EAST GIPPSLAND WATER

STANDARD WATERMAIN DRAWINGS

DRG. No.	DESCRIPTION
SD-000-2020	DRAWING LIST
SD-001-2020	STANDARD DETAILS- 1 - THRUST BLOCKS
SD-002-2020	STANDARD DETAILS- 2 - CONNECTIONS
SD-003-2020	STANDARD DETAILS- 3 - TRENCHING AND BACKFILL
SD-004-2020	STANDARD DETAILS- 4 - VALVES AND HYDRANTS
SD-005-2020	STANDARD DETAILS- 5 - POSTS AND MARKERS

Rv.	APPR.	DATE	REVISIONS
A	S.G	05-10-2020	ORIGINAL ISSUE

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STANDARD DETAILS - 0
DRAWING LIST

DATE: OCTOBER 2020

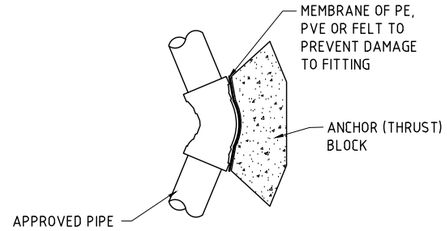
DRAWING No: SD-000-2020

Rv. A

			SOIL CLASSIFICATION																						
			50 kPa ALLOWABLE HORIZONTAL BEARING PRESSURE (AHBP)							100 kPa ALLOWABLE HORIZONTAL BEARING PRESSURE (AHBP)							200 kPa ALLOWABLE HORIZONTAL BEARING PRESSURE (AHBP)								
			SYSTEM TEST PRESSURE							SYSTEM TEST PRESSURE							SYSTEM TEST PRESSURE								
DN	ANGLE/SIZE	FITTING TYPE	1000	1100	1200	1300	1400	1500	1600	1000	1100	1200	1300	1400	1500	1600	1000	1100	1200	1300	1400	1500	1600
100	6°/11.25°	BEND	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN
100	22.5°	BEND	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN
100	45°	BEND	MIN	0.19	0.21	0.23	0.25	0.26	0.28	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN
100	60°	BEND	0.23	0.25	0.28	0.30	0.32	0.34	0.37	MIN	MIN	MIN	MIN	MIN	MIN	0.18	MIN	MIN	MIN	MIN	MIN	MIN	MIN
100	90°	BEND	0.32	0.36	0.39	0.42	0.45	0.49	0.52	MIN	MIN	0.19	0.21	0.23	0.24	0.26	MIN	MIN	MIN	MIN	MIN	MIN	MIN
100		TEE, DEAD END	0.23	0.25	0.28	0.30	0.32	0.34	0.37	MIN	MIN	MIN	MIN	MIN	MIN	0.18	MIN	MIN	MIN	MIN	MIN	MIN	MIN
100		VALVE	0.30	0.30	0.30	0.30	0.32	0.34	0.37	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
150	6°/11.25°	BEND	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN
150	22.5°	BEND	0.19	0.21	0.23	0.24	0.26	0.28	0.30	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN
150	45°	BEND	0.37	0.41	0.44	0.48	0.52	0.55	0.59	0.18	0.20	0.22	0.24	0.26	0.28	0.30	MIN	MIN	MIN	MIN	MIN	MIN	MIN
150	60°	BEND	0.48	0.53	0.58	0.63	0.68	0.72	0.77	0.24	0.27	0.29	0.31	0.34	0.36	0.39	MIN	MIN	MIN	MIN	MIN	0.18	0.19
150	90°	BEND	0.68	0.75	0.82	0.89	0.96	1.02	1.09	0.34	0.38	0.41	0.44	0.48	0.51	0.55	MIN	0.19	0.20	0.22	0.24	0.26	0.27
150		TEE, DEAD END	0.48	0.53	0.58	0.63	0.68	0.72	0.77	0.24	0.27	0.29	0.31	0.34	0.36	0.39	MIN	MIN	MIN	MIN	MIN	0.18	0.19
150		VALVE	0.48	0.53	0.58	0.63	0.68	0.72	0.77	0.30	0.30	0.30	0.31	0.34	0.36	0.39	0.30	0.30	0.30	0.30	0.30	0.30	0.30
150	DN100	TAPER	0.30	0.30	0.30	0.33	0.35	0.38	0.41	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
225	6°/11.25°	BEND	0.20	0.22	0.24	0.26	0.28	0.30	0.32	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN
225	22.5°	BEND	0.40	0.44	0.48	0.52	0.56	0.60	0.64	0.20	0.22	0.24	0.26	0.28	0.30	0.32	MIN	MIN	MIN	MIN	MIN	MIN	MIN
225	45°	BEND	0.79	0.87	0.95	1.03	1.11	1.19	1.27	0.40	0.43	0.47	0.51	0.55	0.59	0.63	0.20	0.22	0.24	0.26	0.28	0.30	0.32
225	60°	BEND	1.03	1.14	1.24	1.34	1.45	1.55	1.65	0.52	0.57	0.62	0.67	0.72	0.77	0.83	0.26	0.28	0.31	0.34	0.36	0.39	0.41
225	90°	BEND	1.46	1.61	1.75	1.90	2.05	2.19	2.34	0.73	0.80	0.88	0.95	1.02	1.10	1.17	0.37	0.40	0.44	0.47	0.51	0.55	0.58
225		TEE, DEAD END	1.03	1.14	1.24	1.34	1.45	1.55	1.65	0.52	0.57	0.62	0.67	0.72	0.77	0.83	0.26	0.28	0.31	0.34	0.36	0.39	0.41
225		VALVE	1.03	1.14	1.24	1.34	1.45	1.55	1.65	0.52	0.57	0.62	0.67	0.72	0.77	0.83	0.30	0.30	0.31	0.34	0.36	0.39	0.41
225	DN100	TAPER	0.80	0.88	0.96	1.04	1.13	1.21	1.29	0.40	0.44	0.48	0.52	0.56	0.60	0.64	0.30	0.30	0.30	0.30	0.30	0.30	0.32
225	DN150	TAPER	0.55	0.61	0.66	0.72	0.77	0.83	0.88	0.30	0.30	0.33	0.36	0.39	0.41	0.44	0.30	0.30	0.30	0.30	0.30	0.30	0.30
300	6°/11.25°	BEND	0.36	0.40	0.43	0.47	0.50	0.54	0.57	MIN	0.20	0.22	0.23	0.25	0.27	0.29	MIN	MIN	MIN	MIN	MIN	MIN	MIN
300	22.5°	BEND	0.72	0.79	0.86	0.93	1.00	1.07	1.14	0.36	0.39	0.43	0.46	0.50	0.54	0.57	MIN	0.20	0.21	0.23	0.25	0.27	0.29
300	45°	BEND	1.40	1.54	1.68	1.82	1.96	2.10	2.24	0.70	0.77	0.84	0.91	0.98	1.05	1.12	0.35	0.39	0.42	0.46	0.49	0.53	0.56
300	60°	BEND	1.83	2.02	2.20	2.38	2.57	2.75	2.93	0.92	1.01	1.10	1.19	1.28	1.37	1.47	0.46	0.50	0.55	0.60	0.64	0.69	0.73
300	90°	BEND	2.59	2.85	3.11	3.37	3.63	3.89	4.15	1.30	1.43	1.56	1.68	1.81	1.94	2.07	0.65	0.71	0.78	0.84	0.91	0.97	1.04
300		TEE, DEAD END, VALVE	1.83	2.02	2.20	2.38	2.57	2.75	2.93	0.92	1.01	1.10	1.19	1.28	1.37	1.47	0.46	0.50	0.55	0.60	0.64	0.69	0.73
300	DN100	TAPER	1.60	1.76	1.92	2.08	2.25	2.41	2.57	0.80	0.88	0.96	1.04	1.12	1.20	1.28	0.40	0.44	0.48	0.52	0.56	0.60	0.64
300	DN150	TAPER	1.35	1.49	1.62	1.76	1.89	2.03	2.16	0.68	0.74	0.81	0.88	0.95	1.01	1.08	0.34	0.37	0.41	0.44	0.47	0.51	0.54
300	DN225	TAPER	0.80	0.88	0.96	1.04	1.12	1.20	1.28	0.40	0.44	0.48	0.52	0.56	0.60	0.64	0.30	0.30	0.30	0.30	0.30	0.30	0.32

