

EXHIBIT N

Codes and Standards

TABLE OF CONTENTS

	<u>Page No.</u>
1.0 Industry Standards	2
2.0 General Standards and Codes	2
3.0 Technical Section Standards	3

1.0 INDUSTRY STANDARDS:

- A. Applicability of Standards: Except where the Design Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Agreement. Such standards are made a part of the Agreement by reference and are stated in each Section.
1. Referenced standards, referenced directly in this Exhibit or by governing regulations, have precedence over non-referenced standards which are recognized in industry for applicability to the Work.
 2. Where compliance with an industry standard is required, the latest standard in effect at time of opening Bids shall govern.
 3. Where an applicable code or standard has been revised and reissued after the effective date of the Contract and before performance of Work affected by the revision, Owner will decide whether to issue a Change Order to proceed with the revised standard.
 4. In every instance the quantity or quality level shown or specified shall be the minimum to be provided or performed. The actual installation may comply exactly, within specified tolerances, with the minimum quantity or quality specified, or it may exceed that minimum within reasonable limits. In complying with these requirements, indicated numeric values are minimum or maximum values, as noted, or appropriate for the context of the requirements. Refer instances of uncertainty to Owner for a decision before proceeding.
 5. Each entity engaged in construction on the Project is required to be familiar with industry standards applicable to that entity's construction activity. Copies of applicable standards are not bound with the Design Documents.
 - a. Where copies of standards are needed for performance of a required construction activity, Contractor shall obtain copies directly from the publication source.
- B. Abbreviations and Names: Trade association names and titles of general standards are frequently abbreviated. Where such acronyms or abbreviations are used in the Specifications or other Design Documents, they mean the recognized name of the trade association, standards generating organization, authority having jurisdiction, or other entity applicable to the context of the text provision.

2.0 GENERAL STANDARDS AND CODES

- A. Applicable Design Standards and Codes
1. 2007 Kentucky Building Code, 9th Edition, Revised November 2011
 2. Americans with Disabilities Act of 1990 (ADA).
 3. American National Standards Institute (ANSI).
 4. American Society for Testing and Materials (ASTM).
 5. American Welding Society (AWS).
 6. American Wood Preservers Institute (AWPI).
 7. Interim Federal Specifications.
 8. National Association of Architectural Metal Suppliers (NAAMM).
 9. Society for Protective Coatings (SSPC).
 10. U.S. Department of Commerce Product Standards.
 11. International Building Code (IBC).
 12. National Fire Protection Association (NFPA).
 13. National Electrical Code (NEC).

14. Insulated Cable Engineer's Association (ICEA).
15. National Electric Safety Code (NESC).
16. National Electrical Manufacturers Association (NEMA).
17. Institute of Electrical and Electronic Engineers (IEEE).
18. Illuminating Engineering Society (IES).
19. The Instrumentation, Systems and Automation Society (ISA)
20. American Bearing Manufacturers Association (ABMA).
21. American Gear Manufacturers Association (AGMA).
22. American Institute of Steel Constructors (AISC).
23. American Iron and Steel Institute (AISI).
24. Air Movement and Control Association (AMCA).
25. American Petroleum Institute (API).
26. American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE).
27. American Society of Mechanical Engineers (ASME).
28. American Water Works Association Standards (AWWA).
29. Associated Air Balance Council (AABC).
30. Conveyor Equipment Manufacturer's Association (CEMA).
31. Chlorine Institute.
32. Factory Mutual (FM).
33. Federal Register.
34. Federal Specifications (FS).
35. Hydraulic Institute (HI).
36. Industrial Gas Cleaning Institute (IGGI).
37. Midwest Insulation Contractors Association (MICA).
38. Mine Safety and Health Administration (MSHA).
39. Manufacturer Standards Society (MSS).
40. North American Insulation Manufacturers Association (NAIMA).
41. National Board of Fire Underwriters (NBFU).
42. National Environmental Balancing Bureau (NEBB).
43. National Institute of Safety and Health (NIOSH).
44. Occupational Safety and Health Act (OSHA).
45. Pipe Fabricators Institute (PFI).
46. Rubber Manufacturers Association (RMA).
47. Society of Automotive Engineers (SAE).
48. Sheet Metal and Air Conditioning Contractors National Association (SMACNA).
49. Testing and Balancing Bureau (TABB).
50. Underwriters Laboratories (UL).
51. American Concrete Institute (ACI).
52. American Institute of Steel Construction, Inc. (AISC).
53. Crane Manufacturers Association of America (CMAA)
54. Metal Building Manufacturers Association (MBMA).

3.0 TECHNICAL SECTION STANDARDS

Contractor's work shall conform to the most recent edition of the codes, standards, and guidelines listed in each specific technical SECTION below:

026617 - GEOMEMBRANE LINER

- A. American Society for Testing and Materials (ASTM):
 1. D638 - Test Method for Tensile Properties of Plastics.
 2. D792 - Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement.

3. D1004 - Test Method for Initial Tear Resistance of Plastic Film and Sheeting.
 4. D1238 - Test Method for Flow Rates of Thermoplastics by Extrusion Plastometer.
 5. D1505 - Test Method for Density of Plastics by the Density-Gradient Technique.
 6. D1603 - Test Method for Carbon Black in Olefin Plastics.
 7. D3895 - Test Method for Oxidative-Induction Time of Polyolefins by Differential Scanning Calorimetry.
 8. D4833 - Test Method for Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products.
 9. D5199 - Thickness of Geomembrane.
 10. D5397 - Test Method for Evaluation of Stress Crack Resistance of Polyolefin Geomembranes Using Notched Constant Tensile Load Test.
 11. D5596 - Test Method for Microscopic Evaluation of the Dispersion of Carbon Black in Polyolefin Geosynthetics.
 12. D5994 - Test Method for Measuring the Core Thickness of Textured Geomembranes.
 13. D6693 - Test Method for Determining Tensile Properties of Nonreinforced Polyethylene and Nonreinforced Flexible Polypropylene Geomembranes.
- B. U.S. Environmental Protection Agency (EPA):
1. EPA/530/SW-91/051 - Technical Guidance Document: Inspection Techniques for the Fabrication of Geomembrane Field Seams.
- C. Geosynthetic Research Institute (GRI):
1. Standard GM13. Test Properties, Testing Frequency and Recommended Warranty for High Density Polyethylene (HDPE) Smooth and Textured Geomembranes.
 2. Standard GM10. Specification for the Stress Crack Resistance of Geomembrane Sheet.
 3. Standard GM19. Seam Strength and Related Properties of Thermally Bonded Polyolefin Geomembranes.

026625 - HDPE Pipe

- A. American National Standards Institute (ANSI):
1. B16.5 - Carbon Steel Pipe Flanges and Flanged Fittings, Class 150.
- B. American Society for Testing and Materials (ASTM):
1. D638 - Test Method for Tensile Properties of Plastics.
 2. D790 - Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
 3. D1238 - Measuring Flow Rates of Thermoplastics by Extrusion Plastometer.
 4. D1505 - Test Method for Density of Plastics by the Density-Gradient Technique.
 5. D2513 - Thermoplastic Gas Pressure Pipe, Tubing, and Fittings.
 6. D2657 - Practice for Heat Joining of Polyethylene Pipe and Fittings.
 7. D3261 - Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene Plastic Pipe and Tubing.
 8. D3350 - Polyethylene Plastics Pipe and Fittings Materials.
 9. F1417 - Installation Acceptance of Plastic Gravity Sewer Lines Using Low-Pressure Air.

031000 – CONCRETE FORMWORK

- A. Applicable Standards:
 - 1. American Concrete Institute (ACI):
 - a. 117 - Specifications for Tolerances for Concrete Construction and Materials.
 - b. 301 - Specifications for Structural Concrete.
 - c. 318 - Building Code Requirements for Reinforced Concrete.
 - d. 347 - Guide to Formwork for Concrete.
 - 2. American Society for Testing and Materials (ASTM):
 - a. C31 - Making and Curing Concrete Test Specimens in the Field.
 - b. C39 - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
 - c. C1077 - Standard Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation.

032000 - CONCRETE REINFORCEMENT

- A. Applicable Standards:
 - 1. American Society for Testing and Materials (ASTM):
 - a. A82 - Steel Wire, Plain, for Concrete Reinforcement.
 - b. A185 - Steel Welded Wire Reinforcement, Plain, for Concrete.
 - c. A615/A615M - Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
 - d. A706/A706M - Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement.
 - 2. American Concrete Institute (ACI):
 - a. 301 - Specifications for Structural Concrete.
 - b. SP-66 - Detailing Manual.
 - c. 318 - Building Code Requirements for Structural Concrete.
 - d. 117 - Specifications for Tolerances for Concrete Construction and Materials.
 - 3. American Welding Society (AWS):
 - a. A5.5 - Low Alloy Steel Electrodes for Shielded Metal Arc Welding.
 - b. B2.1 - Welding Procedure and Performance Qualification.
 - c. D1.4 - Structural Welding Code - Reinforcing Steel.
 - 4. Concrete Reinforcing Steel Institute (CRSI):
 - a. Manual of Standard Practice.

033000 - CONCRETE

- A. Comply with the provisions of the following codes, specifications, and standards, except as otherwise indicated.
 - 1. American Concrete Institute (ACI):
 - a. 301 - Specifications for Structural Concrete.
 - b. 318 - Building Code Requirements for Structural Concrete.
- B. Applicable Standards Where Referenced Herein:
 - 1. American Society for Testing and Materials (ASTM):
 - a. A167 - Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
 - b. B370 - Copper Sheet and Strip for Building Construction.

