VDOT Northern Region Virginia Traffic Engineering Forum, 2017

ANCILLARY STRUCTURES DESIGN UPDATE

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IIM-S&B-90.2 – VDOT Guidelines for AASHTO Specifications

- Supplemental Specifications provides requirements for IIM in contracts
- Adopts AASHTO 2013 Specifications, with VDOT Guidelines
- Design wind speeds vary based on geographic area

VIRGINIA DEPARTMENT OF TRANSPORTATION

STRUCTURE AND BRIDGE DIVISION

INSTRUCTIONAL AND INFORMATIONAL MEMORANDUM

GENERAL SUBJECT: Ancillary Structures	NUMBER: IIM-S&B-90.2 IIM-TE-382.1
SPECIFIC SUBJECT: VDOT Guidelines to AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaries, and Traffic Signals, 6th Edition, 2013 with 2015 interims	Date: April 28, 2016
	SUPERSEDES: IIM-S&B-90.1

Fatigue Importance Categories		
Structure Type	**Span Length*, ft.**	**Fatigue Category**
All structures supporting dynamic message signs	All span lengths	Category I
Overhead sign span structure	> 150	Category I
	≤ 150	Category II
Overhead sign cantilever structure	> 50	Category I
	≤ 50	Category II
Overhead sign butterfly structure	All span lengths	Category II
Signal mast arm**	> 75	Category I
	50 to ≤ 75	Category II
	< 50	No fatigue design required
Overhead signal structure	> 190	Category I
	≤ 190	Category II
High mast light poles	All lengths	Category I
Signal span wires, conventional lights poles and ITS device support poles (excluding DMS)		No fatigue design required

Lighting Specification Updates and LP-1 & LP-2 Lighting Pole Proposed Updates

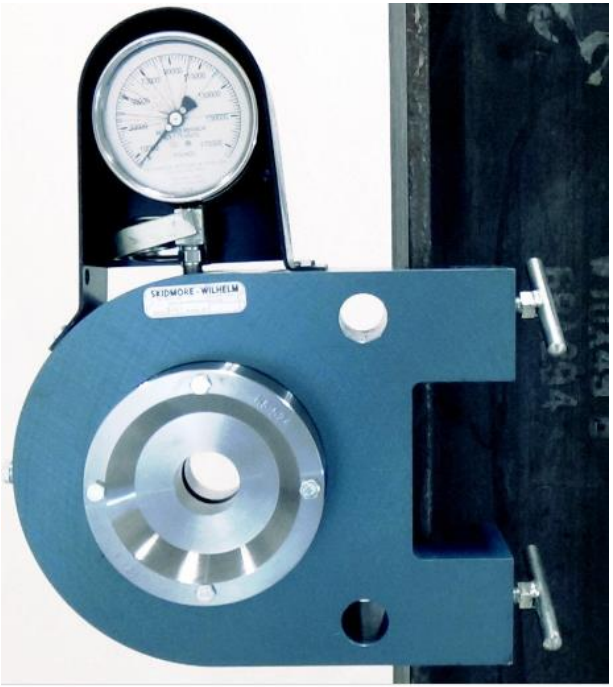
- Dampener is required on aluminum poles
- Designers need to specify breakaway and non-breakaway light pole types
  - Transformer base is shown on LP-1
  - Non-breakaway base still shown on LP-2
  - Both LP-1 and LP-2 require LF-1 foundation

Proposed Updates to Design Guidance/ Specifications

- Pre-Approved Shop Plans
- Updates to welding and tube diameter for traffic signals
- Tightening of High Strength Bolts
- Drilled Shaft Foundation Design for Torsion
- AASHTO LRFD Specifications for Structural Supports…

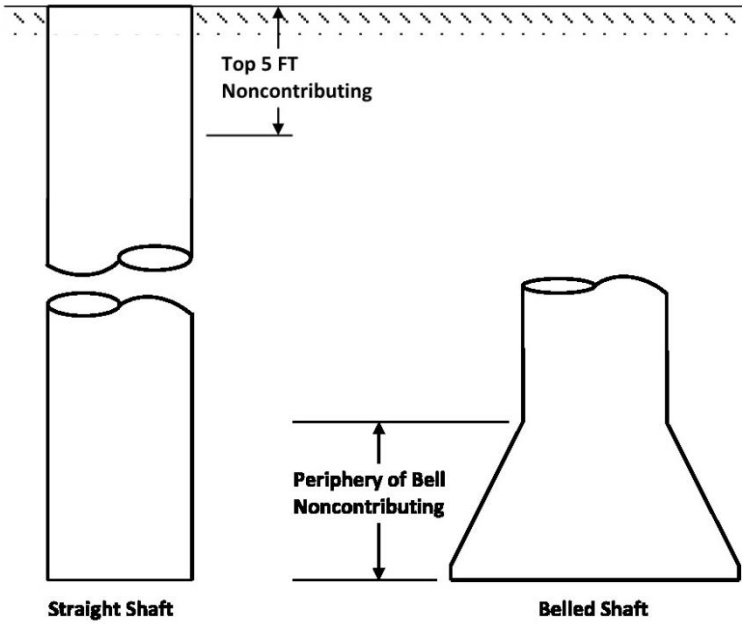
Tightening of High Strength Bolts

- We will allow turn-of-the-nut for tightening of these connections, but this option will require field rotational capacity testing of the bolts.
- We will also allow the use of DTI's and this option will not require any field rotational capacity testing
- Consider limiting bolt size to 1 ½"
- Additional bolts for Materials Division.



