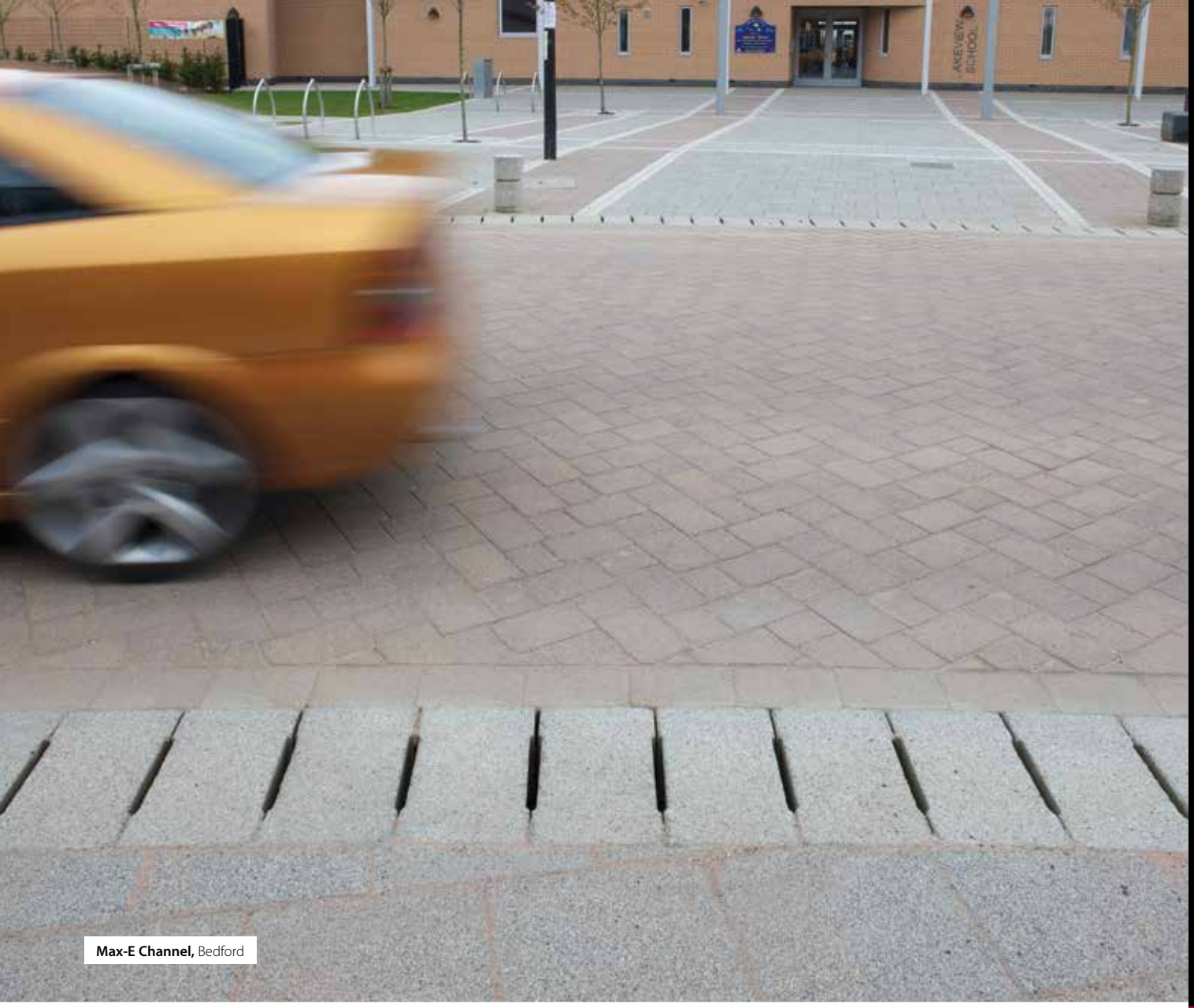


Max-E Channel, Bedford

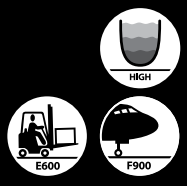
Conservation Silver Grey

Standard Grey & Reinforced Standard Grey

Cast Iron

Max-E Channel

Concrete Drainage System



Max-E Channel is a high capacity system that complements the Beany range to ensure continuity between kerb and top units. The range of different concrete top units offered in a variety of colours and finishes complements any aesthetic. A cast iron top option completes the range and provides a solution for the highest loading classification. Max-E Channel is fully compatible with the full range of Beany junctions, outfalls and other ancillary units.

NBS Plus

Q10 170

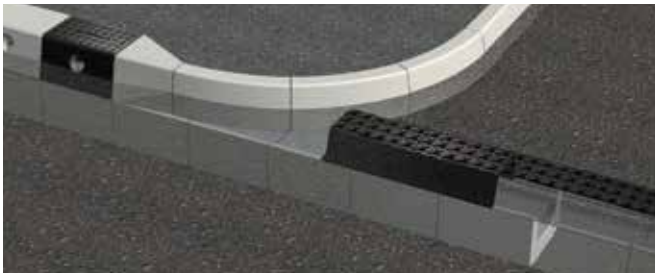
Max-E Channel

Concrete Drainage System

- Max-E-Channel utilises the same base units as the Beany Block system combining with Max-E-Channel top units to form a linear drainage system which is laid level with the pavement surface. This high flow capacity system offers the choice of top units of various materials and load classifications.
- Max-E-Channel top units come in the following materials:
  – Hydraulically pressed concrete
  – Hydraulically pressed reinforced concrete
  – Fabricated galvanised steel
  – Cast iron
- The appropriate top unit is then bedded onto any of the 4 Beany base units being 205mm, 295mm, 365mm and 630mm
- 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

- The various Top Units are easily interchangeable, ensuring easy transition from one type to another where performance requirements vary within the same scheme.
- As expected Max-E-Channel integrates with the Beany Block Top Units creating a unique system capable of providing continuous drainage of the carriageway at road and vehicular crossings.



Beany to Max-E-Channel (cast iron with holes)

- The introduction of the inlaid Top Units offers all the advantages of this high capacity system yet creates a discrete surface to be incorporated into the most aesthetic of landscape schemes.
- Concrete Top Units are available as standard in a natural pimple finish although other aesthetically pleasing units are also available.

