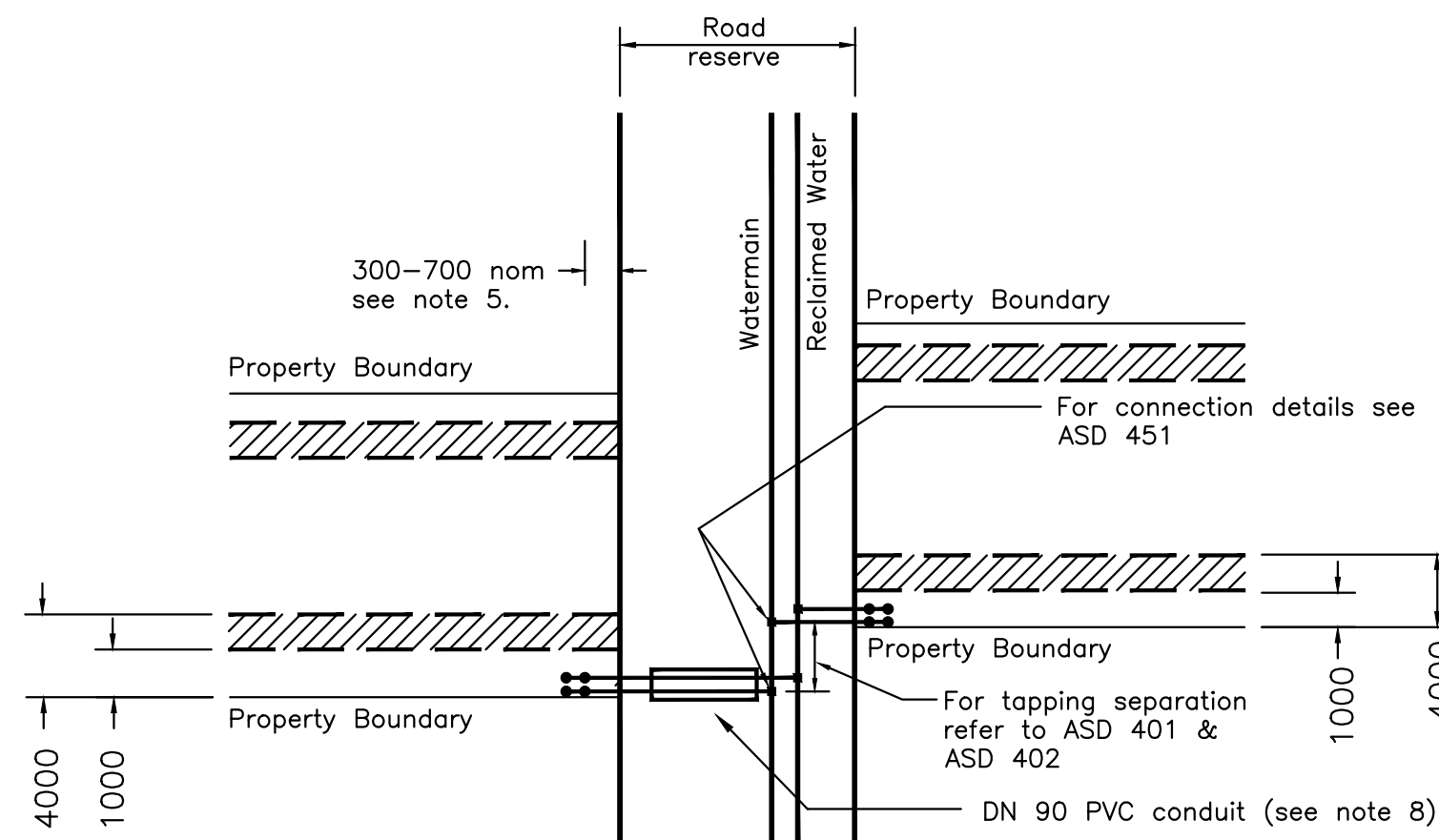
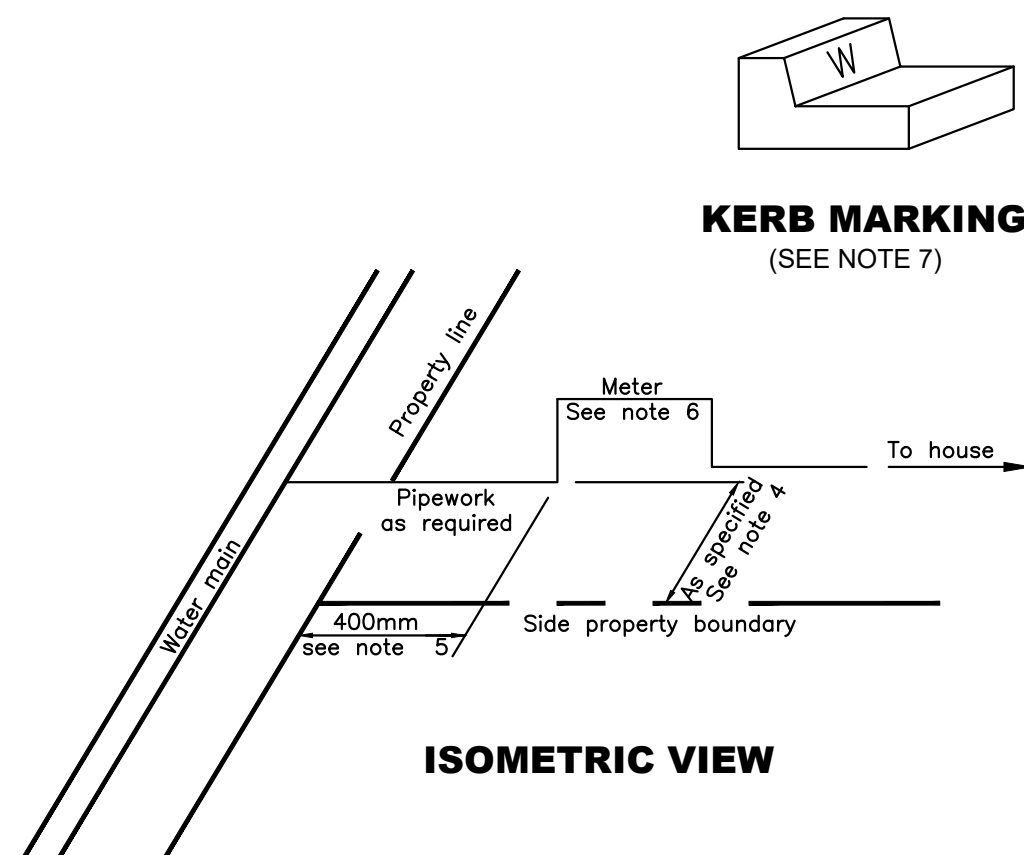
AIR VALVE FOR > DN 300mm

NOTES:

1. All dimensions are in millimetres.
2. Air valves are located at high points in water mains and should preferably be located in footpath areas.
3. Air valves shall be dual type connected via a Hydrant Isolation Valve. Air valve size shall be 80ø unless otherwise specified.
4. Air valves are to be coated with thermosetting epoxy powder coating to AS 3952 and AS 2638.
5. Isolating valves are to have resilient seating and be clockwise closing.
6. Air valve covers and chambers shall be concrete or brick chambers with an approved cast iron cover.
7. Cover opening is to be centred over the air valve.
8. Cover and surround is to be set to match finished level or slope of road or footpath.
9. Solid concrete blocks used to support chambers shall be bedded to ensure that no direct loading is applied to the stop valve or pipe.
10. Direction and grade of the chamber drainage pipe is to suit the position of the stormwater system and is to be indicated on the design plans.
11. Polyethylene sleeving (where required) is to extend into the cover chamber and be sealed off using an approved strapping system.
12. Bolted connections are to use only stainless steel bolts.
13. Hydrants will normally be used in the place of air valves on high points in ordinary reticulation systems.

