# Standard Drawing Index

City of Columbus, Ohio

Department of Public Service
Division of Design and Construction

Reference Index of Standard Construction Drawings

[4000-4333]

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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/BORRED AREA.

3. FOR TRAFFIC SIGNAL CONDUIT BANK AND CONDUIT SEE CITY OF COLUMBUS STANDARD DRAWING 4001.
TRENCH SECTION
CONCRETE ENCASED CONDUIT

NOTE:
"W" IS WIDTH OF CONDUIT.

USE AS DIRECTED.

SIDE ELEVATION
CONCRETE ENCASED CONDUIT

10'-0" STANDARD CONDUIT

2'-6" MAX.
5'-0" INTERVALS
2'-6" MAX.

BOTTOM OF TRENCH
SPACER
COUPLING

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

CONCRETE VARES.
SEE STD DWG 4001.

BIND CONDUIT AND
SPACER USING
GALVANIZED WIRE

3" MIN.

CONCRETE

"W"

3" MIN. CONCRETE

3" MIN. CONCRETE

3" MIN.

NOTE:
"W" IS WIDTH OF CONDUIT.

USE AS DIRECTED.

APPROVED
BACKFILL

8/10/2017
ONE 2" CONDUIT ENCased

ONE 3" CONDUIT ENCased

* TRENCH DEPTH MAY VARY PER PLAN DETAILS

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)

CONCRETE ENCASEMENT

5' SPACER SEPARATION ALONG CONDUIT RUN

CONDUIT WRAPPED W/GALVANIZED WIRE EVERY FIVE FEET

TRENCH DEPTH MAY VARY PER PLAN DETAILS

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

TRAFFIC SIGNAL CONDUIT BANK STANDARDS

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

NOTE:
SMALLER DIAMETER CONDUITS MAY NEED WRAPPED SEPARATELY.

* TRENCH DEPTH MAY VARY PER PLAN DETAILS
FIVE 2" & ONE 1.5" CONDUIT BANK
3" CONCRETE ENCASEMENT - TYPE 1
(4-3/8" CENTER-CENTER CONDUIT SEPARATION)

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

* TRENCH DEPTH MAY VARY PER PLAN DETAILS

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

**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 5 OF 9

* TRENCH DEPTH MAY VARY PER PLAN DETAILS

NOTE:

SMALLER DIAMETER CONDUITS MAY NEED WRAPPED SEPARATELY.
CONDUIT BANK

TRAFFIC SIGNAL
CONDUIT BANK STANDARDS

NOTES:
ARRANGEMENT OF MULTICELL CONDUIT SHALL BE DETERMINED BY DESIGN.
SMALLER DIAMETER CONDUITS MAY NEED WRAPPED SEPARATELY.

* TRENCH DEPTH MAY VARY PER PLAN DETAILS
TOP OF FINISHED SURFACE

18" TRENCH MAX.

17" MIN.

36" *

5' SPACER SEPARATION ALONG CONDUIT RUN

(1)-1.5"
CONDUIT W/TRACING WIRE

10.5"

CONDUIT WRAPPED W/GALVANIZED WIRE EVERY FIVE FEET

CONCRETE ENCASEMENT

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

TOP OF FINISHED SURFACE

18" TRENCH MAX.

17" MIN.

36" *

5' SPACER SEPARATION ALONG CONDUIT RUN

(1)-1.5"
CONDUIT W/TRACING WIRE

17"

CONDUIT WRAPPED W/GALVANIZED WIRE EVERY FIVE FEET

CONCRETE ENCASEMENT

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.
* 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

TRAFFIC SIGNAL CONDUIT BANK STANDARDS
INTERCONNECT / TRAFFIC SIGNAL CONDUIT AND TRAFFIC SIGNAL POWER CONDUIT
WITH 3" CONCRETE ENCASEMENT
MINIMUM DUCT BANK SEPARATION

* TRENCH DEPTH MAY VARY PER PLAN DETAILS
CONDUIT PARALLEL TO GUARDRAIL

CONDUIT GUARDRAIL PROTECTION

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

CONDUIT CROSSING GUARDRAIL
GUARDRAIL POST (TYP.)
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.
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 35B SPECS)

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

MASTIC

LIFTING LOOP

REMOVE WIRE MESH IN KNOCKOUT AREA CENTER

DUCTS IN KNOCKOUT

SECTION X-X PULL BOX
WITH FRAME AND LID

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

12" OD

12" OF #57 COMPACTED AGGREGATE

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

KNOCKOUT AREA

FRAME EDGE

CENTER CASTING ON PULL BOX

USE CLIP WHEN FRAME QUADRANT AREA IS IN DIRT.

