2019 PLS-CADD Advanced Training and User Group

Update on ASCE and NESC Codes and Standards

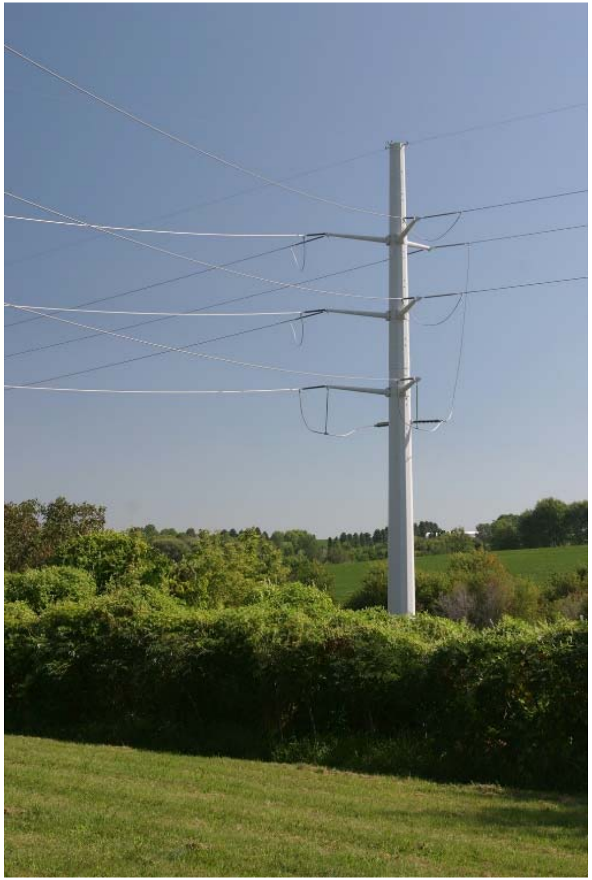
by
Otto J. Lynch, P.E.
Power Line Systems, Inc.

Executive Summary - ASCE

- 2 Standards Committees
  - Directly Under ASCE Structural Engineering Institute (SEI)
- 6 Task Committees
  - Under Electrical Transmission and Substation Structures (ETS) Committee
  - Chair – Ron Carrington
- Triennial ASCE/SEI ETS Conference

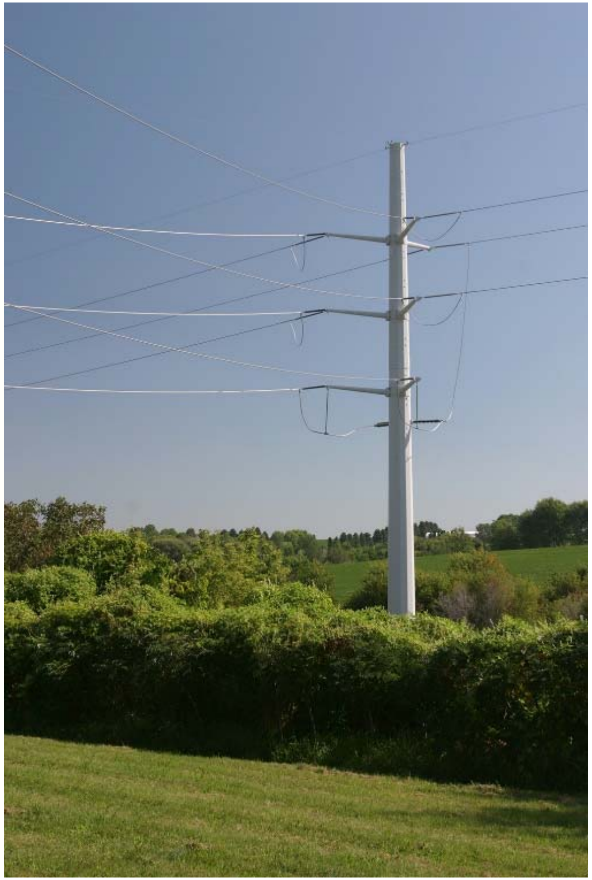
ASCE 48 – Tubular Steel Structures

- Chair - Ken Sharpless
- 3rd Edition (ASCE 48-20)
- Committee Ballots Completed (3)
- Currently in Public Ballot
- Publication in 2020?



ASCE 48 – Tubular Steel Structures

- What to look for:
  - Aesthetic design
  - Expanded Appendix
  - Unloaded member fatigue
  - Shaft to baseplate issues
  - Connections