NOTES:

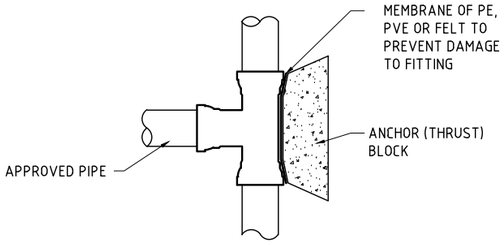
1. WHERE AHBP<50kPa, THE WATER AGENCY MUST BE CONSULTED WHEN DESIGNING THE PIPELINE.
2. FOR THRUST RESTRAINT ON PRESSURE PIPELINES GREATER THAN DN300,THE WRWA THRUST RESTRAINT CALCULATOR SHALL BE USED TO DETERMINE THE MINIMUM TRUST AREA.
3. INTERPOLATION BETWEEN TEST PRESSURES AND/OR SOIL CLASSIFICATION MAY OCCUR,
4. "MIN" REFERS TO MINIMUM THRUST RESTRAINT WHICH IS BASED ON THE TIMBER/RECLYCLED PLASTIC THRUST RESTRAINT AREA OF 0.18m^2 WHICH IS BASED ON 0.6m x 0.30M BLOCKS AS DEFINED IN MRWA-W-206.
5. FOR DETERMINING TEE THRUST BLOCK AREAS, USE THE SIZE OF THE TEE'S OFFTAKE (BRANCH).
6. IN LINE THRUST BLOCK (VALVES/TAPERS) SHALL HAVE MIN THRUST AREA OF 0.30m^2 AND BE CONSTRUCTED OF REINFORCED CONCRETE.
7. THE MINIMUM THRUST AREA FOR TAPER THRUST BLOCKS TO BE EQUAL TO THE DIFFERENCE BETWEEN THE TRUST AREAS FOR DEADENDS OF EQUIVALENT DIAMETER TO THOSE EACH SIDE OF TAPER.
8. FOR TEST PRSSURE>1600kPa, INCREASE THE MINIMUM THRUST AREA BY THE RATIO OF THE TEST PRESSURE TO THE 1600kPa AREA.
9. FORCE ONLY TO BE APPLIED TO CONCRETE THRUST BLOCK AFTER THE CURING TIME OF THE CONCRETE HAS LAPSED