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

TRAFFIC

27" I.D.

ANCHOR & CLIP
AS REQUIRED

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

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

3.8" 4"

AS REQUIRED

ANCHOR & CLIP

35" O.D.

FRAME QUADRANT

AREA IS IN DIRT.

TRAFFIC X X

(4" TO 5" LOOP)

AREA IS IN DIRT.

27" I.D.

4021
CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF DESIGN AND CONSTRUCTION
CITY ENGINEER

PULL BOX
27"

STD DWG
4021
8/10/2017
SHT 1 OF 3
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 35B SPECS)

1 1/2"

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

1"

2 1/2"

3 1/2"

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

1/2" STAINLESS STEEL COPPER COMPRESSION TERMINAL, UL LISTED AND APPROVED FOR #4 AWG COPPER WIRE
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 ENTRAPMENT 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 DUCT SEALED IN THE PULL BOX.

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

CLIP PROFILE (NOM. VALUES)

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

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

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

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

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

0.5" x 5.5" (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

SECTION X-X PULL BOX WITH FRAME AND LID

TOP VIEW OF CONCRETE PULL BOX

3/4" DIA. NC THREADED 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

ANCHOR & CLIP (4 EA)
PULL BOX
32"

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

STD DWG
4022
8/10/2017

CITY ENGINEER

GROUND BOLT INSTALLATION DETAIL

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

FRAME AND COVER DETAIL

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

2" RAISED LETTERS
FLUSH W/TOP SURFACE

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

1"

3 1/2"

35 5/8"
34 5/8"
34 1/4"
1"

1/2"

32 1/2"
34 5/8"
38 1/2"

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

GROUND BOLT

1 1/2"

2 1/2"

3 1/2"

TRAFFIC

OPEN PICK HOLE

4022
CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF DESIGN AND CONSTRUCTION

CITY ENGINEER

SHT 2 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 ENTRAPMENT 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 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. CONTRACTOR SHALL REPLACE THE CONCRETE HOUSING IF DAMAGED AT HIS EXPENSE.

ANY CONDUIT THAT EXITS A PULL BOX, CONTAINS CABLE AND DIRECTLY ENTERS ANY ELECTRONIC CABINET, SHALL BE DUCT SEALED IN THE PULL BOX.

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

1 SHEET 3 x 8
W3 x W2 STEEL MESH
2.5" DIA DRAIN HOLE

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.

0.5" x 5.5" (NOM.) SSLT WEDGE ANCHOR, WASHER AND NUT WITH CLIP. FIELD DRILL ANCHOR HOLE IN CONCRETE PULL BOX.

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

The clip profile (nominal values):
- 0.7"
- 0.25"
- 3.8"
- 1.25"

3 - #5 DIAGONAL, BOTH SIDES (TIE BELOW), 1.5" CLR.

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

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

CITY ENGINEER

STD DWG
4023
8/10/2017
SHT 1 OF 4
**PULL BOX TOP SECTION DETAIL**

- **3 - #5 DIAGONAL, BOTH SIDES (TIE BELOW), 1.5" CLR.**
- **34" DIA OPENING**
- **GROUND BOLT**
- **10"**
- **14"**

**USE WHEN PLACING PULL BOX OVER EXISTING CONDUITS**

**TYPE 2**

**PULL BOX 48"**

**SECTION X-X**

**PULL BOX WITH FRAME AND LID TYPE 2**

- **#5 @ 9" O.C., E.W.; POURED IN PLACE**
- **#57 COMPACTED AGGREGATE**
- **24"**
- **48" ID**
- **58" OD**
- **70" DIA.**
- **10"**
- **6"**
- **6.5"**
- **56" 60°**
- **LIFTERS (TYP.)**
- **Mastic**
- **4"**

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

**CLIP PROFILE (NOM. VALUES)**

- **0.7"**
- **0.25"**
- **3.8"**
- **2.6"**
- **1.25"**
- **1.5"**

**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**

**4"**

**1 SHEET 3 x 8 W3 x W2 STEEL MESH**

**REMOVE WIRE MESH IN KNOCKOUT AREA**

**#5 @ 9" O.C., E.W.; POURED IN PLACE**

**POURED IN PLACE**

**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)

2" RAISED LETTERS
FLUSH W/TOP SURFACE

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

3 1/2"

TRAFFIC

1"

2 1/2"

1 1/2"

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

TRAFFIC

1"

2 1/2"

1 1/2"

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

TRAFFIC

1"

2 1/2"

1 1/2"
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 ENTRAPMENT 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, CONTAINS CABLE AND DIRECTLY ENTERS ANY ELECTRONICS CABINET, SHALL BE DUCT-SEALED IN THE PULL BOX.

