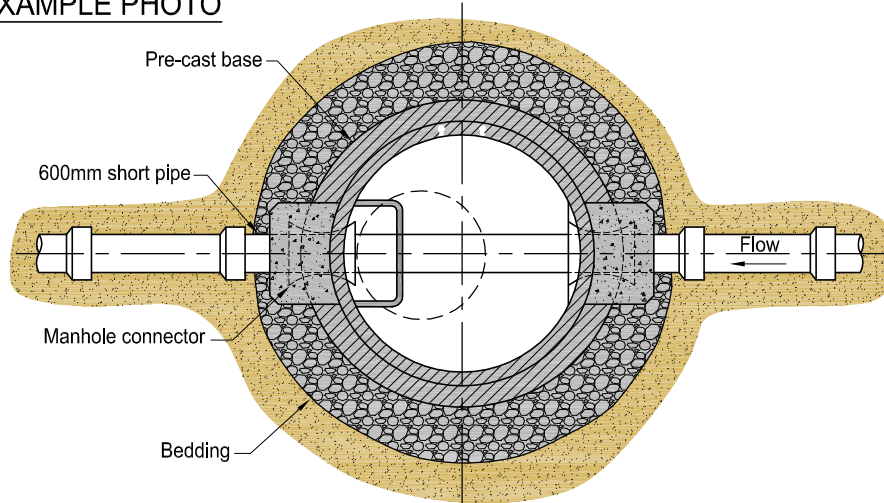




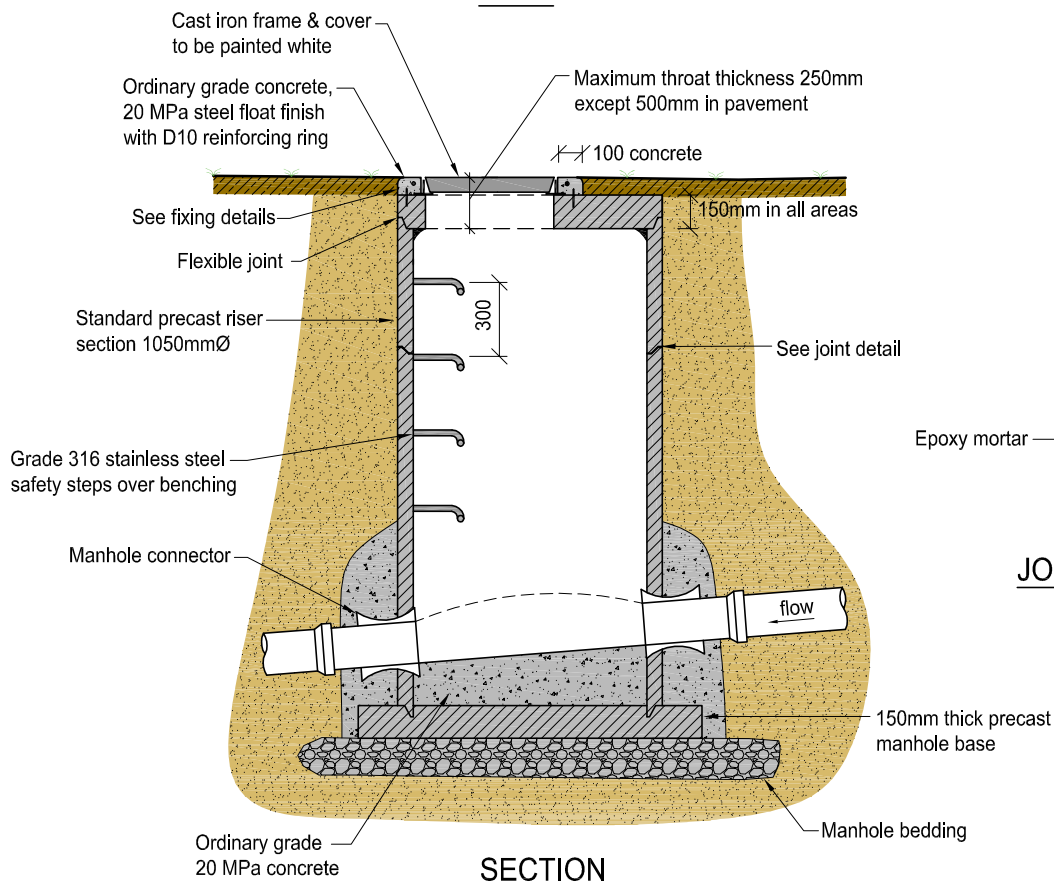
EXAMPLE PHOTO

NOTES:

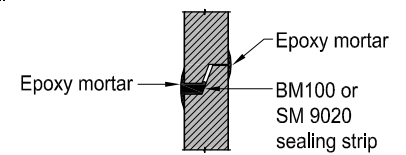
1. Haunching of intersection pipes to provide curved channels to ensure streamline flow.
2. Standard precast manhole components to be used unless approved otherwise.
3. Orientate lid opening and steps to put frame & cover clear of any kerblines.



PLAN



SECTION



JOINT DETAIL

STRUCTURE
MANHOLE - STANDARD

W601

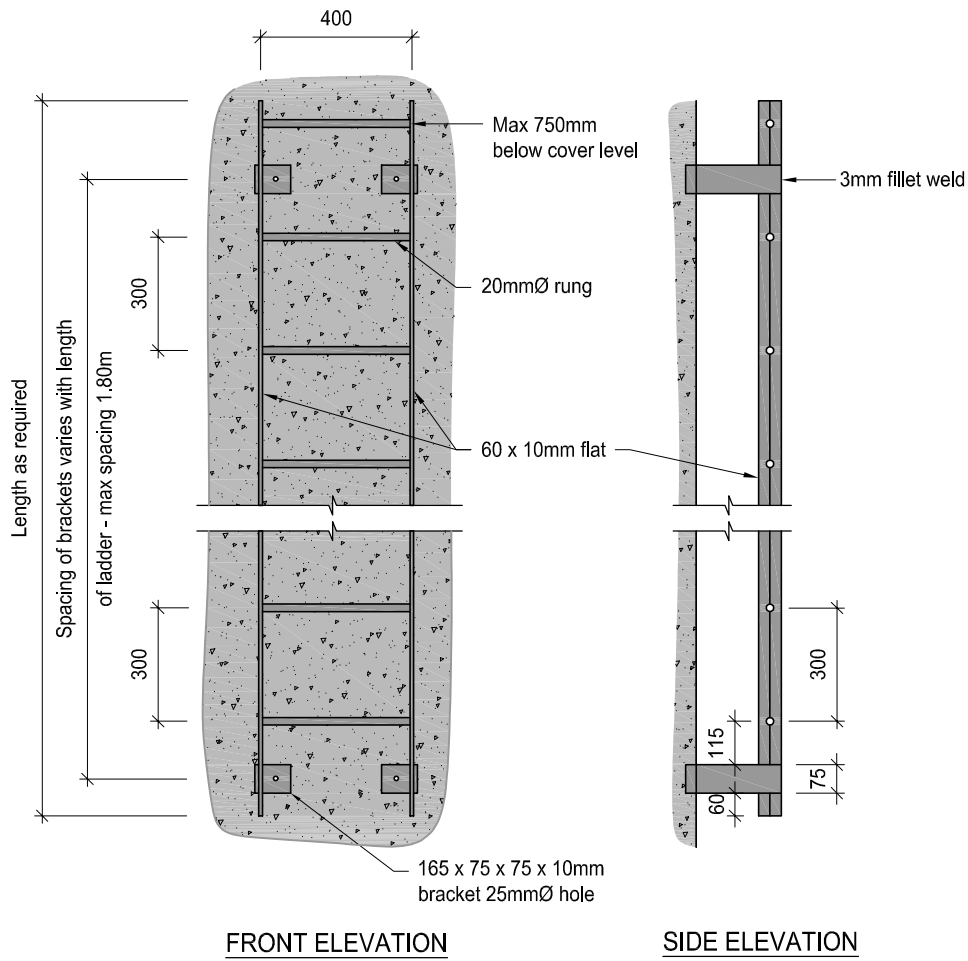
DEVELOPMENT CODE

VERSION 1
AUG 09

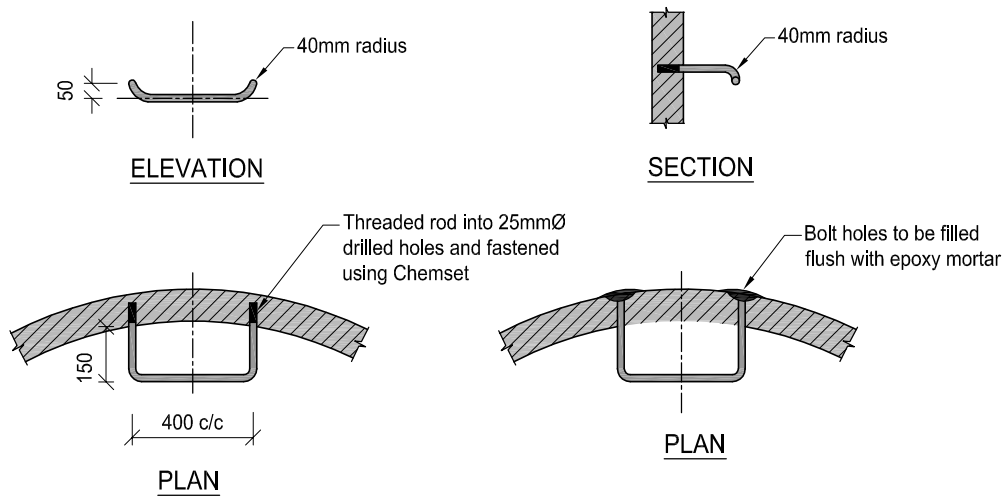
1

NOTES:

1. Manhole ladder to be hot dip galvanized or to be stainless steel.



MANHOLE LADDER



SAFETY STEP IRON DETAILS

STRUCTURE
MANHOLE - LADDER & STEPS

W603

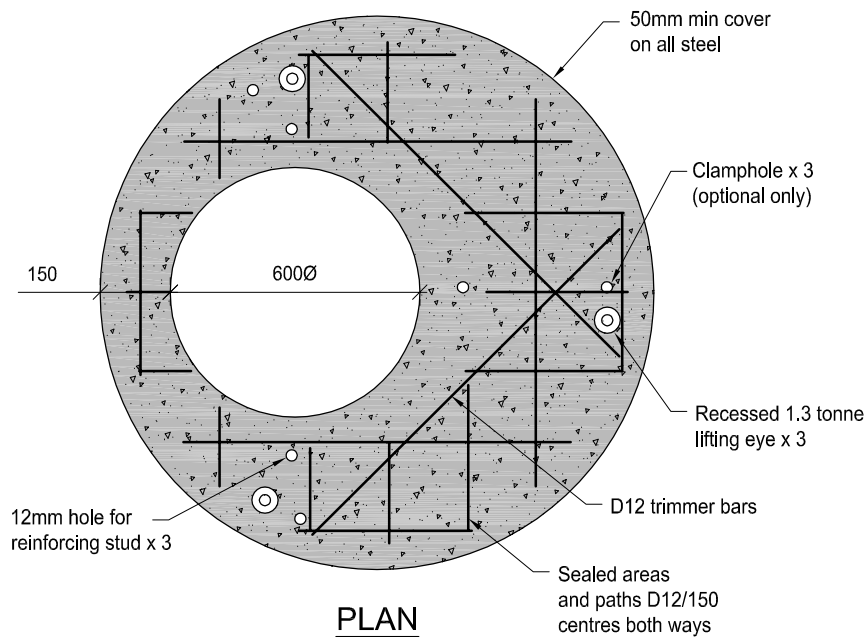
DEVELOPMENT CODE

VERSION 1
AUG 09

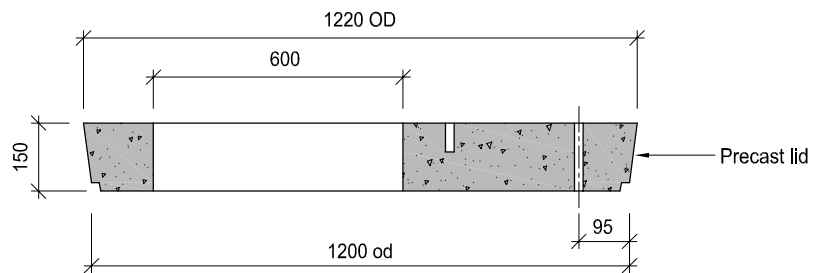
1

NOTES:

1. Standard heavy duty lid 150mm thick except in State Highways (designed for 51kN wheel load).
2. Extra heavy duty for State Highway HN-HN-72.



PLAN



SECTION THROUGH LID

STRUCTURE

MANHOLE - PRECAST 1050mmØ LID

W604

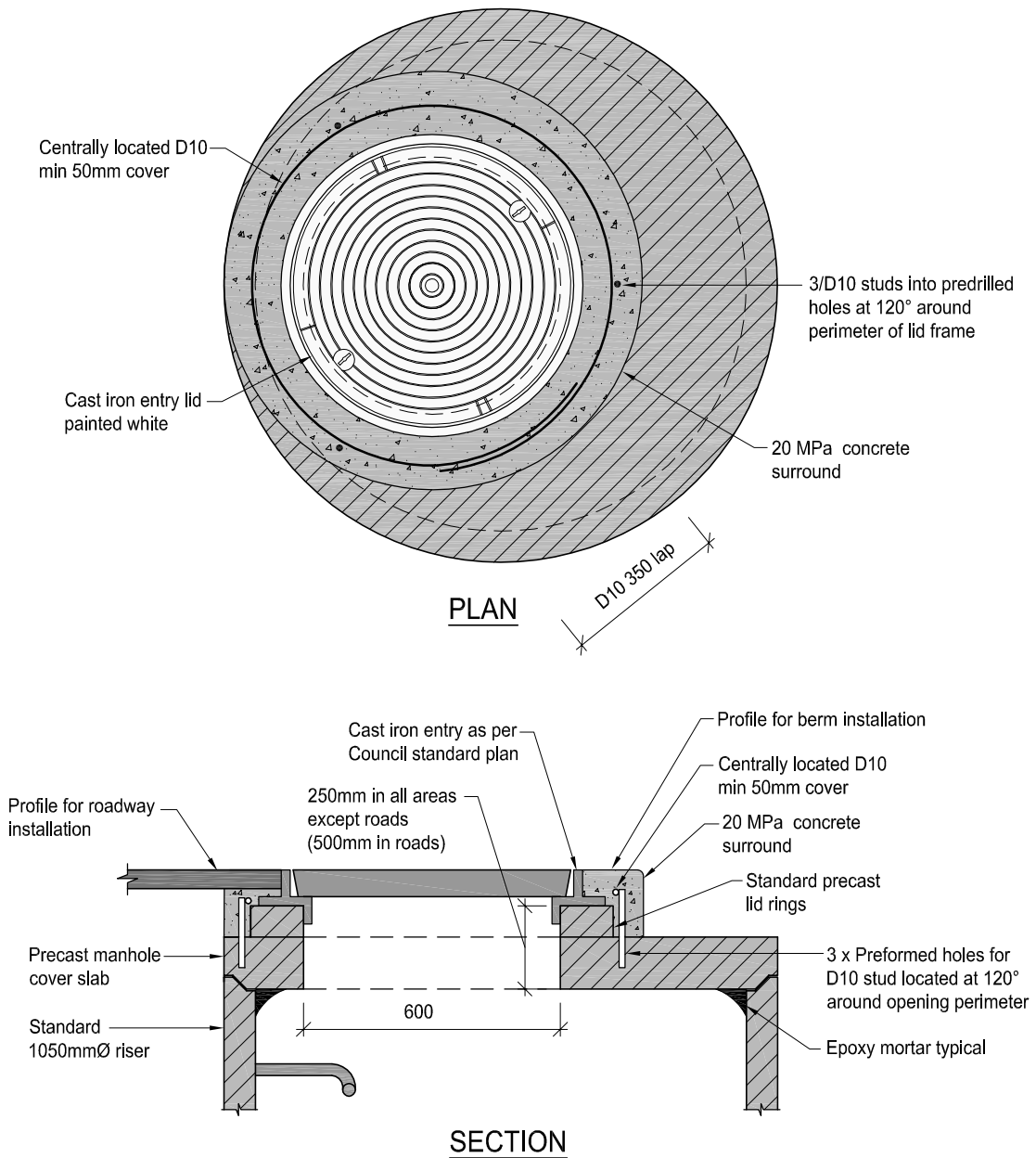
DEVELOPMENT CODE

VERSION 1
AUG 09

1

NOTES:

