MANNINGHAM CITY COUNCIL

STANDARD DRAWINGS

Revised Jan, 2004.

STANDARD DRAWINGS GENERAL NOTES

All civil construction works including excavation, pipelaying, backfilling, concrete work and metal work shall be done in accordance with the Manningham City Council Specifications and must conform with the Standard Drawing details within this document - unless directed otherwise by Council Engineer.

Water Sensitive Urban Design (WSUD) is encouraged by Council and should be implemented in new subdivisions.

Suitable alternative materials which meet the relevant standards (including recycled 'green' products) may be considered for use in place of traditional materials where suitable as approved by Council Engineer.

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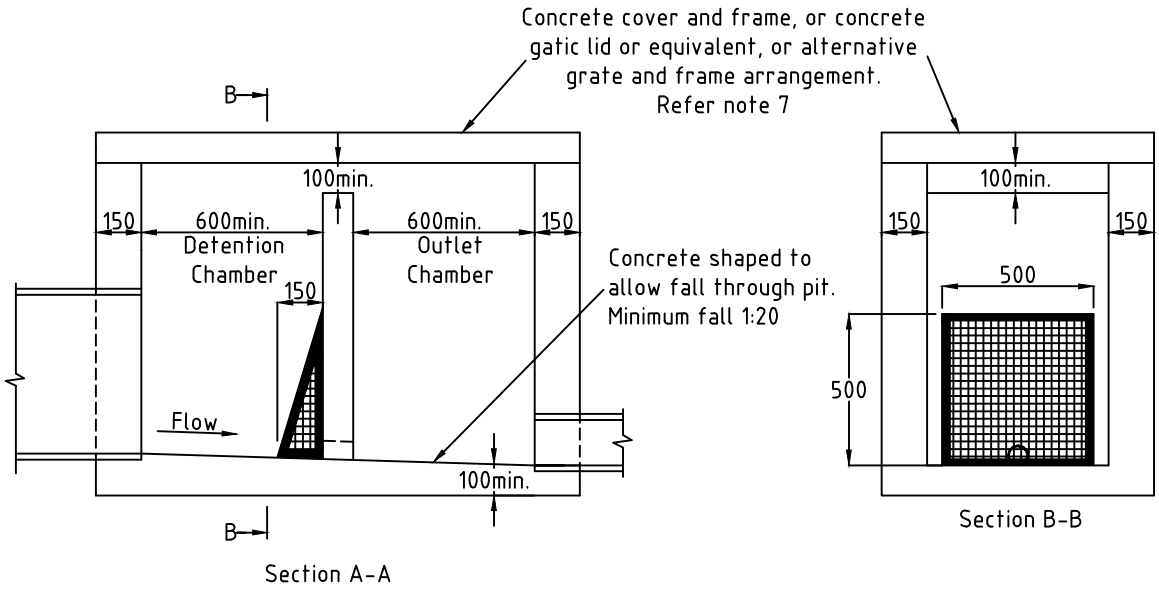
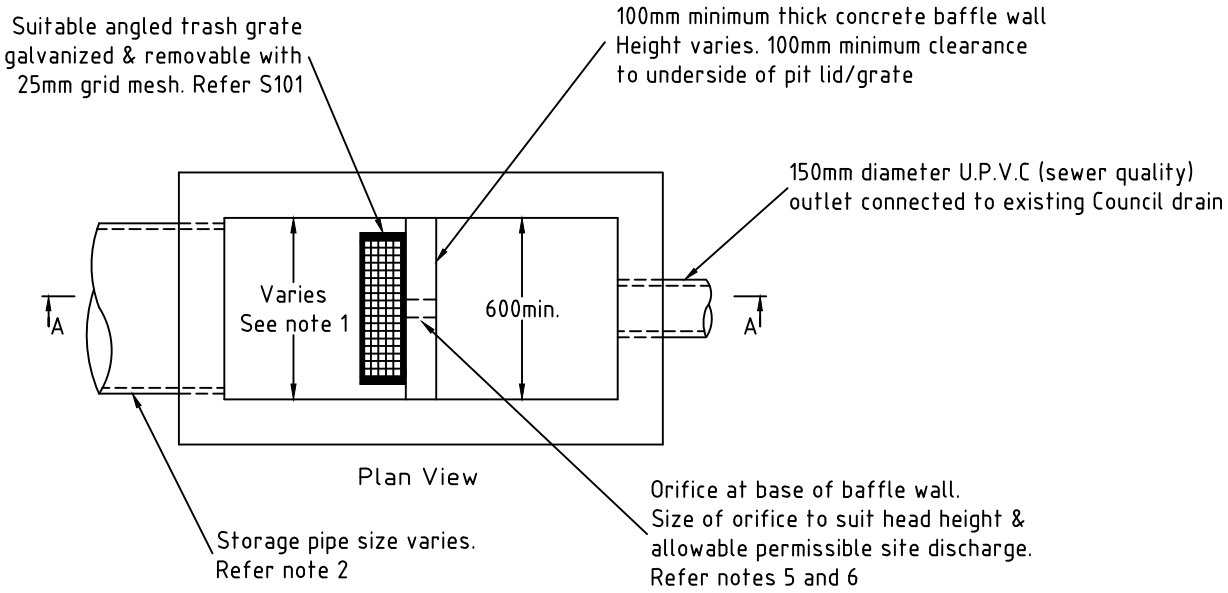
DRAINAGE STANDARDS





NOTES:

1. Detention chamber/outlet chamber will vary according to pipe size/s used for storage. Minimum size is 600x600, unless baffle wall height is < 700, then minimum outlet chamber can be reduced to 450 x 450.
2. Storage pipe size will vary according to the volume requirements of the site. If reinforced concrete or fibre reinforced concrete pipes are used, they shall be rubber ring jointed. Other pipe types must be approved by the Council Engineer.
3. Step irons (S136) shall be fitted to pits greater than 1000mm in depth.
4. Pits greater than 1000mm in depth are to be reinforced with F81 square mesh, placed centrally in pit walls.
5. Minimum allowable orifice diameter shall be 40mm.
6. A multi-cell discharge control unit may be used as an alternative to the orifice/baffle wall discharge pit as detailed above. Refer to S.V.C Phillips Multi-Cell handbook for specifications.
7. Medium duty cast iron covers are to be used in trafficable areas. Alternative grate and frame top may be used in certain circumstances and must be approved by Council Engineer.
8. This standard detail shall be used in conjunction with the Manningham On Site Detention Guide.
9. If two or more rows of pipes are used for storage, then a minimum gap of 150mm is required between the pipes.

SCALE 1:25
DIMENSIONS IN MILLIMETRES

TYPICAL O.S.D BAFFLE WALL PIT ARRANGEMENT

MANNINGHAM CITY COUNCIL

MANNINGHAM
BALANCE OF CITY AND COUNTRY

REVIEWED: D.V CHECKED: W.M

DATE: Jan 2004

STANDARD DRAWING A4/S100

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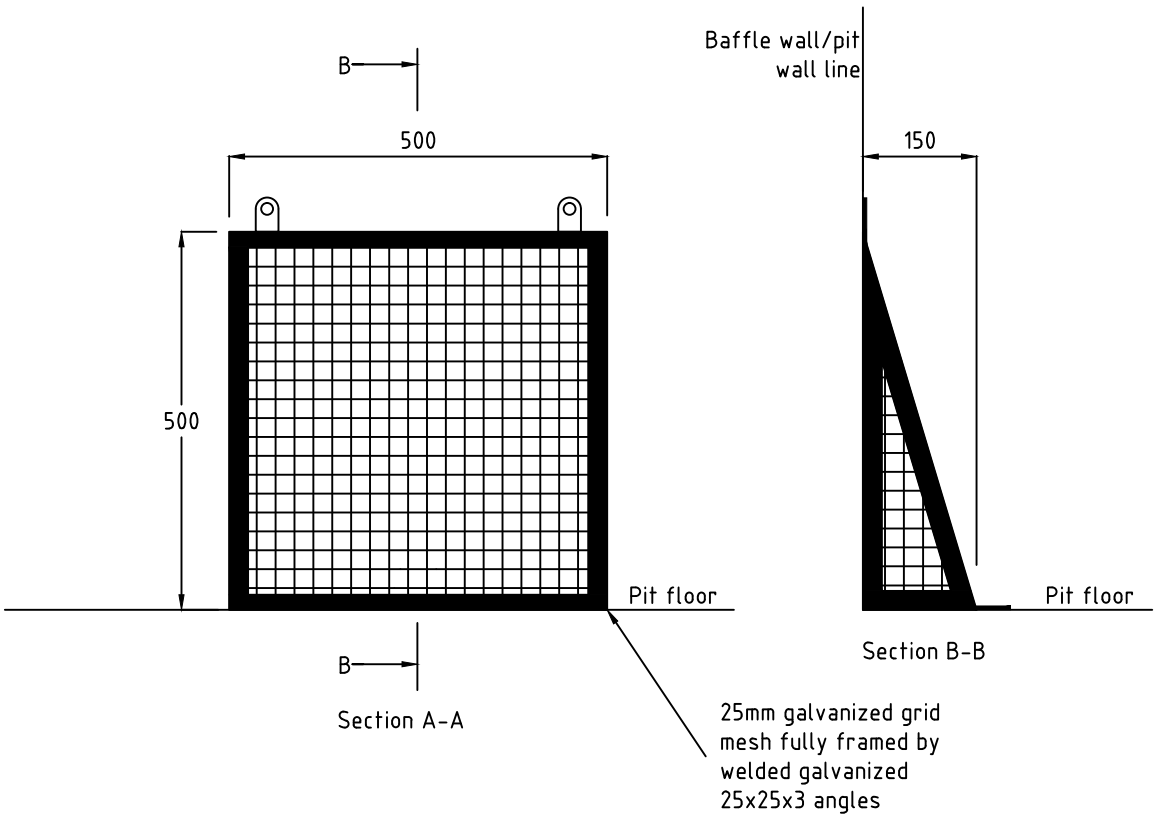

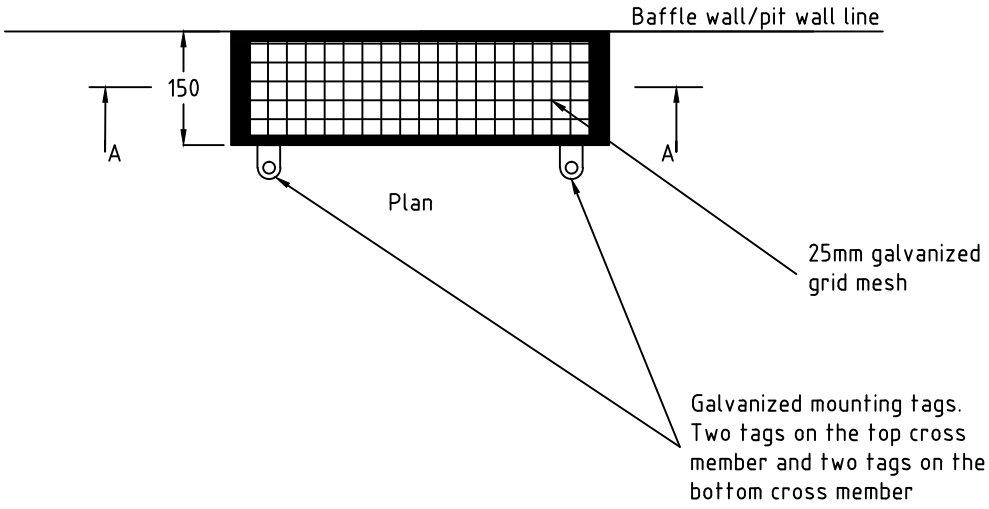

NOTES:

1. Trash grate is to be fixed to the baffle wall, at the four mounting tags, before the orifice (or fixed to the wall of pit, at the outlet, before discharging to the multi-cell) using galvanized masonry anchors.
2. Entire trash grate arrangement is to be hot dip galvanized (AS/NZS 4680) after manufacture.
3. Trash grate arrangement shall fit flush with the bottom of the pit floor and baffle wall / pit wall.
4. Refer to S100 for details of the typical O.S.D baffle wall pit arrangement.
5. This standard detail shall be used in conjunction with the Manningham On Site Detention Guide.

SCALE 1:10
DIMENSIONS IN MILLIMETRES

TYPICAL O.S.D TRASH GRATE ARRANGEMENT

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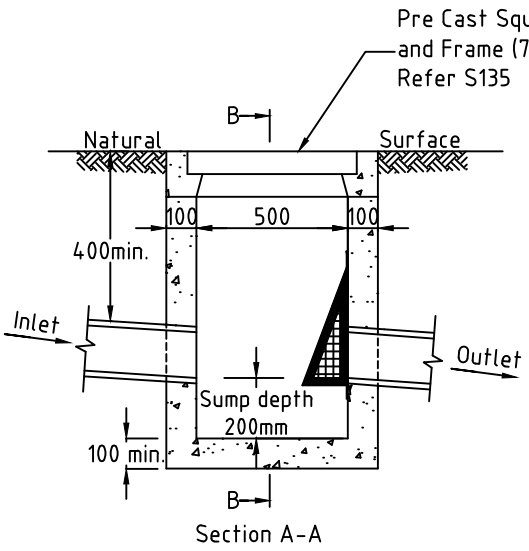

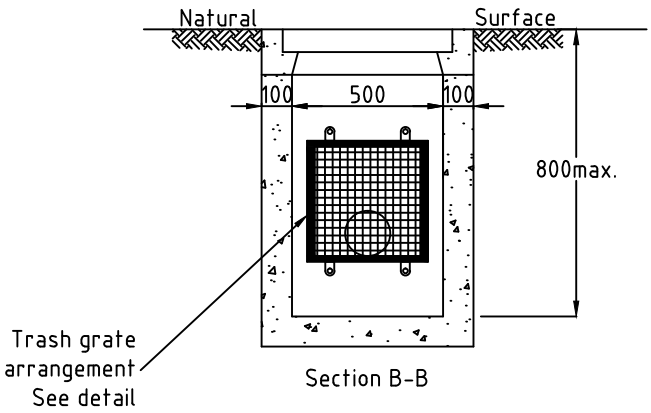

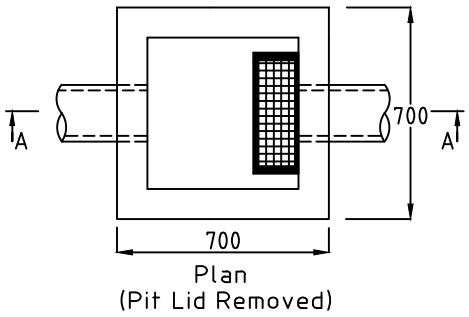

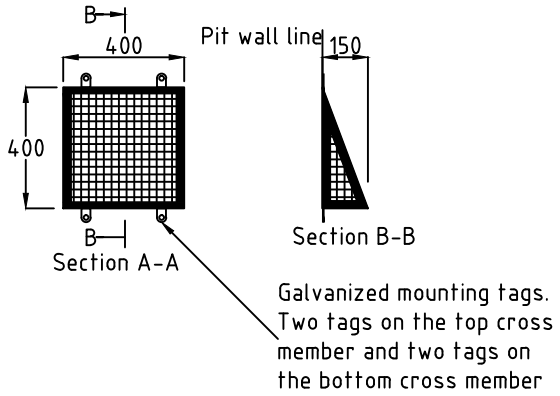

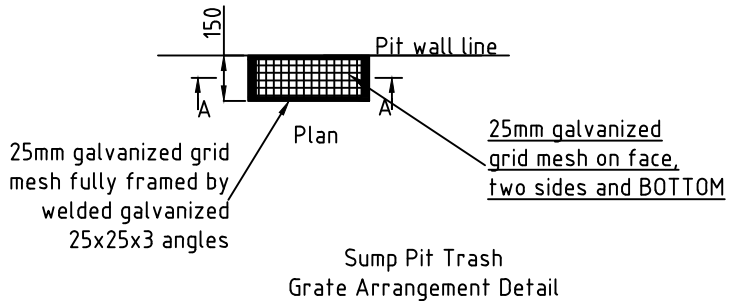

NOTES:

1. Pit is to be located outside of easement and is to be constructed and maintained by the property owner.
2. Entire trash grate is to be hot dip galvanized (AS/NZS 4680) after manufacture.
3. Trash grate is to be fixed to the pit wall at the four mounting tags using galvanized masonry anchors.

SCALE 1:25
DIMENSIONS IN MILLIMETRES

SUMP PIT

Private pit outside easement

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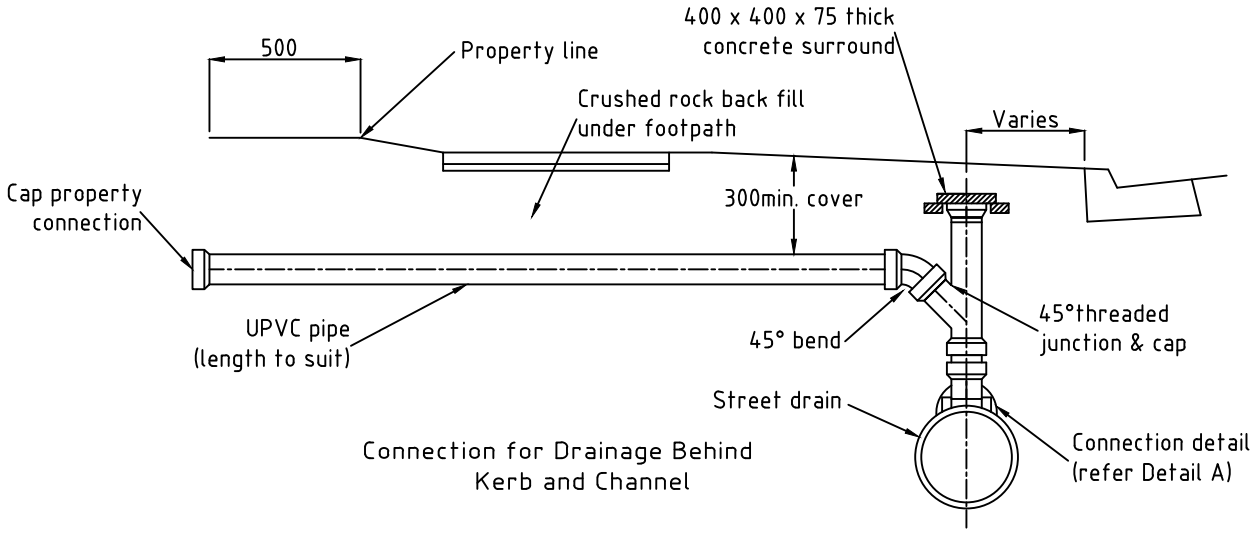
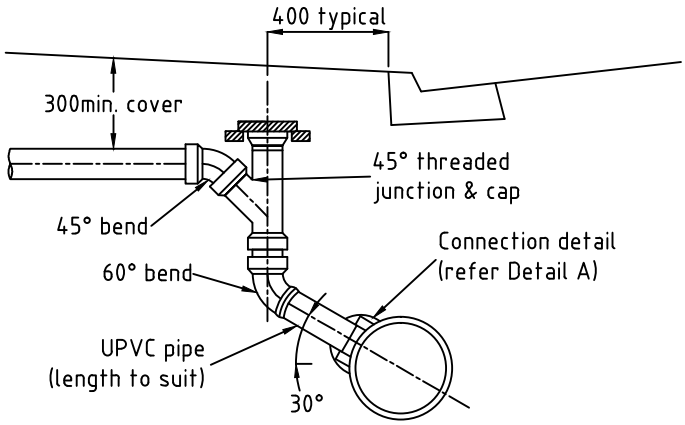
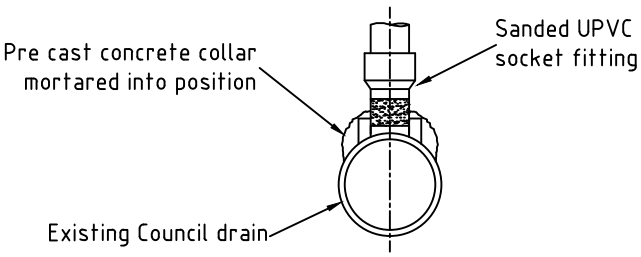


Connection for Drainage Behind
Kerb and Channel



Connection for Drainage Under
Kerb and Channel



Detail A

NOTES:

1. A 100mm UPVC diameter pipe (27A) is to be used for single dwelling development connections.
2. A 150mm UPVC diameter pipe (26A) is to be used for dual occupancy and multi-unit development connections.
3. UPVC joints shall be connected using a manufacturers recommended solvent cement. Rubber ring joints may be used where appropriate and be approved by the Council Engineer.
4. Pipe saddles and other pipe connections may be used where appropriate and approved by the Council Engineer.
5. End of property connection is to be extended 500mm into property and capped.

SCALE 1:25
DIMENSIONS IN MILLIMETRES

HOUSE DRAIN CONNECTIONS
27A and 26A

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STANDARD DRAWING A4/S103

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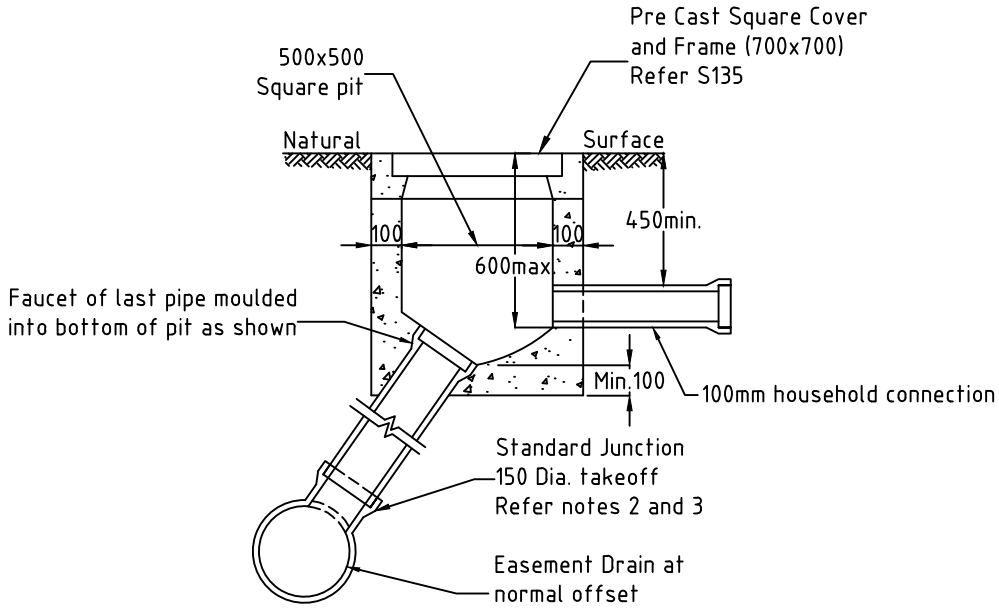
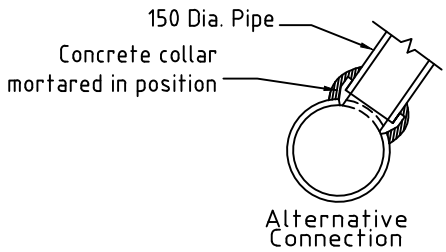


Section View



Alternative
Connection

NOTES:

1. This type of pit is to be used where the easement drain pipe is deeper than 1.0m below the natural surface.
2. A 100mm UPVC diameter pipe is to be used for single dwelling development connections.
3. A 150mm UPVC diameter pipe is to be used for dual occupancy and multi-unit development connections.
4. UPVC joints shall be connected using a manufacturers recommended solvent cement. Rubber ring joints may be used where appropriate and be approved by the Council Engineer.
5. Pipe saddles and other pipe connections may be used where appropriate and be approved by the Council Engineer.

SCALE 1:25
DIMENSIONS IN MILLIMETRES

PROPERTY DISCHARGE PIT

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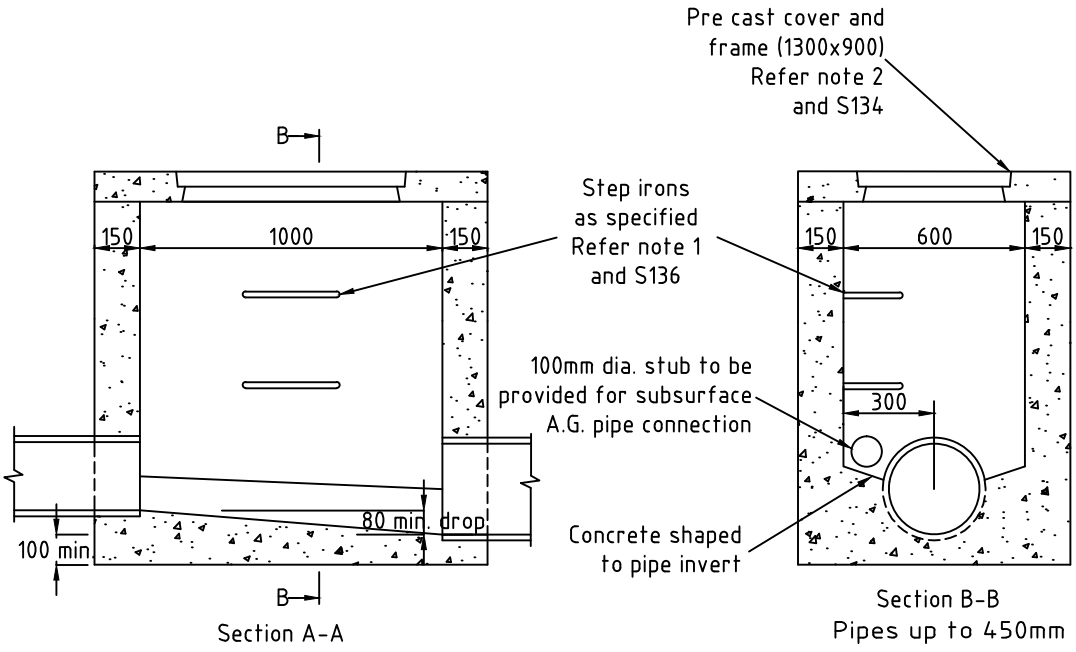
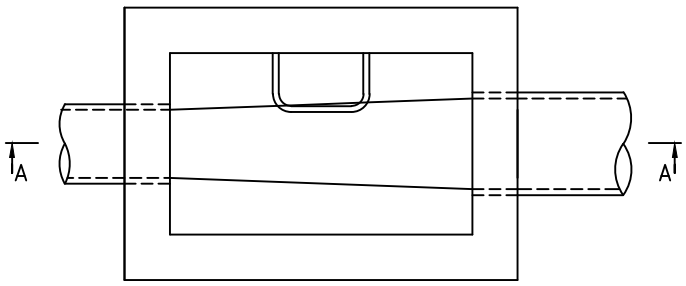


Section A-A

Section B-B
Pipes up to 450mm



Plan
(Pit Lid Removed)

Pipe Diameter	Internal Pit Size
225, 300, 375, 450	1000x600
525 and above	Access Chamber (S119 or S120)

NOTES:

1. Step irons (S136) shall be fitted to pits greater than 1.0m in depth.
2. Heavy duty cast iron covers are to be used in trafficable areas. Alternative grate and frame top may be used in certain circumstances and shall be Class C (AS3996/1992), hot dip galvanised (AS/NZS 4680), pedestrian/bicycle safe, bolt down, weave style or similar - to manufacturers specifications, and must be approved by the Council Engineer.
3. Pits greater than 1.0m in depth are to be reinforced with F81 square mesh, placed centrally in pit walls.
4. Subsurface A.G. drain holes are to be sealed if not used.

SCALE 1:25
DIMENSIONS IN MILLIMETRES

JUNCTION PIT (1000x600)

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BALANCE OF CITY AND COUNTRY

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STANDARD DRAWING A4/S111

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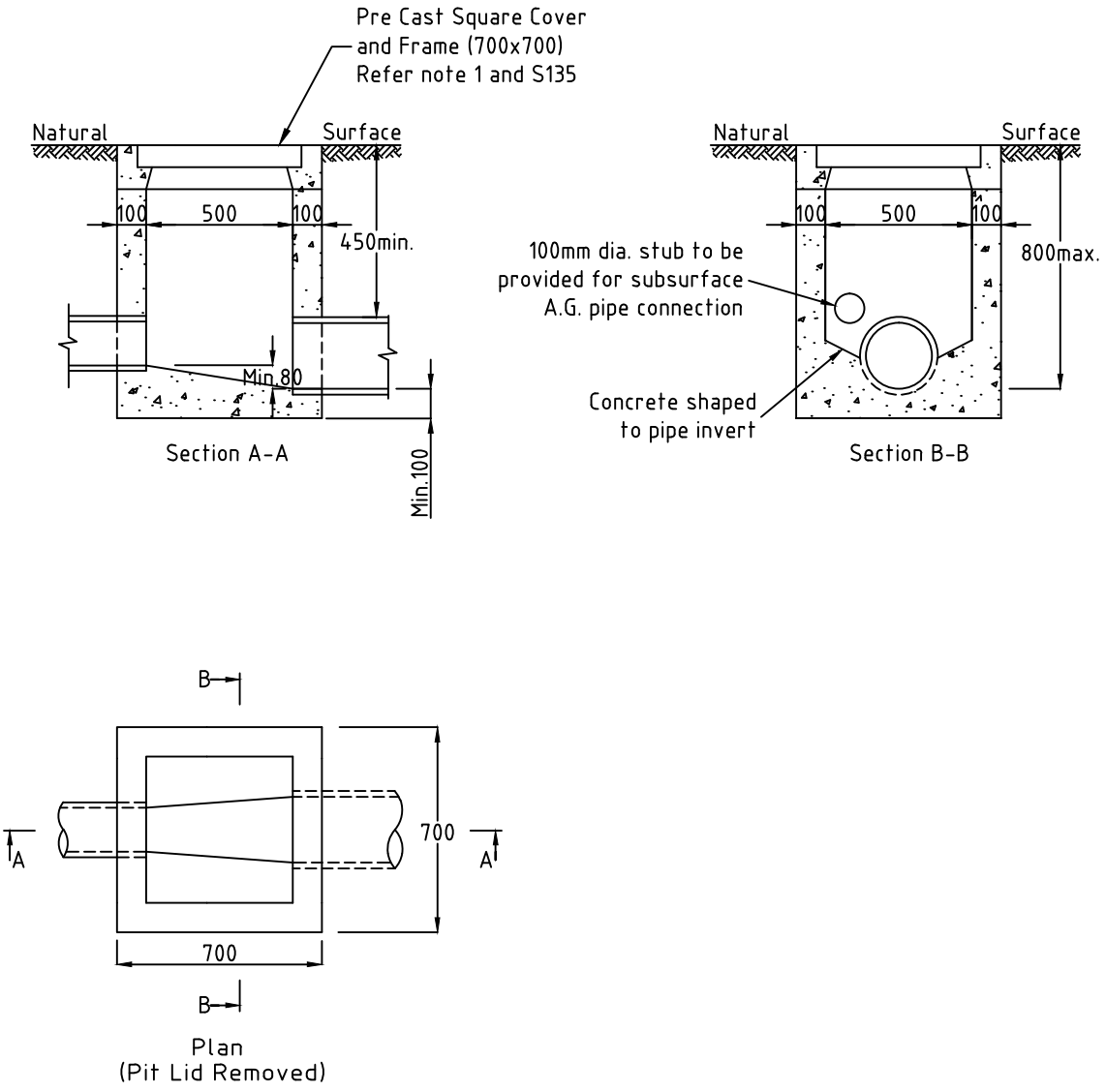

NOTES:

1. Heavy duty cast iron covers are to be used in trafficable areas. Alternative grate and frame top may be used in certain circumstances and shall be Class C (AS3996/1992), hot dip galvanised (AS/NZS 4680), pedestrian/bicycle safe, bolt down, weave style or similar - to manufacturers specifications, and must be approved by the Council Engineer.
2. For pits deeper than 800mm and/or pipe sizes greater than 300mm dia. use junction pit S111 (1000x600).
3. Subsurface A.G. drain holes are to be sealed if not used.

SCALE 1:25
DIMENSIONS IN MILLIMETRES

JUNCTION PIT (500x500)

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STANDARD DRAWING A4/S112

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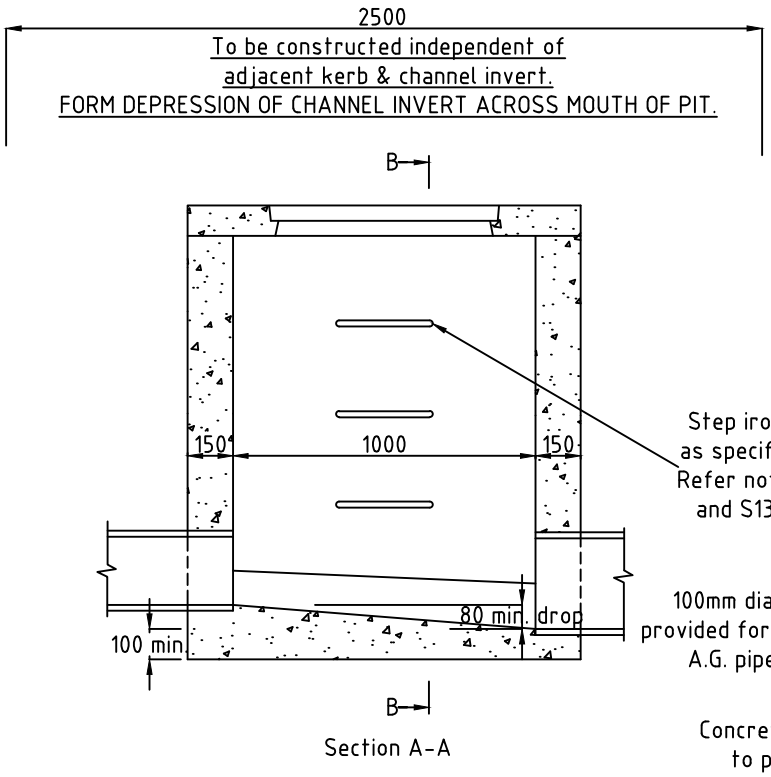

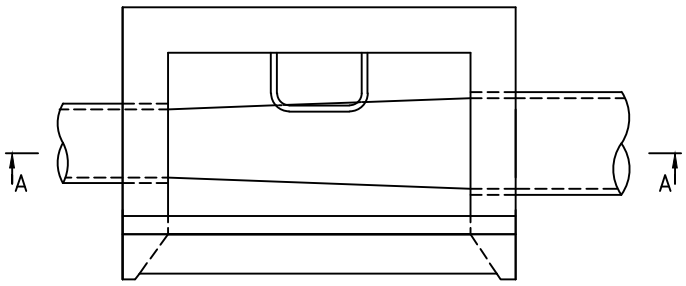

Plan
(Pit Lid Removed)

Pipe Diameter	Internal Pit Size
225, 300, 375, 450	1000x600
525 and above	Access Chamber (S119 or S120)

NOTES:

1. Step irons (S136) shall be fitted to pits greater than 1.0m in depth.
2. Pits greater than 1.0m in depth are to be reinforced with F81 square mesh, placed centrally in pit walls.
3. For pipes 525mm and above which require the access chamber, haunch the pit as per S119/S120 but maintain the existing side entry arrangement detailed above.
4. Subsurface A.G. drain holes are to be sealed if not used.

SCALE 1:25
DIMENSIONS IN MILLIMETRES

SIDE ENTRY PIT

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STANDARD DRAWING A4/S113

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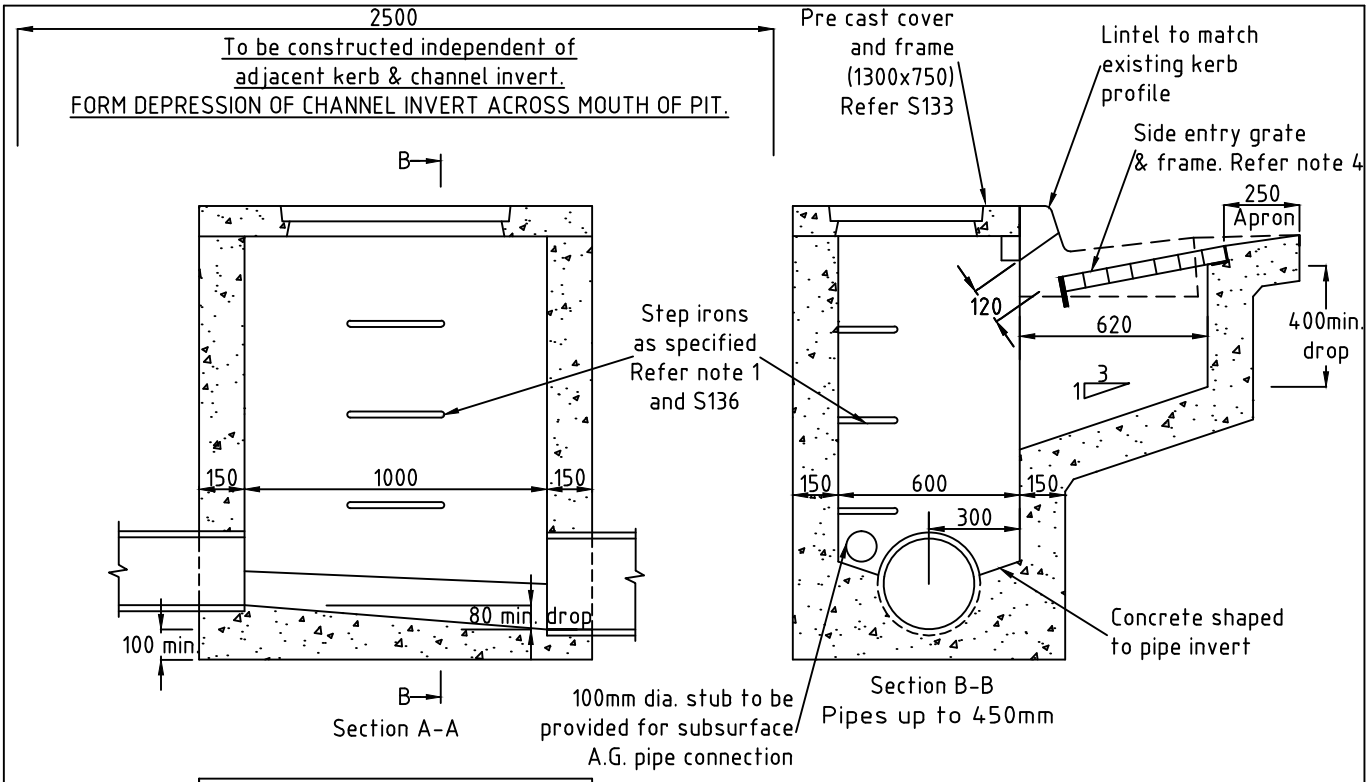
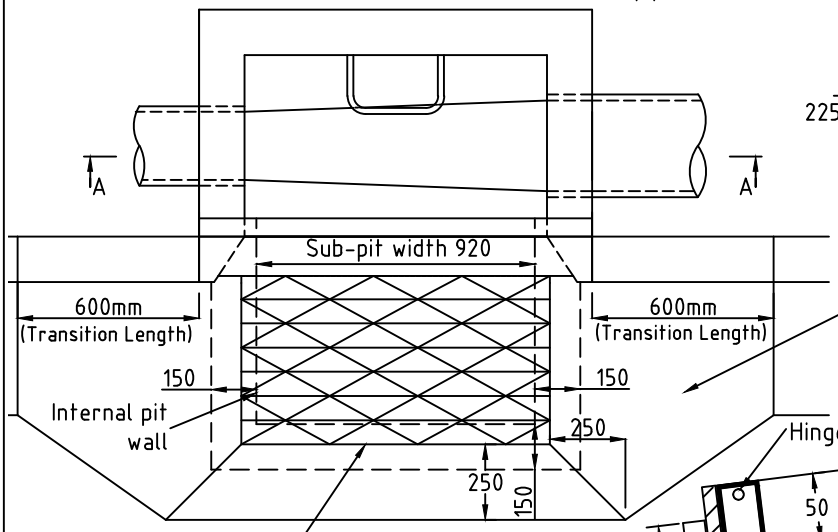
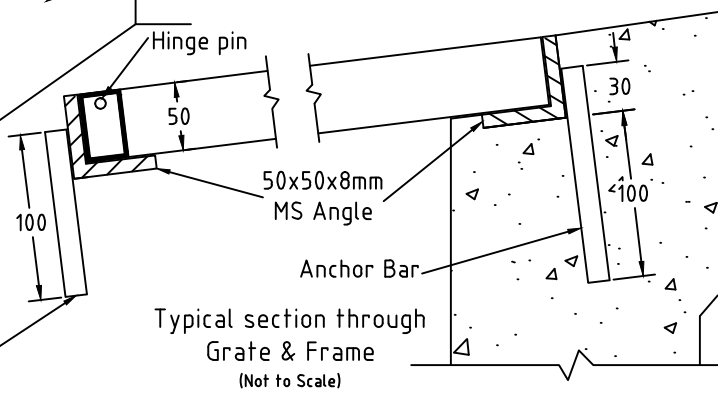


Pipe Diameter	Internal Pit Size
225, 300, 375, 450	1000x600
525 and above	Access Chamber (S119 or 120)





NOTES:

1. Step irons (S136) shall be fitted to pits greater than 1.0m in depth.
2. Pits greater than 1.0m in depth are to be reinforced with F81 square mesh, placed centrally in pit walls.
3. For pipes 525mm and above which require the access chamber, haunch the pit as per S119/S120 but maintain the existing grated side entry arrangement detailed above.
4. Grate type/pattern must be approved by Council Engineer and is to be Class D (AS3996/1992), hot dip galvanized (AS/NZS 4680), pedestrian/bicycle safe, bolt down, weave style or similar - to manufacturers specifications.
5. Subsurface A.G. drain holes are to be sealed if not used.