ASCE 10 – Lattice Steel Structures

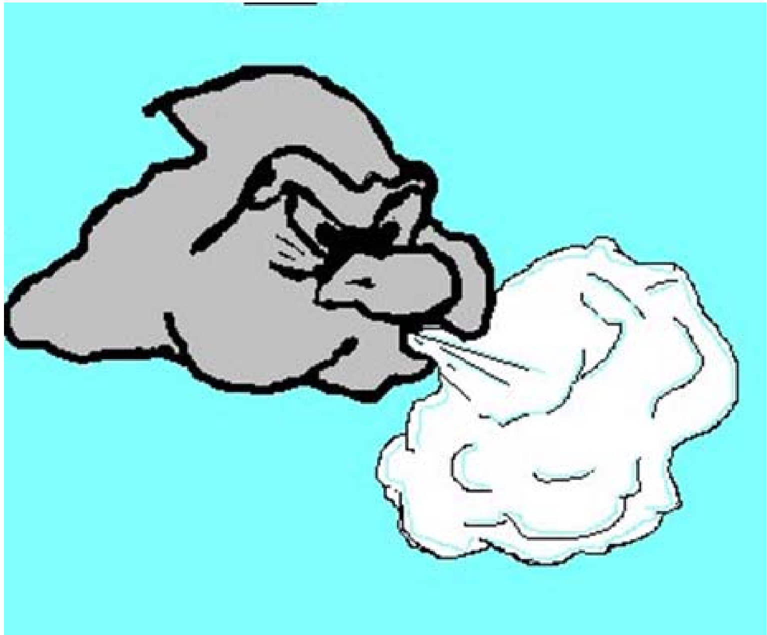
- Chair – Bob Nickerson
- ASCE 10-15 PUBLISHED!!!
  - Order from ASCE Bookstore
  - http://www.asce.org/templates/publications-book-detail.aspx?id=12069
- What to look for:
  - Additional definitions and equations
  - Post angle member splices, welded angles
  - Commentary - Climbing and Fall Protection
  - Appendix C – Guidelines for Existing Towers
    - 12 sections
    - Historical Material Specs
    - Original Compression Curves