Load Classifications

- The Max-E-Channel System is strength tested in accordance with BS EN 1433:2002 to the following classes:

Reinforced Concrete	E600
Cast Iron	F900

Access Cover and Frame

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

Max-E-Channel is a high capacity system able to store storm water. Where limitations are placed on outfall capacities, Max-E-Channel can help eliminate the need for storage reservoirs or balancing ponds

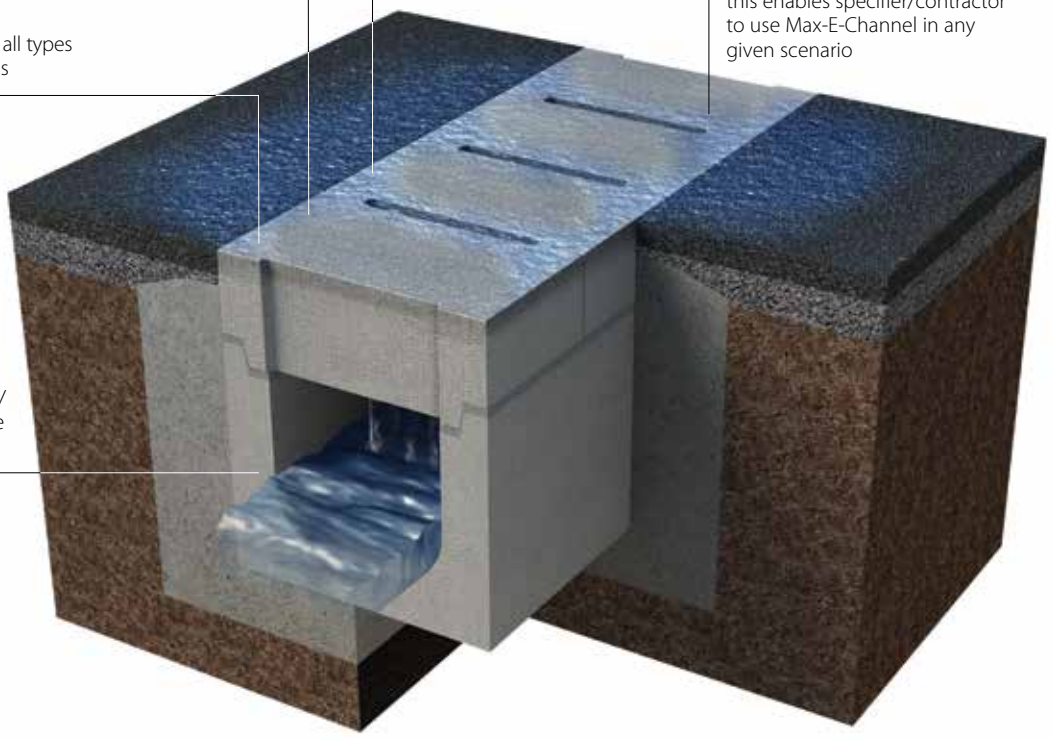
Max-E-Channel System is proven on all types of highway and hard landscape areas

The high inherent strength and durability of the system can:

- Allow complete compaction of surfacing materials adjacent to the channel during construction
- Withstand de-icing salts and freeze/thaw effects reducing maintenance and increasing service life

As Max-E-Channel is compatible with Beany Block, it can be used where continuous drainage of the carriageway is required at vehicular or road crossings

Range of Top Units can be selected in all loading classes, this enables specifier/contractor to use Max-E-Channel in any given scenario



Special Finishes

Conservation and Granite Max-E-Channel

Max-E Channel units are available in the majority of our granite paving ranges or Marshalls concrete Silver-grey to complement areas of high architectural, historical and scenic value. This product complements Marshalls Silver Grey Conservation and granite Paving Kerb and Edging along with Mistral Concrete Block Paving and Conservation Setts.

Textured Max-E-Channel

An exposed aggregate textured finish on the visible faces of the top units is available providing high aesthetic qualities where the granite aggregate finish is not required.

Components

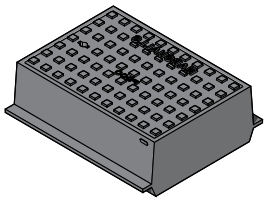
TOP COMPONENTS

Reinforced Concrete E600

- 250mm long hydraulically pressed reinforced concrete.
- Standard natural pimple faced concrete.
- Load classification E600.

Cast Iron F900

- 500mm long cast iron units.
- Ideal for locations subject to fast moving traffic.
- Load classification F900.



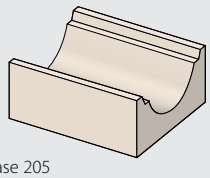
Max-E-Channel Access Cover

- Cast Iron Access Covers and Frames are available for use at outfalls, silt traps and access points.
- A full depth unit compatible with all top units.
- End hinged for ease of access and security.
- Large access opening for the easy emptying of silt traps and outfall sumps.
- Refer to Marshalls Drainage Design Guide for design advice and detailing.
- Load classification F900.

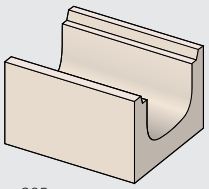
BASE COMPONENTS

All Base Units, Ancillary Items and Transition Units are 500mm long

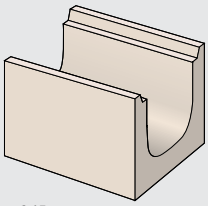
Base Units



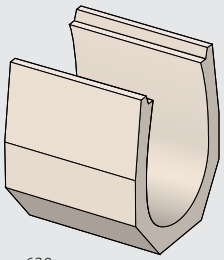
Base 205



Base 295

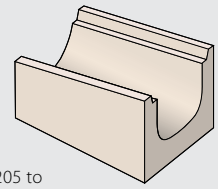


Base 365

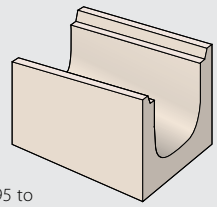


Base 630

Transition Units

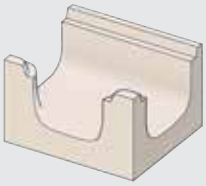


205 to
295 Transition

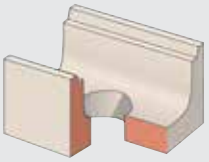


295 to
365 Transition

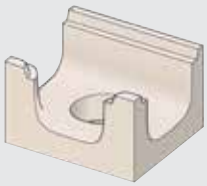
Ancillary Items



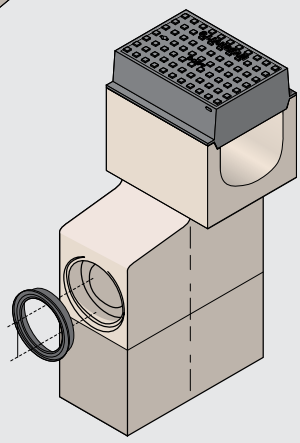
Junction
For base 205 & 295



Outfall (shown sectioned for illustrative purposes)
For bases 205, 295 and 365



Junction/Outfall
For bases 205 and 295

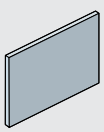


Gully Outfall

A trapped outfall is available to suit either 150mm or 225mm diameter outfall pipe.
Note: Gully Outfall does not include base outfall or access cover and frame.

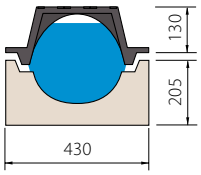
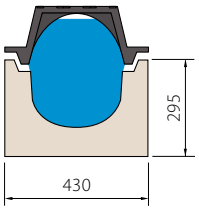
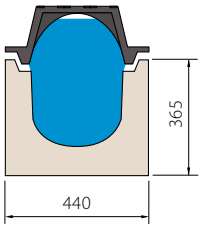
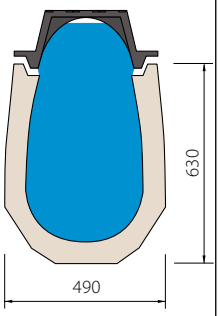
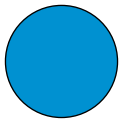
Base End Caps

Base End Caps are available for 205, 295 and 365 base units. The galvanised steel plates act as permanent formwork to a concrete surround. This is an optional detail to the use of engineering bricks, see the Drainage Design Guide.

