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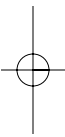
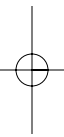
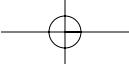
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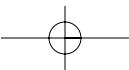
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The following Standards have been issued:

- ANSI/ASCE 1-82 N-725 Guideline for Design and Analysis of Nuclear Safety Related Earth Structures
- ANSI/ASCE 2-91 Measurement of Oxygen Transfer in Clean Water
- ANSI/ASCE 3-91 Standard for the Structural Design of Composite Slabs and ANSI/ASCE 9-91 Standard Practice for the Construction and Inspection of Composite Slabs
- ASCE 4-98 Seismic Analysis of Safety-Related Nuclear Structures
- Building Code Requirements for Masonry Structures (ACI 530-02/ASCE 5-02/TMS 402-02) and Specifications for Masonry Structures (ACI 530.1-02/ASCE 6-02/TMS 602-02)
- ASCE/SEI 7-05 Minimum Design Loads for Buildings and Other Structures
- ANSI/ASCE 8-90 Standard Specification for the Design of Cold-Formed Stainless Steel Structural Members
- ANSI/ASCE 9-91 listed with ASCE 3-91
- ASCE 10-97 Design of Latticed Steel Transmission Structures
- SEI/ASCE 11-99 Guideline for Structural Condition Assessment of Existing Buildings
- ASCE 12-05 Guidelines for the Design of Urban Subsurface Drainage
- ASCE 13-05 Standard Guidelines for Installation of Urban Subsurface Drainage
- ASCE 14-05 Standard Guidelines for Operation and Maintenance of Urban Subsurface Drainage
- ASCE 15-98 Standard Practice for Direct Design of Buried Precast Concrete Pipe Using Standard Installation (SIDD)
- ASCE 16-95 Standard for Load Resistance Factor Design (LRFD) of Engineered Wood Construction
- ASCE 17-96 Air-Supported Structures
- ASCE 18-96 Standard Guidelines for In-Process Oxygen Transfer Testing
- ASCE 19-96 Structural Applications of Steel Cables for Buildings
- ASCE 20-96 Standard Guidelines for the Design and Installation of Pile Foundations
- ASCE 21-96 Automated People Mover Standards—Part 1
- ASCE 21-98 Automated People Mover Standards—Part 2
- ASCE 21-00 Automated People Mover Standards—Part 3
- SEI/ASCE 23-97 Specification for Structural Steel Beams with Web Openings
- ASCE/SEI 24-05 Flood Resistant Design and Construction
- ASCE 25-97 Earthquake-Actuated Automatic Gas Shut-Off Devices
- ASCE 26-97 Standard Practice for Design of Buried Precast Concrete Box Sections
- ASCE 27-00 Standard Practice for Direct Design of Buried Precast Concrete Pipe for Jacking in Trenchless Construction
- ASCE 28-00 Standard Practice for Direct Design of Precast Concrete Box Sections for Jacking in Trenchless Construction
- SEI/ASCE/SFPE 29-99 Standard Calculation Methods for Structural Fire Protection
- SEI/ASCE 30-00 Guideline for Condition Assessment of the Building Envelope
- SEI/ASCE 31-03 Seismic Evaluation of Existing Buildings
- SEI/ASCE 32-01 Design and Construction of Frost-Protected Shallow Foundations
- EWRI/ASCE 33-01 Comprehensive Transboundary International Water Quality Management Agreement
- EWRI/ASCE 34-01 Standard Guidelines for Artificial Recharge of Ground Water
- EWRI/ASCE 35-01 Guidelines for Quality Assurance of Installed Fine-Pore Aeration Equipment
- CI/ASCE 36-01 Standard Construction Guidelines for Microtunneling
- SEI/ASCE 37-02 Design Loads on Structures During Construction
- CI/ASCE 38-02 Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data
- EWRI/ASCE 39-03 Standard Practice for the Design and Operation of Hail Suppression Projects
- ASCE/EWRI 40-03 Regulated Riparian Model Water Code
- ASCE/EWRI 42-04 Standard Practice for the Design and Operation of Precipitation Enhancement Projects
- ASCE/SEI 43-05 Seismic Design Criteria for Structures, Systems, and Components in Nuclear Facilities
- ASCE/EWRI 44-05 Standard Practice for the Design and Operation of Supercooled Fog Dispersion Projects
- ASCE/EWRI 45-05 Standard Guidelines for the Design of Urban Stormwater Systems
- ASCE/EWRI 46-05 Standard Guidelines for the Installation of Urban Stormwater Systems
- ASCE/EWRI 47-05 Standard Guidelines for the Operation and Maintenance of Urban Stormwater Systems
- ASCE/SEI 48-05 Design of Steel Transmission Pole Structures



