



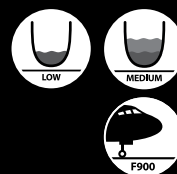
Traffic Drain, Bedford



Traffic Drain Cast Iron

Traffic Drain

Grate Drainage System



Traffic Drain is a medium capacity system that complements the Mini Beany range to provide continuity of flow between kerb and grate units. The robust concrete channel and strong cast iron grates are suitable to withstand fast moving vehicles and heavy loading highway application. Traffic Drain is a medium capacity system that complements the Mini Beany range to provide continuity of flow between kerb and grate units.

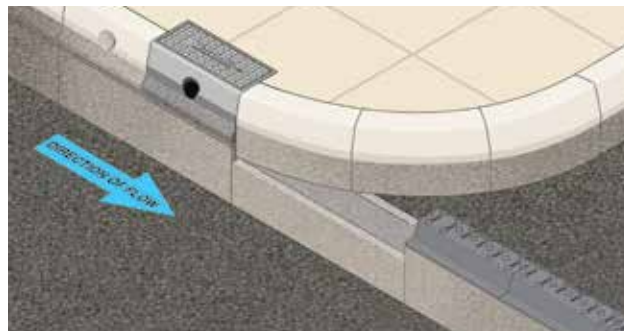
Traffic Drain

Grate Drainage System

- Traffic Drain utilises the same base units as the Mini Beany system combining with Traffic Drain top unit to form a linear drainage system which is laid level with the pavement surface.
- Traffic Drain top unit is manufactured from Cast iron
- The cast iron top unit is then bedded onto any of the 4 Mini Beany base units being 210mm, 260mm, 310mm and 360mm
- This forms a robust linear drainage system suitable for draining large paved surfaces varying from pedestrian precincts to heavy duty industrial areas and highways.

Versatile

- As expected Traffic Drain integrates with the Mini Beany Top Units creating a unique system capable of providing continuous drainage of the carriageway at road and vehicular crossings.



Mini Beany to Traffic Drain (cast iron with holes)

Load Classifications

- The Traffic Drain is strength tested in accordance with BS EN 1433:2002 to F900 Classification

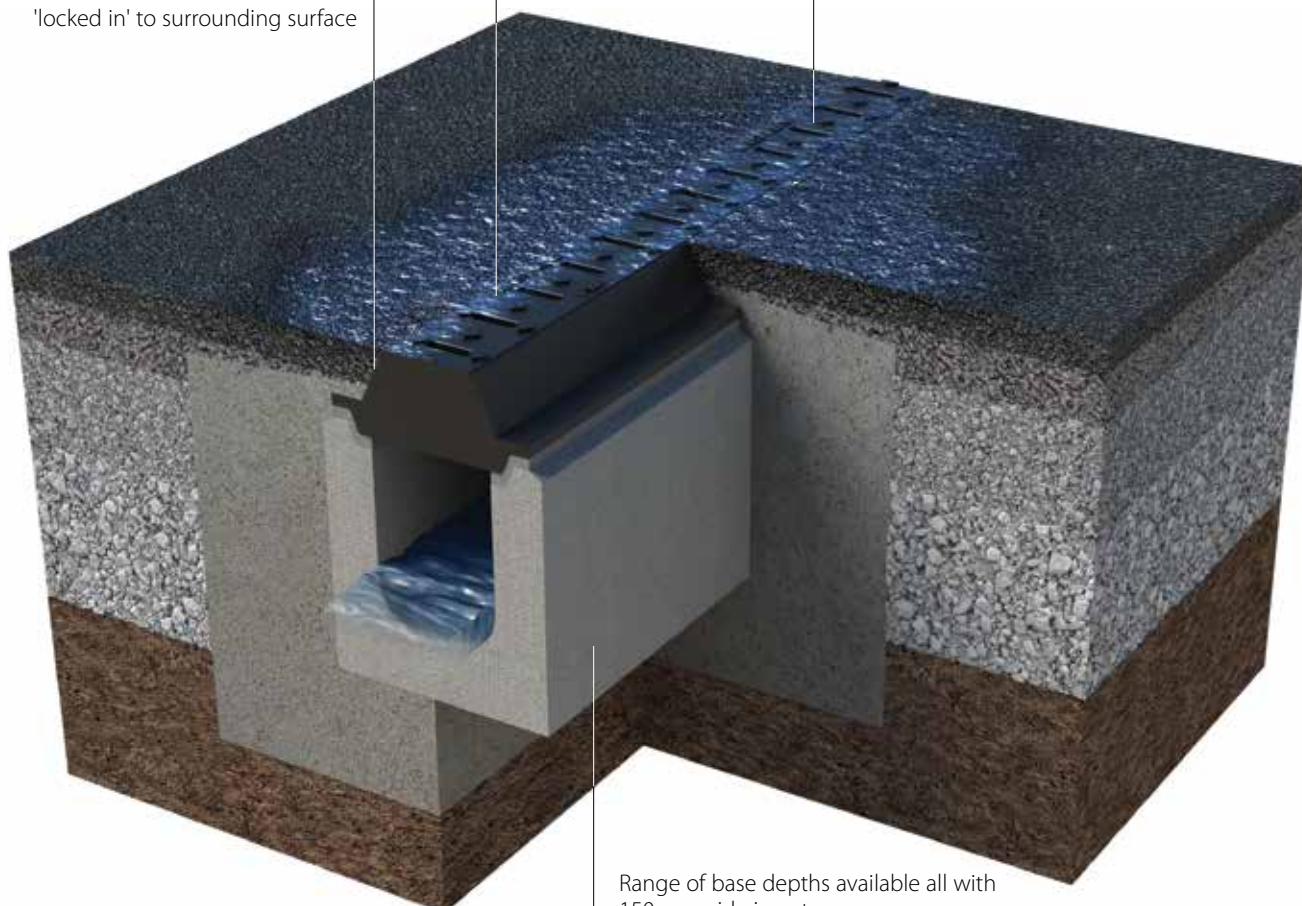
Access Cover and Frame

- A heavy duty cover frame is available for use with Outfalls and Silt Traps to allow for inspection and maintenance.

System is compatible with Mini Beany, Beany Block, Max-E-Channel and Birco 150

Inclined side walls ensure unit is 'locked in' to surrounding surface

High loading classification F900 cast iron Top Units 500mm long

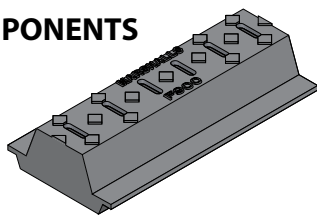


Range of base depths available all with 150mm wide invert

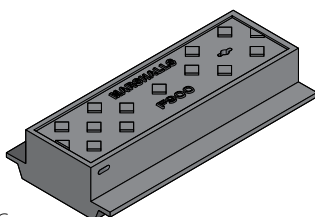
Components

TOP COMPONENTS

Top Units



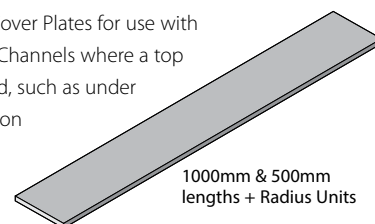
Traffic Drain Top Unit



Traffic Drain Access Cover and Frame 500mm long

Cover Plates

Galvanised steel Cover Plates for use with Traffic Drain Base Channels where a top unit is not required, such as under kerbs for connection to Beany.