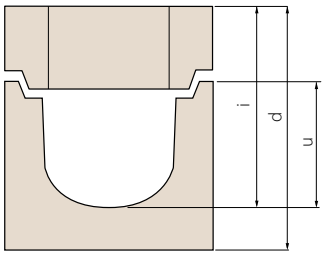


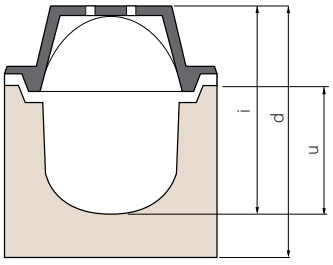
Hydraulic Data

FLOW CAPACITY

Max-E-Channel Cast Iron Top with 205 Base Unit	Max-E-Channel Cast Iron Top with 295 Base Unit	Max-E-Channel Cast Iron Top with 365 Base Unit	Max-E-Channel Cast Iron Top with 630 Base Unit
			
			
Equivalent Pipe Diameter (mm) 225	Equivalent Pipe Diameter (mm) 300	Equivalent Pipe Diameter (mm) 350	Equivalent Pipe Diameter (mm) 475

MAX- E CHANNEL (Concrete or Cast Iron Gratings)





ref.	d	i	u
Base 205	350	280	135
Base 295	440	350	205
Base 365	510	420	275
Base 630	775	700	555

All dimensions measured from grating surface, pavement should be 5mm above this level.

Hydraulic Data

The Max-E-Channel 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.

Max-E-Channel With Cast Iron Top Units

Base 205

Gradient	Zero		1 in 1000		1 in 500		1 in 400		1 in 300		1 in 200		1 in 100		1 in 50	
Length (m)	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	0.45	21	0.53	23	0.58	24	0.60	26	0.65	29	0.73	34	0.85	42	1.05
50	17	0.43	21	0.53	24	0.60	25	0.63	27	0.68	32	0.80	37	0.93	45	1.13
75	15	0.38	20	0.50	24	0.60	26	0.65	29	0.73	34	0.85	39	0.98	47	1.18
100	14	0.35	20	0.50	24	0.60	26	0.65	30	0.75	37	0.93	42	1.05	50	1.25
125	13	0.33	19	0.48	24	0.60	27	0.68	31	0.78	39	0.98	44	1.10	52	1.30
150	12	0.30	19	0.48	25	0.63	28	0.70	32	0.80	42	1.05	47	1.18	55	1.38
175	10	0.25	18	0.45	25	0.63	28	0.70	33	0.83	44	1.10	49	1.23	57	1.43
200	9	0.23	18	0.45	25	0.63	29	0.73	35	0.85	47	1.18	52	1.30	60	1.50

Base 295

Gradient	Zero		1 in 1000		1 in 500		1 in 400		1 in 300		1 in 200		1 in 100		1 in 50	
Length (m)	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	32	0.50	38	0.59	42	0.66	44	0.69	46	0.72	52	0.81	61	0.95	75	1.17
50	31	0.48	37	0.58	42	0.66	45	0.70	48	0.75	55	0.86	64	1.00	78	1.22
75	30	0.47	36	0.56	43	0.67	46	0.72	50	0.78	58	0.91	67	1.05	81	1.27
100	29	0.45	36	0.56	43	0.67	46	0.72	52	0.81	62	0.97	71	1.11	85	1.33
125	27	0.42	35	0.55	43	0.67	47	0.73	54	0.84	66	1.03	74	1.16	88	1.38
150	25	0.39	35	0.55	44	0.69	48	0.75	55	0.86	69	1.08	77	1.20	92	1.44
175	23	0.36	34	0.53	44	0.69	49	0.77	57	0.89	72	1.13	80	1.25	94	1.47
200	21	0.33	33	0.52	44	0.69	50	0.78	58	0.91	76	1.19	84	1.31	98	1.53
225	19	0.30	33	0.52	45	0.70	51	0.80	59	0.92	78	1.22	89	1.39	101	1.58
250	17	0.27	32	0.50	45	0.70	51	0.80	61	0.95	82	1.28	91	1.42	105	1.64
275	16	0.25	31	0.48	45	0.70	52	0.81	63	0.98	85	1.33	94	1.47	109	1.70

Base 365

Gradient	Zero		1 in 1000		1 in 500		1 in 400		1 in 300		1 in 200		1 in 100		1 in 50	
Length (m)	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	46	0.55	54	0.64	59	0.70	61	0.73	65	0.77	72	0.86	84	1.00	104	1.24
50	44	0.52	53	0.63	59	0.70	62	0.74	67	0.80	76	0.90	88	1.05	108	1.29
75	42	0.50	52	0.62	60	0.71	63	0.75	69	0.82	80	0.95	92	1.10	112	1.33
100	40	0.48	51	0.61	60	0.71	64	0.76	70	0.83	84	1.00	95	1.13	116	1.38
125	39	0.46	51	0.61	60	0.71	65	0.77	72	0.86	88	1.05	99	1.18	120	1.43
150	37	0.44	50	0.60	61	0.73	66	0.79	74	0.88	92	1.10	103	1.23	124	1.48
175	35	0.42	49	0.58	61	0.73	67	0.80	76	0.90	94	1.12	107	1.27	127	1.51
200	33	0.39	49	0.58	62	0.74	68	0.81	78	0.93	98	1.17	110	1.31	131	1.56
225	31	0.37	48	0.57	62	0.74	69	0.82	80	0.95	102	1.21	114	1.36	135	1.61
250	29	0.35	47	0.56	62	0.74	70	0.83	81	0.96	108	1.29	118	1.40	138	1.64
275	27	0.32	46	0.55	63	0.75	71	0.85	83	0.99	110	1.31	122	1.45	142	1.69
300	25	0.30	45	0.54	63	0.75	72	0.86	85	1.01	114	1.36	126	1.50	146	1.74
325	24	0.29	45	0.54	63	0.75	73	0.87	87	1.04	118	1.40	130	1.55	150	1.79

Base 630

Gradient	Zero		1 in 1000		1 in 500		1 in 400		1 in 300		1 in 200		1 in 100		1 in 50	
Length (m)	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
50	122	0.67	142	0.78	156	0.85	162	0.89	172	0.94	191	1.04	224	1.22	277	1.51
100	116	0.63	140	0.77	157	0.86	165	0.90	177	0.97	202	1.10	235	1.28	288	1.57
150	110	0.60	138	0.75	158	0.86	168	0.92	182	0.99	213	1.16	246	1.34	299	1.63
200	105	0.57	136	0.74	159	0.87	171	0.93	188	1.03	224	1.22	257	1.40	310	1.69
250	100	0.55	133	0.73	160	0.87	173	0.95	194	1.06	234	1.28	267	1.46	321	1.75
300	95	0.52	130	0.71	162	0.89	176	0.96	199	1.09	245	1.34	278	1.52	332	1.81
350	90	0.49	128	0.70	163	0.89	179	0.98	205	1.12	256	1.40	289	1.58	343	1.87
400	84	0.46	127	0.69	164	0.90	182	0.99	210	1.15	267	1.46	300	1.64	354	1.93
450	78	0.43	125	0.68	165	0.90	184	1.01	215	1.17	278	1.52	311	1.70	365	1.99
500	72	0.39	123	0.67	166	0.91	187	1.02	220	1.20	289	1.58	322	1.76	376	2.05
550	67	0.37	120	0.66	167	0.91	190	1.04	226	1.24	300	1.64	333	1.82	387	2.11
600	62	0.34	118	0.64	168	0.92	193	1.05	231	1.26	311	1.70	344	1.88	397	2.17

