### Standard Drawing Index

City of Columbus, Ohio  
Department of Public Service  
Division of Design and Construction  

Reference Index of Standard Construction Drawings

[4000-4331]

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CONDUIT DIRECTIONALLY BORED OR DRILLED UNDER PAVEMENT

PAVEMENT REPLACEMENT AND SURFACE COURSE PER CITY OF COLUMBUS STANDARD DRAWING 1441

NOTES:

1. CONDUIT THAT IS DRILLED/DIRECTIONALLY BORED SHALL BE (725.052, EPEC-80-HDPE) OR 725.20 SCHEDULE 80. JACKED CONDUIT SHALL BE RIGID METAL CONDUIT (725.04).

2. THE CONTRACTOR WITH THE APPROVAL OF THE ENGINEER OR AT THE DIRECTION OF THE PLANS OR THE ENGINEER SHALL POTHOLE THE PROPOSED JACKING/BORED AREA.

3. FOR TRAFFIC SIGNAL CONDUIT BANK AND CONDUIT SEE CITY OF COLUMBUS STANDARD DRAWING 4001.

ROADWAY CONDUIT STANDARDS

CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF DESIGN AND CONSTRUCTION

STD DWG
4000

CITY ENGINEER

8/10/2017
SHT 1 OF 2
CONCRETE COVER VARIES. SEE STD DWG 4001.

NOTE:
"W" IS WIDTH OF CONDUIT.

** USE AS DIRECTED.

CONCRETE
- CLASS COC1
- COC MS **
- COC FS **

BIND CONDUIT AND SPACER USING GALVANIZED WIRE

3" MIN.

"W" *

3" MIN.

CONCRETE

3" MIN. CONCRETE

3" MIN.

TRENCH SECTION
CONCRETE ENCASED CONDUIT

SIDE ELEVATION
CONCRETE ENCASED CONDUIT

10'-0" STANDARD CONDUIT

2'-6" MAX.

5'-0" INTERVALS

2'-6" MAX.

BOTTOM OF TRENCH

SPACER

COUPLING

APPROVED BACKFILL

ROADWAY CONDUIT STANDARDS

CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF DESIGN AND CONSTRUCTION

STD DWG 4000

8/10/2017

CITY ENGINEER

SHT 2 OF 2
ONE 2" CONDUIT ENCASED

ONE 3" CONDUIT ENCASED

* TRENCH DEPTH MAY VARY PER PLAN DETAILS

NOTE:

SMALLER DIAMETER CONDUITS MAY NEED WRAPPED SEPARATELY.
**CONDUIT BANK**

**TRAFFIC SIGNAL CONDUIT BANK STANDARDS**

**NOTE:**

SMALLER DIAMETER CONDUITS MAY NEED WRAPPED SEPARATELY.

---

**TWO 2" & ONE 1.5" CONDUIT BANK**
WITH 3" CONCRETE ENCASEMENT
(4-3/8" CENTER-CENTER CONDUIT SEPARATION)

**TOP OF FINISHED SURFACE**

- 16" TRENCH MAX.
- 17" MIN.
- CONDUIT WRAPPED W/GALVANIZED WIRE EVERY FIVE FEET
- 8.5"
- 5" SPACER SEPARATION ALONG CONDUIT RUN

(1)-1.5" CONDUIT W/TRACING WIRE

---

**TWO 3" & ONE 1.5" CONDUIT BANK**
WITH 3" CONCRETE ENCASEMENT
(5-1/2" CENTER-CENTER CONDUIT SEPARATION)

**TOP OF FINISHED SURFACE**

- 18" TRENCH MAX.
- 36" *
- CONDUIT WRAPPED W/GALVANIZED WIRE EVERY FIVE FEET
- 9.5"
- 5" SPACER SEPARATION ALONG CONDUIT RUN

(1)-1.5" CONDUIT W/TRACING WIRE

* TRENCH DEPTH MAY VARY PER PLAN DETAILS
CONDUIT BANK

FOUR 2" & ONE 1.5" CONDUIT BANK WITH 3" CONCRETE ENCASEMENT
(4-3/8" CENTER-CENTER CONDUIT SEPARATION)

FOUR 3" & ONE 1.5" CONDUIT BANK WITH 3" CONCRETE ENCASEMENT
(5-1/2" CENTER-CENTER CONDUIT SEPARATION)

* TRENCH DEPTH MAY VARY PER PLAN DETAILS

NOTE:
SMALLER DIAMETER CONDUITS MAY NEED WRAPPED SEPARATELY.

TRAFFIC SIGNAL CONDUIT BANK STANDARDS

CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF DESIGN AND CONSTRUCTION

STD DWG 4001

8/01/2015
SHT 3 OF 9
FIVE 2" & ONE 1.5" CONDUIT BANK
3" CONCRETE ENCASEMENT - TYPE 1
(4-3/8" CENTER-CENTER CONDUIT SEPARATION)

CONDUIT WRAPPED W/ GALVANIZED WIRE EVERY FIVE FEET
5' SPACER SEPARATION ALONG CONDUIT RUN

TOP OF FINISHED SURFACE
(LOOKING UP STATION)

FIVE 2" & ONE 1.5" CONDUIT BANK
3" CONCRETE ENCASEMENT - TYPE 2
(4-3/8" CENTER-CENTER CONDUIT SEPARATION)

CONDUIT WRAPPED W/ GALVANIZED WIRE EVERY FIVE FEET
5' SPACER SEPARATION ALONG CONDUIT RUN

TOP OF FINISHED SURFACE
(LOOKING UP STATION)

* TRENCH DEPTH MAY VARY PER PLAN DETAILS

NOTE:
SMALLER DIAMETER CONDUITS MAY NEED WRAPPED SEPARATELY.
CONDUIT BANK

FOUR 3", TWO 2" & ONE 1.5" CONDUIT BANK
3" CONCRETE ENCASEMENT - TYPE 1
(5-1/2" CENTER-CENTER CONDUIT SEPARATION)

TOP OF FINISHED SURFACE

(LOOKING UP STATION)

(1)-1.5" CONDUIT W/TRACING WIRE
CONDUIT WRAPPED W/GALVANIZED WIRE EVERY FIVE FEET
15"

20" MIN.
17" MIN.
24" TRENCH MAX.
36"*
5' SPACER SEPARATION ALONG CONDUIT RUN
CONCRETE ENCASEMENT

FOUR 3", TWO 2" & ONE 1.5" CONDUIT BANK
3" CONCRETE ENCASEMENT - TYPE 2
(5-1/2" CENTER-CENTER CONDUIT SEPARATION)

TOP OF FINISHED SURFACE

(LOOKING UP STATION)

(1)-1.5"
CONDUIT W/TRACING WIRE
CONDUIT WRAPPED W/GALVANIZED WIRE EVERY FIVE FEET
15"

20" MIN.
17" MIN.
24" TRENCH MAX.
36"*
5' SPACER SEPARATION ALONG CONDUIT RUN
CONCRETE ENCASEMENT

* TRENCH DEPTH MAY VARY PER PLAN DETAILS

NOTE:
SMALLER DIAMETER CONDUITS MAY NEED WRAPPED SEPARATELY.
SIX 2" & ONE 1.5" CONDUIT BANK
3" CONCRETE ENCASEMENT
(4-3/8" CENTER-CENTER CONDUIT SEPARATION)

SIX 3" & ONE 1.5" CONDUIT BANK
3" CONCRETE ENCASEMENT
(5-1/2" CENTER-CENTER CONDUIT SEPARATION)

* TRENCH DEPTH MAY VARY PER PLAN DETAILS

NOTES:

ARRANGEMENT OF MULTICELL CONDUIT
SHALL BE DETERMINED BY DESIGN.

SMALLER DIAMETER CONDUITS MAY NEED
WRAPPED SEPARATELY.
CONDUIT BANK

TWO 4" CONDUITS W/ONE 1.5" CONDUIT BANK FOR TRACER
WITH 3" CONCRETE ENCASEMENT
(6-1/2" CENTER-CENTER CONDUIT SEPARATION)

FOUR 4" CONDUITS W/ONE 1.5" CONDUIT BANK FOR TRACER
WITH 3" CONCRETE ENCASEMENT
(6-1/2" CENTER-CENTER CONDUIT SEPARATION)

* TRENCH DEPTH MAY VARY PER PLAN DETAILS

NOTES:

ARRANGEMENT OF MULTICELL CONDUIT
SHALL BE DETERMINED BY DESIGN.

SMALLER DIAMETER CONDUITS MAY NEED
WRAPPED SEPARATELY.
SIX 4" & ONE 1.5" CONDUIT BANK
3" CONCRETE ENCASEMENT
(6-1/2" CENTER-CENTER CONDUIT SEPARATION)

CONDUIT BANK

NOTES:

ARRANGEMENT OF MULTICELL CONDUIT
SHALL BE DETERMINED BY DESIGN.

SMALLER DIAMETER CONDUITS MAY NEED
WRAPPED SEPARATELY.

* TRENCH DEPTH MAY VARY PER PLAN DETAILS
INTERCONNECT / TRAFFIC SIGNAL CONDUIT AND TRAFFIC SIGNAL POWER CONDUIT
WITH 3" CONCRETE ENCASEMENT
MINIMUM DUCT BANK SEPARATION

* TRENCH DEPTH MAY VARY PER PLAN DETAILS

TRAFFIC SIGNAL
CONDUIT BANK
STANDARDS

CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF DESIGN AND CONSTRUCTION

CONDUIT BANK

4001

8/01/2015

CITY ENGINEER

SHT 9 OF 9
CONDUIT PARALLEL TO GUARDRAIL

CONDUIT GUARDRAIL PROTECTION

CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF DESIGN AND CONSTRUCTION

STD DWG 4002

5/01/2014

SHT 1 OF 2

NOTES:

1. CONDUIT PLACED PARALLEL TO GUARDRAIL AND WITH AN OFFSET BETWEEN 5' AND 8' SHALL BE ENCASED. CONDUIT MAY NOT BE PLACED CLOSER THAN 5' WHEN PARALLEL TO GUARDRAIL.

2. CONDUIT ENCASEMENT SHALL EXTEND A MINIMUM OF 10' PAST THE LAST GUARD RAIL POST.
TRACER WIRE
CONDUIT W/ 3" ENCASEMENT
CONDUIT MARKER POST
GUARDRAIL W-BEAM SECTION
GUARDRAIL POST (TYP.)

X = POST SPACING AS DEFINED BY THE OHIO DEPARTMENT OF TRANSPORTATION STANDARD CONSTRUCTION DRAWING MGS 2.1

TOP VIEW

GUARDRAIL POST (TYP.)

3" CONCRETE ENCASEMENT

CONDUIT W/ 3" ENCASEMENT

10' (MIN.)

FINISH GRADE

FRONT VIEW
SECTION A-A

CONDUIT CROSSING GUARDRAIL
GUARDRAIL PROTECTION

CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF DESIGN AND CONSTRUCTION

STD DWG 4002

5/01/2014

CITY ENGINEER

SHT 2 OF 2
NOTES:

1. AFTER THE CONDUITS HAVE BEEN INSTALLED, ANY OPENING IN THE PULL BOX WALL SHALL BE COMPLETELY FILLED WITH MORTAR OR CONCRETE AND FINISHED FLUSH WITH THE INSIDE PULL BOX WALL. (NO VOIDS)

2. PULL BOX DRAINS IN ACCORDANCE WITH CMSC 603 SHALL BE INSTALLED WHEN SPECIFIED, OR AS DIRECTED BY THE ENGINEER.

3. CONTRACTOR TO VERIFY ROADWAY UNDERDRAIN IS BELOW THE PULL BOX AGGREGATE BEFORE INSTALLING DRAIN.
3/4" DIA. NC THREADED LIFT INSERT OR PRESTRESSED CABLE LIFTING LOOP (4" TO 5" LOOP)

USE CLIP WHEN FRAME QUADRANT AREA IS IN DIRT.

FRAME EDGE
CENTER CASTING ON PULL BOX

KNOCKOUT AREA 12" x 12" (OD DIM.) TYPICAL 4 SIDES

8 EACH, #4 REBAR 26" LONG, GRADE 60 SPACED EACH SIDE OF THE KNOCKOUT (VERTICALLY CENTERED)

35" O.D.
ANCHOR & CLIP AS REQUIRED

TOP VIEW OF CONCRETE PULL BOX

3/4" DIA. LIFT INSERT 5" BELOW TOP OF CONCRETE

4" HEAVY DUTY FRAME WITH SOLID LID WITH WORD "TRAFFIC" IN LID & PICK HOLE. (MEETS ASTM A48 CLASS 358 SPECS)

3/8"x4" (NOM.) SSSLT WEDGE ANCHOR, WASHER AND NUT WITH CLIP. FIELD DRILL ANCHOR HOLE IN CONCRETE PULL BOX. ANGLE WEDGE ANCHOR TO MISS THE WELDED WIRE FABRIC.

ASTM A-185 WELDED WIRE FABRIC (6X6, W2.9 x W2.9)

LIFTING LOOP

REMOVE WIRE MESH IN KNOCKOUT AREA CENTER DUCTS IN KNOCKOUT

SECTION X-X PULL BOX WITH FRAME AND LID

12" OF #57 COMPACTED AGGREGATE

PULL BOX 27"

CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF DESIGN AND CONSTRUCTION

STD DWG
4021
07/01/2020
SHT 1 OF 3

CITY ENGINEER
2" RAISED LETTERS
FLUSH W/TOP SURFACE

4" HEAVY DUTY FRAME WITH SOLID LID WITH
WORD "TRAFFIC" IN LID & PICK HOLE.
(MEETS ASTM A48 CLASS 358 SPECS)

1 1/2"

(2) OPEN PICK HOLES
(EXTRA MATERIAL
UNDERNEATH IS SQUARED OFF)

3 1/2"

1"

2 1/2"

FRAME AND COVER DETAIL

4"

1 1/2"

28 1/4"

26 3/8"

GROUND BOLT

28 1/2"

32 1/2"

1/2" STAINLESS STEEL
(UNC) GROUND BOLT
FIELD DRILL AND TAP
27/64" HOLE

BONDING WIRE

GROUND BOLT INSTALLATION DETAIL

NON-INSULATED ONE
HOLE TIN PLATED
COPPER COMPRESSION
TERMINAL, UL LISTED
AND APPROVED FOR #4
AWG COPPER WIRE

PULL BOX
27"

CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF DESIGN AND CONSTRUCTION
STD DWG 4021
4021
07/01/2020
SHT 2 OF 3
CITY ENGINEER
NOTES:

ONE COAT OF WATER REPELLENT SEALER (SEE CITY OF COLUMBUS QUALIFIED PRODUCTS LIST) SHALL BE APPLIED TO THE INSIDE & OUTSIDE OF THE PULL BOX.

CONCRETE SHALL HAVE AIR ENTRAINMENT OF 6% ± 2% AND SHALL HAVE 4500 PSI STRENGTH AT 28 DAYS.

LID RING LOAD TRANSFER IS TO BE DISTRIBUTED BY USE OF A PREFORMED MASTIC JOINT MATERIAL.

CUT OFF CONDUITS SO THEY EXTEND NO MORE THAN THREE INCHES BEYOND THE INSIDE PULL BOX WALL AND PROVIDE BUSHINGS.

WHenever possible, conduits should enter the Pull Box via a knockout. When approved by the Division of Design and Construction Personnel, conduits may enter the Pull Box through its wall only if the opening is sawn or core drilled. Conduits shall not enter via the bottom of the Pull Box without approval by the Division of Design and Construction Personnel. Conduit shall enter knockout as close to 90° as possible.

The wedge anchor assembly shall be omitted whenever the entire area above the knockout (1/4 of the casting) is either encased in concrete or asphalt. The encasement shall be centered around the knockout.

Enlarging the knockout area if required shall be done by saw cutting the concrete. No other method is allowed. Contractor shall replace the concrete housing if damaged at his expense.

After the conduits have been installed, any opening in the Pull Box wall shall be totally filled with mortar or concrete and finished flush with the inside Pull Box wall. (No voids)

Pull Box bearing capacity to exceed 40,000 pounds.

Any conduit that exits a Pull Box and directly enters any electronic cabinet shall be sealed using duct seal and steel wool at both the cabinet and the Pull Box. At least three layers of each material shall be used and shall be installed in an alternating pattern.

The contractor shall install non-organic fiberglass pull tape with a minimum 1800 ft./lbs tension strength in conduit to facilitate cable placement.

All unused conduits shall be capped and the caps secured to the conduits with tape.

The word "traffic" shall be cast in the lid with 2" raised letters. Separate, bonded, or welded tags shall not be used.
TOP VIEW OF CONCRETE PULL BOX

3/4" DIA. LIFT INSERT OR PRESTRESSED CABLE LIFTING LOOP (4" TO 5" LOOP)

CENTER CASTING ON PULL BOX

USE CLIP WHEN FRAME QUADRANT AREA IS IN DIRT.

FRAME EDGE

44" O.D.

KNOCKOUT AREA
12" x 12" (OD DIM.)
TYPICAL 4 SIDES

8 EACH, #4 REBAR 26" LONG, GRADE 60 SPACED EACH SIDE OF THE KNOCKOUT

ANCHOR & CLIP (4 EA)

TRAFFIC 32" I.D.

THE CLIP SHALL BE MADE FROM A38 METAL, HD GALV (ASTM A123) AND IN THE SHAPE SHOWN.

CLIP PROFILE (NOM. VALUES)

0.7" 0.6" 1.5"

0.25" 3.8" 1.25"

1.0" TO

SECTION X-X PULL BOX
WITH FRAME AND LID

3/4" DIA. LIFT INSERT
5" BELOW TOP OF CONCRETE

4" HEAVY DUTY FRAME WITH SOLID LID WITH WORD "TRAFFIC" IN LID & PICK HOLE.
(MEETS ASTM A48 CLASS 358 SPECS)

MASTIC

0.5"x5.5" (NOM.) SS LT WEDGE ANCHOR, WASHER AND NUT WITH CLIP. FIELD DRILL ANCHOR HOLE IN CONCRETE PULL BOX.

LIFTING LOOP
ASTM A-185
WELDED WIRE FABRIC
(6X6, W2.9 x W2.9)

REMOVE WIRE MESH IN KNOCKOUT AREA CENTER DUCTS IN KNOCKOUT

12" OF #57 COMPACTED AGGREGATE

PULL BOX
32"

CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF DESIGN AND CONSTRUCTION

STD DWG 4022

07/01/2020

CITY ENGINEER

SHT 1 OF 3
NOTES:

ONE COAT OF WATER REPELLENT SEALER (SEE CITY OF COLUMBUS QUALIFIED PRODUCTS LIST) SHALL BE APPLIED TO THE INSIDE AND OUTSIDE OF THE PULL BOX.

CONCRETE SHALL HAVE AIR ENTRAINMENT OF 6% ± 2% AND SHALL HAVE 4500 PSI STRENGTH AT 28 DAYS. CONCRETE MATERIALS SHALL MEET ODOT SPECIFICATIONS. STANDARD PLACEMENT FOR WIRE MESH & REBAR SHALL BE USED.

LID RING LOAD TRANSFER IS TO BE DISTRIBUTED BY USE OF A PREFORMED MASTIC JOINT MATERIAL.

CUT OFF CONDUITS SO THEY EXTEND NO MORE THAN THREE INCHES BEYOND THE INSIDE PULL BOX WALL AND PROVIDE BUSHINGS.

