SECTION 26 08 00

**COMMISSIONING OF ELECTRICAL**

**BASED ON DFD MASTER SPECIFICATION DATED 03/01/21**

***This section has been written to cover most (but not all) situations that you will encounter. Depending on the requirements of your specific project, you may have to add material, delete items, or modify what is currently written. The Division of Facilities Development expects changes and comments from you.***

**PART 1 ‑ GENERAL**

**SCOPE**

This section includes commissioning forms for construction verification and functional performance testing. Included are the following topics:

PART 1 - GENERAL

Scope

Related Work

Reference

Submittals

PART 2 - PRODUCTS

(Not Used)

PART 3 – EXECUTION

***DO NOT INCLUDE ANY COMMISSIONING FORMS for PRELIMINARY review. Just edit the list below and only submit pages 26 08 00-1 through 26 08 00-2 with strikethroughs.***

Commissioning Forms

CV-26 05 13 Medium-Voltage Cables

CV-26 05 19 Low-Voltage Electrical Power Conductors and Cables

CV-26 05 26 Grounding and Bonding for Electrical Systems

CV-26 05 33 Raceways and Boxes for Electrical Systems

CV-26 05 36 Cable Trays for Electrical Systems

CV-26 05 43 Underground Ducts and Raceways for Electrical Systems

CV-26 09 19 Enclosed Contactors

CV-26 09 28 Lighting Control Panels

CV-26 12 13 Medium-Voltage Transformers, Liquid-Filled, Substation Style (Indoor)

CV-26 12 16 Medium-Voltage Transformers, Dry-Type (Indoor)

CV-26 12 19 Medium-Voltage Transformers, Liquid-Filled, Pad-Mounted (Outdoor)

CV-26 13 02 Medium-Voltage Pad Mounted Switchgear

CV-26 13 16 Medium-Voltage Fusible Interrupter Switchgear

CV-26 18 23 Medium-Voltage Surge Arresters

CV-26 22 00 Low-Voltage Transformers

CV-26 24 13 Switchboards

CV-26 24 16 Panelboards

CV-26 27 13 Electricity Metering

CV-26 27 28 Disconnect Switches

CV-26 28 16 Enclosed Switches and Circuit Breakers

CV-26 29 00 Magnetic Motor Starters

CV-26 29 00 Manual Motor Starters

CV-26 29 00 Motor Control Centers

CV-26 32 13.13 Engine-Driven Generators Sets - Diesel

CV-26 32 13.16 Engine-Driven Generators Sets – Natural Gas/LP

CV-26 36 00 Transfer Switches

CV-26 43 13 Surge Protective Devices for Low-Voltage Electrical Power Circuits

CV-26 51 13 Interior Lighting Fixtures, Lamps and Ballasts

CV-26 56 29 Site Lighting

FPT-26 09 28 Lighting Control Panels

FPT-26 32 13.13 Engine-Driven Generators Sets - Diesel

FPT-26 32 13.16 Engine-Driven Generators Sets - Natural Gas/LP

**RELATED WORK**

Section 01 91 01 or 01 91 02 – Commissioning Process

**REFERENCE**

Applicable provisions of Division 1 shall govern work under this section.

**SUBMITTALS**

Reference the General Conditions of the Contract for submittal requirements.

Reference Section 01 91 01 or 01 91 02 Commissioning Process for Construction Verification Checklist and Functional Performance Test submittal requirements.

**PART 2 – PRODUCTS**

(Not Used)

**PART 3 – EXECUTION**

**COMMISSIONING FORMS**

Commissioning forms are to be filled in as work progresses by the individuals responsible for installation and shall be completed for each installation phase.

Provide a description of the work completed since the last entry, the percentage of the total work completed for the system for that area and the step of installation or finalization.

Circle Yes or No for each commissioning form item. If the information requested for an item does not apply to the given stage of installation for the system, list it as “N/A”. Explain all discrepancies, negative responses or N/A responses in the negative responses section.

Once the work is 100% complete and the responses to each item are complete and resolved for a given commissioning forms group, mark as complete, initial and date in the spaces provided.

Provide copies of the commissioning forms to the commissioning agent 2 days prior to construction progress meetings.

***Edit the individual construction verification checklists and provide additional checklists as needed to reflect the verification requirements of assemblies, components, equipment and systems to be commissioned on this project.***

***DO NOT INCLUDE ANY of the following COMMISSIONING FORMS for PRELIMINARY review. Just edit the list in Part I above and only submit pages 26 08 00-1 through 26 08 00-2 with strikethroughs.***

**CV-26 05 13 – Medium-Voltage Cables**

**Equipment Identification/Tag: \_\_\_\_\_\_\_**

**Location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**A) CABLE PULLING CHECKS**

| **Date** | **Description of Work Performed** | **%**  **Complete** | **Initials** | **Questions (See details below)** | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1)** | **2)** | **3)** | **4)** | **5)** | **6)** | **7)** | **8)** | **9)** |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |
| **❑ CHECKLIST GROUP COMPLETE** | | | | **INITIALS:** | |  | | | **DATE:** | |  | | |

**Question Details**

1. All water is pumped out of the manholes prior to beginning work.
2. A mandrel/swab ¼” smaller than the duct diameter is pulled through conduit run to insure adequate opening of conduit run.
3. Conduits swabbed to remove foreign material prior to pulling cables.
4. No cables pulled from an exterior location when the outdoor air temperature was below 40 deg. F.
5. Cable pulling done in accordance with cable manufacturer's recommendations, except as modified herein, and ANSI/IEEE C2 standards.
6. All cables pulled though conduit at the same time, with pulling lubricant used to ease pulling tensions.
7. Actual pulling tensions continuously monitored and permanently recorded in a log and submitted to the Engineer at the end of the project.
8. Excess cable provided at each termination and splice point for purpose of multiple terminations or splices to be performed.
9. Cables not to be terminated within 8 hours to be properly sealed and protected from moisture intrusion until termination.

**Negative Responses**

| **Group/Item** | **Date**  **Found** | **Found**  **By** | **Location** | **Reason for Negative Response** | **Resolved** | **Date**  **Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |

**B) CABLE ROUTING IN MANHOLES OR SWITHGEARS CHECKS**

| **Date** | **Description of Work Performed** | **%**  **Complete** | **Initials** | **Questions (See details below)** | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1)** | **2)** | **3)** | **4)** | **5)** | **6)** | **7)** |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | | | **INITIALS:** | |  | | | **DATE:** | |  | | |

**Question Details**

1. For cabling specified to be looped in a manhole, cabling circles the manhole at least 360 degrees.
2. For cabling specified not to be looped in a manhole, cabling routed along walls with the longest distance between points of entry and exit.
3. All new and existing cabling in manholes is secured as required in specifications.
4. Cabling within switchgear routed in a manner to allow adequate room for bending and termination as per specifications.
5. Cabling within switchgear is secured independently of termination electrical joint.
6. Cable training bending radius is at least 12 times cable diameter.
7. Jumper cable routing maintains adequate through-air clearance between adjacent conductors and between conductors and any metallic or grounded surface.

**Negative Responses**

| **Group/Item** | **Date**  **Found** | **Found**  **By** | **Location** | **Reason for Negative Response** | **Resolved** | **Date**  **Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |

**C) CABLE TERMINATIONS & SPLICES CHECKS**

| **Date** | **Description of Work Performed** | **%**  **Complete** | **Initials** | **Questions (See details below)** | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1)** | **2)** | **3)** | **4)** | **5)** | **6)** | **7)** | **8)** |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | | | **INITIALS:** | |  | | | **DATE:** | |  | | |

**Question Details**

1. Splicing held to a minimum and only per pre-approved locations by Engineer.
2. Termination or splicing of the conductors are made with tool applied compression (swaged) fittings and conform to specification requirements for given cable type.
3. Installed lugs match the pads on the equipment to which the cable will be mounted.
4. All lug terminations are connected per connection torque valve as recommended by the manufacturer.
5. Spacers are used when more than one cable exists on an equipment pad.
6. Cable terminations are taped with approved anti-tracking tape.
7. Fireproofing applied to exposed cabling in manholes, vaults, and cable trays and cabling in pull boxes, troughs, switchgear pull sections, bases, and pulling pits containing two or more sets of cable.
8. Fireproofing material and installation meets specification requirements.

**Negative Responses**

| **Group/Item** | **Date**  **Found** | **Found**  **By** | **Location** | **Reason for Negative Response** | **Resolved** | **Date**  **Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |

**D) TESTING & FINALIZATION CHECKS**

| **Date** | **Description of Work Performed** | **%**  **Complete** | **Initials** | **Questions (See details below)** | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1)** | **2)** | **3)** | **4)** | **5)** |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | | | **INITIALS:** | |  | | | **DATE:** | |  | | |

**Question Details**

1. All exposed cabling has been visually inspected for physical damage and any damaged cabling has been replaced.
2. Cabling jacket and insulation are in good condition.
3. All cable terminations have been checked for proper tightness and clearances per specification and manufacturer recommendations and any adjustments necessary have been made.
4. All specified acceptance tests have been performed on all cables, terminations, and splices and are approved prior to energizing.
5. All splices and terminations are tagged in accordance with specification requirements.

**Negative Responses**

| **Group/Item** | **Date**  **Found** | **Found**  **By** | **Location** | **Reason for Negative Response** | **Resolved** | **Date**  **Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |

**CV-26 05 19 – Low-Voltage Electrical Power Conductor and Cables**

**Equipment Identification/Tag: \_\_\_\_\_\_\_**

**Location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**A) CONDUCTOR AND CABLING PULLING CHECKS**

| **Date** | **Description of Work Performed** | **%**  **Complete** | **Initials** | **Questions (See details below)** | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1)** | **2)** | **3)** | **4)** | **5)** | **6)** | **7)** |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | | | **INITIALS:** | |  | | | **DATE:** | |  | | |

**Question Details**

1. Conductor and cabling sized to maintain less than a 3% voltage drop for rated length and ampacity of circuit.
2. Conductors and cabling coloring match specification requirements for given voltage, wire gauge, and leg of circuit.
3. Conduits swabbed to remove foreign material prior to pulling cables.
4. All cables pulled though conduit at the same time, with pulling lubricant used to ease pulling tensions.
5. Excess cable provided at each termination and splice point for purpose of multiple terminations or splices to be performed.
6. Emergency power conductors and cabling pulled in separate conduits from normal power systems.
7. Outdoor cables not to be terminated within 8 hours to be properly sealed and protected from moisture intrusion until termination.

**Negative Responses**

| **Group/Item** | **Date**  **Found** | **Found**  **By** | **Location** | **Reason for Negative Response** | **Resolved** | **Date**  **Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |

**B) CONDUCTOR AND CABLE TERMINATIONS & SPLICES CHECKS**

| **Date** | **Description of Work Performed** | **%**  **Complete** | **Initials** | **Questions (See details below)** | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1)** | **2)** | **3)** | **4)** | **5)** | **6)** | **7)** | **8)** |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | | | **INITIALS:** | |  | | | **DATE:** | |  | | |

**Question Details**

1. Installed lugs match the pads on the equipment to which the cable will be mounted.
2. All lug terminations are connected per connection torque valve as recommended by the manufacturer.
3. Splices made only in accessible junction boxes.
4. All conductors and cables cleaned prior to termination.
5. All splices made so that the electrical resistance of the splice does not exceed the equivalent resistance of 2’ of conductor.
6. Solderless spring type pressure connectors with insulating covers used for all wires splices and taps of conductors and cabling 10AWG and smaller.
7. Mechanical or compression connectors used for all wire splices and taps of conductors and cabling 8 AWG and larger.
8. Uninsulated conductors and connectors taped with electrical tape equivalent to 150% of the insulation value of the conductor.

**Negative Responses**

| **Group/Item** | **Date**  **Found** | **Found**  **By** | **Location** | **Reason for Negative Response** | **Resolved** | **Date**  **Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |

**C) TESTING & FINALIZATION CHECKS**

| **Date** | **Description of Work Performed** | **%**  **Complete** | **Initials** | **Questions (See details below)** | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1)** | **2)** | **3)** | **4)** | **5)** |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | | | **INITIALS:** | |  | | | **DATE:** | |  | | |

**Question Details**

1. All exposed conductors and cabling has been visually inspected for physical damage and any damaged conductors and cabling has been replaced.
2. Conductors and cabling jacket and insulation are in good condition.
3. All cable terminations have been checked for proper tightness and clearances per specification and manufacturer recommendations and any adjustments necessary have been made.
4. For aluminum conductors and cabling all specified acceptance tests have been performed on all cables, terminations, and splices and are approved prior to energizing.
5. All splices and terminations are to be tagged within 2” to 4” of splice or termination and in accordance with specification requirements.

**Negative Responses**

| **Group/Item** | **Date**  **Found** | **Found**  **By** | **Location** | **Reason for Negative Response** | **Resolved** | **Date**  **Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |

**CV-26 05 26 – Grounding and Bonding for Electrical Systems**

**Equipment Identification/Tag: \_\_\_\_\_\_\_**

**Location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**A) GENERAL GROUNDING AND BONDING INSTALLATION CHECKS**

| **Date** | **Description of Work Performed** | **%**  **Complete** | **Initials** | **Questions (See details below)** | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1)** | **2)** | **3)** | **4)** | **5)** | **6)** | **7)** | **8)** | **9)** |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |
| **❑ CHECKLIST GROUP COMPLETE** | | | | **INITIALS:** | |  | | | **DATE:** | |  | | |

**Question Details**

1. Mechanical connections accessible for inspection and checking, with no insulation of connections.
2. Ground connection surfaces cleaned and all connections made permanent.
3. Grounds attached permanently before permanent building service is energized.
4. Grounding electrode conductors installed in PVC conduit or rigid galvanized steel conduit and bonded at both ends to the grounding electrode conductor with an approved grounding fitting.
5. Grounding electrode is correct size and length.
6. Grounded conductor run to each service disconnecting means and its enclosure.
7. Separate insulated equipment grounding conductor installed with phase conductors within each raceway.
8. All metallic systems (water, gas, sprinkler, etc.) and lightning protection system bonded to ground system.
9. System bonded within 5’ from point of entry into building to at least two of the following: metal underground water pipe, metal frame of building, concrete encased electrodes, ground ring, (underground local systems such as storage tanks, conduit, or piping), ground rod installed 8’ deep or at 45-degree angle and distanced a minimum of 6’ apart., ground plate buried 2-1/2’ deep.

**Negative Responses**

| **Group/Item** | **Date**  **Found** | **Found**  **By** | **Location** | **Reason for Negative Response** | **Resolved** | **Date**  **Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |

**B) MEDIUM VOLTAGE GROUNDING AND BONDING INSTALLATION CHECKS**

| **Date** | **Description of Work Performed** | **%**  **Complete** | **Initials** | **Questions (See details below)** | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1)** | **2)** | **3)** | **4)** | **5)** | **6)** | **7)** | **8)** |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | | | **INITIALS:** | |  | | | **DATE:** | |  | | |

**Question Details**

1. Ground bus installed 18" above finished floor with insulated standoffs 36” on center, completely around the perimeter of the room (vault) containing the high voltage switchgear and unit substation.
2. Six ground rods provided equally spaced around high voltage switchgear room and connected to ground bus with 4/0 copper.
3. Separate 4/0 copper conductors provided from ground bus to, XO terminal of each transformer, each high voltage switch ground bus, and secondary service equipment ground bus.
4. Full size 600V copper THHN/THWN or XHHW-2 grounding conductor provided in each conduit, raceway or enclosure which contains high voltage conductors, and terminated at ground bus of equipment containing high voltage terminations.
5. Each enclosure containing high voltage parts (switches, fuses, transformers, pull boxes, etc.) bonded to room ground bus with 4/0 copper conductor.
6. All conduits containing high voltage conductors or secondary service conductors bonded to penetrated enclosures using grounding bushing and #4 copper conductor.
7. #10 stranded wire provided from each termination shield drain wire to ground bus within enclosure.
8. Ground rod provided in each section of each secondary switchboard with 4/0 copper wire connection to ground rod and to switchgear ground bus.

