Max Q

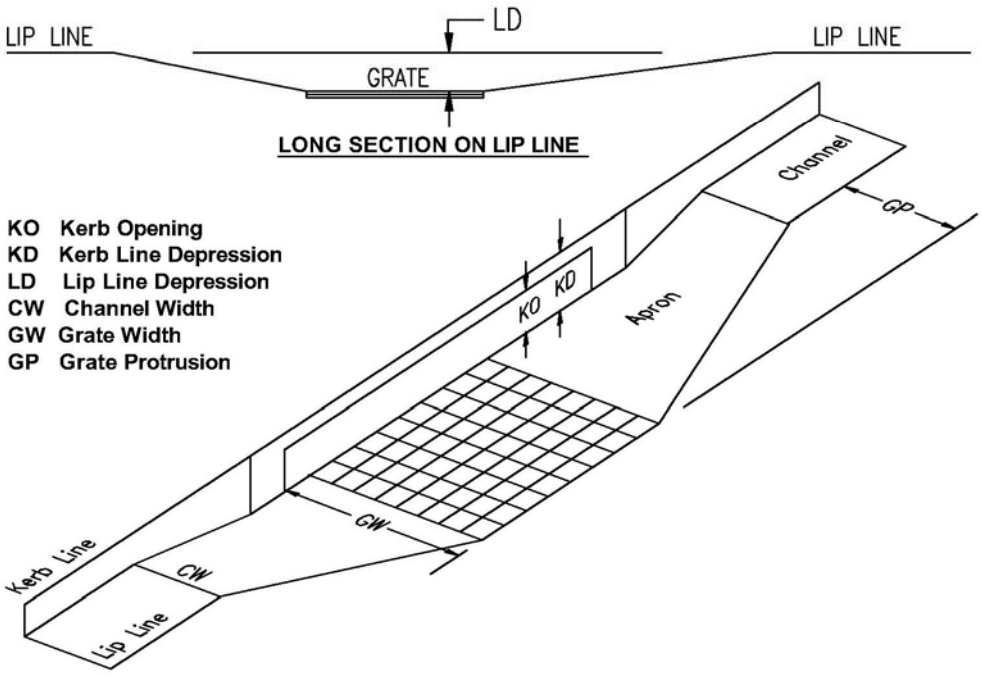
Technical Bulletin No 3

BICYCLE SAFETY OF INLETS

INTRODUCTION

Grate safety is covered by Australian Standard AS 3996 where it is specified in terms of the resistance of the bar configuration to bicycle tyre penetration. The Standard aims to limit dynamic penetration for the range of tyre sizes in common use and tabulates allowable bar spacings determined by the tyre size that will fit between bars running in the direction of travel. Grates complying with this Standard are said to be "bicycle tyre penetration resistant" (BTPR). Allowable bar spacings for BTPR may not satisfy requirements for pedestrian safety which are covered by other provisions. The first requirement for bicycle safety of inlets is that the grate should satisfy the BTPR requirements of AS 3996.

Depressed grate on a cycle path.



GRATE DEPRESSION

Where the grate protrudes *GP* beyond the channel lip, a cyclist travelling on the lip line has to negotiate a sudden fall and rebound *LD* in a short distance. The second requirement then, for bicycle safety, is to limit *GP* and *LD*. This is achieved by a reduced width of grate *GW* for less grate protrusion *GP*, reduced *KO* leading to reduced kerb line depression *KD* and therefore reduced lip line depression *LD*. A cyclist fatality involving high *GP* and *LD* is discussed in Technical Bulletin No 5, Trafficability. Dimensions for some commonly available inlets are set out in the sections that follow.

Grate above - depression on the lip line.

***IPEAQ* DWG D-0060 INLET**
GW = 676.
For BK300, *GP* = 376 and *LD* = 43mm.
For MK and BK450, *GP* = 226 and *LD* = 37mm

***BCC* UMS 330 INLET**
GW = 676.
For BK300, *GP* = 376 and *LD* = 37mm.
For MK and BK450, *GP* = 226 and *LD* =26mm

***KERBWAY* INLETS**
GW = 510.
For BK300, *GP* = 210 and *LD* = 13mm.
For MK and BK450, *GP* = 60 and *LD* =5mm

BK450 = Barrier Kerb 450 channel – IPWEA B1
BK300 = Barrier Kerb 300 channel – IPWEA B2
MK = Mountable Kerb – IPWEA M1


BCC UMS 330 Inlet

It should be noted that Austroads, Part 14 Bicycles, Clause 8.5.1 states that; "It is desirable that the finished surface of a bicycle path does not deviate from a 3m straight edge by more than 5mm at any point". The lip line path across the grate including transitions approximates 3m and as the summary in Tables 1 and 2 shows some lip line depressions exceed the desirable 5mm by a large margin.


Kerbway Manning Inlet


IPWEA Dwg D-0060 Inlet


BCC UMS 330 Inlets

TABLE 1

Mountable Kerb and Barrier Kerb with 450mm Channel			
Description	IPWEA Dwg D-0060 Inlet	BCC UMS 331 Inlet	Kerbway Manning Inlet
Grate protrusion beyond lip line	226	226	60
Grate depression on the lip line	37	26	5

TABLE 2

Barrier Kerb with 300mm Channel			
Description	IPWEA Dwg D-0060 Inlet	BCC UMS 331 Inlet	Kerbway Manning Inlet
Grate protrusion beyond lip line	376	376	210
Grate depression on the lip line	43	37	13

CONCLUSION
Compared with the IPWEA and BCC inlets, Kerbway inlets with Manning grate have acceptable grate protrusion. While not meeting the Austroads "desirable" aim with 300mm channel, of ≤5mm lip line depression, 13mm in that configuration is considered acceptable.