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.

STANDARD PLACEMENT FOR WIRE MESH AND REBAR SHALL BE USED.
2" LOOP CONDUITS PASS CONTINUOUSLY UNDERNEATH PULL BOX.
INTERCONNECT CONDUITS AS PER PLAN.

FINISHED GRADE

LOOP PULLBOX AS PER PLAN

#57 COMPACTED AGGREGATE

6" MIN. (TYP.)

3" MIN. 6" MAX.

INTERCONNECT CONDUITS PASS CONTINUOUSLY UNDERNEATH PULL BOX.
INTERCONNECT CONDUITS AS PER PLAN.

VARIES

CONCRETE ENCASEMENT

2" MIN. VARIATES PER PLAN

24" TO 36" DEPTH

LOOP RACEWAYS

15"-18"

2" LOOP CONDUIT WITH 2" RADIUS

2" LOOP CONDUITS

4024

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

CITY ENGINEER

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SHT 1 OF 1

LOOP PULL BOX INSTALLED
OVER INTERCONNECT
CONDUIT BANK
EVERY 5'.

SUPPORT AT ENDS AND EVERY 5'.

CONDUIT RISER

CONDUIT RISER

WEATHERHEAD

WEATHERHEAD (TYP.)

CONTROLLER CABINET

CONTROLLER CABINET

CONTROLLER CABINET

CONTROLLER CABINET

CABINET HEIGHT (A)

CABINET HEIGHT (A)

CABINET HEIGHT (A)

CABINET HEIGHT (A)

MOUNTING HEIGHT (B)

MOUNTING HEIGHT (B)

MOUNTING HEIGHT (B)

MOUNTING HEIGHT (B)

SUPPORT AT ENDS AND EVERY 5'.

INSTALLATION CONCRETE AFTER TO POLE. REPLACE BRING RISER SAW-CUT SIGNAL CABLE CONDUIT RISER FOR POLE MOUNTED CABINET (SEE NOTES 1 & 4) CONDUIT RISER

RISERS ON WOOD POLE

ANCHOR-BASE POLE (SEE NOTES 1 & 4)

EMBEDDED POLE (SEE NOTE 4)

CABINET HEIGHT (A) MOUNTING HEIGHT (B)

LESS THAN 36" 30" ± 3"

36" AND OVER 23" ± 3"

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 POLE MOUNTED CABINET

CABINET HEIGHT (A) | MOUNTING HEIGHT (B)
-------------------|-------------------
LESS THAN 36"      | 30" ± 3"          
36" AND OVER       | 23" ± 3"          

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)

10.25"

17" (SEE NOTE 8)

ANCHOR BOLT PATTERN

9'-3" SHAFT

8'-3" TAPERED SECTION

8'-3" STRAIGHT SECTION

(SEE NOTE 6)

42" PUSHBUTTON MOUNTING HEIGHT

4.5" OD

7" OD

12" (SEE NOTE 6)

17" (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

10.7' PEDESTAL PEDESTRIAN SIGNAL HEAD MOUNTING

(SEE NOTE 4)

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

CITY ENGINEER

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4101

8/10/2017
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.
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.
17.5' PEDESTAL

STREET NAME SIGNS

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

4.5" OD

6'-3" STRAIGHT SECTION

16-1" SHAFT

12" STRAIGHT SECTION W/ 7" OD

8'-10" TAPERED SECTION

8'

42" PUSHBUTTON MOUNTING HEIGHT

17"

(SEE NOTE 4)

10/01/2018

14.5"

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" FLAT WASHERS
(SEE NOTE 6)

BC= 10.25" SQ.

SEE NOTE 8.

6'-3" STRAIGHT SECTION

STREET NAME SIGNS

CLAMSHELL MOUNTED

PED SIGNAL UNITS

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

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

10/01/2018

14.5"

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" FLAT WASHERS
(SEE NOTE 6)

BC= 10.25" SQ.

SEE NOTE 8.

6'-3" STRAIGHT SECTION

STREET NAME SIGNS

CLAMSHELL MOUNTED

PED SIGNAL UNITS

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

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

10/01/2018

14.5"

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" FLAT WASHERS
(SEE NOTE 6)

BC= 10.25" SQ.

SEE NOTE 8.

