PERMANENT WAY

NOTES

CURVES, CANTS & SPEEDS

THESE NOTES ARE INTENDED FOR THE GUIDANCE AND ASSISTANCE OF STAFF ENGAGED UPON PERMANENT WAY WORK. THEY DO NOT IN ANY WAY MODIFY, SUPPLEMENT OR AMEND THE INSTRUCTIONS LAID DOWN IN E.D.I., STANDARD DRAWINGS, CIRCULARS ETC., WHICH SHOULD BE REFERRED TO IN ALL CASES.

TABLE 1. EQUILIBRIUM CANT & SPEED FOR CURVE RADII 5 CH - 20

VERSINES ON 33' CHORD	VERSINES ON 66' CHORD	RADIUS OF CURVE IN CHAINS	SPEED IN MILES PER HOUR. 10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	9
4 15/16"	1' 7 13/16"	5	1¼	2¾	4¾														
4 1/8"	1' 4½"	6	1	2¼	4	6													
3 9/16"	1' 2⅛"	7	1	2	3½	5½													
3 1/8"	1' 0⅜"	8	¾	1¾	3	4¾													
2 ¾"	11"	9	¾	1½	2¾	4¼	6												
2 ½"	9⅞"	10	½	1½	2½	3¾	5½												
2 1/16"	8¼"	12	½	1¼	2	3¼	4½	6											
1 5/8"	6⅝"	15	½	1	1¾	2½	3¾	5											
1 7/16"	5 13/16"	17	½	¾	1½	2¼	3¼	4½	5¾										
1¼"	4 5/16"	20	½	¾	1¼	2	2¾	3¾	4¾	6									
1"	4"	25		½	1	1½	2¼	3	4	5	6								
	3 5/16"	30		½	¾	1¼	1¾	2½	3¼	4	5	6							
	2 13/16"	35		½	¾	1	1½	2¼	2¾	3½	4¼	5¼							
	2½"	40		½	¾	1	1½	2	2½	3	3¾	4½	5½						
	2 3/16"	45			½	¾	1¼	1¾	2¼	2¾	3¼	4	4¾	5½					
	2"	50			½	¾	1¼	1½	2	2½	3	3¾	4¼	5	6				
	1 13/16"	55			½	¾	1	1½	1¾	2¼	2¾	3¼	4	4¾	5½				
	1 5/8"	60			½	¾	1	1¼	1¾	2	2½	3	3¾	4¼	5	5¾			
	1 7/16"	70				½	¾	1	1½	1¾	2¼	2¾	3¼	3¾	4¼	4¾	5½		
	1¼"	80				½	¾	1	1¼	1½	2	2¼	2¾	3¼	3¾	4¼	4¾	5½	
	1⅛"	90				½	¾	¾	1	1½	1¾	2	2½	2¾	3¼	3¾	4¼	4¾	
	1"	100					½	¾	1	1¼	1½	1¾	2¼	2½	3	3½	3¾	4¼	
	13/16"	120						½	¾	1	1¼	1½	1¾	2¼	2½	2¾	3¼	3¾	
	11/16"	140						½	¾	1	1¼	1¼	1½	1¾	2¼	2½	2¾	3¼	
	5/8"	160						½	¾	¾	1	1¼	1½	1¾	2	2¼	2½	2¾	
	9/16"	180							½	¾	1	1¼	1½	1¾	2	2¼	2½		
	½"	200								½	¾	¾	1	1¼	1½	1¾	2	2¼	

THE LINES SHEW THE LIMITING MAXIMUM PERMISSIBLE SPEED, ALLOWING MAXIMUM ALLOWABLE CANT DEFICIENCY WHERE THE ACTUAL CANT IS AT A MAXIMUM OF SIX INCHES.

---A&B SPECIAL
——A&B NORMAL
·····C&D

EQUILIBRIUM CANT $E_q = \frac{0.08\,V_e^2}{R}$

EQUILIBRIUM SPEED $V_e = 4.08\sqrt{R}$

LIMITING MAXIMUM PERMISSIBLE SPEED $V_m = 4.08\sqrt{R(E+}$

WHERE: R = RADIUS IN CHAINS
V_m = MAXIMUM PERMISSIBLE SPEED IN M.P.H.
V_e = EQUILIBRIUM SPEED IN M.P.H.
E = ACTUAL CANT IN INCHES + MAXIMUM ALLOWABLE CANT DEFICIENCY IN INCHES.

N.B. THE CANTS ARE SHOWN IN STEPS OF ¼" NEGLECTING ALL THOSE BELOW THE FIRST ½ INCH

TABLE 2 MAXIMUM ALLOWABLE CANT DEFICIENCY IN INCHES

CLASS OF LINE	MAXIMUM ALLOWABLE CANT DEFICIENCY IN INCHES.	MAXIMUM ALLOWABLE CANT DEFICIENCY FOR GIVEN VALUES OF ACTUAL CANT. ACTUAL CANT (INCHES) POSITIVE OR NEGATIVE 0	1	2	3	4	5	6
A & B (Special)	4½ − ¼E	4½	4¼	4	3¾	3½	3¼	3
A & B (Normal)	3½ − ¼E	3½	3¼	3	2¾	2½	2¼	2
C & D	2½ − ¼E	2½	2¼	2	1¾	1½	1¼	1

TABLE 3 ACTUAL CANT PLUS MAX. ALLOWABLE CANT DEFICIENCY IN INC

CLASS OF LINE	ACTUAL CANT PLUS MAXIMUM ALLOWABLE CANT DEFICIENCY IN INCHES	ACTUAL CANT PLUS MAX^M ALLOW^L CANT DEFIC^Y FOR GIVEN VALUES OF ACTUAL CANT. ACTUAL CANT (INCHES) POSITIVE OR NEGATIVE 0	1	2	3	4	5	6
A & B (Special)	E + (4½ − ¼E)	4½	5¼	6	6¾	7½	8¼	9
A & B (Normal)	E + (3½ − ¼E)	3½	4¼	5	5¾	6½	7¼	8
C & D	E + (2½ − ¼E)	2½	3¼	4	4¾	5½	6¼	7

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