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.

EXAMPLE PHOTO

PLAN

Cast iron frame & cover to be painted white
Ordinary grade concrete, 20 MPa steel float finish with D10 reinforcing ring
Maximum throat thickness 250mm except 500mm in pavement
100 concrete

See fixing details
Flexible joint
Standard precast riser section 1050mmØ
Grade 316 stainless steel safety steps over benching

SECTION

150mm thick precast manhole base
Ordinary grade 20 MPa concrete
Manhole bedding

JOINT DETAIL

Epoxy mortar
BM100 or SM 9020 sealing strip
NOTES:

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

MANHOLE LADDER

ELEVATION

SECTION

SAFETY STEP IRON DETAILS

STRUCTURE

MANHOLE - LADDER & STEPS
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

12mm hole for reinforcing stud x 3

50mm min cover on all steel

Clamp hole x 3 (optional only)

Recessed 1.3 tonne lifting eye x 3

D12 trimmer bars

Sealed areas and paths D12/150 centres both ways

SECTION THROUGH LID

1220 OD

600

150

1200 OD

95

Precast lid

STRUCTURE
MANHOLE - PRECAST 1050mmØ LID

DEVELOPMENT CODE
1. Cast iron entry lid to be constructed to the existing ground contour as appropriate.
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.
INCLINED ACCESS

Concrete surround poured in-situ using internal and external moulds

Precast extension rings

D10 reinforcing ring and rod

600

500
NOTES:
1. All steel fittings (including bolts) to be Grade 316 stainless steel.
2. 120mmØ 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.

**POST CONSTRUCTION INSTALLATION SECTION**
- Construct channel in original benching or raise height of benching to construct new branch channel into main channel.
- Pipework may be extended to edge of main channel.
- New benching
- Remove section of benching
- Max ½ diameter of main channel

**SECTION**
- Formed channelling to suit

**PLAN**
- Cast iron frame & cover to be painted white
- Ordinary grade concrete, 20 MPa steel float finish with D10 reinforcing ring
- Standard flush jointed precast riser section 1050mmØ with precast holes cast for step irons
- Flexible joint
- Maximum throat thickness 250mm except 500mm in pavement
- Standard PVC 90° London junction
- Concrete haunching
- Concrete haunching
- Flow
- Short pipe
- Standard manhole connector
- Fill void with epoxy mortar or cement mortar
- Grade 316 stainless steel anchors as required at 1500mm crs max
- 45° bend
- 150mm thick precast manhole base

**STRUCTURE**
**MANHOLE - INTERNAL DROP**

**DEVELOPMENT CODE**

**W608**

**VERSION 1 AUG 09**
NOTES:

1. Safety steps to be installed as per standard manhole.
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
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 2
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
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 4
NOTES:
1. All casing to be of best quality grey iron bitumen coated.
2. Paint cover white with road marking paint.

STRUCTURE
MANHOLE - STANDARD COVER AND FRAME

DEV ELOPMENT CODE

APPROX. WEIGHTS
Cover: 54kg
Frame: 52kg
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.

SECTION THRU COVER

SECTION THRU FRAME

PLAN OF KEYHOLE

COVER & FRAME - painted white

Four 10mm thick gussets equi-spaced thus around frame

3mm high x 15mm wide raised rings at 30 c/c

UNDERSIDE OF COVER

APPROX. WEIGHTS
Cover: 30kg
Frame: 25kg

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

PLAN OF KEYHOLE

SECTION THRU COVER

SECTION THRU FRAME

SECTION OF KEYHOLE

UNDERSIDE OF COVER

COVER & FRAME - painted white

Six 15mm thick gussets equi-spaced around frame

3mm high x 18mm wide raised rings at 40mm c/c

APPROX. WEIGHTS
Cover: 51kg
Frame: 37kg

STRUCTURE
MANHOLE - HEAVY DUTY NON-ROCK TYPE COVER & FRAME
Concrete surround poured in-situ using ring mould

Threaded cap

Solvent welded threaded mall fitting

200 mm

600mmØ concrete pipe, length 600mm

Compacted drainage metal

45° uPVC long radius bend

"Y" Junction

Manhole frame and cover or rodding eye, cover and box

PLAN

"Y" Junction

Manhole cover

Frame

Concrete surround

Threaded cap

Connection

uPVC long radius bend as required

WASTEWATER

W620
NOTES:

1. Rodding eye to be same diameter as original pipe size.
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
NOTES:
1. 90° bends will not be accepted.

PROPERTY CONNECTION
DEPTH > 2.5m

DEVELOPMENT CODE
W631
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
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

DEVELOPMENT CODE
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

DEVELOPMENT CODE
LATERAL CONNECTION
SINGLE CONNECTION TO MANHOLE

Lot 2

Rodding eye (as required)

Lot 1

Lateral

SSMH

Sewer main
LATERAL CONNECTION
SINGLE CONNECTION TO MAIN

DEVELOPMENT CODE
NOTES:

1. A saddle connection must only be used on a Sewer main larger than the branch pipe.
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 thick polyurethane for bulkheads adjacent to kerbs and 3mm thick rubber for bulkheads and trench stops on slopes.
9. For slopes > 35% refer to territorial authority for requirements.
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

DEVELOPMENT CODE
CLOSE PROXIMITY
RETAINING WALL RESTRICTIONS

SECTION
Pipe parallel to retaining wall

SECTION
Pipe perpendicular to retaining wall