Hydraulic Data

Max-E-Channel With Concrete Top Units

Base 205

Gradient	Zero		1 in 1000		1 in 500		1 in 400		1 in 300		1 in 200		1 in 100		1 in 50	
Length (m)	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	9	0.38	11	0.46	12	0.50	13	0.54	14	0.58	17	0.71	19	0.79	24	1.00
50	7	0.29	10	0.42	13	0.54	14	0.58	16	0.67	19	0.79	22	0.92	26	1.08
75	6	0.25	10	0.42	13	0.54	14	0.58	17	0.71	22	0.92	24	1.00	29	1.21
100	5	0.21	9	0.38	13	0.54	15	0.63	18	0.75	24	1.00	27	1.13	31	1.29

Base 295

Gradient	Zero		1 in 1000		1 in 500		1 in 400		1 in 300		1 in 200		1 in 100		1 in 50	
Length (m)	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	22	0.46	26	0.54	29	0.60	31	0.65	33	0.69	37	0.77	44	0.92	54	1.13
50	20	0.42	26	0.54	30	0.63	32	0.67	35	0.73	41	0.85	47	0.98	57	1.19
75	18	0.38	25	0.52	30	0.63	33	0.69	37	0.77	45	0.94	51	1.06	61	1.27
100	17	0.35	24	0.50	31	0.65	34	0.71	38	0.79	48	1.00	55	1.15	65	1.35
125	15	0.31	23	0.48	31	0.65	35	0.73	40	0.83	52	1.08	58	1.21	68	1.42
150	13	0.27	23	0.48	31	0.65	35	0.73	42	0.88	56	1.17	62	1.29	72	1.50
175	11	0.23	22	0.46	32	0.67	36	0.75	44	0.92	59	1.23	66	1.38	76	1.58

Base 365

Gradient	Zero		1 in 1000		1 in 500		1 in 400		1 in 300		1 in 200		1 in 100		1 in 50	
Length (m)	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	35	0.51	41	0.60	46	0.68	47	0.69	50	0.74	56	0.82	66	0.97	81	1.19
50	33	0.49	40	0.59	46	0.68	48	0.71	52	0.76	60	0.88	70	1.03	85	1.25
75	31	0.46	39	0.57	46	0.68	49	0.72	54	0.79	64	0.94	74	1.09	89	1.31
100	29	0.43	39	0.57	47	0.69	50	0.74	56	0.82	68	1.00	78	1.15	93	1.37
125	27	0.40	38	0.56	47	0.69	51	0.75	58	0.85	73	1.07	82	1.21	98	1.44
150	25	0.37	37	0.54	47	0.69	52	0.76	60	0.88	77	1.13	86	1.26	102	1.50
175	23	0.34	36	0.53	48	0.71	53	0.78	62	0.91	81	1.19	90	1.32	106	1.56
200	21	0.31	35	0.51	48	0.71	54	0.79	66	0.97	85	1.25	94	1.38	108	1.59
225	19	0.28	35	0.51	49	0.72	55	0.81	67	0.99	89	1.31	98	1.44	114	1.68

Base 630

Gradient	Zero		1 in 1000		1 in 500		1 in 400		1 in 300		1 in 200		1 in 100		1 in 50	
Length (m)	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
50	108	0.65	126	0.75	139	0.83	145	0.87	154	0.92	172	1.03	201	1.20	249	1.49
100	102	0.61	124	0.74	141	0.84	148	0.89	160	0.96	184	1.10	213	1.28	261	1.56
150	96	0.57	123	0.74	142	0.85	151	0.90	166	0.99	195	1.17	224	1.34	272	1.63
200	90	0.54	120	0.72	143	0.86	154	0.92	171	1.02	207	1.24	236	1.41	284	1.70
250	83	0.50	117	0.70	144	0.86	157	0.94	177	1.06	218	1.31	248	1.49	295	1.77
300	79	0.47	115	0.69	145	0.87	160	0.96	183	1.10	230	1.38	259	1.55	307	1.84
350	73	0.44	113	0.68	146	0.87	163	0.98	188	1.13	241	1.44	271	1.62	318	1.90
400	67	0.40	110	0.66	148	0.89	166	0.99	194	1.16	253	1.52	282	1.69	330	1.98
450	62	0.37	108	0.65	149	0.89	168	1.01	200	1.20	265	1.59	294	1.76	341	2.04
500	56	0.34	106	0.63	150	0.90	171	1.02	205	1.23	276	1.65	305	1.83	353	2.11

Theoretical Outfall Capacities

Outfall Type	Outlet Pipe Diameter (mm)	l/s	m/s
Max-E-Channel Outfall with Base 205	150	36	3.32
Max-E-Channel Outfall with Base 295	150	38	3.52
Max-E-Channel Outfall with Base 365	150	40	3.67
Max-E-Channel Outfall with Base 205	225	82	3.40
Max-E-Channel Outfall with Base 295	225	87	3.60
Max-E-Channel Outfall with Base 365	225	91	3.75

Max-E Channel Component Codes

A Top Units

Top Units	Loading	Length (mm)	Width (mm)	Depth (mm)	Unit Weight (kg)	Item Code
Cast Iron Grate	F900	500	430	165	62	DR975020
Standard Grey Reinforced Concrete Top	E600	250	430	170	39	**DR975810**
Conservation Reinforced Top	E600	250	430	170	36	DR975830

B Constant Depth Channels

Constant Depth Channels	Length (mm)	Width (mm)	Invert Width (mm)	Depth (mm)	Invert Depth (mm)	Unit Weight (kg)	Item Code
Channel 205	500	430	280	205	135	70	**DR720021**
Channel 295	500	430	280	295	205	85	**DR720010**
Channel 365	500	440	280	365	275	96	**DR720030**
Channel 630	500	440/490	280/360	630	555	110	**DR720045**

