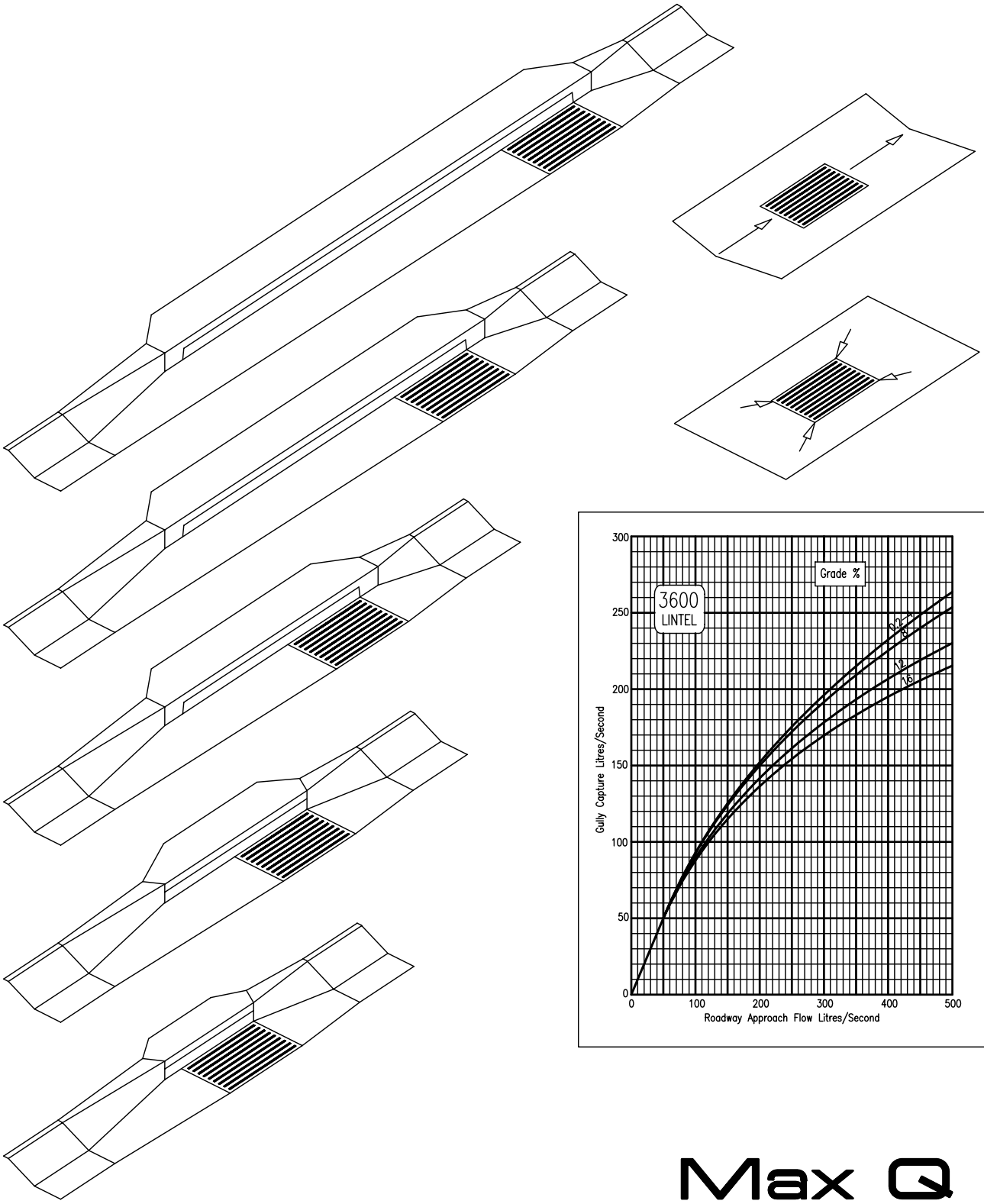
Kerbway

STORMWATER INLET SYSTEM

DESIGN CAPTURE CHARTS



Max Q

KERBWAY

CONTENTS

Note: AutoCAD.dwg files, K1 to F1, may be downloaded from maxq.com.au.

Kerbway is a complete stormwater drainage inlet and manhole system which maintains an intact kerb line in contrast to lip-in-line systems such as *Drainway* and *Stormway*. It is based on the *Manning* grate fully compliant to Class D AS 3996, widely used for over 30 years and well known for being very bicycle friendly and pedestrian friendly to AS 3996 Clause 3.3.5. The 800x500 grate easily complies with AS 2856 and AS 3996 requirements for person entry and the standard 800x700 gully pit permits connection of the normal maximum allowable gully to gully pipe size of 525mm.

Maintenance of an intact kerb line ensures guidance of straying vehicles back into the carriageway and the best protection for pedestrians from straying vehicles mounting the kerb at the setback required for lip-in-line construction. It also removes the risk for pedestrians proceeding along the kerb line, of walking into the setback, which has been the subject of numerous damages claims.

In addition *Manning* grates may be used in conjunction with the look alike *Hazen* 600x300 grate for aesthetically pleasing results and with the *Telford* field inlet grate which fits the same frame as the *Manning* but has increased apertures for improved passage of debris.

KERBWAY
STORMWATER INLET SYSTEM

Introduction
Kerbway is a widely used stormwater inlet system based on 800x500 grates using a standard 800x700 gully pit or a rect-angular inlet man-hole. *Kerbway* safety advantages include:

1. Child safe 90mm kerb inlet openings.
2. Very bicycle and pedestrian friendly *Manning* grate.
3. Vehicle and bike safe kerb-in-line construction.
4. No pedestrian safety risk from setback into the footpath.
5. Work & traffic safety option of inlet-manhole construction.

Other *Kerbway* design advantages include:

1. No kerb transitions with upright kerb, leading to inlet length reduction of up to 2.5m.
2. Five inlet sizes from 1000mm to 4800mm lintel length.
3. Shortest extended kerb inlet – 1600mm lintel.
4. Standard inlet 1000mm overall length.
5. High efficiency capture with bars aligned to the flow.
6. Equivalent capture to most 900x600 grate inlets using up to 140mm kerb opening.

All kerbside inlets have been flow tested using a 90mm kerb opening for child safe inlets to Qudm-2007. The calibration flow range is 330L/s at full scale with curves extrapolated to 500L/s by the test authority. The design is designated *Kerbway* to distinguish it from lip-in-line *Drainway* and *Stormway* inlets. All the inlet capacity charts in this package are based on model testing that incorporates the features listed above.

Hydraulic Modelling
Hydraulic modelling was carried out, at full scale, at the Urban Water Resources Centre, University of South Australia.

Modelling on grade was carried out at 2.5% and 3.3% pavement crossfall with both barrier and mountable kerb.

Sag inlet tests were conducted with the grate covered. Measured sag captures therefore exclude the inflow through the grate which occurs in practice.

Precast Units
The five lintels and inlet top are available as precast units, at competitive prices, from a number of manufacturers. Pits and inlet-manholes are cast in situ, the most economical method of construction for these items.

Inlet Descriptions
Kerbway inlets may be described in terms 'K" for *Kerbway*, the length of the lintel, 'G' for an 800x700 gully pit and 'M' for an inlet-manhole. The five inlets in terms of lintel length and the overall length including transitions are:

Lintel mm	K1000	K1600	K2400	K3600	K4800
Barrier Kerb mm	1000	1600	2400	3600	4800
M'ntable Kerb mm	3000	3600	4400	5000	6200

Construction Details
Construction drawings for *Kerbway* inlets are Dwg K1 for K2400 to 4800 lintels, K2 for the Inlet Manhole, K3 for the 1000 lintel, K4 for the 1600 lintel, and K5&6 for precast manhole top and K6 for Hazen inlets. Kerb transition lengths are:

- Mountable kerb – 1000mm U/S, D/S and in sag.
- Barrier kerb of all types – no transition.

Design Charts
Charts are provided for each of the five lintels described, covering mountable kerb and barrier kerbs of whatever type, cross falls 2.5% and 3.0% and grades 0.5% to 16%. The sag chart covers capture for all kerb types.

Blockage
Blockage factors should be applied to compensate for reduced capture in the field compared with ideal test conditions.

For system design apply Qudm-2007 blockage factors to chart captures as follows:

- Inlet on grade – with grate 0.9
- Inlet in sag – with grate 1.0

Chamber Water Level
To meet test conditions the chamber water level, measured from the D/S channel invert, must not exceed:

Road grade %	Depth to design water level
Sag	0.05m
0.0 to 1%	0.08m
>1% to 3%	0.12m
>3%	0.15m

Where the design chamber water level is ≥300mm below the D/S channel invert the allowable inlet capture on grades over 5% may be increased by 6%.

Child Safety
Kerbway kerb inlet openings are limited to 90mm, a desirable maximum opening to guard against small children being washed into the inlet (Qudm-2007, Sections 7.04.2 (a) (i) and 7.05.3 and Technical Note 7.05.1).

Pedestrian Safety
Pedestrian friendly *Manning* and *Hazen* grates with flat surface and openings <17mm are an acceptable alternatives to covers for use in pedestrian areas (AS 3996-2006 Clause 3.3.5) and roadways in residential areas.

Hydraulic Efficiency
Kerbway, *Manning* and *Hazen* grates, with bars running with the flow exhibit exceptional hydraulically efficiency.

***Hazen* Grate**
The *Hazen* grate is for secondary inlets such as at sag points on intersection turnouts and on grade or wherever small size inlets are required. Design curves are based on full scale tests.

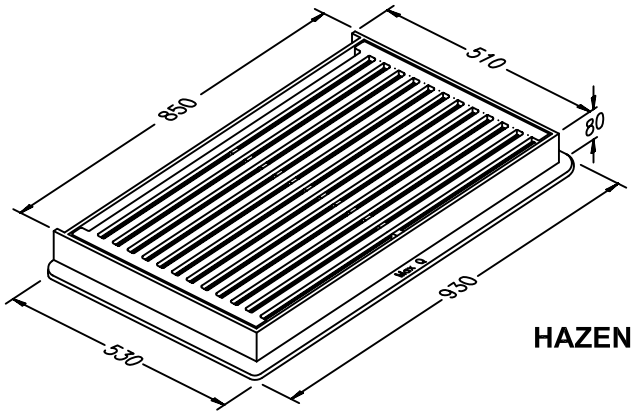
Charts
Kerbway System design charts:

No	Location and Grate Type	Cross-fall
Manning Grates on Grade		
Chart 1	Mountable Kerb	3.3%
Chart 2	Barrier Kerb	3.3%
Manning Grates on Grade		
Chart 3	Mountable Kerb	2.5%
Chart 4	Barrier Kerb	2.5%
Manning Grates in Sag		
Chart 5	All kerb types	All
Centre of Road Inlets		
Chart 6	Manning and Maxflow Grates	2.5 & 3.3%
Field Inlets		
Chart 7	Manning and Telford Grates	NA
Gold Coast City Council Inlets		
Chart 8	Manning Grate	2.5 & 3.3%
Capture Equations		
S10	Barrier Kerb	2.5 & 3.3%
S10	Mountable Kerb	2.5 & 3.3%

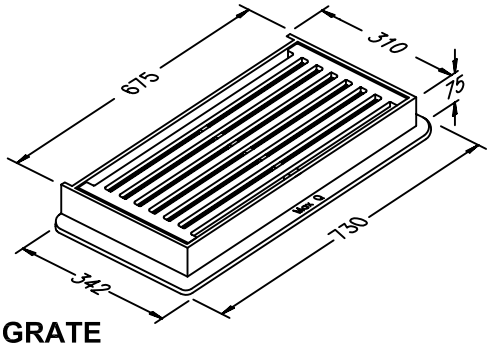
Hazen design charts:

No	Kerb and Channel Type	Cross-fall
Hazen Grate		
Chart 5	Mountable and Barrier	All
Chart 5	Sag capture	All

KERBWAY SYSTEM

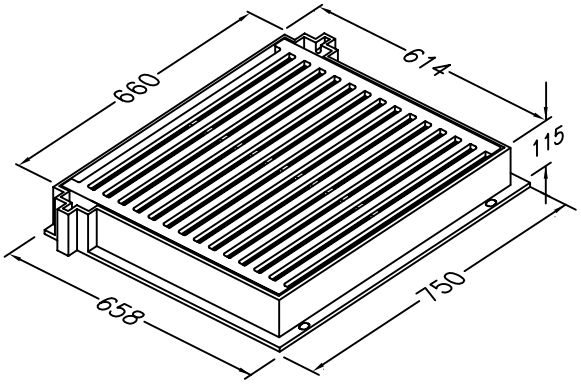


MANNING GRATE

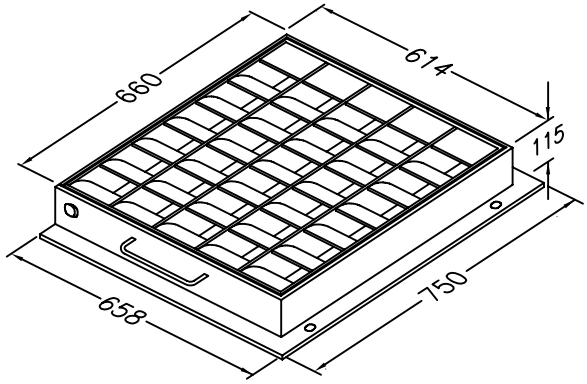


HAZEN GRATE

GRATES FOR GENERAL KERBWAY USE

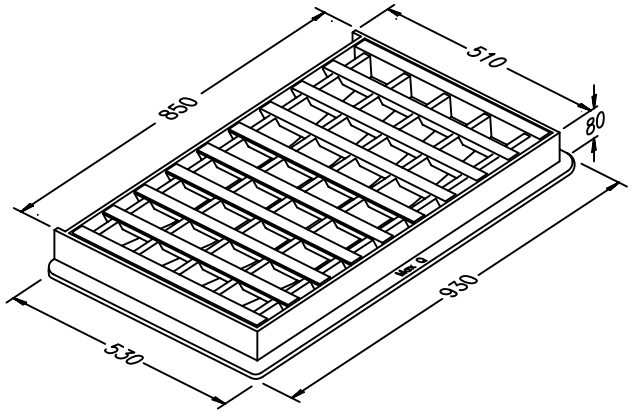


MANNFLOW GRATE

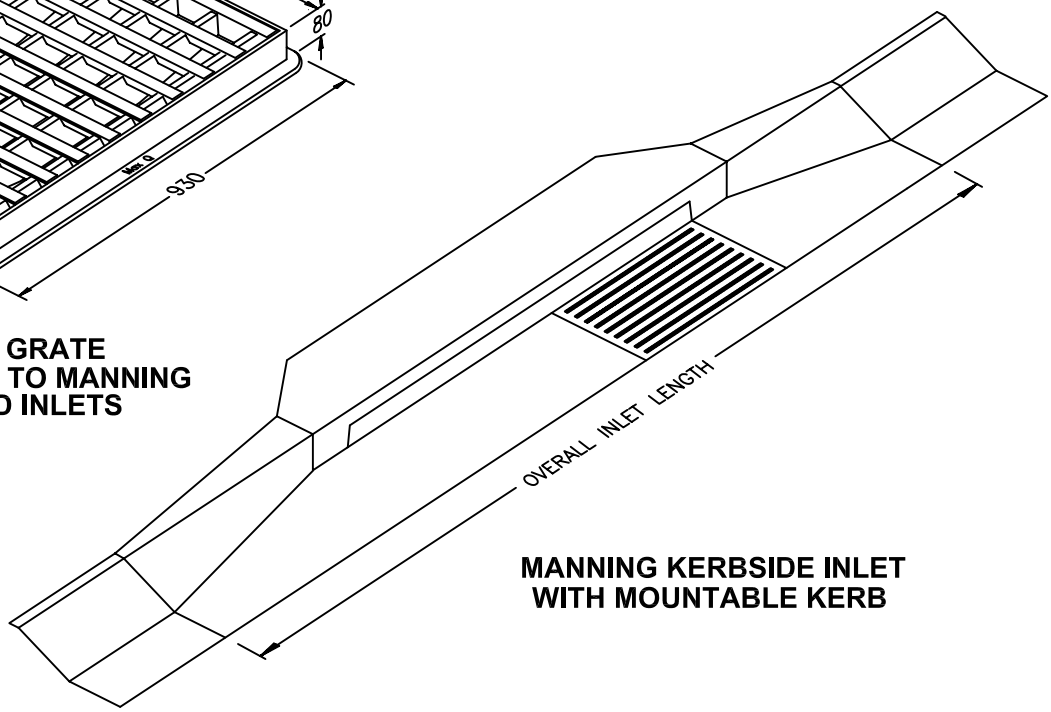


MAXFLOW GRATE

ALTERNATIVE GRATES FOR CENTRE OF ROAD INLETS

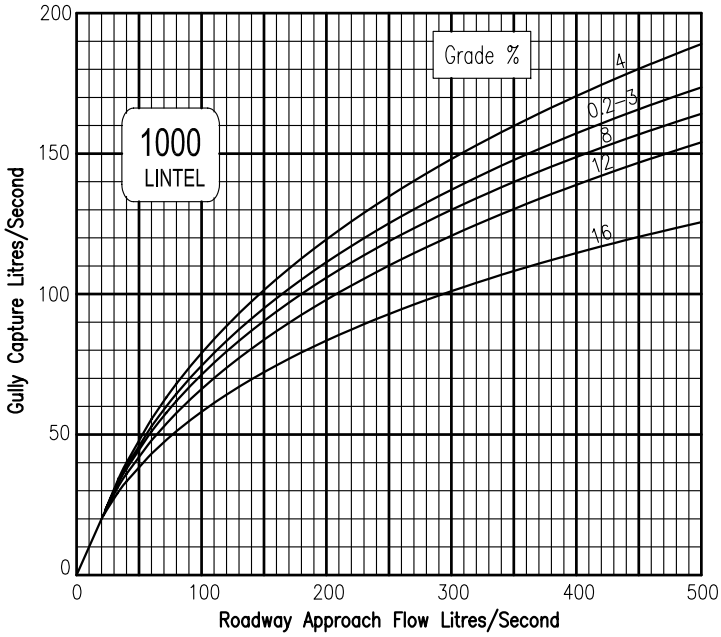


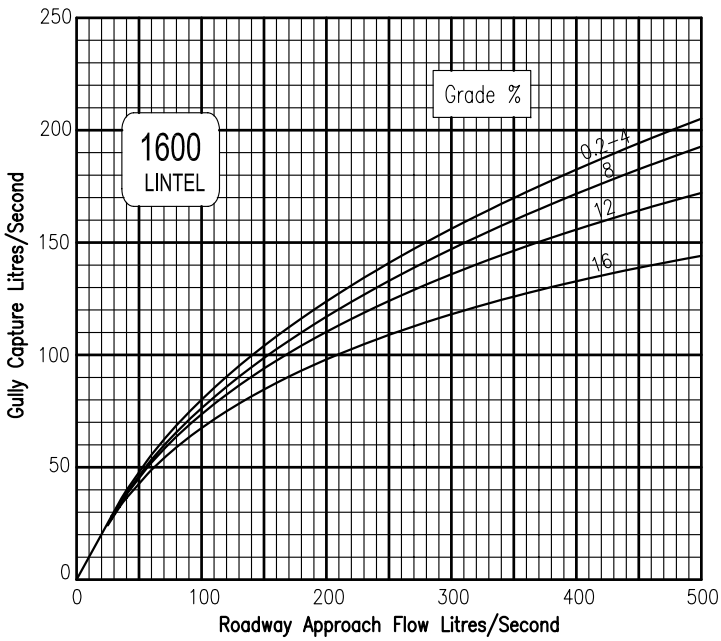
TELFORD GRATE
ALTERNATIVE TO MANNING
FOR FIELD INLETS

