Kimley»Horn

AWS PHX062 – Site Plan Amendment Narrative

This Site Plan Amendment is to update the previously approved Site Plan (ZON24-00019) to identify the Equipment Yard with Control Building and SRP Switchyard. Also, the addition of two Sunrooms are proposed (Building C and Building D). The Sunrooms have a 10'x10' footprint, are pre-engineered steel construction walk-in-cabinets that serve as above ground fiber vaults. These buildings are considered unoccupied and are private (not accessed by the public). The reason for this application is to allow the owner to build owner-owned infrastructure that will support the primary use of this project. For context, this portion of the project is immediately adjacent to the SRP owned switchyard/substation that will serve this site. This application includes minor structures that will allow the site to take the electricity from SRP and use it to support the established use on the site. The equipment detailed in this application is only for the use of the owner. This equipment will not be used to provide electricity to anyone other than the owner. Equipment that will be included in the Equipment Yard will consist of private transformers and associated electrical equipment.

The owner's equipment yard includes essential electrical components and a control house that allow the site to receive power from SRP and use it to support its operations. Electricity enters the yard through overhead lines and is guided through various equipment that helps monitor, manage, and adjust the power as needed. This process ensures the energy is safely and efficiently prepared for use on-site, with systems in place to measure performance and maintain reliability.

Dead-end Structure

A dead-end structure is a steel framework, constructed from galvanized steel, used to support and terminate high-voltage transmission lines. It serves as a mechanical anchor point for conductors, transferring the tension forces safely to the ground through its foundation. This structure also acts as a transition point where overhead transmission lines connect the yard equipment. To ensure electrical isolation and mechanical support, it is equipped with insulator strings or post-type insulators. The design of the dead-end structure accommodates environmental stresses such as wind, ice, and seismic activity while maintaining safe electrical clearances.

Instrument Transformers (CT/PT)

Instrument transformers are essential components in electrical equipment yards, used for measurement and protection. Current transformers reduce high current levels to standardized, lower values suitable for input to protection relays and metering devices, allowing safe and accurate monitoring of system current. Potential transformers perform a similar function for voltage, stepping down high voltages to levels that can be safely handled by meters and protective equipment. These devices ensure electrical isolation between high-voltage circuits and low-voltage control systems, enabling precise system analysis and fault detection without exposing personnel or equipment to dangerous voltages or currents.

Disconnect Switch

A disconnect switch, also known as an isolator, is a manually or motor-operated device used to isolate specific sections of an electrical equipment yard for maintenance or inspection. It is designed to operate only when the circuit is de-energized, ensuring that no current flows through the switch during operation. The primary purpose of a disconnect switch is to provide a visible and physical break in the electrical circuit, enhancing safety for personnel working on downstream equipment. These switches are equipped with mechanical interlocks and position indicators to prevent incorrect operation and to confirm the open or closed status. Disconnect switches do not have interrupting capability and are used in conjunction with circuit breakers or load break switches when switching under load conditions.

Power Transformer

A power transformer is the central component in an electrical equipment yard responsible for voltage transformation between transmission and distribution levels. It steps voltage up or down to match system requirements, enabling efficient power flow across the grid. The transformer is housed in a steel tank filled with insulating oil, which serves both as an electrical insulator and a cooling medium. To ensure safe and reliable operation, the transformer is equipped with temperature sensors that continuously monitor the oil and winding temperatures. Advanced online monitoring systems provide real-time data on key parameters such as temperature, load, oil level, and moisture content, supporting predictive maintenance and operational diagnostics.

Metering Structure

A metering structure is a dedicated assembly within an electrical equipment yard designed for the precise measurement of power consumption essential for billing, system monitoring, and operational control. It supports metering equipment such as energy meters, current transformers (CTs), and potential transformers (PTs), which collectively measure energy consumption, voltage, current, and power factor. These measurements are used by utilities to ensure accurate billing and to monitor system performance. The structure is engineered to meet stringent utility standards for accuracy, reliability, and safety.

Lightning Mast

The primary purpose of a lightning mast is to intercept lightning strikes and safely conduct the current to the ground, protecting sensitive equipment and structures from damage. Unlike traditional lightning rods attached to a building, a lightning mast is a tall, standalone pole placed near the protected area, projecting higher than the protected zone. The mast intercepts the strike, and the current is then directed into a specialized grounding system, preventing it from damaging critical electrical devices, controllers, and the structure itself.

Control House

The control house is an electrical room whose function is to provide secure, temperature-controlled spaces for switchgear equipment and back-up batteries. The control house is not a public building, is

not going to be occupied by any person(s) and is only accessible by data center staff with key card access. It is also not a work area for anyone for any purpose other than monitoring and maintenance of equipment on as-needed basis.

The building is designed to meet the requirements of the 2018 IBC, IECC, IMC, IFC, 2017 NEC/NFPA 70 as well as local building code amendments and zoning ordinances.

CDM Smith has completed the initial design phases to set the parameters and specifications for all elements of the building. Acting as the general contractor we will hire a pre-engineered metal building supplier to provide delegated design engineering services and construction documentation for the building. It will be a standard PEMB with a clear span steel structure and insulated metal panel siding and roof panels.

The exterior massing and material selections have been made with the overall campus plan in mind. The material palette compliments colors and textures that have already been selected by the design team for the overall campus. Since this building will be comprised of IMPs as the exterior cladding material, the CDM Smith Architectural team has selected a series of metal panels that provide variety in color and texture. The rendered elevations include actual materials from a PEMB supplier that is bidding on the project.

The following sections of the Mesa Zoning Ordinance have been adhered to in our design approach:

11-7-3 – Building Massing and Scale

Wall Articulation:

- Shadow reveals are being used between different materials to break up the singular plane of the building facades by providing visual relief.

  • The 5 different metal panels also have 4 different textures (stucco, vertical ribbed, impressaclad, and flat). The panels change pretty consistently across the building facades but not in a repeating pattern. The random pattern is meant to provide further visual interest to the building.

Publicly visible facades:

- The building is set back from the property's edge, and public views of its facades are effectively screened by surrounding campus structures and landscaping. It remains minimally visible from public rights of way, while clearer views are accessible from interior campus roads, including the route connecting the guard shack to the data center. The building employs materials that match the color and tone found throughout the campus, maintaining consistency with the existing architectural style.

3 materials minimum and no more than 50% of one material:

- The material palette includes 4 different types of insulated metal panels and 5 different colors. There is less than 50% of any one material on all of the facades.

Varying Building Heights:

- The building massing is broken into thirds (approximately 42 lineal feet each). The central portion is raised 4 feet higher to provide articulation to the building massing and 2 changes in the roof lines of the building.

    • The materials used on the central taller third of the building are also different than the lower height portions to further accentuate the change in mass with a change in materiality.

Building Entrances:

- All personnel doors are painted a dark gray neutral color that offsets the entries from the surrounding materials.
- The metal panel above each personnel door is a rose-toned impressaclad textured panel. This color was selected to fit within the overall campus material palette and to further distinguish building entries.
- The 3 doors to the control room and battery room which are the main personnel entry doors are also covered with a powder coated metal awning.