



# VDOT Traffic Signal Standards, Specifications, & Guidelines

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VDOT Traffic Engineering Division

NRO Traffic Signals Meeting | July 20, 2015 | Fairfax

# Agenda

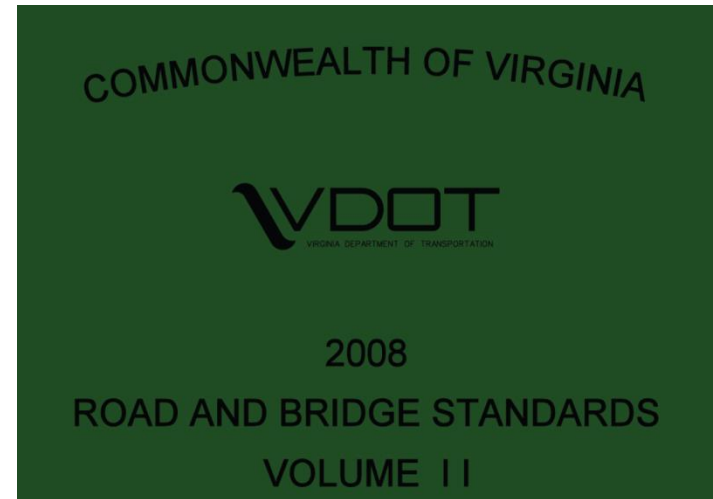
- Standards & Specs Overview
- Signal Poles
- Signal Pole Foundations
- Maximum Span Lengths
- Upcoming Changes
- Other Issues
- Getting Notified of Changes
- Questions & Answers

# Agenda

- ➔ ■ Standards & Specs Overview
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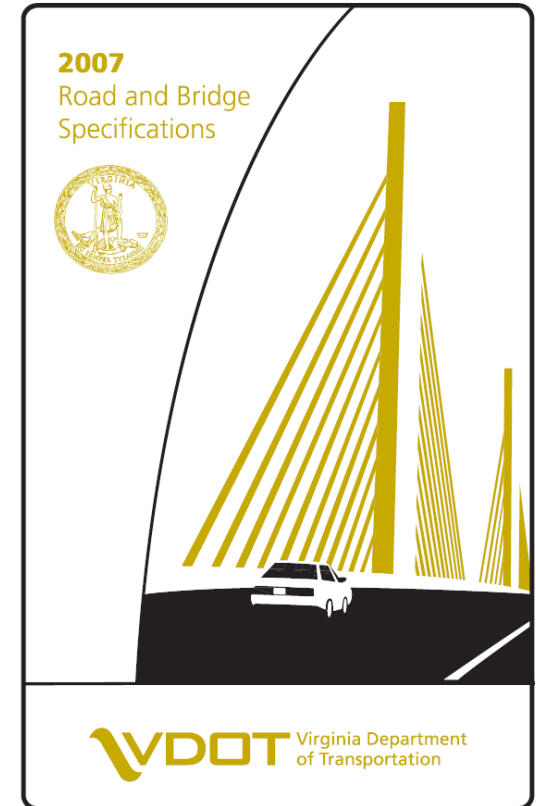
# Standards & Specs Overview | *Standards*

- VDOT *Road & Bridge Standards* represent the standards that Contractors must follow on all VDOT construction projects, unless directed otherwise in the contract documents
- Last published 2008
- Interim updates issued since 2008 must be included as “Insertable Sheets” on projects



# Standards & Specs Overview | *Spec Book*

- VDOT *Road & Bridge Specifications* (the “Spec Book”) specify the materials, construction methods, and payment for all VDOT standard pay items
- Contractors must follow the Specs on both construction and permit jobs, unless directed otherwise
- Book last published in 2007