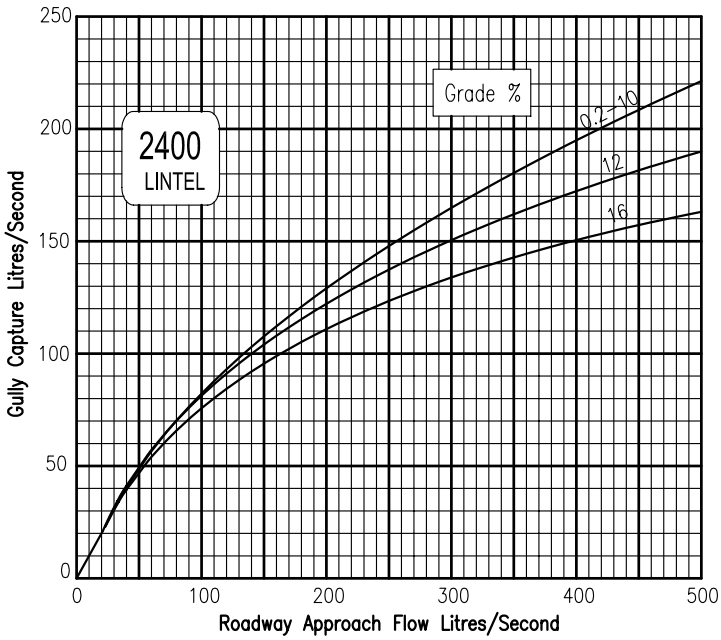


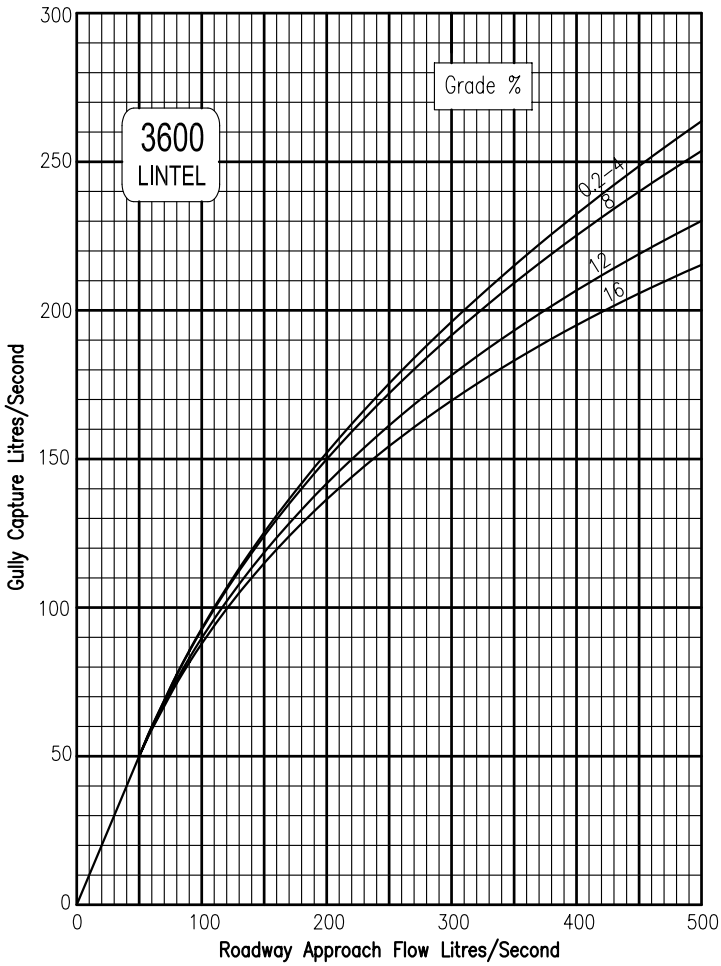
MANNING KERBSIDE INLET
WITH MOUNTABLE KERB

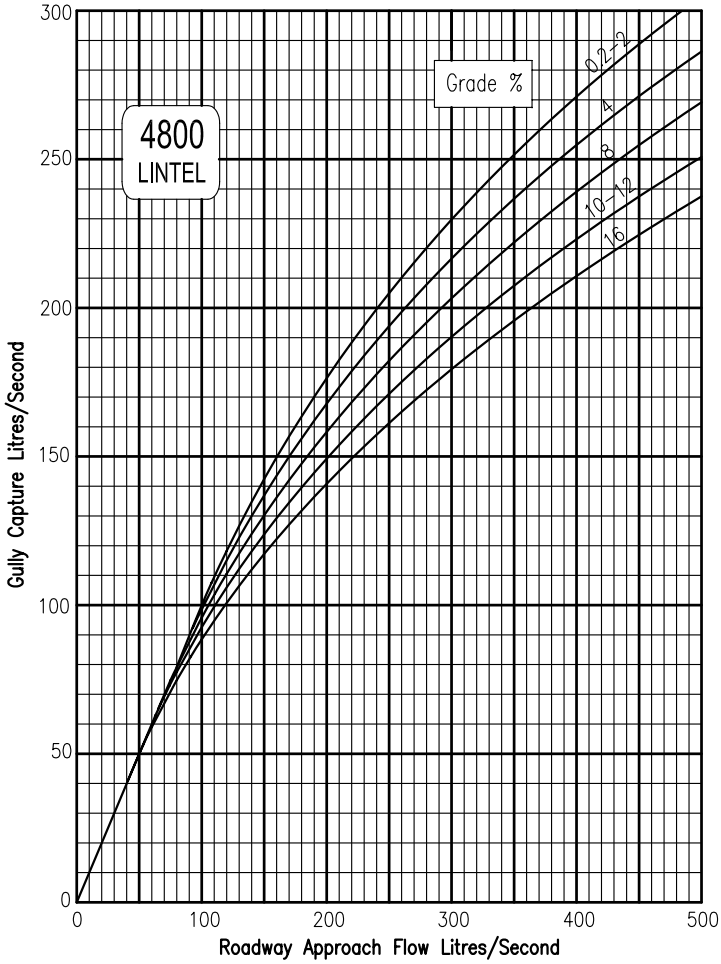
MANNING GRATE
MOUNTABLE KERB - 1:30 CROSSFALL







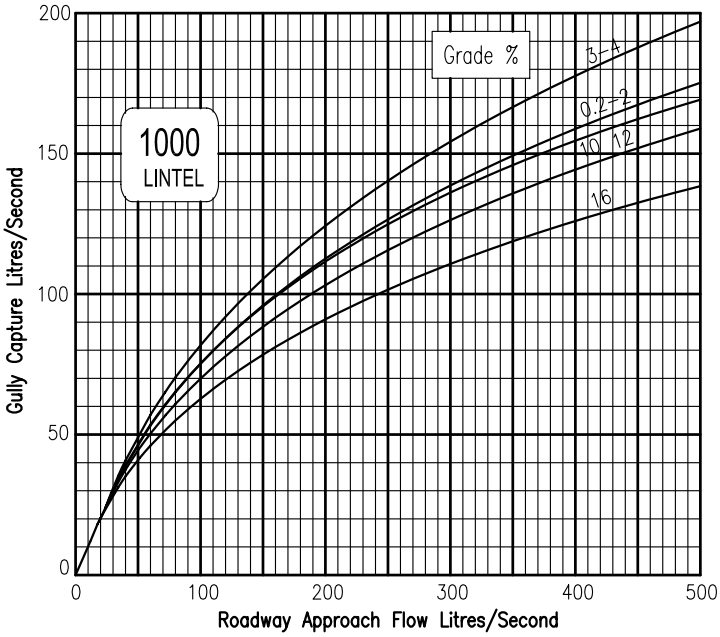


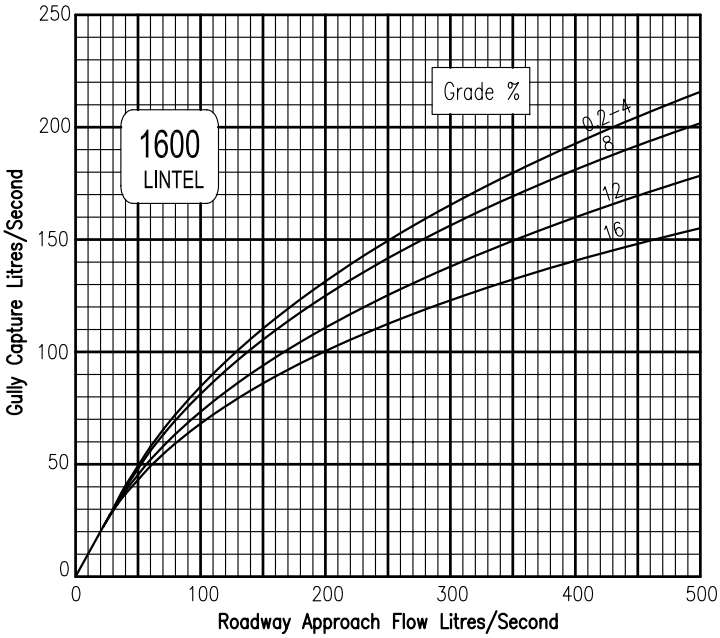


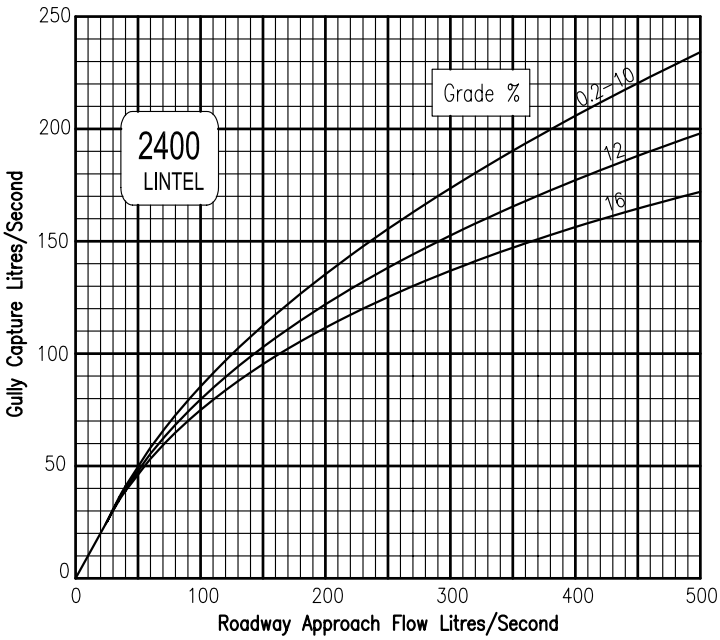
KERB-IN-LINE INLETS

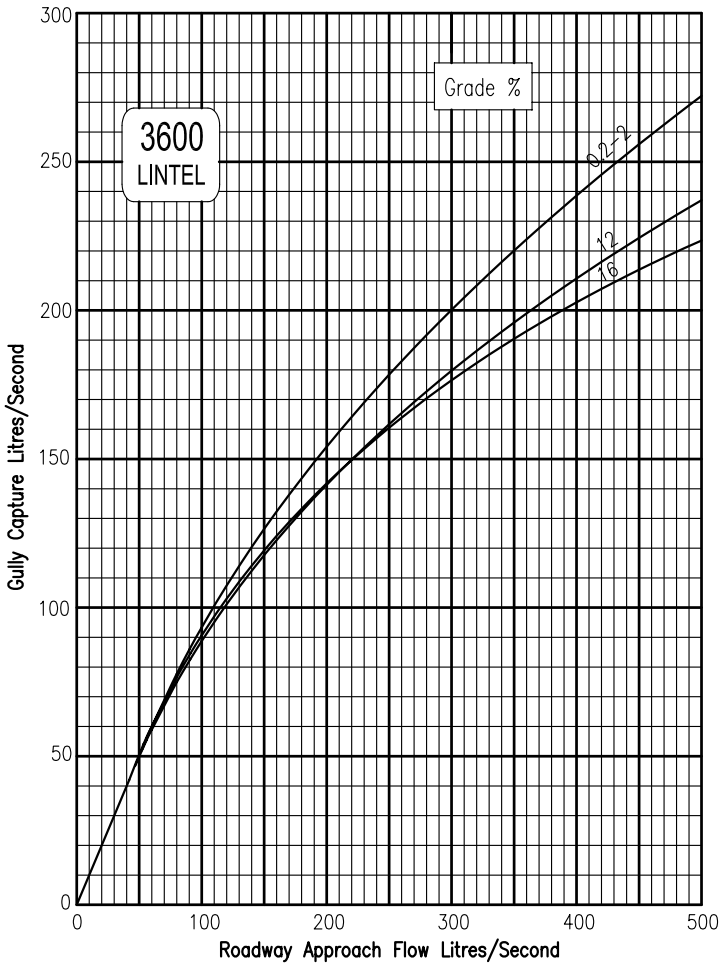
MANNING GRATE
BARRIER KERB - 1:30 CROSSFALL

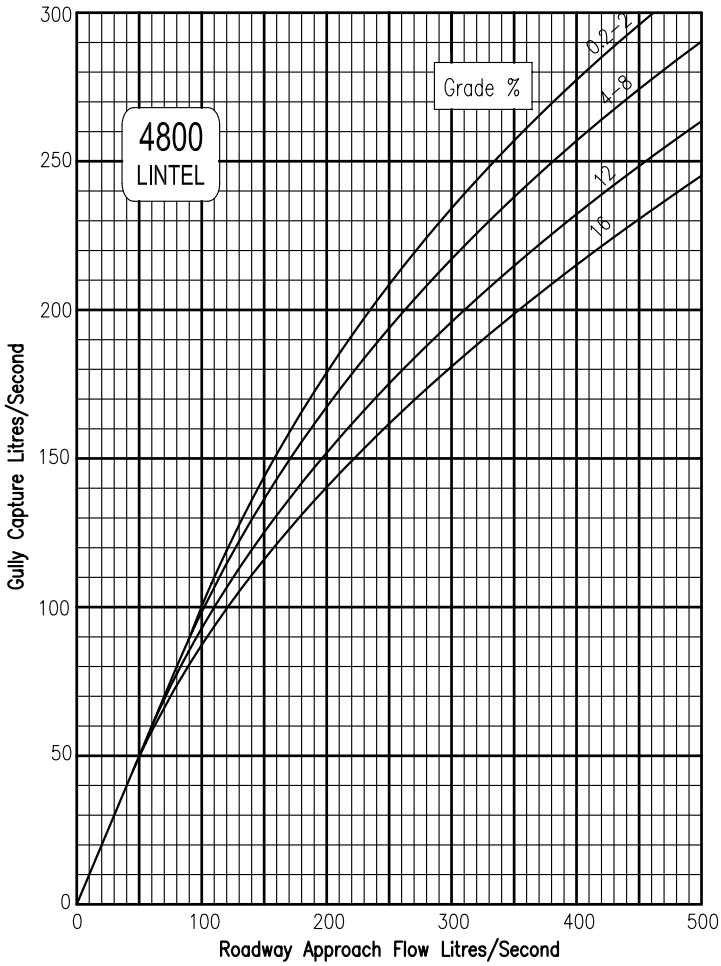
CHART 2





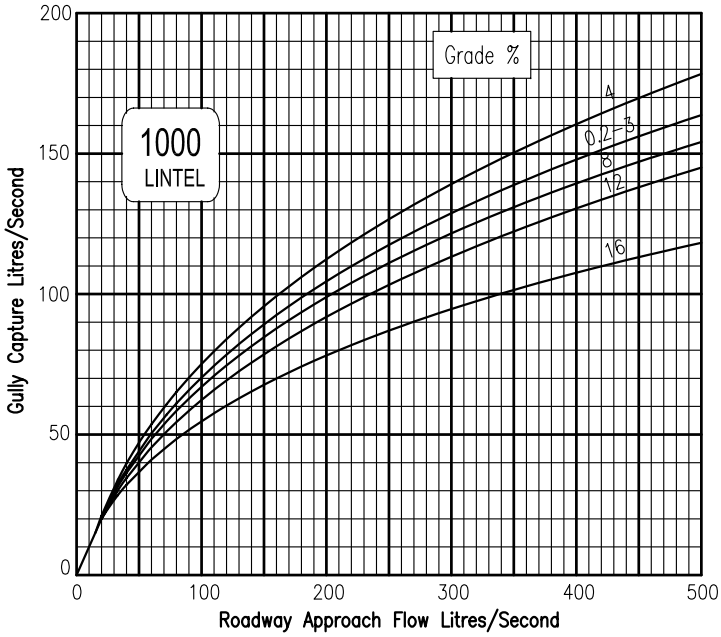


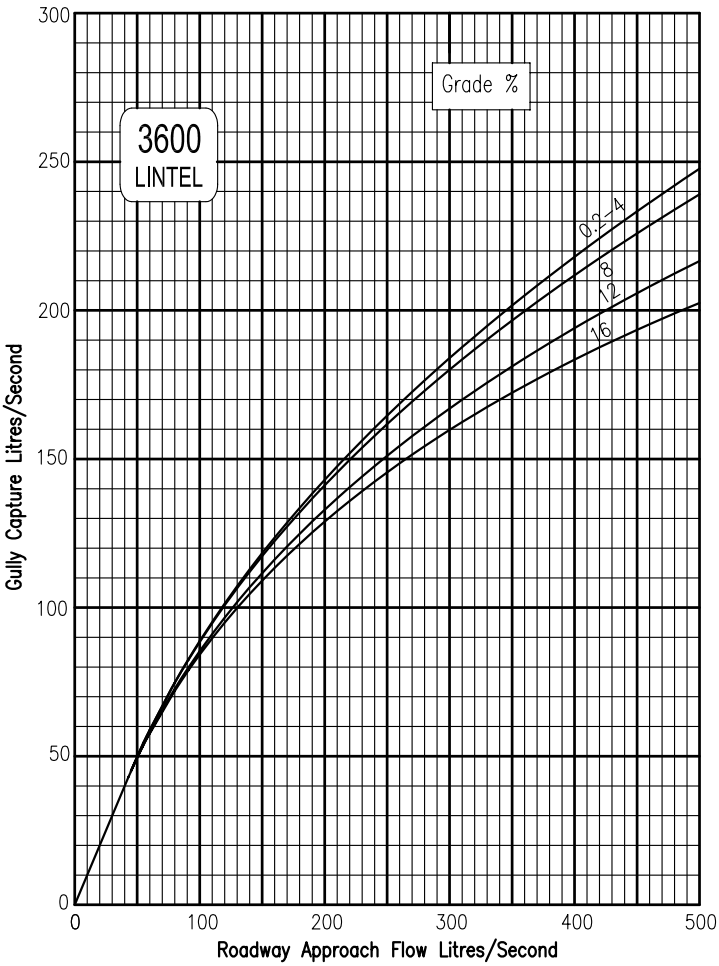


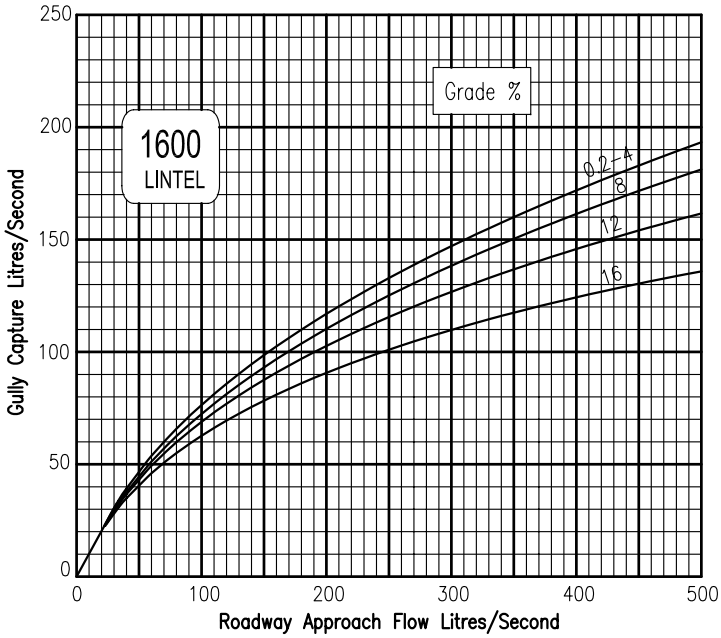


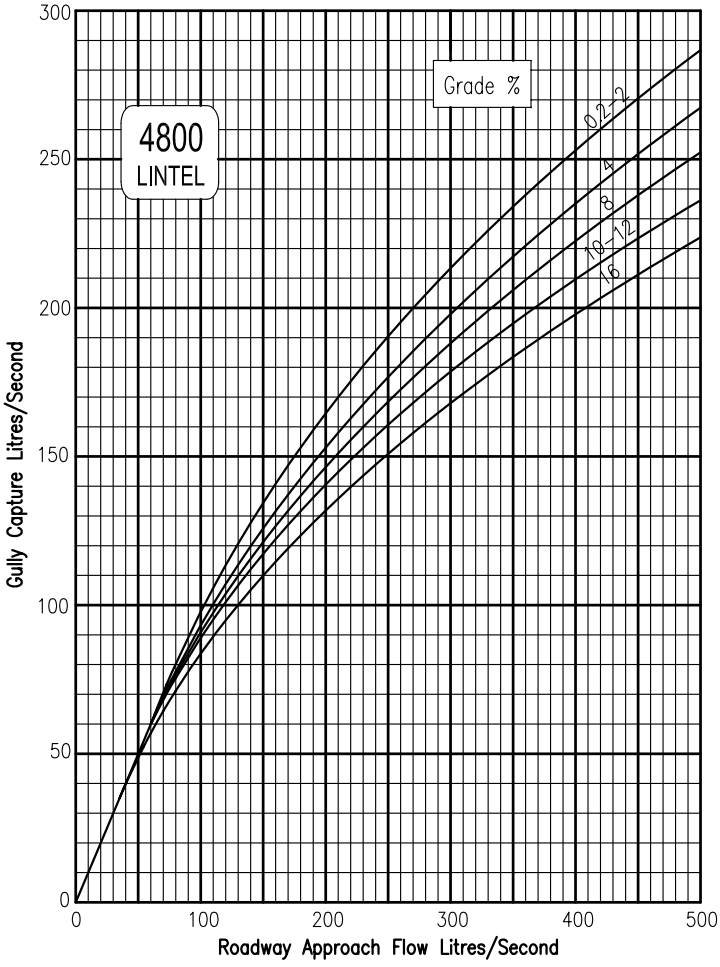
KERB-IN-LINE INLETS

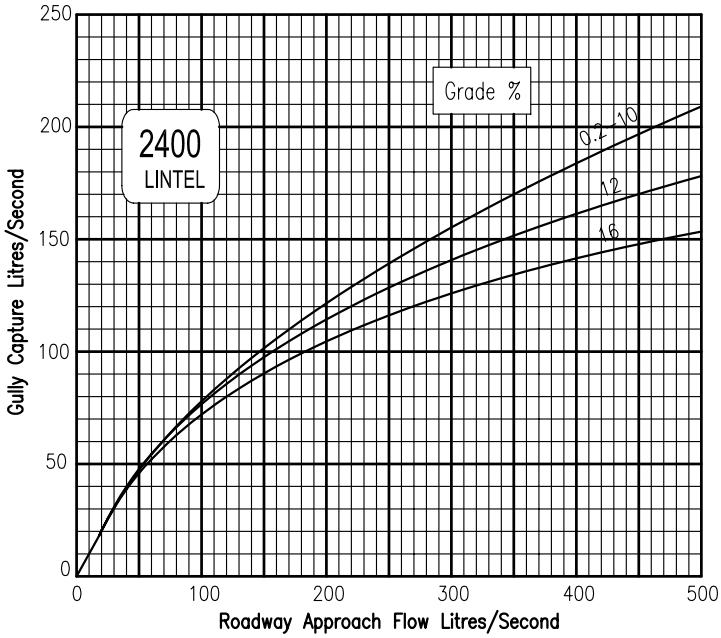
MANNING GRATE
MOUNTABLE KERB - 1:40 CROSSFALL