1. Cast iron entry lid to be constructed to the existing ground contour as appropriate.



STRUCTURE MANHOLE - ENTRY FIXING

W605

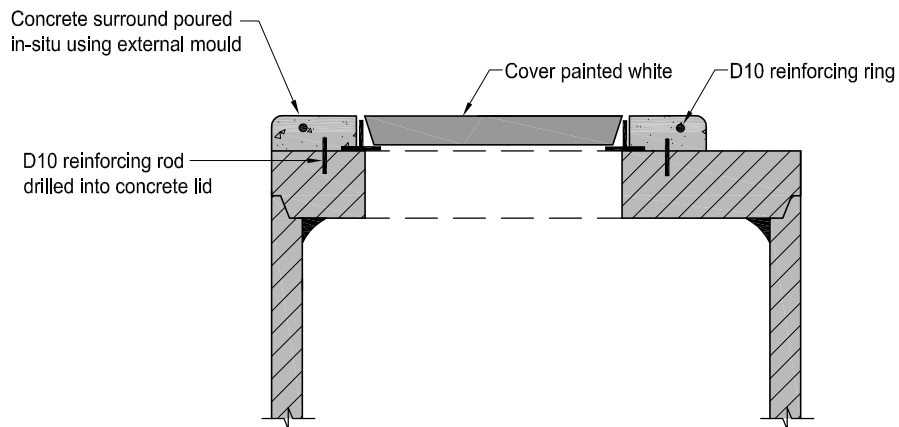
DEVELOPMENT CODE

VERSION 1
AUG 09

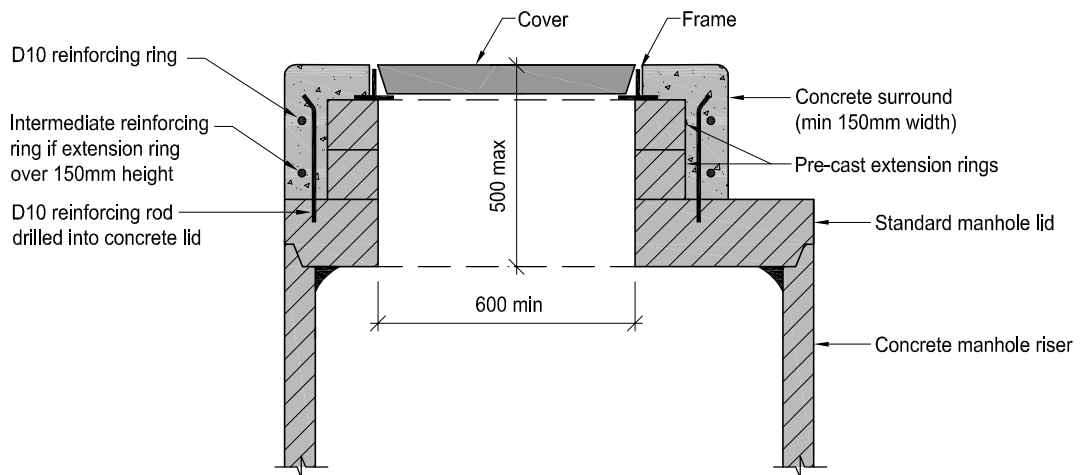
1

NOTES:

1. Non-rock covers to be used in all road carriageways.
2. Heavy duty covers to be used in all road and recreational reserves, commercial and industrial zoned areas, and residential property driveways.
3. Standard duty covers may only be used on residential properties.



STANDARD ACCESS



RAISED ACCESS

STRUCTURE

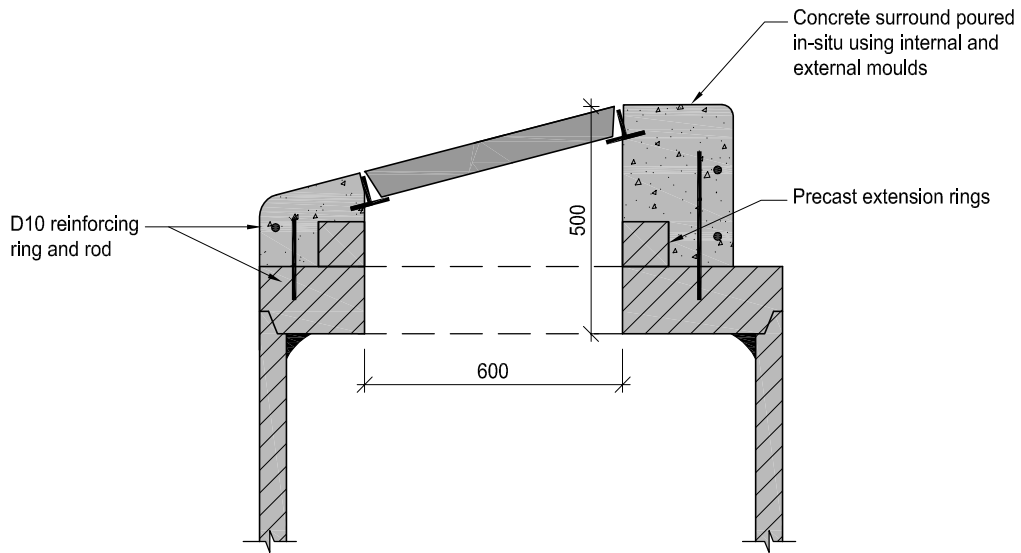
MANHOLE - STANDARD & RAISED ACCESS DETAIL

W606

DEVELOPMENT CODE

VERSION 1
AUG 09

1



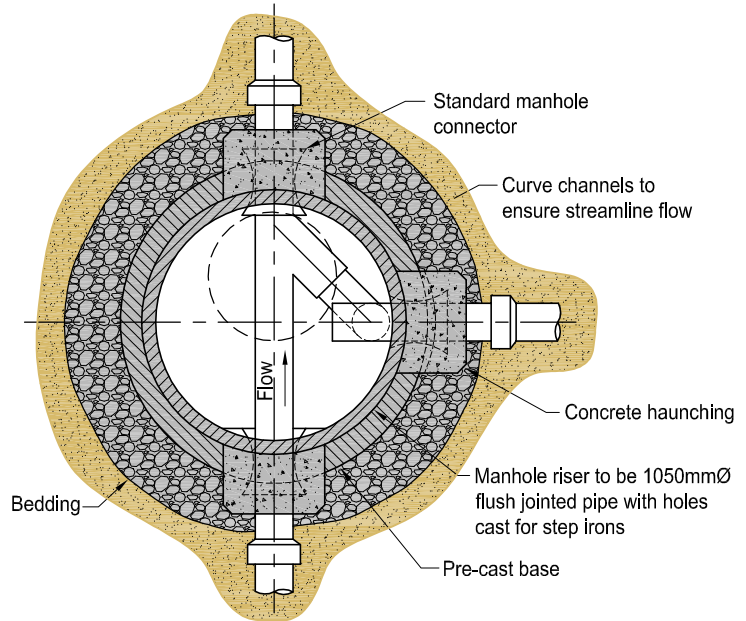
INCLINED ACCESS

STRUCTURE
MANHOLE - INCLINED ACCESS DETAIL

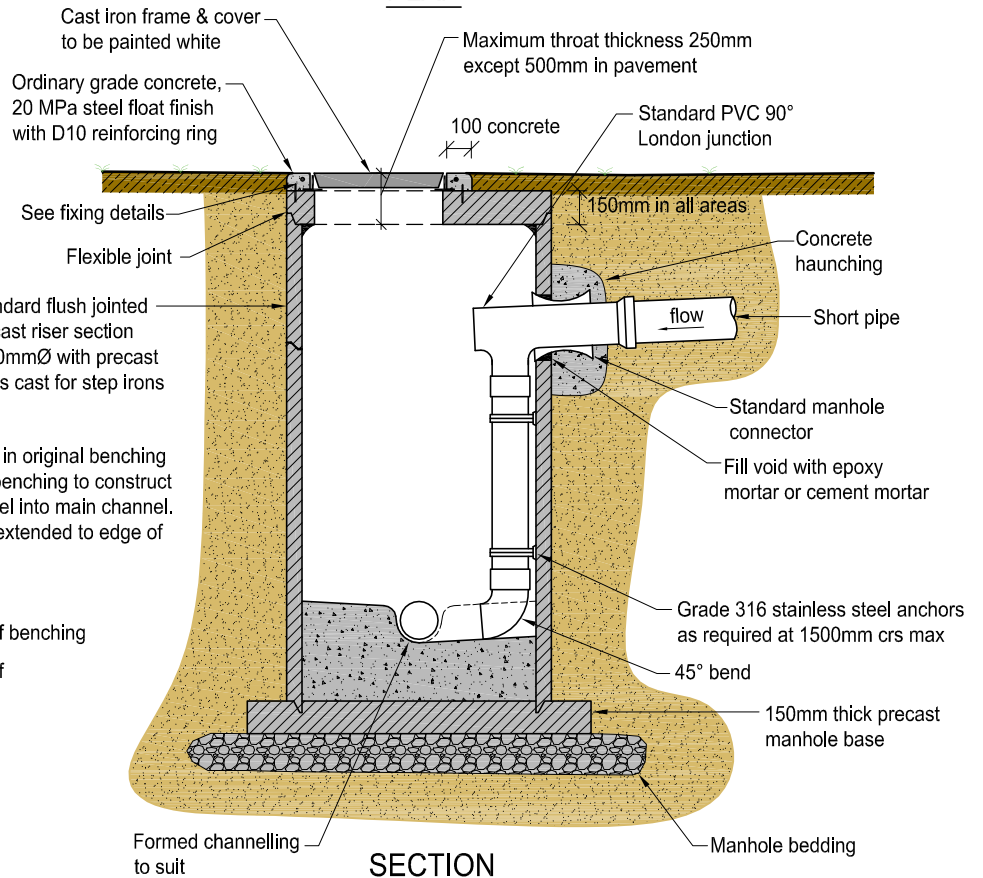
W607

NOTES:

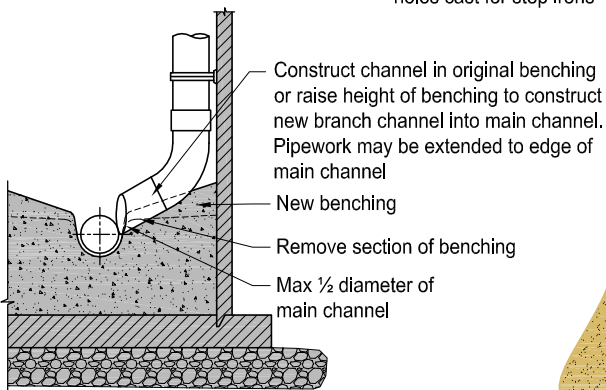
1. All steel fittings (including bolts) to be Grade 316 stainless steel.
2. 1200mmØ manhole to be used where drop pipe > 150mmØ or more than one 150mmØ internal drop is used.
3. Maximum of 3 internal drops per manhole.
4. Safety steps to be installed as per standard manhole.