6'-3" STRAIGHT SECTION

STREET NAME SIGNS

CLAMSHELL MOUNTED

PED SIGNAL UNITS

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

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

10/01/2018

14.5"

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" FLAT WASHERS
(SEE NOTE 6)

BC= 10.25" SQ.

SEE NOTE 8.
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

ANCHOR BOLT PATTERN

(SEE NOTE 8)

14.5" SQ.

8/10/2017

19'-7" SHAFT

16'-6"

42" PUSHBUTTON MOUNTING HEIGHT

(SEE NOTE 6)

8" OD

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

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)

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)

CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
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CITY ENGINEER

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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.
BOLT SLOT TO ACCOMODATE BOLT CIRCLE OF 10.5"-13.5" 

SLOT SHALL ALLOW FOR A 13"-15" DIAMETER BOLT CIRCLE 

FOR ANCHOR BOLT SEE 4163. 

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

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.
10.7' OVERALL POLE HEIGHT

4.5" DIA. (AT TOP)

6.00" DIA. POLE

4.52" I.D. CAST ALUMINUM POLE TOP CAP

DEDECORATIVE BASE
SEE "BASE PLATE DETAIL " & "BASE DETAIL ")

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

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6/1/2018
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DETECTOR UNIT /
TRAFFIC FLOW MONITOR
BRACKET ARM

CITY OF COLUMBUS, OHIO
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SHT 1 OF 3

INSTALL TRAFFIC FLOW MONITOR CABLE IN TOP ARM BRACKET

TAPERED ALUMINUM TUBE (5" O.D.)
150° WALL ALLOY 6063-T6
OVERALL LENGTH UPPER MEMBER 29'-9 11/16"
OVERALL LENGTH LOWER MEMBER 28'-11"

2" SCH. 40 PIPE X 8"
6" HORIZONTAL EXTENSION

REMOVABLE END CAP
(SEE NOTE 11)

FLUSH WELDED 7'-0" END CAP

(4) 3/8" STIFFENERS
3" X 6 1/2"
SECTION

2" STRUT (TYP)

26'-6" TAPERED

26'-0"

2 3/4" O.D.

7 3/4"

6"

6"

6" HORIZONTAL SECTION

1'-5.7"

1'-9"

1'-2 5/16"

1'-9"

12"

1'-12"

3'-0"

5'-1 1/4"

(TYP)

12"

12"

3/4" HORIZONTAL SLIPFITTER

3" X 6 1/2"
SECTION

6" HORIZONTAL
SECTION

3" X 6 1/2"
SECTION

2" STRUT (TYP)

1'-9"

16

5

18

3 16

17

1.5" CABLE ENTRY HOLE

WITH DIMENSIONS PER MANUFACTURER

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

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

1 1/2 5/16"

12"

1/8" DIA

WEEP HOLE

CAST ALUM. POLE BANDS FITTED TO POLE OD
WITH 1/2"-13NC STAINLESS STEEL HARDWARE

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 3/8" 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.

30'-0" BRACKET ARM

30'-0" BRACKET ARM

VIEW A-A
PREVENT BRACKET ROTATION & CABLE SHEARING.

WARNING: TIGHTEN BRACKET CLAMPS SECURELY TO

3" X 6 1/2"  SECTION (TYP.)

2" STRUT (TYP)  1'-10"

17"  (TYP)  1/2"

ALUMINUM VERTICAL  (TYP)

STIFFENERS

11/2"  12"

1/8"  DIA WEEP HOLE

CAST ALUM. POLE BANDS FITTED TO POLE OD WITH STAINLESS STEEL HARDWARE

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.

25'-0" BRACKET ARM

DETECTOR UNIT /
TRAFFIC FLOW MONITOR
BRACKET ARM

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

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SHT 2 OF 3
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 FLOW MONITOR

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

STD DWG 4111
8/10/2017
SHT 1 OF 1

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

POLE FOUNDATION & WORK PAD SURFACES ARE TO BE FLUSH WITH EACH OTHER. WHEN WORK PAD IS ADJACENT TO SIDEWALK, THEN PAD AND SIDEWALK SURFACES ARE TO BE FLUSH.

NOTES:

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

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

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.

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

5. FOR BRACKET ARM DETAILS SEE CITY OF COLUMBUS STANDARD DRAWING 4110.

TRAFFIC SIGNAL POLE SEE STANDARD DRAWING 4170

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

WORK PAD

POLE FOUNDATION

CAMERA CABLE FROM DOME INSIDE UPPER BRACKET ARM TO CAMERA CABINET

CAMERA CABINET (SEE NOTE 3)

32" - 36"

3" BLIND HALF COUPLING

SEE NOTE 2.

