

**CIVIL ENGINEERING DESIGN AND CRITERIA**

## **Civil Engineering Design Criteria**

### **1.0 Introduction**

This appendix summarizes the codes, standards, criteria, and practices that will be generally used in the design and construction of civil engineering systems for the Panoche Energy Center (PEC). More specific project information will be developed during execution of the project to support detailed design, engineering, material procurement specification, and construction specifications as required.

### **2.0 Codes and Standards**

The design of civil engineering systems for the project will be in accordance with the laws, ordinances, and regulations of the federal government, the State of California, and Fresno County, local ordinances and industry standards. The most current issue or revision of rules, regulations, codes, ordinances, and standards at the time of filing this Application for Certification will apply, unless otherwise noted. If there are conflicts between cited documents, the more conservative requirements will be used.

#### **2.1 Civil Engineering Codes and Standards**

The following codes and standards are applicable to the civil engineering design of the power facility:

- American Association of State Highway and Transportation Officials (AASHTO)
- American Concrete Institute (ACI)
- American Institute of Steel Construction (AISC)
- American National Standards Institute (ANSI)
- American Society for Testing and Materials (ASTM)
- American Water Works Association (AWWA)
- American Welding Society (AWS)
- Asphalt Institute (AI)
- California Building Code (CBC)
- California Department of Transportation (Cal Trans)
- California Energy Commission – Recommended Seismic Design Criteria for Non-Nuclear Generating Facilities in California
- Concrete Reinforcing Steel Institute (CRSI)
- Factory Mutual (FM)
- Federal and California Occupational Safety and Health Administration (OSHA and CAL-OSHA)
- National Fire Protection Association (NFPA)

- Steel Structures Painting Council (SSPC)

## **2.2 Engineering Geology Codes, Standards, and Certifications**

Engineering geology activities will conform to the applicable federal, state, and local laws, regulations, ordinances and industry standards.

### **2.2.1 Federal**

None are applicable

### **2.2.2 State**

The Warren-Alquist Act, PRC, Section 25000 et seq. and the California Energy Commission (CEC) Code of Regulations (CCR), Siting Regulations, Title 20 CCR, Chapter 2, require that the Application for Certification (AFC) address the geologic and seismic aspects of the project.

The California Environmental Quality Act (CEQA), PRC 21000 et seq. and the CEQA Guidelines require that potentially significant effects, including geologic hazards, be identified and a determination made as to whether they can be substantially reduced.

### **2.2.3 Local**

California State Planning Law, Government Code Section 65302, requires each city and county to adopt a general plan, consisting of nine mandatory elements, to guide its physical development. Section 65302(f) requires that a seismic safety element be included in the general plan.

The project development activities will require certification by a Professional Geotechnical Engineer and a Professional Engineering Geologist during and following construction, in accordance with the CBC, Chapter 33 and Appendix Chapter 33. The professional Geotechnical Engineer and /or the Professional Engineering Geologist will certify the placement of earthen fills and the adequacy of the site for structural improvements, as follows:

Both the Professional Geotechnical Engineer and the Professional Engineer will address CBC Appendix Chapter 33, Sections 3309 (Grading Permits), 3312 (Cuts), 3313 (Fills), 3315 (Terraces), 3316 (Erosion Control), and 3318 (Final Reports).

The Professional Geotechnical Engineer will also address CBC Appendix Chapter 33, Sections 3314 (Setbacks) and 3315 (Terraces).

Additionally, the Professional Engineering Geologist will present findings and conclusions pursuant to PRC, Section 25523 (a) and (c); and 20 CCR, Section 1752 (b) and (c).

## **2.3 Storm Drainage Codes, Standards, and Certifications**

Storm drainage design activities will conform to the applicable federal, state, and local laws, regulations, ordinances and industry standards. The design of all storm drainage will be performed by, or under the direct supervision of, a licensed civil engineer.

### **2.3.1 Federal**

Finish floors and grade elevations shall be based upon flood plain elevations as established by the Federal Emergency Management Agency.

### **2.3.2 State**

None are applicable

### **2.3.3 Local**

The County of Fresno County has specific design requirements for storm water management that will be met by this project.