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CONTENTS

Foreword	xiii
Acknowledgements	xiv
1.0 SCOPE	1
2.0 APPLICABLE DOCUMENTS	1
3.0 DEFINITIONS	2
4.0 LOADING, GEOMETRY, AND ANALYSIS	3
4.1 INTRODUCTION	3
4.2 LOADING	3
4.2.1 Factored Design Loads	3
4.2.2 Loading Considerations	3
4.2.3 Load Expression	3
4.3 GEOMETRIC CONFIGURATIONS	3
4.3.1 Configuration Considerations	3
4.3.2 Structure Types	3
4.4 METHODS OF ANALYSIS	4
4.4.1 Structural Analysis Methods	4
4.4.2 Analysis of Connections	4
4.5 ADDITIONAL CONSIDERATIONS	4
4.5.1 Structural Support	4
4.5.2 Design Restrictions	4
4.5.3 Climbing and Maintenance Provisions	4
5.0 DESIGN OF MEMBERS	4
5.1 INTRODUCTION	4
5.2 MEMBERS	4
5.2.1 Materials	4
5.2.1.1 Specifications	4
5.2.1.2 Material Properties	4
5.2.1.3 Energy-impact Properties	4
5.2.2 Tension	5
5.2.3 Compression	5
5.2.3.1 Truss Members	5
5.2.3.2 Beam Members	5
5.2.4 Shear	7
5.2.5 Bending	7
5.2.6 Combined Stresses	7
5.3 GUYS	7
5.3.1 Material Properties	7
5.3.2 Tension	7
5.4 TEST VERIFICATION	8
6.0 DESIGN OF CONNECTIONS	8
6.1 INTRODUCTION	8

6.2	BOLTED AND PINNED CONNECTIONS	8
6.2.1	Materials	8
6.2.2	Shear Stress in Bearing Connections	8
6.2.3	Bolts Subject to Tension	8
6.2.4	Bolts Subject to Combined Shear and Tension	9
6.2.5	Bearing Stress in Bolted Connections	9
6.2.6	Minimum Edge Distances and Bolt Spacing for Bolted Connections	9
6.2.7	Bearing Stress in Pinned Connections	9
6.2.8	Minimum Edge Distances for Pinned Connections	9
6.3	WELDED CONNECTIONS	10
6.3.1	Material Properties	10
6.3.2	Effective Area	11
6.3.3	Design Stresses	11
6.3.3.1	Through-Thickness Stress	11
6.3.4	Circumferential Welded Splices	12
6.3.5	Flange and Base Plate to Pole Shaft Welds	12
6.3.6	T-joints	12
6.4	FIELD CONNECTIONS OF MEMBERS	12
6.4.1	Slip Joints	12
6.4.2	Base and Flange Plate Connections	12
6.5	TEST VERIFICATION	12
7.0	DETAILING AND FABRICATION	12
7.1	DETAILING	12
7.1.1	Drawings	12
7.1.2	Drawing Review	12
7.1.3	Erection Drawings	13
7.1.4	Shop Detail Drawings	13
7.1.4.1	Material	13
7.1.4.2	Dimensions and Clearances	13
7.1.4.3	Welding	13
7.1.4.4	Corrosion and Finish Considerations	13
7.1.4.5	Other Requirements	13
7.2	FABRICATION	13
7.2.1	Material	13
7.2.2	Material Preparation	13
7.2.2.1	Cutting	13
7.2.2.2	Forming	13
7.2.2.3	Holes	14
7.2.2.4	Identification	14
7.2.3	Welding	14
8.0	TESTING	14
8.1	INTRODUCTION	14
8.2	FOUNDATIONS	14
8.3	MATERIAL	14
8.4	FABRICATION	14
8.5	STRAIN MEASUREMENTS	14
8.6	ASSEMBLY AND ERECTION	14

