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WW63.pdf	2010070.054	WASTEWATER NETWORK STANDARD MANHOLE RESTRAINT PE JOINT

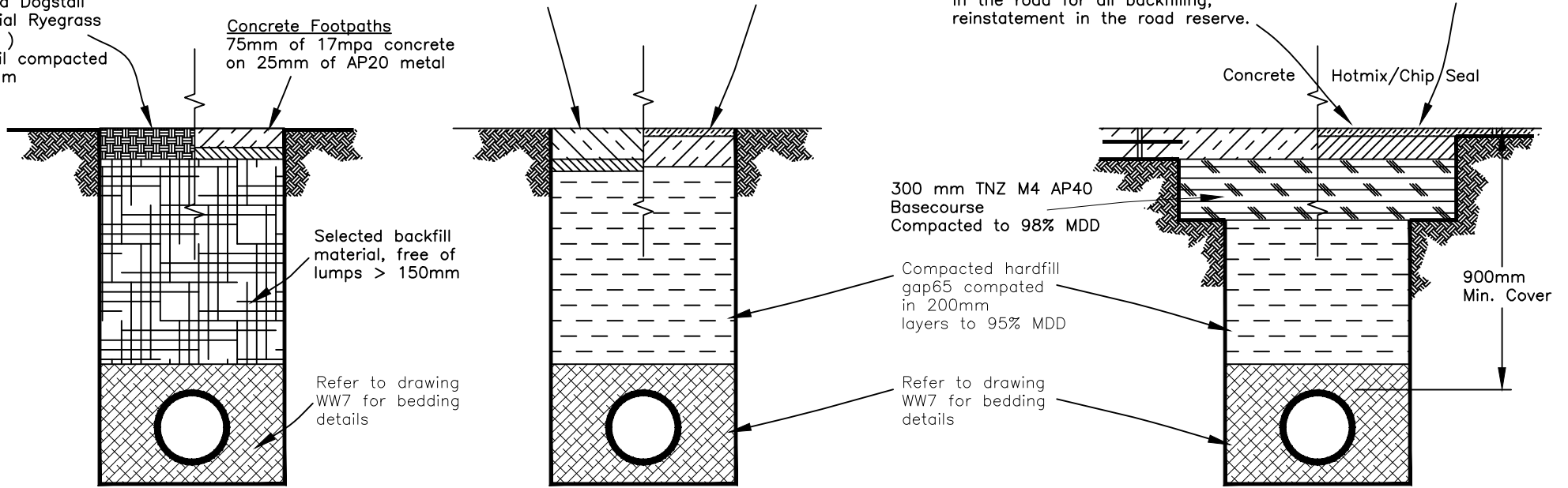
Grass
 Sow with grass seed mix
 15% Chewings Fescue
 7.5% Brown Top
 7.5% Crested Dogstail
 70% Perennial Ryegrass
 (by weight)
 Clean topsoil compacted
 depth 100mm

Concrete
 150mm of 17.5mpa concrete
 on 50mm of TNZ M/4 AP20
 metal. Minimum width of
 surface reinstatement 1m.

Hotmix
 25mm of mix10 AC on
 125mm of AP40 basecourse.

Hotmix – Footpaths
 For existing red chip footpaths
 dress with 4.75mm Red Chip
 footpath aggregate if required
 by Council

Concrete Footpaths
 75mm of 17mpa concrete
 on 25mm of AP20 metal



GRASS AREA & FOOTPATH
 (Not in Road reserve)
 REINSTATEMENT

DRIVEWAY REINSTATEMENT
 (Not in Road Reserve)

FOOTPATH/VEHICLE CROSSING,
 CARRIAGEWAY REINSTATEMENT

NOTES

- All trench reinstatement within the road reserve shall comply with the Auckland Transport "Code of Practice for Working in the Road" These are typical expectations for reinstatements. Contractors need to confirm with Auckland Transport.
- All backfill is to be compacted in 200mm, layers to obtain maximum density, as per standard specifications.
- Where concrete or other stabilized layers exist in the roadway, the trench shall be reinstated with similar material or as directed by the roading engineer.
- Fill shall be clean, Non-contaminated material. Recycled material is not acceptable.

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TYPICAL TRENCH REINSTATEMENT
 DETAILS FOR WASTEWATER

SCALE:	N.T.S.
ISSUE DATE:	14-04-2015
DWG No.	2010070.001B
REFERENCE No.	WW 2

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GENERAL CONSTRUCTION NOTES

STANDARDS RELATING TO WORKS

All works are to be carried out to the requirements of the Health & Safety in Employment Act 1992

All works is to be carried out will be of the highest tradesman like standard.

MANUFACTURERS SPECIFICATIONS

All materials to be used and installed as per Manufacturers Specifications.

CONCRETE

All on-site concrete to be 17.5 Mpa unless otherwise stated.

WELDING & FIXINGS

All steelwork to be workshop fabricated , No on-site welding will be accepted.

All steelwork to be hot-dip Galvanised to AS/NZS 4680

All metal nuts , bolts & washers to be stainless steel 316 unless otherwise stated.
A Nickel anti-seize free of copper , lead , sulphides , chlorides & carbons (graphite) shall be used on bolts.

REINFORCING STEEL

All reinforcing steel is to be deformed mild steel , unless otherwise specified.

All steel is to be centrally placed with minimum cover of 60mm for principal steel and 50mm elsewhere.

All radii to be cold formed.

WORKS REQUIRING EPOXY

Any Stainless Steel fixings that are epoxied in place are to be supplied from the manufacturer ' NOT OILED '.

All Metal fixings and/or Stainless Steel to be epoxied will use EPCON C6 epoxy or similar , to Engineers recommendation.

Concrete riser joints sealed with either Humebond or Hybond epoxy mortar

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GENERAL CONSTRUCTION NOTES

SCALE:	N.T.S.
ISSUE DATE:	14-04-2015
DWG No.	2010070.002B
REFERENCE No.	WW 3

NOTES

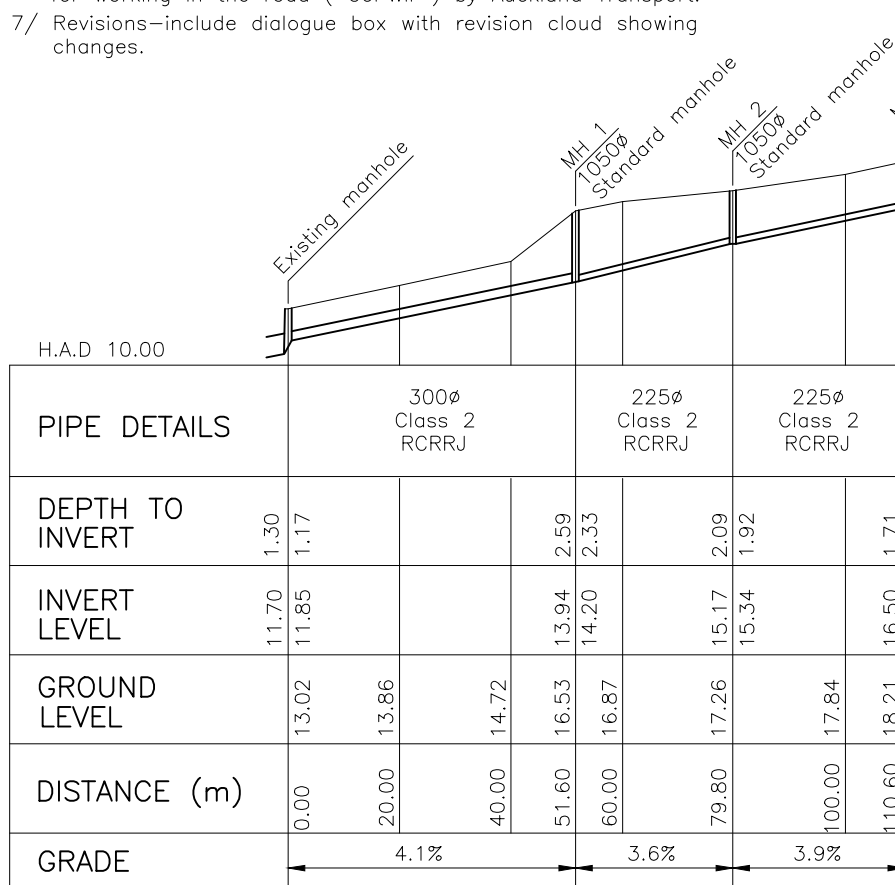
- 1/ Datum is in terms of (LINZ)Datum.
- 2/ Show all underground services on plan and longitudinal sections.
- 3/ This format applicable to WW design only.
- 4/ All workmanship and materials shall comply with Watercare specification and standard details.
- 5/ Calculation of grades are based on the distances between manhole centrelines minus the average diameter of the two manholes.
- 6/ Bedding typically gap 14 or gap 20. Refer to Code of Practice for working in the road (CoPWir) by Auckland Transport.
- 7/ Revisions—include dialogue box with revision cloud showing changes.

LIST OF STRUCTURES PROPOSED TO BE PUBLIC

From	To	Being
Exist MH	New MH3	110m WW (600mm to 225mm dia)

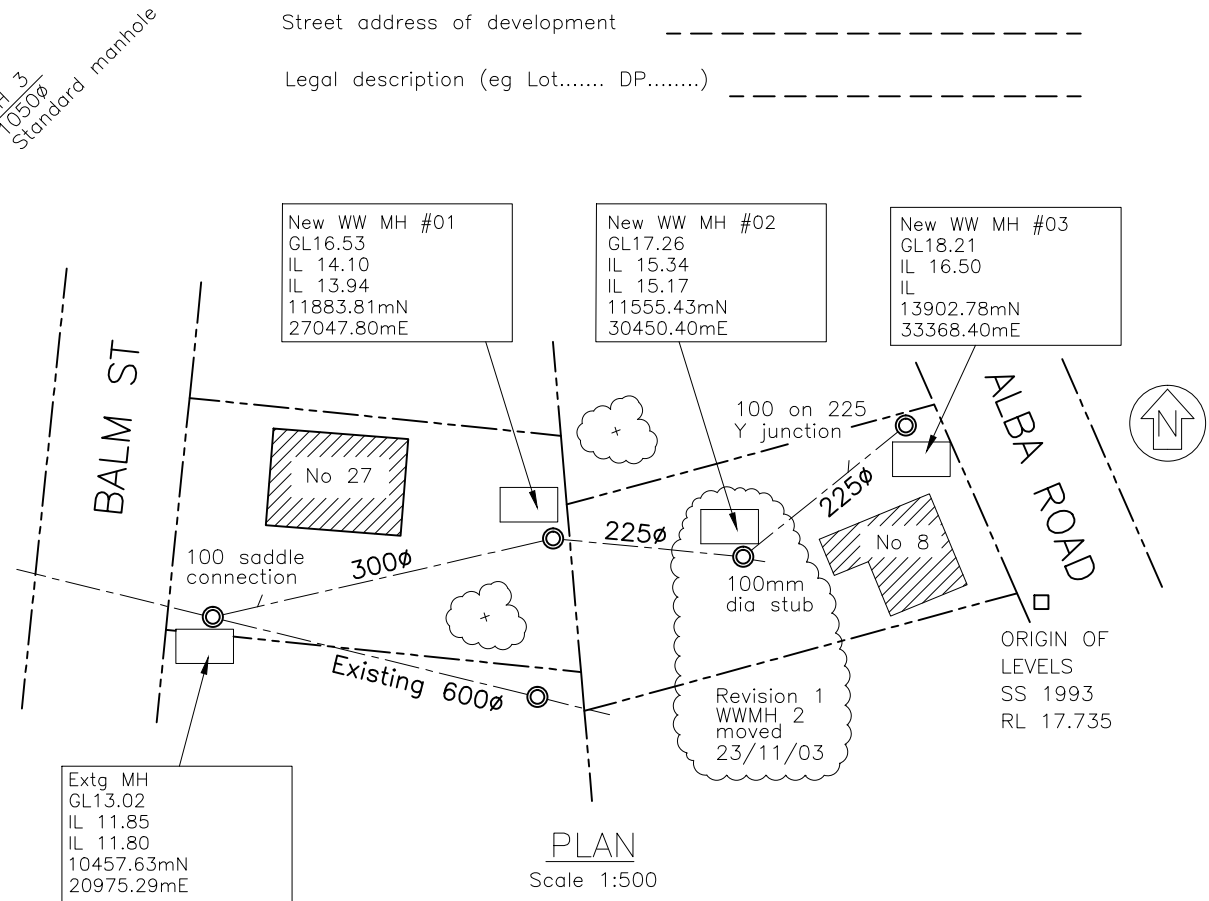
Street address of development _____

Legal description (eg Lot..... DP.....) _____



LONGITUDINAL SECTION

Scale Horiz. 1:500
Vert. 1:100



Extg MH
GL13.02
IL 11.85
IL 11.80
10457.63mN
20975.29mE

New WW MH #01
GL16.53
IL 14.10
IL 13.94
11883.81mN
27047.80mE

New WW MH #02
GL17.26
IL 15.34
IL 15.17
11555.43mN
30450.40mE

New WW MH #03
GL18.21
IL 16.50
IL 16.50
IL 13902.78mN
33368.40mE

ORIGIN OF LEVELS
SS 1993
RL 17.735

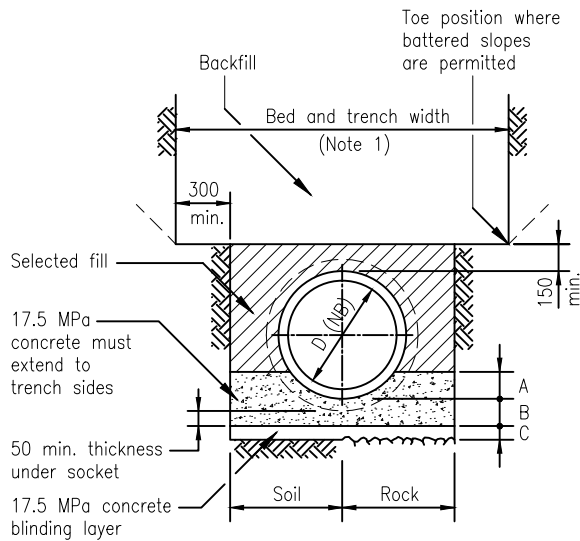
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ISSUE DATE:	20-9-2013
DWG No.	2010070.003
REFERENCE No.	WW 4

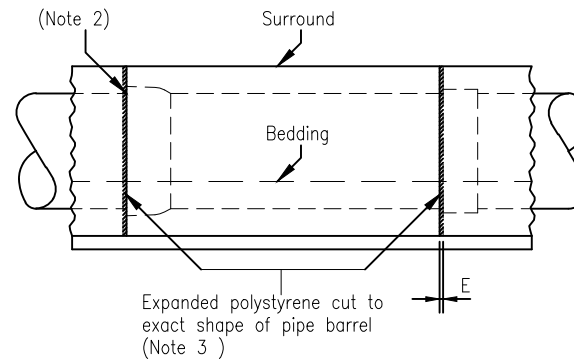
**DRAINAGE PLAN FORMAT
FOR DESIGN**



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CONCRETE BEDDING

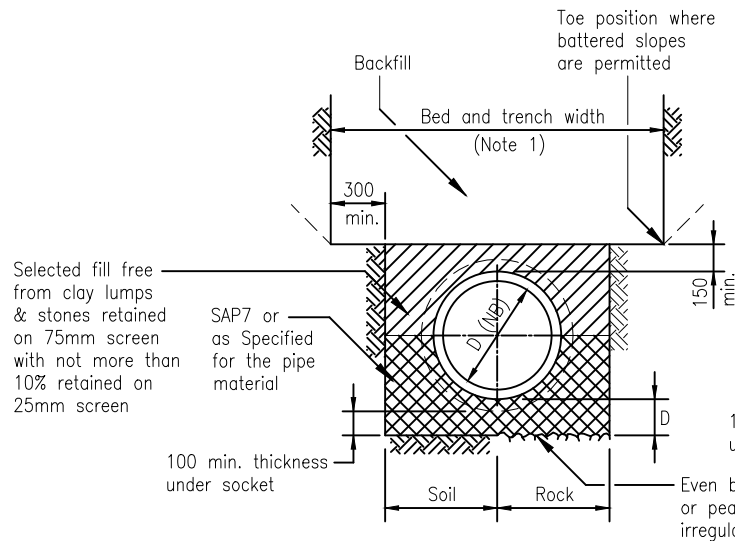


CONCRETE BEDDING AND SURROUND

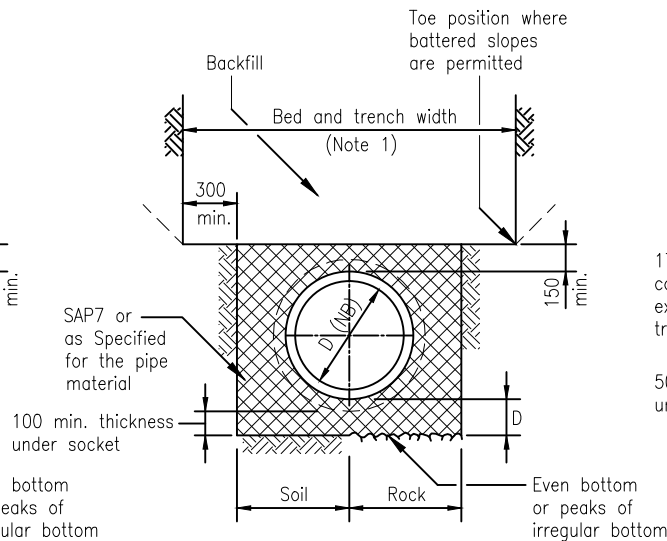
- NOTES :
1. Concrete bedding O.A. Width = $D+200\text{mm}$
Concrete Surround O.A. Width = $D+D/2$ with Min 50mm concrete either side.
Granular bedding Min. 300mm either side of the pipe.
 2. Fill joint gap outside the rubber ring with soft clay or other approved material.
 3. Expanded polystyrene should extend the full cross-section of concrete.
 4. Bedding and backfill shall be well compacted in layers not exceeding 200mm depth, to AS/NZS 2566.2 clause 5.6.3