**Negative Responses**

| **Group/Item** | **Date**  **Found** | **Found**  **By** | **Location** | **Reason for Negative Response** | **Resolved** | **Date**  **Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |

**C) LOW VOLTAGE (<600V) GROUNDING AND BONDING INSTALLATION CHECKS**

| **Date** | **Description of Work Performed** | **%**  **Complete** | **Initials** | **Questions (See details below)** | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1)** | **2)** | **3)** | **4)** | **5)** | **6)** | **7)** |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | | | **INITIALS:** | |  | | | **DATE:** | |  | | |

**Question Details**

1. Code sized copper grounding electrode conductor provided from secondary switchboard ground bus, each separately derived system neutral, secondary service system neutral to street side of water meter, building steel, ground rod, and any concrete encased electrodes.
2. Bonding jumper provided around water meter.
3. Bond together system neutrals, service equipment enclosures, exposed non-current carrying metal parts of electrical equipment, metal raceway systems, grounding conductor bonded in raceways and cables, receptacle ground connectors, and plumbing systems.
4. Separate insulated equipment grounding conductor provided within each raceway.
5. Ground wire provided from each device to the respective enclosure.
6. Communications system grounding conductor provided at point of service entrance and connected to building common grounding electrode system.
7. Telecommunications and audio visual systems installed with an isolated grounding system with only one ground point at the electrical service entrance for the building per specification requirements.

**Negative Responses**

| **Group/Item** | **Date**  **Found** | **Found**  **By** | **Location** | **Reason for Negative Response** | **Resolved** | **Date**  **Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |

**CV-26 05 33 – Raceway and Boxes for Electrical Systems**

**Equipment Identification/Tag: \_\_\_\_\_\_\_**

**Location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**A) CONDUIT & FITTINGS PRE-INSTALLATION CHECKS**

| **Date** | **Description of Work Performed** | **%**  **Complete** | **Initials** | **Questions (See details below)** | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1)** | **2)** |  |  |  |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |  |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | | | **INITIALS:** | |  | | | **DATE:** | |  | | |

**Question Details**

1. Conduit type and material in accordance with specification requirements for given application and location.
2. Conduit sufficiently sized to accommodate cabling and fill requirements of contract document.

**Negative Responses**

| **Group/Item** | **Date**  **Found** | **Found**  **By** | **Location** | **Reason for Negative Response** | **Resolved** | **Date**  **Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |

**B) CONDUIT & FITTINGS INSTALLATION CHECKS**

| **Date** | **Description of Work Performed** | **%**  **Complete** | **Initials** | **Questions (See details below)** | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1)** | **2)** | **3)** | **4)** | **5)** | **6)** | **7)** | **8)** | **9)** | **10)** |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |
| **❑ CHECKLIST GROUP COMPLETE** | | | | **INITIALS:** | |  | | | **DATE:** | |  | | |

**Question Details**

1. Conduit support spacing complies with specification requirements.
2. All conduit supported independently of piping, ductwork, equipment, cable tray or other conduit.
3. Bends in conduit minimized with required bends conforming to specification requirements and no more than an equivalent of three 90 degree bends between boxes.
4. Moisture traps are avoided as much as possible. When unavoidable, a junction box is provided with drain fitting at conduit low point.
5. All equipment requiring maintenance is accessible.
6. Minimum 6” clearance between conduit and piping, and 12” clearance between conduit and heat sources such as flues, steam pipes, and heating appliances is provided.
7. No continuous conduit run exceeds 100’ without a junction box.
8. Expansion‑deflection joints installed where conduit crosses building expansion joints.
9. Where conduit passes between areas of differing temperatures, listed conduit seals are provided.
10. At end of work day suitable conduit caps or other approved seals provided for incomplete work to protect installed conduit against entrance of dirt and moisture.

**Negative Responses**

| **Group/Item** | **Date**  **Found** | **Found**  **By** | **Location** | **Reason for Negative Response** | **Resolved** | **Date**  **Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |

**C) RACEWAY & GUTTER INSTALLATION CHECKS**

| **Date** | **Description of Work Performed** | **%**  **Complete** | **Initials** | **Questions (See details below)** | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1)** | **2)** | **3)** | **4)** | **5)** | **6)** | **7)** | **8)** |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | | | **INITIALS:** | |  | | | **DATE:** | |  | | |

**Question Details**

1. Raceway and gutter support spacing and methods comply with specification requirements.
2. All raceways supported independently of piping, ductwork, equipment, cable tray or other conduit.
3. Suitable insulating bushings and inserts provided at connections to outlets and corner fittings.
4. All equipment requiring maintenance is accessible.
5. Expansion‑deflection joints installed where conduit crosses building expansion joints.
6. Oil tight gutters included gaskets at each joint.
7. Rain-tight gutters are installed in horizontal position only.
8. At end of work day suitable caps or other approved seals provided for incomplete work to protect installed raceways and gutters against entrance of dirt and moisture.

**Negative Responses**

| **Group/Item** | **Date**  **Found** | **Found**  **By** | **Location** | **Reason for Negative Response** | **Resolved** | **Date**  **Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |

**D) JUNCTION, PULL AND OUTLET BOXES INSTALLATION CHECKS**

| **Date** | **Description of Work Performed** | **%**  **Complete** | **Initials** | **Questions (See details below)** | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1)** | **2)** | **3)** | **4)** | **5)** | **6)** | **7)** | **8)** | **9)** |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |
| **❑ CHECKLIST GROUP COMPLETE** | | | | **INITIALS:** | |  | | | **DATE:** | |  | | |

**Question Details**

1. Boxes provided in locations as per contract documents, Engineer’s direction or as necessary for splicing and terminations.
2. Box type and material in accordance with specification requirements for given application and location.
3. No outlet box located where it will be obstructed by other equipment, piping, lockers, benches, counters, etc.
4. All boxes supported independently of conduit, piping, ductwork, equipment, or cable tray.
5. No outlet boxes installed back‑to‑back in walls, and minimum 6” separation between all boxes, except for installations in acoustic walls where a minimum 24” separation between boxes is provided.
6. All boxes are accessible, and where installation is inaccessible, 18” by 24” access door has been provided.
7. Mounting heights for outlet boxes corresponds with contract document requirements.
8. All recessed outlet boxes in finished areas are mounted to the correct depth to accommodate and be flush to final surface finish.
9. Knockout closures provided for unused openings.

**Negative Responses**

| **Group/Item** | **Date**  **Found** | **Found**  **By** | **Location** | **Reason for Negative Response** | **Resolved** | **Date**  **Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |

**E) FINALIZATION CHECKS**

| **Date** | **Description of Work Performed** | **%**  **Complete** | **Initials** | **Questions (See details below)** | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1)** | **2)** | **3)** | **4)** | **5)** | **6)** | **7)** | **8)** | **9)** | **10)** |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |
| **❑ CHECKLIST GROUP COMPLETE** | | | | **INITIALS:** | |  | | | **DATE:** | |  | | |

**Question Details**

1. All penetrations through fire rated wall assemblies have been sealed per specification requirements.
2. All penetrations through non-rated wall assemblies have been sealed per specification requirements for given space type.
3. Conduits that penetrate the building envelope are sealed to prevent intrusion of air and moisture and are accessible.
4. All conduit junction boxes are painted and tagged in accordance with specification requirements.
5. All splices and terminations are to be tagged within 2” to 4” of splice or termination and in accordance with specification requirements.
6. 1/8” nylon pull string provided in all empty conduits, except sleeves and nipples.
7. Grounding and bonding of conduits and raceways conform to specification requirements.

**Negative Responses**

| **Group/Item** | **Date**  **Found** | **Found**  **By** | **Location** | **Reason for Negative Response** | **Resolved** | **Date**  **Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |

**CV-26 05 36 – Cable Trays for Electrical Systems**

**Equipment Identification/Tag: \_\_\_\_\_\_\_**

**Location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**A) CABLE TRAY INSTALLATION CHECKS**

| **Date** | **Description of Work Performed** | **%**  **Complete** | **Initials** | **Questions (See details below)** | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1)** | **2)** | **3)** | **4)** | **5)** | **6)** | **7)** | **8)** |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | | | **INITIALS:** | |  | | | **DATE:** | |  | | |

**Question Details**

1. No sharp edges remain after field fabrication, and the metal cable tray is installed according to NEMA VE2 and manufacturer instructions.
2. The clearance between cable tray and other systems and equipment is a minimum of 1’ on both sides of the cable tray and 8”on top of the cable tray.
3. Tray does not restrict removal of ceiling panels or lighting assemblies. Cable tray location does not impede operation and access to other systems and equipment.
4. Supports provided at each connection point, at the end of each run, and at other points to maintain spacing between supports of 8’ maximum.
5. The maximum allowable deviation of the tray, from the level horizontal plane measured across the width of the tray, is one half of one inch (1/2"), with the tray loaded to capacity, as allowed by the NEC.
6. Expansion fittings are provided at expansion joints and where required.
7. Cable tray is grounded and bonded according to specifications or per NEC 250.96(A).
8. No conduits are attached to the cable tray except for the conduits that terminate at the cable tray.

**Negative Responses**

| **Group/Item** | **Date**  **Found** | **Found**  **By** | **Location** | **Reason for Negative Response** | **Resolved** | **Date**  **Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |

**B) FINALIZATION CHECKS**

| **Date** | **Description of Work Performed** | **%**  **Complete** | **Initials** | **Questions (See details below)** | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1)** | **2)** | **3)** | **4)** |  |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | | | **INITIALS:** | |  | | | **DATE:** | |  | | |

**Question Details**

1. Where cable tray passes below coils, traps, etc., covers are provided extending 12” on either side of cable tray.
2. Cable tray warning signs are installed at 15-foot intervals, e.g. WARNING! DO NOT USE CABLE TRAY AS WALKWAY, LADDER, OR SUPPORT FOR LADDERS OR PERSONNEL.
3. All penetrations through fire rated wall assemblies have been sealed per specification requirements.
4. All penetrations through non-rated wall assemblies have been sealed per specification requirements for given space type.

**Negative Responses**

| **Group/Item** | **Date**  **Found** | **Found**  **By** | **Location** | **Reason for Negative Response** | **Resolved** | **Date**  **Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |

**CV-26 05 43 – Underground Ducts and Raceways for Electrical Systems**

**Equipment Identification/Tag: \_\_\_\_\_\_\_**

**Location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**A) EXCAVATION CHECKS**

| **Date** | **Description of Work Performed** | **%**  **Complete** | **Initials** | **Questions (See details below)** | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1)** | **2)** | **3)** |  |  |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | | | **INITIALS:** | |  | | | **DATE:** | |  | | |

**Question Details**

1. Trench depth, width and height meet contract document requirements.
2. Bottom of trench consists of undisturbed earth or filled to proper level with mechanically compacted sand for low grade trenches.
3. Entire trench section excavated and graded before any duct is laid in section.

**Negative Responses**

| **Group/Item** | **Date**  **Found** | **Found**  **By** | **Location** | **Reason for Negative Response** | **Resolved** | **Date**  **Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |

**B) CONDUIT IINSTALLATION CHECKS**

| **Date** | **Description of Work Performed** | **%**  **Complete** | **Initials** | **Questions (See details below)** | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1)** | **2)** | **3)** | **4)** | **5)** | **6)** | **7)** | **8)** | **9)** | **10)** |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |
| **❑ CHECKLIST GROUP COMPLETE** | | | | **INITIALS:** | |  | | | **DATE:** | |  | | |

**Question Details**

1. Heavy wall galvanized steel conduit provided within 5’ of each building wall or manhole wall penetration, within the concrete envelope to provide protection against vertical shearing.
2. Mechanical seal of assembled rubber links properly sized for conduit is provided for all penetrations into existing facilities.
3. Flush bell ends provided on duct at manholes and buildings.
4. Spacers provided as recommended by conduit manufacturer and specification requirements.
5. Conduit joints staggered a minimum of 6” horizontally for concrete encasement applications.
6. Conduit pitched for proper drainage to manhole or pull box a minimum of 4” per 100’.
7. Not more than one 90 degree bend or equivalent between pull points for primary conduit and two 90 degree bends or equivalent for signal conduit is provided.
8. Insulated grounding bushings provided on steel duct ends.
9. At end of work day suitable caps or other approved seals provided for incomplete work to protect installed conduits against entrance of dirt and moisture.

**Negative Responses**

| **Group/Item** | **Date**  **Found** | **Found**  **By** | **Location** | **Reason for Negative Response** | **Resolved** | **Date**  **Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |

**C) CONDUIT FINALIZATION CHECKS**

| **Date** | **Description of Work Performed** | **%**  **Complete** | **Initials** | **Questions (See details below)** | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1)** | **2)** | **3)** |  |  |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | | | **INITIALS:** | |  | | | **DATE:** | |  | | |

**Question Details**

1. A mandrel/swab ¼” smaller than the duct diameter is pulled through conduit run to insure adequate opening of conduit run.
2. Pull tape with measurement markings provided in each empty duct.
3. All steel bushings grounded per specification requirements.

**Negative Responses**

| **Group/Item** | **Date**  **Found** | **Found**  **By** | **Location** | **Reason for Negative Response** | **Resolved** | **Date**  **Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |

**D) BACKFILL & CONCRETE PLACEMENT CHECKS**

| **Date** | **Description of Work Performed** | **%**  **Complete** | **Initials** | **Questions (See details below)** | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1)** | **2)** | **3)** | **4)** | **5)** | **6)** |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | | | **INITIALS:** | |  | | | **DATE:** | |  | | |

**Question Details**

1. Reinforcing bars installed at a minimum at each corner, with a 12” overlap of the joints and tied the connecting walls of manholes, vaults, and buildings, etc.
2. Minimum of 3” of concrete cover over conduit at the top, bottom and sides of the duct bank is provided with a troweled crowned top on the concrete to prevent water accumulation.
3. Concrete envelope extended to finish floor grade or interior wall surface in buildings and finish pad grade at equipment.
4. Top of concrete envelopes is more than 24” below grade.
5. Underground warning tape provided 12" below finish grade over all ductbanks.
6. All backfill is compacted around ductbank and all ground and pavement surfaces returned to intended or original condition.

