

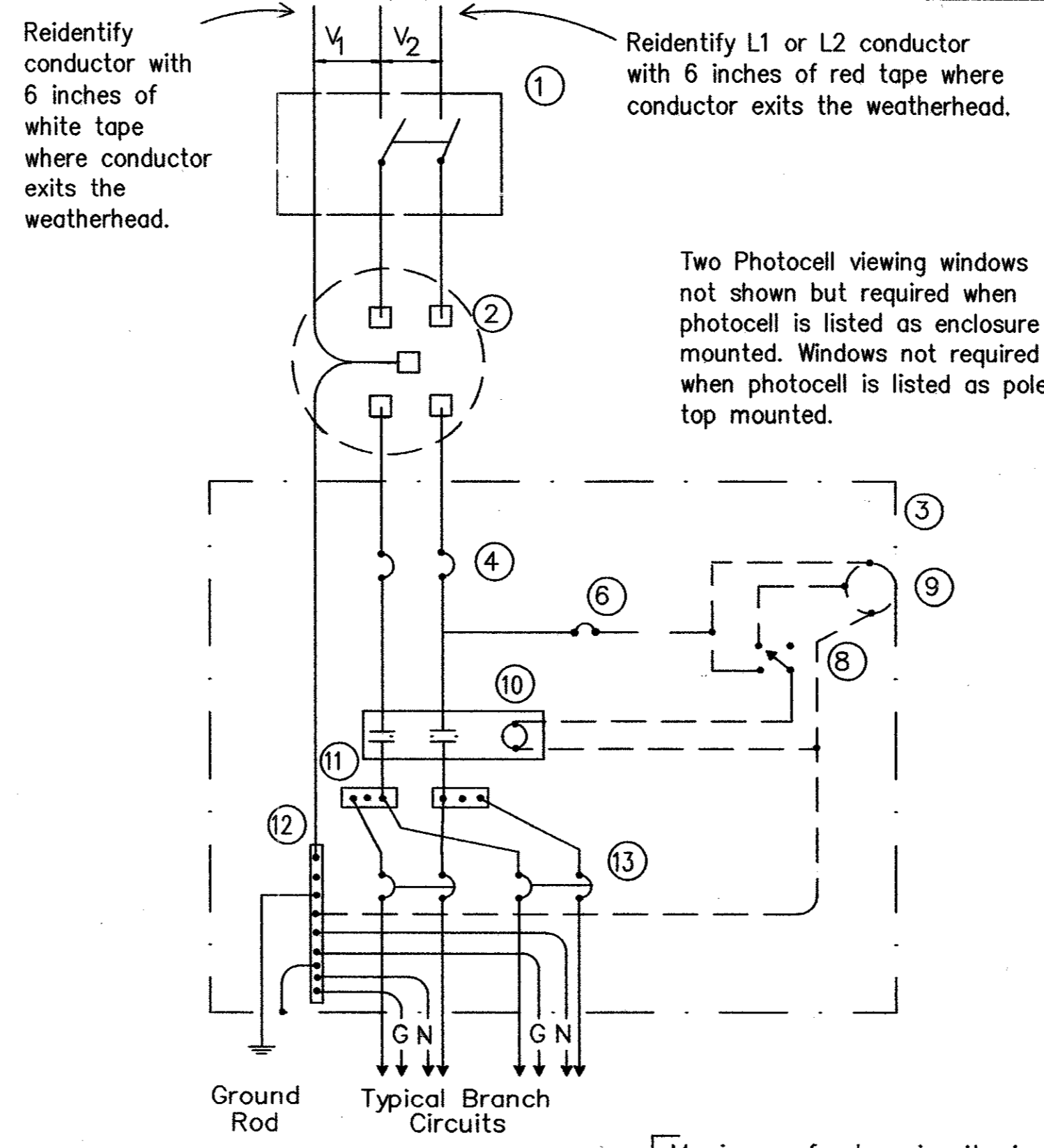
NO.	DATE	REVISION	APPROV.
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SERVICE ENCLOSURE NOTES:

- VIII. Service Assembly Enclosures. All service assemblies and enclosures shall be UL Listed for the intended purpose.
- A. Shop built or shop assembled service assemblies (all types except Type T and Type D without lighting contactor) and all auxiliary equipment enclosures mounted with service equipment and paid for as part of Item 628, "Electrical Services", shall be built or assembled by a UL Listed Industrial Control Panel shop and shall have a unique serial numbered UL Label with the words "LISTED ENCLOSED INDUSTRIAL CONTROL PANEL". The same or an additional label shall have the name, location, and phone number of the shop, the UL file number of the shop, the shop order or drawing number, date of manufacture or assembly, and the line voltage. The enclosure shall also be labeled "SUITABLE ONLY FOR USE AS SERVICE EQUIPMENT".
- B. Conduit entries into the top of all enclosures shall have threaded hubs. No conduit entries through the equipment mounting back plate will be allowed.
- C. All service enclosure front doors shall be permanently labeled "DANGER HIGH VOLTAGE". Label shall be a self sticking type, intended for outdoor installation. Lettering style, layout and colors of red, black and white shall be as required by OSHA. Label letters shall be 1 to 1 1/2 inches high or as high as the enclosure door width will permit for smaller Type T services. Separate or auxiliary lighting enclosures need not be OSHA labeled when mounted in the same viewing plane as the service enclosure front door. Where only one type of load is served by the service, the service door shall be marked using spray painted stenciled letters or self adhesive vinyl weather resistant labels, minimum of 1 inch high; applied in a neat and workman like manner, identifying the load served specifically such as lighting, landscaping, signals, traffic management or other wording as directed by the Engineer. Safety switches need not be OSHA labeled unless specifically required by the serving utility.
- D. Type GS enclosures for service types D, T, and the circuit breaker panelboard of service type C shall be made from pre-galvanized steel sheeting, hot dipped galvanized steel, or powder coat painted steel. Painted enclosures shall be painted inside and outside; galvanized enclosures may be painted. Unless otherwise approved by the Engineer, painted enclosures shall be gray, beige, or white. Panelboard/loadcenter enclosures shall be UL type 3R, 4, 4X or 12 modified or built as shown in paragraph E (below), shall have a dead front trim, and shall have a door with provisions for padlocking. Types D and T shall not have a loadcenter exterior "can" mounted inside another enclosure meeting these specifications. The loadcenter shall be interior mounted in an enclosure with properly adapted dead front trim.
- E. Type GS enclosures for service types A and C shall be a UL type 3R, 4, 4X or 12 enclosure and shall meet additional requirements of this paragraph. UL type 12 enclosures marked for indoor use only are approved for outdoor use when a drip shield or rolled lip is provided and drain fitting is supplied as specified. The enclosure door shall have a rolled lip around all sides of the enclosure opening and a padlock handle. All enclosures may have a continuous stainless steel piano hinge with stainless steel pin, enclosures less than 30 inches may have two heavy duty hinges, those over 30 inches must have three. Heavy duty two and three point hinges shall have a 3/8" minimum diameter electro-zinc plated steel pin or a stainless steel pin. Two point hinged doors shall be rated for 56 lbs of loading. Three point hinged doors shall be rated for 90 lbs of loading. The door shall have a mechanically attached data pocket constructed of either thermoplastic or metal. Pocket shall be 12" x 12", unless that size will not fit in enclosure. The pocket shall then be as large as possible, as approved by the Engineer, and mechanically attached with stainless steel nuts and bolts, or stainless steel or aluminum rivets. The main disconnect remote operator shall be flange-mounted, shall interlock the door when in the "on" position, and shall be pad lockable in both the "on" or the "off" positions. Enclosure shall include an equipment mounting panel installed inside the enclosure on collar studs or tapped bosses, and constructed of either 12-gauge steel or 0.10"-thick aluminum. Equipment mounting panels shall not be painted, but shall be hot-dipped galvanized or made from pre-galvanized sheeting. Enclosure shall have factory installed external mounting feet. Enclosure door shall be capable of opening at least 130 degrees, with arm to hold the door open. Door latch shall latch at two or more points, operate by a handle separate from disconnect switch and be capable of being locked. Lock must be keyed to Master #2195. Door shall be bonded with a #8 ground wire to the grounding bus or from door to enclosure grounding point if one is provided in enclosure. Enclosure shall be either hot dip galvanized, pre-galvanized sheeting or prime and painted. Paint shall be powder coat paint as shown below. Color shall be white or gray. Condensation drainage shall be provided by installation of a drain fitting (Crouse-Hinds CH-ECD11, Appleton ECDB or equal) in the bottom of the enclosure. The Contractor shall place in the service enclosure a laminated copy of the "as built" electrical plans showing the equipment supplied for that electrical service and all applicable wiring diagrams, layouts, and TS-8, TS-9, and TS-10 when standard sheets are in the plan set.