DIMENSION TABLE		
	$D \leq 250$	$D = 300$
A	$0.5D$	150
B	100	150
C	50	50
D	150	150
E*	25	25
E**	25	25

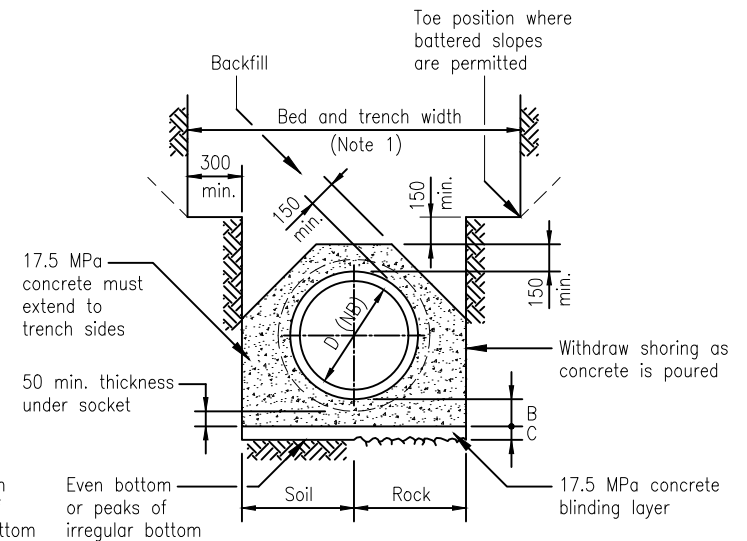
E*=E for concrete surround
E**=E for concrete bedding



GRANULAR BEDDING



GRANULAR SURROUND

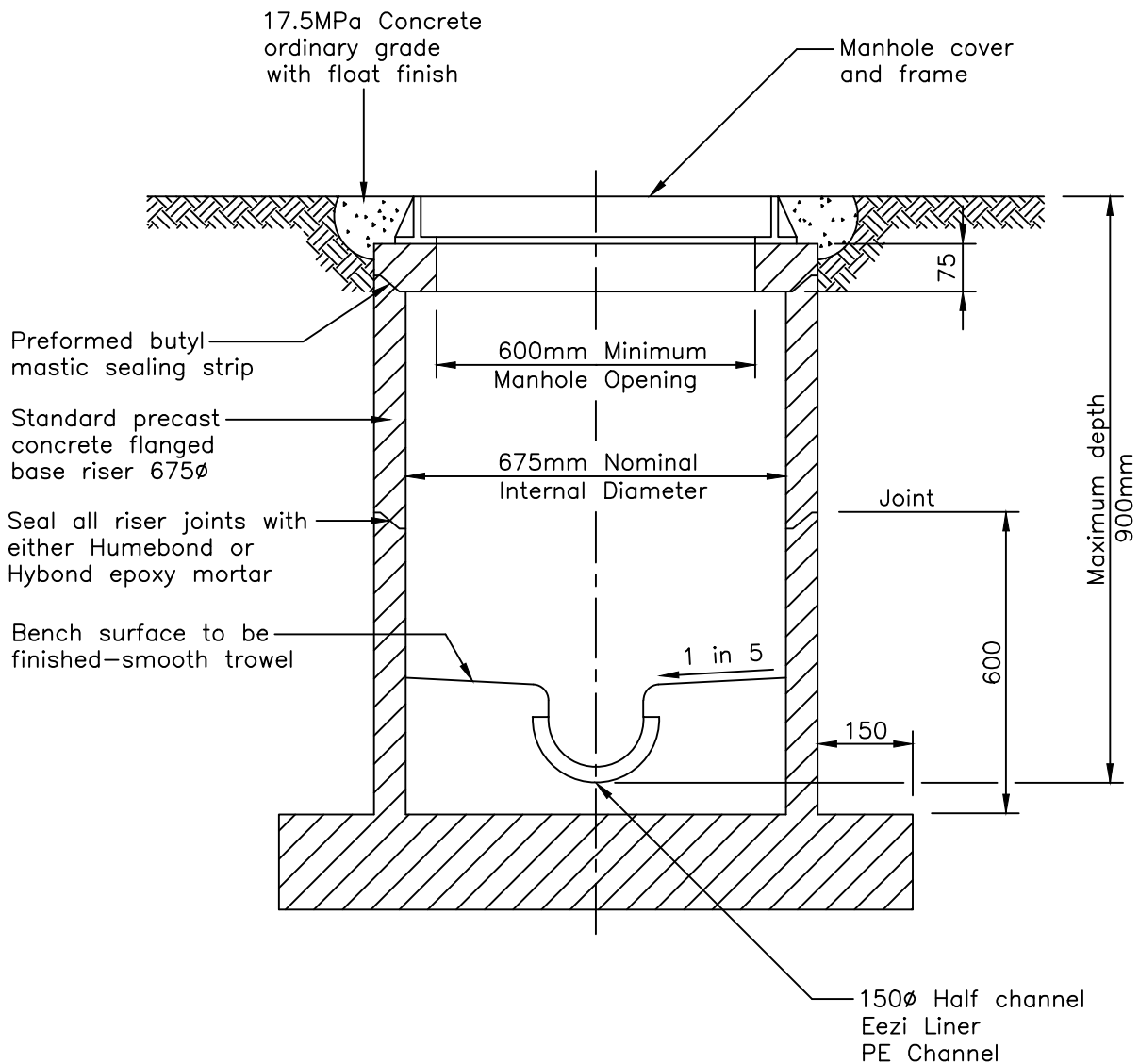


CONCRETE SURROUND

SCALE:	N.T.S.
ISSUE DATE:	14-04-2015
DWG No.	2010070.005B
REFERENCE No.	WW 7

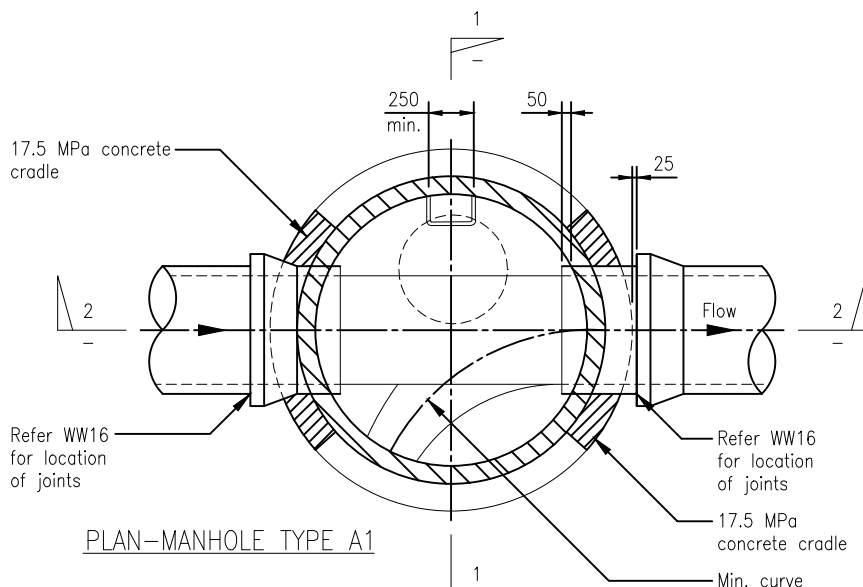
BEDDING DETAILS



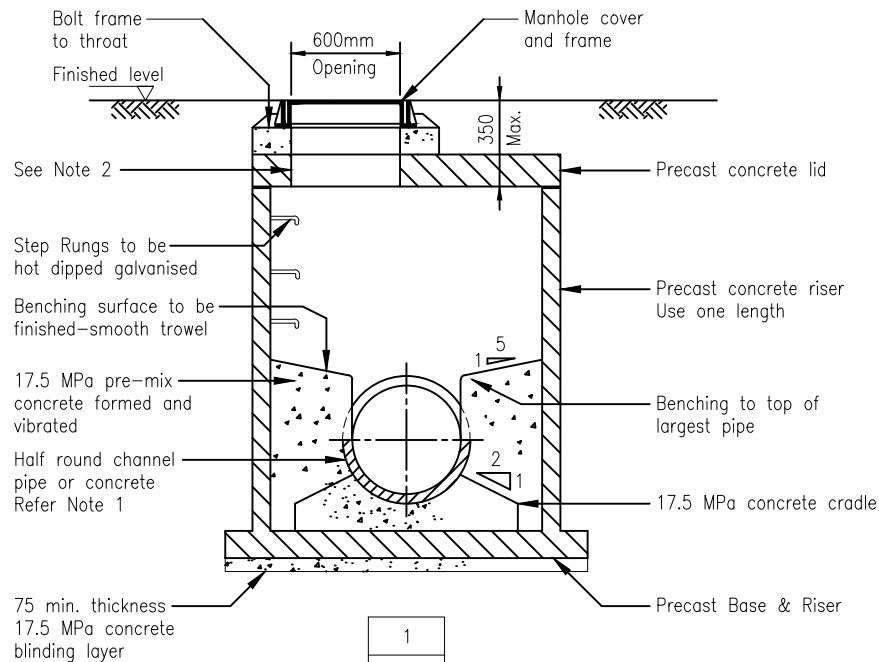
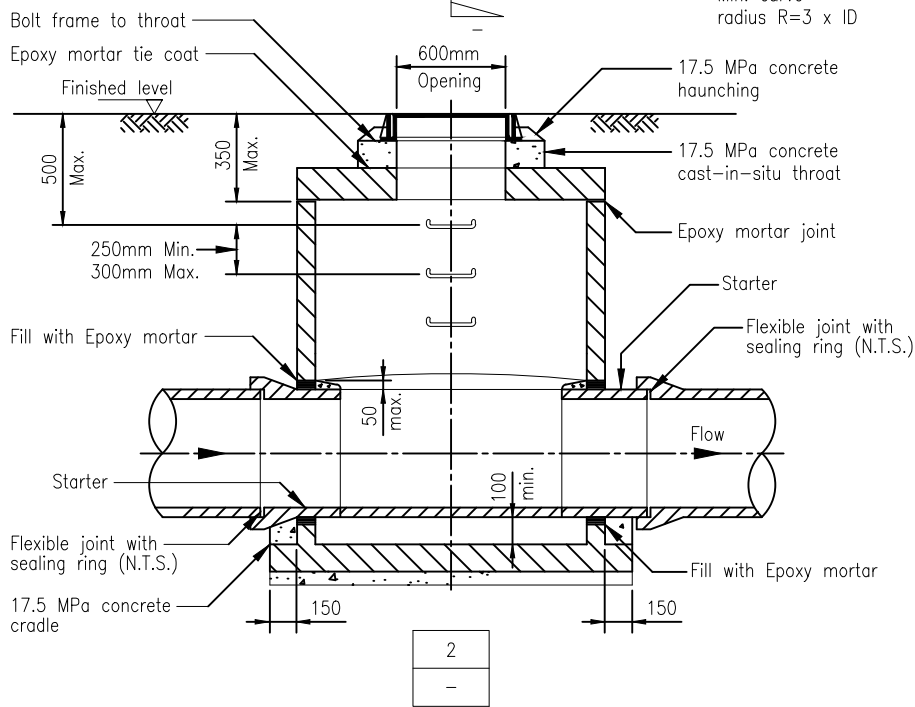


Note:

Only to be used for the terminating manholes on level Residential sites with a maximum of three 100mm ϕ House Connections or when a fixed surface level is established.



PLAN-MANHOLE TYPE A1



75 min. thickness
17.5 MPa concrete
blinding layer

1
-

2
-

NOTES:

1. Where half round channels are not available, the channel shall be formed with 25 MPa pre-mix concrete formed and vibrated to a smooth finish. Plastering is not permitted.
2. Refer WW15 for joint sealing and rung details.
3. Refer WW35 for manhole throat and cover details.

MANHOLE RISER DIAMETERS			
MAX. PIPE DIA.	NO. OF INCOMING PIPES **		
	1	2*	3***
≤250	1050	1050	1050
300	1050	1050	1200

* Based on Max. 120 Deg deflection through manhole.
 ** To be determined with due regard for future potential connections.
 *** Based on Min. 60 Deg between pipes & < 180 Deg between pipe 1 & pipe 3
 [Outside these criteria requires specific design]

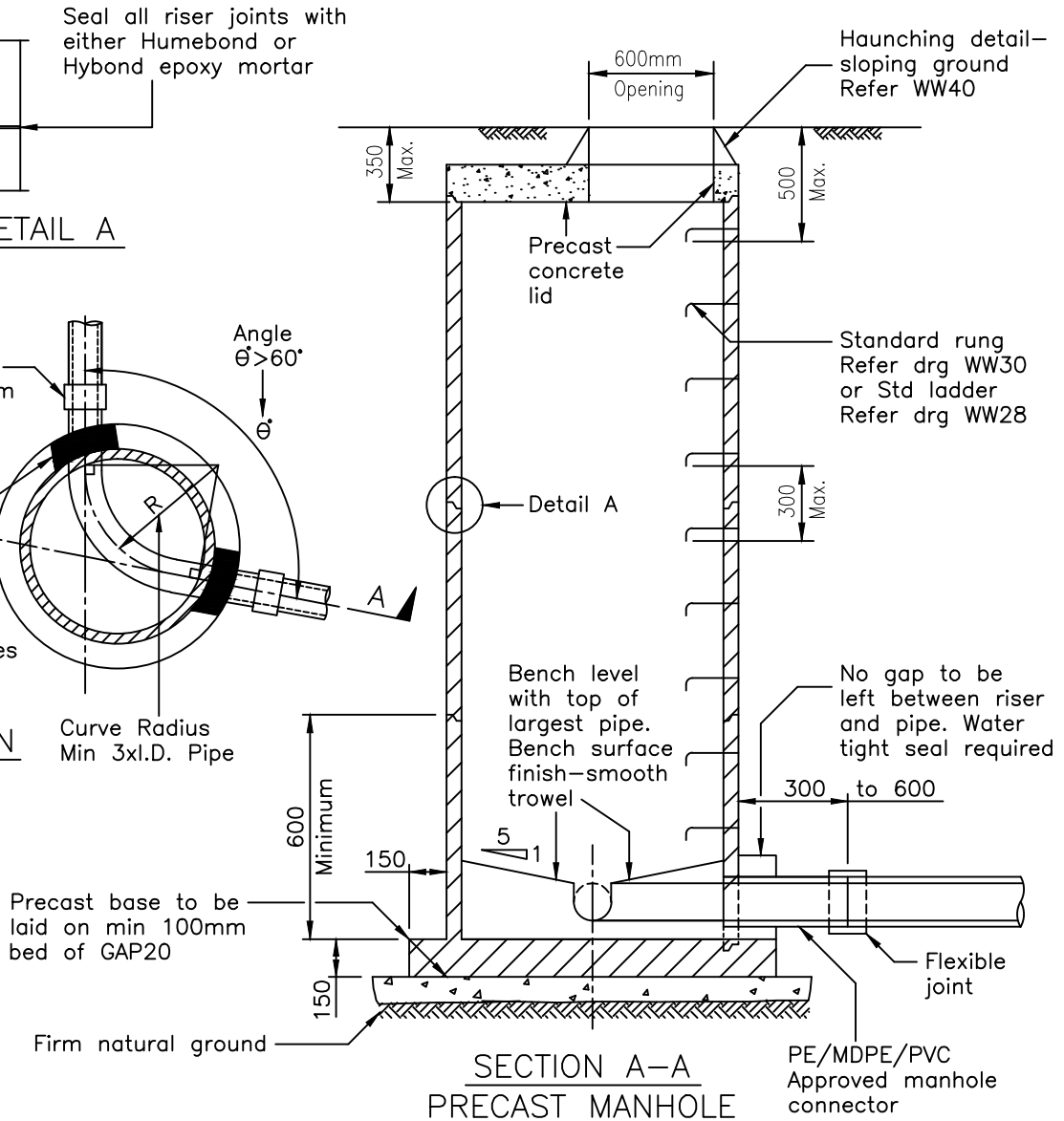
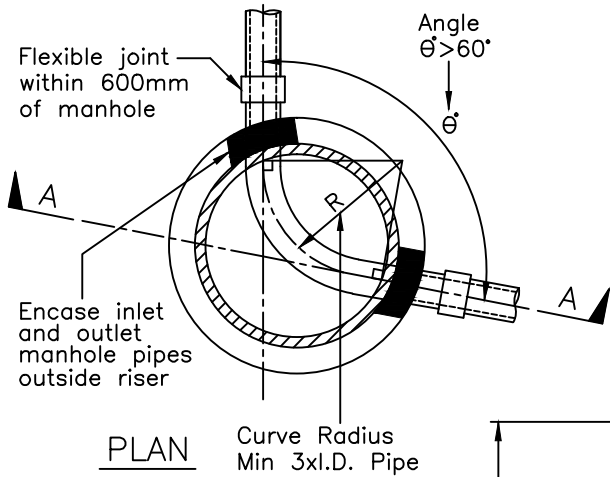
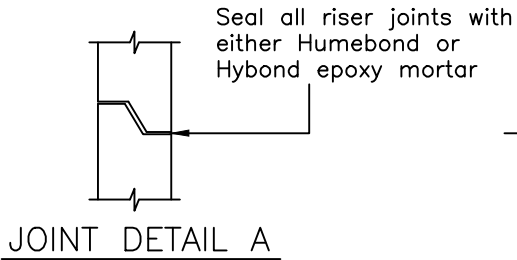
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SCALE:	N.T.S.
ISSUE DATE:	14-04-2015
DWG No.	2010070.010B
REFERENCE No.	WW 13

MANHOLES UP TO 1.8m DEEP TO OUTLET INVERT
 PRECAST BASE WITH VITRIFIED CLAY/REINF. CONCRETE CONNECTION



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Notes:—

1. First joints of inlet and outlet pipes to be not more than 600mm from manholes.
2. Channel through manhole to be lined with vitrified clay half channel.
3. All manhole openings to be cut with concrete saw (Not sledge hammer).
4. All manhole precast risers to be 1050 dia. min. standard for pipes from 150mm dia. up to 300mm dia. Refer to WW13 where there is more than one incoming pipe.
5. If the difference between invert level of outlet and inlet pipes is > 300 mm then refer to drawing WW24
6. The manhole diameter shall be increased to compensate for the reduced access space where more than two internal drop connections or more than three invert connections (in addition to the through line) are to be installed. Specific design will be required in sizing such manholes.
7. The manhole diameter shall be increased to 1200mm for all manholes greater than 3.5 metres deep.
8. Refer WW35 for manhole throat and cover details.

