

**Johns-Manville  
Sales Corporation**

Pipe Division

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January 5, 1976

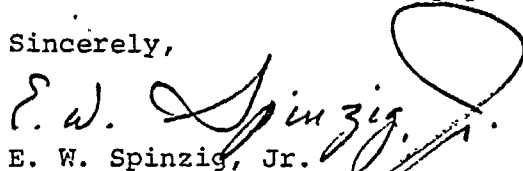
Mr. A. I. Leff  
Certain-Teed Products Corporation  
P.O. Box 860  
Valley Forge, PA 19482RE: AACPP - AD HOC COMMITTEE ON SEWER PIPE REDESIGN  
HEIGHT OF COVER DESIGN LIMITS FOR CONCRETE PIPE  
PER ASTM C-76 and C-14

Dear Al:

In response to my assignment, I am attaching the design heights of cover for concrete pipe per ASTM C-76 and C-14 as recommended by the American Concrete Pipe Association. Table 1 lists values for ASTM C-76 pipe while Table 2 lists the same results for ASTM C-14 pipe. On each Table there are two (2) height of cover values listed. One represents a soil unit weight of  $100 \text{ lb/ft}^3$  and the other in parenthesis represents a unit weight of  $120 \text{ lb/ft}^3$ .

Note the dependence of the C-14 pipe depths on size while those for C-76 pipes are independent of size. It is also noted that the Concrete Pipe Design Manual uses an  $r_{sdP} = -0.5$  to calculate the transition width load while our J-M sewer pipe manual uses  $r_{sdP} = +0.7$ .

Sincerely,

E. W. Spinzig, Jr.  
Product Manager - TRANSITE  
Attachments

cc: Frank T. Duffy - Flintkote  
H. Fraser - Johns-Manville-Canada  
W. R. Perrell - CAPCO  
J. Jackson - A/CPPA  
File (2)

TABLE 1. HEIGHT OF COVER LIMITS FOR  
C-76 REINFORCED CONCRETE PIPE\*

| Soil Unit<br>Weight<br>(lb/ft <sup>3</sup> ) | Height of Cover Design Limit (Ft) |           |          |         |
|----------------------------------------------|-----------------------------------|-----------|----------|---------|
|                                              | Class II                          | Class III | Class IV | Class V |
| 100                                          | 7-8                               | 10-11     | 15-16    | 22-24   |
| 120                                          | 5-6                               | 8-9       | 12-13    | 17-19   |

\* Assumes 0.01 crack three-edge bearing loads with a safety factor of 1.0 and Class C bedding,  $L_f = 1.5$ .

Based on transition width loads contained in the Concrete Pipe Design Manual calculated from  $K_{\omega} = 0.19$   $r_{sdP} = -0.5$  and  $\gamma = 100$  lb/ft<sup>3</sup> and  $\gamma = 120$  lb/ft<sup>3</sup>.

TABLE 2. HEIGHT OF COVER LIMITS FOR  
C-14 CONCRETE SEWER PIPE\*

| Height of Cover Limits for<br>$w = 100 \text{ lb/ft}^3$ (120 lb.ft <sup>3</sup> ) in Feet |         |          |           |
|-------------------------------------------------------------------------------------------|---------|----------|-----------|
| Size                                                                                      | Class I | Class II | Class III |
| 6                                                                                         | 15 (12) | 21 (17)  | 25 (20)   |
| 8                                                                                         | 12 (9)  | 16 (13)  | 19 (15)   |
| 10                                                                                        | 10 (8)  | 13 (11)  | 16 (13)   |
| 12                                                                                        | 9 (8)   | 11 (10)  | 13 (11)   |
| 15                                                                                        | 8 (7)   | 10 (9)   | 11 (10)   |
| 18                                                                                        | 7 (6)   | 10 (9)   | 11 (10)   |
| 21                                                                                        | 7 (5)   | 10 (8)   | 11 (9)    |
| 24                                                                                        | 7 (5)   | 9 (7)    | 11 (9)    |
| 27                                                                                        | 6 (5)   | 9 (7)    | 11 (9)    |
| 30                                                                                        | 6 (5)   | 8 (6)    | 10 (8)    |
| 33                                                                                        | 6 (5)   | 8 (6)    | 9 (8)     |
| 36                                                                                        | 6 (5)   | 8 (6)    | 8 (7)     |

\* Assumes Class C bedding  $L_f = 1.5$  and  
safety factor  $SF = 1.5$ .

Based on Concrete Pipe Design Manual tran-  
sition width loads, calculated from  $K_{wc} = 0.19$   
 $r_{sdP} = -0.5$   $w = 100 \text{ lb/ft}^3$  and  $(120 \text{ lb/ft}^3)$ .