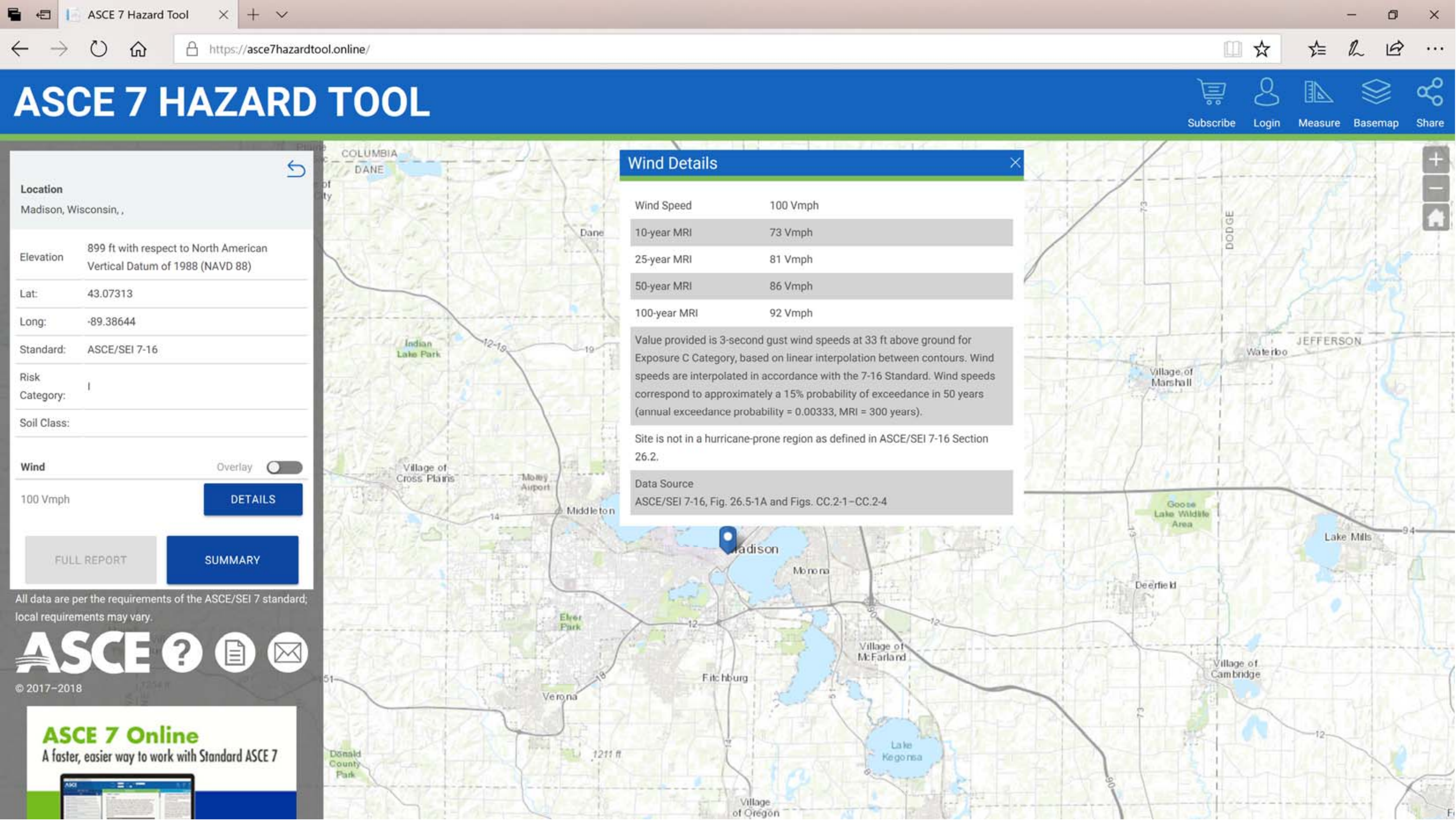
ASCE 10 – Lattice Steel Structures

- 3rd Edition (ASCE 10-20)
  - Committee Meetings Complete
  - Currently in Editorial Review
  - Committee Ballot
  - Public Ballot
  - On Track for Publication
  - 2020?
- 5 Working Groups
- Had over 50 Change Proposals

ASCE 74 – Guidelines for Structure Loadings

- Chair – Frank Agnew
- Blue Ribbon Panel Complete
- Publish target – 2019
- What to look for:
  - Complete rewrite of 3rd Edition
  - Updated wind and ice maps (100 Year)
  - New high-intensity wind numbers
  - New gust-response factors
  - New height adjustment factors
  - Pre-standard appendix




ASCE 7 Hazard Tool
https://asce7hazardtool.online/
ASCE 7 HAZARD TOOL
Subscribe
Login
Measure
Basemap
Share
Location
Madison, Wisconsin, ,
Elevation
899 ft with respect to North American Vertical Datum of 1988 (NAVD 88)
Lat:
43.07313
Long:
-89.38644
Standard:
ASCE/SEI 7-16
Risk Category:
I
Soil Class:
Wind
Overlay
100 Vmph
DETAILS
FULL REPORT
SUMMARY
All data are per the requirements of the ASCE/SEI 7 standard; local requirements may vary.
ASCE
© 2017–2018
ASCE 7 Online
A faster, easier way to work with Standard ASCE 7
Wind Details
Wind Speed 100 Vmph
10-year MRI 73 Vmph
25-year MRI 81 Vmph
50-year MRI 86 Vmph
100-year MRI 92 Vmph
Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-16 Standard. Wind speeds correspond to approximately a 15% probability of exceedance in 50 years (annual exceedance probability = 0.00333, MRI = 300 years).
Site is not in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2.
Data Source
ASCE/SEI 7-16, Fig. 26.5-1A and Figs. CC.2-1–CC.2-4
COLUMBIA
DANE
JEFFERSON
DODGE
Dane
Indian Lake Park
Village of Cross Plains
Middleton
Madison
Monona
Fitchburg
Verona
Village of McFarland
Lake Kegonsa
Village of Oregon
Waterloo
Village of Marshall
Goose Lake Wildlife Area
Lake Mills
Deerfield
Village of Cambridge

ASCE 7 Hazard Tool

https://asce7hazardtool.online/

ASCE 7 HAZARD TOOL

Subscribe Login Measure Basemap Share

Location

Madison, Wisconsin, ,

Elevation	899 ft with respect to North American Vertical Datum of 1988 (NAVD 88)
Lat:	43.07313
Long:	-89.38644
Standard:	ASCE/SEI 7-16
Risk Category:	I
Soil Class:	