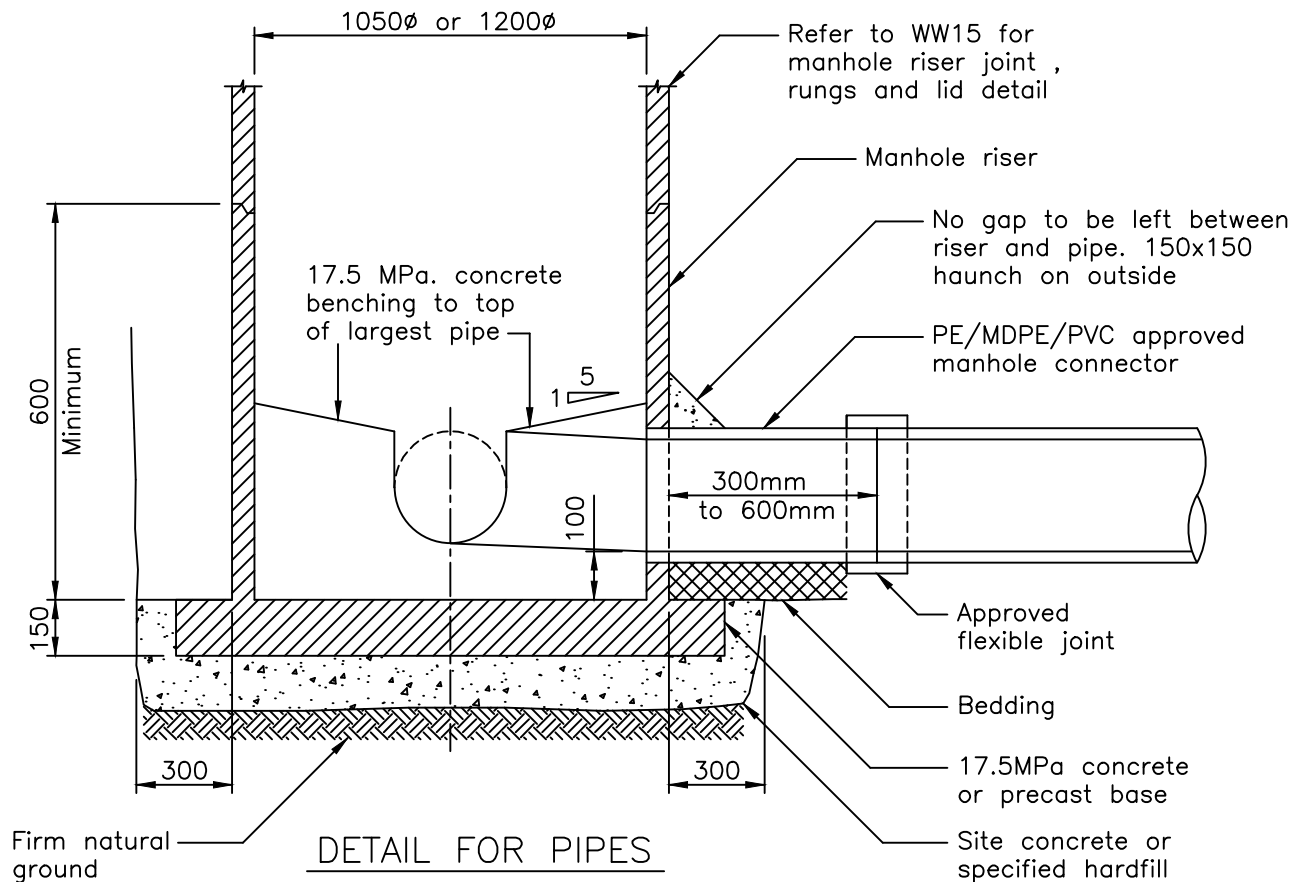
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**PRECAST MANHOLE
& PRECAST BASE**

SCALE:	N.T.S.
ISSUE DATE:	14-04-2015
DWG No.	2010070.012C
REFERENCE No.	WW 15



Notes:

1. First joints of inlet and outlet pipes to be not more than 600mm from manholes.
2. Where depth of manhole exceeds 3.5m from ground level to invert a minimum of 1200mm ϕ manhole shall be used.
3. Channel through manhole to be lined with vitrified clay half channel.
4. Where half round channels are not available, the channel shall be formed with 25 MPa premix concrete formed & vibrated to a smooth finish. Plastering is not permitted.

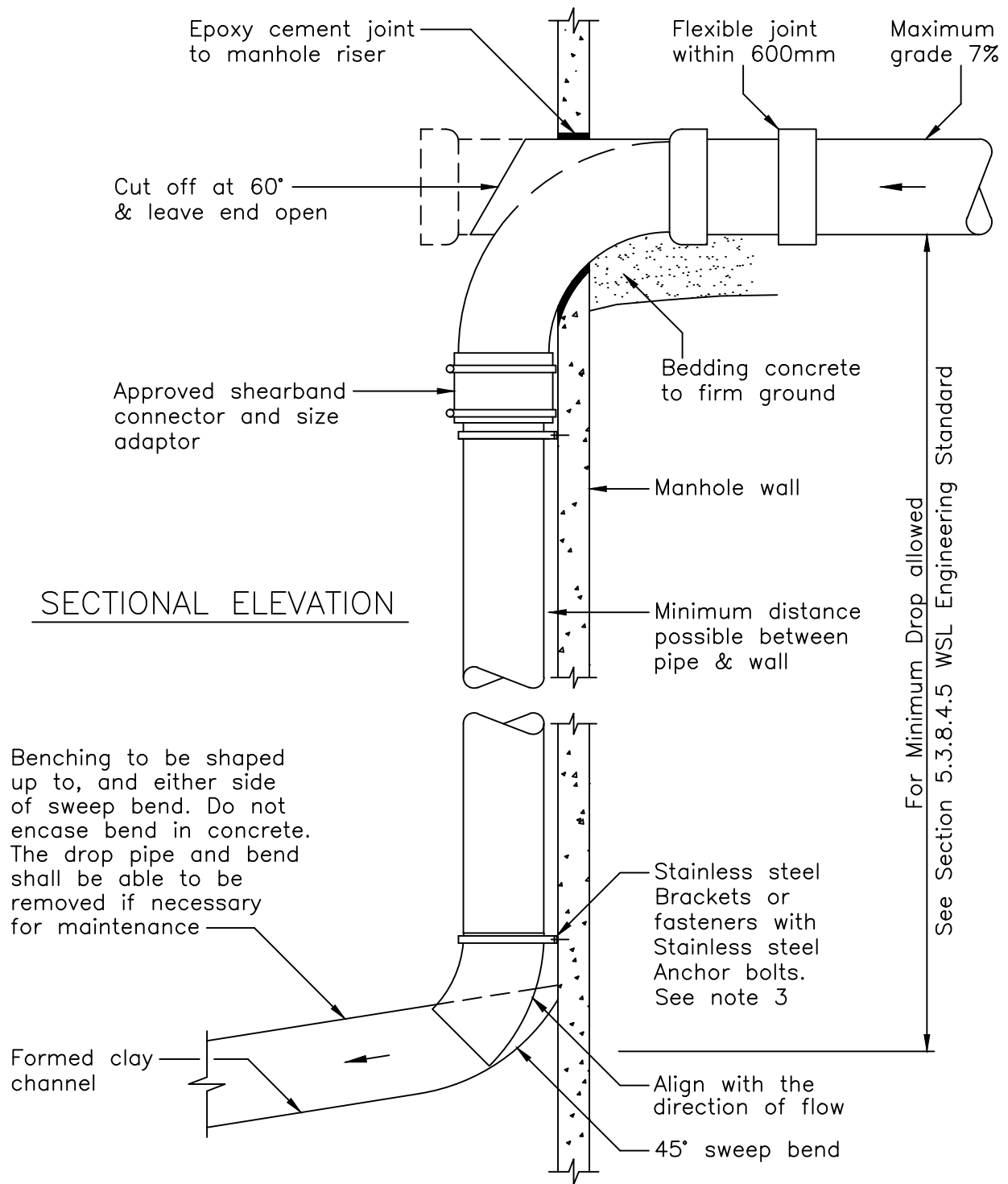
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PRECAST MANHOLE BASE
& PIPE CONNECTIONS

SCALE:	N.T.S.
ISSUE DATE:	14-04-2015
DWG No.	2010070.013C
REFERENCE No.	WW 16



NOTES:

1. Specific approval is required from Watercare for all internal drop connections to existing manholes. Considerations include space available in the existing manhole, number of existing internal drop connections etc.
2. Internal drop shall be clear of Manhole rungs/ladders.
3. 100 ϕ to 225 ϕ mPVC drop pipe held in place by Stainless steel Brackets or fasteners with M10 Stainless steel Anchor bolts every 600 mm.
4. Specific design is required where the incoming grade exceeds 7%
5. The minimum clear diameter in the manhole shall be 1m. Vertical droppers are not allowed in manholes under 1200mm diameter.

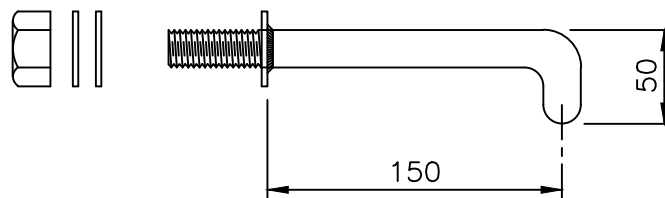
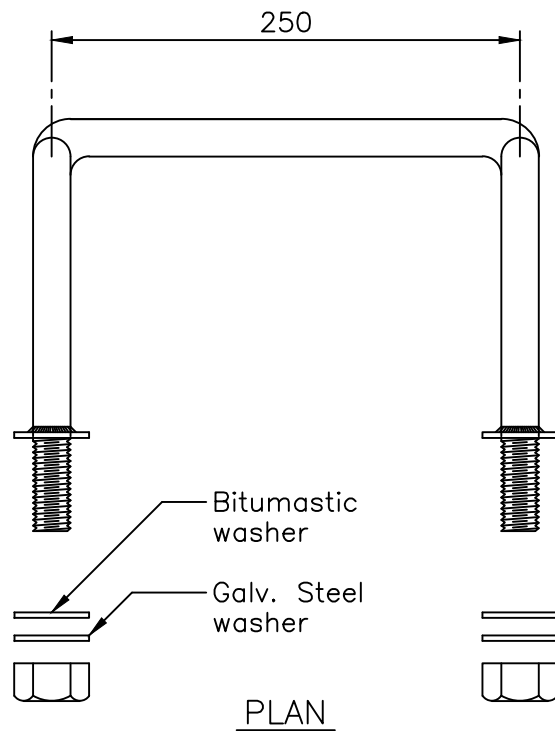
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INTERNAL MANHOLE
DROP PIPE

SCALE:	N.T.S.
ISSUE DATE:	14-04-2015
DWG No.	2010070.018B
REFERENCE No.	WW 24



NOTES:

1. All ironwork to be hot dipped galvanised after fabrication has been completed, with a minimum average coating weight of zinc = 610 g/sqm. to AS/NZS 4680:1999.
2. Refer to fixing notes on drawing WW3

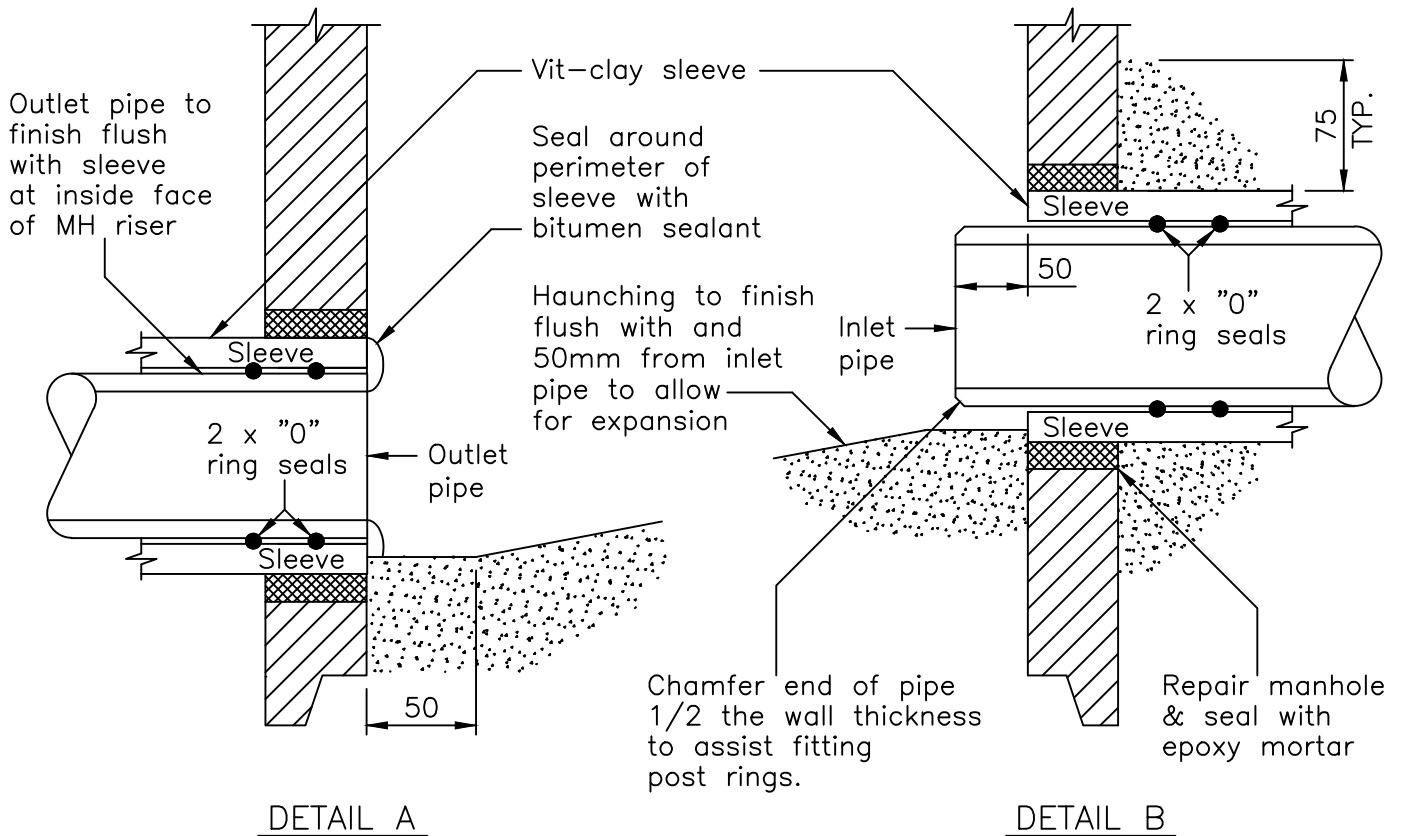
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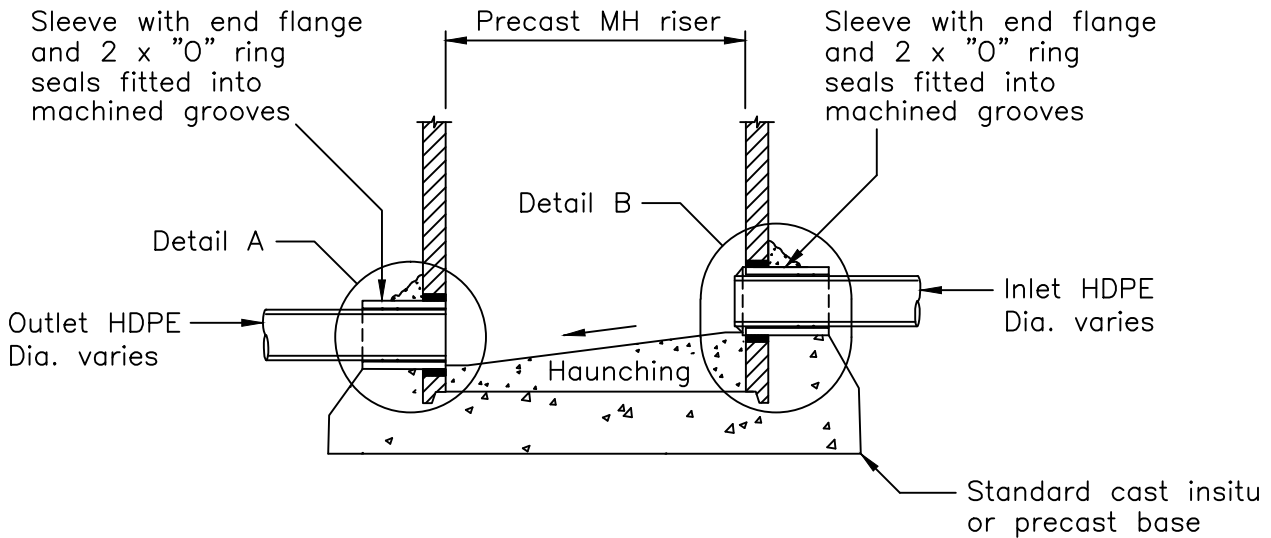
STEP RUNG
FOR STANDARD
PRECAST MANHOLE

