



June 2, 2025

Lauren Plouff
Broaddus & Associates
2330 Bloomdale Rd
McKinney, TX 75071

Subject: Collin County Healthcare Facility, Parking Garage, and Medical Examiners
Revised Request for Change (PCO) No. 032; ASI #3 Medium Voltage Scope of Work

Dear Lauren:

Please find the attached revised PCO No. 032. This proposal is submitted for a deduct of One Hundred Twenty-Eight Thousand Two Hundred and Sixty-Five Dollars (-\$128,265), reflective of the following items:

- **Per ASI #3 drawing revisions.**
- **Site Development**
 - Credit back for MV transfer and terminations.
 - Credit back for setting MV transformer.
 - Credit back for MV transfer ground loop.
 - Credit back for MV wire terminations.
 - Credit back for conduits from ATSS to DSS.
 - Per county direction this pricing PCO is being broken out from PCO #010 ASI #3 drawings revisions.
- **This includes us keeping the grounding in our scope of work as Oncor is not expected to complete that work.**
- ***This PCO will be a deduct back to the contract in the amount of \$-128,265.***

We have not proceeded with this change pending approval of this PCO. Please sign the attached request for change recap indicating approval of this change.

Sincerely,

Jim Terhune
Sr. Project Manager

CC: Bryan Smith , PGAL

☐ Collin County

☐ PGAL - Dallas (Addison)

☐ Project Manager

☐ Accounting

Project:

224057- Collin County Medical Campus
2300 Bloomdale Rd
McKinney, TX 75071

Owner :

Collin County
2300 Bloomdale Rd; Suite 3160
McKinney, TX 75071

From:

The Christman Company

Issue No. 032 - ASI #3 Medium Voltage Scope of Work

Amount

Item: I Site Work

| Phase | Description | Abbreviation | Amount |
|-------|---|--------------|-------------|
| 28 - | Electrical Credit for MV Scope of Work | SUBS | -128,265.00 |

Subtotal Item I -128,265.00

0.00

Request for Change Total:

\$-128,265.00

Qualifications:

1. This Issue is ☐ Original ☒ Revised ☐ Budget Only ☐ Firm Quotation.
2. Contract time will be ☐ Increased by ☐ Decreased by () work days; ☒ Other: None
3. The Christman Company ☐ has ☒ has not proceeded with the work, and this Issue must be accepted within () work days.
4. Funded by ☒ Contract change ☐ Allowance ☐ Contingency ☐ Other: _____

Owner and/or Architect Action:

- ☐ Approved ☐ Proceed as described above (cost and schedule changes to be finalized under a revised Issue)
- ☐ Rejected ☐ Other: _____

Authorization:

The Owner and/or Architect hereby direct The Christman Company to proceed with the performance of the work as described above and/or in any additional documents referenced herein. It is understood that the amount of this Request for Change, if noted as "Budget Only" under Qualification I., will be revised as necessary upon determination of final costs and included in the next Owner Change Order accordingly. If noted as "Firm Quotation" under Qualification I., the amount of this Request will be included in the next Owner Change Order. In addition, all costs included herein may be included in the next payment application as if they had been included in an Owner Change Order or Construction Change Directive.

Authorized By Owner:

Collin County
2300 Bloomdale Rd; Suite 3160
McKinney, TX 75071

Accepted By Architect

PGAL - Dallas (Addison)
14135 Midway Road, Suite G-200
Addison TX 75001

Submitted By Contractor:

The Christman Company

By: _____

By: _____

By: _____

Date: _____

Date: _____

Date: _____

Lauren Orsini



2/27/2025

The Christman Company

Attn: Mr. Jim Terhune

Re: Collin County Medical Campus
Request for Proposal – Credit MV Transformer
GME Proposal X907
GME Project #GME-24-009

Dear Mr. Terhune,

George-McKenna Electrical Contractors has reviewed the above-referenced revision and has found changes to our scope. We are pleased to provide a revised price to you in the deductive amount of **\$ - 117,265.00 (- One Hundred Seventeen Thousand Two Hundred Sixty-Five Dollars and 00/100)** for the changes shown and work described below.

Scope: See attached

Drawings: See Attached

We acknowledge receipt of:

Pricing is firm for 10 days from date of this letter. We recognize this revision is not issued to proceed, but price only. We will proceed with receipt of your written approval by Change Order or Contract.

If additional information is required, please do not hesitate to contact me.

Very Truly Yours,

George-McKenna Electrical Contractors, LLC.

Cary Ratliff

Project Manager



Page Two

Request for Proposal – Credit MV Transformer

GME Proposal X907

GME Project #GME-24-009

Scope:

1. SD- E100- Credit for MV Transformer and terminations, Setting MV Transformer, MV transformer ground loop, MV Wire and terminations, Conduits from ATSS to DSS.

Clarifications:

1. Permits or inspection fees are not included if required.
2. Material may have extended lead time. EST provided once order is placed.

Exclusions:

1. Demo and concrete if new Oncor transformer pad is needed for Utility Transformer and re-work of existing conduits at existing transformer pad

General Conditions:

- 1) Any applicable sales taxes are included in our submission.
- 2) This contractor shall not be held liable for errors or omissions in designs by others, nor inadequacies of materials and equipment specified or supplied by others.
- 3) Equipment and materials supplied by the contractor are warranted only to the extent that the same are warranted by the manufacturer (unless otherwise required by specification).
- 4) This contractor shall not be liable for indirect loss or damage.
- 5) Unless included in this proposal, all bonding and/or special insurance requirements are supplied at additional cost.
- 6) ***We do not include any cutting, patching or painting of concrete, wall surfaces or ceiling surfaces. Our work is bid with the assumption that our work will be scheduled to be installed in accordance with the manufacturers recommended installation procedures and NEC code requirements. All back boxes must be installed prior to wall surfaces for new wall construction and wall surfaces must be removed for installation of electrical systems in existing walls.***
- 7) All material is guaranteed to be as specified (unless noted otherwise). All work to be completed in a workman like manner according to standard practices. Any alteration or deviation from the above specifications involving extra work will be executed and signed for on a daily basis, computed utilizing NECA labor and material units and will become an extra charge over and above the estimate.



- 8) George-McKenna Electrical Contractors, Inc. bids this project with the assumption that there is no asbestos or lead contamination on the project site, and will not be responsible for the removal, protection from, or disposal of same. If asbestos or lead contamination is found, our personnel will stop work until removal of asbestos or lead from the project site has been completed by others.
- 9) ***Our proposal is valid for 10 days. After 10 days we reserve the right to adjust our proposal for material and/or labor increases or avoidance.***

ASI#3 Comments

MISSING FROM THIS LIST:

- 1) LABOR AND MATERIALS FOR INSTALLING ELBOW KITS FOR MV TERMINATIONS. THIS IS AT LEAST \$3,000-\$4,000 PER KIT. **Got estimate for MV connections**
- 2) THIRTY TWO (32) TERMINATIONS ON THE SECONDARY SIDE OF THE TRANSFORMER WHICH ONCOR IS NOW GOING TO MAKE. (24) FOR 2000A FEED TO MAIN ATSS. AND FOUR (4) FOR EACH FIRE PUMP. **Credit the (32) terms can be given back if Oncor is terminating, Lugs are still provided by GME.**
- 3) TIME AND MATERIAL FOR MEDIUM VOLTAGE GROUNDING YOU NO LONGER NEED TO DO FOR THE MV SWITCHGEAR. REFER TO DETAIL 5/SD-E0.11. **There is no note 5 grounding for MV switchgear, it is existing no grounding was in takeoff. The MV switch would already have grounding.**
- 4) TIME AND MATERIAL FOR MEDIUM VOLTAGE GROUNDING YOU NO LONGER NEED TO DO FOR THE MV XFMR. THIS INCLUDES GROUND RODS, GROUND LOOP, ETC AS STATED BY DETAIL 6/SD-E0.11. **Credit (4) 3/4x 10' grd rod 50' bare 2/0**
- 5) COORDINATION WITH ONCOR AS REQUIRED BY IFB SINGLE LINE.
- 6) CRANE RENTAL FOR SETTING AND INSTALLING SWITCHGEAR **Credit**