# Standards & Specs Overview | *New Spec Book*

- Expected to be printed Fall 2015
- Expected to be effective for contracts with ad date  $\geq$  January 2016
- Currently available for Industry Review on OutsideVDOT:  
<https://outsidevdot.cov.virginia.gov/NPCV0/Shared%20Documents/Forms/AllItems.aspx?RootFolder=/NPCV0/Shared%20Documents/2015SpecificationsDraft>
- Comments due **September 12**
- Use standard comment form
- Free registration required to access OutsideVDOT

# Standards & Specs Overview | Goals

- Establish uniform and consistent technical criteria
- Be constructible
- Be unambiguous and enforceable
- Maximize safety
- Address long-term maintenance needs
- Result in quality end product
- Be good stewards of taxpayer dollars
- Minimize claims/disputes

# Standards & Specs Overview | *Terminology*

- VDOT Road & Bridge Specifications (“the Spec Book”)
- Supplemental Specifications
  - Revisions to the Specifications Book that have been issued by VDOT on statewide basis and applicable to all projects after certain ad date
- Special Provisions
  - Specific to each project
  - VDOT may have standardized SP’s already available
- Special Provision Copy Notes (SPCNs)
  - Similar to SPs; usually just a few sentences

# Standards & Specs Overview | *Priority Order*

- In the case of a discrepancy, the following order of priority applies:
  - 1) Special Provision Copy Notes (SPCNs)
  - 2) Pay Items and Pay Units
  - 3) Special Provisions
  - 4) Plans
  - 5) Supplemental Specifications
  - 6) Specifications
  - 7) Standard Drawings

# Standards & Specs Overview | *Traffic*

- Traffic standards = Section 1300
  - Signals
  - Signs and markings
  - Lighting
- Traffic Specifications
  - Division VII – signs/markings/signals/lighting
  - Section 512 – MOT
  - Certain Division II Materials Specs
  - Division VIII – ITS (coming soon in new Spec Book)

# Standards & Specs Overview | *Stakeholders*

- Other VDOT Divisions
- Construction Industry
  - Contractors
  - Vendors
  - Suppliers
- Districts/Regions
  - Designers
  - Inspectors
  - Regional Maintenance
- Consultants
- Developers
- Localities
- Design-Build Teams
- FHWA
- Our Customers

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# Signal Poles | *Current Spec Book*

- Pole and mast arm specially designed for each location
  - Designs must be prepared by Contractor's Virginia PE and approved by VDOT
- Pole and mast arm is a single pay item
- Standard pay items for arm lengths in 2' increments (52', 54', etc.)
- No set pole height
- Does not specify design loadings
- Dual arms do not have to be at 90° to each other
  - Avoid having arms at acute angle ( $< 90^\circ$ )

# Signal Poles | *Regional Special Provision*

- Poles and arms are already designed
  - Regional Contractor required to keep certain inventory on hand
- Pole and mast arm are two separate pay items
- Arm length = 30', 40', 50', 60', 65', 70', 75'
- Pole height = 20.5' (19' to arm attachment)
- Sets design loadings based on length of arm
- Dual arms must be at 90° to each other

# Signal Poles | *Regional vs. Spec Book*

- Why use Regional Special Provision?
  - Poles already designed – cuts down on lead time
  - Can be quickly replaced when struck
- Implications for designers
  - Verify that signal heads will be allowable height above pavement
  - Verify no aerial utility conflicts
  - Arm length can only be 30/40/50/60/65/70/75 ft
  - Affects pay items