PLAN



SECTION



POST CONSTRUCTION INSTALLATION SECTION

STRUCTURE

MANHOLE - INTERNAL DROP

W608

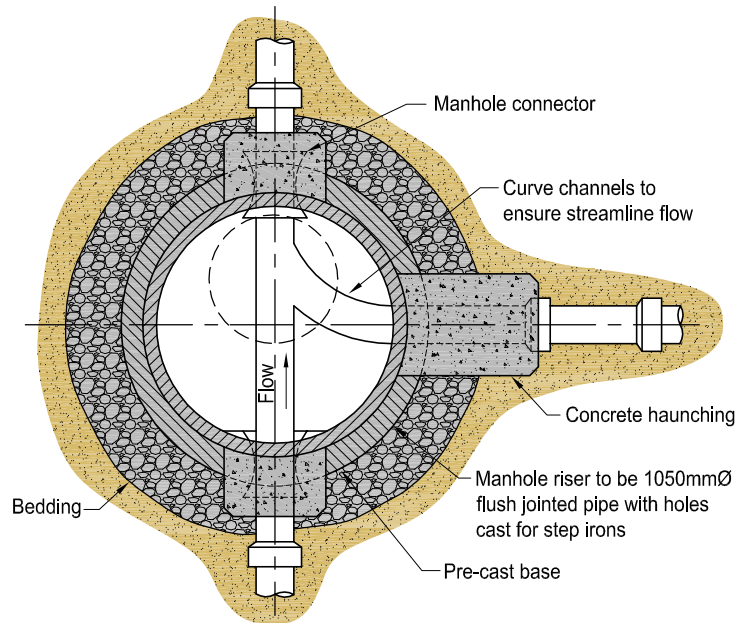
DEVELOPMENT CODE

VERSION 1
AUG 09

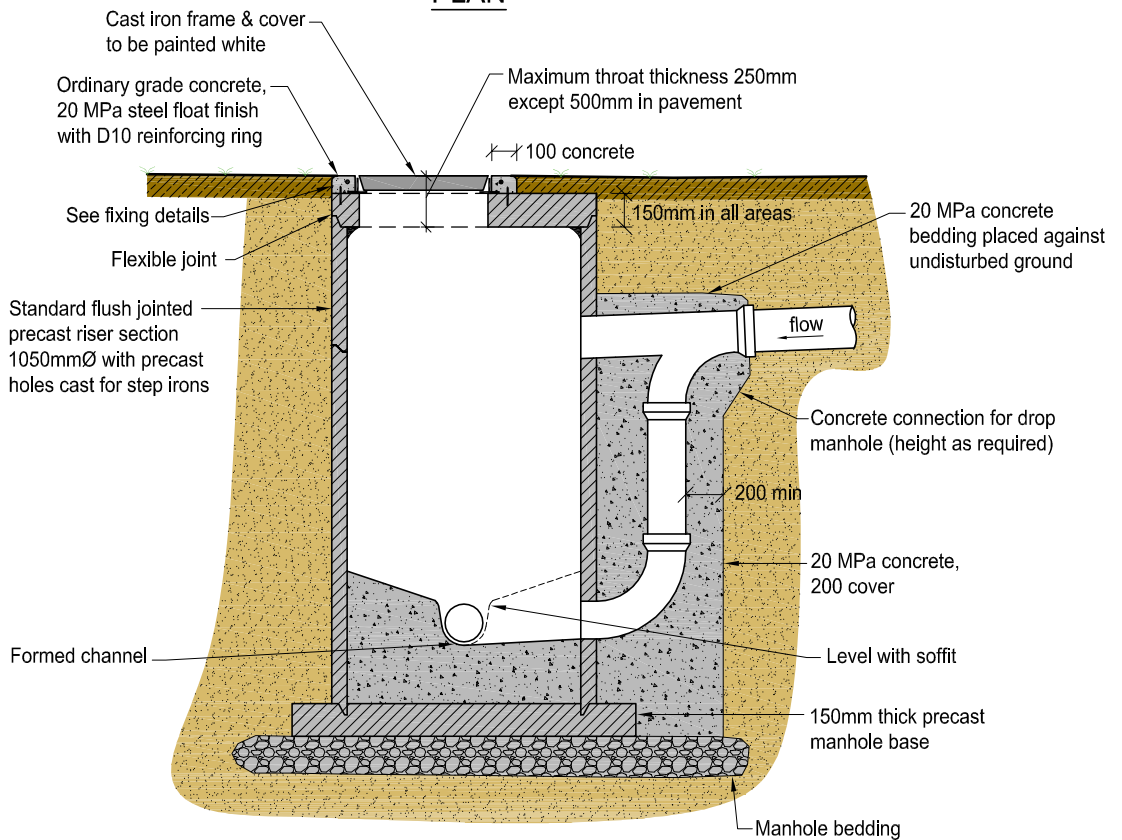
1

NOTES:

1. Safety steps to be installed as per standard manhole.



PLAN



SECTION

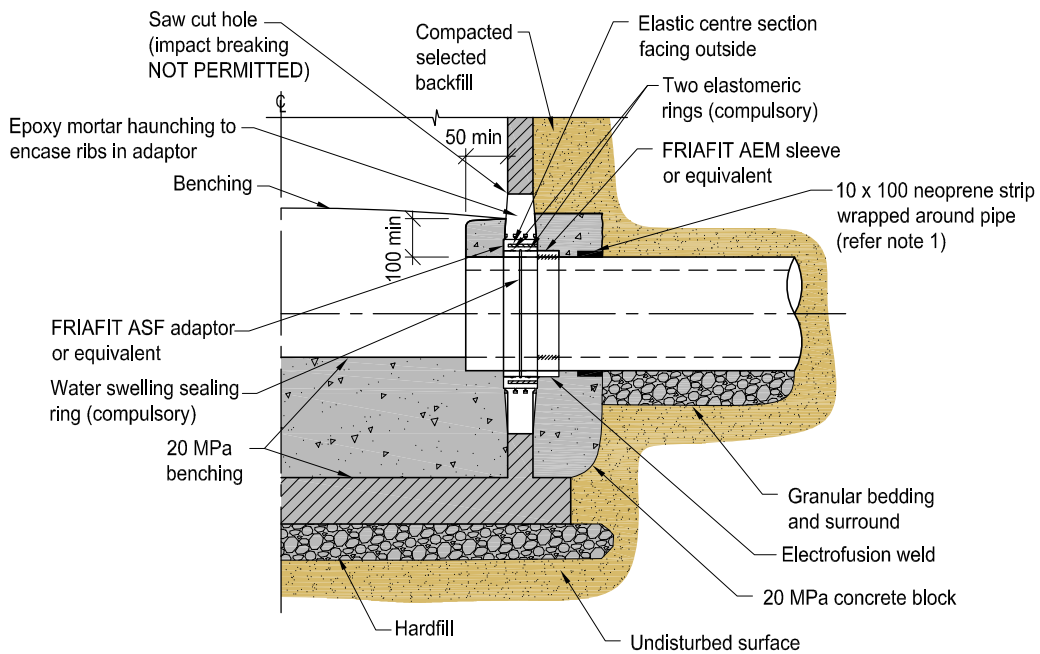
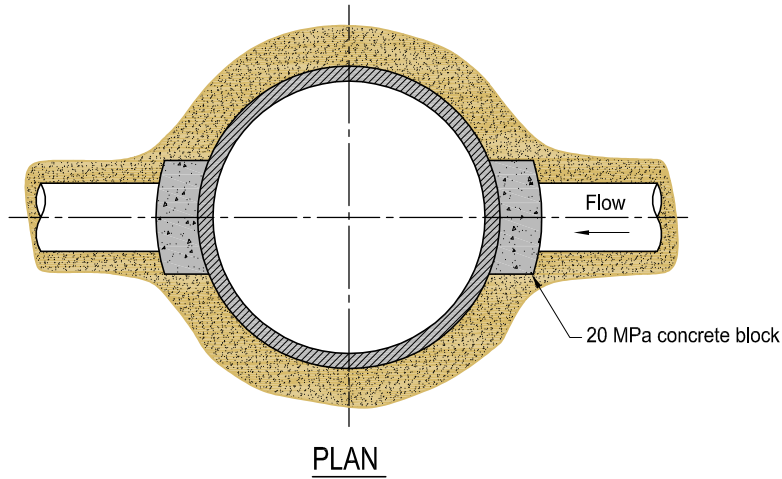
STRUCTURE

MANHOLE - EXTERNAL DROP

W609

NOTES:

1. Neoprene strip shall be wrapped round the pipe barrel, and fully embedded in concrete. Outer edge of the strip shall be flush with concrete surface.



ACCEPTABLE SOLUTION 1

STRUCTURE

MANHOLE - PE PIPE CONNECTIONS - WALL ADAPTER AND PRE-CAST MANHOLE

W610

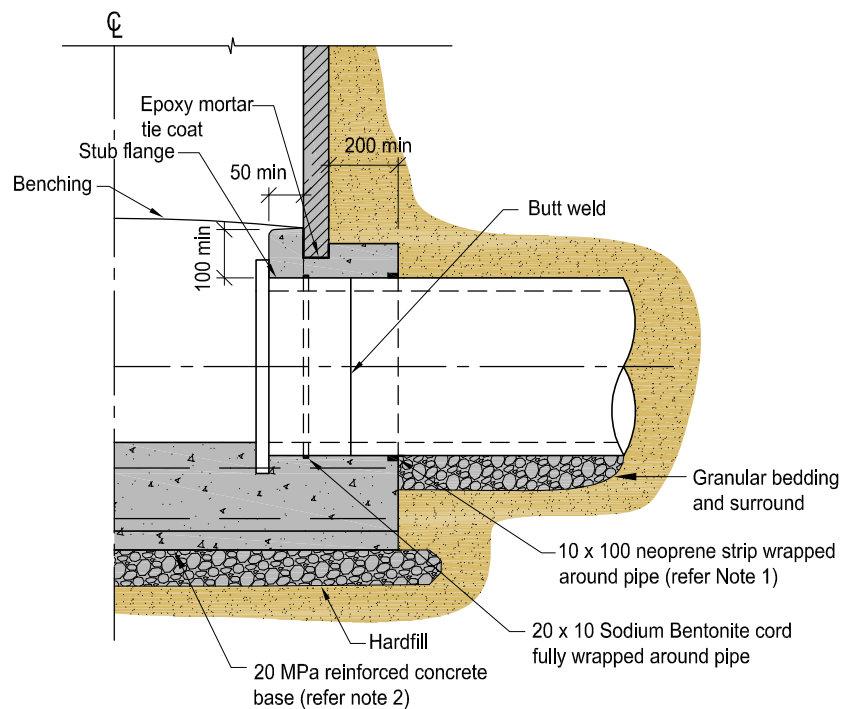
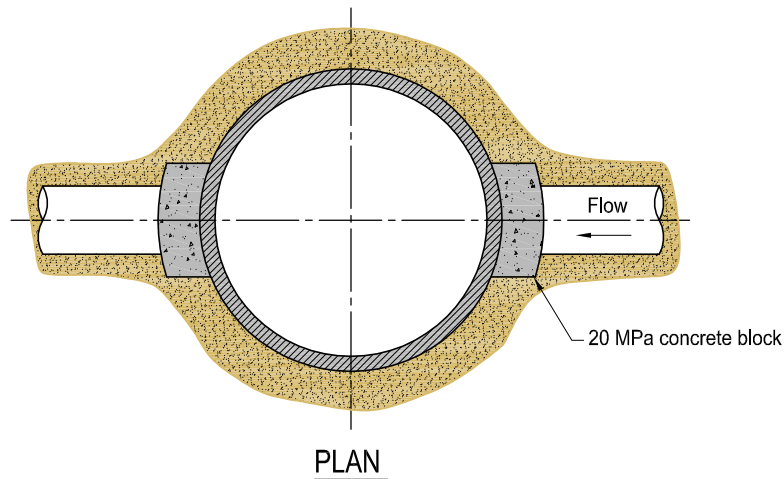
DEVELOPMENT CODE

VERSION 1
AUG 09

1

NOTES:

1. Neoprene strip shall be wrapped round the pipe barrel, and fully embedded in concrete. Outer edge of the strip shall be flush with concrete surface.
2. Reinforcement in base slab to be fabric mesh 661, top and bottom, 50mm concrete cover. Vertical reinforcement to be mesh 661.
3. Box-outs are not permitted. All inlet and outlet pipes shall be fully assembled prior to pouring the base.



STRUCTURE

MANHOLE - PE PIPE CONNECTIONS - STUB FLANGE AND IN-SITU BASE

W611

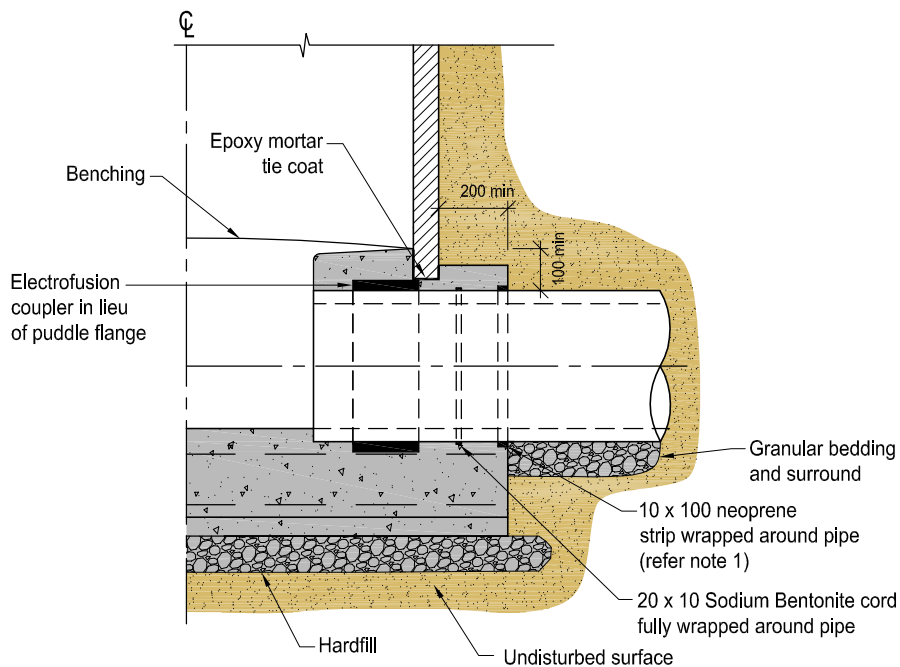
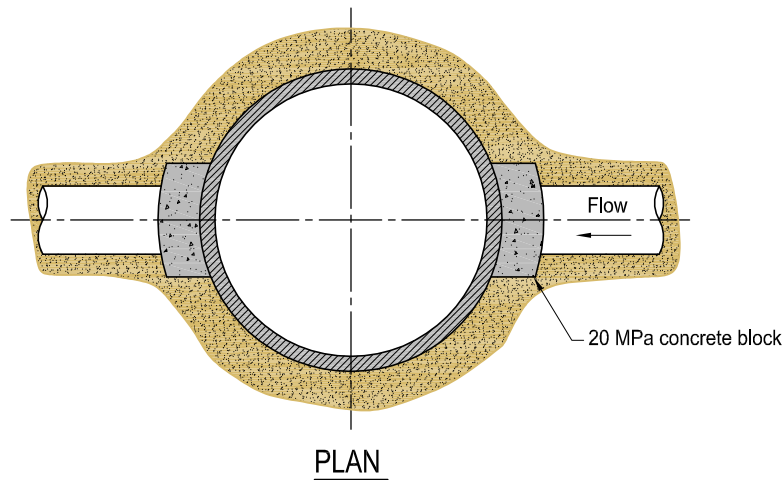
DEVELOPMENT CODE

VERSION 1
AUG 09

1

NOTES:

1. Neoprene strip shall be wrapped round the pipe barrel, and fully embedded in concrete. Outer edge of the strip shall be flush with concrete surface.
2. Reinforcement in base slab to be fabric mesh 661, top and bottom, 50mm concrete cover. Vertical reinforcement to be mesh 661.
3. Box-outs are not permitted. All inlet and outlet pipes shall be fully assembled prior to pouring the base.