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REV 1	DRAFT		10/10/2023





NOTES:

- All dimensions are in millimetres.
- Approved material from water main to copper standpipe is colour coded PE100 for new services. Compression fittings not permitted. Type A or B copper pipe to AS 1432 can be used for renewal of existing services.
- All service connections shall be laid at right angles to water main.
- Location of meter riser relative to the side boundary shall be 400mm. Normally two non-use strips 3,000 wide (shown hatched), starting 1,000 from either boundary, are allowed for driveways. If meter is installed less than 1m from driveway, protection by way of a bollard or similar is required
- Location of meter riser relative to front boundary shall be 400mm or where necessary in the range of 300 to 700mm.
- Meter orientation shall be at right angles to the front property boundary
- The concrete kerbing shall be marked with a 'W' for potable water and recycled water in line with the service connection.
- PVC DWV conduit is required for all water service road crossings. Kerb location to be marked. Conduit is to extend 300mm behind kerb line and be capped.
- Where there is a pavement of any sort over a water main service tapping, a cast iron path box (or approved equivalent) will be required in the pavement over the tapping valve.
- Tappings to live mains may only be carried out by Kempsey Shire Council.
- Separation for potable and recycled water meters is to be minimum 200mm.
- Any water main fittings (hydrants, stop valves, etc) shall be moved clear of driveways if required at no cost to Council.

SPLIT SERVICE FOR LONG SIDE SERVICE CONNECTIONS ARE ACCEPTABLE E.G. DN32 PE SERVICE ACROSS ROAD SPLIT INTO 2 X 20mm COPPER SERVICES ADJACENT TO FRONT PROPERTY BOUNDARY.

FOR TAPPING ARRANGEMENTS AND MAIN TO METER SERVICE DETAILS SEE ASD 451 & ASD 452.

LEGEND:

- METER ISOLATION VALVE & METER
- DRIVEWAY AREA (NOT TO BE USED FOR METER)

SINGLE SERVICE CONNECTION LOCATION DETAIL

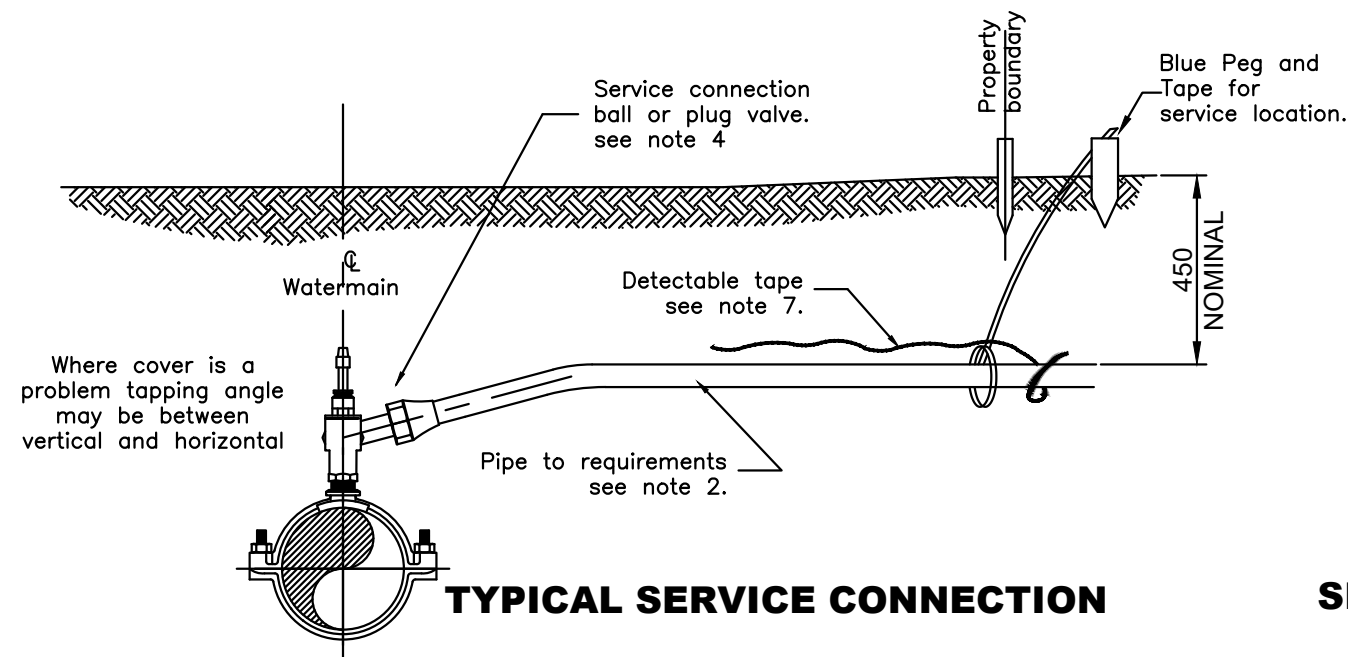
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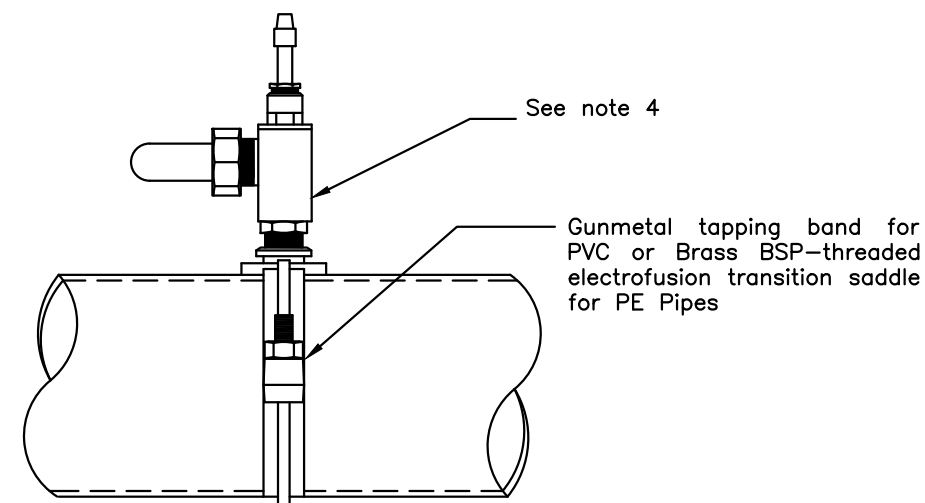
KSC STANDARD DRAWING WATER SERVICE CONNECTIONS OVERVIEW