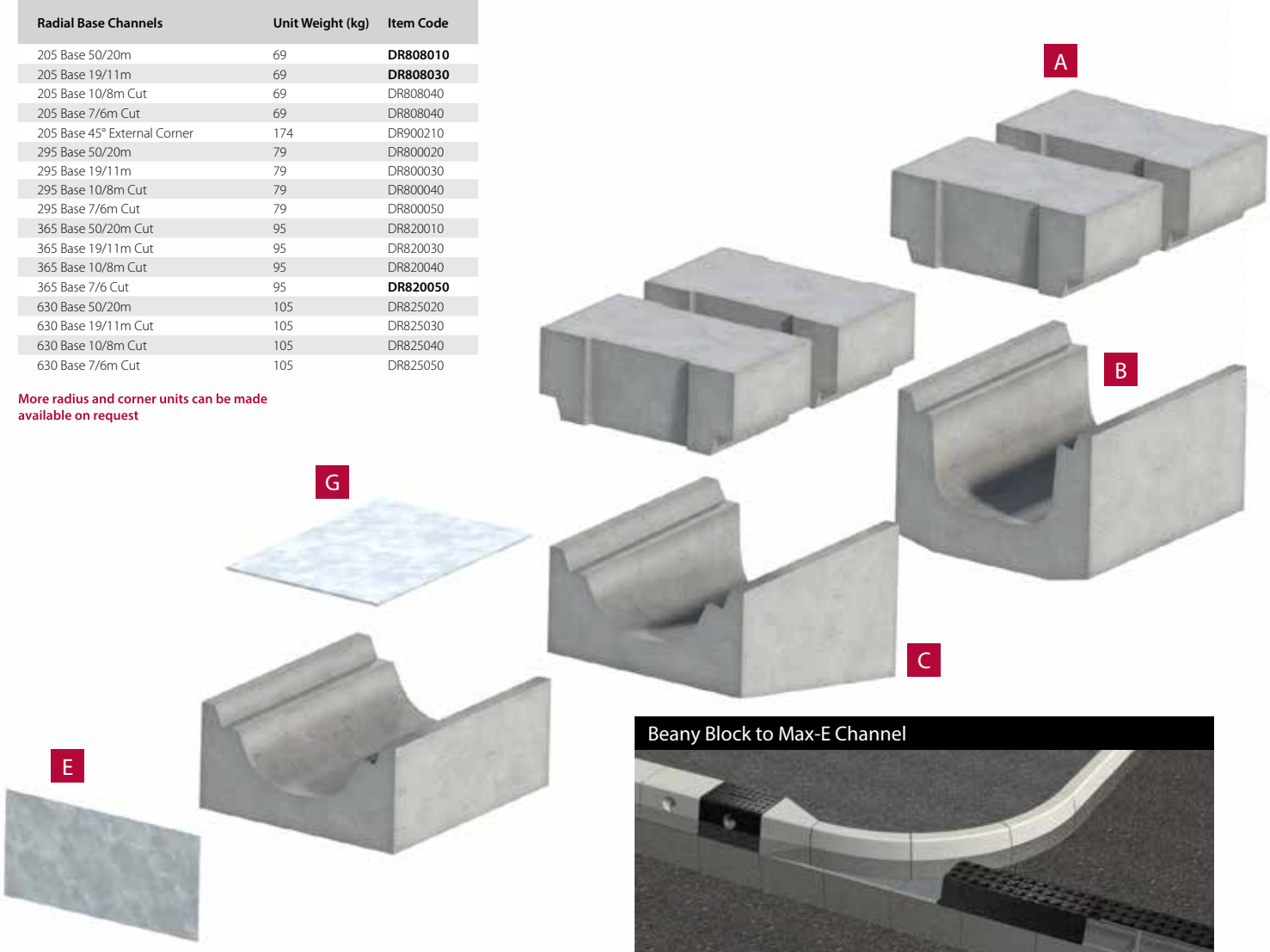
C Transition Channels

Transition Channels	Length (mm)	Width (mm)	Invert Width (mm)	Depth (mm) Upsteam/ Downstream	Invert Depth (mm) Upsteam/ Downstream	Unit Weight (kg)	Item Code
205 - 295	500	430	280	205/295	135/205	100	DR870010
295 - 365	500	430	280	295/365	205/275	87	DR870021

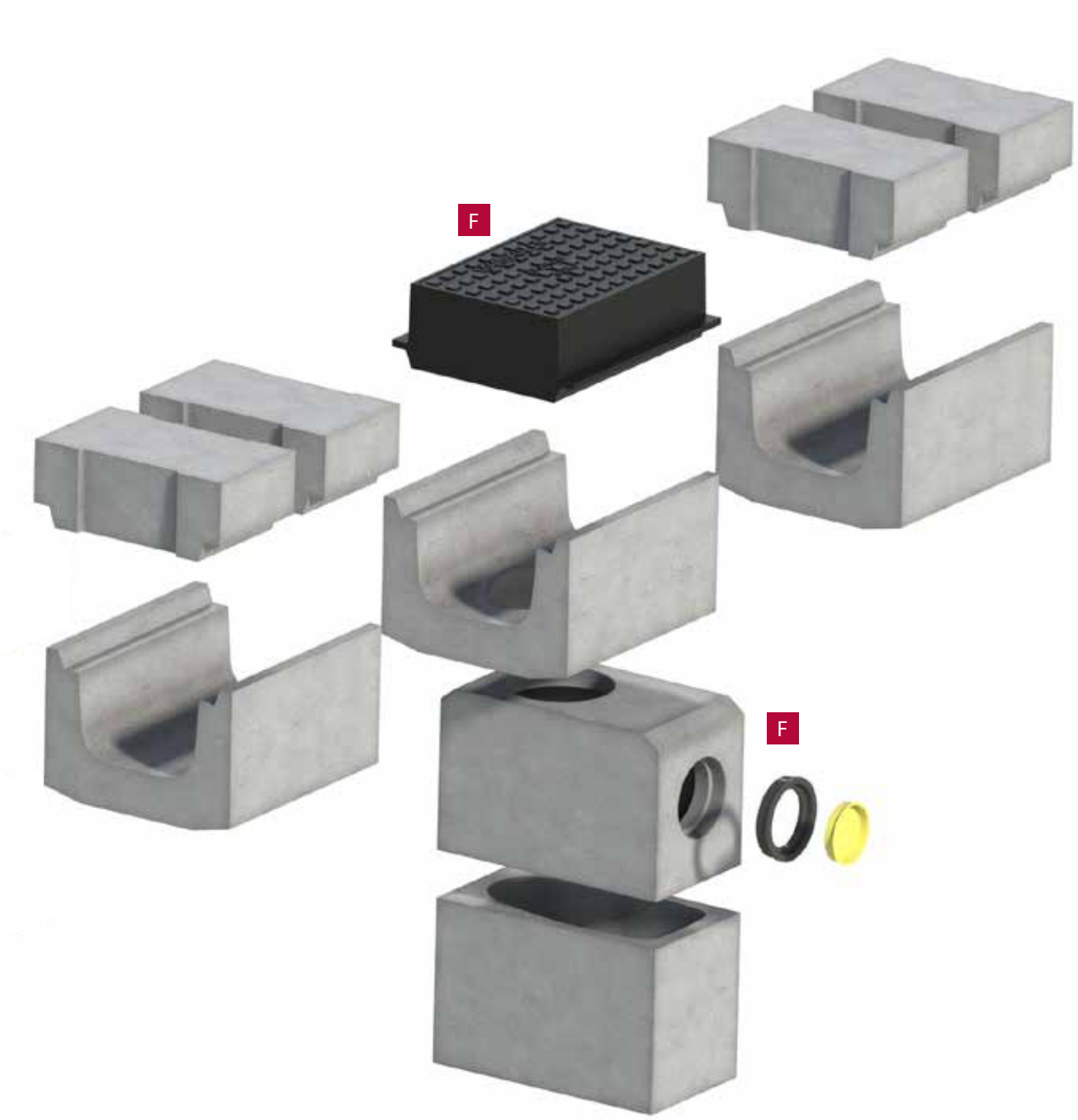
D Radial Channels

Radial Base Channels	Unit Weight (kg)	Item Code
205 Base 50/20m	69	**DR808010**
205 Base 19/11m	69	**DR808030**
205 Base 10/8m Cut	69	DR808040
205 Base 7/6m Cut	69	DR808040
205 Base 45° External Corner	174	DR900210
295 Base 50/20m	79	DR800020
295 Base 19/11m	79	DR800030
295 Base 10/8m Cut	79	DR800040
295 Base 7/6m Cut	79	DR800050
365 Base 50/20m Cut	95	DR820010
365 Base 19/11m Cut	95	DR820030
365 Base 10/8m Cut	95	DR820040
365 Base 7/6 Cut	95	**DR820050**
630 Base 50/20m	105	DR825020
630 Base 19/11m Cut	105	DR825030
630 Base 10/8m Cut	105	DR825040
630 Base 7/6m Cut	105	DR825050