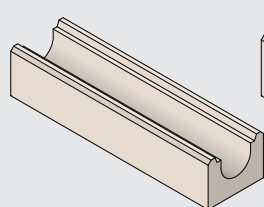


1000mm & 500mm lengths + Radius Units

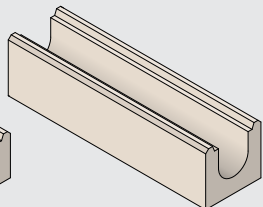
BASE COMPONENTS

All Base Units are 1000mm long, half channels, ancillary items and transition units are 500mm long.

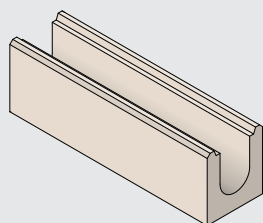
Base Channels



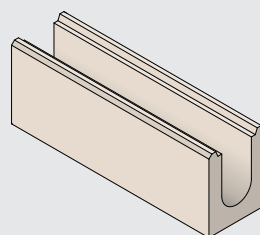
Base 210



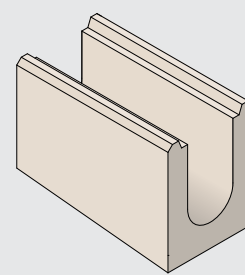
Base 260



Base 310



Base 360

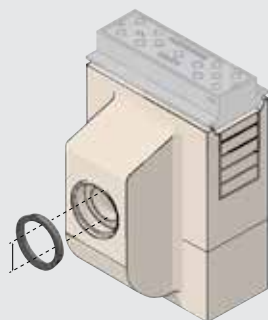
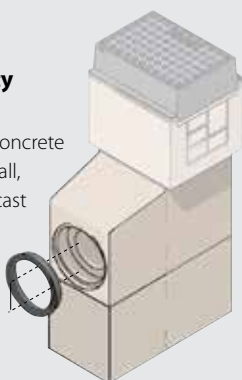


Base Transitions
210-260, 260-310, 310-360

OUTFALLS

High Capacity Outfall

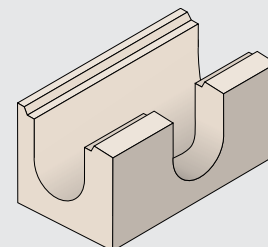
- A 2 section concrete trapped outfall, silt box and cast iron Max-E-Channel access cover.
- Outlet for 150mm or 225mm diameter pipe with universal seals.
- Bottom 2 sections can be orientated in any direction allowing flexibility of pipework layout.
- Cut-out panels in the silt box allow Traffic Drain runs from both sides.



Note: Silt Box and cast iron Access Cover Frame available separately.

Inline End Outlet Outfall

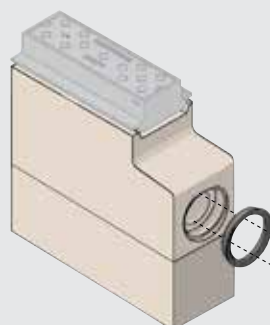
- A 2 section concrete trapped outfall, with cast iron Traffic Drain Access Cover and Frame.
- End outlet for 100mm diameter pipework with universal seal.
- Cut-out panel to allow Traffic Drain run from one side only.



Note: Cast iron Access Cover and Frame available separately.

Inline Side Outlet Outfall

- A 2 section concrete trapped outfall, silt box and cast iron Traffic Drain Access Cover and Frame.
- Side outlet for 150mm diameter pipework with universal seal.
- Cut-out panels in the silt box allow Traffic Drain runs from both sides.



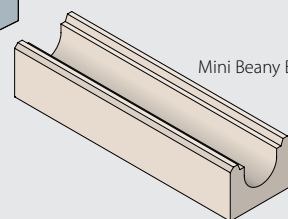
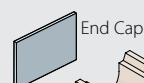
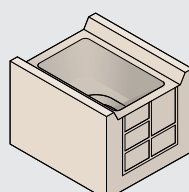
Note: Cast iron Access Cover and Frame available separately.

Traffic Drain T Junction

Available in all 4 base channel depths. 500mm in length.

Silt Box

A concrete unit that with a Max-E-Channel cast iron Access Cover and Frame allows a high capacity outfall or silt trap to be installed in a run of traffic drain. It has cut-out panels either end to accept runs from either or both sides. An aperture in the base allows water to flow vertically into an outfall or silt trap.

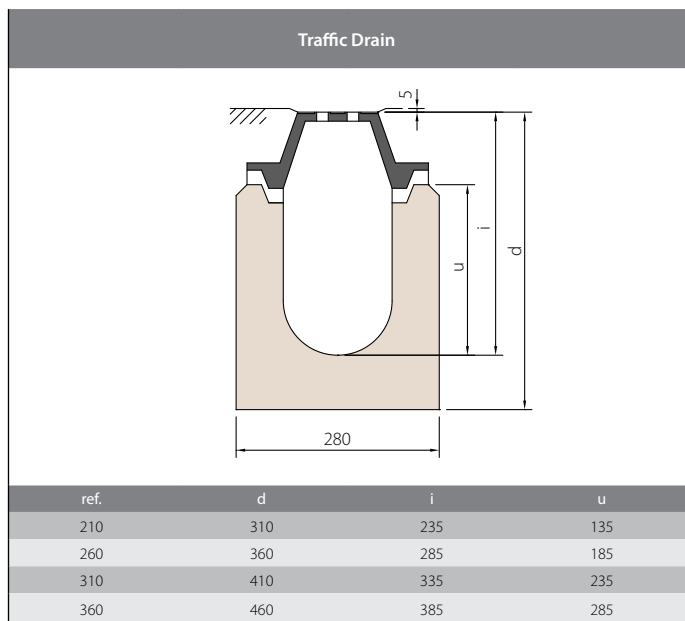
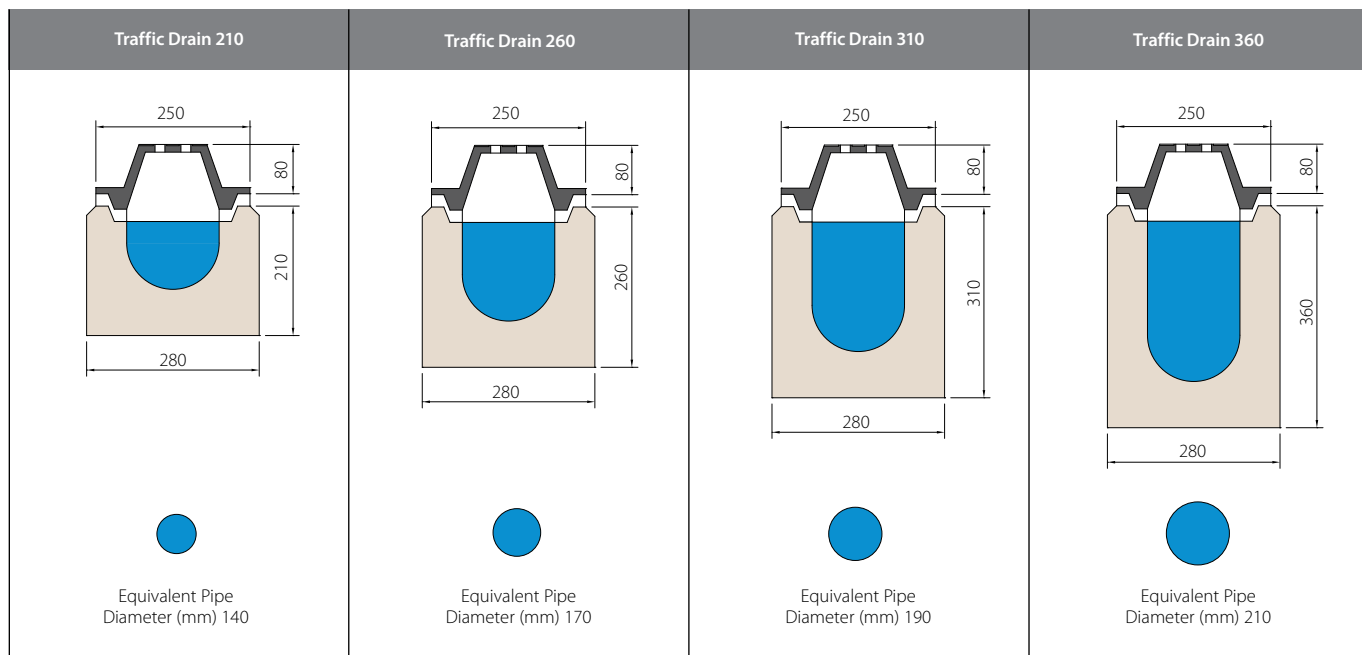


