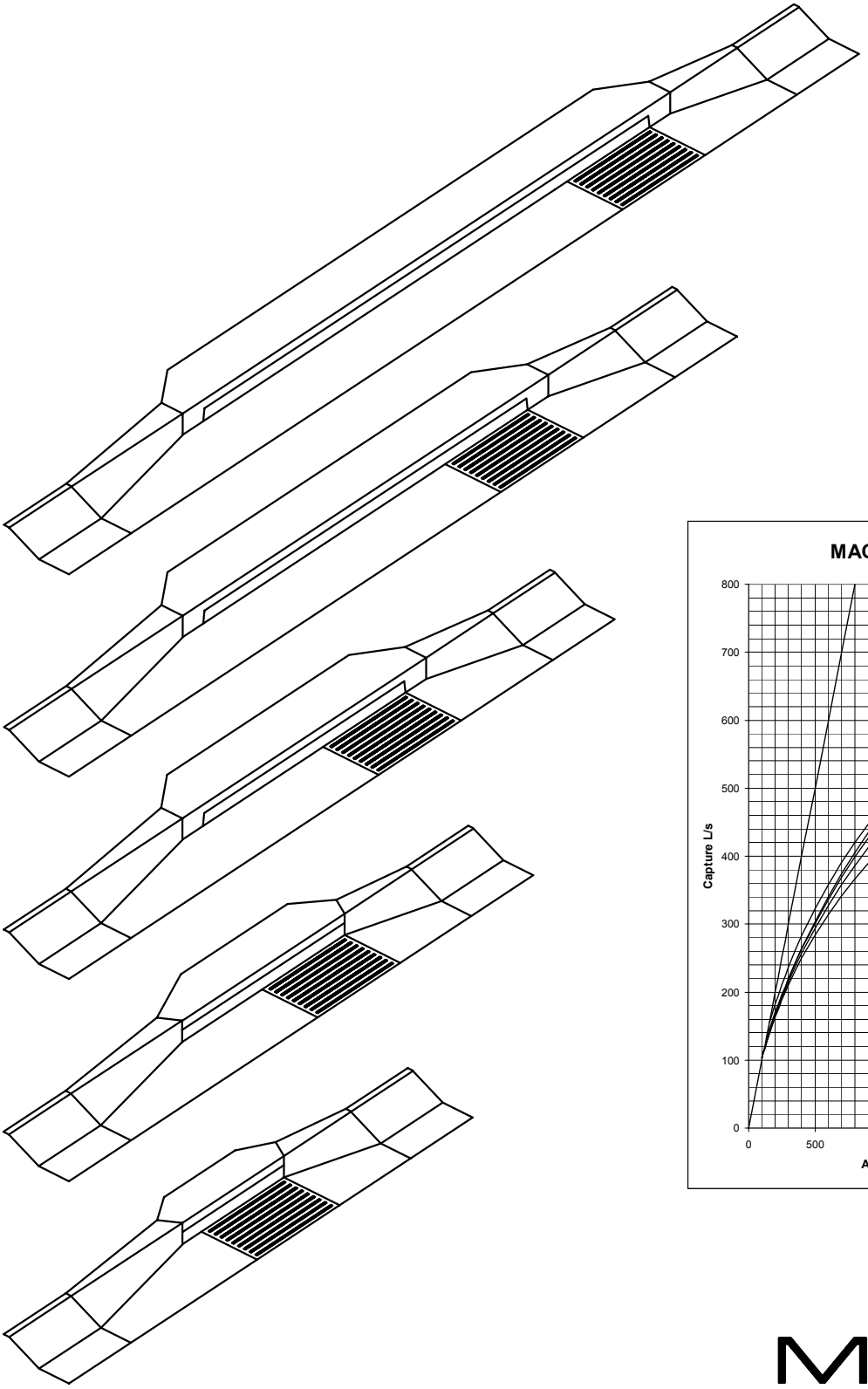
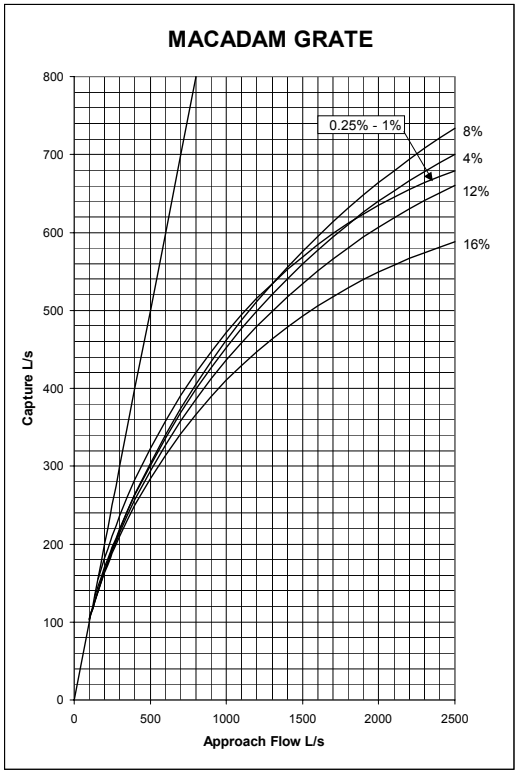
# Stormway

## STORMWATER INLET SYSTEM

# DESIGN CAPTURE CHARTS






Max Q

# STORMWAY

## CONTENTS



**Stormway** like *Drainway* is a complete stormwater drainage inlet and manhole system in its own right. The Manning grate has been widely used for over 30 years. The *Macadam* grate and *Stormcover* are also covered in this package. The 800x500 grates combined with the 800x700 gully pit and the shorter kerb transitions minimise the intrusion of grate and inlet on both roadway and footpath.

With lip-in-line grates and the most widely used 600mm wide kerb and channel, *Stormway* lintels are only 50mm behind the kerb face providing safe continuity of the footpath width. This minimises the risk of injury to pedestrians and associated public liability claims.

*Manning* grates are the preferred standard because of their pedestrian friendly flat surface and bar spacings. Where very high pedestrian usage is likely *Stormcover* may be used. The *Macadam* grate, with its higher capture, is ideal for arterial roads or similar locations where pedestrian usage is limited.

# STORMWAY
## STORMWATER INLET SYSTEM

**Introduction**
*Stormway* is a refined version of a widely used stormwater inlet system based on 800x500 grates and covers using an 800x700 gully pit. *Stormway* inlet safety advantages include:

1. Child safe 100mm kerb inlet openings.
2. Vehicle and bike safe lip-in-line construction.
3. Limited pedestrian safety risk from footpath intrusion.
4. Pedestrian friendly Manning grate as an option.
5. Maximum pedestrian safety using the cover option.
6. Work & traffic safety option of inlet-manhole construction.

Other *Stormway* design advantages include:

1. Inlet options to use either of two grates or a cover.
2. Shorter inlet length with mainly 700mm kerb transitions.
3. Five inlet sizes from 1000mm to 4800mm lintel length.
4. Shortest extended kerb inlet – 1600mm lintel – 3m overall.
5. High efficiency capture with vaned Macadam grate.
6. Design economies - charts extended from 500 to 2500L/s.

Each of the grates and the cover has been flow tested using a 100mm kerb opening and the 700mm transitions. The calibration flow range is 1800L/s with curves extrapolated to 2500L/s by the test authority. The new design is designated *Stormway* to distinguish it from earlier Max Q 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 half scale using the apparatus known to give results that are, for all practical purposes, identical to results at full scale.

Base modelling on grade was carried out at 3% crossfall with mountable kerb. Separate tests for crossfalls from 2% to 4% and barrier kerb with 300mm and 450mm channel permit calculation of factors for conversion of base model captures to other configurations.

Sag inlet tests were conducted with the cover only. Measured sag captures therefore ignore inflow through a grate.

**Precast Units**
The five lintels 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**
*Stormway* inlets are described in terms 'S" for *Stormway*, 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 over-all length including transitions are:

| Lintel mm | S1000 | S1600 | S2400 | S3600 | S4800 |
|---|---|---|---|---|---|
| Overall Length | 2400 | 3000 | 3800 | 5000 | 6200 |

**Construction Details**
Construction details for *Stormway* inlets are shown in Dwg S1 for normal gully pit construction and Dwg S2 for inlet-manhole construction. Kerb transition lengths are:

- Mountable kerb – 700m U/S, D/S and in sag.
- BK300 kerb – 1500mm U/S and 700mm D/S and in sag.
- BK450 – 300mm U/S, D/S and in sag.

**Design Charts**
Charts are provided for the cover and each grate, for each of the four inlet lengths described, covering both mountable kerb types, cross falls 2.5% and 3.0% and grades 0.25% to 16%. Factors provide solutions for other crossfalls and kerb types. The sag chart covers all kerb types, the grates and the cover.

**Blockage**
Blockage factors are applied to compensate for reduced capture in the field compared with ideal test conditions. Manning grates, tested with 10 litres of typical pollutant mix to 250L/s at full scale, showed no capture loss at 1% and a 5% reduction at 4% and 12% grades. Macadam grates with 80x110 streamlined openings are very blockage resistant. For system design apply Qudm-1992 blockage factors, to chart captures, as follows:

- Inlet on grade – with grate 0.9 – with cover 0.8
- Inlet in sag – with grate 1.0 – with cover 0.8

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

| Road grade % | S1000 – S3600 | S4800 |
|---|---|---|
| 0.25% - 8% | 150mm | 150mm |
| >8% to 16% | 150mm | 300mm |

**Child Safety**
*Stormway* kerb inlet openings are limited to 100mm. This is a desirable maximum opening to guard against small children being washed into the inlet.

**Pedestrian Safety**
Covers are often preferred to grates for pedestrian precincts though grates, having better capture, are more cost efficient. Pedestrian friendly Manning grates with flat surface and openings <17mm are usually acceptable alternatives to covers.

**Hydraulic Efficiency**
The pedestrian friendly *Manning* grate is the most widely used but the *Macadam* exhibits more efficient flow capture.

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

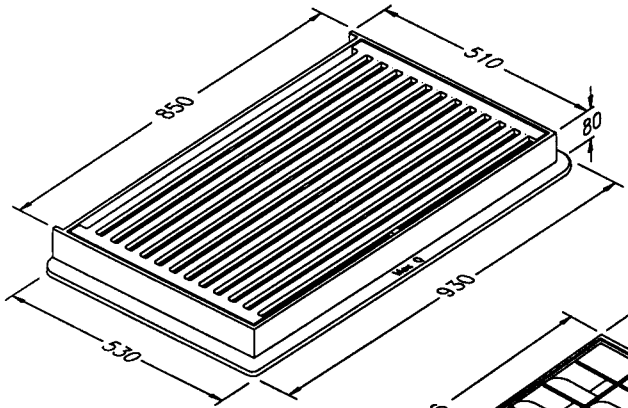
**Charts**
*Stormway System* design charts provided are:

| No | Kerb and Channel Type | Cross-fall |
|---|---|---|
| **Macadam Grate** | | |
| S1 | Mountable regular | 3.0% |
| S2 | Mountable regular | 2.5% |
| **Manning Grate** | | |
| S3 | Mountable regular | 3.0% |
| S4 | Mountable regular | 2.5% |
| **Cover** | | |
| S5 | Mountable regular | 3.0% |
| S6 | Mountable regular | 2.5% |
| **S4800 Lintel Inlets** | | |
| S7 | Mountable regular | 3.0% |
| S8 | Mountable regular | 2.5% |
| **Sag** | | |
| S9 | All Kerb Types | 2 - 4% |
| **Conversion Factors** | | |
| S10 | All Kerb Types | 2 - 4% |

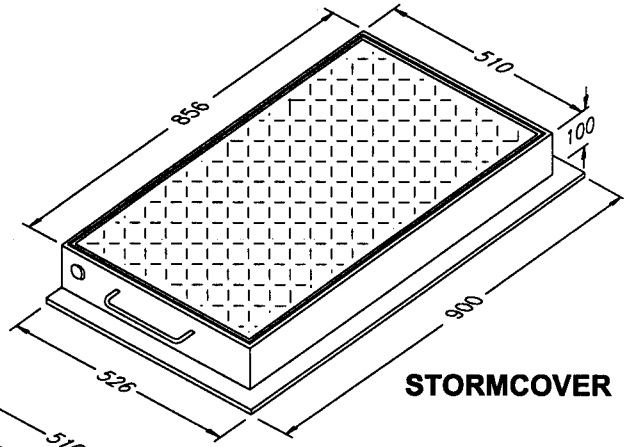
*Hazen* design charts provided are:

| No | Kerb and Channel Type | Cross-fall |
|---|---|---|
| **Hazen Grate** | | |
| S11 | Mountable and Barrier | All |

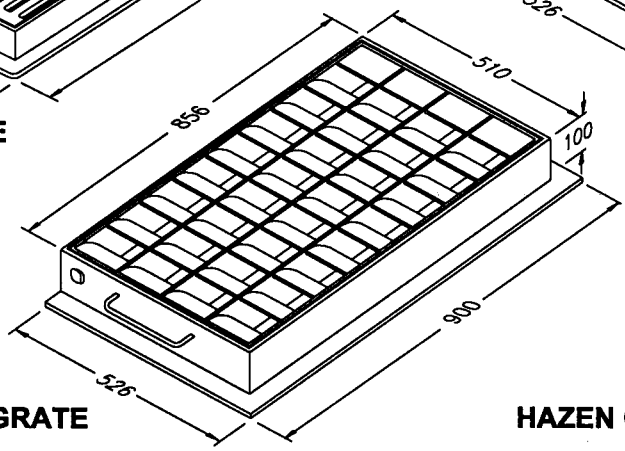
# STORMWAY SYSTEM



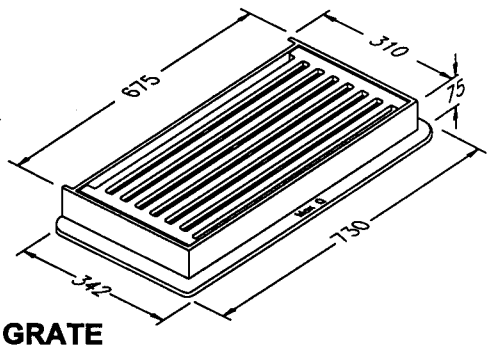

MANNING GRATE



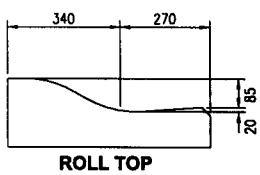

STORMCOVER



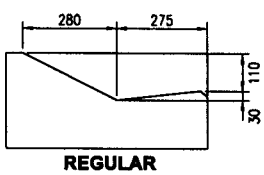

MACADAM GRATE




HAZEN GRATE

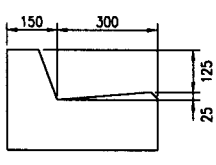



ROLL TOP

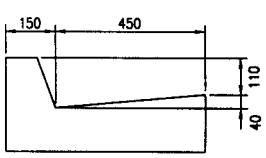



REGULAR

MOUNTABLE KERB TYPES




BARRIER KERB BK300




BARRIER KERB BK450



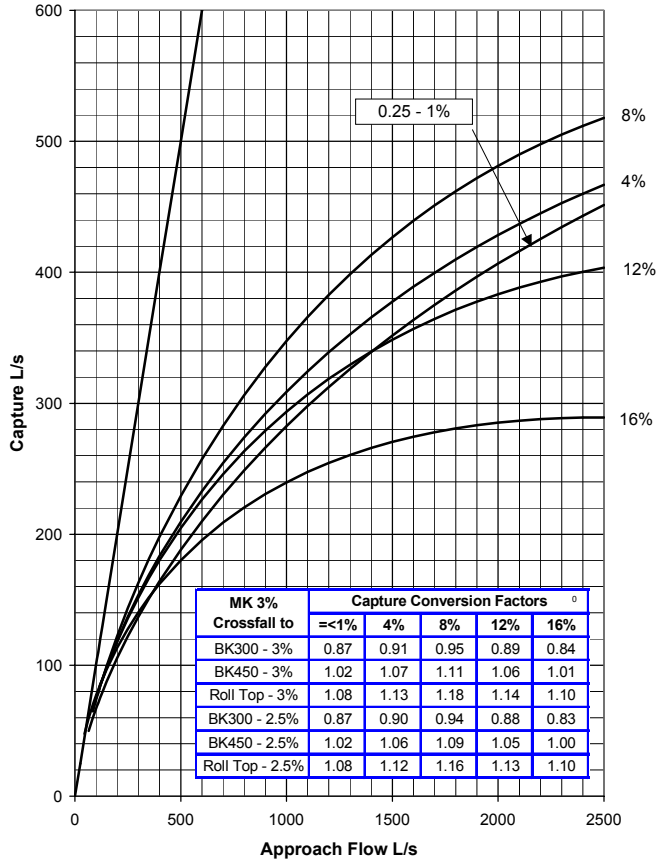

SPECIFICATION CODES:
STORMWAY SYSTEM - S
GULLY INLET - G
INLET MANHOLE - M
MACADAM GRATE - A
MANNING GRATE - B
STORMCOVER - C
LINTELS - 1000, 1600, 2400, 3600, 4800.
TYPICAL UNIT WITH GRATE - S2400G/A
(STORMWAY 2400mm LINTEL AND GULLY INLET WITH MACADAM GRATE)
TYPICAL UNIT WITH COVER - S1000M/C
(STORMWAY 3600mm LINTEL AND INLET MANHOLE WITH STORMCOVER)

**2400 LINTEL & MANNING GRATE**
**REGULAR MOUNTABLE KERB**
**700MM TRANSITIONS**
**(For other configurations, gully box & inlet manhole details see Dwg S1)**

| TYPICAL INLET CODES | | | | | |
|---|---|---|---|---|---|
| COVER/GRATE | 1000 LINTEL | 1600 LINTEL | 2400 LINTEL | 3600 LINTEL | 4800 LINTEL |
| MACADAM GRATE | S1000/A | S1600/A | S2400/A | S3600/A | S4800/A |
| MANNING GRATE | S1000/B | S1600/B | S2400/B | S3600/B | S4800/B |
| STORMCOVER | S1000/C | S1600/C | S2400/C | S3600/C | S4800/C |