SCALE 1:25
DIMENSIONS IN MILLIMETRES

GRATED SIDE ENTRY PIT
Type 1

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DATE: Jan 2004

STANDARD DRAWING A4/S114

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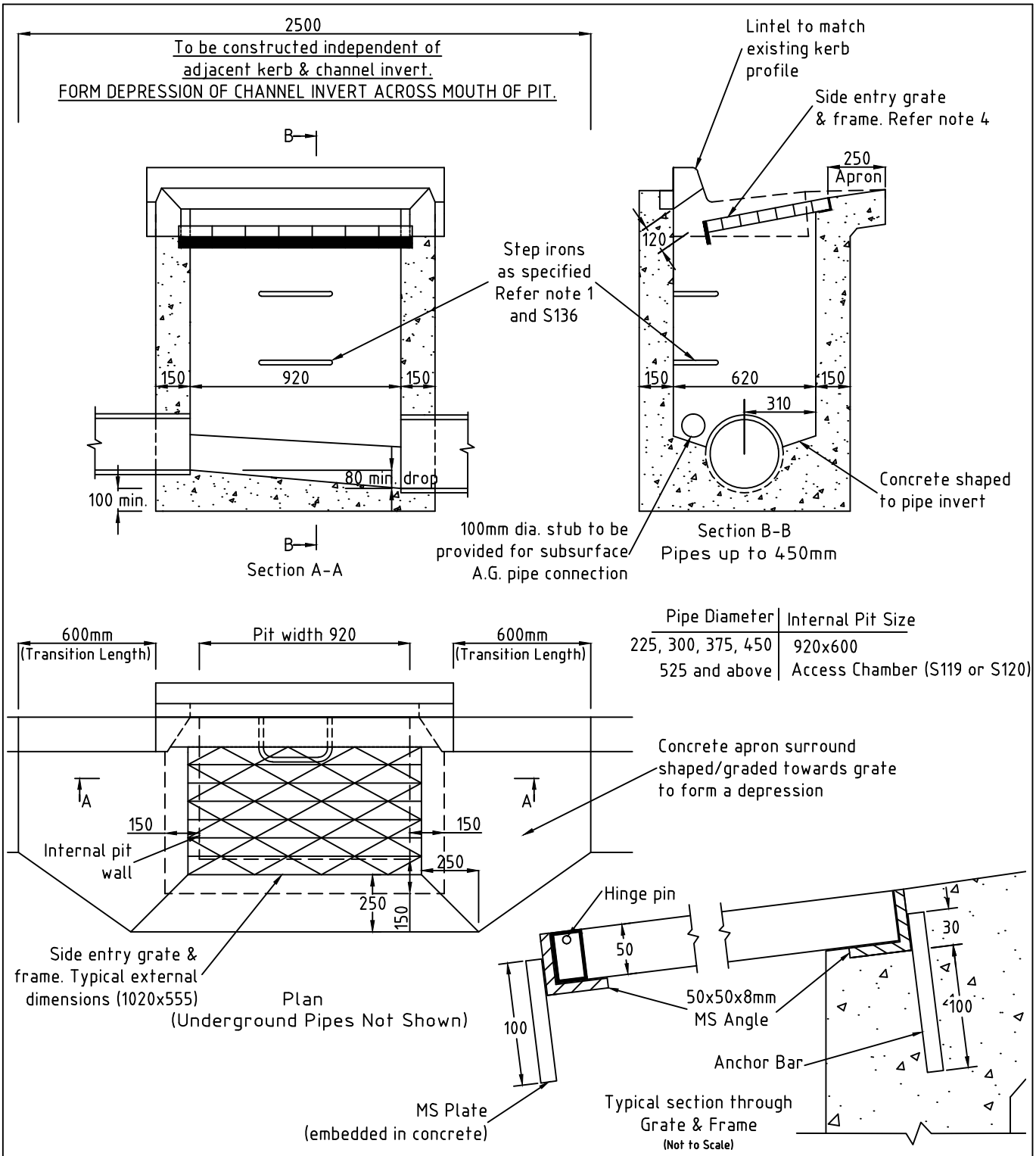

Pipe Diameter	Internal Pit Size
225, 300, 375, 450	920x600
525 and above	Access Chamber (S119 or S120)

NOTES:

1. Step irons (S136) shall be fitted to pits greater than 1.0m in depth.
2. Pits greater than 1.0m in depth are to be reinforced with F81 square mesh, placed centrally in pit walls.
3. For pipes 525mm and above which require the access chamber, haunch the pit as per S119/S120 but maintain the existing grated side entry arrangement detailed above.
4. Grate type/pattern must be approved by Council Engineer and is to be Class D (AS3996/1992), hot dip galvanized (AS/NZS 4680), pedestrian/bicycle safe, bolt down, weave style or similar – to manufacturers specifications.
5. Subsurface A.G. drain holes are to be sealed if not used.

SCALE 1:25
DIMENSIONS IN MILLIMETRES

GRATED SIDE ENTRY PIT
Type 2

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DATE: Jan 2004

STANDARD DRAWING A4/S115

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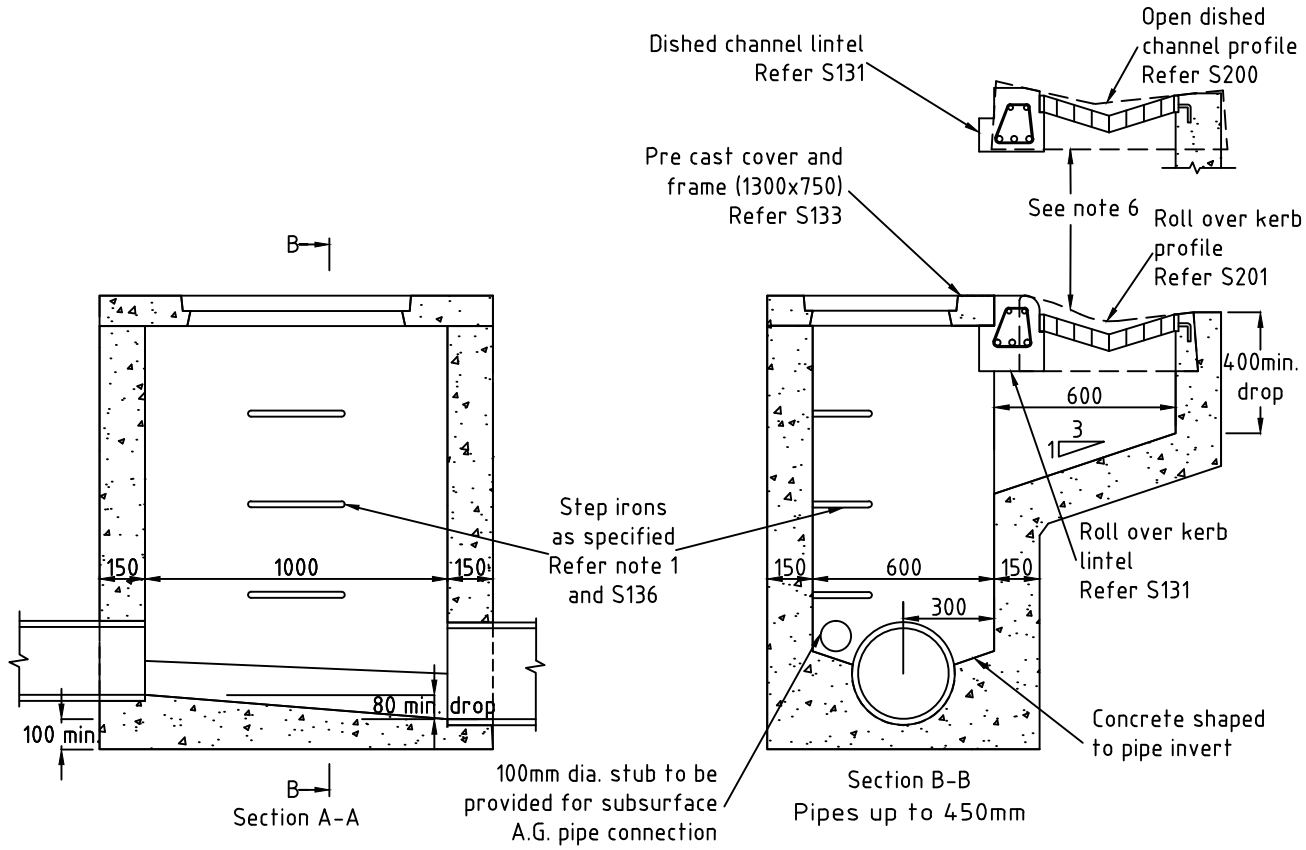
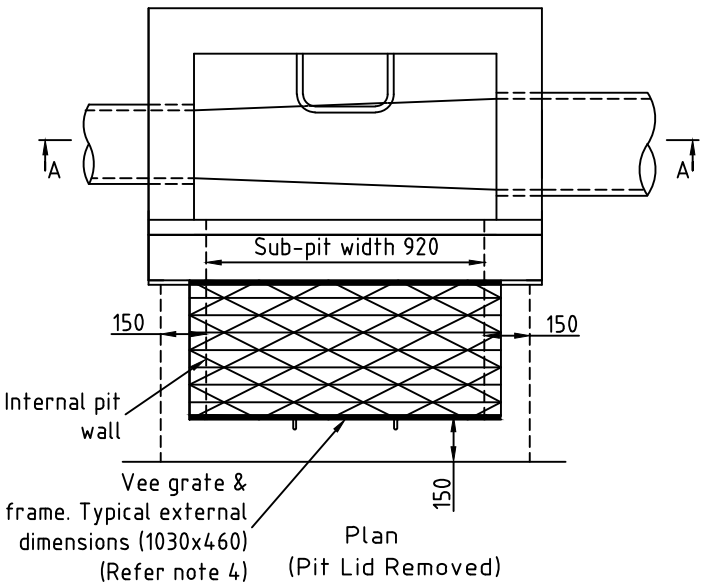
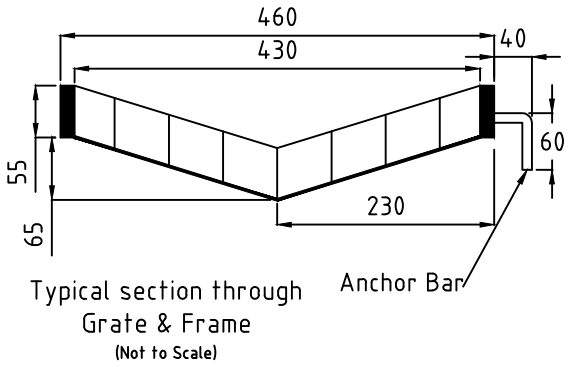




Pipe Diameter	Internal Pit Size
225, 300, 375, 450	1000x600
525 and above	Access Chamber (S119 or S120)



NOTES:

1. Step irons (S136) shall be fitted to pits greater than 1.0m in depth.
2. Pits greater than 1.0m in depth are to be reinforced with F81 square mesh, placed centrally in pit walls.
3. For pipes 525mm and above which require the access chamber, haunch the pit as per S119/S120 but maintain the existing vee grated pit arrangement detailed above.
4. Vee Grate type/pattern must be approved by Council Engineer and be Class D (AS3996/1992), hot dip galvanized (AS/NZS 4680), pedestrian/bicycle safe, bolt down, weave style or similar - to manufacturers specifications.
5. Subsurface A.G. drain holes are to be sealed if not used.
6. Use the roll over lintel / dished channel lintel where appropriate.

SCALE 1:25
DIMENSIONS IN MILLIMETRES

ROLL OVER KERB / DISHED CHANNEL GRATED PIT

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BALANCE OF CITY AND COUNTRY

REVIEWED: D.V CHECKED: B.N

DATE: Jan 2004

STANDARD DRAWING A4/S116

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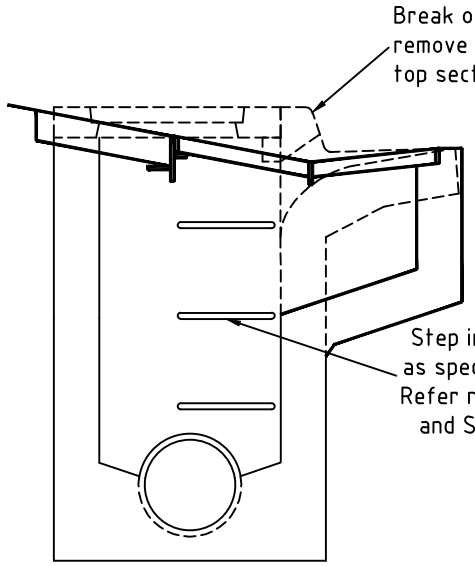
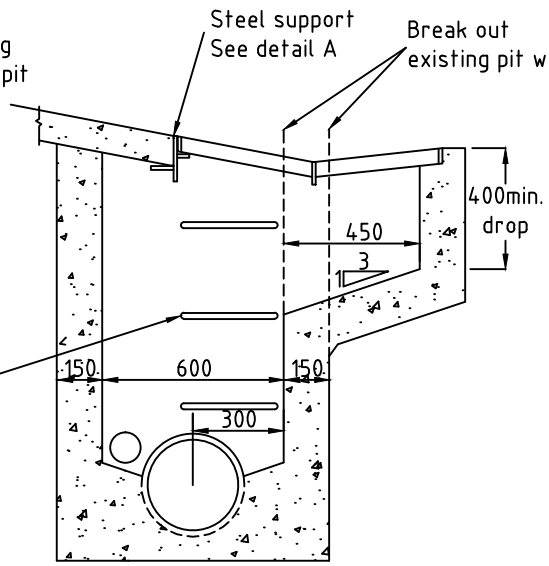
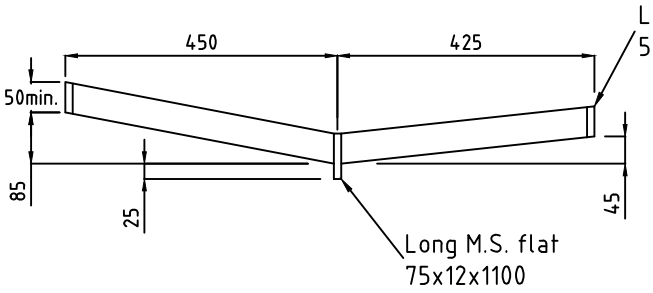


Existing Side Entry Converted
to Standard Layback Grate

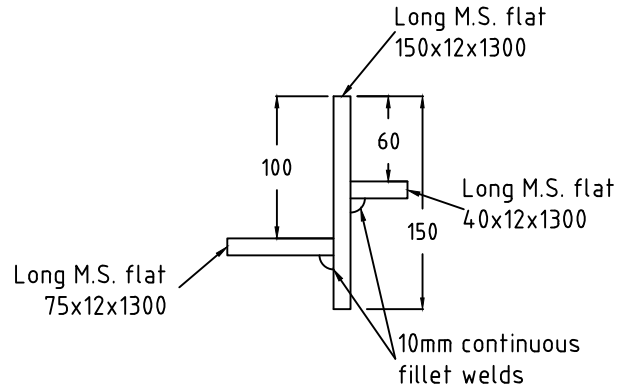


Section A-A
Pipes up to 450mm

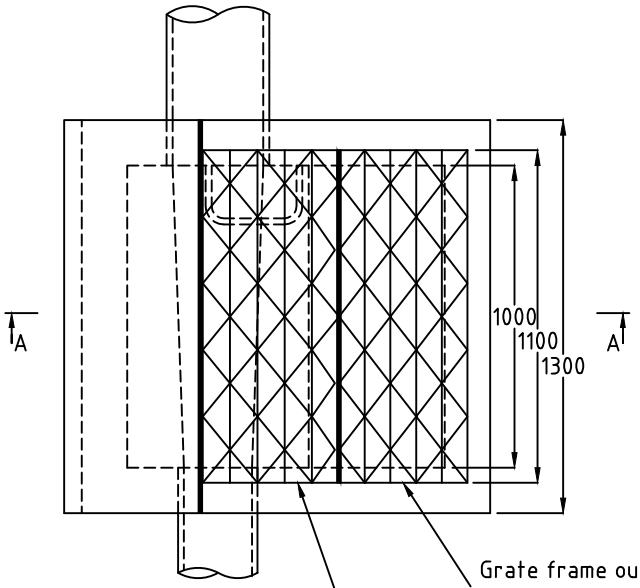
Pipe Diameter	Internal Pit Size
225, 300, 375, 450	1000x600
525 and above	Access Chamber (S119 or S120)



Section Through Grate
(Not to scale)



Detail A - M.S. Support
(Not to scale)



Plan

NOTES:

1. Step irons (S136) shall be fitted to pits greater than 1.0m in depth.
2. Pits greater than 1.0m in depth are to be reinforced with F81 square mesh, placed centrally in pit walls.
3. For pipes 525mm and above which require the access chamber, haunch the pit as per S119/S120 but maintain the standard layback grated arrangement detailed above.
4. Grate type/pattern must be approved by Council Engineer and be Class D (AS3996/1992), hot dip galvanized (AS/NZS 4680), pedestrian/bicycle safe, bolt down, weave style or similar - to manufacturers specifications.
5. Subsurface A.G. drain holes are to be sealed if not used.
6. This pit shall only be used when approved by Council Engineer.

SCALE 1:25
DIMENSIONS IN MILLIMETRES

CONVERTED SIDE ENTRY PIT
To suit standard layback (S247)

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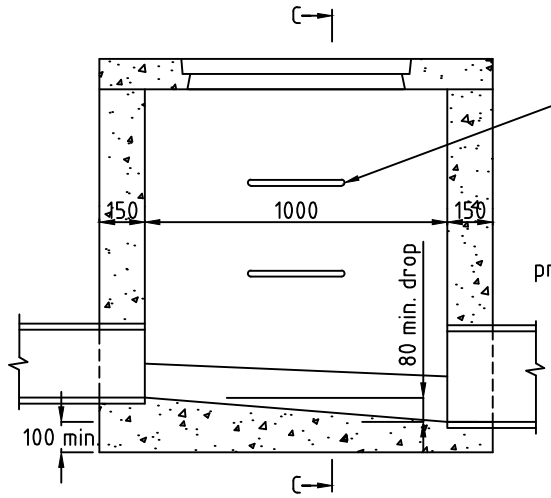
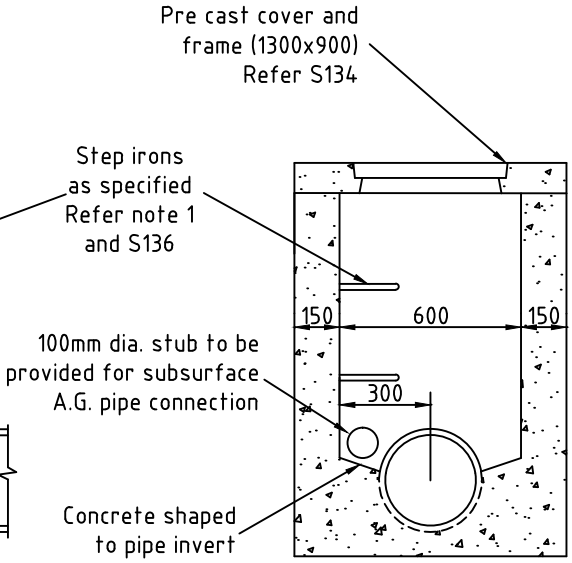
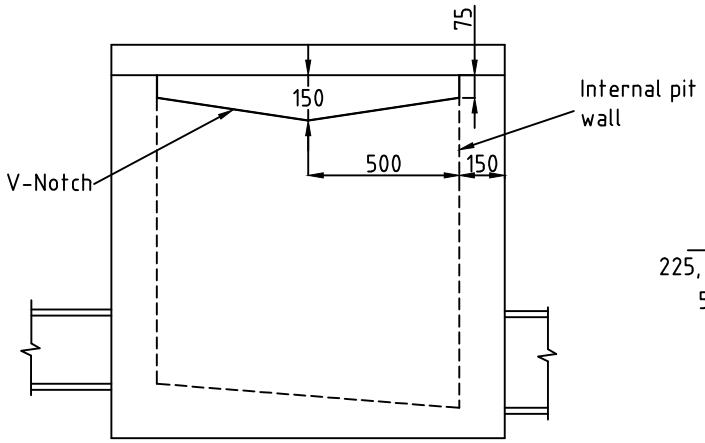


Section B-B

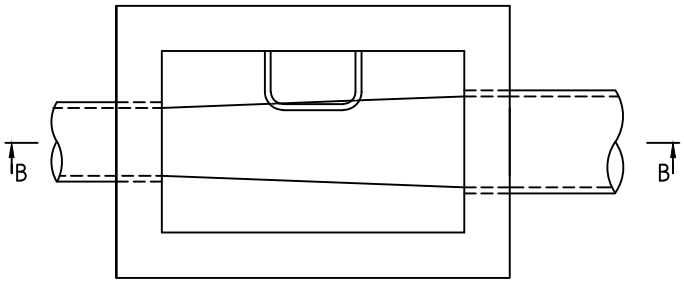


Section C-C
Pipes up to 450mm



Section A-A
V-Notch Profile

Pipe Diameter	Internal Pit Size
225, 300, 375, 450	1000x600
525 and above	Access Chamber (S119 or S120)



Plan
(Pit Lid Removed)

NOTES:

1. Step irons (S136) shall be fitted to pits greater than 1.0m in depth.
2. Pits greater than 1.0m in depth are to be reinforced with F81 square mesh, placed centrally in pit walls.
3. For pipes 525mm and above which require the access chamber, haunch the pit as per S119/S120 but maintain the existing v-notch arrangement detailed above.
4. Subsurface A.G. drain holes are to be sealed if not used.

SCALE 1:25
DIMENSIONS IN MILLIMETRES

V–NOTCH PIT

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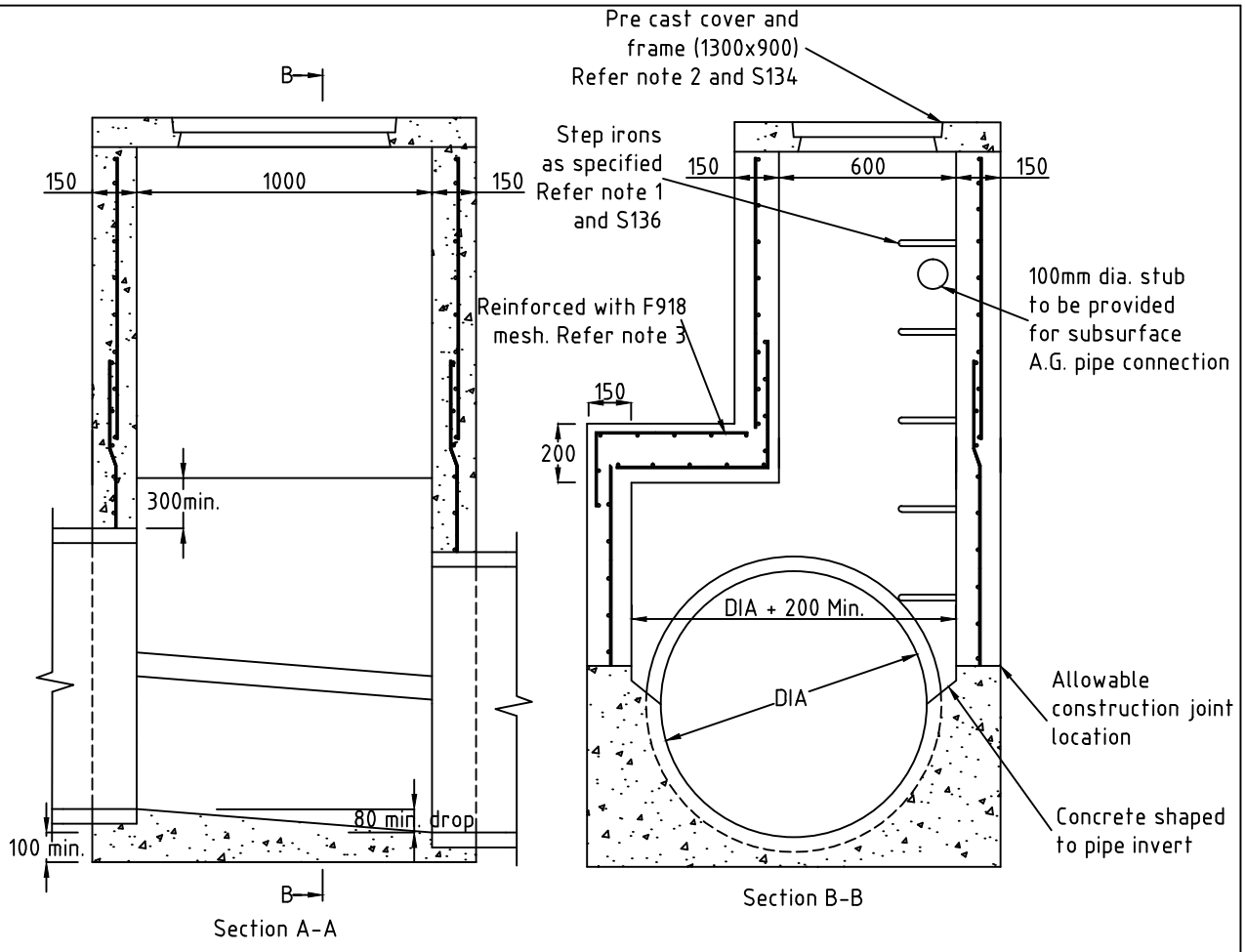

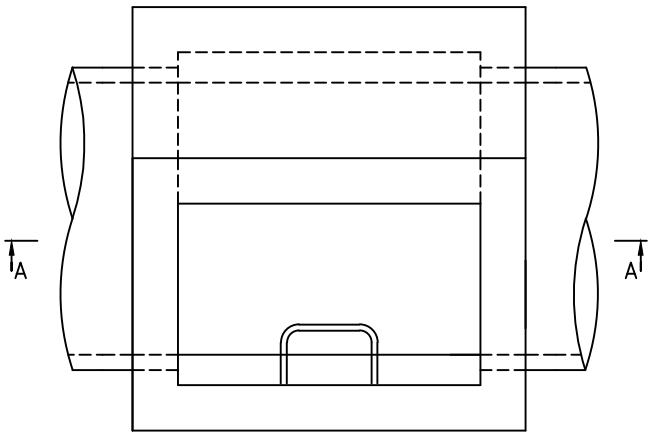

Plan
(Pit Lid Removed)

NOTES:

1. Step irons (S136) shall be fitted to pits greater than 1.0m in depth.
2. Heavy duty cast iron covers are to be used in trafficable areas. Alternative grate and frame top may be used in certain circumstances and shall be Class C (AS3996/1992), hot dip galvanised (AS/NZS 4680), pedestrian/bicycle safe, bolt down, weave style or similar - to manufacturers specifications, and must be approved by the Council Engineer.
3. Reinforcement mesh in shaft shall have the main bars positioned horizontally. Laps to be 300min.
4. Pits with haunching in two directions require special structural design. These standard details do not apply.
5. Subsurface A.G. drain holes are to be sealed if not used.

SCALE 1:25
DIMENSIONS IN MILLIMETRES

ACCESS CHAMBER

Pipes 525mm and above – Pit depth to 3.6m

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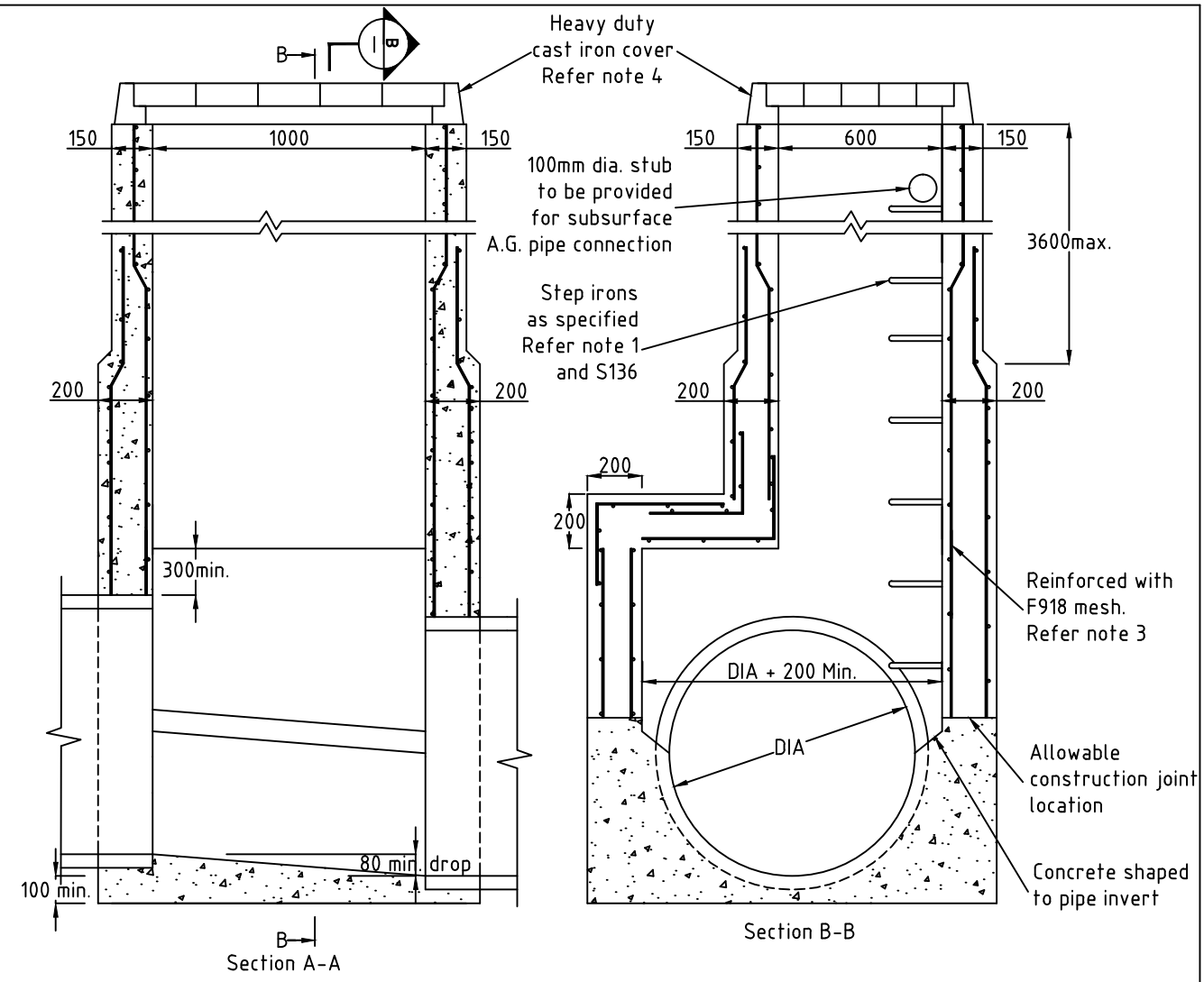

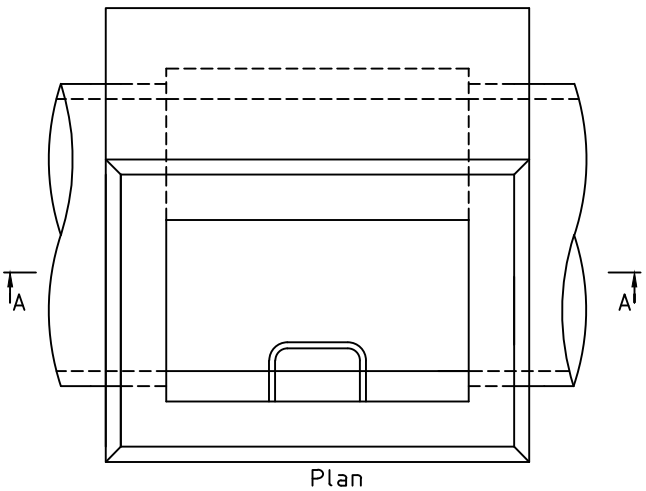

Plan
(Pit Lid Removed)

NOTES:

1. Step irons (S136) shall be fitted to pits greater than 1.0m in depth.
2. Pits with haunching in two directions require special structural design. These standard details don't apply.
3. Reinforcement mesh in shaft shall have the main bars positioned horizontally. Laps to be 300min.
4. Only approved heavy duty cast iron covers are to be used with this pit.
5. Subsurface A.G. drain holes are to be sealed if not used.

SCALE 1:25
DIMENSIONS IN MILLIMETRES

ACCESS CHAMBER

Pipes 525mm and above – Pit depth 3.6m to 7.2m

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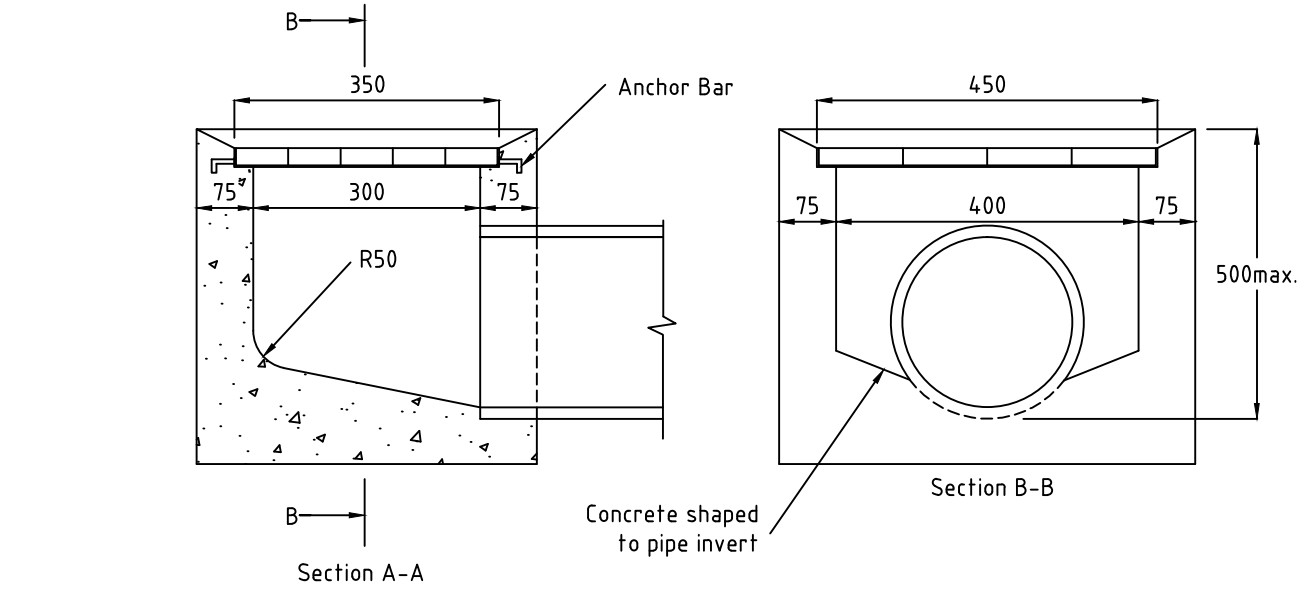

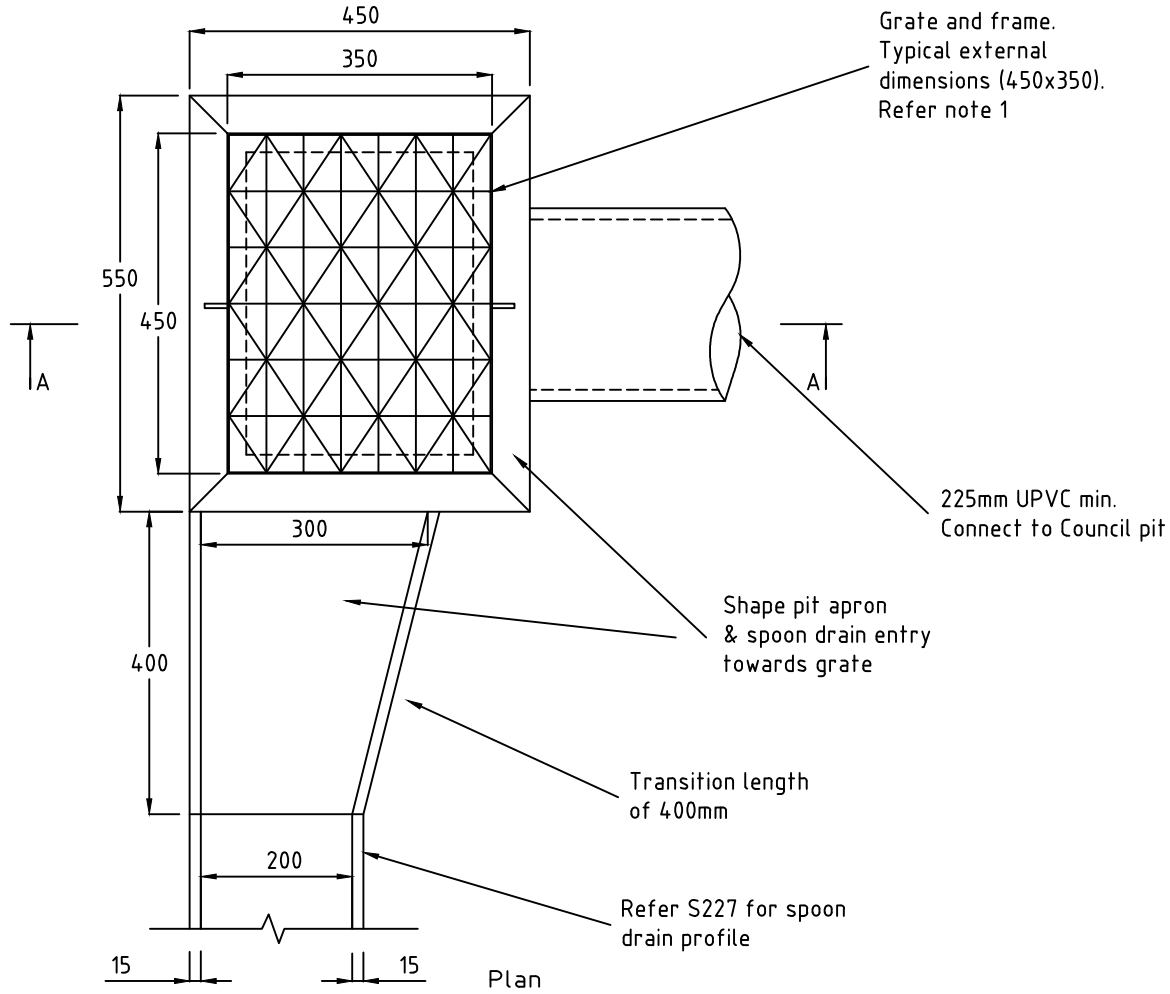

NOTES:

1. Grate type/pattern must be approved by Council Engineer and is to comply with (AS3996/1992), hot dip galvanized (AS/NZS 4680), pedestrian/bicycle safe, bolt down, weave style or similar - to manufacturers specifications.
2. Pit floor is to be sloped at a minimum of 1 in 5 in all directions to the outlet.

