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# **Appendix P**

## Technical Design Standards and Codes



The following is a listing of technical codes and standards that would be applied to the design of the Ventura Compressor Station Modernization Project, as applicable.

### Structural

- ACI 318, Building Code Requirements for Structural Concrete
- ACI 350.3, Seismic Design of Liquid-Containing Concrete Structures and Commentary
- ACI 351.2R, Foundation for Static Equipment
- ACI 351.3R, Foundation of Dynamic Equipment
- ACI 530/ASCE 5/TMS 402, Building Code requirements for Masonry Structures
- AISC, Steel Construction Manual, 14th Edition
- AISI S100, North American Specification for the Design of Cold-Formed Steel Structural Members
- AISC 341, Seismic Provisions for Structural Steel Building
- AISC 360, Specification for Structural Steel building
- ASCE 37, Design Loads on Structures during Construction
- ASCE 7-16, Minimum Design Loads for Building and other Structures
- ASCE 41140, Guidelines for Seismic Evaluation and Design of Petrochemical Facilities
- ASCE 40262, Guidelines for Wind Loads and Anchor Bolt Design for Petrochemical Facilities
- AWS D1.1, Structural Welding Code – Steel
- AWS D14.1, Specifications for Welding Industrial and Mill Cranes and Other Material Handling Equipment
- CBC, California Building Code
- STC01015, Structural Design Criteria
- STE01100, Constructability Design Guide
- STE02465, Augured Cast-in-Place Piles Design Guidelines
- STE03350, Vertical Vessel Foundation Design Guide
- STE03360, Heat Exchanger and Horizontal Vessel Foundation Design Guide
- STE05121, Application of ASCE Anchorage Design for Petrochemical Facilities
- STS02465, Augured Cast-in-Place Piles Installation Specification
- STS03001, Plain and Reinforced Concrete Specification
- STS03600, Nonshrink Cementitious Grout Specification
- STS03601, Epoxy Grout Specifications
- STS05120, Structural and Miscellaneous Steel Fabrication Specification
- SSPC, Steel Structure Painting Council
- RCSC, Specification for Structural Joints Using High Strength Bolts

### Civil

- TGM, Ventura County Technical Guidance Manual for Stormwater Quality Measures
- City of Ventura Stormwater Programs, Post Construction Stormwater Requirements

- CVC01015, Civil Design Criteria
- CVS02100, Site Preparation, Excavation, and Backfill Specification
- CVS02700, Underground Gravity Sewers Specification
- CVI02720, Sewer Details
- CVS02350, Roadway and Area Paving Construction Specification
- CVS02830, Chain Link Fence and Gates Installation Specification
- CTSE1000, Application of External Coating

### Architectural

- ASHRAE, American Society of Heating, Refrigerating, and Air-Conditioning Engineers Handbook
- ASHRAE, Handbook – HVAC Applications
- ASHRAE, Handbook – HVAC Systems and Equipment
- ASHRAE STD 52.2, Filters, General Ventilation Air-Cleaning Devices
- ASHRAE STD 55, Thermal Environmental Conditions for Human Occupancy
- ASHRAE STD 62, Ventilation for Acceptance Indoor Air Quality
- ASHRAE STD 90.1, Energy Standard for Buildings Except Low-Rise Residential Buildings
- CFC, California Fire Code
- CPC, California Plumbing Code
- NFPA 10, Standard for Portable Fire Extinguishers
- NFPA 13, Standard for the Installation of Sprinkler Systems
- NFPA 20, Standard for the Installation of Stationary Pumps for Fire Protection
- NFPA 24, Installation of Private Fire Service Mains and Their Appurtenances
- NFPA 30, Flammable and Combustible Liquids Code
- NFPA 72, National Fire Alarm and Signaling Code
- NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems
- NFPA 90B, Standard for the Installation of Warm Air Heating and Air-Conditioning Systems
- NFPA RP 101, Life Safety Code
- NFPA 750, Standard on Water Mist Fire Protection System
- NFPA 2001, Standard on Clean Agent Fire Extinguishing Systems
- MBMA, Metal Building Manufacturers Association

### Electrical

- API 500, Recommended Practice for Classification of Locations for Electrical Installation at Petroleum Facilities Classified as Class I, Division I and Division 2
- IEC 61508, Electrical/Programmable Electronic Safety - related systems
- IEC 61511, Functional Safety – Safety Instrumented Systems for the Process Industry Sector
- IEEE NESC, National Electrical Safety Code

- IEEE 841, Totally Enclosed Fan-Cooled (TEFC) Squirrel Cage Induction Motors
- ELSGL01, Electrical Construction Specification
- ELSGL01D, Data Sheet for Electrical Construction
- ELSPS01, Electrical Requirements for Packaged Equipment
- ELTFT01, Electrical Equipment and Systems Field Inspection, Testing, and Commissioning
- NFPA 70, National Electrical Code
- NFPA 70E, Standard for Electrical Safety in the Workplace
- NFPA 77, Recommended Practice on Static Electricity
- NFPA 79, Electrical Standard for Industrial Machinery
- NFPA 496, Standard for Purged and Pressurized Enclosures for Electrical Equipment
- NFPA 497, Recommended Practice for the Classification of Flammable Liquids, Gases, or Vapors and Hazardous Locations
- NFPA 780, Standard for the Installation of Lightning Protection Systems
- NFPA 850, Recommended Practice for Fire Protection for Electric Generating Plants and High Voltage Direct Current Converter Stations
- NFPA 37, Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines

### Process/Mechanical

- ANSI B16, Face to Face and End to End Dimensions of Valves
- ANSI B40.1, Gauges - Pressure Indicating Dial Type - Elastic Element
- API 520, Sizing, Selection and Installation of Pressure Relieving Devices
- API 521, Pressure Relieving and Depressuring Systems
- API 541, Form-Wound Squirrel Cage Induction Motors – 375kW (500HP) and Larger
- API 546, Generators
- API 614, Lube Oil
- API 618, Reciprocating Compressors for Petroleum, Chemical, and Gas Industry Services
- API 661, Air Cooled Heat Exchanger
- API 670, Machinery Protection Systems
- API 674, Positive Displacement Pumps – Reciprocating
- API 1104, Welding of Pipelines and Related Facilities
- API RP 520, Design and Installation of Pressure Relieving Systems in Refineries
- API RP 526, Flanged Steel Safety Relief Valves
- API RP 550, Manual on Installation of Refinery Instruments and Control Systems
- API RP 686, Recommended Practice for Machinery Installation & Installation Design
- API Std 650, Welded Steel Tank for Oil Storage
- API Std 2000, Venting Atmospheric and Low-Pressure Storage Tanks
- ASME, Performance Test Codes (PTCs) – Applicable Test Codes
- ASME Section II, Materials Specification

- ASME Section V, Nondestructive Examination
- ASME Section VIII, Div. 1 – Unfired Pressure Vessels
- ASME Section IX, Welding & Brazing Qualifications
- ASME B30.2, Overhead and Gantry Cranes
- ASME B30.11, Monorails and Underhung Cranes
- ASME B30.16, Overhead Hoist (Underhung)
- ASME B30.17, Overhead and Gantry Cranes (Top Running, Single Girder, Underhung Hoist)
- ASME B31.3, Process Piping Design
- ASME B31.8, Gas Transmission and Distribution Piping Code
- ASME B36.19, Stainless Steel Pipe
- ASME B73.1, Horizontal Centrifugal Pumps
- PLC00005, Design of ASME B31.8 Metallic Pipeline Systems within Facilities
- PLE00006, Cathodic Protection Systems for Pipelines
- PLE00012, Piping Examination and Leak Testing Guide – B31.8 Pipelines
- PLSC00001, Fabrication and Examination of ASME 31.8 Metallic Piping
- PLSC0011, Trenching and Excavation for Pipelines
- PLSC0012, Stringing of Pipelines
- PLSC0014, Backfilling of ASME B31.4 and B31.8 Metallic & Nonmetallic Pipelines
- PLSC0019, Specification for Pressure Testing HDPE Plastic Pipeline Systems
- PLSC0021, Leak Testing of Piping System
- PNSC0011, Installation of ASME B31.3 Metallic Piping
- PNSC0021, Leak Testing of Piping
- PNSC0036, Installation of High Density Polyethylene (HPDE) Piping
- PNSM0105, Purchasing Requirement for Gaskets
- PNSM0110, Purchasing Requirement for Valves
- PNSM0115, Purchasing Requirement for Pipe
- PNSM0116, Purchasing Requirement for Fittings and Flanges
- PNSM0117, Purchasing Requirement for Flanges
- PNSM0120, Purchasing Requirement for Bolting

### Instrumentation and Controls

- ISA 5.1, Instrument Symbols and Identification
- ISA 5.2, Binary Logic Diagrams for Process Operations
- ISA 5.3, Graphic Symbols for Distributed Control/Shared Display Instrumentation, Logic and Computer Systems
- ISA 5.4, Instrument Loop Diagrams
- ISA 5.5, Graphic Symbols for Process Displays
- ISA 7, Quality Standard for Instrument Air

- ISA 12, Electrical Equipment for Hazardous Locations
- ISA 18.1, Annunciator Sequences & Specs
- ISA 18.2, Management of Alarm Systems for the Process Industries
- ISA 20, Specs Forms for Process Measurement & Control Instruments
- ISA 37, Measurement Transducers
- ISA 45, Enterprise/Control Integration
- ISA 50, Signal compatibility of Electrical Instruments
- ISA 51.1, Process Instrument Terminology
- ISA 71, Environmental Conditions for Process Measurement & Control
- ISA 75, Control Valve Standards
- ISA 82.03, Safety Standard for Electrical & Electronic Test, Measuring, Controlling & Related Equipment
- ISA 84, Functional Safety; Safety Instrumented Systems for the Process Industry Sector
- ISA 84.91.01-2012, Identification and Mechanical Integrity of Safety Controls, Alarms, and Interlocks in the Process Industry
- ISA 91.00.01, Identification of ESD Systems & Controls That Are Critical to Maintaining Safety in Process Industries
- ISA 92, Performance Requirements for Toxic Gas Detectors
- ISA 96.02.01, Guidelines for the specification of Electric Valve Actuators
- ISA 99, Security for Industrial Automation & Control Systems
- ISA RP 42.00.01, Nomenclature for Instrument Tube Fittings
- ISA 101.01, Human Machine Interface for Process Automation System

## General

- AGA 3, American Gas Association Gas Measurement Committee Report No. 3
- AGA 9, American Gas Association Gas Measurement Committee Report No. 9
- AGA XL1001, Classification of Locations for Electrical Installations in Gas Utility Areas
- PHMSA 49 CFR Part 192, Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards
- OSHA – 29 CFR 1910, U.S. Occupational Safety and Health Standards
- OSHA – 29 CFR 1926, Safety and Health Regulations for Construction
- ISO, International Organization for Standardization

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