

Madera Unified School District
Mr. Joe Halford, Director of Information Technology
1902 Howard Rd.
Madera CA 93637

Subject: Madera Unified District Office Server Room Remodel
HVAC and Associated Plumbing, Electrical, and Structural Detailed Scope

Dear Mr. Halford,

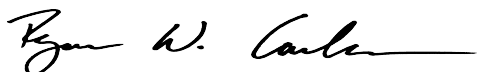
As discussed at our 2/22 meeting, please see below for a more detailed scope for the proposed project:

- As there are no existing building plans available, LEG will perform site visits to physically measure and take pictures of the Server Room and many surrounding areas as required. We'll generate a CAD floor plan, reflected ceiling plan, roof plan, and partial site plan in the area where the generator is proposed to be ground mounted. These CAD plans will be the foundation for the Structural, Electrical, and Mechanical engineers will use to show their discipline's work.
- LEG will provide a preliminary Server Room Air Conditioning unit selection as the basis for the Electrical Engineer and Structural Engineer to investigate how existing infrastructure needs to be modified to accommodate.
 - Given the size of the heat load generated in the room and the specialized nature of server room cooling, LEG proposes to use the Liebert CRV Row Based cooling system with a roof or ground mounted Air Cooled Condensing unit. The main benefits are that the units are designed to maximize Sensible Heat cooling, use digital scroll compressors and ECM fan motors to exactly match heat generation in the room and minimize temperature oscillation common to package unit compressors, and use server rack mounted temperature sensors to precisely control needed airflow and temperature. *(See attached brochure for detailed information.)* Two units will be specified to provide 100% cooling redundancy.
- A conceptual plan for the water free fire suppression system will also be prepared. This type of system is designed to initiate an alarm, suppress combustion, and cool a fire by lowering the oxygen level in the room to a level that will not harm people, but will not allow combustion to occur. The chemicals are not hazardous, not conductive, and do not leave a residue to allow the server room to return to duty immediately.
- Borrelli and Associates will specify a new 125kW diesel fuel supplied generator to power up the Madera USD main computer network distribution network room along with the main network servers and main network switches as well as the cooling system. The generator will connect to an automatic transfer switch which will be connected to the normal PG and E energy source as well to provide normal and emergency power and will automatically transfer power in the event of a power outage. The emergency power system will keep the main computer network distribution room as well as the district's main network servers and network switches online during the power outage. *(See map attached of the proposed location of the generator.)*

- The basis of design backup generator will be Cummins Power Generation or equal. The sound enclosure for the generator will provide for a maximum sound barrier. *(See attached brochure for detailed information.)*
- The existing main data room is fed with an electrical supply that is tenuous. *(See attached photo with the electrical connection indicated with the red and blue tape.)* This connection is a compression slip install conductor termination block that receives its power from the exposed live electrical bussing (see copper conducting-bus in the photo). The electrical design will also remove this in order to create an electrical system less susceptible to outage due to failure of this connection.
- The Structural engineer will conduct a site visit and above ceiling investigation to determine whether the air cooled condensing units can be mounted on a nearby roof, or if the weight exceeds structural capacity, they must be ground mounted. A conceptual plan will be prepared to accommodate the condensing units as well as the enclosure for the ground mounted generator.
- Once all preliminary investigations and design work has been done, a Schematic budget will be created and presented to the district approval to proceed or scope modification to reduce cost.
- When the conceptual budget and final scope are agreed upon, the design team will commence with the preparation of construction documents for bidding purposes. These will include any required floor, ceiling, roof, and site plans needed to show scope of work for all disciplines, detailed calculations, construction installation details, control diagrams, and material specifications.
- The design team will continue to provide support during the bid process by participating in the bid walk to answer technical questions, and pre-bid requests for information.
- During construction, the design team will provide contractor submittal review to ensure that the quality of bid products meets the design intent, conduct periodic site walks to ensure that the contractor craftsmanship meets specifications, and answer technical requests for information.
 - The assumption has been made that the District's construction administration team would handle the non-technical aspects of construction administration such as overseeing contractor scheduling, weekly oversight of contractors, pay applications, etc. The design team is on call as needed to deal with all technical questions, within the defined scope, as required to see the project to conclusion.
- Given the age of the building and the lack of existing plans, it is anticipated that as construction proceeds, issues will be uncovered that will need to be dealt with on the fly and plans adjusted to accommodate.

Sincerely,

LAWRENCE ENGINEERING GROUP



Ryan W. Carlson, P.E.
Principal

LIEBERT® CRV™ ROW-BASED COOLING

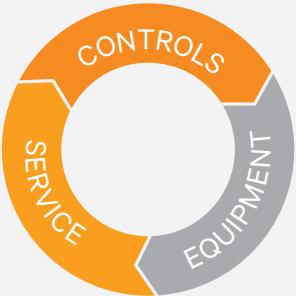
DX Cooling, 19.6 kW



2X THE CAPACITY PER SQUARE FOOT!