- c. C31/C31M - Practice for Making and Curing Concrete Test Specimens in the Field.
- d. C33 - Concrete Aggregates.
- e. C39 - Test Method for Compressive Strength of Cylindrical Concrete Specimens.
- f. C40 - Test Method for Organic Impurities in Fine Aggregates for Concrete.
- g. C42 - Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.
- h. C78 - Test Method for Flexural Strength of Concrete (Using Simple Beam with Third-Point Loading).
- i. C88 - Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate.
- j. C94 - Ready-Mixed Concrete.
- k. C114 - Test Methods for Chemical Analysis of Hydraulic Cement.
- l. C117 - Test Method for Material Finer than 75 μ (No. 200) Sieve in Mineral Aggregates by Washing.
- m. C136 - Test Method for Sieve Analysis of Fine and Coarse Aggregates.
- n. C142 - Test Method for Clay Lumps and Friable Particles in Aggregates.
- o. C143 - Test Method for Slump of Hydraulic Cement Concrete.
- p. C150 - Portland Cement.
- q. C172 - Practice for Sampling Freshly Mixed Concrete.
- r. C192/C192M - Practice for Making and Curing Concrete Test Specimens in the Laboratory.
- s. C231 - Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
- t. C233 - Test Methods for Air-Entraining Admixtures for Concrete.
- u. C260 - Air-Entraining Admixtures for Concrete.
- v. C289 - Test Method for Potential Alkali-Silica Reactivity of Aggregates (Chemical Method).
- w. C295 - Guide for Petrographic Examination of Aggregates for Concrete.
- x. C309 - Liquid Membrane-Forming Compounds for Curing Concrete.
- y. C430 - Test Method for Fineness of Hydraulic Cement by the 45 μ (No. 325) Sieve.
- z. C494 - Chemical Admixtures for Concrete.
- aa. C566 - Test Method for Total Evaporable Moisture Content of Aggregate by Drying.
- bb. C595/C595M - Blended Hydraulic Cements.
- cc. C618 - Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
- dd. C881 - Epoxy-Resin-Base Bonding Systems for Concrete.
- ee. C1107 - Packaged Dry, Hydraulic Cement Grout (Nonshrink).
- ff. C1193 - Guide for Use of Joint Sealants.
- gg. C1315 - Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete.
- hh. D1751 - Preformed Expansion Joint Filler for Concrete Paving and Structural Construction. (Nonextruding and Resilient Bituminous Types).
- ii. D1752 - Preformed Sponge Rubber, Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction.

- jj. D2240 - Test Method for Rubber Property - Durometer Hardness.
- kk. E1155/E1155M - Test Method for Determining F_F Floor Flatness and F_L Floor Levelness Numbers.
- 2. American Concrete Institute (ACI):
 - a. 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete.
 - b. 302.1R - Guide for Concrete Floor and Slab Construction.
 - c. 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete.
 - d. 305R - Committee Report on Hot Weather Concreting.
 - e. 306R - Committee Report on Cold Weather Concreting.
 - f. 308.1 - Standard Specification for Curing Concrete.
 - g. 309R - Guide for Consolidation of Concrete.
 - h. 313 - Standard Practice for Design and Construction of Concrete Silos and Stacking Tubes for Storing Granular Materials.
 - i. 506R - Guide to Shotcrete.
 - j. 506.2 - Specification for Shotcrete.
- 3. Concrete Plant Manufacturers Bureau (CPMB):
 - a. 100 - Concrete Plant Standards.
 - b. 102 - Recommended Guide Specifications for Batching Equipment and Control Systems in Concrete Batch Plants.
 - c. Plant Mixer Manufacturers Division (PMMD) 100 - Concrete Plant Mixer Standards.
- 4. Federal Specification (FS):
 - a. SS-S-200 - Sealants, Joint: Two-Component, Jet-Blast-Resistant, Cold-Applied, for Portland Cement Concrete Pavement.
 - b. TT-S-227 - Sealing Compound: Elastomeric Type, Multi-Component (for Calking, Sealing, and Glazing in Buildings and Other Structures).
- 5. National Bureau of Standards (NBS) Specifications for Scales.
- 6. Truck Mixer Manufacturers Bureau (TMMB):
 - a. Truck Mixer, Agitator and Front Discharge Concrete Carrier Standards.

051200 - STEEL

A. Applicable Standards:

- 1. American Institute of Steel Construction (AISC):
 - a. Steel Construction Manual.
 - b. 303 - Code of Standard Practice for Steel Buildings and Bridges.
 - c. 341 - Seismic Provisions for Structural Steel Buildings.
- 2. American Welding Society (AWS):
 - a. A4.3 - Standard Methods for Determination of the Diffusible Hydrogen Content of Martensitic, Bainitic, and Ferritic Steel Weld Metal Produced by Arc Welding.
 - b. A5.1 - Specification for Carbon Steel Electrodes for Shielded Metal Arc Welding.
 - c. A5.4 - Specification for Stainless Steel Electrodes for Shielded Metal Arc Welding.
 - d. A5.5 - Specification for Low-Alloy Steel Electrodes for Shielded Metal Arc Welding.
 - e. B4.0 - Standard Methods for Mechanical Testing of Welds.
 - f. B5.1 - Specification for the Qualification of Welding Inspectors.

- g. C4.1 - Oxygen Cutting Surface Roughness Gauge and Chart for Criteria Describing Oxygen Cut Surfaces.
 - h. C5.4 - Recommended Practices for Stud Welding.
 - i. D1.1 - Structural Welding Code - Steel.
 - j. D1.6 - Structural Welding Code - Stainless Steel.
 - k. QC1 - Standard for AWS Certification of Welding Inspectors.
3. ASTM International:
- a. A1 - Carbon Steel Tee Rails.
 - b. A6 - Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling.
 - c. A36 - Carbon Structural Steel.
 - d. A53 - Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
 - e. A106 - Seamless Carbon Steel Pipe for High-Temperature Service.
 - f. A108 - Steel Bar, Carbon and Alloy, Cold-Finished.
 - g. A123 - Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - h. A143 - Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement
 - i. A153 - Zinc Coating (Hot-Dip) on Iron and Steel Hardware – AASHTO No.: M232.
 - j. A167 - Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
 - k. A193 - Alloy-Steel and Stainless Steel Bolting Materials for High Temperature or High Pressure Service and Other Special Purpose Applications.
 - l. A240 – Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications
 - m. A264 - Stainless Chromium-Nickel Steel-Clad Plate.
 - n. A307 - Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.
 - o. A312 – Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes.
 - p. A325 -Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
 - q. A384 - Safeguarding Against Warpage and Distortion During Hot-Dip Galvanizing of Steel Assemblies
 - r. A385 - Providing High-Quality Zinc Coatings (Hot-Dip)
 - s. A449 - Hex Cap Screws, Bolts and Studs, Steel, Heat Treated, 120/105/90 ksi Minimum Tensile Strength, General Use.
 - t. A490 - Structural Bolts, Alloy Steel, Heat Treated, 150 ksi Minimum Tensile Strength.
 - u. A500 - Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
 - v. A563 - Carbon and Alloy Steel Nuts.
 - w. A572 - High Strength Low-Alloy Columbium-Vanadium Structural Steel.
 - x. A588 - High-Strength Low-Alloy Structural Steel, up to 50 ksi [345 MPa] Minimum Yield Point, with Atmospheric Corrosion Resistance - AASHTO No.: M 222.
 - y. A673 - Sampling Procedure for Impact Testing of Structural Steel.
 - z. A780 - Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.

- aa. A786 - Hot-Rolled Carbon Low-Alloy, High-Strength Low-Alloy, and Alloy Steel Floor Plates.
 - bb. A992 - Structural Steel Shapes.
 - cc. A1011/A1011M - Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength.
 - dd. B695 - Coatings of Zinc Mechanically Deposited on Iron and Steel.
 - ee. C1107 - Packaged, Dry Hydraulic Cement Grout (Nonshrink).
 - ff. F436 - Hardened Steel Washers.
 - gg. F593 - Stainless Steel Bolts, Hex Cap Screws, and Studs.
 - hh. F594 - Stainless Steel Nuts.
 - ii. F959 - Compressible-Washer-Type Direct Tension Indicator for Use with Structural Fasteners.
 - jj. F1554 - Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength.
 - kk. F2329 - Zinc Coating, Hot-Dip, Requirements for Application to Carbon and Alloy Steel Bolts, Screws, Washers, Nuts, and Special Threaded Fasteners.
- 4. The National Association of Architectural Metal Manufacturers (NAAMM):
 - a. MBG 531 - Metal Bar Grating Manual.
 - b. MBG 532 - Heavy Duty Metal Bar Grating Manual.
 - c. MBG 533 - Welding Specifications for Fabrication of Steel, Aluminum and Stainless Steel Bar Grating.
 - 5. Research Council on Structural Connections (RCSC):
 - a. Specification for Structural Joints Using High-Strength Bolts.
 - 6. Society for Protective Coatings (SSPC) Surface Preparation Specifications:
 - a. SP1 - Solvent Cleaning.
 - b. SP3 - Power Tool Cleaning.
 - c. SP5 - White Metal Blast Cleaning.
 - d. SP6 - Commercial Blast Cleaning.
 - e. SP10 - Near-White Blast Cleaning.
 - f. SP11 - Power Tool Cleaning to Bare Metal.
 - 7. Occupational Safety and Health Administration (OSHA) - All applicable OSHA regulations, including, but not limited to 29 CFR Part 1910 and Part 1926 Subpart R - Steel Erection.

079200 - JOINT SEALANTS

- A. Applicable Standards:
 - 1. American Society for Testing and Materials (ASTM):
 - a. C834 - Latex Sealing Compounds.
 - b. C919 - Practices for Use of Sealants in Acoustical Applications.
 - c. C920 - Elastomeric Joint Sealants.
 - d. C1193 - Guide for Use of Joint Sealants.
 - 2. Code of Federal Regulations (CFR):
 - a. 40 CFR 59, Subpart D - National Volatile Organic Compound Emissions Standard for Architectural Coatings.