BASED ON WSA 03 WATER CODE AND KSC REQUIREMENTS
NOT TO SCALE

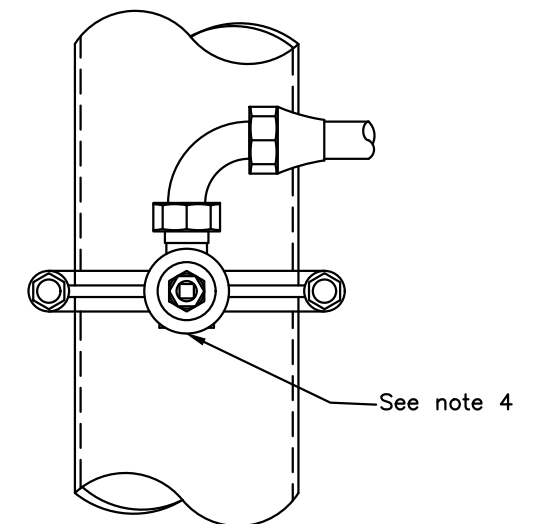
ASD 450



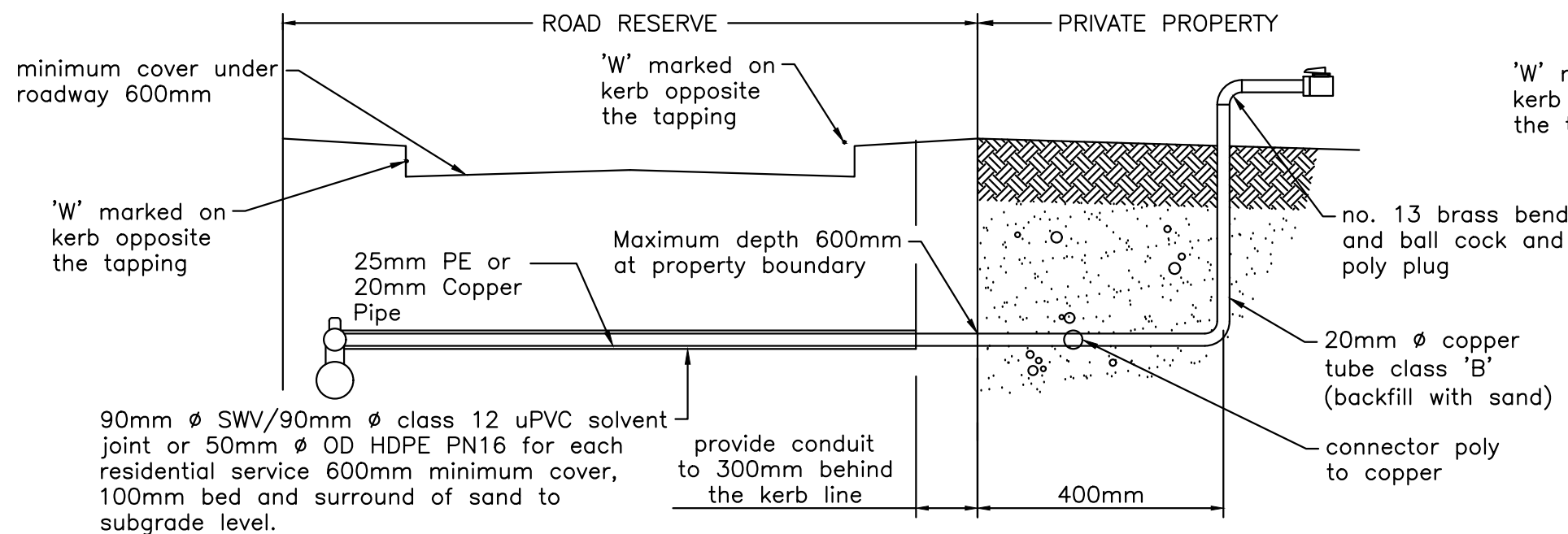
TYPICAL SERVICE CONNECTION



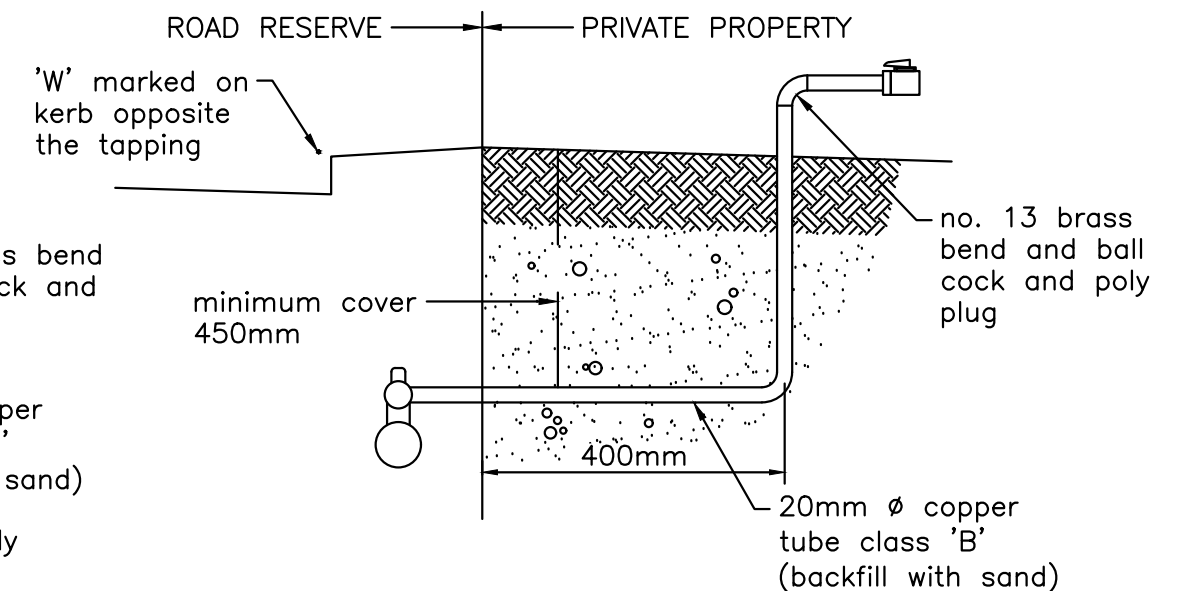
SIDE VIEW OF SERVICE CONNECTION



PLAN VIEW OF SERVICE CONNECTION



ELEVATION - LONG WATER SERVICE



ELEVATION - SHORT WATER SERVICE

NOTES:

1. All dimensions are in millimetres.
2. Approved material from water main to copper standpipe is colour coded PE100 for new services. Compression fittings not permitted. Type A or B copper pipe to AS 1432 can be used for renewal of existing services.
3. Direct tapping of mains is not permitted.
4. Standard in-line ferrule cock service connection valves shall be installed for all service connections.
5. Tapping band is to be of gunmetal construction. Refer to ASD 401 & ASD 402.
6. All tapings to be carried out under pressure unless carried out before the main is commissioned. Service connection valve (main cock) is to be in open position to allow tapings and services to be pressure tested.