WHENEVER POSSIBLE, CONDUITS SHOULD ENTER THE PULL BOX VIA A KNOCKOUT. WHEN APPROVED BY THE DIVISION OF DESIGN AND CONSTRUCTION PERSONNEL, CONDUITS MAY ENTER THE PULL BOX THROUGH ITS WALL ONLY IF THE OPENING IS SAWN OR CORE DRILLED. CONDUITS SHALL NOT ENTER VIA THE BOTTOM OF THE PULL BOX WITHOUT APPROVAL BY THE DIVISION OF DESIGN AND CONSTRUCTION PERSONNEL. CONDUIT SHALL ENTER KNOCKOUT AS CLOSE TO 90° AS POSSIBLE.

THE WEDGE ANCHOR ASSEMBLY SHALL BE OMITTED WHENEVER THE ENTIRE AREA ABOVE THE KNOCKOUT (1/4 OF THE CASTING) IS EITHER ENCASED IN CONCRETE OR ASPHALT. THE ENCAVEMENT SHALL BE CENTERED AROUND THE KNOCKOUT.

AFTER THE CONDUITS HAVE BEEN INSTALLED, ANY OPENING IN THE PULL BOX WALL SHALL BE TOTALLY FILLED WITH MORTAR OR CONCRETE AND FINISHED FLUSH WITH THE INSIDE PULL BOX WALL. (NO VOIDS)

PULL BOX BEARING CAPACITY TO EXCEED 40,000 POUNDS.

ENLARGING THE KNOCKOUT AREA IF REQUIRED SHALL BE DONE BY SAW CUTTING THE CONCRETE. NO OTHER METHOD IS ALLOWED. CONTRACTOR SHALL REPLACE THE CONCRETE HOUSING IF DAMAGED AT HIS EXPENSE.

ANY CONDUIT THAT EXITS A PULL BOX AND DIRECTLY ENTERS ANY ELECTRONIC CABINET SHALL BE SEALED USING DUCT SEAL AND STEEL WOOL AT BOTH THE CABINET AND THE PULL BOX. AT LEAST THREE LAYERS OF EACH MATERIAL SHALL BE USED AND SHALL BE INSTALLED IN AN ALTERNATING PATTERN.

THE CONTRACTOR SHALL INSTALL NON-ORGANIC FIBERGLASS PULL TAPE WITH A MINIMUM 1800 FT./LBS TENSION STRENGTH IN CONDUIT TO FACILITATE CABLE PLACEMENT.

ALL UNUSED CONDUITS SHALL BE CAPPED AND THE CAPS SECURED TO THE CONDUITS WITH TAPE.

THE WORD "TRAFFIC" SHALL BE CAST IN THE LID WITH 2" RAISED LETTERS. SEPARATE, BONDED, OR WELDED TAGS SHALL NOT BE USED.
3 - #5 DIAGONAL, BOTH SIDES (TIE BELOW), 1.5" CLR.

34" DIA OPENING

THE CLIP SHALL BE MADE FROM A36 METAL, HD GALV (ASTM A123) AND IN THE SHAPE SHOWN.

1" TO 0.6" 1.5" 0.7"

0.25" 3.8" 2.6" 1.25"

CLIP PROFILE (NOM. VALUES)

PULL BOX TOP SECTION DETAIL

#4 BARS VERTICAL (TYP. OF 8)

#57 COMPACTED AGGREGATE

CLIP WITH ANCHOR (TYP. OF 4, AS NEEDED)

USE CLIP WHEN FRAME QUADRANT AREA IS IN DIRT.

1 SHEET 3 x 8
W3 x W2 STEEL MESH

2.5" DIA DRAIN HOLE

LIFTERS (TYP.)

14"W x 18"H KNOCKOUT 18" UP F.O.B. (TYP. OF 4)

4" HEAVY DUTY FRAME WITH SOLID LID WITH WORD "TRAFFIC" IN LID & PICK HOLE (MEETS ASTM A48 CLASS 35B SPECS)

0.5"x5.5" (NOM.) SSLT WEDGE ANCHOR, WASHER AND NUT WITH CLIP. FIELD DRILL ANCHOR HOLE IN CONCRETE PULL BOX.

MASTIC

LIFTERS (TYP.)

1 SHEET 3 x 8
W3 x W2 STEEL MESH

REMOVE WIRE MESH IN KNOCKOUT AREA

#5 @ 9" O.C., E.W.

6.5" 6" 10" 18" 60"

MASTIC

SECTION X-X PULL BOX WITH FRAME AND LID TYPE 1

48" ID 58" OD 70" DIA.

CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF DESIGN AND CONSTRUCTION

STD DWG 4023

07/01/2020

CITY ENGINEER

SHT 1 OF 4
PULL BOX TOP SECTION DETAIL

- 3 - #5 DIAGONAL, BOTH SIDES (TIE BELOW), 1.5" CLR.
- 34" DIA OPENING
- 3 - #5 DIAGONAL, BOTH SIDES (TIE BELOW), 1.5" CLR.
- 14" W x 36" H KNOCKOUT (TYP. OF 4)
- LIFTERS (TYP.)
- 2.5" DIA DRAIN HOLE
- #4 BARS VERTICAL (TYP. OF 8)
- #57 COMPACTED AGGREGATE
- CLIP WITH ANCHOR (TYP. OF 4, AS NEEDED)
- USE CLIP WHEN FRAME QUADRANT AREA IS IN DIRT.

4" HEAVY DUTY FRAME WITH SOLID LID WITH WORD "TRAFFIC" IN LID & PICK HOLE (MEETS ASTM A48 CLASS 35B SPECS)

0.5" x 0.5" (NOM.) SSLT WEDGE ANCHOR, WASHER AND NUT WITH CLIP, FIELD DRILL ANCHOR HOLE IN CONCRETE PULL BOX.

SECTION X-X
PULL BOX WITH FRAME AND LID TYPE 2*

*USE WHEN PLACING PULL BOX OVER EXISTING CONDUITS

THE CLIP SHALL BE MADE FROM A36 METAL, HD GALV (ASTM A123) AND IN THE SHAPE SHOWN.

CLIP PROFILE (NOM. VALUES)

1" TO 1.25" 0.6" 1.5"
0.7"
0.25"
3.8" 2.6" 1.25"

PULL BOX 48"

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SHT 2 OF 4
4" HEAVY DUTY FRAME WITH SOLID LID WITH WORD "TRAFFIC" IN LID & PICK HOLE. (MEETS ASTM A46 CLASS 35B SPECS)

2" RAISED LETTERS FLUSH W/TOP SURFACE

(1) OPEN PICK HOLE OPEN PICK HOLE (EXTRA MATERIAL UNDERNEATH IS SQUARED OFF)

3 1/2"

1"

1 1/2"

2 1/2"

35 5/8"

4 3/8"

34 5/8"

34 1/4"

FRAME AND COVER DETAIL

GROUNDBOLT INSTALLATION DETAIL

GROUNDBOLT INSTALLATION DETAIL

1/2" STAINLESS STEEL (UNC) GROUND BOLT FIELD DRILL AND TAP 27/64" HOLE
BONDING WIRE

NON-INSULATED ONE HOLE TIN PLATED COPPER COMPRESSION TERMINAL, UL LISTED AND APPROVED FOR #4 AWG COPPER WIRE

PULL BOX
48"

CITY OF COLUMBUS, OHIO
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CITY ENGINEER

SHT 3 OF 4
NOTES:

ONE COAT OF WATER REPELLENT SEALER (SEE CITY OF COLUMBUS QUALIFIED PRODUCTS LIST) SHALL BE APPLIED TO THE INSIDE AND OUTSIDE OF THE PULL BOX.

CONCRETE SHALL HAVE AIR ENTRAINMENT OF 6% ± 2% AND SHALL HAVE 4500 PSI STRENGTH AT 28 DAYS. CONCRETE MATERIALS SHALL MEET ODOT SPECIFICATIONS.

LID RING LOAD TRANSFER IS TO BE DISTRIBUTED BY USE OF A PREFORMED MASTIC JOINT MATERIAL.

CUT OFF CONDUITS SO THEY EXTEND NO MORE THAN THREE INCHES BEYOND THE PULL BOX WALL AND PROVIDE BUSHINGS

WHENEVER POSSIBLE, CONDUITS SHOULD ENTER THE PULL BOX VIA A KNOCKOUT. WHEN APPROVED BY THE DIVISION OF DESIGN AND CONSTRUCTION PERSONNEL, CONDUITS MAY ENTER THE PULL BOX THROUGH ITS WALL ONLY IF THE OPENING IS SAWN OR CORE DRILLED. CONDUITS SHALL NOT ENTER VIA THE BOTTOM OF THE PULL BOX WITHOUT APPROVAL BY THE DIVISION OF DESIGN AND CONSTRUCTION PERSONNEL. CONDUIT SHALL ENTER KNOCKOUT AS CLOSE TO 90° AS POSSIBLE.

THE WEDGE ANCHOR ASSEMBLY SHALL BE OMITTED WHENEVER THE ENTIRE AREA ABOVE THE KNOCKOUT (1/4 OF THE CASTING) IS ENCASED IN EITHER CONCRETE OR ASPHALT. THE ENCASEMENT SHALL BE CENTERED AROUND THE KNOCKOUT.

AFTER THE CONDUITS HAVE BEEN INSTALLED, ANY OPENING IN THE PULL BOX WALL SHALL BE TOTALLY FILLED WITH MORTAR OR CONCRETE AND FINISHED FLUSH WITH THE INSIDE PULL BOX WALL (NO VOIDS).

PULL BOX BEARING CAPACITY TO EXCEED 40,000 POUNDS.

ENLARGING THE KNOCKOUT AREA, IF REQUIRED, SHALL BE DONE BY SAW CUTTING THE CONCRETE. NO OTHER METHOD IS ALLOWED. THE CONTRACTOR SHALL REPLACE THE CONCRETE HOUSING, IF DAMAGED, AT THEIR EXPENSE.

ANY CONDUIT THAT EXITS A PULL BOX AND DIRECTLY ENTERS ANY ELECTRONIC CABINET SHALL BE SEALED USING DUCT SEAL AND STEEL WOOL AT BOTH THE CABINET AND THE PULL BOX. AT LEAST THREE LAYERS OF EACH MATERIAL SHALL BE USED AND SHALL BE INSTALLED IN AN ALTERNATING PATTERN.

THE CONTRACTOR SHALL INSTALL NON-ORGANIC FIBERGLASS PULL TAPE WITH A MINIMUM 1800 FT./LBS TENSION STRENGTH IN CONDUIT TO FACILITATE CABLE PLACEMENT.

ALL UNUSED CONDUITS SHALL BE CAPPED AND THE CAPS SECURED TO THE CONDUITS WITH TAPE.

THE WORD “TRAFFIC” SHALL BE CAST IN THE LID WITH 2” RAISED LETTERS. SEPARATE, BONDED, OR WELDED TAGS SHALL NOT BE USED.

STANDARD PLACEMENT FOR WIRE MESH AND REBAR SHALL BE USED.

PULL BOX
48"

CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF DESIGN AND CONSTRUCTION

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SHT 4 OF 4
2" LOOP CONDUITS PASS CONTINUOUSLY UNDERNEATH PULL BOX.
INTERCONNECT CONDUITS AS PER PLAN.

FINISHED GRADE

#57 COMPACTED AGGREGATE

CONCRETE ENCASMENT

24" TO 36" DEPTH

15"-18"

2" MIN. Varies PER PLAN

2" LOOP CONDUIT WITH 2' RADIUS

3" MIN. 6" MAX.

LOOP PULLBOX AS PER PLAN

INTERCONNECT CONDUITS AS PER PLAN.

LOOP PULL BOX INSTALLED OVER INTERCONNECT CONDUIT BANK

CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF DESIGN AND CONSTRUCTION

STD DWG
4024

8/10/2017

SHT 1 OF 1

CITY ENGINEER
NOTES:

1. CONDUIT ENTRY AT BASE OF POLE SHOWN IN ANCHOR BASE APPLICATIONS SHALL ONLY BE PERMITTED IF SPECIFIED IN THE CONSTRUCTION PLANS.

2. SEE MESSENGER WIRE DETAILS ON CITY OF COLUMBUS STANDARD DRAWINGS 4330 AND 4331.

3. THESE ARE NOT APPLICABLE FOR POWER SERVICE. SEE CITY OF COLUMBUS STANDARD DRAWING 4052 FOR DETAILS.

4. EXISTING POLE ONLY WITH PRIOR APPROVAL FOR RETRO FIT APPLICATIONS.
POWER SERVICE CONDUIT RISER FOR GROUND MOUNTED CABINET

CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF DESIGN AND CONSTRUCTION

STD DWG 4051

5/01/2014
SHT 1 OF 1

WOOD UTILITY POLE

2" WEATHERHEAD PVC (GRAY)

2"-CONDUIT RISER SCH. 80 PVC (GRAY)

FASTEN TOP, BOTTOM & EVERY 5'

UTILITY POLE

DIRECTION OF TRAFFIC FLOW

(STREET SIDE)

TOP VIEW MOUNTING POSITION
NOTES:

1. POWER AND CONTROLLER SERVICE FOR METAL POLES SHALL BE SIMILAR TO THAT SHOWN FOR THE WOOD POLE WITH THE EXCEPTION OF THE ATTACHMENT HARDWARE.
NOTES:

1. PEDESTAL SUPPORTS SHALL BE COATED IN ACCORDANCE WITH THE PLANS.

2. THE POLE SHAFT SHALL BE 46.75' WITH A DIAMETER OF 4" NPT (4.5" OD, SCH 40), & SHALL BE THREADED FOR INSERTION INTO THE BASE.

3. THE 5 FT. STRUCTURE HEIGHT ENCOMPASSES THE BASE HEIGHT PLUS THE INSERTED POLE SHAFT HEIGHT.

4. THE PUSHBUTTON STRUCTURE SHALL BE ALL ALUMINUM.

5. FOR FOUNDATION DETAILS SEE CITY OF COLUMBUS STANDARD DRAWING 4163.

6. FOR PUSHBUTTON SIGN DETAILS, SEE CITY OF COLUMBUS STANDARD DRAWING 4230.
POLE CAP ALLOY
43, 1/4" 20 NC SS HEX HEAD SCREWS

'C' OR 'J' HOOK

4.5" OD

PED SIGNAL UNITS
CLAMSHELL MOUNTED
(1.4 SQ FT, 25 LBS EACH)

TAPERED ALUM TUBE
(ALLOY 6063-T6, 0.188" WALL)

8'-3" TAPERED SECTION

9'-3" SHAFT

8'-3" STRAIGHT SECTION

42" PUSHBUTTON MOUNTING HEIGHT

7" OD

12" STRAIGHT SECTION

(SEE NOTE 6)

17"

10.25" SQ.

(SEE NOTE 8)

ANCHOR BOLT PATTERN

GALV STL CONNECTING HARDWARE
(4) 1"-8 NC x 3.75" HEX HEAD BOLTS
(4) 1"-8 NC HEX NUTS
(4) 1" LOCKWASHERS
(4) 1" FLATWASHERS

6061-T6 ALUM ALLOY 13.13"
COSMETIC PLATE WHEN REQUIRED
BASE FLANGE ALLOY 356-T6
WITH BOLT COVERS & SS 1/4"
20 NC HEX HD SCREWS

(SEE NOTE 4)

10.7' PEDESTAL
PEDESTRIAN SIGNAL
HEAD MOUNTING

CITY OF COLUMBUS, OHIO
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DIVISION OF DESIGN AND CONSTRUCTION

CITY ENGINEER

STD DWG
4101

8/10/2017
SHT 1 OF 2
NOTES:

1. PEDESTAL SUPPORTS SHALL BE COATED IN ACCORDANCE WITH THE PLANS.

2. PEDESTAL SUPPORTS SHALL BE DESIGNED FOR 90 MPH WINDS, APPROPRIATE GUST FACTOR AND LOADING AS PER PLAN.

3. 4 ANCHOR BOLTS SHALL BE INCLUDED WITH NUTS, LOCK WASHERS AND EIGHT (8) SHIMS.

4. A 17" TRANSFORMER BASE (ALSO KNOWN AS T-BASE) AND ALL CONNECTING HARDWARE SHALL BE FURNISHED WITH EACH PEDESTAL. FOR TRANSFORMER BASE DETAILS SEE CITY OF COLUMBUS STANDARD CONSTRUCTION DRAWING 4105.

5. THE PEDESTAL SHALL BE FURNISHED AND INSTALLED WITH A POLE SHAFT THAT HAS A COMBINED TAPERED-STRAIGHT CROSS-SECTIONAL DESIGN AND A ONE-PIECE CONSTRUCTION WITH NO LONGITUDINAL OR CIRCUMFERENTIAL WELDS EXCEPT FOR THE WELD NEEDED TO ATTACH THE POLE BASE. THE POLE SHAFT SHALL HAVE A ROUND CROSS-SECTIONAL DESIGN.


8. FOR FOUNDATION DETAILS SEE CITY OF COLUMBUS STANDARD CONSTRUCTION DRAWING 4163.

9. THE PEDESTRIAN SIGNAL HEAD HOUSING AND CLAM SHELL MOUNTING BRACKETS SHALL BE BLACK MATCHING FEDERAL STANDARD 595B, COLOR # 27038.

10. FOR PEDESTRIAN PUSHBUTTON SIGN DETAILS SEE CITY OF COLUMBUS STANDARD CONSTRUCTION DRAWING 4230.
12.7' PEDESTAL VEHICULAR SIGNAL HEAD MOUNTING

POLE CAP ALLOY
43, 1/4” 20 NC SS
HEX HEAD SCREWS

4.5" OD
'C' OR
'J' HOOK

5"

SIGNAL HEAD,
BRACKET MOUNTED

TAPERED ALUM TUBE
(ALLOY 6063-T6, 0.188" WALL)

(SEE NOTE 9)

10'-3"
TAPERED
SECTION

8'-4"
PUSHBUTTON
MOUNTING
HEIGHT

42"
PUSHBUTTON
MOUNTING
HEIGHT

12"
STRAIGHT
SECTION

11'-3"
SHAFT

5"

GALV STL CONNECTING HARDWARE
(4) 1"-8 NC x 3.75" HEX HEAD BOLTS
(4) 1"-8 NC HEX NUTS
(4) 1" LOCKWASHERS
(4) 1" FLATWASHERS

6061-T6 ALUM ALLOY 13.13"
COSMETIC PLATE WHEN REQUIRED
BASE FLANGE ALLOY 356-T6
WITH BOLT COVERS & SS 1/4"
20 NC HEX HD SCREWS

(SEE NOTE 4)

17"

(SEE
NOTE 6)

(SEE NOTE 6)

(SEE NOTE 8)

ANCHOR BOLT PATTERN

10.25"
14.5"
SQ.

BOLT PATTERN

POLE CAP ALLOY
43, 1/4” 20 NC SS
HEX HEAD SCREWS

12.7' PEDESTAL VEHICULAR SIGNAL HEAD MOUNTING
NOTES:

1. PEDESTAL SUPPORTS SHALL BE COATED IN ACCORDANCE WITH THE PLANS.

2. PEDESTAL SUPPORTS SHALL BE DESIGNED FOR 90 MPH WINDS, APPROPRIATE GUST FACTOR AND LOADING AS PER PLAN.

3. 4 ANCHOR BOLTS SHALL BE INCLUDED WITH NUTS, LOCK WASHERS AND EIGHT (8) SHIMS.