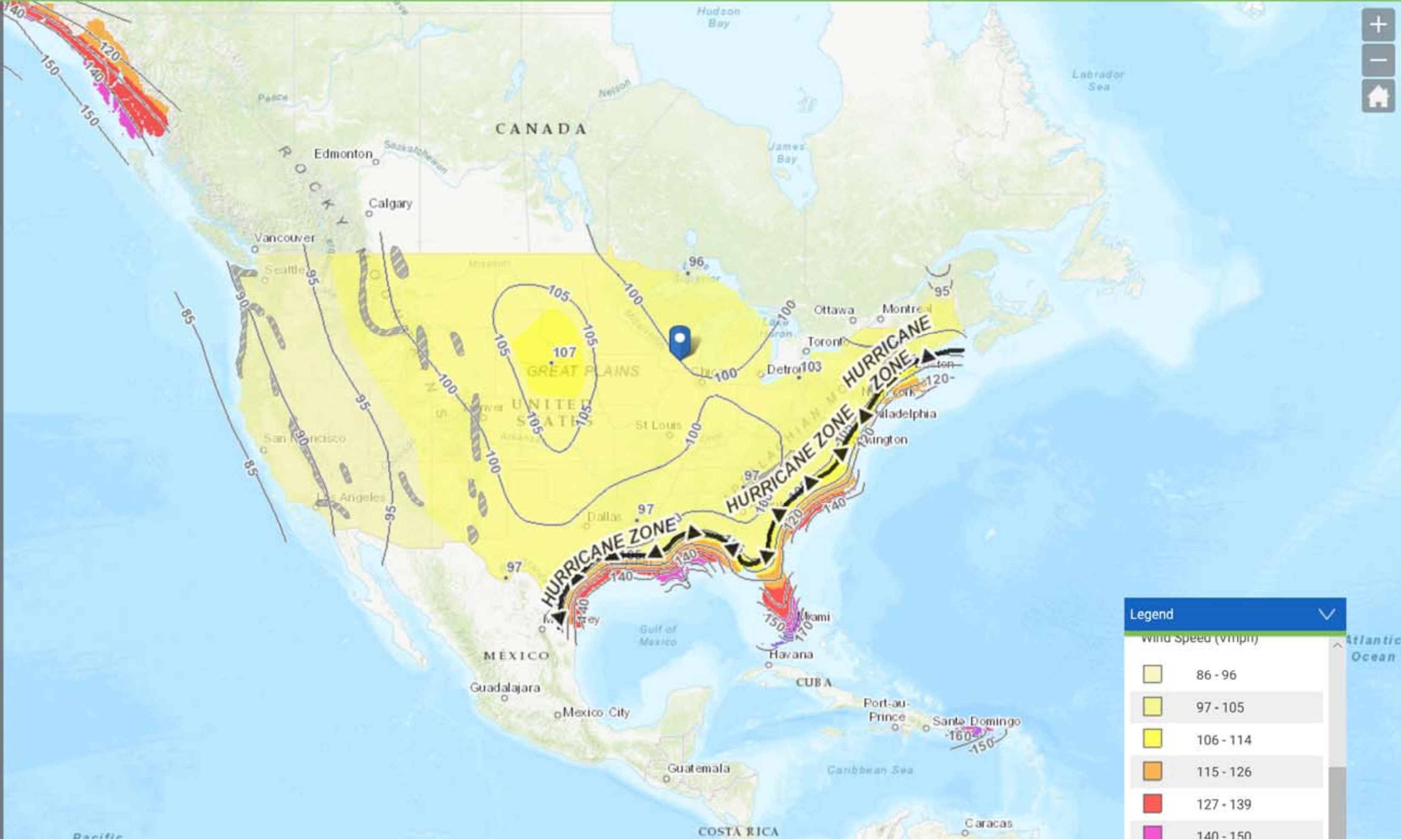
Wind Overlay

100 Vmph DETAILS

FULL REPORT SUMMARY

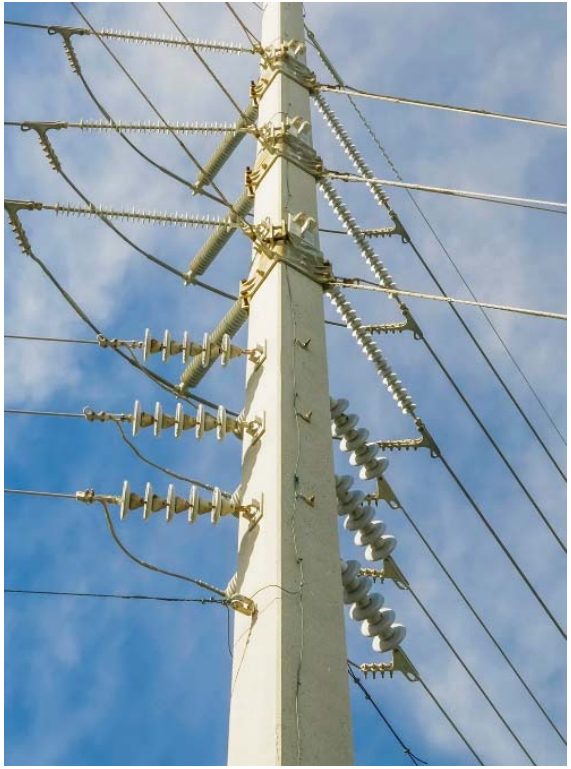
All data are per the requirements of the ASCE/SEI 7 standard; local requirements may vary.

ASCE



ASCE 123 – Concrete Poles

- Co-Chairs – Doug Sherman & Wes Oliphant
- Latest document published 2012.
  - No recent activity.
  - No modifications anticipated.



ASCE 113 – Substation Design

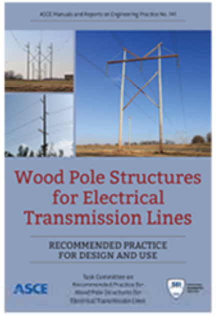
- Chair – George Watson.
- 1st edition released several years ago.
- 2nd revision currently being worked on.
- 2020 Publish Date (?)
- Numerous working groups
- What to look for:
  - Resolution of wind map selection
  - ASCE 7 – 2005 or ASCE 7 – 2010? Or ASCE 7 – 2016.
  - New section on foundation design issues

ASCE 104 FRP (Fiberglass)

- Chair – Galen Fecht
- Blue Ribbon Panel Review Complete
- Approved by ASCE Executive Committee
- In ASCE Publications
- Publication in 2019
- What to look for:
  - Updates to reflect maturing industry
  - Updated design considerations
  - Deflections
  - Foundations
  - Hardware