083323 - OVERHEAD COILING DOORS

- A. American Society for Testing and Materials (ASTM):
 - 1. A36/A36M: Carbon Structural Steel.
 - 2. A123: Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

3. A240/A240M: Heat-Resisting Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels.
 4. A653/A653M: Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 5. A666: Austenitic Stainless Steel Sheet, Strip, Plate and Flat Bar.
 6. B209/B209M: Aluminum and Aluminum-Alloy Sheet and Plate.
 7. B221/B221M: Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes.
 8. E84b: Test Method for Surface Burning Characteristics of Building Materials
- B. National Association of Architectural Metal Manufacturers (NAAMM):
1. Metal Finishes Manual for Architectural and Metal Products.
- C. National Electrical Manufacturers Association (NEMA):
1. ICS 1: Industrial Control and Systems General Requirements.
 2. ICS 2: Industrial Control and Systems Controllers, Contactors, and Overload Relays Rated Not More Than 2000 Volts AC or 750 Volts DC.
 3. ICS 6: Industrial Control and Systems Enclosures.
 4. MG 1: Motors and Generators.
- D. National Fire Protection Association (NFPA):
1. 70: National Electrical Code.
 2. 80: Fire Doors and Fire Windows.
- E. Underwriters Laboratories Inc. (UL):
1. 10b: Fire Tests of Door Assemblies.

099000 - PROTECTIVE COATINGS

- A. Applicable Standards:
1. American National Standards Institute (ANSI):
 - a. A13.1 - Scheme for the Identification of Piping Systems.
 - b. Z53.1 - Safety Color Code for Marking Physical Hazards.
 2. American Society for Testing and Materials (ASTM):
 - a. D2092 – Guide for Treatment of Zinc-Coated (Galvanized) Steel Surfaces for Painting.
 - b. D4258 - Surface Cleaning Concrete for Coating.
 - c. D4259 - Abrading Concrete.
 - d. D4260 - Acid Etching Concrete.
 - e. D4261 - Surface Cleaning Concrete Unit Masonry for Coating.
 3. Society for Protective Coatings (SSPC) Surface Preparation Specifications:
 - a. SP1 - Solvent Cleaning: Removes oil, grease, soil, drawing and cutting compounds, and other soluble contaminants.
 - b. SP2 - Hand Tool Cleaning: Remove loose material. Not intended to remove adherent mill scale, rust, and paint.
 - c. SP3 - Power Tool Cleaning: Removes loose material. Not intended to remove all scale or rust.
 - d. SP5 - White Metal Blast Cleaning: Removes all scale, rust, foreign matter. Leaves surface gray-white uniform metallic color.
 - e. SP6 - Commercial Blast Cleaning: Two-thirds of every nine square inches free of all visible residues; remainder only light discoloration.
 - f. SP7 - Brush-Off Blast Cleaning: Removes only loose material, remaining surface tight and abraded to give anchor pattern.
 - g. SP10 - Near-White Blast Cleaning: At least 95% of every nine square inches shall be free of all visible residues.

- h. SP11 - Power Tool Cleaning to Bare Metal.
- i. SP12 – Surface Preparation and Cleaning of Steel and Other Hard Materials by High and Ultrahigh Pressure Water Jetting Prior to Recoating.
- j. SP13 – Surface Preparation of Concrete.

133419 - METAL BUILDING SYSTEMS

- A. American Architectural Manufacturers Association (AAMA):
 - 1. 603.8 - Voluntary Performance Requirements and Test Procedures for Pigmented Organic Coatings on Extruded Aluminum.
 - 2. 701/702 - Combined Voluntary Specifications for Pile Weather-stripping and Replaceable Fenestration Weather seals.
- B. American Institute of Steel Construction (AISC):
 - 1. S303 - Code of Standard Practice for Steel Buildings and Bridges.
 - 2. S360 - Specification for Structural Steel
- C. American Iron and Steel Institute (AISI):
 - 1. NAS-01 – North American Specification for the Design of Cold-Formed Steel Structural Members.
- D. American National Standards Institute (ANSI):
 - 1. ANSI/AHA A135.4 - Basic Hardboard.
 - 2. ANSI/DHI A115 Series: Specifications for Steel Door and Frame Preparation for Hardware.
 - 3. ANSI Z97.1 - Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test.
- E. American Society for Testing and Materials (ASTM):
 - 1. A36/A36M - Carbon Structural Steel.
 - 2. A53 - Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
 - 3. A123 - Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - 4. A153 - Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
 - 5. A307 - Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
 - 6. A325 - Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
 - 7. A325M - High-Strength Bolts for Structural Steel Joints (Metric).
 - 8. A366/A366M - Steel, Sheet, Carbon, Cold-Rolled, Commercial Quality.
 - 9. A463/A463M - Steel Sheet, Aluminum-Coated, by the Hot-Dip Process.
 - 10. A475 - Zinc-Coated Steel Wire Strand.
 - 11. A490 - Heat-Treated Steel Structural Bolts, 150 ksi Minimum Tensile Strength.
 - 12. A490M - High-Strength Steel Bolts, Classes 10.9 and 10.9.3 for Structural Steel Joints (Metric).
 - 13. A500 - Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
 - 14. A501 - Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.
 - 15. A529/A529M - High-Strength Carbon-Manganese Steel of Structural Quality.
 - 16. A568/A568M - Steel, Sheet, Carbon, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, General Requirements.
 - 17. A569/A569M - Steel, Carbon (0.15 Maximum Percent), Hot-Rolled Sheet and Strip Commercial Quality.
 - 18. A572/A572M High-Strength Low-Alloy Columbium-Vanadium Structural Steel.

19. A653/A653M - Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
20. A755/A755M - Steel Sheet, Metallic Coated by the Hot-Dip Process and Prepainted by the Coil-Coating Process for Exterior Exposed Building Products.
21. A780 - Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
22. A792/A792M - Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
23. A992/A992M – Standard Specification for Structural Steel Shapes.
24. A1008/A1008M - Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
25. A1011/A1011M - Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
26. B221 - Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
27. B221M - Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tube (Metric).
28. B695 - Coatings of Zinc Mechanically Deposited on Iron and Steel.
29. C36 - Gypsum Wallboard.
30. C423 - Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
31. C442 - Gypsum Backing Board and Coreboard.
32. C578 - Rigid, Cellular Polystyrene Thermal Insulation.
33. C591 - Unfaced Preformed Rigid Cellular Polyisocyanurate Thermal Insulation.
34. C665 - Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
35. C920 - Elastomeric Joint Sealants.
36. C991 - Flexible Glass Fiber Insulation for Pre-Engineered Metal Buildings.
37. C1014 - Spray-Applied Mineral Fiber Thermal or Acoustical Insulation.
38. C1036 - Flat Glass.
39. C1048 - Heat-Treated Flat Glass - Kind HS, Kind FT Coated and Uncoated Glass.
40. C1107 - Packaged Dry, Hydraulic-Cement Grout (Nonshrink).
41. C1136 - Flexible, Low Permeance Vapor Retarders for Thermal Insulation.
42. C1149 - Self-Supported Spray Applied Cellulosic Thermal/Acoustical Insulation.
43. D523 - Test Method for Specular Glass.
44. D1494 - Test Method for Diffuse Light Transmission Factor of Reinforced Plastics Panes.
45. D3656 - Insect Screening and Louver Cloth Woven from Vinyl-Coated Glass Yarns.
46. D3841 - Glass-Fiber-Reinforced Polyester Plastic Panels.
47. D4214 - Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films.
48. E84 - Test Method for Surface Burning Characteristics of Building Materials.
49. E94 - Guide for Radiographic Testing.

50. E96 - Test Methods for Water Vapor Transmission of Materials.
 51. E119 - Test Methods for Fire Tests of Building Construction and Materials.
 52. E136 - Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C.
 53. E164 - Practice for Ultrasonic Contact Examination of Weldments.
 54. E165 - Method for Liquid Penetrant Examination.
 55. E283 - Test Method for Determining Rate of Air Leakage through Exterior Windows, Curtain Walls, and Doors under Specified Pressure Differences across the Specimen.
 56. E329 - Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction.
 57. E331 - Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
 58. E548 - Guide for General Criteria Used for Evaluating Laboratory Competence.
 59. E79 - Guide for Magnetic Particle Examination.
 60. E1300 – Standard Practice for Determining Load Resistance of Glass in Buildings.
 61. E1646 - Test Method for Water Penetration of Exterior Metal Roof Panel Systems by Uniform Static Air Pressure Difference.
 62. E1680 - Test Method for Rate of Air Leakage through Exterior Metal Roof Panel Systems.
 63. F568M - Carbon and Alloy Steel Externally Threaded Metric Fasteners.
 64. F959/F959M - Compressible-Washers-Type Direct Tension Indicators for Use with Structural Fasteners.
 65. F1554 – Standard Specification for Anchor Bolts, Steel, 36, 55, 105 ksi Yield Strength.
 66. F1852 – Standard Specification for “Twist Off” Type Tension Control Structural Bolt / Nut / Washer Assemblies, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
 67. F2248 – Standard Practice for Specifying an Equivalent 3-Second Duration Design Loading for Blast Resistant Glazing Fabricated with Laminated Glass.
- F. American Society of Civil Engineers (ASCE):
1. 7 - Minimum Design Loads for Buildings and Other Structures.
- G. American Welding Society (AWS):
1. D1.1 - Structural Welding Code - Steel.
 2. D1.3 - Structural Welding Code - Sheet Steel.
- H. Code of Federal Regulations (CFR):
1. 16 CFR 1201: Safety Standard for Architectural Glazing Materials.
- I. Door and Hardware Institute (DHI):
1. Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames.
- J. Federal Specifications (FS):
1. RR-W-365A(1)-80 - Wire Fabric (Insect Screening).
 2. TT-P-641G(1)-77 - Primer Coating; Zinc Dust-Zinc Oxide (for Galvanized Surfaces).
- K. International Accreditation Services, Inc. (IAS):
1. AC472 – Accreditation Criteria for Inspection Programs for Manufacturers of Metal Building Systems.
- L. Metal Building Manufacturers Association (MBMA):