4. A 17" TRANSFORMER BASE (ALSO KNOWN AS T-BASE) AND ALL CONNECTING HARDWARE SHALL BE FURNISHED WITH EACH PEDESTAL. FOR TRANSFORMER BASE DETAILS SEE CITY OF COLUMBUS STANDARD CONSTRUCTION DRAWING 4105.

5. THE PEDESTAL SHALL BE FURNISHED AND INSTALLED WITH A POLE SHAFT THAT HAS A COMBINED TAPERED-StraIGHT CROSS-SECTIONAL DESIGN AND A ONE-PIECE CONSTRUCTION WITH NO LONGITUDINAL OR CIRCUMFERENTIAL WELDS EXCEPT FOR THE WELD NEEDED TO ATTACH THE POLE BASE. THE POLE SHAFT SHALL HAVE A ROUND CROSS-SECTIONAL DESIGN.


8. FOR FOUNDATION DETAILS SEE CITY OF COLUMBUS STANDARD CONSTRUCTION DRAWING 4163.

9. FOR PEDESTRIAN PUSHBUTTON SIGN DETAILS SEE CITY OF COLUMBUS STANDARD CONSTRUCTION DRAWING 4230.
POLE CAP ALLOY 43, 1/4" 20 NC SS HEX HEAD SCREWS

6'-3" STRAIGHT SECTION

16-1" SHAFT

6" STRAIGHT SECTION

8'-10" TAPERED SECTION

12" STRAIGHT SECTION W/ 7" OD

4.5" OD

STREET NAME SIGNS

6'-3" PEDESTAL

42" PUSHBUTTON MOUNTING HEIGHT

SEE NOTE 4

17.5' PEDESTAL STREET NAME SIGN MOUNTING

6'-3" PEDESTAL

CLAMSHELL MOUNTED PED SIGNAL UNITS

POLE CAP ALLOY 43, 1/4" 20 NC SS HEX HEAD SCREWS

6061-T6 ALUM ALLOY 13.13"

COSMETIC PLATE WHEN REQUIRED

BASE FLANGE ALLOY 356-T6 WITH BOLT COVERS & SS 1/4"

20 NC HEX HD SCREWS

SEE NOTE 6

10/01/2018

17" PUSHBUTTON MOUNTING HEIGHT

GALV STL CONNECTING HARDWARE
(4) 1"-8 NC x 3.75" HEX HEAD BOLTS
(4) 1"-8 NC HEX NUTS
(4) 1" LOCKWASHERS
(4) 1" FLAT WASHERS

SEE NOTE 9

6061-T6 ALUM ALLOY 13.13"

COSMETIC PLATE WHEN REQUIRED

BASE FLANGE ALLOY 356-T6 WITH BOLT COVERS & SS 1/4"

20 NC HEX HD SCREWS

SEE NOTE 6

10/01/2018

GALV STL CONNECTING HARDWARE
(4) 1"-8 NC x 3.75" HEX HEAD BOLTS
(4) 1"-8 NC HEX NUTS
(4) 1" LOCKWASHERS
(4) 1" FLAT WASHERS

SEE NOTE 9

10/01/2018
NOTES:

1. PEDESTAL SUPPORTS SHALL BE COATED IN ACCORDANCE WITH THE PLAN.

2. PEDESTAL SUPPORTS SHALL BE DESIGNED FOR 90 MPH WINDS, APPROPRIATE GUST FACTOR AND LOADING AS PER PLAN.

3. 4 ANCHOR BOLTS SHALL BE INCLUDED WITH NUTS, LOCK WASHERS AND EIGHT (8) SHIMS.

4. A 17" TRANSFORMER BASE (ALSO KNOWN AS T-BASE) AND ALL CONNECTING HARDWARE SHALL BE FURNISHED WITH EACH PEDESTAL. FOR TRANSFORMER BASE DETAILS SEE CITY OF COLUMBUS STANDARD CONSTRUCTION DRAWING 4105.

5. THE PEDESTAL SHALL BE FURNISHED AND INSTALLED WITH A POLE SHAFT THAT HAS A COMBINED TAPERED-STRaight CROSS-SECTIONAL DESIGN AND A ONE-PIECE CONSTRUCTION WITH NO LONGITUDINAL OR CIRCUMFERENTIAL WELDS EXCEPT FOR THE WELD NEEDED TO ATTACH THE POLE BASE. THE POLE SHAFT SHALL HAVE A ROUND CROSS-SECTIONAL DESIGN.


8. FOR FOUNDATION DETAILS SEE CITY OF COLUMBUS STANDARD DRAWING 4163.

9. FOR PEDESTRIAN PUSHBUTTON SIGN DETAILS SEE CITY OF COLUMBUS STANDARD CONSTRUCTION DRAWING 4230.
21' PEDESTAL & VEHICULAR SIGNAL HEAD MOUNTING

POLE CAP ALLOY
43, 1/4" 20 NC SS HEX HEAD SCREWS

4.5" OD (MIN)

'C' OR 'J' HOOK

TAPERED ALUM TUBE
(ALLOY 6063-T6, 0.25" WALL)

(SEE NOTE 4)

6061-T6 ALUM ALLOY 13.13"
COSMETIC PLATE WHEN REQUIRED
BASE FLANGE ALLOY 356-T6
WITH BOLT COVERS & SS 1/4"
20 NC HEX HD SCREWS

(SEE NOTE 6)

8" OD

(SEE NOTE 9)

42" PUSHBUTTON MOUNTING HEIGHT

17"

16'-6"

19'-7" SHAFT

10.25" SQ.

(SEE NOTE 8)

ANCHOR BOLT PATTERN

(SEE NOTE 8)

8/10 NC 3.75" HEX HEAD BOLTS
(4) 1"-8 NC HEX NUTS
(4) 1" LOCKWASHERS
(4) 1" FLATWASHERS

ALLOY 356-T6
WITH BOLT COVERS & SS 1/4" 20 NC HEX HD SCREWS

CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF DESIGN AND CONSTRUCTION
CITY ENGINEER

STD DWG 4104
8/10/2017
SHT 1 OF 2
NOTES:

1. PEDESTAL SUPPORTS SHALL BE COATED IN ACCORDANCE WITH THE PLANS.

2. PEDESTAL SUPPORTS SHALL BE DESIGNED FOR 90 MPH WINDS, APPROPRIATE GUST FACTOR AND LOADING AS PER PLAN.

3. 4 ANCHOR BOLTS SHALL BE INCLUDED WITH NUTS, LOCK WASHERS AND EIGHT (8) SHIMS.

4. A 17” TRANSFORMER BASE (ALSO KNOWN AS T-BASE) AND ALL CONNECTING HARDWARE SHALL BE FURNISHED WITH EACH PEDESTAL. FOR TRANSFORMER BASE DETAILS SEE CITY OF COLUMBUS STANDARD CONSTRUCTION DRAWING 4105.

5. THE PEDESTAL SHALL BE FURNISHED AND INSTALLED WITH A POLE SHAFT THAT HAS A TAPERED CROSS-SECTIONAL DESIGN AND A ONE-PIECE CONSTRUCTION WITH NO LONGITUDINAL OR CIRCUMFERENTIAL WELDS EXCEPT FOR THE WELD NEEDED TO ATTACH THE POLE BASE. THE POLE SHAFT SHALL HAVE A ROUND CROSS-SECTIONAL DESIGN.


8. FOR FOUNDATION DETAILS SEE CITY OF COLUMBUS STANDARD DRAWING 4163.

9. FOR PEDESTRIAN PUSHBUTTON SIGN DETAILS SEE CITY OF COLUMBUS STANDARD CONSTRUCTION DRAWING 4230.
BASE SUPPLIED WITH (8) STEEL WASHERS, 1/2" THICK X 2.75" DIA. (WASHERS MECHANICALLY GALVANIZED PER ASTM B454)

STAINLESS STL. PIANO HINGE CENTERED ON DOOR. (USE AS TEMPLATE FOR DRILLING 3/16" DIA. HOLES IN DOOR AND BASE FOR POP RIVETS.)

FOR ANCHOR BOLT SEE 4163.

DOOR SIZE
9.25"x9.75"x11.75"

1/4"-20 NC TAPPED HOLE (BACK WALL)
1/2"-13 NC TAPPED HOLE

ALUMINUM TRANSFORMER BASE

<table>
<thead>
<tr>
<th>SHAFT SIZE</th>
<th>BASE HEIGHT</th>
<th>TOP SQUARE</th>
<th>BOTTOM SQUARE</th>
<th>TOP BOLT CIRCLE</th>
<th>BOTTOM BOLT CIRCLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>7&quot; &amp; 8&quot;</td>
<td>17&quot;</td>
<td>13.12&quot;</td>
<td>15.38&quot;</td>
<td>10.5&quot;-13.5&quot;</td>
<td>14.5&quot;</td>
</tr>
</tbody>
</table>

NOTES:

A 13.75" SQUARE BOTTOM SECTION CAN BE WELDED TO THE TRANSFORMER BASE TO PROVIDE A 13" TO 15" BOLT CIRCLE.

TRANSFORMER BASE SHALL BE SUPPLIED WITH A TOP OR RIGHT SIDE HINGED DOOR, SCREW AND 1/2" THICK x 2.75" OD GALVANIZED WASHERS.

CONNECTING HARDWARE TO ATTACH SHAFT BASE TO TRANSFORMER BASE SHALL BE SUPPLIED.

TRANSFORMER BASE SHALL ACCEPT 3/4" & 1" DIAMETER ANCHOR BOLTS.

TRANSFORMER BASE SHALL BE COATED IN ACCORDANCE WITH THE PLANS.

FOR FOUNDATION DETAILS SEE CITY OF COLUMBUS STANDARD DRAWING 4163.
4.52" I.D. CAST ALUMINUM POLE TOP CAP

4.5" DIA. (AT TOP)

PEDESTAL SUPPORT FABRICATED FROM 6063-T4 ALUMINUM TUBE (PEDESTAL ASSEMBLY IS HEAT TREATED TO T6 CONDITION AFTER WELDING)

10.7' OVERALL POLE HEIGHT

6.00" DIA. POLE

26" TO 36"

DECORATIVE BASE (SEE "BASE PLATE DETAIL " & "BASE DETAIL ")

10.7'

DECORATIVE PEDESTAL
TAPPED 3/8"-16 HOLE FOR A GROUND CONNECTOR
CAST ALUMINUM HANDHOLE REINFORCEMENT FRAME WITH A FULL CIRCUMFERENCE WELD. 3" X 5" NOMINAL OPENING AND FLUSH FITTING ALUMINUM DOOR ATTACHED WITH (2) 1/4"-20 X 1/2" LONG STAINLESS STEEL COUNTERSUNK SCREWS

NOTES:

1. PEDESTAL SUPPORTS SHALL BE COATED IN ACCORDANCE WITH THE PLANS.

2. PEDESTAL SUPPORTS SHALL BE DESIGNED FOR 90 MPH WINDS, APPROPRIATE GUST FACTOR AND LOADING AS PER PLAN.

3. FOUR ANCHOR BOLTS SHALL BE INCLUDED WITH NUTS, LOCK WASHERS AND EIGHT (8) SHIMS.


5. FOR FOUNDATION DETAILS SEE CITY OF COLUMBUS STANDARD DRAWING 4163.

6. A 17" DECORATIVE BASE SHALL BE USED FOR FOUNDATIONS WITH AN 18" SQUARE FORMED TOP.

10.7' DECORATIVE PEDESTAL

CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF DESIGN AND CONSTRUCTION

STD DWG
4106

CITY ENGINEER
07/01/2020
SHT 2 OF 2
INSTALL TRAFFIC FLOW MONITOR CABLE IN TOP ARM BRACKET

VIEW A-A

25' - 0" BRACKET ARM

DETECTOR UNIT / TRAFFIC FLOW MONITOR BRACKET ARM

CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF DESIGN AND CONSTRUCTION

STD DWG

4110

10/01/2018

SHT 2 OF 3

WARNING: TIGHTEN BRACKET CLAMPS SECURELY TO PREVENT BRACKET ROTATION & CABLE SHEARING.

TOP CLAMP LOCATION IS ONE (1) FOOT BELOW TOP OF POLE. CLAMP "ID" SHALL BE DESIGNED TO FIT THE "OD" OF THE SIGNAL POLE. VERIFICATION OF POLE "OD" MUST BE MADE BEFORE THE CLAMPS ARE MANUFACTURED.

RADAR OR VIDEO DETECTOR (BANDED OR CLAMP MOUNTED)

DRILL A 5/8" HOLE IN THE BOTTOM ARM END CAP JUST LARGE ENOUGH TO PLACE THE DETECTOR CABLE THROUGH IT SEE NOTE F OF CONDUIT ELL SPECIFICATIONS ON SHEET 3 OF 3.

HORIZONTAL SLIPFITTER

PROVIDE THREADED END CAP WHEN HORIZONTAL SLIPFITTER IS NOT USED. CAP SHALL BE COATED TO MATCH ARM AND POLE.

LOADING FACTORS

WEIGHT IN POUNDS

TRAFFIC FLOW CAMERA - 1 SQ FT
VIDEO DETECTOR - 0.75 SQ FT
RADAR DETECTOR - 1 SQ FT

SAFETY FACTOR > 1.6

EFFECTIVE PROJECTED AREA

TRAFFIC FLOW CAMERA - 1 SQ FT
VIDEO DETECTOR - 0.75 SQ FT
RADAR DETECTOR - 1 SQ FT

(2)-5/8" GALVANIZED ANTI-ROTATION BOLTS, EACH FIELD DRILLED INTO POLE (ONE FOR EACH BRACKET CLAMP) ANTI-ROTATION BOLT SHALL NOT PROTRUDE MORE THAN 1/2" INTO SIGNAL SUPPORT.

(H) HD BOLTS WITH HEX NUTS & LOCKWASHERS W/ DIMENSIONS PER MANUFACTURER (STAINLESS STEEL)

1 1/2" CABLE ENTRY HOLE THROUGH CLAMP

_detalle_
INSTALL THE TRAFFIC FLOW MONITOR CABLE IN THE TOP ARM BRACKET.
INSTALL THE DETECTOR CABLE IN THE BOTTOM ARM BRACKET.

THREADED OUTSIDE END OF BRACKET ARM PIPE (1.2' OF STD NPT THREADS)

RADAR OR VIDEO DETECTOR - BANDED OR CLAMP MOUNTED

(SEE NOTE 11)

BRACKET ARM

SEAL THE CABLE ENTRY OPENING IN END CAP (SEE NOTE F)

DETECTOR CABLE W/ DRAIN LOOP

THREADED LOCKNUT

ALL MOUNTING HARDWARE COLOR COATED TO MATCH BRACKET ARM COLOR.

A) THREADED BODY (NPT) WITH NON-CORROSIVE HARDWARE
B) 48 CU. IN. INTERIOR AREA
C) FLAT COVER WITH SOLID NEOPRENE GASKET
D) COVER OPENING - 6" X 2.4"
E) LIGHT WEIGHT ALUMINUM BODY
F) PROVIDE #10 RUBBER STOPPER WITH A HOLE AND SLOT FOR OUTGOING CABLE; ENLARGE STOPPER HOLE AS NEEDED JUST ENOUGH TO FIT CABLE DIAMETER

LL/LR CONDUIT ELL SPECS

NOTES:

1. BRACKET ARMS SHALL BE INSTALLED PARALLEL OR PERPENDICULAR TO THE ROAD CENTERLINE AS PER PLAN.

2. ALL CABLES SHALL BE RUN INSIDE A BRACKET TUBE. ENTRY HOLES INTO THE SIGNAL POLE SHALL BE FIELD DRILLED.

3. BRACKET ARM, VIDEO DETECTOR AND/OR TRAFFIC FLOW MONITOR DOME SHALL BE COLOR COATED AS PER PLAN.

4. HEAT TREAT AFTER WELDING.

5. BRACKET ARMS SHALL BE COATED IN ACCORDANCE WITH THE PLANS TO MATCH THE SIGNAL SUPPORT OR STRAIN POLE STRUCTURE.

6. A TRUSS-STYLE DESIGN SHALL BE USED AND SHALL BE CAPABLE OF SUPPORTING A LUMINAIRE WEIGHING 75 POUNDS AND HAVING AN EFFECTIVE PROJECTED AREA OF 1.6 SQUARE FEET AND OR TRAFFIC DETECTOR AND/OR TRAFFIC FLOW MONITOR.

7. BRACKET ARMS SHALL BE DESIGNED FOR A 90 MPH WIND LOADING WITH APPROPRIATE GUST FACTOR.

8. THE CLAMP MOUNTED ARM SHALL COME WITH BOTH CLAMPS AND MOUNTING HARDWARE.

9. BRACKET ARMS SHALL BE DESIGNED TO FIT A MASTARM POLE SHAFT THAT HAS A NOMINAL TAPER OF 0.14 INCH PER FOOT AND A BOTTOM-OF-POLE OUTSIDE DIAMETER AS PER PLAN.

10. DETAILS AND DIMENSIONS ILLUSTRATED ON THESE DRAWINGS ILLUSTRATE AN ALUMINUM TRUSS ONLY. ALL STRUCTURAL COMPONENTS REMAIN THE RESPONSIBILITY OF THE MANUFACTURER.

11. FOR MECHANICAL DAMPENING DEVICE SEE STANDARD DRAWING 4122.
TRAFFIC SIGNAL POLE
SEE STANDARD DRAWING 4170

39"x24"x21", 336 CABINET W/ RACK FRAME ASSEMBLY (28"x20"x16")

POLE CAP ALLOY 43, 1/4" 20 NC SS HEX HEAD SCREWS

1.25" DIA WIRE HOLE IN SHAFT WITH 1" ID RUBBER GROMMET

CAMERA CABLE FROM DOME INSIDE UPPER BRACKET ARM TO CAMERA CABINET

NOTE 1:
STRAIN POLE SUPPORTS SHALL BE COATED IN ACCORDANCE WITH THE PLANS.

NOTE 2:
FOR FOUNDATION DETAILS SEE CITY OF COLUMBUS STANDARD DRAWING 4160.

NOTE 3:
WHEN A GROUND MOUNTED CABINET IS USED, CONDUITS SHALL ENTER THROUGH THE FOUNDATION AND THE WORK PAD SHALL BE LOCATED ADJACENT TO THE GROUND MOUNTED CABINET.

NOTE 4:
RETAINING WALL WILL BE NEEDED IF ELEVATIONS AROUND WORKPAD ARE GREATER THAN 3:1.

NOTE 5:
FOR BRACKET ARM DETAILS SEE CITY OF COLUMBUS STANDARD DRAWING 4110.
CAP STEEL HEX HEAD THROUGH BOLT
BRACKET ARM
SIGNAL HEAD
VARIES (OVERLAP WHEN REQUIRED)
APPLICABLE TO ALL SIGNAL HEADS
WHEN REQUIRED
SEE NOTE 5
1 3/8" DIA. HOLE IN MASTARM, WITH
1 in GROMMET OR BUSHING (TYPICAL)
APPLICABLE TO ALL SIGNAL HEADS
RISE: 3" MIN., 12 in MAX., AFTER ERECTION
OF SIGNALS (DESIGNS 4-12); RISE: 3" MIN., 30" MAX.
AFTER ERECTION OF SIGNALS (DESIGN 13, 14, C15 & C16)

POLE SHALL BE VERTICAL
WITH MAX. OFFSET OF S/3 ALONG CENTERLINE
MECHANICAL DAMPENING DEVICE (SEE NOTE 16)
MECHANICAL DAMPENING DEVICE (SEE NOTE 16)
ARM CAP
ARM LENGTH
VARES (OVERLAP WHEN REQUIRED)
(SEE NOTE 5)

POLE
HEIGHT
1'-6" (TYP.)