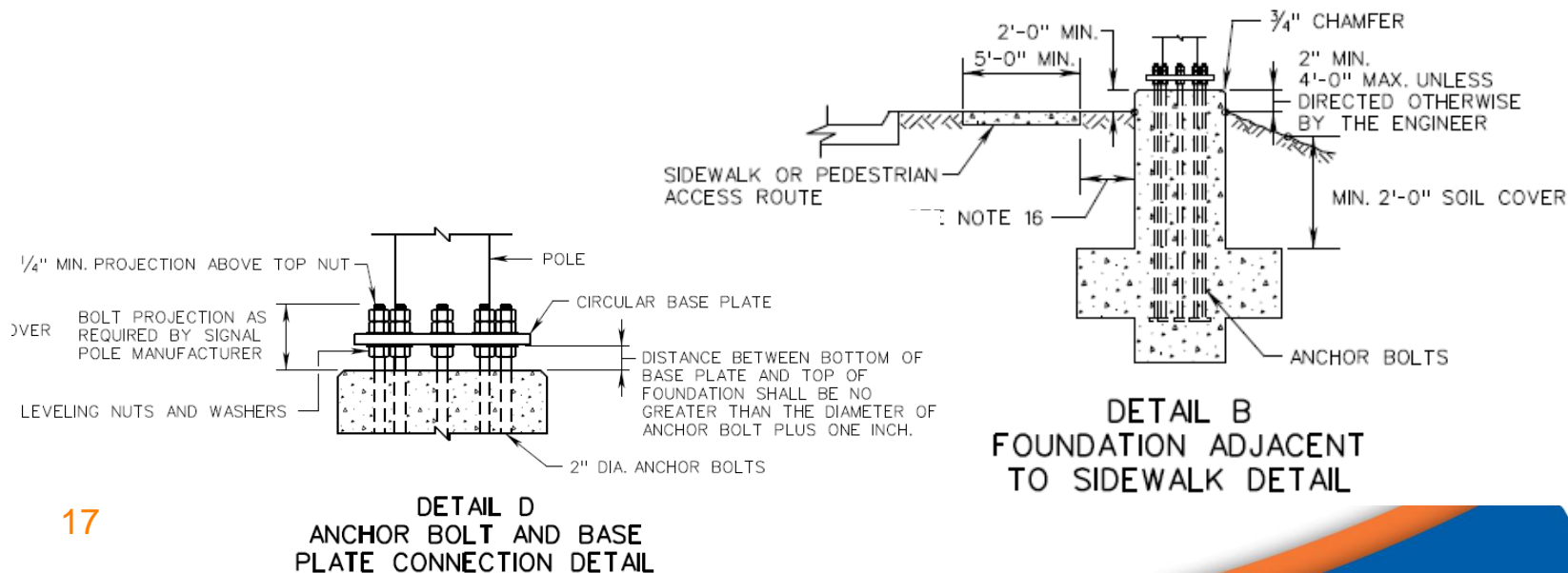


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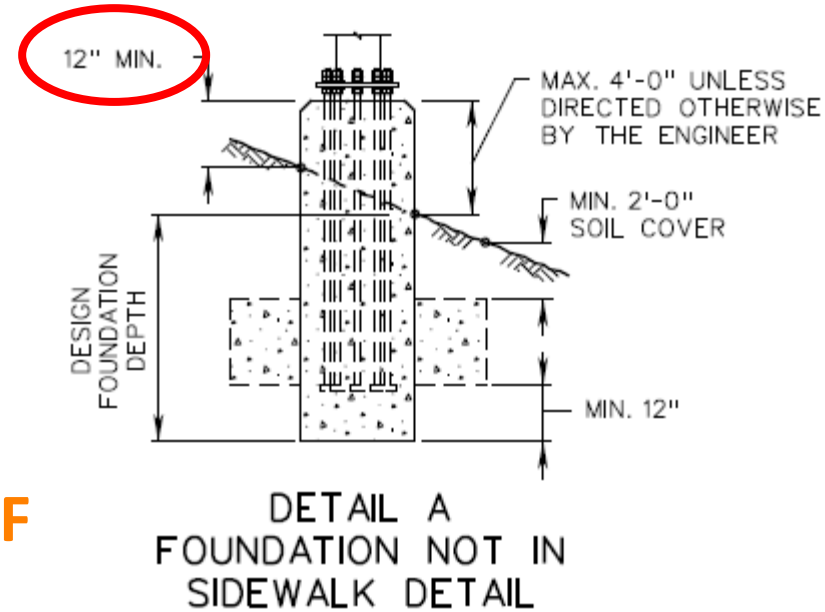
# Signal Pole Foundations