ANDREW MURPHY'S THOUGHTS:

THE CREDIT FOR MEDIUM VOLTAGE LABOR AND MATERAILS APART FROM THE XFMR IS MUCH TOO SMALL. THE LABOR CREDIT IS ABOUT 7% OF THE MATERIAL COST OF THE TRANSFORMER (NOT INCLUDING MISSING MATERAILS LISTED TO THE LEFT). THIS WOULDN'T EVEN COVER THE 10-20% CONTRACTOR MARKUP IN THE ORIGINAL PRICE TO THE OWNER. AT ITS LOWEST, IT WOULD EXPECT THE LABOR COST FOR THE XFMR ALONE TO BE 30-40% FOR SETTING AND INSTALLING THE XFMR. THIS PRECLUDES OTHER INSTALLATION REQUIREMENTS.

The ratio does not work with \$105,965 in equipment.

TO CONTRAST THE COSTS VERSUS THE CREDITS, WE GET A VERY DETAILED COST BREAKDOWN BUT A VERY ANEMIC CREDIT BREAKDOWN. THE MATERIAL:LABOR RATIO IS 5:7 FOR THE COSTS, BUT 51:4 FOR THE CREDIT. I DON'T EXPECT 1:1 FOR LARGE EQUIPMENT INTEGRATION, BUT 7% DOES NOT APPEAR TO BE FAIR TO THE OWNER. I'M FINE WITH A HEALTHY PCO, AS LONG AS THE CONTRACTOR IS ALSO PROVIDING HEALTHY CREDITS. ON THIS PROJECT, THE NEW COSTS ARE OVERWEIGHT AND THE CREDITS BACK HAVE BEEN GAUNT. THIS IS NOT BALANCED.

SUMMIT EXPECTS THE CHRISTMAN COMPANY TO BETTER FILTER THINGS LIKE THIS MOVING FORWARD. **GIVE FAIR COSTS FOR NEW SCOPE ADDED AND FAIR CREDITS FOR SCOPE OF WORK REMOVED.**



GEORGE McKENNA LLC

ELECTRICAL CONTRACTORS

CONSTRUCTION • SERVICE • SECURITY • DATA & PHONE CABLING

THE SAFE CHOICE SINCE 1981

PROPOSAL REQUEST SUMMARY

| | | | |
|----------------------|-------------------------------|----------------------|------------|
| Project: | Collin County Medical Campus | GME Project No. | GME 24-009 |
| Description of Work: | Credit MV 2000kva Transformer | | |
| Submitted by: | Cary Ratliff | Date: | 27-Feb-25 |
| | | Proposal Request No. | X- 906 |

| LABOR | | | | BURDEN | TOTAL |
|-------------------|--------|---|-----------|-------------|-------------|
| JOB EXPENSE | | | | | 133 |
| Project Manager | 0.00 | @ | \$70.00 = | \$0.00 | |
| Project Engineer | 0.00 | | \$55.00 = | \$0.00 | |
| Superintendent | 0.00 | @ | \$60.00 = | \$0.00 | |
| | 0.00 | | | \$0.00 | \$0.00 |
| DIRECT FIELD | | | | | |
| Foreman | 0.00 | @ | \$47.50 = | \$0.00 | |
| Electrician | -75.59 | @ | \$43.50 = | -\$3,288.17 | |
| Estimating | 0.00 | @ | \$55.00 = | \$0.00 | |
| Material Handling | 0.00 | @ | \$0.00 = | \$0.00 | |
| Clean-Up | 0.00 | @ | \$0.00 = | \$0.00 | |
| | -75.59 | | | -\$3,288.17 | -\$1,479.67 |
| | | | | | -\$4,767.84 |

LABOR COST **-\$4,767.84**

| MATERIALS/EQUIPMENT | | Estimated | Sales Tax 8.25% | Cost |
|---------------------|-------------------------|---------------|--------------------|---------------|
| Material | See Attached BOM | -\$2,421.75 | | -\$2,421.75 |
| QUOTES | 2000 kva MV transformer | -\$105,965.00 | | -\$105,965.00 |
| | MV connections | -\$4,110.00 | | -\$4,110.00 |
| | | | \$0.00 | \$0.00 |
| | | -\$112,496.75 | \$0.00 | -\$112,496.75 |

MATERIALS/EQUIPMENT COSTS **-\$112,496.75**

| JOB EXPENSE | | | Cost |
|----------------------------------|------|-----|--------|
| Direct Job Expense (SMALL TOOLS) | | | |
| Indirect Job Expense | 3.0% | Yes | |
| Other Job Expense (2% Labor) | | | |
| | | | \$0.00 |

JOB EXPENSE COST **\$0.00**

| | | |
|------------------------|------|----------------------|
| PRIME COST | | -\$117,264.59 |
| OVERHEAD @ | 0% | \$0.00 |
| SUB-TOTAL | | -\$117,264.59 |
| PROFIT @ | 0% | \$0.00 |
| SUB-TOTAL | | -\$117,264.59 |
| Bond Premium @ | 0.0% | \$0.00 |
| TOTAL ESTIMATED AMOUNT | | -\$117,264.59 |
| QUOTED AMOUNT | | (\$117,265) |

Scope of Work:

Credit MV 2000kva Transformer

See attached scope for detailed description of work.

Proposal is firm for 10 days only!!!

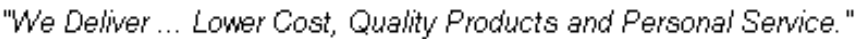
Job ID: GME-24-009CO
Project: Collin County HC Facilities - Change Orders

CO: CO-0007: MV Transformer Credit

Takeoff

Phase: DISTRIBUTION EQUIPMENT

| Item # | Qty | U/M | Q/M | Size | Description | Material Unit | Material Result | Labor Unit | Labor Result |
|---------------|--------|-----|-----|----------|---------------------------------|---------------|-----------------|------------|--------------|
| | 0.00 | | | | Credit-Set MV Transformer Labor | | | | |
| 190208 | -1.00 | EA | M | 112KVA | 480V 3PH OIL TRANSFORMER | 0.0000 | 0.00 | 3.0000 | -3.00 |
| | 0.00 | | | | Credit MV cable | | | | |
| 110044 | -45.00 | FT | M | 2. | 15KV XLP SHIELD GRD | 8.3000 | -373.50 | 0.0300 | -1.35 |
| | 0.00 | | | | Credit- 3 1/2" pvc ATSS-DSS | | | | |
| 10171 | -24.00 | FT | M | 3 1/2 | PVC SCH 40 | 3.8600 | -92.64 | 0.1500 | -3.60 |
| 31420 | -12.00 | EA | M | 3 1/2 | PVC COUPLING | 3.4700 | -41.64 | 0.8100 | -9.72 |
| 20224 | -12.00 | EA | M | 4 | PVC SCH 40 90-DEG-ELBOW | 22.0000 | -264.00 | 1.2500 | -15.00 |
| | 0.00 | | | | MV Transformer TERNinations | | | | |
| 100583 | -32.00 | EA | M | 600 | WIRE TERMINATION LBR | 0.0000 | 0.00 | 1.0000 | -32.00 |
| | 0.00 | | | | MV Transformer Ground Loop | | | | |
| 850010 | -4.00 | EA | M | 3/4 x 10 | COPPER GROUND ROD | 42.0000 | -168.00 | 1.0000 | -4.00 |
| 70401 | -46.00 | FT | M | 2/0 | BARE CU (STR) | 3.4200 | -157.32 | 0.0362 | -1.67 |
| 400187 | -1.00 | CY | M | | HAND DIG/CUBIC YD CLAY SOIL | 0.0000 | 0.00 | 4.5000 | -4.50 |
| 850060 | -5.00 | EA | M | 3/4. | GROUND ROD CLAMP | 4.9300 | -24.65 | 0.1500 | -0.75 |
| | 0.00 | | | | Set MV Transformer | | | | |
| 1 | -1.00 | | M | | Set MV Transformer- Crane | 1,300.0000 | -1,300.00 | 0.0000 | 0.00 |
| Phase Totals: | | | | | | | -2,421.75 | | -75.59 |
| Job Totals: | | | | | | | -2,421.75 | | -75.59 |