HANDEHOLE
4"x6"

HANDEHOLE
3"x5"

HANDEHOLE
5"x8"

STANDARD CITY OF COLUMBUS MAST ARM

CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF DESIGN AND CONSTRUCTION

STD DWG
4120

10/01/2018

CITY ENGINEER

SHT 1 OF 10
### TABLE 1 - PART A - POLE DIMENSIONS

<table>
<thead>
<tr>
<th>DESIGN NO.</th>
<th>MAXIMUM DESIGN AREA SQ FT (NOTE A)</th>
<th>DESIGN DISTANCE FROM C FT</th>
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<th>ARM</th>
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<td>C16 DOUBLE ARM</td>
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ALL DIMENSIONS ARE IN INCHES, UNLESS OTHERWISE NOTED. *=SINGLE PIECE ARM

### TABLE 1 - PART B - POLE DIMENSIONS

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<thead>
<tr>
<th>DESIGN NO.</th>
<th>ARM ATTACHMENT</th>
<th>ANCHOR BASE</th>
<th>PLATE SKIRT</th>
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<td>C15</td>
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<td>C16 DOUBLE ARM</td>
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ALL DIMENSIONS ARE IN INCHES, UNLESS OTHERWISE NOTED.
THESE DESIGNS USE FULL PENETRATION WELDS AT THE ARM AND BASE PLATE CONNECTIONS.

NOTES:
A. MAXIMUM DESIGN AREA IS BASED ON 90 MPH DESIGN WIND SPEED WITH A PRESSURE OF 25 PSF.
B. DIMENSION LOCATIONS ARE ILLUSTRATED ON SHEETS 3 & 6.
BASE PLATE

ANCHOR BOLTS WITH STANDARD STEEL HEX NUTS, PLAIN WASHERS (SEE NOTE 7)

POLE BASE DETAILS

1/4" MIN.
ONE BOLT DIAMETER = MAX.

BASE PLATE

POLE BASE DETAILS

BASE CONNECTION

STANDARD
CITY OF COLUMBUS
MAST ARM

DESIGN 4, 12, 13, & 14

POLE AND ARM FLANGE WELD DETAIL

DESIGN C15 & C16

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FOUNDATION

1/4" STEEL PLATE

1"

POLE

1/4" STEEL PLATE

POLE PLATE

WIDTH + 1/4"

FOUNDATION

COVER GUIDE AND SECTION ATTACHMENT

ID = POLE OD + 1/4"

CORNER RADIUS TO MATCH POLE BASE PLATE RADIUS

TOP VIEW

PRE-DRILLED THREADED HOLE W/ S.S. BOLT

M

POLE PLATE SKIRT

SECTION A-A

STANDARD CITY OF COLUMBUS MAST ARM

CITY OF COLUMBUS, OHIO DEPARTMENT OF PUBLIC SERVICE DIVISION OF DESIGN AND CONSTRUCTION

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SHT 4 OF 10
**ARM ATTACHMENT (TYP.)**

DESIGN 4, 12, 13 & 14

- BOLT DIA. G, WASHER (S) (SEE NOTE 15)
- 2 1/2" DIA. HOLE
- REMOVE SHARP EDGES
- HANDHOLE (4"x6")
- OPENING FOR GALVANIZING
- "J" HOOK
- GUSSET PLATES (THICKNESS = P) (SEE NOTE 17)

**STANDARD CITY OF COLUMBUS MAST ARM**

- GALV. DRAIN OPENINGS
- 2 1/2" DIA. WIRING HOLE IN POLE PLATE CENTERED OVER 3" DIA. HOLE IN POLE (DEBURR HOLE)
- (4) HEX HD CONNECTION BOLTS (SIZE PER CHART) EACH WITH (1) FLAT WASHER (INCLUDED WITH ARM) (SEE NOTE 15)

**ARM ATTACHMENTS**

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CITY ENGINEER
SHT 5 OF 10
2.5" DIA. WIRING HOLE IN POLE PLATE CENTERED OVER 3" DIA. HOLE IN POLE (DEBURR HOLE)

SEE WELD DETAIL ON SHEET 5

4"x6" HANDHOLE BETWEEN MAST ARMS

(P) THK GUSSETS TOP, BOTTOM & SIDES

ARM ATTACHMENT (TYP.)
DESIGN C16

(8)- HEX HD CONNECTION BOLTS (SIZE PER CHART) EACH WITH (1) FLAT WASHER (INCLUDED WITH ARMS)

GALV. DRAIN OPENINGS

2.5" DIA. WIRING HOLE IN POLE PLATE CENTERED OVER 3" DIA. HOLE IN POLE (DEBURR HOLE)

DTV WASHER PLACEMENT
FOR DESIGNS 13, 14, C15 & C16
(SEE NOTE 15)

POLE PLATE
ARM PLATE
DTI WASHER
F436 FLAT WASHER
CONNECTION NUT

ARM ATTACHMENTS/DTI WASHER PLACEMENT
STANDARD
CITY OF COLUMBUS MAST ARM

CITY OF COLUMBUS, OHIO
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CITY ENGINEER
POLE EXTENSION FOR BRACKET ARM

POLE EXTENSION
STANDARD
CITY OF COLUMBUS
MAST ARM

CITY OF COLUMBUS, OHIO
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SHT 7 OF 10
ALLEN WRENCH SOCKET OR PHILLIP TYPE OF STEEL LOCKING BRACKET W/RUST INHIBITING COATING

CURVED COVER PLATE

MACHINE SCREW EXTENDED

4"x6" HANDHOLE

CABLE SUPPORT "J" OR "C" HOOK

EXTENDED POLE SHAFT

HANDHOLE 4"x6"

STEEL LOCKING BRACKET W/RUST INHIBITING COATING

FLUSH HANDHOLE

NO. 12 STAINLESS STEEL SINGLE JACK CHAIN SECURED WITH 0.19" X 0.50" POP RIVETS

12 GA. H.R.M.S. COVER SECURED WITH 0.25" X 0.50" STAINLESS STEEL CAP SCREWS

POLE TUBE WALL

COVER MOUNTING CLIP

LESS THAN 7 GA. = .19
7 GA. THRU 3 GA. = .25

SECTION A-A

HANDHOLE

STANDARD CITY OF COLUMBUS MAST ARM

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NOTES:

1. ARM PLATE HOLE DIAMETER SHALL BE BOLT DIAMETER PLUS 1/8" POLE PLATE TAPPED HOLE SHALL HAVE THREADS WITH 75% (MIN.) FULL PROFILE HEIGHT. THREADS MAY BE RETAPPED AFTER GALVANIZING. (SEE SHEET 5.)

2. FOR SIGN MOUNTING DETAILS, SEE CITY OF COLUMBUS STANDARD CONSTRUCTION DRAWING 4251 AND 4252.

3. FOR FOUNDATION DETAILS, SEE CITY OF COLUMBUS STANDARD CONSTRUCTION DRAWING 4160.

4. THE ARM ATTACHMENT PLATE SHALL BE WELDED USING A FULL PENETRATION WELD. THE POLE ATTACHMENT TO THE BASE PLATE SHALL BE WELDED USING A FULL PENETRATION WELD. (SEE SHEET 3 AND 5.)

5. FOR SIGNAL ATTACHMENT DETAILS, SEE CITY OF COLUMBUS STANDARD CONSTRUCTION DRAWING 4201.

6. FOR BRACKET ARM DETAILS, SEE CITY OF COLUMBUS STANDARD CONSTRUCTION DRAWINGS 4110.

7. A MINIMUM OF ONE BOLT THREAD SHALL REMAIN ABOVE THE ANCHOR NUT. (SEE SHEET 3.)

8. ALL UNUSED COUPLINGS SHALL BE PROVIDED WITH A REMOVABLE GALVANIZED CAST IRON PLUG.

9. FOR POLE AND BASE PLATE DIMENSIONS, SEE TABLES 1A AND 1B. (SEE SHEET 2.)

10. WHEN FREE SWINGING VEHICULAR SIGNAL HEADS ARE PERMITTED, THE WIRE ENTRANCE PART OF THE SIGNAL HEAD MAY BE ORIENTED IN ANY DIRECTION TO KEEP THE CABLE DRIP LOOP FROM RUBBING ON THE SIGNAL HEAD. THE SIGNAL HEAD SHALL HANG LEVEL AND PLUMB. (SEE CITY OF COLUMBUS STANDARD CONSTRUCTION DRAWING 4201.)

11. FOR DETAILS AND LOCATION OF HAND HOLES, SEE FLUSH HAND HOLE AND OPTIONAL HAND HOLE DETAILS. (SEE SHEET 8.)

12. THE DESIGN LOADS WERE CALCULATED AS THE EQUIVALENT AMOUNT OF SIGNAL AREA THAT COULD BE CARRIED AT THE END OF THE ARM.

13. THE DESIGN LOADS WERE DEVELOPED WITHOUT APPLYING GALLOPING FATIGUE LOADS. ALSO, THE STRESS REQUIREMENTS OF NOTE B, TABLE 11-2 IN THE AASHTO CODE WERE NOT APPLIED.

14. THESE STRUCTURES SHOULD BE INSPECTED FOR EXCESSIVE WIND INDUCED DEFLECTION IN THE VERTICAL DIRECTION. IF FOUND, A DAMPING DEVICE SHOULD BE PLACED ON THE ARM.

15. MAST ARM CONNECTION BOLTS SHALL BE ASTM A325 FOR DIAMETERS 1.50" AND SMALLER. BOLTS LARGER THAN DIAMETER 1.50" SHALL BE ASTM A449. DESIGNS 4 THROUGH 12 SHALL USE ASTM F436 FLAT WASHERS. DESIGN 13 AND C16 SHALL USE ASTM F959 DTI WASHERS. DESIGN 14 AND C15 SHALL USE ASTM F2437 TYPE 2 GRADE 5 DTI WASHERS. IF NECESSARY, I.D. OF DTI WASHERS SHALL BE GROUND OR REAMED TO FIT PROPERLY OVER ATTACHMENT BOLTS. PROVIDE PROPER DTI FEELER GAUGE TO ENGINEER. AN F436 WASHER SHALL BE USED DIRECTLY UNDER THE HEAD OF THE BOLT WITH ALL DTI WASHERS. ASSURE THAT THE FLAT WASHER DOES NOT SPIN DURING BOLT TIGHTENING WITH DTI WASHER. (SEE SHEET 5 AND 6).

16. AN APPROVED DAMPING DEVICE SHALL BE INSTALLED AS CLOSE AS POSSIBLE TO THE END OF THE ARM. MECHANICAL DAMPENING DEVICES SHALL BE INSTALLED ON ALL ARMS 59' OR LONGER. FLAT PLATE DAMPERS SHALL ONLY BE USED FOR NEW CONSTRUCTION IF DIRECTED BY THE PLANS OR THE ENGINEER. (SEE SHEET 1.) (SEE STD DWG 4122 FOR VIBRATION MITIGATION DEVICE.)

17. RING-STIFFENED WRAP-AROUND HORIZONTAL PLATES ARE PERMITTED AS AN ALTERNATIVE TO THE HORIZONTAL PLATES SHOWN. (SEE SHEET 5.)

18. PRODUCT SHOP DRAWINGS FOR ALL ITEMS SHALL BE SUBMITTED FOR APPROVAL TO THE CITY OF COLUMBUS.

19. THE STRUCTURAL INTEGRITY OF ALL PRODUCTS SHALL TAKE PRECEDENCE OVER STATED DESIGN DIMENSIONS IF THESE DIMENSIONS IN THE OPINION OF THE MANUFACTURER NEED TO BE INCREASED FOR THAT MANUFACTURER'S PRODUCT TO MEET THE REQUIRED DESIGN LOADING REQUIREMENTS. THE MANUFACTURER SHALL SUBMIT DESIGN CHANGES TO THE CITY OF COLUMBUS FOR REVIEW AND APPROVAL. THE STATED DIMENSIONS ARE SHOWN TO ALLOW FLEXIBILITY IN FUTURE PART REPLACEMENTS AND TO CREATE A STANDARD FOR THE INTERCHANGEABILITY OF PARTS WITHIN THE CITY OF COLUMBUS.

20. ALL PRE-DRILLED HOLES FOR ALL BID ITEMS SHALL BE DEBURRED AND FREE OF ALL SHARP EDGES. ALL OUTSIDE WELDS ON MAST ARM STRUCTURES AND TRAFFIC PEDESTAL STRUCTURES SHALL BE ROLLED OR GROUND SMOOTH. ALL INSIDE WELDS ON MAST ARM STRUCTURES AND TRAFFIC PEDESTAL STRUCTURES SHALL BE VOID OF SHARP EDGES.

21. NO FOUNDATION BOLT PATTERN CHANGE SHALL BE ALLOWED FOR THE POLE SHAFT BASE PLATE. THE POLE BASE PLATE MUST FIT THE GIVEN FOUNDATION BOLT PATTERN AS SHOWN ON CITY OF COLUMBUS STANDARD CONSTRUCTION DRAWING 4160.
22. SIGNAL SUPPORTS SHALL BE HOT DIPPED GALVANIZED AND COATED IN ACCORDANCE WITH THE PLANS.

23. SUPPORTS SHALL HAVE 1, 2, OR 3 HAND HOLES, AS PER PLAN DESIGN, EACH COMPLETE WITH A COVER, A RECTANGULAR OR ELLIPTICAL REINFORCED FRAME, AND A STAINLESS STEEL FASTENER FOR THE COVER. THE FASTENER SHALL BE FLUSH WITH THE HAND HOLE SURFACE. THE HAND HOLES SHALL BE LOCATED 180 DEGREES FROM THE MAST ARM UNLESS SPECIFIED OTHERWISE. (SEE SHEET 8.)

A.) THE HAND HOLE NEAR THE BRACKET ARM SHALL HAVE A MINIMUM INSIDE OPENING OF 3" X 5" AND BE SIMILAR IN DESIGN TO THE BOTTOM HAND HOLE EXCEPT THAT NO GROUNDING PROVISION IS REQUIRED.

B.) THE HAND HOLE NEAR THE ARM ATTACHMENT SHALL HAVE A MINIMUM INSIDE OPENING OF 4" X 6" AND BE SIMILAR IN DESIGN TO THE BOTTOM HAND HOLE EXCEPT THAT NO GROUNDING PROVISION IS REQUIRED.

C.) THE BOTTOM HAND HOLE SHALL HAVE A MINIMUM INSIDE OPENING OF 5" X 8". A GROUNDING PROVISION CAPABLE OF ACCEPTING 4 - #4 AWG COPPER GROUNDING WIRES SHALL BE PROVIDED AND SHALL BE ATTACHED TO THE FRAME.

24. SUPPORT SHALL HAVE A REMOVABLE POLE CAP ATTACHED EITHER BY A MINIMUM OF 3 STAINLESS STEEL SET SCREWS OR BY A STAINLESS STEEL THROUGH BOLT. (SEE SHEET 7.)

25. SUPPORTS SHALL HAVE A STEEL POLE BASE PLATE/ANCHOR BOLT-NUT COVER (1/4" THICK SQUARE PLATE, TWO PIECE CONSTRUCTION, GALVANIZED TO ASTM A123 THEN COATED) THAT SKIRTS THE BOLTS, NUTS AND BASE PLATE. ALL SCREW HOLES SHALL BE PRE-DRILLED AND STAINLESS STEEL FASTENERS SHALL BE USED. (SEE SHEET 4.)

26. SUPPORTS SHALL HAVE 1, 2, OR 3 WELDED CABLE SUPPORT HOOKS (‘J’ OR ‘C’ HOOKS) LOCATED ON THE INSIDE OF THE POLE AND 90 DEGREES FROM THE MAST ARM. (SEE SHEET 7.)

27. THE ARM SHALL MAINTAIN A CIRCULAR CROSS-SECTION (CONSTANT CROSS-SECTIONAL RADIUS).


29. THE ARM SHALL NOT HAVE PRE-DRILLED HOLES FOR SIGNAL HEAD CABLE ENTRY. THE CONTRACTOR SHALL FIELD DRILL THESE HOLES.

POLE SHALL BE VERTICAL WITH MAX. OFFSET OF S/3 ALONG CENTERLINE

MECHANICAL DAMPENING DEVICE (SEE NOTE 15)

5/8" DIA. GALVANIZED STUD WITH (2) LOCK NUTS, 3/4"
HOLE IN OUTBOARD TUBE AND FIELD DRILL INBOARD TUBE TO SNUG FIT. ORIENTATION SHALL BE HORIZONTAL.

VARIES (OVERLAP WHEN REQUIRED) (SEE NOTE 5)

1/8" DIA. HOLE, WITH 1 in GROMMET OR BUSHING (TYPICAL) APPLICABLE TO ALL SIGNAL HEADS

SIGNAL HEAD WITH BACKPLATE

FLUTED VERTICAL POLE SHAFT

DECORATIVE CLAM SHELL BASE, SEE SHEET 5

POLE CAP, 3 SET SCREWS MINIMUM

THRU BOLT STYLE

"J" HOOK

POLE CAP DETAIL (FOR POLES WITHOUT LUMINAIRES ONLY)

NON-COMBINATION POLE

DECORATIVE CITY OF COLUMBUS MAST ARM

CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF DESIGN AND CONSTRUCTION

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CITY ENGINEER
### TABLE 1 - PART A - POLE DIMENSIONS

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<thead>
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<th>DESIGN NO.</th>
<th>MAXIMUM DESIGN AREA SQ. FT (NOTE A)</th>
<th>DESIGN DISTANCE FROM CL FT</th>
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<th>WALL THICK</th>
<th>BASE DIAMETER</th>
<th>MAX. LENGTH</th>
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<th>SIZE</th>
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All dimensions are in inches, unless otherwise noted. * = single piece arm.

### TABLE 1 - PART B - POLE DIMENSIONS

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<th>DESIGN NO.</th>
<th>ARM ATTACHMENT</th>
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<td>C16 (DOUBLE ARM)</td>
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All dimensions are in inches, unless otherwise noted. These designs use full penetration welds at the arm and base plate connections.

### NOTES:

A. Maximum design area is based on 90 MPH design wind speed with a pressure of 25 PSF.

B. Dimension locations are illustrated on sheets 4 & 6.
DECORATIVE BASE

NOTES:

THE HANDHOLE IN DECORATIVE BASE SHALL BE OF SUFFICIENT SIZE AND BE ALIGNED WITH THE HANDHOLE IN THE SUPPORT POLE TO ALLOW FULL ACCESS TO THE POLE HANDHOLE.