SCALE:	N.T.S.
ISSUE DATE:	20-9-2013
DWG No.	2010070.024
REFERENCE No.	WW 30



DETAIL A

DETAIL B



DETAIL OF SLIDING JOINT AT MANHOLE

NOTES:

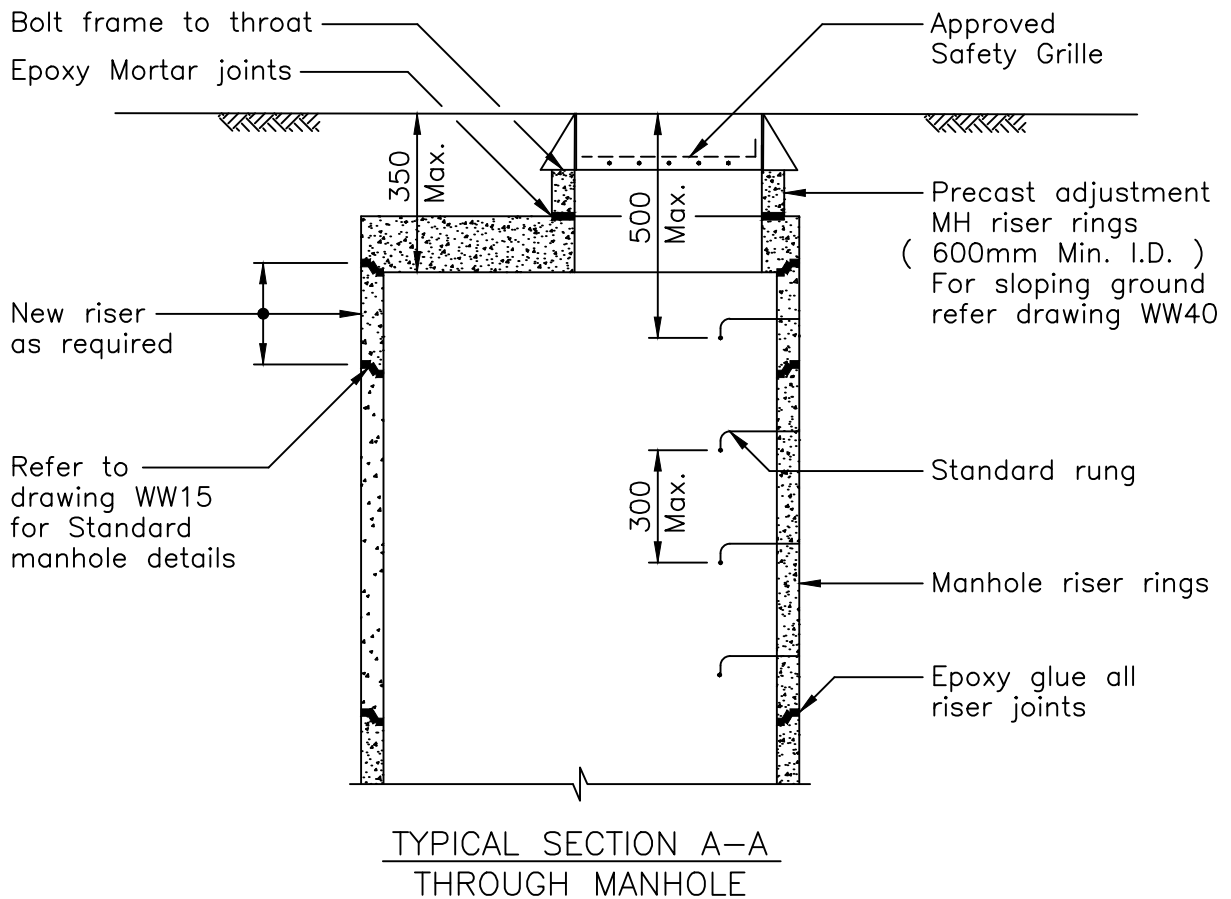
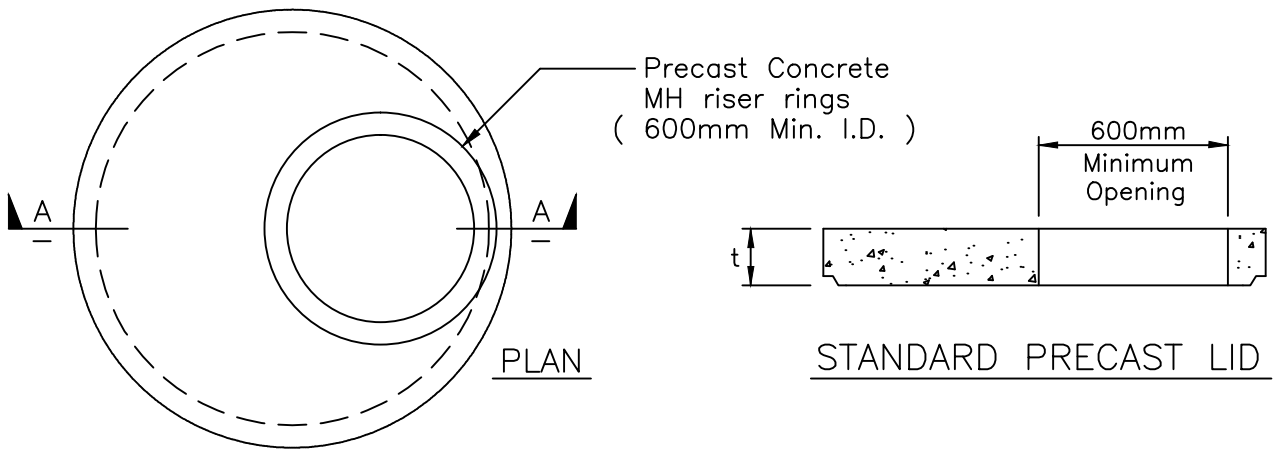
1. Haunching shall be formed to enable the pipe to expand and contract.
2. Sliding joint Vit-Clay sleeve to be factory fabricated to match O.D. of pipe.



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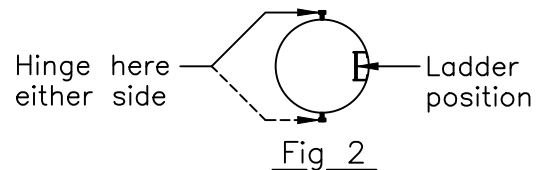
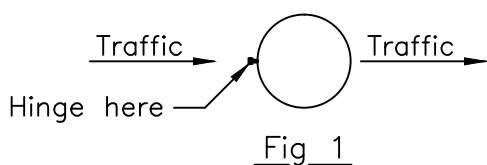
STANDARD MANHOLE
HDPE
SLIDING JOINT

SCALE:	N.T.S.
ISSUE DATE:	17-11-2014
DWG No.	2010070.028A
REFERENCE No.	WW 34



NOTES:

1. Lid supplied to HN-HO-72 loading and Producer Statement 1 (IPENZ)
2. When the height between the top of the existing precast concrete manhole lid and the cast iron frame is greater than 350mm, a new manhole riser is required with a new adjustment ring.
3. Refer drawing WW15 for precast concrete manhole construction details.
4. Refer drawing WW3 for General Construction Notes.
5. Approved Safety Grille below access manhole cover connected to frame.
6. Manhole covers in road shall be constructed so that the cover hinge is facing the oncoming traffic. (Refer Fig 1)
7. For all other covers the orientation should be so that the cover hinge is at 90 degrees from the ladder, Either side. (Refer Fig 2)



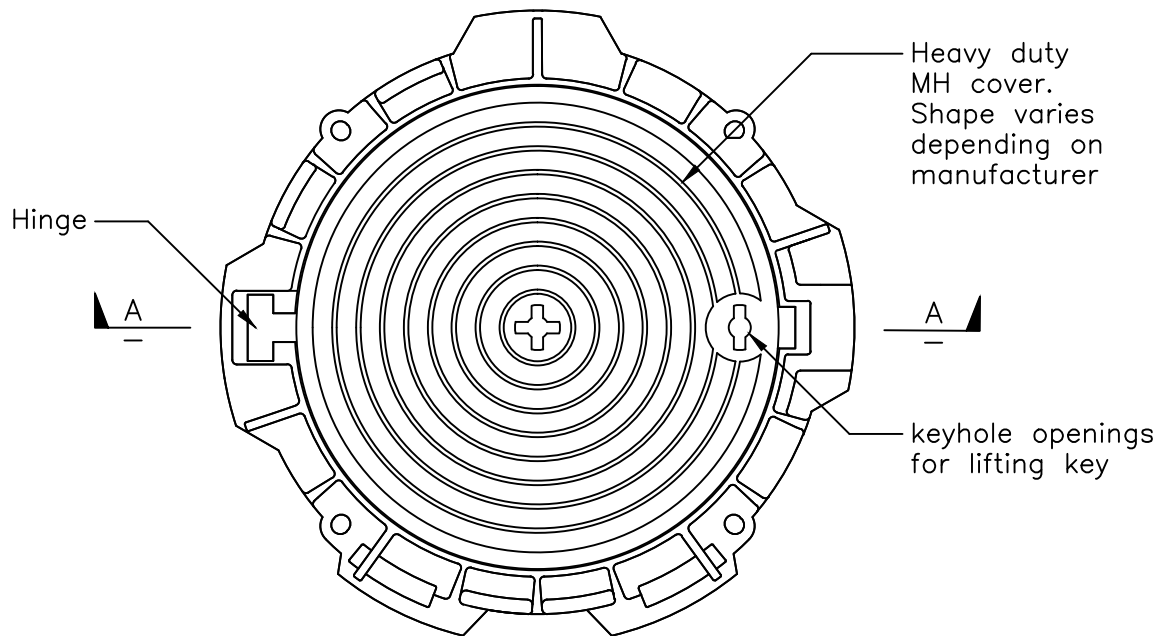
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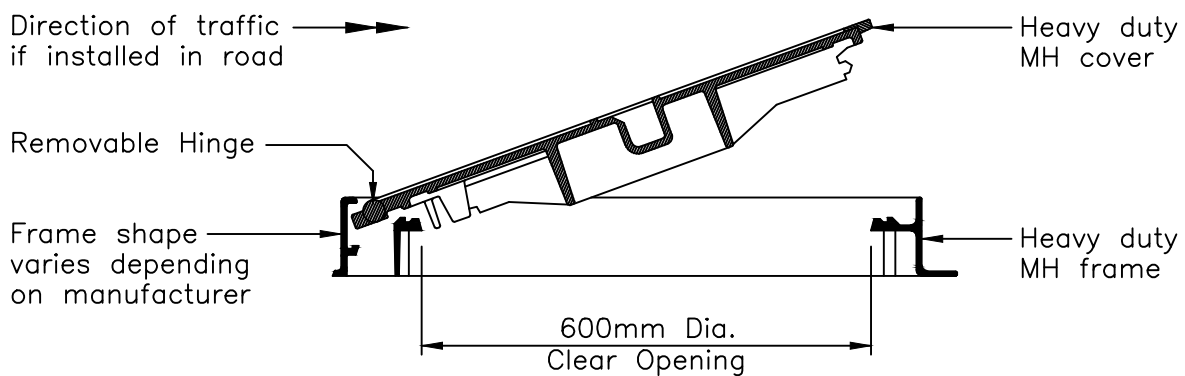
MANHOLE THROAT AND COVER DETAILS

SCALE:	N.T.S.
ISSUE DATE:	17-11-2014
DWG No.	2010070.029A
REFERENCE No.	WW 35



PLAN ON MANHOLE COVER AND FRAME

Not to scale



SECTION A-A

Not to scale

MH cover shape varies depending on manufacturer

NOTES:

1. No light duty Manhole lids allowed.
2. Other covers and frames as approved by Watercare.
3. Locate lid opening over steps in manhole.
4. Ductile Iron Cover and Frame
5. Hinge shall face on coming traffic when installed in traffic area.
6. Provide an approved Safety Grille below manhole lid. Refer diagram on drawing WW40



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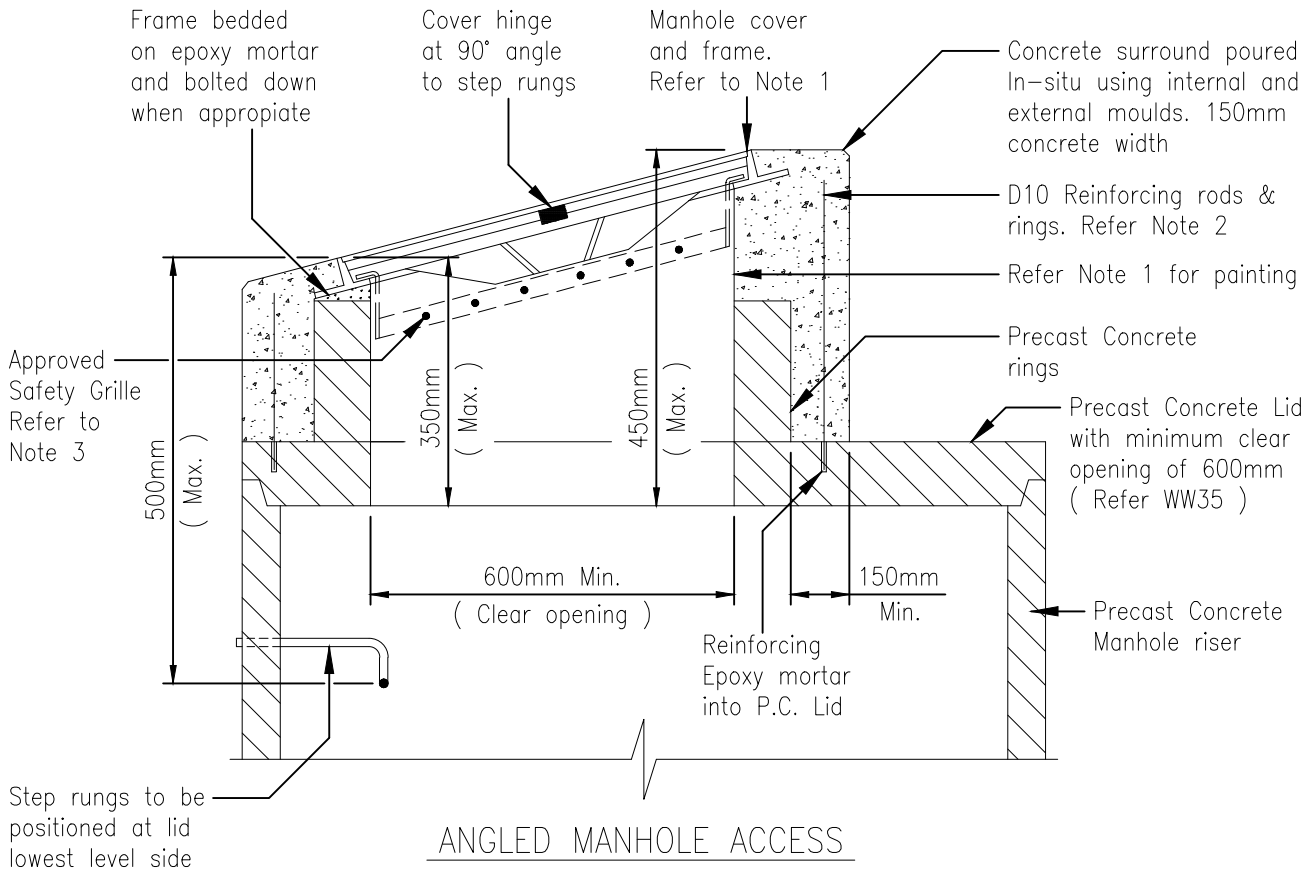
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600mm ϕ HEAVY DUTY
MANHOLE COVER AND FRAME