ACCEPTABLE SOLUTION 3

STRUCTURE

MANHOLE - PE PIPE CONNECTIONS - ELECTROFUSION COUPLER AND IN-SITU BASE

W612

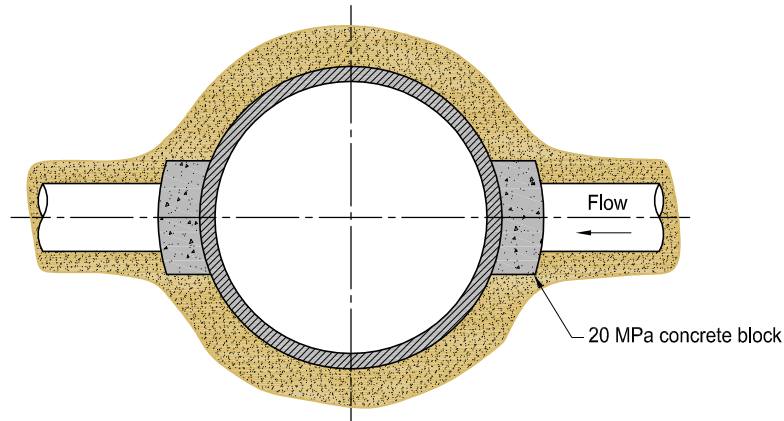
DEVELOPMENT CODE

VERSION 1
AUG 09

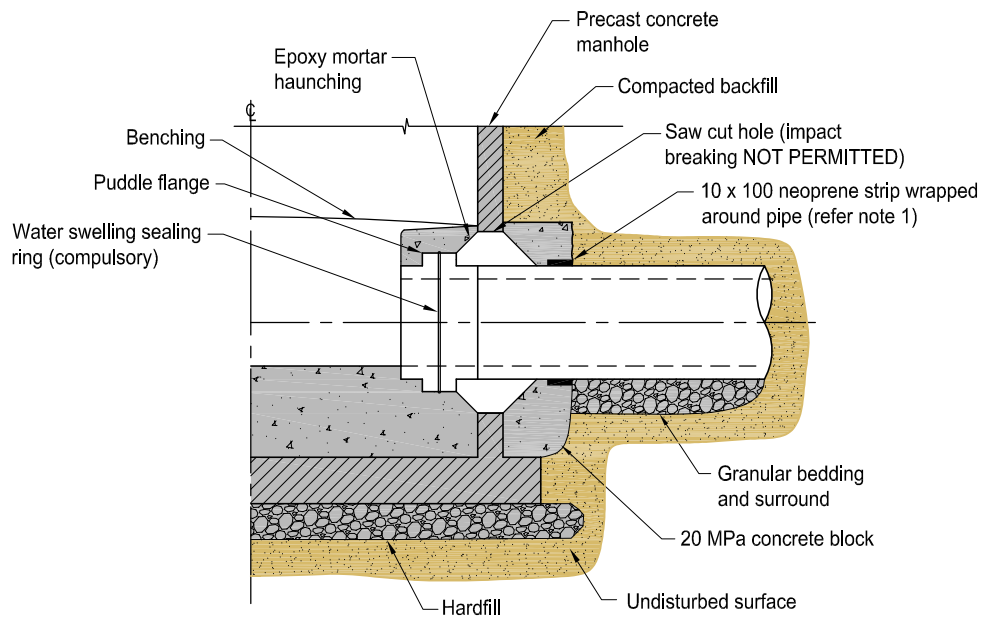
1

NOTES:

1. Neoprene strip shall be wrapped round the pipe barrel, and fully embedded in concrete. Outer edge of the strip shall be flush with concrete surface.



PLAN



ACCEPTABLE SOLUTION 4

STRUCTURE

MANHOLE - PE PIPE CONNECTIONS - PUDDLE FLANGE AND PRE-CAST MANHOLE

W613

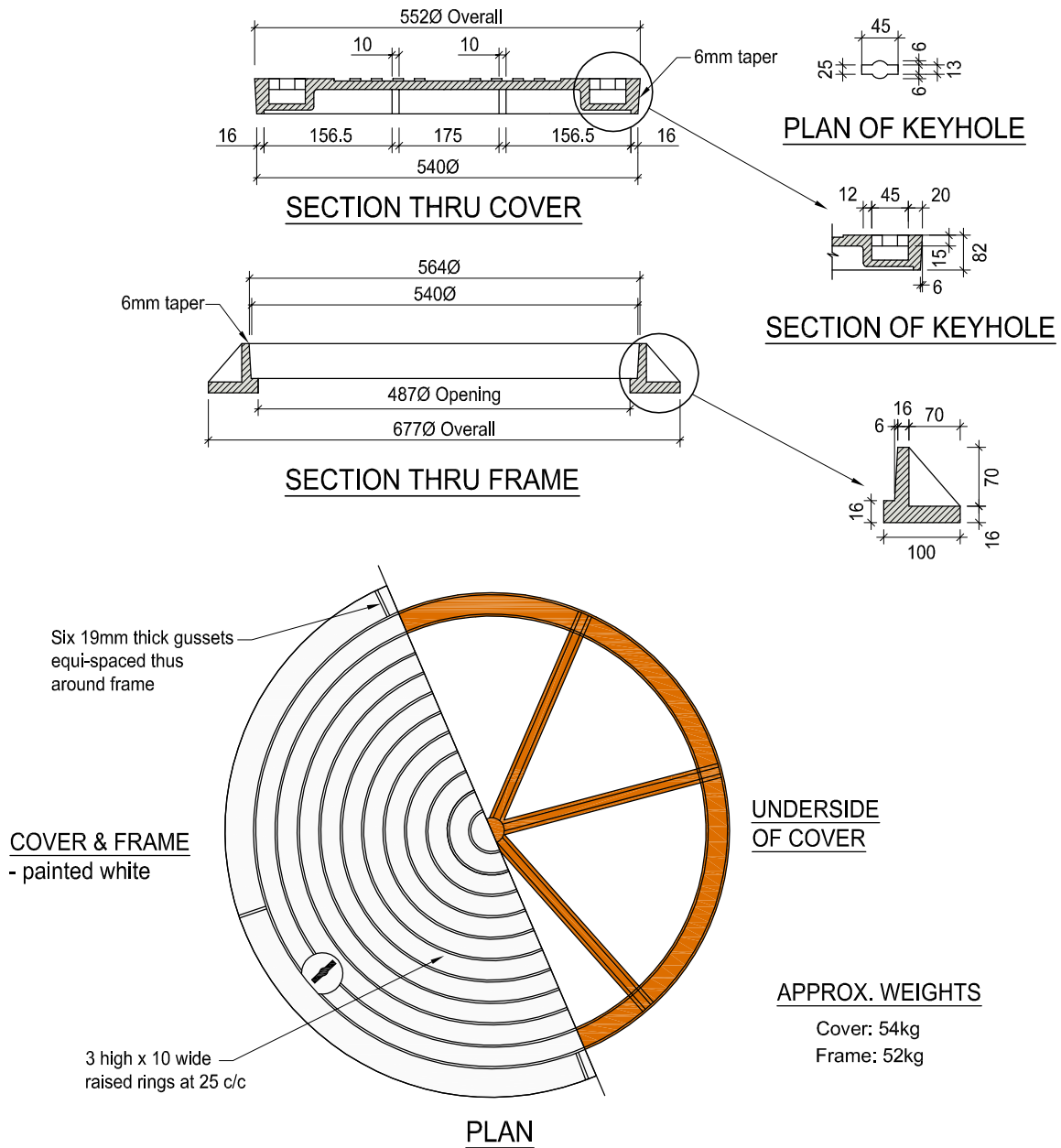
DEVELOPMENT CODE

VERSION 1
AUG 09

1

NOTES:

1. All casting to be of best quality grey iron bitumen coated.
2. Paint cover white with road marking paint.



STRUCTURE
 MANHOLE - STANDARD COVER AND FRAME

W614

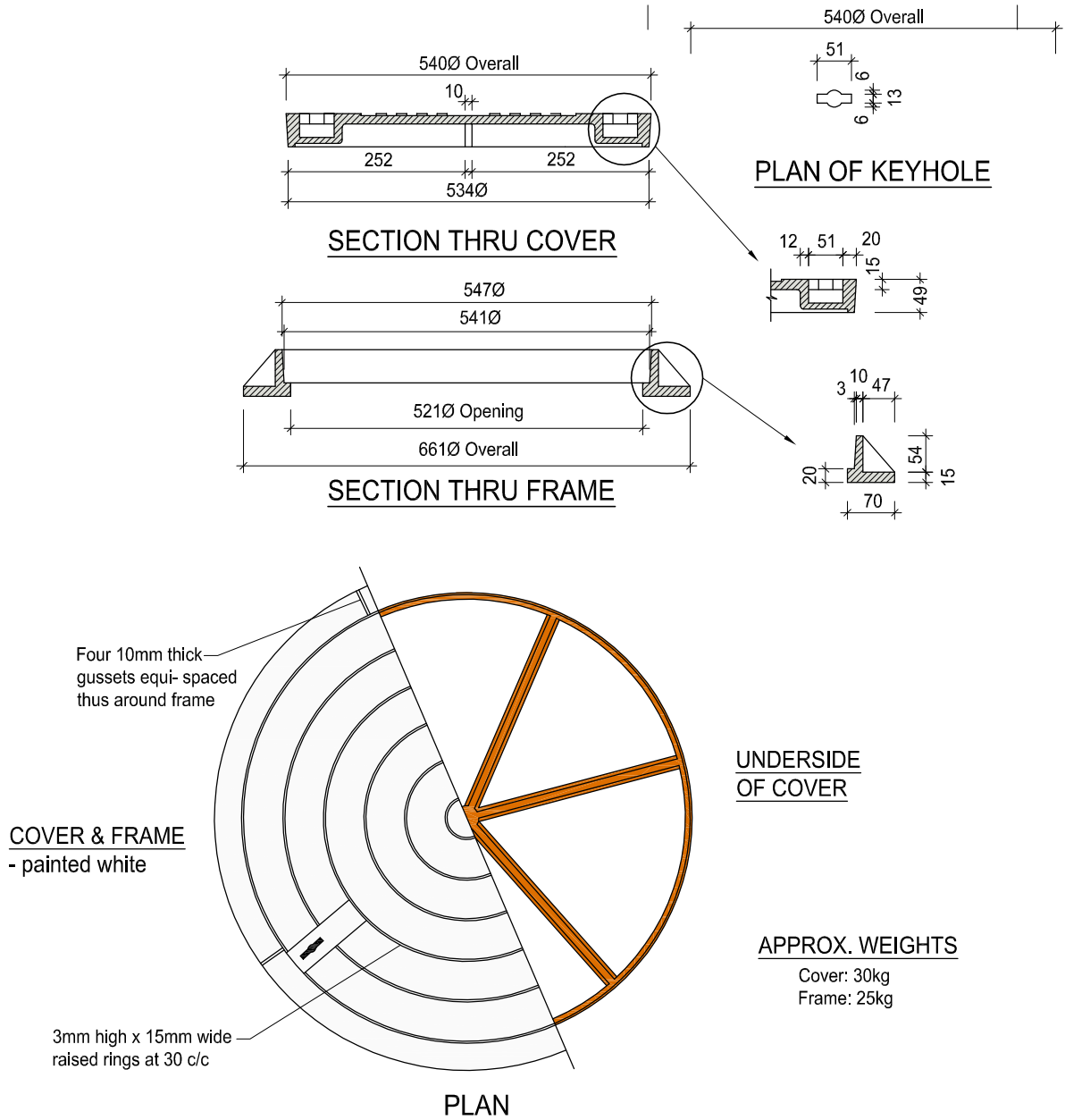
DEVELOPMENT CODE

VERSION 1
 AUG 09

1

NOTES:

1. All casting to be of best quality grey iron bitumen coated.
2. Paint cover white with road marking paint.
3. Light duty covers to be used only in special circumstances with the approval of the Council.



STRUCTURE
MANHOLE - LIGHT COVER AND FRAME

W615

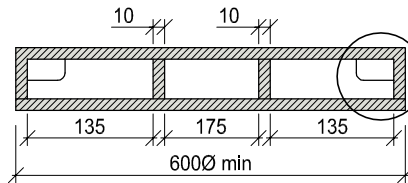
DEVELOPMENT CODE

VERSION 1
AUG 09

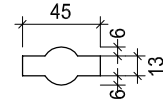
1

NOTES:

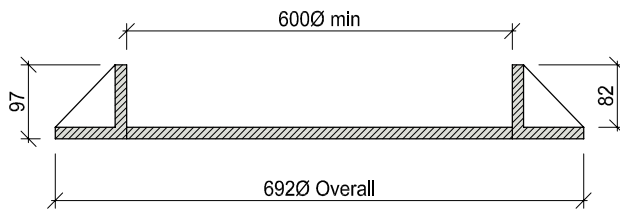
1. All casting to be of best quality grey iron bitumen coated.
2. Paint cover white with road marking paint.