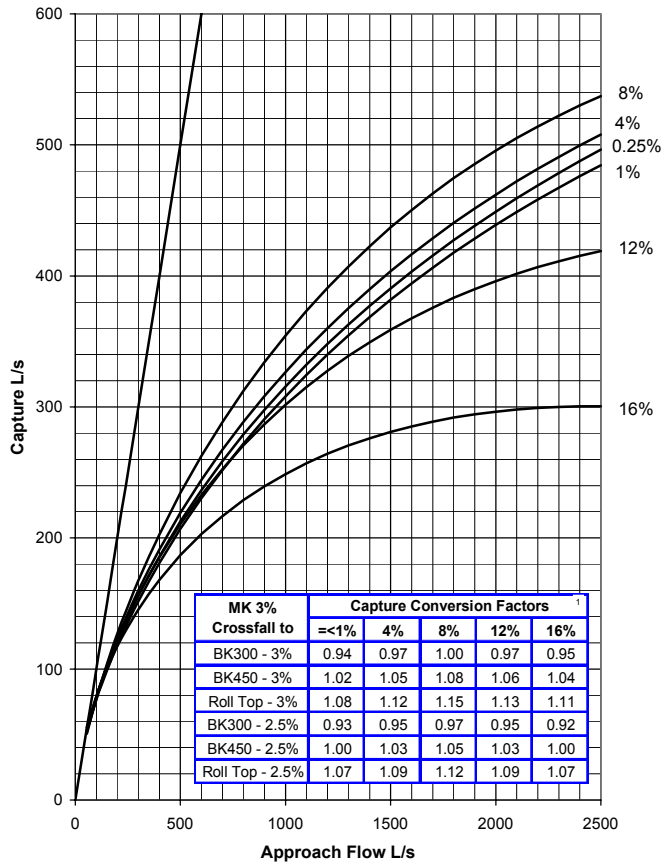
| OVERALL INLET LENGTH INCLUDING TRANSITIONS | | | | | |
|---|---|---|---|---|---|
| TYPES | 1000 LINTEL | 1600 LINTEL | 2400 LINTEL | 3600 LINTEL | 4800 LINTEL |
| MOUNTABLE & SAG | 2400 | 3000 | 3800 | 5000 | 6200 |
| BK 450 ON GRADE | 1600 | 2200 | 3000 | 4200 | 5400 |
| BK 300 ON GRADE | 4600 | 3800 | 4600 | 5800 | 7000 |

## S1000/A - 2400



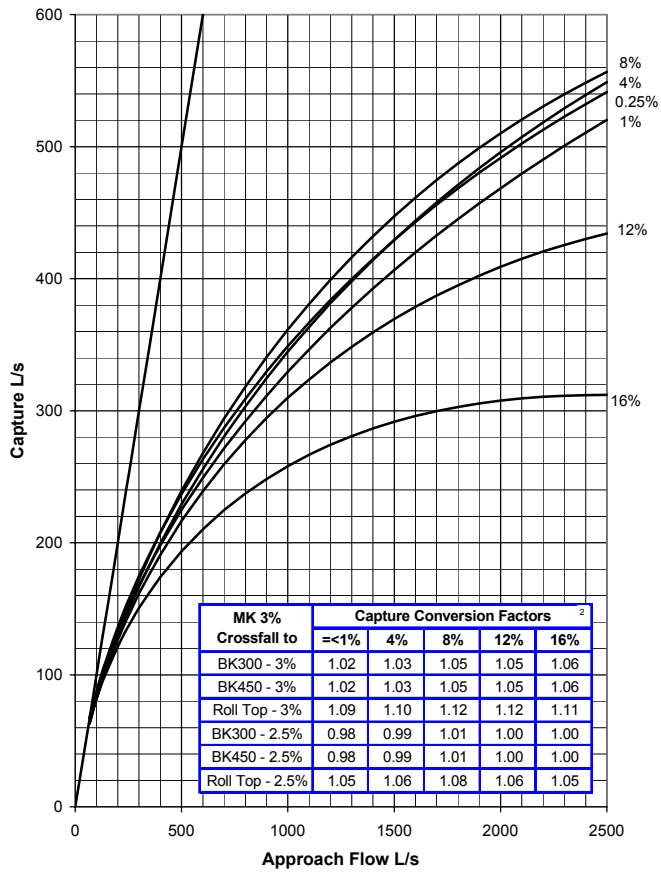

| MK 3% Crossfall to | Capture Conversion Factors 0 | | | | |
|---|---|---|---|---|---|
| | =<1% | 4% | 8% | 12% | 16% |
| BK300 - 3% | 0.87 | 0.91 | 0.95 | 0.89 | 0.84 |
| BK450 - 3% | 1.02 | 1.07 | 1.11 | 1.06 | 1.01 |
| Roll Top - 3% | 1.08 | 1.13 | 1.18 | 1.14 | 1.10 |
| BK300 - 2.5% | 0.87 | 0.90 | 0.94 | 0.88 | 0.83 |
| BK450 - 2.5% | 1.02 | 1.06 | 1.09 | 1.05 | 1.00 |
| Roll Top - 2.5% | 1.08 | 1.12 | 1.16 | 1.13 | 1.10 |

## S1600/A - 3000



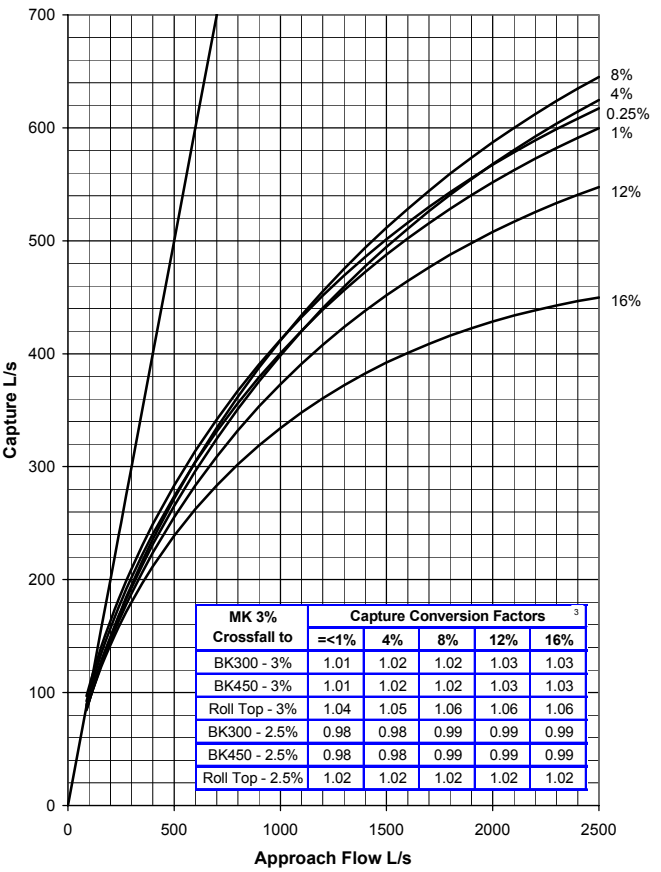

| MK 3% Crossfall to | Capture Conversion Factors 1 | | | | |
|---|---|---|---|---|---|
| | =<1% | 4% | 8% | 12% | 16% |
| BK300 - 3% | 0.94 | 0.97 | 1.00 | 0.97 | 0.95 |
| BK450 - 3% | 1.02 | 1.05 | 1.08 | 1.06 | 1.04 |
| Roll Top - 3% | 1.08 | 1.12 | 1.15 | 1.13 | 1.11 |
| BK300 - 2.5% | 0.93 | 0.95 | 0.97 | 0.95 | 0.92 |
| BK450 - 2.5% | 1.00 | 1.03 | 1.05 | 1.03 | 1.00 |
| Roll Top - 2.5% | 1.07 | 1.09 | 1.12 | 1.09 | 1.07 |

## S2400/A - 3800



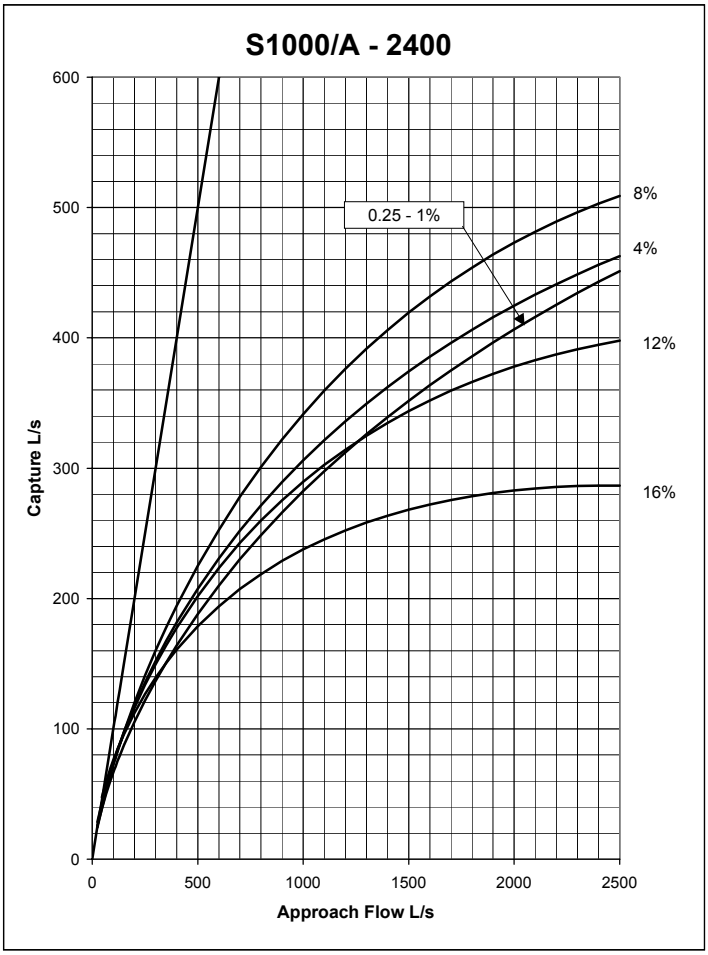

| MK 3% Crossfall to | Capture Conversion Factors 2 | | | | |
|---|---|---|---|---|---|
| | =<1% | 4% | 8% | 12% | 16% |
| BK300 - 3% | 1.02 | 1.03 | 1.05 | 1.05 | 1.06 |
| BK450 - 3% | 1.02 | 1.03 | 1.05 | 1.05 | 1.06 |
| Roll Top - 3% | 1.09 | 1.10 | 1.12 | 1.12 | 1.11 |
| BK300 - 2.5% | 0.98 | 0.99 | 1.01 | 1.00 | 1.00 |
| BK450 - 2.5% | 0.98 | 0.99 | 1.01 | 1.00 | 1.00 |
| Roll Top - 2.5% | 1.05 | 1.06 | 1.08 | 1.06 | 1.05 |

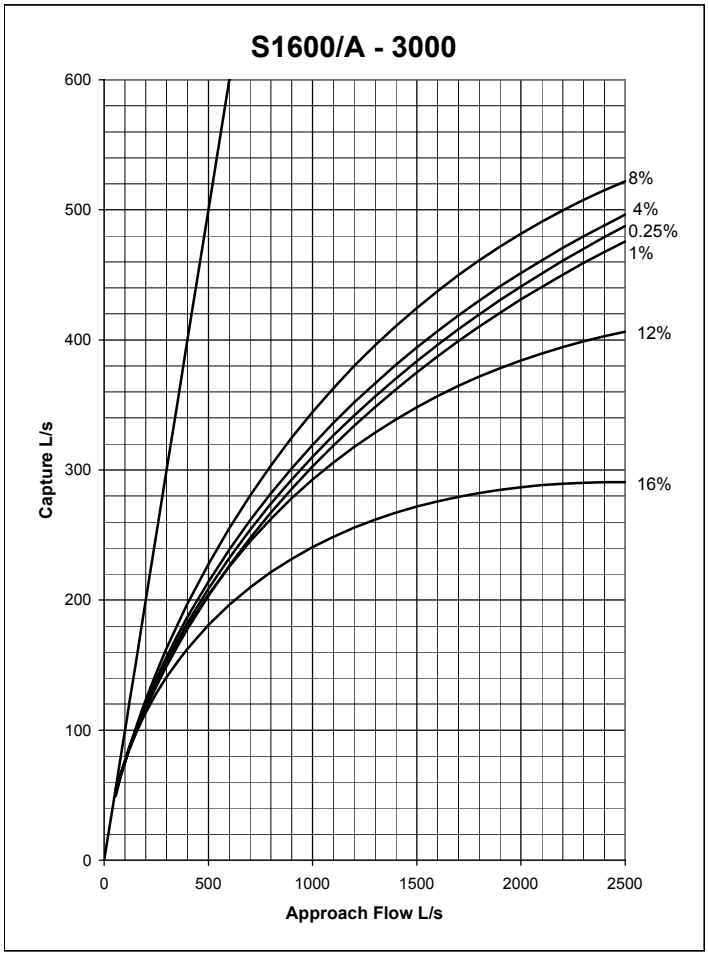
## S3600/A - 5000

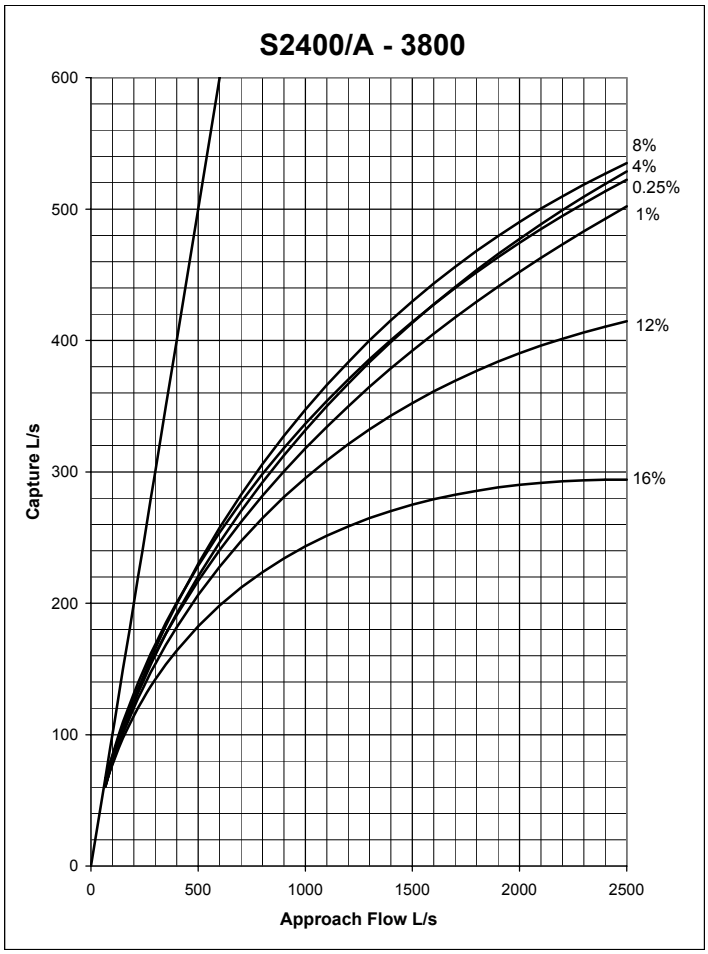


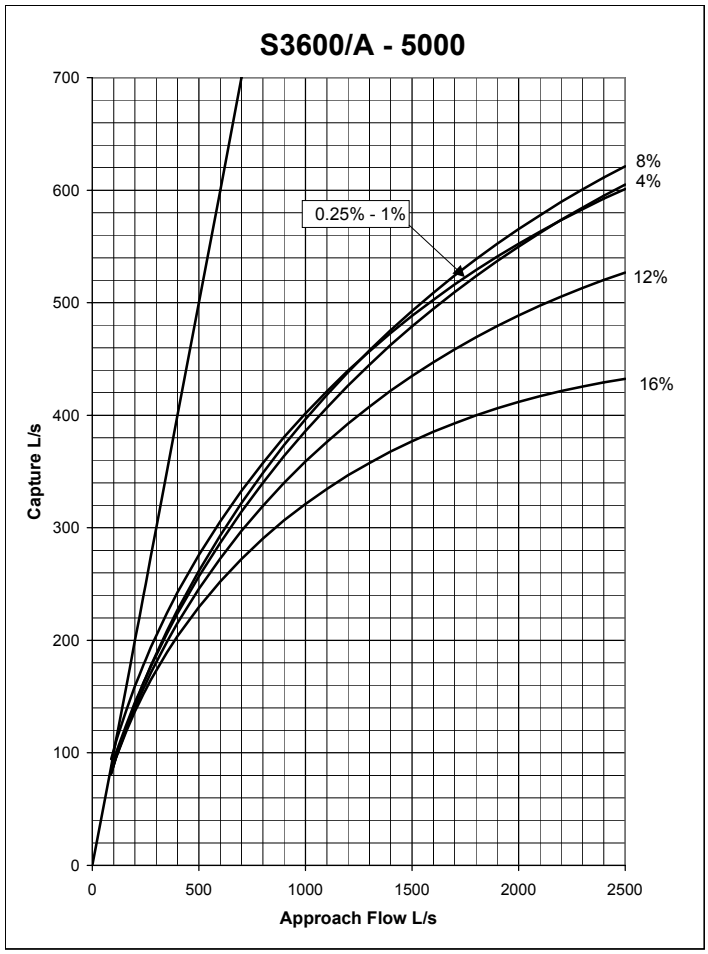

| MK 3% Crossfall to | Capture Conversion Factors 3 | | | | |
|---|---|---|---|---|---|
| | =<1% | 4% | 8% | 12% | 16% |
| BK300 - 3% | 1.01 | 1.02 | 1.02 | 1.03 | 1.03 |
| BK450 - 3% | 1.01 | 1.02 | 1.02 | 1.03 | 1.03 |
| Roll Top - 3% | 1.04 | 1.05 | 1.06 | 1.06 | 1.06 |
| BK300 - 2.5% | 0.98 | 0.98 | 0.99 | 0.99 | 0.99 |
| BK450 - 2.5% | 0.98 | 0.98 | 0.99 | 0.99 | 0.99 |
| Roll Top - 2.5% | 1.02 | 1.02 | 1.02 | 1.02 | 1.02 |