Cap Outlet



Hydraulic Data

FLOW CAPACITY



Hydraulic Data

The Traffic Drain hydraulic data stated in the following tables comprises of flow capacity, in litres per second (l/s) and velocity in metres per second (m/s). This data has been calculated using spatially variable flow design principles.

Base 210																
Gradient Length(m)	Zero		1 in 1000		1 in 500		1 in 400		1 in 300		1 in 200		1 in 100		1 in 50	
	l/s	m/s	l/s	m/s	l/s	m/s	l/s	m/s	l/s	m/s	l/s	m/s	l/s	m/s	l/s	m/s
10	6	0.38	7	0.44	7	0.44	8	0.50	8	0.50	9	0.56	9	0.56	13	0.81
20	6	0.38	7	0.44	7	0.44	8	0.50	8	0.50	10	0.63	11	0.69	14	0.88
30	5	0.31	7	0.44	8	0.50	8	0.50	9	0.56	10	0.63	12	0.75	14	0.88
40	5	0.31	6	0.38	8	0.50	8	0.50	9	0.56	11	0.69	13	0.81	15	0.94
50	5	0.31	6	0.38	8	0.50	9	0.56	9	0.56	11	0.69	13	0.81	15	0.94
75	4	0.25	6	0.38	8	0.50	9	0.56	10	0.63	13	0.81	14	0.88	17	1.06
100	3	0.19	6	0.38	8	0.50	9	0.56	11	0.69	14	0.88	17	1.06	19	1.19

Base 260																
Gradient Length(m)	Zero		1 in 1000		1 in 500		1 in 400		1 in 300		1 in 200		1 in 100		1 in 50	
	l/s	m/s	l/s	m/s	l/s	m/s	l/s	m/s	l/s	m/s	l/s	m/s	l/s	m/s	l/s	m/s
10	10	0.42	11	0.46	12	0.50	13	0.54	14	0.58	15	0.63	17	0.71	22	0.92
20	9	0.38	11	0.46	12	0.50	13	0.54	14	0.58	16	0.67	18	0.75	22	0.92
30	9	0.38	11	0.46	12	0.50	13	0.54	14	0.58	16	0.67	18	0.75	24	1.00
40	9	0.38	11	0.46	13	0.54	13	0.54	14	0.58	17	0.71	19	0.79	24	1.00
50	8	0.33	11	0.46	13	0.54	13	0.54	15	0.63	17	0.71	20	0.83	25	1.04
75	8	0.33	10	0.42	13	0.54	14	0.58	16	0.67	19	0.79	22	0.92	26	1.08
100	7	0.29	10	0.42	14	0.58	14	0.58	16	0.67	21	0.88	26	1.08	29	1.21
150	5	0.21	9	0.38	15	0.63	15	0.63	18	0.75	24	1.00	27	1.13	31	1.29

Base 310																
Gradient Length(m)	Zero		1 in 1000		1 in 500		1 in 400		1 in 300		1 in 200		1 in 100		1 in 50	
	l/s	m/s	l/s	m/s	l/s	m/s	l/s	m/s	l/s	m/s	l/s	m/s	l/s	m/s	l/s	m/s
10	13	0.42	16	0.52	17	0.55	18	0.58	18	0.58	20	0.65	24	0.77	30	0.97
20	13	0.42	15	0.48	17	0.55	18	0.58	19	0.61	21	0.68	25	0.81	30	0.97
30	13	0.42	15	0.48	17	0.55	18	0.58	19	0.61	21	0.68	25	0.81	32	1.03
40	13	0.42	15	0.48	17	0.55	18	0.58	19	0.61	22	0.71	26	0.84	32	1.03
50	12	0.39	15	0.48	17	0.55	18	0.58	20	0.65	23	0.74	27	0.87	33	1.06
75	11	0.35	15	0.48	17	0.55	19	0.61	21	0.68	25	0.81	28	0.90	34	1.10
100	10	0.32	14	0.45	17	0.55	19	0.61	22	0.71	26	0.84	30	0.97	36	1.16
150	9	0.29	14	0.45	18	0.58	20	0.65	23	0.74	30	0.97	34	1.01	39	1.26
200	7	0.23	13	0.42	18	0.58	21	0.68	25	0.81	33	1.06	37	1.19	43	1.39

Base 360																
Gradient Length(m)	Zero		1 in 1000		1 in 500		1 in 400		1 in 300		1 in 200		1 in 100		1 in 50	
	l/s	m/s	l/s	m/s	l/s	m/s	l/s	m/s	l/s	m/s	l/s	m/s	l/s	m/s	l/s	m/s
25	18	0.46	21	0.54	23	0.59	24	0.62	25	0.64	28	0.72	33	0.85	40	1.03
50	17	0.44	20	0.51	23	0.59	24	0.62	26	0.67	30	0.77	35	0.90	42	1.08
75	16	0.41	20	0.51	23	0.59	25	0.64	27	0.69	32	0.82	36	0.92	44	1.13
100	15	0.38	19	0.49	23	0.59	25	0.64	28	0.72	34	0.87	38	0.97	46	1.18
125	14	0.36	19	0.49	23	0.59	25	0.64	29	0.74	35	0.90	40	1.03	48	1.23
150	13	0.33	19	0.49	24	0.62	26	0.67	30	0.77	37	0.95	42	1.08	50	1.28
175	12	0.31	18	0.46	24	0.62	26	0.67	31	0.79	39	1.00	44	1.13	52	1.33
200	11	0.28	18	0.46	24	0.62	27	0.69	32	0.82	41	1.05	46	1.18	54	1.38
225	10	0.26	18	0.46	24	0.62	27	0.69	32	0.82	43	1.10	48	1.23	55	1.41
250	9	0.23	17	0.44	24	0.62	28	0.72	33	0.85	45	1.15	50	1.28	57	1.46
275	8	0.21	17	0.44	25	0.64	28	0.72	34	0.87	47	1.21	51	1.31	59	1.51

Theoretical Outfall Capacities			
Outfall Type	Outlet Pipe Diameter (mm)	l/s	m/s
Traffic Drain High Capacity Outfall	225	87	3.61
Traffic Drain Inline End Outlet Outfall	150	29	2.67
Traffic Drain Inline Side Outlet Outfall	150	29	2.67