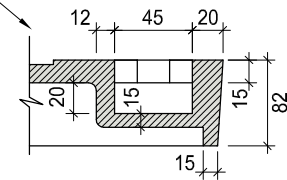
SECTION THRU COVER



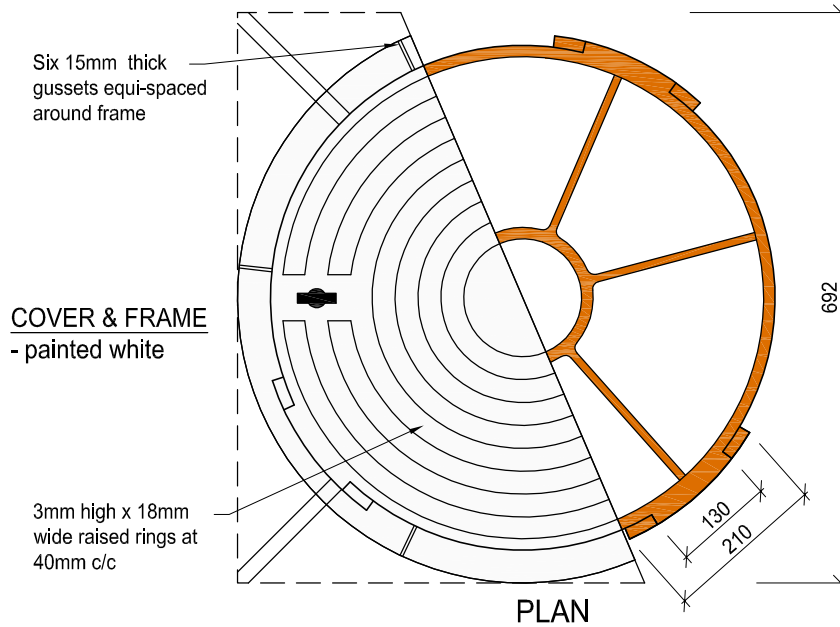
PLAN OF KEYHOLE



SECTION THRU FRAME



SECTION OF KEYHOLE



UNDERSIDE OF COVER

APPROX. WEIGHTS

Cover: 51kg
Frame: 37kg

STRUCTURE

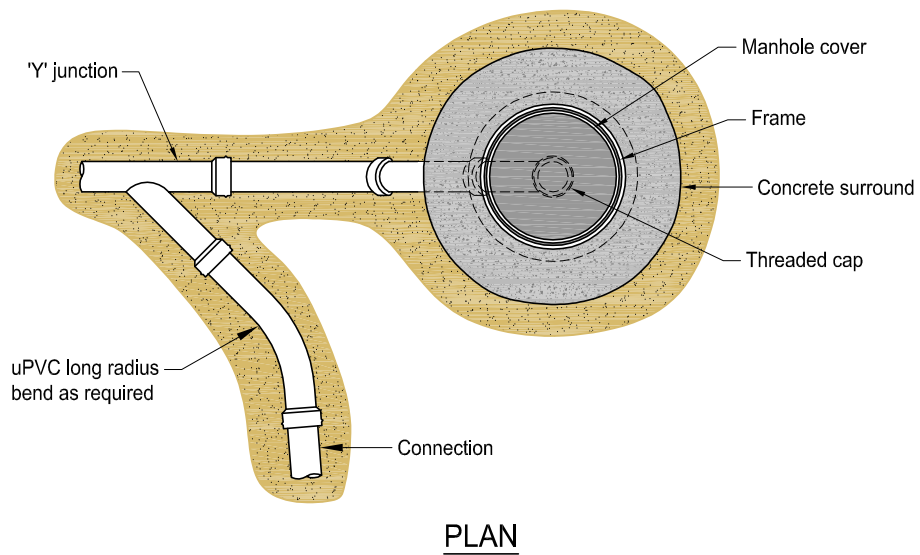
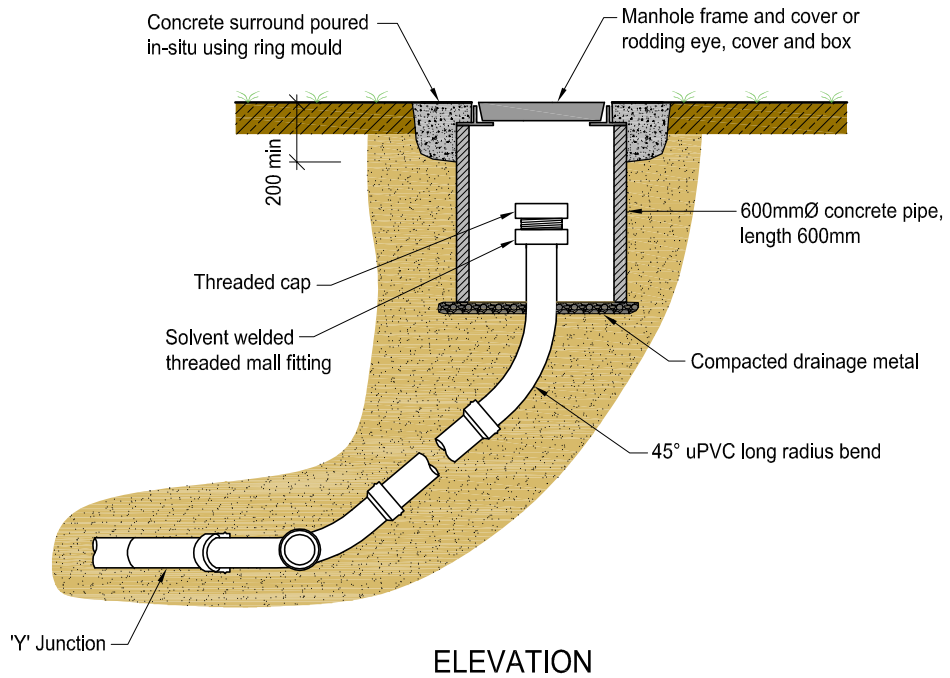
MANHOLE - HEAVY DUTY NON-ROCK TYPE COVER & FRAME

W616

DEVELOPMENT CODE

VERSION 1
AUG 09

1



STRUCTURE

RODDING EYE - SHALLOW < 2.5m

W620

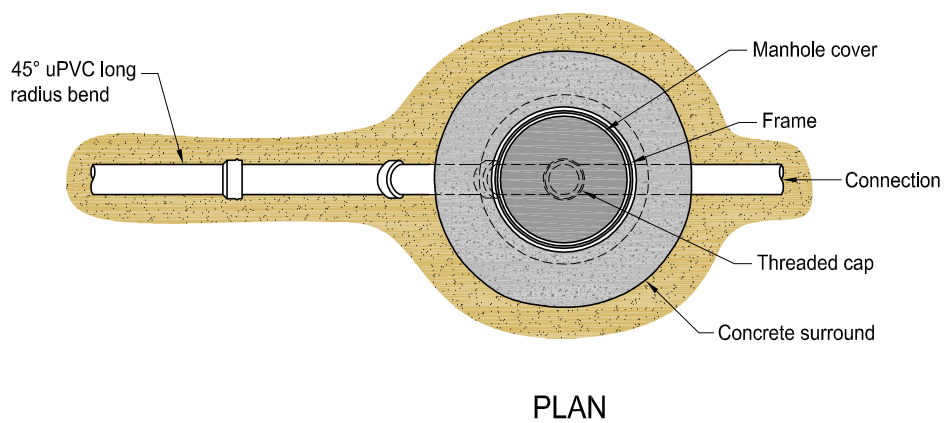
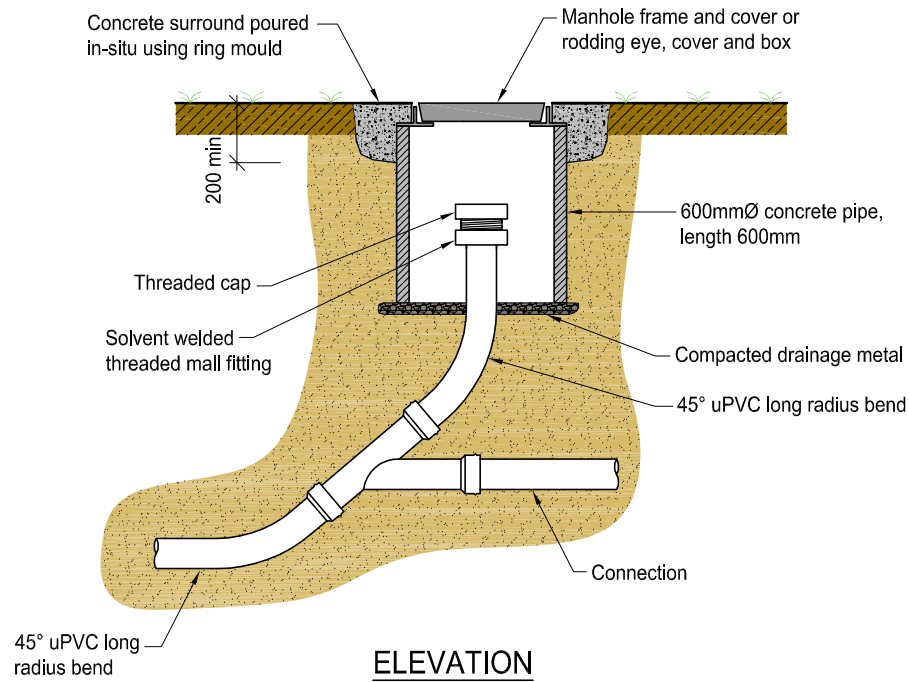
DEVELOPMENT CODE

VERSION 1
AUG 09

1

NOTES:

1. Rodding eye to be same diameter as original pipe size.



STRUCTURE
RODDING EYE - DEEP > 2.5m

W621

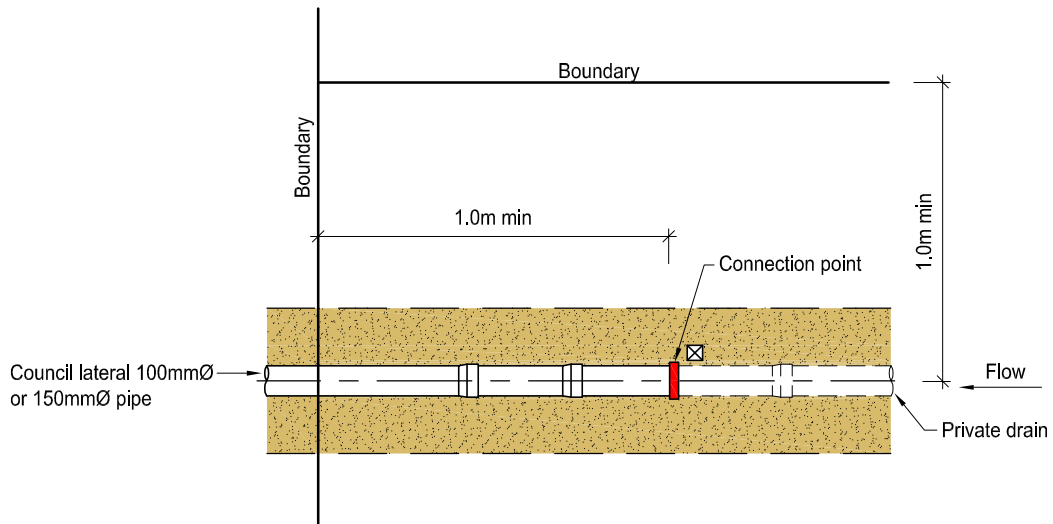
DEVELOPMENT CODE

VERSION 1
AUG 09

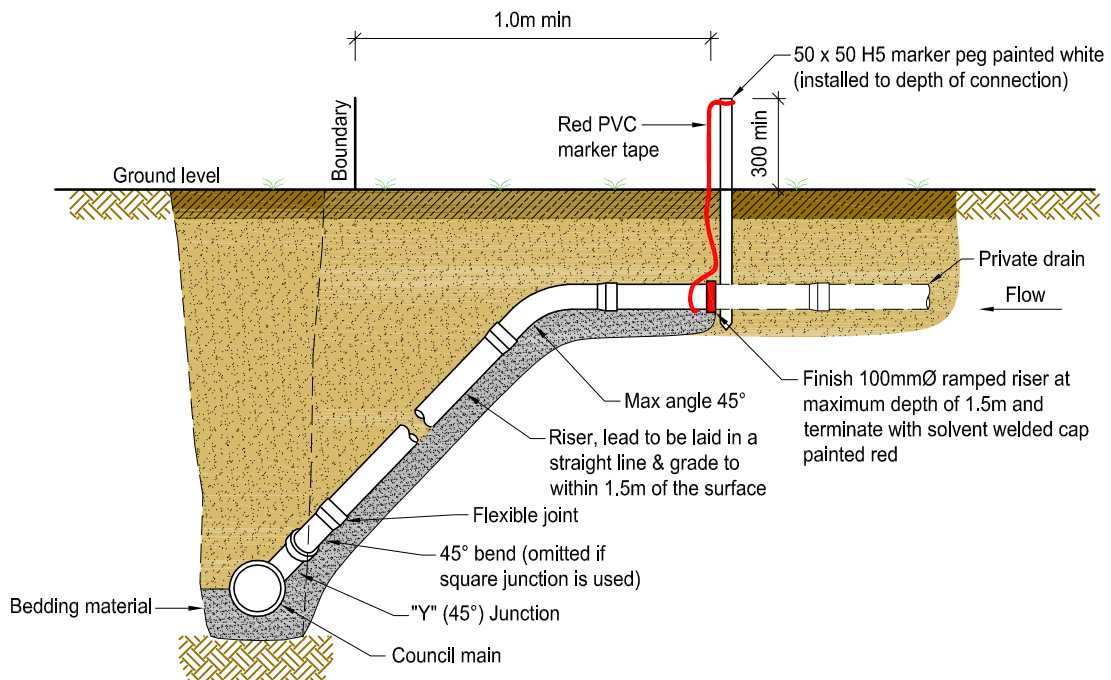
1

NOTES:

1. All gravity pipe and fittings used in Council's network are RRJ.
2. Connection types shown in this drawing are only applicable to PVC.
3. Grade of property connection wastewater pipe to be not less than 1.65% (1 in 60).



PLAN
PROPERTY CONNECTION



ELEVATION
'Y' (45°) JUNCTION RAMPED RISERS

PROPERTY CONNECTION
STANDARD

W630

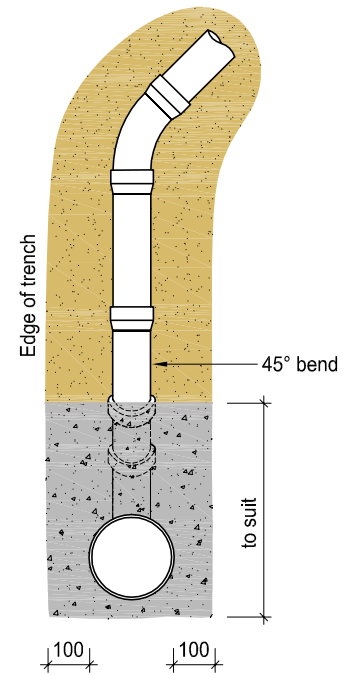
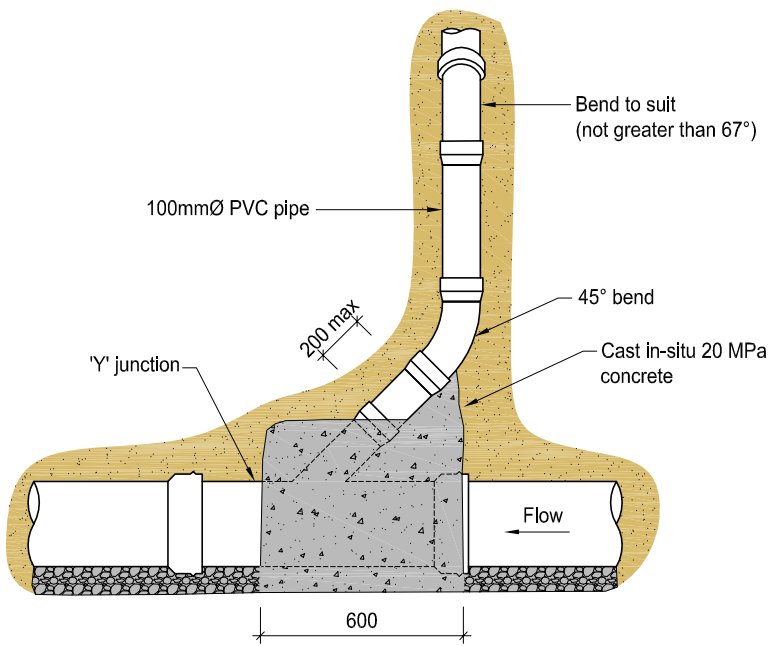
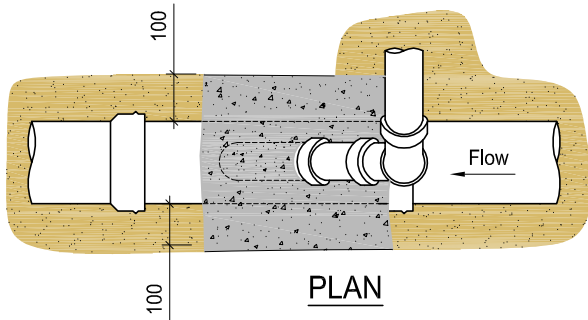
DEVELOPMENT CODE

VERSION 1
AUG 09

1

NOTES:

- 90° bends will not be accepted.