# STORMWAY
# MACADAM GRATE
# MOUNTABLE KERB - 3% CROSSFALL



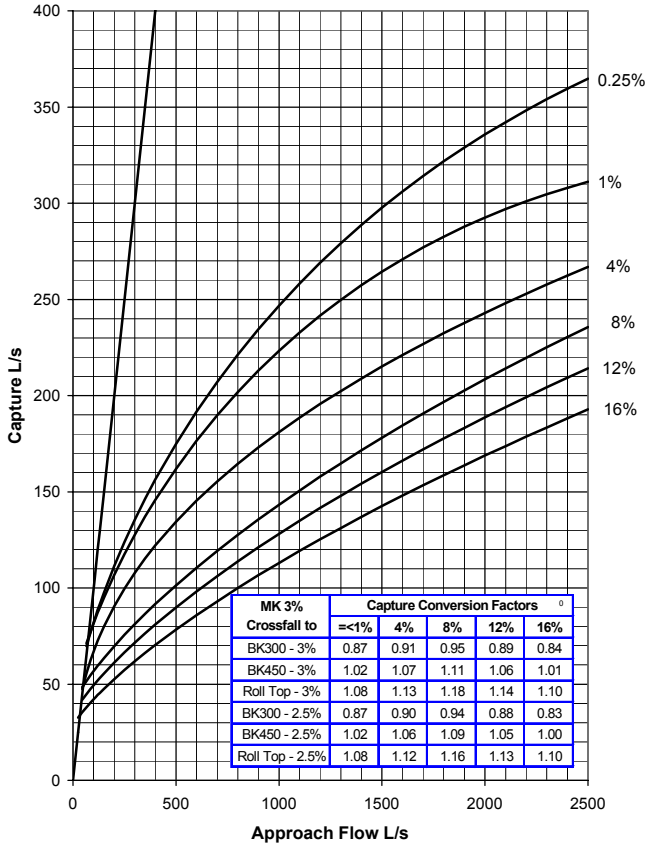



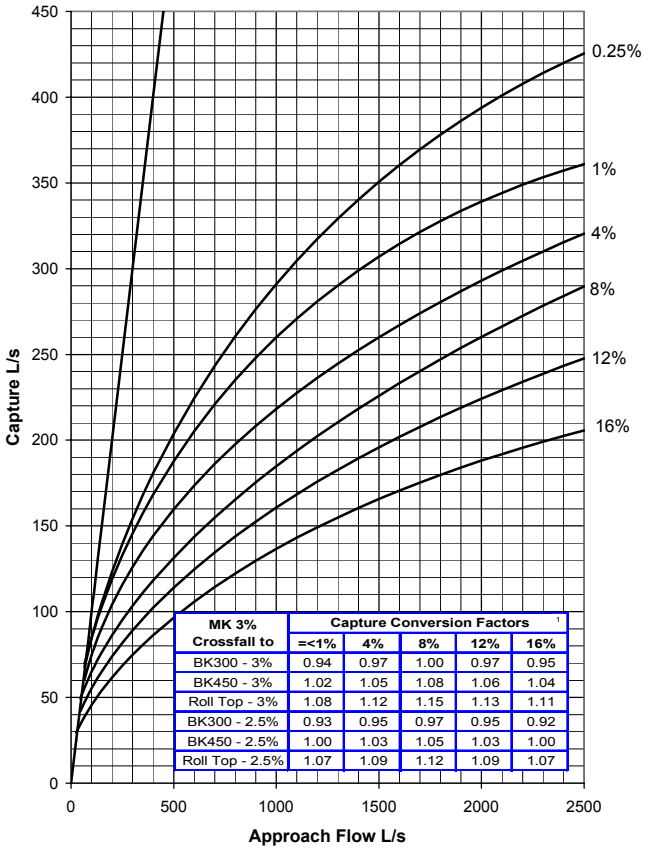

# STORMWAY
# MACADAM GRATE
# MOUNTABLE KERB - 2.5% CROSSFALL

## S1000/B - 2400



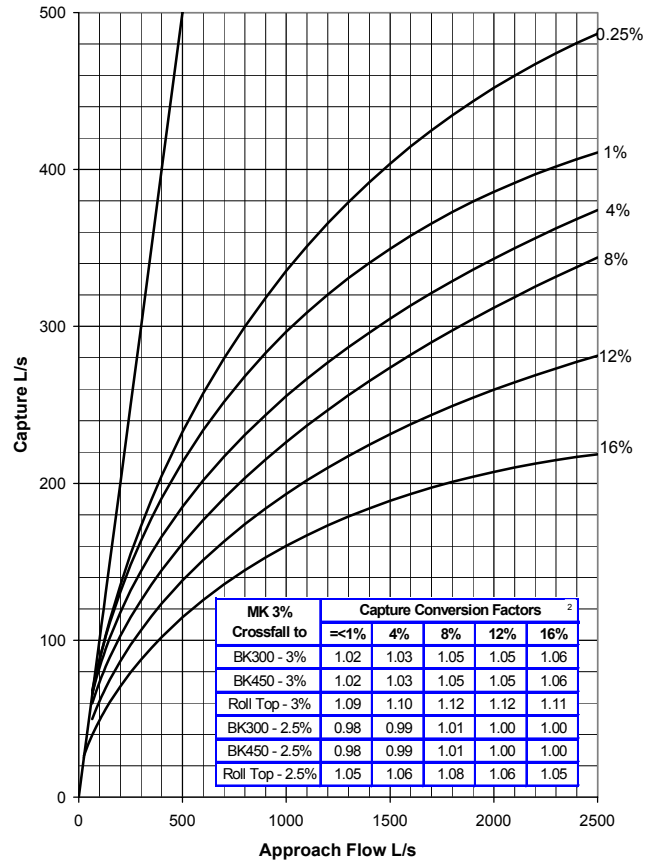

| MK 3% Crossfall to | Capture Conversion Factors [0] | | | | |
|---|---|---|---|---|---|
| | =<1% | 4% | 8% | 12% | 16% |
| BK300 - 3% | 0.87 | 0.91 | 0.95 | 0.89 | 0.84 |
| BK450 - 3% | 1.02 | 1.07 | 1.11 | 1.06 | 1.01 |
| Roll Top - 3% | 1.08 | 1.13 | 1.18 | 1.14 | 1.10 |
| BK300 - 2.5% | 0.87 | 0.90 | 0.94 | 0.88 | 0.83 |
| BK450 - 2.5% | 1.02 | 1.06 | 1.09 | 1.05 | 1.00 |
| Roll Top - 2.5% | 1.08 | 1.12 | 1.16 | 1.13 | 1.10 |

## S1600/B - 3000



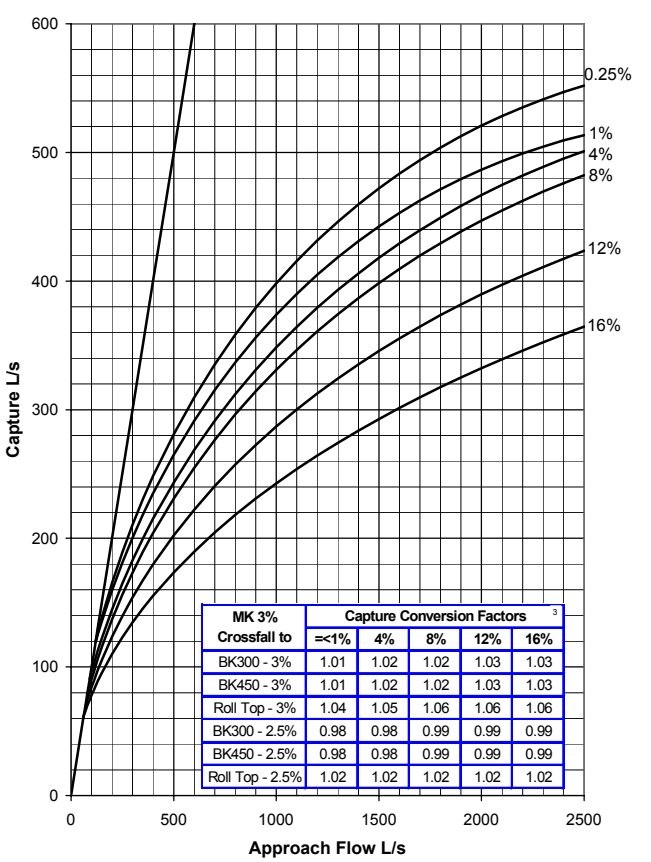

| MK 3% Crossfall to | Capture Conversion Factors [1] | | | | |
|---|---|---|---|---|---|
| | =<1% | 4% | 8% | 12% | 16% |
| BK300 - 3% | 0.94 | 0.97 | 1.00 | 0.97 | 0.95 |
| BK450 - 3% | 1.02 | 1.05 | 1.08 | 1.06 | 1.04 |
| Roll Top - 3% | 1.08 | 1.12 | 1.15 | 1.13 | 1.11 |
| BK300 - 2.5% | 0.93 | 0.95 | 0.97 | 0.95 | 0.92 |
| BK450 - 2.5% | 1.00 | 1.03 | 1.05 | 1.03 | 1.00 |
| Roll Top - 2.5% | 1.07 | 1.09 | 1.12 | 1.09 | 1.07 |

## S2400/B - 3800



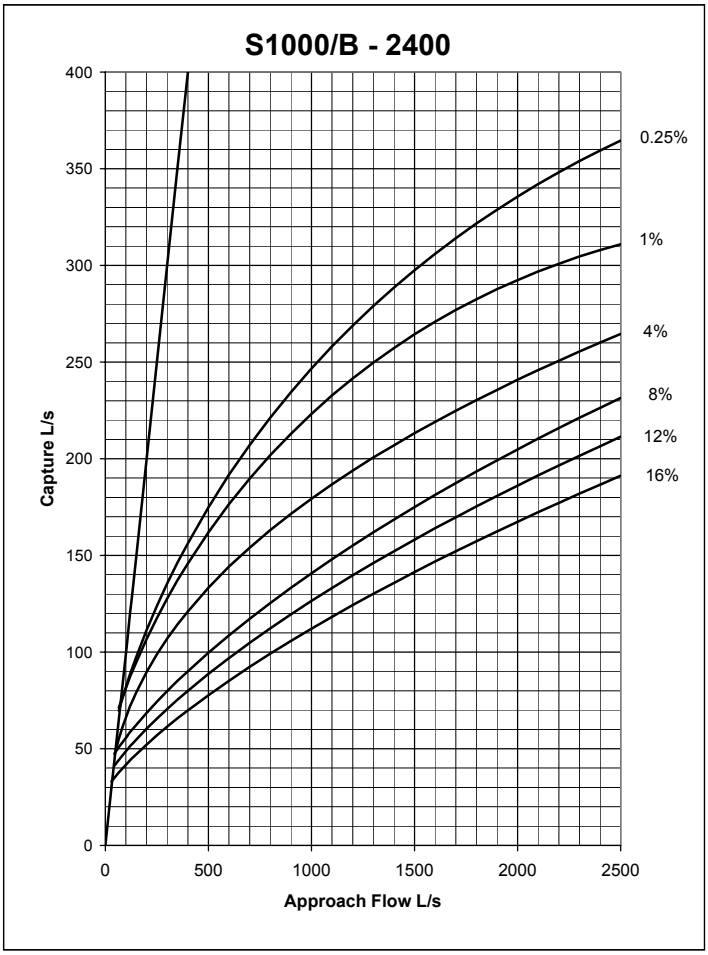

| MK 3% Crossfall to | Capture Conversion Factors [2] | | | | |
|---|---|---|---|---|---|
| | =<1% | 4% | 8% | 12% | 16% |
| BK300 - 3% | 1.02 | 1.03 | 1.05 | 1.05 | 1.06 |
| BK450 - 3% | 1.02 | 1.03 | 1.05 | 1.05 | 1.06 |
| Roll Top - 3% | 1.09 | 1.10 | 1.12 | 1.12 | 1.11 |
| BK300 - 2.5% | 0.98 | 0.99 | 1.01 | 1.00 | 1.00 |
| BK450 - 2.5% | 0.98 | 0.99 | 1.01 | 1.00 | 1.00 |
| Roll Top - 2.5% | 1.05 | 1.06 | 1.08 | 1.06 | 1.05 |

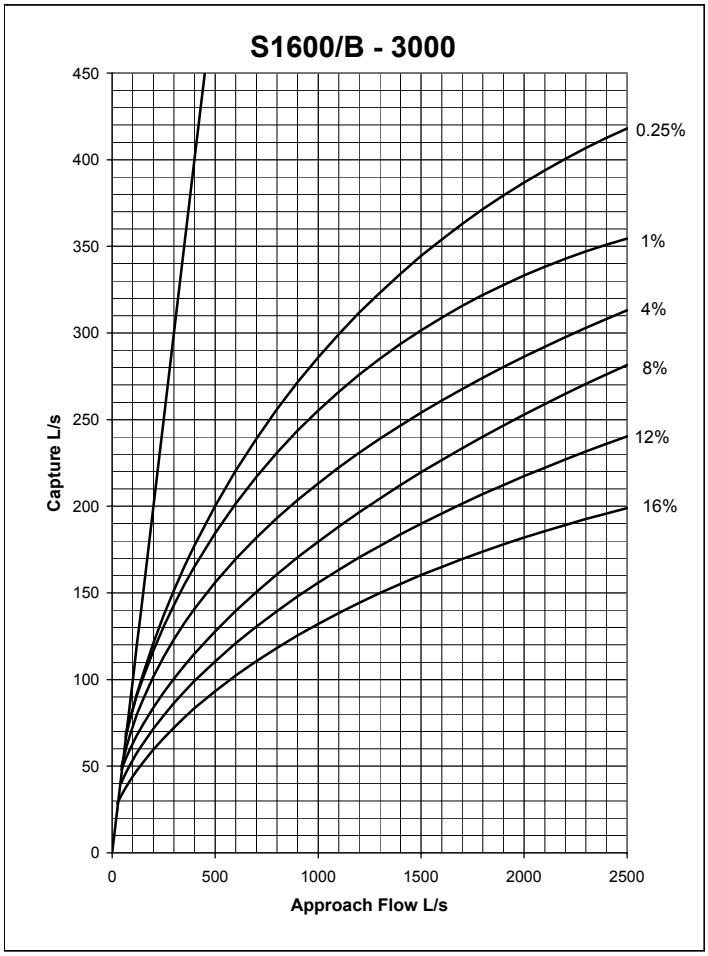
## S3600/B - 5000

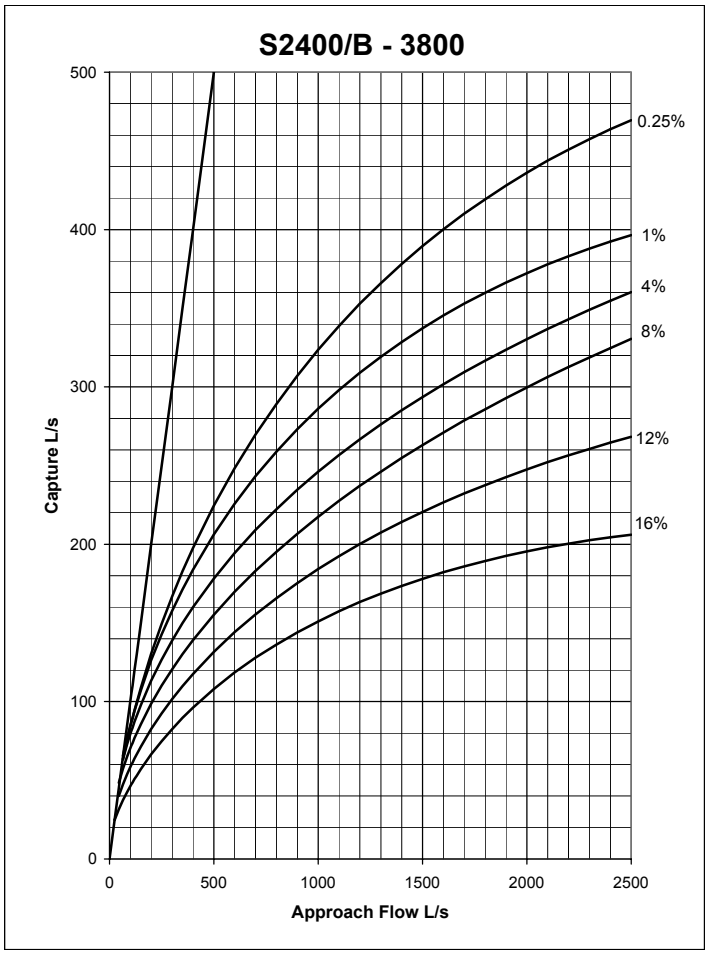


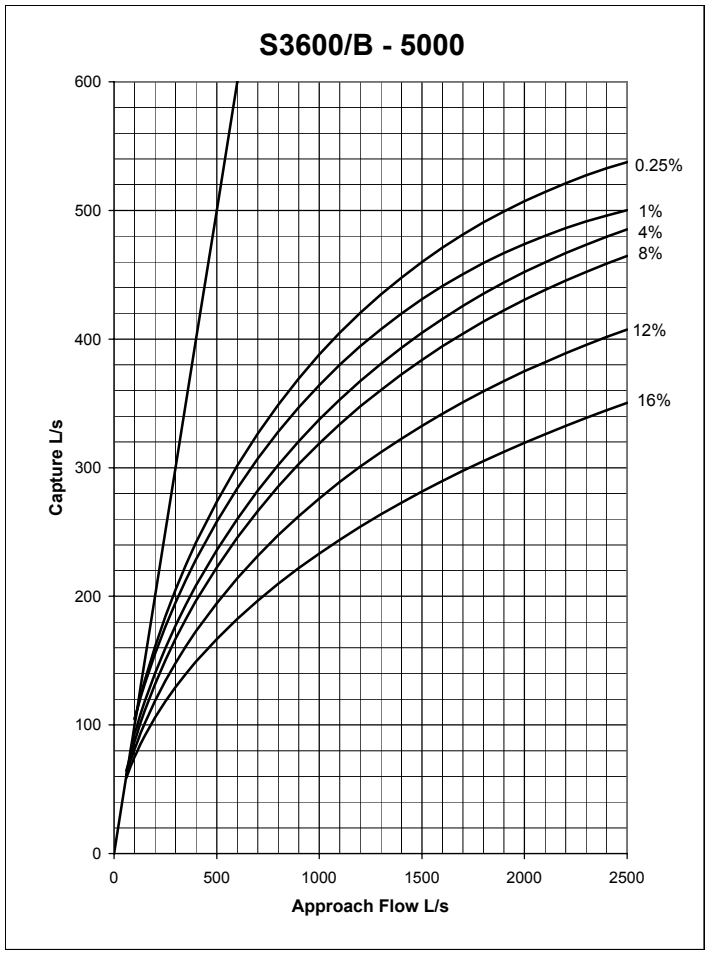

| MK 3% Crossfall to | Capture Conversion Factors [3] | | | | |
|---|---|---|---|---|---|
| | =<1% | 4% | 8% | 12% | 16% |
| BK300 - 3% | 1.01 | 1.02 | 1.02 | 1.03 | 1.03 |
| BK450 - 3% | 1.01 | 1.02 | 1.02 | 1.03 | 1.03 |
| Roll Top - 3% | 1.04 | 1.05 | 1.06 | 1.06 | 1.06 |
| BK300 - 2.5% | 0.98 | 0.98 | 0.99 | 0.99 | 0.99 |
| BK450 - 2.5% | 0.98 | 0.98 | 0.99 | 0.99 | 0.99 |
| Roll Top - 2.5% | 1.02 | 1.02 | 1.02 | 1.02 | 1.02 |