Traffic Drain Component Codes

A Top Unit

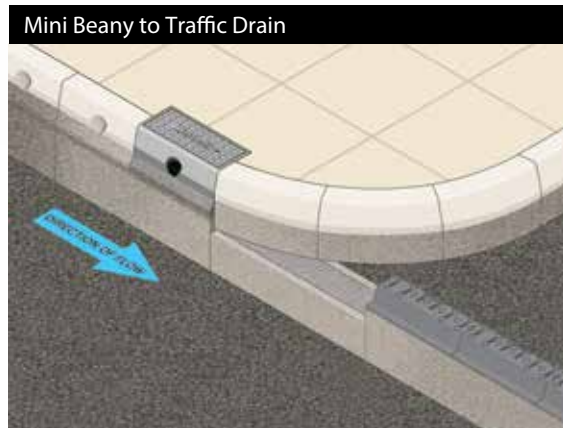
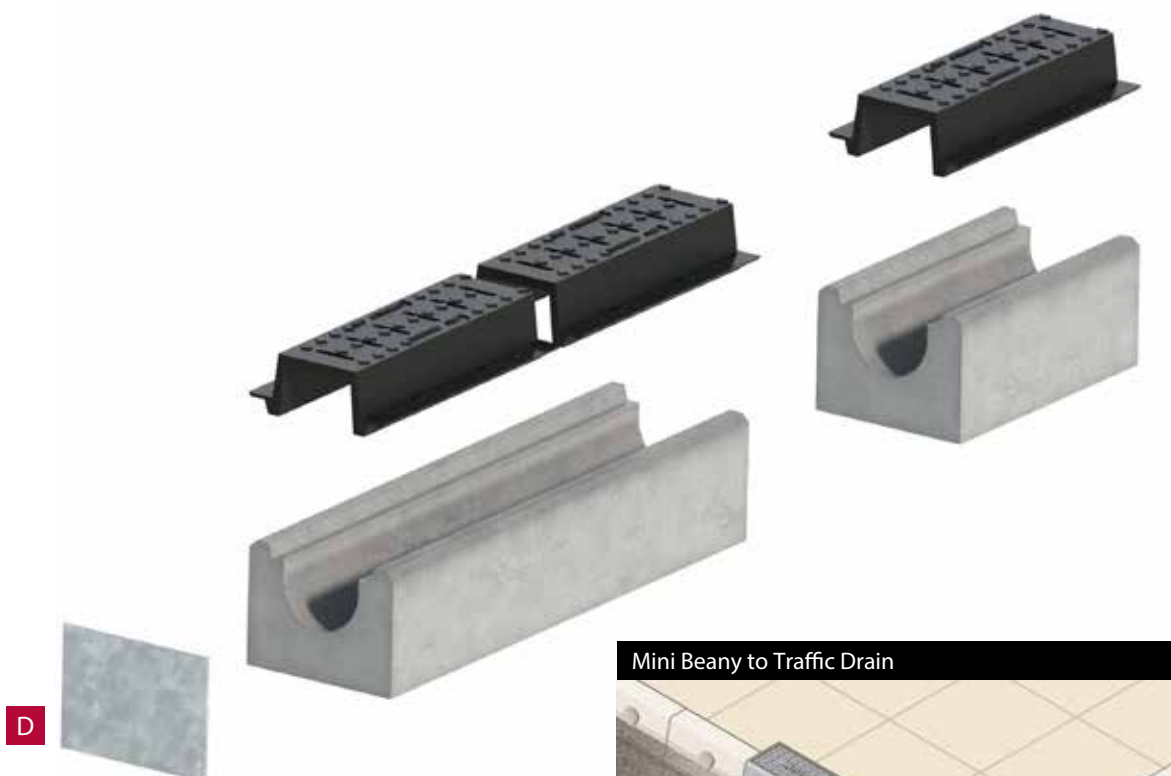
Top Unit	Loading	Length (mm)	Width (mm)	Depth (mm)	Unit Weight (kg)	Item Code
Traffic Drain Cast Iron	F900	500	250	110	23	DR695020

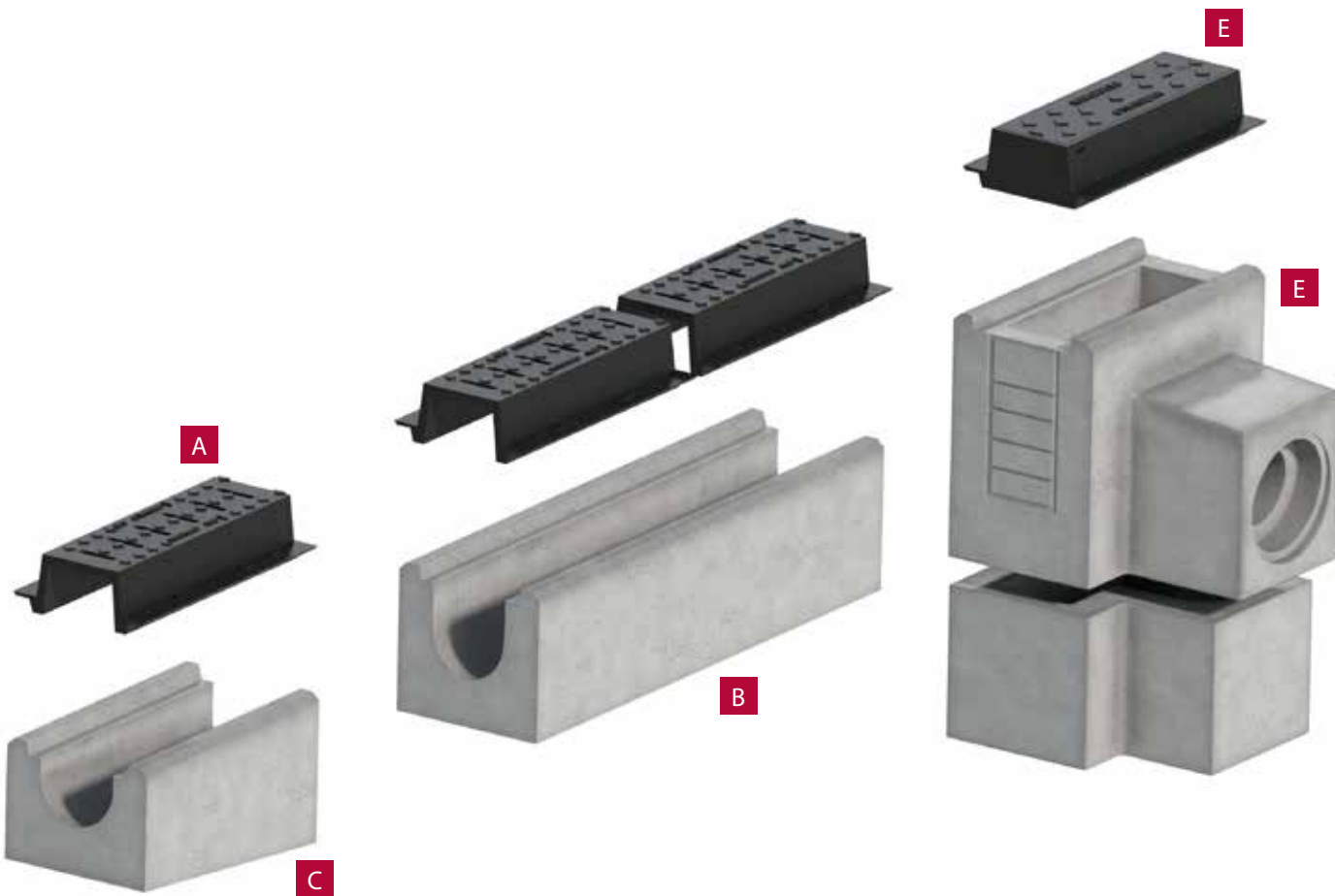
B Constant Depth Channels

Constant Depth Channels	Length (mm)	Width (mm)	Invert Width (mm)	Depth (mm)	Invert Depth (mm)	Unit Weight (kg)	Item Code
210 Press Chan	1000	280	150	210	135	102	DR696010
260 Press Chan	1000	280	150	260	185	109	DR697010
310 Press Chan	1000	280	150	310	235	122	DR698010
360 Press Chan	1000	280	150	360	285	144	DR699010
210 Press Chan	500	280	150	210	135	51	DR696020
260 Press Chan	500	280	150	260	185	55	DR697020
310 Press Chan	500	280	150	310	235	61	DR698020
360 Press Chan	500	280 <td 150	360	285	77	DR699020	