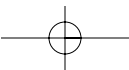
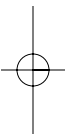
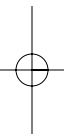
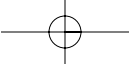
8.7	TEST LOADS	14
8.8	LOAD APPLICATION	14
8.9	LOADING PROCEDURE	14
8.10	LOAD MEASUREMENT	14
8.11	DEFLECTIONS	15
8.12	FAILURES	15
8.13	POSTTEST INSPECTION	15
8.14	DISPOSITION OF PROTOTYPE	15
8.15	REPORT	15
9.0	STRUCTURAL MEMBERS AND CONNECTIONS USED IN FOUNDATIONS	15
9.1	INTRODUCTION	15
9.2	GENERAL CONSIDERATIONS	15
9.3	ANCHOR BOLTS	15
9.3.1	Bolts Subject to Tension	15
9.3.2	Shear Stress	16
9.3.3	Combined Shear and Tension	16
9.3.4	Development Length	16
9.4	DIRECT-EMBEDDED POLES	17
9.5	EMBEDDED CASINGS	17
9.6	TEST VERIFICATION	17
10.0	QUALITY ASSURANCE/QUALITY CONTROL	17
10.1	INTRODUCTION	17
10.2	QUALITY ASSURANCE	17
10.2.1	Design and Drawing	17
10.2.2	Materials	17
10.2.3	Welding	17
10.2.4	Nondestructive Testing	17
10.2.5	Tolerances	17
10.2.6	Surface Coatings	17
10.2.7	Shipping	18
10.3	QUALITY CONTROL	18
10.3.1	Materials	18
10.3.2	Visual Inspection	18
10.3.3	Dimensional Inspection	18
10.3.4	Surface Coating Inspection	18
10.3.5	Weld Inspection	18
10.3.6	Shipment and Storage	18
11.0	ASSEMBLY AND ERECTION	18
11.1	INTRODUCTION	18
11.2	HANDLING	18
11.3	SINGLE POLE STRUCTURES	19
11.3.1	Slip Joints	19

11.3.2	Bolted Flange Joints	19
11.3.3	Attachments to Pole Sections	19
11.3.4	Erection of Assembled Structures	19
11.4	FRAME TYPE STRUCTURES	19
11.4.1	Slip Joints in Frames	19
11.4.2	Erection	19
11.4.3	Bolted Frame Connections	19
11.5	INSTALLATION ON FOUNDATION	19
11.5.1	Anchor Bolt and Base Plate Installation	19
11.5.2	Direct-Embedded Poles	19
11.6	GUYING	19
11.6.1	Guy Anchor Location	19
11.6.2	Guy Installation	20
11.7	POSTERECTION PROCEDURES	20
11.7.1	Inspection	20
11.7.2	Grounding	20
11.7.3	Coating Repair	20
11.7.4	Unloaded Arms	20
11.7.5	Hardware Installation	20
Commentary		
C4.0	LOADING, GEOMETRY, AND ANALYSIS	21
C4.2	LOADING	21
C4.2.1	Factored Design Loads	21
C4.2.2	Loading Considerations	21
C4.2.3	Load Expression	21
C4.3	GEOMETRIC CONFIGURATIONS	22
C4.3.1	Configuration Considerations	22
C4.3.2	Structure Types	22
C4.4	METHODS OF ANALYSIS	22
C4.4.1	Structural Analysis Methods	22
C4.5	ADDITIONAL CONSIDERATIONS	23
C4.5.1	Structural Support	23
C4.5.2	Design Restrictions	23
C4.5.3	Painting and Maintenance Provisions	24
C5.0	DESIGN OF MEMBERS	24
C5.1	INTRODUCTION	24
C5.2	MEMBERS	24
C5.2.1	Materials	24
C5.2.1.1	Specifications	24
C5.2.1.2	Material Properties	24
C5.2.1.3	Energy-Impact Properties	24
C5.2.2	Tension	25
C5.2.3	Compression	25
C5.2.3.1	Truss Members	25
C5.2.3.2	Beam Members	25
C5.2.4	Shear	29
C5.2.5	Bending	29

C5.2.6	Combined Stresses	29
C5.3	GUYS	29
C5.3.1	Material Properties	29
C5.3.2	Tension	29
REFERENCES	29
C6.0	DESIGN OF CONNECTIONS	30
C6.1	INTRODUCTION	30
C6.2	BOLTED AND PINNED CONNECTIONS	30
C6.2.1	Materials	30
C6.2.2	Shear Stress in Bearing Connections	30
C6.2.3	Bolts Subject to Tension	30
C6.2.6	Minimum Edge Distances and Bolt Spacing for Bolted Connections	30
C6.2.7	Bearing Stress in Pinned Connections	31
C6.2.8	Minimum Edge Distances for Pinned Connections	31
C6.3	WELDED CONNECTIONS	31
C6.3.3	Design Stresses	31
C6.3.3.1	Through-Thickness Stress	31
C6.4	FIELD CONNECTIONS OF MEMBERS	31
C6.4.1	Slip Joints	31
C6.4.2	Base and Flange Plate Connections	32
C6.5	TEST VERIFICATION	32
REFERENCE	32
C7.0	DETAILING AND FABRICATION	32
C7.1	DETAILING	32
C7.1.1	Drawings	32
C7.1.2	Drawing Review	32
C7.1.3	Erection Drawings	32
C7.1.4	Shop Detail Drawings	32
C7.1.4.2	Dimensions and Tolerances	32
C7.1.4.4	Corrosion and Finish Considerations	33
C7.1.4.5	Other Requirements	33
C7.2	FABRICATION	33
C7.2.1	Material	33
C7.2.2	Material Preparation	33
C7.2.2.1	Cutting	33
C7.2.2.2	Forming	33
C7.2.2.3	Holes	34
C7.2.2.4	Identification	34
C7.2.3	Welding	34
C8.0	TESTING	34
C8.1	INTRODUCTION	34
C8.2	FOUNDATIONS	34
C8.3	MATERIAL	35
C8.4	FABRICATION	35
C8.5	STRAIN MEASUREMENTS	35