**Negative Responses**

| **Group/Item** | **Date**  **Found** | **Found**  **By** | **Location** | **Reason for Negative Response** | **Resolved** | **Date**  **Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |

**CV-26 09 19 – Enclosed Contactors**

**Equipment Identification/Tag: \_\_\_\_\_\_\_**

**Location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Group/Item** | **Group/Task Description** | | | **Submitted** | **Delivered** |
| *A* | *MODEL VERIFICATION* | | | | |
| 1 | Manufacturer | | |  |  |
| 2 | Model | | |  |  |
| 3 | Serial Number | | |  |  |
| 4 | Voltage (V) | | |  |  |
| 5 | Ampere Ratings (A) | | |  |  |
| 6 | Short Circuit Current Rating (kA) | | |  |  |
| 7 | # of Poles | | |  |  |
| 8 | Enclosure Type | | |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |

| **Group/Item** | **Group/Task Description** | | | **Response** | |
| --- | --- | --- | --- | --- | --- |
| *B* | *PHYSICAL CHECKS* | | | | |
| 1 | Unit is free from physical damage. | | | YES | NO |
| 2 | All components/accessories present. | | | YES | NO |
|  |  | | |  |  |
|  |  | | |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *C* | *INSTALLATION* | | | | |
| 1 | Unit secured as required by manufacturer and specification requirements. | | | YES | NO |
| 2 | Adequate clearance around unit for service. | | | YES | NO |
| 3 | Unit is level, plumb, and square. | | | YES | NO |
| 4 | Identification labels provided per specification requirements. | | | YES | NO |
|  |  | | |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *D* | *WIRING* | | | | |
| 1 | Unit is grounded per project requirements. | | | YES | NO |
| 2 | All connections are terminated properly. | | | YES | NO |
| 3 | All electrical connections are tightened to the proper torque values. | | | YES | NO |
| 4 | All cables are permanently labeled relative to use. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *E* | *CONTROLS INSTALLATION* | | | | |
| 1 | Remote start and stop wiring installed and communication verified. | | | YES | NO |
| 2 | Photocell wiring installed and communication verified (if applicable). | | | YES | NO |
| 3 | Time-clock wiring installed and communication verified (if applicable). | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *F* | *STARTUP* | | | | |
| 1 | All protective coverings removed. | | | YES | NO |
| 2 | Unit has been cleaned of all debris and dirt on interior of unit. | | | YES | NO |
| 3 | All wiring connections verified for proper torques values and are acceptable. | | | YES | NO |
| 4 | Voltage verified to be zero across line and load terminals of each relay. | | | YES | NO |
| 5 | Unit energized by authorized personnel. | | | YES | NO |
| 6 | All relays tested via H-O-A switch and are operational. | | | YES | NO |
| 7 | All damage to unit finish is repaired. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *G* | *CONTROLS STARTUP* | | | | |
| 1 | Unit programmed in accordance with contract documents and manufacturer instructions. | | | YES | NO |
| 2 | Communication with building automation system verified (if applicable). | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |

**Negative Responses**

| **Group/**  **Item** | **Date**  **Found** | **Found**  **By** | **Reason for Negative Response** | **Resolved** | **Date**  **Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |

**CV-26 09 28 – Lighting Control Panels**

**Equipment Identification/Tag: \_\_\_\_\_\_\_**

**Location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Group/Item** | **Group/Task Description** | | | **Submitted** | **Delivered** |
| *A* | *MODEL VERIFICATION* | | | | |
| 1 | Manufacturer | | |  |  |
| 2 | Model | | |  |  |
| 3 | Serial Number | | |  |  |
| 4 | Voltage (V) | | |  |  |
| 5 | Amperage Rating (A) | | |  |  |
| 6 | KAIC rating (kA) | | |  |  |
| 7 | Max / Installed Relays | | | **/** | **/** |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |

| **Group/Item** | **Group/Task Description** | | | **Response** | |
| --- | --- | --- | --- | --- | --- |
| *B* | *PHYSICAL CHECKS* | | | | |
| 1 | Unit is free from physical damage. | | | YES | NO |
| 2 | All components/accessories present. | | | YES | NO |
|  |  | | |  |  |
|  |  | | |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *C* | *INSTALLATION* | | | | |
| 1 | Unit secured as required by manufacturer and specification requirements. | | | YES | NO |
| 2 | Adequate clearance around unit for service. | | | YES | NO |
| 3 | Unit is level, plumb, and square. | | | YES | NO |
| 4 | Identification labels provided per specification requirements. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *D* | *WIRING* | | | | |
| 1 | Unit is grounded per project requirements. | | | YES | NO |
| 2 | All connections are terminated properly. | | | YES | NO |
| 3 | All electrical connections are tightened to the proper torque values. | | | YES | NO |
| 4 | All cables are permanently labeled relative to use. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *E* | *CONTROLS INSTALLATION* | | | | |
| 1 | Remote low-voltage switch wiring installed and communication verified. | | | YES | NO |
| 2 | Photocell wiring installed and communication verified (if applicable). | | | YES | NO |
| 3 | Time-clock wiring installed and communication verified (if applicable). | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *F* | *STARTUP* | | | | |
| 1 | All protective coverings removed. | | | YES | NO |
| 2 | Unit has been cleaned of all debris and dirt on interior of unit. | | | YES | NO |
| 3 | All wiring connections verified for proper torques values and are acceptable. | | | YES | NO |
| 4 | Voltage verified to be zero across line and load terminals of each relay. | | | YES | NO |
| 5 | Unit energized by authorized personnel. | | | YES | NO |
| 6 | All relays tested via override switch and are operational. | | | YES | NO |
| 7 | All damage to unit finish is repaired. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *G* | *CONTROLS STARTUP* | | | | |
| 1 | Unit programmed in accordance with contract documents and manufacturer instructions. | | | YES | NO |
| 2 | Communication with building automation system verified (if applicable). | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |

**Negative Responses**

| **Group/**  **Item** | **Date**  **Found** | **Found**  **By** | **Reason for Negative Response** | **Resolved** | **Date**  **Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |

**CV-26 12 13 – Medium-Voltage Transformers, Liquid Filled,**

**Substation Style (Indoor)**

**Equipment Identification/Tag: \_\_\_\_\_\_\_**

**Location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Group/Item** | **Group/Task Description** | | | **Submitted** | **Delivered** |
| *A* | *MODEL VERIFICATION* | | | | |
| 1 | Manufacturer | | |  |  |
| 2 | Model | | |  |  |
| 3 | Serial Number | | |  |  |
| 4 | Primary / Secondary Voltage (V / V) | | | **/** | **/** |
| 5 | Primary / Secondary Winding Connection | | | **/** | **/** |
| 6 | Primary / Secondary BIL (kV) | | | **/** | **/** |
| 7 | Temperature Rise Rating (deg. C) | | |  |  |
| 8 | Impedance (%) | | |  |  |
| 9 | KVA base rating | | |  |  |
| 10 | KVA fan forced air rating (if applicable) | | |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |

| **Group/Item** | **Group/Task Description** | | | **Response** | |
| --- | --- | --- | --- | --- | --- |
| *B* | *PHYSICAL CHECKS* | | | | |
| 1 | Unit is free from physical damage. | | | YES | NO |
| 2 | All components/accessories present. | | | YES | NO |
| 3 | Nameplate affixed and is readable and accurate. | | | YES | NO |
|  |  | | |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *C* | *INSTALLATION* | | | | |
| 1 | Power conduit “stub-ups” are “roughed-in” to the slab at the proper locations and conduits plugged close. | | | YES | NO |
| 2 | Conduit feeds are aligned with openings and accommodate seismic motion. | | | YES | NO |
| 3 | Unit secured as required by manufacturer and specifications requirements. | | | YES | NO |
| 4 | Set plumb and squared with the housekeeping pad. | | | YES | NO |
| 5 | Adequate clearance around unit for service and applicable codes. | | | YES | NO |
| 6 | Adequate clearance around unit for proper ventilation. | | | YES | NO |
| 7 | Unit labeled and label is easy to see. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *D* | *WIRING* | | | | |
| 1 | Unit is adequately grounded for intended use. | | | YES | NO |
| 2 | Proper phasing has occurred in relationship to phase conductors. | | | YES | NO |
| 3 | All connections are terminated properly. | | | YES | NO |
| 4 | All electrical connections are tight. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *E* | *STARTUP* | | | | |
| 1 | Unit has been cleaned of all debris and dirt on interior of unit. | | | YES | NO |
| 2 | Insulators and supports show no signs of damage or cracks. | | | YES | NO |
| 3 | All wiring connections verified for proper torques values and are acceptable. | | | YES | NO |
| 4 | Unit "XO" connection to ground verified on load side of "WYE" systems. | | | YES | NO |
| 5 | Phase-to-phase, phase-to-ground, and neutral-to-ground, insulation, and dielectric tests have been accomplished and results are acceptable. | | | YES | NO |
| 6 | No hazards or adverse circumstances exist per continuity and high potential tests. | | | YES | NO |
| 7 | All DFD acceptance tests have been conducted and results are acceptable. | | | YES | NO |
| 8 | Unit energized by authorized personnel. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *F* | *TESTING* | | | | |
| 1 | Secondary voltage, phase-to-phase and phase-to-ground measured and results acceptable. | | | YES | NO |
| 2 | Primary taps adjusted so that secondary voltage is within 2% of rated voltage. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |

**Negative Responses**

| **Group/**  **Item** | **Date**  **Found** | **Found**  **By** | **Reason for Negative Response** | **Resolved** | **Date**  **Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |

**CV-26 12 16 – Medium-Voltage Transformers, Dry-Type (Indoor)**

**Equipment Identification/Tag: \_\_\_\_\_\_\_**

**Location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Group/Item** | **Group/Task Description** | | | **Submitted** | **Delivered** |
| *A* | *MODEL VERIFICATION* | | | | |
| 1 | Manufacturer | | |  |  |
| 2 | Model | | |  |  |
| 3 | Serial Number | | |  |  |
| 4 | Primary / Secondary Voltage (V / V) | | | **/** | **/** |
| 5 | Primary / Secondary Winding Connection | | | **/** | **/** |
| 6 | Primary / Secondary BIL (kV) | | | **/** | **/** |
| 7 | Temperature Rise Rating (deg. C) | | |  |  |
| 8 | Impedance (%) | | |  |  |
| 9 | KVA base rating | | |  |  |
| 10 | KVA fan forced air rating (if applicable) | | |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |

| **Group/Item** | **Group/Task Description** | | | **Response** | |
| --- | --- | --- | --- | --- | --- |
| *B* | *PHYSICAL CHECKS* | | | | |
| 1 | Unit is free from physical damage. | | | YES | NO |
| 2 | All components/accessories present. | | | YES | NO |
| 3 | Nameplate affixed and is readable and accurate. | | | YES | NO |
|  |  | | |  |  |
|  |  | | |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *C* | *INSTALLATION* | | | | |
| 1 | Power conduit “stub-ups” are “roughed-in” to the slab at the proper locations and conduits plugged close. | | | YES | NO |
| 2 | Conduit feeds are aligned with openings and accommodate seismic motion. | | | YES | NO |
| 3 | Unit secured as required by manufacturer and specifications requirements. | | | YES | NO |
| 4 | Set plumb and squared with the housekeeping pad. | | | YES | NO |
| 5 | Adequate clearance around unit for service and applicable codes. | | | YES | NO |
| 6 | Adequate clearance around unit for proper ventilation. | | | YES | NO |
| 7 | Unit labeled and label is easy to see. | | | YES | NO |
| 8 | Temporary filters provided for ventilation opening prior to energizing. | | | YES | NO |
|  |  | | |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *D* | *WIRING* | | | | |
| 1 | Unit is adequately grounded for intended use. | | | YES | NO |
| 2 | Proper phasing has occurred in relationship to phase conductors. | | | YES | NO |
| 3 | All connections are terminated properly. | | | YES | NO |
| 4 | All electrical connections are tight. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *E* | *STARTUP* | | | | |
| 1 | Temporary filters and protective coverings removed. | | | YES | NO |
| 2 | Unit has been cleaned of all debris and dirt on interior of unit. | | | YES | NO |
| 3 | Insulators and supports show no signs of damage or cracks. | | | YES | NO |
| 4 | All wiring connections verified for proper torques values and are acceptable. | | | YES | NO |
| 5 | Unit "XO" connection to ground verified on load side of "WYE" systems. | | | YES | NO |
| 6 | Phase-to-phase, phase-to-ground, and neutral-to-ground, insulation, and dielectric tests have been accomplished and results are acceptable. | | | YES | NO |
| 7 | No hazards or adverse circumstances exist per continuity and high potential tests. | | | YES | NO |
| 8 | All DFD acceptance tests have been conducted and results are acceptable. | | | YES | NO |
| 9 | Unit energized by authorized personnel. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *F* | *TESTING* | | | | |
| 1 | Secondary voltage, phase-to-phase and phase-to-ground measured and results acceptable. | | | YES | NO |
| 2 | Primary taps adjusted so that secondary voltage is within 2% of rated voltage. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |

**Negative Responses**

| **Group/**  **Item** | **Date**  **Found** | **Found**  **By** | **Reason for Negative Response** | **Resolved** | **Date**  **Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |

**CV-26 12 19 – Medium-Voltage Transformers, Liquid-Filled,**

**Pad-Mounted (Outdoor)**

**Equipment Identification/Tag: \_\_\_\_\_\_\_**

**Location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Group/Item** | **Group/Task Description** | | | **Submitted** | **Delivered** |
| *A* | *MODEL VERIFICATION* | | | | |
| 1 | Manufacturer | | |  |  |
| 2 | Model | | |  |  |
| 3 | Serial Number | | |  |  |
| 4 | Primary / Secondary Voltage (V / V) | | | **/** | **/** |
| 5 | Primary / Secondary Winding Connection | | | **/** | **/** |
| 6 | Primary / Secondary BIL (kV) | | | **/** | **/** |
| 7 | Temperature Rise Rating (deg. C) | | |  |  |
| 8 | Impedance (%) | | |  |  |
| 9 | KVA base rating | | |  |  |
|  |  | | |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |

| **Group/Item** | **Group/Task Description** | | | **Response** | |
| --- | --- | --- | --- | --- | --- |
| *B* | *PHYSICAL CHECKS* | | | | |
| 1 | Unit is free from physical damage. | | | YES | NO |
| 2 | All components/accessories present. | | | YES | NO |
| 3 | Nameplate affixed and is readable/accurate. | | | YES | NO |
|  |  | | |  |  |
|  |  | | |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *C* | *INSTALLATION* | | | | |
| 1 | Power conduit “stub-ups” are “roughed-in” to the slab at the proper locations and conduits plugged close. | | | YES | NO |
| 2 | Conduit feeds are aligned with openings. | | | YES | NO |
| 3 | Set plumb and squared with the concrete pad. | | | YES | NO |
| 4 | Adequate clearance around unit for service and applicable codes. | | | YES | NO |
| 5 | Unit labeled and label is easy to see. | | | YES | NO |
| 6 | Unit is padlocked and keys given to appropriate authority. | | | YES | NO |
| 7 | Protective bollards have been installed (if applicable). | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *D* | *WIRING* | | | | |
| 1 | Unit is adequately grounded for intended use. | | | YES | NO |
| 2 | Proper phasing has occurred in relationship to phase conductors. | | | YES | NO |
| 3 | All connections are terminated properly. | | | YES | NO |
| 4 | All electrical connections are tight. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *E* | *STARTUP* | | | | |
| 1 | Unit has been cleaned of all debris and dirt on interior of unit. | | | YES | NO |
| 2 | Insulators and supports show no signs of damage or cracks. | | | YES | NO |
| 3 | All wiring connections verified for proper torques values and are acceptable. | | | YES | NO |
| 4 | Unit "XO" connection to ground verified on load side of "WYE" systems. | | | YES | NO |
| 5 | Phase-to-phase, phase-to-ground, and neutral-to-ground, insulation, and dielectric tests have been accomplished and results are acceptable. | | | YES | NO |
| 6 | No hazards or adverse circumstances exist per continuity and high potential tests. | | | YES | NO |
| 7 | All DFD acceptance tests have been conducted and results are acceptable. | | | YES | NO |
| 8 | Unit energized by authorized personnel. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *F* | *TESTING* | | | | |
| 1 | Secondary voltage, phase-to-phase and phase-to-ground measured and results acceptable. | | | YES | NO |
| 2 | Primary taps adjusted so that secondary voltage is within 2% of rated voltage. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |

**Negative Responses**

| **Group/**  **Item** | **Date**  **Found** | **Found**  **By** | **Reason for Negative Response** | **Resolved** | **Date**  **Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |

**CV-26 13 02 – Medium-Voltage Pad-Mounted Switchgear (Outdoor)**

**Equipment Identification/Tag: \_\_\_\_\_\_\_**

**Location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Group/Item** | **Group/Task Description** | | | **Submitted** | **Delivered** |
| *A* | *MODEL VERIFICATION* | | | | |
| 1 | Manufacturer | | |  |  |
| 2 | Model | | |  |  |
| 3 | Serial Number | | |  |  |
| 4 | Voltage (kV) | | |  |  |
| 5 | BIL rating (kV) | | |  |  |
| 6 | Main bus rating (amps) | | |  |  |
|  |  | | |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |

| **Group/Item** | **Group/Task Description** | | | **Response** | |
| --- | --- | --- | --- | --- | --- |
| *B* | *PHYSICAL CHECKS* | | | | |
| 1 | Unit is free from physical damage. | | | YES | NO |
| 2 | All components/accessories present. | | | YES | NO |
| 3 | Nameplate affixed and is readable/accurate. | | | YES | NO |
|  |  | | |  |  |
|  |  | | |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *C* | *INSTALLATION* | | | | |
| 1 | Fiberglass base with finished height of 6” above finished grade and 6” of pea gravel inside base provided for unit. | | | YES | NO |
| 2 | Unit is level, plumb, and square, per manufacturer’s layout diagram. | | | YES | NO |
| 3 | Unit secured as required by manufacturer and specifications. | | | YES | NO |
| 4 | Adequate clearance around unit for service and applicable codes. | | | YES | NO |
| 5 | Unit identification attached and visible. | | | YES | NO |
| 6 | Protective bollards have been installed (if applicable). | | | YES | NO |
|  |  | | |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *D* | *WIRING* | | | | |
| 1 | Internal cabling supported independently of terminations. | | | YES | NO |
| 2 | Unit is adequately grounded for intended use. | | | YES | NO |
| 3 | Proper phasing has occurred in relationship to phase conductors. | | | YES | NO |
| 4 | All connections are properly terminated and torqued. | | | YES | NO |
| 5 |  | | |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *E* | *STARTUP* | | | | |
| 1 | Unit has been cleaned of all debris and dirt on interior of unit. | | | YES | NO |
| 2 | Insulators and supports show no signs of damage or cracks. | | | YES | NO |
| 3 | Fuses have been installed in all switches (if applicable). | | | YES | NO |
| 4 | All wiring connections verified for proper torques values and are acceptable. | | | YES | NO |
| 5 | Phase-to-phase, phase-to-ground, and dielectric tests have been accomplished and results are acceptable. | | | YES | NO |
| 6 | No hazards or adverse circumstances exist per continuity and high potential tests. | | | YES | NO |
| 7 | Insulation megger test accomplished and results acceptable. | | | YES | NO |
| 8 | Interlock keying matches and is fully interchangeable with the existing key interlock scheme on the distribution loop. | | | YES | NO |
| 9 | All DFD acceptance tests have been conducted and results are acceptable. | | | YES | NO |
| 10 | Unit energized by authorized personnel. | | | YES | NO |
| 11 | Unit securely padlocked and keys provided to authorized personnel. | | | YES | NO |
| 12 | Proper warning and labeling signage provided. | | | YES | NO |
| 13 | All damage to unit finish is repaired. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |

**Negative Responses**

| **Group/**  **Item** | **Date**  **Found** | **Found**  **By** | **Reason for Negative Response** | **Resolved** | **Date**  **Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |

**CV-26 13 16 – Medium-Voltage Fusible Interrupter Switchgear**

**Equipment Identification/Tag: \_\_\_\_\_\_\_**

**Location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Group/Item** | **Group/Task Description** | | | **Submitted** | **Delivered** |
| *A* | *MODEL VERIFICATION* | | | | |
| 1 | Manufacturer | | |  |  |
| 2 | Model | | |  |  |
| 3 | Serial Number | | |  |  |
| 4 | Voltage (kV) | | |  |  |
| 5 | BIL rating (kV) | | |  |  |
| 6 | Main bus rating (amps) | | |  |  |
|  |  | | |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |

| **Group/Item** | **Group/Task Description** | | | **Response** | |
| --- | --- | --- | --- | --- | --- |
| *B* | *PHYSICAL CHECKS* | | | | |
| 1 | Unit is free from physical damage. | | | YES | NO |
| 2 | All components/accessories present. | | | YES | NO |
| 3 | Nameplate affixed and is readable/accurate. | | | YES | NO |
|  |  | | |  |  |
|  |  | | |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *C* | *INSTALLATION* | | | | |
| 1 | Conduit feeds are aligned with openings and accommodate seismic motion. | | | YES | NO |
| 2 | Unit secured as required by manufacturer, specifications, and seismic zone requirements. | | | YES | NO |
| 3 | Adequate clearance around unit for service and applicable codes. | | | YES | NO |
| 4 | Adequate clearance between the ceiling and top of switchgear (indoor applications ONLY). | | | YES | NO |
| 5 | Unit is level, plumb, and square, per manufacturer’s layout diagram. | | | YES | NO |
| 6 | Unit identification attached and visible. | | | YES | NO |
| 7 |  | | |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *D* | *WIRING* | | | | |
| 1 | Internal cabling supported independently of terminations. | | | YES | NO |
| 2 | Unit is adequately grounded for intended use. | | | YES | NO |
| 3 | Proper phasing has occurred in relationship to phase conductors. | | | YES | NO |
| 4 | All connections are terminated properly. | | | YES | NO |
| 5 | All electrical connections are tight. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *E* | *STARTUP* | | | | |
| 1 | Unit has been cleaned of all debris and dirt on interior of unit. | | | YES | NO |
| 2 | Insulators and supports show no signs of damage or cracks. | | | YES | NO |
| 3 | Fuses have been installed in all switches (where applicable). | | | YES | NO |
| 4 | All wiring connections verified for proper torques values and are acceptable. | | | YES | NO |
| 5 | Phase-to-phase, phase-to-ground, and neutral-to-ground, and dielectric tests have been accomplished and results are acceptable. | | | YES | NO |
| 6 | No hazards or adverse circumstances exist per continuity and high potential tests. | | | YES | NO |
| 7 | Insulation megger test accomplished and results acceptable. | | | YES | NO |
| 8 | All DFD acceptance tests have been accomplished and results acceptable. | | | YES | NO |
| 9 | Main and flicker blades have been manually exercised and alignment is within manufacturer tolerances. | | | YES | NO |
| 8 | Unit energized by authorized personnel. | | | YES | NO |
| 9 | Unit secured and keys provided to authorized personnel. | | | YES | NO |
| 10 | Proper warning and labeling signage provided. | | | YES | NO |
| 11 | All damage to unit finish is repaired. | | | YES | NO |
|  |  | | |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |

**Negative Responses**

| **Group/**  **Item** | **Date**  **Found** | **Found**  **By** | **Reason for Negative Response** | **Resolved** | **Date**  **Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |

**CV-26 18 23 – Medium-Voltage Surge Arresters**

**Equipment Identification/Tag: \_\_\_\_\_\_\_**

**Location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Group/Item** | **Group/Task Description** | | | **Submitted** | **Delivered** |
| *A* | *MODEL VERIFICATION* | | | | |
| 1 | Manufacturer | | |  |  |
| 2 | Model | | |  |  |
| 3 | Serial Number | | |  |  |
| 4 | Voltage Duty Rating (kV) | | |  |  |
| 5 | MCOV Rating (kV) | | |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |

| **Group/Item** | **Group/Task Description** | | | **Response** | |
| --- | --- | --- | --- | --- | --- |
| *B* | *PHYSICAL CHECKS* | | | | |
| 1 | Unit is free from physical damage. | | | YES | NO |
| 2 | Manufacturer’s ratings readable/accurate. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *C* | *INSTALLATION* | | | | |
| 1 | Adequate clearance around unit for service. | | | YES | NO |
| 2 | Adequate clearance between line side terminal and grounded components. | | | YES | NO |
| 3 | Unit labeled and is easy to see. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *D* | *WIRING* | | | | |
| 1 | Unit is adequately grounded for intended use. | | | YES | NO |
| 2 | Each phase is connected with each surge arrestor lead. | | | YES | NO |
| 3 | All phase and ground leads are as short as possible with no bends. | | | YES | NO |
| 4 | Adequate clearance between line side lead wires and grounded components. | | | YES | NO |
| 5 | All connections are terminated properly. | | | YES | NO |
| 6 | All electrical connections are tight. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *E* | *STARTUP* | | | | |
| 1 | Unit tested in accordance with manufacturer recommendations and results acceptable. | | | YES | NO |
| 2 | Ground continuity test accomplished and results acceptable. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |

**Negative Responses**

| **Group/**  **Item** | **Date**  **Found** | **Found**  **By** | **Reason for Negative Response** | **Resolved** | **Date**  **Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |

**CV-26 22 00 – Low-Voltage Transformers**

**Equipment Identification/Tag: \_\_\_\_\_\_\_**

**Location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Group/Item** | **Group/Task Description** | | | **Submitted** | **Delivered** |
| *A* | *MODEL VERIFICATION* | | | | |
| 1 | Manufacturer | | |  |  |
| 2 | Model | | |  |  |
| 3 | Serial Number | | |  |  |
| 4 | Primary / Secondary Voltage (V / V) | | | **/** | **/** |
| 5 | Primary / Secondary Winding Connection | | | **/** | **/** |
| 6 | Primary / Secondary BIL rating (kV) | | | **/** | **/** |
| 7 | Rated Temperature Rise (deg. C) | | |  |  |
| 8 | KVA | | |  |  |
| 9 | Impedance | | |  |  |
|  |  | | |  |  |
|  |  | | |  |  |
|  |  | | |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |

| **Group/Item** | **Group/Task Description** | | | **Response** | |
| --- | --- | --- | --- | --- | --- |
| *B* | *PHYSICAL CHECKS* | | | | |
| 1 | Unit is free from physical damage. | | | YES | NO |
| 2 | All components/accessories present. | | | YES | NO |
| 3 | Power conduit openings are plugged. | | | YES | NO |
| 4 | Unit tags affixed. | | | YES | NO |
| 5 | Manufacturer’s ratings readable/accurate. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *C* | *INSTALLATION* | | | | |
| 1 | Power conduit “stub-ups” are “roughed-in” to the slab at the proper locations and conduits plugged close (if applicable). | | | YES | NO |
| 2 | Conduit feeds are aligned with openings and accommodate seismic motion. | | |  |  |
| 3 | Unit secured as required by manufacturer, specifications, and seismic zone requirements. | | | YES | NO |
| 4 | Set plumb and squared with pad. | | | YES | NO |
| 5 | Adequate clearance around unit for service and applicable codes. | | | YES | NO |
| 6 | Adequate clearance around unit for proper ventilation. | | | YES | NO |
| 7 | Unit labeled and is easy to see. | | | YES | NO |
| 8 | Temporary filters provided for ventilation opening prior to energizing. | | | YES | NO |
|  |  | | |  |  |
|  |  | | |  |  |
|  |  | | |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *D* | *WIRING* | | | | |
| 1 | Minimum of 2’ of flexible conduit provided for exposed connections to unit. | | | YES | NO |
| 2 | Unit is adequately grounded for intended use. | | | YES | NO |
| 3 | Proper phasing has occurred in relationship to phase conductors. | | | YES | NO |
| 5 | All connections are terminated properly. | | | YES | NO |
| 6 | All electrical connections are tight. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *E* | *STARTUP* | | | | |
| 1 | Temporary filters and protective coverings removed. | | | YES | NO |
| 2 | Unit has been cleaned of all debris and dirt on interior of unit. | | | YES | NO |
| 3 | Insulators and supports show no signs of damage or cracks. | | | YES | NO |
| 4 | All wiring connections verified for proper torques values and are acceptable. | | | YES | NO |
| 5 | Phase-to-phase, phase-to-ground, and neutral-to-ground, insulation, and dielectric tests have been accomplished and results are acceptable. | | | YES | NO |
| 6 | No hazards or adverse circumstances exist per continuity and high potential tests. | | | YES | NO |
| 7 | Unit energized by authorized personnel. | | | YES | NO |
|  |  | | |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *F* | *TESTING* | | | | |
| 1 | Secondary voltage, phase-to-phase and phase-to-ground measured and results acceptable. | | | YES | NO |
| 2 | Primary taps adjusted so that secondary voltage is within 2.5% of rated voltage. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |

**Negative Responses**

| **Group/**  **Item** | **Date**  **Found** | **Found**  **By** | **Reason for Negative Response** | **Resolved** | **Date**  **Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |

**CV-26 24 13 – Switchboards**

**Equipment Identification/Tag: \_\_\_\_\_\_\_**

**Location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Group/Item** | **Group/Task Description** | | | **Submitted** | **Delivered** |
| *A* | *MODEL VERIFICATION* | | | | |
| 1 | Manufacturer | | |  |  |
| 2 | Model | | |  |  |
| 3 | Serial Number | | |  |  |
| 4 | Voltage (V) | | |  |  |
| 5 | # of Wires | | |  |  |
| 6 | Main Amps (A) | | |  |  |
| 7 | Circuit Count | | |  |  |
| 8 | kAIC Rating (kA) | | |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |

| **Group/Item** | **Group/Task Description** | | | **Response** | |
| --- | --- | --- | --- | --- | --- |
| *B* | *PHYSICAL CHECKS* | | | | |
| 1 | Unit is free from physical damage. | | | YES | NO |
| 2 | All components/accessories present. | | | YES | NO |
| 3 | Power conduit openings are plugged. | | | YES | NO |
| 4 | Unit tags affixed. | | | YES | NO |
| 5 | Manufacturer’s ratings readable/accurate. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *C* | *INSTALLATION* | | | | |
| 1 | Concrete housekeeping pad provided for unit at location specified in contract documents. | | | YES | NO |
| 2 | Power conduit “stub-ups” are “roughed-in” to the slab at the proper locations and conduits plugged close. | | | YES | NO |
| 3 | Conduit feeds are aligned with openings and accommodate seismic motion. | | | YES | NO |
| 4 | Unit secured as required by manufacturer, specifications, and seismic zone requirements. | | | YES | NO |
| 5 | Adequate clearance around unit for service and applicable codes. | | | YES | NO |
| 6 | Adequate clearance between the ceiling and top of switchgear. | | | YES | NO |
| 7 | Unit sections connected per manufacturer instructions. | | | YES | NO |
| 8 | Through-bus and ground-bus splice connections/kits between unit sections have been installed. | | | YES | NO |
| 9 | Unit is level and all sections plumb and square per manufacturer’s layout diagram. | | | YES | NO |
| 10 | Unit identification attached and visible. | | | YES | NO |
| 11 | Temporary filters provided for ventilation opening prior to energizing. | | | YES | NO |
|  |  | | |  |  |
|  |  | | |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *D* | *WIRING* | | | | |
| 1 | Ground bus has been installed. | | | YES | NO |
| 2 | Internal cabling supported independently of terminations. | | | YES | NO |
| 3 | Unit is adequately grounded and bonded for intended use. | | | YES | NO |
| 4 | Proper phasing has occurred in relationship to phase conductors. | | | YES | NO |
| 5 | All connections are terminated properly. | | | YES | NO |
| 6 | All electrical connections are tight. | | | YES | NO |
|  |  | | |  |  |
|  |  | | |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *E* | *STARTUP* | | | | |
| 1 | Temporary filters and protective coverings removed. | | | YES | NO |
| 2 | Unit has been cleaned of all debris and dirt on interior of unit. | | | YES | NO |
| 3 | Insulators and supports show no signs of damage or cracks. | | | YES | NO |
| 4 | Current transformers secured and wired per manufacturer instructions (metering applications ONLY). | | | YES | NO |
| 5 | All switches and circuit breakers have been manually tested. | | | YES | NO |
| 6 | All electronic circuit breaker settings have been adjusted to desired setting (if applicable). | | | YES | NO |
| 7 | Fuses have been installed in all switches (if applicable). | | | YES | NO |
| 8 | Ground-fault-protection (GFP) trip and time delays have been adjusted to desired setting (if applicable). | | | YES | NO |
| 9 | All wiring connections verified for proper torques values and are acceptable. | | | YES | NO |
| 10 | Phase-to-phase, phase-to-ground, and neutral-to-ground, and dielectric tests have been accomplished and results are acceptable. | | | YES | NO |
| 11 | No hazards or adverse circumstances exist per continuity and high potential tests. | | | YES | NO |
| 12 | Insulation megger test at 1000V accomplished and results acceptable. | | | YES | NO |
| 13 | Unit energized by authorized personnel. | | | YES | NO |
|  |  | | |  |  |
|  |  | | |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *F* | *TESTING & FINALIZATION* | | | | |
| 1 | Solid state circuit breaker self-diagnostics completed. | | | YES | NO |
| 2 | Electronic circuit breaker trip unit tests completed and results acceptable (if applicable). | | | YES | NO |
| 3 | Ground-fault-protection (GFP) system tested and certified (if applicable). | | | YES | NO |
| 4 | Proper warning and labeling signage provided. | | | YES | NO |
| 5 | All damage to unit finish is repaired. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |

**Negative Responses**

| **Group/**  **Item** | **Date**  **Found** | **Found**  **By** | **Reason for Negative Response** | **Resolved** | **Date**  **Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |

**CV-26 24 16 – Panelboards**

**Equipment Identification/Tag: \_\_\_\_\_\_\_**

**Location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Group/Item** | **Group/Task Description** | | | **Submitted** | **Delivered** |
| *A* | *MODEL VERIFICATION* | | | | |
| 1 | Manufacturer | | |  |  |
| 2 | Model | | |  |  |
| 3 | Catalog Number | | |  |  |
| 4 | Voltage / Phase / Frequency (V / - /Hz) | | | **/ /** | **/ /** |
| 5 | Main Amps (A) | | |  |  |
| 6 | Circuit Count | | |  |  |
| 7 | kAIC rating (kA) | | |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |

| **Group/Item** | **Group/Task Description** | | | **Response** | |
| --- | --- | --- | --- | --- | --- |
| *B* | *PHYSICAL CHECKS* | | | | |
| 1 | Unit is free from physical damage. | | | YES | NO |
| 2 | All components/accessories present. | | | YES | NO |
| 3 | Circuit breaker capacities documented. | | | YES | NO |
| 4 | Unit tags affixed. | | | YES | NO |
| 5 | Manufacturer’s ratings readable/accurate. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *C* | *INSTALLATION* | | | | |
| 1 | Unit secured as required by manufacture, specifications, and seismic zone requirements. | | | YES | NO |
| 2 | Adequate clearance around unit for service per table NEC-110.26. | | | YES | NO |
| 3 | Top of tub set at 6’ from finished floor unless specified otherwise in contract documents. | | | YES | NO |
| 4 | Conduit feeds are aligned with openings and accommodate seismic motion. | | | YES | NO |
| 5 | Unit is level, plumb, and square. | | | YES | NO |
| 6 | Unit labeled and is easy to see. | | | YES | NO |
|  |  | | |  |  |
|  |  | | |  |  |
|  |  | | |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *D* | *WIRING* | | | | |
| 1 | Three spare ¾” empty conduits provided (recessed units ONLY). | | | YES | NO |
| 2 | Unit is adequately grounded to grounding lug for intended use. | | | YES | NO |
| 3 | Proper phasing has occurred in relationship to phase conductors. | | | YES | NO |
| 4 | All connections are terminated properly. | | | YES | NO |
| 5 | All electrical connections are tight. | | | YES | NO |
| 6 | All cables are permanently labeled relative to use. | | | YES | NO |
|  |  | | |  |  |
|  |  | | |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *E* | *STARTUP* | | | | |
| 1 | All protective coverings have been removed. | | | YES | NO |
| 2 | Unit has been cleaned of all debris and dirt on interior of unit. | | | YES | NO |
| 3 | Insulators and supports show no signs of damage or cracks. | | | YES | NO |
| 4 | Current transformers secured and wired per manufacturer instructions (metering applications ONLY). | | | YES | NO |
| 5 | All electronic circuit breaker settings have been adjusted to desired setting (if applicable). | | | YES | NO |
| 6 | Ground-fault-protection (GFP) trip and time delays have been adjusted to desired setting (if applicable). | | | YES | NO |
| 7 | All wiring connections verified for proper torques values and are acceptable. | | | YES | NO |
| 8 | Phase-to-phase, phase-to-ground, and neutral-to-ground, and dielectric tests have been accomplished and results are acceptable. | | | YES | NO |
| 9 | No hazards or adverse circumstances exist per continuity and high potential tests. | | | YES | NO |
| 10 | Insulation megger test accomplished and results acceptable. | | | YES | NO |
| 11 | Unit energized by authorized personnel. | | | YES | NO |
| 12 | All damage to unit finish is repaired. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *F* | *TESTING & FINALIZATION* | | | | |
| 1 | Overcurrent protective devices have been manually exercised. | | | YES | NO |
| 2 | Solid state circuit breaker self-diagnostics completed. | | | YES | NO |
| 3 | Electronic circuit breaker trip unit tests completed. | | | YES | NO |
| 4 | Ground-fault-protection (GFP) system tested and certified. | | | YES | NO |
| 5 | Filler plates provided for all unused spaces. | | | YES | NO |
| 6 | As-built circuit index provided and attached to interior of unit door. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |

**Negative Responses**

| **Group/**  **Item** | **Date**  **Found** | **Found**  **By** | **Reason for Negative Response** | **Resolved** | **Date**  **Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |

**CV-26 27 13 – Electricity Metering**

**Equipment Identification/Tag: \_\_\_\_\_\_\_**

**Location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Group/Item** | **Group/Task Description** | | | **Submitted** | **Delivered** |
| *A* | *MODEL VERIFICATION* | | | | |
| 1 | Manufacturer | | |  |  |
| 2 | Model | | |  |  |
| 3 | Serial Number | | |  |  |
| 4 | Voltage (V) | | |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |

| **Group/Item** | **Group/Task Description** | | | **Response** | |
| --- | --- | --- | --- | --- | --- |
| *B* | *PHYSICAL CHECKS* | | | | |
| 1 | Unit is free from physical damage. | | | YES | NO |
| 2 | All components/accessories present. | | | YES | NO |
|  |  | | |  |  |
|  |  | | |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *C* | *INSTALLATION* | | | | |
| 1 | Unit secured as required by manufacturer and specification requirements. | | | YES | NO |
| 2 | Adequate clearance around unit for service. | | | YES | NO |
| 3 | Unit is level, plumb, and square. | | | YES | NO |
| 4 | Current and potential transformers installed and braced for specified short circuit current noted in specifications. | | | YES | NO |
| 5 | Center mounted no higher than 5’-6” above finished floor. | | | YES | NO |
|  |  | | |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *D* | *WIRING* | | | | |
| 1 | Unit is grounded per project requirements. | | | YES | NO |
| 2 | Meter test switch provided in-between meter and current and potential transformers (Main Electrical Service ONLY). | | | YES | NO |
| 3 | All connections are terminated properly. | | | YES | NO |
| 4 | All electrical connections are tightened to proper torque values. | | | YES | NO |
| 5 | All cables are permanently labeled relative to use (e.g. Power conductor phasing, CT and PT leads, etc.). | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *E* | *STARTUP* | | | | |
| 1 | All protective coverings have been removed. | | | YES | NO |
| 2 | Unit has been cleaned of all debris and dirt on interior of unit. | | | YES | NO |
| 3 | All damage to unit finish is repaired. | | | YES | NO |
| 4 | Unit programmed per manufacturer instructions. | | | YES | NO |
| 5 | Communication with building automation system verified (if applicable). | | | YES | NO |
| 6 | Unit voltage and current measurements have been independently measured using a third party meter and verified as accurate. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |

**Negative Responses**

| **Group/**  **Item** | **Date**  **Found** | **Found**  **By** | **Reason for Negative Response** | **Resolved** | **Date**  **Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |

**CV-26 27 28 – Disconnect Switches**

**Equipment Identification/Tag: \_\_\_\_\_\_\_**

**Location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Group/Item** | **Group/Task Description** | | | **Submitted** | **Delivered** |
| *A* | *MODEL VERIFICATION* | | | | |
| 1 | Manufacturer | | |  |  |
| 2 | Model | | |  |  |
| 3 | Serial Number | | |  |  |
| 4 | Voltage (V) | | |  |  |
| 5 | Ampere Rating (A) | | |  |  |
| 6 | kAIC Rating (kA) | | |  |  |
| 7 | Horsepower Rating (HP) | | |  |  |
| 8 | Enclosure Type | | |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |

| **Group/Item** | **Group/Task Description** | | | **Response** | |
| --- | --- | --- | --- | --- | --- |
| *B* | *PHYSICAL CHECKS* | | | | |
| 1 | Unit is free from physical damage. | | | YES | NO |
| 2 | All components/accessories present. | | | YES | NO |
| 3 | Unit tags affixed. | | | YES | NO |
| 4 | Manufacturer’s ratings readable/accurate. | | | YES | NO |
| 5 | Unit is rated “Heavy Duty”. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *C* | *INSTALLATION* | | | | |
| 1 | Unit secured as required by manufacturer and specification requirements. | | | YES | NO |
| 2 | Adequate clearance around unit for service. | | | YES | NO |
| 3 | Conduit feeds are aligned with openings and accommodate seismic motion. | | | YES | NO |
| 4 | Unit is level, plumb, and square. | | | YES | NO |
| 5 | Unit labeled and is easy to see. | | | YES | NO |
|  |  | | |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *D* | *WIRING* | | | | |
| 1 | Unit is adequately grounded for intended use. | | | YES | NO |
| 2 | All connections are terminated properly. | | | YES | NO |
| 3 | All electrical connections are tight. | | | YES | NO |
| 4 | All cables are permanently labeled relative to use. | | | YES | NO |
| 5 | Fuses have been installed in all switches. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |

**Negative Responses**

| **Group/**  **Item** | **Date**  **Found** | **Found**  **By** | **Reason for Negative Response** | **Resolved** | **Date**  **Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |

**CV-26 28 16 – Enclosed Switches and Circuit Breakers**

**Equipment Identification/Tag: \_\_\_\_\_\_\_**

**Location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Group/Item** | **Group/Task Description** | | | **Submitted** | **Delivered** |
| *A* | *MODEL VERIFICATION* | | | | |
| 1 | Manufacturer | | |  |  |
| 2 | Model | | |  |  |
| 3 | Serial Number | | |  |  |
| 4 | Voltage (V) | | |  |  |
| 5 | Ampere Rating (A) | | |  |  |
| 6 | kAIC Rating (kA) | | |  |  |
| 7 | Enclosure Type | | |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |

| **Group/Item** | **Group/Task Description** | | | **Response** | |
| --- | --- | --- | --- | --- | --- |
| *B* | *PHYSICAL CHECKS* | | | | |
| 1 | Unit is free from physical damage. | | | YES | NO |
| 2 | All components/accessories present. | | | YES | NO |
| 3 | Unit tags affixed. | | | YES | NO |
| 4 | Manufacturer’s ratings readable/accurate. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *C* | *INSTALLATION* | | | | |
| 1 | Unit secured as required by manufacturer and specification requirements. | | | YES | NO |
| 2 | Adequate clearance around unit for service. | | | YES | NO |
| 3 | Conduit feeds are aligned with openings and accommodate seismic motion. | | | YES | NO |
| 4 | Unit is level, plumb, and square. | | | YES | NO |
| 5 | Unit labeled and is easy to see. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *D* | *WIRING* | | | | |
| 1 | Unit is adequately grounded for intended use. | | | YES | NO |
| 2 | All connections are terminated properly. | | | YES | NO |
| 3 | All electrical connections are tight. | | | YES | NO |
| 4 | All cables are permanently labeled relative to use. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *E* | *STARTUP* | | | | |
| 1 | Electronic circuit breaker settings have been adjusted to desired setting (if applicable). | | | YES | NO |
| 2 | Overcurrent protective devices have been manually exercised. | | | YES | NO |
| 3 | Electronic circuit breaker trip unit test completed. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |

**Negative Responses**

| **Group/**  **Item** | **Date**  **Found** | **Found**  **By** | **Reason for Negative Response** | **Resolved** | **Date**  **Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |

**CV-26 29 00 – Magnetic Motor Starters**

**Equipment Identification/Tag: \_\_\_\_\_\_\_**

**Location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Group/Item** | **Group/Task Description** | | | **Submitted** | **Delivered** |
| *A* | *MODEL VERIFICATION* | | | | |
| 1 | Manufacturer | | |  |  |
| 2 | Model | | |  |  |
| 3 | Serial Number | | |  |  |
| 4 | Voltage (V) | | |  |  |
| 5 | Ampere Rating (A) | | |  |  |
| 6 | kAIC Rating (kA) | | |  |  |
| 7 | Horsepower Rating (Hp) | | |  |  |
| 8 | NEMA Size | | |  |  |
| 9 | Motor Being Served | | |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |

| **Group/Item** | **Group/Task Description** | | | **Response** | |
| --- | --- | --- | --- | --- | --- |
| *B* | *PHYSICAL CHECKS* | | | | |
| 1 | Unit is free from physical damage. | | | YES | NO |
| 2 | All components/accessories present. | | | YES | NO |
|  |  | | |  |  |
|  |  | | |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *C* | *INSTALLATION* | | | | |
| 1 | Unit secured as required by manufacturer and specification requirements. | | | YES | NO |
| 2 | Adequate clearance around unit for service. | | | YES | NO |
| 3 | Unit is level, plumb, and square. | | | YES | NO |
| 4 | Identification labels provided per specification requirements. | | | YES | NO |
|  |  | | |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *D* | *WIRING* | | | | |
| 1 | Unit is grounded per project requirements. | | | YES | NO |
| 2 | Heater elements installed and sized properly for motor being controlled. | | | YES | NO |
| 3 | All connections are terminated properly. | | | YES | NO |
| 4 | All electrical connections are tightened to proper torque values. | | | YES | NO |
| 5 | All cables are permanently labeled relative to use. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *E* | *STARTUP* | | | | |
| 1 | Circuit breaker settings have been adjusted to desired setting (if applicable). | | | YES | NO |
| 2 | Fuses have been installed in all switches (if applicable). | | | YES | NO |
| 3 | Overcurrent protective devices have been manually exercised. | | | YES | NO |
| 4 | Operation of unit and associated motor verified and acceptable. | | | YES | NO |
| 5 | All indicating lamps are operational. | | | YES | NO |
| 6 | Communication with building automation system verified (if applicable). | | | YES | NO |
| 7 | Motor data sheet provided on interior door of unit. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |

**Negative Responses**

| **Group/**  **Item** | **Date**  **Found** | **Found**  **By** | **Reason for Negative Response** | **Resolved** | **Date**  **Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |

**CV-26 29 00 – Manual Motor Starters**

**Equipment Identification/Tag: \_\_\_\_\_\_\_**

**Location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Group/Item** | **Group/Task Description** | | | **Submitted** | **Delivered** |
| *A* | *MODEL VERIFICATION* | | | | |
| 1 | Manufacturer | | |  |  |
| 2 | Model | | |  |  |
| 3 | Serial Number | | |  |  |
| 4 | Voltage (V) | | |  |  |
| 5 | Ampere Rating (A) | | |  |  |
| 6 | kAIC Rating (kA) | | |  |  |
| 7 | Horsepower Rating (Hp) | | |  |  |
| 8 | NEMA Size | | |  |  |
| 9 | Motor Being Served | | |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |

| **Group/Item** | **Group/Task Description** | | | **Response** | |
| --- | --- | --- | --- | --- | --- |
| *B* | *PHYSICAL CHECKS* | | | | |
| 1 | Unit is free from physical damage. | | | YES | NO |
| 2 | All components/accessories present. | | | YES | NO |
|  |  | | |  |  |
|  |  | | |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *C* | *INSTALLATION* | | | | |
| 1 | Unit secured as required by manufacturer and specification requirements. | | | YES | NO |
| 2 | Adequate clearance around unit for service. | | | YES | NO |
| 3 | Unit is level, plumb, and square. | | | YES | NO |
| 4 | Identification labels provided per specification requirements. | | | YES | NO |
|  |  | | |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *D* | *WIRING* | | | | |
| 1 | Unit is grounded per project requirements. | | | YES | NO |
| 2 | Heater elements installed and sized properly for motor being controlled. | | | YES | NO |
| 3 | All connections are terminated properly. | | | YES | NO |
| 4 | All electrical connections are tightened to proper torque values. | | | YES | NO |
| 5 | All cables are permanently labeled relative to use. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *E* | *STARTUP* | | | | |
| 1 | Operation of unit and associated motor verified and acceptable. | | | YES | NO |
| 2 | All indicating lamps are operational. | | | YES | NO |
| 3 | Motor data sheet provided on interior door of unit. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |

**Negative Responses**

| **Group/**  **Item** | **Date**  **Found** | **Found**  **By** | **Reason for Negative Response** | **Resolved** | **Date**  **Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |

**CV-26 29 00 –Motor Control Centers**

**Equipment Identification/Tag: \_\_\_\_\_\_\_**

**Location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Group/Item** | **Group/Task Description** | | | **Submitted** | **Delivered** |
| *A* | *MODEL VERIFICATION* | | | | |
| 1 | Manufacturer | | |  |  |
| 2 | Model | | |  |  |
| 3 | Serial Number | | |  |  |
| 4 | Voltage (V) | | |  |  |
| 5 | # of Wires | | |  |  |
| 6 | Main Amps (A) | | |  |  |
| 7 | Circuit Count | | |  |  |
| 8 | kAIC Rating (kA) | | |  |  |
|  |  | | |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |

| **Group/Item** | **Group/Task Description** | | | **Response** | |
| --- | --- | --- | --- | --- | --- |
| *B* | *PHYSICAL CHECKS* | | | | |
| 1 | Unit is free from physical damage. | | | YES | NO |
| 2 | All components/accessories present. | | | YES | NO |
|  |  | | |  |  |
|  |  | | |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *C* | *INSTALLATION* | | | | |
| 1 | Concrete housekeeping pad provided for unit at location specified in contract documents. | | | YES | NO |
| 2 | Power conduit “stub-ups” are aligned with openings. Conduits plugged closed. | | | YES | NO |
| 3 | Independent conduits provided for control wiring. | | | YES | NO |
| 4 | Unit secured as required by manufacturer, specifications, and seismic zone requirements. | | | YES | NO |
| 5 | Adequate clearance around unit for service and applicable codes. | | | YES | NO |
| 6 | Unit sections attached per manufacturer instructions (if applicable). | | | YES | NO |
| 7 | Through-bus and ground-bus splice connections/kits between unit sections have been installed. | | | YES | NO |
| 8 | Unit is level and all sections plumb and square per manufacturer’s layout diagram. | | | YES | NO |
| 9 | Identification labels provided per specification requirements. | | | YES | NO |
| 10 | Temporary filters provided for ventilation opening prior to energizing. | | | YES | NO |
| 11 | Insulators and supports show no signs of damage or cracks. | | | YES | NO |
|  |  | | |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *D* | *WIRING* | | | | |
| 1 | Ground bus has been installed. | | | YES | NO |
| 2 | Internal cabling supported independently of terminations. | | | YES | NO |
| 3 | Unit is grounded per project requirements. | | | YES | NO |
| 4 | Proper phasing has been verified between phase conductors and bus phases. | | | YES | NO |
| 5 | All connections are terminated properly. | | | YES | NO |
| 6 | All electrical connections are tightened to proper torque values. | | | YES | NO |
| 7 | All cables are permanently labeled relative to use. | | | YES | NO |
| 8 | Current transformers secured and wired per manufacturer instructions (if applicable). | | | YES | NO |
|  |  | | |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *E* | *STARTUP* | | | | |
| 1 | Temporary filters and protective coverings removed. | | | YES | NO |
| 2 | Unit has been cleaned of all debris and dirt on interior of unit. | | | YES | NO |
| 3 | All switches and circuit breakers have been manually tested. | | | YES | NO |
| 4 | All electronic circuit breaker settings have been adjusted to desired setting (if applicable). | | | YES | NO |
| 5 | Each motor circuit protector has been adjusted to the full load amperes of the motor it serves (if applicable). | | | YES | NO |
| 6 | Fuses have been installed in all switches (if applicable). | | | YES | NO |
| 7 | Phase-to-phase, phase-to-ground, neutral-to-ground, and dielectric tests have been accomplished and results are acceptable. | | | YES | NO |
| 8 | No hazards or adverse circumstances exist per continuity and high potential tests. | | | YES | NO |
| 9 | Insulation megger test accomplished and results acceptable. | | | YES | NO |
| 10 | Unit energized by authorized personnel. | | | YES | NO |
| 11 | Indicating lamps function properly. | | | YES | NO |
| 12 | Operation of unit and associated motor verified and acceptable. | | | YES | NO |
| 13 | Ensure indicating lights are the “Push-to-test” type with LED lamps and “Red” covers. | | | YES | NO |
| 14 | Ensure control transformer primary/secondary conductors are fused and have “X2” terminal grounded. | | | YES | NO |
|  |  | | |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *F* | *TESTING & FINALIZATION* | | | | |
| 1 | Each starter within the MCC has been individually commissioned. | | | YES | NO |
| 2 | Communication with building automation system verified. | | | YES | NO |
| 3 | Motor data sheet provided on interior door of each starter. | | | YES | NO |
| 4 | Proper warning and labeling signage provided. | | | YES | NO |
| 5 | All damage to unit finish is repaired. | | | YES | NO |
|  |  | | |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |

**Negative Responses**

| **Group/**  **Item** | **Date**  **Found** | **Found**  **By** | **Reason for Negative Response** | **Resolved** | **Date**  **Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |

**CV-26 32 13.13 – Engine-Driven Generator Sets - Diesel**

**Equipment Identification/Tag: \_\_\_\_\_\_\_**

**Location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Group/Item** | **Group/Task Description** | | | **Submitted** | **Delivered** |
| *A* | *MODEL VERIFICATION* | | | | |
| 1 | Manufacturer | | |  |  |
| 2 | Model | | |  |  |
| 3 | Serial Number | | |  |  |
| 4 | Voltage / Phase / Frequency (V / - / Hz) | | | **/ /** | **/ /** |
| 5 | Capacity (kW / kVA) | | | **/** | **/** |
| 6 | Wiring Configuration | | |  |  |
| 7 | Engine Manufacturer | | |  |  |
| 8 | Engine Model | | |  |  |
| 9 | Fuel Type | | |  |  |
| 10 | Integral or Separate Fuel Tank | | |  |  |
| 11 | Tank Capacity (gal) | | |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |

| **Group/Item** | **Group/Task Description** | | | **Response** | |
| --- | --- | --- | --- | --- | --- |
| *B* | *PHYSICAL CHECKS* | | | | |
| 1 | Unit is free from physical damage. | | | YES | NO |
| 2 | The water and fuel pipe openings are sealed with plastic plugs. | | | YES | NO |
| 3 | All exhaust and supply ventilation openings are sealed with durable plastic or other weatherproof means. | | | YES | NO |
| 4 | All components present. | | | YES | NO |
| 5 | Installation and startup manual provided. | | | YES | NO |
| 6 | Unit tags affixed. | | | YES | NO |
| 7 | Manufacturer’s ratings readable/accurate. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *C* | *INSTALLATION* | | | | |
| 1 | Unit secured as required by manufacturer and specification requirements. | | | YES | NO |
| 2 | Adequate clearance around unit for service and applicable codes. | | | YES | NO |
| 3 | Feeder, power, service outlet(s) and control conduit feeds are aligned with openings and accommodate seismic motion. | | | YES | NO |
| 4 | Equipment location coordinated with piping, ductwork, conduit and equipment of other trades to allow sufficient clearances. | | | YES | NO |
| 5 | All components accessible for maintenance. | | | YES | NO |
| 6 | Battery powered emergency lighting located in generator room (indoor installation ONLY). | | |  |  |
| 7 | Unit labeled and is easy to see. | | | YES | NO |
|  |  | | |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *D* | *FUEL TANK* | | | | |
| 1 | Fuel tank secured as required by manufacture and code requirements. | | | YES | NO |
| 2 | Fuel leak sensor installed and operational. | | | YES | NO |
| 3 | Pressure relief valve installed. | | | YES | NO |
| 4 | Pressure relief valve is piped to outdoors (indoor installations ONLY). | | | YES | NO |
|  |  | | |  |  |
|  |  | | |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *E* | *INSTALLATION – REMOTE RADIATOR (is applicable)* | | | | |
| 1 | Unit secured as required by manufacturer and specification requirements. | | | YES | NO |
| 2 | Adequate clearance around unit for service and applicable codes. | | | YES | NO |
| 3 | Unit location provides adequate ventilation and air circulation to accommodate cooling. | | | YES | NO |
| 4 | Unit is level. | | | YES | NO |
| 5 | Unit labeled and is easy to see. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *F* | *FUEL PIPING* | | | | |
| 1 | Fuel supply is the same type as listed on the unit data plate. | | | YES | NO |
| 2 | Fuel line connections to tank and unit utilize flexible connectors. | | | YES | NO |
| 3 | All piping components have been installed (in the correct order) as required by contract document or manufacturer. | | | YES | NO |
| 4 | Piping arranged for ease of unit removal. | | | YES | NO |
| 5 | Piping supported as required by specifications. | | | YES | NO |
| 6 | Piping is clean. | | | YES | NO |
| 7 | Piping and valves properly checked and free of leaks. | | | YES | NO |
| 8 | Piping insulation is complete and installed as per specifications. | | | YES | NO |
| 9 | All valves and test ports are easily accessible. | | | YES | NO |
| 10 | Valve tags attached. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *G* | *WATER PIPING – REMOTE RADIATOR (if applicable)* | | | | |
| 1 | All piping components have been installed (in the correct order) as required by contract document or manufacturer. | | | YES | NO |
| 2 | Piping arranged for ease of unit removal. | | | YES | NO |
| 3 | Equipment connected to water supply, return, and drain piping using unions or flanges and isolation valves. | | |  |  |
| 4 | Piping supported independent of unit and as required by specifications. | | | YES | NO |
| 5 | Piping is clean. | | | YES | NO |
| 6 | Dielectric fittings installed to isolate dis-similar pipe materials. | | | YES | NO |
| 7 | Piping and valves properly checked and free of leaks. | | | YES | NO |
| 8 | Drain valve with hose connection provided. | | | YES | NO |
| 9 | All valves and test ports are easily accessible. | | | YES | NO |
| 10 | Valve tags attached. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *H* | *DUCTWORK-EXHAUST* | | | | |
| 1 | Muffler installed and supported by non-combustible mechanisms. | | | YES | NO |
| 2 | Exhaust ducting adequately supported as per specifications. | | | YES | NO |
| 3 | All horizontal runs of exhaust ducting are sloped to unit or drain valve if installed. | | | YES | NO |
| 4 | All hot ducting surfaces have been insulated. | | | YES | NO |
| 5 | Intake and exhaust air inlets/outlets located on opposite ends of unit. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *I* | *DUCTWORK-INTAKE* | | | | |
| 1 | Sufficient fresh air supply for proper unit operation has been verified. All motor-operated dampers should be supplied with emergency power and fail-open on loss of power. | | | YES | NO |
| 2 | Fresh air not taken from areas that contain negative pressure producing devices. | | | YES | NO |
| 3 | Fresh air supply free of corrosive elements and flammable vapors. | | | YES | NO |
| 4 | Fresh air openings sized and located (high / low) correctly with consideration given to the blocking effect of louvers and grilles. | | | YES | NO |
| 5 | Ductwork is the same cross-sectional area as the openings. | | | YES | NO |
| 6 | All ductwork is properly sealed and sloped per manufacturer specifications. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *J* | *ELECTRICAL* | | | | |
| 1 | Local disconnect installed in accessible and visible location. | | | YES | NO |
| 2 | Unit is adequately and permanently grounded for intended use. | | | YES | NO |
| 3 | Crankcase and water jacket heaters wired and operational. | | | YES | NO |
| 4 | Starter battery installed and wired properly. | | | YES | NO |
| 5 | Battery charger wired and operational. | | | YES | NO |
| 6 | All electrical connections are tight. | | |  |  |
| 7 | All electrical components are grounded. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *K* | *CONTROLS INSTALLATION* | | | | |
| 1 | Remote start and stop wiring installed and communication verified. | | | YES | NO |
| 2 | Remote status wiring installed and communication verified. | | | YES | NO |
| 3 | Remote alarm wiring installed and communication verified. | | | YES | NO |
| 4 | Remote annunciator installed and operational. Verify main breaker causes trouble alarm in the tripped or off position. | | | YES | NO |
| 5 | Remote manual emergency stop station installed and operational. | | | YES | NO |
| 6 | All local alarms and safeties wiring installed and operational. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *L* | *STARTUP* | | | | |
| 1 | All protective coverings removed. | | | YES | NO |
| 2 | Unit has been cleaned of all debris and dirt on interior of unit. | | | YES | NO |
| 3 | Fuel tank filled. Verify fuel oil transfer pumps are supplied with emergency power and rotation is correct. | | |  |  |
| 4 | Cooling system is filled with specified water/antifreeze mixture. | | | YES | NO |
| 5 | Air inlet and outlet dampers are functioning properly (indoor installations ONLY). | | | YES | NO |
| 6 | Jacket water heater has operated for a period of 24 hours prior to startup. | | | YES | NO |
| 7 | Engine crankcase has been filled to proper levels with oil. | | | YES | NO |
| 8 | Current transformers secured and wired per manufacturer instructions. | | | YES | NO |
| 9 | All switches and circuit breakers have been manually tested. | | | YES | NO |
| 10 | All wiring connections verified for proper torques values and are acceptable. | | | YES | NO |
| 11 | Phase-to-phase, phase-to-ground, and neutral-to-ground, and dielectric tests have been accomplished and results are acceptable. | | | YES | NO |
| 12 | No hazards or adverse circumstances exist per continuity and high potential tests. | | | YES | NO |
| 13 | Gaseous fumes have been vented from space (indoor installations ONLY). | | | YES | NO |
| 14 | Drive belts have proper tension. | | | YES | NO |
| 15 | Battery is fully charged. | | | YES | NO |
| 16 | Unit energized by authorized personnel. | | | YES | NO |
| 17 | Indicating lamps function properly. | | | YES | NO |
| 18 | All damage to unit finish is repaired. | | | YES | NO |
| 19 | Operation of unit and associated transfer switch verified and acceptable. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *M* | *TESTING* | | | | |
| 1 | Operation of power transfer from normal to emergency source and back functions properly. | | | YES | NO |
| 2 | Unit load tested for duration of 4 hours per specification requirements and results acceptable. | | | YES | NO |
| 3 | Battery, capacity, charge and integrity tests completed and results acceptable. | | | YES | NO |
| 4 | Exhaust system back pressure test completed and results acceptable. | | | YES | NO |
| 5 | Voltage and frequency transient stability test completed and results acceptable. | | | YES | NO |
| 6 | Noise level test completed and results acceptable. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |

**Negative Responses**

| **Group/**  **Item** | **Date**  **Found** | **Found**  **By** | **Reason for Negative Response** | **Resolved** | **Date**  **Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |

**CV-26 32 13.16 – Engine-Driven Generator Sets – Natural Gas / Propane**

**Equipment Identification/Tag: \_\_\_\_\_\_\_**

**Location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Group/Item** | **Group/Task Description** | | | **Submitted** | **Delivered** |
| *A* | *MODEL VERIFICATION* | | | | |
| 1 | Manufacturer | | |  |  |
| 2 | Model | | |  |  |
| 3 | Serial Number | | |  |  |
| 4 | Voltage / Phase / Frequency (V / - / Hz) | | | **/ /** | **/ /** |
| 5 | Capacity (kW / KVA) | | | **/** | **/** |
| 6 | Wiring Configuration | | |  |  |
| 7 | Engine Manufacturer | | |  |  |
| 8 | Engine Model | | |  |  |
| 9 | Gas Type | | |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |

| **Group/Item** | **Group/Task Description** | | | **Response** | |
| --- | --- | --- | --- | --- | --- |
| *B* | *PHYSICAL CHECKS* | | | | |
| 1 | Unit is free from physical damage. | | | YES | NO |
| 2 | The water and gas pipe openings are sealed with plastic plugs. | | | YES | NO |
| 3 | All exhaust and supply ventilation openings are sealed with durable plastic or other weatherproof means. | | | YES | NO |
| 4 | All components present. | | | YES | NO |
| 5 | Installation and startup manual provided. | | | YES | NO |
| 6 | Unit tags affixed. | | | YES | NO |
| 7 | Manufacturer’s ratings readable/accurate. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *C* | *INSTALLATION* | | | | |
| 1 | Unit secured as required by manufacturer and specification requirements. | | | YES | NO |
| 2 | Adequate clearance around unit for service and applicable codes. | | | YES | NO |
| 3 | Feeder, power, service outlet(s) and control conduit feeds are aligned with openings and accommodate seismic motion. | | | YES | NO |
| 4 | Equipment location coordinated with piping, ductwork, conduit and equipment of other trades to allow sufficient clearances. | | | YES | NO |
| 5 | All components accessible for maintenance. | | | YES | NO |
| 6 | Battery powered emergency lighting located in generator room (indoor installation ONLY). | | |  |  |
| 7 | Unit labeled and is easy to see. | | | YES | NO |
|  |  | | |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *D* | *INSTALLATION – REMOTE RADIATOR (is applicable)* | | | | |
| 1 | Unit secured as required by manufacturer and specification requirements. | | | YES | NO |
| 2 | Adequate clearance around unit for service and applicable codes. | | | YES | NO |
| 3 | Unit location provides adequate ventilation and air circulation to accommodate cooling. | | | YES | NO |
| 4 | Unit is level. | | | YES | NO |
| 5 | Unit labeled and is easy to see. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *F* | *GAS PIPING* | | | | |
| 1 | Gas supply is the same type as listed on the unit data plate. | | | YES | NO |
| 2 | Gas line is direct feed from utility main. | | | YES | NO |
| 3 | Pressure reducing valves provide correct pressure to unit. | | | YES | NO |
| 4 | Gas cock / valve and union provided on gas supply. | | | YES | NO |
| 5 | Drip / dirt leg and cap provided on gas supply. | | | YES | NO |
| 6 | Piping and valves properly checked and free of leaks. | | | YES | NO |
| 7 | Pressure relief valves are piped to outdoors (indoor installations ONLY). | | | YES | NO |
| 8 | All valves and test ports are easily accessible. | | | YES | NO |
| 9 | Valve tags attached. | | | YES | NO |
| 10 | Gas utility company inspected installation (if required). | | | YES | NO |
|  |  | | |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *G* | *WATER PIPING – REMOTE RADIATOR (if applicable)* | | | | |
| 1 | All piping components have been installed (in the correct order) as required by contract document or manufacturer. | | | YES | NO |
| 2 | Piping arranged for ease of unit removal. | | | YES | NO |
| 3 | Equipment connected to water supply, return, and drain piping using unions or flanges and isolation valves. | | |  |  |
| 4 | Piping supported independent of unit and as required by specifications. | | | YES | NO |
| 5 | Piping is clean. | | | YES | NO |
| 6 | Dielectric fittings installed to isolate dis-similar pipe materials. | | | YES | NO |
| 7 | Piping and valves properly checked and free of leaks. | | | YES | NO |
| 8 | Drain valve with hose connection provided. | | | YES | NO |
| 9 | All valves and test ports are easily accessible. | | | YES | NO |
| 10 | Valve tags attached. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *H* | *DUCTWORK-EXHAUST* | | | | |
| 1 | Muffler installed and supported by non-combustible mechanisms. | | | YES | NO |
| 2 | Exhaust ducting adequately supported as per specifications. | | | YES | NO |
| 3 | All horizontal runs of exhaust ducting are sloped to unit or drain valve if installed. | | | YES | NO |
| 4 | All hot ducting surfaces have been insulated. | | | YES | NO |
| 5 | Intake and exhaust air inlets/outlets located on opposite ends of unit. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *I* | *DUCTWORK-INTAKE* | | | | |
| 1 | Sufficient fresh air supply for proper unit operation has been verified. All motor-operated dampers should be supplied with emergency power and fail-open on loss of power. | | | YES | NO |
| 2 | Fresh air not taken from areas that contain negative pressure producing devices. | | | YES | NO |
| 3 | Fresh air supply free of corrosive elements and flammable vapors. | | | YES | NO |
| 4 | Fresh air openings sized and located (high / low) correctly with consideration given to the blocking effect of louvers and grilles. | | | YES | NO |
| 5 | Ductwork is the same cross-sectional area as the openings. | | | YES | NO |
| 6 | All ductwork is properly sealed and sloped per manufacturer specifications. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *J* | *ELECTRICAL* | | | | |
| 1 | Local disconnect installed in accessible and visible location. | | | YES | NO |
| 2 | Unit is adequately and permanently grounded for intended use. | | | YES | NO |
| 3 | Crankcase and water jacket heaters wired and operational. | | | YES | NO |
| 4 | Starter battery installed and wired properly. | | | YES | NO |
| 5 | Battery charger wired and operational. | | | YES | NO |
| 6 | All electrical connections are tight. | | |  |  |
| 7 | All electrical components are grounded. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *K* | *CONTROLS INSTALLATION* | | | | |
| 1 | Remote start and stop wiring installed and communication verified. | | | YES | NO |
| 2 | Remote status wiring installed and communication verified. | | | YES | NO |
| 3 | Remote alarm wiring installed and communication verified. | | | YES | NO |
| 4 | Remote annunciator installed and operational. Verify main breaker causes trouble alarm in the tripped or off position. | | | YES | NO |
| 5 | Remote manual emergency stop station installed and operational. | | | YES | NO |
| 6 | All local alarms and safeties wiring installed and operational. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *L* | *STARTUP* | | | | |
| 1 | All protective coverings removed. | | | YES | NO |
| 2 | Unit has been cleaned of all debris and dirt on interior of unit. | | | YES | NO |
| 3 | Cooling system is filled with specified water/antifreeze mixture. | | | YES | NO |
| 4 | Air inlet and outlet dampers are functioning properly (indoor installations ONLY). | | | YES | NO |
| 5 | Jacket water heater has operated for a period of 24 hours prior to startup. | | | YES | NO |
| 6 | Engine crankcase has been filled to proper levels with oil. | | | YES | NO |
| 7 | Current transformers secured and wired per manufacturer instructions. | | | YES | NO |
| 8 | All switches and circuit breakers have been manually tested. | | | YES | NO |
| 9 | All wiring connections verified for proper torques values and are acceptable. | | | YES | NO |
| 10 | Phase-to-phase, phase-to-ground, and neutral-to-ground, and dielectric tests have been accomplished and results are acceptable. | | | YES | NO |
| 11 | No hazards or adverse circumstances exist per continuity and high potential tests. | | | YES | NO |
| 12 | Gaseous fumes have been vented from space (indoor installations ONLY). | | | YES | NO |
| 13 | Drive belts have proper tension. | | | YES | NO |
| 14 | Battery is fully charged. | | | YES | NO |
| 15 | Unit energized by authorized personnel. | | | YES | NO |
| 16 | Indicating lamps function properly. | | | YES | NO |
| 17 | All damage to unit finish is repaired. | | | YES | NO |
| 18 | Operation of unit and associated transfer switch verified and acceptable. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *M* | *TESTING* | | | | |
| 1 | Operation of power transfer from normal to emergency source and back functions properly. | | | YES | NO |
| 2 | Unit load tested for duration of 4 hours per specification requirements and results acceptable. | | | YES | NO |
| 3 | Battery, capacity, charge and integrity tests completed and results acceptable. | | | YES | NO |
| 4 | Exhaust system back pressure test completed and results acceptable. | | | YES | NO |
| 5 | Voltage and frequency transient stability test completed and results acceptable. | | | YES | NO |
| 6 | Noise level test completed and results acceptable. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |

**Negative Responses**

| **Group/**  **Item** | **Date**  **Found** | **Found**  **By** | **Reason for Negative Response** | **Resolved** | **Date**  **Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |

**CV-26 36 00 – Transfer Switches**

**Equipment Identification/Tag: \_\_\_\_\_\_\_**

**Location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Group/Item** | **Group/Task Description** | | | **Submitted** | **Delivered** |
| *A* | *MODEL VERIFICATION* | | | | |
| 1 | Manufacturer | | |  |  |
| 2 | Model | | |  |  |
| 3 | Serial Number | | |  |  |
| 4 | Voltage (V) | | |  |  |
| 5 | Ampere Rating (A) | | |  |  |
| 6 | Withstand Ratings (kA) | | |  |  |
| 7 | # of Switched Poles | | |  |  |
|  |  | | |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |

| **Group/Item** | **Group/Task Description** | | | **Response** | |
| --- | --- | --- | --- | --- | --- |
| *B* | *PHYSICAL CHECKS* | | | | |
| 1 | Unit is free from physical damage. | | | YES | NO |
| 2 | All components and accessories present. | | | YES | NO |
| 3 | All penetrations sealed properly. | | | YES | NO |
| 4 | Installation and startup manual provided. | | | YES | NO |
| 5 | Unit tags affixed. | | | YES | NO |
| 6 | Manufacturer’s ratings readable/accurate. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *C* | *INSTALLATION* | | | | |
| 1 | Unit secured as required by manufacturer and specifications. | | | YES | NO |
| 2 | Adequate clearance around unit for service. | | | YES | NO |
| 3 | All components accessible for maintenance. | | | YES | NO |
| 4 | Unit labeled and is easy to see. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *D* | *WIRING* | | | | |
| 1 | Ground bus has been installed. | | | YES | NO |
| 2 | Unit is adequately grounded and bonded for intended use. | | | YES | NO |
| 3 | Proper phasing has occurred in relationship to phase conductors. | | | YES | NO |
| 4 | All connections are terminated properly. | | | YES | NO |
| 7 | All electrical connections are tight. | | | YES | NO |
| 8 | All cables are permanently labeled relative to use. | | | YES | NO |
|  |  | | |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *E* | *STARTUP* | | | | |
| 1 | All protective coverings removed. | | | YES | NO |
| 2 | Unit has been cleaned of all debris and dirt on interior of unit. | | | YES | NO |
| 3 | Insulators and supports show no signs of damage or cracks. | | | YES | NO |
| 4 | Current transformers secured and wired per manufacturer instructions. | | | YES | NO |
| 5 | All switches and circuit breakers have been manually tested. | | | YES | NO |
| 6 | All wiring connections verified for proper torques values and are acceptable. | | | YES | NO |
| 7 | Phase-to-phase, phase-to-ground, and neutral-to-ground, and dielectric tests have been accomplished and results are acceptable. | | | YES | NO |
| 8 | No hazards or adverse circumstances exist per continuity and high potential tests. | | | YES | NO |
| 9 | Insulation megger test accomplished and results acceptable. | | | YES | NO |
| 10 | Time delays for transfer and generator shut down set per contract documents. | | | YES | NO |
| 11 | Unit energized by authorized personnel. | | | YES | NO |
| 12 | Indicating lamps function properly. | | | YES | NO |
| 13 | Proper warning and labeling signage provided. | | | YES | NO |
| 14 | All damage to unit finish is repaired. | | | YES | NO |
| 15 | Operation of unit and associated generator verified and acceptable. | | | YES | NO |
| 16 | Digital metering provided for all transfers switches. | | | YES | NO |
|  |  | | |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *F* | *TESTING* | | | | |
| 1 | Operation of generator start signal verified and operational. | | | YES | NO |
| 2 | Operation of power transfer from normal to emergency source and back functions properly. | | | YES | NO |
| 3 | Operation of test switch verified and acceptable. | | | YES | NO |
| 4 | Return to normal switch operation verified and acceptable. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |

**Negative Responses**

| **Group/**  **Item** | **Date**  **Found** | **Found**  **By** | **Reason for Negative Response** | **Resolved** | **Date**  **Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |

**CV-26 43 13 – Surge Protective Devices for Low-Voltage**

**Electrical Power Circuits**

**Equipment Identification/Tag: \_\_\_\_\_\_\_**

**Location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Group/Item** | **Group/Task Description** | | | **Submitted** | **Delivered** |
| *A* | *MODEL VERIFICATION* | | | | |
| 1 | Manufacturer | | |  |  |
| 2 | Model | | |  |  |
| 3 | Serial Number | | |  |  |
| 4 | Voltage (V) | | |  |  |
| 5 | SCCR - Short Circuit Current Rating (kA) | | |  |  |
| 6 | VPR - Voltage Protective Rating L-L, L-G, N-G (V / V / V) | | | **/ /** | **/ /** |
| 7 | Associated Switchboard or Panelboard | | |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |

| **Group/Item** | **Group/Task Description** | | | **Response** | |
| --- | --- | --- | --- | --- | --- |
| *B* | *PHYSICAL CHECKS* | | | | |
| 1 | Unit is free from physical damage. | | | YES | NO |
| 2 | All components/accessories present. | | | YES | NO |
| 3 | Unit tags affixed. | | | YES | NO |
| 4 | Manufacturer’s ratings readable/accurate. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *C* | *INSTALLATION* | | | | |
| 1 | Unit location does not exceed manufacturer's recommended lead length between unit and load. | | | YES | NO |
| 2 | Unit secured as required by manufacture, specifications, and seismic zone requirements. | | | YES | NO |
| 3 | Adequate clearance around unit for service. | | | YES | NO |
| 4 | Unit labeled and is easy to see. | | | YES | NO |
|  |  | | |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *D* | *WIRING* | | | | |
| 1 | Unit is adequately grounded and bonded for intended use. | | | YES | NO |
| 2 | Integral or external disconnect provided for SPD. | | | YES | NO |
| 3 | Proper phasing has occurred in relationship to phase conductors. | | | YES | NO |
| 4 | All connections are terminated properly. | | | YES | NO |
| 5 | All electrical connections are tight. | | | YES | NO |
| 6 | All cables are permanently labeled relative to use. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *E* | *STARTUP* | | | | |
| 1 | All protective coverings have been removed. | | | YES | NO |
| 2 | Unit has been cleaned of all debris and dirt on interior of unit. | | | YES | NO |
| 3 | All switches and circuit breakers have been manually tested. | | | YES | NO |
| 4 | All wiring connections verified for proper torques values and are acceptable. | | | YES | NO |
| 5 | Unit energized by authorized personnel. | | | YES | NO |
| 6 | Indicating LEDs function properly. | | | YES | NO |
| **❑ CHECKLIST GROUP COMPLETE** | | **INITIALS:** |  | **DATE:** |  |
| *F* | *TESTING & FINALIZATION* | | | | |
| 1 | Phase diagnostic test performed and results satisfactory. | | | YES | NO |
| 2 | Ground continuity test accomplished and results acceptable. | | | YES | NO |
| 3 | Surge counter operational. | | | YES | NO |
|  |  | | |  |  |

**Negative Responses**

| **Group/**  **Item** | **Date**  **Found** | **Found**  **By** | **Reason for Negative Response** | **Resolved** | **Date**  **Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |
|  |  |  |  | **YES / NO** |  |  |

**CV-26 51 13 – Interior Light Fixtures, Lamps and Ballasts**

**Equipment Identification/Tag: \_\_\_\_\_\_\_**

**Location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**A) INSTALLATION CHECKS**

| **Date** | **Description of Work Performed** | **%**  **Complete** | **Initials** | **Questions (See details below)** | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1)** | **2)** | **3)** | **4)** | **5)** | **6)** | **7)** | **8)** | **9)** | **10)** |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |
| **❑ CHECKLIST GROUP COMPLETE** | | | | **INITIALS:** | |  | | | **DATE:** | |  | | |

**Question Details**

1. Fixtures, ballasts, and lamps are free from damage.
2. Identical ballasts provided for each fixture type.
3. All fixtures and exit signs installed in locations specified in contract documents.
4. Fixtures do not impede access to other systems or equipment for maintenance.
5. Suspended fixtures and exit signs are hung independent of any other fixture, system, or equipment, are level, and are suspended with appropriate materials and methods defined within the contract documents.
6. Fixtures larger than 2’x4’ or greater than 50 lbs. are supported independently from ceiling framing.
7. All recessed fixtures are installed flush to ceiling or wall finish.
8. All recessed fixtures are installed to permit removal and access to lamps from below.
9. All wall mounted fixtures and exit signs are mounted at heights specified in contract documents.
10. All fixtures are supported and installed in accordance with manufacturer and specification requirements.

