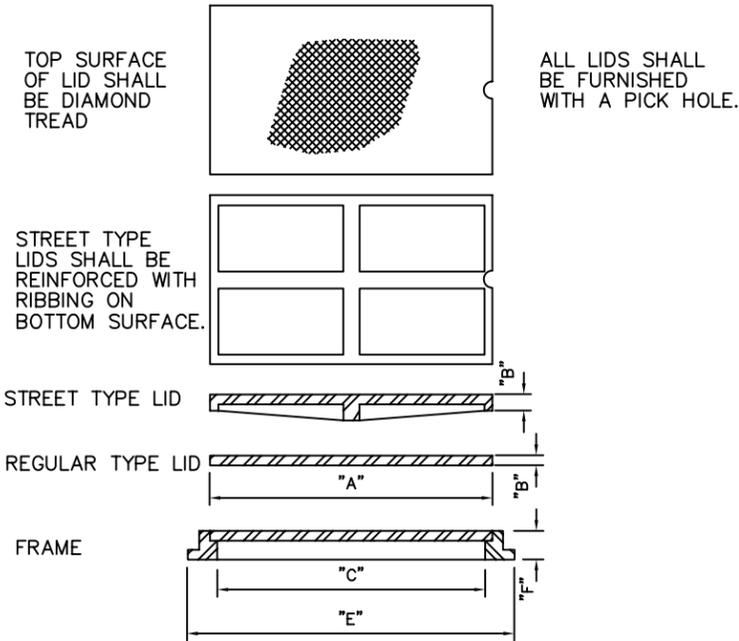
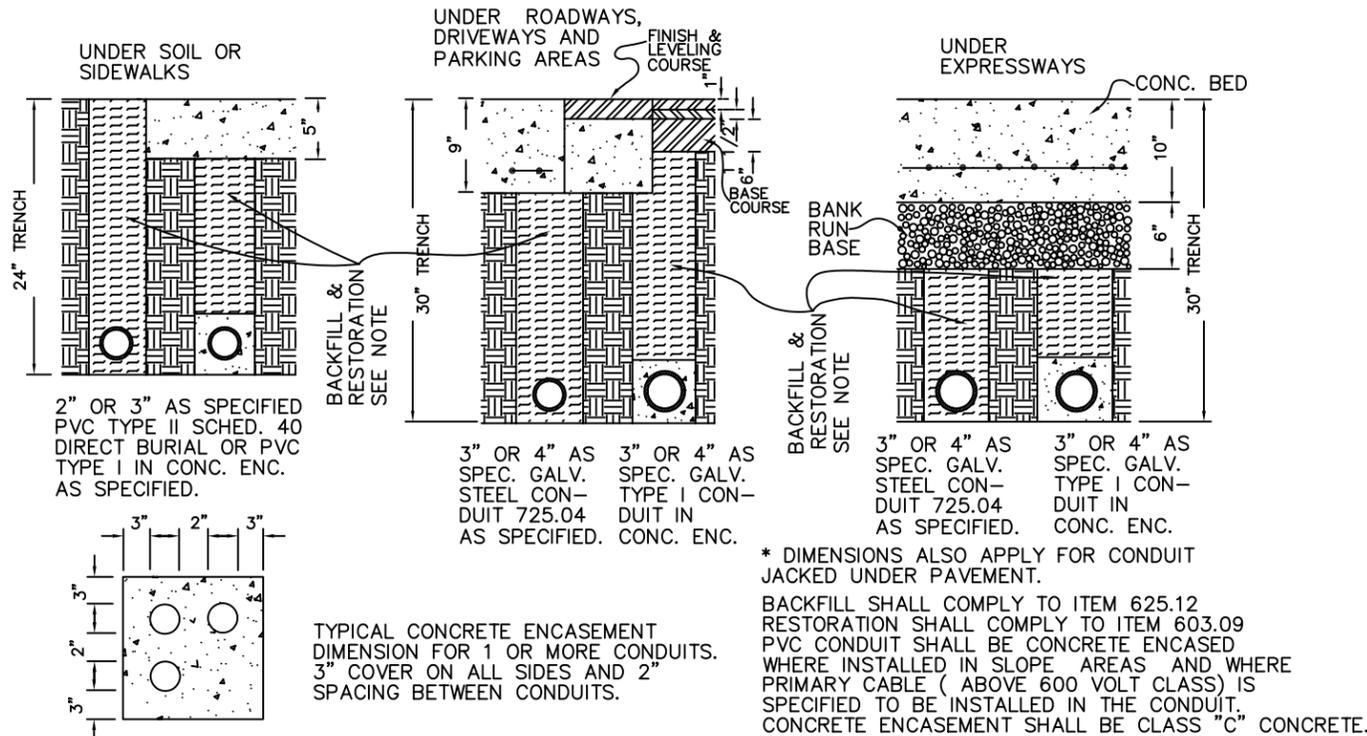