QUOTATION

| | |
|-----------|---------------------------------------|
| JOB NAME: | COLLIN COUNTY HEALTHCARE MED EXAMINER |
| DATE: | |
| BY: | DANNY SPECK |

[illegible]



Collin County Healthcare Facilities – MV Terminations

Contact information:

David Flores

Outside Sales

Mob: 512.294.4287

Email: david.flores@resapower.com



WWW.RESAPOWER.COM



Cary Ratliff

George McKenna Electrical Contractors LLC
Quote Reference #06772

02/27/25

Cary,

With regard to your interest in quotation for Electrical Acceptance Testing at Collin County Healthcare Facilities at 2330 Bloomdale Road McKinney TX 75071 we propose the following:

MV TERMINATIONS:

S&C Pad-Mounted Gear SG1

- (3) 600A Dead Break Elbow - 15kV, 4awg CU, Single Conductor Tape Shield Cable
- (3) Ground Drains

Transformer T2

- (3) 600A Dead Break Elbow - 15kV, 4awg CU, Single Conductor Tape Shield Cable
- (3) Ground Drains

Notes:

1. Customer to provide 120V 20A, 208/240V 60A or 480V 100A temp power as needed.
2. Testing to be performed in accordance with NETA ATS/MTS, as applicable.
3. One mobilization included. Equipment must be available allowing our crew to work in a continuous fashion from start to finish.
4. No Saturday, Sunday or Holiday work hours included in this proposal.
5. Manhole safety equipment and safety watch not included in scope, unless otherwise stated above. RESA can provide at additional cost upon request.
6. Termination Kits and grounding materials provided by RESA. Termination ground installation labor included. Excludes electrical equipment grounding materials/labor.
7. Equipment submittals were not provided in bid documents. Termination kits listed above are presumptions. Price subject to change once equipment submittals are received and exact term kits verified.
8. Standard RESA MV Termination installation methods to be utilized. The customer did not provide site specific MV Term installation requirements during the quoting period.
9. For MV Terminations, scope excludes any cable pulls, feeding cable through wire ways, pull boxes, from vaults/manholes to equipment.
10. Standard RESA documentation to be utilized for reports. Any special report requirements/formats must be submitted to RESA prior to work beginning. Changes to reports after work has begun will result in additional charges.
11. Any form of report data entry to document management software is excluded from scope. RESA can perform data entry at an additional cost upon request.
12. Unless otherwise specified in the scope of work, all equipment must be de-energized or made readily



available during testing.

13. Equipment, Materials and Accessories not mentioned in this proposal will be the responsibility of others.
14. Equipment to be tested one time only. Any retest due to equipment failure, repairs and or replacements will be considered as out of scope and will incur additional charges.
15. No engineering work will be required by RESA and the full scope of work of the project has been engineered by others.
16. RESA cannot be responsible for any delays caused by others. Delays will be charged on T&M rates.
17. RESA assumes that switching services of electrical equipment will be performed by the customer.
18. Excludes any permits, fees or licenses associated with this project.
19. Any special training/orientation needed for entry to this site are not included and will incur additional charges if applicable.

PRICE:

| | |
|---------------------------|-------------------|
| MV Termination Labor: | \$1,680.00 |
| MV Termination Materials: | \$2,430.00 |
| TOTAL | \$4,110.00 |

This price expires on 03/27/25.

Price does not include applicable local, state, or federal tax.

We appreciate this opportunity to quote and look forward to being of service to you in the near future. If you have any questions, please do not hesitate to contact me.



David Flores • Outside Sales
RESA Power – Dallas Service
3209 Century Drive
Rowlett, TX 75088
m: 512.294.4287 | **w:** resapower.com
e: david.flores@resapower.com