C Transition Channels

Transition Channels	Length (mm)	Width (mm)	Invert Width (mm)	Depth (mm) Upstream/Downstream	Invert Depth (mm) Upstream/Downstream	Unit Weight (kg)	Item Code
210 - 260	1000	280	150	210/260	135/185	54	DR696330
260 - 310	1000	280	150	260/310	185/235	61	DR697330
310 - 360	1000	280	150	310/360	235/285	77	DR698330





D End Cap/Cap Outlets

End Cap/Cap Outlets	Unit Weight (kg)	Item Code
210 End Cap	1	DR696310
260 End Cap	1	DR697310
310 End Cap	1	DR698310
360 End Cap	1	DR699310
210 Cap Outlet	2	DR696320
260 Cap Outlet	2	DR697320
310 Cap Outlet	2	DR698320
360 Cap Outlet	3	DR699320

E Outfalls & Access Covers

Outfalls & Access Covers	Unit Weight (kg)	Item Code
Traffic Drain Cast Iron Access C&F	34	DR6950100
Inline Side Outfall	150	DR689000
Inline End Outfall	142	DR689010
Silt Box	72	DR689910

F Cover Plates

Cover Plates	Unit Weight (kg)	Item Code
Cover Plate 500 mm	6	DR691030
Cover Plate 1000 mm	12	DR691040
Cover Plate 30/10	6	DR691050
Cover Plate 9/6	6	DR691060

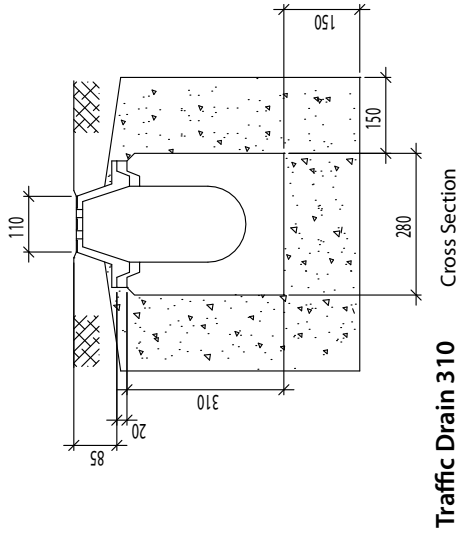
Mini Beany to Traffic Drain

Mini Beany can be used with Traffic Drain where the drainage run continues but the kerb line finishes. A smooth channel invert ensures undisturbed flow.

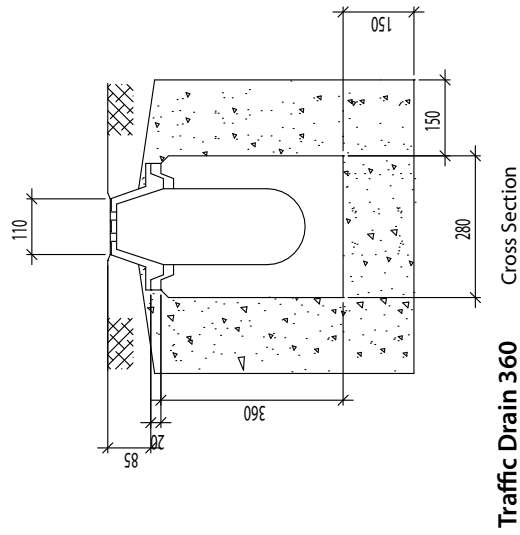
Traffic Drain with reference numbers indicated in **bold** black are available ex-stock. Traffic Drain with reference numbers indicated in light are manufactured to order. Contact our sales office to discuss your requirements.