SCALE 1:10
DIMENSIONS IN MILLIMETRES

SPOON DRAIN PIT

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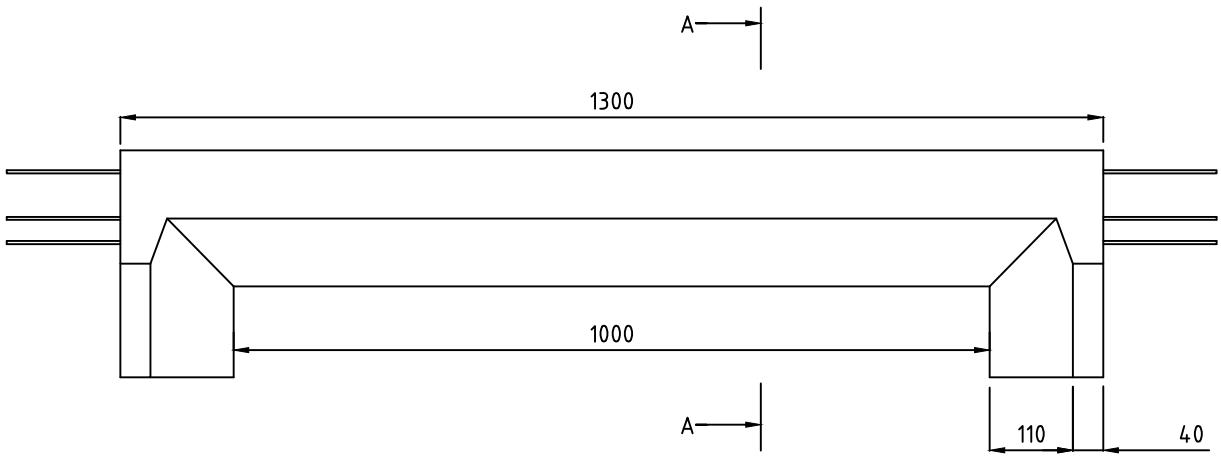
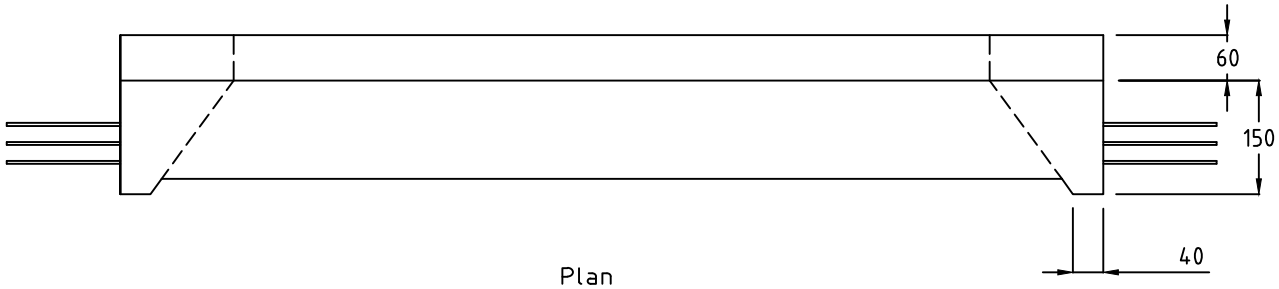
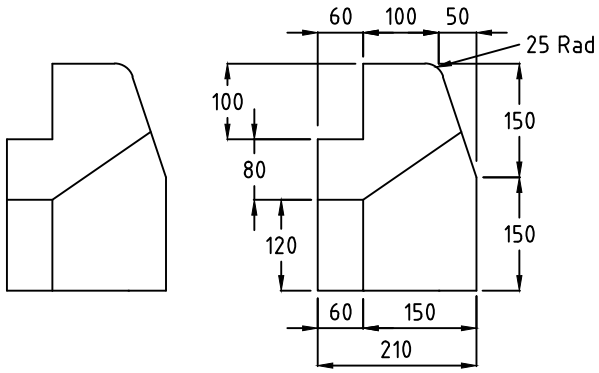


Front Elevation



Plan



Section A-A

NOTES:
1. Lintels shall be cured for 28 days before use on construction works.
2. Lintels are to be reinforced according to manufacturers specifications.

SCALE 1:10
DIMENSIONS IN MILLIMETRES

PRE CAST CONCRETE KERB LINTEL

Barrier Kerb and Channel

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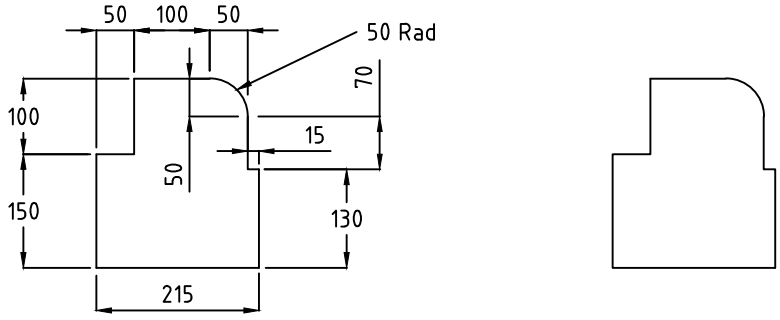
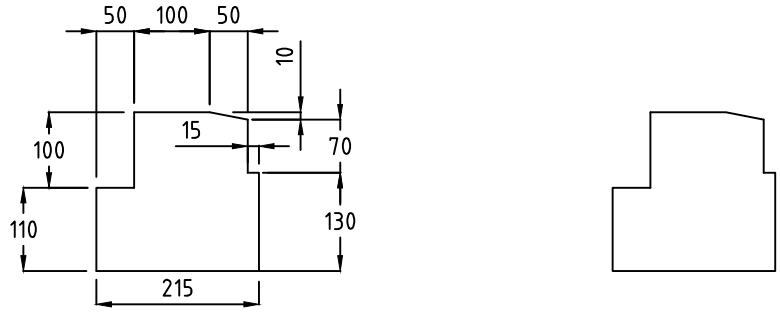
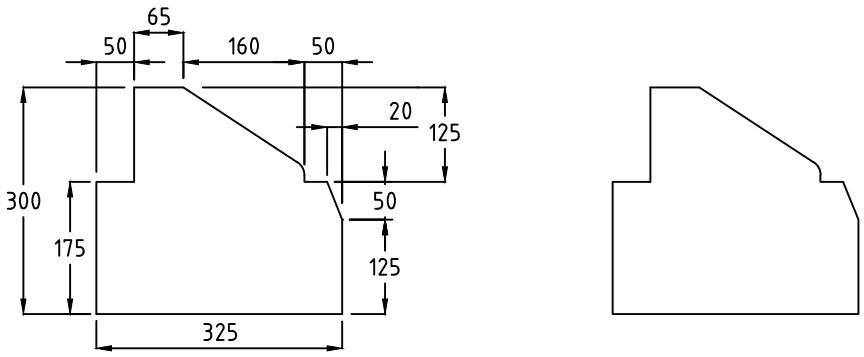


Roll Over Kerb Lintel



Dished Channel Lintel



Fully Mountable Lintel

NOTES:
1. Lintels shall be cured for 28 days before use on construction works.
2. Lintels are to be reinforced according to manufacturers specifications.

SCALE 1:10
DIMENSIONS IN MILLIMETRES

PRE CAST CONCRETE KERB LINTELS
Dished Channel / Roll Over Kerb / Fully Mountable

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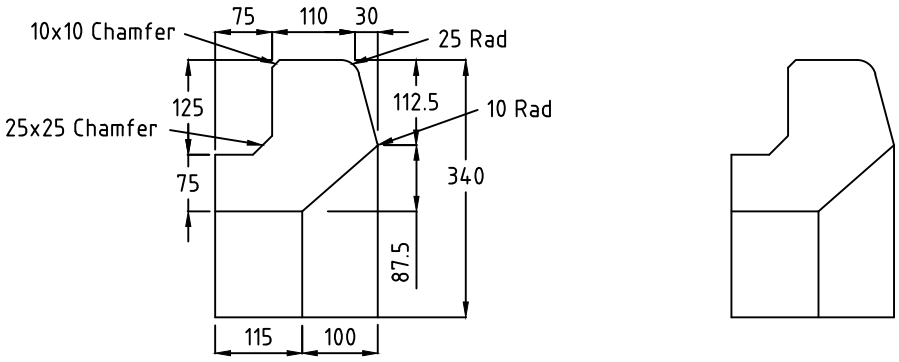
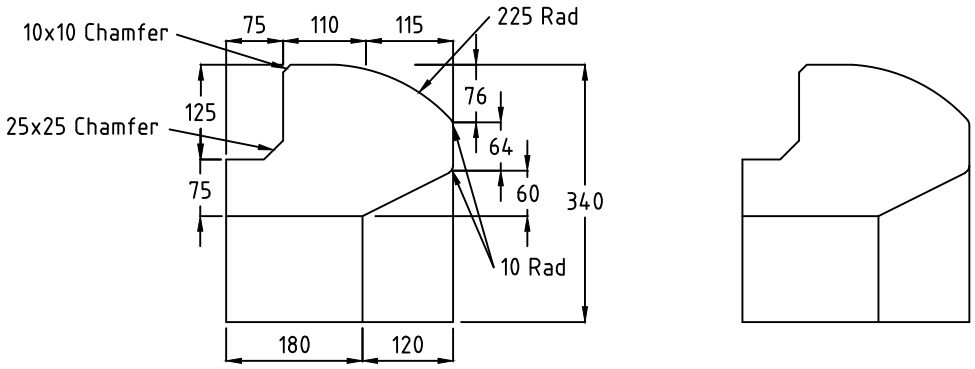


B Type Lintel



SM Type Lintel

NOTES:
1. Lintels shall be cured for 28 days before use on construction works.
2. Lintels are to be reinforced according to manufacturers specifications.

SCALE 1:10
DIMENSIONS IN MILLIMETRES

PRE CAST CONCRETE KERB LINTELS
B Type / SM Type

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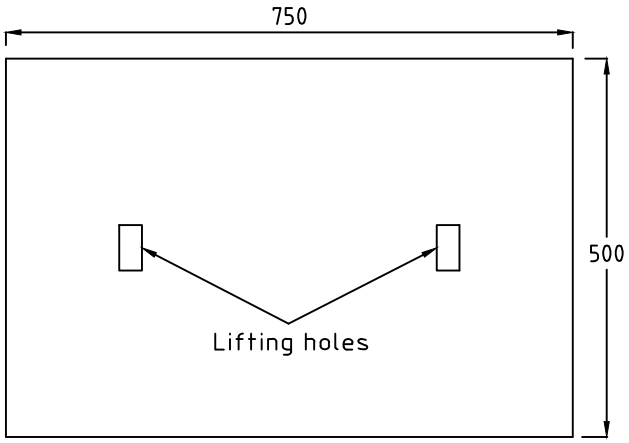
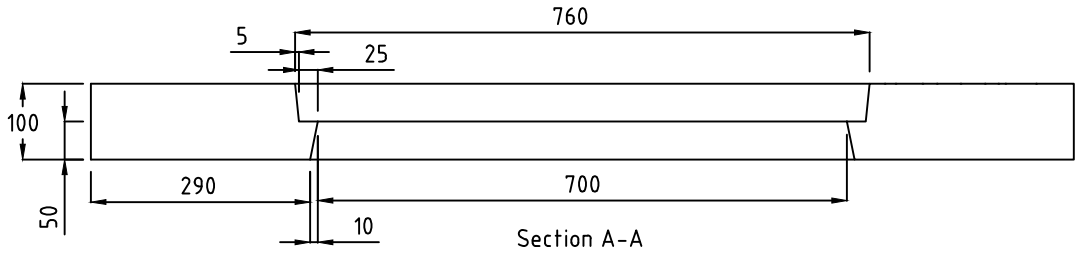
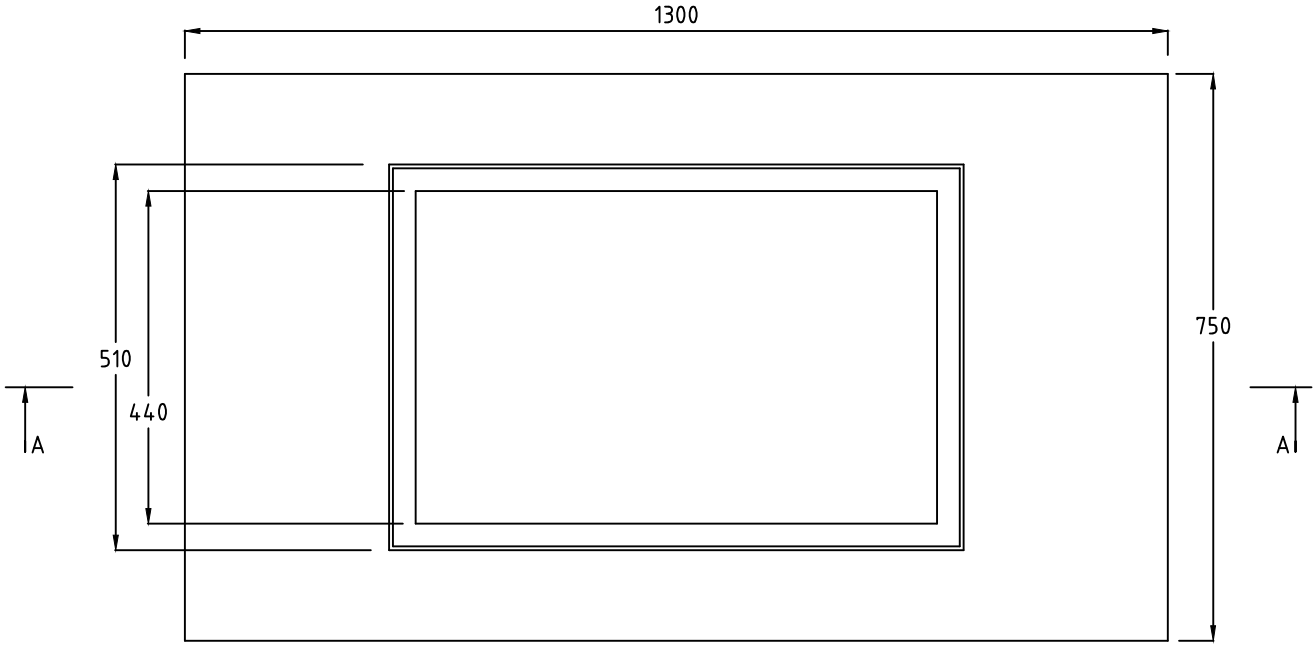


Cover



Section A-A



Frame

NOTES:

1. Covers and frames shall be cured for 28 days before use on construction works.
2. Covers and frames are to be reinforced according to manufacturers specifications.
3. Heavy duty cast iron covers are to be used in trafficable areas and this detail does not apply.
4. All lids shall fit flush and have provision for lifting.

SCALE 1:10
DIMENSIONS IN MILLIMETRES

PRE CAST CONCRETE COVER AND FRAME
(1300x750)

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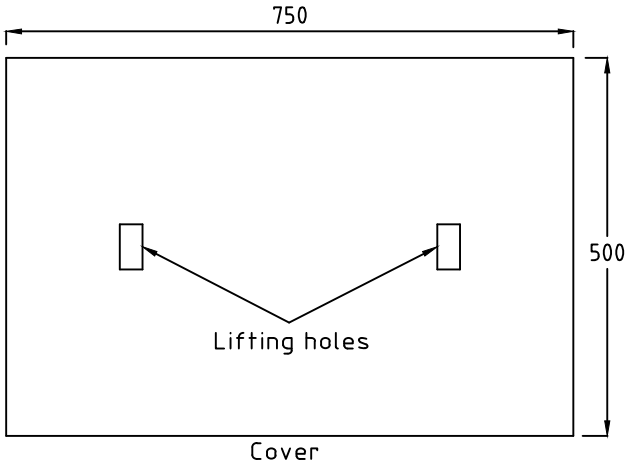
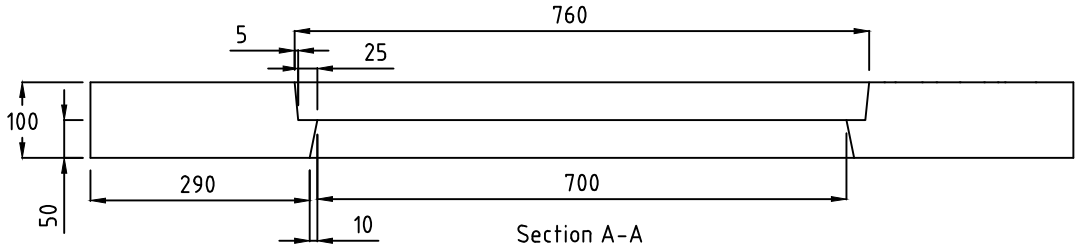
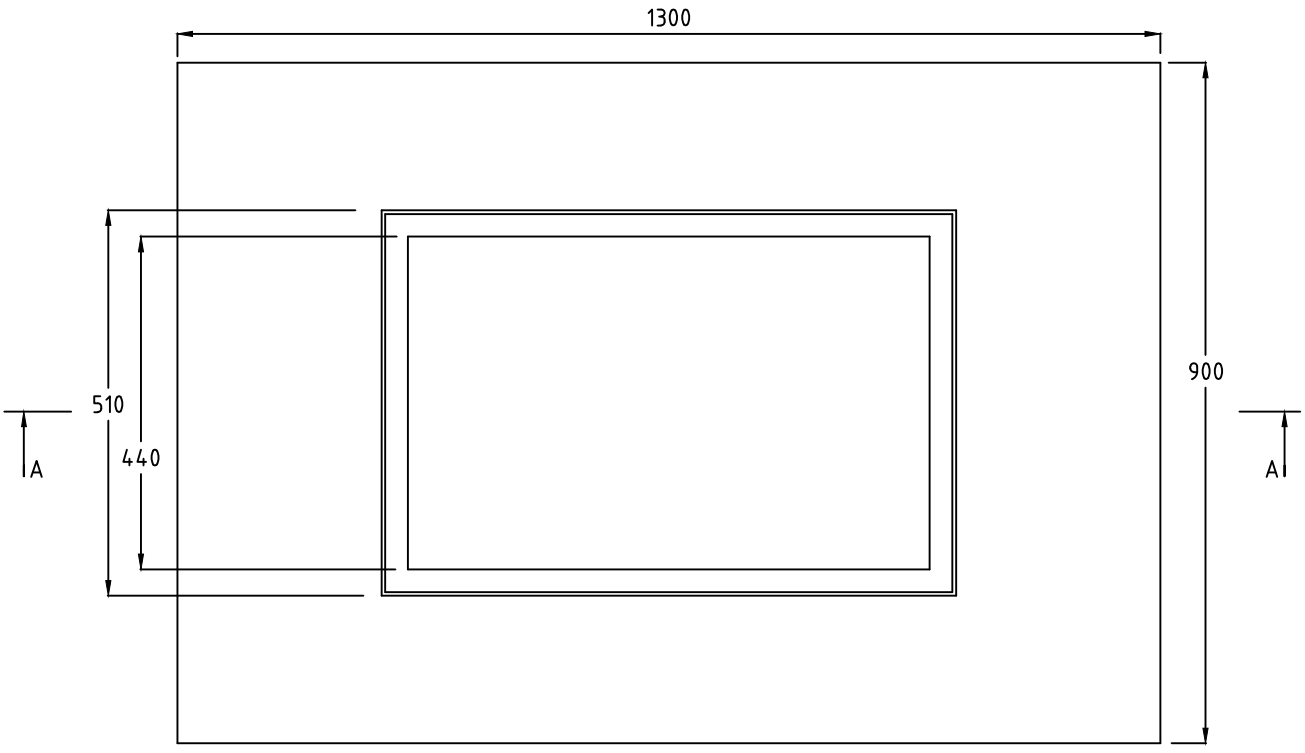


Cover



Section A-A



Frame

NOTES:

1. Covers and frames shall be cured for 28 days before use on construction works.
2. Covers and frames are to be reinforced according to manufacturers specifications.
3. Heavy duty cast iron covers are to be used in trafficable areas and this detail does not apply.
4. All lids shall fit flush and have provision for lifting.

SCALE 1:10
DIMENSIONS IN MILLIMETRES

PRE CAST CONCRETE COVER AND FRAME
(1300x900)

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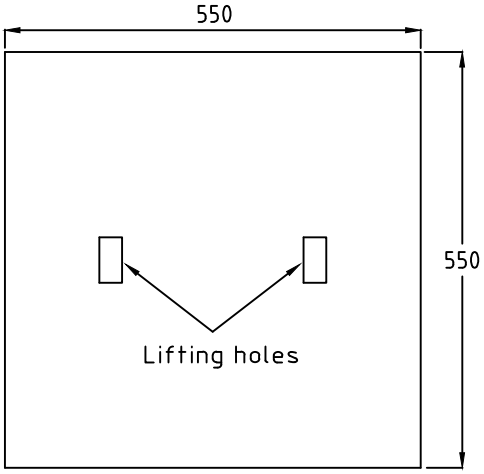
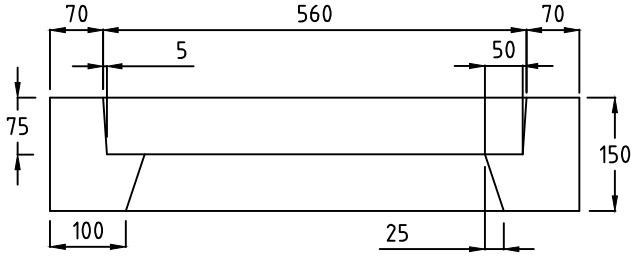
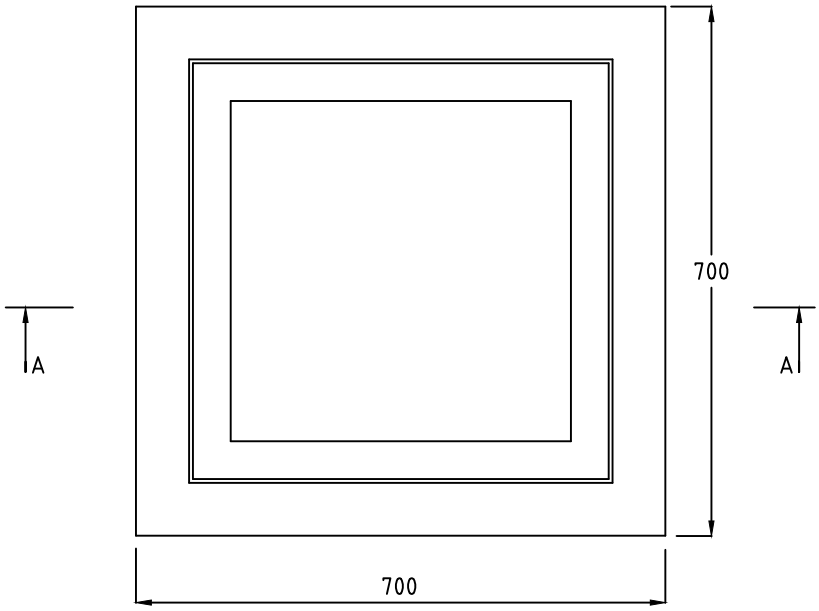


Cover



Section A-A



Frame

NOTES:

1. Covers and frames shall be cured for 28 days before use on construction works.
2. Covers and frames are to be reinforced according to manufacturers specifications.
3. Heavy duty cast iron covers are to be used in trafficable areas and this detail does not apply.
4. All lids shall fit flush and have provision for lifting.

SCALE 1:10
DIMENSIONS IN MILLIMETRES

PRE CAST SQUARE CONCRETE COVER AND FRAME (700X700)

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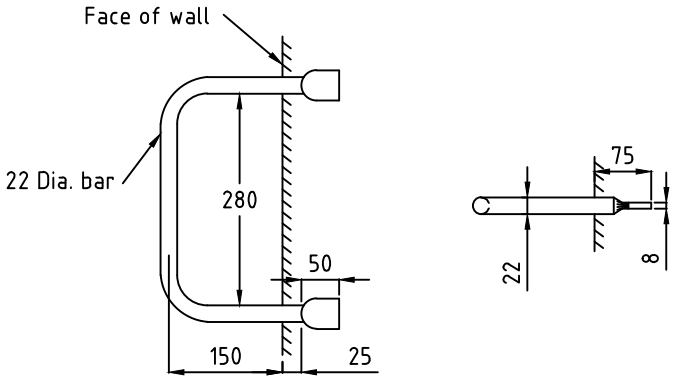
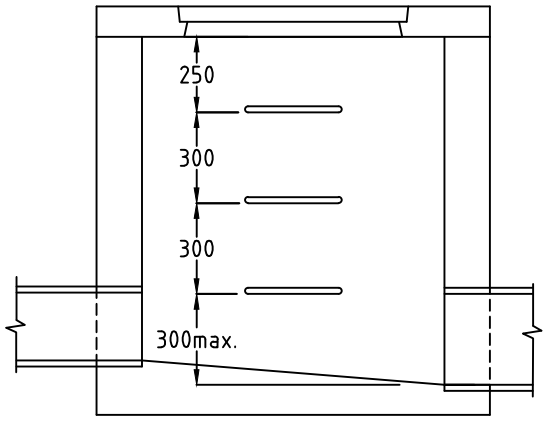
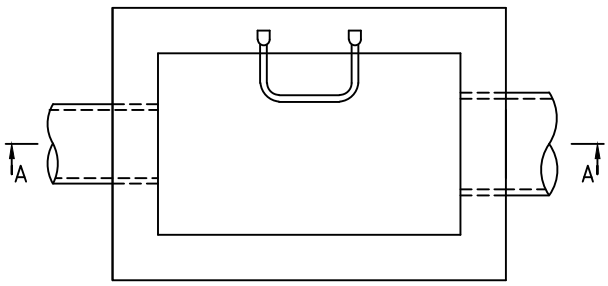


Step Iron Detail
Scale 1:10



Section A-A



Plan
(Pit Lid Removed)

NOTES:
1. Pits deeper than 1 metre shall be fitted with step irons.
2. Step irons shall be located:
   - Directly below the opening in the cover.
   - Desirably on a wall without openings.
   - Desirably on one of the long sides of the pit.
3. Steel for step irons shall be structural grade 250 to AS3679/1990 part 1.
4. Step irons shall be hot dip galvanized after fabrication to AS/NZS 4680.
5. Step irons shall have sharp edges rounded.

SCALE 1:25
DIMENSIONS IN MILLIMETRES

STEP IRONS

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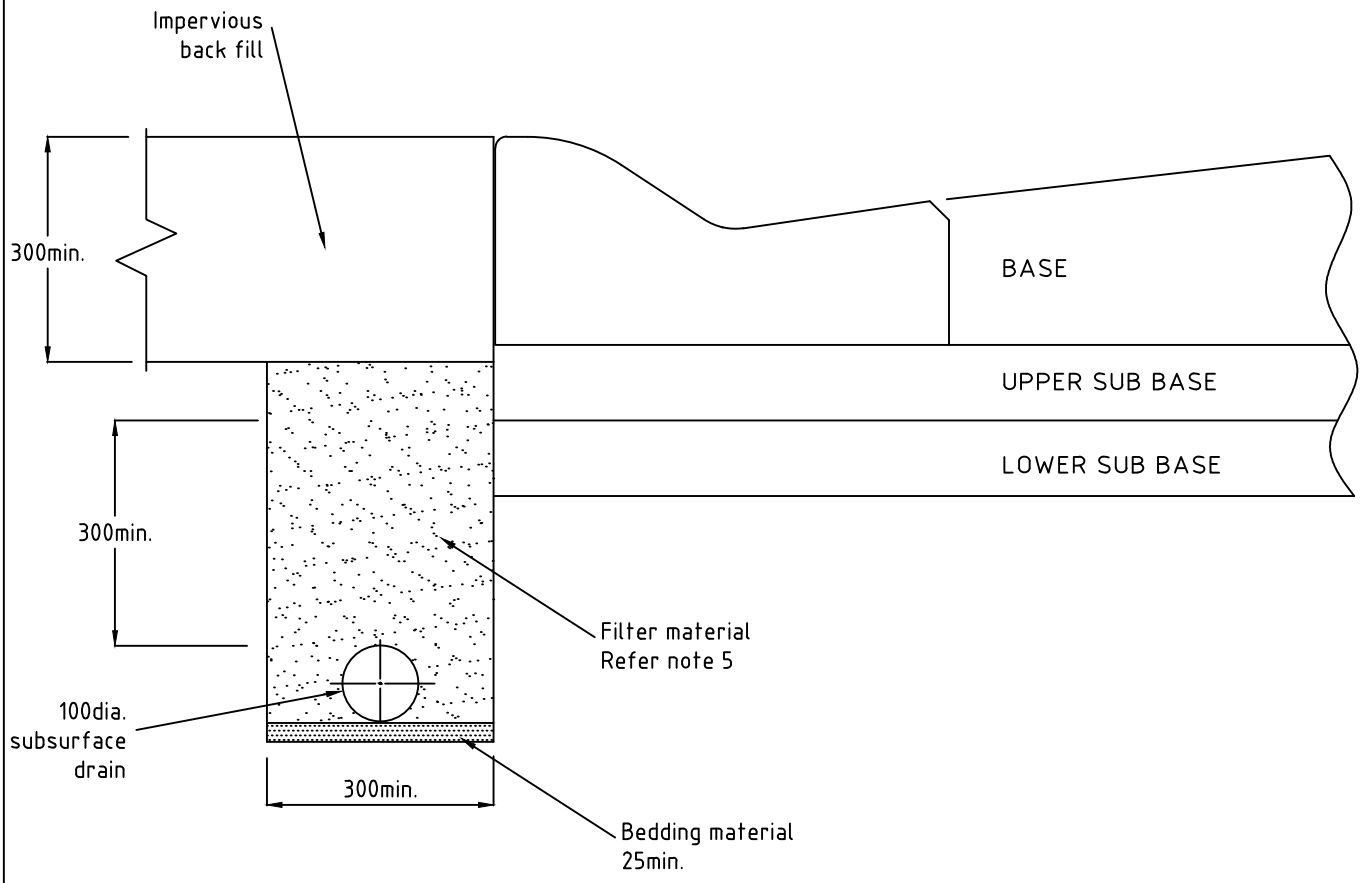

Preferred Location on New Roads

NOTES:

1. This standard drawing details the preferred location of subsurface drainage on new roads. Certain circumstances may require special design and this standard will not apply. Refer to VicRoads standard drawings SD1601 and SD1621 for further location and type details.
2. On rural roads, pavement drains may be omitted if the table drain invert is 200mm lower than the pavement boxing and provision is made for the draining of the boxing.
3. Subsurface drainage outlets shall be connected to Council storm water pits.
4. Pavement drains shall be located clear of areas affected by guard fence posts.
5. Filter material is to be approved by the Council Engineer prior to commencement of construction.

SCALE 1:10
DIMENSIONS IN MILLIMETRES

SUBSURFACE DRAIN

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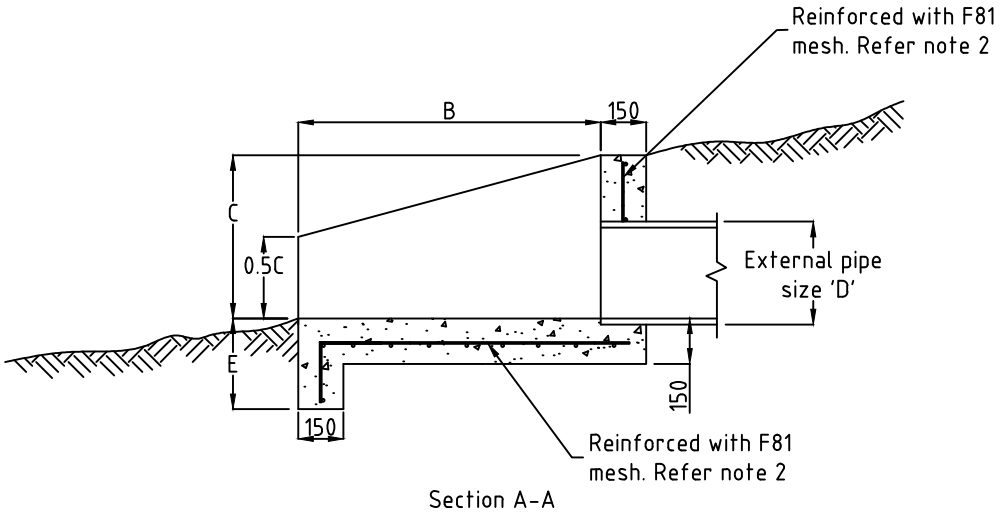
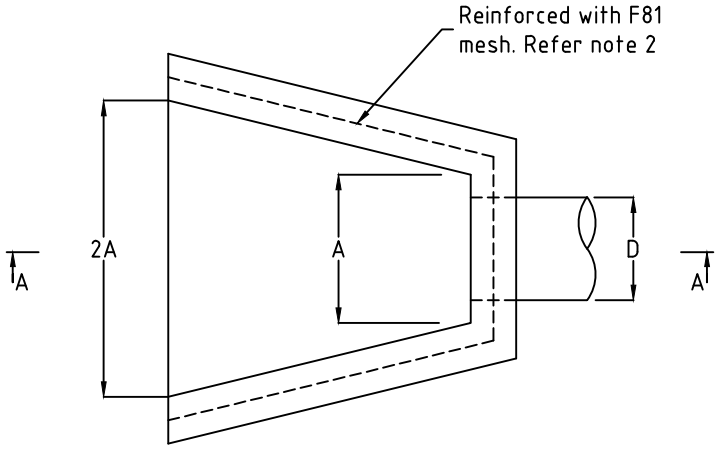


Section A-A



Plan

Internal Pipe Size	A	B	C	E
225 – 300	D+150	1000	D+200	300
375 – 525	D+200	1200	D+250	300
600 – 825	D+250	1400	D+300	400
900 – 1200	D+300	1600	D+500	400

NOTES:

1. This standard drawing details a typical culvert endwall only. Special circumstances such as skew pipes, box culverts and multiple pipe culverts may require further investigation into different arrangements. Refer to VicRoads standard drawings.
2. S142 shall be used where end pipe grades are steep and water velocity is high.
3. Reinforcement mesh shall have the main bars positioned horizontally. Laps to be 300min.
4. Driveable culvert endwall shall be installed as per S143 and is required in areas where head on collisions are likely to occur, where an end of the culvert is within the clear zone (refer Austroads Urban Road
5. Design Guide – 14.3.1 & 14.3.2), and where determined by Council Engineer.
   Pre cast culvert endwalls may be used where appropriate and shall be approved by Council Engineer.

SCALE 1:25
DIMENSIONS IN MILLIMETRES

TYPICAL CULVERT ENDWALL

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STANDARD DRAWING A4/S141

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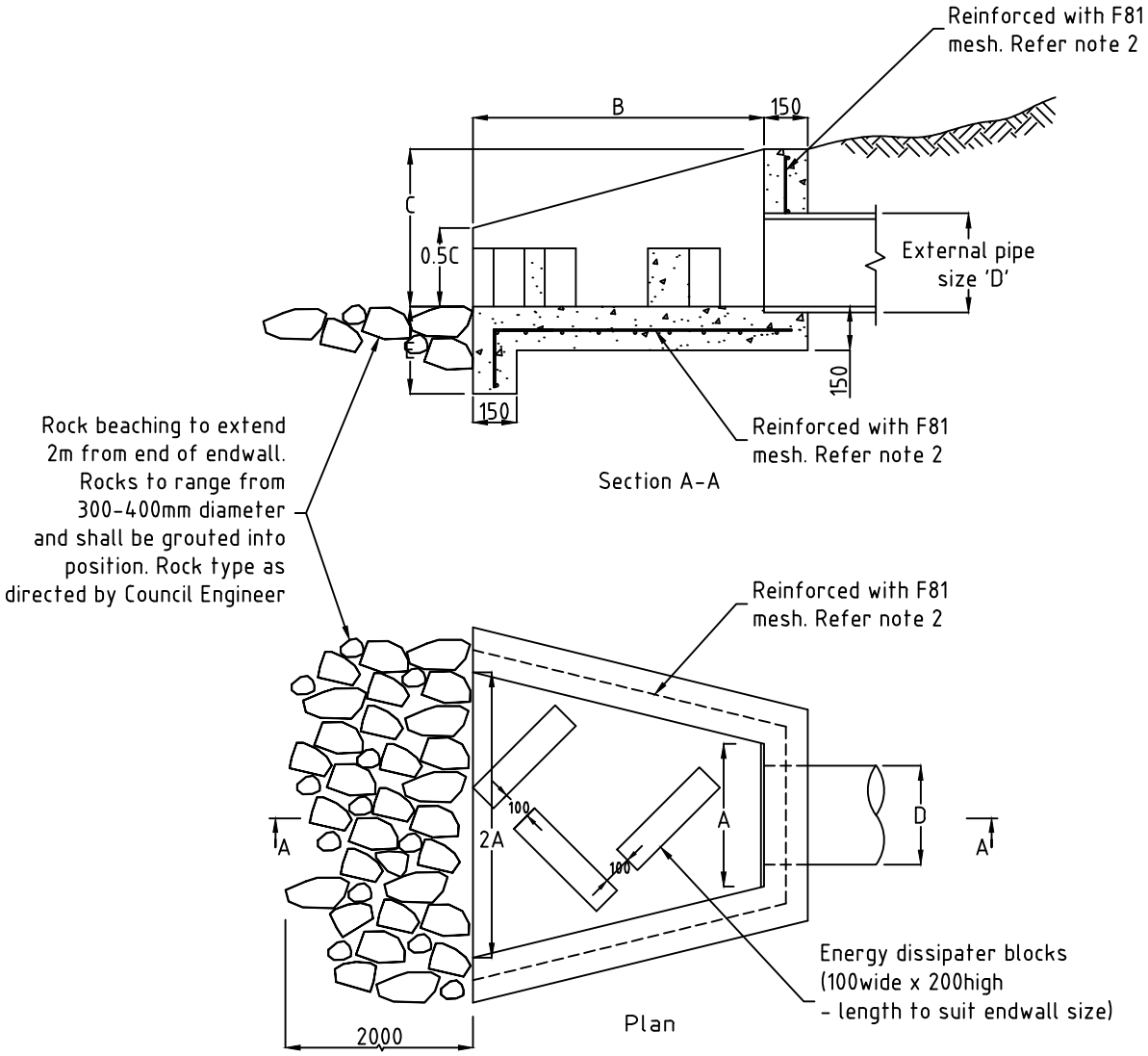

Internal Pipe Size	A	B	C	E
225 – 300	D+150	1000	D+200	300
375 – 525	D+200	1200	D+250	300
600 – 825	D+250	1400	D+300	400
900 – 1200	D+300	1600	D+500	400

NOTES:

1. This standard shall be used where end pipe grades are steep and water velocity is high.
2. This standard drawing details a typical culvert endwall only (energy dissipater). Special circumstances such as skew pipes, box culverts and multiple pipe culverts may require further investigation into different arrangements. Refer to VicRoads standard drawings.
3. Reinforcement mesh shall have the main bars positioned horizontally. Laps to be 300min.
4. Driveable culvert endwall shall be installed as per S143 and is required in areas where head on collisions are likely to occur, where an end of the culvert is within the clear zone (refer Austroads Urban Road Design Guide - 14.3.1 & 14.3.2), and where determined by Council Engineer.
5. Pre cast culvert endwalls may be used where appropriate and shall be approved by Council Engineer.