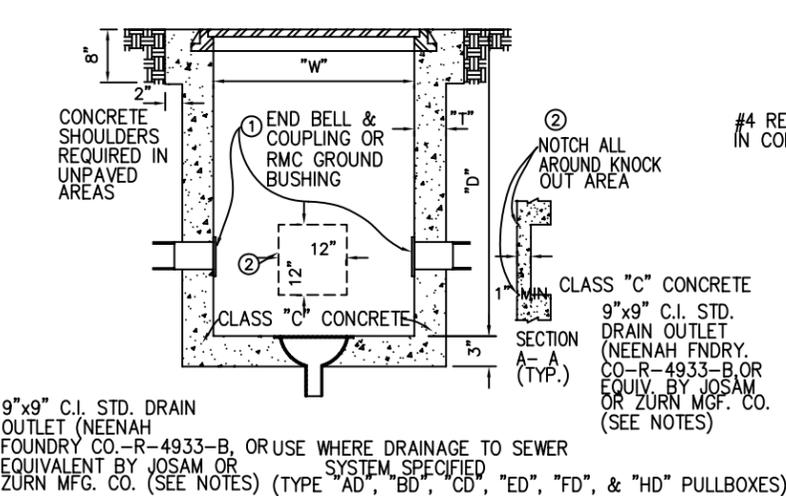
**TYPICAL PULLBOX FRAME & COVER DIMENSIONS**



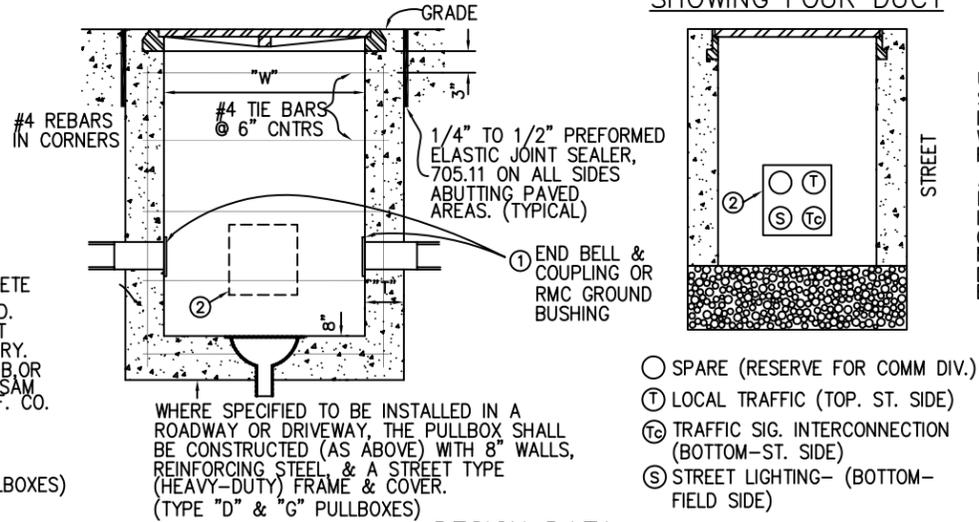
**TYPICAL CONDUIT INSTALLATIONS**



**TYPICAL PULLBOX CONSTRUCTION METHODS**



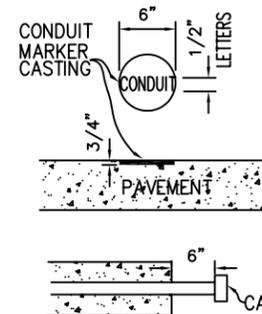
**TYPICAL U.G. CABLING ASSIGNMENT SHOWING FOUR DUCT**



USE MANUFACTURER'S STANDARD SPACERS. INSTALL IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDED METHODS. ALL CABLES INSTALLED IN CONDUIT SHALL BE IDENTIFIED BY RESPECTIVE CKT, ETC. AND SHALL BE MAINTAINED IN THE SAME DUCT THROUGHOUT THE ENTIRE RUN.

