

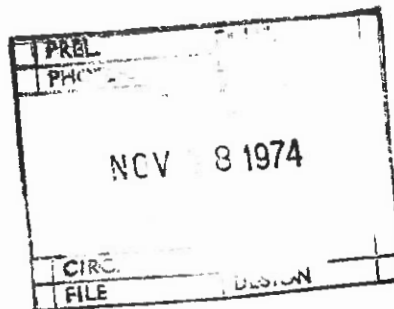
<p>TO:</p> <p>215. M. Tegza Final Plans Rev. Bur. Bldg. 5 4th Fl.</p> <p>SUPERSEDED BY EI 76-034 EFFECTIVE 5/4/1976</p>	<h1>ENGINEERING INSTRUCTION</h1> <p>NEW YORK STATE DEPARTMENT OF TRANSPORTATION</p>
<p>Distribution:</p> <p><input type="checkbox"/> Main Office <input type="checkbox"/> Regions <input checked="" type="checkbox"/> Special</p>	<p>SUBJECT: REVISION TO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES</p> <p>Subject Code: 7.35-4</p>
<p>APPROVED:</p> <p style="text-align: center;"><i>R. M. Kamp</i></p> <p>Deputy Chief Engineer (Structures)</p>	<p>Code: <u>EI 74-101</u></p> <p>Date: <u>10/29/74</u></p> <p>Supersedes: MODIFIES EI 74-086 DATE 9/6/74</p>

The attached sheets are to correct errors in revisions issued with EI 74-86, dated September 6, 1974.

Page 26 - Group III corrected by changing "W" to "WL" in last value.

Page 91 - Corrected to agree with previous revision.

Page 92 - No change.



THE MAXIMUM SECTION REQUIRED SHALL BE USED.

		PERCENTAGE OF UNIT STRESS
GROUP I	=D+L+I+E+B+SF+CF	100
GROUP II	=D+E+B+SF+W	125
GROUP III	=GROUP I+LF+F+30%W+WL	125
GROUP IV	=GROUP I+R+S+T	125
GROUP V	=GROUP II+R+S+T	140
GROUP VI	=GROUP III+R+S+T	140
GROUP VII	=D+E+B+SF+EQ	133-1/3
GROUP VIII	=GROUP I+ICE	140
GROUP IX	=GROUP II+ICE	150
D	=DEAD LOAD	
L	=LIVE LOAD	
I	=LIVE LOAD IMPACT	
E	=EARTH PRESSURE	
B	=BUOYANCY	
W	=WIND LOAD ON STRUCTURE	
WL	=WIND LOAD ON LIVE LOAD-100 POUNDS PER LINEAR FOOT	
LF	=LONGITUDINAL FORCE FROM LIVE LOAD	
CF	=CENTRIFUGAL FORCE	
F	=LONGITUDINAL FORCE DUE TO FRICTION	
R	=RIP SHORTENING	
S	=SHRINKAGE	
T	=TEMPERATURE	
EQ	=EARTHQUAKE	
SF	=STREAM FLOW PRESSURE	
ICE	=ICE PRESSURE	

CR_c MAY BE ESTIMATED USING THE FOLLOWING AVERAGE VALUES. THESE VALUES APPLY TO SECTIONS THAT ARE BOTH WITH AND WITHOUT COMPOSITE DECK SLABS.

f_{cd} (PSI)	CR_c (PSI)
500	8,000
800	13,000
1200	19,000

(D) RELAXATION OF PRESTRESSING STEEL *****

STRESS RELIEVED STRAND

$$CR_s = 20000 + 6250(\%GUTS - 70)/5 - 0.125(SH + ES + CR_c)$$

STABILIZED STRAND

$$CR_s = 5270 + 1480(\%GUTS - 70)/5 - 0.06(SH + ES + CR_c)$$

*%GUTS IS RATIO OF JACKING FORCE TO GUARANTEED ULTIMATE TENSILE STRENGTH.

(2) POST TENSIONED

$$\Delta f_s = 0.8(SH) + 0.5(ES) + CR_c + CR_{sp}$$

$$\text{WHERE } CR_{sp} = 20,000 - 0.125 \left[(0.8)(SH) + (0.5)(ES) + CR_c \right]$$

1.6.8--FLEXURE

PRESTRESSED CONCRETE MEMBERS MAY BE ASSUMED TO ACT AS UNCRACKED MEMBERS SUBJECTED TO COMBINED AXIAL AND BENDING STRESSES WITHIN SPECIFIED SERVICE LOADS.

IN CALCULATIONS OF SECTION PROPERTIES, THE TRANSFORMED AREA OF BONDED REINFORCEMENT MAY BE INCLUDED IN PRETENSIONED MEMBERS AND IN POST-TENSIONED MEMBERS AFTER GROUTING) PRIOR TO BONDING OF TENDONS, AREAS OF THE OPEN DUCTS SHALL BE DEDUCTED.

1.6.9--ULTIMATE FLEXURAL STRENGTH

(A) RECTANGULAR SECTIONS

FOR RECTANGULAR OR FLANGED SECTIONS IN WHICH THE NEUTRAL AXIS LIES WITHIN THE FLANGE, THE ULTIMATE FLEXURAL STRENGTH

SHALL BE ASSUMED AS

$$M_u = A_s^* f_{su}^* d \left(1 - 0.6 \frac{p^* f_s^*}{f_c'} \right)$$

(B) FLANGED SECTIONS

IF THE NEUTRAL AXIS FALLS OUTSIDE THE FLANGE (USUALLY IF THE FLANGE THICKNESS IS LESS THAN $1.4 d p^* f_s^* / f_c'$), THE ULTIMATE FLEXURAL STRENGTH SHALL BE ASSUMED AS

$$M_u = A_{sr} f_{su}^* d \left(1 - 0.6 \frac{A_{sr} f_{su}^*}{b' d f_c'} \right) + 0.85 f_c' (b - b') t (d - 0.5t)$$

WHERE

$A_{sr} = A_s^* - A_{sf}$ = THE STEEL AREA REQUIRED TO DEVELOP THE ULTIMATE COMPRESSIVE STRENGTH OF THE WEB OF A FLANGED SECTION.

$A_{sf} = 0.85 f_c' (b - b') t / f_{su}^*$ = STEEL AREA REQUIRED TO DEVELOP THE ULTIMATE COMPRESSIVE STRENGTH OF THE OVERHANGING PORTIONS OF THE FLANGE.

(C) STEEL STRESS

UNLESS THE VALUE OF f_{su}^* CAN BE MORE ACCURATELY KNOWN FROM DETAILED ANALYSIS, THE FOLLOWING VALUES MAY BE USED:

BONDED MEMBERS..... $f_{su}^* = f_s' \left(1 - 0.5 \frac{p^* f_s'}{f_c'} \right)$

UNBONDED MEMBERS..... $f_{su}^* = f_{su} + 15,000$

PROVIDED THAT:

- (1) THE STRESS-STRAIN PROPERTIES OF THE PRESTRESSING STEEL APPROXIMATE THOSE SPECIFIED IN ASTM A416.
- (2) THE EFFECTIVE PRESTRESS AFTER LOSSES IS NOT LESS THAN 0.5%