- Current PF-8 Standard (released August 2014)
  - Torsion wings are optional – just one method to achieve torsional resistance
  - Eight (8) 2" anchor bolts required
  - Maintain 5'0" min. sidewalk/pedestrian access route
- PF-1 standard was deleted August 2014



# Signal Pole Foundations (Cont.)

- Current PF-8: 24" min. above grade
- Proposed PF-8 Standard (to be released summer/fall 2015)
  - 12" min. above grade
  - Shall not be placed in center of drainage ditch.
  - May be placed in side of ditch **IF** approved by Engineer.
  - Designers: if foundation **MUST** be placed in side of ditch, consider requiring 24" min. elevation. Do not block drainage flow!!!

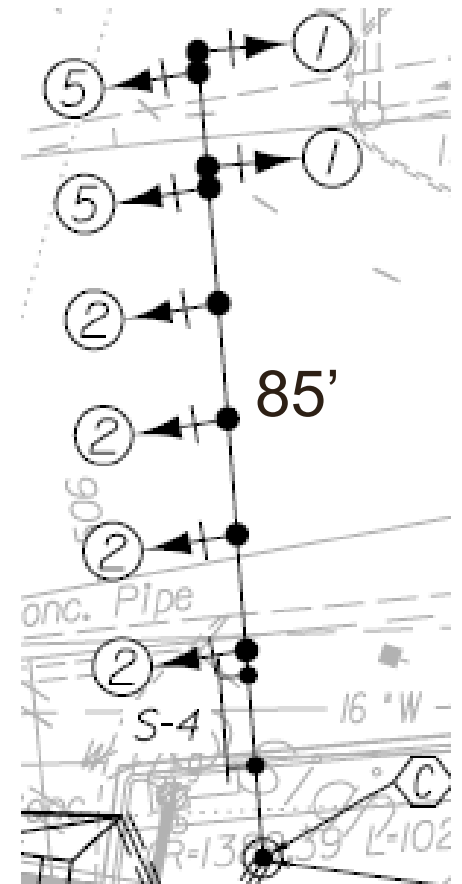


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# Maximum Span Lengths

- TE-375 / IIM-S&B-89 / IIM-LD-250, dated Oct. 2013
- Design Waiver required to exceed span length maximums
  - Single-arm mast arms: 78'
  - Dual-arm mast arms: 70' per single arm; total of both arms = 130'
- Design Waiver to be submitted to TED (Harry Campbell).
- TED recommends approval; CO S&B has ultimate approval authority



# Maximum Span Lengths (Cont.)

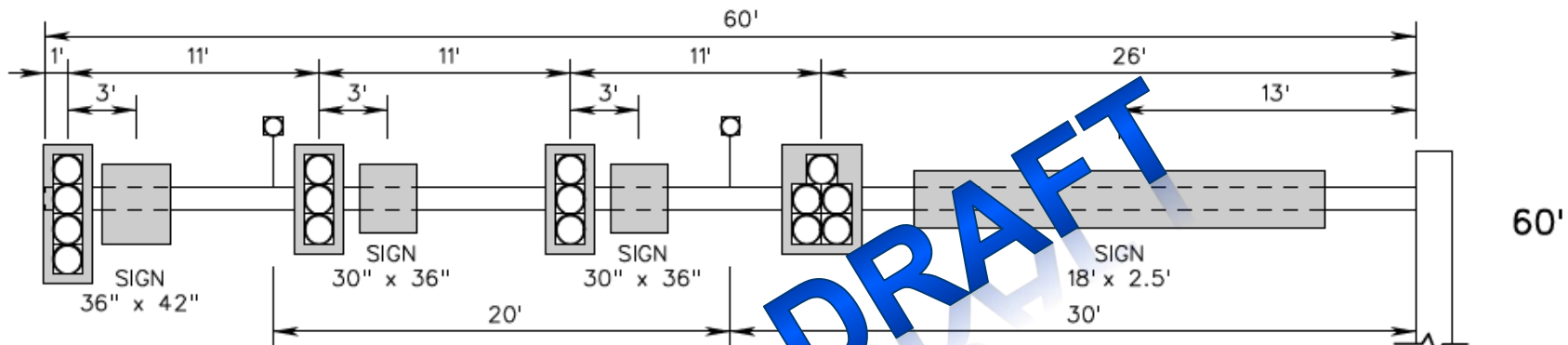
- Design Waiver (Form LD-448) should include the following information:
  - Location and length of proposed structure
  - Justification why shorter structure is not feasible
  - Proposed mitigation
- Example mitigation strategies that TED/S&B Division may require:
  - Higher Fatigue Importance Category
  - Wind loading calculation requirements
- Please be sure that proposed mitigation is written into Contract Documents!