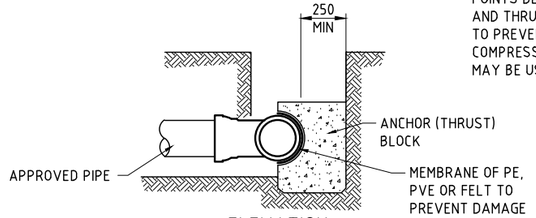
PLAN

TABLE 205A-B IN LINE RESTRAINT STEEL REINFORCEMENT SELECTION (SINGLE MAIN) DETAILS

THRUST RESTRAINT AREA	MESH (REINFORCEMENT) REQUIREMENTS
0.3m^2	NONE IF RESTRAINT IS >400 THICK OTHERWISE 1 LAYER OF SL82
0.31m^2 TO 1.5m^2	1 LAYER OF SL82
1.51m^2 TO 3.0m^2	1 LAYER OF RL1018 OR 2 LAYERS OF SL82
>3.0m^2	2 LAYERS OF SL82



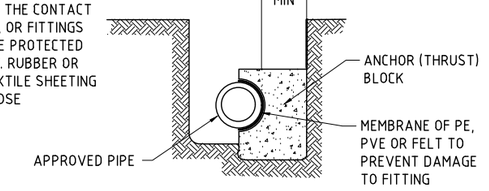
PLAN



ELEVATION

ANCHOR BLOCK NOTES

1. ANCHOR BLOCKS MEMBRANE - THE CONTACT POINTS BETWEEN THE PE PHE, OR FITTINGS AND THRUST BLOCKS MUST BE PROTECTED TO PREVENT ABRASION OF PE. RUBBER OR COMPRESSIBLE PE OR GEO TEXTILE SHEETING MAY BE USED FOR THIS PURPOSE

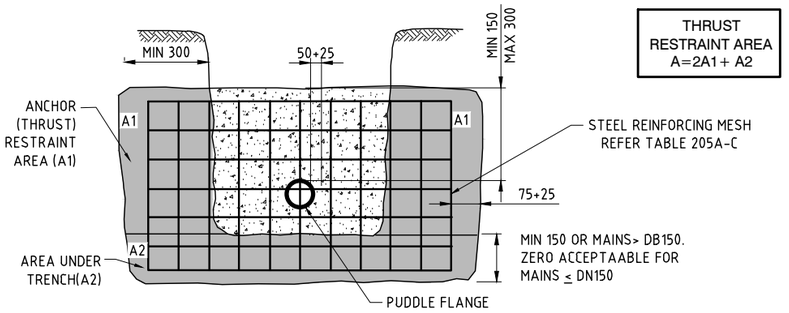


ELEVATION

ANCHOR BLOCK DETAIL - HORIZONTAL BEND

(REFER TO FIG. 7.12 WSA-03-2011)
NOT TO SCALE

THRUST RESTRAINT AREA A=2A1+ A2

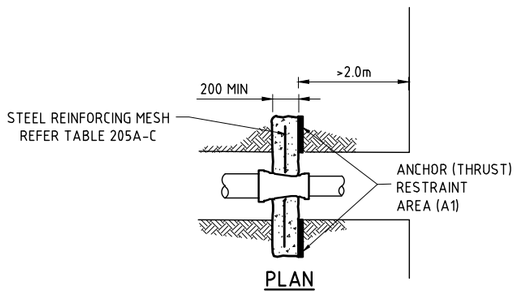


INLINE THRUST RESTRAINT DETAIL -INLINE THRUST (ELEVATION))

(REFER TO FIG.205A-H WSA-03-2011)
NOT TO SCALE

ANCHOR BLOCK DETAIL - HORIZONTAL TEE

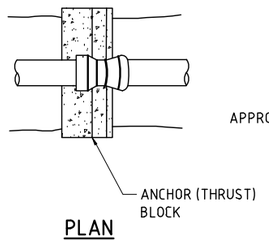
(REFER TO FIG. 7.12 WSA-03-2011)
NOT TO SCALE



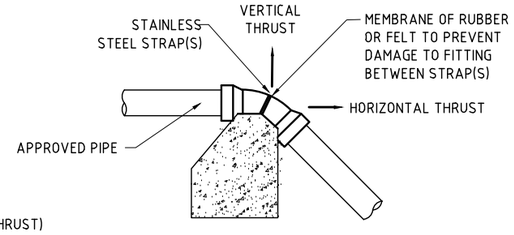
PLAN

INLINE THRUST RESTRAINT DETAIL -INLINE THRUST

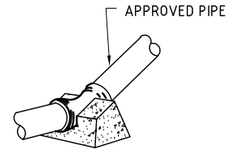
(REFER TO FIG.205A-I WSA-03-2011)
NOT TO SCALE



PLAN



ELEVATION



ISOMETRIC VIEW

ANCHOR BLOCK DETAIL - VERTICAL BEND

(REFER TO FIG. 5.17 WSA-03-2011)
NOT TO SCALE

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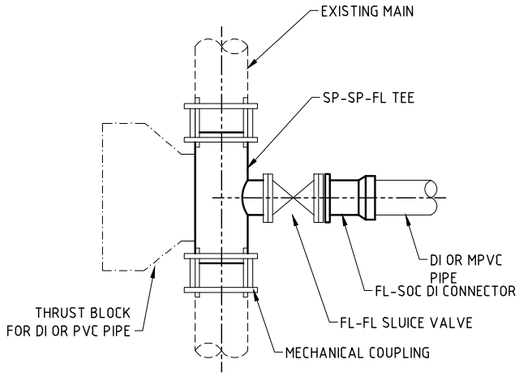
STANDARD DETAILS - 1 THRUST BLOCKS