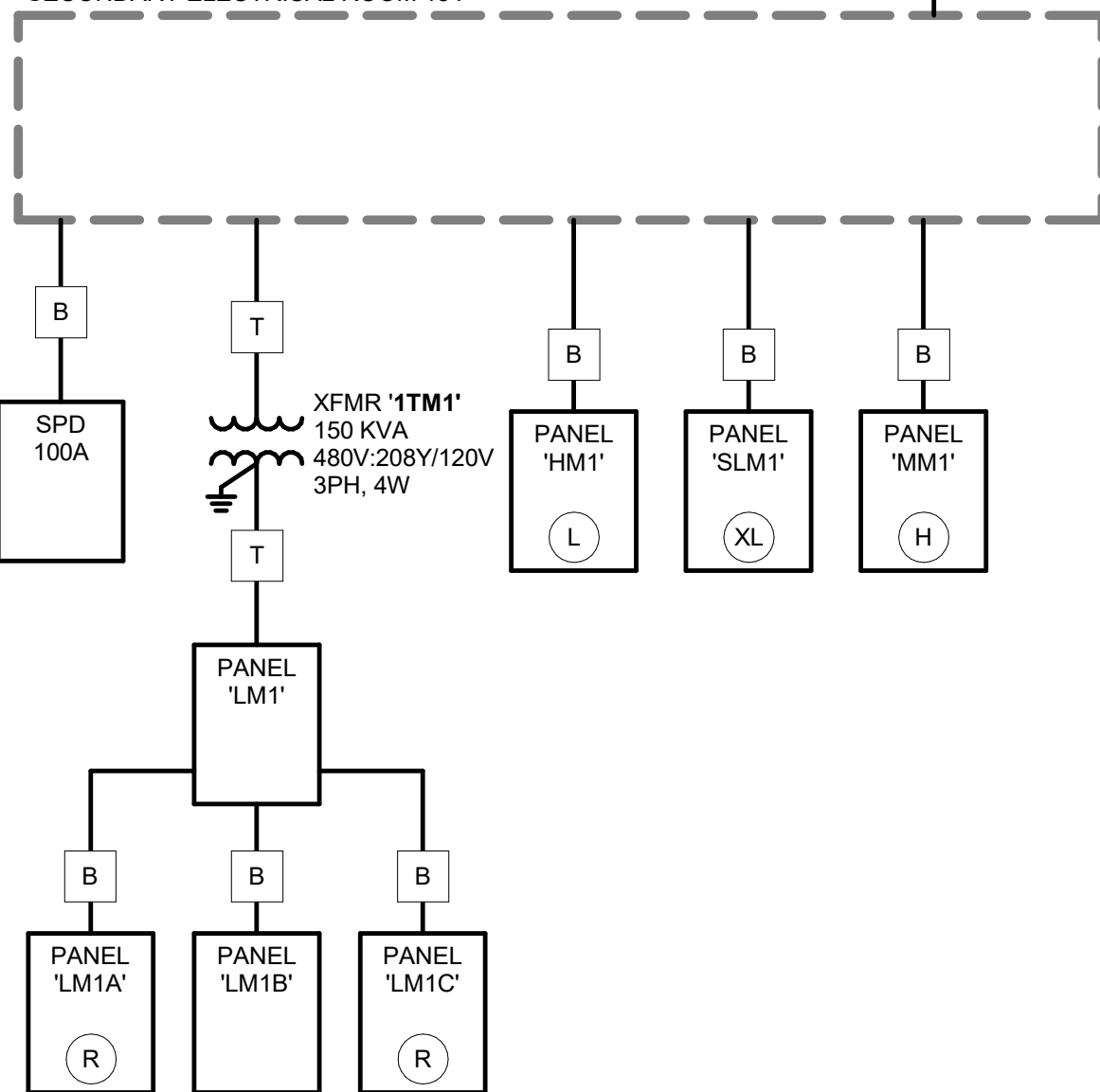
MEDIUM VOLTAGE GENERAL NOTES

- MEDIUM VOLTAGE SYSTEM IS 14.400V. COMPONENTS, CLEARANCES, AND ALL OTHER DETAILS SHALL BE INSTALLED PER NEC AND INDUSTRY STANDARDS. VERIFY EXISTING CONDITIONS WITH ONCOR.
- UNLESS OTHERWISE NOTED, ALL PRIMARY SIDE EQUIPMENT SHALL BE RATED MINIMUM 800A, 15KV.
- MINIMUM BIL FOR ALL 15KV EQUIPMENT SHALL BE 95KV.
- FEEDER NOTE BY SYMBOL NUMBER DENOTES AMPACITY (###) AND AERIAL (A), BURIED (B) OR (E) FOR EXISTING. REFER TO SINGLE LINE NOTES BY SYMBOL FOR FEEDER SIZING.
- FAULT INTERRUPTORS AND FUSE SIZING SHALL BE SELECTED TO PROTECT CONDUCTORS AND TRANSFORMERS, IN ACCORDANCE WITH MANUFACTURER'S DAMAGE CURVES FOR CONDUCTORS AND TRANSFORMERS.
- ALL SWITCHES ARE NORMALLY CLOSED, UNLESS NOTED OTHERWISE.

| LOAD SUMMARY | | | | | | |
|--------------|----------------------------|-------------|-------------|---------------|-----------------|--|
| LOAD TYPE | CONNECTED LOAD BY BUILDING | | | DEMAND FACTOR | ESTIMATED TOTAL | |
| | HGF (VOL 2) | MEO (VOL 3) | PKG (VOL 4) | | | |
| COOLING | 46154 VA | 91937 VA | 8197 VA | 0.82 | 146278 VA | |
| ELEVATOR | 207008 VA | 0 VA | 161284 VA | 1 | 301999 VA | |
| HEATING | 23314 VA | 3750 VA | 10000 VA | 1 | 37064 VA | |
| LIGHTING | 41881 VA | 25407 VA | 29381 VA | 1.25 | 120574 VA | |
| MOTOR | 151914 VA | 80775 VA | 19735 VA | 1 | 252424 VA | |
| POWER | 9707 VA | 70441 VA | 17580 VA | 1 | 97738 VA | |
| RECEPTACLE | 225048 VA | 158886 VA | 9000 VA | 0.52 | 294387 VA | |
| TOTAL VA | | | | | 1160444 VA | |
| TOTAL AMPS | | | | | 1396 AMPS | |

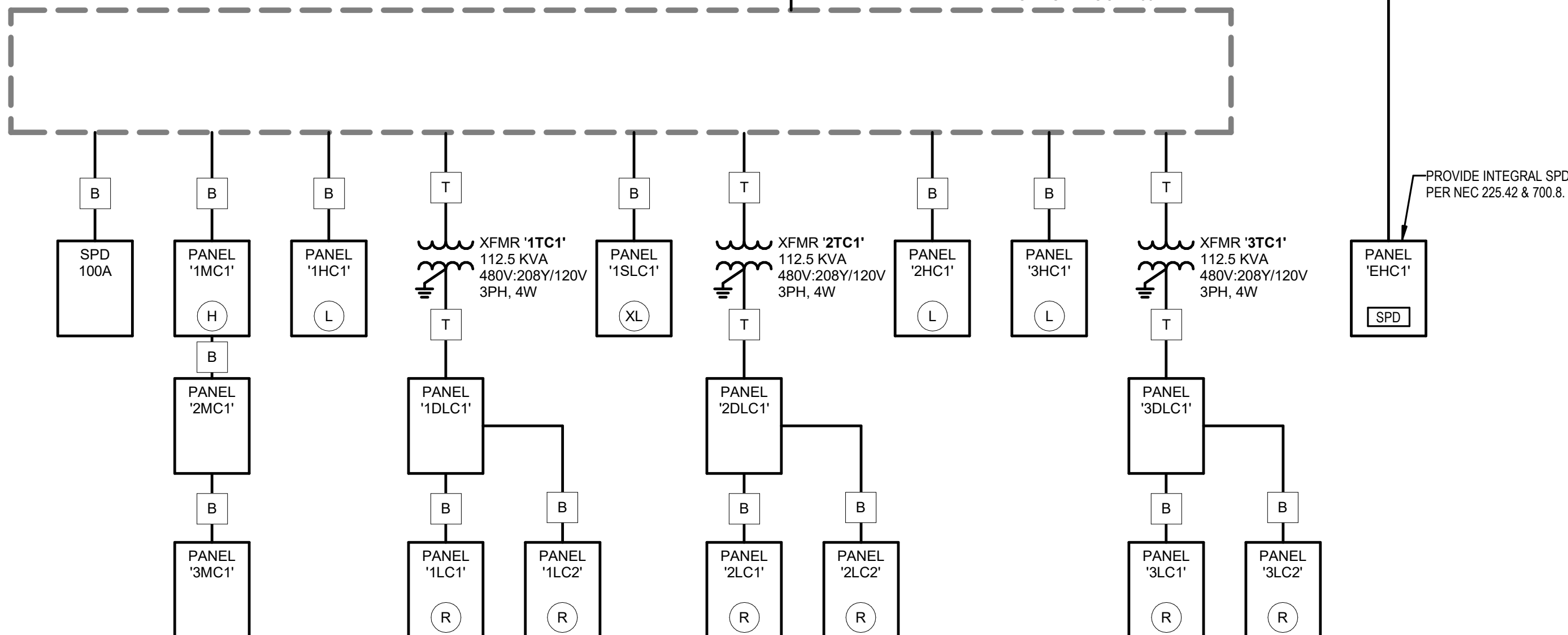
NEW DISTRIBUTION PANEL 'DPM'

MEDICAL EXAMINER'S BUILDING
SECONDARY ELECTRICAL ROOM 154



NEW DISTRIBUTION PANEL 'DPC'