More radius and corner units can be made available on request



Beany Block to Max-E Channel



E End Caps

End Caps	Unit Weight (kg)	Item Code
205 Base End Cap	2.2	**DR7200250**
295 Base End Cap	3	**DR7200150**
365 Base End Cap	3.8	**DR7200350**

F Outfalls & Access Covers

Outfalls & Access Covers	Unit Weight (kg)	Item Code
Max-E Full Depth Access Cover & Frame	85	**DR9800150**
Gully Outfall 225	242	**DR4604060**
Gully Outfall 150	277	**DR4604010**

G Cover Plates

Cover Plates	Unit Weight (kg)	Item Code
Cover Plate Standard	17	**DR910005**
Cover Plate Cut 50/11m	16	DR910010

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

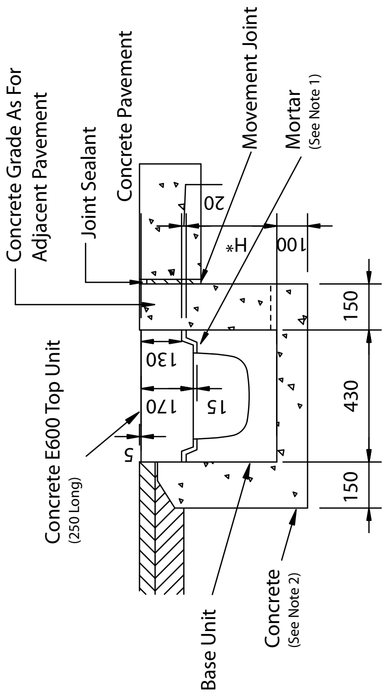
Beany Block to Max-E Channel

Beany can be used with Max-E Channel where the drainage run continues but the kerb line finishes. A smooth channel invert ensures undisturbed flow

Standard Details

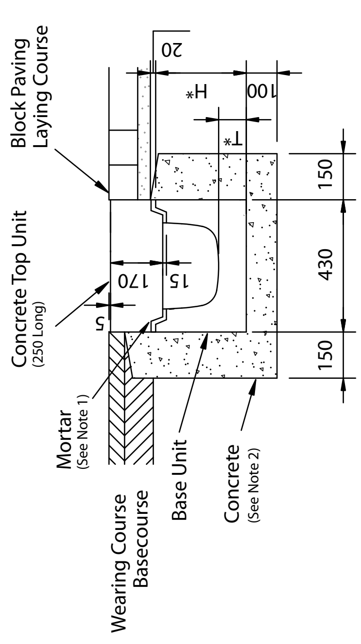
Drawing 1 of 4

*For values of T & H, refer to Beany Block details.



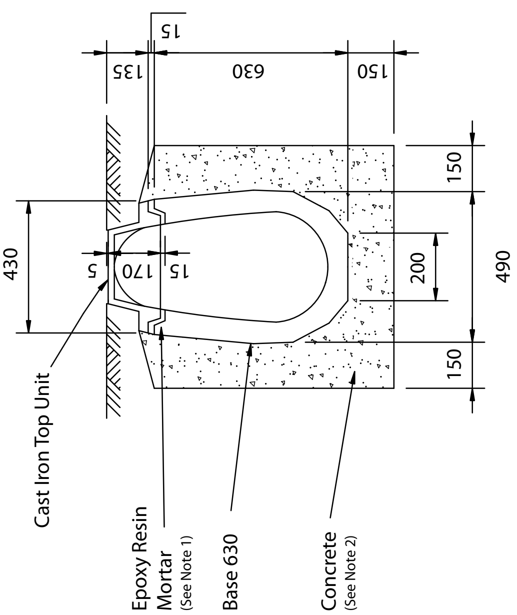
Cross Section

Base Unit & Reinforced Concrete Top Unit (With Flexible Or Concrete Pavement Loading E600)



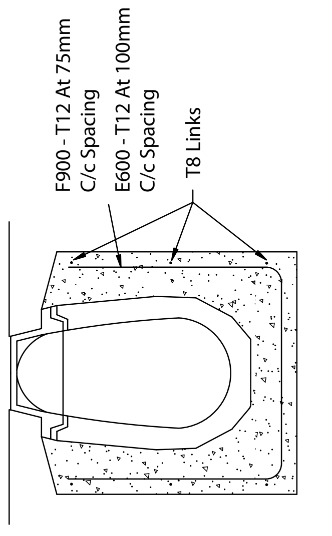
Cross Section

Base Unit & Concrete Top Unit (With Flexible Or Block Paved Surfacing Loading C250)



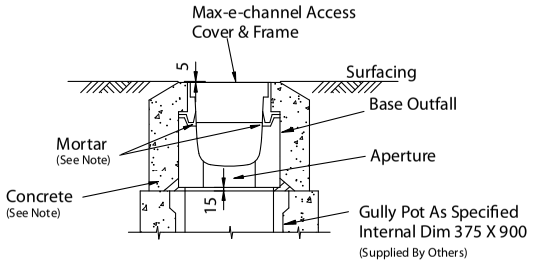
Cross Section

Base 630 & Cast Iron Top Unit (Loading To D400)