DATE: OCTOBER 2020

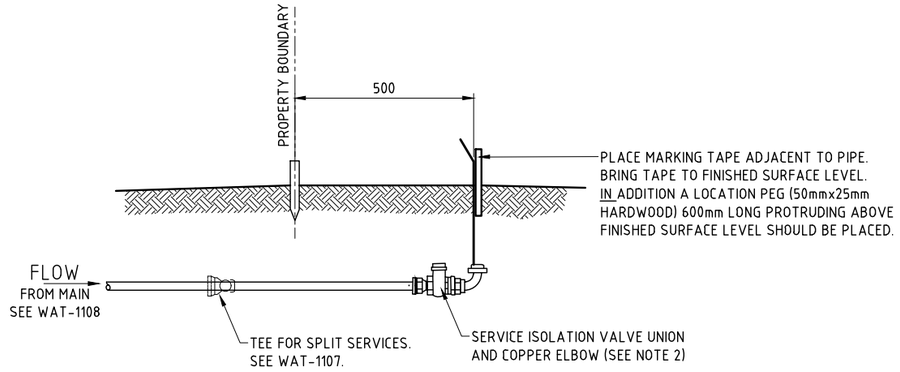
DRAWING No: SD-001-2020

Rv. A

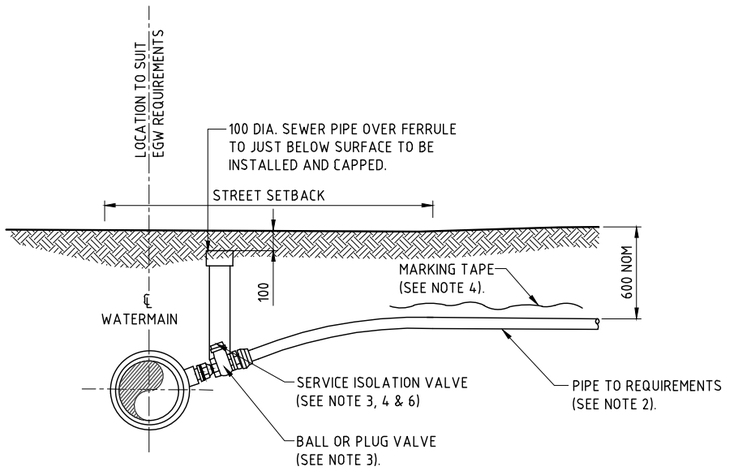


CUT-IN CONNECTION METHOD - MPVC

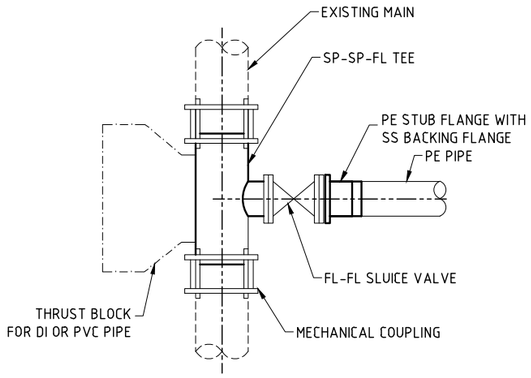
(USING MECHANICAL COUPLINGS)
REFER TO FIG. 5.6 WSA-03-2011



TYPICAL PRE-LAID SERVICE TERMINATION

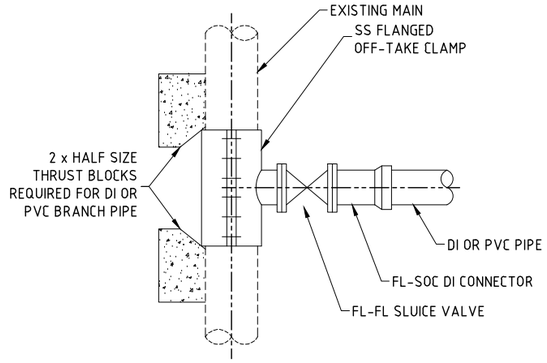


TYPICAL SERVICE CONNECTION



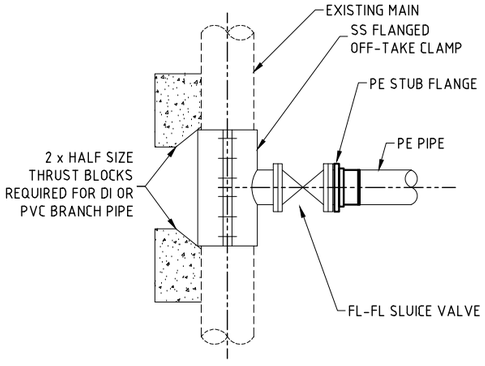
CUT-IN CONNECTION METHOD - PE

(USING MECHANICAL COUPLINGS)
REFER TO FIG. 5.6 WSA-03-2011



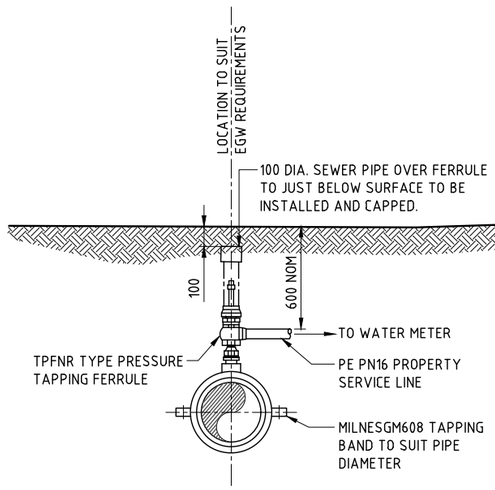
UNDER PRESSURE CONNECTION METHOD - MPVC

(USING SS WRAP FLANGE OFFTAKE)
REFER TO FIG. 5.7 WSA-03-2011



UNDER PRESSURE CONNECTION METHOD - PE

(USING SS WRAP FLANGE OFFTAKE)
REFER TO FIG. 5.7 WSA-03-2011



TYPICAL SERVICE CONNECTION

NARROW CLAMP TAPPING BAND
SCALE: NTS
(FOR PVC, PE & DI PIPE)