7. Where possible all service connections shall be laid at right angles to water main. Where this is not possible, detectable marker tape is to be laid above the service connection.
8. Where there is a pavement of any sort over a watermain service tapping, a cast iron path box (or approved equivalent) will be required in the pavement over the tapping valve.
9. Tapings to live mains may only be carried out by Kempsey Shire Council.
10. Commercial/Industrial water services to be minimum 25mm ID. Dry connections (drillings/tapings) shall not be provided in industrial or commercial development as the location and size of property services can only be determined at the time of application to connect in conjunction with building development.

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REV 1	DRAFT		10/10/2023



**KSC STANDARD DRAWING
SERVICE CONNECTIONS -
MAIN CONNECTION DETAIL**

NOT TO SCALE
BASED ON WSA 03 WATER CODE AND KSC REQUIREMENTS

ASD 451

TABLE A			
APPROXIMATE DIMENSIONS			
ITEM	150 mm	100 mm	REMARKS
A.	435	335	
B.	270	230	
C.	410	330	SINGLE
D.	VARIES FROM 0 TO 1,500 mm OR MORE		
E.	1,400	1,130	SINGLE
F.	ALLOW UP TO 3,600 mm SEE NOTES 3 & 4		
G.	380	290	
H.	620	510	

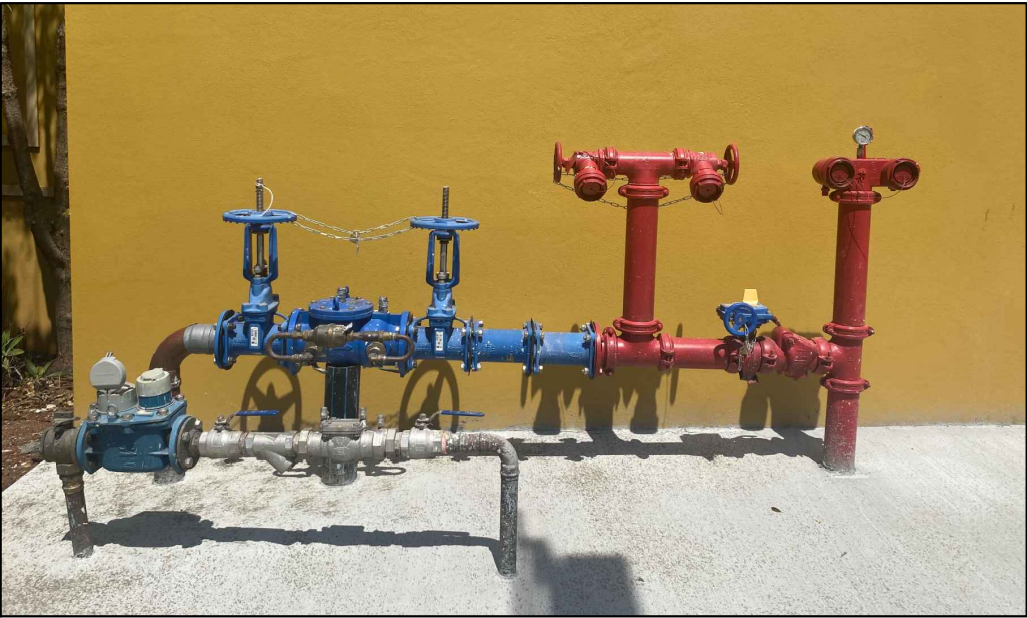
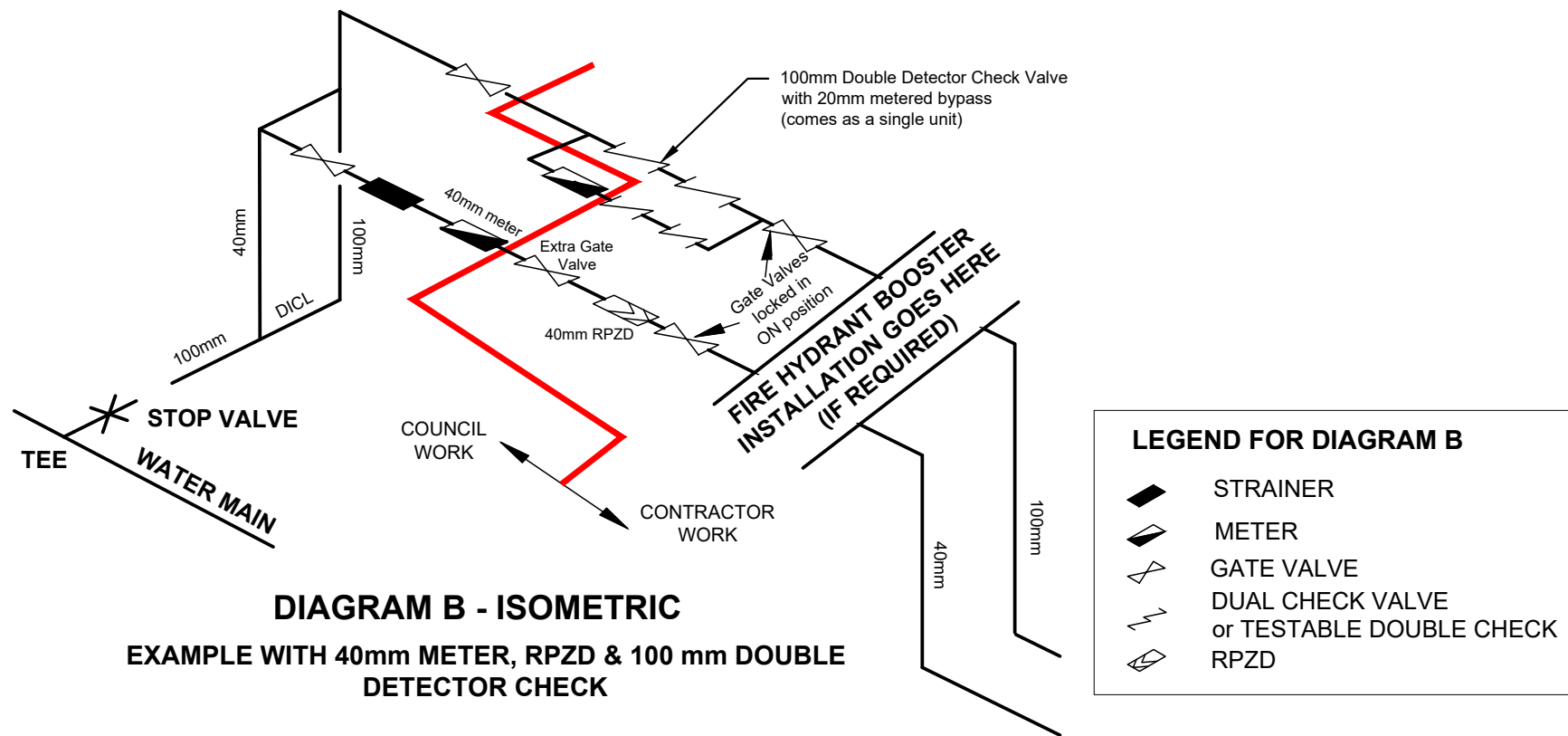
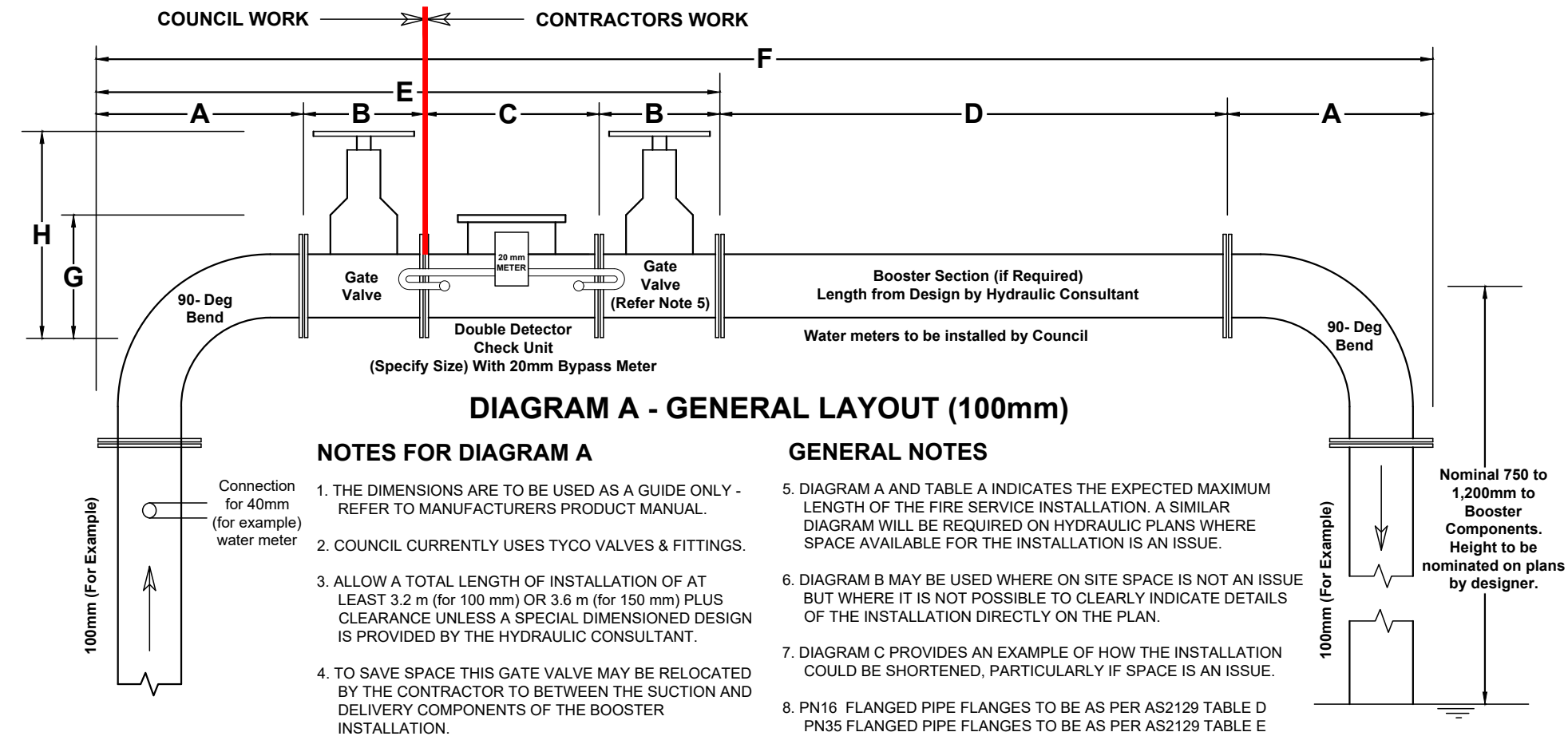