# STORMWAY
# MANNING GRATE
# MOUNTABLE KERB - 3% CROSSFALL



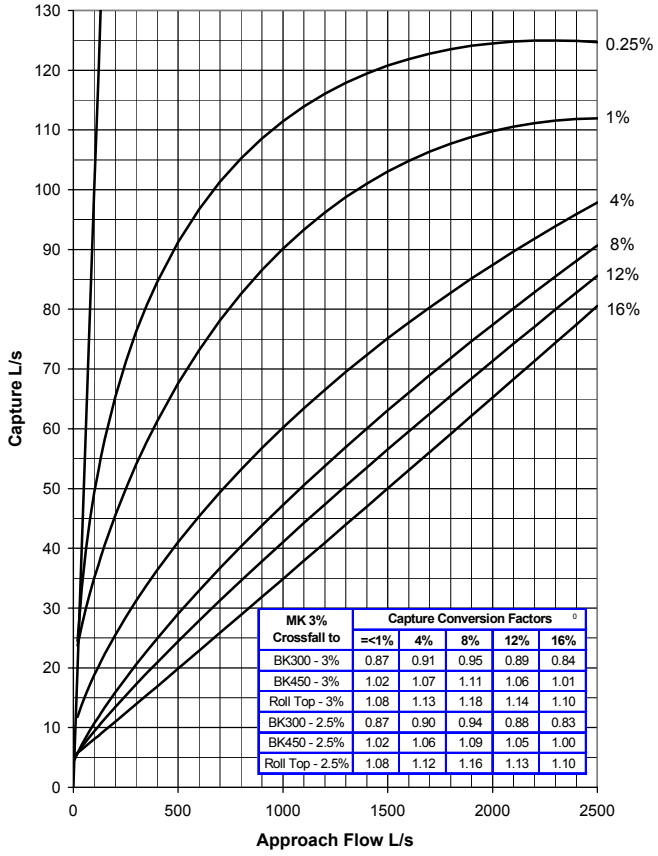




# STORMWAY
# MANNING GRATE
# MOUNTABLE KERB - 2.5% CROSSFALL



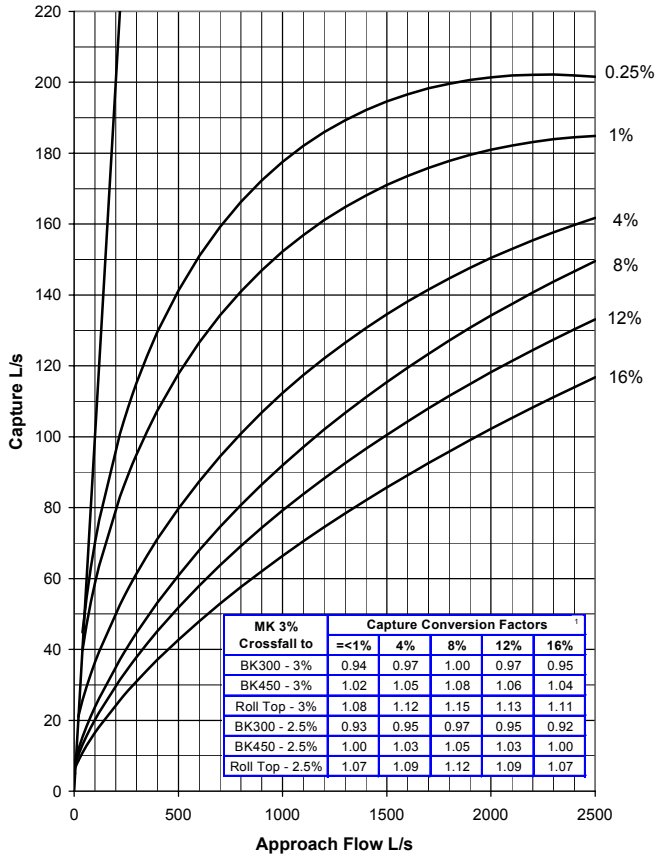
**CHART S4**

## S1000/C - 2400



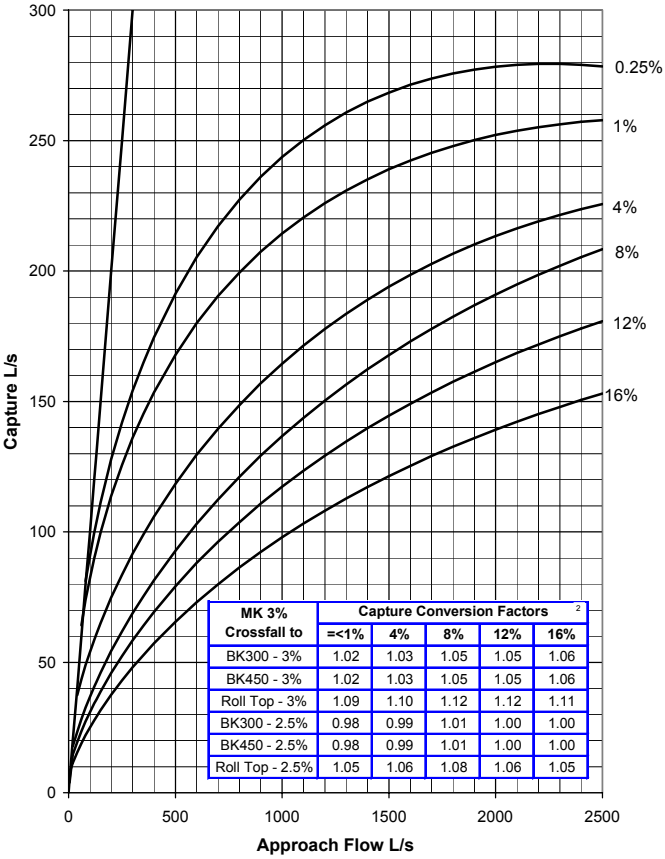

| MK 3% Crossfall to | Capture Conversion Factors | | | | |
|---|---|---|---|---|---|
| | =<1% | 4% | 8% | 12% | 16% |
| BK300 - 3% | 0.87 | 0.91 | 0.95 | 0.89 | 0.84 |
| BK450 - 3% | 1.02 | 1.07 | 1.11 | 1.06 | 1.01 |
| Roll Top - 3% | 1.08 | 1.13 | 1.18 | 1.14 | 1.10 |
| BK300 - 2.5% | 0.87 | 0.90 | 0.94 | 0.88 | 0.83 |
| BK450 - 2.5% | 1.02 | 1.06 | 1.09 | 1.05 | 1.00 |
| Roll Top - 2.5% | 1.08 | 1.12 | 1.16 | 1.13 | 1.10 |

## S1600/C - 3000



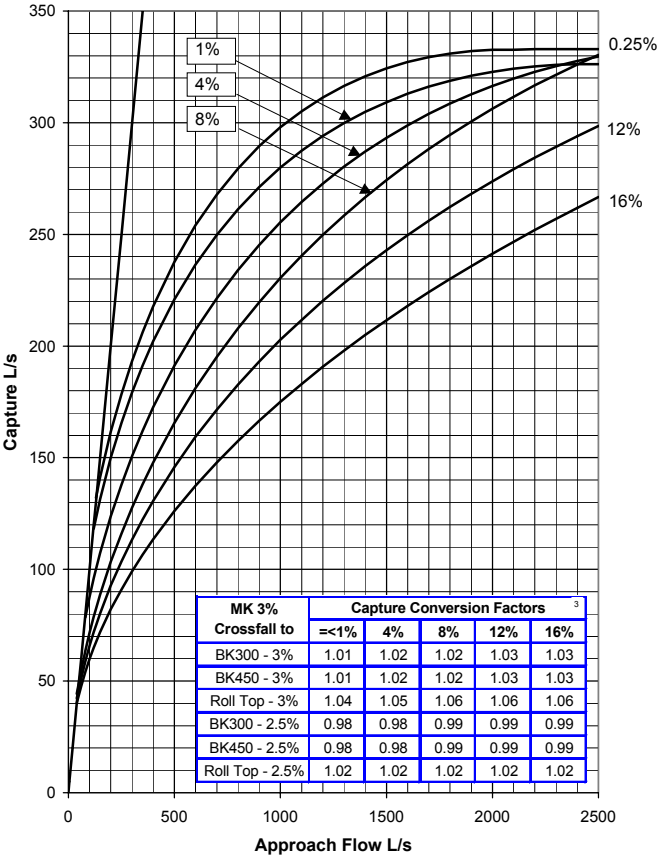

| MK 3% Crossfall to | Capture Conversion Factors | | | | |
|---|---|---|---|---|---|
| | =<1% | 4% | 8% | 12% | 16% |
| BK300 - 3% | 0.94 | 0.97 | 1.00 | 0.97 | 0.95 |
| BK450 - 3% | 1.02 | 1.05 | 1.08 | 1.06 | 1.04 |
| Roll Top - 3% | 1.08 | 1.12 | 1.15 | 1.13 | 1.11 |
| BK300 - 2.5% | 0.93 | 0.95 | 0.97 | 0.95 | 0.92 |
| BK450 - 2.5% | 1.00 | 1.03 | 1.05 | 1.03 | 1.00 |
| Roll Top - 2.5% | 1.07 | 1.09 | 1.12 | 1.09 | 1.07 |

## S2400/C - 3800



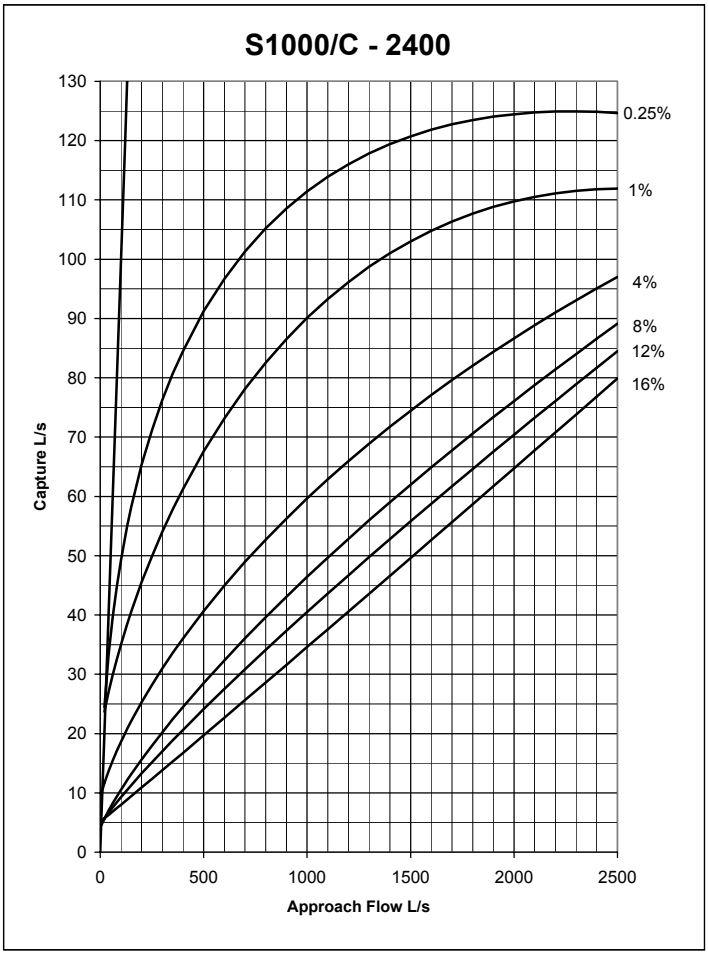

| MK 3% Crossfall to | Capture Conversion Factors | | | | |
|---|---|---|---|---|---|
| | =<1% | 4% | 8% | 12% | 16% |
| BK300 - 3% | 1.02 | 1.03 | 1.05 | 1.05 | 1.06 |
| BK450 - 3% | 1.02 | 1.03 | 1.05 | 1.05 | 1.06 |
| Roll Top - 3% | 1.09 | 1.10 | 1.12 | 1.12 | 1.11 |
| BK300 - 2.5% | 0.98 | 0.99 | 1.01 | 1.00 | 1.00 |
| BK450 - 2.5% | 0.98 | 0.99 | 1.01 | 1.00 | 1.00 |
| Roll Top - 2.5% | 1.05 | 1.06 | 1.08 | 1.06 | 1.05 |

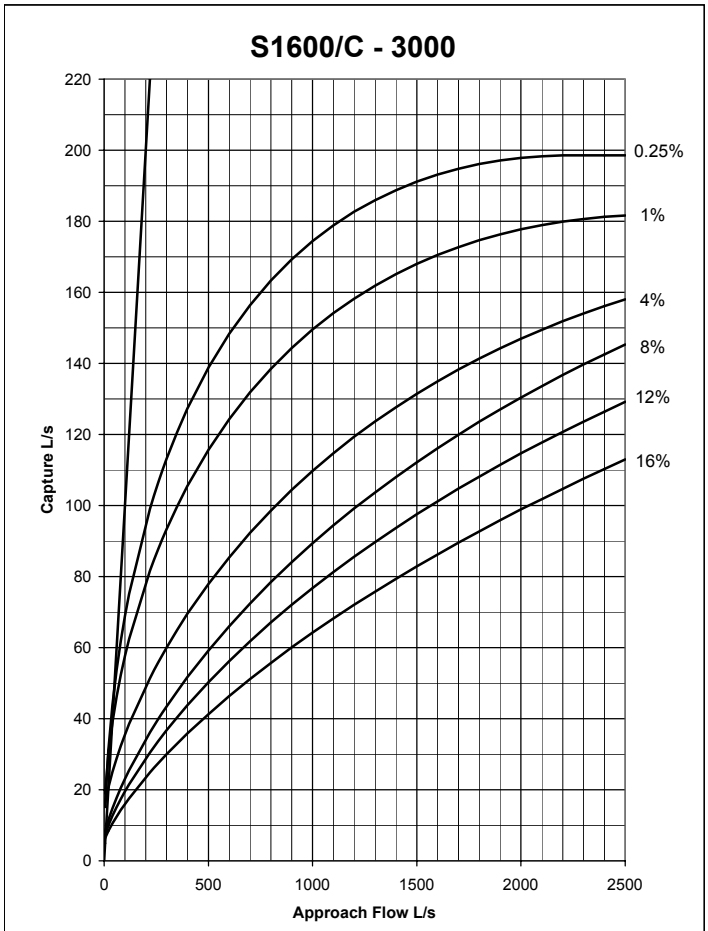
## S3600/C - 5000

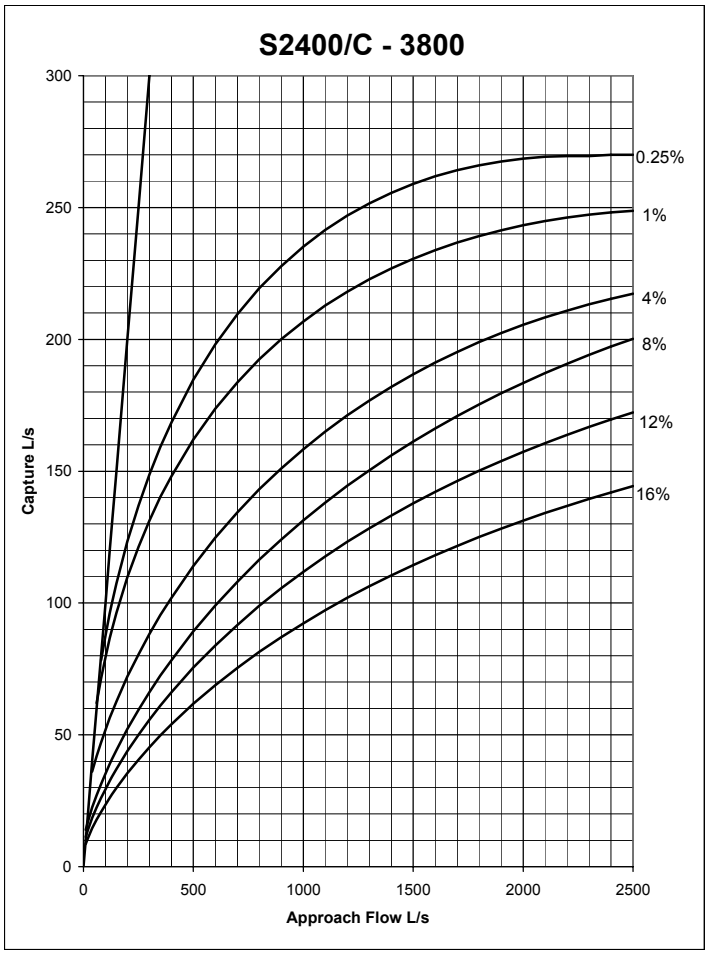


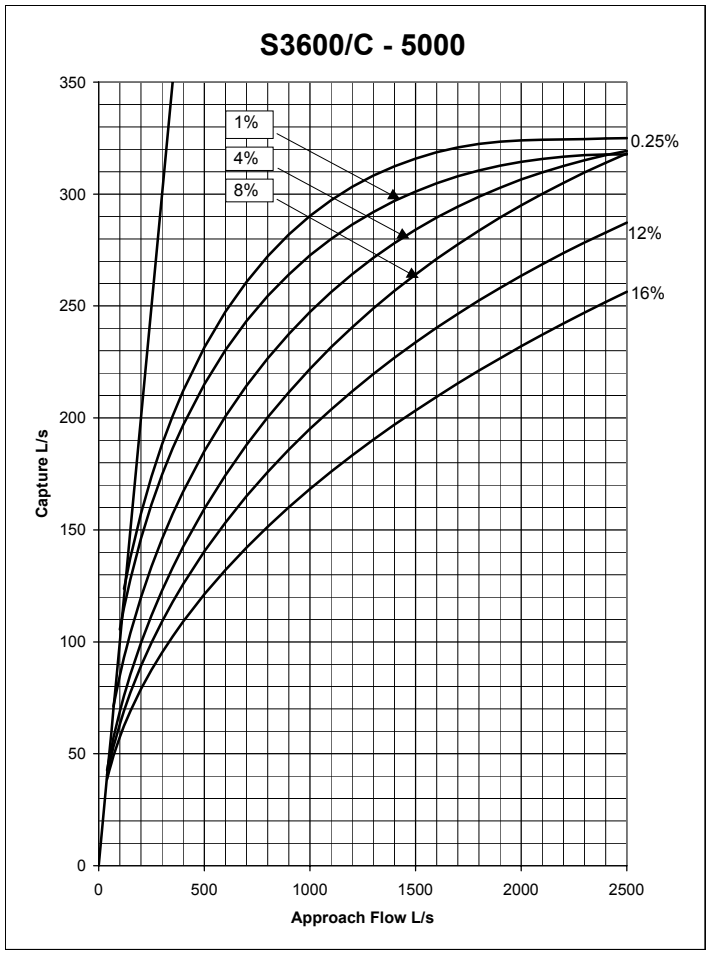

| MK 3% Crossfall to | Capture Conversion Factors | | | | |
|---|---|---|---|---|---|
| | =<1% | 4% | 8% | 12% | 16% |
| BK300 - 3% | 1.01 | 1.02 | 1.02 | 1.03 | 1.03 |
| BK450 - 3% | 1.01 | 1.02 | 1.02 | 1.03 | 1.03 |
| Roll Top - 3% | 1.04 | 1.05 | 1.06 | 1.06 | 1.06 |
| BK300 - 2.5% | 0.98 | 0.98 | 0.99 | 0.99 | 0.99 |
| BK450 - 2.5% | 0.98 | 0.98 | 0.99 | 0.99 | 0.99 |
| Roll Top - 2.5% | 1.02 | 1.02 | 1.02 | 1.02 | 1.02 |