SCALE 1:25
DIMENSIONS IN MILLIMETRES

TYPICAL CULVERT ENDWALL
Energy Dissipater

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BALANCE OF CITY AND COUNTRY

REVIEWED: D.V CHECKED: B.N

DATE: Jan 2004

STANDARD DRAWING A4/S142

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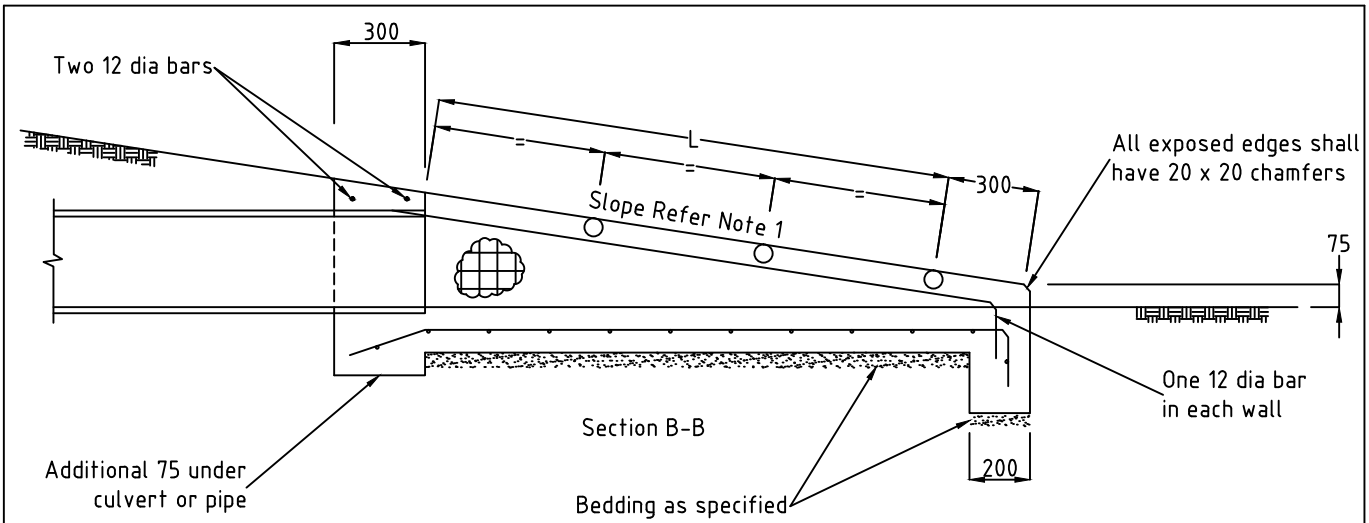
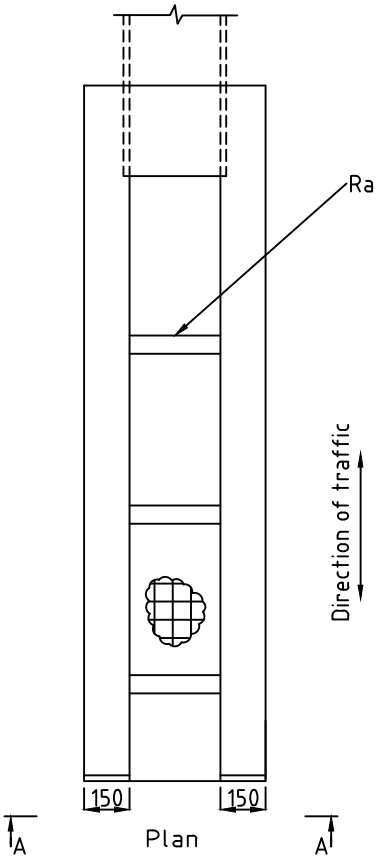
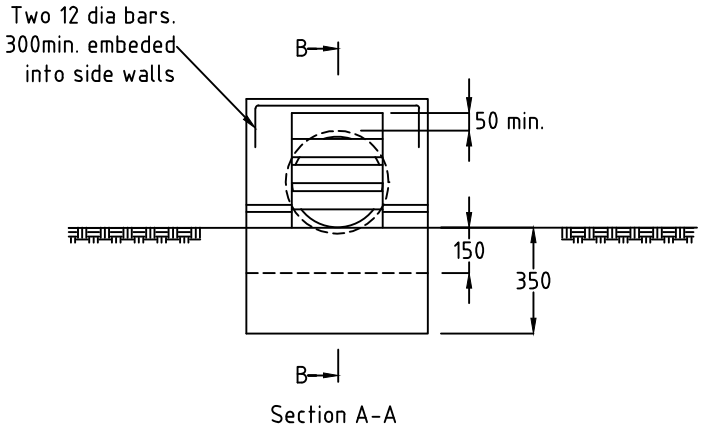




L (mm)	Total number of rails
100 - 600	1
601 - 1200	2
1201 - 1800	3
1801 - 2400	4



NOTES:

1. Slope of endwall to match batter slope. Maximum slope of 4 to 1.
2. This endwall is required in areas where head on collisions are likely to occur, where an end of a culvert is within the clear zone (refer Austroads Urban Road Design Guide - 14.3.1 & 14.3.2), and where determined by Council Engineer. Where traffic direction is perpendicular to culvert or pipe, refer to VicRoads standard drawing SD 1992, driveable culvert endwall type 2.
3. Reinforcement F81 unless otherwise specified. Distribution bars 12 diameter at 200 centres.
4. Rails within section "L" shall be evenly spaced. The maximum spacing shall not exceed 600mm.
5. Rails are 60.3mm diameter galvanized tubes 5.4mm thick. These are to be grouted into the slots in the walls.
6. Pre cast driveable culvert endwalls may be used where appropriate and shall be approved by Council Engineer.

SCALE 1:25
DIMENSIONS IN MILLIMETRES

DRIVEABLE CULVERT ENDWALL

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BALANCE OF CITY AND COUNTRY

REVIEWED: D.V CHECKED: B.N

DATE: Jan 2004

STANDARD DRAWING A4/S143

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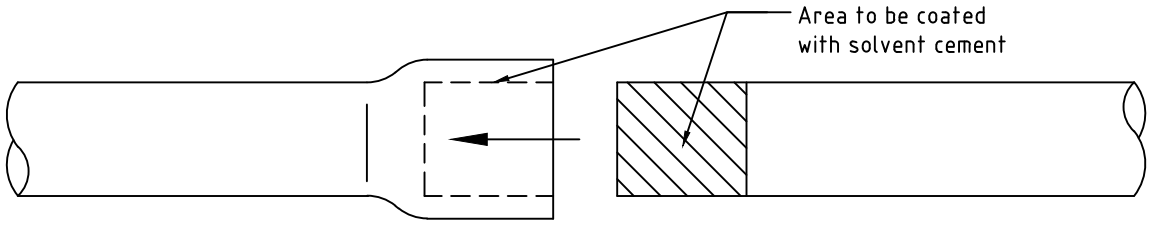
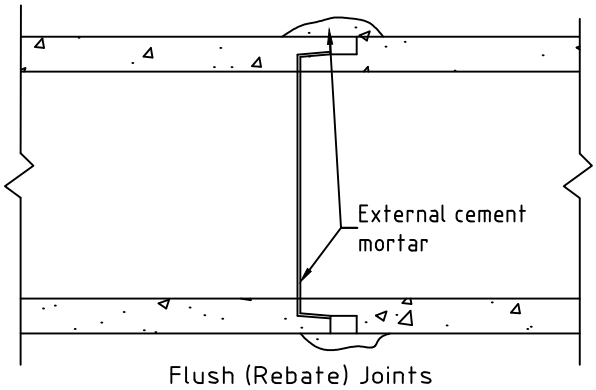
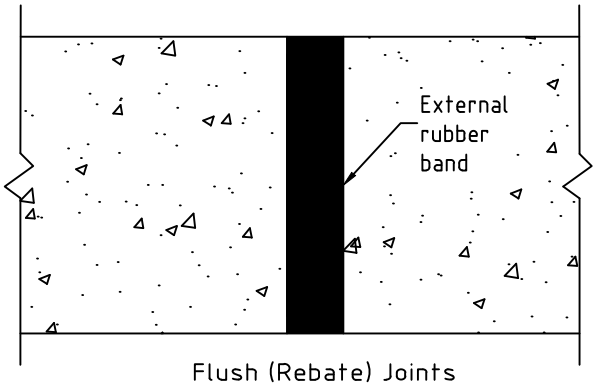


Solvent & Cement Joint
(for U.P.V.C pipes)



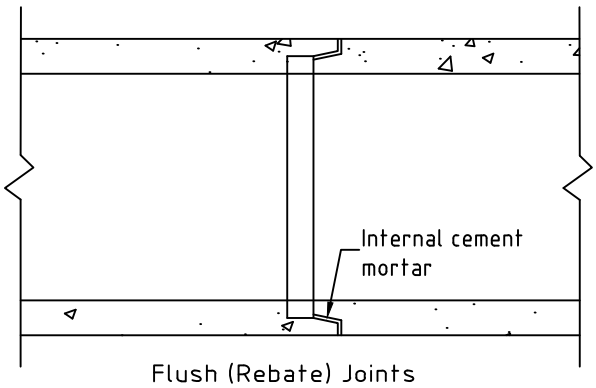
Flush (Rebate) Joints

- External Grouting
(for pipes less than 600)



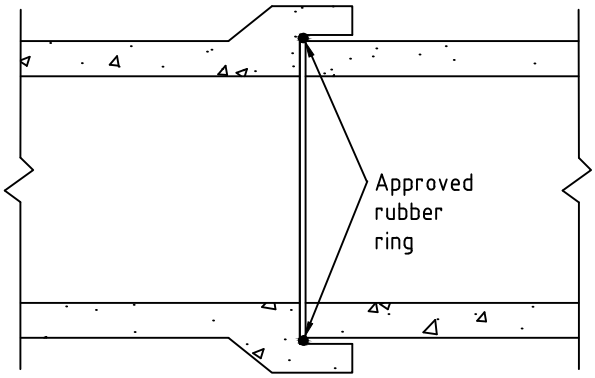
Flush (Rebate) Joints

- External Rubber Band Seal
(for pipes greater than 600)



Flush (Rebate) Joints

- Internal Grouting
(for pipes greater than 600)



Spigot & Socket
(for all pipe types)

NOTES:

1. Bandage joints shall only be used with the approval of the Council Engineer.
2. Rubber ring joints shall be made in accordance with the manufacturers specifications.
3. For U.P.V.C. pipes, the solvent cement shall be continuously applied to both the spigot and the socket, after ensuring the pipe ends are clean and debris free.

SCALE 1:10
DIMENSIONS IN MILLIMETRES

PIPE JOINTING

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BALANCE OF CITY AND COUNTRY

REVIEWED: D.V	CHECKED: B.N	STANDARD DRAWING A4/S144
DATE: Jan 2004		

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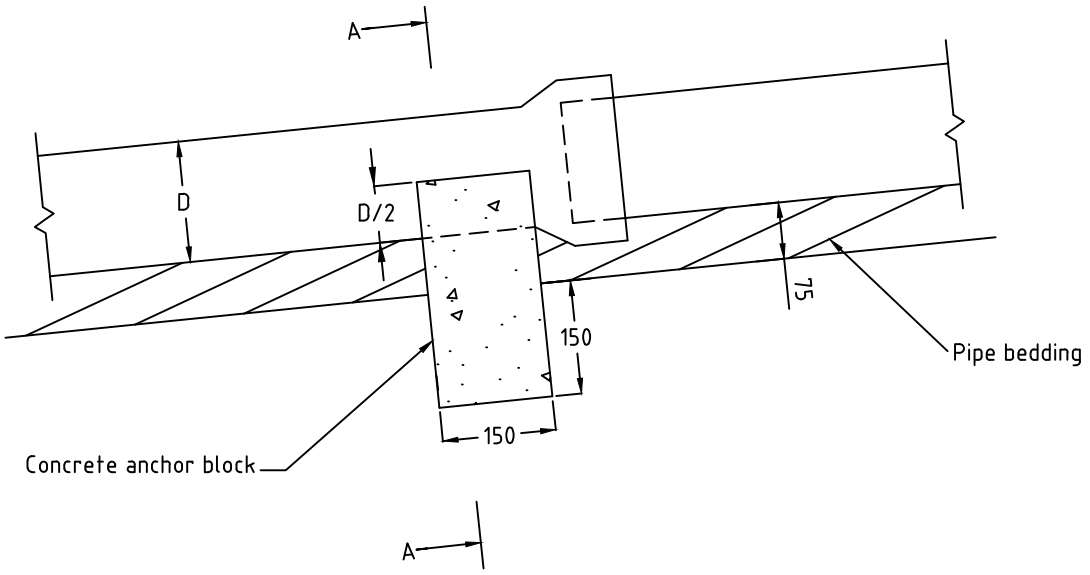

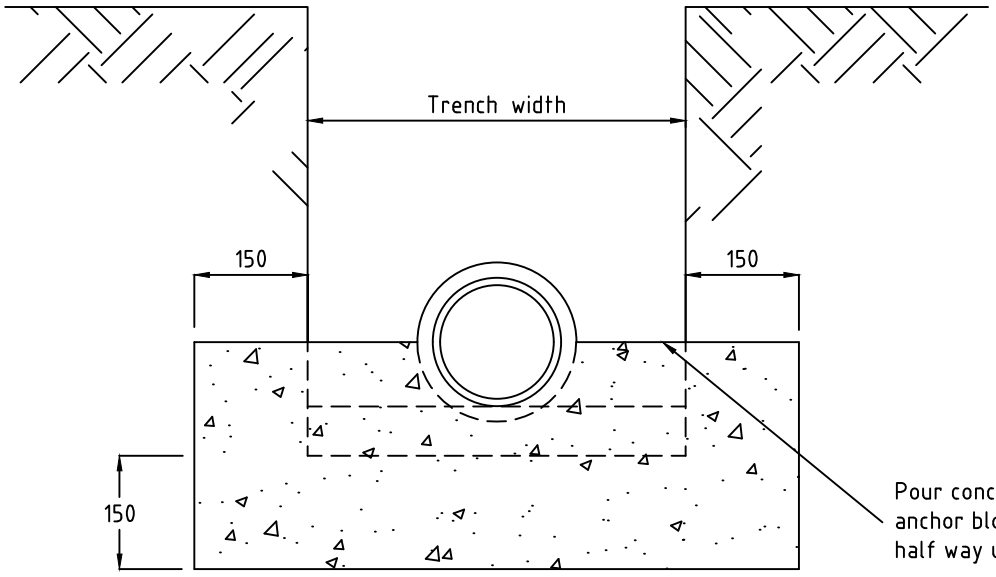

Section A-A

NOTES:

1. Pipe anchor blocks shall be used where the pipe slope exceeds 1 in 7 and the distance between pits exceeds 10 metres.
2. Pipe anchor blocks shall be spaced at 10m apart unless otherwise specified by the Council Engineer.
3. Where possible, pipe anchor blocks shall be located immediately behind the socket of the pipe.

SCALE 1:10
DIMENSIONS IN MILLIMETRES

PIPE ANCHOR BLOCK

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BALANCE OF CITY AND COUNTRY

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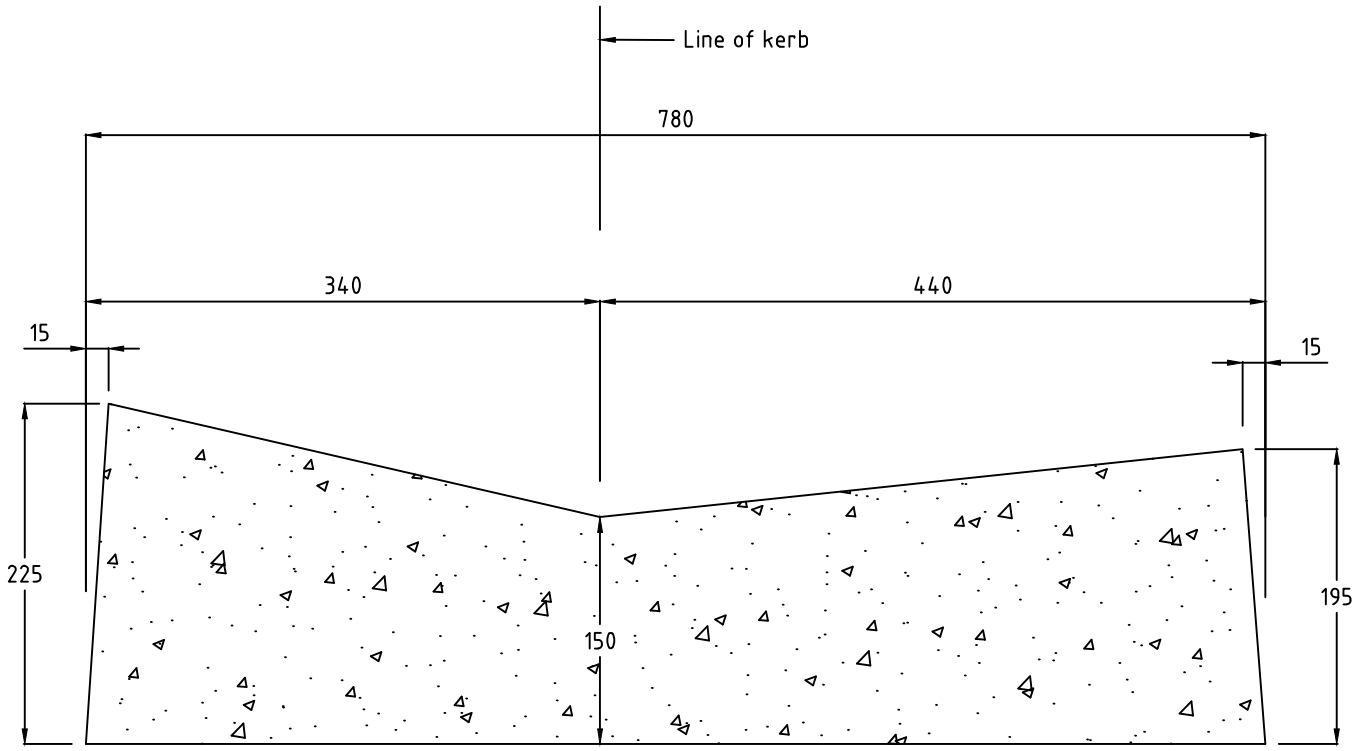
KERB STANDARDS



NOTES:

1. Open dished channel shall be constructed in accordance with the Manningham Technical Specification.
2. Concrete strength 25MPa @ 28 days.
3. Cross sectional area of open dished channel is approximately 0.14 m² or 1.0m³ of concrete per 7.0 metres.

SCALE 1:5
DIMENSIONS IN MILLIMETRES

OPEN DISHED CHANNEL

MANNINGHAM CITY COUNCIL

MANNINGHAM
BALANCE OF CITY AND COUNTRY

REVIEWED: D.V CHECKED: K.K	STANDARD DRAWING A4/S200
DATE: Jan 2004	

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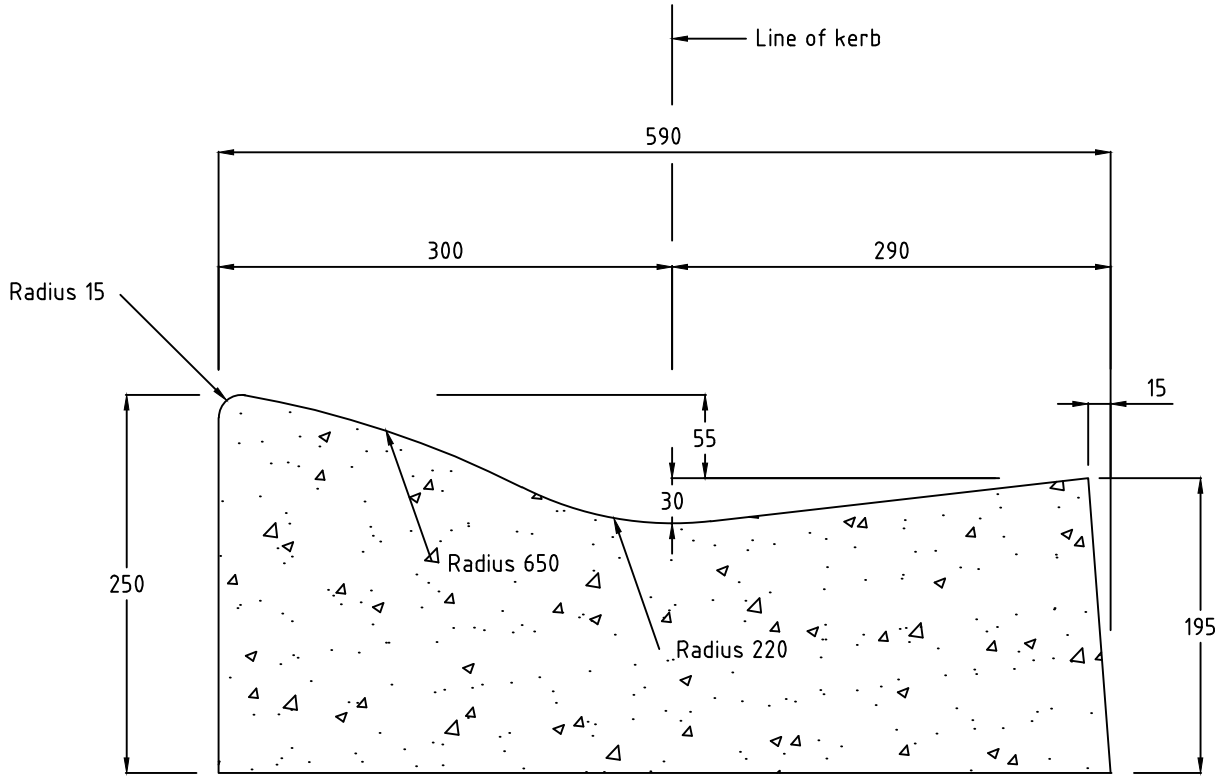

NOTES:

1. Roll over kerb shall be constructed in accordance with the Manningham Technical Specification.
2. Concrete strength 25MPa @ 28 days.
3. Cross sectional area of roll over kerb is approximately 0.12 m² or 1.0m³ of concrete per 8.2 metres.

SCALE 1:5
DIMENSIONS IN MILLIMETRES

ROLL OVER KERB

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BALANCE OF CITY AND COUNTRY

REVIEWED: D.V CHECKED: K.K

DATE: Jan 2004

STANDARD DRAWING A4/S201

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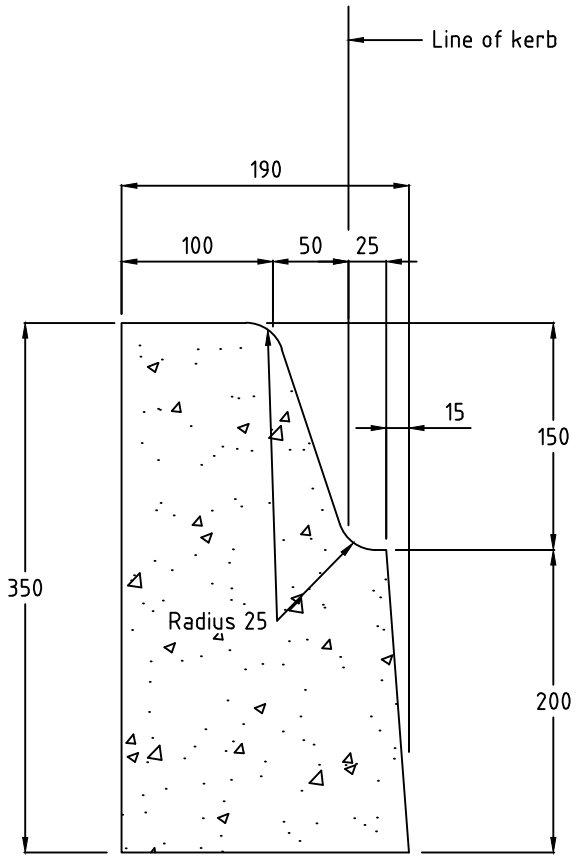

NOTES:

1. Barrier kerb only shall be constructed in accordance with the Manningham Technical Specification.
2. Concrete strength 25MPa @ 28 days.
3. Cross sectional area of barrier kerb only is approximately 0.06 m² or 1.0m³ of concrete per 16.7 metres.

SCALE 1:5
DIMENSIONS IN MILLIMETRES

BARRIER KERB ONLY

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DATE: Jan 2004

STANDARD DRAWING A4/S202

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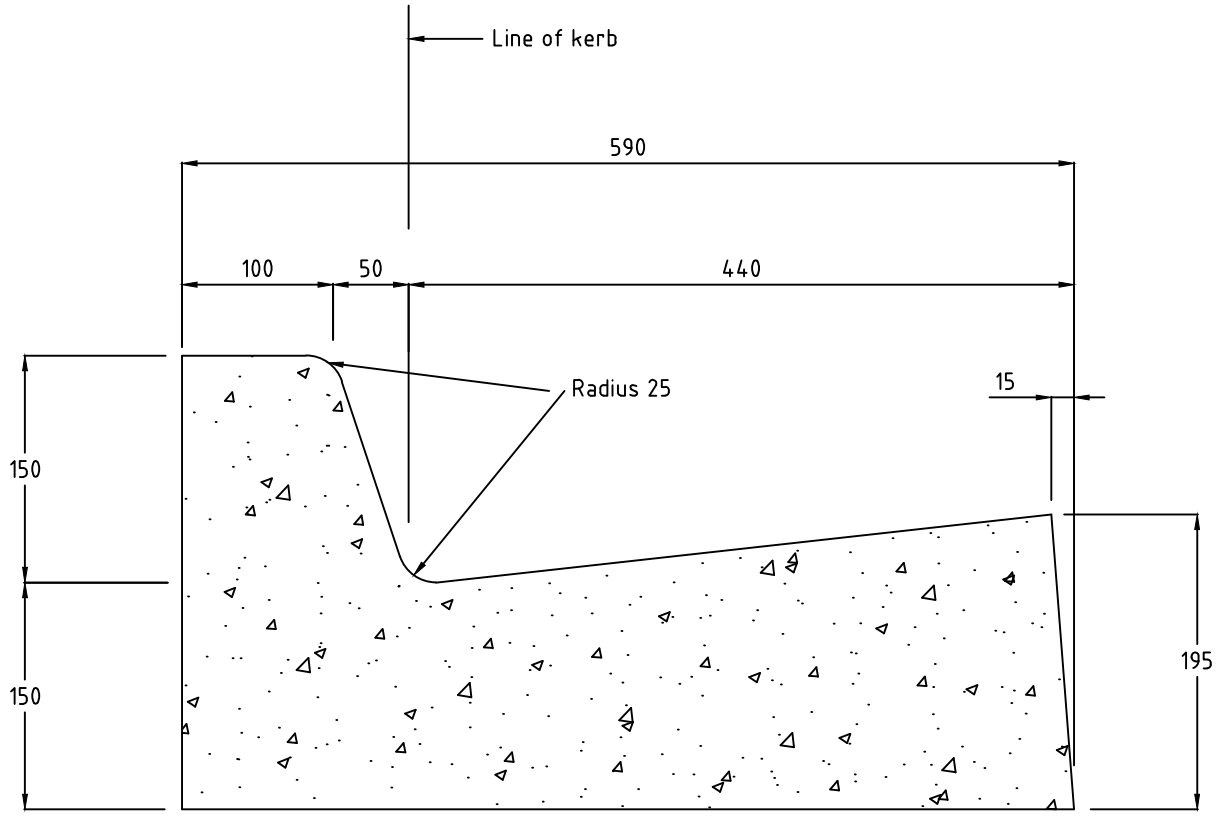

NOTES:

1. Barrier kerb and channel shall be constructed in accordance with the Manningham Technical Specification.
2. Concrete strength 25MPa @ 28 days.
3. Cross sectional area of barrier kerb and channel is approximately 0.12 m² or 1.0m³ of concrete per 8.2 metres.

SCALE 1:5
DIMENSIONS IN MILLIMETRES

BARRIER KERB AND CHANNEL

MANNINGHAM CITY COUNCIL

MANNINGHAM
BALANCE OF CITY AND COUNTRY

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DATE: Jan 2004

STANDARD DRAWING A4/S203

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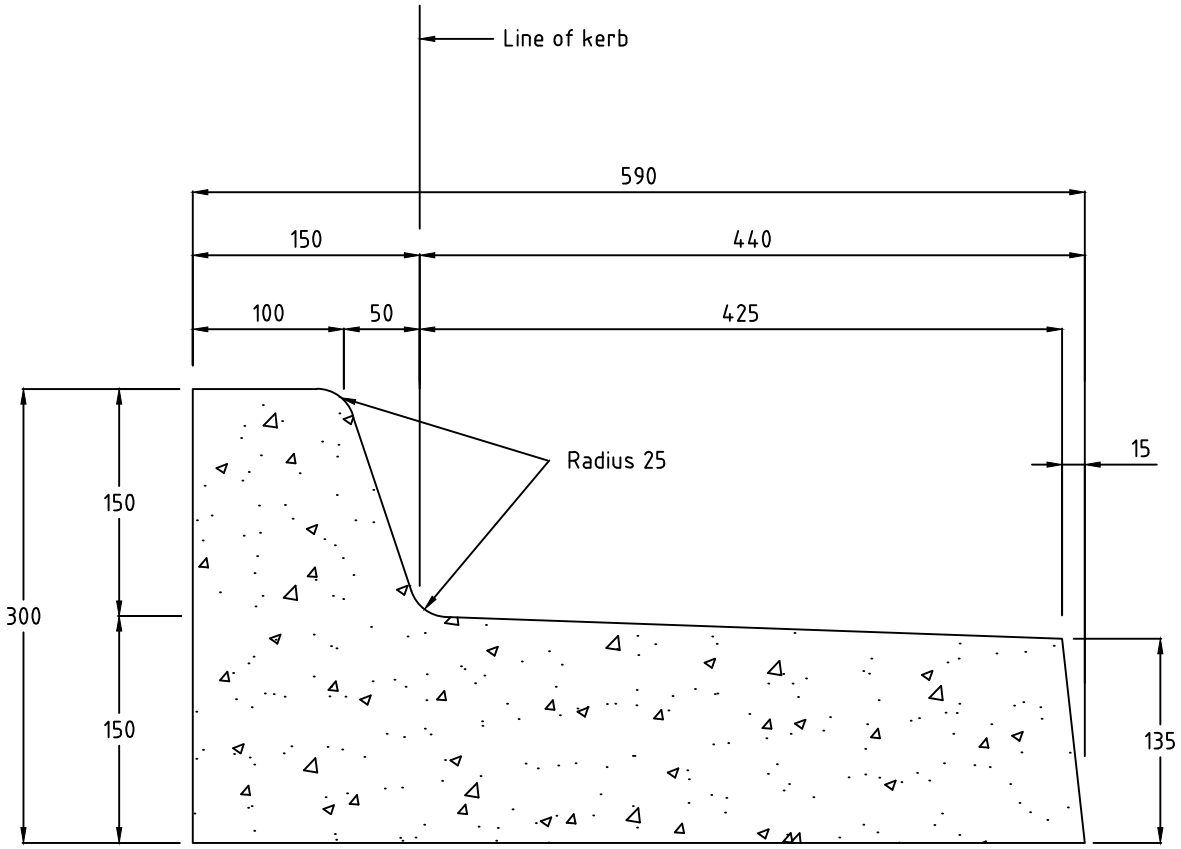

NOTES:

1. Barrier kerb and apron shall be constructed in accordance with the Manningham Technical Specification.
2. Concrete strength 25MPa @ 28 days.
3. Cross sectional area of barrier kerb and apron is approximately 0.10 m^2 or 1.0m^3 of concrete per 10.0 metres.
4. This barrier kerb and apron shall only be used where the road pavement falls away from kerb.

SCALE 1:5
DIMENSIONS IN MILLIMETRES

BARRIER KERB AND APRON

MANNINGHAM CITY COUNCIL

MANNINGHAM
BALANCE OF CITY AND COUNTRY

REVIEWED: D.V CHECKED: K.K

DATE: Jan 2004

STANDARD DRAWING A4/S204

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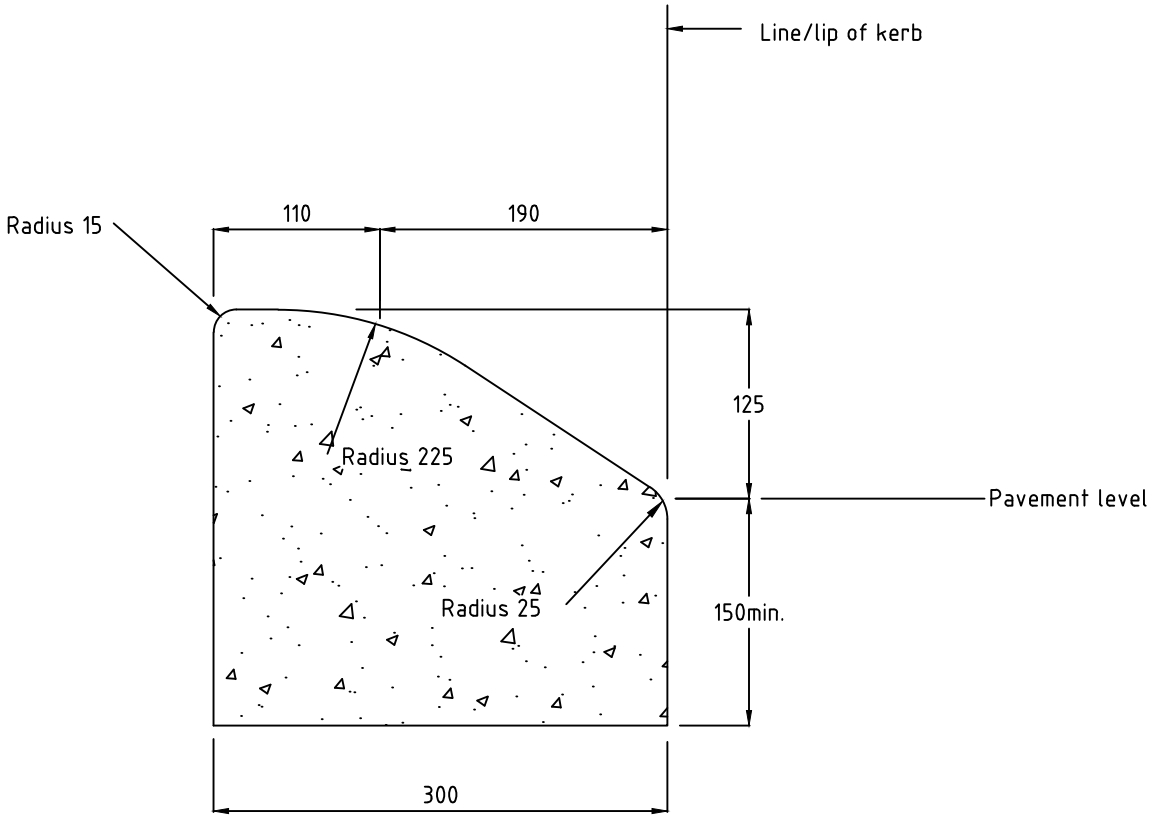

NOTES:

1. SM1 kerb shall be constructed in accordance with the Manningham Technical Specification.
2. Concrete strength 25MPa @ 28 days.
3. Cross sectional area of the SM1 kerb is approximately 0.07 m² or 1.0m³ of concrete per 14.3 metres.

SCALE 1:5
DIMENSIONS IN MILLIMETRES

SEMI–MOUNTABLE KERB ONLY – SM1

MANNINGHAM CITY COUNCIL

MANNINGHAM
BALANCE OF CITY AND COUNTRY

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DATE: Jan 2004

STANDARD DRAWING A4/S205

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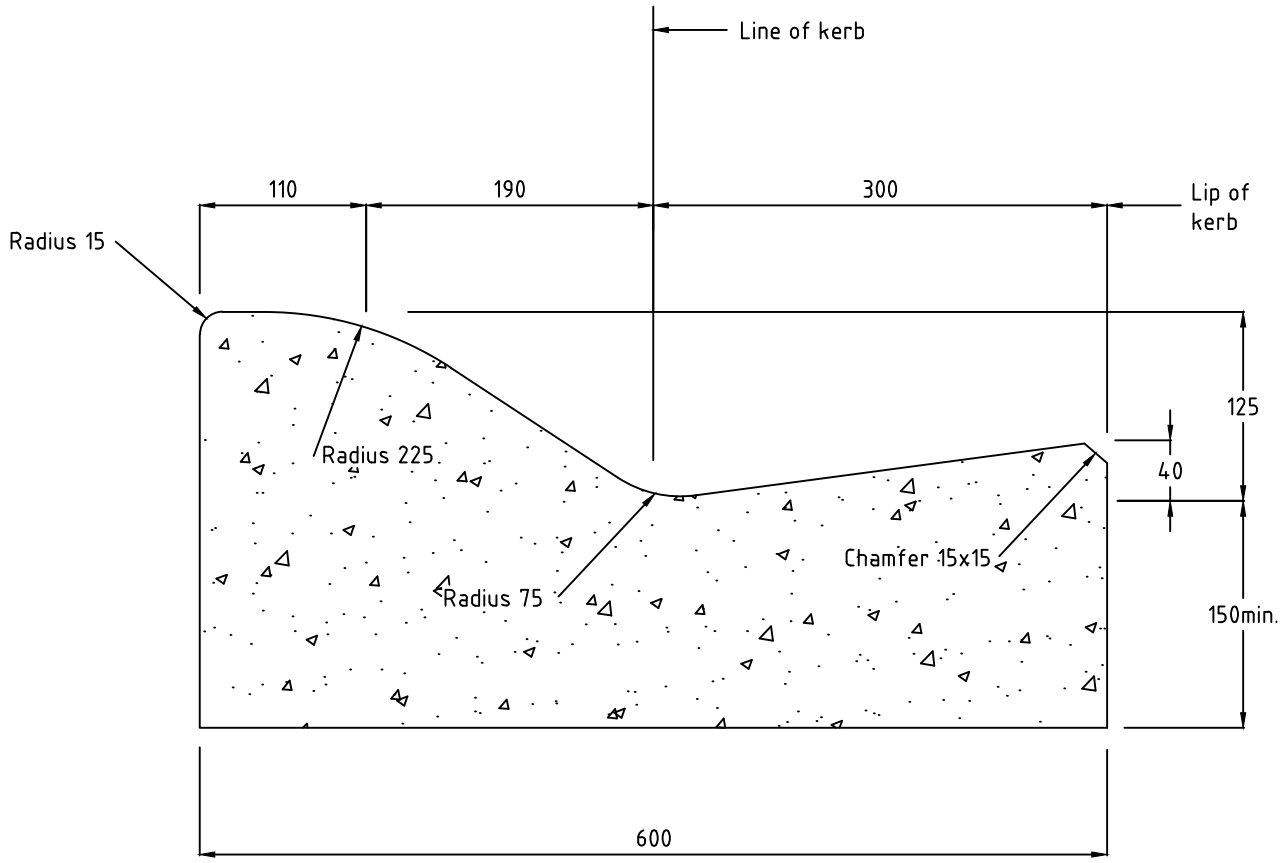

NOTES:

1. SM2 kerb shall be constructed in accordance with the Manningham Technical Specification.
2. Concrete strength 25MPa @ 28 days.
3. Cross sectional area of the SM2 kerb is approximately 0.12 m² or 1.0m³ of concrete per 8.33 metres.

