|  |  |  |
| --- | --- | --- |
| **CMGT 235 – Electrical and Mechanical Systems** | | |
| **Discussion No. 21** | **Unit 3 - Electrical Systems** | **Fall 2019** |

**ONE-LINE DIAGRAM - IN-CLASS EXAMPLE**

Complete Table 1 – Meter Base and Main Disconnect Switch, Table 2 – Panelboards, and Table 3 – Transformers

Project: Waste Management Hauling Facility

Drawing: E3 Panelboards One-Line Diagrams

* List all TRIP/POLES (BRKR) as largest to smallest
* List FEEDERS (conductors) as smallest to largest [see NEC Article 310, Table 310.15(B)(16)]

**Table 1 – Meter Base and Main Disconnect Switch**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Equipment** | **AMPS** | **VOLTAGE** | Ø **WIRES** | **NEMA** | **FEEDERS - QTY** |
| Meter Base |  |  |  |  |  |
| Main Disconnect Switch |  |  |  |  |  |

**Table 2 - Panelboards**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Panel** | **AMPS** | **VOLTAGE** | Ø **WIRES** | **MLO/MCB** | **CKTS** | **TRIP/POLES-QTY** | **FEEDERS - QTY** |
| MDP |  |  |  |  |  |  |  |
| PNL H1 |  |  |  |  |  |  |  |
| PNL H2 |  |  |  |  |  |  |  |
| PNL L1 |  |  |  |  |  |  |  |
| PNL L2 |  |  |  |  |  |  |  |

**Table 3 - Transformers**

|  |  |  |
| --- | --- | --- |
| **Equipment** | **Specifications** | **Feeders - QTY** |
| Transformer (XFMR) |  |  |

**ANSWERS**

**Table 1 – Meter Base and Main Disconnect Switch**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **EQUIPMENT** | **AMPS** | **VOLTAGE** | Ø **WIRES** | **NEMA** | **FEEDERS-QTY** |
| Meter Base | 600A | 277/480V | 3Ø 4W | N3R | #350 – 8 |
| Disconnect Switch | 600A | 277/480V | 3Ø 4W | N3R | #1 – 1  #350 – 8 |

**Table 2 - Panelboards**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Panel** | **AMPS** | **VOLTAGE** | Ø **WIRES** | **MLO/MCB** | **CKTS** | **TRIP/POLES-QTY** | **FEEDERS - QTY** |
| MDP | 600A | 277/480V | 3Ø 4W | MCB | 18 | 400/3 – 1  200/3 – 1 | #6 – 1  #1 – 1  #1/0 – 1  #3/0 - 4  #350 – 8  #600 – 4 |
| PNL H1 | 400A | 277/480V | 3Ø 4W | MCB | 42 | 125/3 – 1  60/3 – 2  30/3 – 2  20/3 – 1  20/1 - 8 | #8 – 1  #1/0 – 1  #3 – 4  #600 – 4 |
| PNL H2 | 200A | 277/480V | 3Ø 4W | MCB | 42 | 20/2 – 1 | #6 – 1  #3/0 – 4 |
| PNL L1 | 400A | 120/208V | 3Ø 4W | MCB | 42 | 120/3 – 1  60/2 – 2  45/2 – 1  20/2 – 1  15/2 – 1  20/1 - 26 | #6 – 2  #3/0 – 8 |
| PNL L2 | 150A | 120/208V | 3Ø 4W | MLO | 42 | 15/3 – 3  30/2 – 1  15/2 -1  20/1 – 17 | #6 – 1  #3/0 – 4 |

**Table 3 - Transformers**

|  |  |  |
| --- | --- | --- |
| **EQUIPMENT** | **SPECIFICATIONS** | **Feeders-QTY** |
| Transformer (XFMR) | 112.5 KVA  480 – 120/208V  3Ø 4W | #8 – 1  #6 – 1  #3 – 4  #3/0 – 4 |