1. Metal Building Systems Manual.
- M. National Academy of Sciences:
 1. Expansion Joints in Buildings, Technical Report No. 65.
- N. National Association of Architectural Metal Manufacturers (NAAMM):
 1. Metal Finishes Manual for Architectural and Metal Products.
- O. National Fire Protection Association (NFPA):
 1. 80 - Fire Doors and Fire Windows.
 2. 252 - Fire Tests for Door Assemblies.
- P. North American Insulation Manufacturers Association (NAIMA):
 1. 202 - Standard for Flexible Fiber Glass Insulation Used in Metal Buildings.
- Q. Research Council on Structural Connections
 1. Specification for Structural Joints Using ASTM A325 or A490 Bolts.
- R. Sheet Metal and Air Conditioning Contractors' National Association (SMACNA):
 1. Architectural Sheet Metal Manual.
- S. Steel Door Institute (SDI):
 1. 100 - Recommended Specifications for Standard Steel Doors and Frames (ANSI).
- T. Steel Joist Institute (SJI):
 1. JG-1.1 – Standard Specification for Joist Girders
 2. K-1.1 – Standard Specification for Open Web Steel Joists, K-Series.
 3. LH/DLH-1.1 – Standard Specification for Longspan Steel Joists, LH Series and Deep Longspan Steel Joists.
- U. Society for Protective Coatings (SSPC):
 1. Paint 20 - Zinc-Rich Primers (Type I - Inorganic and Type II - Organic).
 2. SP1 - Surface Preparation Specification No. 1: Solvent Cleaning.
 3. SP2 - Surface Preparation Specification No. 2: Hand Tool Cleaning.
 4. SP3 - Surface Preparation Specification No. 3: Power Tool Cleaning.
 5. SP6 - Surface Preparation Specification No. 5: Commercial Blast Cleaning.
- V. Steel Window Institute (SWI):
 1. The Specifier's Guide to Steel Windows. (Undated.)
- W. Underwriters Laboratories Inc. (UL):
 1. 580 - Tests for Uplift Resistance of Roof Assemblies.

260000 – ELECTRICAL GENRAL REQUIREMENTS

- A. National Fire Protection Association (NFPA):
 1. 70 - National Electrical Code (NEC).
- B. Underwriter's Laboratories, Inc. (UL).
 1. 1277 - Type TC Power and Control Tray Cables.

260002 – ELECTRICAL EQUIP – GENERAL TECHNICAL REQUIREMENTS

- A. Applicable Codes and Standards:
 1. American Society for Testing and Materials (ASTM):
 - a. A6/A6M – Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling
 - b. A36/A36M – Standard Specification for Carbon Structural Steel.
 - c. A123/A123M – Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - d. A153/A153M – Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
 - e. A283/A283M – Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates.

- f. A325 – Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength..
- g. B187/B187M – Standard Specification for Copper, Bus Bar, Rod, and Shapes and General Purpose Rod, Bar, and Shapes.

260504 - WIRE, CABLE AND ACCESSORIES

A. Applicable Standards:

1. National Fire Protection Association (NFPA):
 - a. 70 - National Electrical Code (NEC).
2. Underwriter's Laboratories, Inc. (UL):
 - a. 44 - Rubber-Insulated Wires and Cables.
 - b. 83 - Thermoplastic-Insulated Wires and Cables.
 - c. 854 - Service Entrance Cables.
 - d. 1277 - Electrical Power and Control Tray Cables with Optional Optical-Fiber Members.
3. Insulated Cable Engineer's Association (ICEA):
 - a. ICEA S-95-658 / NEMA WC70 - Power Cables Rated 2000 Volts or Less for the Distribution of Electrical Energy.
 - b. ICEA S-93-639 / NEMA WC74 - 5-46 kV Shielded Power Cable for Use in the Transmission and Distribution of Electric Energy.
 - c. ICEA S-97-682 - Standard for Utility Shielded Power Cables Rated 5 - 46 kV .
4. Institute of Electrical and Electronic Engineers (IEEE):
 - a. 48 - Test Procedures and Requirements for High Voltage Alternating-Current Cable Terminations.
 - b. 404 - Cable Joints for Use with Extruded Dielectric Cable Rated 5,000 through 46,000 Volts, and Cable Joints for Use with Laminated Dielectric Cable Rated 2,500 through 500,000 Volts.
 - c. 1202 - Standard for Flame-Propagation Testing of Wire and Cable.
 - d. 1210 - Tests for Determining Compatibility of Cable-Pulling Lubricants with Wire and Cable.
5. American Society for Testing and Materials (ASTM):
 - a. B3 - Soft or Annealed Copper Wire.
 - b. B8 - Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft.
 - c. B33 - Tinned Soft or Annealed Copper Wire for Electrical Purposes.
 - d. B172 - Rope-Lay-Stranded Copper Conductors, Having Bunch Stranded Members, for Electrical Conductors.
 - e. B189 - Lead-Coated and Lead-Alloy-Coated Soft Copper Wire for Electrical Purposes.
6. Fiber-Optic Cable (In addition to the above references):
 - a. Electric Industry Association (EIA):
 - (1) EIA-455-25A - Repeated Impact Testing of Fiber Optic Cables and Cable Assemblies.
 - (2) EIA-455-30A - Frequency Domain Measurement of Multimode Optical Fiber Information Transmission Capacity.
 - (3) EIA-455-33A - Fiber Optic Cable Tensile Loading and Bending Test.
 - (4) EIA-455-41 - Compressive Loading Resistance of Fiber Optic Cables.
 - (5) EIA/TIA-455-46A - Spectral Attenuation Measurement for Long-length, Graded-Index Optical Fibers.
 - (6) EIA/TIA-455-47A - Output Farfield Radiation Pattern Measurement.
 - (7) EIA-455-104 - Fiber Optic Cable Cyclic Flexing Test.
 - (8) EIA/TIA-RS-359A - Color Coding of Fiber Optic Cables.

260506 - SPECIALS

- A. Applicable Standards:
 - 1. American National Standards Institute (ANSI):
 - a. C2 - National Electrical Safety Code (NESC).
 - 2. American Society for Testing and Materials (ASTM):
 - a. E814 - Methods for Fire Tests of Through-Penetration Fire Stops.
 - 3. Factory Mutual System (FM).
 - 4. National Electrical Manufacturers Association (NEMA).
 - a. 250 – Enclosures for Electrical Equipment (1,000 Volts Maximum)
 - 5. National Fire Protection Association (NFPA):
 - a. 70 - National Electrical Code (NEC).
 - 6. Underwriters Laboratories, Inc. (UL):
 - a. 50 – Electrical Cabinets and Boxes.
 - b. UL-1025 - Electric Air Heaters.
 - c. 1479 - Fire Test of Through - Penetration Firestops.
 - d. Fire Resistance Directory.
 - 7. Institute of Electrical and Electronics Engineers (IEEE):
 - a. 634 - Cable-Penetration Fire Stop Qualification Test.

260507 – PIPE FREEZE PROTECTION SYSTEM

- A. Applicable Standards:
 - 1. National Electrical Code (NEC/NFPA 70).
 - 2. National Fire Protection Association (NFPA).
 - 3. Occupational Safety and Health Act (OSHA).
 - 4. National Electrical Manufacturers Association (NEMA).
 - 5. American National Standards Institute (ANSI).
 - 6. Institute of Electrical and Electronic Engineers (C57.12.91).
 - 7. Institute of Electrical and Electronic Engineers (IEEE 515).
 - 8. Insulated Cable Engineers Association (ICEA).
 - 9. American Society of Mechanical Engineers (ASME B31.1).
 - 10. American Society for Testing and Materials International (A1016/A1016M).
- B. Equipment and materials shall be approved and/or listed in accordance with either of the following:
 - 1. Factory Mutual (FM).
 - 2. Underwriters Laboratory (UL).

260526 - GROUNDING

- A. Applicable Standards:
 - 1. National Fire Protection Association (NFPA):
 - a. 70 - National Electrical Code (NEC).
 - b. 780 - Lightning Protection Code.
 - 2. American Society for Testing and Materials (ASTM):
 - a. B8 - Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft.
 - 3. American National Standards Institute (ANSI):
 - a. C2 - National Electrical Safety Code (NESC).
 - 4. Underwriters Laboratories (UL).
 - a. 467 - Standard for Grounding and Bonding Equipment.

260533 - CONDUIT AND ACCESSORIES

- A. Applicable Standards:
 - 1. American Society For Testing and Materials (ASTM):
 - a. A123 - Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - b. A153 - Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

- c. A307 - Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.
- d. A668 - Steel Forgings, Carbon and Alloy, for General Industrial Use.
- e. B241 - Aluminum and Aluminum-Alloy Seamless Pipe and Seamless Extruded Tube.
- f. F512 - Smooth-Wall, Poly(Vinyl Chloride) (PVC) Conduit and Fittings for Underground Installation.
2. Federal Specifications (FS):
 - a. A-A-55810 - Conduit, Metal, Flexible.
3. National Fire Protection Association (NFPA):
 - a. 70 - National Electrical Code (NEC).
4. National Electrical Manufacturers' Association (NEMA):
 - a. C80.1 – Electrical Rigid Steel Conduit.(ERSC)
 - b. C80.3 – Steel Electrical Metallic Tubing. (EMT)
 - c. C80.5 – Electrical Rigid Aluminum Conduit.(ERAC)
 - d. FB1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable.
 - e. TC2 - Electrical Polyvinyl Chloride (PVC) Conduit.
 - f. TC3 - Polyvinyl Chloride (PVC) Fittings for Use with Rigid PVC Conduit and Tubing.
 - g. TC6 and 8 - Polyvinyl Chloride (PVC) Plastic Utilities Duct for Underground Installations.
 - h. TC9 - Fittings for Polyvinyl Chloride (PVC) Plastic Utilities Duct for Underground Installation.
 - i. TC14 – Reinforced Thermosetting Resin Conduit (RTRC) and Fittings
 - j. RN1 - Polyvinyl-Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit.
5. Underwriters' Laboratories, Inc. (UL):
 - a. 1 - Flexible Metal Conduit.
 - b. 6 – Electrical Rigid Metal Conduit - Steel.
 - c. 467 - Grounding and Bonding Equipment.
 - d. 514A - Metallic Outlet Boxes.
 - e. 514B – Conduit, Tubing, and Cable Fittings.
 - f. 514C - Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers.
 - g. 651 - Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings.
 - h. 651A – Schedule 40 and 80 High Density Polyethylene (HDPE) Conduit.
 - i. 886 - Outlet Boxes and Fittings for Use in Hazardous (Classified) Locations.

