

NARRATIVE

Will County Community Health Center

Emergency System Upgrades
Schematic Design Narrative

Date 01.20.20

Electrical /

Applicable Codes and Standards:

1. NFPA 70- 2014; National Electrical Code
2. NFPA 72-2012; National Fire Alarm Code
3. NFPA 99-2012; Health Care Facilities Code
4. NFPA 101-2012; Life Safety Code
5. NFPA 110-2016; Standard for Emergency and Standby Power Systems
6. ADA-2010; Standards for Accessible Design
7. Illinois Accessibility Code 2018

General Requirements:

1. Obtain and pay for all licenses, permits, inspections, and fees required by the Authority Having Jurisdiction.
2. Manufacturer Qualifications: Provide products of manufacturers regularly engaged in the manufacturing of electrical products complying with the project requirements that have been used on at least five projects of similar size and scope as this project.
3. Provide electrical equipment and materials that are UL listed and labeled.
4. Grounding:
 - a. Provide green insulated equipment grounding conductor in all branch circuits and feeders sized per NEC Article 250, unless indicated otherwise.
 - b. Ground and bond all electrical systems and equipment according to NEC Article 250.
5. Identification: All electrical installations shall be identified and labeled using UL listed identification products. Identification shall be provided for the following:
 - a. Branch circuit and feeder conductors.
 - b. Electrical equipment, including but not limited to transformers, transfer switches, generator, panelboards, and safety disconnect switches. Plastic engraved phenolic labeling shall be used.
 - c. All accessible points of control and power wiring.
 - d. Circuit conductors shall be color coded according to NEC and industry standard
 - e. Cable and circuit conductors shall be identified color coding and circuit number.
 - f. Raceway identification shall be preprinted self-adhesive plastic tape, 4" long with 1-1/8" high lettering extending 360-degrees around the conduit.
6. Provide typed circuit directories for all panelboards. Indicate the panel name, amperage and voltage ratings, load description and room number for each branch circuit.

Existing Power Distribution:

1. The Community Health Center was constructed in 2005 and provides local health and wellness services for the residents of Will County. The incoming electrical service to the building is provided by an outdoor, pad-mounted Utility transformer. From the transformer, an underground, 208V, 3-phase, 1,600-amp feeder provides normal Utility

power service to a Main Distribution Panel (MDP) installed in the basement of the facility. The existing MDP is an EATON Pow-R-Line C switchboard. The Utility meter and CT equipment is located within the first vertical section of switchboard just above the main fused switch.

2. Utility meter data indicates that the highest kilo-watt (KW) billing demand reading in the last 24-months was 149.76 KW during July, 2018. This data has been rounded up to 150 KW, or 520 amps assuming 0.8 power factor, as it pertains to this narrative.
3. An existing, 125KW Olympian model #G125G1, natural gas generator supplies emergency power to a 400-amp automatic transfer switch via an underground feeder. The transfer switch supplies a 400-amp distribution panel which feeds (3) emergency panelboards on the lower level.
4. The emergency panels contain loads for the required life-safety and critical branches of power as required per NFPA 70 and NFPA 99. These loads include emergency egress lighting, the fire alarm system, medical refrigerators, generator related accessories, communication receptacles, and dental suite lighting, power and equipment.

New Electric Service and Whole-Facility Generator:

1. Project summary: To modify the existing facility electrical infrastructure and install a new building-wide, backup generator. This project will include all labor and material required for equipment installation, wiring, Utility coordination, and start-up services.
2. Design Considerations: The Community Health Center is open for business 6 days per week and typically contains a full parking lot during business hours. New work must be designed and constructed in a phased manor that limits power outages to a single day (Sunday) and allows for minimal disruption of traffic and parking areas. A new electrical service will allow for the installation of all new equipment before an outage must occur. Outages shall be 1 day in length and involve reconnection of the existing MDP and emergency transfer switch (ATS-LSCR) with wiring that has already been installed and is in place prior to the outage.
3. New Emergency Generator: A new 300 KW emergency, natural gas generator shall be installed on the southeast end of the paved parking area. New underground emergency feeders shall be installed. The generator shall provide (1) 400-amp feeder to the existing transfer switch (ATS-LSCR) and (1) 1000-amp feeder to the optional standby transfer switch (ATS-OS) located in the third vertical section of Panel SEDP. The generator shall be a Level 2, Type 10 per NFPA 110. Refer to **Exhibit A: One Line Diagram** and **Exhibit C: Basement Plan** for more detailed information.
4. New Utility Service: A new Utility transformer shall be installed adjacent to the new generator. New empty conduits per Utility company requirements shall be installed underground to the electric service point for the property. New 1600-amp secondary wiring shall be installed underground to the Utility section of Panel SEDP. Refer to **Exhibit A: One Line Diagram** and **Exhibit B: Site Plan** for more detailed information.
5. New Service Entrance Panel: A new 1600A Panel SEDP shall be installed outside on the east side of the building. Section 1 of Panel SEDP shall contain the Utility CT/PT equipment with a meter base installed on the side of the enclosure. Section 2 of Panel SEDP shall contain the main service disconnects which supply the normal power for both transfer switches. Section 3 shall contain a 1000-amp automatic transfer switch.

This switch shall contain a load shedding relay capable of opening the switch upon a signal from the generator.

6. **Demolition:** Upon re-connection of Panel MDP to the new transfer switch ATS-OS, the existing 1600-amp wiring shall be removed back to the existing transformer location. The existing conduits shall be filled with grout and abandoned in place. The existing transformer and associated primary wiring shall be removed. The existing generator shall be removed. All existing concrete pads and bollards shall be removed, and the area shall be backfilled and mulched per the Owner's requirements.

Additional Design Requirements:

1. The existing gas service and meter shall be examined by a qualified individual for adequacy in supplying the new generator.
2. A power systems study is recommended to be completed for the entire facility per the requirements of NFPA 70E.
3. The contractor shall confirm existing above-ceiling space and verify all proposed conduit routing paths shown in this narrative can be installed.
4. All existing site utilities shall be field verified and confirmed by a civil engineer to determine adequate routing of underground conduits shown in this narrative.
5. A new GFCI receptacle and exterior lighting shall be installed at the new Panel SEDP location and shall be fed from the existing emergency system.
6. A civil engineer shall design concrete pads for the new generator, Utility Transformer and Panel SEDP. Concrete pads shall be a minimum of 1' above existing grade. Additional grading or retainage walls may be required for Panel SEDP.
7. An existing hose bib may require relocation adjacent to the new Panel SEDP. Relocate such that 3' clearance is provided from all electrical equipment.

Branch Circuiting:

1. Interior branch circuiting installed in accessible locations shall be installed in EMT conduit with steel compression type fittings.
2. All outlet and rough-in boxes shall be stamped steel with grounding strap to equipment grounding conductor.
3. Wiring shall be THHN-THWN-2 minimum size #12 rated 90°C. All conduit runs shall contain a separate green grounding conductor.
4. All branch circuiting shall be installed in complete conformance with the latest edition of the NEC.
5. Receptacles shall be specification grade devices or approved equals.
6. GFCI type receptacles shall comply with UL943. Feed through devices shall not be used.
7. Exterior receptacles shall be GFCI/WP type with cast aluminum "IN USE" hinged covers.

Existing Photos:



Photo 1: Existing generator and Utility Transformer.



Photo 2: Existing east end of property.



