

HEAD LOSS COMPUTATION FOR CLOSED CONDUITS

STATE		PROJECT			
BY	DATE	CK BY	DATE	JOB	
SUBJECT			SHEET	OF	
OPEN CHANNEL ENTRANCE AND OUTLET TO CLOSED CONDUITS					
ENT. WATERSURFACE EL.					
OUT. WATERSURFACE EL.					
Total Head Available					
CLOSED CONDUIT DATA					
Length (ft.)					
Approx. s ft./ft.					
Type of Conduit					
Mannings "n"					
Design Q (c.f.s.)					
Conduit Size (in.) = d					
Flow Area (ft.) ²					
Kp from ES - 42 *					
Velocity in Conduit (f.p.s.)					
Velocity Head = $V^2/2g$					
Head Loss Factors from Section 5, National Eng. Hdbk., HYDRAULICS	One Pipe Velocity Head	1.00	1.00	1.00	1.00
	K_0 = Entrance				
	K_1 = $K_p L$ = Friction				
	K_2 = Enlargement				
	K_3 = Contraction				
	K_4 = Obstruction				
	K_5 = Bends				
$\Sigma K =$					
Total Head Loss = $(\Sigma K)(V^2/2g)$					
Min. required entrance head, $H_i = (1+K_0)V^2/2g + d$					
Max. elevation of invert of pipe at entrance = Ent.W.S.El.- H_i					

Notes: 1. Velocity of approach is neglected.
 2. Outlet loss assumed to equal Velocity Head in pipe loss Velocity Head of outlet channel.
 * See Revision of K_p coefficients, Exhibit 3-4, Page 3-75 of the Engineering Field Manual.