SIDE ELEVATION

END ELEVATION

PROPERTY CONNECTION

DEPTH > 2.5m

W631

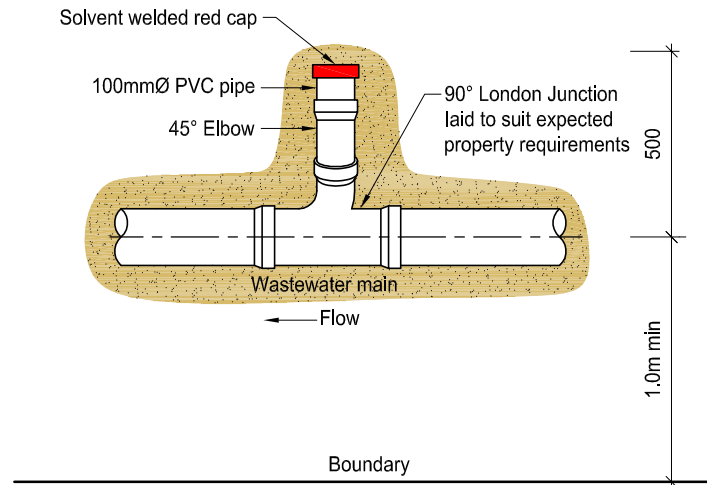
DEVELOPMENT CODE

VERSION 1
AUG 09

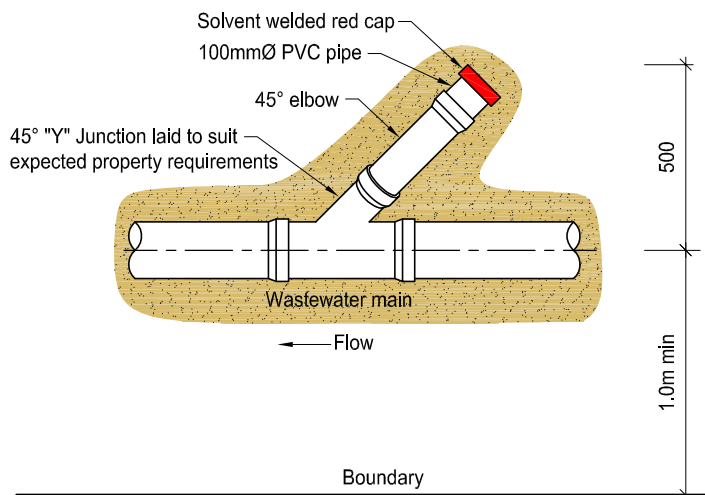
1

NOTES:

1. Connection types shown in this drawing are only applicable to PVC.
2. Grade of property connection wastewater pipe to be not less than 1.65% (1 in 60).



90° CONNECTION



45° CONNECTION

PROPERTY CONNECTION WITHIN PROPERTY

W632

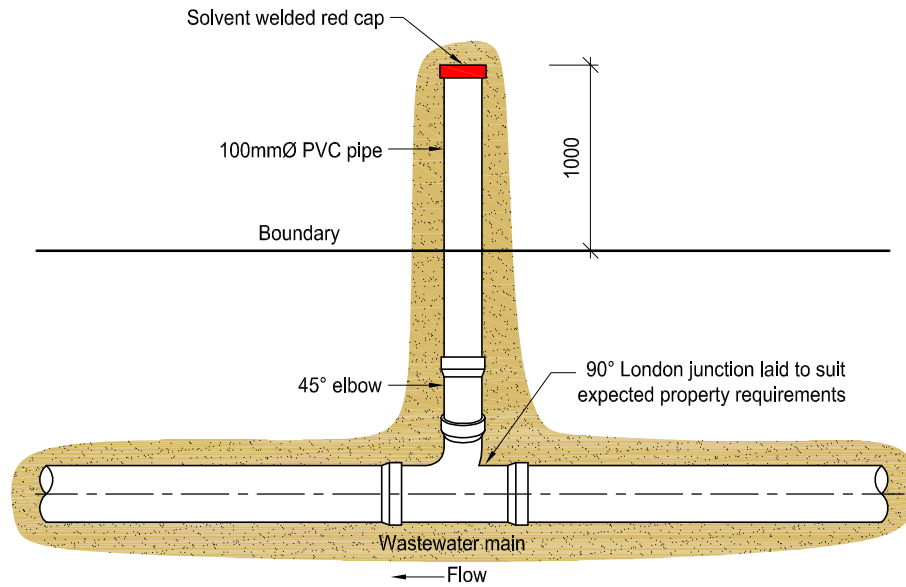
DEVELOPMENT CODE

VERSION 1
AUG 09

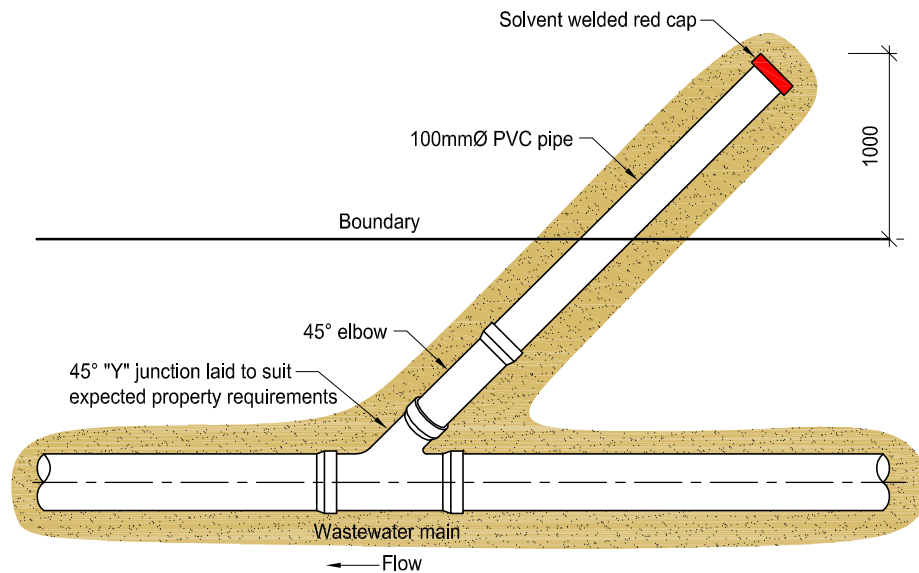
1

NOTES:

1. Connection types shown in this drawing are only applicable to PVC.
2. Grade of property connection wastewater pipe to be not less than 1.65% (1 in 60).



90° CONNECTION



45° CONNECTION

PROPERTY CONNECTION
OUTSIDE PROPERTY

W633

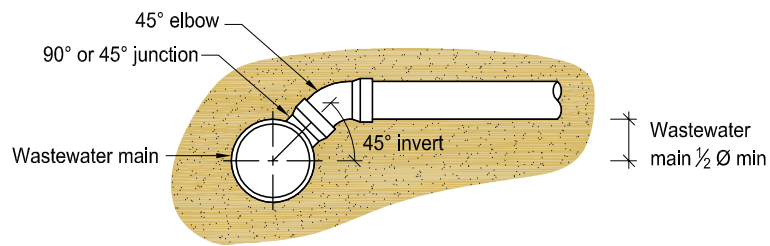
DEVELOPMENT CODE

VERSION 1
AUG 09

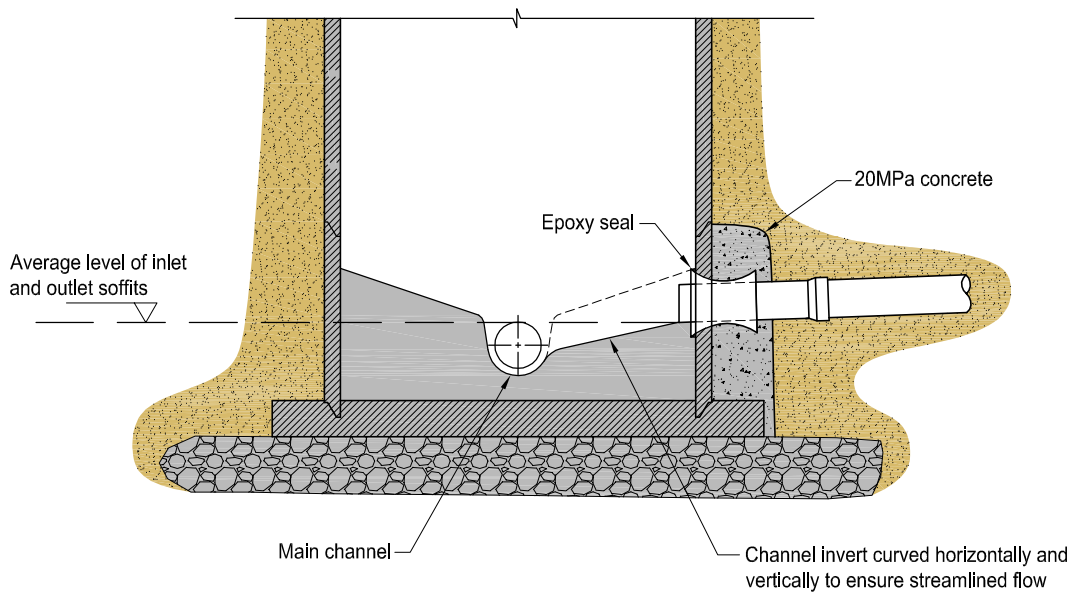
1

NOTES:

1. Invert of connection pipe prior to junction must be above the soffit level of the sewer main.
2. Invert of connection pipe at point of entry to manhole must be above the average soffit level of the inlet and outlet pipes.



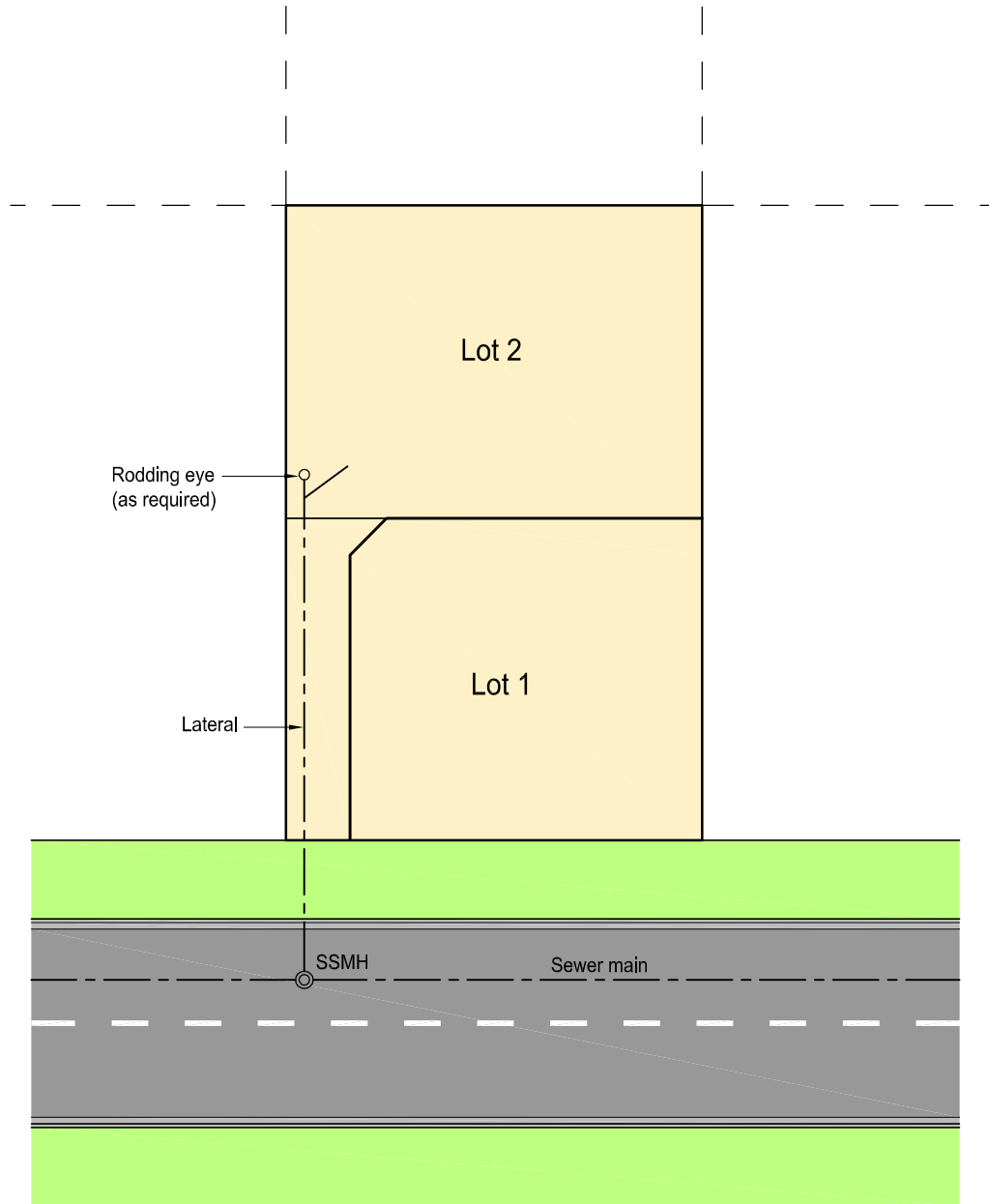
CONNECTION TO MAIN



CONNECTION TO MANHOLE

PROPERTY CONNECTION ENTRY TO WASTEWATER MAIN/MANHOLE

W634



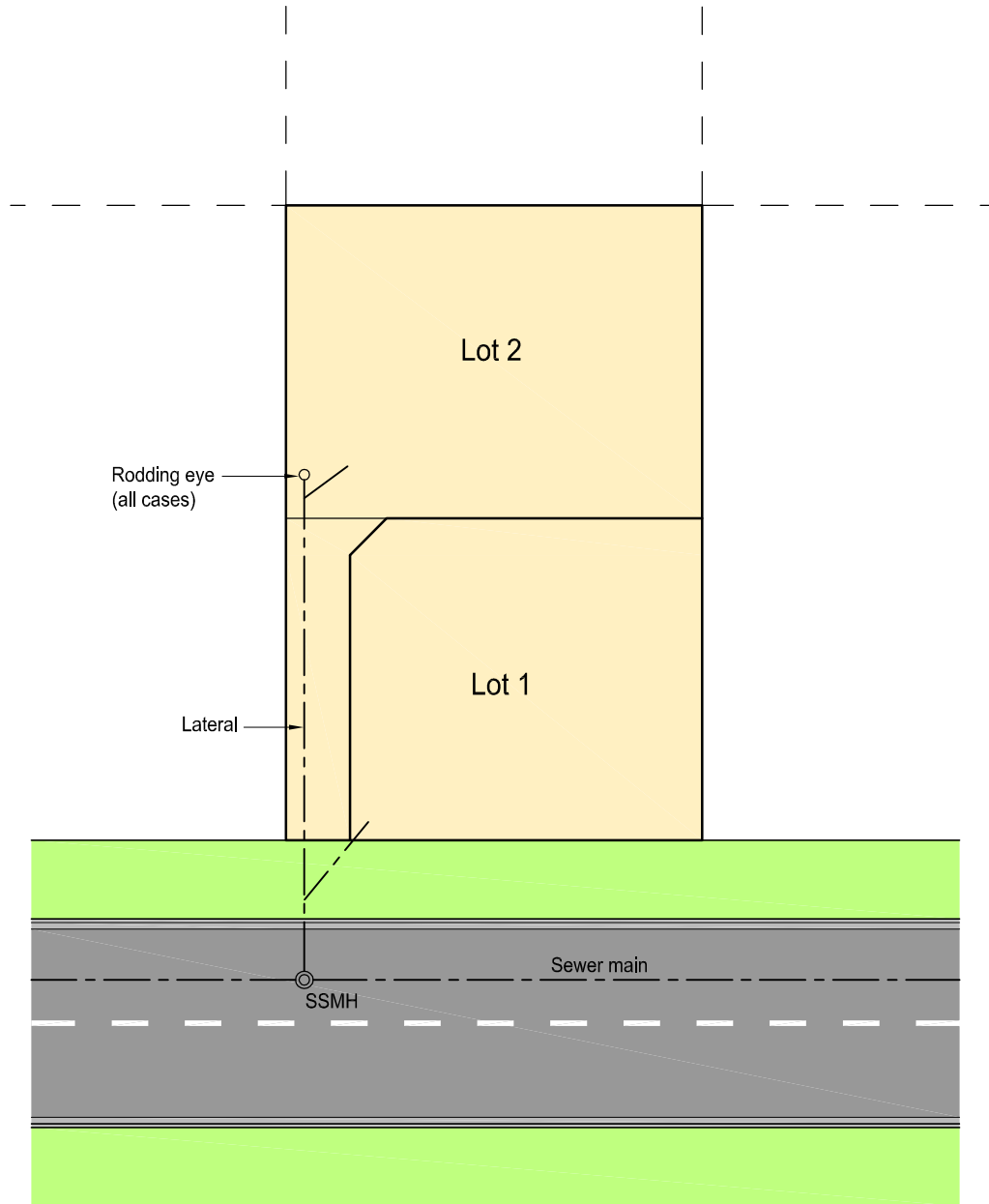
LATERAL CONNECTION
SINGLE CONNECTION TO MANHOLE

