100mm thick concrete capping when cover to non-pressure pipes is less than 450mm.

Min. 75mm Sidefill

Granular bedding: 20mm down well graded scoria or similar approved.

For pipes greater than 675 dia, this layer must be placed and compacted prior to laying of pipes.

Minimum trench width to be pipe outside diameter + 200mm and maximum width as designed.

**DESIGN FACTORS TO USE WITH AS 2566**

Bedding constant, $R = 0.100$
Deflection lag factor, $L = 1.40$
50 year tensile creep modules, $E_c = 690 \text{ N/mm}^2$
Modulous of soil reaction, $E' = Y/(Dm/t)\text{N/mm}^2$
$Y_{factor} = 83 \text{ N/mm}^2$
Notes:
1. All dimensions are in Millimetres unless noted otherwise.
2. All Concrete to be ordinary grade 17.5 MPa at 28 days.
3. All pipes to be finished flush with inside wall of Catchpit.
Cast iron cover & concrete throat to be painted BLUE:
MD-1 Residential Areas
MD-2 Road reserves & Industrial areas
Non rock in road carriageways

Ordinary grade Concrete 17.5MPa, steel float finish.

Maximum throat thickness of 250mm*
(* May increase to 350 with heavy duty lids when fixed surface levels are to be matched)

100mm Residential
150mm Industrial & roads

Lid Rings

Dry joint

Standard 1050Ø precast riser section

300

Safety steps over benching

1 in 6

150 min

Benching

Ordinary grade Concrete 17.5MPa

Compacted hardfill backfill under all drops

Sectional View

Notes:
1- All dimensions are in Millimetres unless noted otherwise.
2- For pipes greater than 600mm dia., manholes are to be specifically designed.
3- For pipes 1200 dia. and greater, manholes to be factory fabricated bends with riser off-taker.
130 thick Concrete with one layer of steel mesh (ref 665) 60 cover over 100 thick compacted G.A.P. 40

675x450 Cast Iron Catchpit Grating & Frame. Note that Captive Grates are not required.

See Detail-D8 for backfill around pipes

225Ø C.P. Lead
Class 2 (under berms)
Class 4 (under road pavement)

0.5% min grade
1650-1800

110Ø TNZ F/2 (Double Red Band) Geotextile Socked Underchannel Drain

Stancard Precast Catchpit 1650 deep minimum
50 Compacted S.A.P 20 bedding

Notes:
1. All dimensions are in Millimetres unless noted otherwise.
2. All Concrete to be ordinary grade 17.5 MPa at 28 days.
3. All pipes to be finished flush with inside wall of Catchpit.

SECTION A-A

FIELD CATCHPIT

MANUKAU CITY COUNCIL
Rises, lead to be laid in a straight line & grade to within 1.0m of the surface.

Threaded access cap 558–100. A temporary plug may be installed in the socket in cases where building work is imminent.

Solvent cement joint

Concrete bedding & haunching

Factory made solid wall upVC 100 or 150 London junction as on drawings MD-24 for PVC main lines. Vitrified clay junction with upVC adapter for vitrified clay main lines.

Note:
Maximum gradient desirable 1:1. Steeper gradient will be permitted to maintain building area. Pipe must be supported on natural ground where possible.
DESIGN FACTORS TO USE WITH NZS/AS 3725

Load factor for wide and narrow trench condition $F_t = 1.9$
Settlement ratio for wide trench condition $Y_s = +0.6$
Projection ratio for wide trench condition $p = 1.15$

1/6 of the outside pipe diameter and not less than 75 min.

For pipes greater than 675 dia, this layer must be placed and compacted prior to laying of pipes

Minimum Trench width to be pipe outside diameter + 200mm

and maximum width as designed

Ordinary backfill

Trench to be backfilled up to 300 above the top of the pipe with either firm clay, no particle of which is over 75, or stones larger than 25 or an approved fine granular material.