HEALTHCARE FACILITY
ELECTRICAL ROOM 139



FEEDER & BREAKER SCHEDULE
3-PHASE 4-WIRE COPPER & ALUMINUM

| CIRCUIT AMPACITY | CIRCUIT BREAKER | CONDUCTOR SETS, QTY & SIZE | EQUIP. GROUND | CONDUIT |
|---|------------------|----------------------------|-------------------|---------|
| NEC TABLE 310.15(B)(16) | NEC 240.4(B) | NEC TABLE 310.15(B)(16) | NEC TABLE 250.122 | |
| FOR FEEDERS UP TO 90 A, PROVIDE COPPER | | | | |
| 20 A | 20 A, 3P | 1 SET OF 4 #12 | #12 G | 3/4" |
| 30 A | 25 A, 3P | 1 SET OF 4 #10 | #10 G | 3/4" |
| 30 A | 30 A, 3P | 1 SET OF 4 #10 | #10 G | 3/4" |
| 40 A | 35 A or 40 A, 3P | 1 SET OF 4 #8 | #10 G | 1" |
| 55 A | 45 A or 50 A, 3P | 1 SET OF 4 #6 | #10 G | 1" |
| 70 A | 60 A, 3P | 1 SET OF 4 #4 | #10 G | 1-1/4" |
| 70 A | 70 A, 3P | 1 SET OF 4 #4 | #8 G | 1-1/4" |
| 85 A | 80 A or 90 A, 3P | 1 SET OF 4 #3 | #8 G | 1-1/4" |
| FOR FEEDERS 100 A AND ABOVE, PROVIDE ALUMINUM | | | | |
| 100 A | 100 A, 3P | 1 SET OF 4 #10 | #8 G | 1-1/2" |
| 110 A | 110 A, 3P | 1 SET OF 4 #10 | #4 G | 2" |
| 135 A | 125 A, 3P | 1 SET OF 4 #20 | #4 G | 2" |
| 155 A | 150 A, 3P | 1 SET OF 4 #30 | #4 G | 2" |
| 180 A | 175 A, 3P | 1 SET OF 4 #40 | #4 G | 2-1/2" |
| 205 A | 200 A, 3P | 1 SET OF 4 #250 | #4 G | 2-1/2" |
| 230 A | 225 A, 3P | 1 SET OF 4 #300 | #2 G | 2-1/2" |
| 250 A | 250 A, 3P | 1 SET OF 4 #350 | #2 G | 2-1/2" |
| 310 A | 300 A, 3P | 1 SET OF 4 #500 | #2 G | 3" |
| 375 A | 350 A, 3P | 1 SET OF 4 #700 | #1 G | 3-1/2" |
| 410 A | 400 A, 3P | 2 SETS OF 4 #250 | #1 G | 2-1/2" |
| 460 A | 450 A, 3P | 2 SETS OF 4 #300 | #10 G | 2-1/2" |
| 500 A | 500 A, 3P | 2 SETS OF 4 #350 | #10 G | 2-1/2" |
| 620 A | 600 A, 3P | 2 SETS OF 4 #500 | #20 G | 3" |
| 750 A | 700 A, 3P | 3 SETS OF 4 #350 | #30 G | 3" |
| 810 A | 800 A, 3P | 3 SETS OF 4 #400 | #30 G | 3" |
| 1,000 A | 1,000 A, 3P | 4 SETS OF 4 #350 | #40 G | 3" |
| 1,240 A | 1,200 A, 3P | 4 SETS OF 4 #500 | #250 G | 3" |
| 1,700 A | 1,600 A, 3P | 5 SETS OF 4 #600 | #350 G | 3-1/2" |
| 2,040 A | 2,000 A, 3P | 6 SETS OF 4 #600 | #400 G | 3-1/2" |
| 2,625 A | 2,500 A, 3P | 7 SETS OF 4 #700 | #600 G | 4" |
| 3,000 A | 3,000 A, 3P | 8 SETS OF 4 #700 | #600 G | 4" |
| 4,125 A | 4,000 A, 3P | 11 SETS OF 4 #700 | #700 G | 4" |

NEC 250.66
GROUNDING ELECTRODE CONDUCTOR

GEC FOR SERVICES, SEPARATELY DERIVED SYSTEMS (ALUMINUM CONDUCTORS, CU GEC).

LARGEST CONDUCTOR OR EQUIVALENT AREA OF PARALLEL CONDUCTORS (ALUM.)

| | |
|-------------|-------|
| 1/0 OR LESS | #8 G |
| 20 - 30 | #8 G |
| 40 - 250 | #4 G |
| 251 - 500 | #2 G |
| 501 - 900 | #10 G |
| 901 - 1,750 | #20 G |
| 1,751+ | #30 G |

- WHERE **S** SYMBOL IS SHOWN, PROVIDE SERVICE FEEDER WITH AMPACITY EQUAL TO OR GREATER THAN THAT OF THE SERVICE DISCONNECT, WITH NO EQUIPMENT GROUND CONDUCTOR.
- WHERE **2HR** SYMBOL IS SHOWN, NORMAL AND EMERGENCY FEEDERS SERVING FIRE PUMP AND FIRE SERVICE ELEVATOR SHALL BE ENCASED IN CONCRETE PROVIDING 2-HOUR FIRE RATING. A 2-HOUR RATING SHALL BE MAINTAINED FROM THE ROOM CONTAINING THE FEEDER'S SOURCE BREAKER OR DISCONNECT TO THE ROOM CONTAINING THE ATS. THE ELEVATOR FEEDER IS NOT REQUIRED TO BE ENCASED IN CONCRETE INSIDE THE ELEVATOR HOISTWAY OR PENTHOUSE. FIRE PUMP FEEDERS SHALL COMPLY WITH NEC 695.

3Ø TRANSFORMER SCHEDULE
COPPER & ALUMINUM CONDUCTORS AS NOTED

| WHERE T SYMBOL IS SHOWN, INSTALL FEEDERS AS SHOWN BELOW. | | | | | |
|---|----------|---------------------------|--------------------------------|----------|-------------|
| XFMR SIZE | PRI OCPD | PRIMARY FEEDERS (CU, UNO) | SECONDARY FEEDERS (CU, UNO) | SEC OCPD | XFMR GND |
| 15 KVA | 25 A | 3#10, #10 G, 3/4" C | 4#4, #8 G, 1/2" C | 60 A | #8 CU |
| 30 KVA | 50 A | 3#6, #10 G, 1" C | 4#10, #4 G AL, 2" C | 110 A | #4 AL |
| 45 KVA | 70 A | 3#4, #8 G, 1-1/2" C | 4#40, #4 G AL, 2 1/2" C | 175 A | #2 AL |
| 75 KVA | 125 A | 3#20, #4 G AL, 2" C | 4#500, #2 G AL, 4" C | 300 A | #10 AL |
| 112.5 KVA | 200 A | 3#250, #4 G AL, 2 1/2" C | 2 SETS (4#250, #30 G AL, 3" C) | 400 A | #30 AL |
| 150 KVA | 225 A | 3#300, #2 G AL, 2 1/2" C | 2 SETS (4#500, #40 G AL, 4" C) | 600 A | #40 AL |
| 225 KVA | 350 A | 3#700, #1 G AL, 3 1/2" C | 3 SETS (4#400, 250G AL, 4" C) | 800 A | 250kcmil AL |

ENERGY MONITORING SCHEDULE
PER IECC C405.12

| WHERE # SYMBOL IS SHOWN, PROVIDE POWER METERING CONTACT. | |
|---|--|
| SYMBOL | DESCRIPTION |
| M | MAIN POWER METER |
| H | TOTAL HVAC SYSTEMS - HEATING, COOLING AND VENTILATION, INCLUDING BUT NOT LIMITED TO FANS, PUMPS, BOILERS, CHILLERS AND WATER HEATING. ENERGY USED BY 120V EQUIPMENT, OR BY 208/120V EQUIPMENT THAT IS LOCATED IN A BUILDING WHERE THE MAIN SERVICE IS 480/277V POWER, IS PERMITTED TO BE EXCLUDED FROM THE TOTAL HVAC SYSTEM ENERGY USE. |
| L | INTERIOR LIGHTING - LIGHTING SYSTEMS LOCATED WITHIN THE BUILDING. |
| XL | EXTERIOR LIGHTING - LIGHTING SYSTEMS LOCATED ON THE BUILDING SITE BUT NOT WITHIN THE BUILDING. |
| R | PLUG LOADS - DEVICES, APPLIANCES AND EQUIPMENT CONNECTED TO CONVENIENCE RECEPTACLE OUTLETS. |
| P | PROCESS LOADS - ANY SINGLE LOAD THAT IS NOT INCLUDED IN HVAC, LIGHTING, OR PLUG LOAD CATEGORY AND THAT EXCEEDS 5% OF THE PEAK CONNECTED LOAD OF THE WHOLE BUILDING, INCLUDING BUT NOT LIMITED TO DATA CENTERS, MANUFACTURING EQUIPMENT, AND COMMERCIAL KITCHENS. |