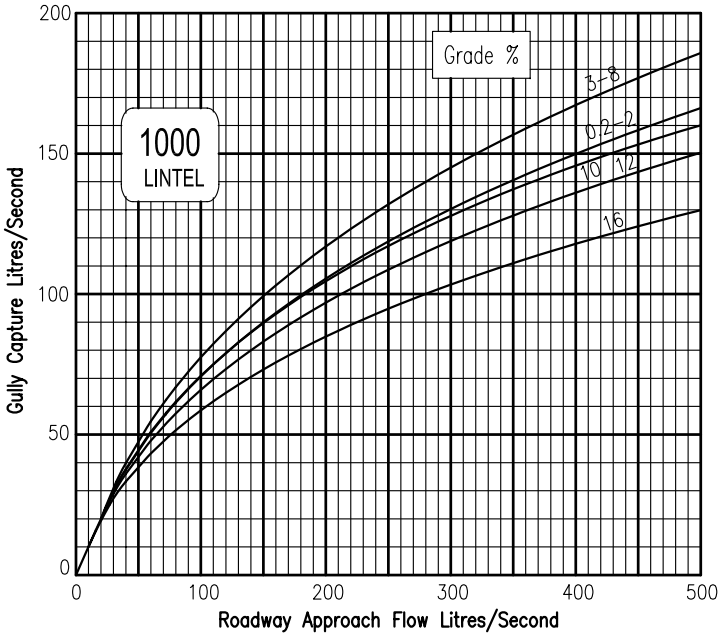


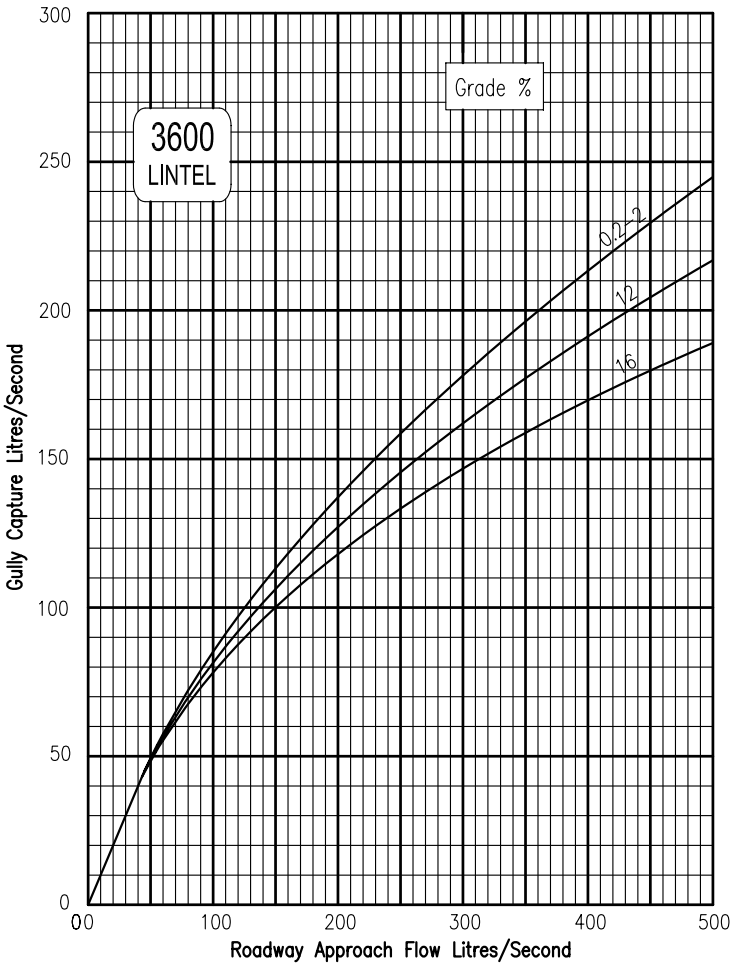


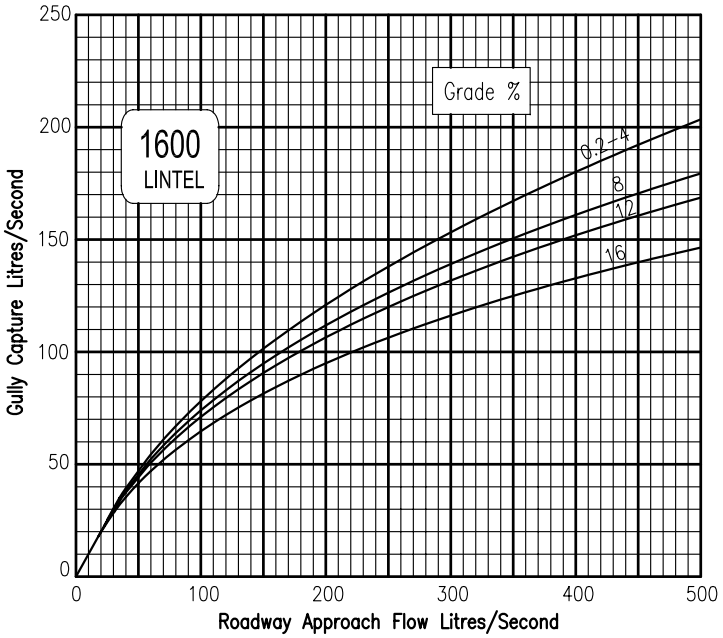


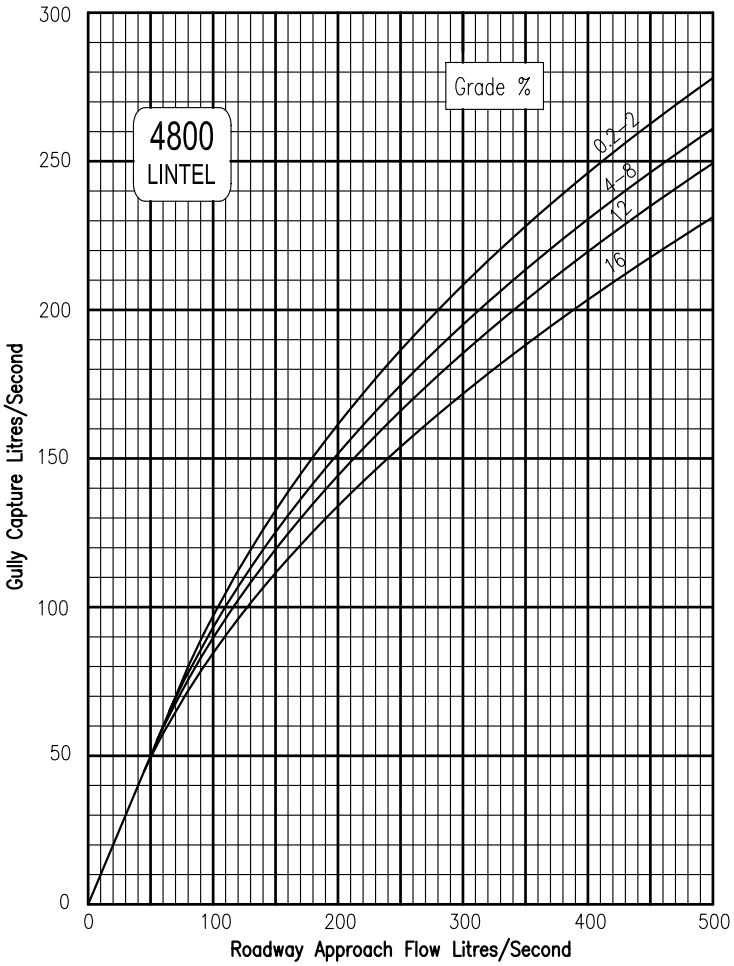
KERB-IN-LINE INLETS

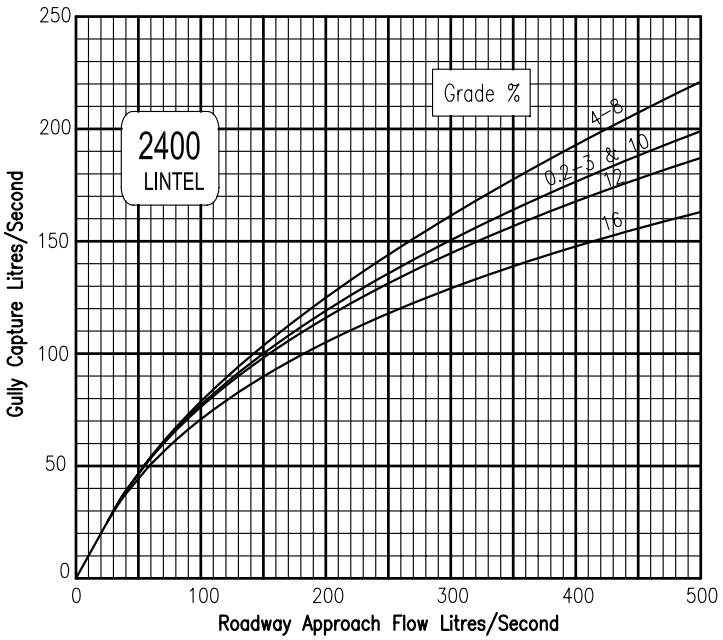
MANNING GRATE
BARRIER KERB - 1:40 CROSSFALL