- F. Type SS Stainless steel enclosure shall meet all the requirements above for the respective type GS except that the enclosure shall be UL type 4X conforming to UL 50. Type GS circuit breaker panel interiors and load center interiors housed in a stainless steel UL type 4X enclosure conforming to UL 50 shall be considered complying with the Type SS requirements for service types D & T.
- IX. Powder Coat Paint. Powder coating shall be either a polyester thermosetting resin, a zinc rich primer with a TGIC (triglycidyl isocyanurate) powder overcoating, or a zinc-rich epoxy powder, applied by either electrostatic spray or fluidized bed immersion, high temperature oven cured, high density, low gloss, 4 mil thick (minimum), coating. Adhesion shall meet the SA or SB classifications of ASTM D3359. Finish shall be uniform in appearance and free of scratches.
- X. Main Disconnect. Main disconnect device shall be a circuit breaker, as specified in the Electrical Service Data, shall be two or three pole, and rated for the voltage and amperage specified. Circuit breaker shall be a UL Listed thermal-magnetic circuit breaker with flange-mounted remote operator in the service assembly enclosure. Circuit breakers shall have a minimum interrupting rating of 10,000 Amps. When the utility company provides a transformer larger than 50 KVA, Contractor shall verify that the available fault current is less than the circuit breaker amps interrupting capacity (AIC) rating and shall provide documentation from the Utility to the Engineer. Documentation shall be submitted at the same time as other electrical submittals. Circuit breaker shall be UL Listed to UL489. No backfed breakers as main disconnects will be allowed.
- XI. Control Circuit. Control circuit protection shall be either a 10 or 15 amp circuit breaker.
- XII. Control Station ("H-O-A" Switch). Control station shall be a maintained-contact, three position selector switch in a UL type enclosure. Switch shall be rated 600 volts and shall be fitted with "Hand-Off-Auto" legend.
- XIII. Photo Electric Control. Photo electric control shall consist of a photocell, internal lightning arrester, and relay or bimetallic switch mounted inside a weatherproof enclosure with standard 3-prong twist lock photocell plug and receptacle. The enclosure shall be made of poly-acrylic with clear acrylic window. Enclosure chassis shall be molded thermosetting plastic. The photocell shall have a polyethylene gasket, and shall have a hermetically sealed cadmium sulfide cell. The arrester shall have an enclosed type expulsion arrester rated 2.0 kV sparkover with 5,000 amps follow-through. Relay or switch shall be time delay type with normally closed contacts. Photo electric control shall be rated a minimum of 1800 VA, voltage as required. Enclosure mounted photocells shall be the same as above except that the photocell shall be mounted inside the enclosure. The enclosure shall have two acrylic paned windows, or other material approved by the Engineer, one on each side of the enclosure. Each window shall be rectangular approximately one inch by two inches, round 2 inch diameter, or as otherwise approved by the Engineer. The photocell shall be mounted in a position to receive light from one window. Top of pole mounted photocells shall be mounted as shown on ED(4). The Contractor shall be responsible for proper operation of the photo-electric control. The Contractor shall move and/or adjust or shield the photocell from stray or ambient nighttime light or shall make any other adjustments required for proper operation. The photocell shall face North when practicable. Unless otherwise shown on the plans, the photocell shall turn on the illumination system at 1.0 +(-) 0.5 footcandle and turn off the illumination system at two footcandles higher than turn on.
- XIV. Lighting Contactor. Lighting contactor shall be a UL Listed NEMA rated lighting contactor, two-pole or multipole as required, electrically held type designed to control high pressure sodium lighting loads, with silver alloy double break contacts rated at 240 volts, 480 volts or 600 volts as required. Lighting contactor shall not be the DIN rail mounted type.
- XV. Power Distribution Terminal Blocks. Power distribution terminal blocks shall be rated for 600 volts and shall be used for line side connections to branch circuit breakers where more than one circuit breaker is required. Lugs on blocks shall be properly sized for conductors being used. Only one conductor shall be placed under each lug.
- XVI. Neutral/Ground Bus. Neutral/ground bus shall be a factory made bus permanently bonded to the enclosure with properly sized lugs for grounding and neutral conductors.