NOTES:

1. ALL DIMENSIONS IN MILLIMETRES.
2. MATERIAL FROM THE MAIN TO METER ASSEMBLY:
   - COPPER PIPE – TYPE A TO AS 1432.
   - POLYETHYLENE PIPE TO WSA 01. (MUST HAVE COPPER WIRE TRACE).
3. IN-LINE METAL PLUG OR BALL VALVES REQUIRED WHEN MAIN IS TAPPED UNDER PRESSURE
4. INSTALL IN-LINE METAL SERVICE ISOLATION VALVES WHERE REQUIRED BY THE EAST GIPPSLAND WATER.
5. LAY SERVICE CONNECTIONS AT RIGHT ANGLES TO WATER MAIN
6. USE DI PIPE PROTECTIVE SLEEVING TO ENCAPSULATE THE PIPE CONNECTION & ISOLATION VALVE

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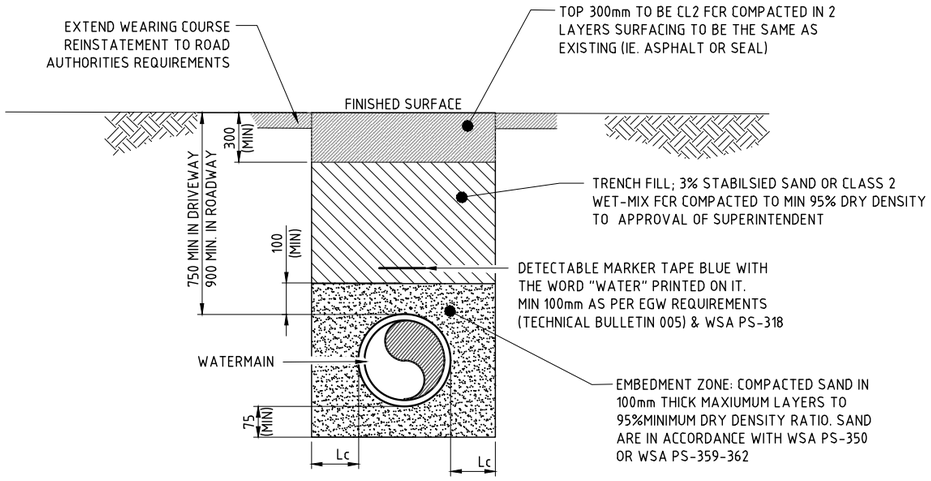
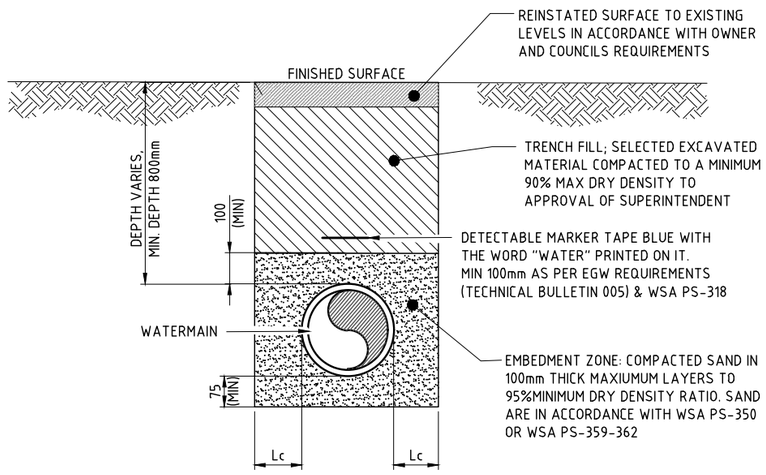
STANDARD DETAILS - 2 CONNECTIONS

DATE: OCTOBER 2020
DRAWING No: SD-002-2020
Rv. A



TYPICAL TRENCH DETAIL TRAFFICABLE LOCATIONS



TYPICAL TRENCH DETAIL NON-TRAFFICABLE LOCATIONS

PIPE DN	Lc
100	100
150	100
180	150
200	150
225	150
300	150-200

BEDDING AND BACKFILLING MATERIALS

NOT TO SCALE

NOTES:

1. BEDDING MATERIAL SHALL COMPLY WITH EITHER WSA PS - 350, 361 OR 362, FROM THE WSA PRODUCT SPECIFICATIONS, REFER TO SPECIFICATION FOR COMPACTION STANDARDS.