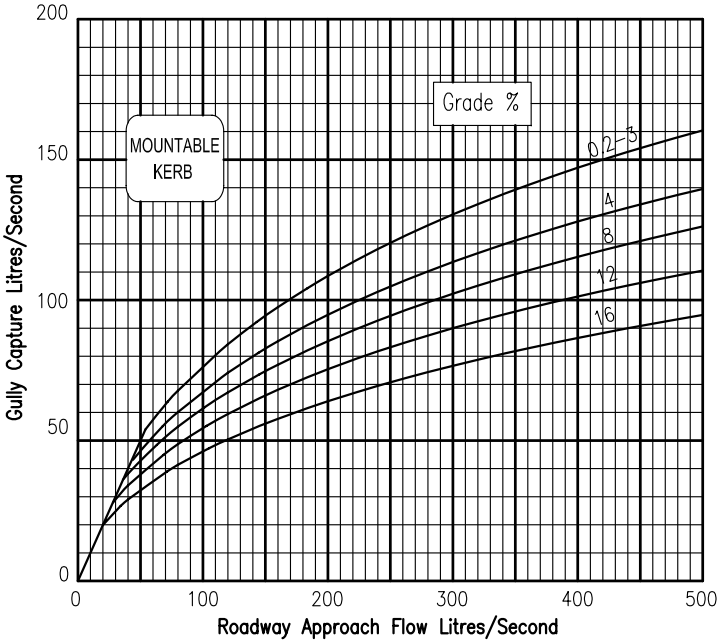


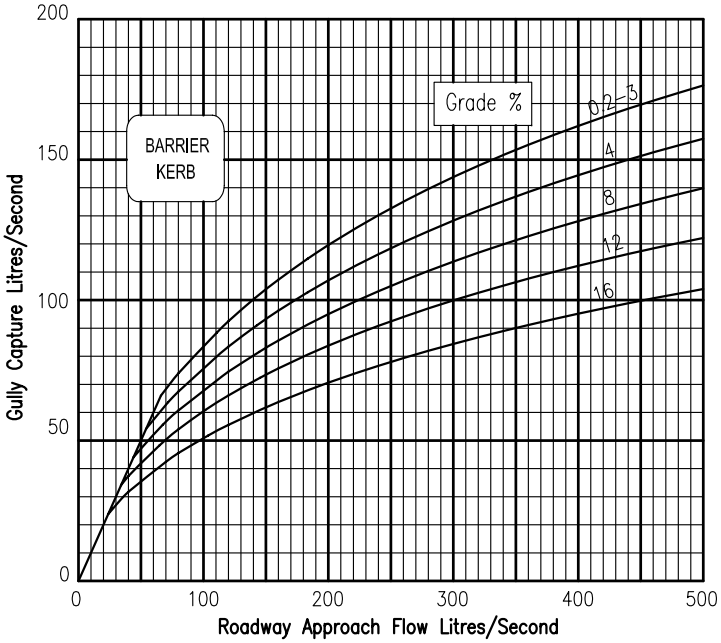




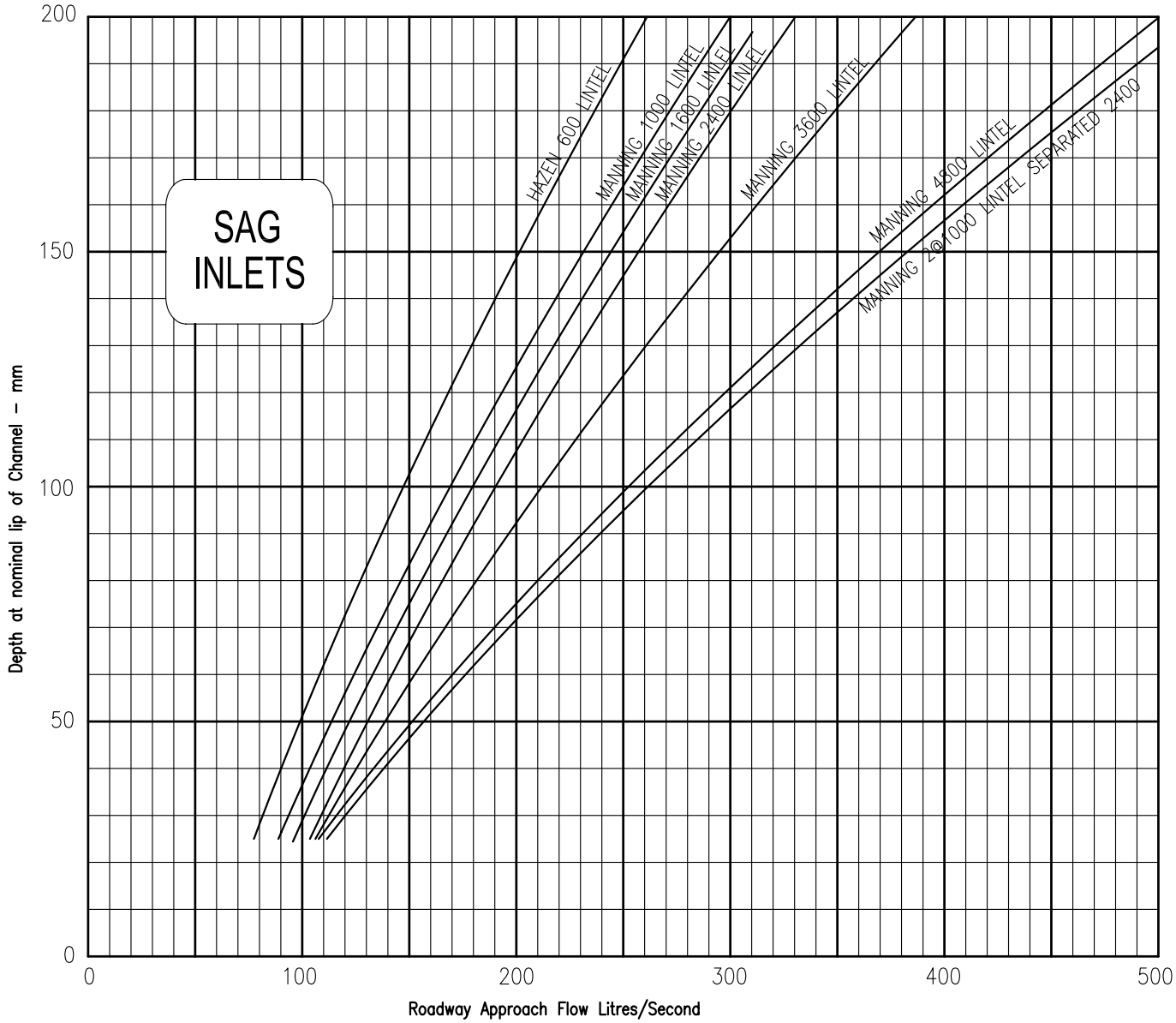
KERB-IN-LINE INLETS

HAZEN GRATE
1:30 &1:40 CROSSFALL

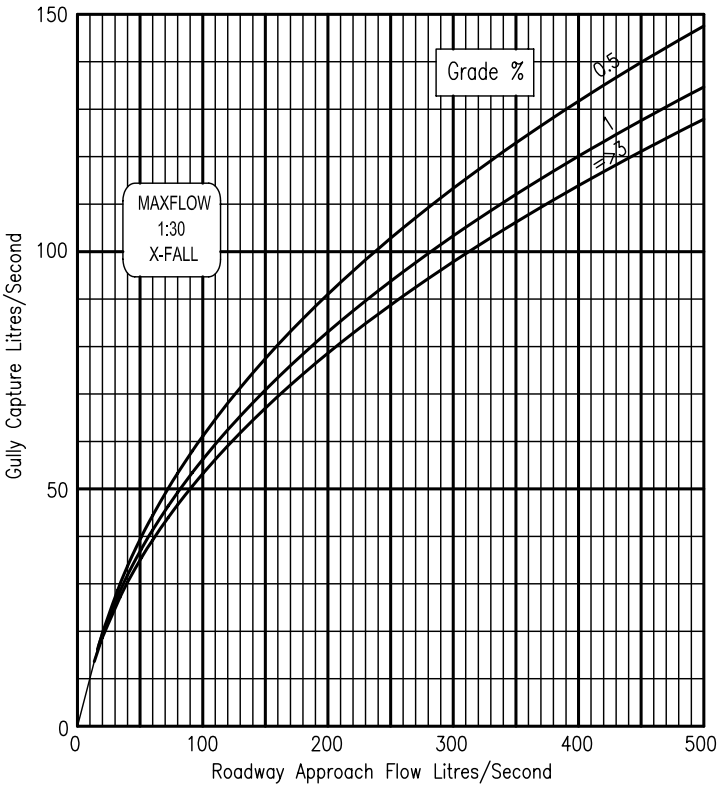


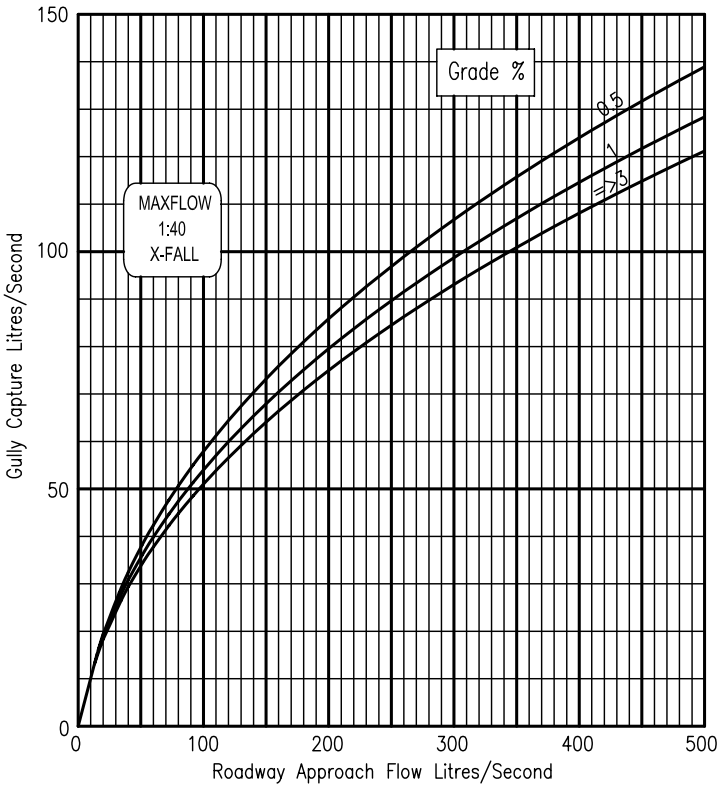


INLETS IN SAGS
MANNING AND HAZEN GRATES

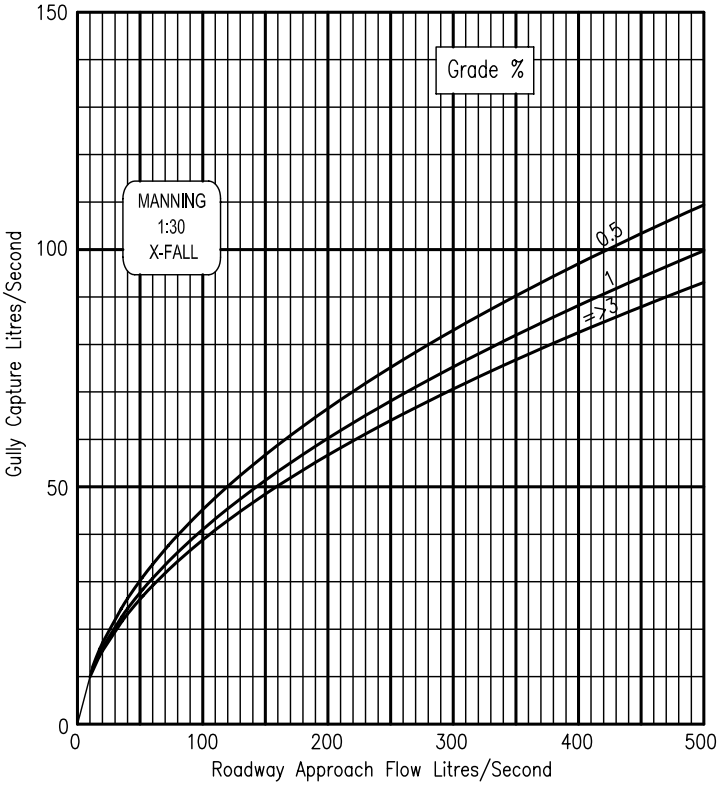


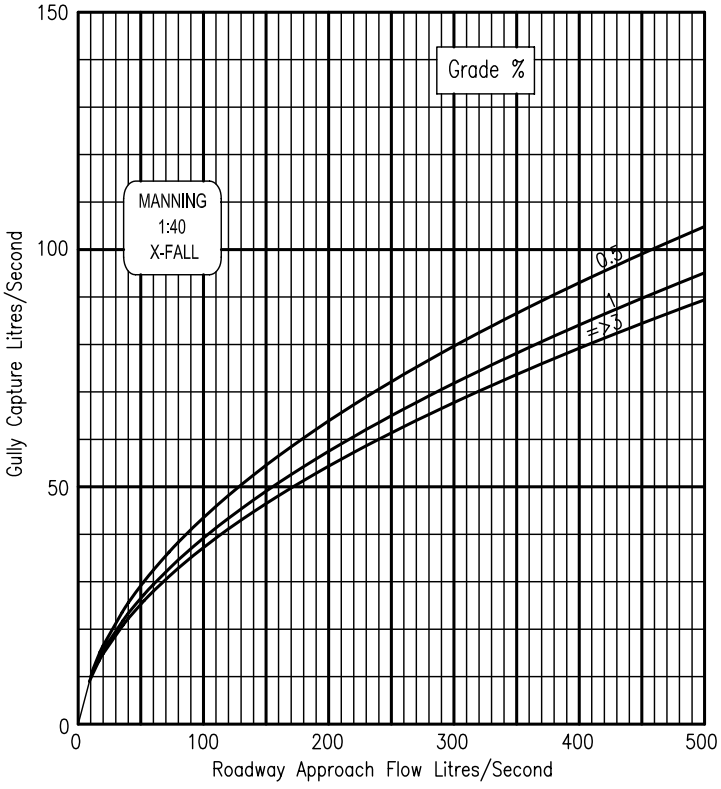
MANNFLOW & MAXFLOW GRATES
CENTRE OF ROAD DRAINAGE



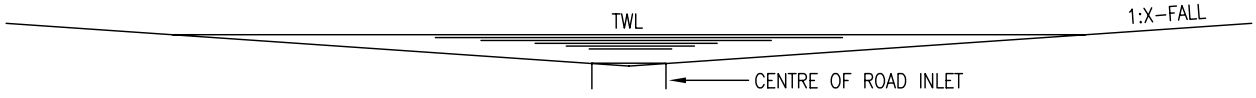


MANNING GRATE
CENTRE OF ROAD DRAINAGE



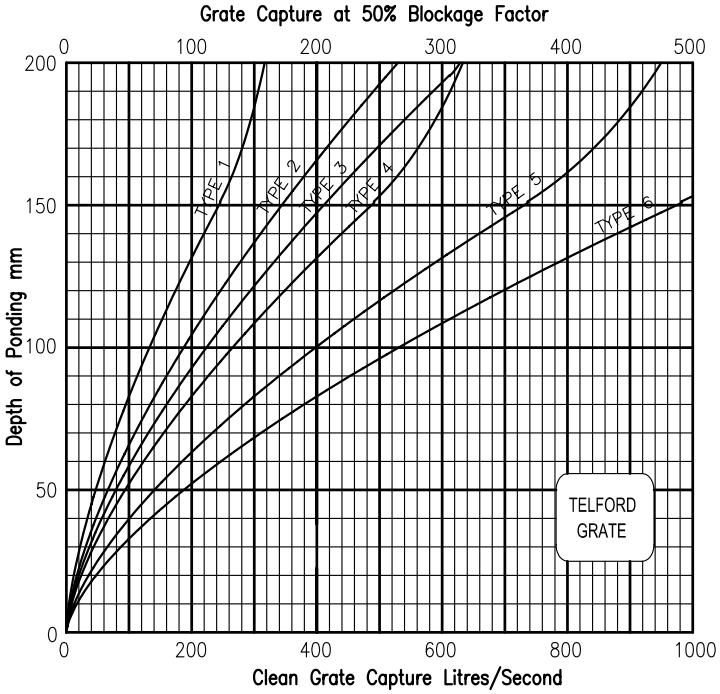


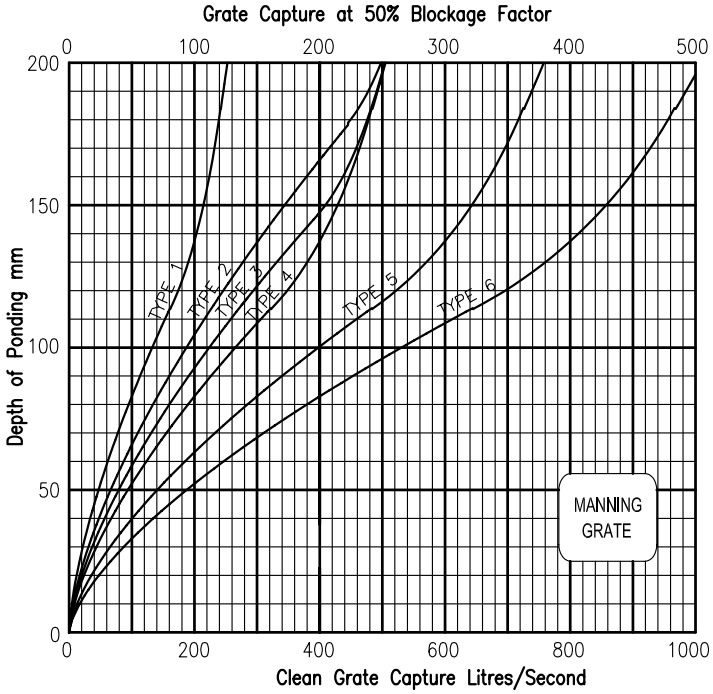
NOTES:
1. THE OPEN VANED MAXFLOW GRATE MAY BE PREFERRED FOR DEDICATED ROADS.
2. USE THE MANNING GRATE FOR PEDESTRIAN PRECINCTS (AS3996 – 3.3.5)
3. SLOTS OF THE MANNFLOW AND MANNING GRATES RUN WITH THE FLOW.



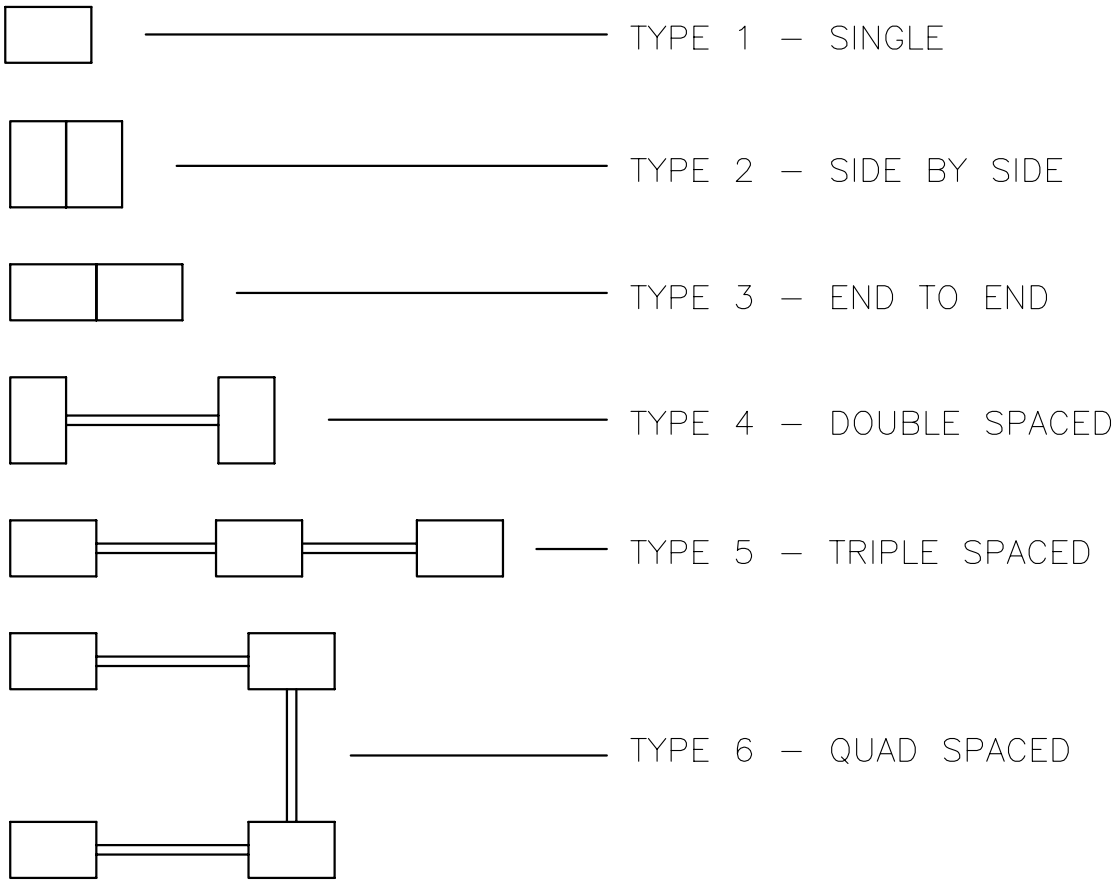
FIELD INLETS
TELFORD AND MANNING GRATES

CHART 7



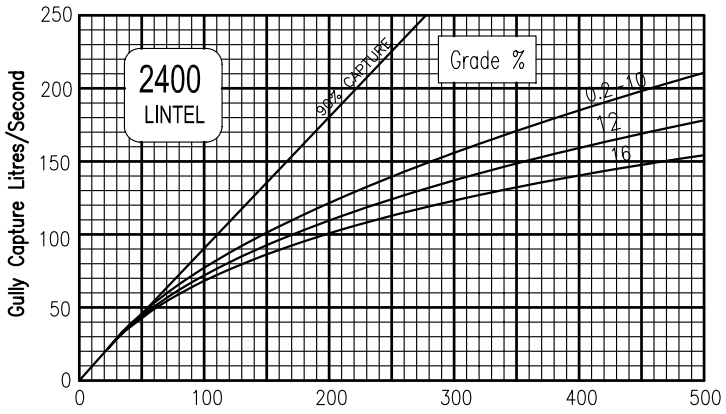


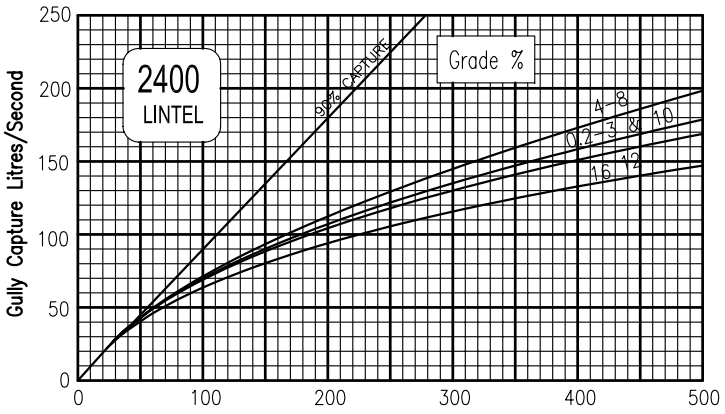
NOTES:
1. FIELD INLETS SHOULD BE SET IN A DEPRESSION OR SLOW MOVING CHANNEL.
2. THE TELFORD GRATE IS RECOMMENDED FOR VEGITATED AREAS.
3. THE MANNING GRATE IS PREFERRED FOR PEDESTRIAN PRECINCTS.
4. SPACED CHAMBERS HAVE A SEPARATION OF 2.4M BETWEEN INSIDE WALLS.

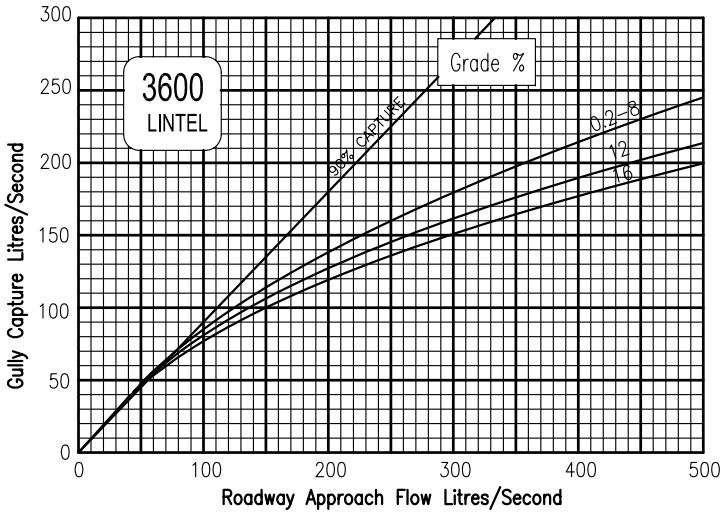


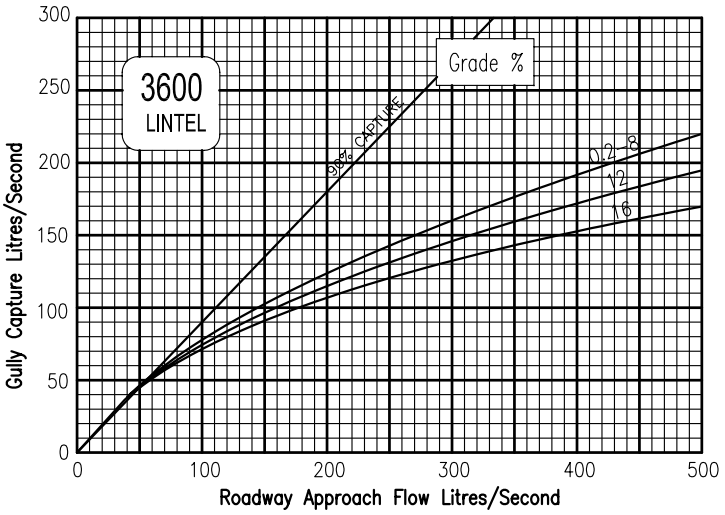
INLET CONFIGURATIONS

MANNING GRATE KERB-IN LINE
GOLD COAST CITY COUNCIL DESIGN CURVES

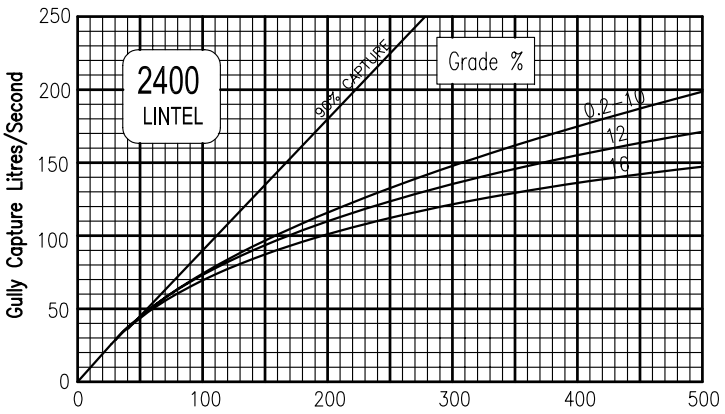


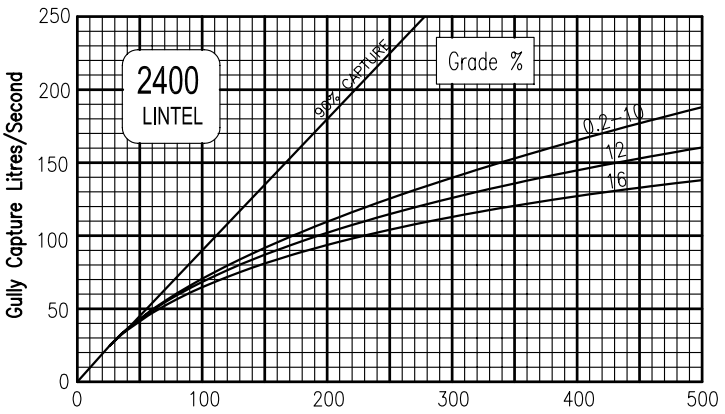


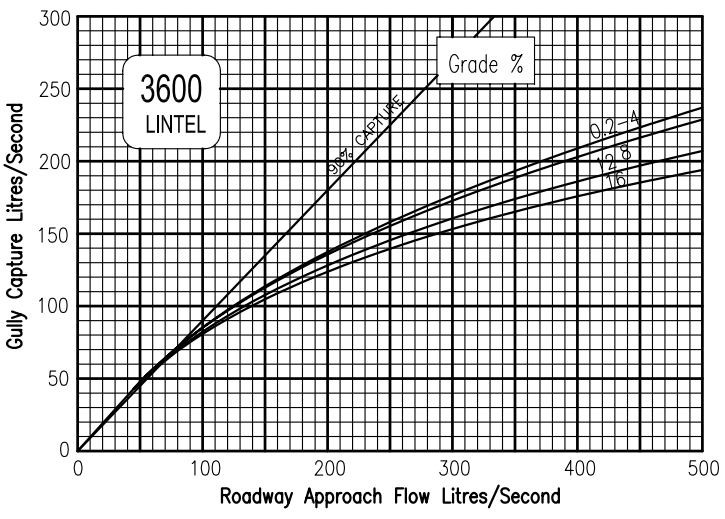


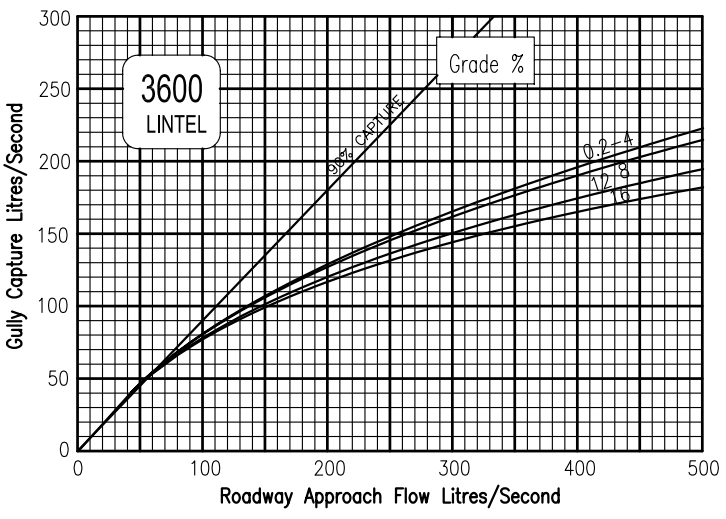


1:30 CROSS FALL **BARRIER KERB** **1:40 CROSS FALL**









1:30 CROSS FALL **MOUNTABLE KERB** **1:40 CROSS FALL**

Charts allow 10% blockage. Apply additional lip in line reduction on grades >8% ; 12% – 0.92, 16% – 0.88.