# STORMWAY
# STORMCOVER
# MOUNTABLE KERB - 3% CROSSFALL

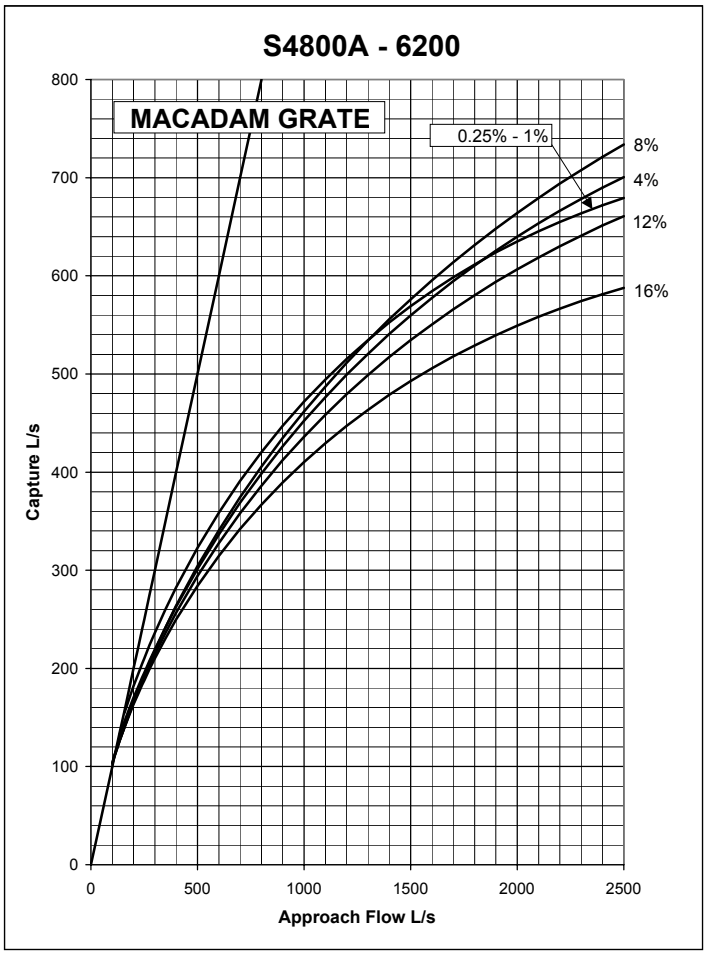


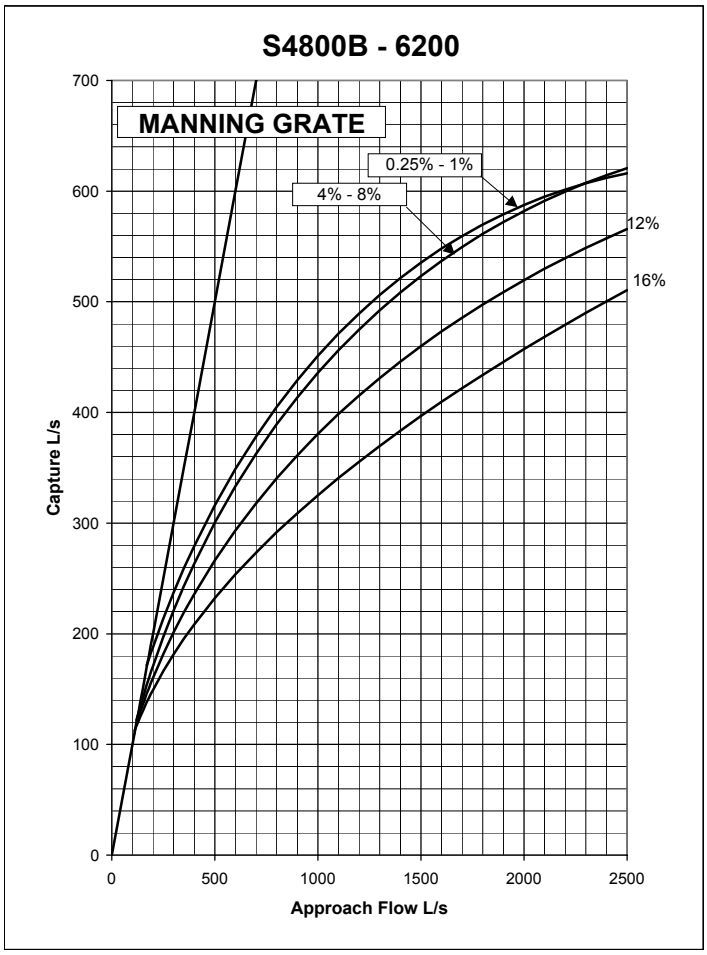



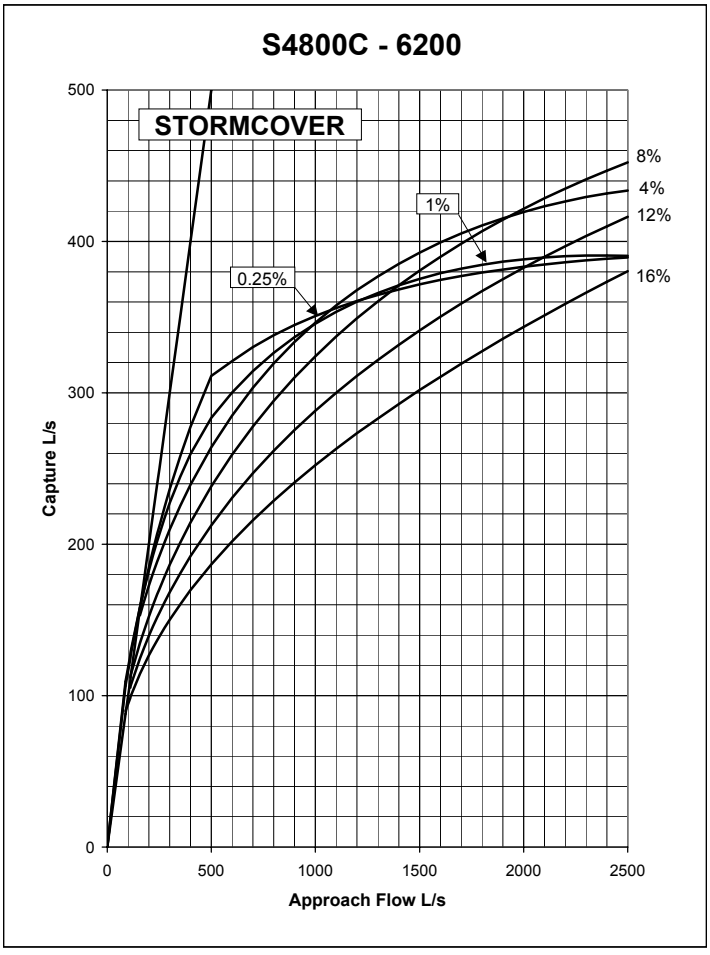



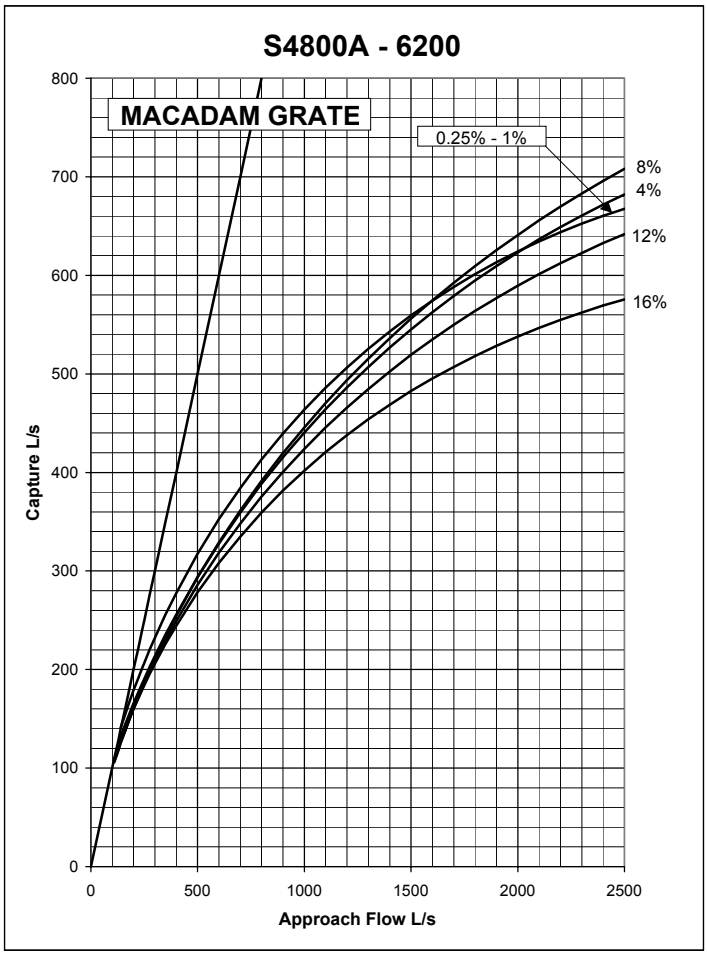

# STORMWAY
# STORMCOVER
# MOUNTABLE KERB - 2.5% CROSSFALL

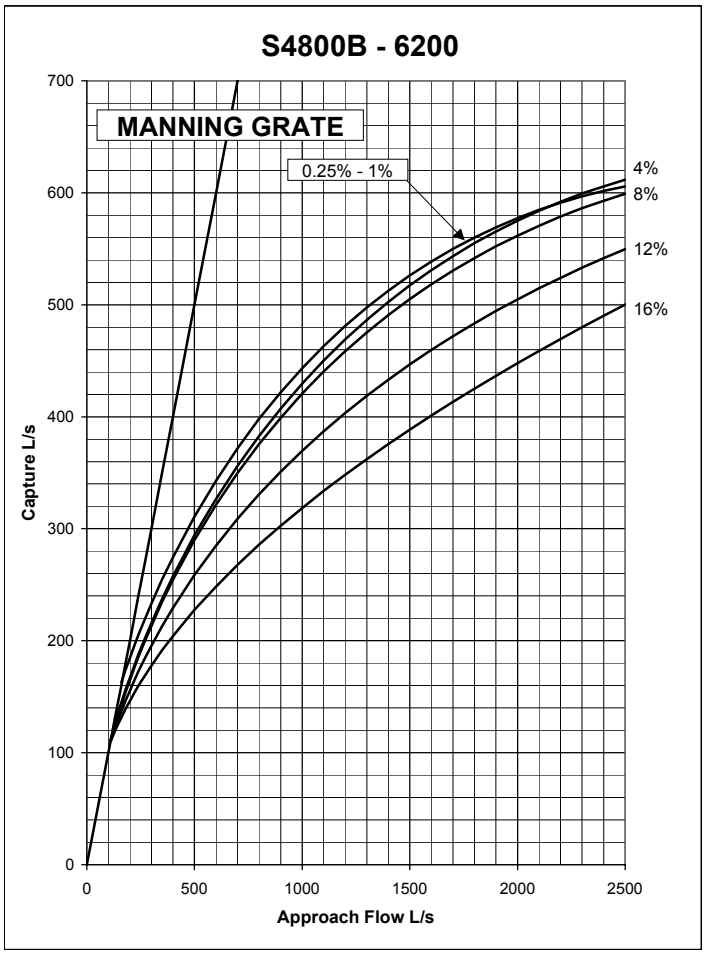


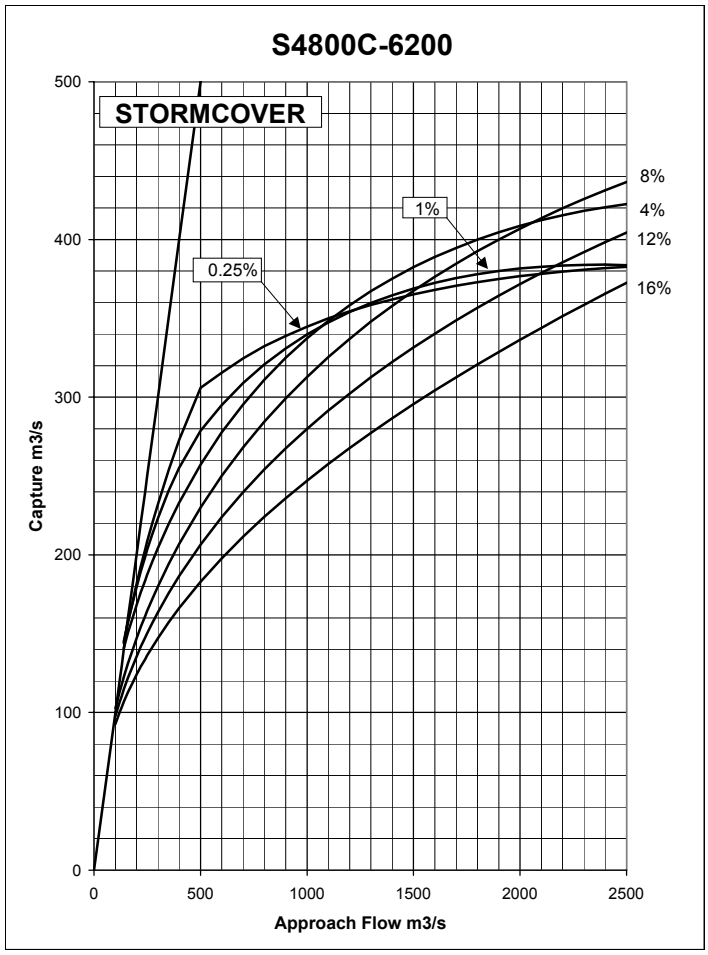



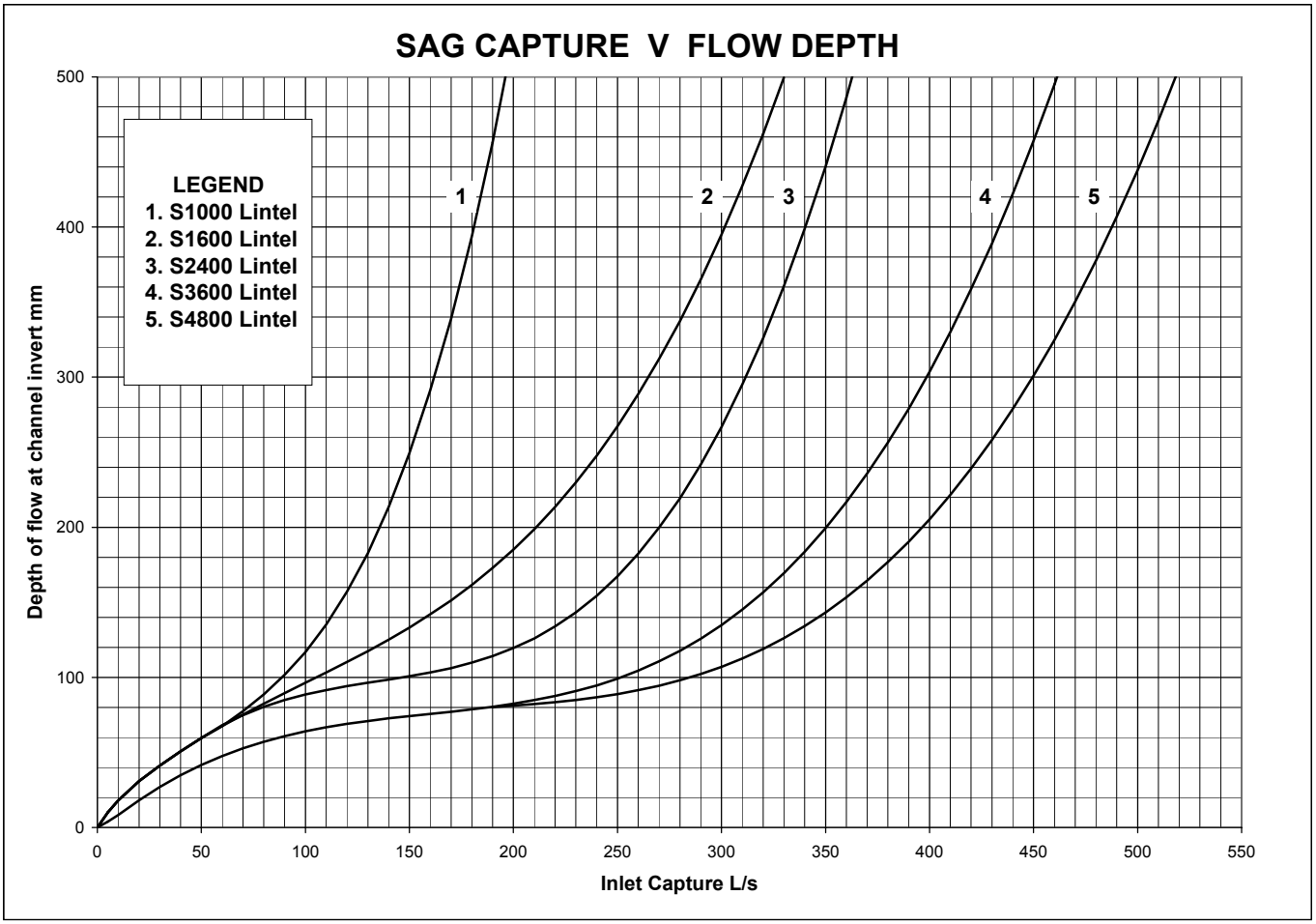

# STORMWAY
# S4800 - 6200 INLETS
# ALL KERB TYPES - 3% CROSSFALL



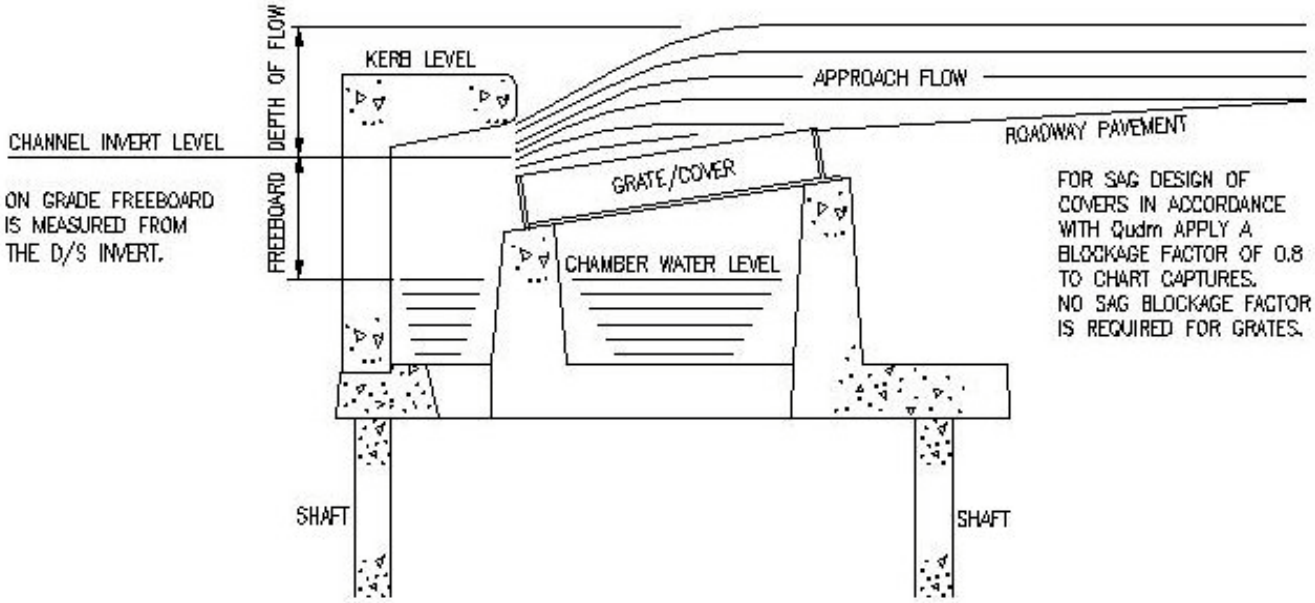




# STORMWAY
# S4800 - 6200 INLETS
# ALL KERB TYPES - 2.5% CROSSFALL




| MINIMUM DESIGN FREEBOARD | | |
|---|---|---|
| ROAD GRADE % | 0TP, 1TP, 2PT | 3PT |
| SAG – 8% | =>150mm | =>150mm |
| 8% – 16% | =>150mm | =>300mm |




PIT CROSS SECTION

# STORMWAY
# SAG CAPTURE - ALL GRATES AND COVER
# ALL KERB TYPES AND CROSSFALLS

12-May-08 10:59:26

**CHART S9**

## Mountable Kerb and Channel M1 - At Pavement Crossfalls 2% to 4%

**TABLE S1**

| Inlet | Factor to be applied to Mountable Kerb and Channel M1 3.0% Crossfall chart captures | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X-fall | 2% | | | | | 2.5% | | | | | 3% | | | | | 3.3% | | | | | 4% | | | | |
| Grade | =<1% | 4% | 8% | 12% | 16% | =<1% | 4% | 8% | 12% | 16% | =<1% | 4% | 8% | 12% | 16% | =<1% | 4% | 8% | 12% | 16% | =<1% | 4% | 8% | 12% | 16% |
| 1000 | 0.92 | 0.91 | 0.91 | 0.90 | 0.88 | 1.00 | 0.99 | 0.98 | 0.99 | 0.99 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.02 | 1.02 | 1.02 | 1.02 | 1.03 | 1.08 | 1.07 | 1.06 | 1.08 | 1.10 |
| 1600 | 0.91 | 0.92 | 0.92 | 0.92 | 0.91 | 0.98 | 0.98 | 0.97 | 0.97 | 0.97 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.02 | 1.02 | 1.02 | 1.02 | 1.03 | 1.07 | 1.07 | 1.06 | 1.08 | 1.10 |
| 2400 | 0.90 | 0.92 | 0.94 | 0.93 | 0.93 | 0.96 | 0.96 | 0.96 | 0.95 | 0.94 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.02 | 1.02 | 1.02 | 1.02 | 1.03 | 1.06 | 1.06 | 1.06 | 1.08 | 1.10 |
| 3600 | 0.91 | 0.92 | 0.93 | 0.93 | 0.92 | 0.97 | 0.97 | 0.96 | 0.96 | 0.96 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.02 | 1.02 | 1.02 | 1.02 | 1.03 | 1.06 | 1.06 | 1.05 | 1.08 | 1.10 |
| 4800 | 0.93 | 0.92 | 0.92 | 0.92 | 0.91 | 0.98 | 0.97 | 0.97 | 0.97 | 0.98 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.02 | 1.02 | 1.01 | 1.02 | 1.03 | 1.06 | 1.05 | 1.04 | 1.07 | 1.10 |
| Average | 0.92 | | | | | 0.97 | | | | | 1.00 | | | | | 1.02 | | | | | 1.07 | | | | |

## Rolltop Kerb and Channel M3 - At Pavement Crossfalls 2% to 4%

**TABLE S2**

| Inlet | Factor to be applied to Mountable Kerb and Channel M1 3.0% Crossfall chart captures | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X-fall | 2% | | | | | 2.5% | | | | | 3% | | | | | 3.3% | | | | | 4% | | | | |
| Grade | =<1% | 4% | 8% | 12% | 16% | =<1% | 4% | 8% | 12% | 16% | =<1% | 4% | 8% | 12% | 16% | =<1% | 4% | 8% | 12% | 16% | =<1% | 4% | 8% | 12% | 16% |
| 1000 | 1.00 | 1.03 | 1.07 | 1.02 | 0.98 | 1.08 | 1.12 | 1.16 | 1.13 | 1.10 | 1.08 | 1.13 | 1.18 | 1.14 | 1.10 | 1.11 | 1.15 | 1.20 | 1.17 | 1.14 | 1.17 | 1.21 | 1.25 | 1.23 | 1.21 |
| 1600 | 0.99 | 1.02 | 1.06 | 1.03 | 1.01 | 1.07 | 1.09 | 1.12 | 1.09 | 1.07 | 1.08 | 1.12 | 1.15 | 1.13 | 1.11 | 1.11 | 1.14 | 1.17 | 1.16 | 1.14 | 1.16 | 1.19 | 1.22 | 1.22 | 1.22 |
| 2400 | 0.98 | 1.01 | 1.05 | 1.04 | 1.04 | 1.05 | 1.06 | 1.08 | 1.06 | 1.05 | 1.09 | 1.10 | 1.12 | 1.12 | 1.11 | 1.11 | 1.13 | 1.14 | 1.15 | 1.15 | 1.15 | 1.17 | 1.20 | 1.21 | 1.23 |
| 3600 | 0.95 | 0.97 | 0.98 | 0.98 | 0.98 | 1.02 | 1.02 | 1.02 | 1.02 | 1.02 | 1.04 | 1.05 | 1.06 | 1.06 | 1.06 | 1.06 | 1.07 | 1.08 | 1.08 | 1.09 | 1.11 | 1.11 | 1.12 | 1.14 | 1.16 |
| 4800 | 0.93 | 0.92 | 0.92 | 0.92 | 0.91 | 0.98 | 0.97 | 0.97 | 0.97 | 0.98 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.02 | 1.02 | 1.01 | 1.02 | 1.03 | 1.06 | 1.05 | 1.04 | 1.07 | 1.10 |
| Average | 0.99 | | | | | 1.05 | | | | | 1.08 | | | | | 1.11 | | | | | 1.16 | | | | |