SCALE:	N.T.S.
ISSUE DATE:	20-9-2013
DWG No.	2010070.031
REFERENCE No.	WW 37

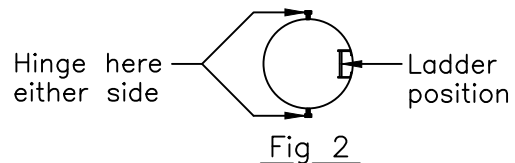
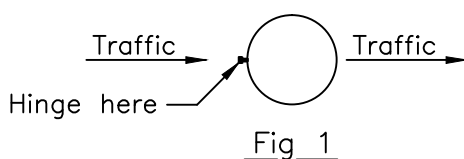


SAFETY GRILLES



NOTES :

1. Refer to drawing WW37 for manhole cover and frame requirements.
2. D10 vertical reinf. rods & horizontal rings to be spaced at 300mm Max. crs.
3. Approved Safety Grille below access manhole cover connected to frame.
4. Manhole covers in road shall be constructed so that the cover hinge is facing the oncoming traffic. (Refer Fig 1)
5. For all other covers the orientation shall be so that the cover hinge is at 90 degrees from the ladder, Either side. (Refer Fig 2)



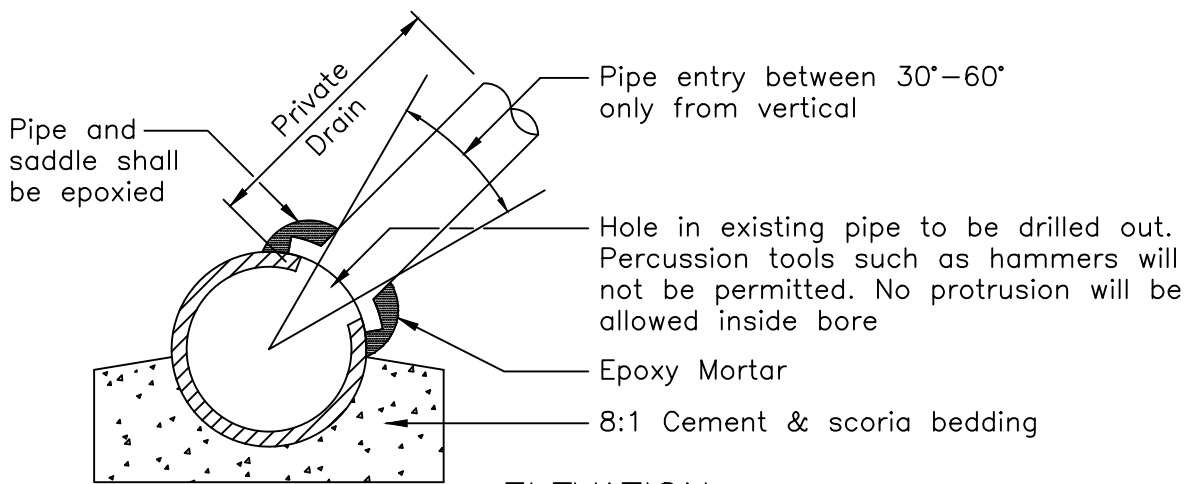
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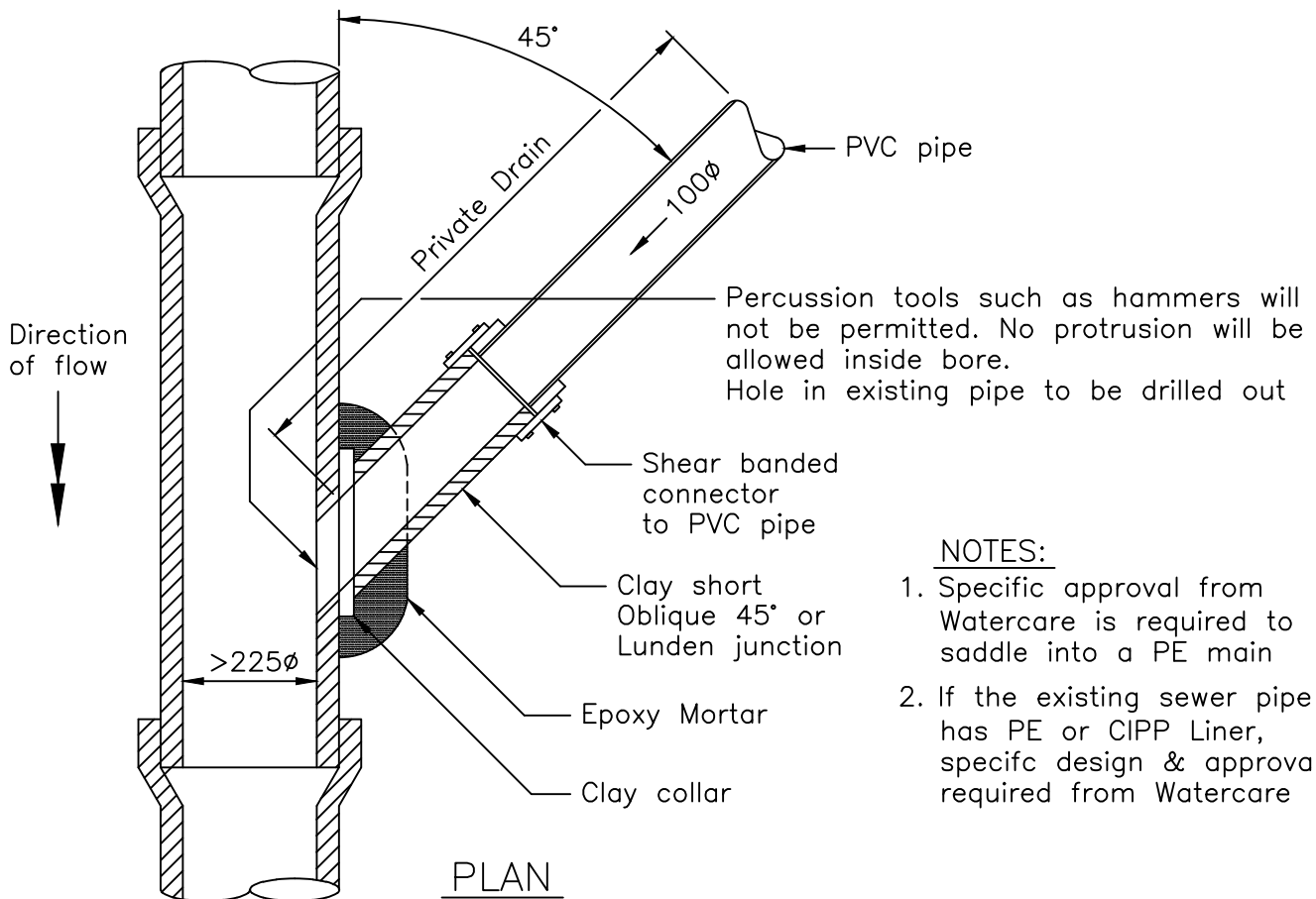
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ANGLED MANHOLE ACCESS DETAILS
AND SAFETY GRILLES

SCALE:	N.T.S.
ISSUE DATE:	14-04-2015
DWG No.	2010070.033B
REFERENCE No.	WW 40



ELEVATION



PLAN

NOTES:

1. Specific approval from Watercare is required to saddle into a PE main
2. If the existing sewer pipe has PE or CIPP Liner, specific design & approval required from Watercare

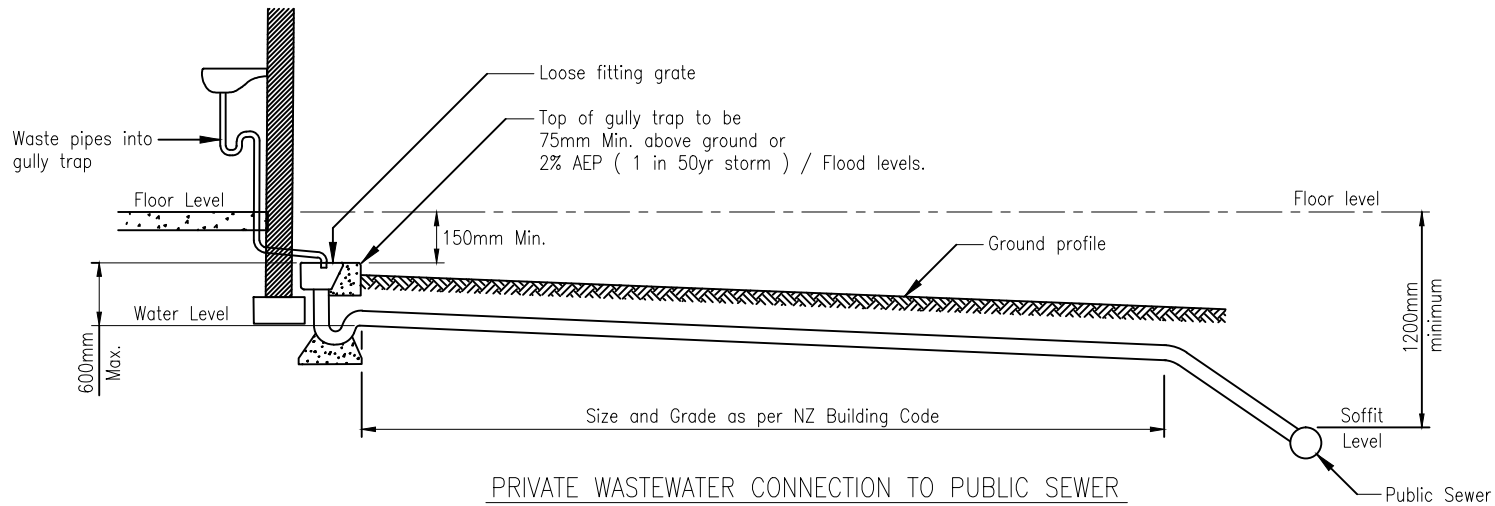
Max Lateral Saddle ϕ shall be $<$ half the ϕ of the main.
MPVC – Specific approval required from Watercare

TYPICAL CONNECTIONS TO CONCRETE OR EARTHENWARE PUBLIC SEWER

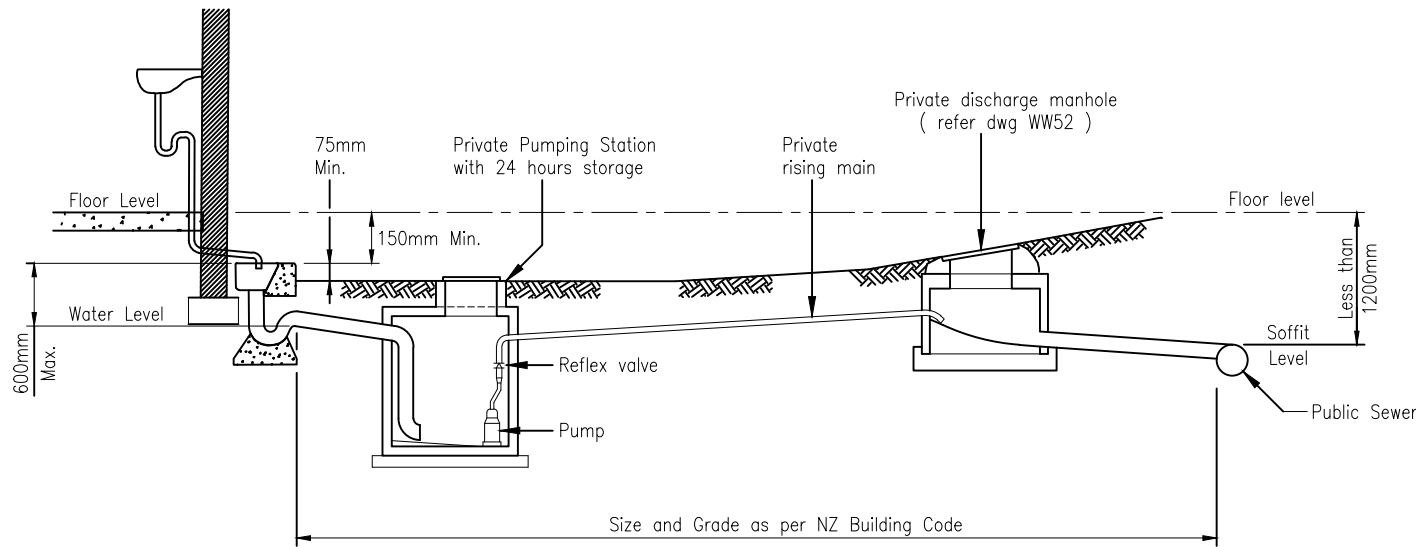
The saddle connection shown above applies to all concrete and earthenware sewers of 225mm diameter or greater. For connections to 150mm dia. or less diameter a vitrified clay Y-junction or Lunden junction is to be cut in with approved joints. Refer drawing WW47

TYPICAL CONNECTION TO FIBROLITE PUBLIC SEWER

No saddle connections allowed. For all sizes a vitrified clay Y-junction or Lunden junction is to be cut in with approved joints. Refer drawing WW47



PRIVATE WASTEWATER CONNECTION TO PUBLIC SEWER
 (Floor level to soffit 1200mm minimum unless approved by Watercare)



PRIVATE WASTEWATER PUMPING STATION CONNECTION TO PUBLIC SEWER
 (Floor level to soffit less than 1200mm)

NOTE:

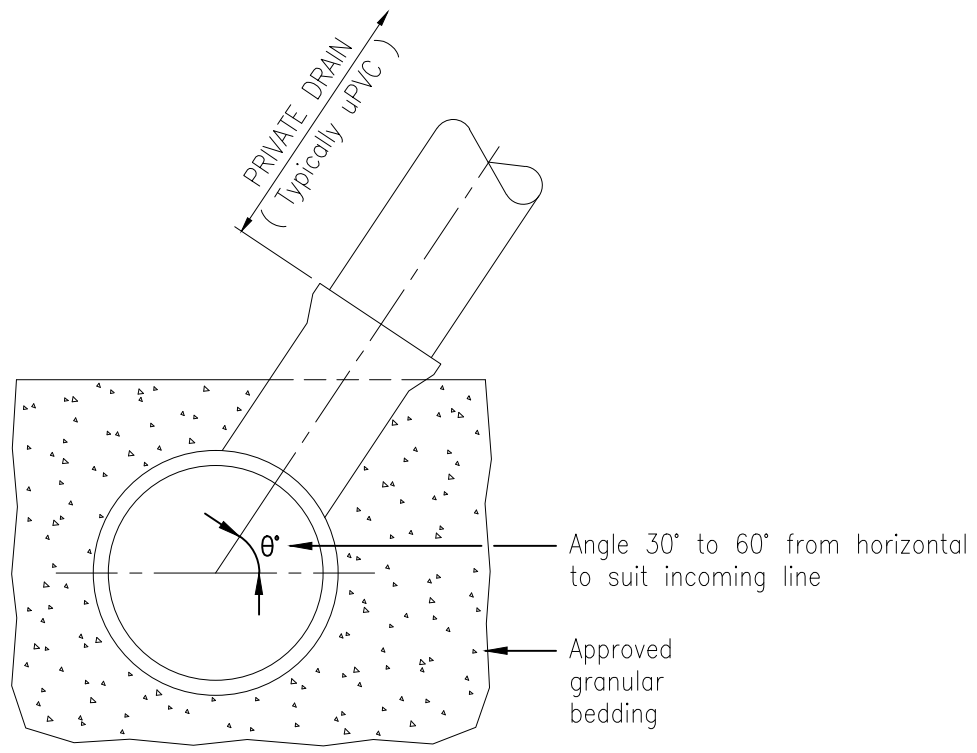
EXAMPLE OF HOUSE SERVICE CONNECTION TO A PUBLIC SEWER

1. Minimum requirements are satisfied when the floor level is at least 1200mm above the soffit of the receiving sewer.
2. Where the receiving sewer is less than 1200mm a private pumping station and discharge manhole shall be installed.
3. Ground around gully trap shall be at least 75mm below the gully trap or 2% of the AEP (Annual exceedance probability) – Rain fall flood levels.
4. Building floor shall be at least 150mm above the gully trap. Gully traps shall not be placed in over land flow paths.