DIAGRAM C REFER TO NOTE 3

THIS DRAWING INCLUDES COLOURED INFORMATION. IF YOU HAVE A BLACK AND WHITE COPY YOU DO NOT HAVE ALL THE INFORMATION. THIS NOTE IS COLOURED RED.

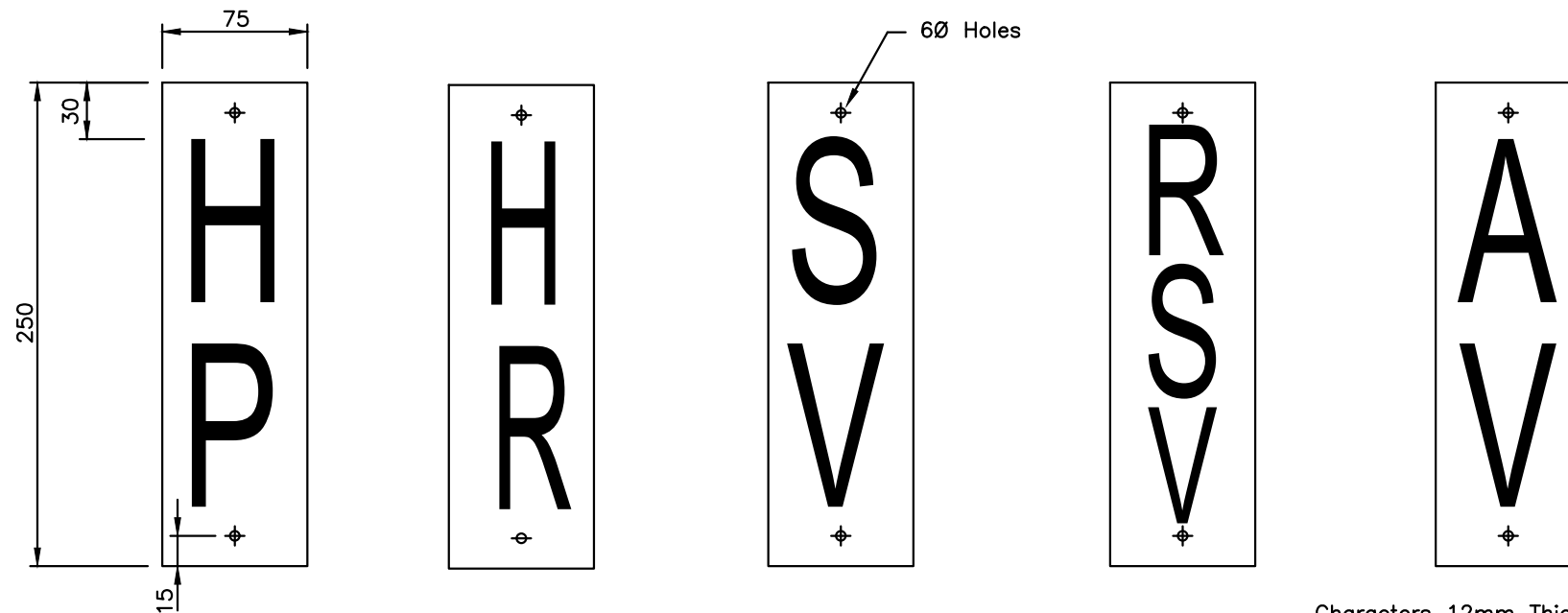
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KSC STANDARD DRAWING
FIRE HYDRANT BOOSTER ARRANGEMENT WITH
100 mm & 150 mm DETECTOR CHECK UNITS