Standard Details

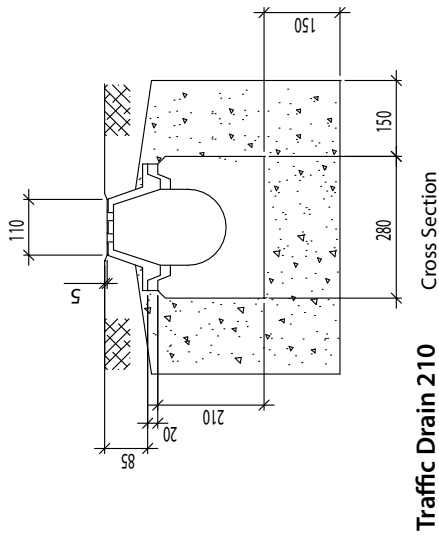
Drawing 1 of 5



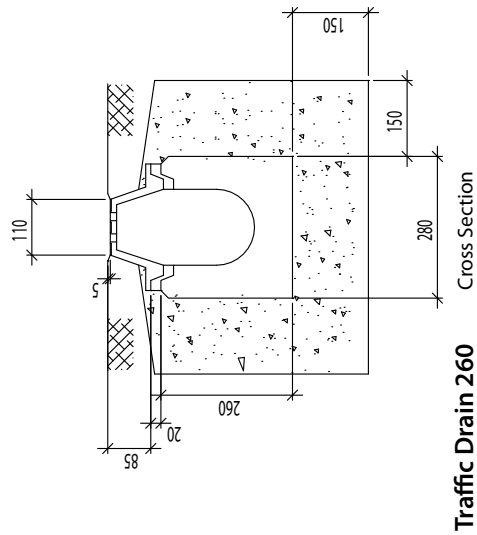
Traffic Drain 310



Traffic Drain 360



Traffic Drain 210

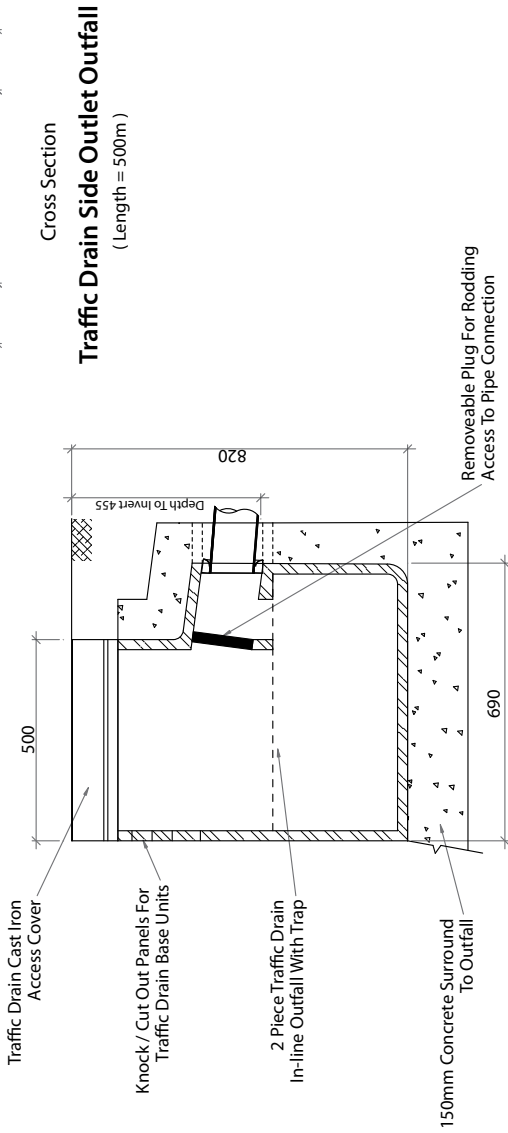
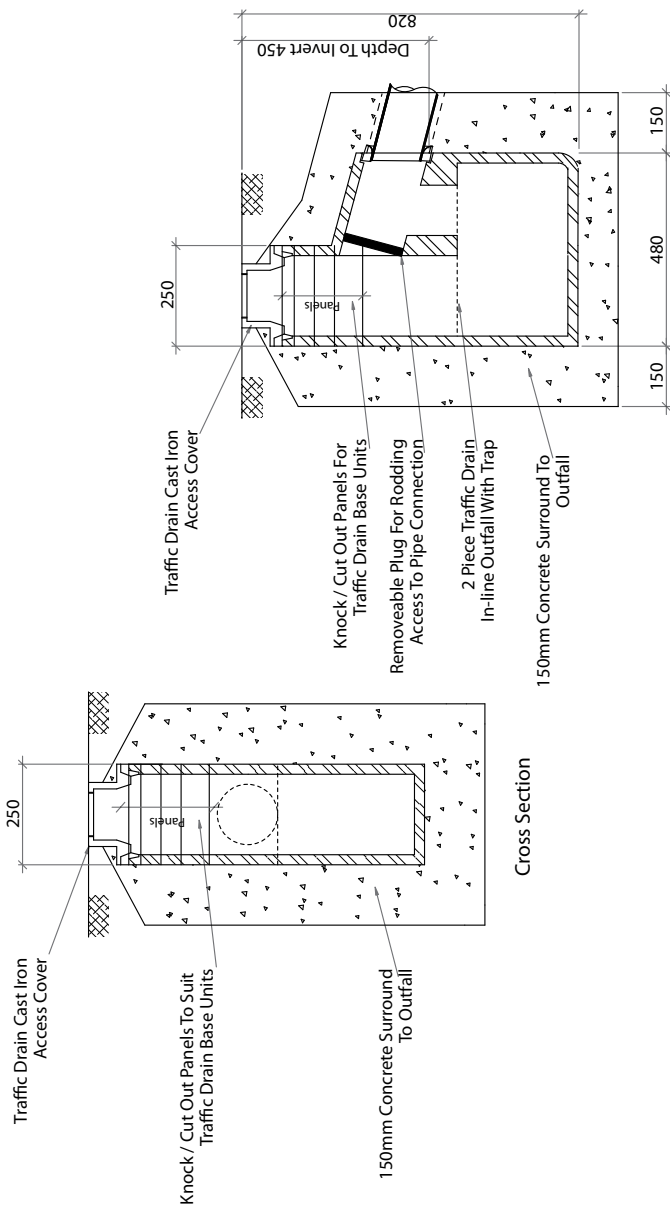
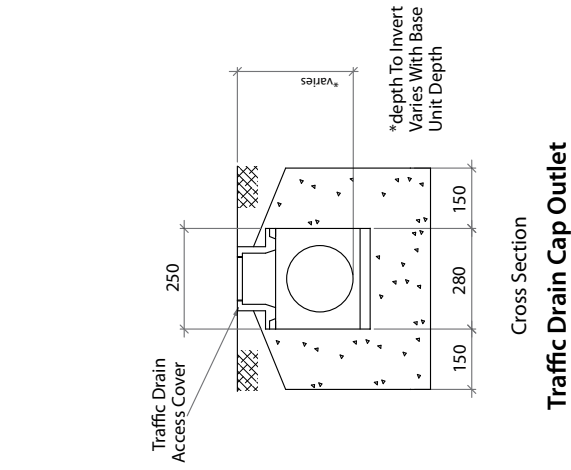