W637

DEVELOPMENT CODE

VERSION 1
AUG 09

1



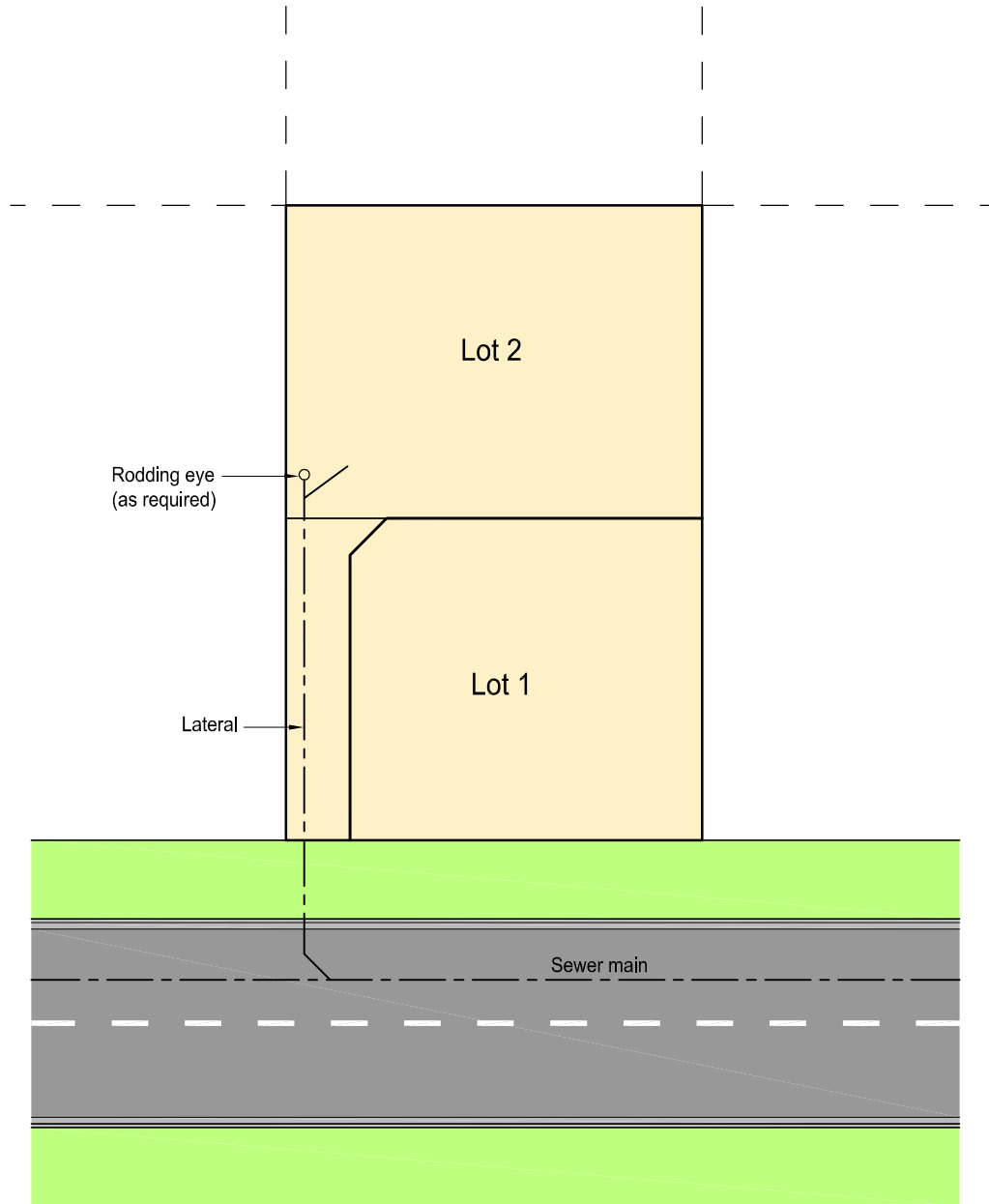
LATERAL CONNECTION
2 TO 6 CONNECTIONS TO MANHOLE

W638

DEVELOPMENT CODE

VERSION 1
AUG 09

1



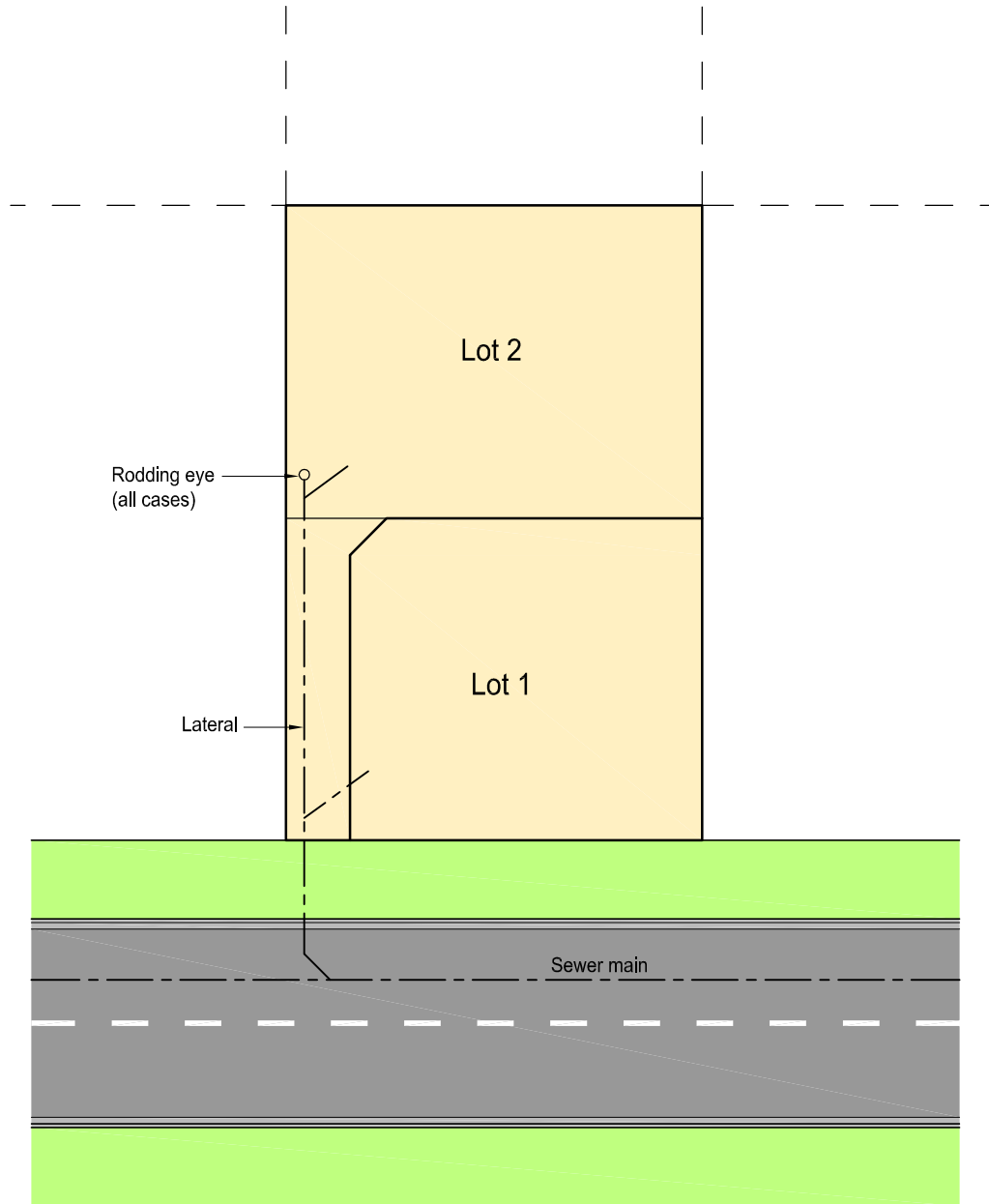
LATERAL CONNECTION
SINGLE CONNECTION TO MAIN

W639

DEVELOPMENT CODE

VERSION 1
AUG 09

1



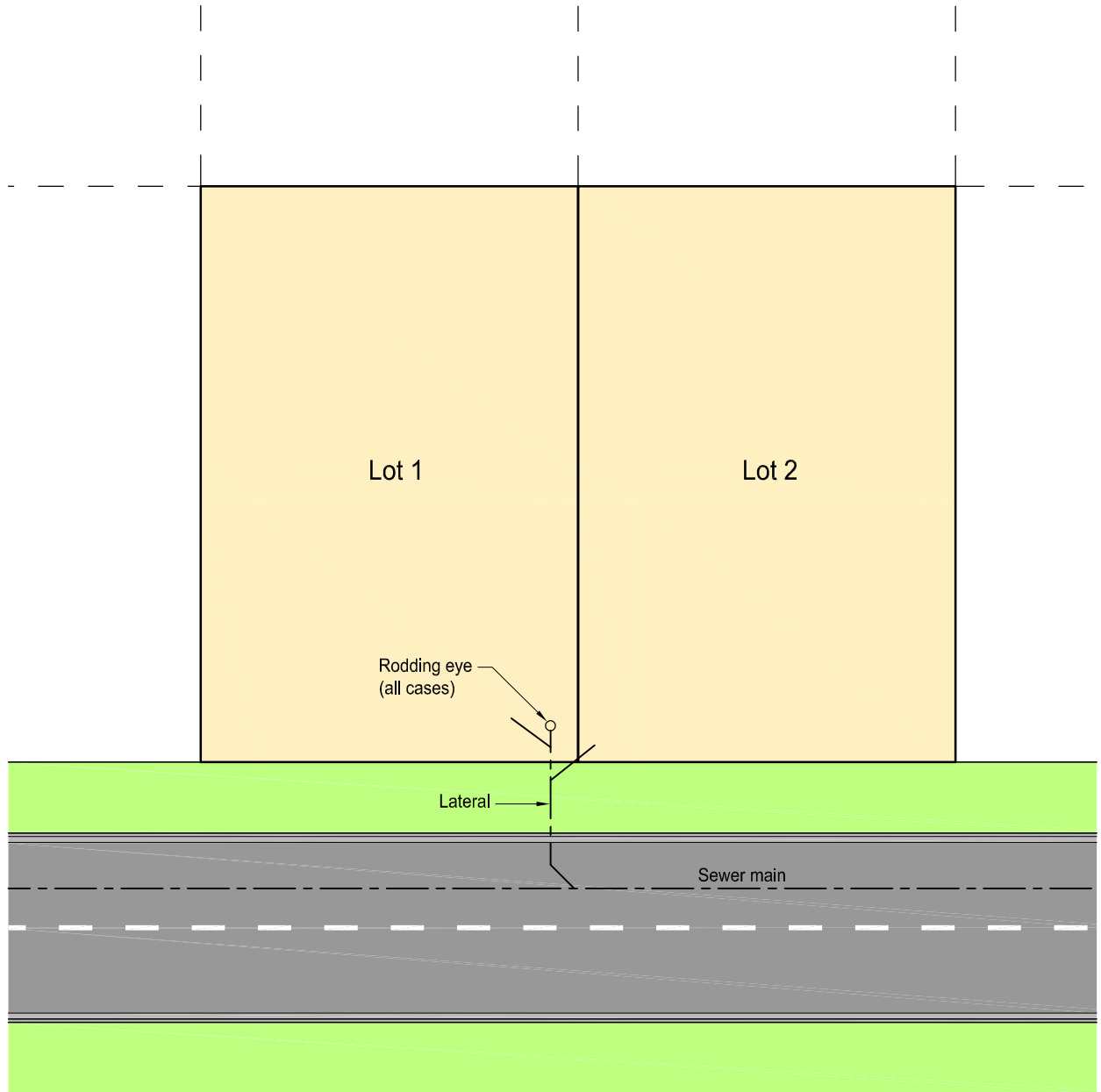
LATERAL CONNECTION
TWO CONNECTIONS TO MAIN

W640

DEVELOPMENT CODE

VERSION 1
AUG 09

1



LATERAL CONNECTION
TWO ADJACENT CONNECTIONS TO MAIN

W641



ALTERNATIVE OPTION
(Requires easement and approval by TCC))

PREFERRED OPTION
(Both laterals are council assets)