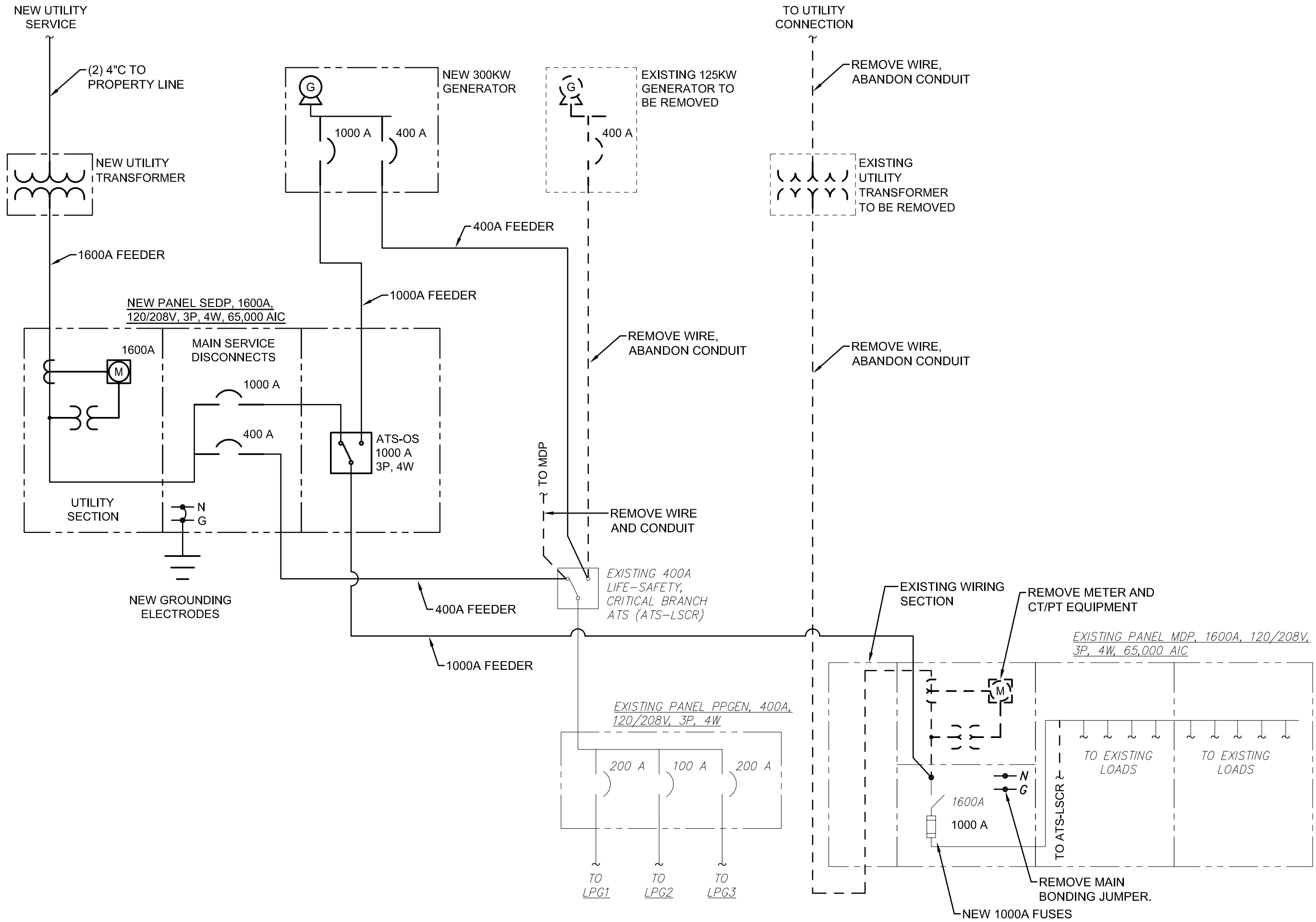
Photo 3: Proposed Panel SEDP location.

Attachments:

- Exhibit A: One-Line Diagram
- Exhibit B: Site Plan
- Exhibit C: Basement Plan

END OF NARRATIVE

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Will County Community Health Center
Joliet, IL

EXHIBIT A: ONE-LINE DIAGRAM

PROJECT NO.: 0160174.05A	JAG	BMS
DRAWN:		
REVIEWED:		
DATE:		01-20-2020



Will County Community Health Center
Engineer: Farnsworth Group, Inc.