## Barrier Kerb B1 with 300 Channel - At Pavement Crossfalls 2% to 4%

**TABLE S3**

| Inlet | Factor to be applied to Mountable Kerb and Channel M1 3.0% Crossfall chart captures | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X-fall | 2% | | | | | 2.5% | | | | | 3% | | | | | 3.3% | | | | | 4% | | | | |
| Grade | =<1% | 4% | 8% | 12% | 16% | =<1% | 4% | 8% | 12% | 16% | =<1% | 4% | 8% | 12% | 16% | =<1% | 4% | 8% | 12% | 16% | =<1% | 4% | 8% | 12% | 16% |
| 1000 | 0.80 | 0.83 | 0.86 | 0.80 | 0.74 | 0.87 | 0.90 | 0.94 | 0.88 | 0.83 | 0.87 | 0.91 | 0.95 | 0.89 | 0.84 | 0.89 | 0.93 | 0.97 | 0.92 | 0.86 | 0.94 | 0.98 | 1.01 | 0.97 | 0.92 |
| 1600 | 0.86 | 0.89 | 0.92 | 0.89 | 0.86 | 0.93 | 0.95 | 0.97 | 0.95 | 0.92 | 0.94 | 0.97 | 1.00 | 0.97 | 0.95 | 0.96 | 0.99 | 1.02 | 1.00 | 0.98 | 1.01 | 1.04 | 1.06 | 1.05 | 1.05 |
| 2400 | 0.92 | 0.95 | 0.98 | 0.99 | 0.99 | 0.98 | 0.99 | 1.01 | 1.00 | 1.00 | 1.02 | 1.03 | 1.05 | 1.05 | 1.06 | 1.04 | 1.05 | 1.07 | 1.08 | 1.10 | 1.08 | 1.10 | 1.11 | 1.14 | 1.17 |
| 3600 | 0.92 | 0.94 | 0.95 | 0.95 | 0.95 | 0.98 | 0.98 | 0.99 | 0.99 | 0.99 | 1.01 | 1.02 | 1.02 | 1.03 | 1.03 | 1.03 | 1.03 | 1.04 | 1.05 | 1.06 | 1.07 | 1.07 | 1.08 | 1.11 | 1.14 |
| 4800 | 0.93 | 0.92 | 0.92 | 0.92 | 0.91 | 0.98 | 0.97 | 0.97 | 0.97 | 0.98 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.02 | 1.02 | 1.01 | 1.02 | 1.03 | 1.06 | 1.05 | 1.04 | 1.07 | 1.10 |
| Average | 0.90 | | | | | 0.96 | | | | | 0.99 | | | | | 1.01 | | | | | 1.06 | | | | |

## Barrier Kerb B1 with 450 Channel - At Pavement Crossfalls 2% to 4%

**TABLE S4**

| Inlet | Factor to be applied to Mountable Kerb and Channel M1 3.0% Crossfall chart captures | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X-fall | 2% | | | | | 2.5% | | | | | 3% | | | | | 3.3% | | | | | 4% | | | | |
| Grade | =<1% | 4% | 8% | 12% | 16% | =<1% | 4% | 8% | 12% | 16% | =<1% | 4% | 8% | 12% | 16% | =<1% | 4% | 8% | 12% | 16% | =<1% | 4% | 8% | 12% | 16% |
| 1000 | 0.94 | 0.97 | 1.01 | 0.95 | 0.89 | 1.02 | 1.06 | 1.09 | 1.05 | 1.00 | 1.02 | 1.07 | 1.11 | 1.06 | 1.01 | 0.91 | 0.99 | 1.08 | 0.97 | 0.87 | 1.10 | 1.14 | 1.18 | 1.15 | 1.11 |
| 1600 | 0.93 | 0.96 | 0.99 | 0.97 | 0.94 | 1.00 | 1.03 | 1.05 | 1.03 | 1.00 | 1.02 | 1.05 | 1.08 | 1.06 | 1.04 | 0.98 | 1.04 | 1.10 | 1.06 | 1.01 | 1.09 | 1.12 | 1.15 | 1.14 | 1.14 |
| 2400 | 0.92 | 0.95 | 0.98 | 0.99 | 0.99 | 0.98 | 0.99 | 1.01 | 1.00 | 1.00 | 1.02 | 1.03 | 1.05 | 1.05 | 1.06 | 1.05 | 1.09 | 1.12 | 1.14 | 1.16 | 1.08 | 1.10 | 1.11 | 1.14 | 1.17 |
| 3600 | 0.92 | 0.94 | 0.95 | 0.95 | 0.95 | 0.98 | 0.98 | 0.99 | 0.99 | 0.99 | 1.01 | 1.02 | 1.02 | 1.03 | 1.03 | 1.04 | 1.05 | 1.06 | 1.08 | 1.10 | 1.07 | 1.07 | 1.08 | 1.11 | 1.14 |
| 4800 | 0.93 | 0.92 | 0.92 | 0.92 | 0.91 | 0.98 | 0.97 | 0.97 | 0.97 | 0.98 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.02 | 1.02 | 1.01 | 1.02 | 1.03 | 1.06 | 1.05 | 1.04 | 1.07 | 1.10 |
| Average | 0.95 | | | | | 1.00 | | | | | 1.03 | | | | | 1.04 | | | | | 1.11 | | | | |

EXAMPLE:

*What is the capture for 1000L/s approach flow to a 2400 lintel inlet with Manning Grate, barrier kerb and 300 channel, 1% grade, 2% pavement crossfall.*

(a) Manning Grate, mountable kerb, 3% crossfall is Chart S3, with 2400 lintel is graph S2400/B where capture for 1000L/s at 1% grade is 299L/s.

(b) Conversion factor to Barrier Kerb 300 channel at 2% pavement crossfall from Table S3 - 2400/1% = 0.92.

(c) Capture = 299x0.92 = 275L/s.

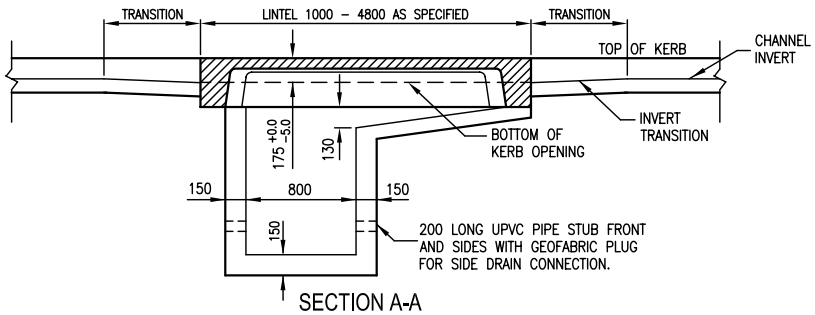
Conversion Factors from mountable kerb 3% Xfall to Rolltop, BK300, BK450 at 3% and 2.5% X-falls, as set out above, are repeated for convenience in tables on Charts S1, S3 and S5.

Separate charts for mountable kerb with 3.0% and 2.5% crossfall crossfall allow direct reading of captures, for the most common design configurations, without use of the tables.

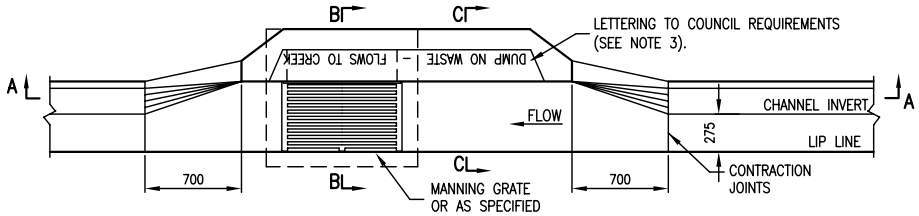
The "Average" factors may be used where it is considered the resulting loss of accuracy is tolerable.