Minimum Sidefill 75mm

Granular bedding:
As specified in NZS/AS 3725 or 20 down well graded may be used for pipes less than 675Ø
All bolts 12mmØ x 350mm long Eng. bolts with 25mmØ washers each end. All to be hot dipped galvanised

All timber 150mmØ treated pine poles

Vertical poles to be driven or placed in bored holes & backfilled with rammed earth

Note:
Grouted stonework to be placed at 45° to retain adjoining ground.
PARKING AREA

1400 wide concrete footpath

Form dish with length of 100 dia. piping

LOW LEVEL PATH

DISHED CHANNEL
DESIGN

Minimum grade of 1 in 100 & minimum cover of 1.2m below kerb level. For pipe lines larger than 150mmØ utilising vitrified clay or concrete, with belled joints, the void between the pipe and drilled hole is to be concrete grouted.

ACCEPTANCE

No undersloping in pipe, maximum 1/2 pipe oververtical provided no ponding in the line. If not within the specified tolerance the pipe may have to be reconstructed by normal trenching techniques requiring an open excavation permit.

When direct drilled into existing manhole, all debris to be caught and removed.

If the drill hole exceeds the pipe outside diameter by more than 25mm it shall be concrete grouted.

MATERIAL

All pipe materials and connections are to comply with the approved standards. For stormwater thrusting purposes, solvent cement jointed PVC pipes complying with the following standard diameter wall thickness maybe used.

<table>
<thead>
<tr>
<th>Normal size (ID)</th>
<th>Diameter (OD)</th>
<th>Wall thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>225mm</td>
<td>250mm</td>
<td>8.9mm</td>
</tr>
<tr>
<td>300mm</td>
<td>315mm</td>
<td>11.2mm</td>
</tr>
<tr>
<td>375mm</td>
<td>400mm</td>
<td>14.2mm</td>
</tr>
</tbody>
</table>
CONCRETE ANCHOR BLOCK DETAIL

NOTES
1. Groundwater drain through anchor block 2x DN 80 PVC drain pipes. Cover upstream opening with filter membrane and anchor the filter membrane to a minimum of 150mm deep in the bedding material on the upstream side.
2. Reinforcing for concrete anchor block to be shown on design drawing.
3. For PVC and PE pipes, concrete anchor blocks are to be located at pipe joints and not exceed 6m spacings.
Notes
1. Mounting holes in risers only required if riser top is above surrounding ground level.
2. Burr bolt end after installation.

<table>
<thead>
<tr>
<th>SCRUFFY DOME INSTALLATION</th>
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</thead>
<tbody>
<tr>
<td>Engineering Quality Standards</td>
</tr>
<tr>
<td>DETAIL: D14</td>
</tr>
<tr>
<td>UPDATE: OCT 2003</td>
</tr>
</tbody>
</table>
Note:
Only to be used for the terminating manholes on level Residential sites with a maximum of three 100mmØ House Connections or when a fixed surface level is established.
JUNCTIONS INSERTED INTO EXISTING MAINS $\phi < 225$mm

VITRIFIED CLAY COLLAR INSERTED INTO EXISTING CONCRETE OR CLAY PIPE MAIN $\phi \geq 225$mm

VITRIFIED CLAY SADDLE INSERTED INTO EXISTING CONCRETE OR CLAY PIPE

CONNECTION INTO EXISTING PIPES

ENGINEERING QUALITY STANDARDS

DETAIL: D16

UPDATED: AUG 2006
Cast Iron Circular Grate & Frame. Note that captive grates are not required.

130 thick Concrete steel float finish with one layer of steel mesh (ref 665) 60 cover over 100 thick compacted G.A.P. 40

PLAN

Cas:--in-situ concrete to fix lid frame

Cast Iron Circular Grate & Frame
Precoat MH Lid adjusting ring or Cast-in-situ concrete

INLET PIPE

OUTLET PIPE

Safety step

Compacted hardfill under all drops

50 Compacted S.A.P 20 bedding

SECTION A--A

110Ø TNZ F/2 (Double Red Band) Geotextile Socked Underchannel Drain

INLET PIPE

Compacted G.A.P. 40

Standard 1050Øx150th. Flange Base Precast Manhole Riser

Notes:
1. All dimensions are in Millimetres unless noted otherwise.
2. All Concrete to be ordinary grade 17.5MPa at 28 days.