ASCE 141 - Wood Structures

- Chair – Jim McGuire of Great River Energy
- 1st Edition
- Editorial Review Complete
- Blue Ribbon Panel COMPLETE
- APPROVED by ASCE Executive Committee (8/6/2018)
- ASCE 141
- Available Now!
- https://ascelibrary.org/doi/book/10.1061/9780784415245



Wood Pole Structures for Electrical Transmission Lines: Recommended Practice for Design and Use

ASCE Task Committee on Recommended Practice for Wood Pole Structures for Electrical Transmission Lines; Edited by James M. McGuire, P.E.; Otto J. Lynch, P.E.; Vicki Schneider, P.E.; Jaron T. Reay, P.E., S.E.; Timothy P. Wachholz, P.E., S.E.; Nelson G. Bingel III

MOP 141 | ISBN (print): 9780784415245 | ISBN (PDF): 9780784482056

TOOLS BUY E-BOOK BUY PRINT BOOK

Abstract

Prepared by the Task Committee on Wood Pole Structures for Electrical Transmission Lines of the Committee on Electrical Transmission Structures of the Structural Engineering Institute of ASCE

DETAILS RELATED

ASCE Task Committee on Recommended Practice for Wood Pole Structures for Electrical

Civil Engineering

Prepared by the Task Committee on Wood Pole Structures for Electrical Transmission Lines of the Committee on Electrical Transmission Structures of the Structural Engineering Institute of ASCE.

Wood Pole Structures for Electrical Transmission Lines: Recommended Practice for Design and Use, MOP 141, provides comprehensive knowledge of the principles and methods for the design and use of wood poles for overhead utility line structures. The use of wood pole structures, properly designed utilizing consistent structural engineering principles, may provide a simple, cost effective, and more resilient option than some of the other pole materials commonly used. This manual examines

- Structural configurations and pole applications,
- Critical factors and design considerations specific to wood pole structures,
- Mechanical properties applicable standards and specifications used to manufacture wood poles,
- Wood pole foundations and anchoring,
- Construction of wood pole structures, and
- Inspection and maintenance of wood pole structures and lines.

This Manual of Practice will be valuable to engineers involved in utility and structural engineering.

MOP 141 provides a vital overview on the design and use of wood poles for overhead utility line structures using sound engineering practices.

ISBN 978-0-7844-1524-5
9 780784 415245

ASCE AMERICAN SOCIETY OF CIVIL ENGINEERS

MOP 141

Wood Pole Structures for Electrical Transmission Lines

ASCE

ASCE Manuals and Reports on Engineering Practice No. 141

Wood Pole Structures for Electrical Transmission Lines

RECOMMENDED PRACTICE FOR DESIGN AND USE

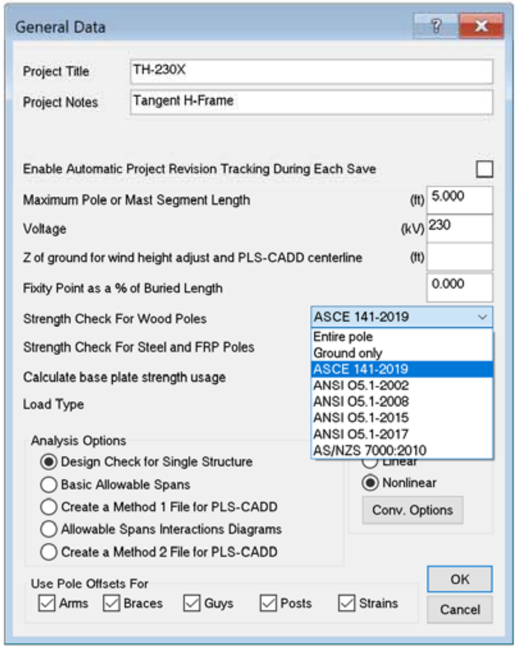
ASCE

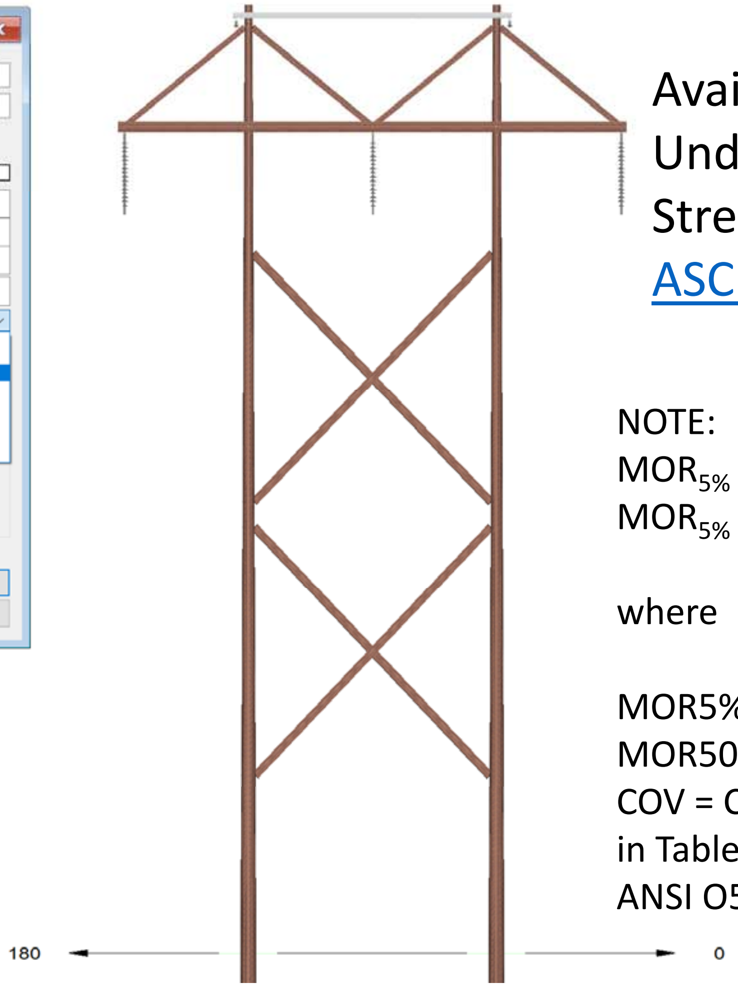
Task Committee on Recommended Practice for Wood Pole Structures for Electrical Transmission Lines