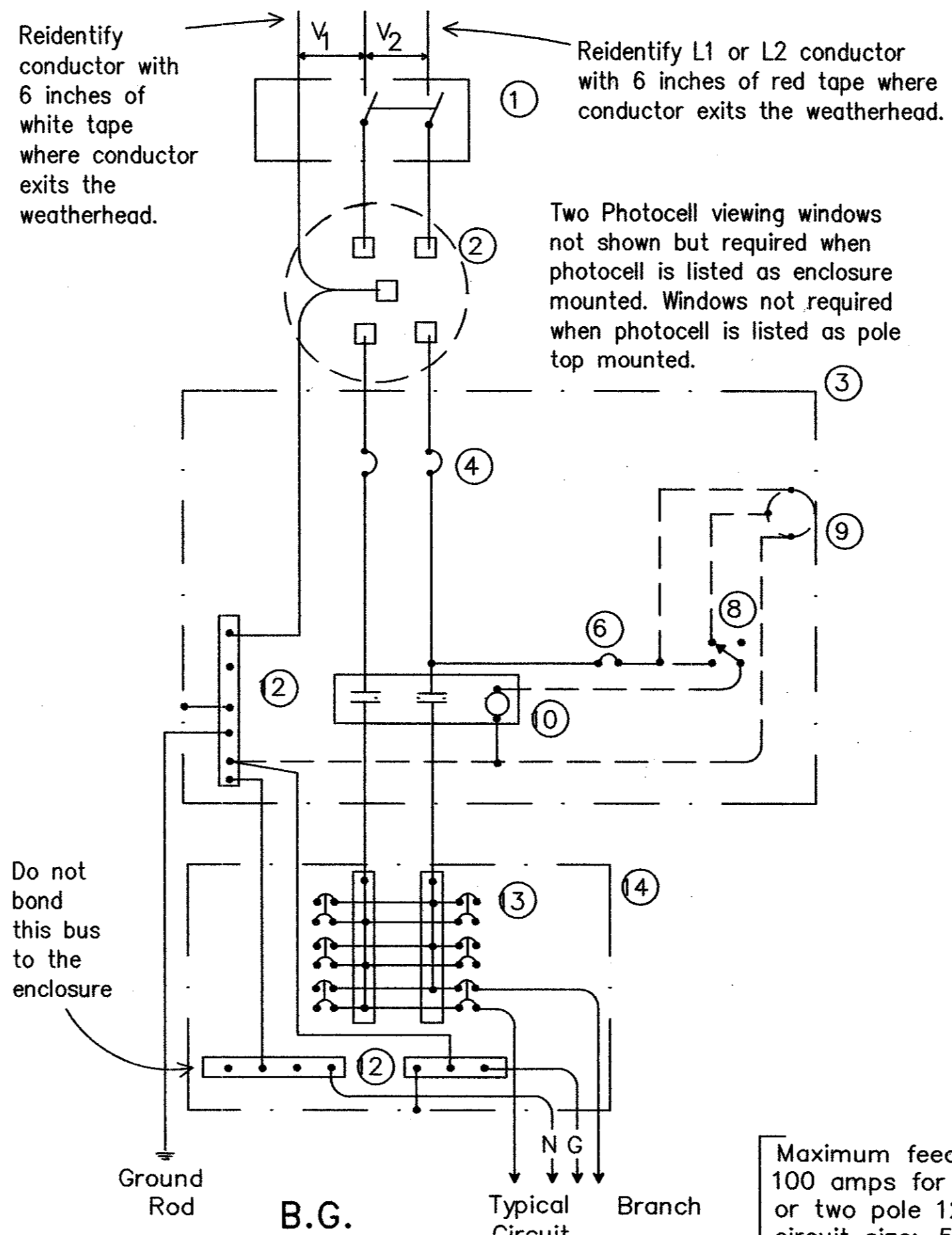
SCHEMATIC LEGEND

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|---|---|
| 1 - Safety Switch (when required) | 11 - Power Distribution Terminal Blocks |
| 2 - Meter (when required) | 12 - Neutral/Ground Bus |
| 3 - Service Assembly Enclosure | 13 - Branch Circuit Breaker (See Electrical Service Data) |
| 4 - Main Disconnect Breaker (See Electrical Service Data) | 14 - Circuit Breaker Panelboard (See Electrical Service Data) |
| 5 - Omit | 15 - Load Center |
| 6 - Circuit Breaker, 15A Typical for control wiring | |
| 7 - Auxiliary Enclosure | — Power Wiring |
| 8 - Control Station ("H-O-A" Switch) | — Control Wiring |
| 9 - Photo Electric Control (enclosure-mounted shown) | — N — Neutral Conductor (when required) |
| 10 - Lighting Contactor | — G — Equipment grounding conductor—always required |