MANNING GRATE 800 x 500 - MOUNTABLE KERB

Mountable Kerb - 1:30 Crossfall

No Kerb Inlet Extension

Grade at Inlet	a	b	c	Curve Start l/s	Curve Q500 l/s
0.2 - 3%	11.48	-0.107	-30	23	174
4%	12.33	-0.106	-34	23	189
8%	10.75	-0.100	-26	23	164
10 - 12%	9.34	-0.069	-20	21	154
16%	8.05	-0.080	-14	20	126

Small Kerb Inlet Extension

Grade at Inlet	a	b	c	Curve Start l/s	Curve Q500 l/s
0.2 - 10%	11.48	-0.007	-32	23	221
12%	13.03	-0.131	-36	21	190
16%	12.70	-0.174	-34	23	163

Medium Kerb Inlet Extension

Grade at Inlet	a	b	c	Curve Start l/s	Curve Q500 l/s
0.2 - 4%	15.66	-0.057	-58	50	264
8%	16.24	-0.099	-60	50	254
10 - 12%	16.05	-0.145	-56	50	230
16%	15.85	-0.171	-54	50	215

Large Kerb Inlet Extension

Grade at Inlet	a	b	c	Curve Start l/s	Curve Q500 l/s
0.2 - 2%	23.96	-0.228	-117	90	305
4%	21.21	-0.186	-95	80	286
8%	18.21	-0.129	-73	65	269
10 - 12%	16.33	-0.109	-60	63	251
16%	14.36	-0.071	-48	41	238

Mountable Kerb - 1:40 Crossfall

No Kerb Inlet Extension

Grade at Inlet	a	b	c	Curve Start l/s	Curve Q500 l/s
0 - 3%	10.34	-0.086	-25	20	164
4%	10.91	-0.079	-26	15	178
8%	9.67	-0.081	-22	20	154
10 - 12%	8.44	-0.054	-17	20	145
16%	7.18	-0.063	-11	20	118

Small Kerb Inlet Extension

Grade at Inlet	a	b	c	Curve Start l/s	Curve Q500 l/s
0.2 - 10%	10.29	0.010	-26	19	209
12%	11.74	-0.109	-30	18	178
16%	11.57	-0.154	-28.3276	18	154

Medium Kerb Inlet Extension

Grade at Inlet	a	b	c	Curve Start l/s	Curve Q500 l/s
0.2 - 4%	13.80	-0.029	-46	45	248
8%	14.29	-0.065	-48	45	239
10 - 12%	14.02	-0.105	-44	45	217
16%	14.43	-0.150	-45.1	43	203

Large Kerb Inlet Extension

Grade at Inlet	a	b	c	Curve Start l/s	Curve Q500 l/s
0 - 3%	18.53	-0.100	-78	60	287
4%	15.49	-0.043	-57	60	267
8%	14.46	-0.043	-49	60	252
10 - 12%	14.02	-0.065	-45	60	236
16%	12.50	-0.036	-37.7	35	224

SAG INLETS

Curve coefficients

Sag Grate Type	Size of Grate	Inlet Extnsn m	a	b	Q at d=200 L/s
Hazen	600x300	0	8	115	261
Manning	800x500	0	7	115	300
Manning	800x500	S	7	125	330
Manning	800x500	M	6	103	387
Manning	800x500	L	4	73	501
Manning	2@2.4m	0	4	73	517

NOTES

Mathematical curves have been fitted to the test results. For flow v capture the equation is of the form $y=ax^{0.5}+bx+c$ where y = the capture and x = the approach flow. For sags the equation is $y=ax^{2/3}-b$ where y = the ponded depth as a height in mm above the nominal lip level of the channel at the centre of the grate and x = the flow. All flows are in litres/second.

PLEASE NOTE IF HEIGHT IS RELATED TO INVERT LEVEL OF THE CHANNEL THEN APPROX 30mm SHOULD BE ADDED TO THE CALCULATED DEPTH.

MANNING GRATE 800 x 500 - BARRIER KERB

Barrier Kerb - 1:40 Crossfall

No Kerb Inlet Extension

Grade at Inlet	a	b	c	Curve Start l/s	Curve Q500 l/s
0.2 - 2%	10.38	-0.082	-25	23	166
3% - 4%	11.74	-0.092	-31	20	186
8%	12.33	-0.136	-34	30	174
10%	10.84	-0.112	-26	20	160
12%	9.45	-0.081	-21	16	150
16%	8.03	-0.070	-15	10	130

Small Kerb Inlet Extension

Grade at Inlet	a	b	c	Curve Start l/s	Curve Q500 l/s
0.2 - 3%	10.83	-0.031	-28	20	199
4 - 8%	10.61	0.024	-28	20	221
10%	10.83	-0.031	-28	20	199
12%	10.50	-0.044	-26	20	187
16%	10.50	-0.094	-25	20	163

Medium Kerb Inlet Extension

Grade at Inlet	a	b	c	Curve Start l/s	Curve Q500 l/s
0.2 - 8%	11.47	0.045	-34	45	245
12%	11.25	-0.009	-30	45	217
16%	11.53	-0.079	-29	43	189

Large Kerb Inlet Extension

Grade at Inlet	a	b	c	Curve Start l/s	Curve Q500 l/s
0.2 - 2%	18.30	-0.113	-75	80	278
4% - 8%	15.75	-0.067	-58	65	261
12%	13.99	-0.033	-47	55	249
16%	12.22	-0.011	-37	45	231

Barrier Kerb - 1:30 Crossfall

No Kerb Inlet Extension

Grade at Inlet	a	b	c	Curve Start l/s	Curve Q500 l/s
0.2 - 2%	11.78	-0.114	-31	28	175
3% - 4%	13.04	-0.115	-37	24	197
8%	13.60	-0.159	-40	35	185
10%	12.16	-0.141	-32	24	169
12%	10.47	-0.101	-25	19	159
16%	8.91	-0.086	-18	12	138

Small Kerb Inlet Extension

Grade at Inlet	a	b	c	Curve Start l/s	Curve Q500 l/s
0.- 10%	12.13	-0.003	-36	25	234
12%	12.07	-0.077	-33	25	198
16%	11.77	-0.121	-31	24	172

Medium Kerb Inlet Extension

Grade at Inlet	a	b	c	Curve Start l/s	Curve Q500 l/s
0.2 - 8%	15.28	-0.025	-57	52	272
12%	14.72	-0.084	-50	47	237
16%	12.51	-0.040	-37	42	222

Large Kerb Inlet Extension

Grade at Inlet	a	b	c	Curve Start l/s	Curve Q500 l/s
0.2 - 2%	24.26	-0.218	-121	90	313
4% - 8%	20.00	-0.138	-88	80	290
12%	15.59	-0.055	-58	59	264
16%	12.94	-0.005	-42	45	245

HAZEN GRATE 600x300

Barrier Kerb 1:40-1:30 Crossfall

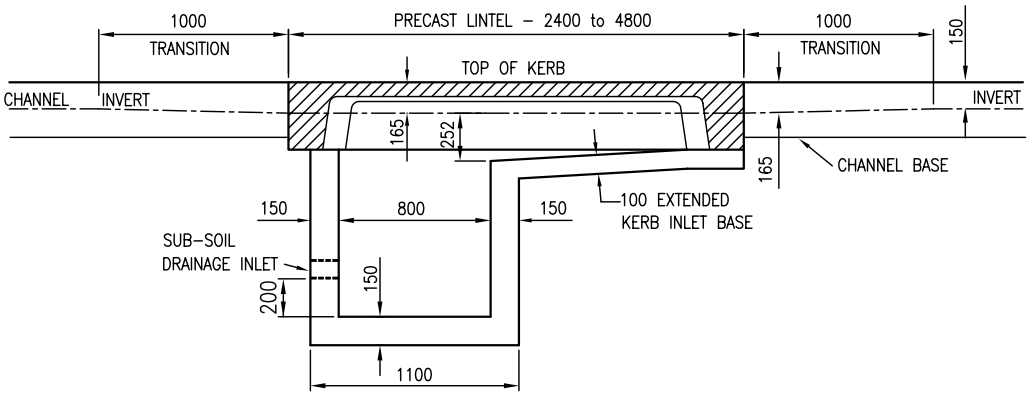
No Kerb Inlet Extension

Grade at Inlet	a	b	c	Curve Start l/s	Curve Q250 l/s
0.2 - 3%	8.50	-0.140	-11	27	88
4%	7.18	-0.110	-7	22	79
8%	6.05	-0.085	-5	18	70
12%	5.36	-0.080	-4	14	61
16%	4.34	-0.057	-2	10	52

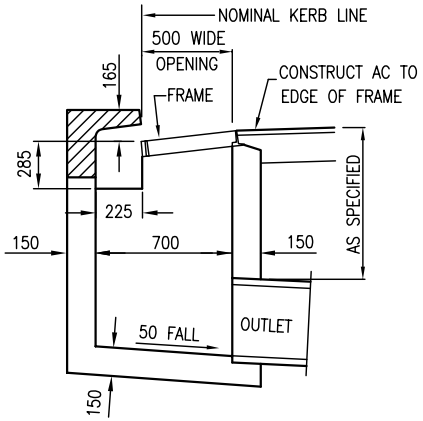
Mountable Kerb 1:40-1:30 Crossfall

No Kerb Inlet Extension

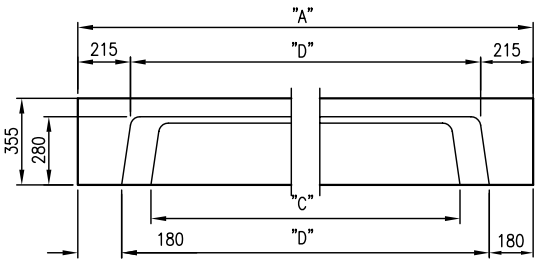
Grade at Inlet	a	b	c	Curve Start l/s	Curve Q250 l/s
0.2 - 3%	7.45	-0.116	-9	27	80
4%	6.20	-0.091	-6	22	70
8%	5.24	-0.067	-3	18	63
12%	4.67	-0.064	-3	14	55
16%	3.83	-0.046	-2	10	47



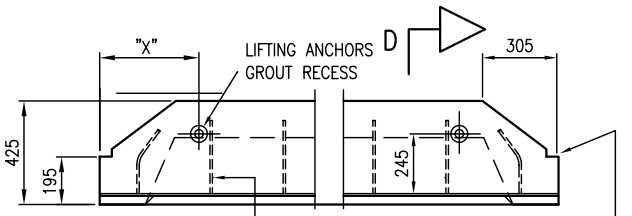
SECTION A-A



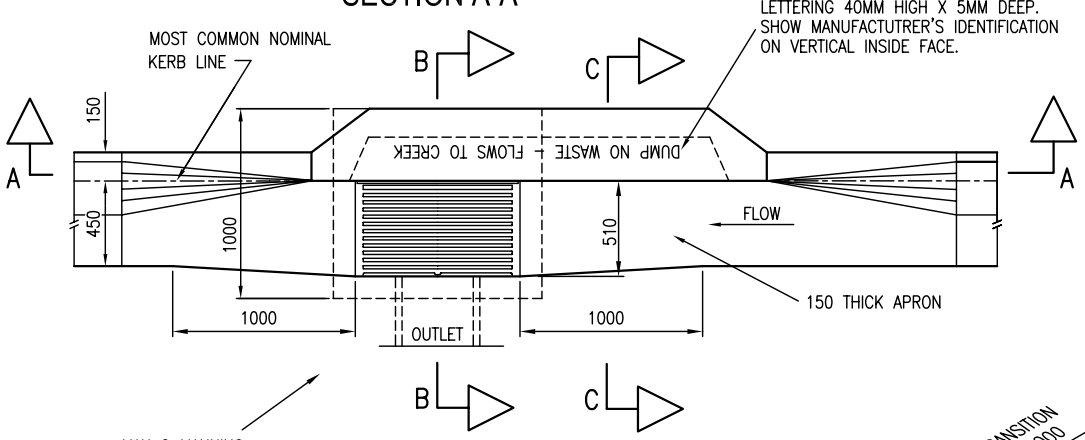
SECTION B-B



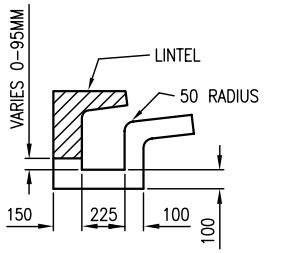
ELEVATION



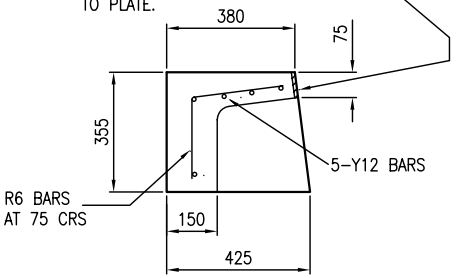
PLAN



PLAN OF INLET ON GRADE



SECTION C-C

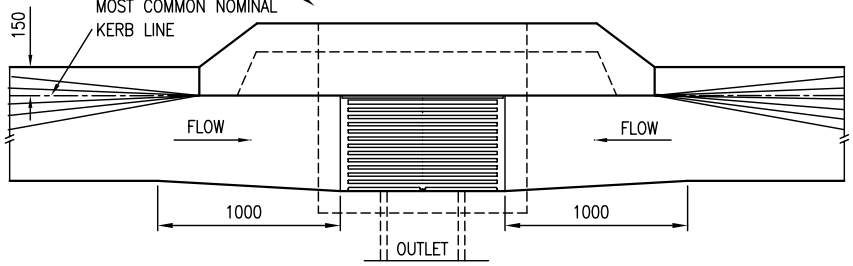


SECTION D-D

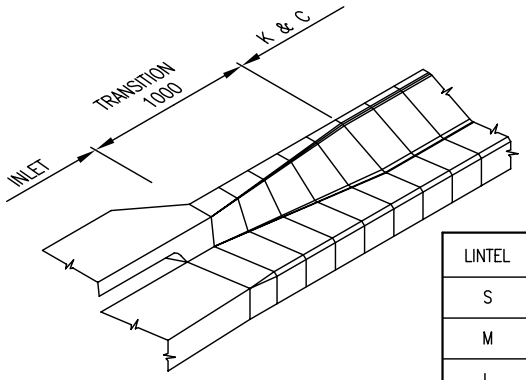
75 x 10 GALV. PLATE WITH Y12 STUDS EACH 300 LONG, 150 FROM EACH END AND AT 250 CRS WITH 6MM COMPLETE FILLET WELD TO PLATE.

FULL DEPTH VERTICAL REBATE FOR KERB FORM 50MM X 38MM AT TOP FACE

MAX Q MANNING
800 X 500
GRATE & FRAME



PLAN OF INLET IN SAG



MOUNTABLE KERB TRANSITION

PRECAST LINTEL DETAIL

LINTEL	"A"mm	"B"mm	"C"mm	"D"mm	"X"mm	MASS(kg)
S	2400	2040	1800	1970	400	445
M	3600	3240	3000	3170	690	550
L	4800	4440	4200	4370	1000	725

NOTES:
1. PRECAST LINTELS GRADE N30 CONCRETE TO AS 3600.
2. COVER TO ALL BARS TO BE 40MM MIN.
3. LIFTING ANCHORS "SWIFTLIFT "OR EQUAL, 1.3T GALV.
4. REINFORCING STEEL TO AS 1302
5. LINTEL TYPES 'S'=SMALL, 'M'=MEDIUM, 'L'=LARGE.
6. CHECK GRATE OPENS FULLY BEFORE CONCRETING.
7. INSTALL STEP IRONS TO AS1657–1992 IN PITS DEEPER THAN 1.35M. LOCATE OTHER THAN ON BACK WALL.
8. LINTELS ARE TO BCC SPECIFICATION BUT LINTELS APPROVED FOR THE LOCALITY ARE ACCEPTABLE.
9. THE IMEAQ NOMINAL KERB LINE IS ON CHANNEL INVERT.

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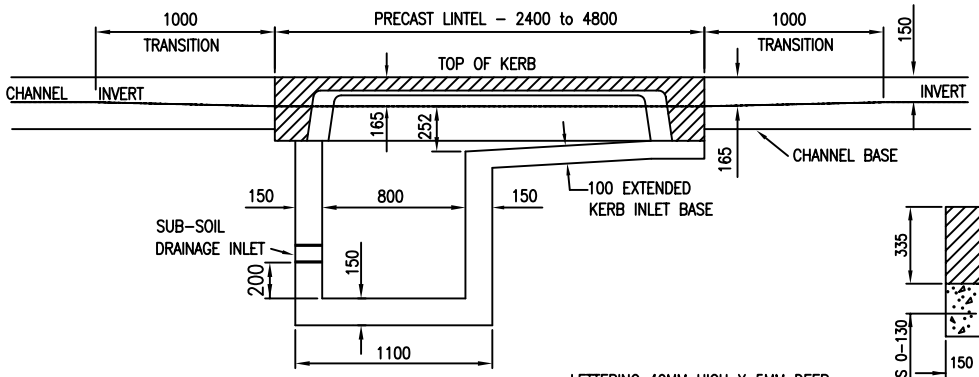
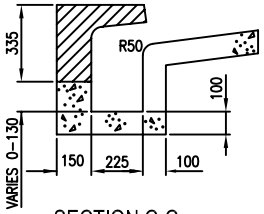
KERBWAY

EXTENDED KERB INLETS

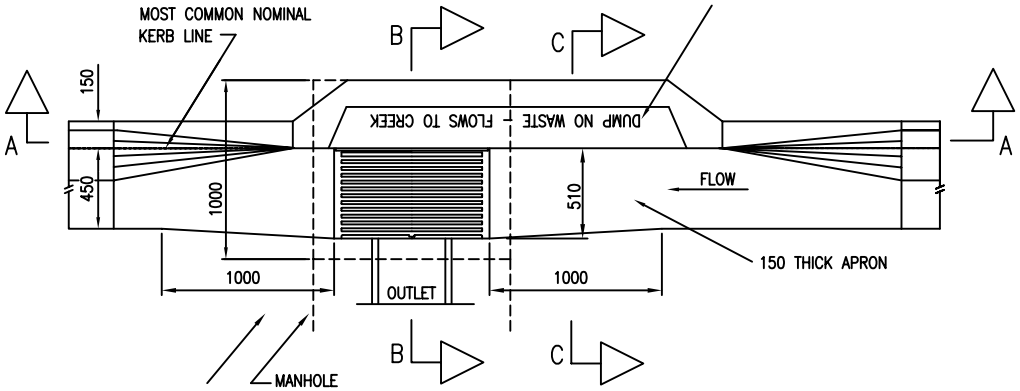
K1



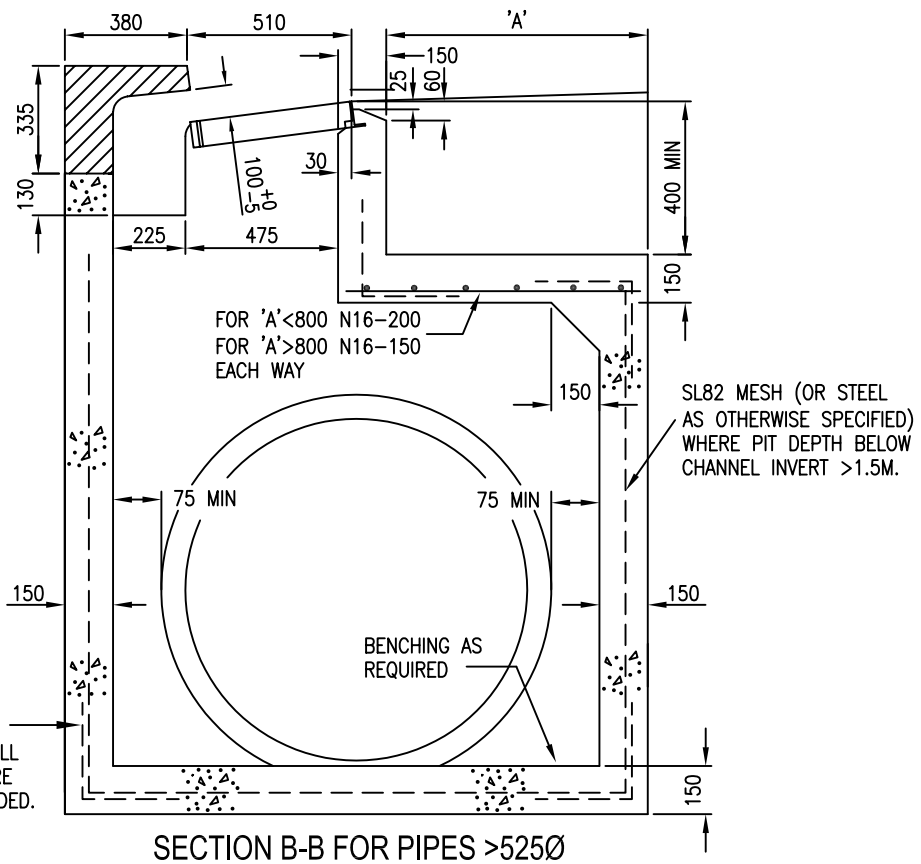
SECTION A-A



SECTION C-C



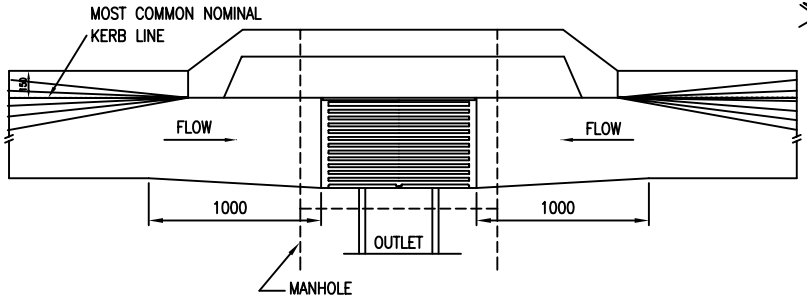
PLAN OF INLET ON GRADE



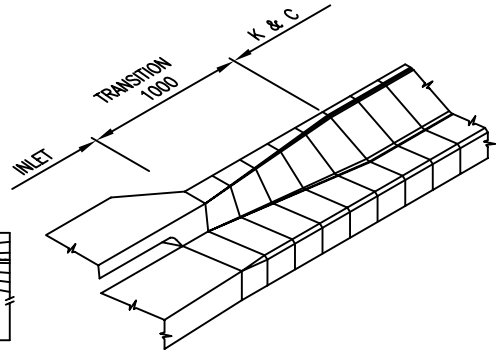
SECTION B-B FOR PIPES >525Ø

INLET MANHOLE

MAX Q MANNING
800 X 500
GRATE & FRAME



PLAN OF INLET IN SAG



MOUNTABLE KERB
TRANSITION

NOTES:
1. PRECAST LINTELS SHOULD, AS APPROPRIATE, COMPLY WITH DRAWINGS:
   (A) 2400–4800: BCC UMS 331, GCCC 59301 OR IPWEAQ D–0061.
   (B) 2400–4800: DRAWINGS OF OTHER AUTHORITIES.
   (C) 1000–4800: MAX Q DRAWING S3.
2. LINTELS – 1000, 1600, 2400, 3600, 4800 AS SPECIFIED.
3. LETTERING ON ALL LINTELS TO MEET COUNCIL REQUIREMENTS.
4. CONFIGURE 1000 AND 1600 LINTELS AS SHOWN ON DWGS K3 AND K4.
5. UNLESS OTHERWISE SPECIFIED THE MANNING GRATE SHALL BE USED.
6. TOLERANCE FOR 100mm KERB OPENINGS = +0.00 –5.00mm.
7. KERB AND CHANNEL TYPE SHALL BE AS SPECIFIED.
8. CAST IN SITU CONCRETE N25 TO AS 1379 AND AS 3600.
9. MAX DEPTH 800X700 PIT 1.5M UNLESS SPECIFICALLY APPROVED.