Traffic Drain 260

Base Unit Length = 1000mm
Top Unit Length = 500mm

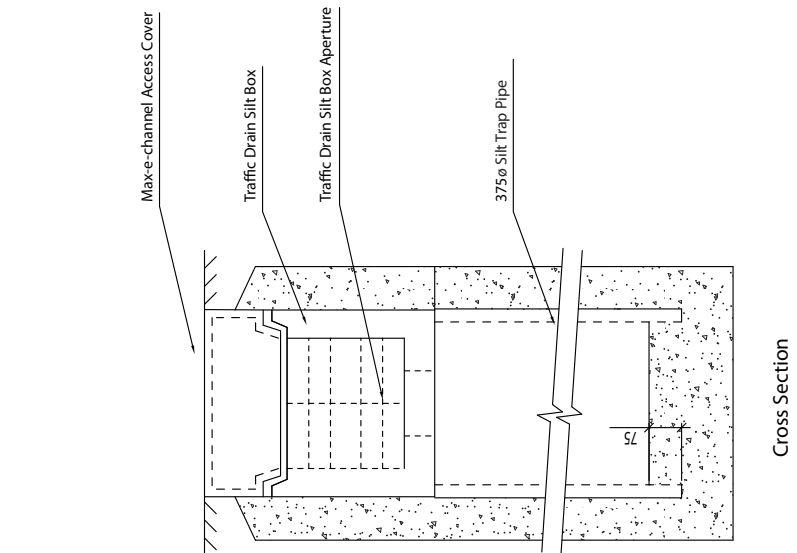
Standard Details

Drawing 2 of 5

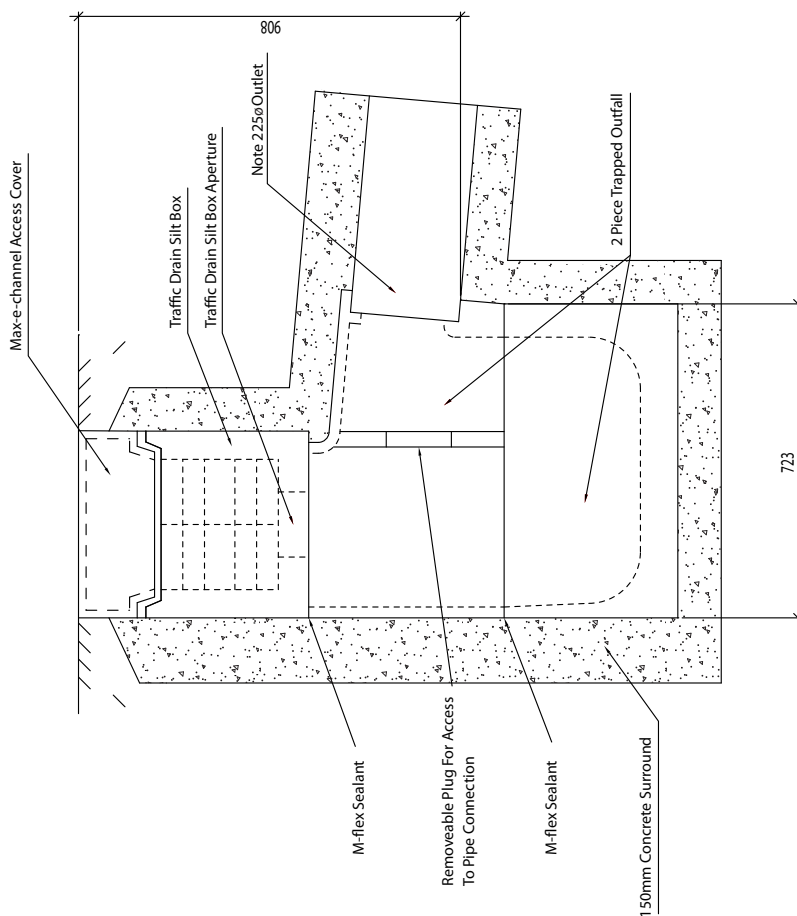


Standard Details

Drawing 3 of 5



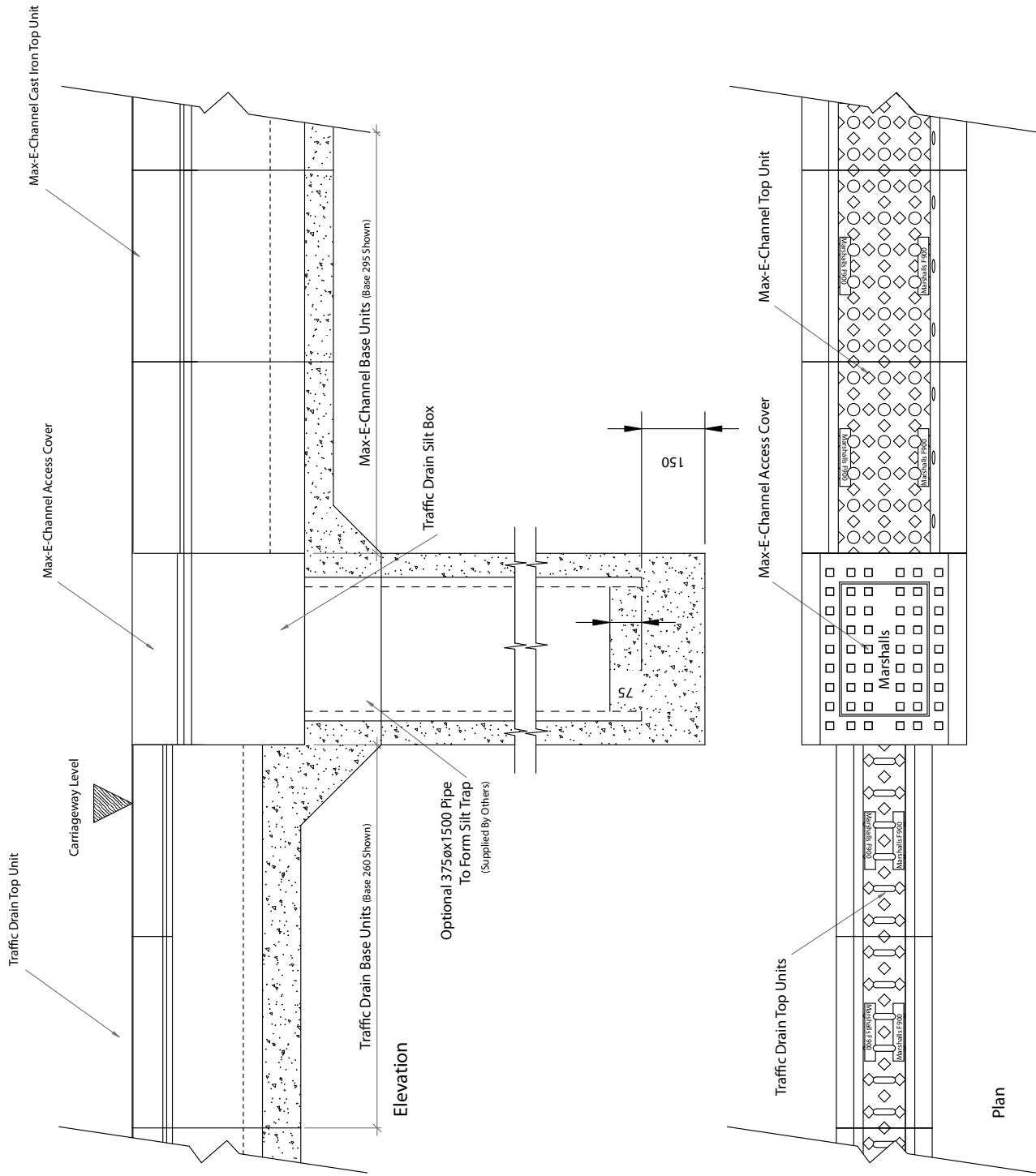
Cross Section
Traffic Drain Silt Trap Assembly



Cross Section
Traffic Drain Trapped Gully

Standard Details

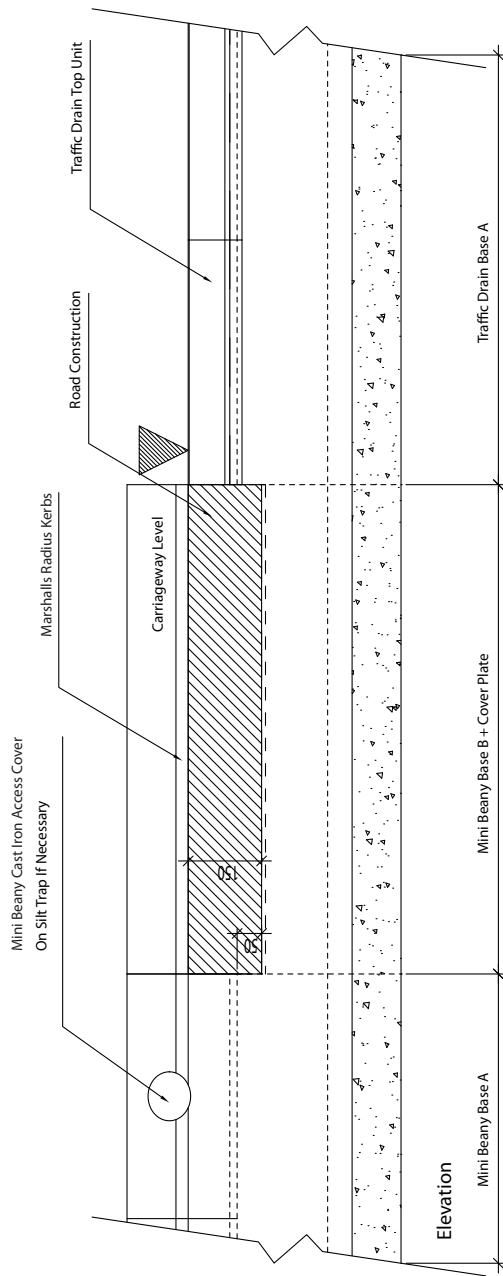
Drawing 4 of 5



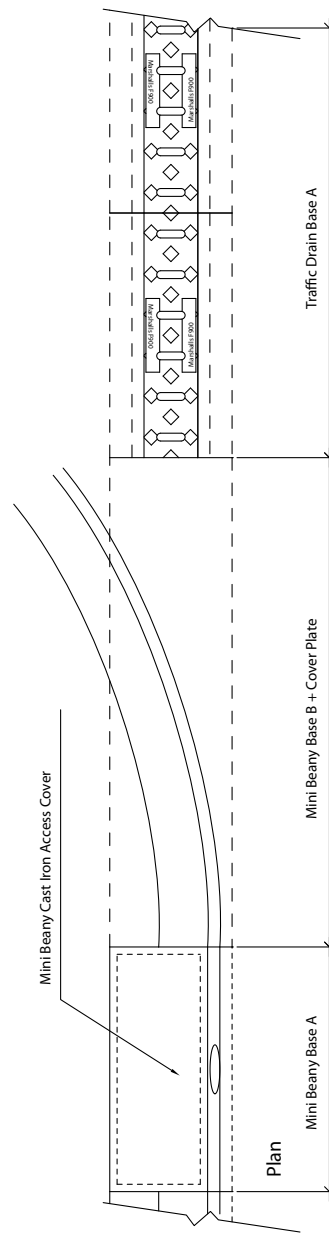
Traffic Drain To Max-E-Channel - On-line Transition