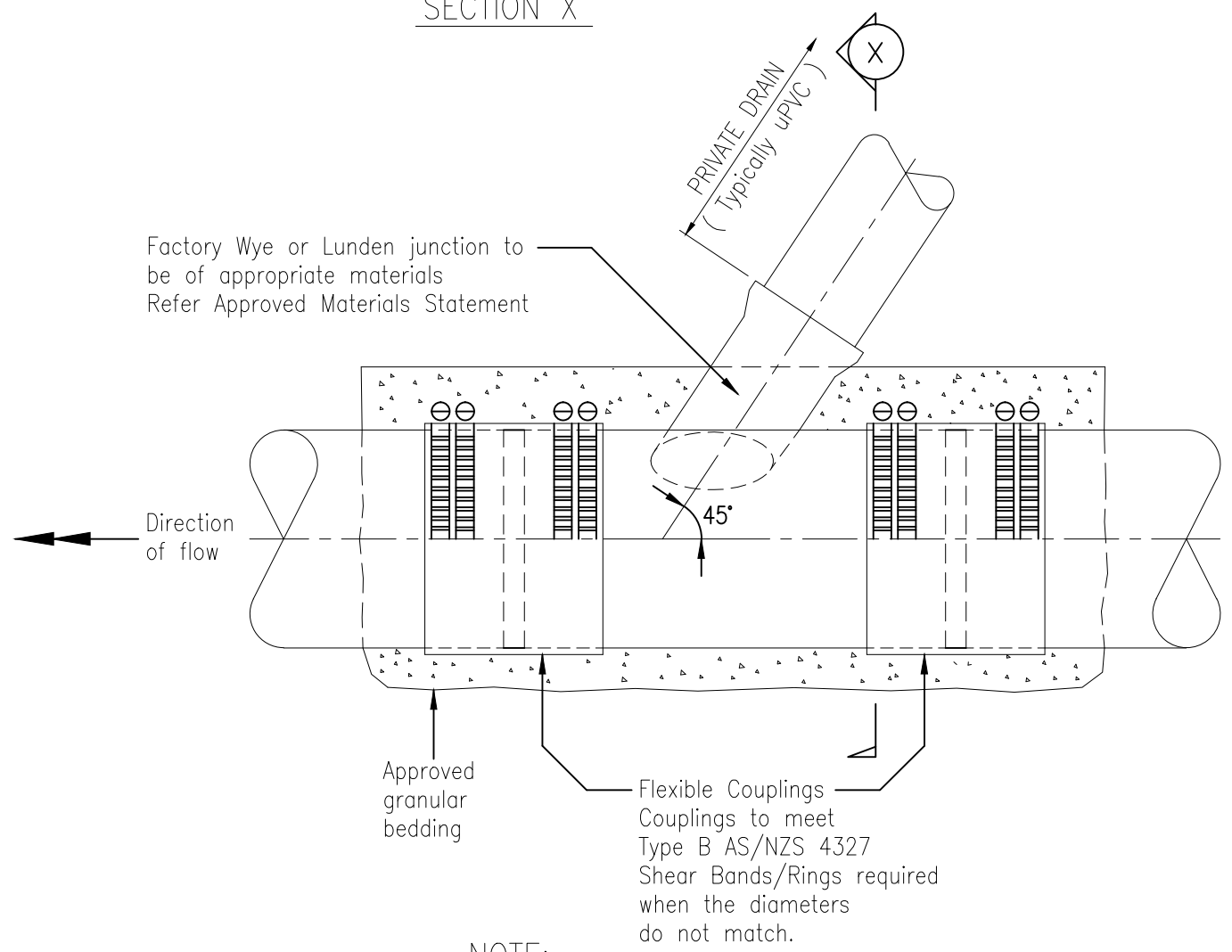


MINIMUM REQUIREMENTS
 FOR PRIVATE CONNECTIONS
 (FLOOR LEVEL TO SOFFIT OF SEWER)

SCALE:	N.T.S.
ISSUE DATE:	17-11-2014
DWG No.	2010070.037A
REFERENCE No.	WW 46



SECTION X



NOTE:

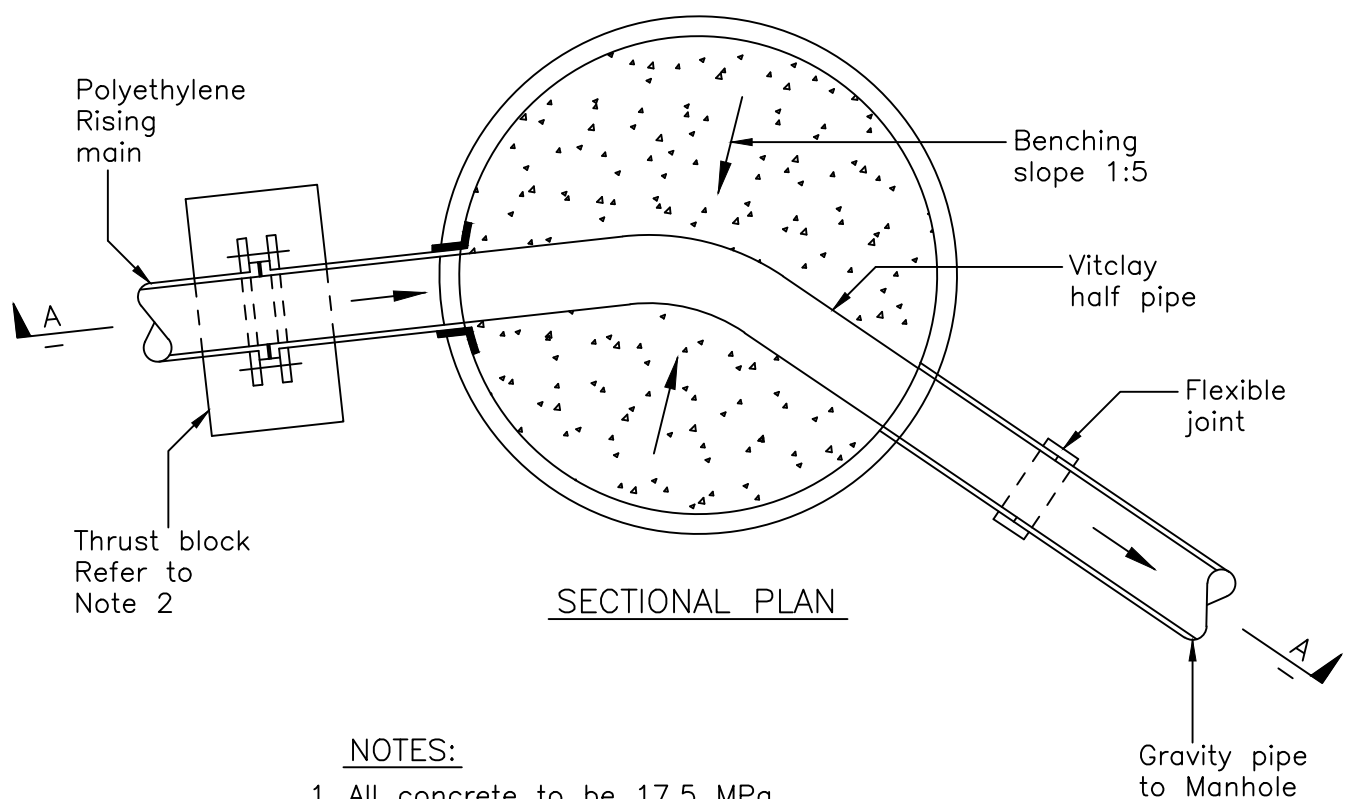
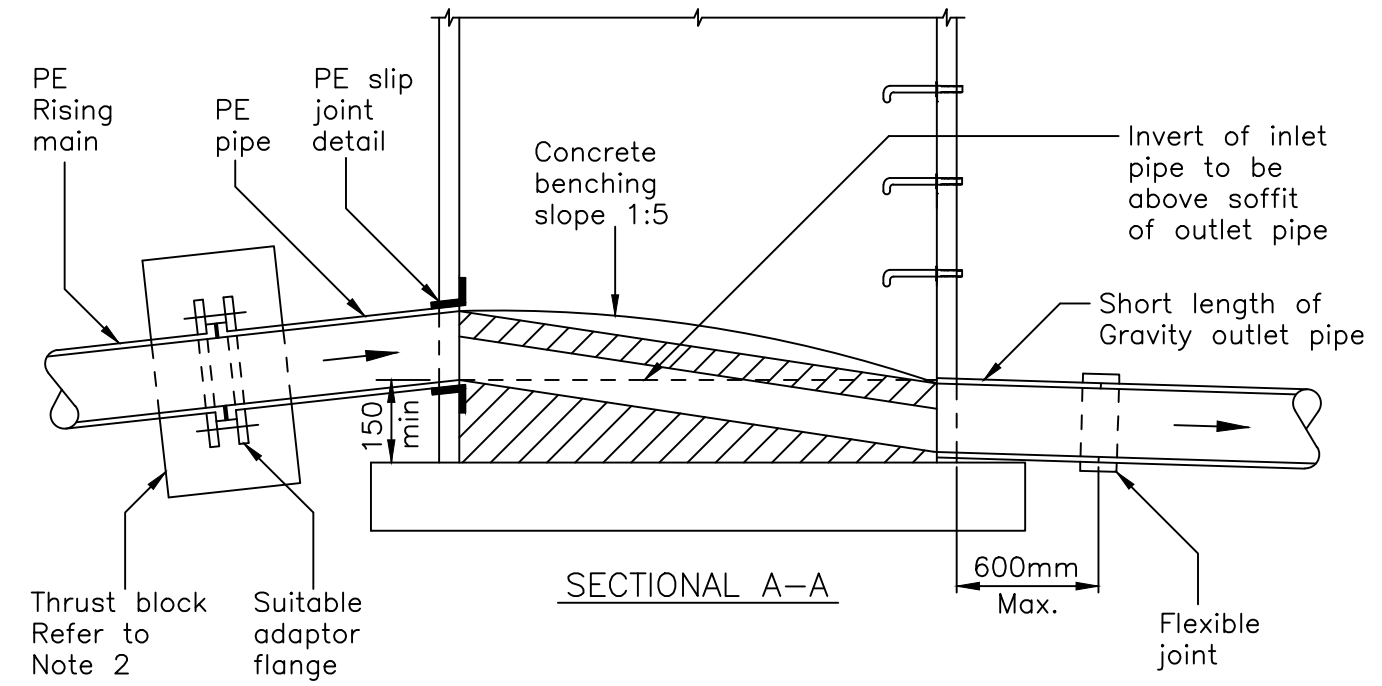
1. Use same method (with straight length of pipe) where sewer repairs are to be carried out.



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TYPICAL SERVICES CONNECTIONS
TO PUBLIC PVC/VC/CONCRETE/PE
WASTEWATER SEWERS

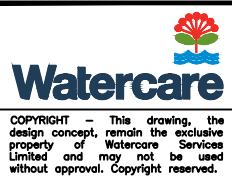
SCALE:	N.T.S.
ISSUE DATE:	05-12-2014
DWG No.	2010070.038
REFERENCE No.	WW 47



NOTES:

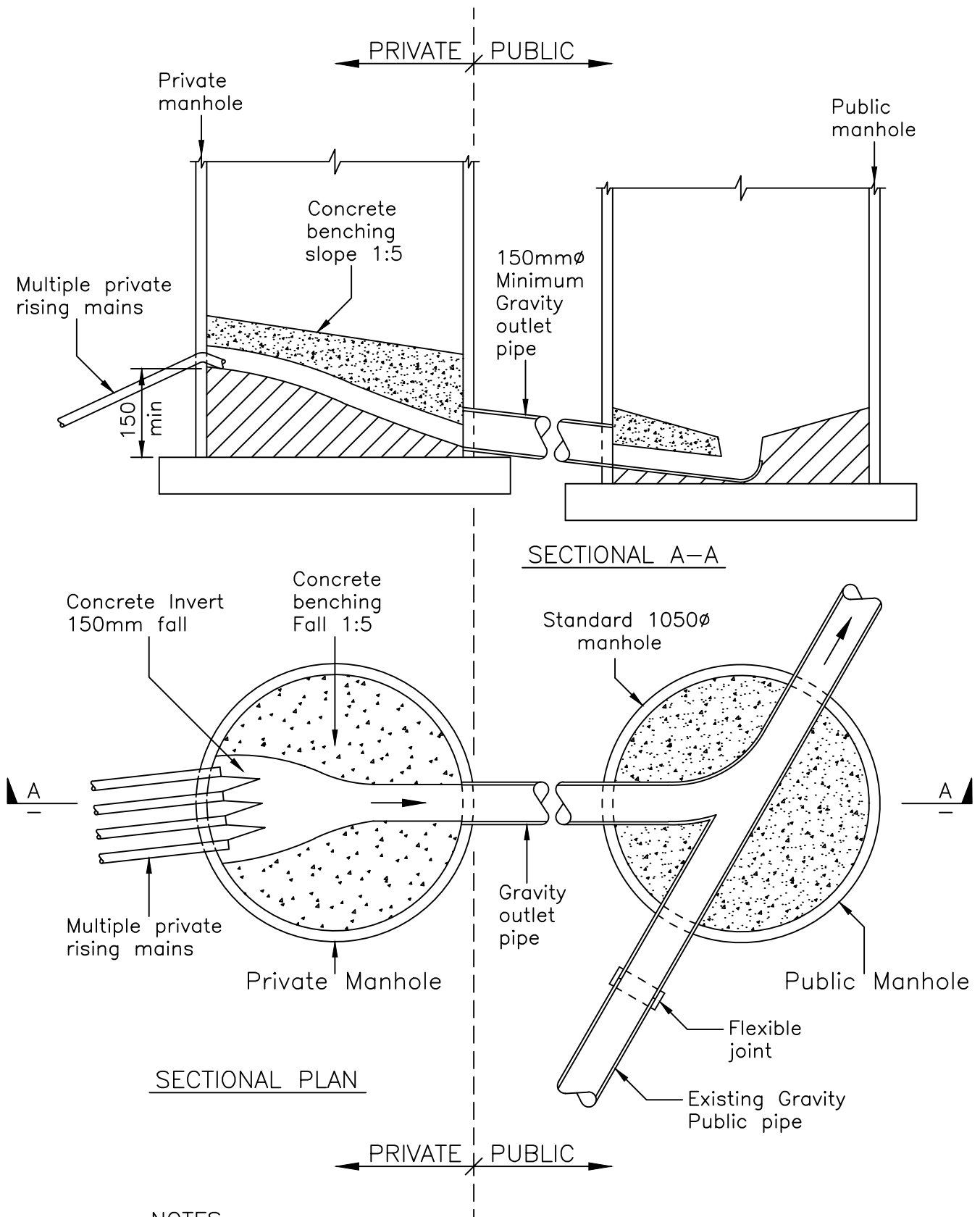
1. All concrete to be 17.5 MPa.
2. Thrust blocks to be constructed on Rising main inlet and will be cast against firm ground. For Thrust block details refer to drawing WW62
3. For standard manhole refer to drawings WW15 and WW16
4. For private rising main connections refer to drawing WW52

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PUBLIC RISING MAIN
OUTLET TO GRAVITY
PUBLIC

SCALE:	N.T.S.
ISSUE DATE:	20-9-2013
DWG No.	2010070.041
REFERENCE No.	WW 50



NOTES:

1. All concrete to be 17.5 MPa.
2. For public rising main refer to drawing WW50
3. A single Private Main connection to the Public Sewer shall be made via a Private Shallow manhole with a Public 150mm Min. gravity pipe feed to the Public Sewer or Manhole.

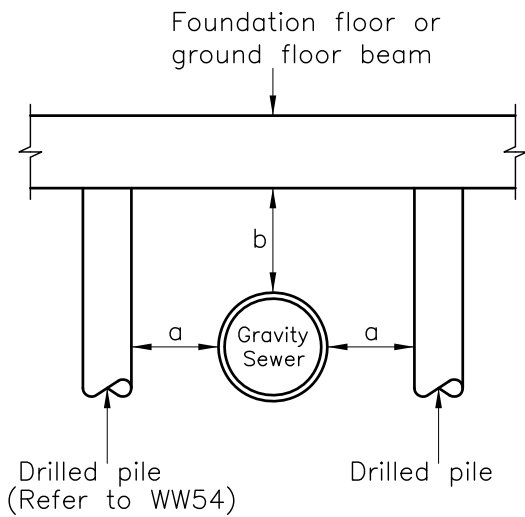
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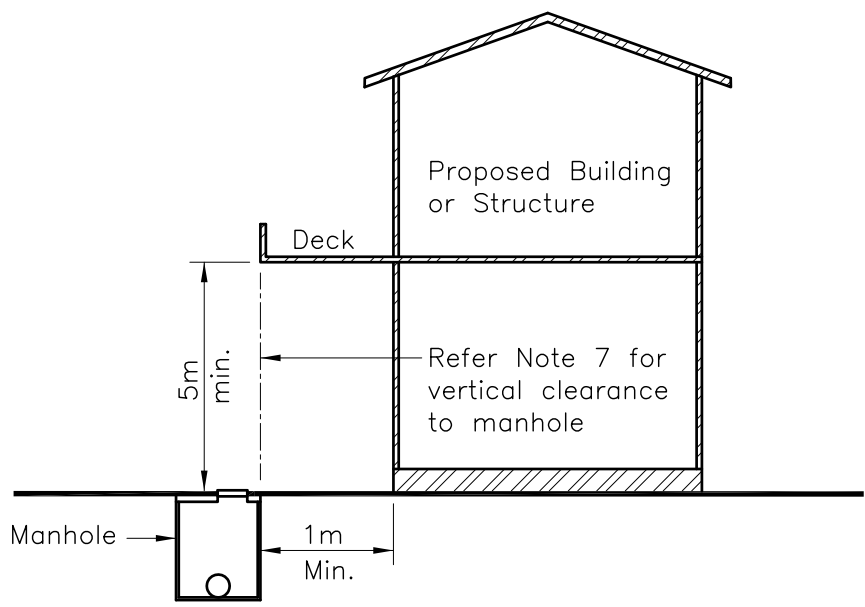
RISING MAIN CONNECTION
PRIVATE

SCALE:	N.T.S.
ISSUE DATE:	20-9-2013
DWG No.	2010070.043
REFERENCE No.	WW 52



Minimum Pile Clearances						
Type of Sewer	Sewer Depth < 3m		Sewer Depth 3m–5m		Sewer Depth >5m	
	a	b	a	b	a	b
Local Wastewater Network	1m	0.6m	1m	0.6m	1.5m	0.6m
Transmission (Trunk) Sewer	1m	1m	2m	1m	3m	1.5m