LATERAL CONNECTION
REAR LOT CONNECTION

W642

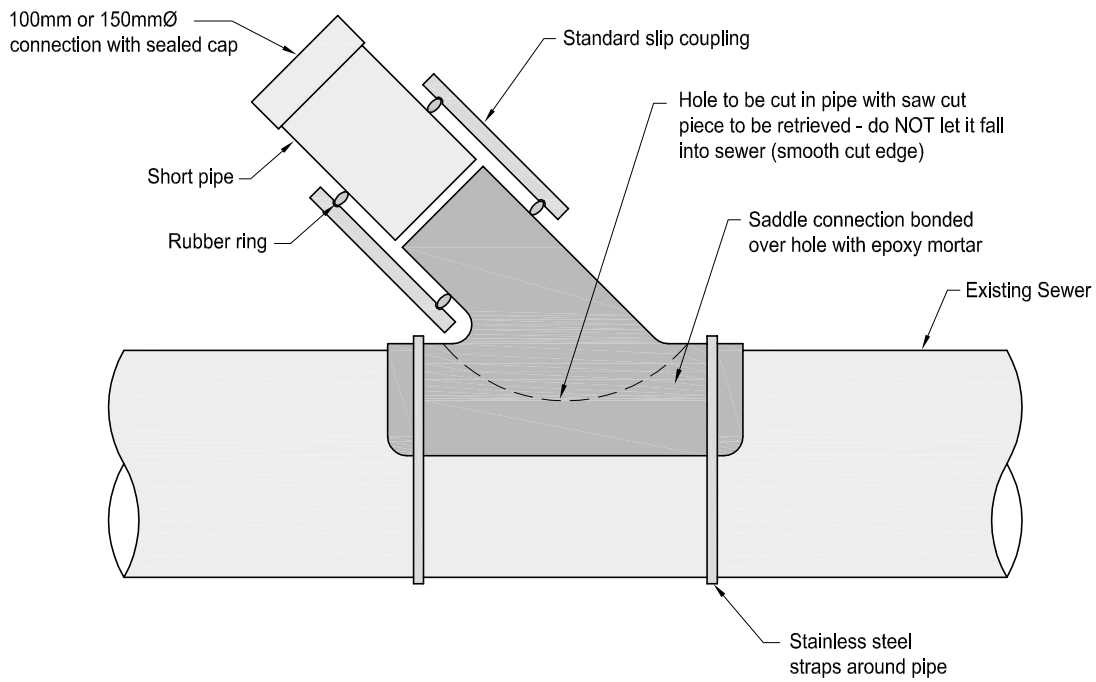
DEVELOPMENT CODE

VERSION 1
AUG 09

1

NOTES:

1. A saddle connection must only be used on a Sewer main larger than the branch pipe.



MAINS CONNECTION SADDLE CONNECTION

W643

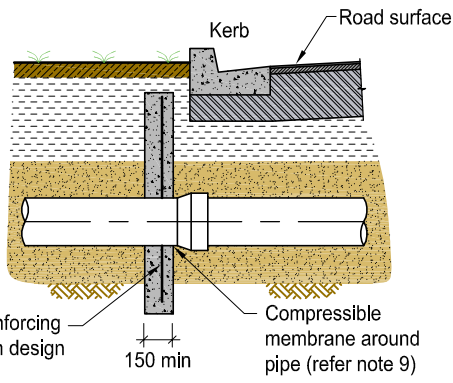
DEVELOPMENT CODE

VERSION 1
AUG 09

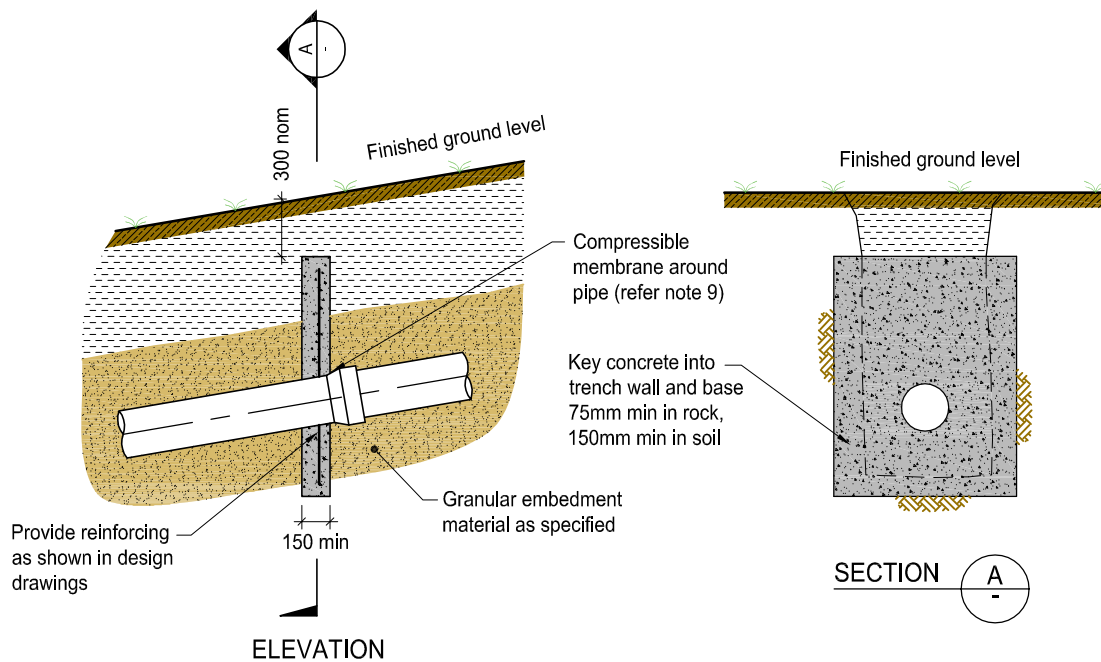
1

NOTES:

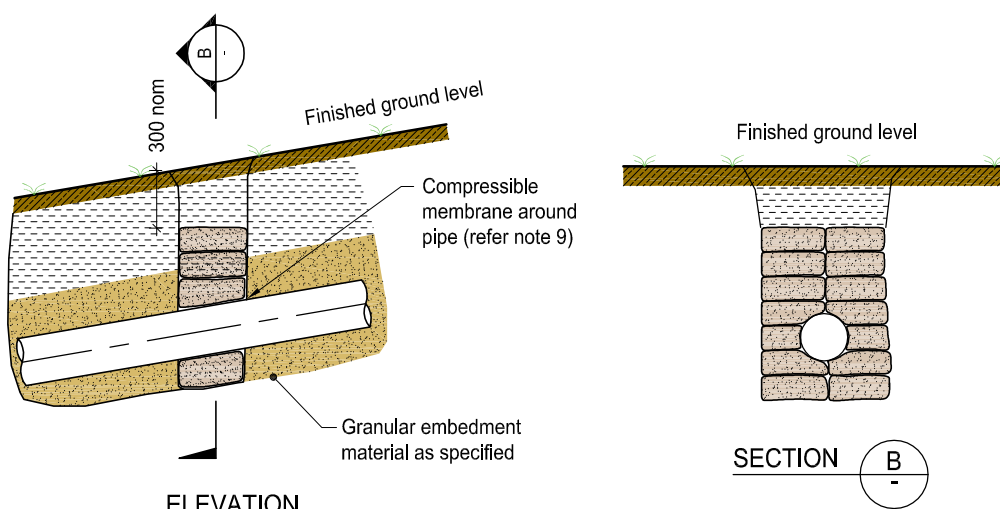
1. Construct concrete bulkheads and trench stops at locations specified in design drawings.
2. Construct bulkhead adjacent to kerb & gutter shoulder of sealed roads.
3. Bulkhead at a retaining wall to be under the wall.
4. Key concrete bulkheads into sides and bottom of trench against a bearing surface of undisturbed soil.
5. Concrete to be 20 MPa.
6. Do not deform pipes during placement of concrete or bags.
7. Seal bags to prevent leakage of contaminated material.
8. Compressible membrane around pipe to be 10mm thk polystyrene for bulkheads adjacent to kerbs and 3mm thk rubber for bulkheads and trenchstops on slopes.
9. For slopes > 35% refer to territorial authority for requirements.



**TYP ROAD CROSSING
BULKHEAD DETAIL**



CONCRETE BULKHEAD DETAIL



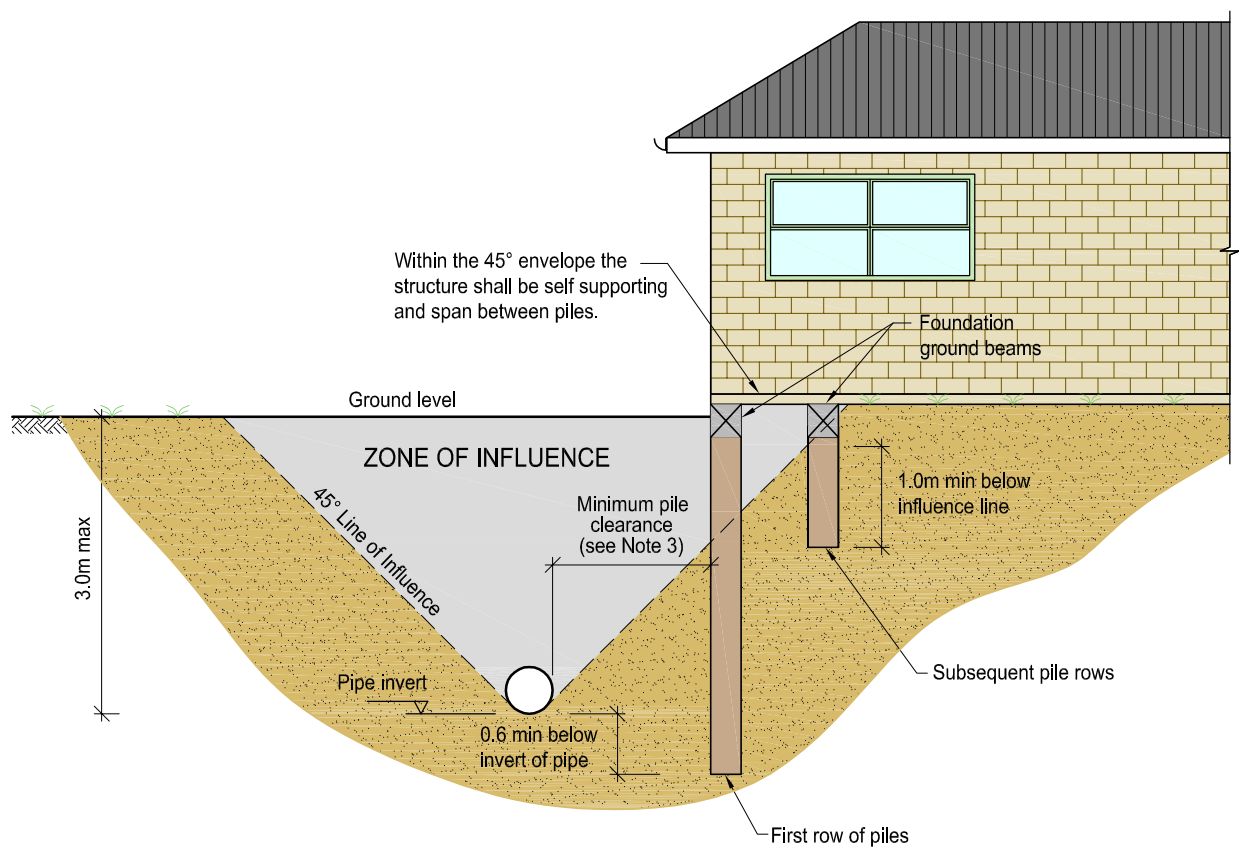
TRENCH STOP DETAIL

BULK HEAD & TRENCHSTOP

W644

NOTES:

1. Pile spacing and ground beams are to be designed by Chartered Professional Engineer (CPE).
2. Ground beams must be fully supported by the piles such that the ground surface is not required to support the structure within the "Line of Influence" of the sewer position.
3. Minimum pile clearance is 1000mm for 150mm diameter mains, and 1500mm for all rising mains and trunk mains (225mm diameter and larger).



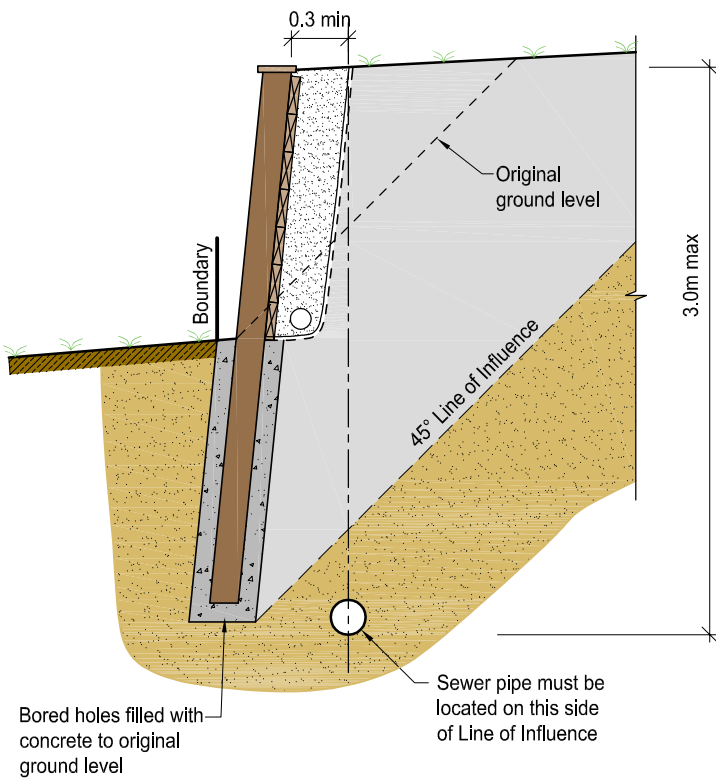
CLOSE PROXIMITY BUILDING NEAR PUBLIC MAINS

W652

DEVELOPMENT CODE

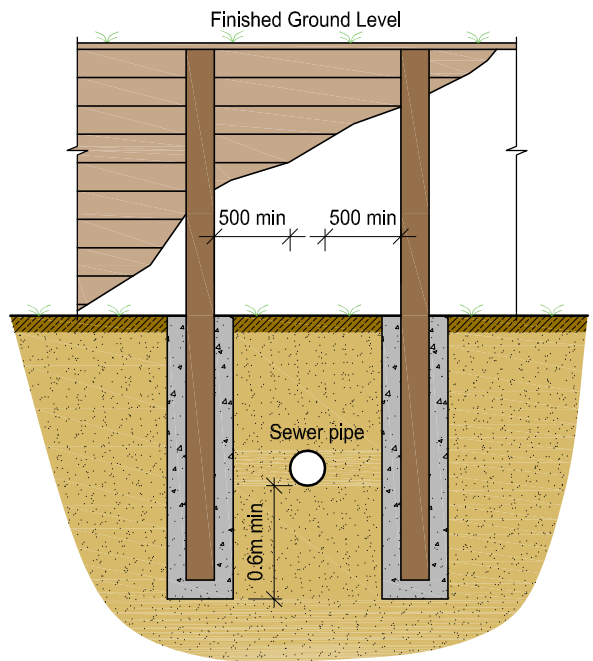
VERSION 1
AUG 09

1



SECTION

Pipe parallel to retaining wall



SECTION

Pipe perpendicular to retaining wall

**CLOSE PROXIMITY
RETAINING WALL RESTRICTIONS**

W653