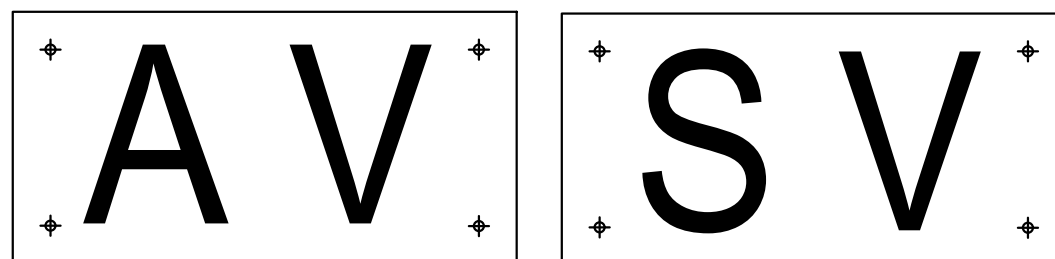
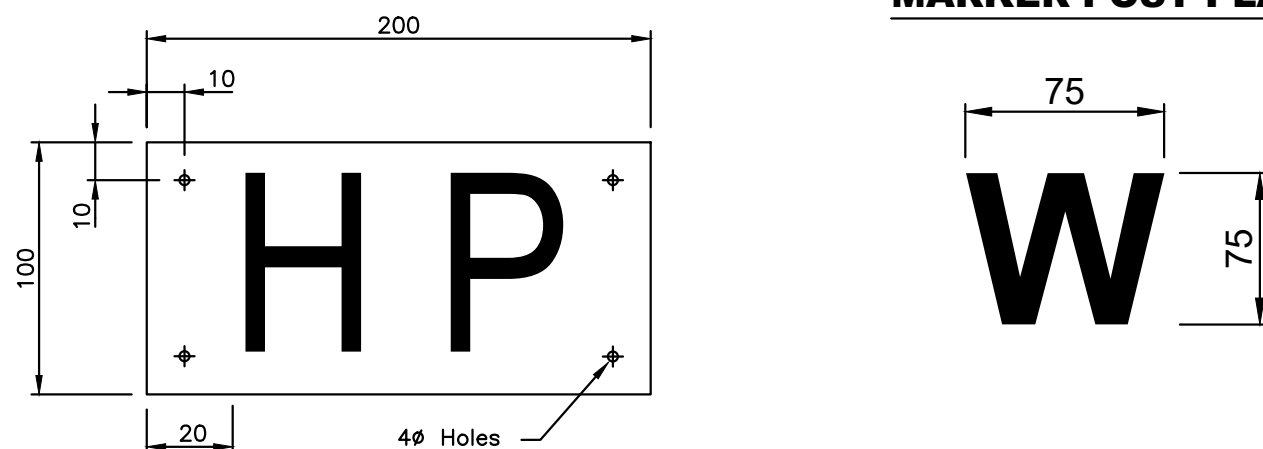
NOT TO SCALE
BASED ON WSA 03 WATER CODE AND KSC REQUIREMENTS

ASD 453



FIRE HYDRANT PATH FIRE HYDRANT ROAD STOP VALVE RECLAIMED STOP VALVE AIR VALVE

MARKER POST PLATES

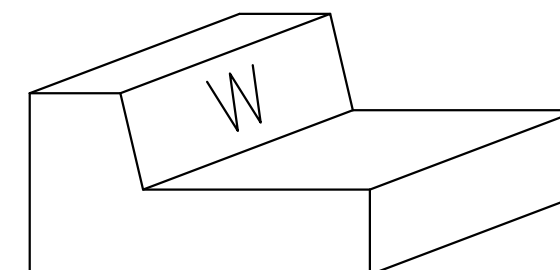


KERB MARKER PLATES

NOTES:

1. All dimensions are in millimetres
2. All hydrants, stop valves and air valves shall be marked with marker plates. marker posts shall be used in the absence of a suitable kerb fixing position or as directed by Kempsey Shire Council
3. In urban areas, in lieu of marker plates the valve or hydrant cover and the kerb adjacent to each valve or hydrant is to be painted with two (2) coats of approved nonslip paint as follows

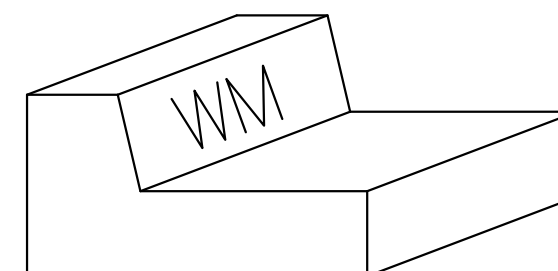
Valves	- White
Closed valves	- Red
Hydrants	- Yellow
Hydrants & Valves (Reclaimed)	- Lilac
4. Marker plates shall be constructed from 1.60mm aluminium sheet
5. Letters for all markers shall be painted in red enamel with the background to be painted with white enamel paint
6. Kerb marker plates shall be fixed to the face of kerb with no.4 2.4 ϕ x 20 concrete nails with washers and positioned directly in line with valve / hydrant
7. Water main (WM) marker posts where required shall be located at all line deviations and at 200 metres max. centres. (see ASD 461)



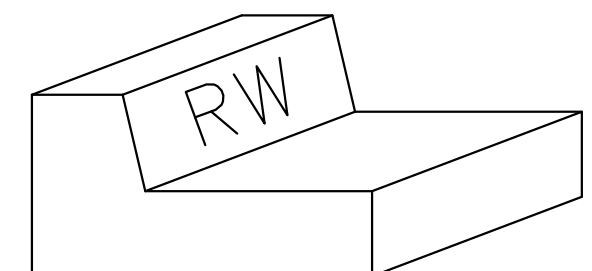
**WATER SERVICE
(POTABLE OR RECLAIMED WATER)**

KERB MARKER CUTS/ STAMPS

Sawcut in existing kerb or stamp in new kerb.



WATERMAIN



RECLAIMED WATERMAIN

REVISION	DESCRIPTION	INITIAL	DATE
REV 3	ISSUED FOR USE FOLLOWING INDUSTRY FEEDBACK	RT	13/01/2025
REV 2	ISSUED FOR ADOPTION	RT	14/05/2024
REV 1	DRAFT		10/10/2023



**KSC STANDARD DRAWING
WATER MAIN MARKER PLATES**

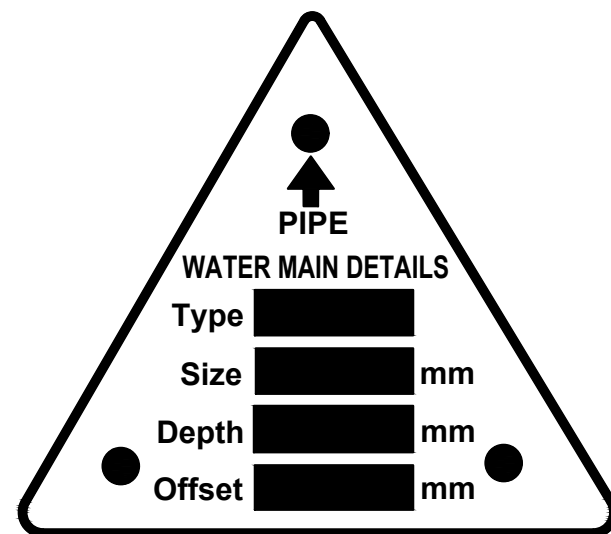
BASED ON WSA 03 WATER CODE AND KSC REQUIREMENTS