SCALE 1:5
DIMENSIONS IN MILLIMETRES

SEMI–MOUNTABLE KERB AND CHANNEL – SM2

MANNINGHAM CITY COUNCIL

MANNINGHAM
BALANCE OF CITY AND COUNTRY

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DATE: Jan 2004

STANDARD DRAWING A4/S206

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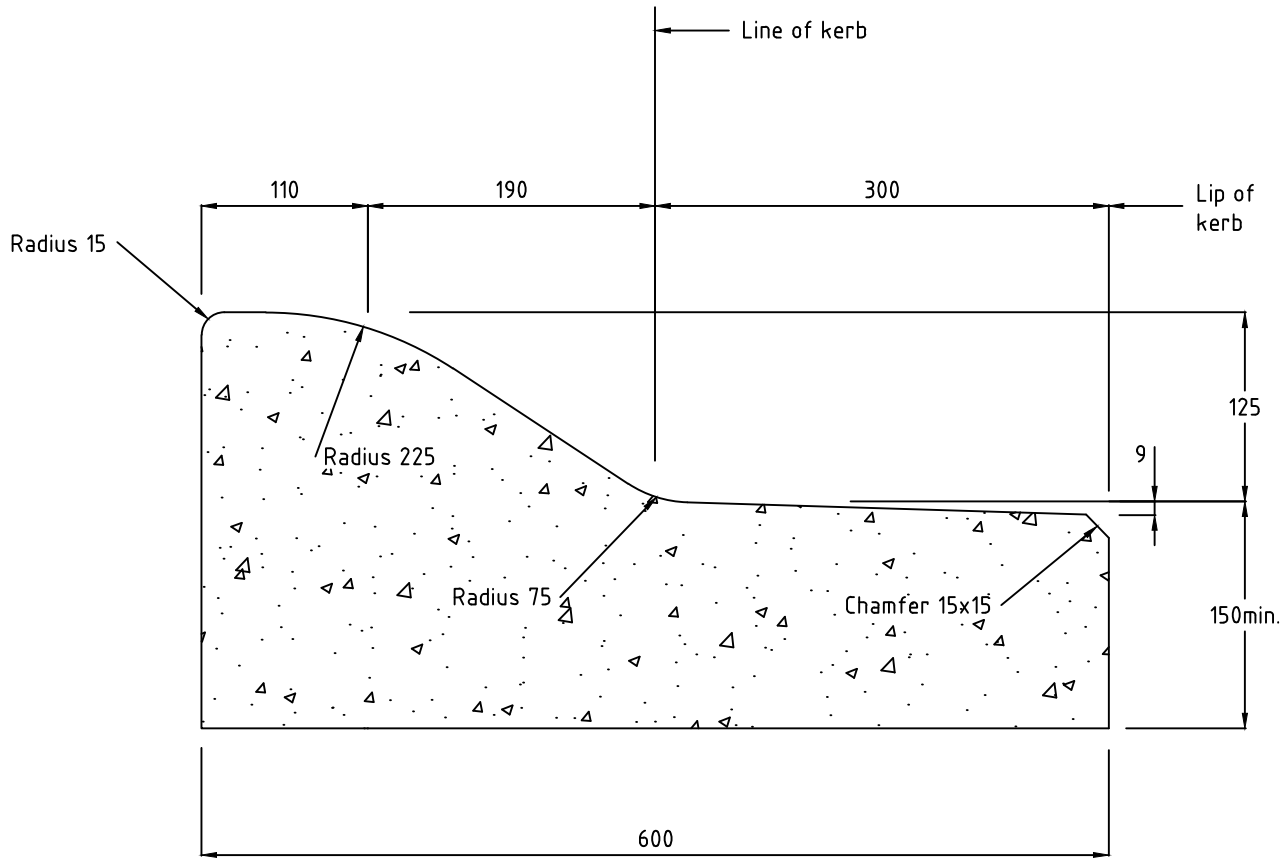

NOTES:

1. SM3 kerb shall be constructed in accordance with the Manningham Technical Specification.
2. Concrete strength 25MPa @ 28 days.
3. Cross sectional area of the SM3 kerb is approximately 0.11 m² or 1.0m³ of concrete per 9.10 metres.
4. SM3 kerb shall only be used where the road pavement falls away from the kerb.

SCALE 1:5
DIMENSIONS IN MILLIMETRES

SEMI–MOUNTABLE KERB AND APRON – SM3

MANNINGHAM CITY COUNCIL

MANNINGHAM
BALANCE OF CITY AND COUNTRY

REVIEWED: D.V CHECKED: N/A

DATE: Jan 2004

STANDARD DRAWING A4/S207

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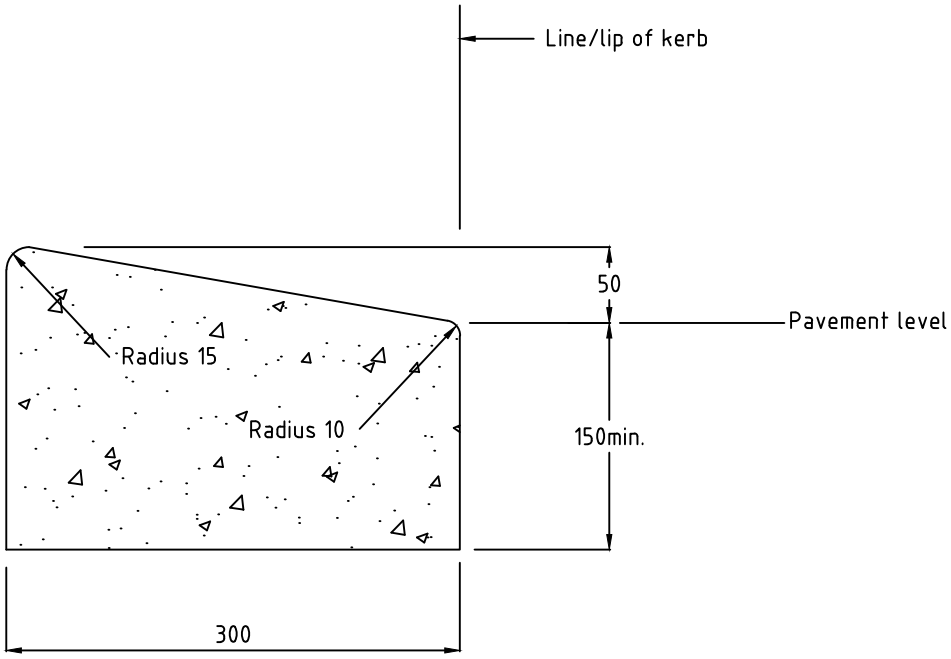

NOTES:

1. M1 kerb shall be constructed in accordance with the Manningham Technical Specification.
2. Concrete strength 25MPa @ 28 days.
3. Cross sectional area of the M1 kerb is approximately 0.06 m² or 1.0m³ of concrete per 16.7 metres.

SCALE 1:5
DIMENSIONS IN MILLIMETRES

MOUNTABLE KERB ONLY – M1

MANNINGHAM CITY COUNCIL

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BALANCE OF CITY AND COUNTRY

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DATE: Jan 2004

STANDARD DRAWING A4/S208

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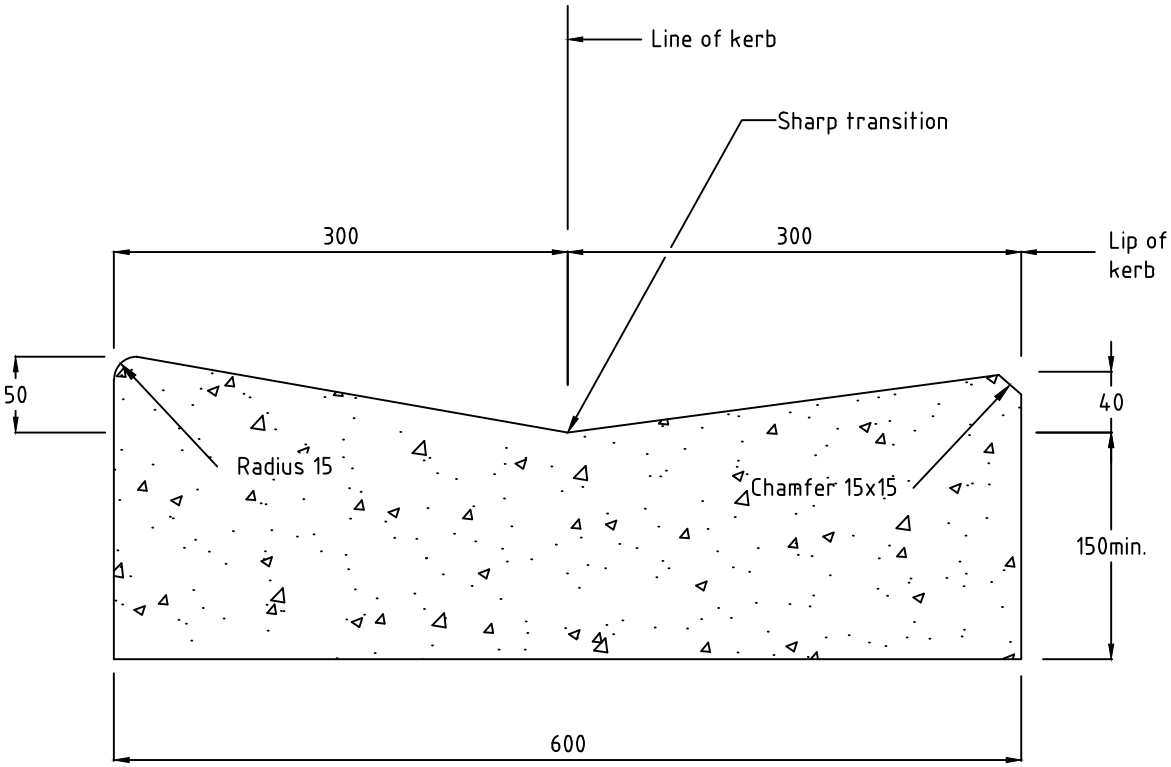

NOTES:

1. M2 kerb shall be constructed in accordance with the Manningham Technical Specification.
2. Concrete strength 25MPa @ 28 days.
3. Cross sectional area of the M2 kerb is approximately 0.104 m² or 1.0m³ of concrete per 9.6 metres.

SCALE 1:5
DIMENSIONS IN MILLIMETRES

MOUNTABLE KERB AND CHANNEL – M2

MANNINGHAM CITY COUNCIL

MANNINGHAM
BALANCE OF CITY AND COUNTRY

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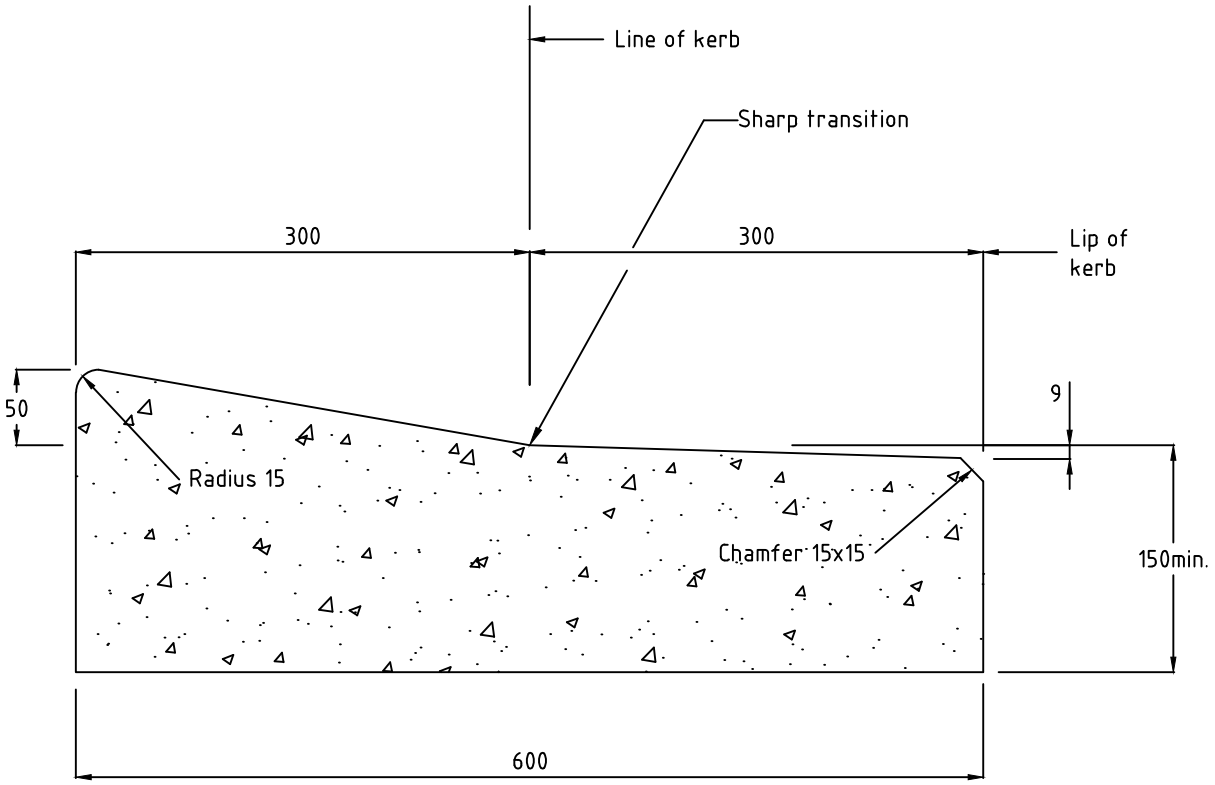

NOTES:

1. M3 kerb shall be constructed in accordance with the Manningham Technical Specification.
2. Concrete strength 25MPa @ 28 days.
3. Cross sectional area of the M3 kerb is approximately 0.1 m² or 1.0m³ of concrete per 10.0 metres.
4. M3 kerb shall only be used where the road pavement falls away from the kerb.

SCALE 1:5
DIMENSIONS IN MILLIMETRES

MOUNTABLE KERB AND APRON – M3

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BALANCE OF CITY AND COUNTRY

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DATE: Jan 2004

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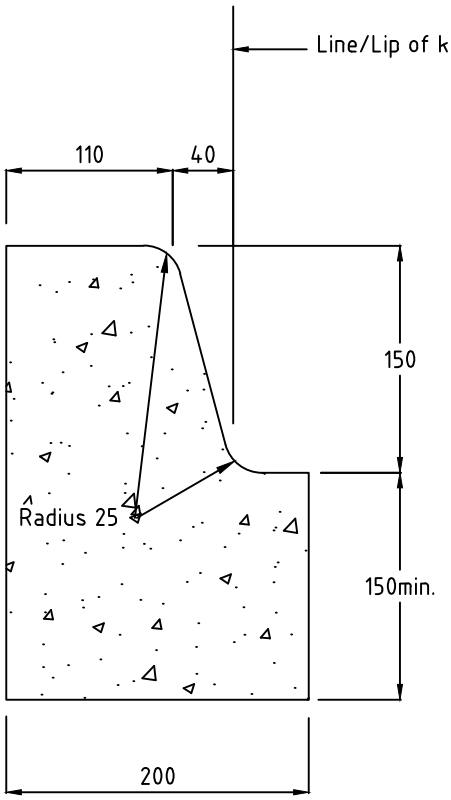

NOTES:

1. B1 kerb shall be constructed in accordance with the Manningham Technical Specification.
2. Concrete strength 25MPa @ 28 days.
3. Cross sectional area of the B1 kerb is approximately 0.05 m² or 1.0m³ of concrete per 20.0 metres.

SCALE 1:5
DIMENSIONS IN MILLIMETRES

BARRIER KERB ONLY – B1

MANNINGHAM CITY COUNCIL

MANNINGHAM
BALANCE OF CITY AND COUNTRY

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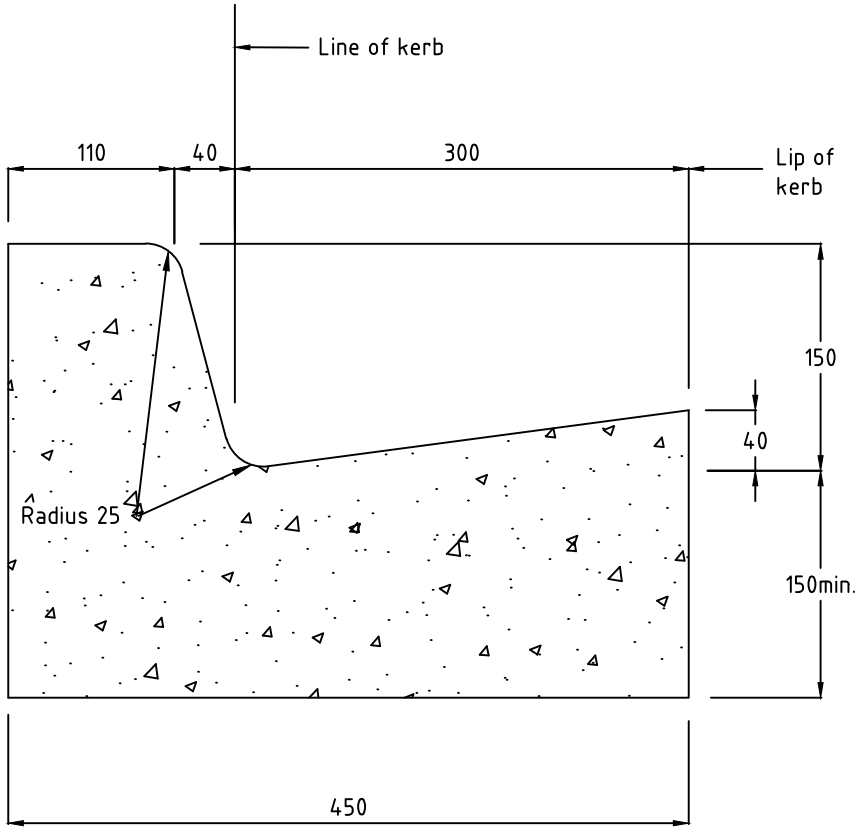

NOTES:

1. B2 kerb shall be constructed in accordance with the Manningham Technical Specification.
2. Concrete strength 25MPa @ 28 days.
3. Cross sectional area of the B2 kerb is approximately 0.09 m² or 1.0m³ of concrete per 11.1 metres.

SCALE 1:5
DIMENSIONS IN MILLIMETRES

BARRIER KERB AND CHANNEL – B2

MANNINGHAM CITY COUNCIL

MANNINGHAM
BALANCE OF CITY AND COUNTRY

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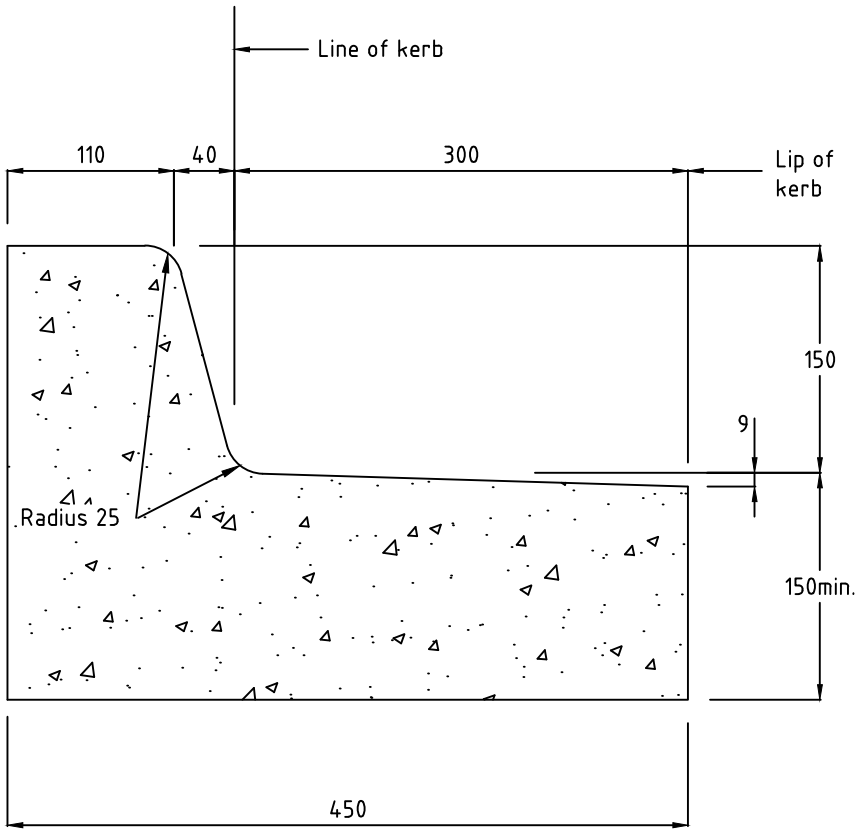

NOTES:

1. B3 kerb shall be constructed in accordance with the Manningham Technical Specification.
2. Concrete strength 25MPa @ 28 days.
3. Cross sectional area of the B3 kerb is approximately 0.09 m² or 1.0m³ of concrete per 11.1 metres.

SCALE 1:5
DIMENSIONS IN MILLIMETRES

BARRIER KERB AND APRON – B3

MANNINGHAM CITY COUNCIL

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BALANCE OF CITY AND COUNTRY

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DATE: Jan 2004

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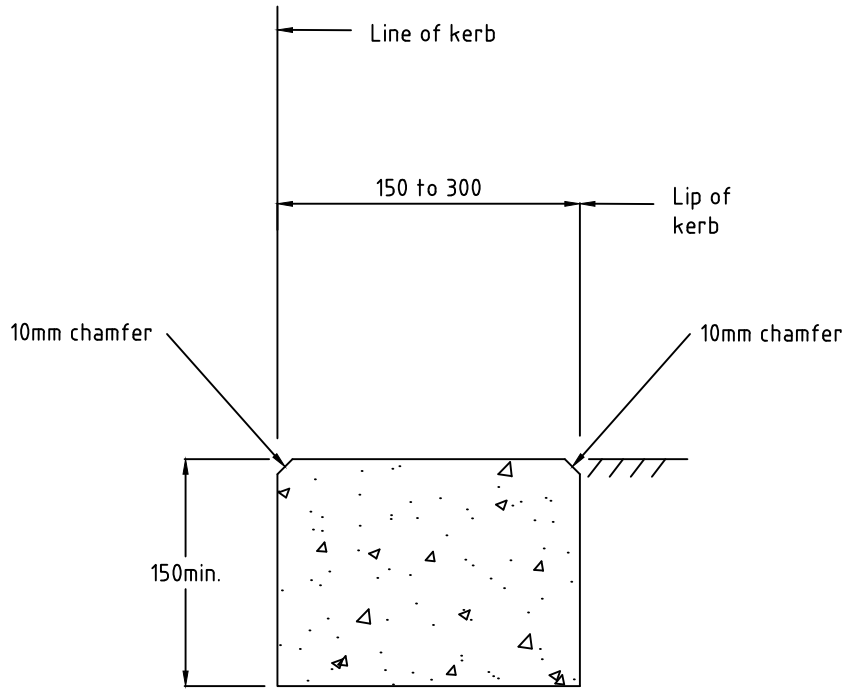

NOTES:

1. Edge strip shall be constructed in accordance with the Manningham Technical Specification.
2. Concrete strength 25MPa @ 28 days.
3. Edge strip dimensions may vary according to site specifics and shall be approved by Council Engineer.

SCALE 1:5
DIMENSIONS IN MILLIMETRES

EDGE STRIP

MANNINGHAM CITY COUNCIL

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DATE: Jan 2004

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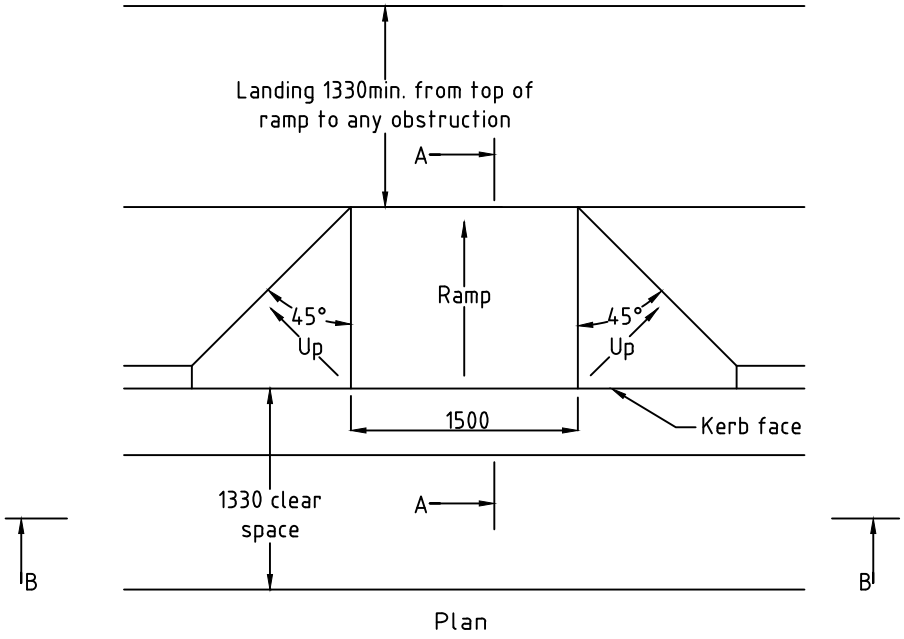
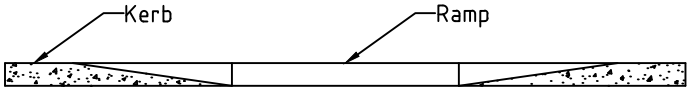
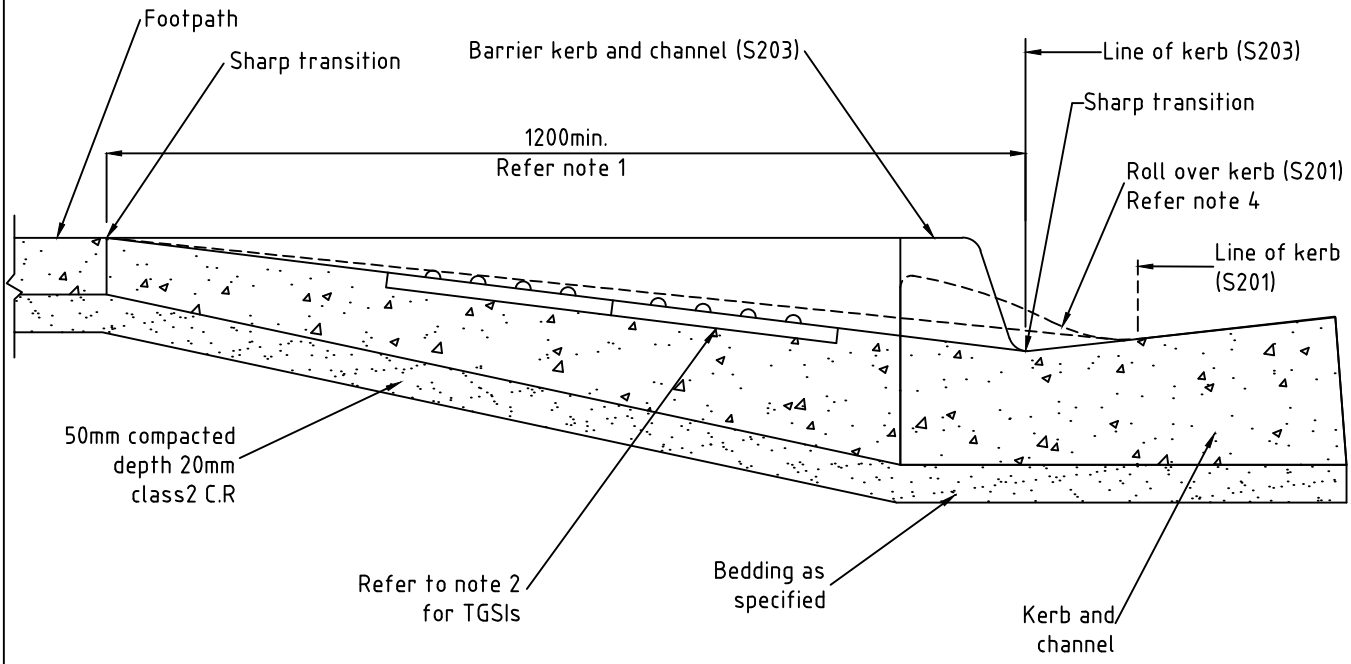


Plan



Section B-B

Scale 1:50



Section A-A

(Scale 1:10)

NOTES:

1. A ramp grade of 1 in 14 is to be achieved where possible (1 in 8 maximum).
2. Tactile ground surface indicators (TGSIs) shall be installed as per current AS/NZS 1428.4:2002.
3. Special circumstances including severe crossfall require individual design and this standard will not apply.
4. Roll over kerb perambulator shall be constructed (where roll over kerb exists) as per drawing, with the ramp beginning at the S201 line of kerb.
5. The ramp and sloping sides shall be slip resistant (U2 Floated Finish).

DIMENSIONS IN MILLIMETRES

PERAMBULATOR

MANNINGHAM CITY COUNCIL

MANNINGHAM
BALANCE OF CITY AND COUNTRY

REVIEWED: D.V CHECKED: K.K

DATE: Jan 2004

STANDARD DRAWING A4/S215

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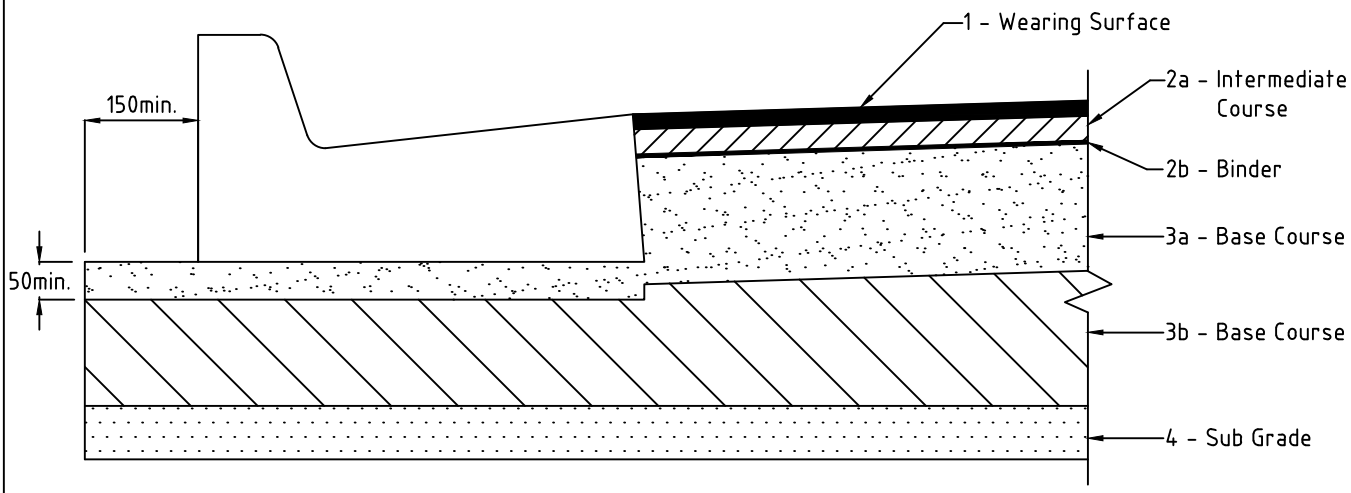
TRAFFIC AND PEDESTRIAN RELATED STANDARDS



1 - Wearing Surface
20mm compacted depth of
7mm nominal size asphaltic concrete

2a - Intermediate Course
35mm compacted depth of
14mm nominal size asphaltic concrete

2b - Binder
Tack coat / prime and seal

3a - Base Course
170mm compacted depth of
20mm nominal size class 2 crushed rock

3b - Base Course
Variable depth of
40mm nominal size class 3 crushed rock

4 - Sub Grade
To be determined by sub grade testing
Shall be approved by Council Engineer

NOTES:
1. The wearing course type (course 1) may vary according to specific treatment requirements and shall be approved by Council Engineer.
2. The minimum pavement depth to be adopted shall be determined by C.B.R. tests on the subgrade.
3. Refer to Manningham Standard Drawing S140 for subsurface drainage details.

SCALE 1:10
DIMENSIONS IN MILLIMETRES

TYPICAL BITUMINOUS ROAD PAVEMENT
For typical local roads

MANNINGHAM CITY COUNCIL

MANNINGHAM
BALANCE OF CITY AND COUNTRY

REVIEWED: D.V CHECKED: K.K

DATE: Jan 2004

STANDARD DRAWING A4/S220

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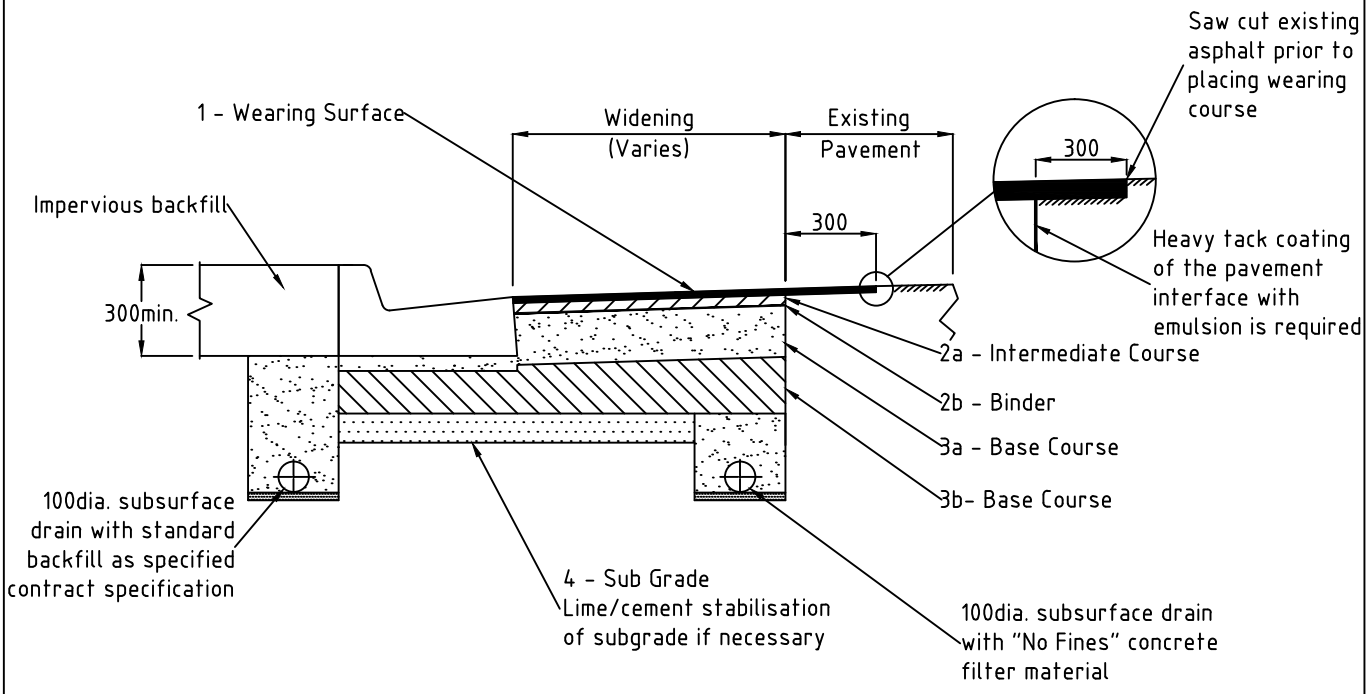

1 - Wearing Surface
20mm compacted depth of
7mm nominal size asphaltic concrete

2a - Intermediate Course
35mm compacted depth of
14mm nominal size asphaltic concrete

2b - Binder
Tack coat / prime and seal

3a - Base Course
170mm compacted depth of
20mm nominal size class 2 crushed rock

3b - Base Course
Variable depth of
40mm nominal size class 3 crushed rock

4 - Sub Grade
To be determined by sub grade testing
Shall be approved by Council Engineer

NOTES:
1. The wearing course type (course 1) may vary according to specific treatment requirements and shall be approved by Council Engineer.
2. The minimum pavement depth to be adopted shall be determined by C.B.R. tests on the subgrade.
3. Refer to Manningham Standard Drawing S140 for subsurface drainage details.