brochures\drawings\S2.dwg

NO	REVISIONS	DATE	INITS
C			
B			
A			
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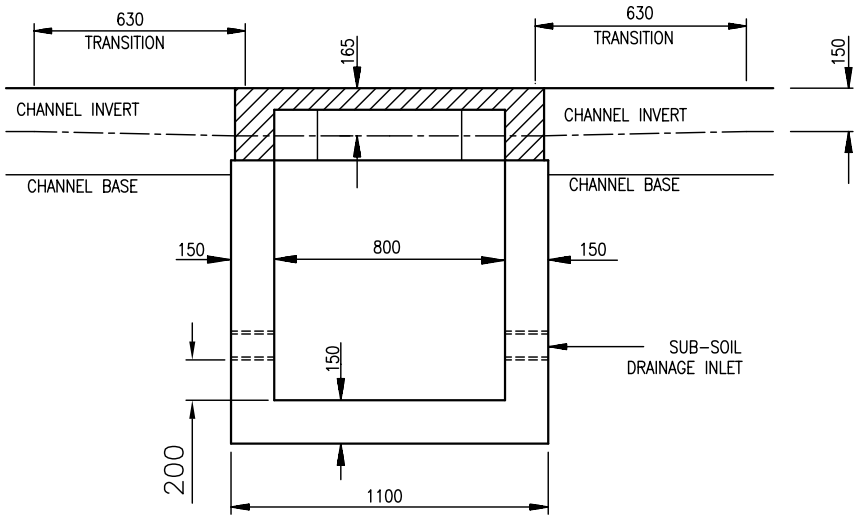
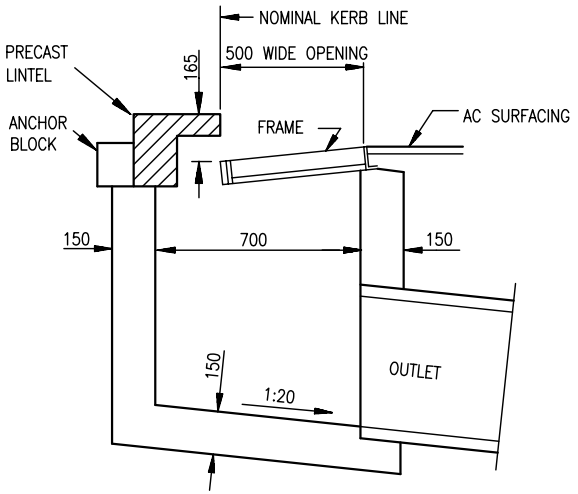
KERBWAY

KERBWAY INLET MANHOLE

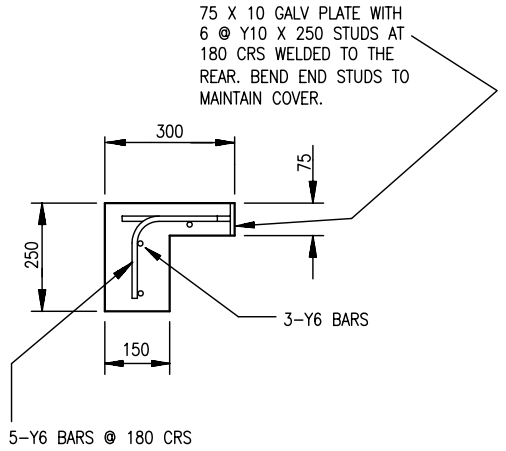
K2



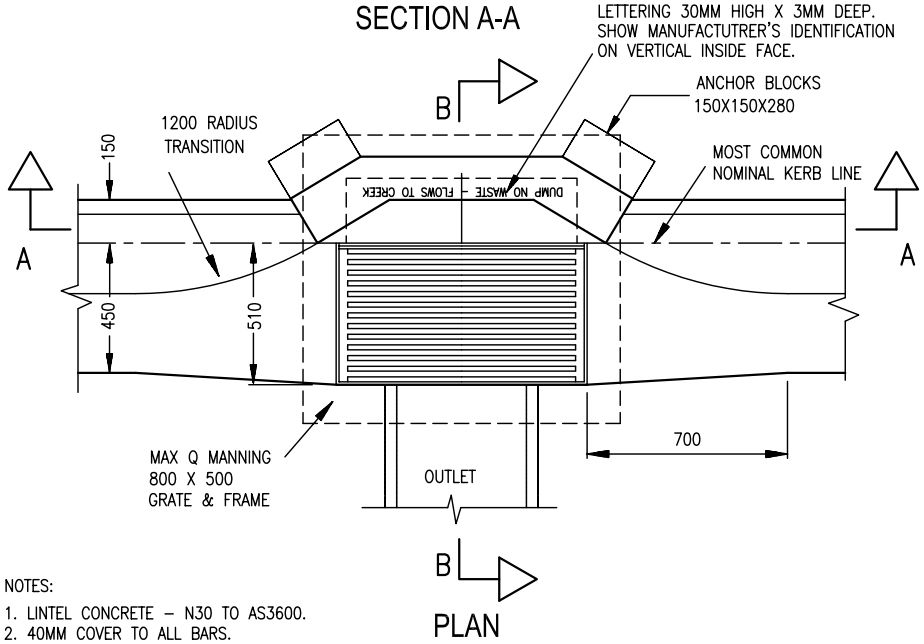
SECTION A-A



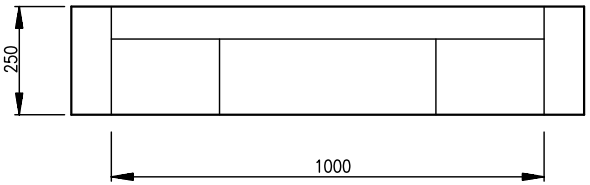
SECTION B-B



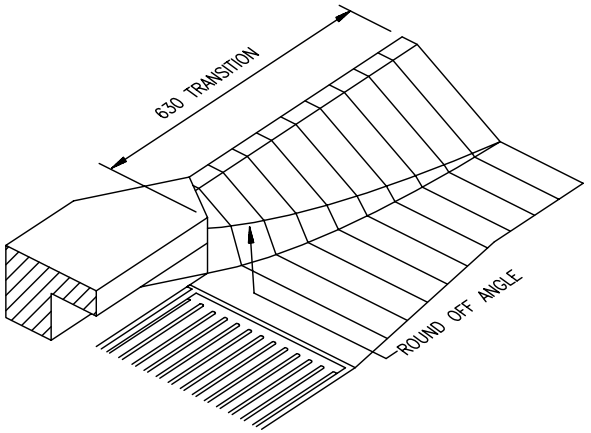
SECTION C-C



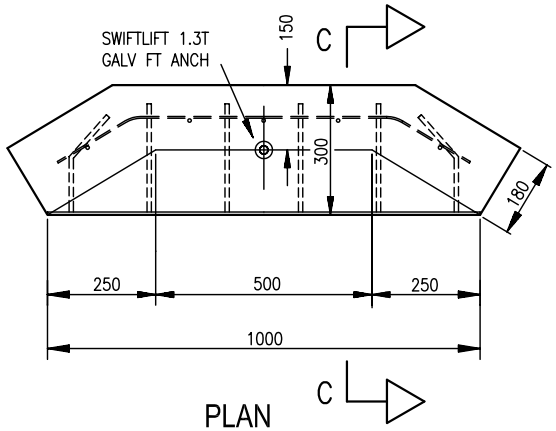
PLAN



ELEVATION



MOUNTABLE KERB
TRANSITION



PLAN
PRECAST 1000 LINTEL

NOTES:

1. LINTEL CONCRETE – N30 TO AS3600.
2. 40MM COVER TO ALL BARS.
3. GALVANISE LINTEL PLATE AFTER WELDING.
4. BARRIER KERB NEEDS NO TRANSITION.
5. CHECK GRATE OPENS FULLY BEFORE CONCRETING.
6. WEIGHT OF LINTEL = 115KG.
7. INSTALL STEP IRONS TO AS1657–1992 IN PITS DEEPER. THAN 1.35M. LOCATE OTHER THAN ON BACK WALL.
8. THE IMEAQ NOMINAL KERB LINE IS ON THE CHANNEL INVERT.

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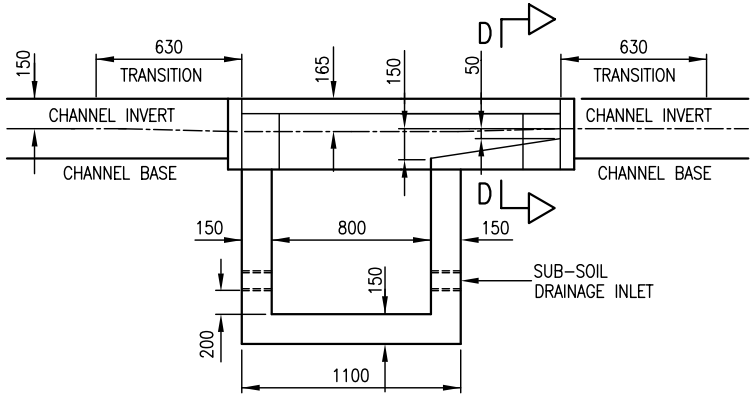
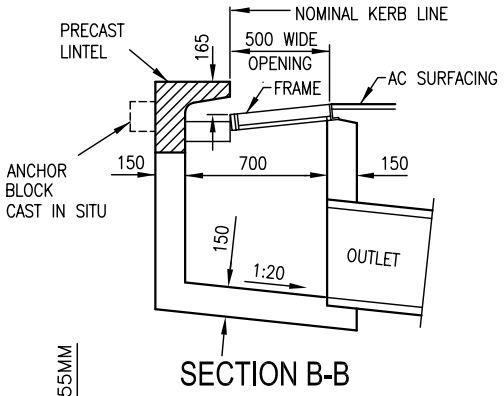
KERBWAY

STANDARD INLET

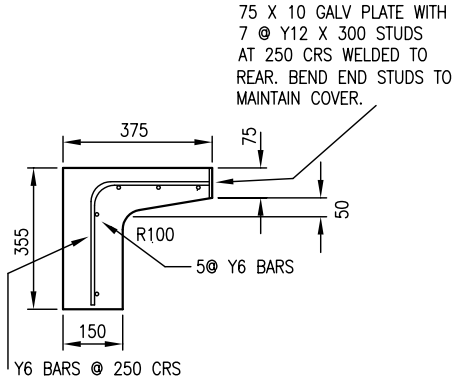
K3



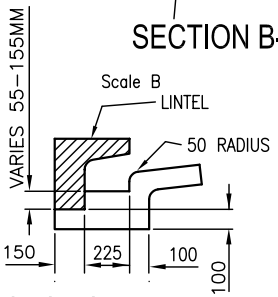
SECTION A-A
Scale B



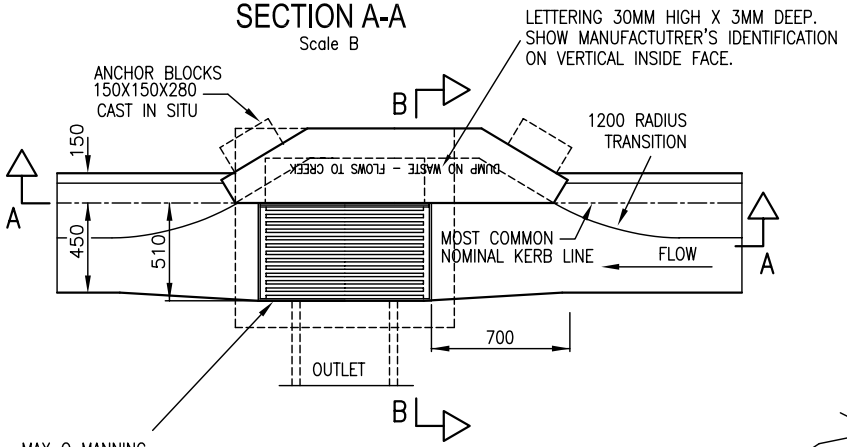
SECTION B-B



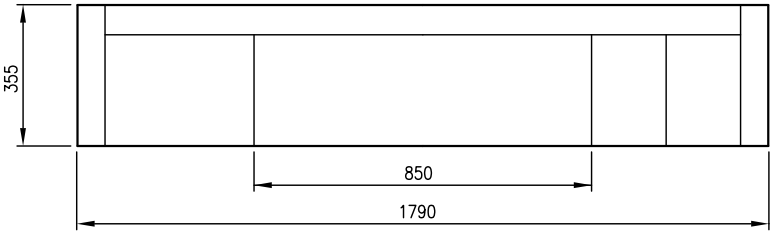
SECTION C-C
Scale B



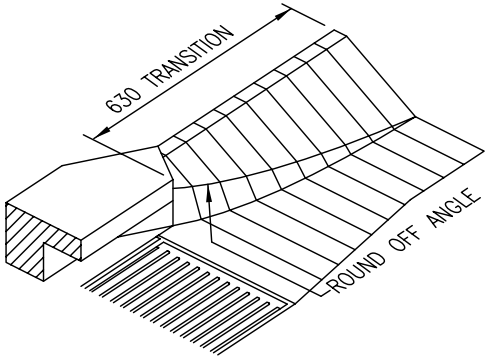
SECTION D-D



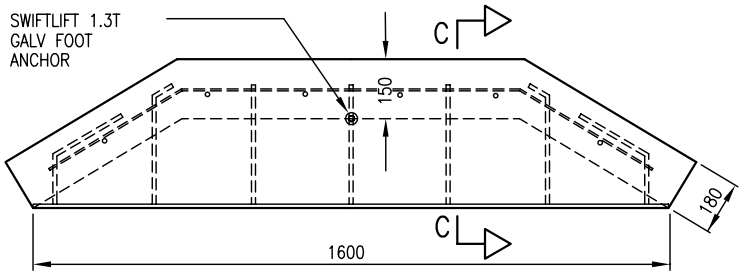
PLAN OF INLET ON GRADE
Scale B



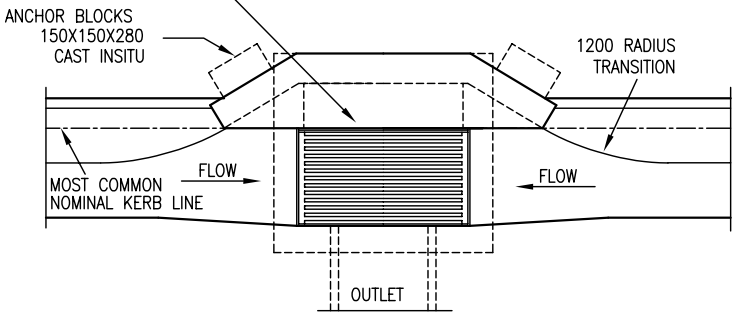
ELEVATION



MOUNTABLE KERB
TRANSITION



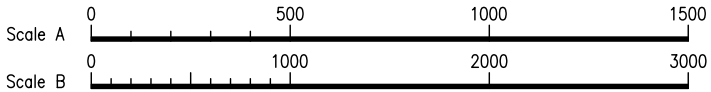
PLAN
PRECAST 1600 LINTEL
Scale A



PLAN OF INLET IN SAG
Scale B

NOTES:

1. LINTEL CONCRETE – N30 TO AS3600.
2. 40MM COVER TO ALL BARS.
3. GALVANISE LINTEL PLATE AFTER WELDING.
4. BARRIER KERB NEEDS NO TRANSITION.
5. WEIGHT OF LINTEL = 136KG.
6. INSTALL STEP IRONS TO AS1657–1992 IN PITS DEEPER. THAN 1.35M. LOCATE OTHER THAN ON BACK WALL.
7. CHECK GRATE OPENS FULLY BEFORE CONCRETING.
8. THE IMEAQ NOMINAL KERB LINE IS ON THE CHANNEL INVERT.

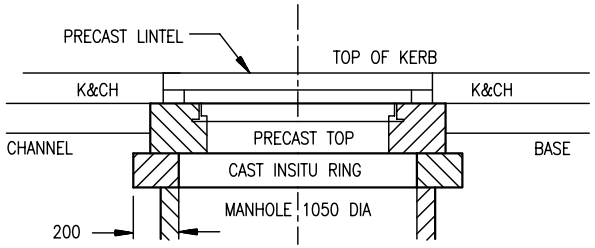


NO	REVISIONS	DATE	INITS
	ORIGINAL ISSUE	1-5-99	PGB

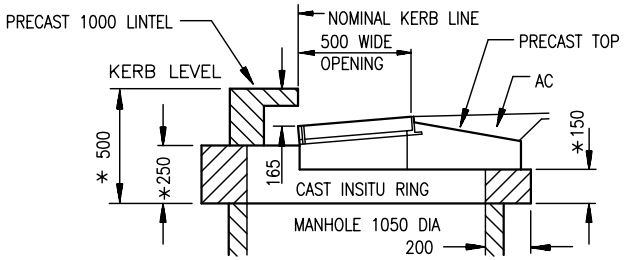
KERBWAY

COMPACT INLET

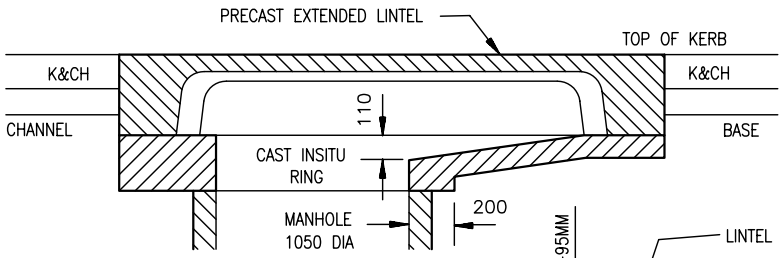
K4



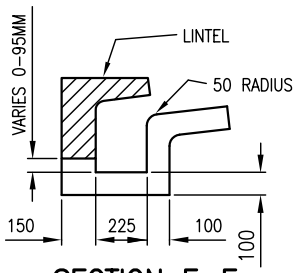
SECTION A-A



SECTION B-B

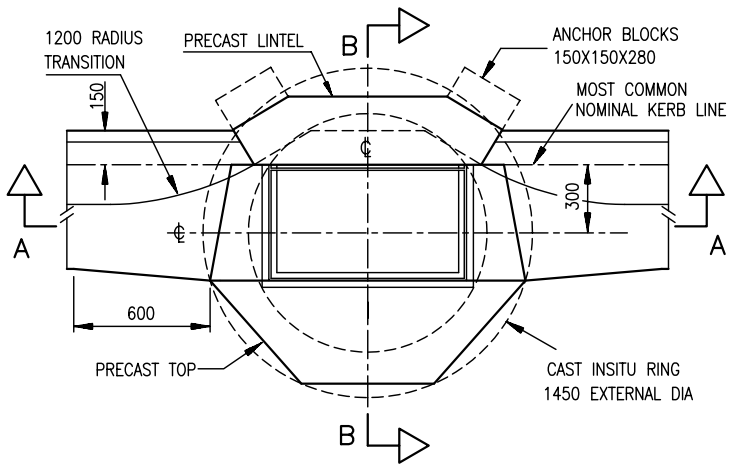


SECTION C-C

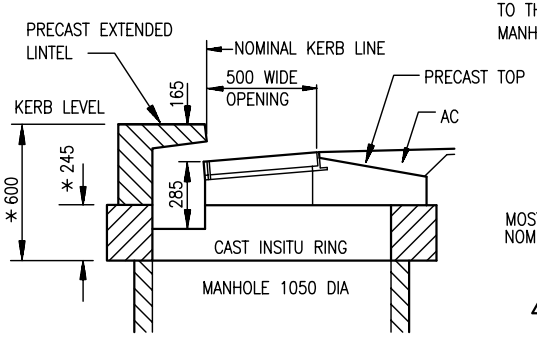


SECTION E-E

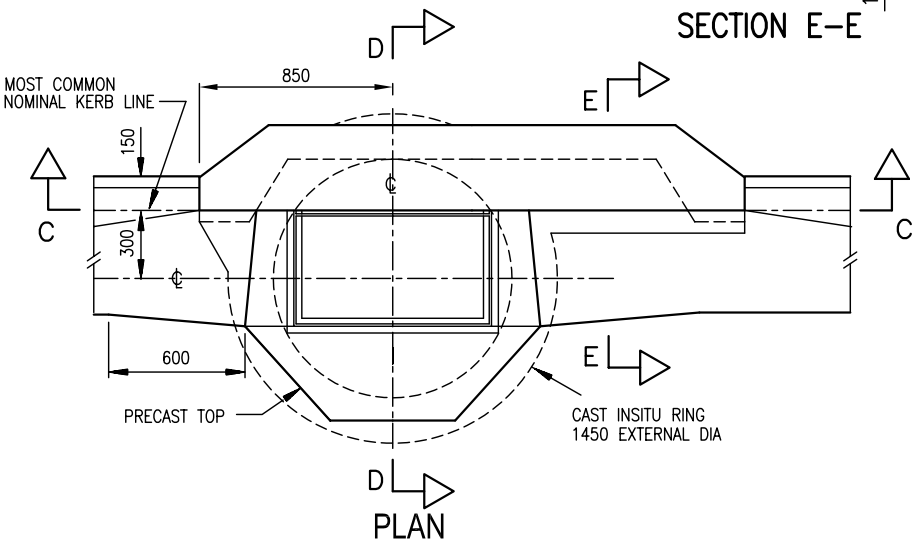
* MINIMUM DIMENSIONS TO THE TOP OF THE MANHOLE STEM.