NOT TO SCALE

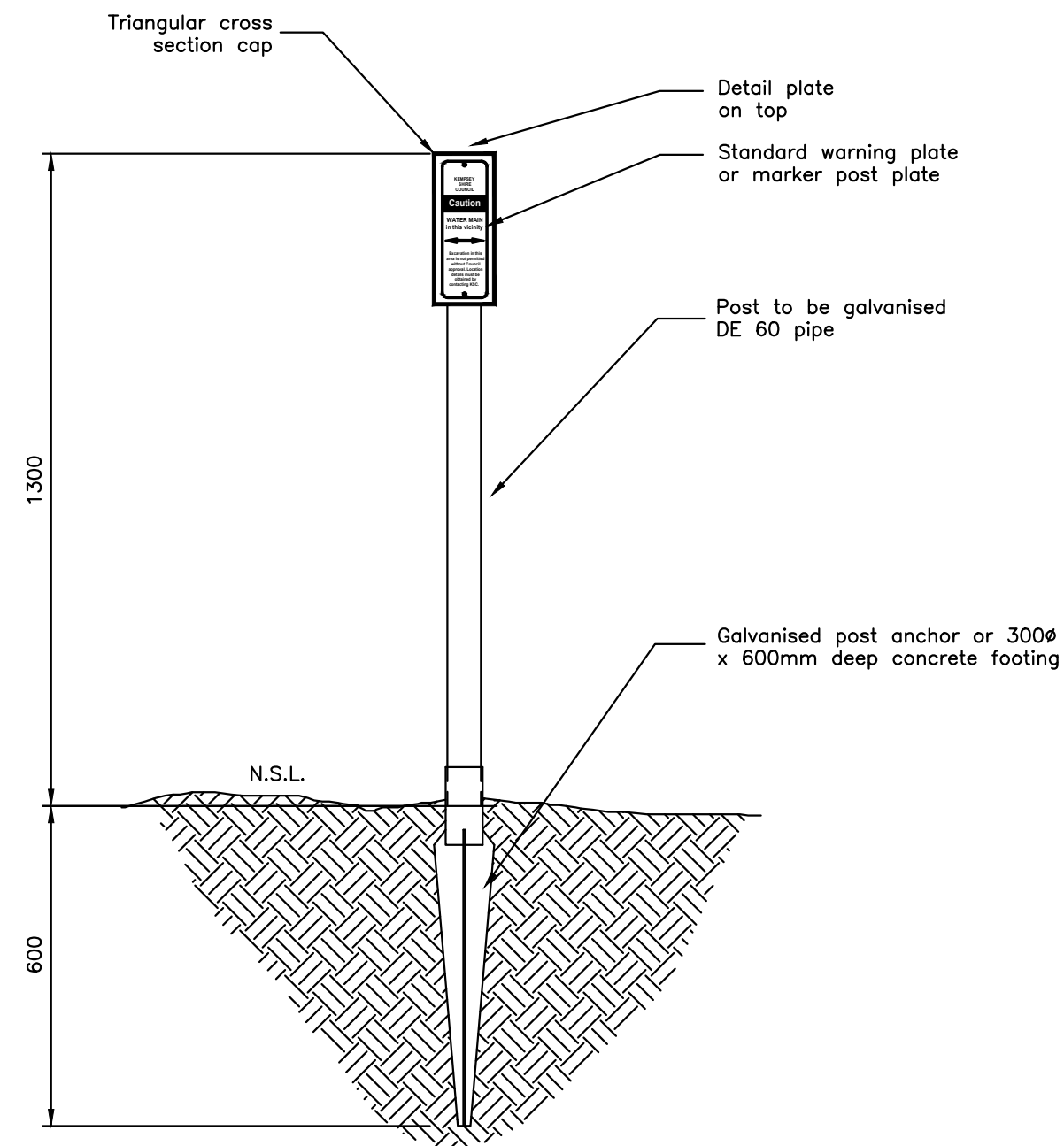
ASD 460



STANDARD WARNING PLATE



DETAIL PLATE



MARKER POST

NOTES:

1. All dimensions are in millimetres.
2. All marker post locations and post anchoring details are to be approved by Kempsey Shire Council prior to erection.
3. Concrete minimum N25 in accordance with AS 3600.
4. Developer or contractor is responsible for procurement of, and information stamped on detail plate.
5. See standard drawing ASD 460 for other marker post plate details.
6. Water main (WM) marker posts where required shall be located at all line deviations and at 200 metres max centres.
7. Marker plates shall be constructed from 1.60mm aluminium sheet.
8. Valve and hydrant marker posts where required in low density residential developments, adjacent to sewer pressure mains or through crown land, shall be located 200 clear of road / property boundary with the marker plate facing the main.
9. Notwithstanding the requirements of note 8, valve and hydrant marker posts shall not be located greater than 5.0 metres clear of the water main alignment .

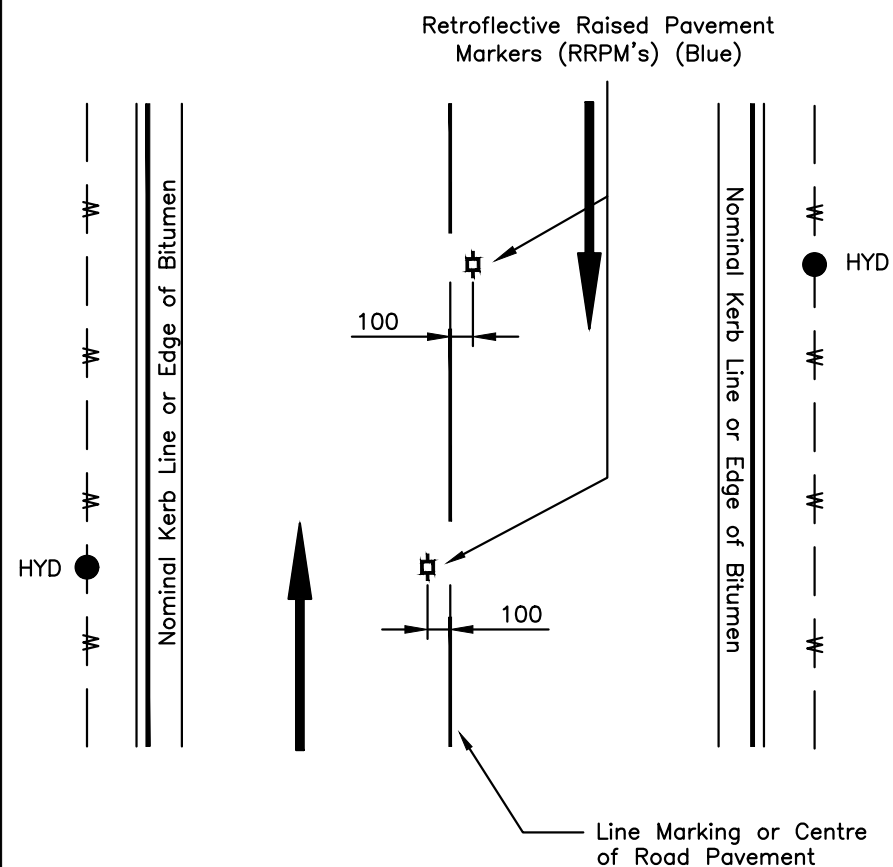
REVISION	DESCRIPTION	INITIAL	DATE
REV 3	ISSUED FOR USE FOLLOWING INDUSTRY FEEDBACK	RT	13/01/2025
REV 2	ISSUED FOR ADOPTION	RT	14/05/2024
REV 1	DRAFT		10/10/2023