COMPACTION TESTING NOTES:

1) COMPACTION TESTING TO BE COMPLETED IN ACCORDANCE WITH WSA 03-2011 SECTION 19.3.
2) ALL COMPACTION TEST REPORTS TO BE PROVIDED TO THE SUPERINTENDENT WITHIN 2 BUSINESS DAYS OF TEST COMPLETION.
3) MINIMUM COMPACTION REQUIREMENT IS 95% DRY DENSITY RATIO (DDR) FOR TRAFFICABLE AREAS, 90% DDR FOR NON-TRAFFICABLE AREAS.
4) MINIMUM COMPACTION TESTING FREQUENCY IS ONE TEST PER 300mm DEPTH & 300M2 AREA FOR TRAFFICABLE AREAS, 900mm DEPTH & 1200m^2 AREA FOR NON-TRAFFICABLE AREAS.
5) WHERE ANY COMPACTION TEST DOES NOT MEET THE MINIMUM COMPACTION REQUIREMENTS ABOVE, RE-TESTING & RECTIFICATION WORKS SHALL BE COMPLETED BY THE CONTRACTOR IN ACCORDANCE WITH WSA 03-2011 SECTION 19.3.2.5.
6) THE CONTRACTOR SHALL COMPLETE ADDITIONAL COMPACTION TESTS WHERE DIRECTED BY THE SUPERINTENDENT. - WHERE ADDITIONAL TEST/S FAIL THE MINIMUM COMPACTION REQUIREMENTS OF 2) ABOVE, THESE TEST/S, ALL RECTIFICATION WORKS AND RE-TESTING AT COMPLETION SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. - WHERE THE ADDITIONAL TEST/S PASS, THE CONTRACTOR SHALL BE ENTITLED TO A VARIATION TO THE VALUE OF THE ADDITIONAL TEST/S.

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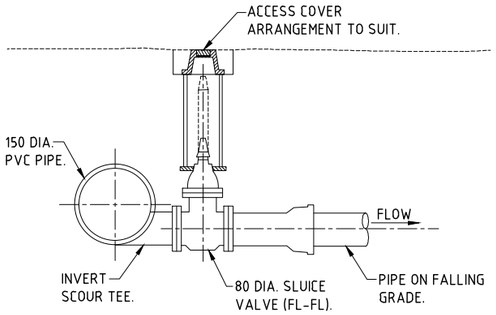
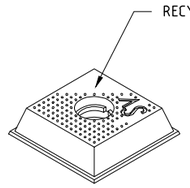
STANDARD DETAILS - 3
TRENCHING & BACKFILLING
DATE: OCTOBER 2020
DRAWING No: SD-003-2020
Rv. A

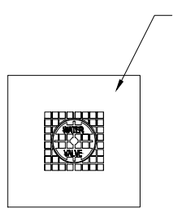


SCOUR CONNECTION DETAIL
NOT TO SCALE

WASH OUT COVER & SURROUND
NOT TO SCALE



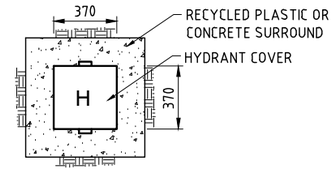
NON TRAFFICABLE AREAS



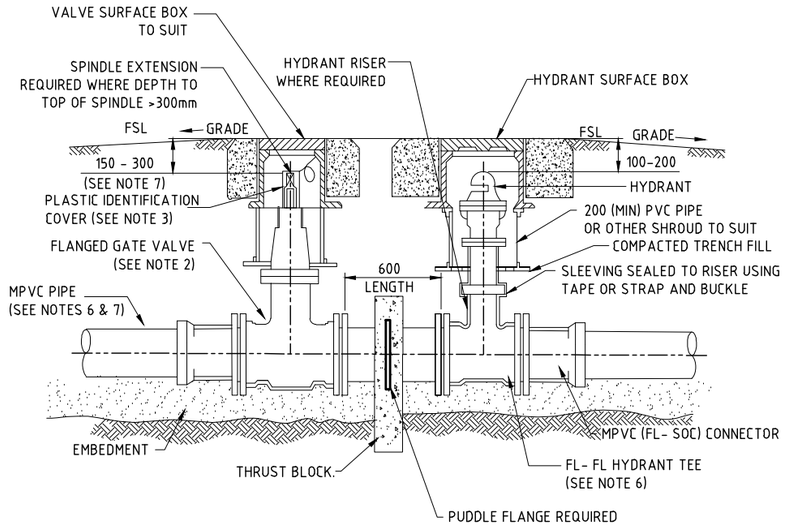
TRAFFICABLE VALVE COVERS
IN NATURSTRIPS

TRAFFICABLE VALVE COVERS
PAVED AREAS
(NO SURROUND)