260536 - CABLE TRAY AND WIREWAY

- A. Applicable Standards:
 1. American Society For Testing and Materials (ASTM):
 - a. A123 - Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 2. Underwriters' Laboratories, Inc. (UL): Require products which are UL-listed and labeled.
 3. National Electrical Manufacturers Association (NEMA):
 - a. VE1 - Metallic Cable Tray Systems.
 - b. VE2 - Cable Tray Installation Guidelines.
 4. National Fire Protection Association (NFPA):
 - a. 70 - National Electrical Code (NEC).

260551 - ALTERNATING CURRENT ELECTRIC MOTORS

- A. Applicable standards:
 1. American National Standards Institute (ANSI):
 - a. C50.41 - Polyphase Induction Motors for Power Generating Stations.
 - b. C57.13 – Standard Requirements for Instrument Transformers

2. American Petroleum Institute (API):
 - a. 541 – Form-wound Squirrel-Cage Induction Motors – 500 Horsepower and Larger.
3. American Society for Testing and Materials (ASTM):
 - a. A 345 – Flat-Rolled Electrical Steels for Magnetic Applications.
4. American Bearing Manufacturers Association (ABMA):
 - a. 9 - Load Ratings and Fatigue Life for Ball Bearings.
 - b. 11 - Load Ratings and Fatigue Life for Roller Bearings.
5. Institute of Electrical and Electronics Engineers (IEEE):
 - a. 43 - Recommended Practice for Testing Insulation Resistance of Rotating Machinery.
 - b. 112 - Standard Test Procedure for Polyphase Induction Motors and Generators.
 - c. 429 - Recommended Practice for Thermal Evaluation of Sealed Insulation Systems for AC Electric Machinery Employing Form-Wound, Pre-Insulated Stator Coils for Machines 6900V and below.
6. National Electrical Manufacturers Association (NEMA):
 - a. MG 1 - Motors and Generators.
 - b. MG 2 - Safety Standard for Construction, and Guide for Selection, Installation, and Use of Electric Motors and Generators.
7. Underwriters Laboratories, Inc. (UL):
 - a. 674 – Standard for Electric Motors and Generators for Use in Division I (Classified) Hazardous Locations.
 - b. 1004 – Standard for Electric Motors.

260810 - ELECTRICAL TESTING

- A. Applicable Standards:
 1. American National Standards Institute (ANSI):
 - a. C37.20.1 - Metal-Enclosed Low-Voltage Power Circuit Breaker Switchgear.
 - b. C37.20.2 - Metal-Clad and Station-Type Switchgear.
 - c. C37.20.3 - Metal Enclosed Interrupter Switchgear.
 - d. C2 - National Electrical Safety Code (NESC).
 2. American Society For Testing and Materials (ASTM):
 - a. D1816 - Test Method for Dielectric Breakdown Voltage of Insulating Oils of Petroleum Origin Using VDE Electrodes.
 3. National Fire Protection Association (NFPA):
 - a. 70 - National Electrical Code (NEC).
 4. National Electrical Manufacturers Association (NEMA):
 - a. SG5 - Power Switchgear Assemblies.
 - b. WC7 - Cross-Linked Thermosetting-Polyethylene-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy (ICEA S-66-524).
 5. Institute of Electrical and Electronic Engineers (IEEE):
 - a. No. 43 - Recommended Practice for Testing Insulation Resistance of Rotating Machinery.
 - b. No. 62 - Field Testing Power Apparatus.
 - c. No. 450 - Recommended Practice for Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Generating Stations and Substations.
 6. International Electrical Testing Association (NETA):
 - a. Acceptance Testing Specifications for Electric Power Distribution Equipment and Systems.

261200 – SMALL POWER TRANSFORMERS

- A. Applicable Codes and Standards:
 1. Design, construct, assemble and test all Equipment furnished to conform with, but not limited to, the following:

- a. Institute of Electrical and Electronics Engineers (IEEE):
 - (1) No. 21 – General Requirements and test Procedure for Outdoor Apparatus Bushings.
 - (2) No. 24 – Electrical, Dimensional, and Related Requirements for Outdoor Apparatus Bushings.
 - (3) No. 32 – Neutral Grounding Devices.
- b. American National Standards Institute (ANSI):
 - (1) C37.90 – Relays Associated with Electrical Power Apparatus.
 - (2) C57.12.00 – General Requirements for Liquid Immersed Distribution, Power, and Regulating Transformers.
 - (3) C57.12.10 – Requirements for Transformers 230,000 Volts and Below, 833/958 Through 8333/10417 kVA Single Phase and 750/862 Through 60,000/80,000/100,000 kVA Three Phase.
 - (4) C57.12.70 – Terminal Markings and Connections for Distribution and Power Transformers.
 - (5) C57.12.80 – Terminology for Power and Distribution and Power Transformers.
 - (6) C57.12.90 – Test Code for Liquid Immersed Distribution, Power, and Regulating Transformers and Guide for Short-Circuit Testing of Distribution and Power Transformers.
 - (7) C57.13 – Requirements for Instrument Transformers.
 - (8) C62.1 – Surge Arresters for AC Power Circuits.
 - (9) C62.11 – Metal-Oxide Surge Arresters for AC Power Circuits.
- c. National Electrical Manufacturer’s Association (NEMA):
 - (1) CC1 – Electric Power Connectors.
 - (2) LA1 – Surge Arresters.
 - (3) TR1 – Standards for Transformers, Regulators, and Reactors.

261313 – 4,160-VOLT METALCLAD SWITCHGEAR

- A. Applicable Codes and Standards: Design, fabricate, assemble, and test all Equipment furnished to conform to the following codes and standards:
 1. American National Standards Institute (ANSI):
 - a. C37.04 - Rating Structure for AC High-Voltage Circuit Breakers.
 - b. C37.06 - Preferred Ratings and Related Required Capabilities for AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis.
 - c. C37.09 - Test Procedure for AC High-Voltage Circuit Breakers.
 - d. C37.010 - Application Guide for AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis.
 - e. C37.11 - Requirements for Electrical Control for AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis or a Total Current Basis.
 - f. C37.20.2 - Metal-Clad and Station-Type Cubicle Switchgear.
 - g. C37.23 - Metal Enclosed Bus and Calculating Losses in Isolated Phase Bus.
 - h. C37.90 - Relays and Relay Systems Associated with Electric Power Apparatus.
 - i. C37.90.1 - Surge Withstand Capability (SWC) Tests for Protective Relays and Relay Systems.
 - j. C37.100 - Definitions for Power Switchgear.
 - k. C39.1 - Requirements for Electrical Analog Indicating Instruments.
 - l. C57.13 - Requirements for Instrument Transformers.
 - m. C62.1 - Surge Arresters for Alternating Current Power Circuits.
 - n. C62.11 - Metal-Oxide Surge Arresters for AC Power Circuits.
 2. National Electrical Manufacturers' Association (NEMA).
 - a. CC1 - Electric Power Connectors for Substations.
 - b. SG4 - Power Circuit Breakers.
 - c. SG5 - Power Switchgear Assemblies.
 3. American Society of Testing and Materials (ASTM).

4. American Institute of Steel Construction (AISC).

262300 – 480-VOLT LOAD CENTERS AND BUS EQUIPMENT

- A. Applicable Codes and Standards: Design, fabricate, assemble and test all equipment furnished to conform to the following codes and standards:
 1. American National Standards Institute (ANSI):
 - a. C37.11 - IEEE Standard Requirements for Electrical Control for AC High-Voltage.
 - b. C37.13 - Low-Voltage AC Power Circuit Breakers Used in Enclosures.
 - c. C37.16 - Preferred Ratings, Related Requirements, and Application Recommendations for Low-Voltage Power Circuit Breakers and AC Power Circuit Protectors.
 - d. C37.17 - Trip Devices for AC and General Purpose DC Low-Voltage Power Circuit Breakers.
 - e. C37.20.1 - Metal-Enclosed Low Voltage Power Circuit Breaker Switchgear.
 - f. C37.23 - Guide for Metal-Enclosed Bus and Calculating Losses in Isolated Phase Bus.
 - g. C37.50 - Test Procedures for Low-Voltage AC Power Circuit Breakers Used in Enclosures.
 - h. C37.90 - Relays and Relay Systems Associated With Electric Power Apparatus.
 - i. C37.90.1 - Surge Withstand Capability (SWC) Tests for Protective Relays and Relay Systems.
 - j. C37.100- Definitions for Power Switchgear.
 - k. C39.1 - Requirements for Electrical Analog Indicating Instruments.
 - l. C57.12.01 - General Requirements for Dry-Type Distribution and Power Transformers.
 - m. C57.12.51 - Requirements for Ventilated Dry-Type Power Transformers, 501 kVA and Larger, 3-Phase, with High-Voltage 601 to 34,500 Volts, Low-Voltage 208Y/120 to 4,160 Volts.
 - n. C57.12.70 - Terminal Markings and Connections for Distribution and Power Transformers.
 - o. C57.12.80 - Terminology for Distribution, Power, and Regulating Transformers, and Reactors Other Than Current-Limiting Reactors.
 - p. C57.12.91 - Test Code for Dry-Type Distribution and Power Transformers.
 - q. C57.13 - Standard Requirements for Instrument Transformers.
 2. National Electrical Manufacturer's Association (NEMA):
 - a. CC1 - Electric Power Connectors for Substations.
 - b. SG5 - Power Switchgear Assemblies.
 - c. TR1 - Transformers, Regulators and Reactors.
 - d. ST-20 - Dry Type Transformers for General Applications.