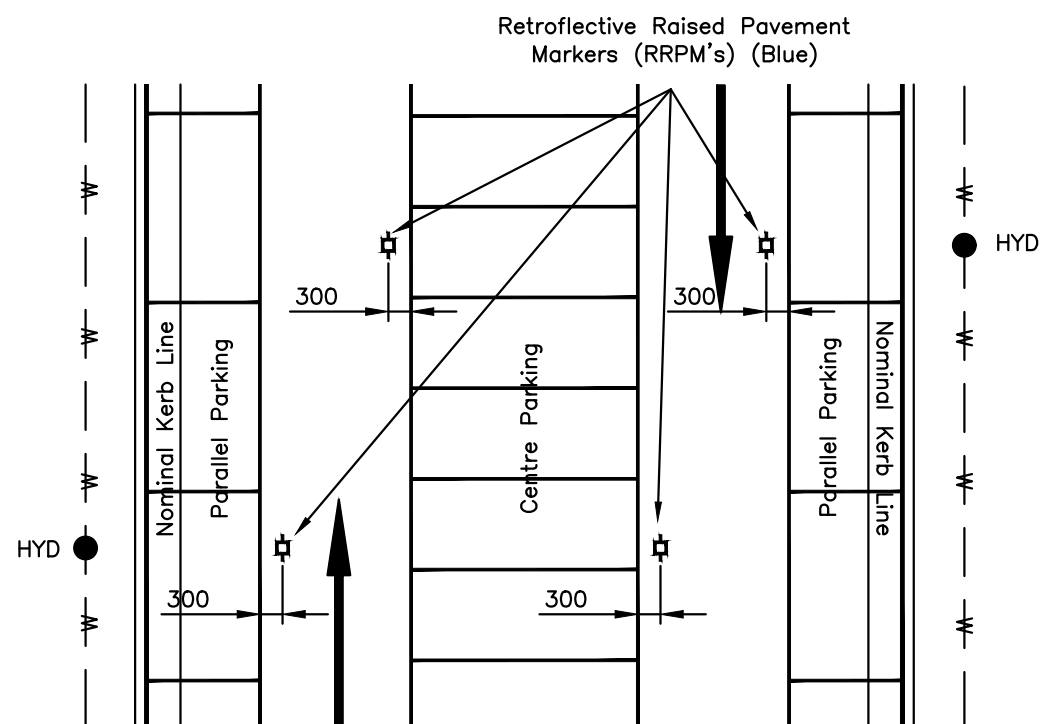
**KSC STANDARD DRAWING
MARKER POSTS AND PLATES - WATER MAINS**

BASED ON WSA 03 WATER CODE AND KSC REQUIREMENTS
NOT TO SCALE

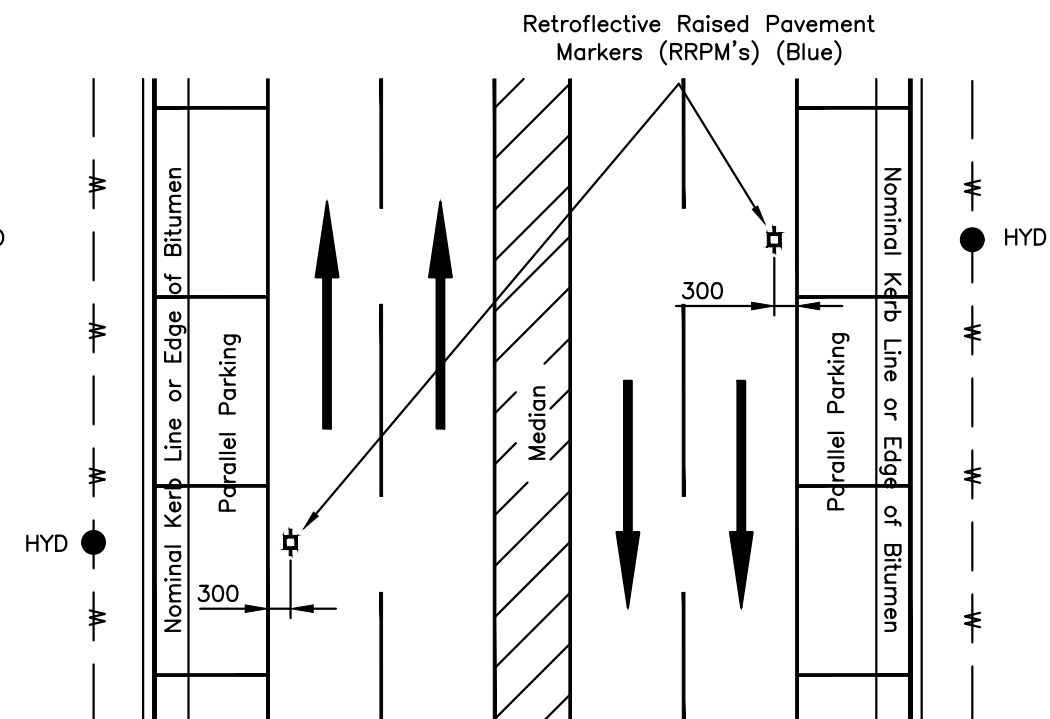
ASD 461



STANDARD INSTALLATION FOR URBAN STREETS AND RURAL ROADS



STANDARD INSTALLATION FOR CENTRAL BUSINESS DISTRICT (CBD) AREAS - 2



STANDARD INSTALLATION FOR CENTRAL BUSINESS DISTRICT (CBD) AREAS - 1

NOTES:

1. All dimensions are in millimetres.
2. RRPM's shall be installed in accordance with AS. 1742.2, manual for uniform traffic control devices part 2.
3. All RRPM's are to be bidirectional and blue in colour.
4. RRPM's are to be fixed to the road surface with an authorized high strength impact resistant epoxy adhesive.

REVISION	DESCRIPTION	INITIAL	DATE
REV 3	ISSUED FOR USE FOLLOWING INDUSTRY FEEDBACK	RT	13/01/2025
REV 2	ISSUED FOR ADOPTION	RT	14/05/2024
REV 1	DRAFT		10/10/2023



**KSC STANDARD DRAWING
ON ROAD HYDRANT MARKING USING RETROFLECTIVE
RAISED PAVEMENT MARKERS**

NOT TO SCALE
BASED ON WSA 03 WATER CODE AND KSC REQUIREMENTS

ASD 462