VALVE COVERS & SURROUNDS
NOT TO SCALE

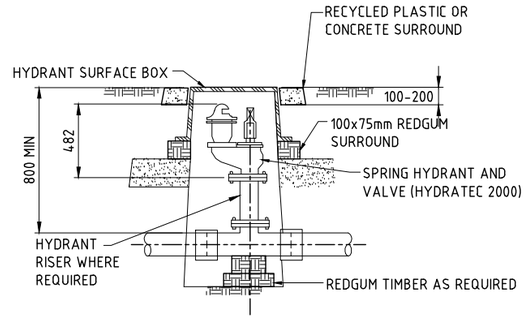


PLAN



REFER TO FIG. 8.2 WSA-03-2011

VALVE, PUDDLE FLANGE & HYDRANT AT STANDARD DEPTHS
REFER TO FIG. 8.2 WSA-03-2011

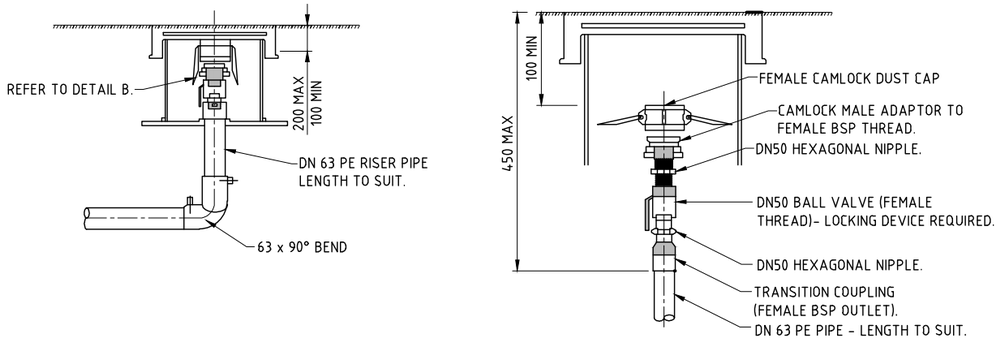


TYPE F.P 2

TYPCIAL FIRE PLUG DETAIL
NOT TO SCALE

NOTES:

1. FIRE PLUG ASSEMBLY TO BE 80mm NOM UNLESS OTHERWISE SPECIFIED

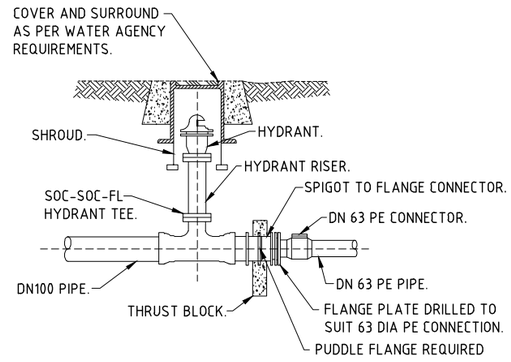


DETAIL B

DN 63 PE WASH OUT (FLUSHING) POINT (IN-LINE)
NOT TO SCALE

NOTES:

1. ALL DIMENSIONS IN MILLIMETRES.
2. VALVES DN 200 AND GREATER TO BE RESTRAINED WHERE SPECIFIED BY WATER AGENCY UNLESS SPECIFIED OTHERWISE ON THE DESIGN DRAWINGS.
3. WHERE SPECIFIED BY WATER AGENCY INSTALL PLASTIC IDENTIFICATION COVERS. TOP OF IDENTIFICATION COVERS AND SURFACE BOX TO BE PAINTED WITH AN APPROVED ROAD MARKING PAINT.SEE TABLE FOR COLOUR CODES.
4. TO PREVENT THE TRANSFER OF TRAFFIC LOAD TO THE MAIN, ENSURE SHROUD AND ANY SHROUD SUPPORT RING DOES NOT COME IN CONTACT WITH THE GATE VALVE OR HYDRANT.
5. INSTALL AN EXTENSION SPINDLE WHERE DEPTH FROM SURFACE LEVEL TO TOP OF GATE VALVE EXCEEDS 350.
6. DI PIPES AND FITTINGS WITH BITUMINOUS EXTERNAL COATING TO BE PROTECTED WITH POLYETHENE SLEEVING.
7. DEPTH OF MAIN MAY BE LOCALLY INCREASED TO ACHIEVE REQUIRED MINIMUM VALVE SPINDLE COVER.
8. ALL VALVES ARE TO BE ANTI CLOCKWISE CLOSING.



HYDRANT- PVC TO PE CONNECTION
NOT TO SCALE

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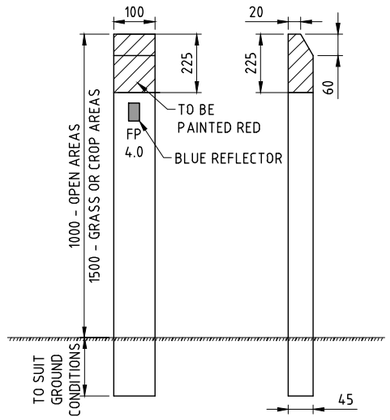
STANDARD DETAILS - 4
VALVES & HYDRANTS