# STORMWAY
# CONVERSION FACTORS
# MOUNTABLE KERB - 3% CROSSFALL TO OTHER CONFIGURATIONS

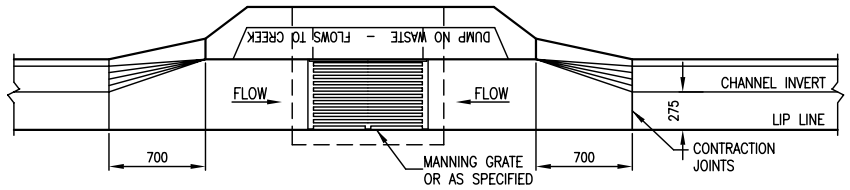
**CHART S10**



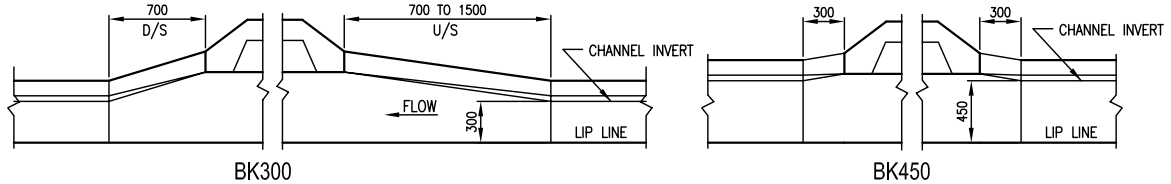

SECTION A-A




2400-4800 INLETS ON GRADE - MOUNTABLE KERB

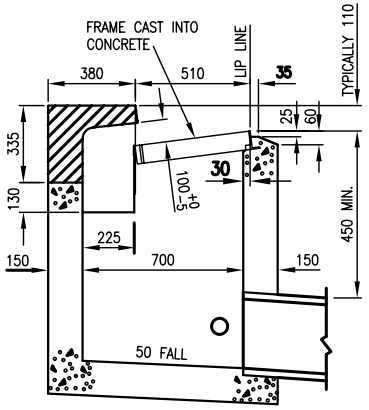



2400-4800 INLETS IN SAG - MOUNTABLE KERB

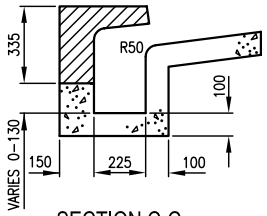



BK300 BK450

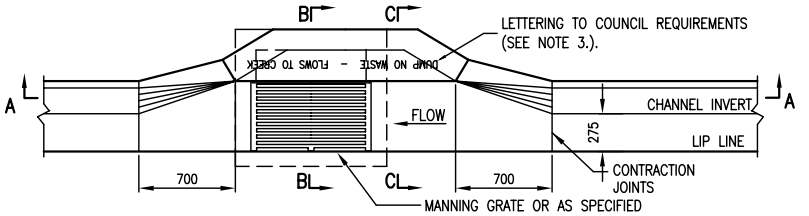
TYPICAL TRANSITIONS - BARRIER KERB



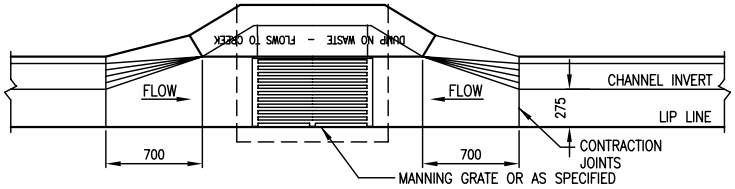

SECTION B-B



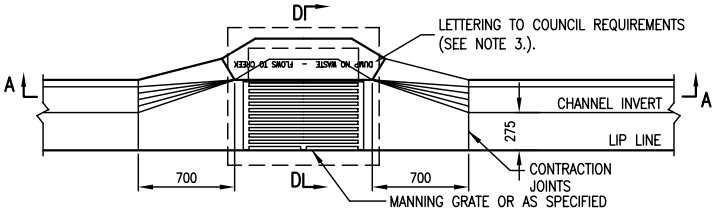

SECTION C-C



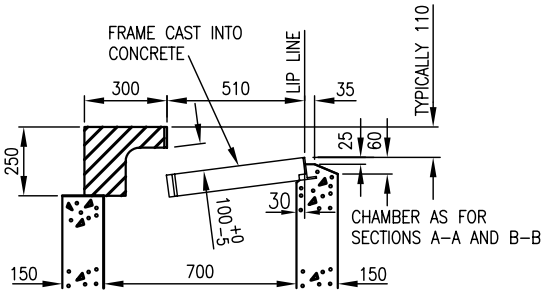

1600 INLET ON GRADE - MOUNTABLE KERB




1600 INLET IN SAG - MOUNTABLE KERB




1000 INLET GRADE AND SAG - MOUNTABLE KERB




SECTION D-D

| INLET TRANSITION LENGTHS | | | | |
|---|---|---|---|---|
| LINTEL | KERB TYPE | PLACE | D/S | U/S |
| ALL TYPES | MOUNTABLE | ON GRADE | 700 | 700 |
| | | IN SAG | 700 | 700 |
| | BARRIER 450 CHANNEL | ON GRADE | 300 | 300 |
| | | IN SAG | 300 | 300 |
| 2400–4800 | BARRIER 300 CHANNEL | ON GRADE | 700 | 1500 |
| | | IN SAG | 700 | 700 |
| 1600 | | ON GRADE | 700 | 1100 |
| | | IN SAG | 700 | 700 |
| 1000 | | ON GRADE | 700 | 700 |
| | | IN SAG | 700 | 700 |

SPECIFICATION CODES:
STORMWAY CODE – S
MACADAM GRATE – A
MANNING GRATE – B
STORMCOVER – C
GULLY INLET – G
INLET MANHOLE – M
LINTELS – 1000, 1600, 2400, 3600, 4800.
TYPICAL UNIT WITH GRATE – S3600M/B
(STORMWAY 3600 LINTEL AND INLET MANHOLE WITH MANNING GRATE.)
TYPICAL UNIT WITH COVER – S1000G/C
(STORMWAY 1000 LINTEL AND GULLY INLET WITH STORMWAY COVER.)
TO ENSURE INLETS ACHIEVE THEIR DESIGN FLOW CAPTURE, CONTRACTORS MUST NOT SUBSTITUTE ANOTHER GRATE FOR THAT SPECIFIED.

| LINTELS | | | | | |
|---|---|---|---|---|---|
| LENGTH OF LINTEL | 1000 | 1600 | 2400 | 3600 | 4800 |
| KERB OPENING | 1000 | 1600 | 2040 | 3240 | 4440 |
| MASS kg | 140 | 315 | 500 | 700 | 900 |

| KERB TYPE | OVERALL INLET LENGTH WITH TRANSITIONS | | | | |
|---|---|---|---|---|---|
| EXCEPT AS BELOW | 2400 | 3000 | 3800 | 5000 | 6200 |
| BK450 | 1600 | 2200 | 3000 | 4200 | 5400 |
| BK300 ON GRADE | 2400 | 3400 | 4600 | 5800 | 7000 |

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. UNLESS OTHERWISE SPECIFIED THE MANNING GRATE SHALL BE USED.
5. THE FOLLOWING ALTERNATIVE GRATES/COVER MAY BE SPECIFIED.
   (A) MACADAM
   (B) STORMCOVER
6. KERB AND CHANNEL TYPE SHALL BE AS SPECIFIED.
7. CAST IN SITU CONCRETE SHALL BE N25 TO AS 1379 AND AS 3600.
8. CHAMBERS SHALL NOT EXCEED 1.35M DEPTH WITHOUT PRIOR APPROVAL.
9. USE 150X300 STEP IRONS IF GULLY DEPTH > 1.2M.

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| NO | REVISIONS | DATE | INITS |
|---|---|---|---|
| C | | | |
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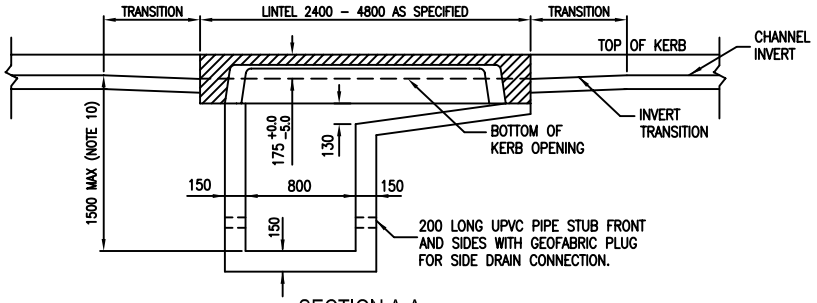
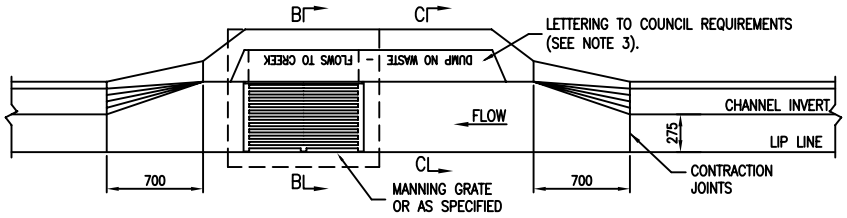
# STORMWAY

## STORMWAY GULLY INLET
## 1000, 1600, 2400, 3600 AND 4800 LINTELS

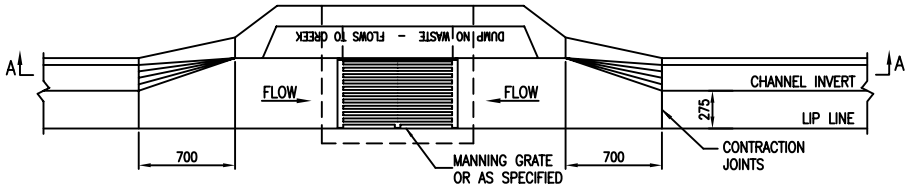
S1



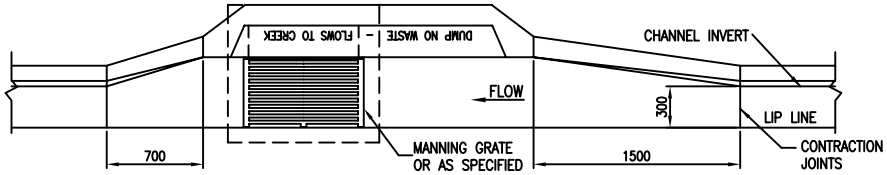

SECTION A-A



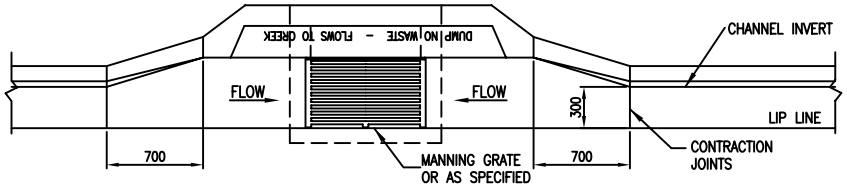

TYPICAL INLET ON GRADE - MOUNTABLE KERB



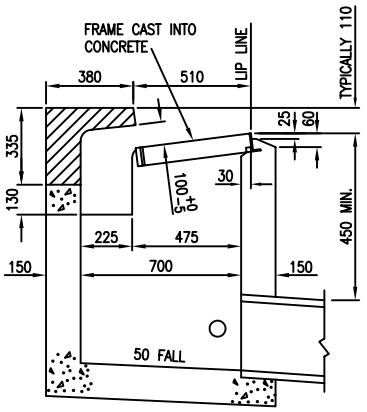

TYPICAL INLET IN SAG - MOUNTABLE KERB



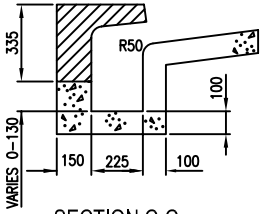

TYPICAL INLET ON GRADE - BARRIER KERB - 300 CHANNEL




TYPICAL INLET IN SAG - BARRIER KERB - 300 CHANNEL



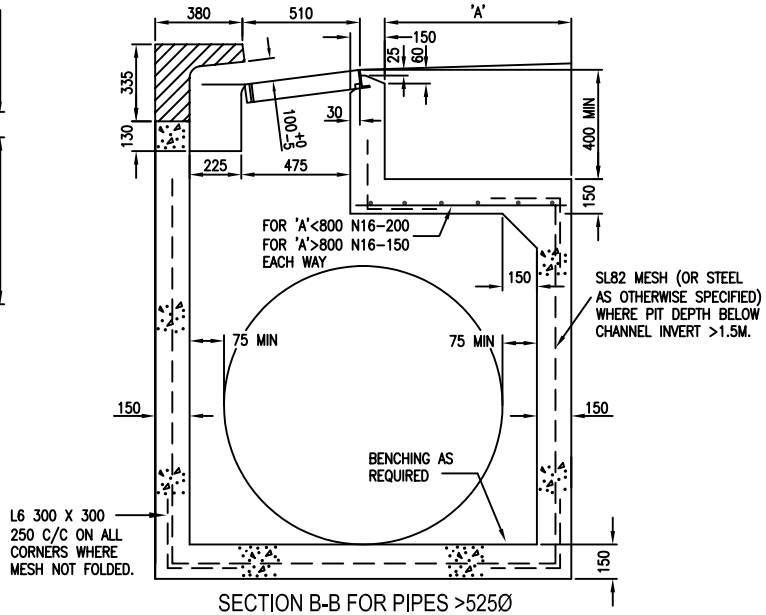

SECTION B-B
FOR PIPES TO 525Ø



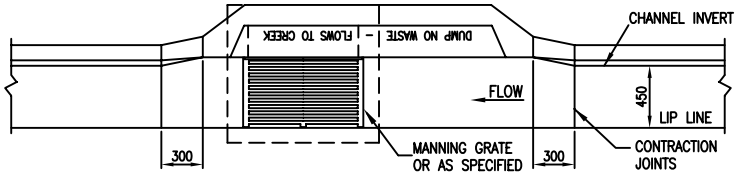

SECTION C-C

SPECIFICATION CODES:
STORMWAY CODE – S
MACADAM GRATE – A
MANNING GRATE – B
STORMCOVER – C
GULLY INLET – G
INLET MANHOLE – M
LINTELS – 1000, 1600, 2400, 3600, 4800.
TYPICAL UNIT WITH GRATE – S3600M/B
(STORMWAY 3600 LINTEL AND INLET MANHOLE WITH MANNING GRATE.)
TYPICAL UNIT WITH COVER – S1000G/C
(STORMWAY 1000 LINTEL AND GULLY INLET WITH STORMWAY COVER.)
TO ENSURE INLETS ACHIEVE THEIR DESIGN FLOW CAPTURE, CONTRACTORS MUST NOT SUBSTITUTE ANOTHER GRATE FOR THAT SPECIFIED.

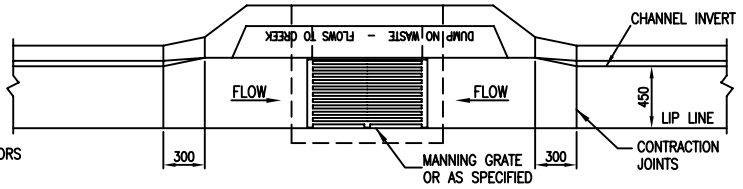
NOTES:
1. PRECAST LINTELS SHOULD, AS APPROPRIATE, COMPLY WITH DRAWINGS:
   (A) 2400–4800: BCC UMS 331, GCCC 59301 OR IPWEAQ D–0061.
   (B) 2400–4800: DRAWINGS OF OTHER AUTHORITIES.
   (C) 1000–4800: MAX Q DRAWING S3.
2. LINTELS – 1000, 1600, 2400, 3600, 4800 AS SPECIFIED.
3. LETTERING ON ALL LINTELS TO MEET COUNCIL REQUIREMENTS.
4. CONFIGURE 1000 AND 1600 LINTELS AS SHOWN ON DWG S1.
5. UNLESS OTHERWISE SPECIFIED THE MANNING GRATE SHALL BE USED.
6. THE FOLLOWING ALTERNATIVE GRATE/COVER MAY BE SPECIFIED.
   (A) MACADAM
   (C) STORMCOVER
7. TOLERANCE FOR 100mm KERB OPENINGS = +0.00 –5.00mm.
8. KERB AND CHANNEL TYPE SHALL BE AS SPECIFIED.
9. CAST IN SITU CONCRETE N25 TO AS 1379 AND AS 3600.
10. MAX DEPTH 800X700 PIT 1.5M UNLESS SPECIFICALLY APPROVED.