SEI STRUCTURAL ENGINEERING INSTITUTE

ASCE Wood Structures

- What to look for:
  - Preface
  - Definitions
  - 1 - Structural Configurations and Pole Applications
  - 2 - Initial Considerations
  - 3 - Materials
  - 4 - Design
  - 5 - Connections
  - 6 - Foundations
  - 7 - Manufacturing and Quality Assurance
  - 8 - Assembly and Erection
  - 9 - Inspection, Maintenance and Repair
  - Appendix A – Resiliency of Wood Pole Overhead Lines
  - Appendix B – Examples – Wood Pole Design
  - Appendix C – Laminated Wood Poles
  - Appendix D – Quality and Strength Assessment Tools and Devices
  - Appendix E – Examples – Foundations
  - Glossary
  - Notation
  - Bibliography (References)





Available Now in PLS-POLE Under General/General Data Strength Check For Wood Poles [ASCE 141]

NOTE:

$MOR_{5\%} = MOR_{50\%} (1 - 1.645 \times COV)$

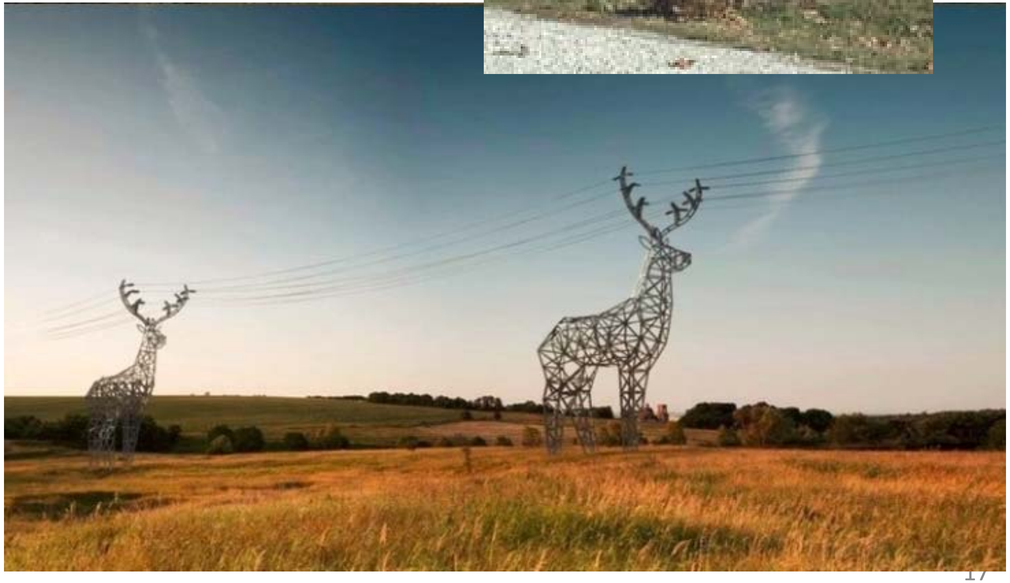
$MOR_{5\%} = MOR_{50\%} * 0.671$

where

MOR5% = 5% lower exclusion limit,
MOR50% = 50% lower exclusion limit, and
COV = Coefficient of variation as designated in Table 1, footnote 4 of ANSI O5.1.