SCALE 1:25
DIMENSIONS IN MILLIMETRES

ROAD PAVEMENT WIDENING
For typical local roads

MANNINGHAM CITY COUNCIL

MANNINGHAM
BALANCE OF CITY AND COUNTRY

REVIEWED: D.V CHECKED: K.K

DATE: Jan 2004

STANDARD DRAWING A4/S221

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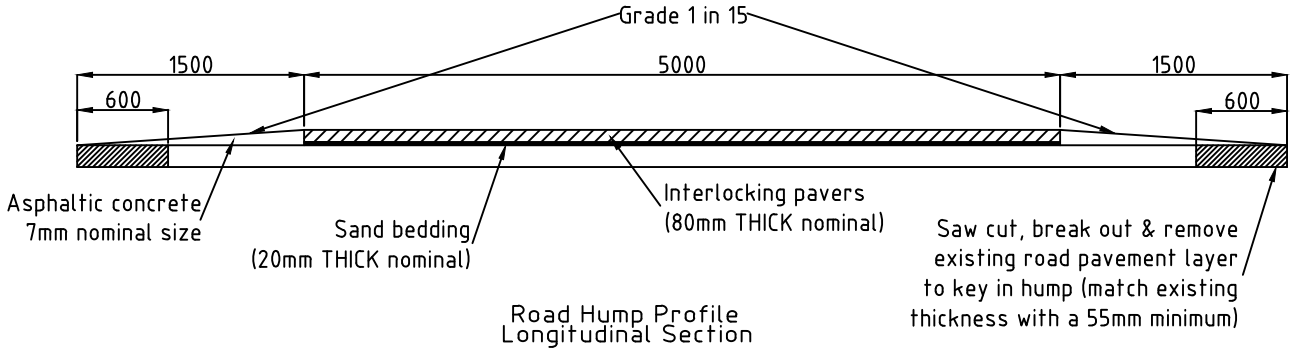
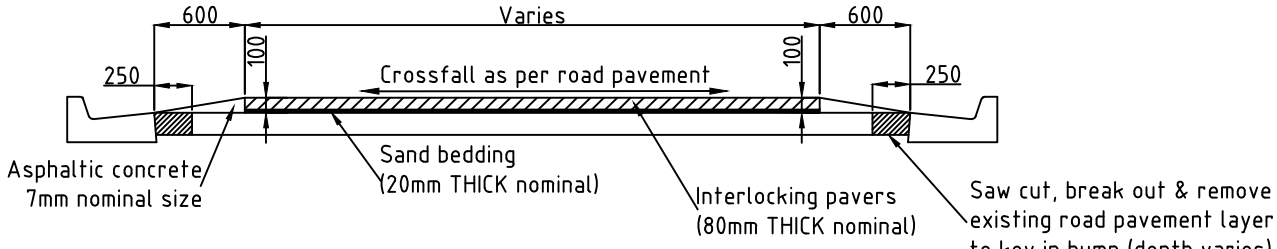
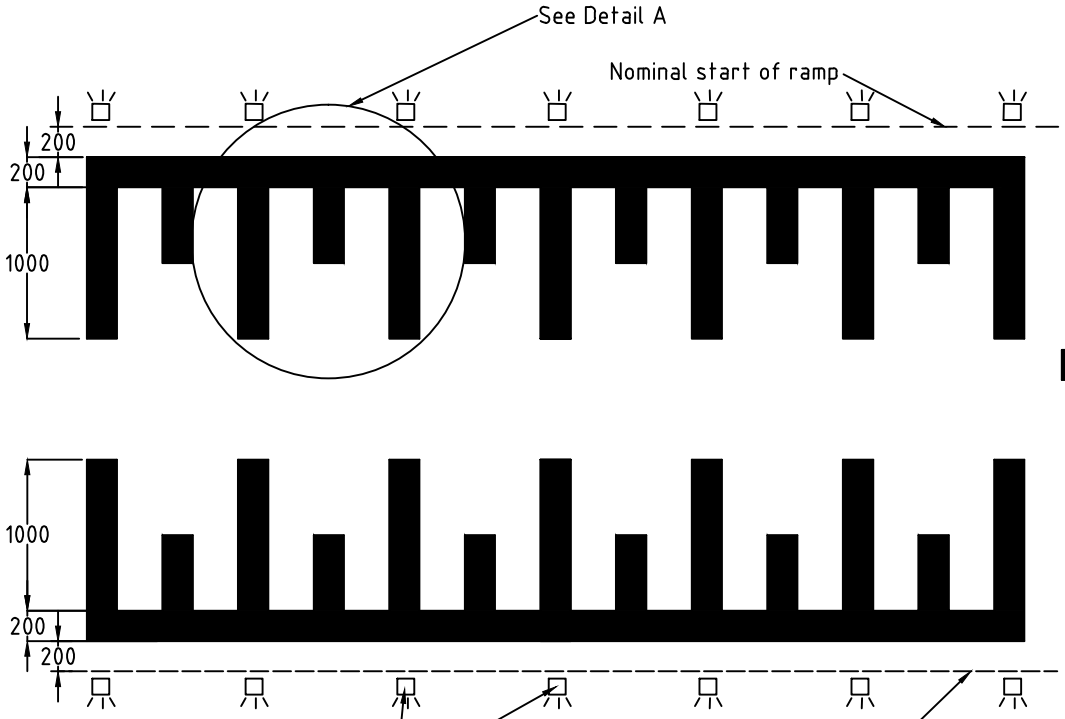
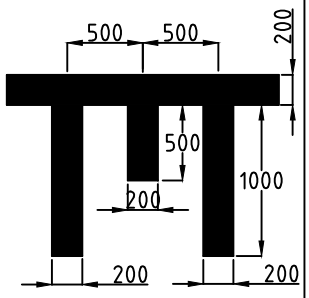


Road Hump Profile
Longitudinal Section



Cross Section Profile





Detail A

Pavement Marking for Road Humps

NOTES:

1. Raised Reflective Pavement Markers (R.R.P.M) are to be installed as shown.
2. All line marking is to be carried out as shown (AS1742.13) using long life paint.
3. Interlocking paving is to be constructed using 80mm thick (nominal) concrete pavers laid on 20mm thick (nominal) of bedding sand.

SCALE 1:50
DIMENSIONS IN MILLIMETRES

SPEED CONTROL HUMP

Flat top profile

MANNINGHAM CITY COUNCIL

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BALANCE OF CITY AND COUNTRY

REVIEWED: D.V CHECKED: G.G

DATE: April 2005

STANDARD DRAWING A4/S222

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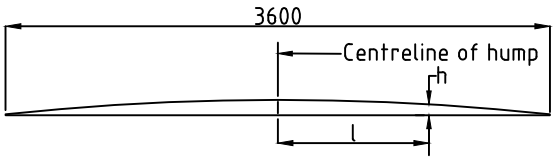
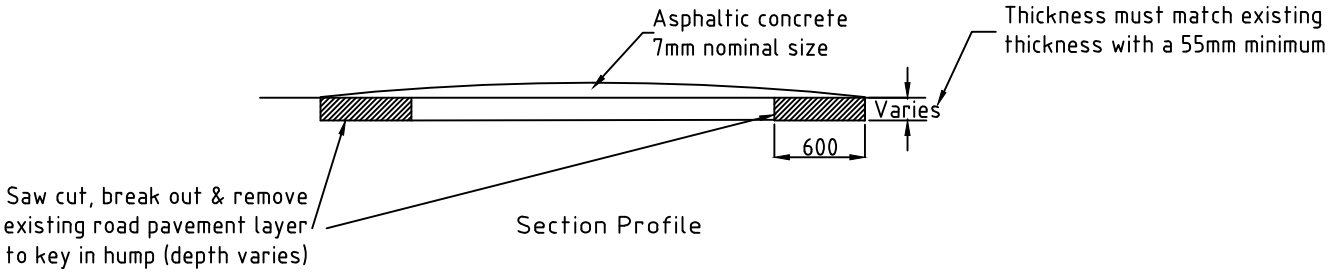
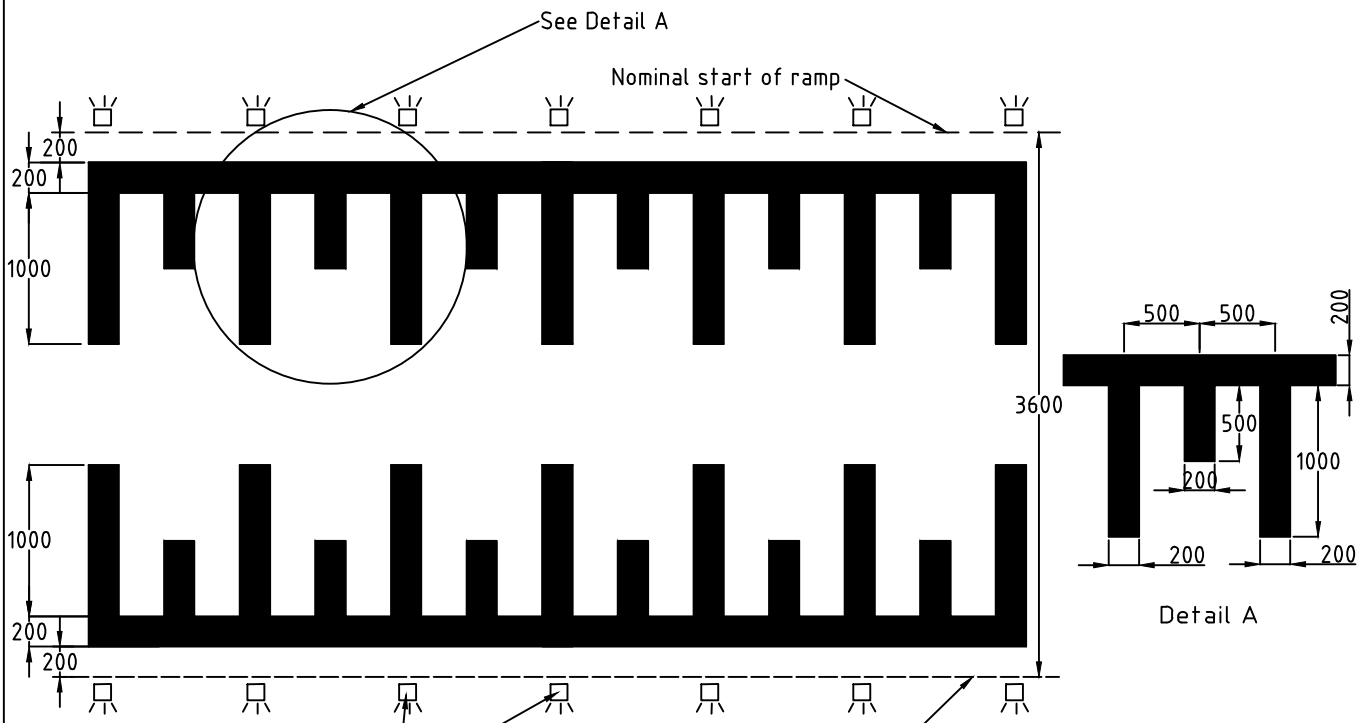


l (m)	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8
h (mm)	100	100	99	97	95	93	90	86	81	76	71	65	58	51	43	34	25	16	5

Road Hump Profile – Watts



Section Profile



Detail A

Pavement Marking for Road Humps

NOTES:

1. Raised Reflective Pavement Markers (R.R.P.M) are to be installed as shown.
2. All line marking is to be carried out as shown (AS1742.13) using long life paint.

SCALE 1:50
DIMENSIONS IN MILLIMETRES

SPEED CONTROL HUMP

Watts profile

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MANNINGHAM
BALANCE OF CITY AND COUNTRY

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STANDARD DRAWING A4/S223

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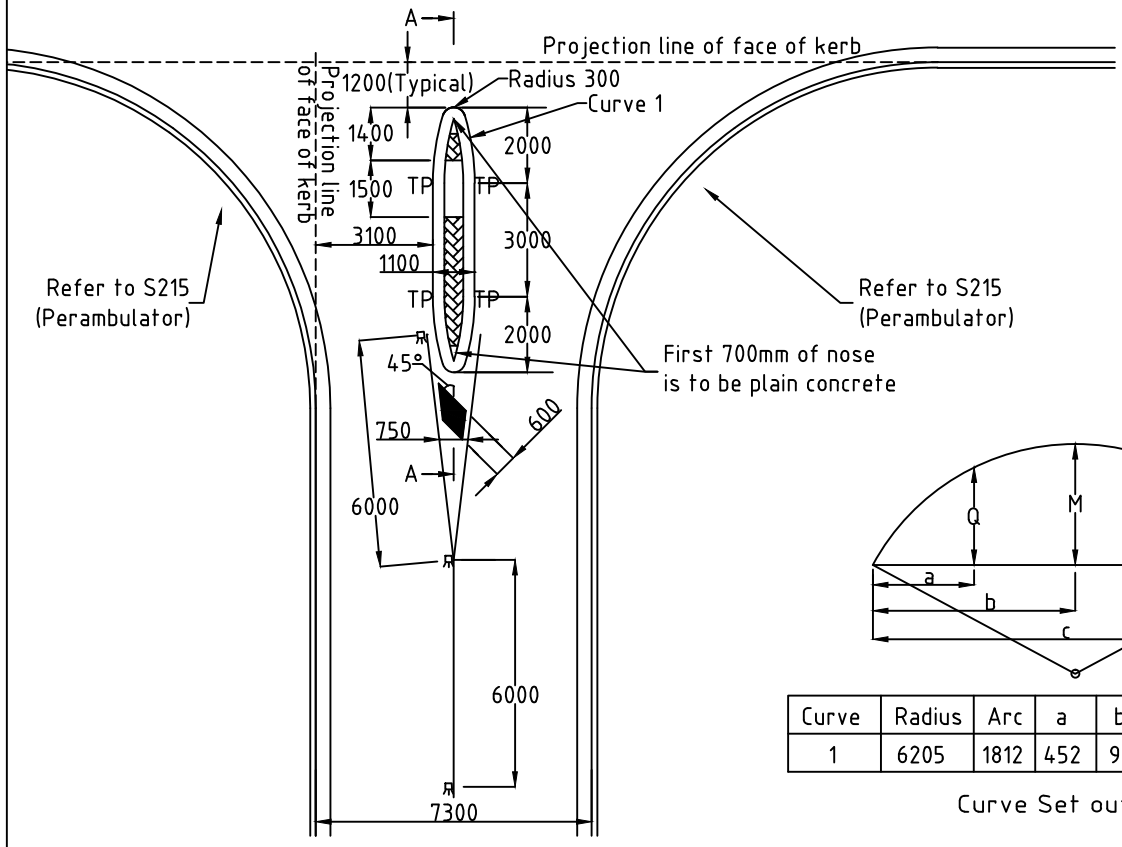
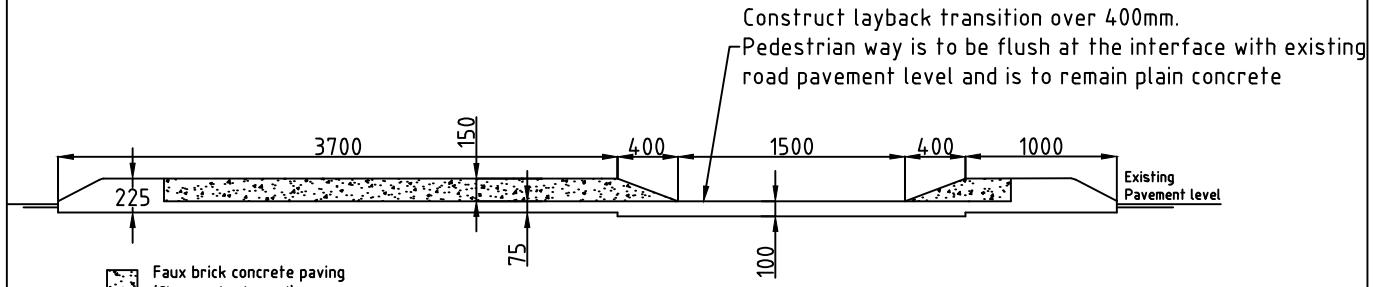


Plan
(Scale 1:200)

Curve	Radius	Arc	a	b	c	M	Q
1	6205	1812	452	903	1806	66	50

Curve Set out Detail



Section A-A
(Scale 1:50)

NOTES:

1. All dimensions are to face of kerb unless noted otherwise.
2. Construct all kerbs, as semi-mountable to Council standard S205. Noses of islands are to be painted white.
3. Raised Reflective Pavement Markers (R.R.P.M) are to be installed as shown.
4. All linemarking is to be carried out as shown (AS1742.2) using long life paint.
5. This standard only applies to perpendicular (T-Junction) intersections. Skew intersections will require special design and this standard will not apply.
6. Faux brick paving is to consist of 150mm thick concrete with F82 mesh on 75mm class 2 FCR bedding.
7. Splitter island layout is symmetrical.

DIMENSIONS IN MILLIMETRES

SPLITTER ISLAND
For standard road width of 7.3m

MANNINGHAM CITY COUNCIL

MANNINGHAM
BALANCE OF CITY AND COUNTRY

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DATE: Jan 2004

STANDARD DRAWING A4/S224

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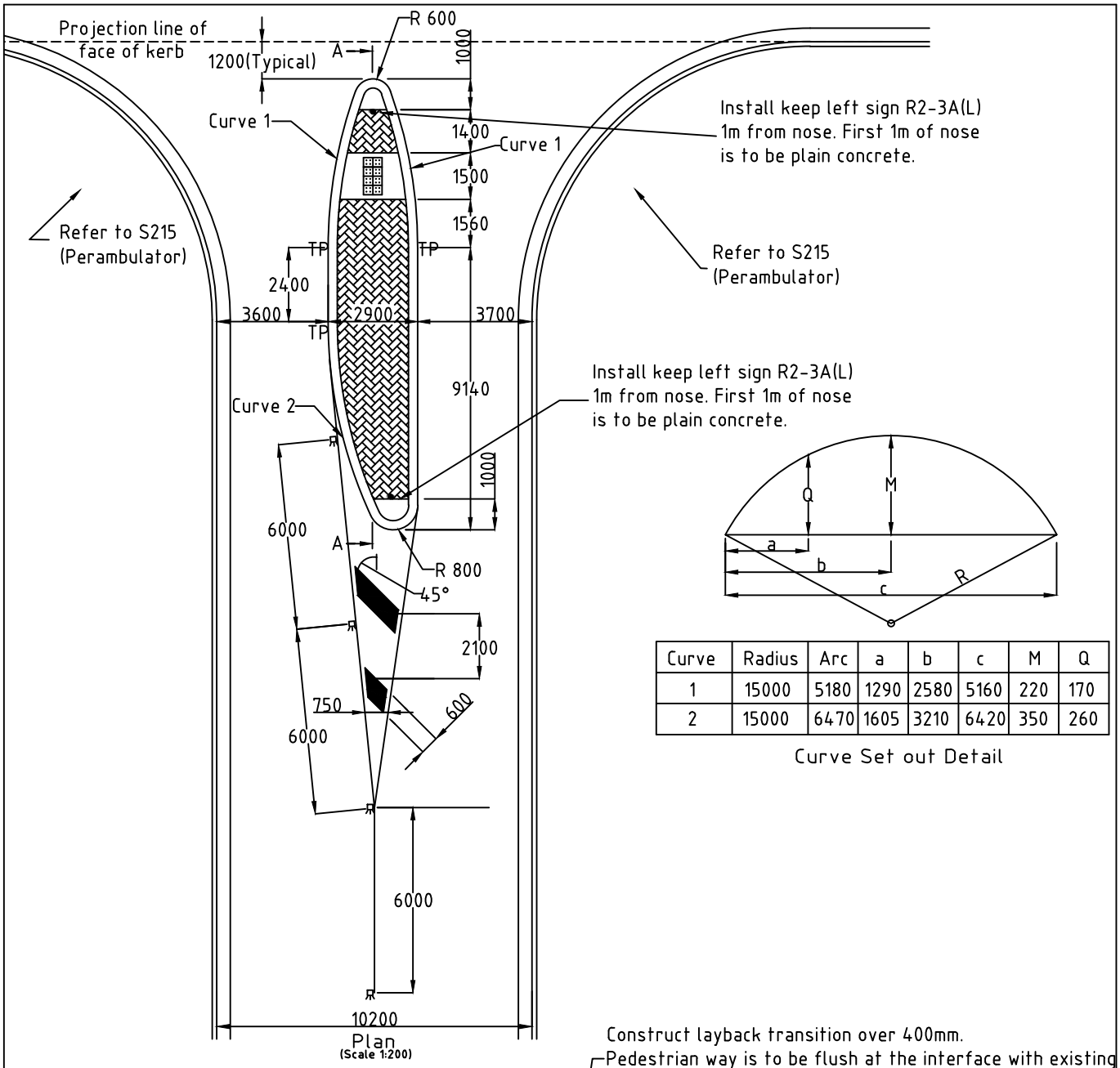
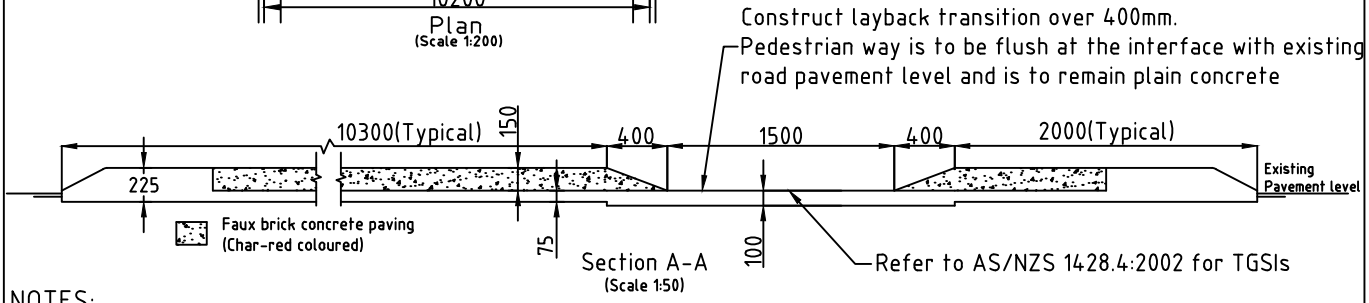


Curve	Radius	Arc	a	b	c	M	Q
1	15000	5180	1290	2580	5160	220	170
2	15000	6470	1605	3210	6420	350	260

Curve Set out Detail



Section A-A
(Scale 1:50)

NOTES:

1. All dimensions are to face of kerb unless noted otherwise.
2. Construct all kerbs, as semi-mountable to Council standard S205. Noses of islands are to be painted white.
3. This standard only applies to perpendicular (T-Junction) intersections. Skew intersections will require special design and this standard will not apply.
4. Faux brick paving is to consist of 150mm thick concrete with F82 mesh on 75mm class 2 FCR bedding.
5. Raised Reflective Pavement Markers (R.R.P.M) are to be installed as shown.
6. All line marking is to be carried out as shown (AS1742.2) using long life paint.

DIMENSIONS IN MILLIMETRES

SPLITTER ISLAND

For standard road width of 10.2m

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BALANCE OF CITY AND COUNTRY

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DATE: Jan 2004

STANDARD DRAWING A4/S225

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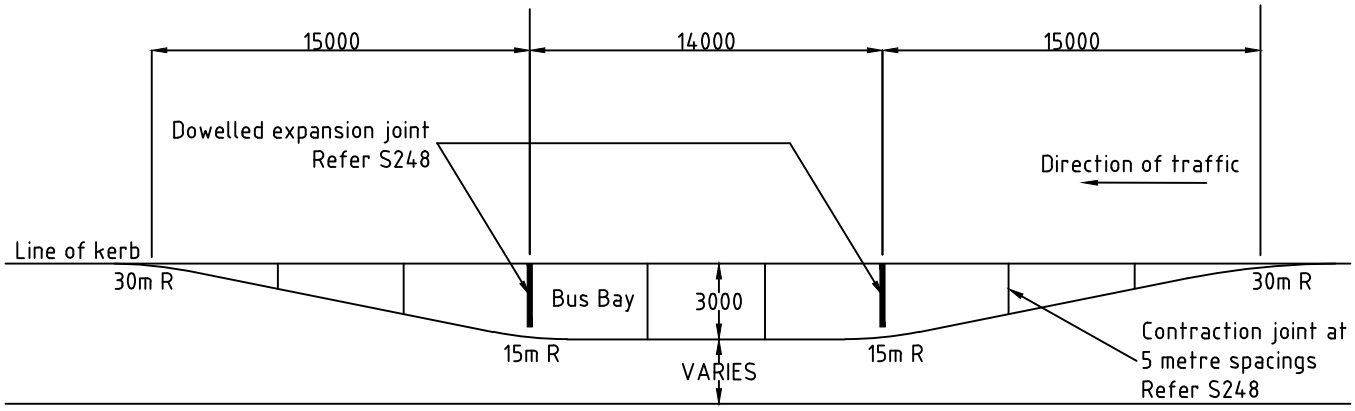
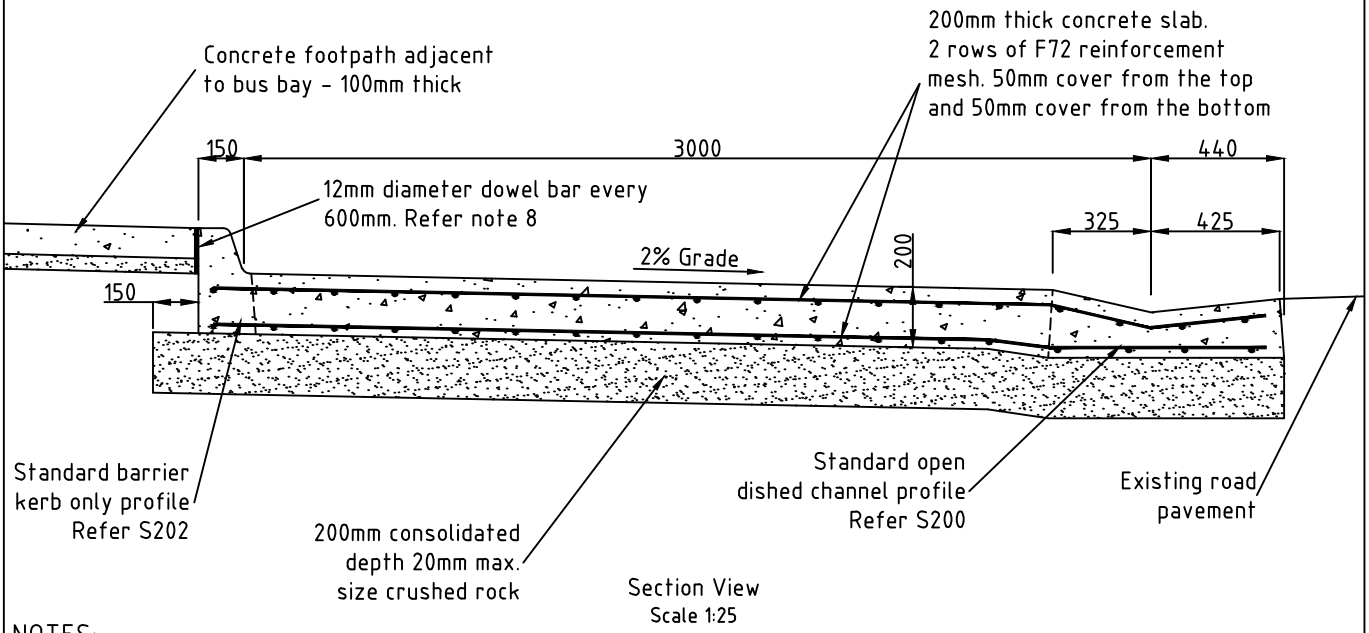


Plan View
Scale 1:300



Section View
Scale 1:25

NOTES:

1. Bus bay shall be constructed in accordance with Council Specification.
2. Concrete shall be minimum 32MPa.
3. Refer to S248 for details of expansion and contraction joints.
4. Bus bay is to be reinforced with F72 mesh (50mm cover from the top and bottom). Steel reinforcement used for separate pour sections shall be overlapped by 300mm.
5. Mountable kerb and channel (M2 - S209) shall be used in place of the standard open dished channel profile (S200) when transition into a SM kerb profile occurs.
6. Tactile ground surface indicators (TGSIs) shall be installed as per AS/NZS 1428.4:2002.
7. In rural areas, bus bay shall be dimensioned as per this standard. Modifications to the kerb and to the bus bay surface type may be required, as directed by Council Engineer. Other special circumstances including severe cross fall require individual design and this standard will not apply.
8. Provide a 12mm diameter dowel bar (approximately 300mm long) every 600mm where footpath abuts kerb, to tie footpath in with bus bay kerb.

DIMENSIONS IN MILLIMETRES

FULLY INDENTED BUS BAY

MANNINGHAM CITY COUNCIL

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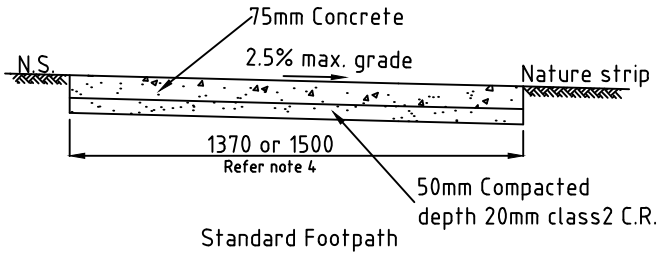
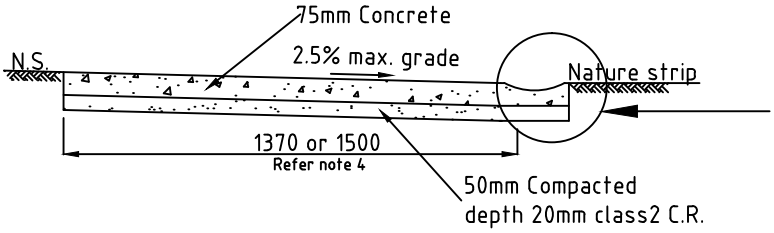
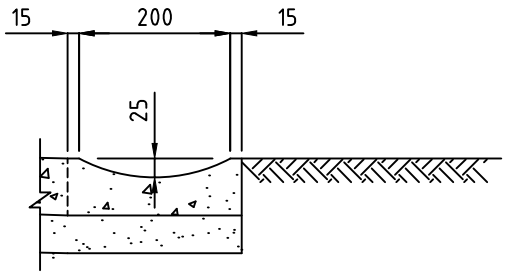
N.S. - Natural surface



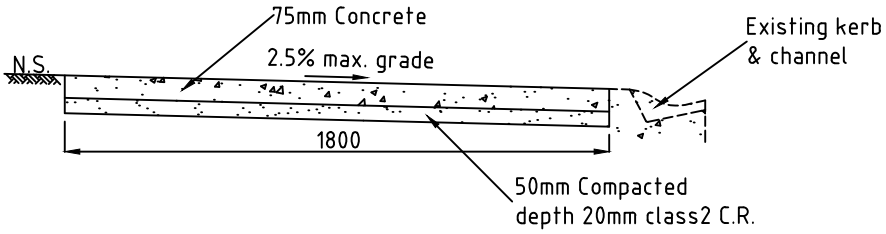
Standard Footpath



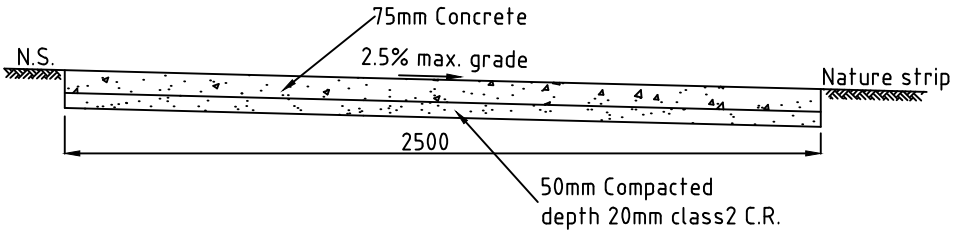
Footpath Reverse Fall Nature Strip



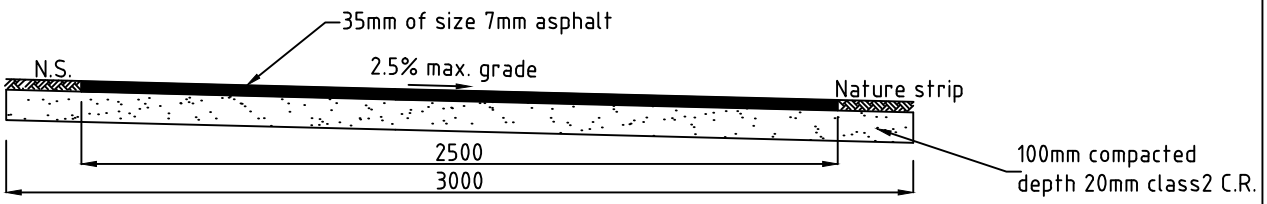
Spoon Drain Detail
Scale 1:10



Footpath Abutting Kerb & Channel



Cycle way Residential Subdivisions



Bike path Reserves

NOTES:

1. At crossover locations, concrete to be 125mm thick and reinforced with F62 mesh.
2. Refer to Council standard S121 for footpath spoon drain pit detail.
3. Footpaths shall be shaped to match existing fixtures (pit covers, driveways) within 5mm.
4. Standard footpath width is 1370mm minimum. 1500mm width may be required as directed by Council Engineer.
5. Contraction joints shall be constructed after the concrete has been placed and screeded and shall be generally located at 1.5m spacings. Refer S248.
6. Expansion joints (12mm wide) shall be located at intervals of 12 metres maximum spacing. They shall consist of a neoprene compression seal or approved equivalent. Refer S248.

SCALE 1:25
DIMENSIONS IN MILLIMETRES

FOOTPATH AND SHARED PATH CROSS–SECTIONS

MANNINGHAM CITY COUNCIL

MANNINGHAM
BALANCE OF CITY AND COUNTRY

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DATE: Jan 2004		

SIDE LINE BUILDING

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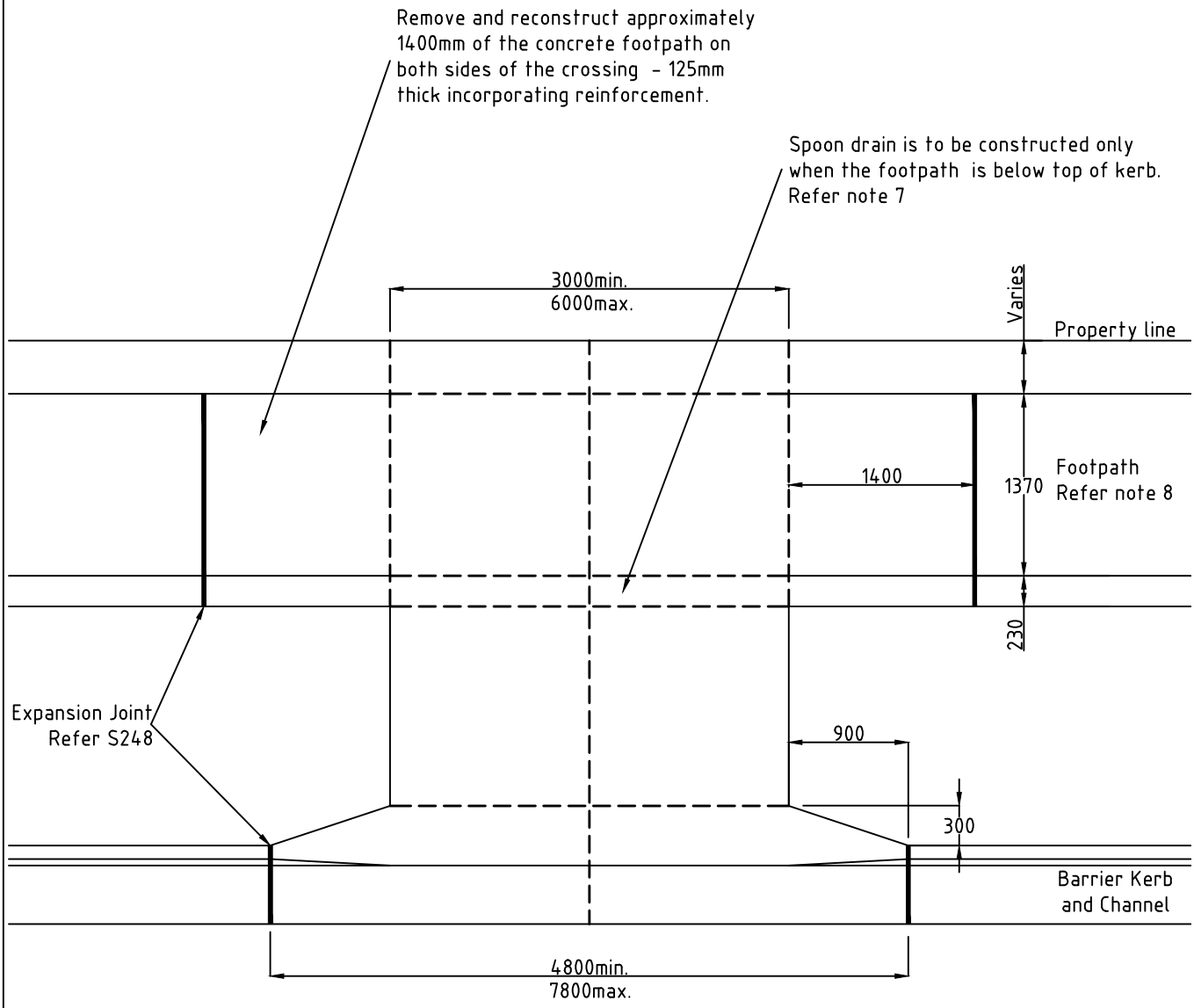
VEHICLE CROSSING STANDARDS



Plan View

NOTES:

1. Crossing shall be constructed in accordance with Council Specification / Council Vehicle Crossing Policy.
2. Dimensions detailed in this standard will apply to all vehicle crossings with barrier kerb and channel including skew crossings and where no footpath exists unless approved by Council Engineer.
3. Concrete shall be minimum 25MPa.
4. Contraction joint locations are indicated by dashed lines. Desirable maximum spacing of 1.5 metres or as directed by Council Engineer. Refer to S248 for details of expansion and contraction joints.
5. Granting of a permit for a new vehicle crossing is subject to the removal of existing crossing/s, as directed by Council Engineer.
6. Crossing is to be reinforced with F62 mesh (50mm cover from the top). Steel reinforcement used for separate pour sections shall be overlapped by 300mm.
7. 230mm spoon drain is to be constructed when the footpath finished surface level is below the top of kerb. Where the finished surface level of the footpath is above the top of kerb, no spoon drain is required.
8. Standard footpath width is 1370mm minimum. 1500mm width may be required as directed by Council Engineer.
9. Refer to S241 for cross section details of this crossing.

