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ERRATA for *AASHTO LRFD Bridge Design Guide Specifications for GFRP-Reinforced Concrete Bridge Decks and Traffic Railings* (GFRP-1)

AASHTO has issued an errata that includes technical revisions to the *AASHTO LRFD Bridge Design Guide Specifications for GFRP-Reinforced Concrete Bridge Decks and Traffic Railings*.

To ensure that your editions are accurate and current, we are providing you with the attached summary of the errata changes, as well as the revised pages to which they apply.

Should you need additional copies of the errata, you can download them free of charge on the AASHTO Online Bookstore at the following URL: http://downloads.transportation.org/GFRP-1-E1.pdf

We sincerely apologize for any inconvenience. Please feel free to contact us if you have questions or need any additional information.

Page	Existing Text	Corrected Text
Section 2		
29	Eq. 2.12.2.1-1 reads: $\ell_d = \dfrac{31.6\alpha \dfrac{f_f}{\sqrt{f'_c}} - 340}{13.6 + \dfrac{C}{d_b}} d_b$	Revise numerator to read: $\ell_d = \dfrac{\alpha \dfrac{f_f}{\sqrt{f'_c}} - 340}{13.6 + \dfrac{C}{d_b}} d_b$

An increase of 30 percent in the value of M_r/V_u shall be permitted when the ends of reinforcement are confined by a compressive reaction.

2.12.1.2.3—Negative Moment Reinforcement

At least one-third of the total tension reinforcement provided for negative moment at a support shall have an embedment length beyond the point of inflection not less than:

- The effective depth of the member,
- 12 times the nominal diameter of bar, or
- 0.0625 times the clear span.

2.12.2—Development of Reinforcement

2.12.2.1—Deformed Bars in Tension

The tension development length, ℓ_d, shall not be less than the value reported in Eq. 1 or $20d_b$, whichever is greater.

$$\ell_d = \frac{\alpha \dfrac{f_f}{\sqrt{f_c'}} - 340}{13.6 + \dfrac{C}{d_b}} d_b \qquad (2.12.2.1\text{-}1)$$

where:

α = bar location modification factor

f_f = effective strength in reinforcement computed according to Eq. 2.9.3.1-1, ksi

C = lesser of the cover to the center of the bar or one-half of the center-to-center spacing of the bars being developed, in.

d_b = GFRP bar diameter, in.

The term C/d_b shall not be taken larger than 3.5.

The bar location modification factor, α, shall be set equal to 1.0 except for bars with more than 12 in. of concrete cast below for which a value of 1.5 shall be adopted.

C2.12.2.1

Wambeke and Shield (2006) followed the methodology for the determination of development length of FRP reinforcing bars originally adopted for steel bars. Accordingly, a consolidated database of 269 beam bond tests was created and this database was limited to beam-end tests, notch-beam tests, and splice tests. The majority of the reinforcing bars represented in the database were composed of GFRP. The bar surface deformation (spiral wrap versus helical lug) and the presence of confining reinforcement did not appear to affect the results. GFRP bars have a very low relative rib area and, therefore, the presence of confinement may not increase the average bond stress.

During concrete placement, air, water, and fine particles migrate upward through the concrete. This phenomenon can cause a significant drop in bond strength under the reinforcing bars horizontally placed. From the database assembled by Wambeke and Shield (2006), there were 15 tests where horizontal reinforcement had more than 12 in. of concrete below it at the time of embedment. Accordingly, a bar location modification factor was proposed and set to 1.5.