PIPE CONSTRUCTION CLEARANCE

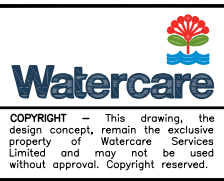


MANHOLE CONSTRUCTION CLEARANCE

NOTES:

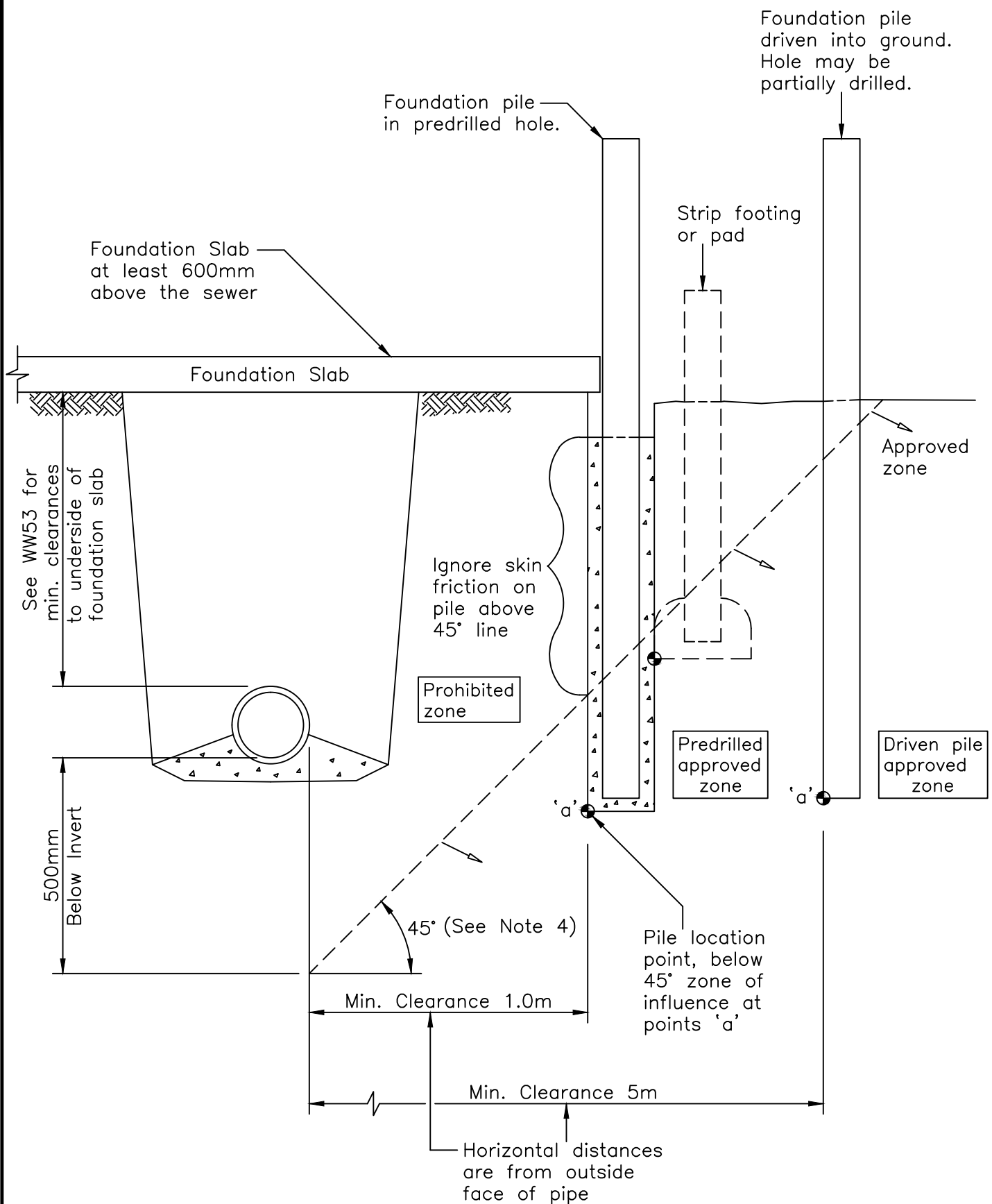
1. Locate sewer to survey accuracy or by hand piloting.
2. No driven piles within 5m of a sewer or 10m of brick sewer.
3. All manholes shall have 24 hrs unobstructed access.
4. No construction shall occur above a manhole or within tolerances 'a' or 'b' in table above.
5. Rising mains shall not be built over.
6. Brick sewers and those sewers in poor condition shall not be built over unless they are replaced with new sewers which will be to current standard.
7. Vertical clearance from the top of the chamber shall be 5m Min. over the full width of the chamber.

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PIPE AND MANHOLE CONSTRUCTION CLEARANCE

SCALE:	N.T.S.
ISSUE DATE:	19-05-2015
DWG No.	2010070.044B
REFERENCE No.	WW 53



NOTES:

1. No driven piles are permitted within 10m of brick Sewers, or within 5m of all other sewers.
2. Piles that are required to resist horizontal forces will require specific design.
3. Pile/Footing location point must be below 45° zone of influence.
4. Zone of influence typically 45° or angle determined by a structural engineer.

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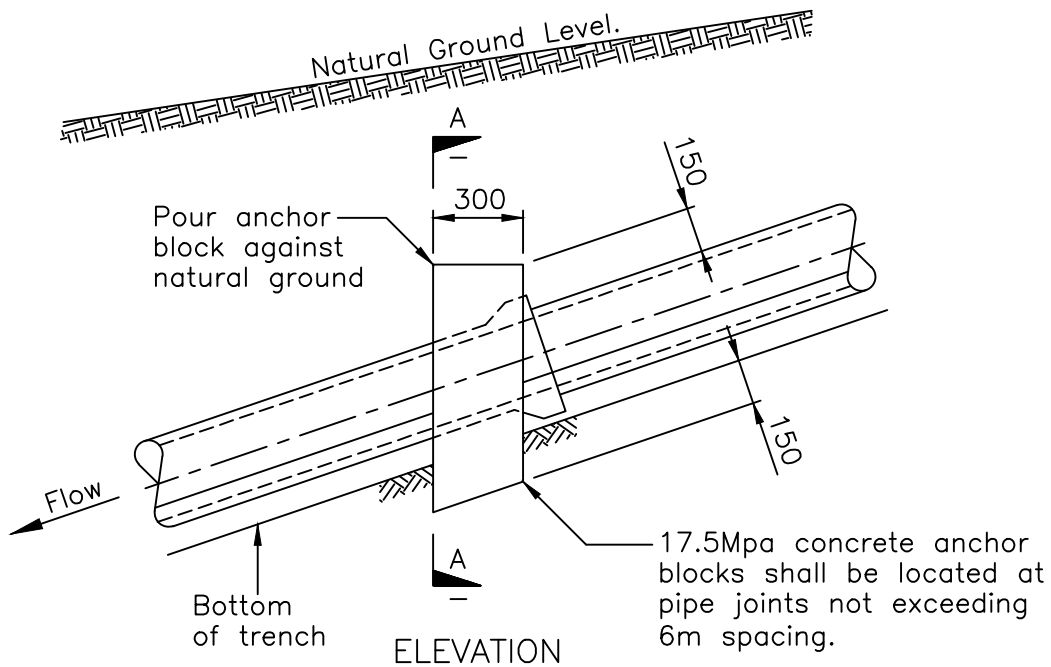
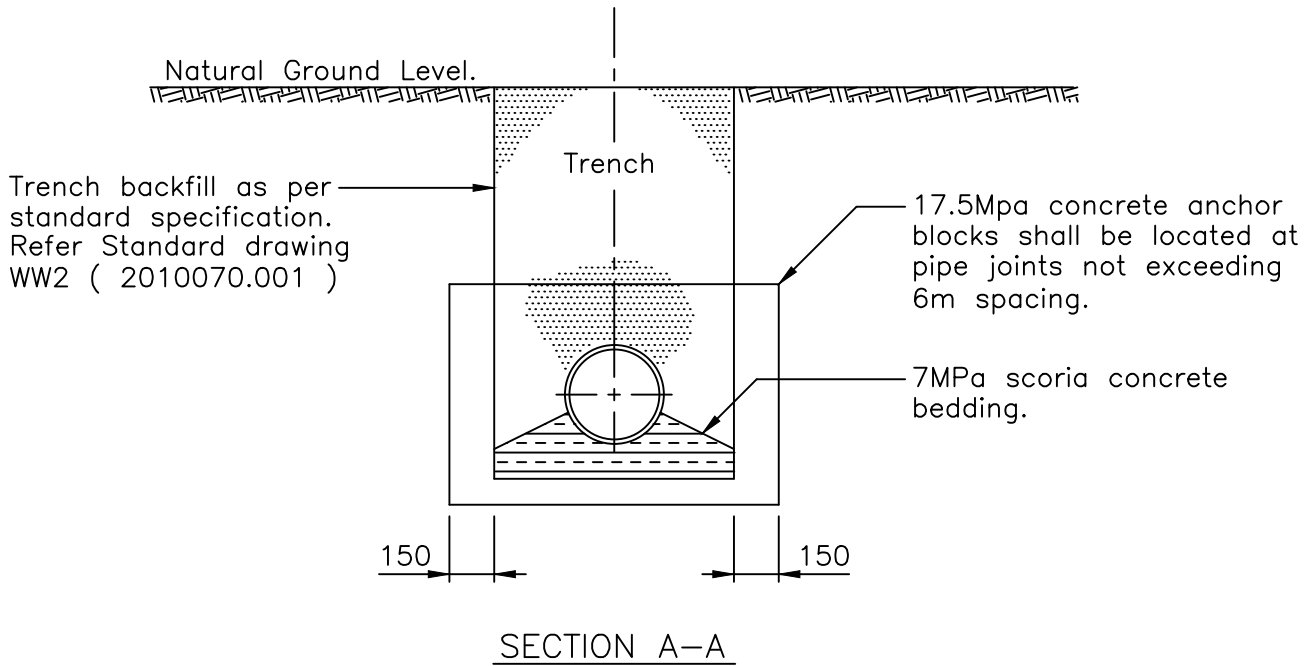
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BUILDING CLOSE TO OR OVER LOCAL NETWORK SEWER

SCALE:	N.T.S.
ISSUE DATE:	20-9-2013
DWG No.	2010070.045
REFERENCE No.	WW 54

NOTE:

For wastewater lines laid at grades steeper than 10% (including service connections) the bedding and surround material shall be of a low-grade (7MPa) scoria concrete. For lines exceeding a grade of 20% anchor blocks shall be located at pipe joints, not exceeding 6m spacing.



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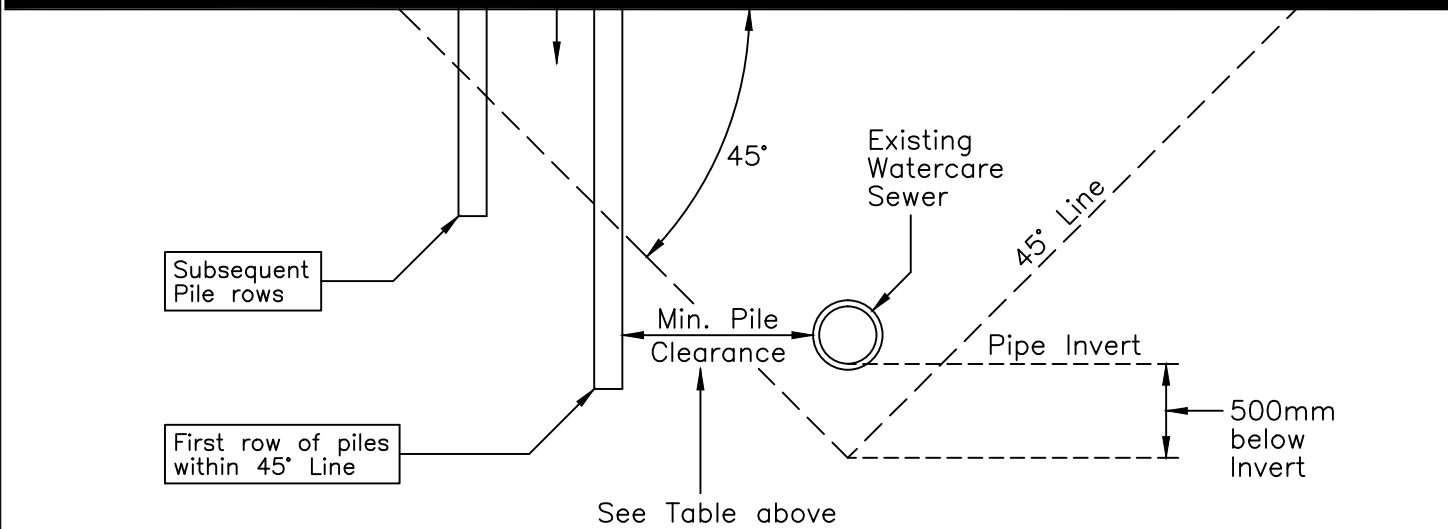
ANCHOR AND
ANTI-SCOUR BLOCK

SCALE:	N.T.S.
ISSUE DATE:	20-9-2013
DWG No.	2010070.049
REFERENCE No.	WW 58

GUIDELINE ONLY

SEWER DEPTH	MIN. PILE CLEARANCES
< 3.0m	1.0m
3m-5m	2.0m
> 5.0m	3.0m

Within the 45° envelope the structure shall be self-supporting and span between piles.



SECTION THROUGH BUILDING AND TRANSMISSION SEWER

NOTES:

1. This detail shall be used as a guideline only. All applications will be assessed on individual basis and conditions imposed could be more specific than these shown.
2. No structural loads are to be placed on public sewer lines.
3. All structural loads on piles shall be absorbed outside the 45° envelope and below the pipe invert level for the first row of piles.
4. Where raft foundations or strip footings are proposed within the 45° envelope, statement from a structural engineer is required to confirm that the foundation design complies with Clause 2.
5. Driven piles are not permitted within 10 metres of a brick sewer or 5 metres of any other sewers.
6. Closed Circuit Television (CCTV) inspections of Transmission sewer only on approval from Watercare Services Ltd.
7. Drawings of the proposed works must accurately identify the location of the sewer/s affected and the distances with cross-section details for all structures. Watercare approved registered surveyor must be engaged to carry out the mark out.