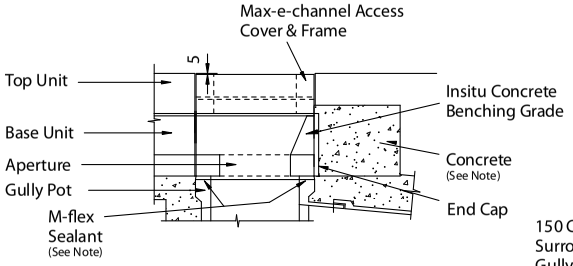


Cross Section

E600 & F900 Applications For Base 630 only

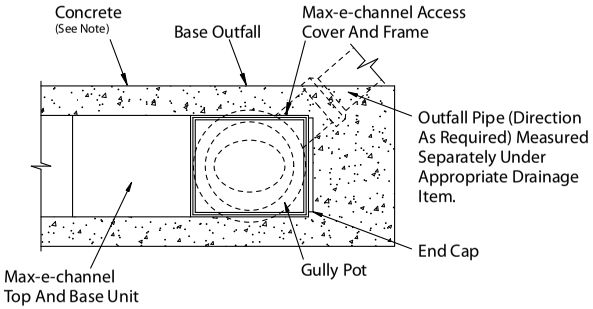


Cross Section

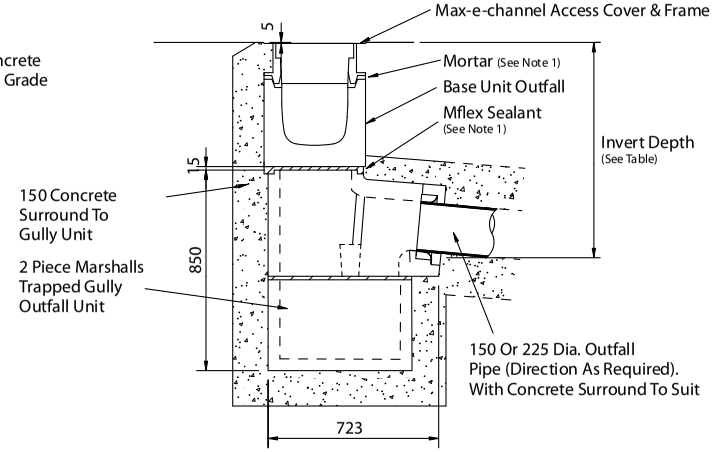


Longitudinal Section

Outfall Using Gully Pot



Plan



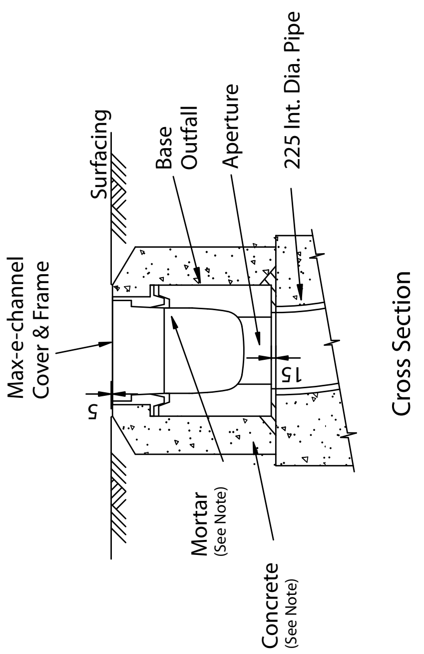
Cross Section

Outfall Using Marshalls Gully Outfall

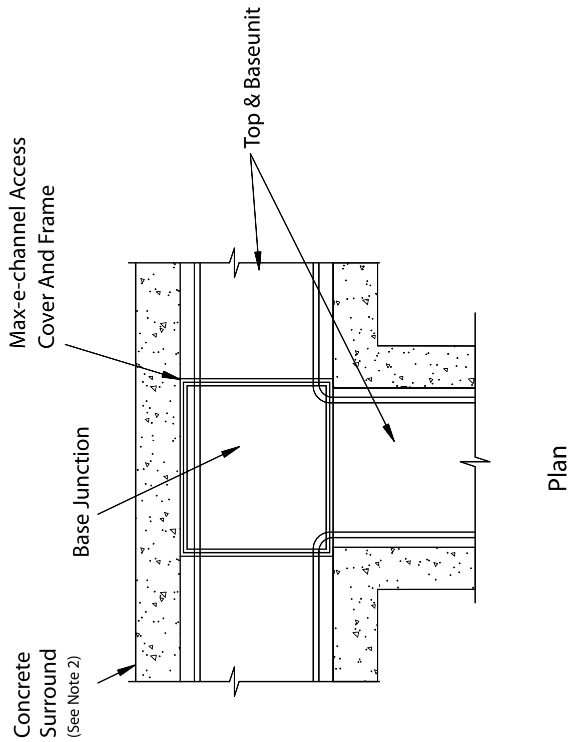
Outfall Pipe Invert Depth From Carriageway Level (Mm)		
Beany Base	150 Ø Outfall	225 Ø Outfall
205	701	738
295	791	828
365	861	898