SCALE 1:50
DIMENSIONS IN MILLIMETRES

VEHICLE CROSSING
Barrier Kerb and Channel

MANNINGHAM CITY COUNCIL

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BALANCE OF CITY AND COUNTRY

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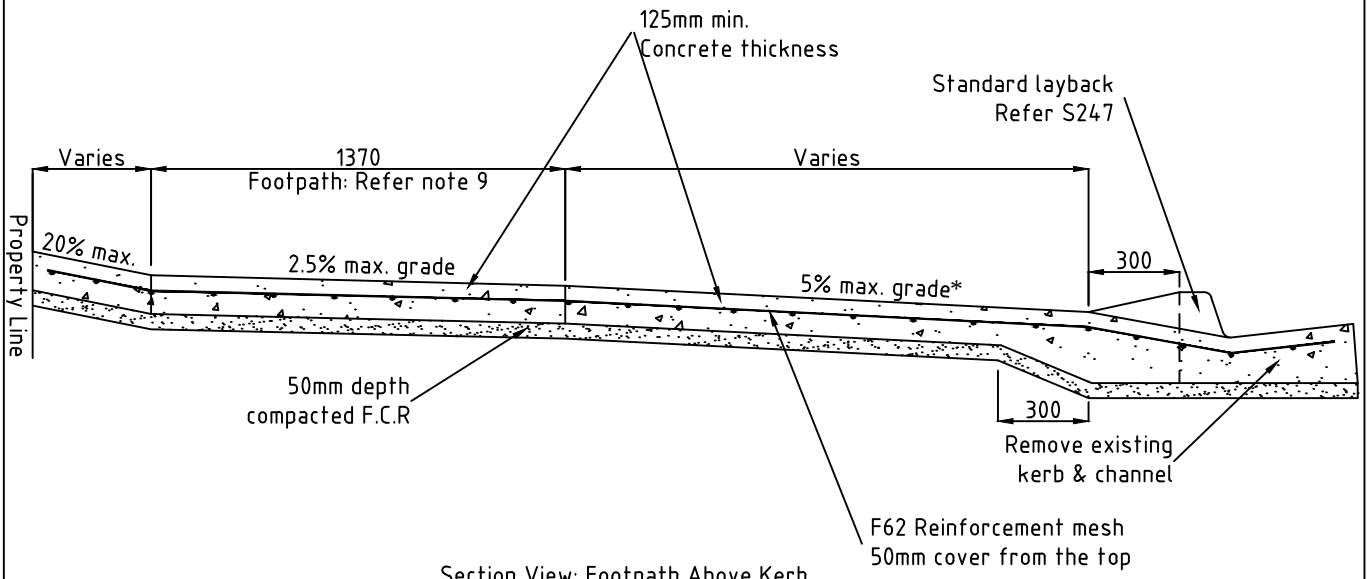
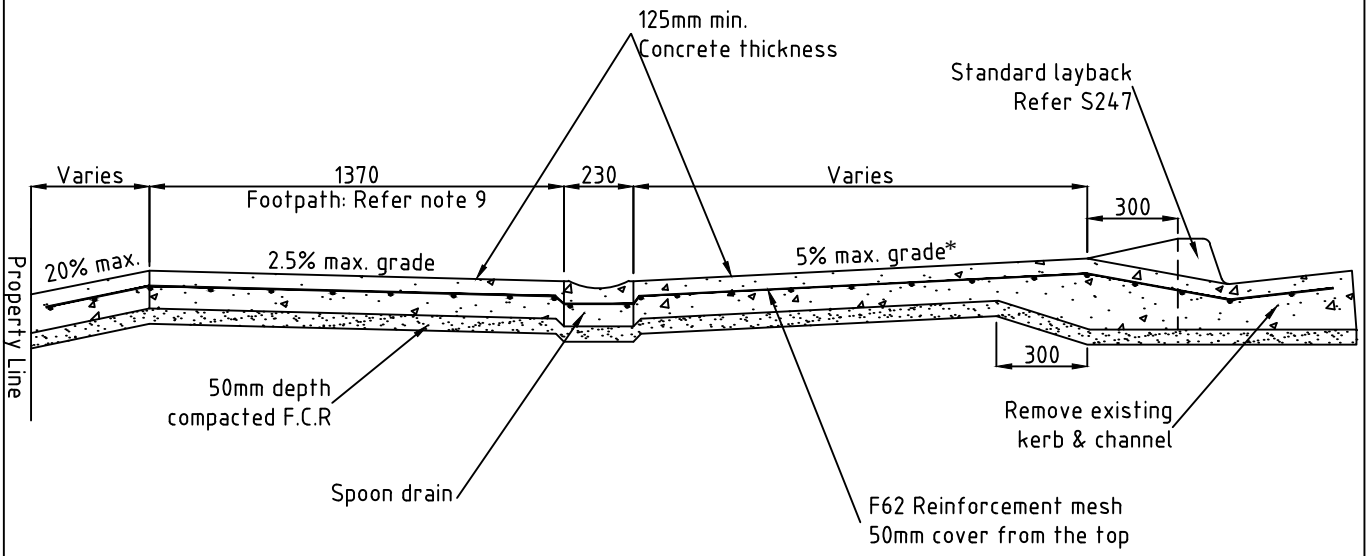


Section View: Footpath Above Kerb



Section View: Footpath Below Kerb Incorporating Spoon Drain

NOTES:

1. Crossing shall be constructed in accordance with Council Specification / Council Vehicle Crossing Policy.
2. Dimensions detailed in this standard will apply to all vehicle crossings with barrier kerb and channel including skew crossings and where no footpath exists unless approved by Council Engineer.
3. Concrete shall be minimum 25MPa.
4. Refer to S248 for details of expansion and contraction joints.
5. Granting of a permit for a new vehicle crossing is subject to the removal of existing crossing/s, as directed by Council Engineer.
6. Crossing is to be reinforced with F62 mesh (50mm cover from the top). Steel reinforcement used for separate pour sections shall be overlapped by 300mm.
7. 230mm spoon drain is to be constructed when the footpath finished surface level is below the top of kerb.
8. Where the finished surface level of the footpath is above the top of kerb, no spoon drain is required.
9. Standard footpath width is 1370mm minimum. 1500mm width may be required as directed by Council Engineer.

*Note: It is recognised that limiting domestic driveway grades to 5% maximum may not be practicable in certain circumstances and will therefore be determined by the Council Engineer.

SCALE 1:25
DIMENSIONS IN MILLIMETRES

VEHICLE CROSSING CROSS SECTION DETAILS

For Barrier Kerb and Channel

MANNINGHAM CITY COUNCIL

MANNINGHAM
BALANCE OF CITY AND COUNTRY

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STANDARD DRAWING A4/S241

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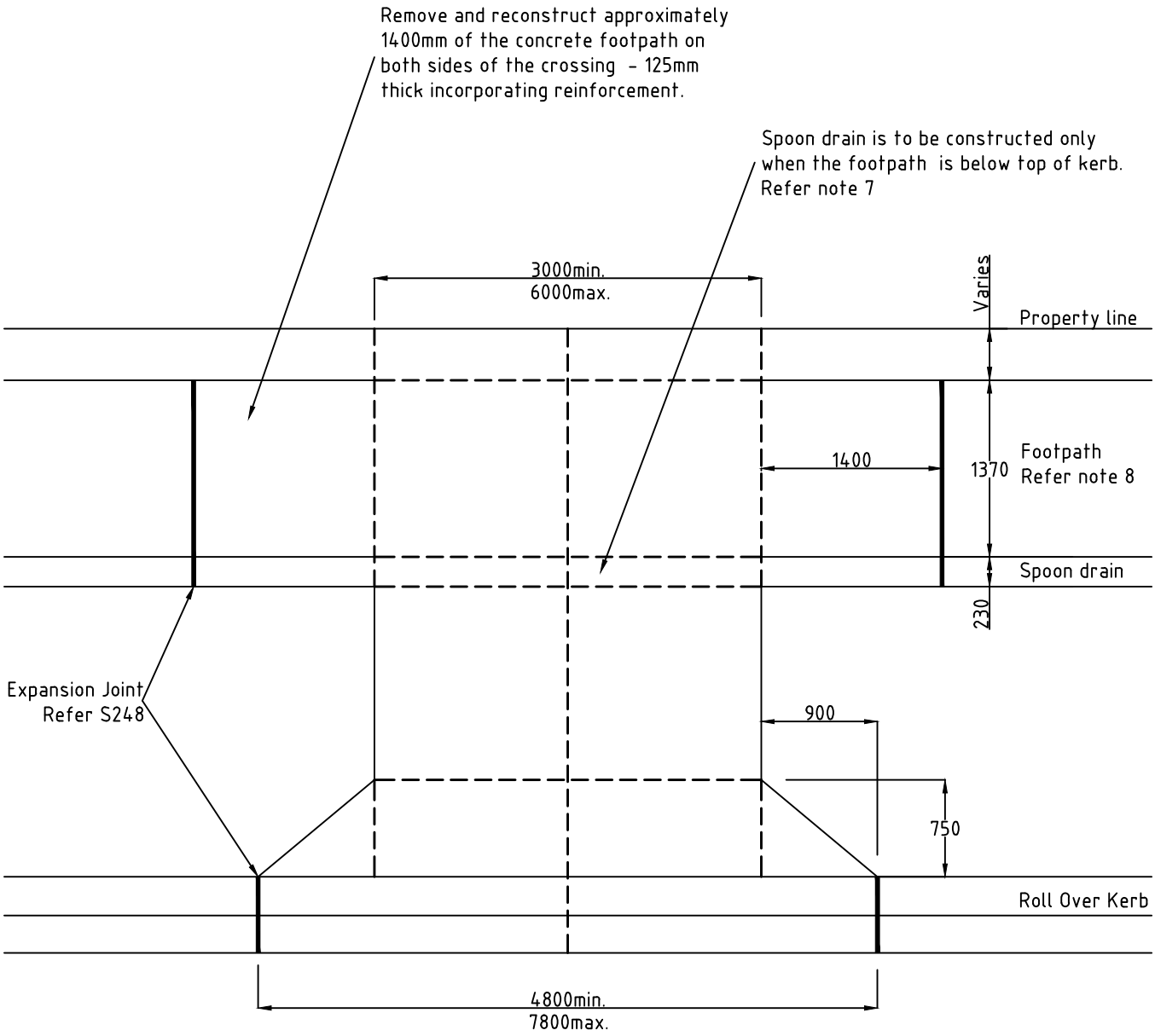

Plan View

NOTES:

1. Crossing shall be constructed in accordance with Council Specification / Council Vehicle Crossing Policy.
2. Dimensions detailed in this standard will apply to all vehicle crossings with roll over kerb including skew crossings and where no footpath exists unless approved by Council Engineer.
3. Concrete shall be minimum 25MPa.
4. Contraction joint locations are indicated by dashed lines. Desirable maximum spacing of 1.5 metres or as directed by Council Engineer. Refer to S248 for details of expansion and contraction joints.
5. Granting of a permit for a new vehicle crossing is subject to the removal of existing crossing/s, as directed by Council Engineer.
6. Crossing is to be reinforced with F62 mesh (50mm cover from the top). Steel reinforcement used for separate pour sections shall be overlapped by 300mm.
7. 230mm spoon drain is to be constructed when the footpath finished surface level is below the top of kerb. Where the finished surface level of the footpath is above the top of kerb, no spoon drain is required.
8. Standard footpath width is 1370mm minimum. 1500mm width may be required as directed by Council Engineer.
9. Refer to S243 for cross section details of this crossing.

SCALE 1:50
DIMENSIONS IN MILLIMETRES

VEHICLE CROSSING
Roll Over Kerb and Channel

MANNINGHAM CITY COUNCIL

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STANDARD DRAWING A4/S242

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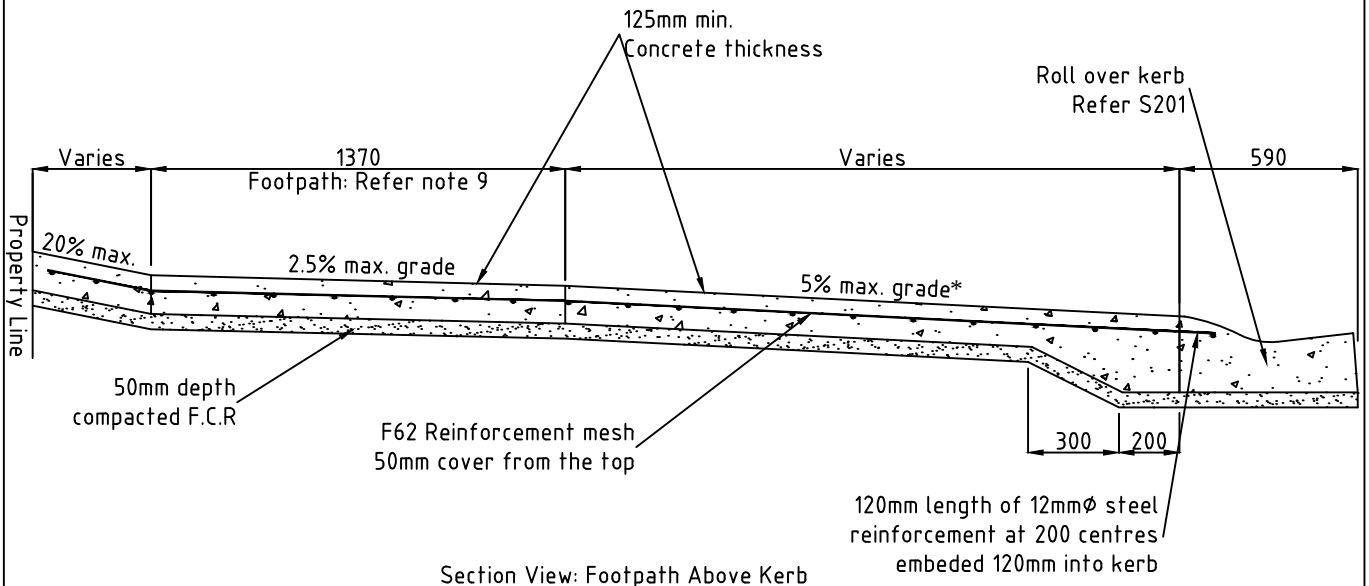
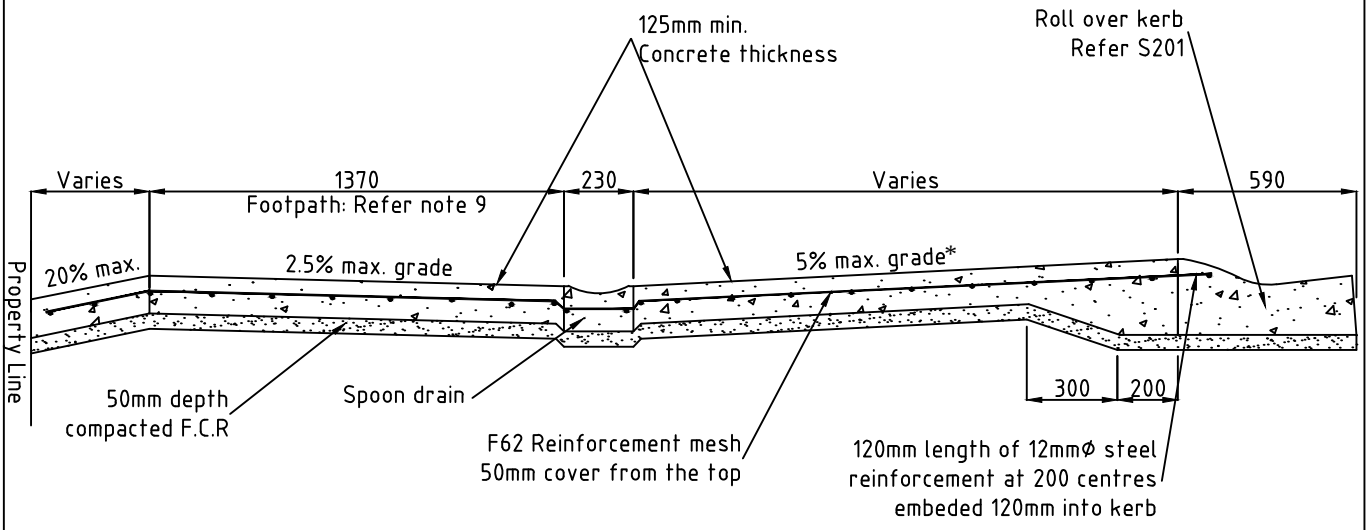


Section View: Footpath Above Kerb



Section View: Footpath Below Kerb Incorporating Spoon Drain

NOTES:

1. Crossing shall be constructed in accordance with Council Specification / Council Vehicle Crossing Policy.
2. Dimensions detailed in this standard will apply to all vehicle crossings with roll over kerb including skew crossings and where no footpath exists unless approved by Council Engineer.
3. Concrete shall be minimum 25MPa.
4. Refer to S248 for details of expansion and contraction joints.
5. Granting of a permit for a new vehicle crossing is subject to the removal of existing crossing/s, as directed by Council Engineer.
6. Crossing is to be reinforced with F62 mesh (50mm cover from the top). Steel reinforcement used for separate pour sections shall be overlapped by 300mm.
7. 230mm spoon drain is to be constructed when the footpath finished surface level is below the top of kerb.
8. Where the finished surface level of the footpath is above the top of kerb, no spoon drain is required.
9. Standard footpath width is 1370mm minimum. 1500mm width may be required as directed by Council Engineer.

*Note: It is recognised that limiting domestic driveway grades to 5% maximum may not be practicable in certain circumstances and will therefore be determined by the Council Engineer.

SCALE 1:25
DIMENSIONS IN MILLIMETRES

VEHICLE CROSSING CROSS SECTION DETAILS

For Roll Over Kerb and Channel

MANNINGHAM CITY COUNCIL

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BALANCE OF CITY AND COUNTRY

REVIEWED: D.V	CHECKED: K.K	STANDARD DRAWING A4/S243
DATE: Jan 2004		

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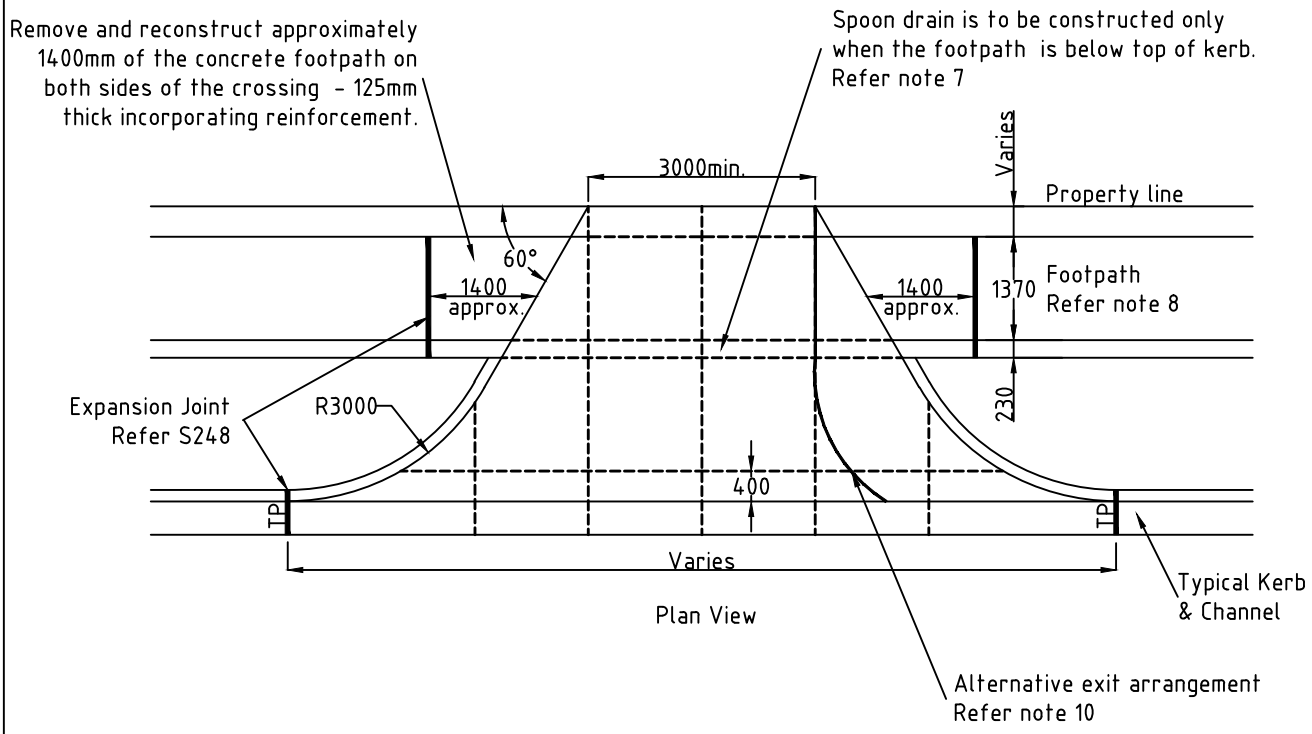

NOTES:

1. Crossing shall be constructed in accordance with Council Specification / Council Vehicle Crossing Policy.
2. Dimensions detailed in this standard will apply to main road vehicle crossings including where no footpath exists unless approved by Council Engineer.
3. Concrete shall be minimum 25MPa.
4. Contraction joint locations are indicated by dashed lines. Desirable maximum spacing of 1.5 metres or as directed by Council Engineer. Refer to S248 for details of expansion and contraction joints.
5. Granting of a permit for a new vehicle crossing is subject to the removal of existing crossing/s, as directed by Council Engineer.
6. Crossing is to be reinforced with F62 mesh (50mm cover from the top). Steel reinforcement used for separate pour sections shall be overlapped by 300mm.
7. 230mm spoon drain is to be constructed when the footpath finished surface level is below the top of kerb. Where the finished surface level of the footpath is above the top of kerb, no spoon drain is required.
8. Standard footpath width is 1370mm minimum. 1500mm width may be required as directed by Council Engineer.
9. This standard will not apply where a wide nature strip exists and special design will be required as directed by Council Engineer.
10. Exit radius will vary in certain circumstances. Maximum radius should match entry radius of 3000mm. Where a smaller exit radius (2000mm min.) is desired, this must be approved by Council Engineer.

SCALE 1:100
DIMENSIONS IN MILLIMETRES

TYPICAL MAIN ROAD VEHICLE CROSSING

MANNINGHAM CITY COUNCIL

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STANDARD DRAWING A4/S244

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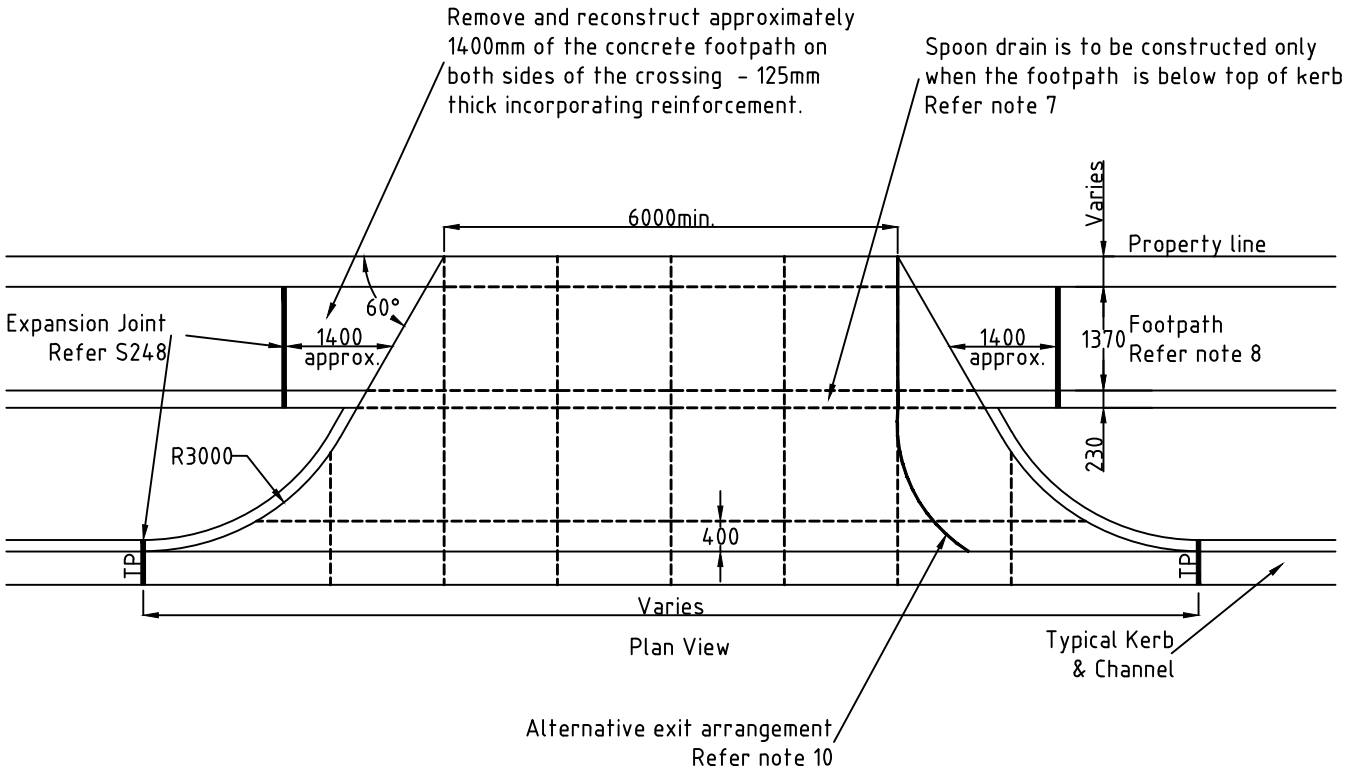

NOTES:

1. Crossing shall be constructed in accordance with Council Specification / Council Vehicle Crossing Policy.
2. Dimensions detailed in this standard will apply to double main road vehicle crossings including where no footpath exists unless approved by Council Engineer.
3. Concrete shall be minimum 25MPa.
4. Contraction joint locations are indicated by dashed lines. Desirable maximum spacing of 1.5 metres or as directed by Council Engineer. Refer to S248 for details of expansion and contraction joints.
5. Granting of a permit for a new vehicle crossing is subject to the removal of existing crossing/s, as directed by Council Engineer.
6. Crossing is to be reinforced with F62 mesh (50mm cover from the top). Steel reinforcement used for separate pour sections shall be overlapped by 300mm.
7. 230mm spoon drain is to be constructed when the footpath finished surface level is below the top of kerb. Where the finished surface level of the footpath is above the top of kerb, no spoon drain is required.
8. Standard footpath width is 1370mm minimum. 1500mm width may be required as directed by Council Engineer.
9. This standard will not apply where a wide nature strip exists and special design will be required as directed by Council Engineer.
10. Exit radius will vary in certain circumstances. Maximum radius should match entry radius of 3000mm. Where a smaller exit radius (2000mm min.) is desired, this must be approved by Council Engineer.

SCALE 1:100
DIMENSIONS IN MILLIMETRES

TYPICAL MAIN ROAD VEHICLE CROSSING

Double Crossing

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MANNINGHAM
BALANCE OF CITY AND COUNTRY

REVIEWED: D.V CHECKED: K.K

DATE: Jan 2004

STANDARD DRAWING A4/S245

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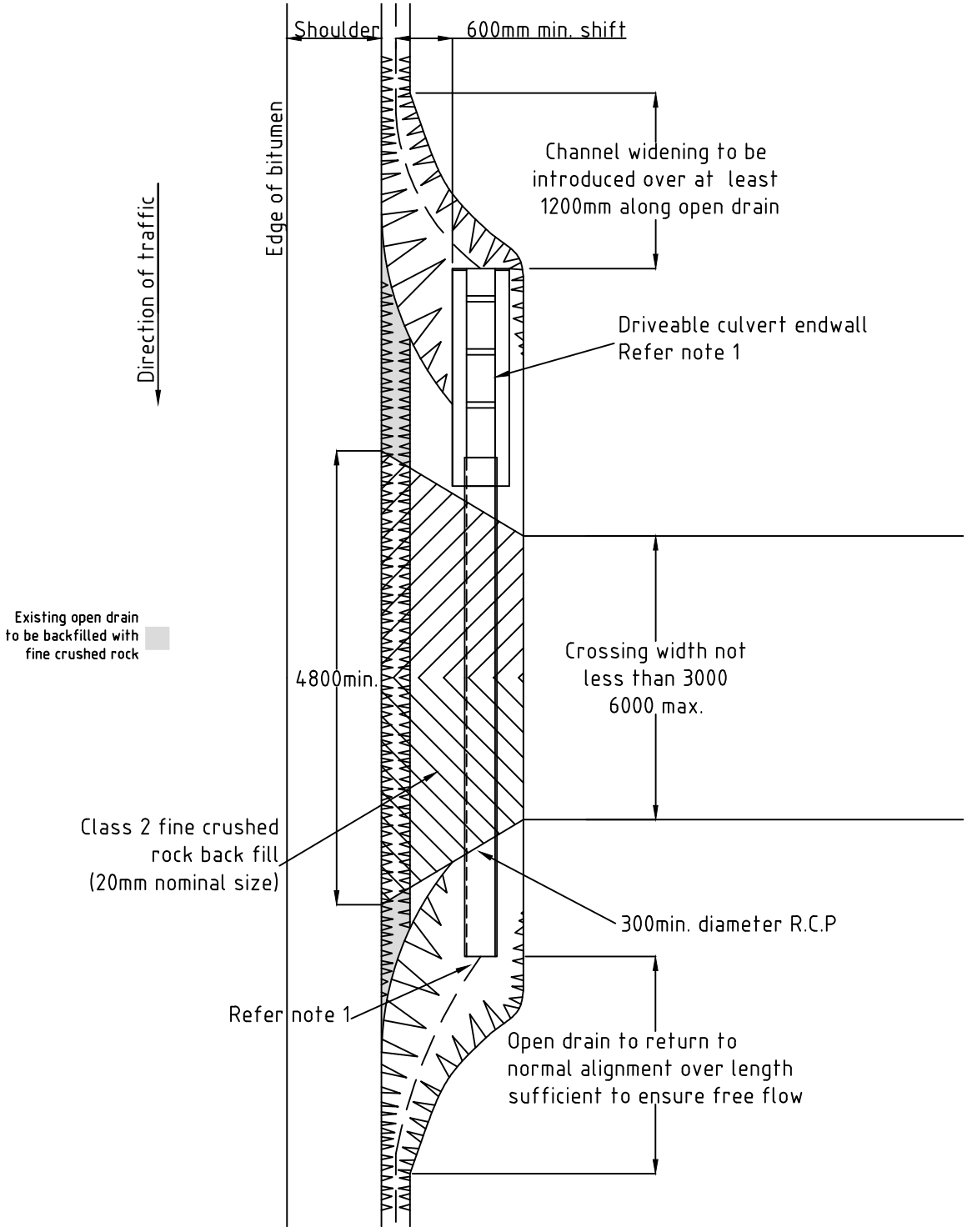

NOTES:

1. Driveable culvert endwall shall be installed as per S143 and is required in areas where head on collisions are likely to occur, where an end of the culvert is within the clear zone (refer Austroads Urban Road Design Guide – 14.3.1 & 14.3.2), and where determined by Council Engineer.
2. Culvert type is to consist of a minimum 300mm diameter reinforced concrete pipe. Class of pipe will vary according to cover achievable. An alternative pipe may be considered with approval from Council Engineer.
3. Crossing surface material may vary and shall consist of either crushed rock, concrete, asphalt, or similar.
4. This standard only applies in rural areas where kerb and channel does not exist.

SCALE N/A
DIMENSIONS IN MILLIMETRES

RURAL VEHICLE CROSSING
Over table drain

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DATE: Jan 2004

STANDARD DRAWING A4/S246

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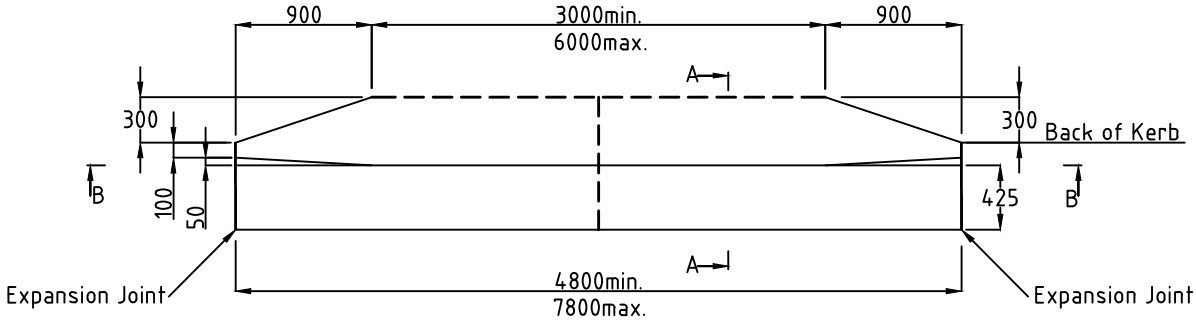
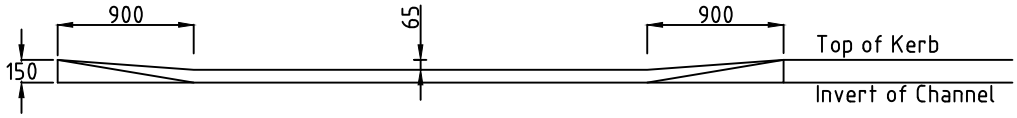
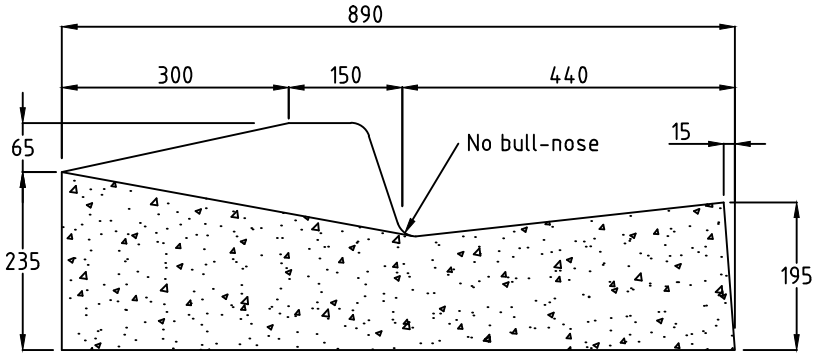


Plan View



Section B-B



Section A-A
Scale 1:10

NOTES:

1. Crossing shall be constructed in accordance with Council Specification / Council Vehicle Crossing Policy.
2. Dimensions detailed in this standard will apply to all vehicle crossings with barrier kerb and channel including skew crossings and where no footpath exists unless approved by Council Engineer.
3. Concrete shall be minimum 25MPa.
4. Contraction joint locations are indicated by dashed lines. Desirable maximum spacing of 1.5 metres or as directed by Council Engineer. Refer to S248 for details of expansion and contraction joints.
5. Granting of a permit for a new vehicle crossing is subject to the removal of existing crossing/s, as directed by Council Engineer.
6. Crossing is to be reinforced with F62 mesh (50mm cover from the top). Steel reinforcement used for separate pour sections shall be overlapped by 300mm.

SCALE 1:50
DIMENSIONS IN MILLIMETRES

STANDARD LAYBACK
For Barrier Kerb and Channel

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BALANCE OF CITY AND COUNTRY

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STANDARD DRAWING A4/S247

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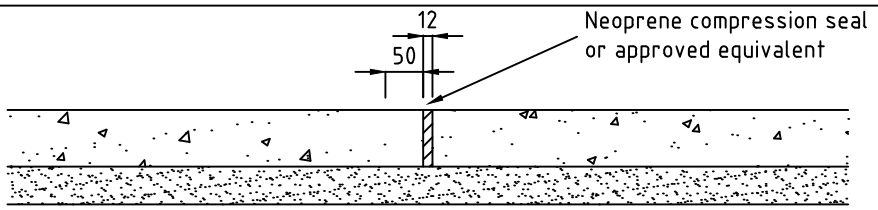
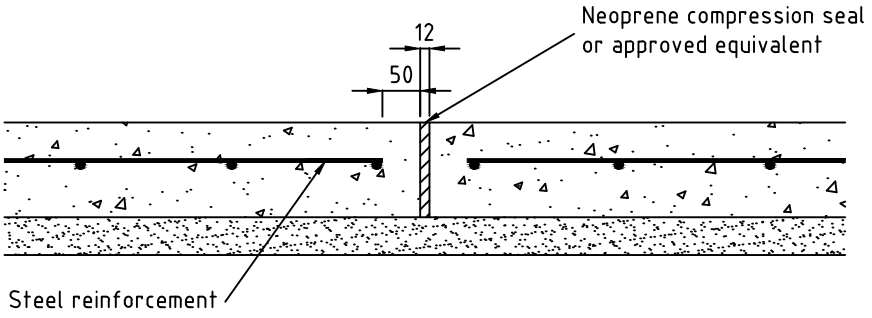
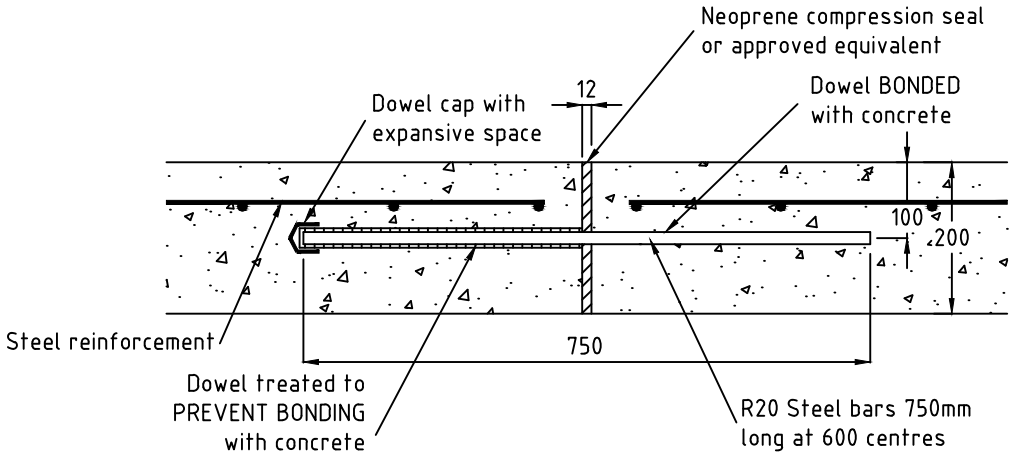


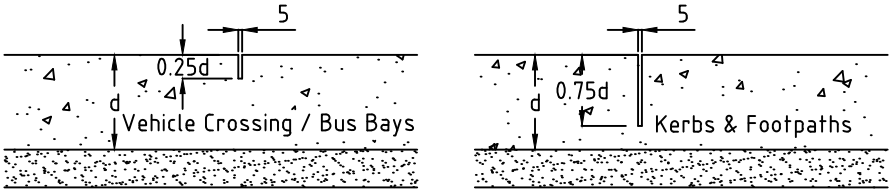
Expansion Joint For Footpaths & Shared Paths



Expansion Joint For Vehicle Crossings



Doweled Expansion Joint For Bus Bays



Contraction Joint

NOTES:

1. Concrete shall be minimum 25MPa (32MPa for bus bays).
2. Doweled expansion joints for bus bays shall be located at intervals of 14 metres maximum spacing.
3. Expansion joints for footpaths and shared paths shall be located at intervals of 12 metres maximum spacing.
4. Contraction joints shall be constructed after the concrete has been placed and screeded and shall be generally located at a desirable maximum spacing of 1.5 metres for kerbs and footpaths and a spacing of 5 metres for bus bays or as directed by Council Engineer.
5. A bond breaker or approved equivalent is to be provided on one end of steel bar and face of joint, to prevent bonding, for the bus bay doweled expansion joint.