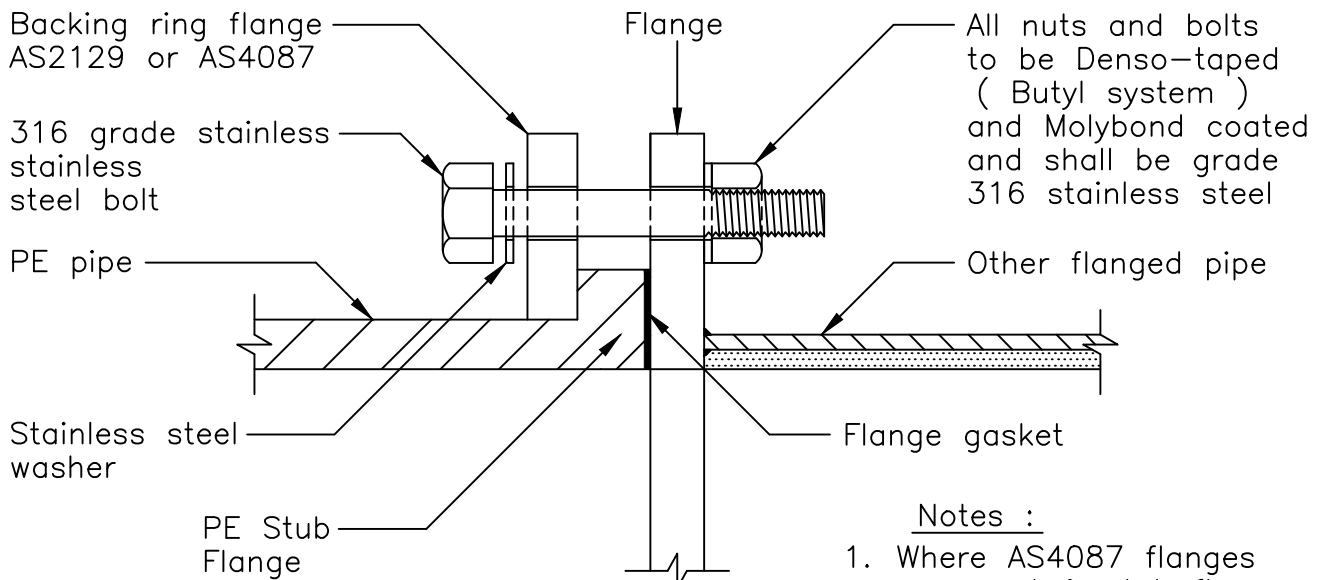
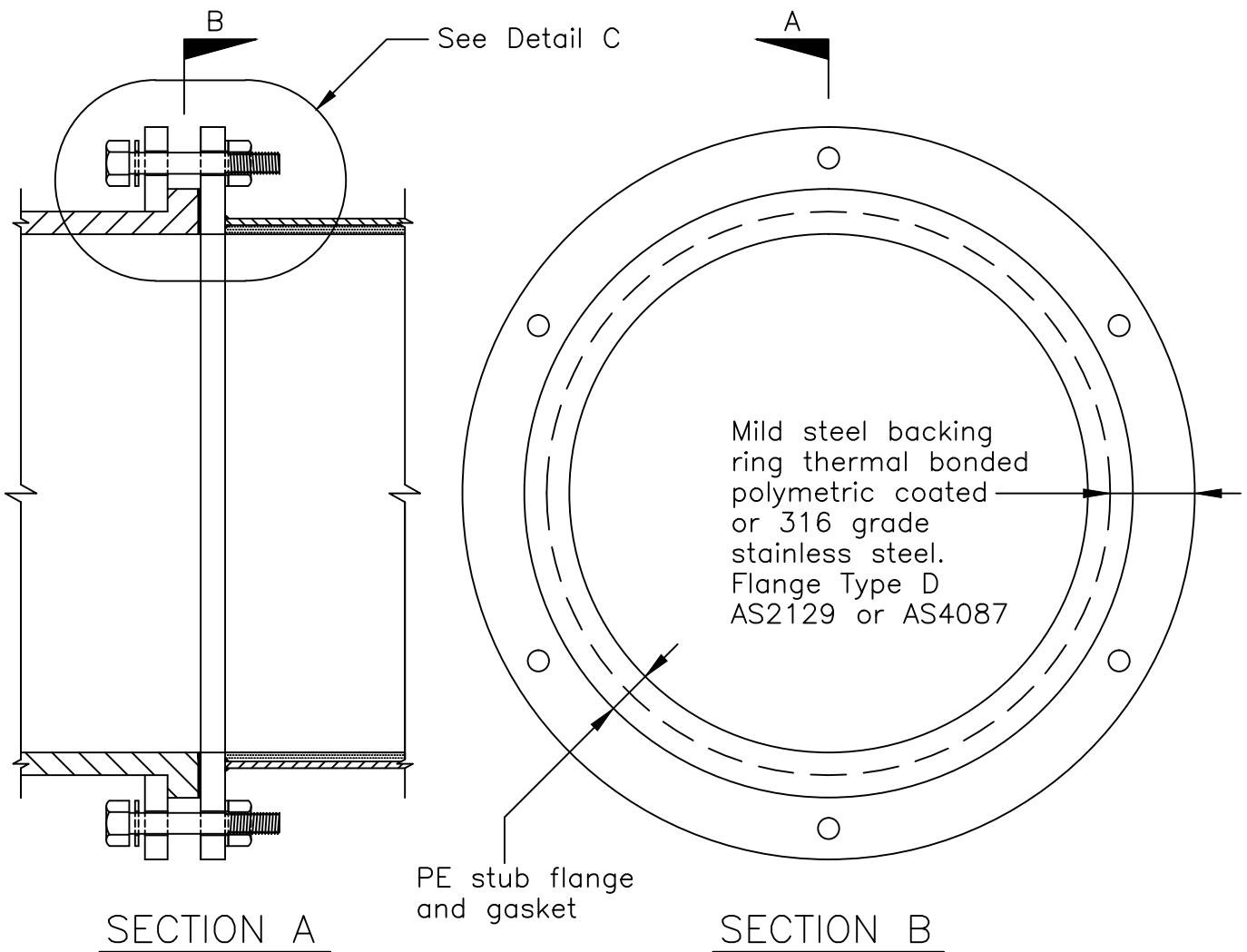
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GUIDELINE FOR BUILDING CLOSE TO OR OVER TRANSMISSION (TRUNK) SEWER

SCALE:	N.T.S.
ISSUE DATE:	14-04-2015
DWG No.	2010070.051A
REFERENCE No.	WW 60



DETAIL C

Notes :

1. Where AS4087 flanges are used & stub flange reduced to fit, calculations should show Max. allowable operating pressure is met.
2. Use BSEN1092 flanges where connections are to transmission mains. (Typical)

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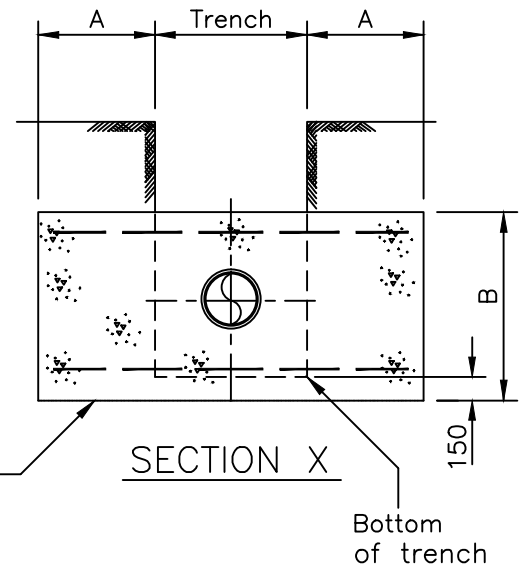
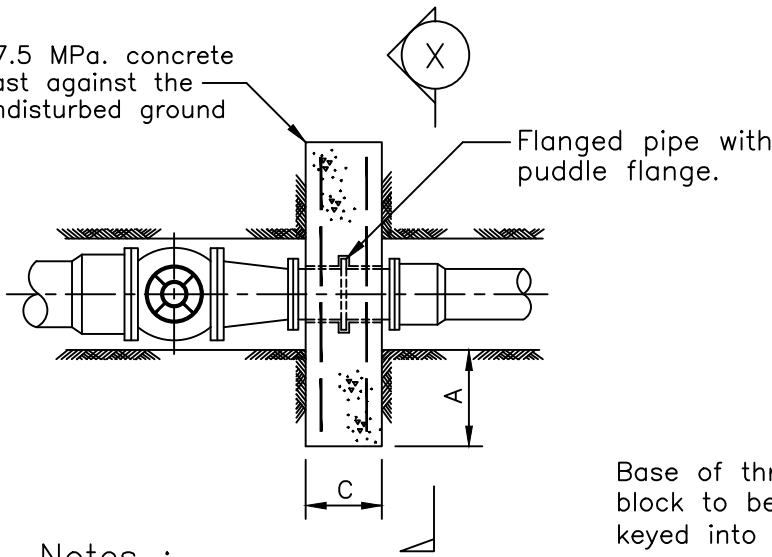


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FLANGE CONNECTION DETAIL
PE MAIN TO OTHER

SCALE:	N.T.S.
ISSUE DATE:	17-11-2014
DWG No.	2010070.052A
REFERENCE No.	WW61

17.5 MPa. concrete cast against the undisturbed ground



Base of thrust block to be keyed into base of trench.

Notes :

1. Concrete thrust block dimensions for firm soil conditions.
2. The dimensions to be increased or decreased for variation in soil conditions.
3. Allowable bearing stress used - 100KPa.
4. Internal pipe test pressure up to 1400KPa.
5. As built locations to be obtained prior to backfill.
6. Protective membrane (Polythene) between concrete and pipe.
7. 75mm clearance between fittings/flanges and concrete casting.
8. All fittings to be Denso wrapped to the product specification.
(Butyl system for Plastic pipes)

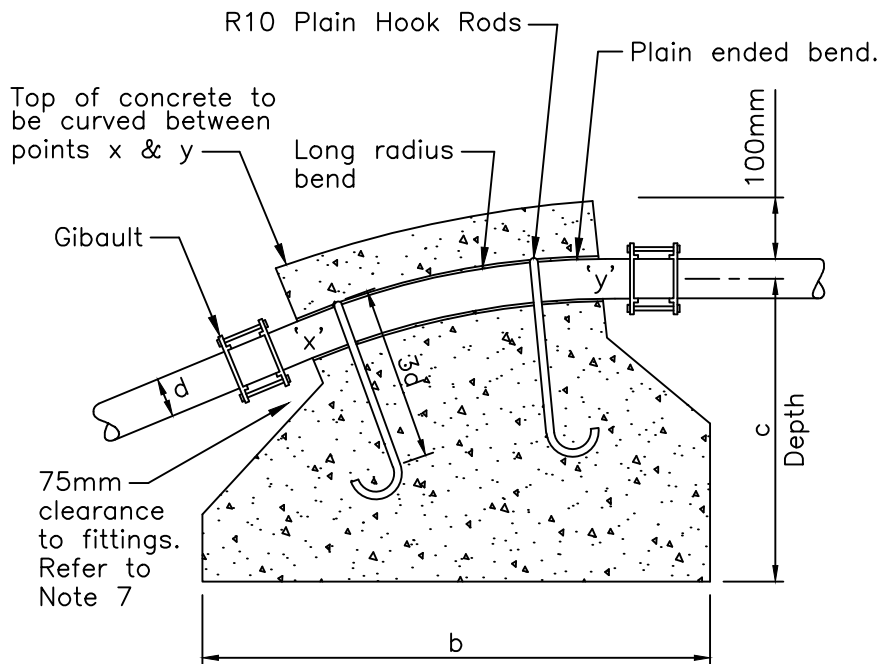
Reducer mm	Reducers		
	A	B	C
100-150	250	350	300
100-200	500	350	300
150-200	250	500	300
150-250	500	500	300
200-250	250	600	300
200-300	400	700	300
250-300	300	800	300

ANCHOR BLOCKS AT REDUCERS

Pipe Dia	Vertical Bends-45°		
	a	b	c
100mm	600	800	700
150mm	800	1000	800
200mm	1000	1200	800
250mm	1000	1600	1000
300mm	1000	2000	1200

Pipe Dia	Vertical Bends-22.5°		
	a	b	c
100mm	500	500	500
150mm	500	800	800
200mm	700	1000	800
250mm	800	1200	900
300mm	900	1500	1000

Pipe Dia	Vertical Bends-11.25°		
	a	b	c
100mm	400	500	500
150mm	500	600	600
200mm	500	800	800
250mm	700	1000	800
300mm	800	1200	900



a = Width of Anchor Block

VERTICAL SECTION

ANCHOR BLOCKS AT BENDS IN VERTICAL PLANE

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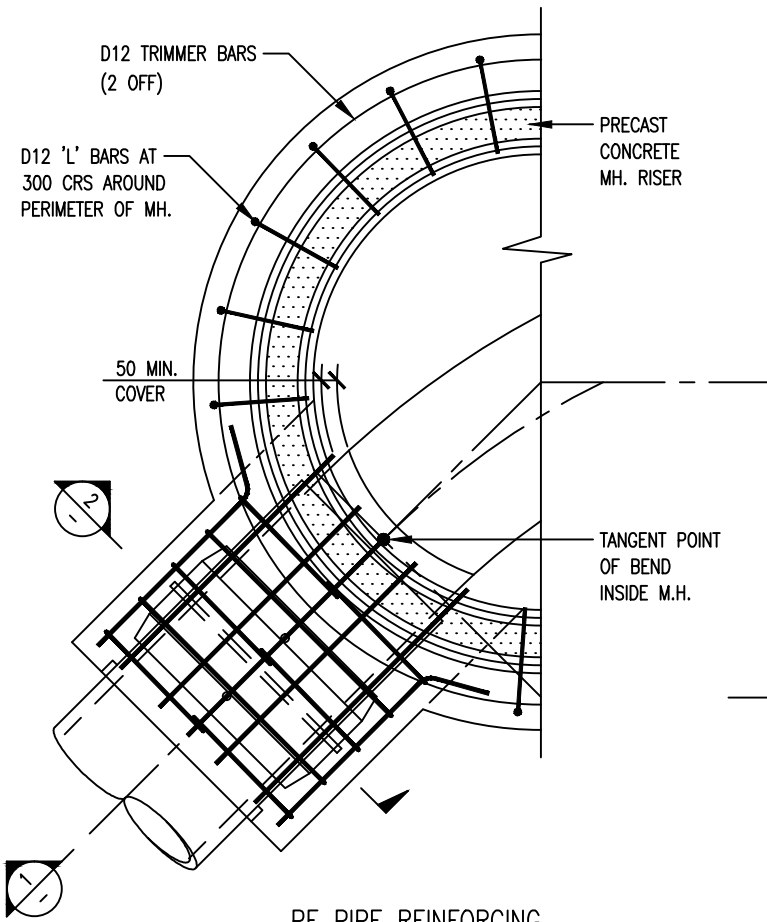
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ANCHOR BLOCK DETAILS
REDUCERS AND VERTICAL BENDS

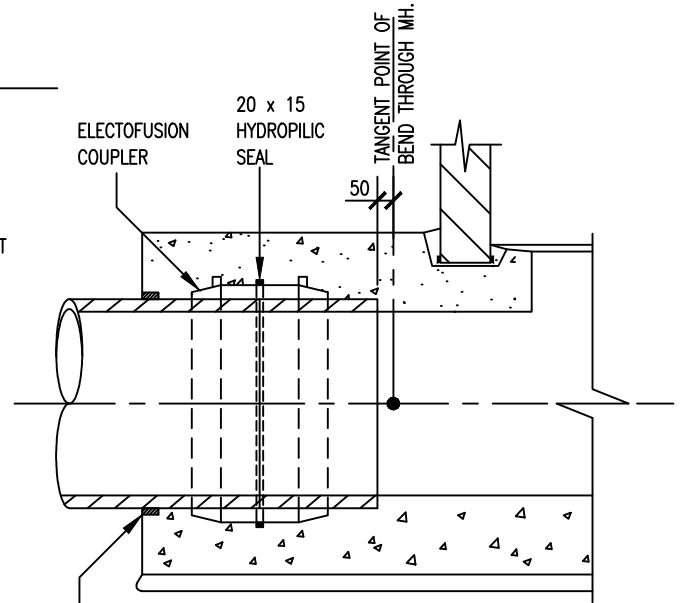
SCALE:	N.T.S.
ISSUE DATE:	17-11-2014
DWG No.	2010070.053A
REFERENCE No.	WW 62

GENERAL NOTES :

1. APPLICATION WHERE PIPE GRADE IS > 7%
2. ALL REINFORCEMENT TO BE DEFORMED MILD STEEL.
3. ALL CONCRETE TO HAVE A 28 DAY STRENGTH OF 30 MPa.
4. PROVIDE 50mm MIN. COVER TO ALL REINFORCEMENT.

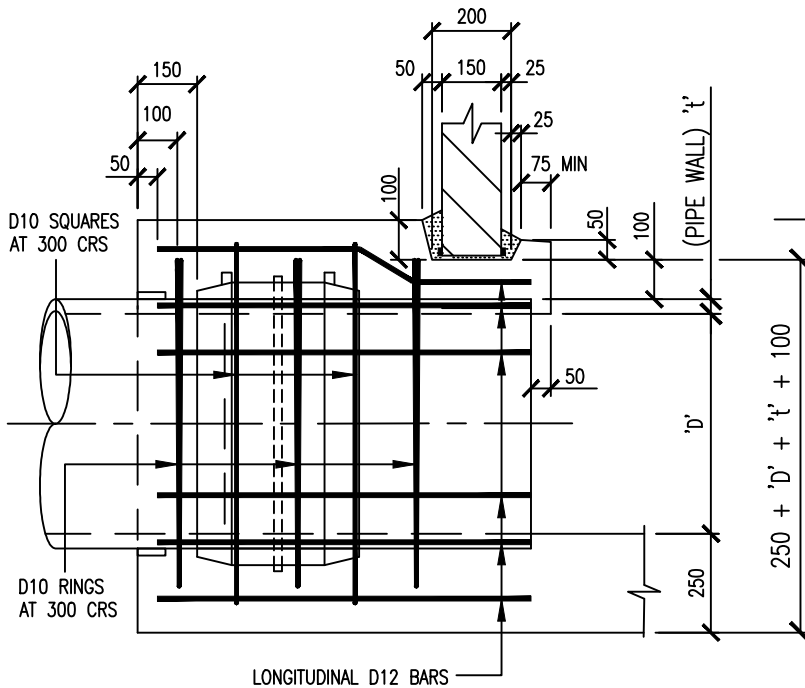


PE PIPE REINFORCING
SCALE. 1:25

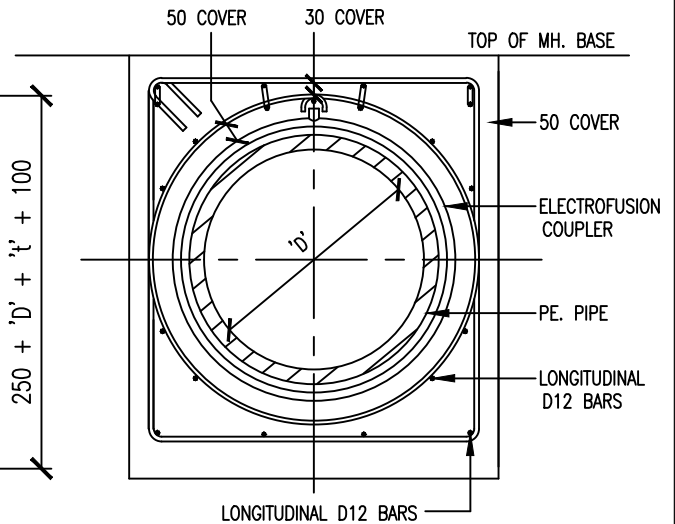


SECTION 1 REINFORCING NOT SHOWN FOR CLARITY
SCALE. 1:25

20 x 50 PLAIN RUBBER INSERT (NON HYDROPHILIC)



SECTION 1 REINFORCING FOR BASE EXTENSION
SCALE. 1:20



SECTION 2
SCALE. 1:20

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STANDARD MANHOLE RESTRAINT PE JOINT

SCALE:	AS SHOWN
ISSUE DATE:	17-11-2014
DWG No.	2010070.054
REFERENCE No.	WW 63