- METERING EQUIPMENT
- PROVIDE A MULTI-CIRCUIT POWER METER, VERIFEYE SERIES 7100 OR APPROVED EQUAL, IN NEMA 1 ENCLOSURE ADJACENT TO ELECTRICAL EQUIPMENT.
 - INSTALL METER COMMUNICATION TO DATA ACQUISITION SERVER IN NEAREST IDF ROOM. COORDINATE BMS INTEGRATION AND CONNECTION OF CONTROL WIRING WITH DIVISION 23 CONTROL CONTRACTOR PRIOR TO ROUGH-IN OF METERING EQUIPMENT.
 - METER AND INSTALLATION TO COMPLY WITH IECC 2021 POWER METERING STANDARDS. REFER TO ELECTRICAL DETAILS FOR ADDITIONAL INFORMATION.
 - COORDINATE EXACT ELECTRICAL REQUIREMENTS FOR POWER METERING EQUIPMENT WITH EQUIPMENT PROVIDER.

- BUILDING SERVICE MONITORING
- PROVIDE MAIN POWER METER INTEGRAL TO SERVICE ENTRANCE EQUIPMENT PER ELECTRICAL SPECIFICATIONS.
 - THIS SHALL MONITOR THE TOTAL BUILDING LOAD. INTEGRATE TO SUB-METERING SYSTEM PER MANUFACTURER'S RECOMMENDED INSTALLATION GUIDELINES.

- ENERGY-USE CATEGORY MONITORING
- ALL OTHER CTS PROVIDED SHALL DIVIDE OUT THE TOTAL BUILDING LOAD INTO ENERGY USE CATEGORIES PER IECC 2021 REQUIREMENTS.
 - IF A PANEL IS TO BE MONITORED, THE SINGLE LINE-DIAGRAM(S) DENOTES HOW EACH PANEL'S LOADS SHALL BE CATEGORIZED.
 - THE ABBREVIATIONS REFER TO THE FOLLOWING ENERGY USE CATEGORIES AS DEFINED BY SECTION C405.12.2 OF IECC 2021. PROVIDE A POWER METERING CT, LEAD LINE SERIES 7000 OR APPROVED EQUAL, TO MONITOR CURRENT AT THE INCOMING FEEDER FOR EACH PHASE OF THE PANEL. DENOTED, TERMINATE CT IN VERIFEYE POWER METER.
 - INDIVIDUAL BRANCH CIRCUIT BREAKER(S) MAY BE UTILIZED TO MAINTAIN POWER METERING REQUIREMENTS. REFER TO ELECTRICAL PANEL SCHEDULES FOR ADDITIONAL INFORMATION. IN EACH INSTANCE, THIS INDIVIDUALLY METERED LOAD SHALL BE ADDED TO ITS RESPECTIVE ENERGY USE CATEGORY. IF IT IS IN A METERED PANEL, THIS LOAD SHALL BE SUBTRACTED FROM THE OVERALL PANEL'S MONITORED LOAD.
 - IN THIS WAY, METERING EQUIPMENT SHALL BE PROGRAMMED TO ADD TOGETHER THESE CATEGORIES AT THE MAIN DATA ACQUISITION HUB. ALL OTHER LOADS SHALL BE CATEGORIZED AS BUILDING OPERATIONS AND OTHER MISCELLANEOUS LOADS.

SINGLE LINE DIAGRAM NOTES

- MAIN SWITCHBOARD SHALL BE EQUIPPED WITH A SOLID STATE POWER QUALITY METER.
- PROVIDE 4-INCH HIGH CONCRETE PAD 3-INCHES WIDER THAN SWITCHGEAR ON SIDES AND FRONT. PROVIDE CONCRETE PAD FOR ALL FLOOR-MOUNTED ELECTRICAL EQUIPMENT INCLUDING TRANSFER SWITCHES AND DRY-TYPE TRANSFORMERS.
- CONTRACTOR SHALL PERFORM ARC FLASH STUDY USING DATA FOR THE SUPPLIED MANUFACTURER'S EQUIPMENT, AND PROVIDE AND INSTALL ARC FLASH LABELS LABELS ON ALL ELECTRICAL EQUIPMENT. LABELS SHALL INDICATE ARC FLASH PROTECTION REQUIREMENTS AND SHOCK PROTECTION REQUIREMENTS AND OTHER INFORMATION AS REQUIRED BY OSHA AND NFPA 70E. SERVICE EQUIPMENT SHALL BE MARKED WITH THE MAXIMUM AVAILABLE FAULT CURRENT IN ACCORDANCE WITH NEC.
- CONTRACTOR SHALL ADJUST ALL BREAKER SETTINGS ON SITE TO MATCH SETTINGS SHOWN IN MANUFACTURER'S ARC FLASH STUDY.
- CONTRACTOR SHALL PROVIDE AND PERFORM COMPLETE OVERCURRENT PROTECTION COORDINATION STUDY IN ACCORDANCE WITH NEC REQUIREMENTS PRIOR TO PURCHASE OF EQUIPMENT AND PROVIDE STUDY WITH SWITCHBOARD AND PANELBOARD SUBMITTALS. CONTRACTOR SHALL SUBMIT COORDINATION STUDY TO CITY INSPECTOR UPON REQUEST, AND INCLUDE COORDINATION STUDY WITH SUBMITTALS.
- PROVIDE SERVICE ENTRANCE RATED LISTED CONNECTION SURGE PROTECTIVE DEVICE (SPD/ TVSS) WITH SURGE RATING AS RECOMMENDED BY MANUFACTURER FOR THE SERVICE SIZE SHOWN. DEVICE SHALL INCLUDE INTEGRAL DISCONNECT/FUSE MOUNTED TO SIDE OF SWITCHBOARD OR PANEL ENCLOSURE, CONNECTED TO BUS USING MANUFACTURER'S CABLE. CONDUCTORS SHALL BE ROUTED SO AS TO AVOID SHARP BENDS AND MINIMIZE LEAD LENGTHS.
- BREAKERS SERVING DRY-TYPE TRANSFORMERS LOCATED REMOTELY FROM THE BREAKER SERVING THE TRANSFORMER SHALL BE PROVIDED WITH A PERMANENT LOCKING CLASP IN COMPLIANCE WITH NEC 110.25 AND 450.14. CONTRACTOR SHALL ALSO PROVIDE SIGNAGE ON TRANSFORMER INDICATING LOCATION OF REMOTE DISCONNECTING MEANS.
- PER NEC 210.8(B), GFCI PROTECTION SHALL BE PROVIDED FOR ALL 20A TO 50A SINGLE PHASE RECEPTACLES RATED UP TO 150V TO GROUND AND 20A TO 100A THREE PHASE RECEPTACLES RATED UP TO 150V TO GROUND LOCATED IN INDOOR WET LOCATIONS, BATHROOMS, KITCHENS, AND WHERE WITHIN 6 FT OF ANY SINK, OR LOCATED OUTDOORS, ON ROOFTOPS, OR IN VEHICLE GARAGES AND SERVICE BAYS.
- INSTALL WALL-MOUNTED GROUND BAR ON INSULATED STANDOFFS LOCATED IN EACH IT ROOM. VERIFY EXACT LOCATION WITH IT PERSONNEL. GROUNDING CONDUCTOR SHALL BE CONTINUOUS AND UN-CUT ACROSS GROUND BAR, OR CONNECTIONS SHALL BE MADE BY EXOTHERMIC WELD.
- ALL OVERCURRENT DEVICES RATED 1,200A OR LARGER SHALL HAVE ARC ENERGY REDUCING CAPABILITY AS REQUIRED BY NEC. INSTALL BREAKERS WITH ZONE-SELECTIVE INTERLOCKING OR AN ENERGY REDUCING MAINTENANCE SWITCH WITH LOCAL STATUS INDICATOR.
- SURGE PROTECTION SHALL BE INSTALLED ON ALL EMERGENCY BRANCH PANELS IN ACCORDANCE WITH NEC 700.8.
- CONTRACTOR SHALL INSTALL ENGRAVED TAGS ON ALL ELEVATOR DISCONNECTS INDICATING ELEVATOR NUMBER AND THE PANEL AND CIRCUIT FEEDING THE DISCONNECT. LETTERING SHALL BE AT LEAST 1.5" IN HEIGHT.
- ELECTRICAL CONTRACTOR SHALL INSTALL CONDUIT AND WIRING FROM ATS TO ELEVATOR CONTROLLERS FOR ELEVATORS ON GENERATOR POWER. ATS SHALL PROVIDE "PENDING TRANSFER" SIGNAL TO ELEVATOR CONTROLLERS TO ALLOW CONTROLLERS TO STOP ELEVATORS AT A SPECIFIED FLOOR BEFORE POWER TRANSFER OCCURS.