ASCE Aesthetic Structures

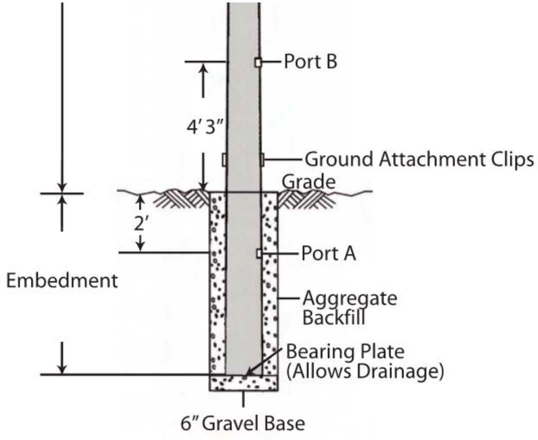
- Chair – Mike Khavari
- White Paper
  - Guidelines to Consider
- Publish in 2019



ASCE Foundations – New Committee

- Chair – Vicki Schnieder
  - Mortenson Engineering Services, Inc.
  - direct 763.287.5758 | mobile 701.212.6736
  - vicki.schneider@mortenson.com
- Committee Forming Soon
- Send email to Vicki (or Otto) if Interested

Figure 6-2. Direct embedded pole.

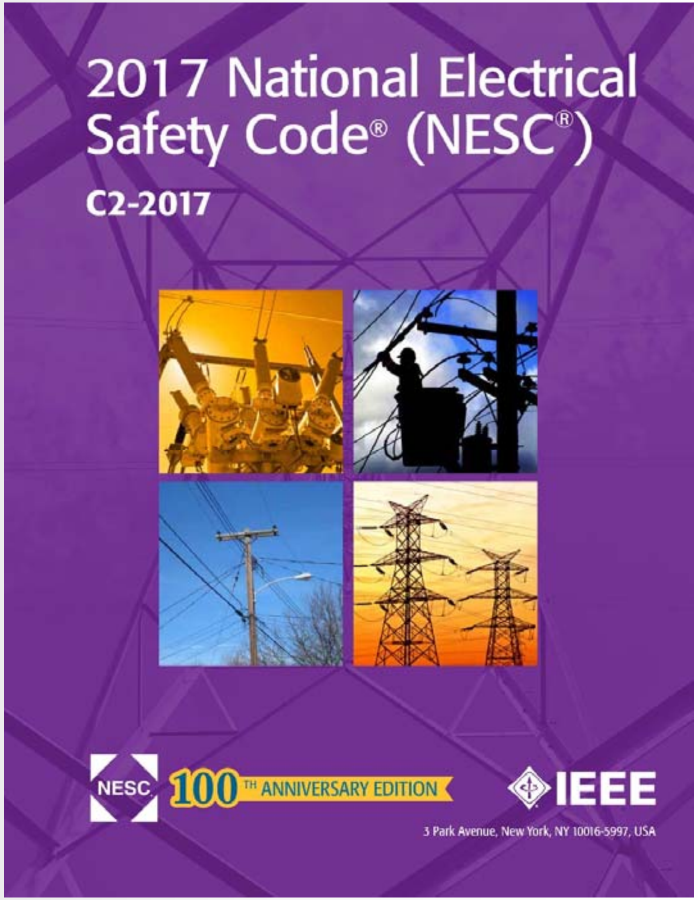


ASCE Electrical Transmission and Substations Conference

- 2018 Conference – Atlanta, GA
  - Over 1600 Attendees!
- 2021 Conference – Orlando, FL, Spetember 19th – 23rd, 2021
- Chair – Tim Cashman
- Accepting Abstracts Later This Year or Early 2020
- Booths
- Sponsorships
- www.etsconference.org

National Electrical Safety Code (NESC)

- 2017 Edition Published
  - No Significant Changes to Structural
  - 261H1c – Limiting Cable Tensions
  - 35% at initial tension without external loading
  - 25% at final tension without external loading
  - NOTE 1: Initial tension in this application is a conductor condition that exists immediately after installation. This condition exists before inelastic elongation, creep or stress relaxation occurs and before the conductor is subjected to external loads.
  - NOTE 2: Final tension in this application is intended to be the tension that exists after long term creep and prior to ice or wind loading.



National Electrical Safety Code (NESC)

- 2022 Next Edition
- Preprint Available July 1st, 2019
- http://standards.ieee.org/about/nesc