The Liebert® CRV™ is the Most Efficient Row-Based Cooling Solution

- Industry's Highest Delivered Row-Based Efficiency
- 2X the Capacity as the Competition
- Availability Approaching 100%
- Industry's Most Advanced Control & Performance Optimization
- Backed by the Industry's Best Service and Support



Industry's Highest Delivered Row-Based Efficiency

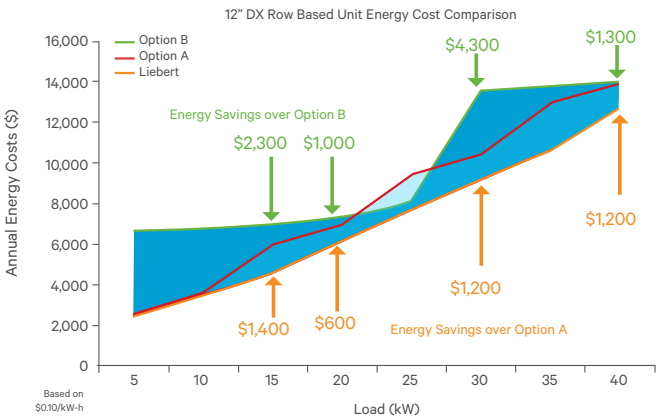
- Moving cooling closer to the source
- Digital Scroll Compressor to match load & saves energy with 80-step capacity modulation
- Variable Speed Fans to match load
- Field-adjustable air baffles - getting the air where it really needs to be



Hydrophilic Coated Coil

Availability Approaching 100%

- Hydrophilic coating to ensure no water blow off
- Emergency airflow capacity (20%)
- Real-time environmental control from rack sensors
- Automatic performance optimization with Liebert iCOM™ controls and teamwork modes
- Wellness monitor alerts users in advance of potential issues



Industry's Most Advanced Control & Performance Optimization

- Only row-based product that can separate the compressor and fan speed for the best efficiency
- Allows for six different control modes for greater flexibility
- Controls up to 20 rack sensors to ensure the correct amount of cold air is provided compared to 3 or less for the competition

Technical Data

Nominal capacity	19.6 kW, Air-Cooled, Water/Glycol
Input Voltage	208-230V, 3ph, 60Hz, 460V, 60Hz
Refrigerant	R410A
Compressor	Digital Scroll, Variable Capacity 20-100%
Refrigerant	Digital Scroll, Variable Capacity 20-100%
Controls	Liebert iCOM™ Control with large graphical display and 20 sensors for up to 10 racks
Communications	HTTP, SNMP, RS-485 Modbus, Modbus IP/BACnet IP, Liebert Site Scan(R) Web 4.0
DIMENSIONS	
Height	79 in (2000mm)
Width	12 in (300mm)
Depth	43 in (1100mm)



Backed by the Industry's Best Service and Support

- Fast and easy Installation with casters & pre-piped connections
- Both top and bottom piping and electrical connections are standard
- NO side access required
- Nationwide service through local factory trained technicians
- 24-hour customer and tech support
- Remote Monitoring delivered by data center experts
- Energy optimization services



Enclosures and tanks

35-230 kW gensets



> Specification sheet

Our energy working for you.™



Enclosure features

- 14-gauge, low carbon, hot-rolled ASTM A569 steel construction (panels)
- 12-gauge, low carbon, hot-rolled ASTM A569 steel construction (posts)
- Stainless steel hardware
- Compact footprint
- Zinc phosphate pretreatment, e-coat primer and super durable powder topcoat paint minimize corrosion and color fade
- Package listed to UL 2200
- Fuel and electrical stub-up area within enclosure perimeter
- Two or three recessed doors per side, depending on generator set dimensions, for service access
- Doors key and padlockable for added security
- Weather protective seals around all doors on sound-attenuated enclosures
- Enclosed exhaust silencer improves safety and protects against rust
- Critical sound level exhaust silencers in sound-attenuated enclosures
- Rain collar and rain cap
- Non-hydroscopic sound-attenuating material
- Easy access lifting points for spreader bars or forklift, depending on model
- Compatible with most under-set fuel tanks
- Enclosure attaches directly to generator set skid base or fuel tank, depending on model
- Designed for ambient temperatures up to 50 °C (122 °F)
- Refer to genset model cooling system data sheets for specific capabilities
- Enclosures are designed for outdoor use only

Options

- Two levels of sound attenuation, and weather protective enclosure, steel and aluminum (most models).
- Super durable powder coat painted aluminum construction minimizes corrosion and color fade, panels and posts .1" thick, ASTM B209, 5052 H32.
- Aluminum wind rated to 150 mph (per ASCE 7-05 exposure D, category 1 importance factor) (also available on some steel enclosures).
- Window for control viewing.
- Kits to up fit existing gensets or to upgrade existing enclosures with additional sound attenuation.
- Exterior oil and coolant drains with interior valves for ease of service.
- Overhead 2-point lifting brackets (some models).

Photo -1 Main Electrical supply for the district main servers.