262400 - PANELBOARDS, SWITCHBOARDS AND TRANSFORMERS

- A. Applicable Standards:
 1. American National Standards Institute (ANSI):
 - a. C57 Series - Transformers, Regulators, and Reactors.
 - b. C37.20 - IEEE Standard for Switchgear Assemblies Including Metal-Enclosed Bus.
 2. National Fire Protection Association (NFPA):
 - a. 70 - National Electrical Code (NEC).
 3. National Electrical Manufacturers Association (NEMA):
 - a. AB1 - Molded Case Circuit Breakers and Molded Case Switches.
 - b. ICS1 - Industrial Control and Systems.
 - c. ICS2 - Industrial Control Devices, Controllers and Assemblies.
 - d. ICS4 - Terminal Blocks for Industrial Use.

- e. PB1 - Panelboards.
- f. PB2 - Deadfront Distribution Switchboards.
- g. ST1 - Specialty Transformers (Except General-Purpose Type).
- h. 250 - Enclosures for Electrical Equipment (1000V Maximum).
- 4. Underwriters' Laboratories, Inc. (UL):
 - a. 50 - Enclosures for Electrical Equipment.
 - b. 67 - Panelboards.
 - c. 506 - Specialty Transformers.
 - d. 508 - Industrial Control Equipment.
 - e. 891 - Dead-Front Switchboards.
- 5. Federal Specifications:
 - a. FED-STD-595B - Colors Used in Government Procurement.
 - b. W-P-115C - Panel, Power Distribution.
 - c. W-C-375 - Circuit Breakers, Molded Case, Branch Circuit and Service, Type I, Series Trip, Three Pole (10 through 100 Amperes).

262419 - 480 VOLT MOTOR CONTROL CENTER EQUIPMENT

- A. Applicable Standards:
 - 1. National Fire Protection Association (NFPA):
 - 2. National Electrical Code (NEC).
 - 3. National Electrical Safety Code (NESC).
 - 4. National Electrical Manufacturers' Association (NEMA):
 - a. AB1 - Molded Case Circuit Breakers.
 - b. CC1 - Electric Power Connectors.
 - c. ICS1 - General Standards for Industrial Control and Systems.
 - d. ICS2 - Standards for Industrial Control Devices, Controllers and Assemblies.
 - e. ST1 - Specialty Transformers.
 - 5. Underwriters' Laboratories Inc. (UL):
 - a. 508 - Industrial Control Equipment.
 - b. 845 - Motor Control Centers.

262900 - POWER SWITCHING AND CONTROL DEVICES

- A. Applicable Standards:
 - 1. Institute of Electrical and Electronic Engineers (IEEE):
 - a. C37.90 - Relays and Relay Systems Associated with Electric Power Apparatus.
 - 2. National Fire Protection Association (NFPA):
 - a. 70 - National Electrical Code (NEC).
 - b. 110 - Emergency and Standby Power Systems.
 - 3. National Electrical Manufacturer's Association (NEMA):
 - a. AB1 - Molded-Case Circuit Breakers and Molded Case Switches.
 - b. ICS1 - General Standards for Industrial Control and Systems.
 - c. ICS2 - Industrial Control Devices, Controllers and Assemblies.
 - d. ICS4 - Terminal Blocks for Industrial Use.
 - e. 250 - Enclosures for Electrical Equipment (1,000 Volts Maximum).
 - f. ICS-2-447 - AC Automatic Transfer Switches.
 - 4. Underwriters' Laboratories, Inc. (UL):
 - a. 50 - Enclosures for Electrical Equipment.
 - b. 508 - Industrial Control Equipment.
 - c. 89 - Molded-Case Circuit Breakers and Circuit Breaker Enclosures.
 - d. 1008 - Automatic Transfer Switches.
 - e. 1087 - Molded Case Switches.
 - 5. Federal Specification (FS):
 - a. W-C-375B - Molded Case Circuit Breakers.
 - 6. American National Standards Institute (ANSI):

- a. 446 - Emergency and Standby Power Systems for Industrial and Commercial Applications.

263353 - UNINTERRUPTIBLE POWER SYSTEM

- A. Applicable Standards:
 1. Institute of Electrical and Electronics Engineers (IEEE):
 - a. 450 - Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Generating Stations and Substations.
 - b. 484 - Recommendations for Installation of Large Lead Storage Batteries.
 - c. 485 - Recommended Practice for Sizing Large Lead Storage Batteries for Generating Stations and Substations.
 2. National Electrical Manufacturer's Association (NEMA):
 - a. CC1 - Electric Power Connectors for substations.
 - b. AB1 - Molded Case Circuit Breakers.
 - c. IB1 - Definitions for Industrial Lead-Acid Storage Batteries.
 - d. TR1 - Transformers, Regulators, and Reactors.
 - e. ICS - Industrial Controls and Systems.
 - f. ST2 - Specialty Transformers.
 3. Underwriters' Laboratories (UL):
 - a. 508 - Industrial Control Equipment.
 - b. 67 - Panelboards.
 - c. 506 - Specialty Transformers.
 4. National Fire Protection Association (NFPA):
 - a. 70 - National Electrical Code (NEC).
 - b. National Electric Safety Code (NESC).
 5. American National Standards Institute (ANSI).

264100 - LIGHTNING PROTECTION SYSTEMS

- A. Applicable Standards:
 1. Underwriters' Laboratories, Inc. (UL):
 - a. 96A - Installation Requirements for Lightning Protection Systems.
 - b. 467 - Standard for Grounding and Bonding Equipment.
 2. American Society for Testing and Materials (ASTM):
 - a. B8 - Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft.
 3. National Fire Protection Association (NFPA):
 - a. 70 - National Electrical Code.
 - b. 780 - Lightning Protection Code.

264200 - CATHODIC PROTECTION EQUIPMENT AND MATERIALS

- A. Applicable Standards:
 1. American National Standards Institute (ANSI) Publications:
 - a. B36.10 Welded and Seamless Wrought-Iron Pipe.
 - b. C2 - National Electrical Safety Code.
 - c. C80.1 - Rigid Steel Conduit, Zinc-Coated.
 2. National Fire Protection Association (NFPA):
 - a. 70 - National Electrical Code.
 3. National Electrical Manufacturers Association (NEMA):
 - a. MR 20 - Cathodic Protection Units (R 1971).
 4. National Association of Corrosion Engineers (NACE):
 - a. RP-01-69 - Recommended Practice - Control of External Corrosion on Underground or Submerged Metallic Piping Systems.
 - b. RP-05-72 - Recommended Practice - Design, Installation, Operation and Maintenance of Impressed Current Deep Groundbeds.

5. Underwriters' Laboratories, Inc. (UL):
 - a. UL-6 - Rigid Metal Electrical Conduit.
 - b. UL-486 - Wire Connectors and Soldering Lugs for Use with Copper Conductors.
 - c. UL-510 - Insulating Tape.
6. American Society for Testing and Materials (ASTM):
 - a. D1785 - Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80 and 120.
 - b. D2104 - Polyethylene (PE) Plastic Pipe, Schedule 80.
 - c. D2241 - Poly (Vinyl Chloride) (PVC) Plastic Pipe (SDR-PR).
 - d. 3261 - Butt Heat fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing.

264210 - CATHODIC PROTECTION INSTALLATION

- A. Applicable Standards:
 1. American National Standards Institute (ANSI):
 - a. C2 - National Electrical Safety Code.
 2. American Society for Testing and Materials (ASTM):
 - a. D2774 - Underground Installation of Thermoplastic Pressure Piping.
 - b. D2855 - Making Solvent-Cemented Joints with PVC Pipe and Fittings.
 3. National Fire Protection Association (NFPA):
 - a. 70 - National Electrical Code.
 4. National Association of Corrosion Engineers (NACE):
 - a. RP-01-69 - Recommended Practice - Control of External Corrosion on Underground or Submerged Metallic Piping Systems.
 - b. RP-05-72 - Recommended Practice - Design, Installation, Operation and Maintenance of Impressed Current Deep Groundbeds.

265000 - LIGHTING, RECEPTACLES AND CONTROLLING DEVICES

- A. Applicable Standards:
 1. American National Standards Institute (ANSI):
 - a. WD6 - Dimensions of Caps, Plugs and Receptacles (ANSI/NEMA).
 - b. C62 Series: Surge voltages.
 - c. C78 Series:
 - (1) Electric Discharge Lamps (Fluorescent).
 - (2) Electric Discharge Lamps (HID).
 - d. C81 Series - Electric Lamp Bases and Holders.
 - e. C82 Series - Lamp Ballasts.
 - f. Z55.1.24 - No. 24 Dark Gray Finish.
 2. Certified Ballast Manufacturers (CBM).
 3. Electrical Testing Laboratories (ETL).
 4. Illuminating Engineering Society of North America (IESNA).
 5. National Fire Protection Association (NFPA):
 - a. 70 - National Electric Code (NEC).
 6. National Electrical Manufacturers Association (NEMA).
 7. Reflector and Lamp Manufacturers (RLM) Standards Institute (RLMSI):
 - a. Industrial Lighting Units.
 8. Underwriters' Laboratories, Inc. (UL):
 - a. 943 - Ground-Fault Circuit Interrupters.
 - b. 8750 - Light Emitting Diode (LED) Equipment for Use in Lighting Products
 9. National Appliance Energy Conservation Act of 1987 (Public Law 100-357).
 10. Energy Policy Act of 1992 (Public Law 102-486).