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# Upcoming Changes | Loading Standards

- Graphically lay out loadings that all poles shall be designed for
- Designers will be required to verify that they are not exceeding these standards
- Will not work for dual mast arm structures where arms are not at  $90^\circ$  to each other

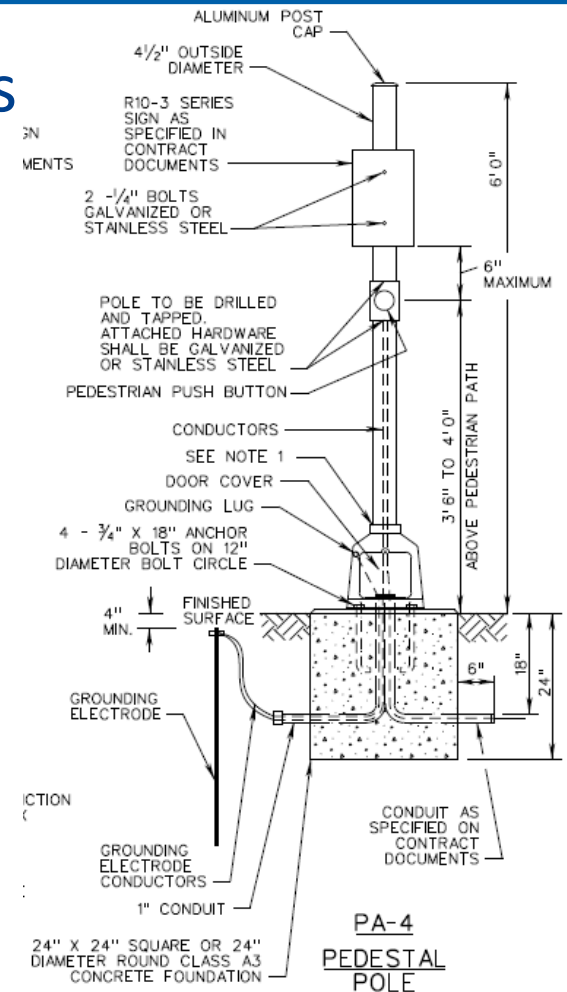


# Upcoming Changes | *Regional Poles*

- Adoption of 2013 AASHTO *Standard Specifications for Structural Supports*
- Different pole types depending on arm length
- Pole length = 19', not 20'
  - Length is being reduced to be consistent with new 2014 requirements that PF-8 foundations be elevated above grade

# Upcoming Changes | Other

- Three new Regional Signal Contracts being advertised this fall (NWRO, SWRO, ERO)
- Structural Design Requirements (IIM-S&B-90.1)
- Updated Signal and Electrical Standards
- Signal & sign bracket requirements