- SPARE (RESERVE FOR COMM DIV.)
- Ⓣ LOCAL TRAFFIC (TOP. ST. SIDE)
- Ⓢ TRAFFIC SIG. INTERCONNECTION (BOTTOM-ST. SIDE)
- Ⓛ STREET LIGHTING- (BOTTOM-FIELD SIDE)

**CONDUIT MARKER (USE WHERE CONDUIT TERMINATE UNDERGROUND)**



**NOTES:**

| FED. RD. DIV. | STATE | PROJECT | FISCAL YEAR |
|---------------|-------|---------|-------------|
| 5             | OHIO  |         |             |

**FRAME & COVER\*\***

REGULAR TYPE PULLBOX FRAMES & COVERS SHALL BE CONSTRUCTED OF GRAY IRON MEETING THE REQUIREMENTS OF ASTM-A48, CLASS 30, WITH MINIMUM TENSILE STRENGTH OF 30,000 PSI.

STREET TYPE PULLBOX FRAMES & COVERS SHALL BE CONSTRUCTED OF DUCTILE IRON MEETING THE REQUIREMENTS OF ASTM A-536, GRADE 60-40-18, WITH A MIN. TENSILE STRENGTH OF 60,000 PSI.

ALL FRAMES & COVERS SHALL BE OF UNIFORM QUALITY & FREE FROM BLOWHOLES, HARDSPOTS, SHRINKAGE DISTORTION, & OTHER DEFECTS, AND SHALL HAVE THE DIMENSIONS SPECIFIED IN THE DESIGN DATA TABLE.

COVERS ( OR LIDS) SHALL BE TREADED AND EQUIPPED WITH PICK HOLES FOR LIFTING LID OFF FRAME. WHEN FLANGE AND LID ARE NOT CASTED IN THE PULLBOX, THEY SHOULD BE BOLTED DOWN & CAPPED WITH CONCRETE.

**PULLBOX CONSTRUCTION**

PULLBOX SHALL BE CONSTRUCTED AS SHOWN, & WITH FRAME, SHALL BE CAST IN PLACE, OR APPROVED PRE-CAST WITH FRAME PRECAST INTO BOX AND WITH REIN., EXCEPT STREET TYPE BOXES.

EXISTING PULLBOXES MAY BE MODIFIED WITH CONCRETE BRICK MEETING REQUIREMENTS OF ITEM 704.02. IF CONCRETE BRICK IS USED, THE SIDE WALLS SHALL HAVE A MINIMUM THICKNESS OF 7 1/2", AND BRICK MASONRY SHALL HAVE CONSTRUCTED IN ACCORDANCE WITH ITEM 602.

STREET TYPE PULLBOXES SHALL BE CAST-IN-PLACE CLASS "C" CONCRETE WITH REINFORCING MEETING THE REQUIREMENTS OF ITEM 709.01 DRAINAGE

WHERE A PULLBOX IS SPECIFIED TO BE DRAINED TO THE SEWER SYSTEM, A 9"x9" CAST IRON STANDARD DRAIN OUTLET, WITH LID, (NEENAH FOUNDRY CO. R-4933-B, OR EQUIVALENT BY JOSAM OR ZURN MFG. CO.) SHALL BE INSTALLED AT THE BOTTOM OF PULLBOX AND CONNECTED TO A 3" CAST IRON PIPE DRAIN LINE TO THE SPECIFIED SEWER CONNECTION. DRAIN LINE SHALL HAVE A MIN. SLOPE OF 1/4" PER FOOT TOWARD SEWER. CAST IRON PIPE, ELBOWS, & OTHER FITTINGS SHALL CONFORM TO REQUIREMENTS OF ASTM-A-74.

UNLESS OTHERWISE SPECIFIED, PULLBOX DRAINAGE SHALL CONSIST OF 6" OF COMPACTED, COARSE, WASHED GRAVEL #7 OR #8 AGGREGATE PER ITEM 703.