275116 - INTERCOMMUNICATIONS AND PUBLIC ADDRESS SYSTEM

- A. Applicable Standards:

1. National Fire Protection Association (NFPA):
 - a. 70 - National Electrical Code (NEC).
2. Underwriters Laboratories, Inc. (UL):
 - a. 813 - Commercial Audio Equipment.
3. American with Disabilities Act (ADA).
4. Factory Mutual, Inc. (FM).

312050 – SITE PREPARATION AND EARTHWORK

A. Applicable Standards:

1. American Society for Testing and Materials (ASTM) (Equivalent AASHTO standards may be substituted as approved):
 - a. C33 - Concrete Aggregates.
 - b. C88 - Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate.
 - c. C94 - Ready-Mix Concrete.
 - d. C144 - Aggregate for Masonry Mortar.
 - e. C150 - Portland Cement.
 - f. C173 - Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
 - g. C231 - Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
 - h. C403 - Test Method for Time of Setting of Concrete Mixtures by Penetration Resistance.
 - i. C618 - Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
 - j. C939 - Test Method for Flow of Grout for Preplaced-Aggregate Concrete (Flow Cone Method).
 - k. C940 - Test Method for Expansion and Bleeding of Freshly Mixed Grouts for Preplaced-Aggregate Concrete in the Laboratory.
 - l. D698 - Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³).
 - m. D1556 – Test Method for Density and Unit Weight of Soil in Place by the Sand Cone Method.
 - n. D1557 – Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³).
 - o. D2167 - Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
 - p. D2487 - Classification of Soils for Engineering Purposes (Unified Soil Classification System).
 - q. D3776 – Test Methods for Mass per Unit Area (Weight) of Fabric.
 - r. D4253 - Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table.
 - s. D4254 - Test Methods for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density.
 - t. D4318 - Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
 - u. D4546 - Test Methods for One-Dimensional Swell or Collapse of Cohesive Soils.
 - v. D4632 - Test Method for Grab Breaking Load and Elongation of Geotextiles.

- w. D4751 - Test Method for Determining Apparent Opening Size of a Geotextile.
- x. D4832 - Test Method for Preparation and Testing of Controlled Low Strength Material (CLSM) Test Cylinders.
- y. D4833 - Test Method for Index Puncture Resistance of Geomembranes and Related Products.
- z. D6938 - Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).
- 2. Kentucky Transportation Cabinet Standard Specifications for Road and Bridge Construction.
 - a. Section 601 – Concrete.
 - b. Section 805 – Coarse Aggregates.

321100 – CRUSHED ROCK BASE AND SURFACE COURSE

- A. Applicable Standards:
 - 1. American Society for Testing and Materials (ASTM): Equivalent AASHTO standards may be substituted as approved.
 - a. C29 –Test Method for Bulk Density (“Unit Weight”) and Voids in Aggregate.
 - b. C88 Test Method for Soundness of Aggregates by use of Sodium Sulfate or Magnesium Sulfate.
 - c. C117 – Test Method for Materials Finer than No. 200 Sieve in Mineral Aggregates by Washing.
 - d. C131 – Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
 - e. C136 – Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - f. D75 – Practice for Sampling Aggregates.
 - g. D698 – Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³).
 - h. D2419 – Test Method for Sand Equivalent Value of Soils and Fine Aggregate.
 - i. D4318 – Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
 - j. D6938 - Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).
 - 2. Kentucky Transportation Cabinet Standard Specification for Road and Bridge Construction.
 - a. Section 805 – Coarse Aggregates.

329200 - SEEDING

- A. Applicable Standards:
 - 1. Kentucky Transportation Cabinet Standard Specifications:
 - a. Section 212 – Erosion Control.

334100 - STORM DRAINAGE SYSTEM

- A. Applicable Standards:
 - 1. American Society for Testing and Materials (ASTM):
 - a. C76 - Reinforced Concrete Culvert, Storm Drain and Sewer Pipe.
 - b. C270 - Mortar for Unit Masonry.
 - c. C443 - Joints for Concrete Pipe and Manholes, Using Rubber Gaskets.

- d. C478 - Precast Reinforced Concrete Manhole Sections.
- e. C506 - Reinforced Concrete Arch Culvert, Storm Drain, and Sewer Pipe.
2. American Association of State Highway and Transportation Officials (AASHTO):
 - a. M252 - Corrugated Polyethylene Drainage Pipe.
 - b. M294 – Standard Specification for Corrugated Polyethylene Pipe, 12” to 60” Diameter.

411209 - BELT CONVEYORS

A. Applicable Standards:

1. American Gear Manufacturers Association (AGMA):
 - a. 151.02 - Application Classification for Helical, Herringbone and Spiral Bevel Gear Speed Reducers.
 - b. 250.02 - Lubrication of Industrial Enclosed Gearing.
 - c. 420.04 - Practice for Helical and Herrington Gear Speed Reducers and Increasesers.
2. American Iron and Steel Institute (AIS):
 - a. C-1042.
 - b. C-1045.
 - c. C-4140.
3. American National Standards Institute (ANSI):
 - a. B15.1 - Safety Standards for Mechanical Power Transmission Apparatus.
 - b. B20.1 - Safety Standards for Conveyors and Related Equipment.
 - c. B105.1 - Welded Steel Conveyor Pulleys with Compression-Type Hubs.
 - d. Z535.4 - Product Safety Signs and Labels.
4. American Society of Mechanical Engineers (ASME):
 - a. B106.1M - Code for the Design of Transmission Shafting.
5. American Society for Testing and Materials (ASTM):
 - a. A36 - Structural Steel.
 - b. A167 - Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
6. American Bearing Manufacturer's Association (ABMA).
7. Conveyor Equipment Manufacturer's Association (CEMA):
 - a. Belt Conveyors for Bulk Materials.
8. Mine Safety and Health Administration (MSHA).
9. National Electrical Manufacturer's Association (NEMA).
10. Rubber Manufacturers Association (RMA):
 - a. Conveyor and Elevator Belting Handbook.

411230 - CHUTES, HOPPERS, AND GATES

A. Applicable Standards:

1. American Institute of Steel Construction (AISC):
 - a. Manual of Steel Construction.
 - b. Quality Criteria and Construction Standards.
2. American Iron and Steel Institute (AIS):
 - a. C-1042.
 - b. C-1045.
 - c. C-4140.
3. American Society for Testing and Materials (ASTM):
 - a. A6 - General Requirements for Rolled Plates for Structural Use.

- b. A36 - Carbon Structural Steel.
- c. A666 - Austenite Stainless Steel, Sheet, Strip, and Flat Bar for Structural Applications.
4. American Welding Society (AWS):
 - a. D1.1 - Structural Welding Code - Steel.
5. National Electrical Code (NEC).
6. National Electrical Manufacturers Association (NEMA).

411250 - SAFETY GUARDS AND CAGES

- A. American Society of Mechanical Engineers (ASME):
 1. B15.1 – Safety Standard for Mechanical Power Transmission Apparatus.
 2. B20.1 - Safety Standards for Conveyors and Related Components.

411435 – BELT SCALES

- A. Applicable Standards:
 1. Weighing and Inspection Bureau (applicable to area) or National Institute of Standards and Technology (NIST), Handbook 44 (whichever applicable).
 2. Conveyor Equipment Manufacturers Association (CEMA):
 - a. Belt Conveyors for Bulk Materials Manual - latest edition.
 3. National Electric Code (NEC).
 4. National Electrical Manufacturers Association (NEMA).
 5. National Type Evaluation Program (NTEP).

411525 – CONTROL DEVICES FOR MATERIAL HANDLING

- A. Applicable Standards:
 1. American National Standard Institute (ANSI):
 - a. B20.1 - Safety Standards for Conveyors and Related Equipment.
 2. American Society for Testing and Materials (ASTM).
 3. Institute of Electrical and Electronics Engineers (IEEE).
 4. International Power Cable Engineers' Association (IPCEA).
 5. National Institute of Standards and Technology, Handbook 44 (where specified for load cells).
 6. National Fire Protection Association (NFPA):
 - a. 70 - National Electrical Code (NEC).
 - b. 850 - Recommended Practice for Fire Protection for Electric Generating Plants and High Voltage Direct Current Converter Stations.
 7. National Electrical Manufacturers' Association (NEMA).
 8. National Electric Safety Code (NESC).

485272 - BOTTOM ASH EQUIPMENT

- A. American National Standards Institute (ANSI):
 1. B29.1 - Precision Power Transmission Roller Chains, Attachments, and Sprockets.
- B. American Society for Testing and Materials (ASTM):
 1. A283 - Low and Intermediate Tensile Strength Carbon Steel Plates of Structural Quality.
- C. Society of Automotive Engineers (SAE):
 1. SP-68 - Inverted Tooth (Silent) Chain and Sprocket Teeth.

485280 - FLY ASH & GYPSUM EQUIPMENT

- A. Air Movement and Control Association, Inc. (AMCA).
- B. American Society of Mechanical Engineers (ASME):
 - 1. B16.1 – Cast Iron Pipe Flanges and Flanged Fittings.
 - 2. B16.5 – Pipe Flanges and Flanged Fittings.
- C. American Society for Testing and Materials (ASTM):
 - 1. A283/A283M - Low and Intermediate Tensile-Strength Carbon-Steel Plates, Shapes, and Bars.
- D. National Electrical Manufacturer's Association (NEMA).