DECORATIVE BASE MATERIAL SHALL BE MADE FROM CAST ALUMINUM.
(G)-STUD DIA. (4)-STUDS EACH WITH (2)-HEX NUTS & (2) FLAT WASHERS (SEE NOTE 1 AND 3)

TOP VIEW

(2)-1/2" 13NC x 3 1/2" LG HEX HD CAP SCREWS (FIELD DRILL 5/8" DIA. HOLES IN POLE) 3/16" DIA. HOLES THRU PIPE & BOLT FOR 1/8" x 1 1/2" COTTER PINS

PLATE THICKNESS 3/8" (SEE NOTE 4)

SEE WELD DETAIL BELOW

1/2" SCH 80 PIPE x 3/4" LG WELDED TO CLAMP

SECTION VIEW

3/16"

1/4" 1/4" 45" CJP 3/16" CJP

1/4" x 2" BACK-UP RING

1/2" MIN 1" MAX

ARM FLANGE WELD DETAIL

MAST ARM CLAMP CONNECTION

DECORATIVE CITY OF COLUMBUS MAST ARM

CITY OF COLUMBUS, OHIO
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3" x 5" HANDHOLE NEAR BRACKET ARM FRAME DETAIL
4" x 6" HANDHOLE NEAR MAST ARM FRAME DETAIL

11 GA COVER WITH 1/4"-20NC S.S. MACHINE SCREW & S.S. CHAIN

GROUNDING PROVISION NUT RETAINER C24774 WELDED TO HANDHOLE FRAME WITH 1/2"-13NC S.S. SQ NUT & 3/4" LG S.S. HEX BOLT

HANDELHOLE
DECORATIVE CITY OF COLUMBUS
MST ARM

CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
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07/01/2020

CITY ENGINEER
SHT 7 OF 10
TOP OF POLE DETAIL
(FOR POLES WITH LUMINAIRE ONLY)

LUMINAIRE BRACKET ARM NOT SHOWN FOR
CLARITY. SEE MIS-104 FOR ADDITIONAL DETAILS.

DTI WASHER PLACEMENT
(FOR DESIGNS 13, 14, C15 & C16)
(SEE NOTE 30)

POLE TENON / DTI WASHER PLACEMENT
DECORATIVE
CITY OF COLUMBUS
MAST ARM
NOTES:

1. ARM PLATE HOLE DIAMETER SHALL BE BOLT DIAMETER PLUS 1/8". (SEE SHEETS 1 AND 2.)

2. FOR SIGN MOUNTING DETAILS, SEE CITY OF COLUMBUS STANDARD CONSTRUCTION DRAWING 4251 AND 4252.

3. FOR FOUNDATION DETAILS, SEE CITY OF COLUMBUS STANDARD CONSTRUCTION DRAWING 4160.

4. THE ARM ATTACHMENT PLATE SHALL BE WELDED USING A FULL PENETRATION WELD. THE POLE ATTACHMENT TO THE BASE PLATE SHALL BE WELDED USING A FULL PENETRATION WELD. (SEE SHEETS 4 AND 6.)

5. FOR SIGNAL ATTACHMENT DETAILS, SEE CITY OF COLUMBUS STANDARD CONSTRUCTION DRAWING 4201.

6. FOR BRACKET ARM DETAILS, SEE CITY OF COLUMBUS STANDARD CONSTRUCTION DRAWINGS 4110.

7. A MINIMUM OF ONE BOLT THREAD SHALL REMAIN ABOVE THE ANCHOR NUT. (SEE SHEET 4.)

8. ALL UNUSED COUPLINGS SHALL BE PROVIDED WITH A REMOVABLE GALVANIZED CAST IRON PLUG.

9. FOR POLE AND BASE PLATE DIMENSIONS, SEE TABLES 1A AND 1B. (SEE SHEET 3.)

10. WHEN FREE SWINGING VEHICULAR SIGNAL HEADS ARE PERMITTED, THE WIRE ENTRANCE PART OF THE SIGNAL HEAD MAY BE ORIENTED IN ANY DIRECTION TO KEEP THE CABLE DRIP LOOP FROM RUBBING ON THE SIGNAL HEAD. THE SIGNAL HEAD SHALL HANG LEVEL AND PLUMB. (SEE CITY OF COLUMBUS STANDARD CONSTRUCTION DRAWING 4201.)

11. FOR DETAILS AND LOCATION OF HAND HOLES, SEE FLUSH HAND HOLE AND OPTIONAL HAND HOLE DETAILS. (SEE SHEETS 1, 2, AND 7.)

12. THE DESIGN LOADS WERE CALCULATED AS THE EQUIVALENT AMOUNT OF SIGNAL AREA THAT COULD BE CARRIED AT THE END OF THE ARM.

13. THE DESIGN LOADS WERE DEVELOPED WITHOUT APPLYING GALLOPING FATIGUE LOADS. ALSO, THE STRESS REQUIREMENTS OF NOTE B, TABLE 11-2 IN THE AASHTO CODE WERE NOT APPLIED.

14. THESE STRUCTURES SHOULD BE INSPECTED FOR EXCESSIVE WIND INDUCED DEFLECTION IN THE VERTICAL DIRECTION. IF FOUND, A DAMPING DEVICE SHOULD BE PLACED ON THE ARM.

15. AN APPROVED DAMPING DEVICE SHALL BE INSTALLED AS CLOSE AS POSSIBLE TO THE END OF THE ARM. MECHANICAL DAMPING DEVICES SHALL BE INSTALLED ON ALL ARMS 58' OR LONGER. FLAT PLATE DAMPERS SHALL ONLY BE USED FOR NEW CONSTRUCTION IF DIRECTED BY THE PLANS OR THE ENGINEER. (SEE SHEETS 1 AND 2.)

16. A TENON SHALL BE PROVIDED TO ACCOMMODATE THE LUMINAIRE BRACKET ARM. (SEE SHEET 8.)

17. PRODUCT SHOP DRAWINGS FOR ALL ITEMS SHALL BE SUBMITTED FOR APPROVAL TO THE CITY OF COLUMBUS.

18. THE STRUCTURAL INTEGRITY OF ALL PRODUCTS SHALL TAKE PRECEDENCE OVER STATED DESIGN DIMENSIONS IF THESE DIMENSIONS IN THE OPINION OF THE MANUFACTURER NEED TO BE INCREASED FOR THAT MANUFACTURER'S PRODUCT TO MEET THE REQUIRED DESIGN LOADING REQUIREMENTS. THE MANUFACTURER SHALL SUBMIT DESIGN CHANGES TO THE CITY OF COLUMBUS FOR REVIEW AND APPROVAL. THE STATED DIMENSIONS ARE SHOWN TO ALLOW FLEXIBILITY IN FUTURE PART REPLACEMENTS AND TO CREATE A STANDARD FOR THE INTERCHANGEABILITY OF PARTS WITHIN THE CITY OF COLUMBUS.

19. ALL PRE-DRILLED HOLES FOR ALL BID ITEMS SHALL BE DEBURLED AND FREE OF ALL SHARP EDGES. ALL OUTSIDE WELDS ON MAST ARM STRUCTURES AND TRAFFIC PEDESTAL STRUCTURES SHALL BE ROLLED OR GROUND SMOOTH. ALL INSIDE WELDS ON MAST ARM STRUCTURES AND TRAFFIC PEDESTAL STRUCTURES SHALL BE VOID OF SHARP EDGES.

20. NO FOUNDATION BOLT PATTERN CHANGE SHALL BE ALLOWED FOR THE POLE SHAFT BASE PLATE. THE POLE BASE PLATE MUST FIT THE GIVEN FOUNDATION BOLT PATTERN AS SHOWN ON CITY OF COLUMBUS STANDARD CONSTRUCTION DRAWING 4160.
21. SIGNAL SUPPORTS SHALL BE HOT DIPPED GALVANIZED AND COATED IN ACCORDANCE WITH THE PLANS.

22. SUPPORTS SHALL HAVE 1, 2, OR 3 HAND HOLES, AS PER PLAN DESIGN, EACH COMPLETE WITH A COVER, A RECTANGULAR OR ELLIPTICAL REINFORCED FRAME, AND A STAINLESS STEEL FASTENER FOR THE COVER. THE FASTENER SHALL BE FLUSH WITH THE HAND HOLE SURFACE. THE HAND HOLES SHALL BE LOCATED 180 DEGREES FROM THE MAST ARM UNLESS SPECIFIED OTHERWISE. (SEE SHEET 7.)

A.) THE HAND HOLE NEAR THE BRACKET ARM SHALL HAVE A MINIMUM INSIDE OPENING OF 3” X 5” AND BE SIMILAR IN DESIGN TO THE BOTTOM HAND HOLE EXCEPT THAT NO GROUNDING PROVISION IS REQUIRED.

B.) THE HAND HOLE NEAR THE ARM ATTACHMENT SHALL HAVE A MINIMUM INSIDE OPENING OF 4” X 6” AND BE SIMILAR IN DESIGN TO THE BOTTOM HAND HOLE EXCEPT THAT NO GROUNDING PROVISION IS REQUIRED.

C.) THE BOTTOM HAND HOLE SHALL HAVE A MINIMUM INSIDE OPENING OF 4” X 8”. A GROUNDING PROVISION CAPABLE OF ACCEPTING 4 - #4 AWG COPPER GROUNDING WIRES SHALL BE PROVIDED AND SHALL BE ATTACHED TO THE FRAME.

23. THE VERTICAL POLE SHAFT SHALL HAVE 16 SHARP FLUTES.

24. THE DECORATIVE BASE SHALL BE AS DETAILED ON SHEET 5.

25. SUPPORTS SHALL HAVE 1, 2 OR 3 WELDED CABLE SUPPORT HOOKS (‘J’ OR ‘C’ HOOKS) LOCATED ON THE INSIDE OF THE POLE AND 90 DEGREES FROM THE MAST ARM.

26. THE ARM SHALL MAINTAIN A CIRCULAR CROSS-SECTION (CONSTANT CROSS-SECTIONAL RADIUS).


28. THE ARM SHALL NOT HAVE PRE-DRILLED HOLES FOR SIGNAL HEAD CABLE ENTRY. THE CONTRACTOR SHALL FIELD DRILL THESE HOLES.


30. MAST ARM CONNECTION BOLTS SHALL BE ASTM A325 FOR DIAMETERS 1.50” AND SMALLER. BOLTS LARGER THAN DIAMETER 1.50” SHALL BE ASTM A449. DESIGNS 4 THROUGH 12 SHALL USE ASTM F436 FLAT WASHERS. DESIGN 13 AND C18 SHALL USE ASTM F959 DTI WASHERS. DESIGN 14 AND C15 SHALL USE ASTM F2437 TYPE 2 GRADE 5 DTI WASHERS. IF NECESSARY, I.D. OF DTI WASHERS SHALL BE GROUND OR READIED TO FIT PROPERLY OVER ATTACHMENT BOLTS. PROVIDE PROPER DTI FEELER GAUGE TO ENGINEER. AN F436 WASHER SHALL BE USED DIRECTLY UNDER THE HEAD OF THE BOLT WITH ALL DTI WASHERS. ASSURE THAT THE FLAT WASHER DOES NOT SPIN DURING BOLT TIGHTENING WITH DTI WASHER. (SEE SHEETS 6 AND 8).

31. THE 4”X6” HAND HOLE (COMBINATION POLE ONLY) SHOULD BE PLACED ABOVE THE MAST ARM WHEN FEASIBLE. HAND HOLE MAY BE PLACED BELOW THE MAST ARM WHEN MAST ARM AND BRACKET ARM MOUNTING HEIGHTS DO NOT PROVIDE SUFFICIENT ROOM.
NOTE:
NON-STAINLESS STEEL ITEMS
SHALL BE COATED TO MATCH
BRACKET / MAST ARM.
MINIMUM (2)-2” CONDUIT ELL(S) (SEE NOTE 5)

BOLT CIRCLE

3” CLEAR

MINIMUM (2)-2” CONDUIT ELL(S) (SEE NOTE 5)

TOP VIEW

ANCHOR BOLTS
TOP FLUSH WITH SIDEWALK

CONDUIT TO EXTEND 2” TO 3” ABOVE FOUNDATION

ANCHOR BOLTS

ROUND CORNERS (SEE NOTE 9)

CAP UNUSED CONDUIT

(2)-2” CONDUIT ELLS (SEE NOTE 5)

SIDE VIEW

36” DIA. DRILLED SHAFT

42” - 48” DIA. DRILLED SHAFT

14 #8’s

20 #9’s (48”)

18 #8’s (42”)

VERTICAL REBAR

3-1/2” ± 1/2”

8” MIN.

24”

18”

12”

VERTICAL REBARS. SEE VERTICAL REBAR DIAGRAM FOR SIZE AND NUMBER. (SEE NOTE 11)

GROUNDING CONDUCTOR

GROUND ROD (1”x10’)

(2)-2” CONDUIT ELLS (SEE NOTE 5)

WALK

ANCHOR BOLTS
TOP VIEW

SIDE VIEW

W 3” CLEAR

WALK

ANCHOR BOLTS

TOP FLUSH WITH SIDEWALK

CONDUIT TO EXTEND 2” TO 3” ABOVE FOUNDATION

ANCHOR BOLTS

ROUND CORNERS (SEE NOTE 9)

CAP UNUSED CONDUIT

(2)-2” CONDUIT ELLS (SEE NOTE 5)

SIDE VIEW

36” DIA. DRILLED SHAFT

42” - 48” DIA. DRILLED SHAFT

14 #8’s

20 #9’s (48”)

18 #8’s (42”)

VERTICAL REBAR

3-1/2” ± 1/2”

8” MIN.

24”

18”

12”

VERTICAL REBARS. SEE VERTICAL REBAR DIAGRAM FOR SIZE AND NUMBER. (SEE NOTE 11)

GROUNDING CONDUCTOR

GROUND ROD (1”x10’)

(2)-2” CONDUIT ELLS (SEE NOTE 5)

WALK

ANCHOR BOLTS
ALL DIMENSIONS IN INCHES UNLESS OTHERWISE NOTED

CITY OF COLUMBUS 4120 & 4121 TYPE SUPPORTS

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<td>2 X 62</td>
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<tr>
<td>C16</td>
<td>15</td>
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CITY OF COLUMBUS 4170 TYPE SUPPORTS

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</tr>
<tr>
<td>13</td>
<td>16 42 or 48</td>
<td>3 X 66</td>
<td>26 11.75</td>
</tr>
<tr>
<td>14</td>
<td>17 48</td>
<td>3 X 72</td>
<td>34 11.75</td>
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ANCHOR BOLTS

<table>
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<tr>
<th>DIA.</th>
<th>TOP THREAD LENGTH</th>
<th>THREADS PER INCH</th>
<th>PLATE WASHER DIAMETER</th>
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<td>1.25</td>
<td>8</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>1.5</td>
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<td>6</td>
<td>3</td>
</tr>
<tr>
<td>1.75</td>
<td>9</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>9</td>
<td>4.5</td>
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</tr>
<tr>
<td>2.25</td>
<td>10</td>
<td>4.5</td>
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</tr>
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<td>2.5</td>
<td>10</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>12</td>
<td>4</td>
<td>6</td>
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</table>

SIGNAL SUPPORT/STRAIN POLE FOUNDATIONS

CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF DESIGN AND CONSTRUCTION

STD DWG 4160
10/01/2018
SHT 2 OF 3
NOTES:

1. USE 1/2” PREFORMED JOINT FILLER AS PER 705.03 BETWEEN FOUNDATIONS AND ADJACENT PAVED AREAS.

2. A SPECIAL FOUNDATION DESIGN WILL BE REQUIRED WHEN COHESIVE SOIL WITH UNDRAINED SHEAR STRENGTH OF LESS THAN 2000 LB/FT² OR GRANULAR SOIL WITH AN ANGLE OF INTERNAL FRICTION LESS THAN 30° AND A WET DENSITY LESS THAN 120 LB/FT³ IS ENCOUNTERED. THE CONTRACTOR SHALL NOTIFY THE ENGINEER WHEN THESE CONDITIONS ARE IDENTIFIED.

3. PROVIDE ALL ANCHOR BOLTS WITH STANDARD STEEL HEX NUTS, LEVELING NUTS, AND PLAIN WASHERS. THE NUTS SHALL BE CAPABLE OF DEVELOPING THE FULL STRENGTH OF THE ANCHOR BOLTS.


5. THE SIZE, NUMBER (MINIMUM OF 2), TYPE, AND ORIENTATION OF CONDUIT ELLS SHALL BE AS SHOWN IN THE PLAN, EXCEPT THAT A 3/4” SCHEDULE 40 PVC CONDUIT SHALL BE INSTALLED IN EACH FOUNDATION. UNUSED CONDUIT ELLS SHALL BE CAPPED.

6. TIE SPACING, STARTING FROM THE TOP OF THE DRILLED SHAFT, SHALL BE 3” BETWEEN THE FIRST TWO TIES AND 12” SPACING THEREAFTER.

7. THE ANCHOR BASE POLE FOUNDATION SIDES SHALL BE ORIENTATED PARALLEL TO THE SIDEWALK OR BACK-OF-CURB OR EDGE-OF-PAVEMENT.

8. THE TOP OF THE FOUNDATION SHALL BE SET BASED ON THE FOLLOWING GUIDELINES:

   - FOUNDATION LOCATED ENTIRELY IN WALK OR CONCRETE AREA
     TOP OF FOUNDATION SHALL BE AS PER CITY OF COLUMBUS STANDARD DRAWING 4161.

   - FOUNDATION LOCATED BEHIND CURB ASSOCIATED WITH CURB RAMP
     TOP OF FOUNDATION SHALL BE FLUSH WITH TOP OF CURB AT BACK OF RAMP FOR A PARALLEL RAMP.

   - FOUNDATION LOCATED ADJACENT TO WALK OR CONCRETE AREA
     TOP OF FOUNDATION SHALL BE FLUSH WITH WALK OR CONCRETE AREA FOR A PERPENDICULAR RAMP.

   - FOUNDATION LOCATED ADJACENT TO WALK OR CONCRETE WITH STEEP GRADE CHANGE (RISES STEEPLY BEHIND WALK)

9. THE POLE FOUNDATION TOP SHALL BE EDGED USING A 1/2” SIDEWALK EDGER AND NOT CHAMFERED.

10. ANCHOR BOLT LENGTH SHALL BE INCREASED WHEN FOUNDATION IS INSTALLED IN BRICK SIDEWALK. SEE CITY OF COLUMBUS STANDARD DRAWING 4161 AND 2301 FOR INCREASED LENGTH REQUIREMENTS.

11. ALL REINFORCING STEEL SHALL BE EPOXY COATED AND COMPLY WITH AND BE PLACED IN ACCORDANCE WITH CMSC 509. REBAR CAGE SHALL EXTEND TO WITHIN 3 1/2" ± 1/2" OF TOP AND BOTTOM OF FOUNDATION.

12. IF SHALLOW BEDROCK IS ENCOUNTERED, THE FOUNDATION LENGTH MAY BE DECREASED BY EMBEDDING THE SHAFT A MINIMUM OF 5 FT INTO BEDROCK. FIELD CUT THE VERTICAL REBAR TO FIT THE SHORTENED FOUNDATION.

13. IF EXCAVATING WITHIN 8 FEET OF, BUT GREATER THAN 5 FEET FROM THE EDGE OF AN EXISTING SIGNAL SUPPORT OR STRAIN POLE FOUNDATION, PROVIDE TEMPORARY SUPPORT OF THE POLE (DOWN GUY, HEAD GUY, BASE GUY, MECHANICAL/CRANE SUPPORT, ETC.) DURING EXCAVATION AND CONSTRUCTION ACTIVITIES.

14. IF A UTILITY IS WITHIN 5 FEET OF THE FOUNDATION, INCREASE THE FOUNDATION LENGTH (D) TO THE LENGTH SHOWN IN THE TABLE BELOW.