Standard Details

Drawing 5 of 5



Base Depths	
Base Depth A	Base Depth B
260	210
310	260
360	310



Mini Beany To Traffic Drain Vehicle Crossing

Standard Details

Specification

Notes For Traffic Drain

Drawings 1 to 5

1. Mortars shall be;
 - i) A Mortar class 12 cement mortar to BS EN 998-2 for bedding of the Cast Iron Top Units for applications up to Load Classification D400 to BS EN 1433
 - ii) Marshalls' M-Bond epoxy mortar for bedding of Cast Iron Top Units for applications E600 and F900 to BS EN 1433
 - iii) Marshalls' M-Flex for bedding the sections of the Traffic Drain High Capacity Outfall
2. Concrete bed, haunch and surround shall be;
 - i) A C20/25 concrete to BS 8500-1&2 and BS EN 206-1 for applications up to Load Classification C250 to BS EN 1433
 - ii) A C25/30 concrete to BS 8500-1&2 and BS EN 206-1 for applications up to Load Classification F900 to BS EN 1433
 - iii) A mix ST4 concrete to BS 8500-1&2 and BS EN 206-1 for Outfalls and Silt Trap details
 - iv) The specification for carrier pipe concrete surround is by others
3. Marshalls' vertical joint sealant, M-Seal, shall be applied to all Base Channels.
4. Movement joint details that fully isolate the Traffic Drain whilst maintaining restraint shall be provided adjacent to all concrete slabs, even when the slab is covered by other materials.
5. When used in conjunction with the Mini Beany system, Traffic Drain base channels are the same as Mini Beany base channels.
6. All dimensions are in millimetres.

Introduction

The following specification covers the complete Traffic Drain system including ancillary fittings and is compatible with the Standard Detail sheets.

Where the Manual of Contract Documents for Highway Works is used, information for "Appendix 5/6: Linear Drainage Systems" is available on request.

Traffic Drain

1. The linear drainage system shall be Traffic Drain, manufactured in pre-cast concrete and cast iron as supplied by Marshalls, Halifax HX5 9HT in accordance with Standard Detail Sheets.
2. The linear drainage system shall consist of a two part system with cast iron top units together with base units that are **210/260/310/360mm*** deep. The overall width of the system shall be not less than 280mm.
3. All components of the Traffic Drain system, shall comply with the British Standard BS EN1433:2002, Load Classification F900 and the as following:
 - (i) Cast iron top units with inclined side walls.
 - (ii) The system shall have a minimum of 10,200mm²/m water inlet aperture area.
 - (iii) The top unit shall be bonded to the base units using Marshalls' M-Bond mortar.
 - (iv) When installed, the minimum depth of construction above the top of the base unit to the drained area surface level shall be not less than 125mm.
4. The linear drainage system comprising straight top and base units, outfalls, silt traps, access covers, junctions, end caps and sealant shall be installed to the line and levels indicated in the contract documents and in accordance with the manufacturer's instructions and Standard Details.

Note: * delete as required

Construction

Introduction

Installation of the traffic drain linear drainage system should be carried out in accordance with the specification and standard detail sheets. The following method of installation is recommended.

Excavation

Sufficient material should be excavated to accommodate top and base units, concrete bedding and haunching, any 'soft spots' or poorly compacted formation should be made good.

Setting out

Setting out pins should be accurately located, with a string line level with the top front corners of the base units. Pins can be located to the rear of the units to avoid having to lift the units over the string line.

Base units

Starting at the outfall, i.e. Working uphill, the units should be bedded on to a freshly mixed foundation of the appropriate grade and thickness of concrete (refer to standard detail sheet).

Concrete bed, haunch and surround shall be:

- A C20/25 concrete to BS 8500-1&2 and BS EN 206-1 for applications up to load classification C250 to bs en 1433
- A C25/30 concrete to BS 8500-1&2 and BS EN 206-1 for applications up to load classification F900 to BS EN 1433
- A mix ST4 concrete to bs 8500-1&2 and BS EN 206-1 for Max-E-Channel trapped gullies, silt traps and outfall details
- The specification for carrier pipe concrete surround is by others

Alternatively, the units may be bedded on to a layer of cement mortar 10-40mm thick on a previously prepared concrete foundation.

Jointing of adjacent units shall be carried out during installation. Marshalls' M-Seal sealant should be trowel applied to the face of the channel. Surplus sealant shall be removed from the inner surface of the units as work proceeds.

One drum of M-Seal is sufficient to seal the following.

M-Seal Requirement	
Base Type	Coverage (lin.m/18l)
210	240
260	185
310	150
360	125

Where cutting is necessary, one or two base units shall be cut so that no single base unit is less than 350mm in length. All cutting and trimming of the units shall be carried out with a concrete saw or disc cutter.

At the termination of traffic drain runs, not located at outfalls, the base units shall be closed using galvanised steel end caps as detailed in the standard detail sheets.

Top units

The string line should be set to the level of the top front corner of the units.

Again, starting at the outfall, the units should be set directly onto a liberal quantity of stiff, cement mortar (or M-bond epoxy mortar* where specified) to completely fill the whole of the joint. Cement mortar shall be class 12 in accordance with BS EN 998-2. These should be tamped into position close to previously laid units and the alignment checked. The levels should

be checked using the string line and a spirit level. In addition, the general alignment should be checked from all directions as each unit is laid. Surplus mortar shall be removed from the units as work proceeds.

Top units shall be laid with the top of the unit 5mm below the final pavement level.

The inside and outside of the joints between base and top units should be pointed and cleaned out with a brush or rag as work proceeds.

Top units shall not be cut.

* M-bond epoxy mortar coverage approximately 7.5l/m per 25 litres

Notes

1. In order to obtain a 'good line', it is very important to lay the top units on the specified thickness of compacted mortar using the string line and base units as a guide. Too thin a layer of mortar will not allow sufficient sideways movement of the units to achieve an acceptable alignment.
2. It is not necessary for top and base unit vertical joints to line up.
3. Where traffic drain is laid on or adjacent to existing or proposed concrete slabs, transverse joints shall be formed within the units and haunching adjacent to the slab joints and also longitudinal movement joints between the haunching and the slabs. Where necessary, top unit drainage apertures shall be protected against the ingress of material during concreting operations.
4. Outfalls, silt traps and access covers shall be constructed in accordance with the standard detail sheet. In silt traps, the pipe shall be bedded into mix ST4 concrete which shall be fully compacted to make a watertight seal.
5. In situ concrete haunching or surround should not be placed until the installed blocks have been inspected and approved by the engineer. The haunching/surrounding should be carried out as one operation to complete lines of top and base units in accordance with the standard detail sheet
6. Adjacent carriageway and/or footway construction shall not be commenced within 3 days of any jointing or haunching/surrounding concrete being placed. Base units and outfalls, not covered by fully bedded top units or covers and frames, and shall be adequately supported against loadings imposed by construction traffic.
7. On completion of the works, the traffic drain system shall be cleaned out by high pressure water jetting (100-150 bar at 200 l/min minimum) and left free from obstructions and all outfalls and silt traps shall be emptied. Top unit drainage apertures shall be covered by timber boards or other approved method, during jetting operations. The cleaning process shall be repeated where necessary after the completion of any remedial works.
8. Installation operations should be discontinued if weather conditions are such that the performance of the inspection chamber may be jeopardised.

Installation should not be undertaken when the temperature is below 3 degrees on a falling thermometer and below 1 degree on a rising thermometer.
9. All necessary personal protective equipment (PPE) should be worn on site, as the site rules dictate. Goggles, ear protection, dust masks and protective footwear must always be worn whenever cutting operations are undertaken.

