

STLRFD

No. 016
 April 29, 2021

STLRFD 2.6.0.0 Issue with Noncomposite Utility Load (UT1) Uncured Slab Checks

An issue has been identified in the application of the noncomposite utility load (UT1) for the uncured slab checks in STLRFD version 2.6.0.0. The issue is caused by an internal uninitialized value leading to the moment due to the UT1 load increasing over the length of the girder, rather than increasing and decreasing as expected.

This issue is only affecting the uncured slab checks, not the final condition checks or individual deck pour checks. This issue can lead to specification check failure indications where none truly exist.

PROBLEM DETAILS

The following output is from STLRFD version 2.6.0.0:

UNCURED SLAB WEB SPECIFICATION CHECK

Span No.	Dist. (ft)	Shear Force in Web				Compressive Stress in Web		Code Check**
		Gamma*	Vr* (kips)	4*Vdl* (kips)	Vu* (kips)	fcw* (ksi)	fu* (ksi)	
1	0.000	999.9	309.94	N/A	20.50	-30.00	0.00	
1	5.536	48.3	286.68	N/A	16.40	-30.00	-2.70	
1	11.073	19.6	286.68	N/A	12.30	-30.00	-6.64	
1	16.609	11.4	286.68	N/A	8.20	-30.00	-11.42	
1	17.885L	9.5	286.68	N/A	7.26	-30.00	-13.78	
1	17.885R	8.1	286.68	N/A	7.26	-30.00	-16.01	
1	22.146	6.2	277.84	N/A	4.10	-30.00	-21.10	
1	27.682	5.0	262.79	N/A	0.00	-30.00	-26.32	<= midspan
1	33.219	4.2	277.84	N/A	-4.10	-30.00	-31.16	C

Similar output from STLRFD version 2.5.0.0, with the UT1 load defined as a DC1 load:

UNCURED SLAB WEB SPECIFICATION CHECK

Span No.	Dist. (ft)	Shear Force in Web				Compressive Stress in Web		Code Check**
		Gamma*	Vr* (kips)	4*Vdl* (kips)	Vu* (kips)	fcw* (ksi)	fu* (ksi)	
1	0.000	999.9	309.94	N/A	20.50	-30.00	0.00	
1	5.536	58.9	286.68	N/A	16.40	-30.00	-2.21	
1	11.073	33.2	286.68	N/A	12.30	-30.00	-3.93	
1	16.609	25.3	286.68	N/A	8.20	-30.00	-5.16	
1	17.885L	24.3	286.68	N/A	7.26	-30.00	-5.37	
1	17.885R	24.3	286.68	N/A	7.26	-30.00	-5.37	
1	22.146	22.1	277.84	N/A	4.10	-30.00	-5.90	
1	27.682	21.2	262.79	N/A	0.00	-30.00	-6.14	<= midspan
1	33.219	22.1	277.84	N/A	-4.10	-30.00	-5.90	

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**STLRFD 2.6.0.0 Issue with Noncomposite
Utility Load (UT1) Uncured Slab Checks**

As observed in the STLRFD version 2.5.0.0 output, the compressive stress increases to midspan at 27.682', then starts to decrease. A fix has been made to a STLRFD development version and the correct results match those shown when the UT1 load is defined as a DC1 load.

WORKAROUND

A workaround for this issue is to create a second input file that redefines the UT1 loads as noncomposite dead loads (DC1) and use the program output from this second input file exclusively for looking at the uncured slab specification checks. Because the load factors for UT1 loads and DC1 loads are identical for the construction limit states (and some checks are of unfactored loads), the magnitude of the UT1/DC1 load should be the same between the two runs of the program.

The following output reports are affected by this issue:

UNCURED SLAB WEB SPECIFICATION CHECK
UNCURED SLAB FACTORED LATERAL STRESSES
UNCURED SLAB FLANGE SPECIFICATION CHECK (NO LTB) (PART 1)
UNCURED SLAB FLANGE SPECIFICATION CHECK (NO LTB) (PART 2)
INTERMEDIATE VALUES FOR LATERAL TORSIONAL BUCKLING CALCULATIONS (UNCURED SLAB)
LATERAL TORSIONAL BUCKLING CAPACITY (UNCURED SLAB)
UNCURED SLAB NET SECTION FRACTURE CHECK

PROBLEM RESOLUTION

A fix for this problem will be included in the next release of the STLRFD program.

Please direct any questions concerning the above to:

Robert F. Yashinsky, P.E.

*PA Office of Administration | Infrastructure and Economic Development
Bureau of Solutions Management | Highway Applications Division*

Phone: (717) 787-8407 | Fax: (717) 705-5529

e-mail: ryashinsky@pa.gov