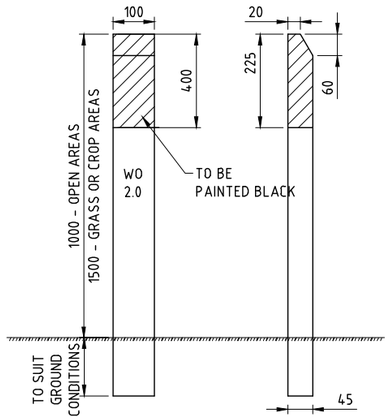
DATE: OCTOBER 2020

DRAWING No: SD-004-2020

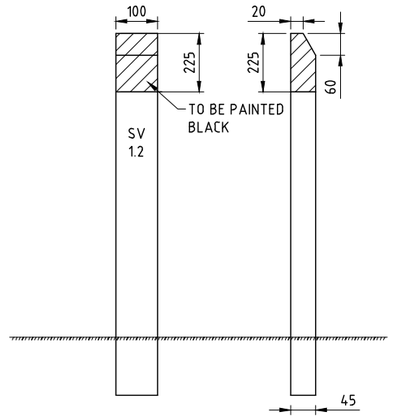
Rv. A



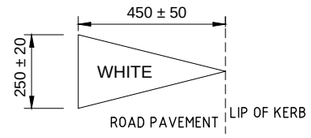
FIRE PLUG MARKER POST
NOT TO SCALE



WASH OUT MARKER POST
NOT TO SCALE



VALVE MARKER POST
NOT TO SCALE



WHITE REFLECTIVE TRIANGLE
REFER TO MRWA-W-301 ROAD PAVEMENT HYDRANT REFLECTIVE PATCH
NOT TO SCALE

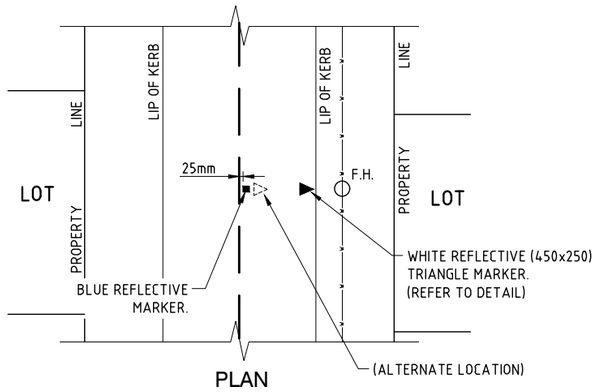
BLUE REFLECTIVE CATS EYE
REFER TO MRWA-W-301 ROAD PAVEMENT HYDRANT REFLECTIVE PATCH
NOT TO SCALE

MARKER POST MARKING LEGEND:

AV	AIR VALVE	WM	WATERMAIN
SCV	SCOUR VALVE	WO	WASH OUT
SV	STOP VALVE		
FP	FIRE PLUG		

NOTES:

1. MARKER POSTS ARE TO BE INSTALLED ADJACENT TO STOP VALVES, VALVES AND FIREPLUG AS DIRECTED.
2. MARKER POSTS ARE TO BE MADE FROM RECYCLED PLASTIC OR POWDERED COATED STEEL
3. FIRE PLUGS SHALL BE MARKED 'FP' AND HAVE A RED NON-REFLECTIVE TOP OF AT LEAST 225mm IN LENGTH, BLUE REFLECTIVE MARKER 36mmx20mm, AND BE INSTALLED IN SUCH A MANNER AS TO HAVE THE REFLECTIVE MARKERS VISIBLE TO THE DIRECTION OF APPROACHING TRAFFIC.
4. MARKER POSTS ARE TO BE AT LEAST 1000mm IN HEIGHT ABOVE THE FINISHED GROUND LEVEL AND BE INSTALLED IN SUCH A MANNER AS TO ENSURE THEY WILL NOT BE EASILY REMOVED (EG. CONCRETED OR TO MANUFACTURERS SPECIFICATION).
5. MARKER POSTS ARE TO BE LOCATED NEXT TO THE ASSET. DISTANCE TO THE MAIN (TO NEAREST 0.1m) MUST BE INCLUDED ON ALL POSTS THAT ARE NOT ADJACENT TO THE ASSET.
6. ANY MARKER POSTS WHICH HAVE A TAPERED TOP DESIGN TO INDICATE THE DIRECTION OF THE VALVE OR FIRE PLUG, MUST BE INSTALLED WITH THE TAPER FACING TOWARDS THE ASSET.
7. LETTERS 65mm HIGH & 40mm WIDE STENCILED & PAINTED BLACK
   NUMBERS 50mm HIGH & 25mm WIDE STENCILED & PAINTED BLACK



RAISED REFLECTIVE ROAD MARKERS
NOT TO SCALE

NOTES:

1. BLUE RAISED REFLECTIVE ROAD MARKERS, WHEN USED, MUST COMPLY WITH AS 1906.3-1992 - RETOREFLECTIVE MATERIALS AND DEVICES FOR ROAD TRAFFIC CONTROL PURPOSES - RAISED PAVEMENT MARKERS (RETOREFLECTIVE AND NON-RETROREFLECTIVE) AND ARE TO BE INSTALLED 25mm FROM THE CENTRE LINE OF THE ROAD FOR SINGLE CARRIAGEWAYS ON THE HYDRANT SIDE OR 25mm FROM THE LANE MARKING LINE ON THE HYDRANT SIDE FROM MULTIPLE CARRIAGEWAYS AND DIVIDED ROADS.
2. WHITE REFLECTIVE TRIANGLE MARKERS MUST: MEET THE REQUIREMENTS OF AUSTRALIAN STANDARD AS 4049.2 2005 - PAINTS AND RELATED MATERIALS - PAVEMENT MARKING MATERIALS - THERMOPLASTIC PAVEMENT MARKING MATERIALS - FOR USE WITH SURFACE APPLIED GLASS BEADS OR AS PER WATER AGENCY PRODUCTS CATALOGUE OR USING VICROADS APPROVED MARKING PAINT. THEY ARE TO BE APPROXIMATELY 450mm LONG BY 250mm WIDE, THE TIP OF THE TRIANGLE MUST POINT TO THE LOCATION OF THE HYDRANT AND THEY ARE TO BE INSTALLED ON THE EDGE OF THE ROAD (KERB SIDE, BUT NOT ON THE KERB ITSELF).
3. APPLY AS PER MANUFACTURERS INSTRUCTIONS. ROUGHEN SURFACE WITH COLD CHISEL & USE WIRE BRUSH TO THOROUGHLY CLEAN SURFACE BEFORE APPLICATION. ATTACH TO GROUND USING HOTMELT MARKER ADHESIVE (BITUMINOUS) OR TWO PACK EPOXY ADHESIVE AS PER AS1906.3.

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STANDARD DETAILS - 5
POSTS & MARKERS

DATE: OCTOBER 2020

DRAWING No: SD-005-2020

Rv. A