PLAN
STANDARD INLET

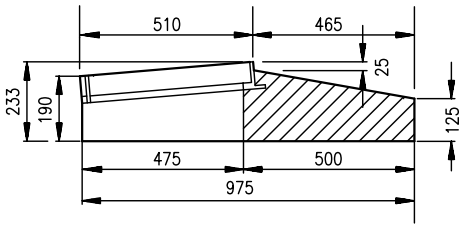


SECTION D-D



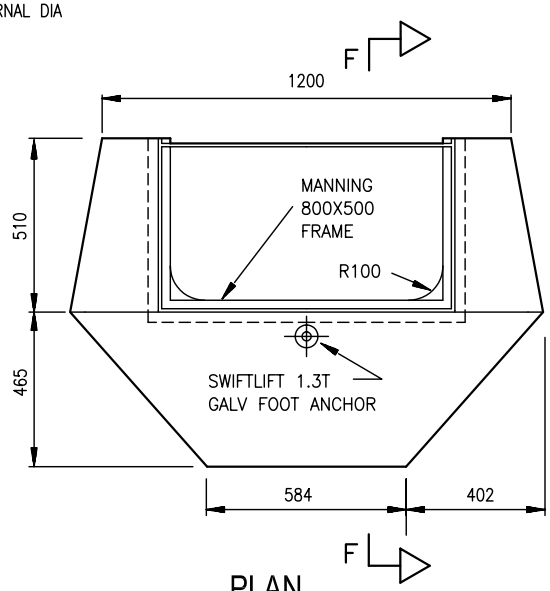
PLAN

EXTENDED KERB INLETS



SECTION F-F

PRECAST TOP



PLAN

NOTES:

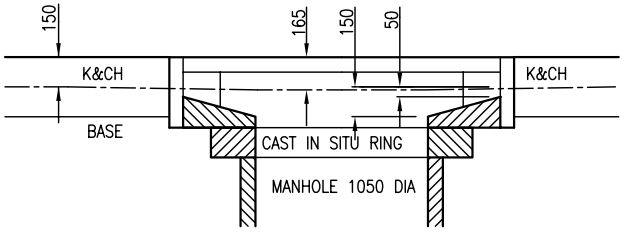
1. LINTEL CONCRETE TO BE GRADE N30 TO AS3600.
2. FOR LARGER MANHOLES USE A SIZE CONVERTER TO 1050 DIA.
3. RING DEPTH MAY BE INCREASED TO SUIT MANHOLE STEM HEIGHT.
4. RING MAY BE CAST TOGETHER WITH CAST INSITU MANHOLE STEM.
5. SLOPE OF THE PRECAST TOP MUST MATCH K&CH TYPE AND GRADE.
6. THE STANDARD INLET LINTEL IS DETAILED ON DWG NoK1.
7. EXTENDED INLET LINTELS ARE DETAILED ON DWG NoK3.
8. KERB INLET TRANSITIONS ARE DETAILED ON DWG Nos K1&K3.
9. FOR INLET MANHOLE, COMPACT LINTEL SEE DWG. K5.
10. CHECK GRATE OPENS FULLY BEFORE CONCRETING.
11. THE IMEAQ NOMINAL KERB LINE IS ON THE CHANNEL INVERT.
12. WEIGHT OF PRECAST TOP(CONCRETE ONLY) = 260KG.
13. WEIGHT OF PRECAST TOP WITH GRATE & FRAME = 350KG.

	REVISIONS	DATE	INITS
NO	ORIGINAL ISSUE	1-5-99	PGB

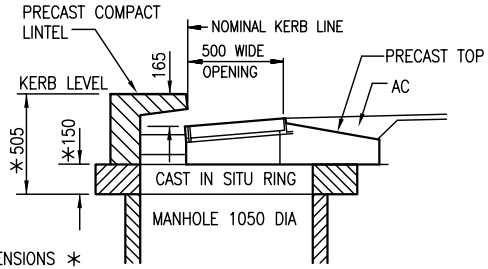
KERBWAY

INLET MANHOLE TOP

K5

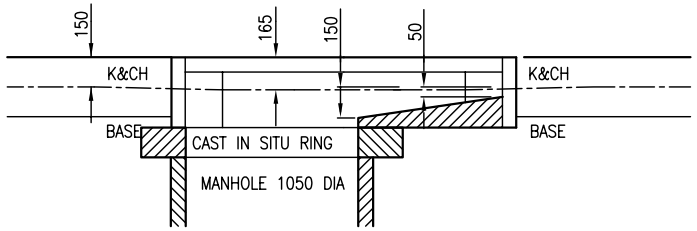


SECTION A-A
Scale B

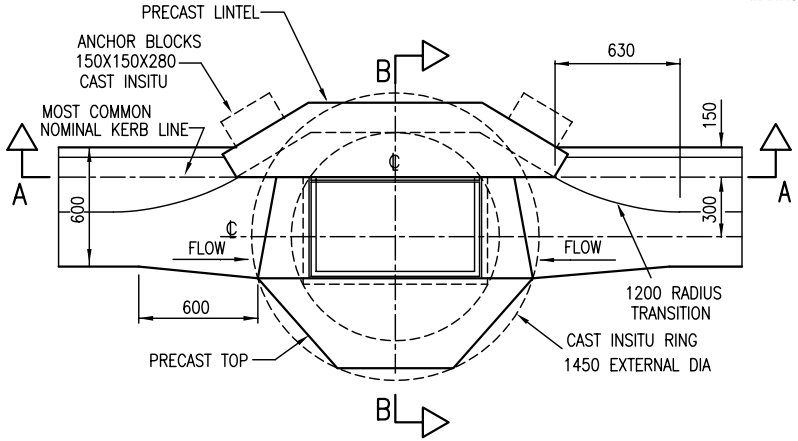


MINIMUM DIMENSIONS * TO THE TOP OF THE MANHOLE STEM.

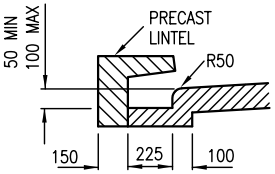
SECTION B-B
Scale B



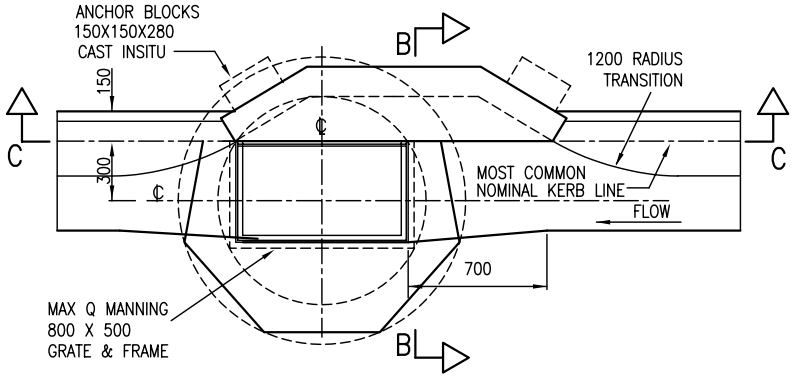
SECTION C-C
Scale B



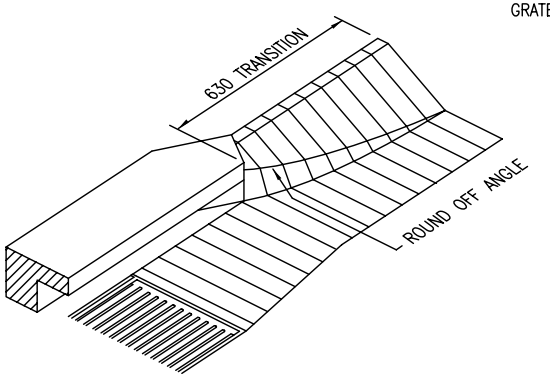
PLAN OF INLET IN SAG
Scale B



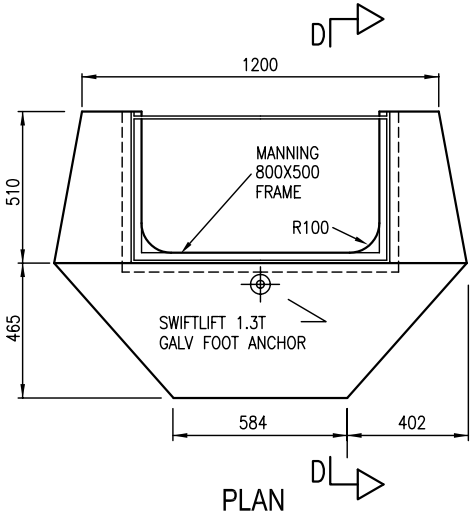
SECTION E-E
Scale B



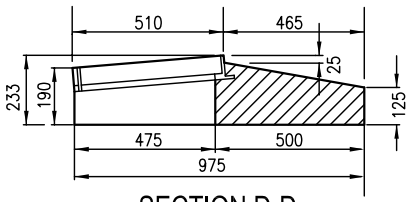
PLAN OF INLET ON GRADE
Scale B



MOUNTABLE KERB TRANSITION



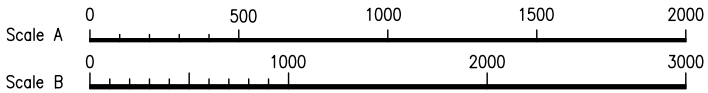
PLAN



SECTION D-D

PRECAST TOP
Scale A

NOTES:
1. LINTEL CONCRETE TO BE GRADE N30 TO AS3600.
2. FOR LARGER MANHOLES USE A SIZE CONVERTER TO 1050 DIA.
3. RING DEPTH MAY BE INCREASED TO SUIT MANHOLE STEM HEIGHT.
4. RING MAY BE CAST TOGETHER WITH CAST INSITU MANHOLE STEM.
5. SLOPE OF THE PRECAST TOP MUST MATCH K&CH TYPE AND GRADE.
6. THE INLET LINTEL IS DETAILED ON DWG No K2.
7. CHECK GRATE OPENS FULLY BEFORE CONCRETING.
8. THE IMEAQ NOMINAL KERB LINE IS ON THE CHANNEL INVERT.
9. WEIGHT OF PRECAST TOP(CONCRETE ONLY) = 260KG.
10. WEIGHT OF PRECAST TOP WITH GRATE & FRAME = 350KG.

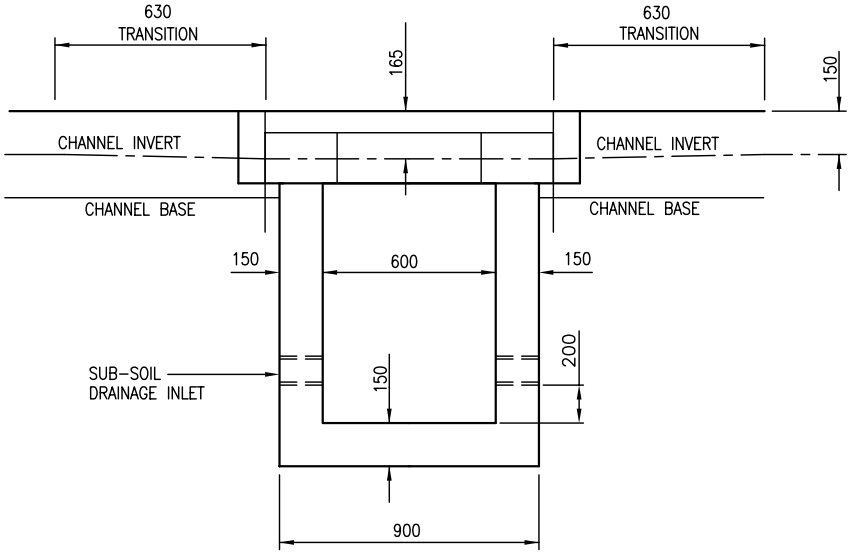


NO	REVISIONS	DATE	INITS
	ORIGINAL ISSUE	1-5-99	PGB

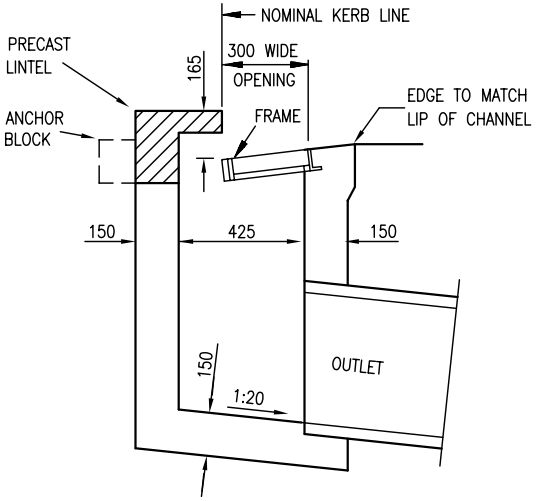
KERBWAY

INLET MANHOLE TOP - COMPACT LINTEL

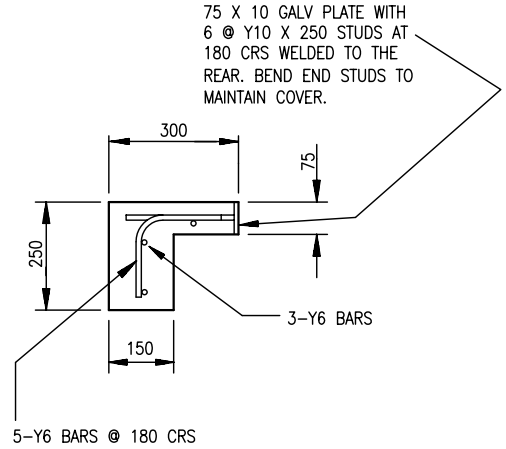
K6



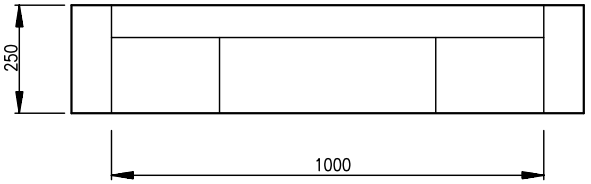
SECTION A-A



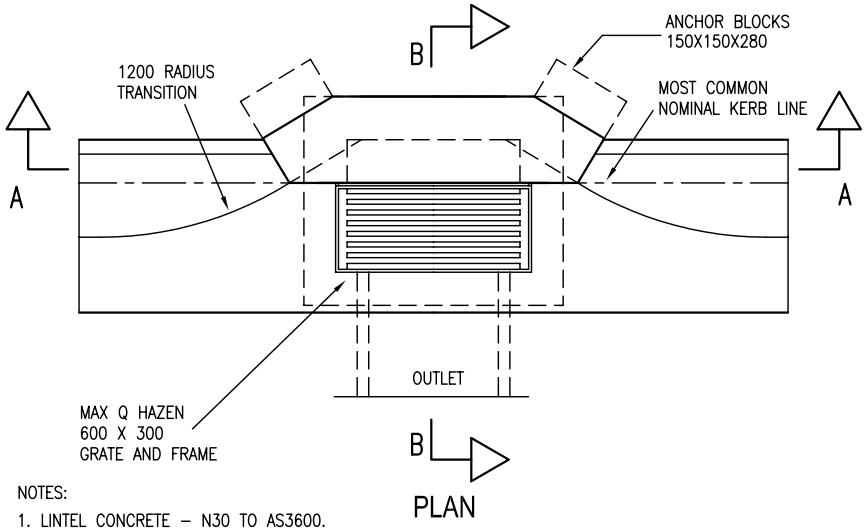
SECTION B-B



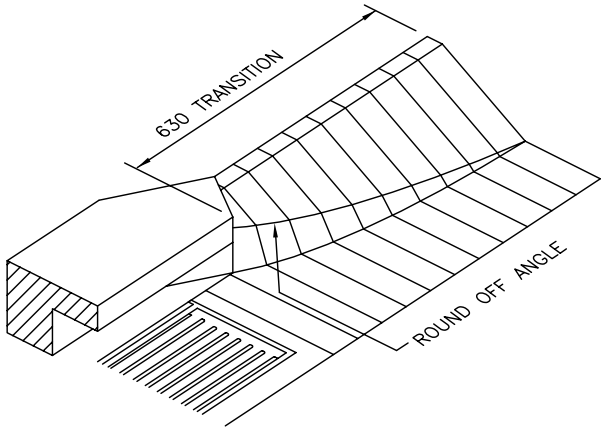
SECTION C-C



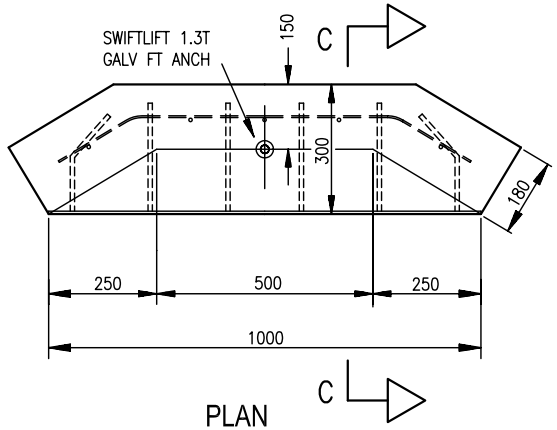
ELEVATION



PLAN



MOUNTABLE KERB
TRANSITION



PLAN
PRECAST 1000 LINTEL

NOTES:

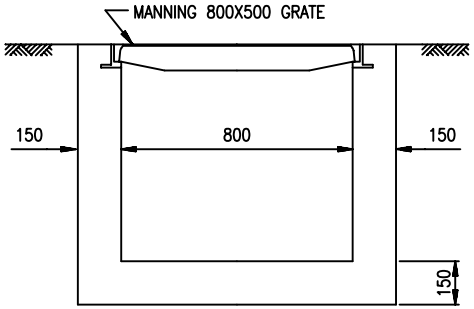
1. LINTEL CONCRETE – N30 TO AS3600.
2. 40MM COVER TO ALL BARS.
3. GALVANISE LINTEL PLATE AFTER WELDING.
4. BARRIER KERB NEEDS NO TRANSITION.
5. WEIGHT OF LINTEL = 115KG.
6. INSTALL STEP IRONS TO AS1657–1992 IN PITS DEEPER THAN 1.35M. LOCATE OTHER THAN ON BACK WALL.
7. CHECK GRATE OPENS FULLY BEFORE CONCRETING.
8. THE IMEAQ NOMINAL KERB LINE IS ON THE CHANNEL INVERT.