SECTION B-B FOR PIPES >525Ø




TYPICAL INLET ON GRADE - BARRIER KERB - 450 CHANNEL




TYPICAL INLET IN SAG - BARRIER KERB - 450 CHANNEL

| LINTELS | | | | | |
|---|---|---|---|---|---|
| LENGTH OF LINTEL | 1000 | 1600 | 2400 | 3600 | 4800 |
| KERB OPENING | 1000 | 1600 | 2040 | 3240 | 4440 |
| MASS kg | 140 | 315 | 500 | 700 | 900 |

| KERB TYPE | OVERALL INLET LENGTH WITH TRANSITIONS | | | | |
|---|---|---|---|---|---|
| EXCEPT AS BELOW | 2400 | 3000 | 3800 | 5000 | 6200 |
| BK450 | 1600 | 2200 | 3000 | 4200 | 5400 |
| BK300 ON GRADE | 2400 | 3400 | 4600 | 5800 | 7000 |

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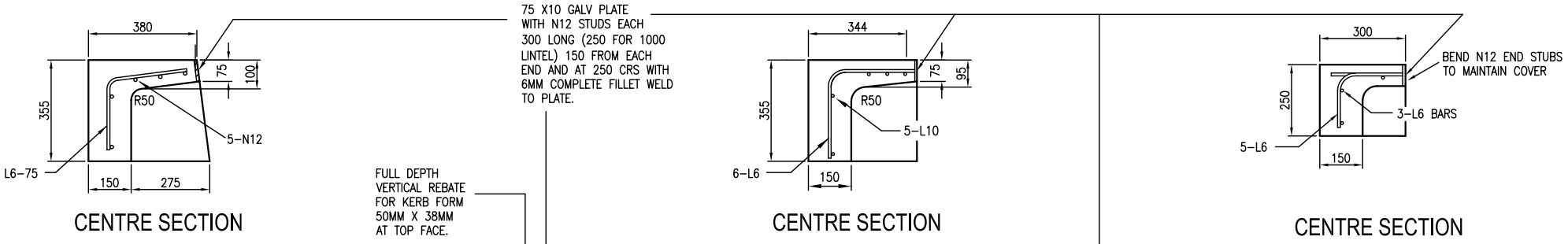
| NO | REVISIONS | DATE | INITS |
|---|---|---|---|
| C | | | |
| B | | | |
| A | | | |
| 0 | ORIGINAL ISSUE | 1–10–03 | PGB |

# STORMWAY

STORMWAY INLET MANHOLE
1000, 1600, 2400, 3600 AND 4800 LINTELS

S2




CENTRE SECTION

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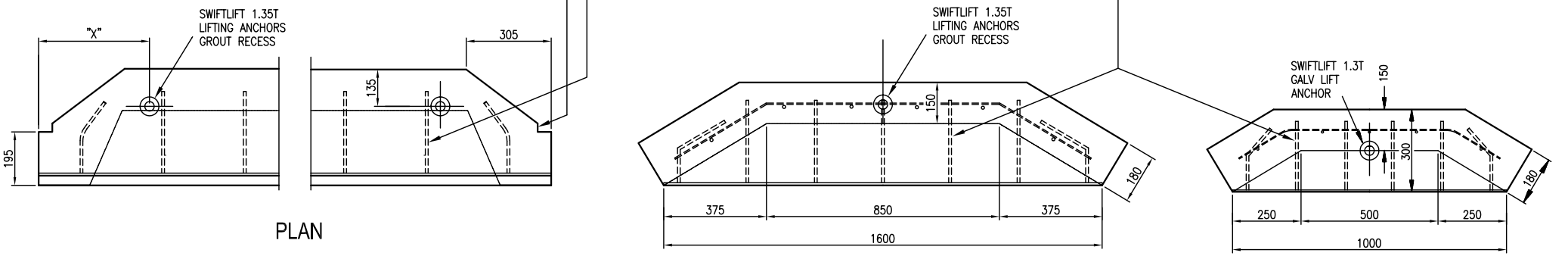
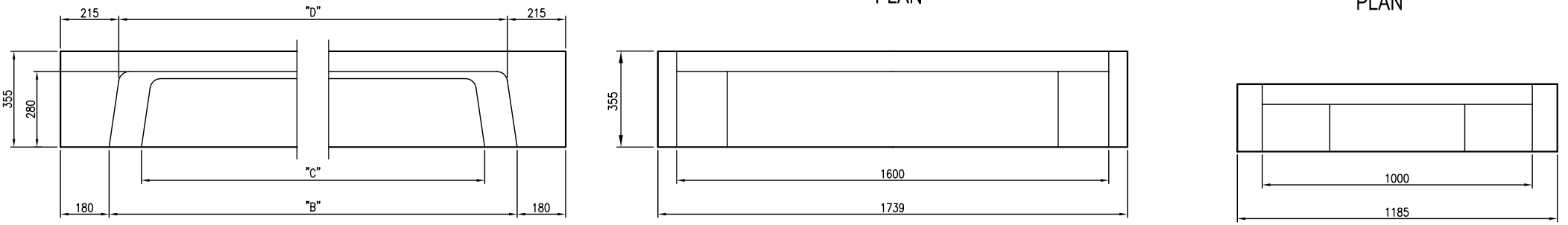



PLAN

PLAN

PLAN




ELEVATION

2400, 3600 AND 4800 LINTELS

ELEVATION

1600 LINTEL

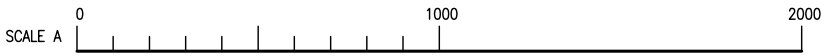
MASS = 315kg

ELEVATION

1000 LINTEL

MASS = 140kg

| 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 |

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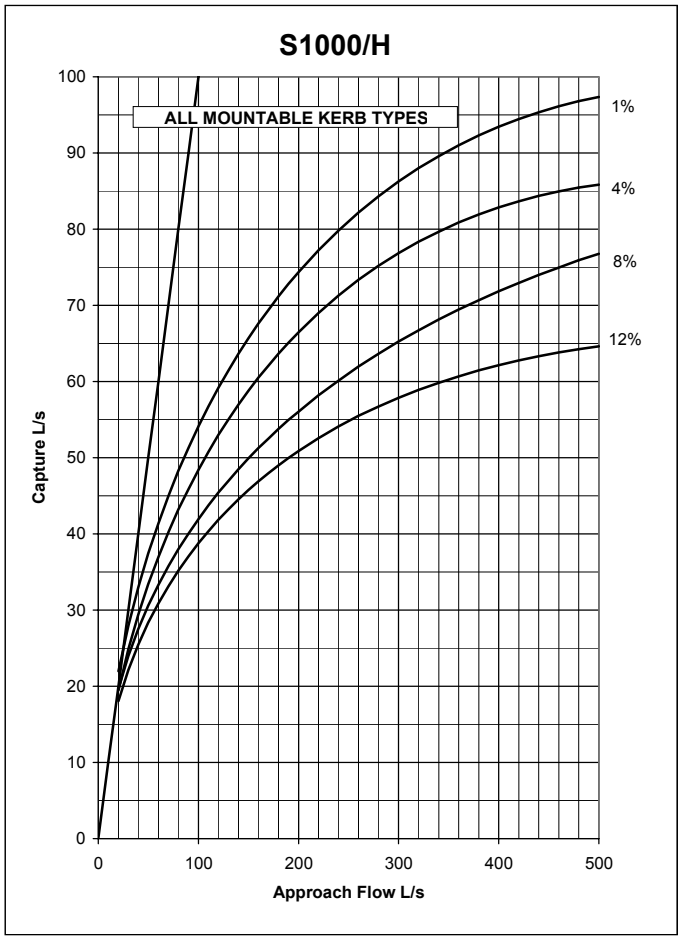
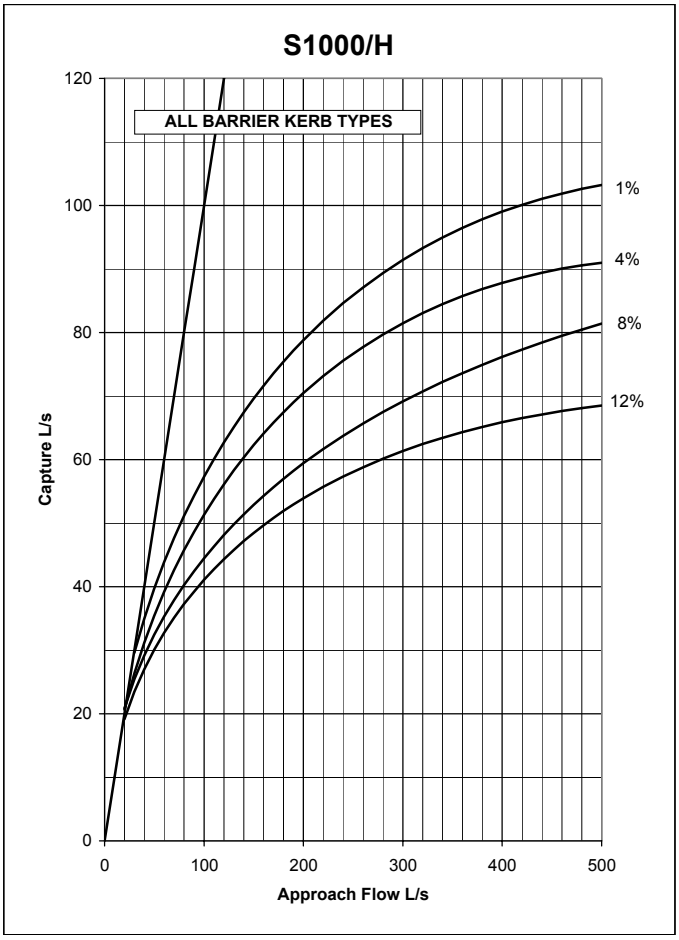
| NO | REVISIONS | DATE | INITS |
|---|---|---|---|
| C | | | |
| B | | | |
| A | | | |
| 0 | ORIGINAL ISSUE | 1-10-03 | PGB |

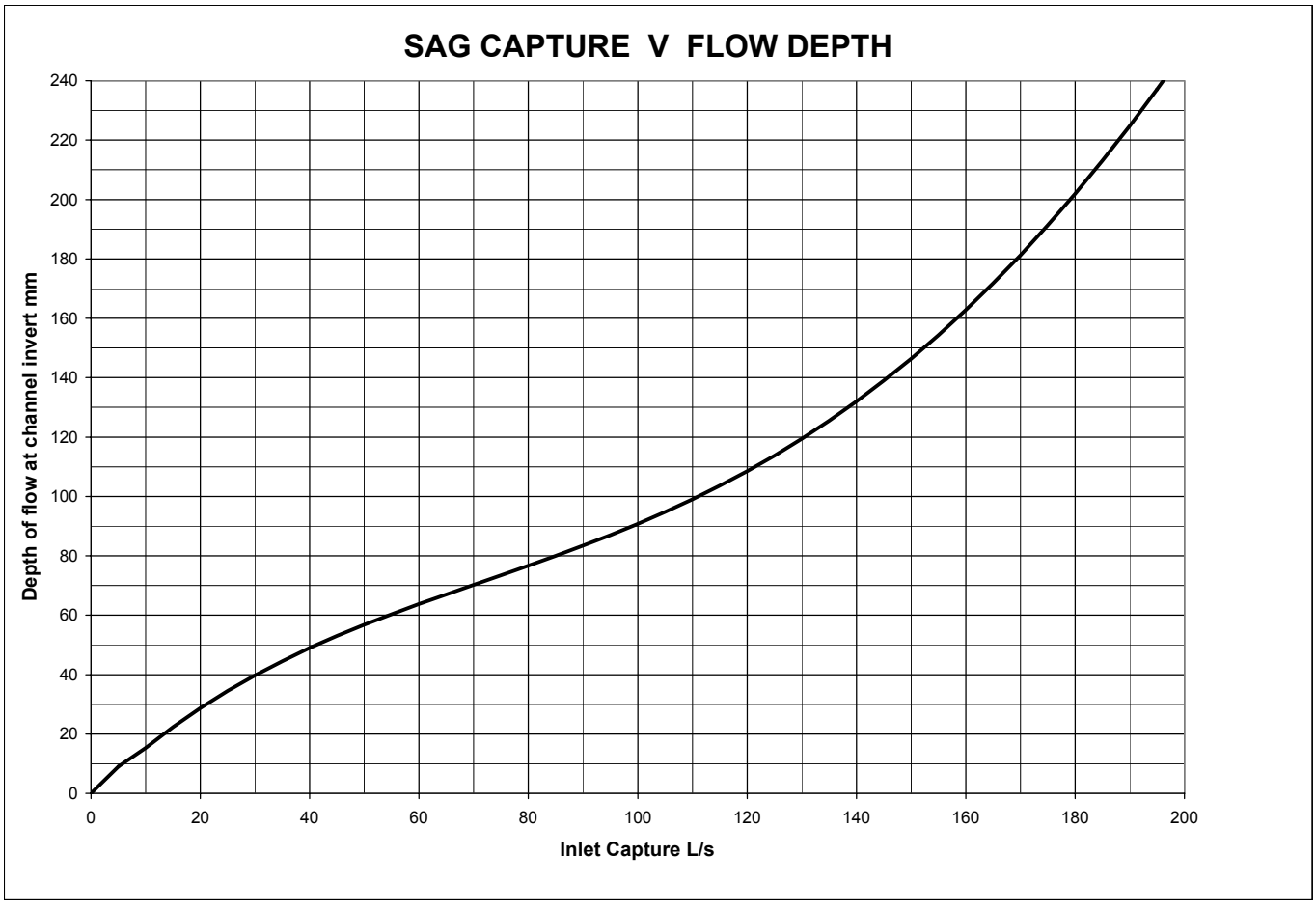
# STORMWAY

STORMWAY INLETS
LINTELS 1000 - 4800

S3

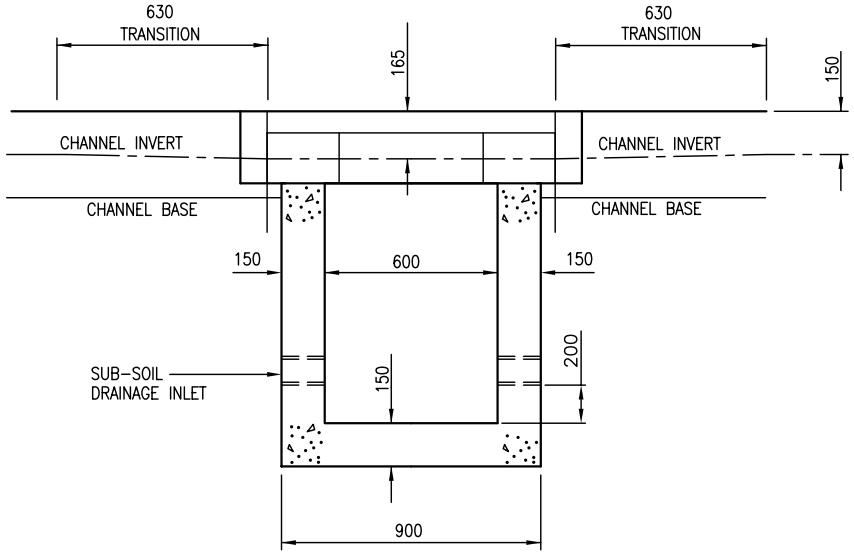


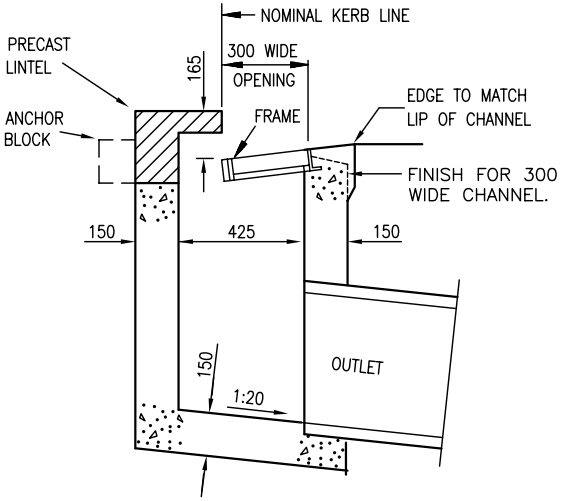




# STORMWAY
# HAZEN GRATE
# ALL CROSSFALLS

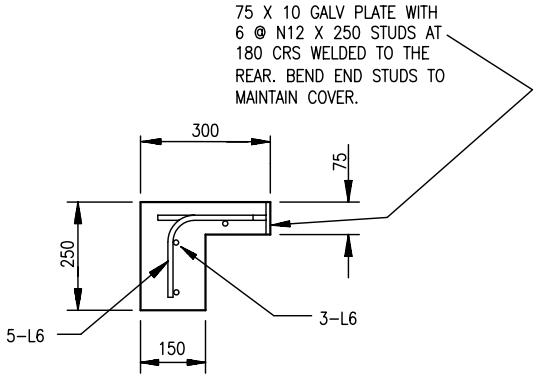
**CHART S11**



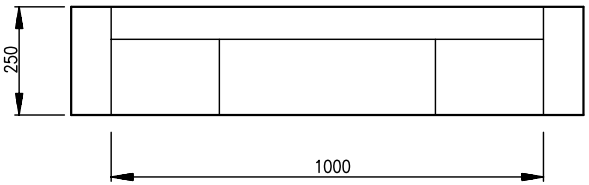

SECTION A-A



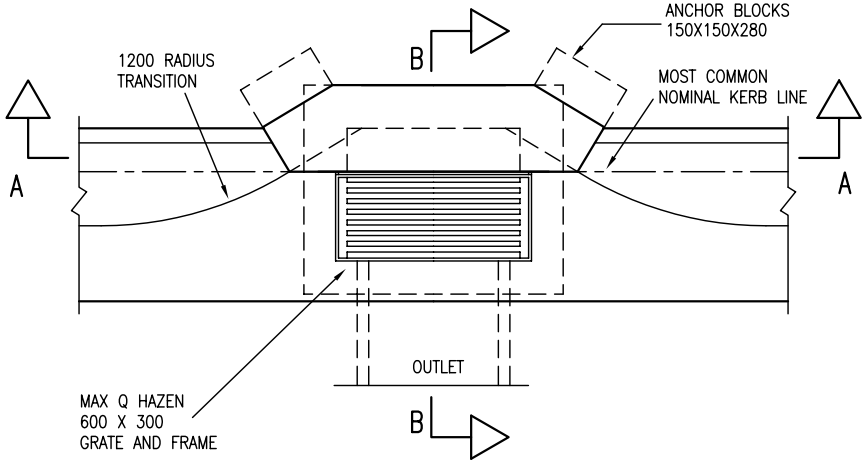

SECTION B-B



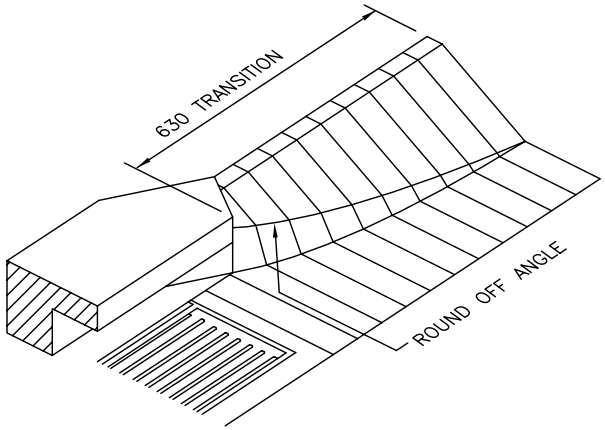

SECTION C-C



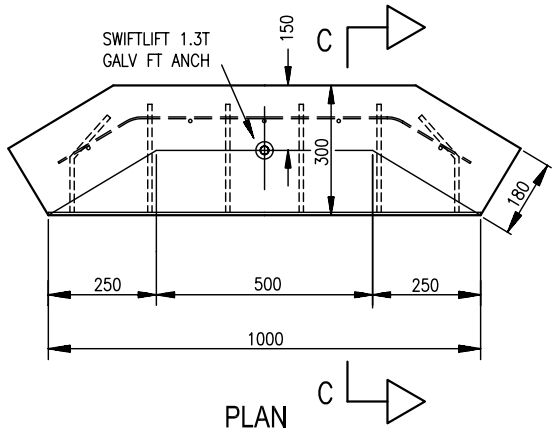

ELEVATION




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 INVERT.

SPECIFICATION CODE:

STORMWAY CODE – S
HAZEN GRATE – H
GULLY INLET – G
LINTEL – 1000
TYPICAL UNIT WITH GRATE – S1000G/H
(STORMWAY 1000 LINTEL, GULLY INLET WITH HAZEN GRATE.)

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| NO | REVISIONS | DATE | INITS |
|---|---|---|---|
| C | | | |
| B | | | |
| A | | | |
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# STORMWAY

## SECONDARY INLET
## HAZEN GRATE WITH 1000 LINTEL

S4