NESC 2022 Edition Revision Schedule IEEE

16 July 2018	Final date to receive change proposals from the public for revision of the 2017 Edition of the NESC, preparatory to the publication of a 2022 Edition.
September–October 2018	NESC Subcommittees consider change proposals to the NESC and prepare their recommendations.
1 July 2019	Preprint of the change proposals for incorporation into the 2022 Edition of the NESC published for distribution to the NESC Committee and other interested parties. This opens the comment period, by interested parties, on the submitted change proposals and the subcommittee recommendations.
1 March 2020	The final date to submit comments on the submitted change proposal and the subcommittee recommendations. All comments and recommendations on these proposals are due to the Secretary, NESC Committee.
September–October 2020	Period for NESC Subcommittee Working Groups and NESC Subcommittees to reconsider all recommendations concerning the proposed amendments and prepare final report.
15 January 2021	Proposed revision of the NESC, Accredited Standards Committee C2, submitted to NESC Committee for letter ballot and to ANSI for concurrent public review.
15 May 2021	NESC Committee approved revisions of the NESC submitted to ANSI for recognition as an ANSI standard.
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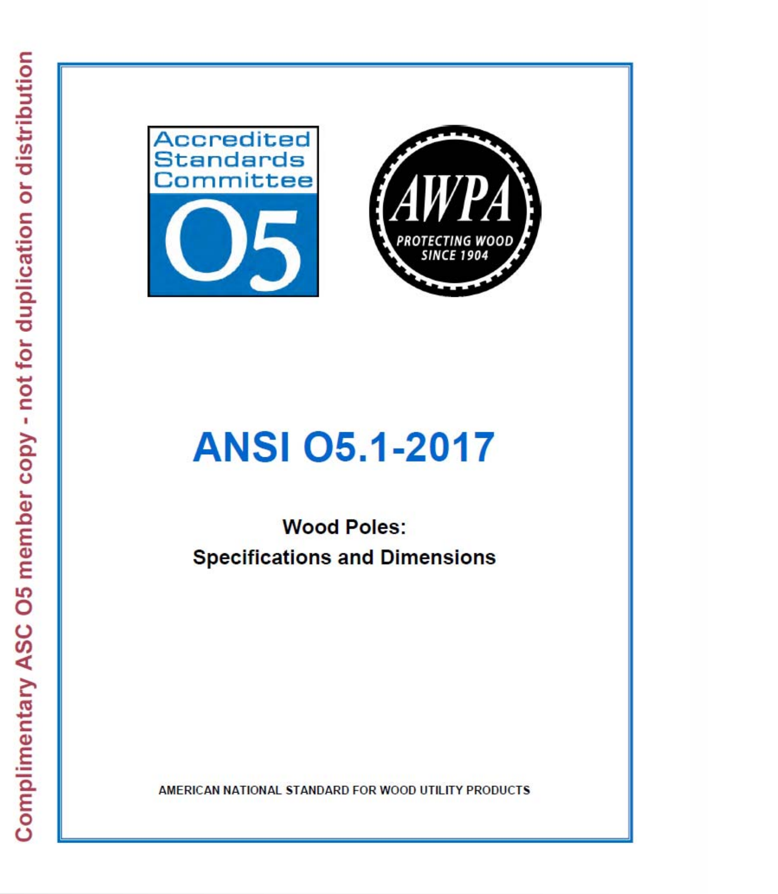
ANSI O5.1

- 2017 Edition Published
- Table 1 – Adds MOE
- Different from REA 1724E-200 MOE
  - Values usually larger so poles will show less deflection and therefore lower stresses when using nonlinear anlaysis



ANSI O5.1

RUS 1724E-200 Values → 2017 ANSI O5.1 Values

Wood Material Properties (From file "c:\users\public\documents\pls\pls_pole\examples\rus structur

ANSI O5.1.2008 - American National Standard for Wood Poles and Wood Products
Wood Poles - Specifications and Dimensions
Code Letters used are per Section 7.5, Page 12
Fiber Strengths used are per Table 1, Page 14, and coincide with the fiber strength of those materials listed in REA Bulletin 1728F-700, 1993, REA Specification for Wood Poles, Stubs and Anchor Logs (Table 1, Page 35). RUS does not provide properties for Scots Pine and Interior North

	Material Label	Modulus of Elasticity (ksi)	Design Stress MOR (ksi)	Weight Density (lbs/ft^3)	ANSI O5.1 Status	Allowable Shear Stress (ksi)	All Co S
1	SP-Southern Pine	1800	8	60	Included	NA	
2	DF-Douglas Fir	1920	8	60	Included	NA	
3	JP-Jack Pine	1220	6.6	60	Not Included	NA	
4	LP-Lodgepole Pine	1340	6.6	60	Not Included	NA	
5	NP-Red Pine	1800	6.6	60	Not Included	NA	
6	WP-Ponderosa Pine	1260	6	60	Not Included	NA	
7	WC-Western Red Cedar	1120	6	50	Included	NA	

Save | Save As | Merge | Report | Cancel

Wood Material Properties (From file "c:\users\otto\documents\standards\asce\wood structure mo

ANSI O5.1.2017 - American National Standard for Wood Poles and Wood Products
Wood Poles - Specifications and Dimensions
Code Letters used are per Section 7.5, Page 12
Fiber Strengths (MOR) and Moduluses of Elasticity (MOE) used are per Table 1, Page 14

	Material Label	Modulus of Elasticity (ksi)	Design Stress MOR (ksi)	Weight Density (lbs/ft^3)	ANSI O5.1 Status	Allowable Shear Stress (ksi)	All Co S
1	SP-Southern Pine	2130	8	60	Included	NA	
2	DF-Douglas Fir	2380	8	60	Included	NA	
3	JP-Jack Pine	1220	6.6	60	Not Included	NA	
4	LP-Lodgepole Pine	1660	6.6	60	Not Included	NA	
5	NP-Red Pine	1470	6.6	60	Not Included	NA	
6	WP-Ponderosa Pine	1260	6	60	Not Included	NA	
7	WC-Western Red Cedar	1430	6	50	Included	NA	

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Any Questions About ASCE / NESC / ANSI O5?

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