	REVISIONS	DATE	INITS
NO	ORIGINAL ISSUE	1–5–99	PGB

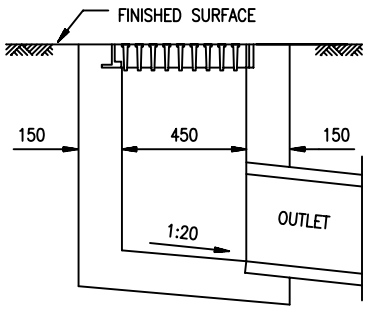
KERBWAY

SECONDARY INLET

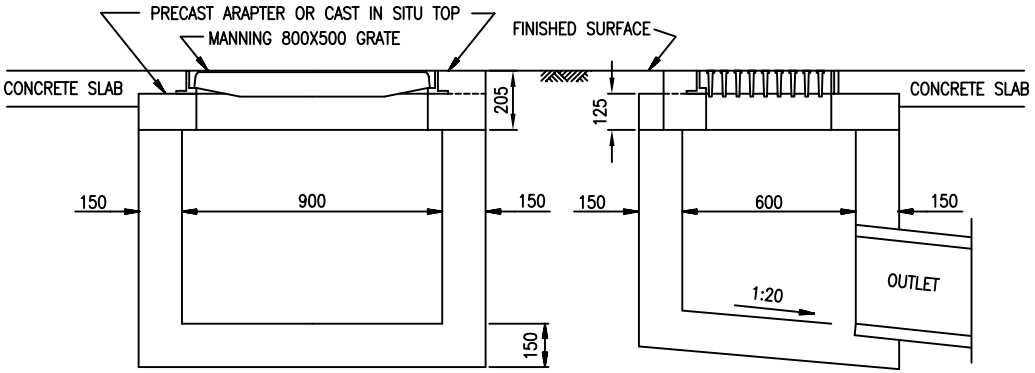
K7



SECTION A-A

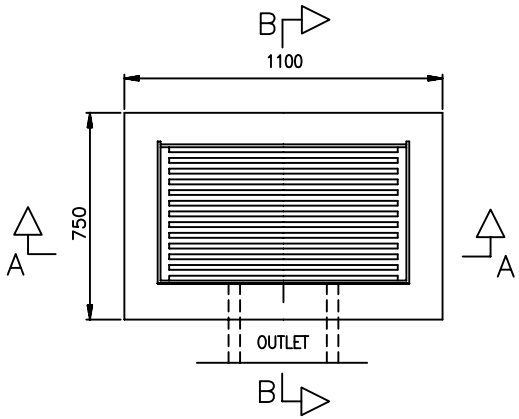


SECTION B-B

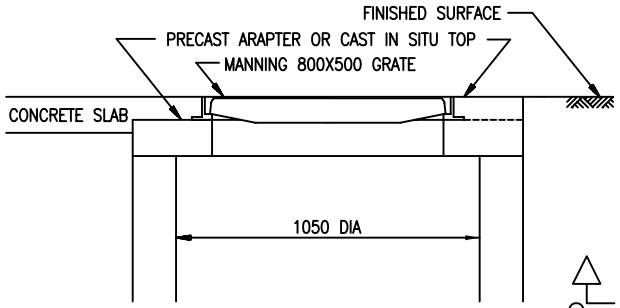


SECTION C-C

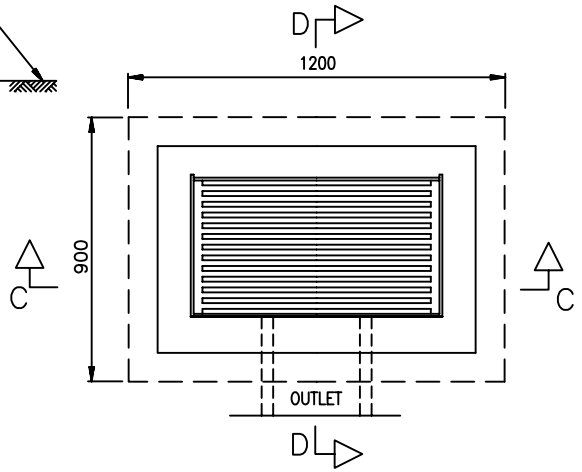
SECTION D-D



MANNING GRATE OVER 800 X 450 PIT



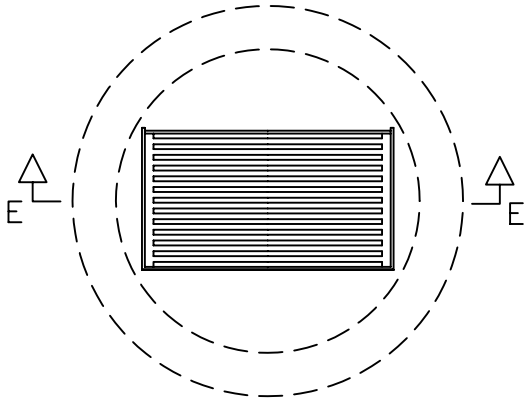
SECTION E-E



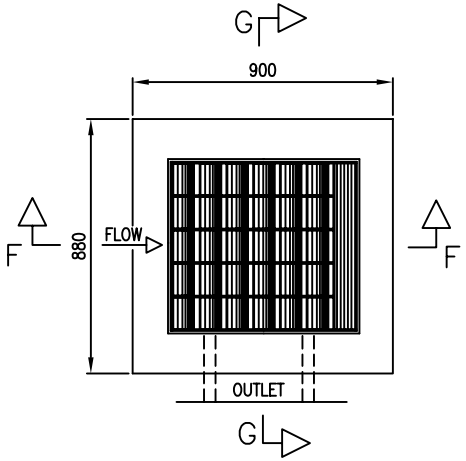
MANNING GRATE
OVER 900 X 600 PIT

NOTES:

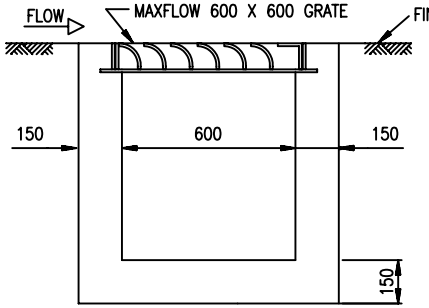
1. THE MAXFLOW GRATE GIVES HIGHEST CAPTURE AND PASSES DEBRIS TO 110MM X 40MM.
2. THE MANNING GRATE IS PREFERRED FOR PEDESTRIAN PRECINCTS.
3. THE BARS OF THE MANNING GRATE SHOULD BE ALIGNED WITH THE FLOW.
3. THE VANES OF THE MAXFLOW GRATE SHOULD BE ALIGNED WITH THE FLOW AS DRAWN.



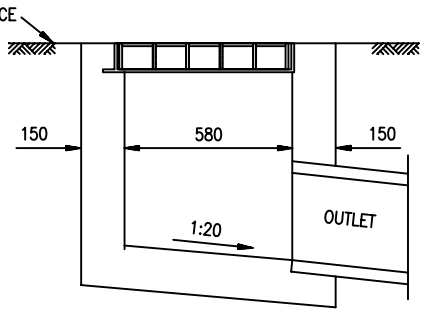
MANNING GRATE OVER 1050 DIA MANHOLE



PLAN



SECTION F-F



SECTION G-G

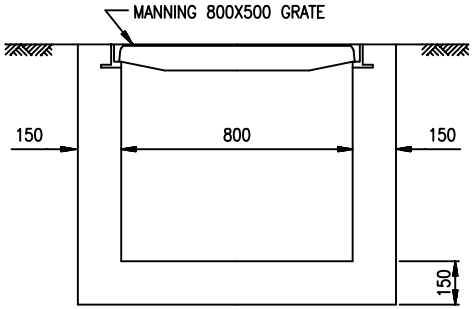
MAXFLOW GRATE OVER 600 X 580 PIT

	REVISIONS	DATE	INITS
NO	ORIGINAL ISSUE	1-5-99	PGB

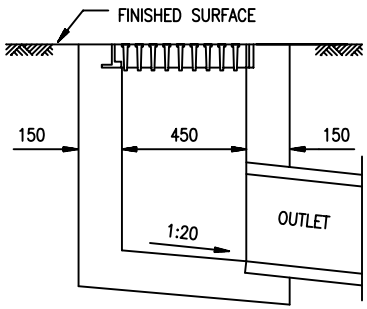
Max Q

CENTRE OF ROAD INLETS

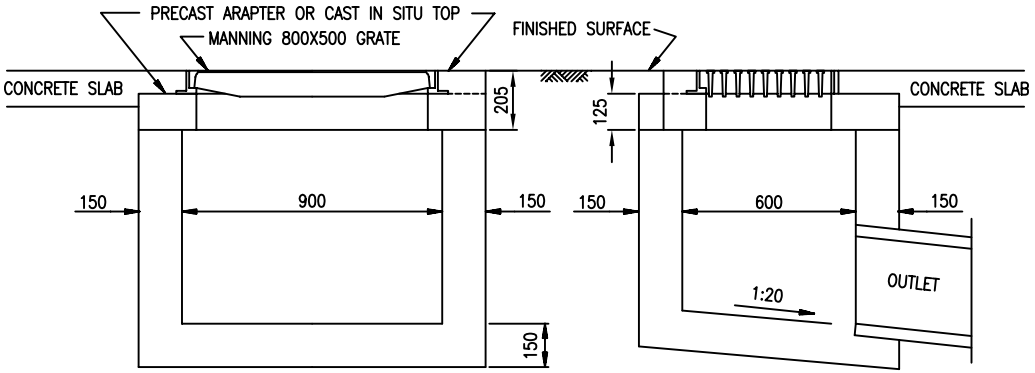
C1



SECTION A–A

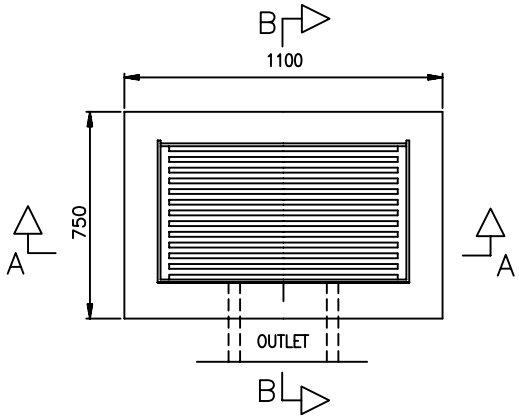


SECTION B–B

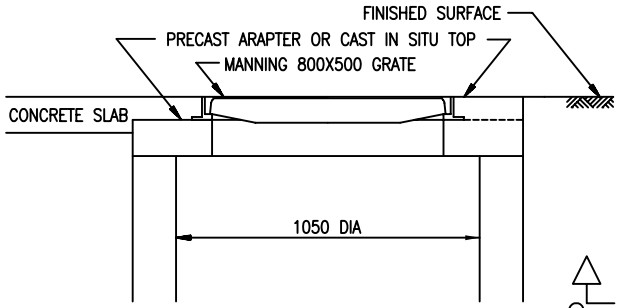


SECTION C–C

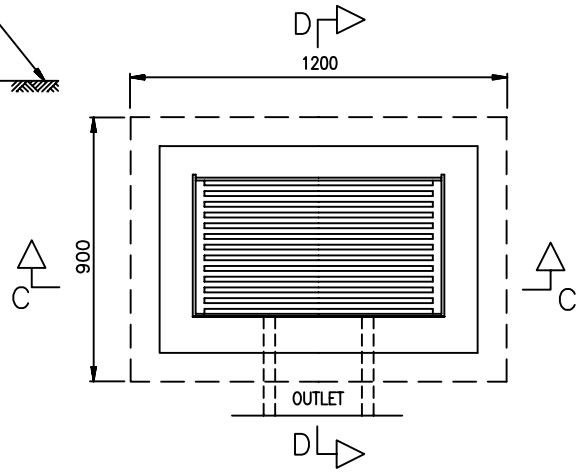
SECTION D–D



MANNING GRATE OVER 800 X 450 PIT



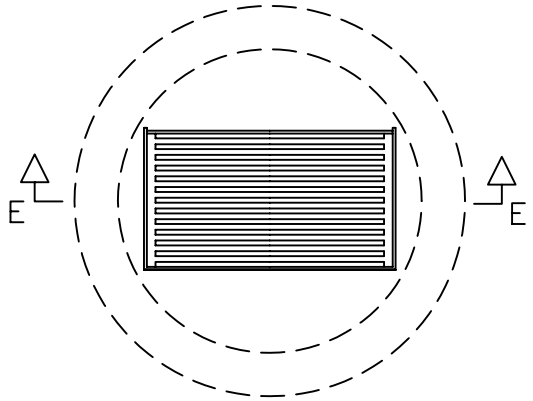
SECTION E–E



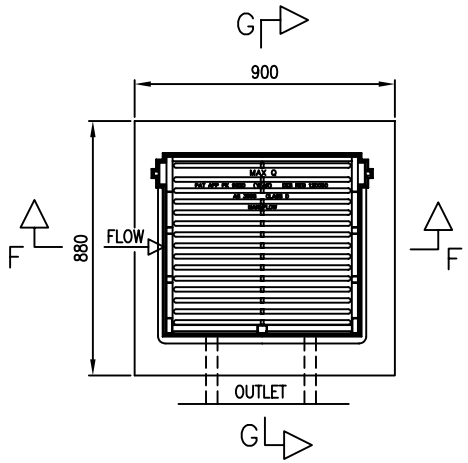
MANNING GRATE
OVER 900 X 600 PIT

NOTES:

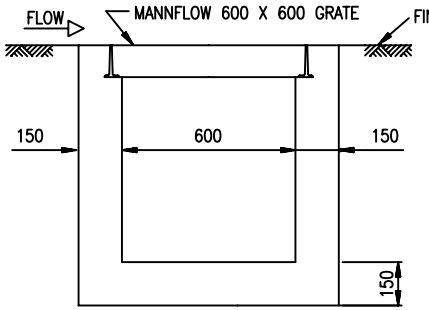
1. MANNFLOW & MAXFLOW GRATES ARE BICYCLE AND PEDESTRIAN SAFE TO AS 3995 – 2006
2. MANNING & MANNFLOW GRATES ARE IN ADDITION THE MOST BICYCLE AND PEDESTRIAN FRIENDLY GRATES AVAILABLE.
3. THE BARS OF MANNING & MANNFLOW GRATES SHOULD BE ALIGNED WITH THE FLOW.



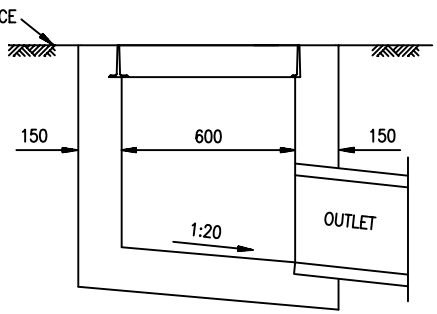
MANNING GRATE OVER 1050 DIA MANHOLE



PLAN



SECTION F–F



SECTION G–G

MANNFLOW GRATE OVER 600 X 600 PIT

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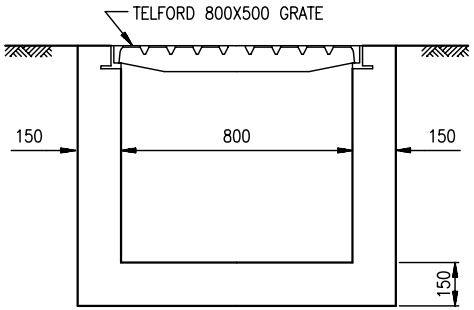
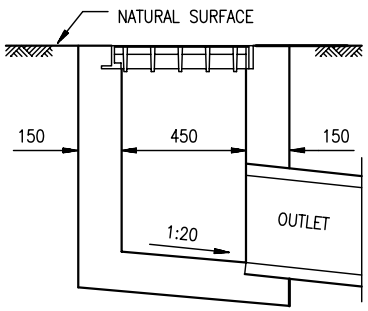
CENTRE OF ROAD INLETS

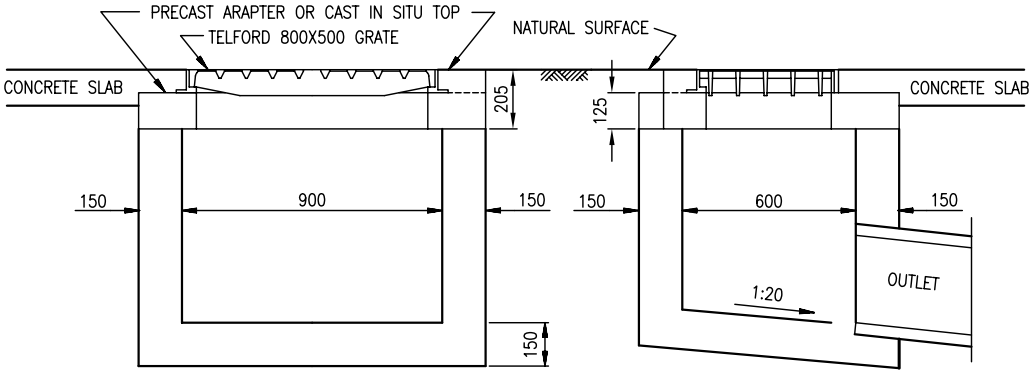
C2



SECTION A-A

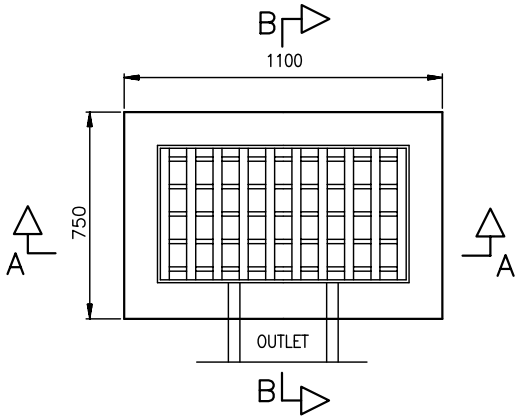


SECTION B-B

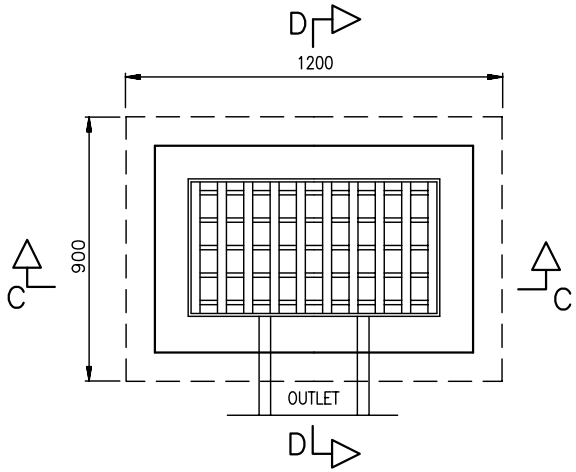


SECTION C-C

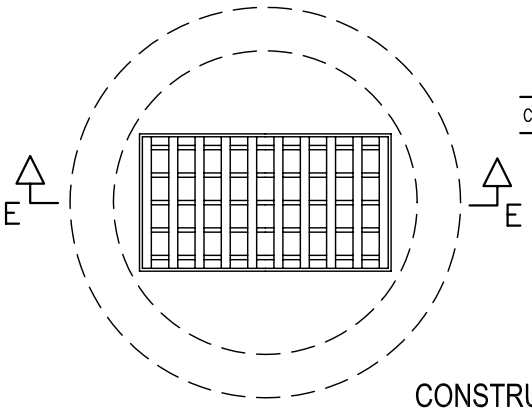
SECTION D-D

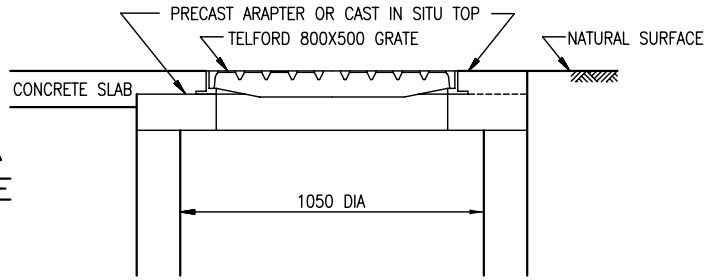


NORMAL CONSTRUCTION
OVER 800 X 450 PIT



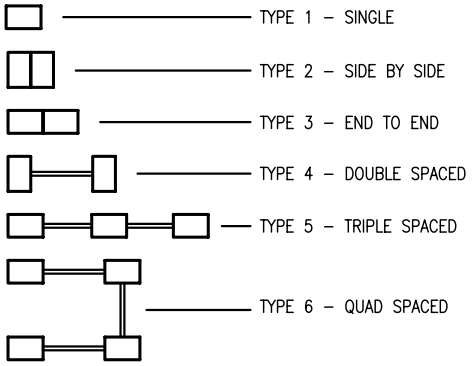
CONSTRUCTION
OVER 900 X 600 PIT





SECTION E-E

CONSTRUCTION OVER 1050 DIA MANHOLE



INLET CONFIGURATIONS

NOTES:

1. FIELD INLETS SHOULD BE SET IN A DEPRESSION OR SLOW MOVING CHANNEL.
2. THE TELFORD GRATE IS ILLUSTRATED AND IS RECOMMENDED FOR VEGITATED AREAS.
3. THE MANNING GRATE IS PREFERRED FOR PEDESTRIAN PRECINCTS.
4. THE TELFORD AND MANNING GRATES ARE INTERCHANGEABLE, USING IDENTICAL FRAMES.
6. PRECAST CONVERTERS ARE AVAILABLE FOR 1050 MH AND 900X600 PITS.
5. SPACED CHAMBERS HAVE A SEPARATION OF 2.4M BETWEEN INSIDE WALLS.

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FIELD INLETS

F1