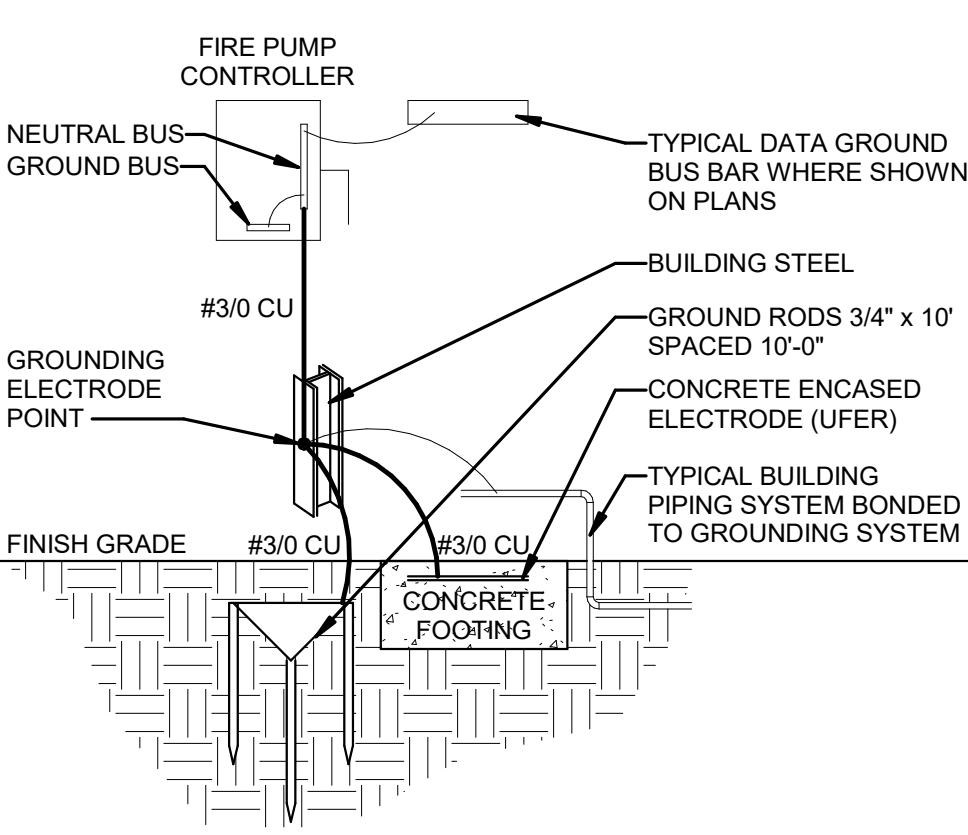
FIRE PUMP NOTES

- FIRE PUMP INSTALLATION SHALL BE IN ACCORDANCE WITH NEC 695.
- FIRE PUMP DISCONNECTING MEANS SHALL BE SUPERVISED IN THE CLOSED POSITION BY THE FIRE ALARM PANEL, OR IT SHALL BE LOCKABLE IN THE "ON" POSITION. ONLY A SINGLE DISCONNECTING MEANS SHALL EXIST BETWEEN THE FIRE PUMP AND THE UTILITY TRANSFORMER.
- UTILITY AND GENERATOR FEEDERS TO FIRE PUMP MUST BE BURIED OR ENCASED IN CONCRETE WITH A MINIMUM 2" THICKNESS, OR PROTECTED BY A 2-HOUR FIRE RATED ASSEMBLY. THIS PROTECTION IS NOT REQUIRED WHERE THE FEEDER IS LOCATED INSIDE THE ROOM WITH THE PUMP CONTROLLER.
- WHERE FIRE PUMP FEEDER IS BURIED OUTSIDE OF BUILDING, INSTALL FEEDER A MINIMUM OF 48" BELOW GRADE. INSTALL WARNING TAPE 12" BELOW GRADE DIRECTLY ABOVE CONDUIT.
- VOLTAGE DROP MUST BE NO MORE THAN 15% AT LOCKED ROTOR CURRENT, AND NO MORE THAN 5% AT 115% OF FULL LOAD.

AVAILABLE FAULT CURRENT CALCULATION
(INFINITE FAULT CURRENT ON PRIMARY)

$$AFC = \frac{2000 \text{ KVA} \times 1000}{480V \times \sqrt{3} \times 2.5}$$

MAXIMUM 3Ø AFC = 48131 A



- FIRE PUMP SERVICE ENTRANCE GROUNDING DETAIL NOTES:
- AT THE CONTRACTOR'S OPTION, ANY ONE OF THE THREE ALLOWED ELECTRODE SYSTEMS SHOWN MAY BE USED AS THE MAIN GROUNDING ELECTRODE POINT (BUILDING STEEL, GROUND RODS OR "JERRY" WITH ALL OTHER ELECTRODES BONDED TO IT. THE EXAMPLE SHOWN USES BUILDING STEEL AS THE MAIN ELECTRODE POINT.
 - THE GROUNDING ELECTRODE CONDUCTOR (GEC) SHALL BE SIZED IN ACCORDANCE WITH NEC TABLE 250.66. REFER TO FEEDER SCHEDULE.