<table>
<thead>
<tr>
<th>4120 &amp; 4121 TYPE SUPPORTS</th>
<th>4170 TYPE SUPPORTS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>D</strong></td>
<td><strong>3 FT</strong></td>
</tr>
<tr>
<td>4</td>
<td>D=18</td>
</tr>
<tr>
<td>12</td>
<td>D=18</td>
</tr>
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</tr>
<tr>
<td>C15</td>
<td>D=18</td>
</tr>
<tr>
<td>C16</td>
<td>SEE BELOW</td>
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SPECIAL FOUNDATION REQUIRED FOR UTILITY EXCAVATIONS ADJACENT TO C16.

<table>
<thead>
<tr>
<th>4120 &amp; 4121 TYPE SUPPORTS</th>
<th>4170 TYPE SUPPORTS</th>
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<tbody>
<tr>
<td><strong>D</strong></td>
<td><strong>3 FT</strong></td>
</tr>
<tr>
<td>11</td>
<td>D=20</td>
</tr>
<tr>
<td>13</td>
<td>D=20</td>
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</table>
LEVEL & SLOPE THE SUBGRADE AS SHOWN. COMPACT THE SUBGRADE AROUND THE FOUNDATION. THOROUGHLY CLEAN THE CONCRETE FOUNDATION SURFACE SO THE WALK CONCRETE WILL BOND.

LEAVE THE FOUNDATION CONCRETE DOWN 8" TO 9". POUR THE WALK CONCRETE OVER THE FOUNDATION.

NOTE:

WHEN POURING WALK, EMBED 1/2" THICK EXPANSION JOINT FILLER (CMSC 608.03C AND 705.03). FORM A 3'x3' SQUARE (STRAIN POLE AND MAST ARM POLE FOUNDATION) OR 2'x2' SQUARE (PEDESTAL POLE FOUNDATION) AND CENTER THE JOINT FILLER AROUND THE FOUNDATION AS DIRECTED BY THE ENGINEER. ORIENT THE EXPANSION JOINTS PARALLEL TO OTHER GEOMETRIC LINES.

POLE FOUNDATION IN SIDEWALK AREA
NOTES:

1. WHEN POURING THE CONCRETE WALK BASE, EMBED 1/2" THICK EXPANSION JOINT FILLER (606.03C AND 705.03). FORM A 3'x3' SQUARE (STRAIN POLE AND MAST ARM POLE FOUNDATION) OR 2'x2' SQUARE (PEDESTAL POLE FOUNDATION) AND CENTER THE JOINT FILLER AROUND THE FOUNDATION AS DIRECTED BY THE ENGINEER. ORIENTATE THE FILLER SQUARE PARALLEL TO OTHER GEOMETRIC LINES.

2. REBAR CAGE NOT SHOWN FOR CLARITY.


4. LEVEL & SLOPE THE SUBGRADE AS SHOWN. COMPACT THE SUBGRADE AROUND THE FOUNDATION. THOROUGHLY CLEAN THE CONCRETE FOUNDATION SURFACE SO THE CONCRETE WALK BASE WILL BOND.

5. LEAVE THE FOUNDATION CONCRETE DOWN 8". POUR THE CONCRETE WALK BASE OVER THE LOWERED FOUNDATION.

6. PAVER AND SETTING BED DIMENSIONS SHALL BE PER CITY OF COLUMBUS STANDARD DRAWING 2301 OR PER PLAN.
SURFACE MUST BE LEVEL & CLEAN
EDGE CORNER WITH 1/2" SIDEWALK EDGER (TYPICAL ALL SIDES)

GROUND WIRE (9)

CUT CONDUITS OFF WITHIN 2" ABOVE SURFACE. METAL CONDUITS SHALL HAVE BUSHINGS AND BE CENTERED IN FOUNDATION.

ANCHOR BOLTS & CONDUITS ARE INCIDENTAL TO THIS ITEM.

CONTROLLER WORK PAD SEE DETAIL ON SHEET 2

ANCHOR BOLTS CAN BE ENCASED IN CONCRETE OR MIN. 8" STUD ANCHOR BOLTS CAN BE INSTALLED BY FIELD DRILLING.

CONDUITS PER PLAN; 2' RADIUS

PERMANENTLY EMBED A VISIBLE MARKER IN THE CONCRETE ON TOP OF THE BASE 5" FROM THE EDGE & OVER THE EXITING 3/4" PVC CONDUIT.

GROUND RODS ARE 1"X10' AND SPACED 6' APART. DO NOT ENCASE END OF ROD IN CONCRETE.

NOTE:
USE EXPANSION MATERIAL BETWEEN THE BASE CONCRETE & OTHER CONCRETE AREAS.
### Controller Cabinet and Foundation Dimensions

<table>
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<tr>
<th></th>
<th>M36 Stretch (In.)</th>
<th>Size 6 Cabinet (In.)</th>
<th>P-UPS Cabinet (#1) (In.)</th>
<th>P-UPS Cabinet (#2) (In.)</th>
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<tr>
<td>C₀ = Cabinet Depth</td>
<td>17</td>
<td>26</td>
<td>26</td>
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<tr>
<td>Cₘ = Cabinet Width</td>
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<td>Fₘ₁ = Foundation Width 1</td>
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<td>Fₘ₂ = Foundation Width 2</td>
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</table>

*Pole mounted cabinet (no foundation)

### UPS Cabinet Foundation / Work Pad

#### Type 1

- **UPS #1**
  - Door
  - Door Hinge
  - Concrete Pad
  - Door Hinge

#### Type 2

- **UPS #2**
  - Door
  - Door Hinge
  - Concrete Pad

### Size 6 Cabinet Foundation / Work Pad

- **Signal Cabinet**
  - Door Hinge
  - Door

- **Concrete Work Pad or Sidewalk**

### M36 Stretch Cabinet Work Pad

- **Strain Pole**
  - Door Hinge
  - Door

### Traffic Signal Controller Cabinet Foundation

**NOTE:**

Build-up/stabilization of surrounding area may be required by engineer and is incidental to the installation. This applies to all sloped area installations.

---

**Traffic Signal Controller Cabinet Foundation**

- **City of Columbus, Ohio**
- **Department of Public Service**
- **Division of Design and Construction**
- **STD DWG 4162**
- **City Engineer**
- **SHT 2 OF 2**
**FOUNDATION DETAILS**

<table>
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<th>PEDESTAL TYPE (HT.)</th>
<th>DEPTH (D)</th>
<th>BOLT CIRCLE</th>
<th>REBAR REQUIRED</th>
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**SECTION VIEW**

**TOP VIEW**

**PEDESTAL ANCHOR BOLT**
ANCHOR BOLT PROJECTS 2.75" ABOVE BASE

(4) 36"-8 NC GALV STEEL
ANCHOR BOLTS, ASTM F-1554 GR55, TOP 10" GALV PER ASTM A153, "L" SHAPED (4"L)
(4) 8 NC GALV STEEL HEX NUTS
(4) GALV STEEL LOCKWASHERS
NOTES:

1. 1/2" PREFORMED JOINT FILLER AS PER 608.03C SHALL BE USED BETWEEN FOUNDATIONS AND ADJACENT PAVED OR CONCRETE AREAS.

2. THE TYPE, SIZE, NUMBER (MINIMUM OF 2) AND ORIENTATION OF CONDUIT ELLS SHALL BE AS SHOWN IN THE PLAN, EXCEPT THAT A 3/4" SCHEDULE 40 PVC CONDUIT SHALL BE INSTALLED IN EACH FOUNDATION. UNUSED CONDUIT ELLS SHALL BE CAPPED.

3. THE SIZE, NUMBER AND LOCATION OF ANCHOR BOLTS SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

4. ALL PEDESTALS SHALL BE PROVIDED WITH A METHOD OF SECURELY ATTACHING A 4 AWG INSULATED COPPER GROUNDING CONDUCTOR TO THE PEDESTAL OR ANCHOR BOLT. NO CABLES OR CONNECTIONS SHALL BE EXTERNAL TO THE PEDESTAL.

5. THE PEDESTAL BASE SHALL SET ON THE FOUNDATION TOP WITHOUT GROUTING, PREFORMED FILLERS OR LEVELING NUTS UNDER THE BASE. STAINLESS STEEL SHIMS MAY BE USED UNDER THE BASE FOR LEVELING THE INSTALLATION.

6. THE FOUNDATION AREA OF CONTACT WITH THE PEDESTAL BASE SHALL BE LEVEL. IF ADJACENT PAVED AREAS SLOPE, THE REMAINDER OF THE FOUNDATION TOP SHALL BE BEVELED TO MEET THE ADJACENT ELEVATIONS.

7. THE TOP OF THE FOUNDATION SHALL BE SET BASED ON THE FOLLOWING GUIDELINES:

A. FOUNDATION LOCATED ENTIRELY IN WALK OR CONCRETE AREA

TOP OF FOUNDATION SHALL BE AS PER CITY OF COLUMBUS STANDARD DRAWING 4161.

B. FOUNDATION LOCATED AT BACK OF RAMP AND/OR BEHIND WALK OR PATH


C. FOUNDATION LOCATED ADJACENT TO WALK OR CONCRETE AREA

TOP OF FOUNDATION SHALL BE FLUSH WITH WALK OR CONCRETE AREA.

D. FOUNDATION LOCATED ADJACENT TO WALK OR CONCRETE WITH STEEP GRADE CHANGE

POWER METER CABINET TYPE I
FOUNDATION

POWER METER
CABINET AND
FOUNDATION

CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF DESIGN AND CONSTRUCTION

CITY ENGINEER

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SHT 1 OF 4

POWER METER CABINET (12.00"W x 8.25"D x 50.00"H)

CITY SECTION

POWER PROVIDER/ SERVICE SECTION

WALK OR GROUND LEVEL

GROUND WIRE (PROVIDE 3' SLACK)

ANCHOR BOLTS

WELDED GROUND WIRE JUMPER VARNISH WELD

GROUND WIRE

GROUND WIRE

CUT CONDUITS OFF MIN. 2" ABOVE SURFACE

WALK OR GROUND LEVEL

3/4" SCH 40 PVC

1" x 10' GROUND ROD
(ADD RODS AS NEEDED FOR 10 OHMS OR LESS AS PER CMSC 625.16)

GROUND RODS ARE SPACED PER CMSC 625.16 (DO NOT ENCASE ROD OR EMT END IN CONCRETE)

2" SCH 40 CONDUIT FROM POWER SERVICE
2' R SWEEP
CONDUIT MUST ENTER SERVICE SIDE OF CABINET

36"

40"

36"

36"

28"

18"

18"

15"

18"

2" CONDUITS SCH 40 2' R SWEEP

2" SCH 40 CONDUIT TO SIGNAL CABINET
2' R SWEEP
CONDUIT MUST ENTER CITY SIDE OF CABINET

WALK OR GROUND LEVEL

2" SCH 40 CONDUIT FROM POWER SERVICE 2' R SWEEP CONDUIT MUST ENTER SERVICE SIDE OF CABINET
POWER METER CABINET TYPE II

120/240 VAC, 200 A METER BASE WITH BYPASS LEVER (13"W x 5"D x 19"H)

SCH 40 PVC ENTRANCE FITTING/END BELL (TYPICAL)

CONCRETE CABINET FOUNDATION (24"W x 19"D x 40"H)

TOP OF METER SOCKET 4" TO 6" FROM TOP OF ALUMINUM PANEL KIT

1" NON-METALLIC, FLEXIBLE CONDUIT CONNECTING POWER METER LOAD CONDUCTORS TO CIRCUIT BREAKER PANEL

GROUND BUS BAR MOUNTED TO METAL BACKPLATE WITHIN 1' OF BASE

WALK OR GROUND SURFACE ELEVATION

WELDED GROUND WIRE JUMPER VARNISH WELD

CABINET DOOR LOCKING BAR

POWER MET CABS METER (20"W x 15"D x 36"H)

SEE PLANS FOR DOOR ORIENTATION

1" FLEX PVC 6" R

CONDUITS MAY BE SLEEVED OVER CONDUIT ENTERING BOTTOM OF CABINET

3/4" SCH 40 PVC ANCHOR BOLTS

1" SCH 40 CONDUIT CONNECTING POWER METER LOAD CONDUCTORS TO CIRCUIT BREAKER PANEL

2" SCH 40 CONDUIT TO SIGNAL CABINET

1" X 10' GROUND RODS (ADD RODS AS NEEDED FOR 10 OHMS OR LESS AS PER CMSC 625.16)

GROUND RODS ARE SPACED PER CMSC 625.15. DO NOT ENCASE ROD OR END IN CONCRETE

GROUND WIRE

3/4" SCH 40 PVC

GROUN DIST BUR BAR WITHIN 1' OF BASE

3/4" SCH 40 PVC GROUND WIRE

1" NON-METALLIC FLEXIBLE SCH 40 CONDUIT CONNECTING POWER METER LOAD CONDUCTORS TO CIRCUIT BREAKER PANEL

1" FLEX PVC 1.75" R (TYPICAL)

BONDING JUMPER

CUT CONDUITS MIN. 2" ABOVE SURFACE CLAMP SERVICE/LOAD CONDUITS TO FLEXIBLE CONDUITS

2" SCH 40 CONDUIT FROM POWER SERVICE 2' R SWEEP

GROUND RODS

2" SCH 40 CONDUIT TO SIGNAL CABINET 2' R SWEEP USE ADAPTER FITTING IN CABINET TO CONNECT TO FLEXIBLE CONDUIT

2" SCH 40 CONDUIT FROM POWER SERVICE

POWER MET CABINET AND FOUNDATION

CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF DESIGN AND CONSTRUCTION

CITY ENGINEER

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10/01/2020
SHT 2 OF 4
POWER SERVICE
120/240 VAC SINGLE PHASE
3 WIRE

120/240 VAC 200 A METER BASE WITH BYPASS LEVEL

POWER METER SOCKET, 200 AMP, FIVE TERMINAL, RINGLESS, SINGLE POSITION LEVER BYPASS

NEUTRAL BUS BAR 7 TERMINAL (#14-#4 AWG)

N-G BONDING JUMPER

GROUND BUS BAR 7 TERMINAL (#14-#4 AWG)

GROUND ROD(S)

ENCLOSURE BONDING LUG (TYPICAL)

GROUNDING ELECTRODE CONDUCTOR

GROUND ROD(S)

POWER SERVICE WIRING DETAILS

POWER METER CABINET AND FOUNDATION

CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF DESIGN AND CONSTRUCTION

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4164

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SHT 3 OF 4

CITY ENGINEER
**FOUNDATION NOTES:**
1. USE EXPANSION MATERIAL BETWEEN FOUNDATION CONCRETE AND OTHER CONCRETE AREAS.
2. ANCHOR BOLTS AND CONDUITS ARE INCIDENTAL TO THIS PAY ITEM.
3. PERMANENTLY EMBED A VISIBLE MARKER ON TOP OF THE FOUNDATION 1" FROM THE EDGE AND CENTERED OVER THE EXITING 3/4" CONDUIT FOR GROUND WIRE.
4. FOUNDATION SURFACE SHALL BE LEVEL AND CLEAN.
5. ANCHOR BOLTS CAN BE ENCASED IN CONCRETE OR STUD ANCHORS CAN BE INSTALLED BY FIELD DRILLING.
6. FOUNDATION SHALL BE EDGED USING A 1/2" SIDEWALK EDGER.

**WIRING NOTES:**
1. A #4 WIRE LUG SHALL BE PROVIDED FOR ATTACHING A GROUNDING WIRE FROM A GROUND ROD. THE GROUNDING WIRE LUG SHALL BE CONNECTED TO THE NEUTRAL BUS BAR WITHIN THE LOAD CENTER ENCLOSURE.
2. THE NEUTRAL BUS BAR WITHIN THE LOAD CENTER SHALL BE BONDED TO THE GROUND BUS BAR, WHICH SHALL BE MOUNTED ON THE CABINET BACK PLATE WITHIN ONE FOOT OF THE CABINET FOUNDATION, DIRECTLY GROUNDING IT TO THE CABINET.
3. THE POWER METER SOCKET ENCLOSURE SHALL BE CONNECTED TO THE GROUND BUS BAR.

**CABINET NOTES:**
1. PROVIDE AN ARC FLASH HAZARD WARNING SIGN ON THE OUTSIDE OF THE FRONT DOOR OF THE CABINET IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE PARAGRAPH 110.16.

**FOR TYPE I CABINETS:**
1. THE CONTRACTOR SHALL LOCK THE METER CABINET'S HINGED METER SECTION AND THE CUSTOMER SECTION LIFT-OFF SERVICE COVER WITH PADLOCKS UNTIL ACCEPTED BY THE CITY, AT WHICH POINT THE CONTRACTOR SHALL REMOVE THE LOCKS AND THE CITY WILL PLACE THEIR LOCKS. THE POWER SERVICE SUPPLIER SHALL LOCK THE UTILITY SECTION LIFT-OFF SERVICE COVER.

**FOR TYPE II CABINETS:**
1. THE POWER METER CABINET SHALL BE A NEMA 3R, BASE-MOUNTED, LARGE SINGLE DOOR ENCLOSURE.
2. THE CABINET SHALL BE SUPPLIED WITH TWO (2) ADJUSTABLE “C” MOUNTING CHANNELS ON EACH SIDE WALL AND ON THE BACK WALL OF THE CABINET, AND THE CABINET SHALL BE SUPPLIED WITH AN ALUMINUM PANEL KIT THAT IS FULL HEIGHT OF THE CABINET.
3. THE POWER METER SOCKET ENCLOSURE SHALL BE MOUNTED TO THE PANEL KIT HORIZONTALLY IN THE POWER METER CABINET AND FOUR TO SIX INCHES FROM THE TOP.
4. THE LOAD CENTER PANEL SHALL BE A 60 AMP, TWO BREAKER, FOUR CIRCUIT CAPACITY ENCLOSURE WITH COVER AND DOOR INCLUDING 30 AMP, SINGLE POLE CIRCUIT BREAKERS REQUIRED AS PER PLAN WITH 10K AMP SHORT CIRCUIT CURRENT RATING.
5. THE LOAD CENTER PANEL SHALL BE MOUNTED TO THE RIGHT SIDE OF THE CABINET WALL.
6. THE CABINET MATERIAL SHALL BE 5052 MARINE GRADE, 0.125 INCH THICK ALUMINUM SHEETING WITH A 32 HARDNESS IN ITS NATURAL COLOR.
7. ALL EXTERIOR SEAMS SHALL BE EITHER CONTINUOUSLY WELDED, TACK WELDED, SEALED WITH A 15 TO 20 YEAR SILICONE SEALER, AND/OR OVERLAPPED SUCH THAT WATER DOES NOT ENTER THE CABINET. ALL CABINET EDGES SHALL BE SMOOTH (FREE OF ANY SHARP EDGES).
8. THE CABINET DOOR FRAME OPENING SHALL BE DOUBLE-FLANGED ON ALL FOUR SIDES. THE CABINET DOOR SHALL BE HINGED USING A HEAVY GAUGE CONTINUOUS HINGE THAT HAS A STAINLESS STEEL HINGE PIN. THE HINGE SHALL BE BOLTED TO THE CABINET SO THE DOOR CAN BE REMOVED.
9. THE BOLTS AND NUTS SHALL BE MADE OF STAINLESS STEEL, BE TAMPERPROOF AND SECURELY FASTENED TO PREVENT VIBRATIONS FROM LOOSEENING THE NUTS.
10. THE DOOR, SEALED WITH A NEOPRENE GASKET, SHALL BE EQUIPPED WITH A THREE (3) POINT LATCHING MECHANISM AND A HANDLE WHICH CAN BE PADLOCKED. THE DOOR SHALL BE DESIGNED SUCH THAT THE DOOR CAN BE LOCKED IN AN OPEN POSITION AT 90, 135, AND 180 DEGREES (NOMINAL VALUES) TO THE CABINET FACE.
11. BOLT PATTERN SHALL CONSIST OF AN ANCHOR BOLT POSITIONED IN EACH CABINET CORNER.
12. THE POWER METER CABINET SHALL BE SUPPLIED WITHOUT A DOOR LOCK, SWITCH COMPARTMENT, AND POLICE DOOR ON THE CABINET DOOR.
14. ALL AC+ AND NEUTRAL CONDUCTORS SHALL BE INSTALLED IN FLEXIBLE NON-METALLIC CONDUIT TO PREVENT ACCIDENTAL CONTACT DURING MAINTENANCE WITHIN THE CABINET. ONLY GROUND CONDUCTORS MAY BE INSTALLED OUTSIDE OF CONDUIT.