SCALE 1:10

DIMENSIONS IN MILLIMETRES

EXPANSION AND CONTRACTION JOINTS

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BALANCE OF CITY AND COUNTRY

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DATE: Jan 2004	

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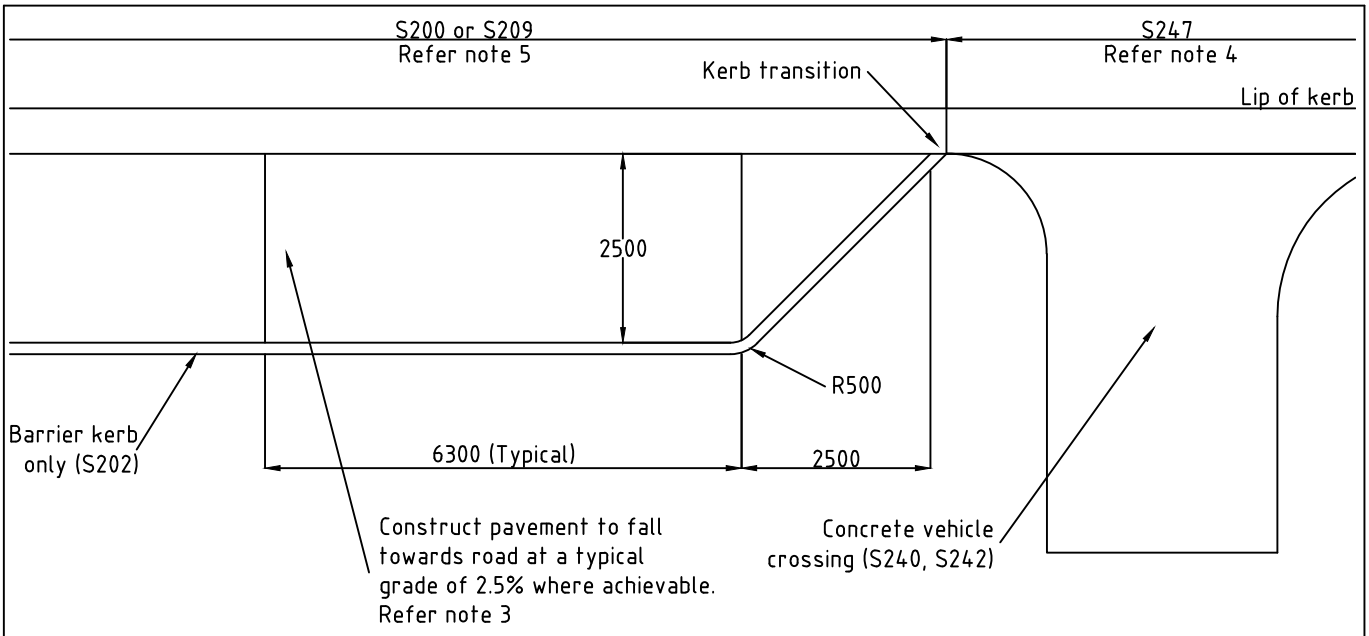
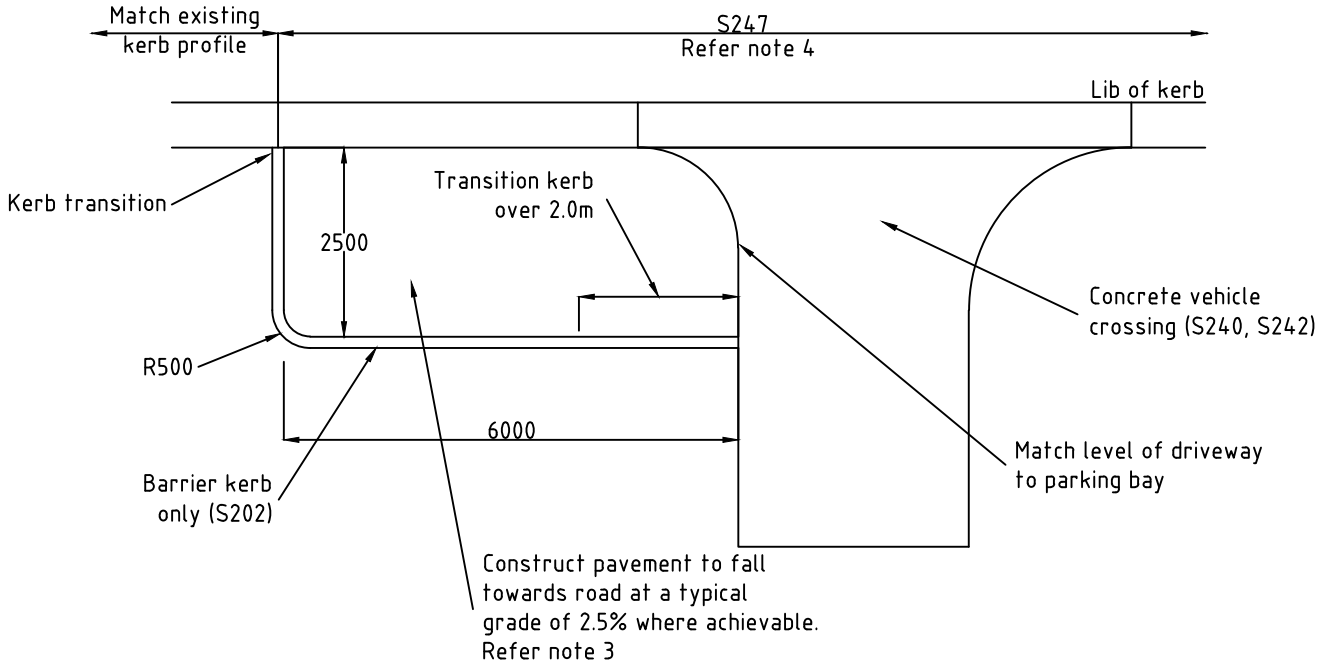


Parking Indent Independent Of Vehicle Crossing



Parking Indent Abutting Vehicle Crossing

NOTES:

1. Crossing shall be constructed in accordance with Council Specification / Council Vehicle Crossing Policy.
2. Concrete shall be minimum 25MPa.
3. A grade of 2.5% shall be used. Where 2.5% is not appropriate due to the existing surrounding area or existing vehicle crossing grade, an appropriate grade shall be used as directed by Council Engineer.
4. Vehicle crossing layback type shall match existing adjacent kerb type (either VicRoads type or Council type) as directed by Council Engineer.
5. S200 or S209 shall be used within this area pending the overall kerb profile being used within the road. If roll over kerb is used within the road, it may be used within this area, as directed by Council Engineer.
6. Refer to S248 for details of expansion and contraction joints.

SCALE 1:100
DIMENSIONS IN MILLIMETRES

TYPICAL PARKING INDENT

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STANDARD DRAWING A4/S249

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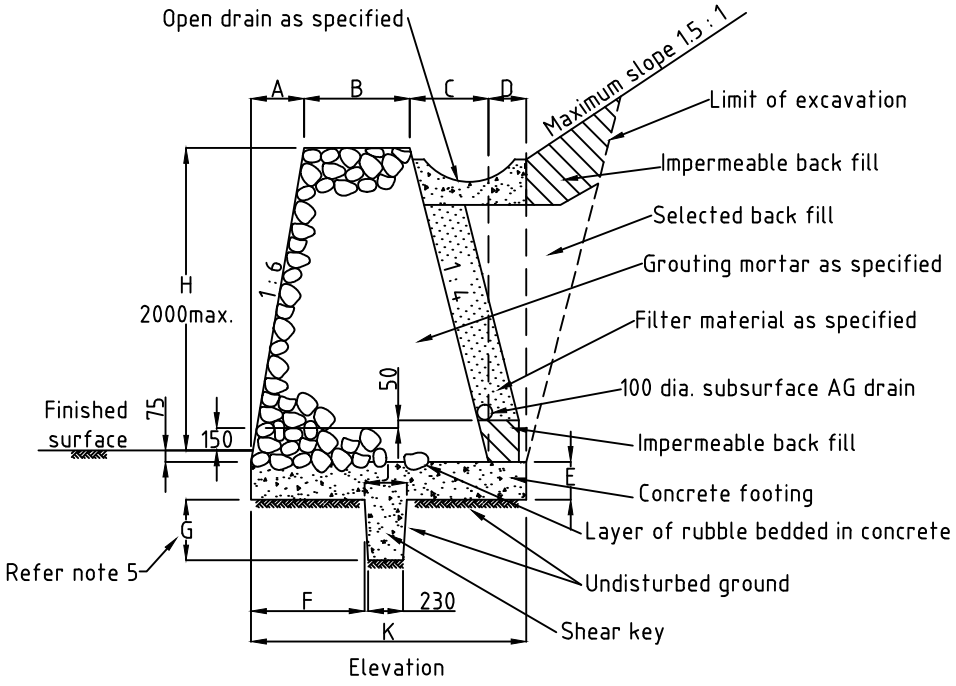
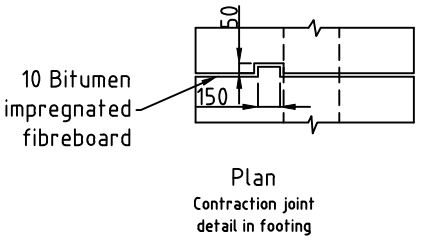
RETAINING WALL STANDARDS

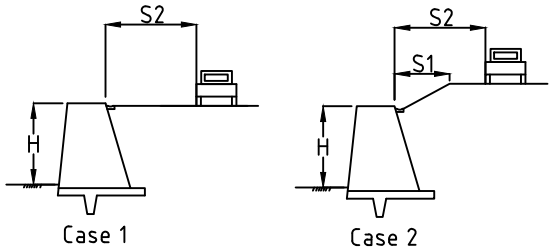




Plan
Contraction joint detail in footing

Loading	H	A	B	C	D	E	F	G	J	K	Rubble volume m³ / m	Concrete volume m³ / m
300 Surcharge (D300)	1000	180	450	270	100	150	400	250	250	1000	0.73	0.21
	1500	260	600	390	200	200	550	300	260	1450	1.47	0.37
	2000	350	700	520	250	250	750	400	280	1820	2.36	0.56
1200 Surcharge (D1200)	1000	180	900	270	350	200	650	500	300	1700	1.21	0.47
	1500	260	1150	390	400	250	850	500	300	2200	2.33	0.69
	2000	350	1250	520	500	350	1150	500	300	2620	3.50	1.05
1.5 to 1 Sloping Back fill	1000	180	400	270	300	200	300	500	300	1150	0.67	0.36
	1500	260	600	390	300	200	350	500	300	1550	1.47	0.45
	2000	350	800	520	300	250	350	500	300	1970	2.56	0.63

*Volumes given are to be used as a guide only



Case 1 – Live load on horizontal back fill:
Where S2 ≥ H, Use dimensions for 300 surcharge (D300)
Where S2 < 0.5H, Use dimensions for 1200 surcharge (D1200)
Where 0.5H ≤ S2 < H, Dimensions = D1200 x 2 (H–S2)/H + D300 x (2 x S2–H)/H

Case 2 – Live load on sloping back fill:
Where S1 ≥ H, Use dimensions for sloping back fill
Where 0.5H ≤ S1 < H.
(i) If S2 < 0.75H, Dimensions = D1200
(ii) If S2 ≥ 0.75H, Dimensions = D1200 x S1/H + D300 x (H – S1)/H
Where S1 < 0.5H, Dimensions = D1200 x F1 + D300 x F2

The values of F1 and F2 are given below:

S2	F1	S2
≥ H	S1/H	(H –S1)/H
< H and ≥ 0.5H	(H + S1)/(2H)	(H – S1)/(2H)
< 0.5H	1	0

NOTES:
1. Minimum safe bearing value of the foundation shall be 200kPa. Walls shall not be founded on soft clay, loose sand or un-compacted fill. Concrete base shall be cast on undisturbed soil.
2. Selected back fill and filter material will vary according to existing conditions. Only approved back fill and filter material shall be used as directed by Council Engineer.
3. Spacing of Contraction joints shall not exceed
   (a) 4000 centres on rock
   (b) 6000 centres on other materials
4. Weepholes shall be spaced at 3000mm max. and shall be 75mm diameter, or as directed by Council Engineer.
5. A 100mm deep shear key is adequate where wall is founded on rock.
6. Minimum design factor of safety against overturning and sliding: 1.5.

SCALE 1:50
DIMENSIONS IN MILLIMETRES

GROUTED ROCK RETAINING WALL
Height to 2.0 metres

MANNINGHAM CITY COUNCIL

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BALANCE OF CITY AND COUNTRY

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DATE: Jan 2004

STANDARD DRAWING A4/S300

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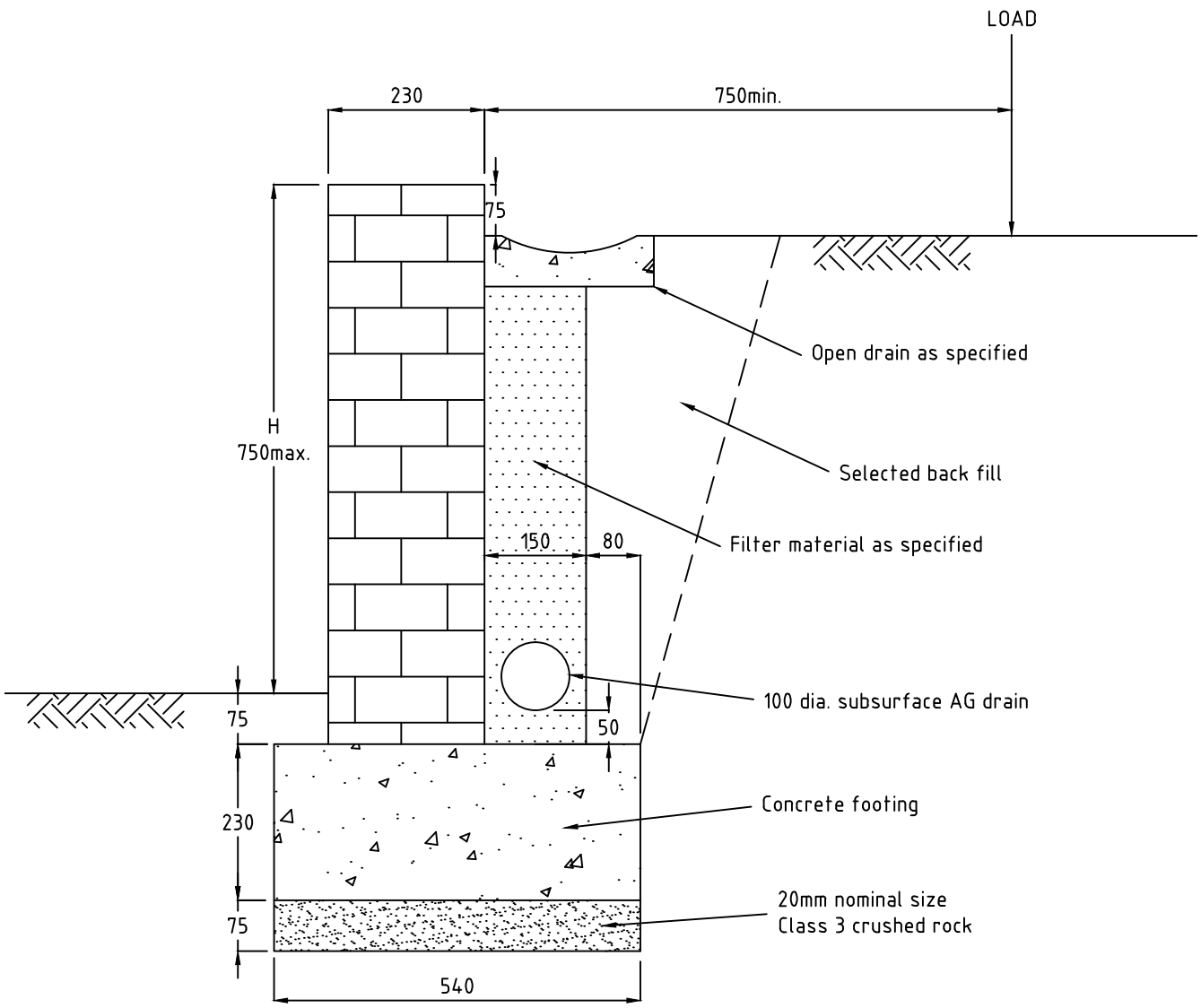

Typical Section

NOTES:

1. Minimum safe bearing value of the foundation shall be 200kPa. Walls shall not be founded on soft clay, loose sand or un-compacted fill. Concrete base shall be cast on crushed rock bedding.
2. Selected back fill and filter material will vary according to existing conditions. Only approved back fill and filter material shall be used as directed by Council Engineer.
3. Spacing of Contraction joints shall not exceed 7500mm. Contraction joints shall consist of a 13mm wide gap for the full height of the wall, filled with a flexible mastic type joint filler as directed by Council Engineer.
4. Weepholes shall be spaced at 3000mm max. and shall be 75mm diameter, or as directed by Council Engineer.
5. Surcharge loading shall not be applied at less than 750mm from the back of the wall.
6. Minimum design factor of safety against overturning and sliding: 1.5.

SCALE 1:10
DIMENSIONS IN MILLIMETRES

BRICK RETAINING WALL
Height to 0.75 Metres

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BALANCE OF CITY AND COUNTRY

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DATE: Jan 2004

STANDARD DRAWING A4/S301

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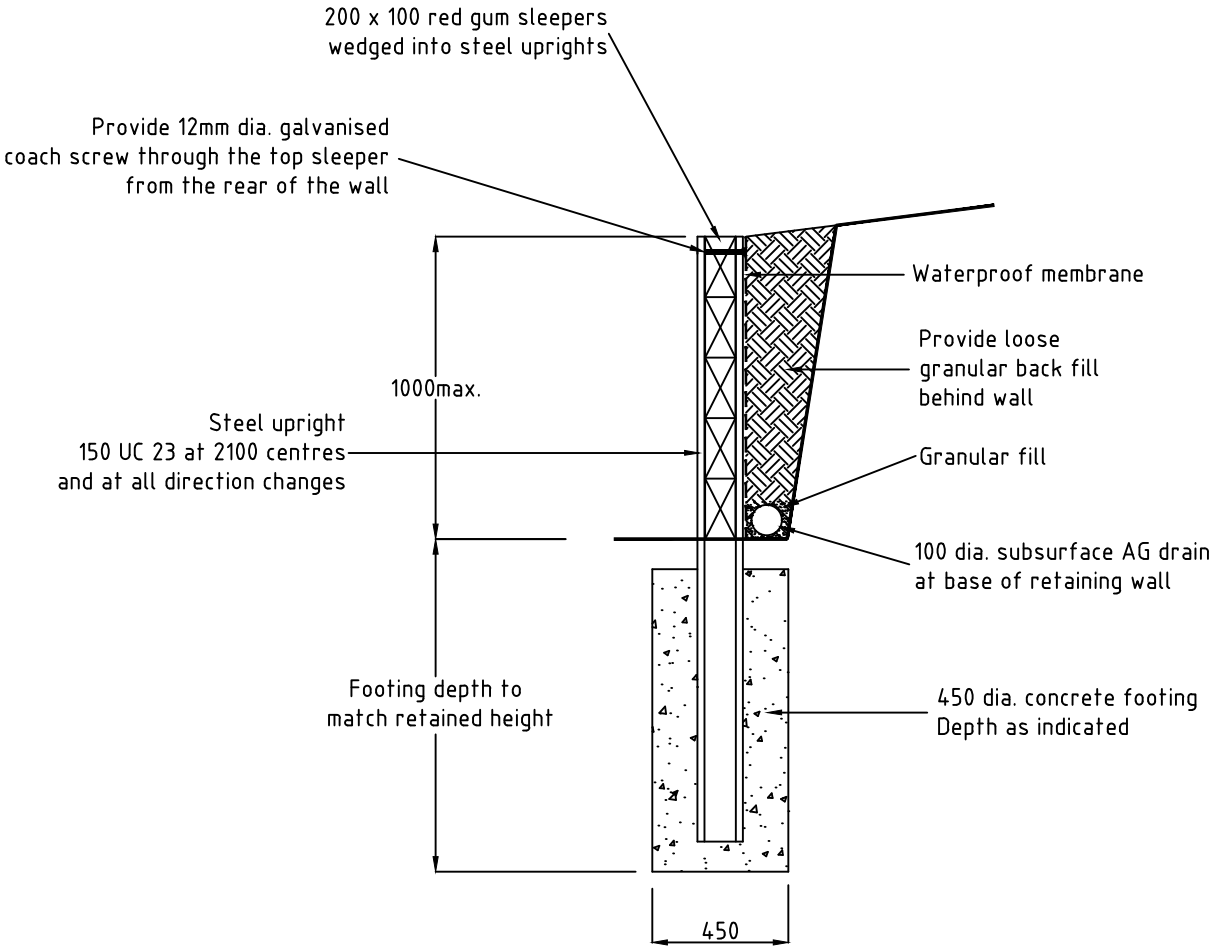

Typical Section

NOTES:

1. Maximum height of this retaining wall shall be 1000mm. If required height is greater than 1000mm, engineer design is required and this standard does not apply.
2. Subsurface A.G. drain with geotextile sock must be connected to a suitable Council storm water outlet and shall be approved by Council Engineer.
3. The area behind this retaining wall is for pedestrian type traffic only. Walls subject to surcharges and/or vehicular loads must be engineer designed and this standard does not apply.
4. Sleeper retaining wall heights above 1000mm require structural design and a building permit - this standard detail will not apply.

SCALE 1:25
DIMENSIONS IN MILLIMETRES

TIMBER SLEEPER RETAINING WALL

Height to 1.0 Metres

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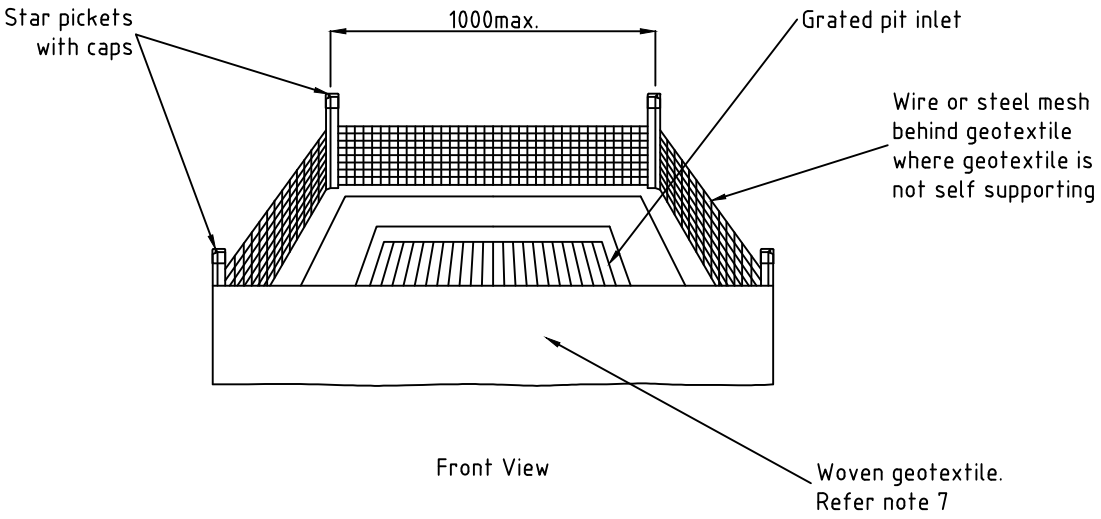
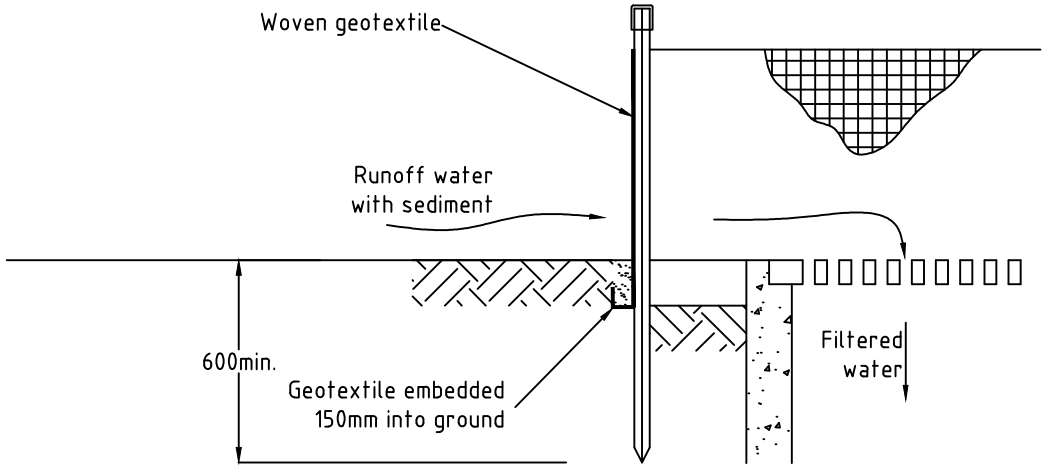
ENVIRONMENTAL MANAGEMENT SYSTEM STANDARDS





Typical Section

NOTES:

1. Grated pit inlet must not be covered with geotextile.
2. Support geotextile with mesh tied to posts at 1 metre centres.
3. A 150mm deep trench shall be dug around the perimeter of the fence for the bottom of the fabric to be entrenched.
4. Trench shall be back filled over base of fabric.
5. Fabric segments shall be joined at a support post with a 150mm minimum lap.
6. All exposed star pickets must be fitted with safety caps.
7. Straw bales may be used as an alternative to the geotextile depicted. Install straw bales as per S403.
8. Environmental Management Systems must be maintained on a regular basis, as directed by Council Engineer.

SCALE N/A
DIMENSIONS IN MILLIMETRES

GEOTEXTILE INLET FILTER

MANNINGHAM CITY COUNCIL

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BALANCE OF CITY AND COUNTRY

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DATE: Jan 2004

STANDARD DRAWING A4/S400

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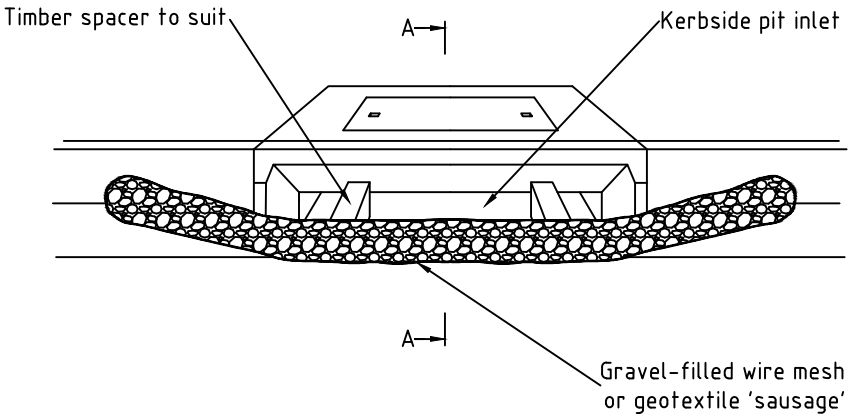
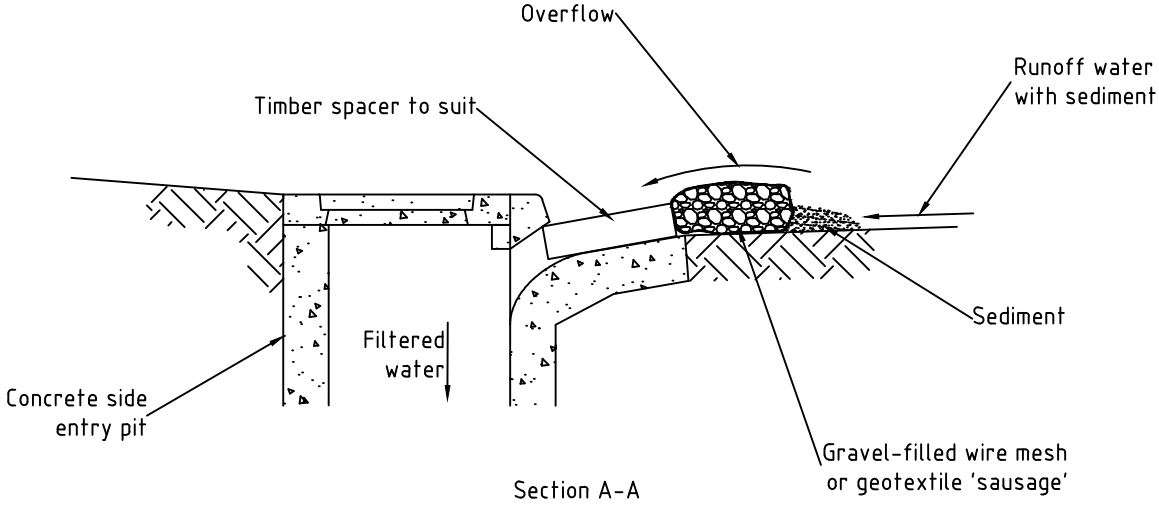


Front View



Section A-A

NOTES:

1. Gravel-filled wire mesh or geotextile 'sausage' shall be made from wire mesh or geotextile longer than the length of the pit inlet.
2. Filter material shall consist of gravel size 25-50mm.
3. Gravel-filled wire mesh or geotextile 'sausage' shall form an elliptical shape with a cross section of approximately 150mm high x 400mm wide.
4. Gravel-filled wire mesh or geotextile 'sausage' shall be placed at the opening of the kerb inlet leaving a 100mm gap at the top of the filter to act as an emergency spillway. Maintain the opening using appropriate spacer blocks.
5. Gravel-filled wire mesh or geotextile 'sausage' must be placed in a manner that forms a seal with the kerb around the pit preventing sediment bypassing the filter.
6. Sand bags may be required, as directed by Council Engineer, to ensure 'sausage' ends firmly abut the kerb.
7. Environmental Management Systems must be maintained on a regular basis, as directed by Council Engineer.

SCALE N/A
DIMENSIONS IN MILLIMETRES

PIT INLET FILTER

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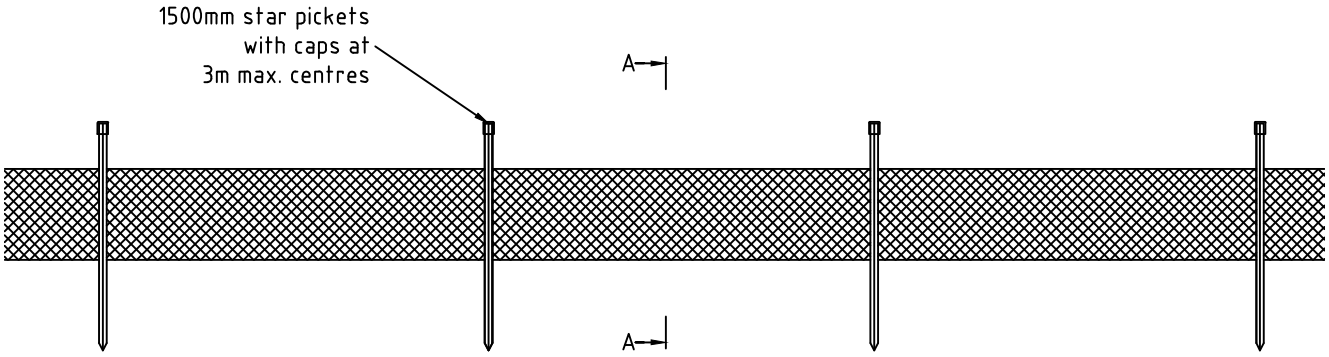
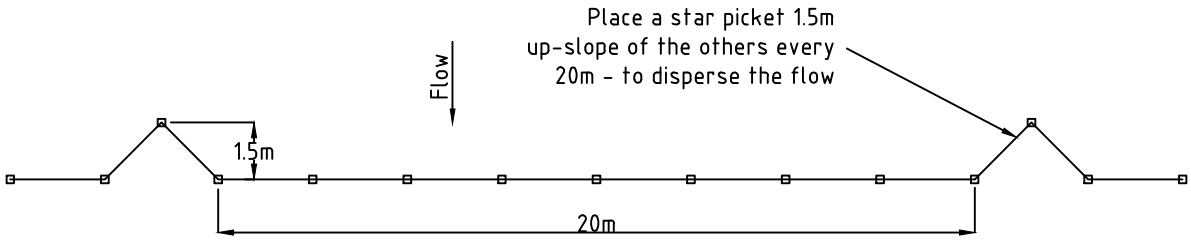
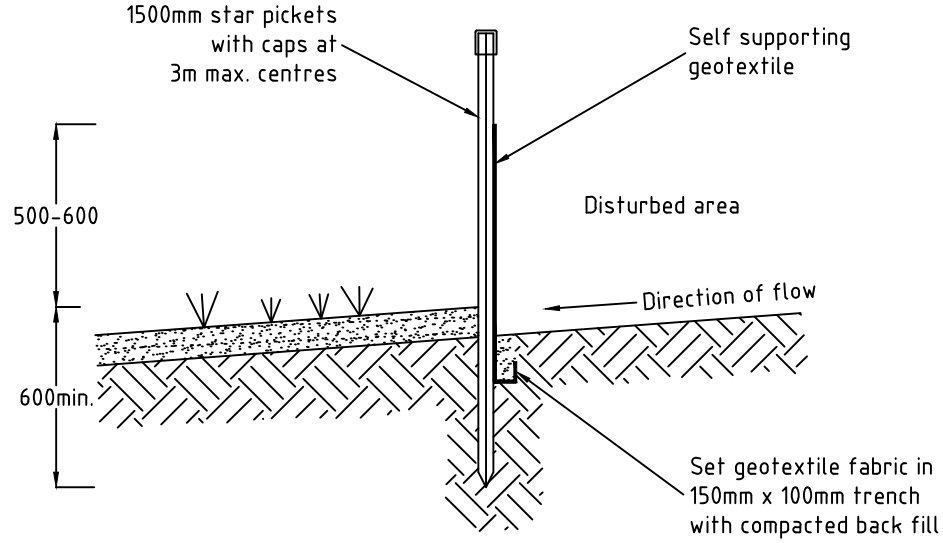


Elevation



Plan View



Section A-A

NOTES:

1. Sediment fence shall be constructed as close as possible to parallel to the contours of the site.
2. Drive 1.5 metre long star pickets into the ground, 3 metres apart.
3. A 150mm deep trench shall be dug along the up-slope line of the fence for the bottom of the fabric to be entrenched.
4. Trench shall be back filled over base of fabric.
5. Geotextile fabric shall be fixed to up-slope side of star pickets with wire ties or as recommended by geotextile manufacturer.
6. Fabric segments shall be joined at a support post with a 150mm minimum lap.
7. All exposed star pickets must be fitted with safety caps.

SCALE N/A
DIMENSIONS IN MILLIMETRES

SEDIMENT FENCE

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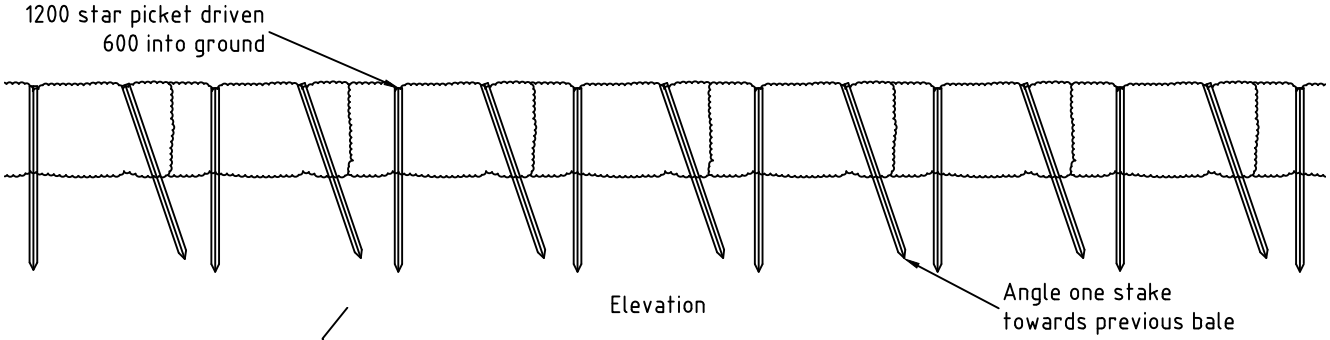
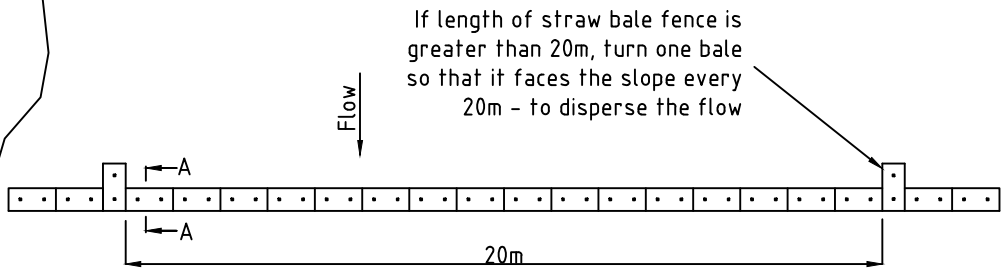
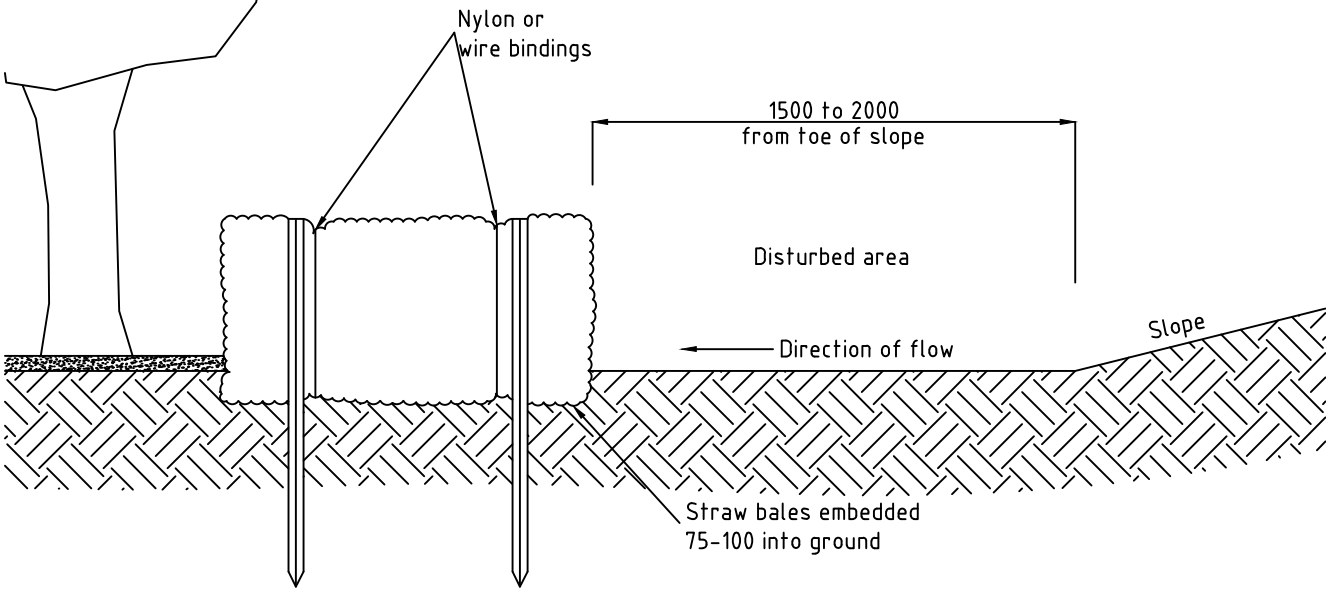


Elevation



Plan View



Section A-A

NOTES:

1. Straw bale filters shall be constructed as close as possible to parallel to the contours of the site or at the toe of a slope.
2. Straw bales shall be placed length wise in a row with ends tightly abutting. Use straw to fill any gaps between bales.
3. Maximum height of filter shall be one bale.
4. Each straw bale is to be embedded 75-100mm and anchored in place with two 1.2 metre star pickets. One star picket shall be angled towards previously placed bales and driven 600mm into the ground and flush with the top of the bales.
5. Straw bales constructed down slope from a disturbed batter shall be located 1.5 to 2 metres down slope from the toe of the batter.
6. Environmental Management Systems must be maintained on a regular basis, as directed by Council Engineer.
7. All exposed star pickets must be fitted with safety caps.
8. Only straw bales shall be used. Hay bales are not accepted.

SCALE N/A
DIMENSIONS IN MILLIMETRES

STRAW BALE FILTER

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DATE: Jan 2004

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