485290 - ASH HANDLING PIPING, VALVES & FITTINGS

- A. American Society for Testing and Materials (ASTM):
 - 1. A53 - Welded and Seamless Steel Pipe.

485295 - ASH HANDLING INSTRUMENTS & CONTROLS

- A. American Society of Mechanical Companies (ASME):
 - 1. B31.1 - Power Piping.
- B. National Electrical Manufacturer's Association (NEMA).

485422 - HORIZONTAL END-SUCTION PUMPS

- A. American Bearing Manufacturer's Association (ABMA).
- B. American National Standards Institute (ANSI).
- C. American Water Works Association (AWWA).
- D. Hydraulic Institute (HI).
- E. American Welding Society (AWS).
- F. American Society for Testing and Materials (ASTM).
- G. Society for Protective Coatings (SSPC).

485435 – VERTICAL CAN PUMPS

- A. American Bearing Manufacturer's Association (ABMA).
- B. American National Standards Institute (ANSI).
- C. American Water Works Association (AWWA).
- D. Hydraulic Institute (HI).
- E. American Welding Society (AWS).
- F. American Society for Testing and Materials (ASTM).
- G. Society for Protective Coatings (SSPC).

485460 - HORIZONTAL HARD METAL SLURRY PUMPS

- A. American Bearing Manufacturers Association (ABMA).
- B. American National Standards Institute (ANSI).
- C. American Society for Testing and Materials (ASTM).
- D. American Society of Mechanical Engineers (ASME).
- E. American Welding Society (AWS).
- F. American Water Works Association (AWWA).
- G. Hydraulic Institute (HI).
- H. National Electrical Manufacturers Association (NEMA).
- I. Society for Protective Coatings (SSPC).

485502 – COMPRESSED AIR SYSTEM EQUIPMENT

- A. American Gear Manufacturers Association (AGMA):
 - 1. 421-06.

- B. American National Standards Institute (ANSI):
 - 1. B31.1 - Power Piping.
 - 2. C2 - National Electrical Safety Code.
- C. American Society for Testing and Materials (ASTM):
 - 1. A53 - Pipe, Steel, Black and Hot-Dipped, Zinc Coated Welded and Seamless.
- D. American Society of Mechanical Engineers (ASME):
 - 1. B19.1 – Safety Standard for Air Compressor Systems.
 - 2. B19.3 – Safety Standard for Compressors for Process Industries.
 - 3. B31.1 – Power Piping.
 - 4. Section VIII. Code for Unfired Pressure Vessels.
- E. Institute of Electrical and Electronics Engineers (IEEE):
- F. Heat Exchange Institute (HEI).
- G. National Electrical Manufacturers Association (NEMA).
- H. National Electrical Code (NEC).

485660 – FIELD ERECTED TANKS

- A. Design and fabricate tanks in accordance with the applicable provisions of standards including, but not limited to, the following:
 - 1. American Water Works Association (AWWA):
 - a. D100 - Steel tanks for water storage.
 - b. D102 - Painting steel tanks.
 - 2. American Society of Testing and Materials (ASTM):
 - a. A36 - Carbon Structural Steel.
 - b. A53 - Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
 - c. A106 - Seamless Carbon Steel Pipe for High-Temperature Service.
 - d. A181 - Forgings, Carbon Steel for General-Purpose Piping.
 - e. A283 - Low and Intermediate Steel Plates of Structural Quality.
 - f. A285 - Low and Intermediate Steel Plates for Pressure Vessels.
 - g. A307 - Carbon Steel Externally Threaded Standard Fasteners.
 - h. A312 - Seamless and Welded Austenitic Stainless Steel Pipe.
 - i. A515 - Carbon Steel Plates for Pressure Vessels for Intermediate and Higher Temperature Service.
 - 3. American Welding Society (AWS):
 - a. A5.1 - Mild Steel Arc-Welding Electrodes.
 - b. Standard Welding Terms and Definitions.
 - c. Standard Welding Symbols.
 - 4. American National Standards Institute (ANSI):
 - a. B16.5 - Steel Pipe Flanges.
 - b. B16.9 - Steel Butt Weld Fittings.
 - c. B16.11 - Steel Socket Weld Fittings.
 - d. B16.25 - Butt Welding Ends.
 - 5. American Society of Mechanical Engineers (ASME):
 - a. Boiler and Pressure Vessel Code, Sections II and IX.
 - 6. Society for Protective Coatings (SSPC) Surface Preparation Specifications:
 - a. SP1 - Solvent Cleaning.
 - b. SP3 - Power Tool Cleaning.
 - c. SP5 - Blast Cleaning to White Metal.
 - d. SP6 - Commercial Blast Cleaning.
 - e. SP8 - Pickling.
 - 7. American Petroleum Institute (API):
 - a. Specifications for Welded Oil Storage Tanks, API Standard 650.
 - 8. National Fire Protection Association (NFPA):
 - a. National Fire Codes, Sections 22, 30, 37.

9. Occupational Safety and Health Act (OSHA).

485935 - POWER PIPING WELDING AND FABRICATION

- A. Applicable Codes and Standards:
 1. American National Standards Institute (ANSI):
 - a. B16.25 - Butt-welding Ends.
 2. American Society of Mechanical Engineers (ASME):
 - a. B31.1 - Code for Pressure Piping - Power Piping.
 - b. Boiler and Pressure Vessel Code.
 - c. LOS-1M - Recommended Practices for Cleaning, Flushing and Purification of Steam and Gas Turbine Lubrication Systems.
 3. American Welding Society (AWS).
 4. Pipe Fabrication Institute (PFI):
 - a. ES3 - Fabricating Tolerances.
 - b. ES16 - Access Holes, Bosses and Plugs for Radiographic Inspection of Pipe Welds.
 - c. ES21 - Internal Machining and Fit-up of GTAW Root Pass Circumferential Butt Welds.
 - d. ES24 - Pipe Bending Methods, Tolerances, Process and Material Requirements.
 5. Society for Protective Coatings (SSPC):
 - a. SP3 - Power Tool Cleaning.
 - b. SP5 - White Metal Blast Cleaning.
 - c. SP6 - Commercial Blast Cleaning.

485940 – POWER PIPING HANGERS & SUPPORTS

- A. Applicable Codes and Standards:
 1. American Society of Mechanical Engineers (ASME):
 - a. B31.1 - Code for Pressure Piping - Power Piping.
 - b. Boiler and Pressure Vessel Code.
 2. American Society of Testing and Materials (ASTM):
 - a. A125 - Steel Springs, Helical, Heat-Treated.
 - b. A193 - Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature Service.
 - c. A194 - Carbon and Alloy Steel Nuts for Bolts for High Pressure or High-Temperature Service.
 - d. A335 - Seamless Ferritic Alloy-Steel Pipe for High-Temperature Service.
 - e. A387 - Pressure Vessel Plates, Alloy Steel, Chromium-Molybdenum.
 3. Manufacturers Standardization Society of the Valve and Fittings Industry (MSS):
 - a. SP58 - Pipe Hangers and Supports - Materials Design and Manufacture.
 - b. SP69 - Pipe Hangers and Supports - Selection and Application.
 - c. SP89 - Pipe Hangers and Supports - Fabrication and Installation Practices.
 - d. SP90 - Guideline on Terminology for Pipe Hangers and Supports.
 4. Society of Protective Coatings (SSPC) Surface Preparation Specifications:
 - a. SP1 - Solvent Cleaning.
 - b. SP3 - Power Tool Cleaning.
 - c. SP5 - White Metal Blast Cleaning.
 - d. SP6 - Commercial Blast Cleaning.

- e. SP10 - Near-White Blast Cleaning.
- f. SP11 - Power Tool Cleaning to Bare Metal.

485965 - EQUIPMENT ERECTION

- A. Applicable Codes and Standards:
 - 1. Erect, install, weld, and test Equipment and Materials in accordance with the following codes and standards:
 - a. American National Standards Institute (ANSI):
 - (1) B16.25 - Butt Welding Ends.
 - (2) B31.1 - Code for Pressure Piping, Power Piping Section, hereinafter referred to as the Power Piping Code.
 - b. American Society of Mechanical Engineers (ASME):
 - (1) Boiler and Pressure Vessel Code.
 - c. American Waterworks Association (AWWA).
 - d. Pipe Fabrication Institute (PFI):
 - (1) Standard ES-1 - End Preparation and Machined Backing Rings for Butt Welds.
 - (2) Standard ES-5 - Cleaning Fabricated Piping.
 - (3) Standard ES-21 - Manual Gas Tungsten Arc Welding End Preparation.
 - e. American Society of Testing and Materials (ASTM):
 - (1) A304 - Steel Bars, Alloy, Subject to End Quench Hardenability Requirements.
 - (2) C150 - Specification for Portland Cement.
 - (3) C157 - Test Method for Length Change of Hardened Hydraulic Cement Mortar and Concrete.
 - f. Manufacturers Standardization Society of the Valves and Fittings Industry (MSS):
 - (1) MSS Standard Practice SP-58 - Pipe Hangers and Supports.
 - g. Society for Protective Coatings (SSPC):
 - (1) Surface Preparation Standard SP-1: Solvent Cleaning.
 - h. American Welding Society (AWS):
 - (1) D1.1 - Structural Welding Code.
 - i. Underwriters Laboratories (UL):
 - (1) Building Materials Directory.

485990 – ERECTION AND INSTALLATION OF POWER PIPING

- A. American Society of Mechanical Engineers (ASME):
 - 1. Boiler and Pressure Vessel Code.
 - 2. B31.1 - Code for Pressure Piping - Power Piping.
- B. American Welding Society (AWS).
- C. Pipe Fabrication Institute (PFI):
 - 1. ES-3 - Fabricating Tolerances.