Torsion Design of Drilled Shafts

- Increasing the length of shaft not contributing for torsion resistance from the current value of 1.5 feet to a shaft diameter
- For side resistance in rock, the maximum N value that will be allowed for design is 50
- In lieu of making reference to the LRFD equations, we will show the equations that may be used for design in the Specifications



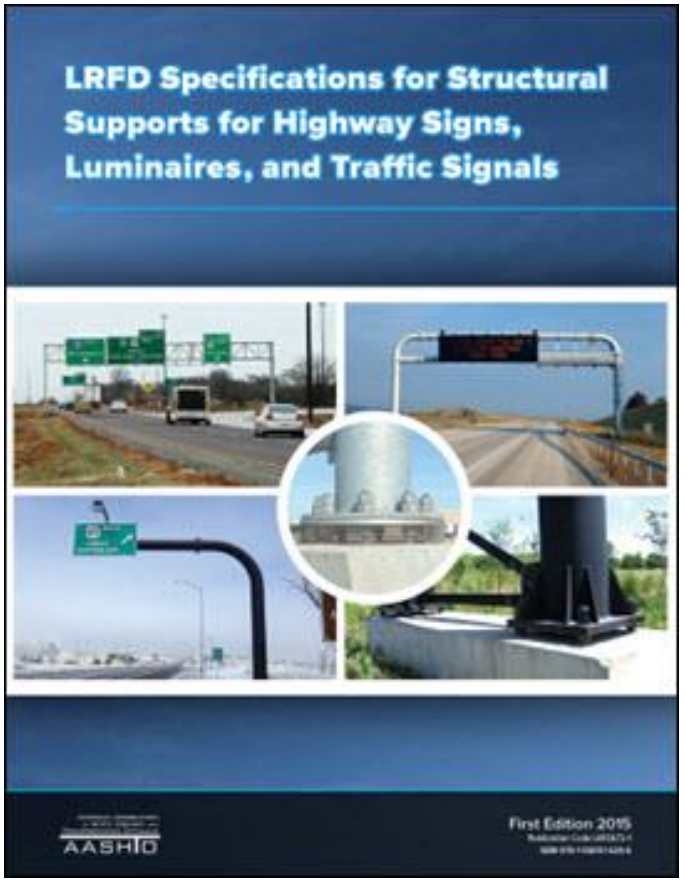
Welding and Size of Columns

- For tubes 18” diameter and greater, the backing ring shall be attached at the top and bottom face of the ring using a continuous fillet weld.
- For tubes less than 18” diameter, the backing ring shall be attached at the bottom face using a continuous fillet weld and the top shall be caulked to provide a thick durable continuous

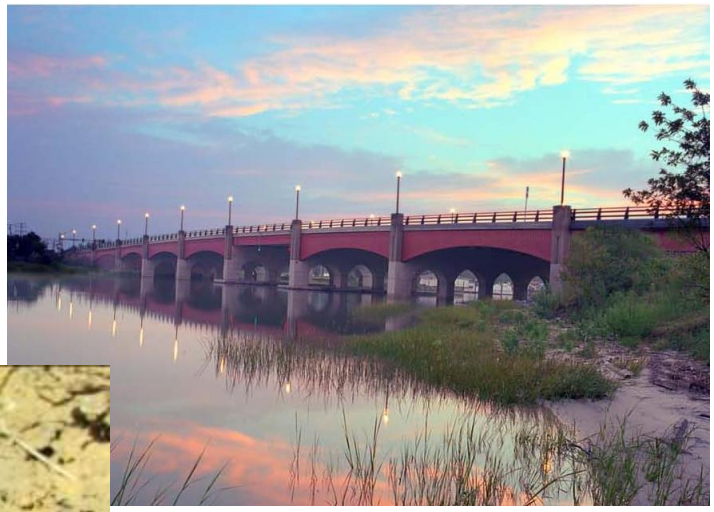
Configuration	Arm Length	Design Loading	Max. column diameter at base of column	Max. arm diameter at base of arm
Dual arm	Length of one arm exceeds 70’ or total length of both arms exceeds 130’	--	22”	20”
	All other dual-arm structures	--	20”	18”
Single arm	> 75’	--	22”	20”
	≤ 75’	“Case 2” loading as per Standard Drawing MP-3	22”	20”
		“Case 1” loading as per Standard Drawing MP-3	20”	18”

LRFD

- No plan to adopt unless required by FHWA.
- New wind model, with ADT as a design criteria
- Fatigue design, no change from current Specifications.



QUESTIONS??



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