**CONDUIT ENTRIES**

① A CONDUIT ENTRY THROUGH A PULLBOX WALL SHALL CONSIST OF AN END BELL & COUPLING WHICH SHALL PROTRUDE BEYOND THE OUTER FACE OF THE WALL, SUFFICIENT IN SIZE & LENGTH FOR CONNECTION TO THE PROPOSED DUCT SYSTEM IF RMC CONDUIT, A GROUND BUSHING MUST BE PROVIDED.

② A SECTION OF EACH WALL SHALL BE KNOCKED AND RECESSED FOR PROPOSED AND FUTURE CONDUIT ENTRIES. (SEE DETAIL)

WHEN CONDUITS ARE INSTALLED, ALL OPENINGS & SPACES SHALL BE FILLED WITH CLASS "C" CONCRETE & FINISHED OR POINTED UP TO SATISFACTION OF THE ENGINEER.

IN CUTTING OR BREAKING INTO WALLS WHERE THE INSTALLATION OF ADDITIONAL CONDUIT IS SPECIFIED CONNECTED TO AN EXISTING PULLBOX, ANY DAMAGE TO THE WALL SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

**UNDERGROUND CONDUIT**

ALL CONDUIT SPECIFIED AS PVC TYPE I, (TYPE DB OR SCHEDULE 40) SHALL BE CONCRETE ENCASED.

(NOTE: - ALL UNDERGROUND CONDUIT SHALL BE PVC, CONCRETE ENCASED, UNLESS SPECIFIED OTHERWISE ON THE PLANS.)

ALL CONDUIT SPECIFIED AS DIRECT BURIAL SHALL BE:

PVC- TYPE II ( INDUSTRIAL SCHEDULE 40- HEAVY WALL) OR, RIGID METAL CONDUIT ( RMC )- 725.04

MAXIMUM CONDUIT RUN BETWEEN PULLBOXES SHALL NOT EXCEED 150 FT. (UNLESS SPECIFIED ON PLANS). EACH UN-USED CONDUIT SHALL BE PROVIDED WITH A #10 AWG. SOLID COPPER PULL WIRE.

**BACKFILL**

EXCAVATED MATERIAL SHALL BE USED AS BACKFILL. BACKFILL SHALL BE PLACED IN LAYERS AND TAMPED TO PREVENT FUTURE SETTLEMENT OF BACKFILL MATERIAL IN ACCORDANCE WITH 625.12

**RESTORATION**

SHALL COMPLY WITH 603.09

SPECIFICATION NUMBERS REFER TO OHIO DEPT. OF TRANSP., "CONSTR. & MATERIAL" SPECS. & ASTM SPECIFICATIONS.

CITY OF CINCINNATI SUPPLEMENTAL SPECS. TO O.D.O.T. C & M SPECS. ITEM 1322 ALSO APPLIES FOR CITY PROJECTS AND CONTRACTS.

**DESIGN DATA**

| PULLBOX DIMENSIONS (INCHES) & CLASS |             |                     |               | DESIGN COND. USE PER PULLBOX SIZE  |                                  | FRAME & COVER DIMENSIONS (IN INCHES)** |                                |                               |                          |                |                         |
|-------------------------------------|-------------|---------------------|---------------|------------------------------------|----------------------------------|--|--------------------------------|-------------------------------|--------------------------|----------------|-------------------------|
| CLASSIFICATION OR TYPE AS SPECIFIED | INSIDE WALL | WALL THICKNESS MIN. | OVERALL DEPTH | MAX. NO. OF COND. PER PULLBOX WALL | MAX. COND. SIZE 4"               | NOMINAL SIZE OF LID                    | NOMINAL THICKNESS OF LID+1/16" | NOMINAL SIZE OF OPENING ±1/8" | NOMINAL FRAME SIZE ±1/8" | FRAME DEPTH    | * DESIGN NO.            |
| REGULAR                             | STREET      | W/DRAIN             | "W"           | "T"                                | "D"                              | "A"                                    | "B"                            | "C"                           | "E"                      | "F"            |                         |
| A                                   | AD          | 10X 18              | 3             | 30                                 | 2                                | 10 3/4x18 3/4"                         | 1/2                            | 10x 18                        | 16x 24                   | 3              | R-6684-2<br>E-1840      |
| B                                   | BD          | 17X 17              | 3             | 30                                 | 2                                | 17 5/8x17 5/8"<br>18x 18 + 1/8"        | 1/2                            | 17x 17                        | 22x 22                   | 3              | R-6681-2<br>E-1846      |
| C                                   | CD          | 24X 24              | 3             | 36                                 | 4 & STREET CROSSING              | 23 3/4x23 3/4"<br>24x 24"              | 1                              | 22x 22                        | 30x 30                   | 3              | R-6683-2<br>E-1850      |
| D                                   |             | 22X 22              | 8             | 36                                 | 4                                | 23 3/4x23 3/4"                         | 1 1/2                          | 22x 22                        | 28x 28                   | 4              | R-1878-A5               |
| E                                   | ED          | 24X 36              | 4             | 36                                 | 4 ( 24" SIDES)<br>6 ( 36" SIDES) | 24x 36"<br>25x 37"                     | 1                              | 23x 34 3/4"<br>24x 36"        | 29x 41<br>29 1/4x 41     | 3 1/8<br>2 1/2 | R-6685-5<br>E-1871      |
| F                                   | FD          | 36X 36              | 4             | 42                                 | 12                               | 37x 37"                                | 1                              | 36x 36                        | 42x 42                   | 3 1/2          | E-1843                  |
| G                                   |             | 36X 36              | 8             | 42                                 | 12                               | 37 1/2x37 1/2"                         | 1 1/2                          | 36x 36                        | 42x 42                   | 4              | R-1878-A10              |
| H                                   | HD          | 20X 20              | 3             | 32                                 | 2 & STREET CROSSING              | 21 13/16x21 13/16"                     | 1 3/4                          | 19 13/16 x<br>19 13/16"       | 23 5/16 x<br>23 5/16"    | 2 7/16         | R-1883-E4<br>PA2222WA00 |