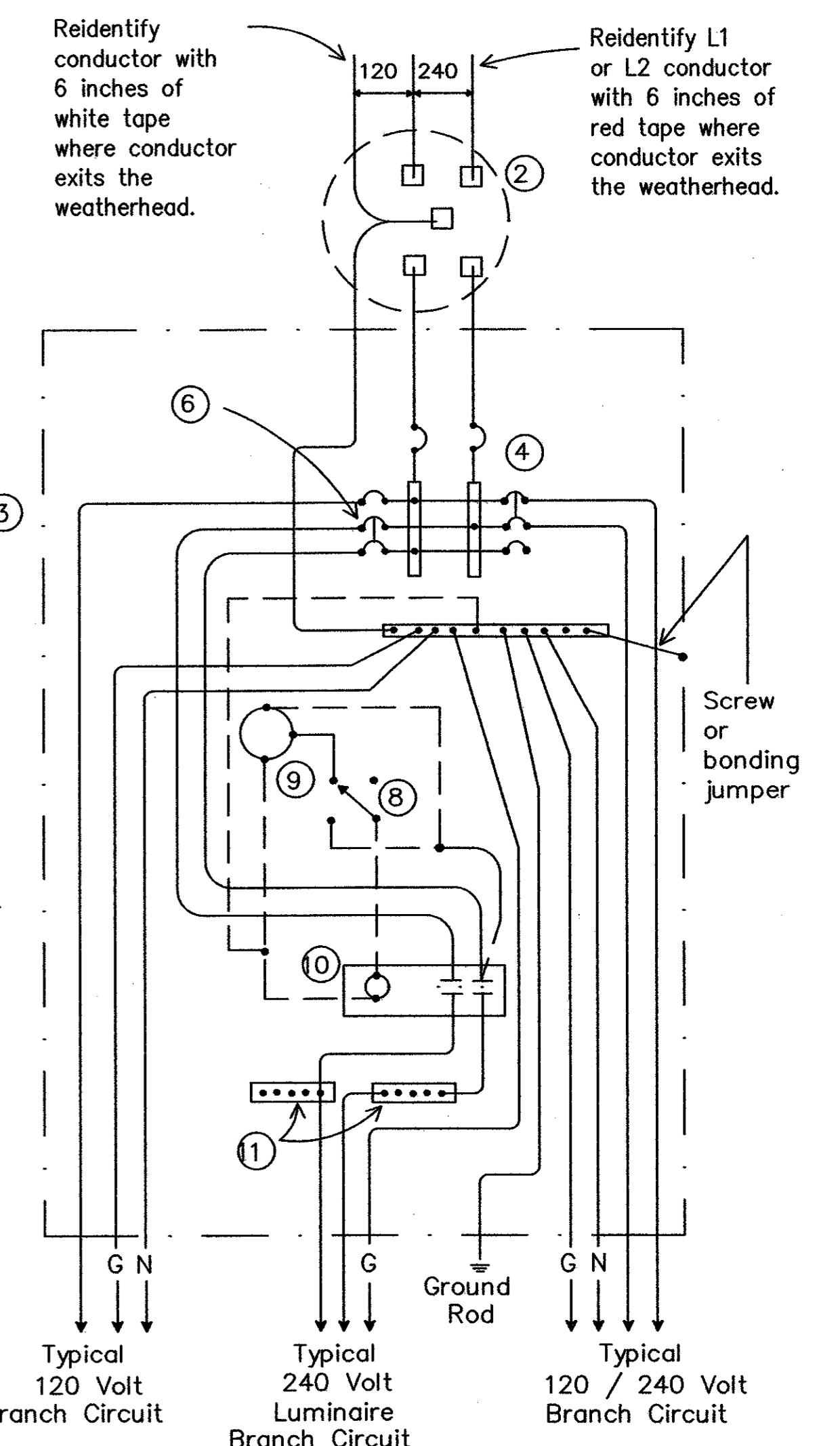
SCHEMATIC TYPE A
THREE WIRE

Maximum feeder circuit size (High Mast Poles):
100 amps for two pole 480V, 125 amps for one or two pole 120V or 240V. Maximum branch circuit size: 50 amps.



SCHEMATIC TYPE C
THREE WIRE

Maximum feeder circuit size (High Mast Poles):
100 amps for two pole 480V, 125 amps for one or two pole 120V or 240V. Maximum branch circuit size: 50 amps.

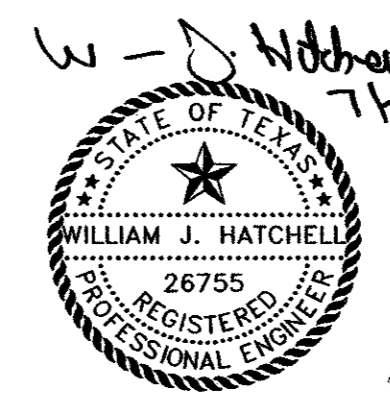


SCHEMATIC TYPE D
120/240 VOLTS - THREE WIRE

Install photocell and lighting contactor when shown on Electrical Service Data. See Type D service notes.

TYPE D SERVICE NOTES

Photocell and lighting contactor shall be located either in the same UL type 3R enclosure with load center or, if approved by Engineer, in separate enclosure. Photocells shall have a window on each side of enclosure to allow operation. Both photocell contactor and breaker area shall have dead front trim. Enclosure, except for RT and PS supports, shall not exceed 36 inches in height or 16 inches in width unless approved by the Town. Ty D load center with lighting controls or TY D separate lighting control enclosure shall have power distribution blocks for a minimum of 4, #8 conductors per phase.



THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY: WILLIAM J. HATCHELL ON 7-21-04. ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT.

DATE:	MAY 2004	SCALE:	NOT TO SCALE	JOB NO.:	320
DRAWN:	G&A	DESIGN:	BRG	REVIEWED:	BRG
				DWG:	320DETAILS-ELEC

ARAPAHO ROAD PHASE III
STANDARD CONSTRUCTION DETAILS
TRAFFIC SIGNAL ELECTRICAL - SHEET 5
TOWN OF ADDISON

g&a Grantham & Associates, Inc. SHT. TS-9

1919 S. SHILOH ROAD, SUITE 310, L.B. 8 GARLAND, TEXAS 75042 (972) 964-2333 (TELE) (972) 964-2334 (FAX)

THIS DETAIL SHEET WAS OBTAINED FROM TXDOT