**POWER METER CABINET AND FOUNDATION**

CITY OF COLUMBUS, OHIO  
DEPARTMENT OF PUBLIC SERVICE  
DIVISION OF DESIGN AND CONSTRUCTION

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CITY ENGINEER

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ANCHOR BASE

HAN D HOLE REQUIRED IF SPAN WIRE CLAMP IS GREATER THAN 3' BELOW TOP OF POLE.

POLE HEIGHT

TAPERED TUBE

HANDHOLE

HAN D HOLE

EXTENDED STRAIN POLE

J HOOK

SPAN WIRE CLAMP

2''/3'' BLIND HALF COUPLING (SEE NOTE 1 & 6)

3''x5'' HANDHOLE

4'' x 6'' NOM. HANDHOLE

2''/3'' BLIND HALF COUPLING (SEE NOTE 1 & 6)

10/01/2018

CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF DESIGN AND CONSTRUCTION

STD DWG
4170

10/01/2018

CITY ENGINEER

SHT 1 OF 7
POLE DETAILS

ANCHOR BOLTS WITH STD. STEEL HEX NUTS AND PLAIN WASHERS (SEE NOTE 5)

SPAN WIRE CLAMP (SEE NOTE 2)

J HOOK (SEE NOTE 7)

POLE CAP 3 SET SCREWS (MIN.)

(SEE NOTE 4)

(SEE NOTE 10)

1/4" MIN.
POLE PLATE SKIRT

SECTION A-A

PRE-DRILLED
THREADED HOLE W/ S.S. BOLT

M

POLE PLATE WIDTH +1/4"

FOUNDATION

1/4" STEEL PLATE

1"

TOP VIEW

CORNER RADIUS TO MATCH POLE BASE PLATE RADIUS

ID = POLE OD + 1/4"

RADIUS

COVER GUIDE AND SECTION ATTACHMENT

STEEL BASE COVER

STRAIN POLE
BOLT CIRCLE

H (DIA.)

S

F

S

BASE PLATE

NO. 12 STAINLESS STEEL SINGLE JACK CHAIN SECURED WITH 0.19" X 0.50" POP RIVETS

5" MIN

UPPER HANDHOLE MINIMUM SIZE IS 4" x 6"

0.50" TAPPED HOLE IN THE RIM FOR A GROUND WIRE LUG BOLT

LOWER HANDHOLE

12 GA. H.R.M.S. COVER SECURED WITH 0.25" x 0.50" STAINLESS STEEL CAP SCREWS

5" MIN

8" MIN

10/01/2018

POLE TUBE WALL

COVER MOUNTING CLIP

SECTION A-A

LESS THAN 7 GA. = .19
7 GA. THRU 3 GA. = .25

STRAIN POLE

CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF DESIGN AND CONSTRUCTION
CITY ENGINEER

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10/01/2018
SHT 4 OF 7
ANCHOR TYPE SHACKLE

5/8" DIA. U-BOLT

3/16" STRANDED STAINLESS STEEL CLAMP

3/16" DIA. HOLES FOR 5/32" x 2" S.S. COTTER PINS

1/4" THICK CLEVIS

SPAN WIRE CLAMP

1-1/4"

2-1/2"

1-3/8" DIA. HOLE FOR 1" SCH 80 PIPE X 2-1/4" LONG

CONNECTION POINTS SHALL BE WELDED

5/8" HEX NUT AND LOCKWASHER

1/4"

3/4"

3/16"

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CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF DESIGN AND CONSTRUCTION

STRAIN POLE

STD DWG

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<th>TAPERED (NOTE A)</th>
<th>TAPERED (NOTE B)</th>
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NOTES:

A. TAPERED TUBE SHALL BE STEEL WITH A MINIMUM OF 55,000 PSI YIELD STRESS AFTER GALVANIZING.

B. DESIGN 5 SHALL BE ASTM A595M STEEL WITH A MINIMUM OF 55,000 PSI YIELD STRENGTH AFTER GALVANIZING. DESIGNS 6 THRU 14 SHALL BE ASTM A572M GRADE 55 OR 65 STEEL WITH A MINIMUM OF 55,000 OR 65,000 PSI YIELD STRENGTH AFTER GALVANIZING, RESPECTIVELY.

C. MAX. DESIGN BASE MOMENT; DESIGN 13 AND 14 STRAIN POLES ARE AASHTO 1994 COMPLIANT.
NOTES:

1. SIGNAL CABLE ENTRANCE SHALL BE A 2" MINIMUM BLIND HALF COUPLING PROVIDED IN EACH POLE ON CORNERS WITHOUT CABINET. MINIMUM OF 3" BLIND HALF COUPLING ON CORNER WITH CABINET OR AS SPECIFIED ON THE PLANS.

2. SPAN WIRE CLAMP SHALL BE GALVANIZED STEEL, CAPABLE OF RESISTING A LOAD OF 12,500 POUNDS MINIMUM WITHOUT PERMANENT DISTORTION.

3. FOR FOUNDATION DETAILS, INCLUDING ANCHOR BOLT DETAILS, SEE CITY OF COLUMBUS STANDARD CONSTRUCTION DRAWING 4160.

4. THE BASE PLATE SHALL BE WELDED TO TWO PLY POLES WITH AWS PREQUALIFIED WELDS IN CONFORMANCE WITH 730.04.

5. A MINIMUM OF ONE FULL BOLT THREAD SHALL REMAIN ABOVE THE ANCHOR NUT.

6. ALL UNUSED COUPLINGS SHALL BE PROVIDED WITH A REMOVABLE GALVANIZED CAST IRON PLUG.

7. PROVIDE 1 OR 2 WELDED CABLE SUPPORT HOOKS (‘J’ OR ‘C’ HOOKS) LOCATED ON THE INSIDE OF THE POLE.

8. STRAIN POLES SHALL BE COATED IN ACCORDANCE WITH THE PLANS.

9. PROVIDE 1, 2 OR 3 HANDHOLES, AS PER PLAN DESIGN, EACH COMPLETE WITH A COVER, A RECTANGULAR OR ELLIPTICAL REINFORCED FRAME, AND A STAINLESS STEEL FASTENER FOR THE COVER. THE FASTENER SHALL BE FLUSH WITH THE HANDHOLE SURFACE. THE HANDHOLES SHALL BE LOCATED 180 DEGREES FROM THE RESULTANT FORCE UNLESS SPECIFIED OTHERWISE.

   A.) THE HAND HOLE NEAR THE BRACKET ARM SHALL HAVE A MINIMUM INSIDE OPENING OF 3" X 5" AND BE SIMILAR IN DESIGN TO THE BOTTOM HAND HOLE EXCEPT THAT NO GROUNDING PROVISION IS REQUIRED.

   B.) THE HAND HOLE NEAR THE SPAN WIRE ATTACHMENT POINT SHALL HAVE A MINIMUM INSIDE OPENING OF 4" X 6" AND BE SIMILAR IN DESIGN TO THE BOTTOM HAND HOLE EXCEPT THAT NO GROUNDING PROVISION IS REQUIRED.

   C.) THE BOTTOM HAND HOLE SHALL HAVE A MINIMUM INSIDE OPENING OF 5" X 8". A GROUNDING PROVISION CAPABLE OF ACCEPTING 4 - #4 AWG COPPER GROUNDING WIRES SHALL BE PROVIDED AND SHALL BE ATTACHED TO THE FRAME.

10. PROVIDE A REMOVABLE POLE CAP ATTACHED EITHER BY A MINIMUM OF 3 STAINLESS STEEL SET SCREWS OR BY A STAINLESS STEEL THROUGH BOLT.

11. FOR BRACKET ARM DETAILS SEE CITY OF COLUMBUS STANDARD DRAWING 4110.
NOTES:

1. SIGNAL HEAD CONDUIT BRACKETS AND CONDUIT FITTINGS SHALL BE GALVANIZED AND PAINTED (EXCEPT POLE CLAMPS OR BANDS) TO MATCH THE POLE.

2. THE SIGNAL HEAD BRACKET ARMS SHALL BE ATTACHED TO STEEL POLES BY HUB PLATES ATTACHED TO THE POLE WITH 3/4" WIDE STAINLESS STEEL BANDS (TWO BANDS PER HUB PLATE).

   A. HOLES FOR WIRE ACCESS SHALL BE FIELD DRILLED.

      FIELD INSTALLATION OF THE WIRING HOLES FOR SIGNAL HEADS AND PUSHBUTTONS WILL BE PERMITTED PROVIDED THAT THE HOLES ARE DRILLED OR HOLE SAWN. NO TORCH CUTTING OR FIELD WELDING WILL BE PERMITTED. CUT SURFACES SHALL BE FILED SMOOTH AND COVERED WITH TWO COATS OF ZINC RICH PAINT. GROMMETS OR WIRING GUIDES SHALL BE INSTALLED IN THE HOLES.

3. VERTICAL SPACING BETWEEN BRACKET FITTINGS SHALL BE DETERMINED BY THE CONTRACTOR, AND SHALL BE THE DIMENSION FROM CENTERLINE TO CENTERLINE OF THE BRACKET ARMS NECESSARY TO ACCOMMODATE THE VERTICAL HEIGHT OF THE SIGNAL HEAD PLUS NOT MORE THAN 10".

4. OUTER JACKET OF THE PEDESTRIAN SIGNAL CABLE SHALL EXTEND INTO THE SIGNAL HOUSING

5. THE PEDESTRIAN SIGNAL HEAD HOUSING AND CLAM SHELL MOUNTING BRACKETS SHALL BE BLACK MATCHING FEDERAL STANDARD 595B, COLOR # 27038.

6. CLEARANCE DISTANCES PROVIDED IN THE OHIO DEPARTMENT OF TRANSPORTATION'S LOCATION AND DESIGN MANUAL, VOLUME 1 OR A MINIMUM OF 2', WHICH EVER IS GREATER, SHALL BE MAINTAINED.

7. PLACEMENT OF PEDESTRIAN PUSHBUTTONS SIGN SHALL BE PER CITY OF COLUMBUS STANDARD CONSTRUCTION DRAWING 4230.

POLE MOUNTING STANDARD

CITY OF COLUMBUS, OHIO DEPARTMENT OF PUBLIC SERVICE DIVISION OF DESIGN AND CONSTRUCTION

STD DWG 4200

8/01/2015

CITY ENGINEER

SHT 2 OF 2
OVERHEAD SIGNAL ATTACHMENTS - SPAN WIRE

CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF DESIGN AND CONSTRUCTION

STANDARD DRAWING

CITY ENGINEER

8/10/2017

SHT 1 OF 7
OVERHEAD SIGNAL ATTACHMENTS - SPAN WIRE

CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF DESIGN AND CONSTRUCTION

4202

8/10/2017

SHT 2 OF 7
OVERHEAD SIGNAL
ATTACHMENTS - SPAN WIRE

CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF DESIGN AND CONSTRUCTION

4202

8/10/2017

CITY ENGINEER

SHT 3 OF 7
DETAIL B2:
DOUBLE SPREADER BARS AND CROSS-BRACING ON SKEWED SPANS (BOTTOM VIEW)

TETHER WIRE

WIRE ROPE CLAMP

DIRECTION OF VEHICLE TRAVEL UNDER SIGNAL

STRAIN-RELIEF SPRING (SEE NOTE 9)

SPREADER BARS

CROSS-BRACES:
MIN. 0.125" THICK
2" WIDTH
GALVANIZED STEEL
(MAY BE FIELD DRILLED)

CROSS-BRACES:
MIN. 0.125" THICK
2" WIDTH
GALVANIZED STEEL
(MAY BE FIELD DRILLED)

OVERHEAD SIGNAL ATTACHMENTS - SPAN WIRE
NOTES:

1. ADJUST HANGER AND SPAN WIRE CLAMP TO ELIMINATE ALL PLAY BETWEEN HANGER AND CLAMP BY USING SHIM WASHERS AS NECESSARY. CAST 3/4" ALUMINUM MATCHING CLAMPS AND HANGERS WITH A TIGHT INITIAL FIT SHALL BE USED.

2. ALL SIGNAL HEAD ASSEMBLIES SHALL BE INSTALLED IN A PLUMB POSITION AND PERPENDICULAR TO THE APPROACH LANE.

3. ALL SIGNAL HEADS SHALL BE INSTALLED WITH THEIR LOWEST PART (INCLUDING TETHER ATTACHMENT HARDWARE AND BACKPLATES) WITH A CLEARANCE ABOVE THE ROADWAY PAVEMENT AT ALL POINTS OF 16.5' MINIMUM, 19' MAXIMUM. HOWEVER 17' IS PREFERRED HEIGHT. TO OBTAIN 17' IT IS INTENDED THAT THIS CLEARANCE BE OBTAINED WITHOUT THE USE OF BOTTOM EXTENDERS, BUT RATHER BY THE CAREFUL SELECTION OF FOUNDATION HEIGHTS, ATTACHMENT HEIGHTS, SPAN WIRE SAG, AND OTHER FACTORS DURING THE INSTALLATION. IF THE INSTALLATION CANNOT BE ADJUSTED TO THE PROPER CLEARANCE THE CONTRACTOR SHALL ADVISE THE CITY OF ALL SIGNALS WHICH EXCEED THE MAXIMUM.

4. SIGNAL HEAD ROTATION SHALL BE PREVENTED BY THE USE OF SERRATED RINGS AND TRI-STUDS OR OTHER POSITIVE LOCKING DEVICES INCORPORATED IN THE SIGNAL HOUSING AND AT CRITICAL LOCATIONS IN THE SUPPORTING HARDWARE. ONLY SINGLE-PIECE TRI-STUD ENTRANCE PORTS SHALL BE USED, NOT INSERTS. NYLON LOCKING OR DEFORMED-THREADED NUTS SHALL BE USED.

5. ALL CONDUCTORS SHALL HAVE ADEQUATE CLEARANCE BETWEEN HANGERS, THIMBLES, BULLRINGS, ETC. IN ORDER TO AVOID DAMAGE FROM RUBBING.

6. FOR ALL TETHERED INSTALLATIONS, BREAKAWAY TETHER ANCHOR(S) SHALL BE INSTALLED IN BOTTOM BRACKET. SIGNAL HEIGHT ADJUSTMENT SHALL BE MADE BY TOP-MOUNTED EXTENDERS ONLY. BREAKAWAY CLAMP SHALL BE FULL WIDTH WITH ROUNDED EDGES. CLAMP SHOULD COMRESS TETHER WIRE ONLY AGAINST A FLAT SURFACE (DETAIL A).

7. BACKUP TIE SHALL BE 1/4", 7-STRAND WIRE IDENTICAL TO TETHER WIRE. THREE CAST WIRE ROPE CLIPS ON EACH SIDE SHALL BE USED WITH 18" OVELAP AND SPACING AS SHOWN. TIE SHALL HANG NO LOWER THAN 17" ABOVE PAVEMENT, AND MUST NOT RUB AGAINST THE BREAKAWAY CLAMP. TIES UNDER 3-SECTION HEADS ARE RECOMMENDED IN WINDY AREAS; SHALL BE INSTALLED IF SPECIFIED IN PLANS, OR IF DIRECTED BY THE CITY. SPACING OF CLIPS MAY BE ADJUSTED TO ACCOMODATE ADJACENT HEADS. CLOSELY SPACED ADJACENT HEADS MAY SHARE A SINGLE BACKUP TIE AND WIRE ROPE CLIPS; THERE SHALL BE A MINIMUM OF THREE WIRE ROPE CLIPS BETWEEN HEADS.

8. MULTI-WAY HEADS WITH BACKPLATES SHALL NOT BE USED ON TETHERED SPANS. EXISTING MULTI-WAY HEADS SHALL BE SEPARATED AS DIRECTED BY THE CITY. REWIRE AS NECESSARY TO SEPARATE THE HEADS PER THE PROPER ALIGNMENT.

9. COMPRESSION SPRING, 0.375" OD, 0.054" WIRE DIAMETER, 10-12 COILS PER INCH, STAINLESS STEEL 6" MINIMUM LENGTH.
10. S-HOOK IS MATCHED TO THE STRAIN POLE DESIGN NUMBER (SEE TABLE 1). S-HOOK AND TURNBUCKLE ARE REQUIRED ONLY AT ONE END OF SIMPLE SPANS, ALL ENDS OF COMPLEX SPANS. S-HOOK SHALL BE CLOSED AT POLE END. IF S-HOOK BEGINS TO YIELD DURING INSTALLATION, IT SHALL BE REMOVED AND REPLACED. THE WIRE TENSION SHALL BE ADJUSTED TO MINIMIZE MOVEMENT OF SIGNAL HEADS IN HIGH WINDS. TYPICAL TENSION IS 600 TO 800 LBS.

**TABLE 1 - S-HOOK PROPERTIES**

<table>
<thead>
<tr>
<th>Strain Pole Design No.</th>
<th>Galvanized Mild Steel S-Hook Wire Diameter (Inches)</th>
<th>S-hook yield point (+10%/-20%) (Pounds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 - 14</td>
<td>1/2</td>
<td>3300</td>
</tr>
</tbody>
</table>

11. LOCK WIRE SHALL BE STAINLESS STEEL, 1/8" SOFT TEMPER, WOUND TO PREVENT TURNING OF THE TURNBUCKLE BODY. FINISHED SPAN SHALL HAVE AT LEAST 2" OF SPACE FOR TURNBUCKLE ADJUSTMENT. TURNBUCKLE SHALL NOT BE OVERTIGHTENED. USE 8-INCH HAND TOOLS, MAXIMUM.

12. IF SIGNAL ORIENTATION IS NOT PERPENDICULAR TO SPAN AND TETHER WIRE, THEN USE AN ANCHOR EXTENSION. CLAMP ASSEMBLY MUST BE ATTACHED TO THE FLAT SIDE OF THE EXTENDER BAR.

13. INSTALL SAFETY TIE AT EACH TURNBUCKLE. THIS WIRE SHALL BE 1"X19", 1/8" STAINLESS STEEL. TIE SHOULD BE SLACK, BUT NOT SO SLACK AS TO CONTACT POLE. USE 3 CLIPS PER END AT 3-1/4" SPACING.

14. TETHER WIRE SHALL BE 7-STRAND ASTM A475 HS OR EHS GRADE 1/4" ON ALL SPANS, INSTALL TETHER HORIZONTALLY. MAINTAIN PREFERRED CLEARANCE OF 17" OVER ROADWAY.