\* REFER TO ACCEPTABLE FRAMES & COVERS FURNISHED BY: CHRIS ERHARDT FOUNDRY & MACHINE CO., CINCINNATI, OHIO ("E" NUMBERS); NEENAH FOUNDRY CO., NEENAH, WISC. ("R" NUMBERS)

\*\* IF SPECIFIED, PULLBOX LIDS MAY BE COMPOSITE MATERIAL MEETING DETAILED SPECIFICATIONS PROVIDED IN THE PLANS.



**ELEC.SERVICE & UNDERGROUND SYSTEMS (ES-2)**

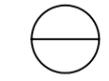
**STANDARD PULLBOXES & CONDUIT SYSTEM**

CITY OF CINCINNATI  
DEPT. OF TRANSPORTATION & ENGINEERING  
DIV. OF TRAFFIC ENGR.

APPROVED: *Steven Bailey* DATE: 3-4-99

|               |        |                     |         |        |       |        |       |          |
|---------------|--------|---------------------|---------|--------|-------|--------|-------|----------|
| FRAME ONLY    | S.C.H. | <i>Steve Bailey</i> | 8/3/04  | UPDATE | SCALE | SOURCE | DRAWN | FILE NO. |
| COMPOSITE LID | T.E.   |                     | 9/14/94 | WO #   |       |        |       | ES-2-1   |

| FED. RD. DIV. | STATE | PROJECT | FISCAL YEAR |
|---------------|-------|---------|-------------|
| 5             | OHIO  |         |             |



**NOTES**

**ENCLOSURES**

SAFETY SWITCHES SHALL BE NEMA 4X (STAINLESS STEEL) PER SPECIFICATION 1324.03. SWITCHES SHALL BE RATED 240 VOLTS SERVICE (MINIMUM), 3 WIRE, 2 POLE WITH SOLID NEUTRAL.

FUSES SHALL BE 250-VOLT CARTRIDGE TYPE, UL CLASS RK-1, SIZED PER ENCLOSURE AMPERE SIZE (SEE CHART).

REFER TO SPEC 1324 FOR OTHER SPECIFIED ENCLOSURES.

**GROUNDING**

GROUND ALL METAL NONCURRENT CARRYING EQUIPMENT INCLUDING CONDUIT MESSENGER WIRE, POLE, ENCLOSURE, ENCLOSURE EQUIPMENT PANELS, OR CHASSIS AND GROUND ROD.

**ENTRANCE FITTINGS**

FURNISH AND INSTALL ANY REQUIRED FITTINGS INCLUDING DRILLING HOLES AND WELDING THE THREADED PIPE NIPPLE TO POLE. PAINT HOLES AND NIPPLES WITH ZINC-RICH SPOT PRIMER PER SPEC 1317.