C8.6	ASSEMBLY AND ERECTION	35
C8.7	TEST LOADS	35
C8.8	LOAD APPLICATION	35
C8.9	LOADING PROCEDURE	35
C8.10	LOAD MEASUREMENT	36
C8.11	DEFLECTIONS	36
C8.12	FAILURES	36
C8.13	POSTTEST INSPECTION	36
C8.14	DISPOSITION OF PROTOTYPE	36
C8.15	REPORT	36
C9.0	STRUCTURAL MEMBERS AND CONNECTIONS USED IN FOUNDATIONS	37
C9.1	INTRODUCTION	37
C9.2	GENERAL CONSIDERATIONS	38
C9.3	ANCHOR BOLTS	38
C9.3.1	Bolts Subject to Tension	38
C9.3.2	Shear Stress	38
C9.3.3	Combined Shear and Tension	38
C9.3.4	Development Length	39
C9.4	DIRECT-EMBEDDED POLES	39
C9.5	EMBEDDED CASINGS	39
C10.0	QUALITY ASSURANCE/QUALITY CONTROL	39
C10.1	INTRODUCTION	39
C10.2	QUALITY ASSURANCE	39
C10.2.1	Design and Drawings	40
C10.2.4	Nondestructive Testing	40
C10.2.5	Tolerances	40
C10.2.6	Surface Coatings	40
C10.2.7	Shipping	40
C10.3	QUALITY CONTROL	40
C10.3.1	Materials	40
C10.3.3	Dimensional Inspection	40
C10.3.4	Surface Coating Inspection	40
C10.3.5	Weld Inspection	40
C10.3.6	Shipment and Storage	41
C11.0	ASSEMBLY AND ERECTION	41
C11.1	INTRODUCTION	41
C11.2	HANDLING	41
C11.3	SINGLE POLE STRUCTURES	41
C11.3.1	Slip Joints	42
C11.3.2	Bolted Flange Joints	42
C11.3.3	Attachments to Pole Sections	42
C11.3.4	Erections of Assembled Structures	42

C11.4	FRAME TYPE STRUCTURES	42
C11.4.1	Slip Joints in Frames	43
C11.4.2	Erection	43
C11.5	INSTALLATION ON FOUNDATION	43
C11.5.1	Anchor Bolt and Base Plate Installation	43
C11.5.2	Direct-Embedded Poles	43
C11.6	GUYING	43
C11.6.1	Guy Anchor Location	43
C11.6.2	Guy Installation	44
C11.7	POSTERECTION PROCEDURES	44
C11.7.1	Inspection	44
C11.7.2	Grounding	44
C11.7.3	Coating Repair	44
C11.7.4	Unloaded Arms	44
C11.7.5	Hardware Installation	44
APPENDIX I	NOTATION	45
APPENDIX II	PROPERTIES OF VARIOUS TUBULAR SECTIONS	46
APPENDIX III	HORIZONTAL TESTING	48
Test Equipment		48
Test Procedure for Pole Test		48
APPENDIX IV	HEADED ANCHOR BOLTS	48
Headed Bolts Development Length		48
Background		48
APPENDIX V	ASSEMBLY AND ERECTION	49
Introduction		49
Helicopter Erection		49
In-Service Structure Maintenance and Inspection		49
Wind-Induced Vibration		49
APPENDIX VI	SHAFT-TO-FOUNDATION CONNECTION	50
Base Plates Analysis Considerations		50
Calculation of Anchor Bolt Load		50
INDEX		53



FOREWORD

The Engineering Manual and Report on Engineering Practice No. 72 titled “Design of Steel Transmission Pole Structures” has been used by electric transmission design professionals since 1973. The purpose of the design guide was to provide a uniform basis for the design, fabrication, testing, assembling, and erecting of steel transmission pole structures. Because many changes continue to take place in the steel pole industry, in 1989 it was proposed that ASCE form a committee to develop a standard. The proposal was approved, and the committee was organized in 1991. The second edition of Manual 72 served as the primary resource document for the development of this standard. The previous work of the ASCE task committee on Manual 72 is greatly appreciated.