Standard Details

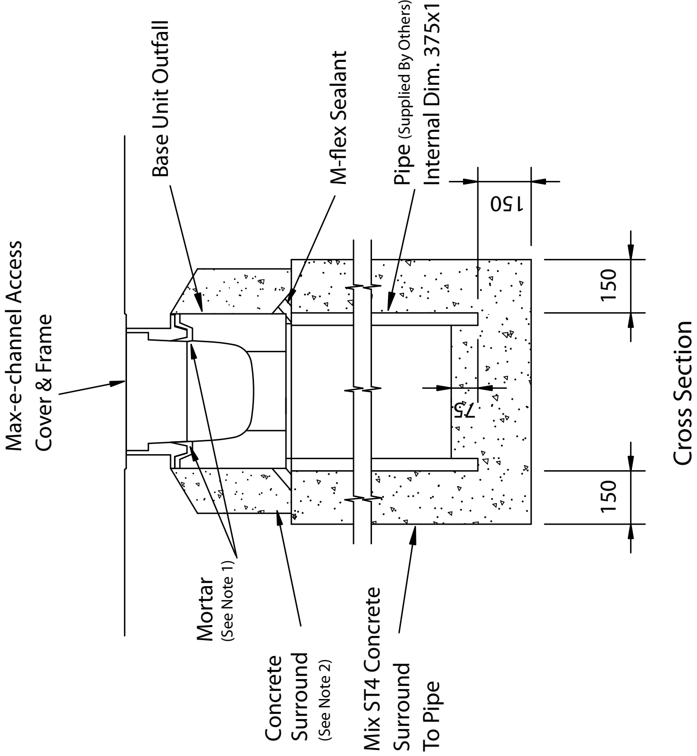
Drawing 3 of 4



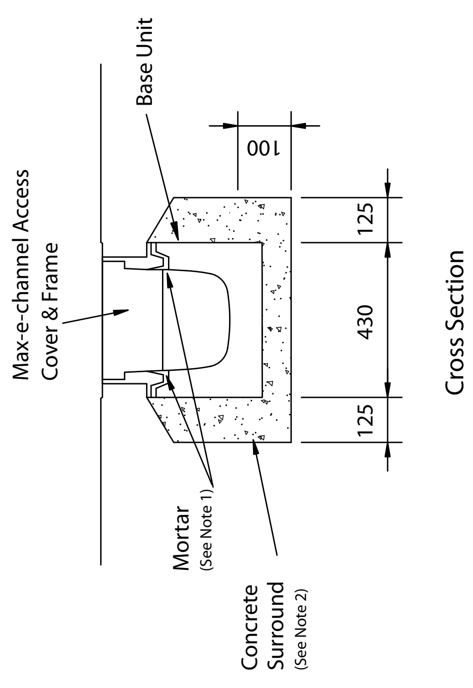
Outfall Direct To 225 Dia. Pipe



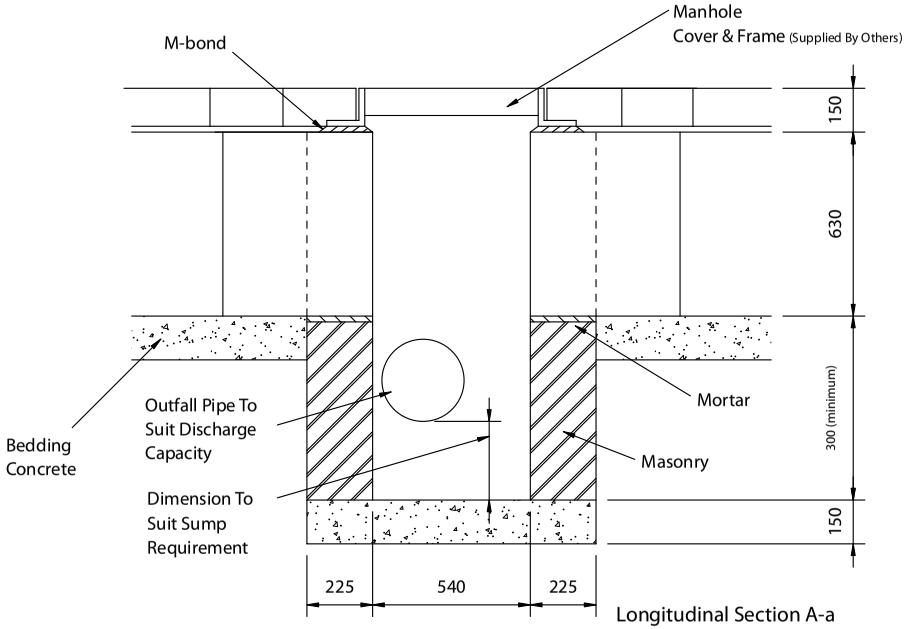
'T' Junction



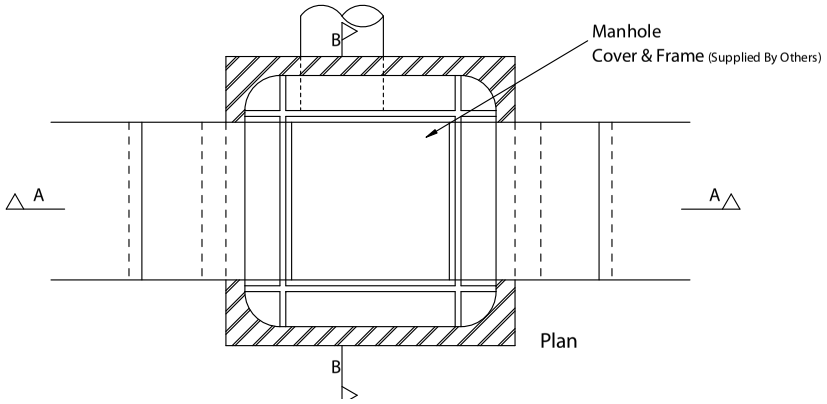
Silt Trap



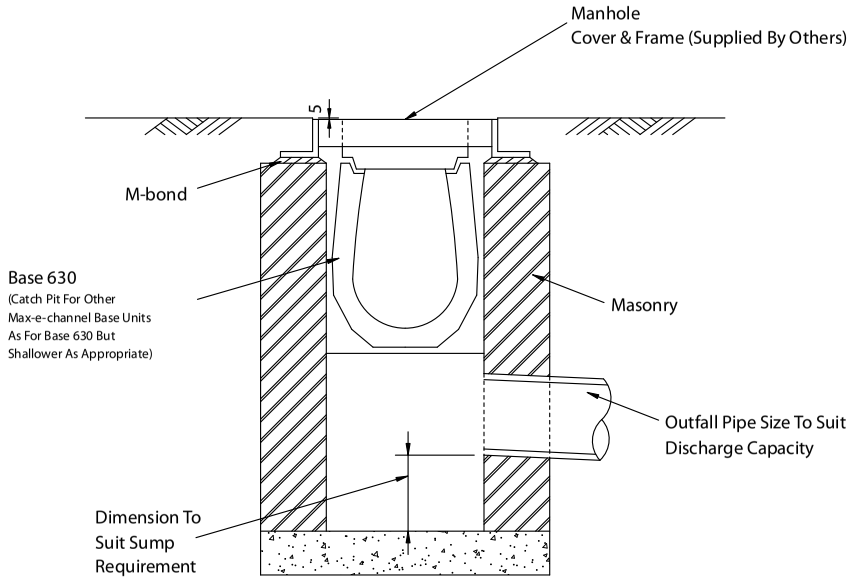
Access Cover



Longitudinal Section A-a



Plan



Cross Section B-b

Max-E-Channel Catchpit/outfall With Base 630

Standard Details

Notes For Max-E-Channel

Drawings 1 to 4

1. Mortars shall be;

i) A Mortar class 12 cement mortar to BS EN 998-2 for bedding of the Concrete 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 and reinforced concrete Top Units for Load Classification E600 and F900

iii) Marshalls' M-Flex for bedding Base Block Outfalls onto the Beany Trapped Gully Unit

iv) Marshalls' M-Flex for bedding the sections of the Marshalls' Trapped Gully Unit sections

2. Concrete bed, haunch and surround shall be;

i) 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

ii) Reinforcement details for Base 630 E600 and F900 applications only are as indicated

iii) A mix ST4 concrete to BS 8500-1&2 and BS EN 206-1 for Beany Trapped Gully, Silt Traps, Catch Pits and outfall 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 Blocks.

4. For Base 630 applications, all Outfalls, Silt Traps and junctions should be formed by a brick Catch Pit structure;

i) The outfall pipe diameter, gradient, depth to invert, depth of trap shall be by others

ii) The internal dimensions of the catch pit shall be 540 wide x 1000 long for Base 630 applications

iii) Corbelled brickwork with a maximum of 22mm steps shall be used to support the Access Cover and Frames

5. Movement joint details that fully isolate the Max-E-Channel whilst maintaining restraint shall be provided adjacent to all concrete slabs, even when the slab is covered by other materials.

6. When used in conjunction with the Beany Block system, Max-E-Channel base units are the same as Beany Block Bases.

7. All dimensions are in millimetres.

Specification

Introduction

The following specification covers the complete Max-E-Channel 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.

Max-E-Channel

1. The linear drainage system shall be Max-E-Channel, manufactured in pre-cast concrete, with the exception of certain fitments of cast iron or galvanised steel 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 consisting of top units of plain concrete/reinforced concrete/ galvanised mild steel/cast iron* together with base units that are 205/295/365/630mm* deep. The overall width of the system is not less than 430mm.

3. All components of the Max-E-Channel system, shall comply with the British Standard BS EN1433, Load Classification as follows:

(i) Reinforced concrete top units to E600*

(ii) Cast iron top units to F900*

4. The system shall have a minimum of 11,200mm^2/m water inlet aperture area.

5. 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 150mm.

6. 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 Max-E-Channel 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:

i) 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

ii) Reinforcement details for Base 630 application E600 and F900 ONLY are as indicated

iii) A mix ST4 concrete to BS 8500-1&2 and BS EN 206-1 for Max-E-Channel Trapped Gullies, Silt Traps, Catch Pits and outfall details

iv) 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.

Sufficient M-Seal bituminous mastic jointing compound should be trowelled on to one or both end faces so that the joint will be well sealed when the next Unit is tamped into position. Surplus sealant shall be removed from the inner surface of the Units as work proceeds.

18 litres of M-Seal should be sufficient for the following length of Max-E-Channel:

M-Seal Requirement	
Base Type	**Coverage (m/18l)**
205	90
295	70
365	55
630	35

Where cutting is necessary, one or two Units shall be cut so that no single Unit is less than 200mm in length. All cutting and trimming of the Units shall be carried out with a concrete saw or disc cutter. Cutting of Base Junctions or Outfall Units is not recommended.

At the termination of Max-E-Channel 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 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.

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 Max-E-Channel 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 using the appropriate type of Base Unit. Units shall be bedded on sufficient M-Flex sealant over a gully pot, Outfall Unit or vertical pipe, to make a watertight joint. Where necessary in-situ concrete benching shall be shaped to the full depth of the Base unit. 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 units 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, Outfalls or Junctions not covered by fully bedded Top Units or covers and frames, shall be adequately supported against loadings imposed by construction traffic.

7. On completion of the works, the Max-E-Channel 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 Max-E-Channel may be jeopardised.

   Installation should not be undertaken when the temperature is below 3°C on a falling thermometer and below 1°C 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.