**CONDUIT**

PVC CONDUIT SHALL BE SCHEDULE 40.

ALUMINUM CONDUIT SHALL BE SCHEDULE 40

**SERVICE CABLE**

CABLE SHALL BE:

- DUPLEX (NO. 4 AWG MINIMUM ACSR INCLUDING A BARE ALUMINUM NEUTRAL). CONNECT TO COPPER POWER CABLES WITH APPROVED BI-METALLIC SPLIT BOLTS OR BUTT CONNECTORS.

THE INSULATED, UNGROUNDED CONDUCTOR SHALL BE HIGH-DENSITY POLYETHYLENE, 600V RATED, SUITABLE FOR EXPOSURE TO SUNLIGHT AND ATMOSPHERIC ENVIRONS. CABLE SHALL MEET THE REQUIREMENTS OF ICEA S-61-4.02/NEMA WCS-1989 SPECS.

OR

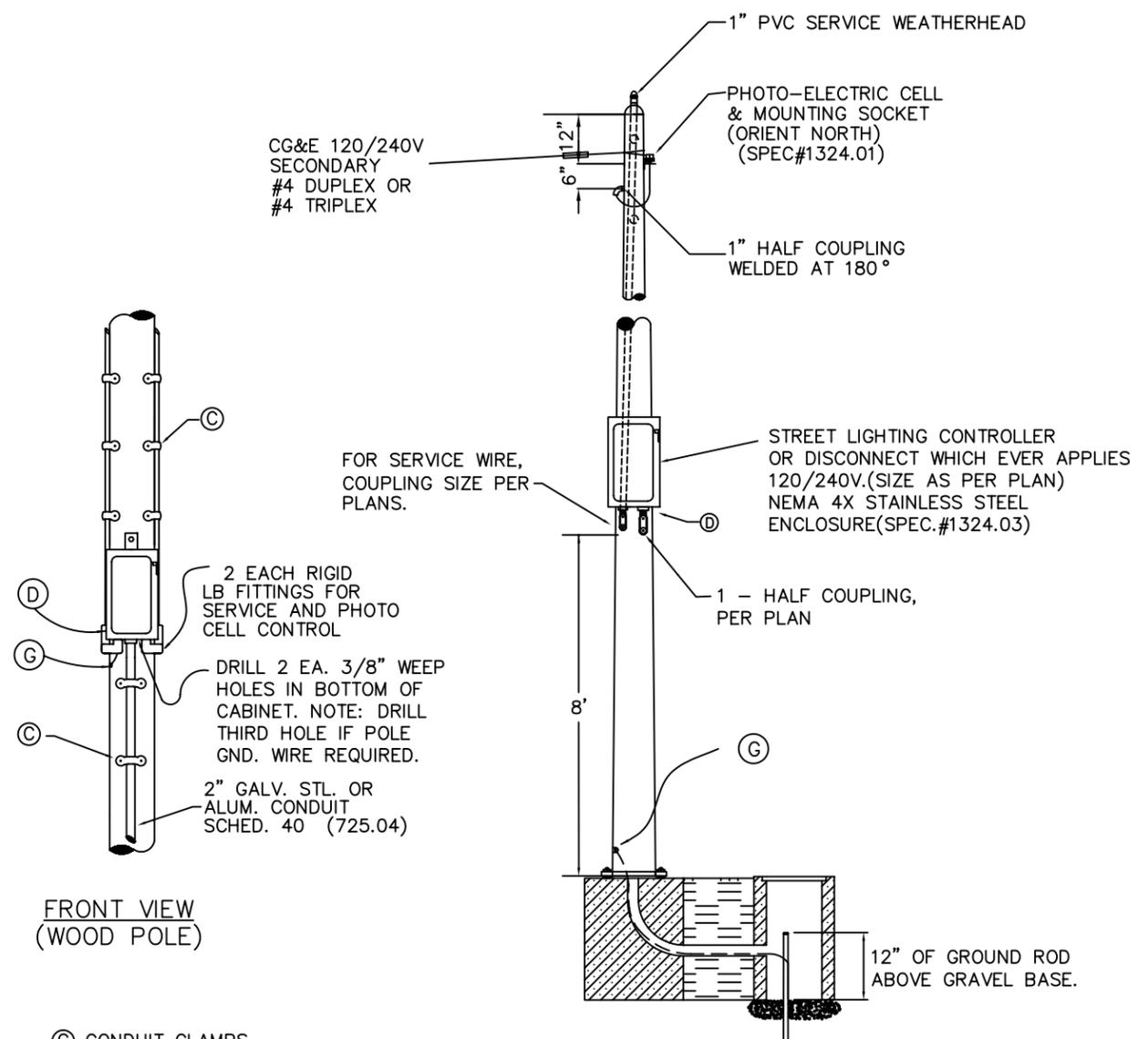
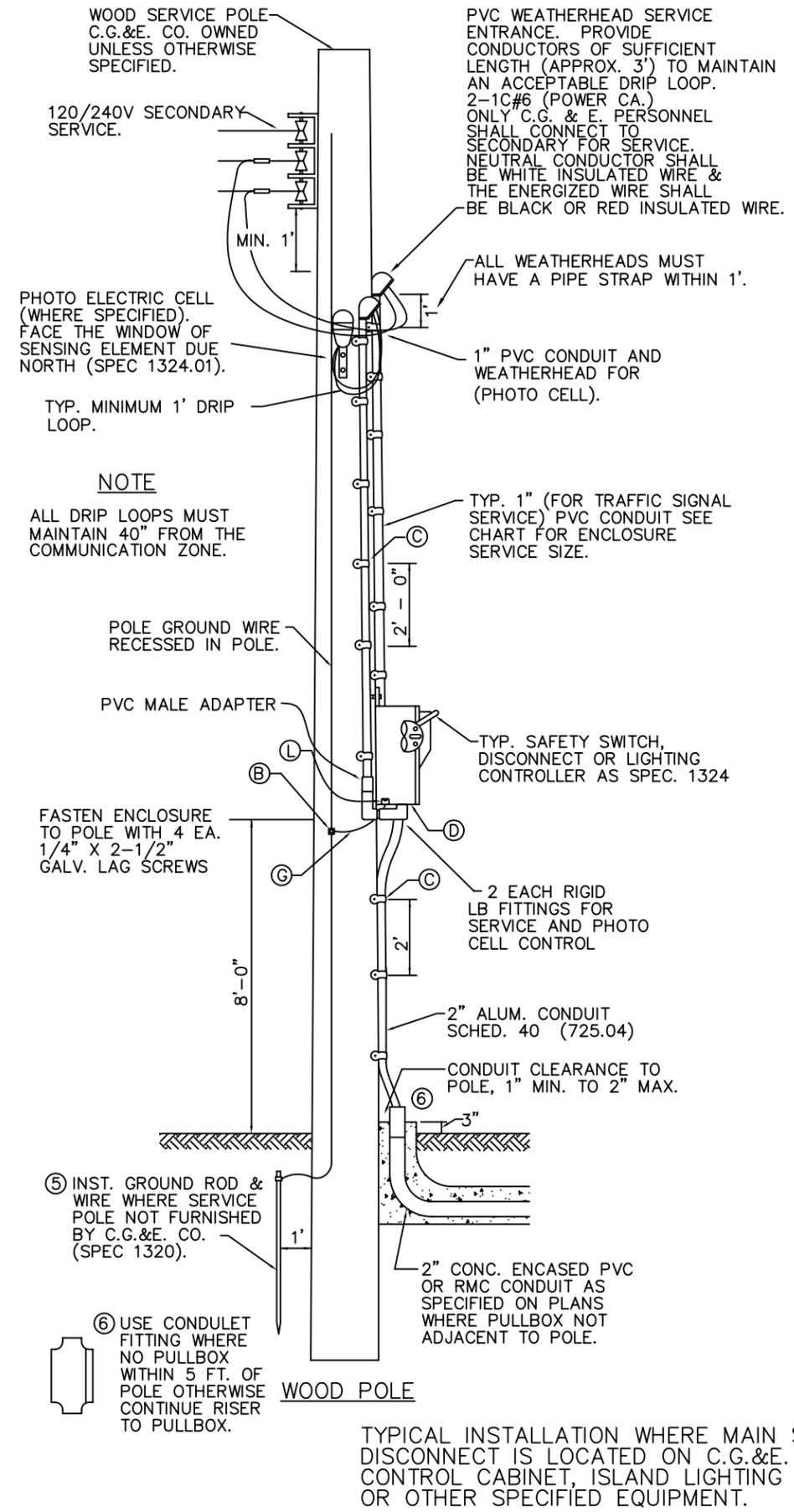
- TWO EACH RHH/RHW/USE INSULATED POWER CABLES (SPEC 1323.01) SUPPORTED WITH 1/4-INCH MESSENGER WIRE. (SPEC. 1323.02)

**REQUEST FOR SERVICE**

IN REQUESTING ELECTRIC SERVICE FROM THE C. G. & E. CO., CONTACT TRAFFIC SERVICES BUREAU, 352-3705.