This standard includes commentary and appendices that are furnished as supplemental information. The commentary and appendices are *not* mandatory.

This standard has been prepared in accordance with recognized engineering principles and should not be used without the user’s competent knowledge for a given application. The publication of this standard by ASCE is not intended as a warrant that the information contained therein is suitable for any general or specific use, and the Society takes no position with regards to the validity of patent rights. Users are advised that the determination of patent rights or risk of infringement is entirely their own responsibility.

It is with much appreciation that we acknowledge the contributions of two committee members who are no longer with us, Jerome G. Hanson and Dan S. Thiemann.

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Committee. Those individuals who serve on the Design of Steel Transmission Pole Structures Standards Committee are

Richard F. Aichinger, P.E.
Gary E. Bowles, P.E.
David G. Brinker
Michael D. Brown, P.E.
Donald D. Cannon
Jerry G. Crawford, P.E.
Dana R. Crissey, P.E.
Martin L. De La Rosa, P.E.
David Endorf, P.E.
Michael R. Gall, P.E.
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Marlon W. Vogt, P.E.

Design of Steel Transmission Pole Structures

1.0 SCOPE

Design of Steel Transmission Pole Structures specifies requirements for the design, fabrication, testing, assembly, and erection of cold-formed tubular members and connections for steel electrical transmission pole structures. Structure components (members, connections, guys) are selected to resist factored design loads at stresses approaching yielding, buckling, fracture, or any other limiting condition specified in this standard. Distribution, substation, communication, and railroad electric traction structures are not included within the scope of this standard.

Units of measurement herein are expressed first in English units followed by the International System (SI) units in parentheses. Formulae are based on English units, and, thus, some formulae require a conversion factor to use SI units. The appropriate conversion factor is given following each formula.

2.0 APPLICABLE DOCUMENTS

The following standards are referenced in this document:

ASTM International (ASTM) Standards
 A6/A6M-04 Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling
 A36/A36M-03a Standard Specification for Carbon Structural Steel
 A123/A123M-02 Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
 A143/A143M-03 Standard Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement
 A153/A153M-03 Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
 A193/A193M-03 Standard Specification for Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature Service
 A307-03 Standard Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength
 A325-04 Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength

A325M-04 Standard Specification for Structural Bolts, Steel Heat Treated 830 MPa Minimum Tensile Strength [Metric]

A354-03a Standard Specification for Quenched and Tempered Alloy Steel Bolts, Studs, and Other Externally Threaded Fasteners

A370-03a Standard Test Methods and Definitions for Mechanical Testing of Steel Products

A385-03 Standard Practice for Providing High-Quality Zinc Coatings (Hot-Dip)

A394-00 Standard Specification for Steel Transmission Tower Bolts, Zinc-Coated and Bare

A449-04 Standard Specification for Quenched and Tempered Steel Bolts and Studs

A475-03 Standard Specification for Zinc-Coated Steel Wire Strand

A490-04 Standard Specification for Structural Bolts, Alloy Steel, Heat Treated, 150 ksi Minimum Tensile Strength

A490M-04 Standard Specification for High-Strength Steel Bolts, Classes 10.9 and 10.9.3, for Structural Steel Joints [Metric]

A529/A529M-03 Standard Specification for High Strength Carbon-Manganese Steel of Structural Quality

A563-04 Standard Specification for Carbon and Alloy Steel Nuts

A563M-03 Standard Specification for Carbon and Alloy Steel Nuts [Metric]

A568/A568M-03 Standard Specification for Steel, Sheet, Carbon, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, General Requirements for

A572/A572M-03 Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel

A588/A588M-03 Standard Specification for High-Strength Low-Alloy Structural Steel with 50 ksi [345 MPa] Minimum Yield Point to 4 in. [100 mm] Thick

A595-98(2002) Standard Specification for Steel Tubes, Low-Carbon, Tapered for Structural Use

A606-01 Standard Specification for Steel, Sheet and Strip, High-Strength, Low-Alloy, Hot-Rolled, and Cold-Rolled, with Improved Atmospheric Corrosion Resistance

A615/A615M-04 Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement

A633/A633M-01 Standard Specification for Normalized High-Strength Low-Alloy Structural Steel Plates