

HRRMC Master Plan
12/9/22
Preliminary MEP Narrative

Mechanical

- **Air handlers**
 - We anticipate that there will be a new rooftop air handler (RTU) for each of the following hospital expansion areas: Materials Management, Surgery, Imaging, Emergency Department (ED), Observation Unit (COU), and C-suite (if in expansion). During design, some adjacent expansion areas may be served by a single RTU depending on the capacity requirements.
 - For the MOB expansion, we would anticipate a single RTU to serve both floors of the expansion.
 - All RTUs will be DX cooling with heating hot water reheat similar to the existing building units. To provide redundancy
- **Split Systems**
 - DX split systems will be added as required for equipment rooms for Imaging Equipment or other critical spaces.
- **Exhaust Fans**
 - New high-plume exhaust fans will be added on the upper roof of the ED/COU expansion for the decontamination shower room, ED waiting, and any added isolation rooms.
 - Additional general exhaust fans will be added as required.
- **Steam Boilers**
 - The newly replaced steam boilers have the capacity to serve the planned expansion areas. No changes are expected other than new piping to expansion areas as needed by the program.
- **Heating Hot Water**
 - It is anticipated that there will be two new boilers and associated pumps added in Central Utility Plant (CUP) expansion to add capacity to the existing heating water system. These new boilers will interconnect with the existing and a dedicated main will be routed from the CUP through the expansion areas to the new RTUs.
 - The existing MOB heating water system will need to have a further review to determine if the system is adequate or if additional capacity will need to be added.

Electrical

- **Main Service and Normal Power Distribution**
 - With the estimated additional load of 705kVA for the new facility expansion areas, it is anticipated that Xcel Energy will need to replace their existing transformer with a new

larger unit. A transformer replacement would require the facility to run on the emergency generator for 24-48 hours.

- The main switchboard (MSB) for the hospital has spaces to accommodate additional circuit breakers that could be used to feed the facility expansion areas. However, it is unknown currently whether there is enough spare capacity on the existing MSB for the estimated additional load of 705kVA. Should there not be enough spare capacity on the existing MSB, it is proposed that a new main switchboard be installed in the new CUP area that would back feed the existing MSB and provide power distribution to the facility expansion areas, including the new parking garage. This new MSB would be fed from the new utility transformer.
- Further discussions with Xcel Energy will be needed to address the power quality and drop-off issues the facility has been experiencing, which have mostly been due to tree branch and avian contact with the overhead lines. When these types of outages occur, it can take 30 or more minutes for Xcel to restore utility power to the facility. One option to decrease the outage durations would be for Xcel to install automatic throw-over switches in their overhead distribution, potentially at the hospital's expense. Xcel has indicated they may have other options to make their service more reliable and will make recommendations on such after receipt of a formal request by HRRMC.

- Emergency Power Distribution System

- Emergency power to the facility is provided by a single 800kW 500Cummins diesel generator located in a weatherproof enclosure on the northwest side of the existing CUP.
 - The generator has approximately forty percent loading, so there should be enough spare capacity on the emergency generator for the estimated additional loads of the facility expansion areas.
 - Additional transfer switches for the Life Safety, Critical, and Equipment branches associated with the facility expansion areas will require a new emergency power distribution room to be provided in the new CUP area for the additional equipment.
- The existing generator includes a 1605-gallon main fuel tank that would allow for 30 hours of run time at full load. The minimum run time before refueling is 24 hours per 2018 FGI. HRRMC will need to determine if additional run time above this is required for operational plans. Additional fuel storage will be needed per the Code required minimum capacity of at least 133% of the minimum generator run time.
- In addition to the single emergency generator, there also is a tap box for the connection of a temporary portable generator as required per the National Electrical Code (NEC) for facilities with only one emergency generator. The connection of a temporary generator is required whenever the permanent generator is offline for maintenance or repairs. Should HRRMC want to eliminate the need, and expense, for a portable generator, then it is proposed that a second permanent generator of equal or smaller size be provided that would be paralleled with the existing one. This would then provide for a 2N or N+1 redundancy arrangement, and the paralleling gear would be in the new CUP expansion area.

- Fire Alarm System

- The existing fire alarm control panel is a Simplex 4100ES that is networkable and can support up to 3,000 addressable points. Additional control panels can be added to the

new facility expansion areas and then networked together for a single system. Additional amplifiers and power supplies would also be added to support the additional notification appliances (speakers, horns, strobes).

- Nurse Call System

- There are two existing nurse call systems in the existing facility – a Rauland Responder 4 in the original hospital and a Rauland Responder 5 in the new addition.
 - The R4 system is outdated and should be replaced with new R5 devices and main control equipment. This would include replacing all the existing R4 cabling with CAT5 cables for the new R5 system.
 - R5 devices would also be installed in the new facility expansion areas.

Plumbing

- Medical Gases

- Oxygen – The existing Bulk tank with cylinder reserve will be replaced with a new 3,000-gallon main tank and 500-gallon reserve tank in the Hyperbaric Suite project. This is being sized by Airgas to accommodate the expansions planned in the master plan. The location of the new bulk tank assembly, located on a 25'x25' concrete pad, will be coordinated with the expansion and may be placed along the access road to the side of the existing CUP.
- Medical Vacuum: The existing duplex medical vacuum pump will be reviewed for adequate capacity, but it appears an additional or larger vacuum pump assembly may be required.
- Medical Air: The existing duplex medical air compressor will be reviewed for adequate capacity, but it appears an additional or larger vacuum pump assembly may be required.
- Nitrous Oxide: It is expected that the 2x2 manifold will be adequate for the expansion
- Nitrogen: It is expected that the 2x2 manifold will be adequate for the expansion
- Carbon Dioxide: It is expected that the 2x2 manifold will be adequate for the expansion

- Domestic Water

- With the ED expansion, including the decontamination showers, it is expected that additional domestic water heaters will be required in the new CUP expansion. These will interconnect with the existing and a dedicated main will be routed from the CUP through the OR and Imaging expansion areas to the ED.
- An additional domestic cold water tap with entry may be required in the CUP expansion.

- Sanitary Waste and Vent

- A new below-ground decontamination water holding tank will be placed adjacent to the new ED expansion for service to the decontamination showers. This will have an integral pump to allow for the removal of contaminated water to a tanker truck for disposal.
- We anticipate new connections to exterior sanitary mains for the expansion areas.