**Negative Responses**

| **Group/Item** | **Date**  **Found** | **Found**  **By** | **Location** | **Reason for Negative Response** | **Resolved** | **Date**  **Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |

**B) WIRING INSTALLATION CHECKS**

| **Date** | **Description of Work Performed** | **%**  **Complete** | **Initials** | **Questions (See details below)** | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1)** | **2)** | **3)** | **4)** | **5)** |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | | | **INITIALS:** | |  | | | **DATE:** | |  | | |

**Question Details**

1. Fixture and accessories grounded and bonded to branch circuit grounding conductor.
2. Maximum of 6’ of flexible conduit provided for lay-in, recessed fixtures.
3. All electrical connections are tight.
4. All conductors are labeled per specification requirements.

**Negative Responses**

| **Group/Item** | **Date**  **Found** | **Found**  **By** | **Location** | **Reason for Negative Response** | **Resolved** | **Date**  **Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |

**C) STARTUP & TESTING CHECKS**

| **Date** | **Description of Work Performed** | **%**  **Complete** | **Initials** | **Questions (See details below)** | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1)** | **2)** | **3)** | **4)** |  |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | | | **INITIALS:** | |  | | | **DATE:** | |  | | |

**Question Details**

1. Emergency indicating button/lamp visible and verified to be operational (if applicable).
2. Associated emergency ballast tested and operation verified (if applicable).
3. Occupancy sensor and associated fixture(s) tested and operation verified (if applicable).
4. Lighting control schedules programmed and operation verified for all associated fixtures (if applicable).

**Negative Responses**

| **Group/Item** | **Date**  **Found** | **Found**  **By** | **Location** | **Reason for Negative Response** | **Resolved** | **Date**  **Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |

**D) FINALIZATION CHECKS**

| **Date** | **Description of Work Performed** | **%**  **Complete** | **Initials** | **Questions (See details below)** | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1)** | **2)** | **3)** | **4)** | **5)** | **6)** | **7)** | **8)** | **9)** | **10)** |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |
| **❑ CHECKLIST GROUP COMPLETE** | | | | **INITIALS:** | |  | | | **DATE:** | |  | | |

**Question Details**

1. Protective covering removed.
2. Lens, trim ring and other architectural accessories installed.
3. Recessed fixtures are flush to finished surface with no visible gaps.
4. Code-required hardware is installed to secure recessed grid-supported fixtures in place.
5. Recessed fixtures in fire rated assemblies have been sealed per manufacturer and specification requirements to maintain assembly rating.
6. Number and type of lamps specified for each fixture installed and operational.
7. Fluorescent lamps installed in fixtures with dimming ballasts have been burned in at 100% rated output for a minimum of 100 hours.
8. Fixture adjusted and aimed for specific task or effect per contract documents and/or Architect’s directions.
9. All damages to fixture finish repaired.
10. Fixtures and lens are clean.

**Negative Responses**

| **Group/Item** | **Date**  **Found** | **Found**  **By** | **Location** | **Reason for Negative Response** | **Resolved** | **Date**  **Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |

**CV-26 56 29 – Site Lighting**

**Equipment Identification/Tag: \_\_\_\_\_\_\_**

**Location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**A) INSTALLATION CHECKS**

| **Date** | **Description of Work Performed** | **%**  **Complete** | **Initials** | **Questions (See details below)** | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1)** | **2)** | **3)** | **4)** | **5)** | **6)** | **7)** | **8)** |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | | | **INITIALS:** | |  | | | **DATE:** | |  | | |

**Question Details**

1. Fixtures, ballasts, and lamps are free from damage.
2. Identical ballasts provided for each fixture type.
3. Base with conduit stubs provided in location and per contract documents for all pole mounted fixtures.
4. Pole anchors extend a minimum of 2” above base.
5. All fixtures installed in locations specified in contract documents.
6. All wall mounted fixtures are mounted at heights specified in contract documents.
7. Fixture poles are plumb.
8. All penetrations of facility envelope have been filled and sealed per specification requirements.

**Negative Responses**

| **Group/Item** | **Date**  **Found** | **Found**  **By** | **Location** | **Reason for Negative Response** | **Resolved** | **Date**  **Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |

**B) WIRING INSTALLATION CHECKS**

| **Date** | **Description of Work Performed** | **%**  **Complete** | **Initials** | **Questions (See details below)** | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1)** | **2)** | **3)** | **4)** | **5)** |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |  |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | | | **INITIALS:** | |  | | | **DATE:** | |  | | |

**Question Details**

1. Fixture, accessories, pole, and pole base grounding are bonded to branch circuit grounding conductor.
2. All electrical connections are tight.
3. All conductors are labeled per specification requirements.

4) Ensure all ungrounded conductors for individual poles are protected with in-line fuses.

**Negative Responses**

| **Group/Item** | **Date**  **Found** | **Found**  **By** | **Location** | **Reason for Negative Response** | **Resolved** | **Date**  **Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |

**C) TESTING & FINALIZATION CHECKS**

| **Date** | **Description of Work Performed** | **%**  **Complete** | **Initials** | **Questions (See details below)** | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1)** | **2)** | **3)** | **4)** | **5)** | **6)** | **7)** | **8)** |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |
|  |  |  |  | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** | **YES**  **NO** |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | | | | **INITIALS:** | |  | | | **DATE:** | |  | | |

**Question Details**

1. Emergency lighting operation verified (if applicable).
2. Lighting control schedules programmed and operation verified for all associated fixtures (if applicable).
3. Protective covering removed.
4. Lens and other accessories installed.
5. Number and type of lamps specified for each fixture installed and operational.
6. Fixture adjusted and aimed for specific task or effect per contract documents and/or Architect’s directions.
7. All damages to fixture finish repaired.
8. Fixtures, lenses, and photometric surfaces are clean.

**Negative Responses**

| **Group/Item** | **Date**  **Found** | **Found**  **By** | **Location** | **Reason for Negative Response** | **Resolved** | **Date**  **Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |

***Edit the individual functional performance test forms and provide additional test forms as needed to reflect the functional performance test requirements of assemblies, components, equipment, and systems to be commissioned on this project. Include test forms with final review documents; no submission is required at preliminary review.***

***Edit to provide test forms unique to the specific test requirements of the project and remove the “SAMPLE” watermark. Edited or unedited test forms may be used in the bidding documents. Unedited test forms must be edited by the A/E at the time of shop drawing submittal and accompany the submittals when returned to the contractor prior to functional performance testing. Incorporate changes to the contract documents into the test forms prior to testing. This option is preferred for medium and large projects where there are many functional performance tests to be done.***

**FPT-26 09 28 – Lighting Control Panels**

**Equipment Identification/Tag: \_\_\_\_\_\_\_**

**Location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Test Duration**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Date: |  | Start Time: |  | End Time |  |
|  |  |  |  |  |  |
| Estimated Duration: | |  |  |  |  |
| Cx Provider(s): | |  | |  |  |
|  | |  | |  |  |
|  | |  | |  |  |
|  | |  | |  |  |
| Applicable Equipment: | |  | | | |
|  | |  | | | |

**Objectives**

This test is performed to investigate the functionality of the low voltage lighting controls.

**Instrumentation**

|  |  |  |
| --- | --- | --- |
| **Instrument** | **Accuracy** | **Measurement** |
| N/A | N/A | N/A |

**Stated Sequence**

*To be defined by A/E and commissioning provider.*

**Sampling Set**

All sequences for a minimum of 20% of the total areas present. However, ensure at least one area representing each lighting control method is tested.

**Procedure**

1. Manual Control (if applicable)
   1. Using the final as-built documentation, systematically check the lighting circuitry by manually operating the low-voltage light switches designated for each area.
2. Scheduled Control (if applicable)
   1. Verify lighting system is in occupied mode. If not override system into occupied mode.
   2. Verify all fixtures are energized.
   3. Override system to unoccupied mode.
   4. Verify all fixtures are de-energized, except those noted as “night lights”.
   5. Return system to normal operation.
3. Occupancy Control (if applicable)
   1. Verify occupancy sensor calls luminaries “On” upon entry to room.
   2. Manually operate override switch to “Off” position and then back to “On” position. Verify switch is operational and that fixtures respond to “On” position.
   3. Record occupancy sensor time-out setting.
   4. After predetermined time-out setting re-check space to verify lighting has been de-energized.
4. Daylighting Control (if applicable)
   1. Verify lighting system is in occupied mode. If not override system into occupied mode.
   2. Take reading of current lighting levels in room.
   3. Cover daylight sensor in room.
   4. Verify lamps are raised to highest output level, and take reading of light levels in room.

**Results**

**Manual Control (if applicable):**

| Room # | Switch ID | Relay # | Fixture ID | # of Fixtures | Accepted? | Notes |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | Y / N |  |
|  |  |  |  |  | Y / N |  |
|  |  |  |  |  | Y / N |  |

**Schedule Control (if applicable):**

| Room # | Fixture ID | # of Fixtures | Accepted? | Notes |
| --- | --- | --- | --- | --- |
|  |  |  | Y / N |  |
|  |  |  | Y / N |  |
|  |  |  | Y / N |  |

**Occupancy Control (if applicable):**

| **Room #** | **Occupancy Sensor Time-out Setting** | **Fixture ID** | **# of Fixtures** | **Accepted?** | **Notes** |
| --- | --- | --- | --- | --- | --- |
|  |  |  |  | Y / N |  |
|  |  |  |  | Y / N |  |
|  |  |  |  | Y / N |  |

**Daylighting Control (if applicable):**

| **Room #** | **Design Light**  **Levels (f-c)** | **Initial Light**  **Levels (f-c)** | **Test Light**  **Levels (f-c)** | **Fixture ID** | **# of Fixtures** | **Accepted?** | **Notes** |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  | Y / N |  |
|  |  |  |  |  |  | Y / N |  |
|  |  |  |  |  |  | Y / N |  |

**Conclusion**

Acceptable Criteria: All schedules and lighting levels comply with contract documents. All lights turn on and off when called for by switch, schedule and/or sensor.

Comments:

Observations:

Final Status: ❑ Accepted ❑ Not Accepted

**Relevant Trend Data**

N/A

**Witnesses**

| **Name** |  | **Signature** |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**FPT-26 32 13.13 and 26 32 13.16 – Engine-Driven Generator Sets**

**Equipment Identification/Tag: \_\_\_\_\_\_\_**

**Location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Test Duration**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Date: |  | Start Time: |  | End Time |  |
|  |  |  |  |  |  |
| Estimated Duration: | |  |  |  |  |
| Cx Provider(s): | |  | |  |  |
|  | |  | |  |  |
|  | |  | |  |  |
|  | |  | |  |  |
| Applicable Equipment: | |  | | | |
|  | |  | | | |

**Objectives**

This test is performed to investigate the functionality of the generator to provide emergency power to the facility in concert with automatic transfer switches upon loss of normal power.

**Instrumentation**

|  |  |  |
| --- | --- | --- |
| **Instrument** | **Accuracy** | **Measurement** |
| N/A | N/A | N/A |

**Sampling Set**

All units and all sequences.

**Procedure**

1. Power Transfer
   1. Open the main utility feed breaker.
   2. Verify the generator starts and comes up to speed.
   3. Record the time delay between loss of power and generator start up.
   4. Verify the ATS transfers loads to the generator.
   5. Verify the generator annunciator panel provides indication that the generator is running.
   6. Close the main utility feed breaker (only complete this step after all emergency mode tests have been completed).
   7. Verify ATS transfers power back to utility feed.
   8. Verify generator annunciator panel indicates transfer to utility power.
   9. Verify generator shuts down after given cool down period.
   10. Record time from power transfer to generator shut down.
2. Emergency Load Tests
   1. Lighting
      1. Verify facility is being supplied by emergency power system only.
      2. Using the final as-built documentation and the Lighting table under the results section, systematically verify the fixtures noted to be supplied by emergency power are energized.
   2. Receptacle Loads
      1. Verify facility is being supplied by emergency power system only.
      2. Using the final as-built documentation and the Receptacle Loads table under the results section, systematically verify the receptacles noted to be supplied by emergency power are powered via a receptacle test plug.
   3. Process and Equipment Loads
      1. Verify facility is being supplied by emergency power system only.
      2. Using the BAS system and the Process/Equipment Loads table under the results section, systematically verify the connected equipment is operational by manually overriding each unit through the BAS system.

**Results - Power Transfer**

|  |  |
| --- | --- |
| Generator starts in response to loss of utility power? | Y / N |
| Time Delay Between Loss of Power and Generator Start-up: |  |
| ATS properly transfers power to generator without any issues or hitches in transfer? | Y / N |
| Generator enunciator panel clearly indicates generator and emergency mode power operation? | Y / N |
| ATS transfers power back to utility feed in response to restoration of utility feed? | Y / N |
| Generator enunciator panel clearly indicates transfer of power back to utility feed? | Y / N |
| Generator successfully shuts down after cool down period? | Y / N |
| Time From Transfer to Utility Feed to Generator Shut Down: |  |

**Emergency Load Tests**

*Lighting*

| Room # | Circuit # | Fixture ID | # of Fixtures | Accepted? | Notes |
| --- | --- | --- | --- | --- | --- |
|  |  |  |  | Y / N |  |
|  |  |  |  | Y / N |  |
|  |  |  |  | Y / N |  |

*Receptacle Loads*

| Room # | Circuit # | # of Recpt. | Accepted? | Notes |
| --- | --- | --- | --- | --- |
|  |  |  | Y / N |  |
|  |  |  | Y / N |  |
|  |  |  | Y / N |  |

*Process/Equipment Loads*

| Unit Tag | Circuit # | Accepted? | Notes |
| --- | --- | --- | --- |
|  |  | Y / N |  |
|  |  | Y / N |  |
|  |  | Y / N |  |

**Conclusion**

Acceptable Criterion: Generator and ATS transfer power without issue and in accordance with specified time delays for power transfer and cool down, all attached loads to emergency power comply with as-built documentation and are operational.

Comments:

Observations:

Final Status: ❑ Accepted ❑ Not Accepted

**Relevant Trend Data**

N/A

**Witnesses**

| **Name** |  | **Signature** |
| --- | --- | --- |
|  |  |  |
|  |  |  |