AUTOMATIC TRANSFER SWITCH SCHEDULE

- ALL ATS'S SHALL BE MOTOR OPERATED WITH CENTER OFF FEATURE FOR LOAD SHEDDING.
- STANDBY TRANSFER SWITCH, WHERE PROVIDED, SHALL MONITOR GENERATOR LOAD TO PERFORM LOAD SHED FUNCTION.
- TRANSFER SWITCHES SHALL INTERFACE WITH ELEVATOR CONTROLLERS, WHERE PROVIDED. ATS'S SHALL SEND "PENDING TRANSFER" SIGNAL AND "EMERGENCY MODE" SIGNAL TO ELEVATOR CONTROLLERS.
- INSTALLATION SHALL BE IN ACCORDANCE WITH ARTICLES 700, 701, AND 702 OF THE NATIONAL ELECTRIC CODE.

| NAME | BRANCH | AMPS | POLES | WCR | PRIORITY | NOTES |
|------|-----------|------------|-------|-----|----------|--|
| ATSE | EMERGENCY | 225 A | 4 | 65k | 1 | LIFE SAFETY LOADS ONLY |
| ATSS | STANDBY | 200 A W/CB | 4 | 65k | 2 | STANDBY LOADS ONLY. PROVIDE WITH SERVICE-RATED LSIG CIRCUIT BREAKER. |

GENERATOR SCHEDULE

- CONTRACTOR SHALL INSTALL CONCRETE PAD IN ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS. COORDINATE WITH STRUCTURAL PACKAGE.
- PROVIDE VIBRATION ISOLATION SUPPORT SYSTEM AS RECOMMENDED BY SOUND ATTENUATION CONSULTANT.
- VERIFY DAMPING LOADS WITH ELECTRICAL PANEL SCHEDULES AS SHOWN ON THE BUILDING CONSTRUCTION DESIGN DRAWINGS.
- IN EACH PADMOUNT TRANSFORMER, PROVIDE A & B SWITCHING INCLUDING LOAD BREAK, GANG OPERATED SWITCH THAT IS EXTERNALLY OPERABLE FROM THE HIGH-VOLTAGE COMPARTMENT THROUGH USE OF A HOT-STICK.
- ELECTRICAL CONTRACTOR SHALL FIELD VERIFY PRIMARY VOLTAGE AND UTILITY CONFIGURATION (WYE OR DELTA) PRIOR TO SUBMITTING EQUIPMENT. DOCUMENT IN-FIELD DISCOVERY (VOLTAGE/CONFIGURATION) OF EXISTING CONDITIONS AS A PART OF TRANSFORMER SUBMITTAL.

| KVA/KW/ STARTING KVA | VOLTAGE, PHASE, WIRE, POWER FACTOR | ENCLOSURE | FUEL | CAPACITY | GEN. CLASSIFICATION | TANK CLASSIFICATION |
|-------------------------------------|------------------------------------|---------------------------------|--------|----------|----------------------------|---------------------|
| 1250KW/1562.5KVA/ 5500 STARTING KVA | 480Y/277V, 3PH, 0.8PF | WEATHERPROOF: SOUND ATTENUATING | DIESEL | 8 HOURS | UL 2200; NFPA 110; LEVEL 1 | UL 142 |

MEDIUM VOLTAGE TRANSFORMER SCHEDULE

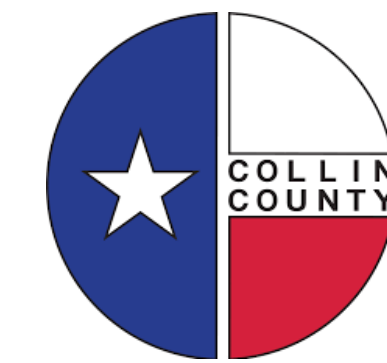
- SCHEDULE NOTES:
- ALL TRANSFORMER RATINGS SHALL BE IN COMPLIANCE WITH IEEE C57.12.91
 - PROVIDE SECONDARY BISSING & LUG SPACE TO ACCOMMODATE THE FEEDER CONDUCTOR SIZE AND NUMBER OF SETS AS INDICATED ON THE BUILDING CONSTRUCTION DESIGN DRAWINGS (PROVIDE A MINIMUM OF 12 SECONDARY SIDE LUG CONNECTIONS).
 - VERIFY DAMPING LOADS WITH ELECTRICAL PANEL SCHEDULES AS SHOWN ON THE BUILDING CONSTRUCTION DESIGN DRAWINGS.
 - IN EACH PADMOUNT TRANSFORMER, PROVIDE A & B SWITCHING INCLUDING LOAD BREAK, GANG OPERATED SWITCH THAT IS EXTERNALLY OPERABLE FROM THE HIGH-VOLTAGE COMPARTMENT THROUGH USE OF A HOT-STICK.
 - ELECTRICAL CONTRACTOR SHALL FIELD VERIFY PRIMARY VOLTAGE AND UTILITY CONFIGURATION (WYE OR DELTA) PRIOR TO SUBMITTING EQUIPMENT. DOCUMENT IN-FIELD DISCOVERY (VOLTAGE/CONFIGURATION) OF EXISTING CONDITIONS AS A PART OF TRANSFORMER SUBMITTAL.

| XFMR NAME | SYMBOL DESCRIPTION | PRIMARY | SECONDARY | SIZE | IMPEDANCE (%Z) |
|-----------|--|---------|-----------|---------|----------------|
| T2 | TRANSFORMER SERVING NEW HEALTHCARE FACILITY, PARKING GARAGE, AND MEDICAL EXAMINER BUILDING (DELTAWYE; MINIMUM OF TWELVE (12) SECONDARY SIDE LUG CONNECTIONS) | 14400V | 480Y/277V | 2000KVA | 5.8% |

MEDIUM VOLTAGE FEEDER SCHEDULE

| NOTE NUMBER | NOTE |
|-------------|--|
| 120B | IN EXISTING CONDUIT, PROVIDE 3#4 AWG, 15KV, CU, TAPE SHIELD, EPR JACKET, MV-90, 133% MV CABLE, 120 AMPACITY, #30 GND. ELECTRICAL CONTRACTOR SHALL FIELD VERIFY WHAT HAS ALREADY BEEN INSTALLED IN EXISTING SWITCHGEAR. CONTRACTOR SHALL MATCH EXISTING MATERIAL (CJAL), WIRE TYPE (MV-90/MV-105), NEUTRAL (CONCENTRIC/TAPE SHIELD), AND INSULATION TYPE. COORDINATE IN-FIELD DISCOVERIES THAT DEViate FROM WHAT IS IN CONTRACT DOCUMENTS WITH ENGINEER PRIOR TO ORDERING FEEDER. |
| 315B | PROVIDE (2) 6" CONDUIT, ONE SPARE AND ONE CONDUIT WITH 3 #40 AWG, 15KV, CU, TAPE SHIELD, EPR JACKET, MV-105, 133% MV CABLE, 315 AMPACITY, #30 GND |
| 475A | PROVIDE 3 #250.8 KCML (TPARTIDGES), 2607 ASCR AERIAL CONDUCTORS, 475 AMPACITY |

CLIENT



COLLIN COUNTY

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ARCHITECT

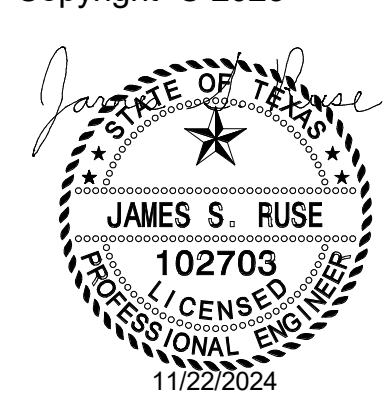


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DRAWING HISTORY

| NO. | DATE | DESCRIPTION |
|-----|------------|------------------|
| 1 | 10/16/2023 | ISSUE FOR PERMIT |
| 2 | 12/01/2023 | REVISION 1 |
| 3 | 01/22/2024 | ISSUE FOR BID |
| 4 | 04/04/2024 | ADDENDUM 4 |
| 5 | 10/07/2024 | AS1 #2 |
| 6 | 11/22/2024 | AS1 #3 |

KEY PLAN

PROJECT NAME

COLLIN COUNTY HEALTHCARE, PARKING GARAGE, & MEDICAL EXAM. FACILITIES

PROJECT LOCATION

2310, 2320, & 2330 Bloomdale Rd, McKinney, TX 75071

PROJECT NUMBER

1006549.00

SHEET TITLE

SINGLE LINE DIAGRAM

VOLUME 1

SITE DEVELOPMENT SHEET NUMBER

SD-E5.01