15. SPAN WIRE CLAMP AS PER CITY OF COLUMBUS STANDARD CONSTRUCTION DRAWING 4170 REQUIRED FOR TETHER WIRE ATTACHMENT OR APPROVED EQUAL RATED AT 3650 LBS. OR HIGHER. ALTERNATE ATTACHMENT METHOD SHALL NOT BE PERMITTED.

16. SAFETY TIE ANCHOR HEIGHT ABOVE TETHER IS ADJUSTED IN THE FIELD BEFORE S-HOOK IS INSTALLED. DIMENSION X (SAFETY TIE HEIGHT) SHALL BE ADJUSTED SO THAT THE MINIMUM VERTICAL CLEARANCE OF THE SAGGING TETHER WIRE ABOVE THE PAVEMENT WITHOUT THE S-HOOK INSTALLED IS AT LEAST 14'. MINIMUM DISTANCE BETWEEN THE SAFETY TIE CLAMP AND TETHER CLAMP SHALL BE 1.5" AND CONTAIN ENOUGH SLACK FOR HEAD TO SWAY IN HIGH WINDS. SAFETY TIE ANCHOR MAY BE ANY GALVANIZED OR STAINLESS STEEL POLE CLAMP ASSEMBLY RATED AT 3650 POUNDS OR HIGHER.

17. ON SPANS WITH BULLRINGS, A TIE SHALL BE PROVIDED BETWEEN MESSENGER AND TETHER BULLRINGS IF A 14" CLEARANCE CANNOT BE MAINTAINED AFTER S-HOOK OPENING. THIS VERTICAL TIE SHALL BE 1"X19", 1/16" STAINLESS STEEL. TIE SHALL BE SLIGHTLY SLACK, TIED BACK USING CAST WIRE ROPE CLIPS AS SHOWN. WIRE ROPE CLIPS SHALL NOT BE OVER-TIGHTENED.

18. FOR BACKPLATES SEE CITY OF COLUMBUS STANDARD CONSTRUCTION DRAWING 4205.

19. ALL SPREADER BAR HARDWARE SHALL BE STAINLESS STEEL, WITH NYLON LOCKING OR DEFORMED-THREAD NUTS.

20. DO NOT TETHER SIGNS ON SIGNAL SPANS.
NOTE:

ALL BACKPLATES SHALL HAVE LOUVERS AND 2" FLUORESCENT YELLOW REFLECTIVE BORDER. BORDER SHALL NOT BE APPLIED OVER LOUVERS. LOUVERS SHOULD BE ORIENTED TO SCOOP AIR FROM THE FRONT SIDE AND ORIENTED WITH THE OPENINGS FACING ALTERNATE DIRECTIONS BY GROUPS, AS SHOWN. LOUVER OPEN AREA SHALL BE AT LEAST 8 PERCENT OF THE TOTAL BACKPLATE AREA. 5-SECTION BACKPLATES SHALL HAVE NOTCHED TOP CORNERS, AS SHOWN.
NOTE:
THE BOTTOM OF THE PUSHBUTTON SIGN SHALL BE MOUNTED JUST ABOVE THE TOP OF THE PUSHBUTTON.

Pedestrian Signal Heads Present
NOTE:
THE BOTTOM OF THE PUSHBUTTON SIGN SHALL BE MOUNTED JUST ABOVE THE TOP OF THE PUSHBUTTON.

Pedestrian Signal Heads Not Present

PUSHBUTTON AND SIGN INSTALLATION DETAIL

CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF DESIGN AND CONSTRUCTION

STD DWG
4230

10/01/2018

CITY ENGINEER

SHT 2 OF 2
NOTES:

1. USE A MINIMUM OF 2 BRACKETS (LOCATED 6" FROM TOP AND BOTTOM OF SIGN) PER INSTALLATION WITH MAXIMUM SPACING OF 3'.

2. ALL MOUNTING HARDWARE SHALL BE COATED TO MATCH SUPPORT STRUCTURE.

3. STAINLESS STEEL BANDING SHALL NOT BE PAINTED.

SIGN SUPPORT ASSEMBLY
POLE MOUNTED

CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF DESIGN AND CONSTRUCTION

STD DWG 4253
5/01/2014
SHT 1 OF 1
**VEHICULAR DETECTOR STANDARDS**

**CITY OF COLUMBUS, OHIO**
**DEPARTMENT OF PUBLIC SERVICE**
**DIVISION OF DESIGN AND CONSTRUCTION**

**STD DWG 4300**

**07/01/2020**

**SHT 1 OF 7**

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**NOTES:**

1. **ONLY ONE SET OF LOOP WIRES SHALL BE RUN IN A SAW SLOT.**

2. **ALL ADJACENT SAW SLOTS SHALL HAVE A MINIMUM DISTANCE OF 1 FT BETWEEN THEM. NO SAW SLOT SHALL BE LOCATED WITHIN 1 FT OF A LONGITUDINAL OR TRANSVERSE JOINT IN P.C.C. PAVEMENTS IF THE SLOT IS PARALLEL TO THE JOINT.**

3. **DETECTOR LOOPS SHALL EACH BE ON A SEPARATE DETECTOR UNIT CHANNEL.**

4. **ALL CONDUIT FROM THE LOOP DETECTOR TO THE PULL BOX SHALL BE 725.04.**

5. **THE DETECTOR LOOP SHALL BEGIN 20 FT. BEHIND THE STOP LINE.**

6. **THE DETECTOR LOOP SHOULD EXTEND TO WITHIN 15 FT. OF THE CROSSING STREET'S EXTENSION OF THE FACE OF CURB/EDGE LINE.**

7. **DETECTOR LOOPS SHALL NOT EXCEED 39 FT. IN LENGTH.**

8. **THE 15 FT. REQUIREMENT MAY BE INCREASED IN ORDER TO NOT EXCEED THE MAXIMUM LENGTH REQUIREMENT.**

---

**MULTIPLE LOOP DETECTOR INSTALLATION DETAIL**

**VEHICULAR DETECTOR**

*LANE WIDTH. DOES NOT INCLUDE WIDTH OF CURB AND GUTTER. LOOP SHALL BE CENTERED IN LANE AND SHALL MAINTAIN 2.5' FROM ADJACENT LANES.*

**LOOP WIDTH**

<table>
<thead>
<tr>
<th>LANE WIDTH (W)</th>
<th>LOOP WIDTH (FT.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 ≤ W &lt; 11</td>
<td>5.0</td>
</tr>
<tr>
<td>11 ≤ W &lt; 12</td>
<td>5.5</td>
</tr>
<tr>
<td>12 ≤ W &lt; 13</td>
<td>6.0</td>
</tr>
<tr>
<td>13 ≤ W &lt; 14</td>
<td>3.5 - 3.5 (Q)</td>
</tr>
<tr>
<td>14 ≤ W &lt; 15</td>
<td>4.0 - 4.0 (Q)</td>
</tr>
<tr>
<td>15 ≤ W &lt; 16</td>
<td>4.5 - 4.5 (Q)</td>
</tr>
<tr>
<td>16 ≤ W &lt; 17</td>
<td>5.0 - 5.0 (Q)</td>
</tr>
<tr>
<td>W ≥ 17</td>
<td>USE TWO LOOPS</td>
</tr>
</tbody>
</table>

(Q) = QUADRUPOLE LOOP

**2" CONDUIT (TYP.) W/ LEAD-IN CABLE**

**PULL BOX**

(12"X18" FOR 1 TO 3 LOOPS)
(18"X24" FOR 4 TO 6 LOOPS)
USE MULTIPLE PULL BOXES IF GREATER THAN 6 LOOPS

**1" CONDUIT (725.04) SHALL EXTEND 2' PAST CURB/CURB & GUTTER/BERM OR TO LOOP PULL BOX IF CLOSER THAN 2'. SEE SHEET 5.**
RECTANGULAR DETECTOR LOOP DETAILS

WIDTH AS SPECIFIED IN PLAN

LENGTH SPECIFIED IN PLAN

SEE DETAIL A ON SHEET 6 OF 7

SEE CONDUIT DRILLED HOLE DETAIL ON SHEET 5 OF 7.

SAW CUT LAYOUT

WINDING PATTERN
SEE TABLE FOR NUMBER OF turns

<table>
<thead>
<tr>
<th>LOOP TYPE</th>
<th>NUMBER OF turns</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRESENCE DETECTION LOOPS</td>
<td>3</td>
</tr>
<tr>
<td>ADVANCED DETECTION LOOPS (6&quot;x6&quot;)</td>
<td>4</td>
</tr>
</tbody>
</table>

VEHICULAR DETECTOR STANDARDS

CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF DESIGN AND CONSTRUCTION

STD DWG 4300
07/01/2020
CITY ENGINEER
SHT 2 OF 7
QUADRUPOLE LOOP DETAILS

WIDTH AS SPECIFIED IN PLAN

LENGTH SPECIFIED IN PLAN

SEE DETAIL A ON SHEET 6 OF 7

SEE "CONDUIT DRILLED HOLE DETAIL" FOR 1" CONDUIT ON SHEET 5 OF 7

SAW CUT LAYOUT

WINDING PATTERN
NUMBER OF TURNS IS 2-4-2

VEHICULAR DETECTOR STANDARDS
WINDING DETAIL

BICYCLE ONLY
LOOP DETECTOR
INSTALLATION DETAIL

BICYCLE LOOP CONSTRUCTION

<table>
<thead>
<tr>
<th>LOOP TYPE</th>
<th>NUMBER OF turning</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRESENCE DETECTION LOOPS</td>
<td>3-3-3-3</td>
</tr>
</tbody>
</table>

VEHICULAR DETECTOR STANDARDS

CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF DESIGN AND CONSTRUCTION

STD DWG 4300

07/01/2020

CITY ENGINEER

SHT 4 OF 7
NOTES:

1. THE DRILLED HOLE SHALL BE LOCATED AS SHOWN ABOVE AND WITHIN THE FULL DEPTH PAVEMENT. IT SHALL NOT BE DRILLED OR CUT THROUGH THE PAVED BERM, CURB OR CURB AND GUTTER SECTION.

2. IN AREAS OF POOR PAVEMENT CONDITION, THE SAW SLOT DEPTH SHALL BE INCREASED TO INSURE ADEQUATE WIRE EMBEDMENT. ALL FIELD ADJUSTMENTS SHALL BE SUBJECT TO THE APPROVAL OF THE ENGINEER.

3. IF AN EXISTING PAVED BERM IS 4.5" THICK OR MORE, THE LOOP WIRE MAY BE INSTALLED IN A SAW SLOT CUT ACROSS THE BERM. WHEN PAVED BERM ARE LESS THAN 4.5" THICK, THE CONDUIT RACEWAY SHALL BE INSTALLED AS SHOWN.

**TYPICAL DRILLED HOLE LOCATIONS FOR 1" CONDUIT**

**VEHICULAR DETECTOR STANDARDS**

CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF DESIGN AND CONSTRUCTION

STD DWG 4300

07/01/2020

SHT 5 OF 7
JOINT CROSSING DETAIL
IN PORTLAND CEMENT CONCRETE
PAVEMENTS

CUT OUT PAVEMENT AND JOINT
MATERIAL TO DEPTH OF SAWCUT
APPROXIMATELY 3"
SQUARE OR 3" DIAMETER.
LAY WIRES IN "S" SHAPE.
FILL WITH ELASTIC JOINT
MATERIAL OR ASPHALT.

DETAIL A

1 1/4" DIAMETER (MIN.) HOLE
DRILLED TO DEPTH OF SAW SLOT.
SPLICE ENCLOSEMENT DETAIL

NOTES:

1. LOOP DETECTOR WIRE TO LEAD-IN CABLE SPLICES WITHIN THE ENCAPSULATED SPLICE ENCLOSURE SHALL BE SOLDERED.

2. IF A PULLBOX IS NOT SPECIFIED IN THE PLANS, THE WATERPROOF SPLICE ENCLOSURE SHALL BE LOCATED IN THE FIRST ENTERED POLE OR PEDESTAL, EXCEPT IF THE CONTROLLER CABINET IS MOUNTED ON THAT POLE OR PEDESTAL, IN WHICH CASE THE LOOP WIRES SHALL BE ROUTED DIRECTLY INTO THE CABINET.

3. THE ENCLOSURE SHALL NOT CONTAIN VISIBLE AIR BUBBLES (VOIDS) GREATER THAN 1/4 IN (16 MM)

4. LOOP SLOT DEPTH SHALL BE 4 IN.

5. LOOP DETECTOR WIRE IN TUBING SHALL BE AS SPECIFIED IN CMSC TABLE 732.19-1

6. LOOP DETECTOR SEALANT SHALL BE PER THE CITY OF COLUMBUS PRE-QUALIFIED PRODUCT LIST.

7. SAW SLOTS SHALL BE THOROUGHLY CLEANED AND DRIED PRIOR TO INSTALLATION OF SEALANT.
NOTES:

BICYCLE DETECTOR MARKINGS SHALL:
- Be used when a bicycle needs to actuate a traffic signal phase in order to proceed through an intersection.
- Not be used for right turn only lanes, when right turn on red is permitted.
- Not be used for second vehicle detection.
- Be accompanied by a R10-22 bicycle detector sign.

PLACEMENT GUIDELINES:
- Locate near the stop line.
- Locate to avoid conflicts with other markings.
- Locate in the right-most through lane and right-most left turn lane.
- Locate on the left side of an induction loop, except for the left lane of one-way streets.
- Locate on the right side of an inductive loop for the left lane of one-way streets.

INDUCTIVE LOOP DETECTOR APPLICATION

BIKE DETECTOR MARKINGS

CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF DESIGN AND CONSTRUCTION

CITY ENGINEER

STD DWG 4301
8/10/2017
SHT 1 OF 2
BIKE DETECTOR MARKINGS SHALL:
- BE USED WHEN A BICYCLE NEEDS TO ACTUATE A TRAFFIC SIGNAL PHASE IN ORDER TO PROCEED THROUGH AN INTERSECTION.
- NOT BE USED FOR RIGHT TURN ONLY LANES, WHEN RIGHT TURN ON RED IS PERMITTED.
- NOT BE USED FOR SECOND VEHICLE DETECTION.
- BE ACCOMPANIED BY A R10-22 BICYCLE DETECTOR SIGN.

PLACEMENT GUIDELINES:
- LOCATE NEAR THE STOP LINE.
- LOCATE TO AVOID CONFLICTS WITH OTHER MARKINGS.
- LOCATE IN THE RIGHT-MOST THROUGH LANE AND RIGHT-MOST LEFT TURN LANE.
- LOCATE IN THE HORIZONTAL CENTER OF A RADAR OR VIDEO DETECTION ZONE.
STAPLE TO POLE AT 5' INTERVALS. COVER WITH WIRE MOULDING OR PLACE THE WIRE IN 1/2" SCH. 80 PVC FROM THE GROUND LINE TO 10' ABOVE THE GROUND LINE.

SEE NOTE 1 ON SHEET 2.

GROUND CLAMP, TYPE FOR BARE MESSENGER WIRE

4 AWG INSULATED GROUNDING CONDUCTOR

MESSENGER WIRE

SUSPENSION CLAMP

THIMBLE (SEE NOTE 1 ON SHEET 2)

SQUARE NUTS

LOCKNUT

MESSENGER WIRE

WOOD POLE

SIDE VIEW

LASHING WIRE

CLAMP

SPINNING OR LASHING RODS

1' MAX

LOOP DETECTOR LEAD-IN CABLE TO CONTROLLER OR CONTINUED ON SPAN

CABLE TO CONTROLLER BY CONDUIT RISER OR BY WEATHERHEAD TO THE INSIDE OF POLE

CONTINUATION OF POLE (SEE NOTE 5)

STEEL POLE

WEATHERHEAD

LASHING WIRE

CLAMP

CLAMP MESSANGER

MESSANGER WIRE

4 AWG INSULATED BONDING JUMPER

FOR PAINTED POLES DRILL AND TAP FOR A 1/2" GROUNDING BOLT WITH TWO WASHERS

3-BOLT CLAMP, OR PREFORMED DEAD END MAY BE USED

GROUND CLAMP

GROUND CLAMP

WOOD POLE

FRONT VIEW

LOOP DETECTOR

LEAD-IN ATTACHMENT

DETAILS

1' MAX
NOTES:

1. MESSENGER WIRE POLE ATTACHMENT SHALL BE BY A POLE CLAMP ON STEEL POLES AND BE A 5/8" THRU-BOLT (OR THIMBLE-EYE BOLT) WITH WASHERS ON WOOD POLES.

2. THE LOOP DETECTOR LEAD-IN CABLE SHALL HAVE A SAG BETWEEN 3% AND 5% OR MATCH EXISTING UTILITY LINES.

3. THE POWER SERVICE MESSENGER WIRE SHALL BE GROUNDED AT THE FIRST AND LAST POLES IN A CABLE RUN AND AT INTERVALS NOT TO EXCEED 1200 FEET. WHEN ATTACHED TO WOOD POLES, THE MESSENGER WIRE SHALL BE GROUNDED BY BONDING TO AN EXISTING GROUND ROD. THE MESSENGER WIRE SHALL BE BONDED TO GROUNDED STEEL POLES BY USE OF A 1/2" BOLT, DRILLED AND TAPPED INTO THE POLE.

4. THE MINIMUM 3-BOLT CLAMP SHALL BE 6 INCH LONG WITH 1/2" DIAMETER BOLTS. PREFORMED GUY GRIPS SHALL NOT BE USED TO ATTACH THE MESSENGER WIRE TO THE SIGNAL POLES. THEIR USE IS LIMITED TO BULLRING ATTACHMENTS.

5. FOR CONTINUATION OF POLE SEE CITY OF COLUMBUS STANDARD CONSTRUCTION DRAWING 4050.
"WHEN X" IS NOT EQUAL TO 180° OR AT A TERMINUS POINT A DOWN GUY IS REQUIRED.

NOTES:

1. FOR ANGLES OF 166° THROUGH 180° USE ATTACHMENT DETAILS SHOWN ON CITY OF COLUMBUS STANDARD CONSTRUCTION DRAWING 4330. MESSENER WIRE POLE ATTACHMENT SHALL BE BY A POLE CLAMP ON STEEL POLES AND BY A 5/8 INCH THRU-BOLT OR THIMBLEYE BOLT WITH 2" SQUARE WASHERS ON WOOD POLES.

2. POWER SERVICE MESSENER WIRE SHALL BE ELECTRICALLY GROUNDED AT THE FIRST AND LAST POLES IN A CABLE RUN AND AT INTERVALS NOT TO EXCEED 1200 FEET.

3. WHEN ATTACHED TO WOOD POLES, THE MESSENER WIRE SHALL BE GROUNDED BY BONDING TO EXISTING SIGNAL GROUND WIRE OR CONNECTION TO A GROUND ROD. THE MESSENER WIRE SHALL BE BONDED TO GROUNDED STEEL POLES BY USE OF A 1/2" BOLT, DRILLED AND TAPPED INTO THE POLE.

4. LOOP DETECTOR LEAD-IN CABLE SHALL HAVE A SAG TO MATCH THE EXISTING UTILITY LINES OR WHEN NO EXISTING LINES A SAG OF 3% TO 5%.

5. GROUNDING OF POLES SHALL BE AS SHOWN ON CITY OF COLUMBUS STANDARD CONSTRUCTION DRAWING 4330.