Exhibit B: Site Plan

To Transformer
To Generator

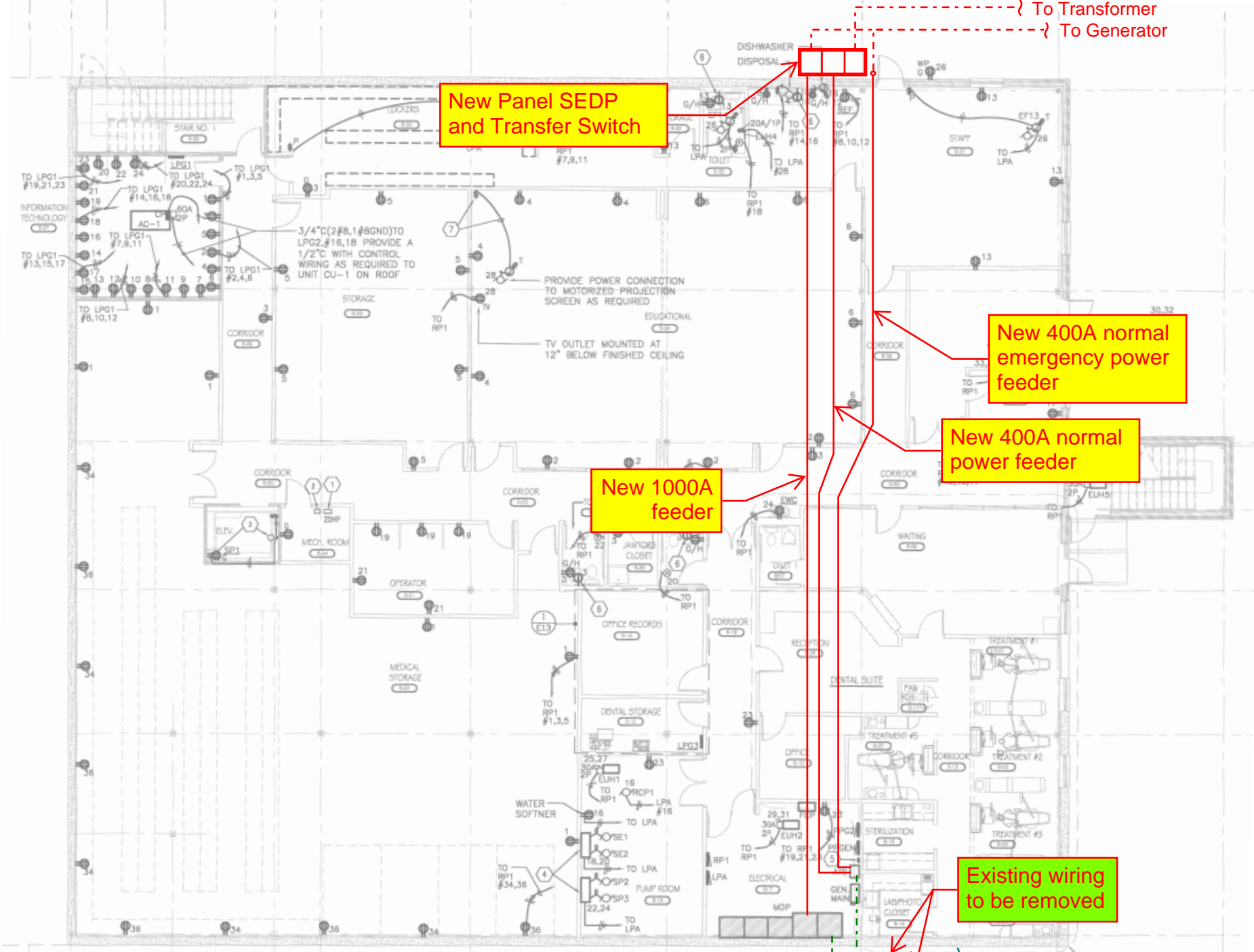
New Panel SEDP
and Transfer Switch

New 400A normal
emergency power
feeder

New 400A normal
power feeder

New 1000A
feeder

Existing wiring
to be removed



Will County Community Health Center
Engineer: Farnsworth Group, Inc.
Exhibit C: New Full-Building Generator Basement Plan