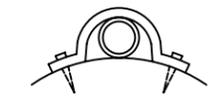
CG&E CREWS SHALL MAKE THE POWER WIRING CONNECTION TO THEIR SECONDARY LINES.

- ① PVC COUPLING PROVIDE STAINLESS STEEL BANDING FOR SECURING CONDUIT CLEAVISES AND CABINETS TO STEEL POLES.
- ② FOR CONDUITS, USE 3/4" WIDE X .020" THICK BANDING.
- ③ FOR ENCLOSURES, USE 3/4" WIDE X .030" THICK BANDING AND SERVICE CLEVIS.
- ④ SPLIT BOLT CONNECTOR: DOSSERT, BLACKBURN, OR APPROVED EQUAL.
- ⑤ GALVANIZED STEEL OR MALLEABLE IRON CONDUIT CLAMPS. PROVIDE 2" SPACING C/C FOR ALL CONDUIT 2' ABOVE ENCLOSURES AND 2' SPACING FOR CONDUIT BETWEEN ENCLOSURES TO GRADE. SECURE TO WOOD POLES WITH GALV. NAILS. SEE DETAIL.
- ⑥ DRILL 3/8" DRAIN HOLE IN LOWEST PART OF CABINETS AND FITTINGS.
- ⑦ SOLID NO. 6 AWG BARE COPPER GROUND WIRE.
- ⑧ TEMPORARY THREE BOLT CABLE SUSPENSION CLAMP. SERVE WITH 5" TO 7" MAUSS BEFORE REMOVING. (SEE STANDARD DRAWING ES-3-4.)
- ⑨ GROUNDING LUGS: BLACKBURN L-125, T&B 1300 SERIES, OR APPROVED EQUAL. GROUNDING LUG MAY BE PROVIDED IN SIDE ENCLOSURE. IN THIS CASE, FEED GROUND WIRE THROUGH ADDITIONAL ENCLOSURE DRAIN HOLE.



**FRONT VIEW  
(WOOD POLE)**

③ CONDUIT CLAMPS  
USE DOUBLE  
HOLE TYPE.



**LOAD SIZING**

| CABINET<br>OR<br>ENCLOSURE<br>SIZE<br>(AMPERES) | POWER<br>CABLE<br>SIZE<br>(AWG) | MAX.<br>FUSE<br>SIZE<br>(AMPS) | POWER<br>SERVICE<br>CONDUIT<br>SIZE<br>(INCHES) |
|---|---------------------------------|--------------------------------|---|
| UP TO 50  | #6                              | 40                             | 1   |
| 50 TO 80  | #4                              | 65                             | 1-1/2   |
| 80 TO 100                                       | #2                              | 90                             | 1-1/2   |



|  |                   |                   |          |
|--|-------------------|-------------------|----------|
| ELEC. SERVICE & UNDERGROUND SYSTEMS (ES-2)   |                   |                   |          |
| ELECTRIC SERVICE<br>120 VOLTS  |                   |                   |          |
| CITY OF CINCINNATI<br>DEPT. OF TRANSPORTATION & ENGINEERING<br>DIV. OF TRAFFIC ENGR. |                   |                   |          |
| DESIGN   | REVISION          | DATE              | WO #     |
| S.C.H.   | Stone Bailey      | 8/3/04            | UPDATE   |
| T.E.   |                   | 3/1/98            |          |
| R.R.R.   | APPROVED          | 6/26/92           |          |
| SCALE  | SOURCE            | DRAWN             | FILE NO. |
|  | ES - 16<br>7/7/72 | CDS<br>ASSOCIATES | ES-2-2   |

TYPICAL INSTALLATION WHERE MAIN SERVICE DISCONNECT IS LOCATED ON C.G.&E. WOOD POLE CONTROL CABINET, ISLAND LIGHTING SYSTEM, OR OTHER SPECIFIED EQUIPMENT.