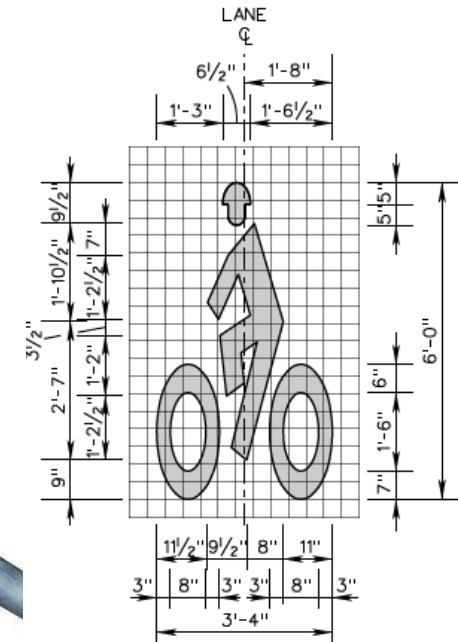
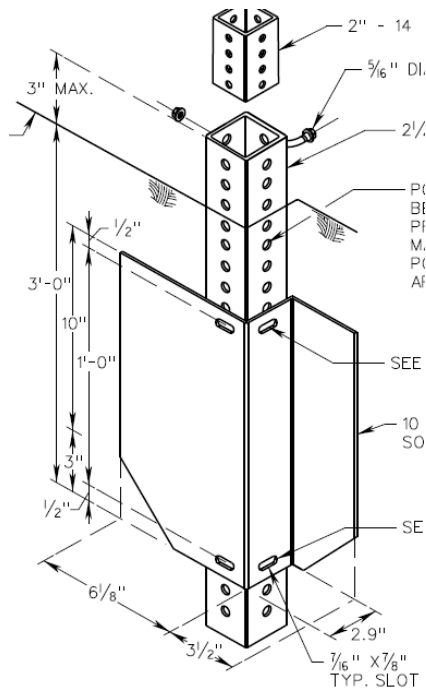


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# Other Issues | Standards & Specs

- STP Standards revised January 2015
- PM Standards revised January 2015
- LED Roadway Luminaire Spec being finalized – expected release summer/fall 2015



# Other Issues | Proprietary Interest Finding

- New process governed by *IIM-CD-2015.01.01* dated April 2015
  - Requires Form C-98a, C-98b, or C-98c
  - For all federal-aid projects
- Required whenever spec/standard explicitly or implicitly requires a proprietary item
  - “can 3 or more products on the market meet this standard/spec?”



# Other Issues | *Proprietary Interest Finding*

- Potential justifications
  - Essential for synchronization
  - No suitable alternative exists
  - Aesthetics
  - Experimental products
- Applies to VDOT Construction projects and locally-administered VDOT projects
- Must be approved by Construction Division prior to advertisement
  - District-wide or locality-wide approvals must be approved by FHWA



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# Getting Notified of Changes

- Construction Division and L&D Division send blast email internally within VDOT
- CD/L&D/TED try to notify major Industry groups – VTCA, VAA, etc.
  - Should other Industry groups be included?
- Designers have responsibility to regularly visit VDOT's website to look for changes
- Contractors have responsibility to thoroughly read and understand Contract Docs
- Next Standards book will likely be a web-only document

# Getting Notified of Changes / Websites

- *2008 Road & Bridge Standards*
  - [www.virginiadot.org/business/locdes/2008\\_road\\_and\\_bridge\\_standards.asp](http://www.virginiadot.org/business/locdes/2008_road_and_bridge_standards.asp)
- *2007 Road & Bridge Specifications*
  - [www.virginiadot.org/business/resources/const/2007SpecBook.pdf](http://www.virginiadot.org/business/resources/const/2007SpecBook.pdf)
- *Supplemental Specifications (Revisions to 2007 R&B Specifications)*
  - [www.virginiadot.org/business/const/spec-default.asp](http://www.virginiadot.org/business/const/spec-default.asp)
- *Virginia Supplement to the MUTCD*
  - [www.virginiadot.org/business/virginia\\_mutcd\\_supplement.asp](http://www.virginiadot.org/business/virginia_mutcd_supplement.asp)



**You've got questions ... I've  
(maybe) got answers!**

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