WORK PAD

LB WITH COVER

SEE NOTE 2.

CAMERA CABINET

CABINET

DOOR

DOOR

3'

18" (SEE NOTE 5)

3'

18" (SEE NOTE 5)

3'

18" (SEE NOTE 5)

3'

18" (SEE NOTE 5)
MECHANICAL DAMPENING DEVICE (SEE NOTE 16)

ARM LENGTH

VARIES (OVERLAP WHEN REQUIRED)

(SEE NOTE 5)

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

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)

SIGNAL HEAD WITH BACKPLATE

1/2" MIN. STAINLESS OR GALV. STEEL HEX HEAD THROUGH BOLT WITH LOCK NUT, SNAP.

19' MAX., 17' PREFERRED
16.5' MIN.

HANDHOLE (4"x6")

POLE HEIGHT

POLE HEIGHT

HANDHOLE (5"x8")

HAND HOLE (3"x5")

1 1/6 (TYP.)

REVIEWED:

4/16/2018

SIGNATORY:

10/1/2018

APPRENTICE:

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

<table>
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<tr>
<th>DESIGN NO.</th>
<th>MAXIMUM DESIGN AREA, SQ FT (NOTE A)</th>
<th>DESIGN DISTANCE FROM G FT</th>
<th>POLE TYPE</th>
<th>WALL THICK</th>
<th>BASE DIAMETER</th>
<th>MAX LENGTH</th>
<th>ARM TYPE</th>
<th>WALL THICK</th>
<th>SIZE</th>
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<td>.239</td>
<td>10.32X5.00' *</td>
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**ALL DIMENSIONS ARE IN INCHES, UNLESS OTHERWISE NOTED.**

### TABLE 1 - PART B - POLE DIMENSIONS

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<th>DESIGN NO.</th>
<th>ARM ATTACHMENT</th>
<th>ANCHOR BASE</th>
<th>PLATE SKIRT</th>
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<tr>
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<td>19.50</td>
<td>16.50</td>
<td>15</td>
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<td>C15</td>
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<td>C16 DOUBLE</td>
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**ALL DIMENSIONS ARE IN INCHES, UNLESS OTHERWISE NOTED.**

**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.

---

**STANDARD CITY OF COLUMBUS MAST ARM**

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

STD DWG 4120

CITY ENGINEER

10/01/2018
SHT 2 OF 10
ANCHOR BOLTS WITH STANDARD STEEL HEX NUTS, PLAIN WASHERS
(SEE NOTE 7)

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

DESIGN 4, 12, 13, & 14

BASE PLATE

POLE BASE DETAILS

BASE CONNECTION

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 3 OF 10
FOUNDATION

ID = POLE OD + 1/4"

POLE

RADIUS

COVER GUIDE AND SECTION ATTACHMENT

CORNER RADIUS TO MATCH POLE BASE PLATE RADIUS

TOP VIEW

1/4" STEEL PLATE

POLE PLATE

K

POLE PLATE SKIRT

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

SECTION A-A

POLE PLATE WIDTH + 1/4"

STEEL BASE COVER

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 4 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

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

4"x6" HANDHOLE BETWEEN MAST ARMS

(P) THK GUSSETS TOP, BOTTOM & SIDES

4/16 GUSSETS

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

GALV. DRAIN OPENINGS

4/16 GUSSETS

3/8" ARM PLATE

DTI WASHER

F436 FLAT WASHER

CONNECTION NUT

POLE PLATE

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

ARM ATTACHMENT (TYP.)

DESIGN C16
POLE CAP, 3 SET SCREWS MINIMUM
THRU BOLT STYLE
"J" HOOK
3"x5" HANDHOLE
EXTENDED SIGNAL SUPPORT POLE
4"x6" HANDHOLE
"J" HOOK

POLE EXTENSION FOR BRACKET ARM

POLE EXTENSION
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
SHT 7 OF 10
CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF DESIGN AND CONSTRUCTION

City Engineer

4120

10/01/2018

Standard City of Columbus Mast Arm

Handhole

Cover

Mounting Clip

Section A-A

Pol Tube Wall

Less Than 7 Ga. = .19
7 Ga. Thru 3 Ga. = .25
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.

DECORATIVE CITY OF COLUMBUS MAST ARM

120 VOLT LUMINAIRE MIS-801

POLE SHALL BE VERTICAL WITH MAX. OFFSET OF 5/3 ALONG CENTERLINE

LUMINAIRE BRACKET ARM PER MIS-104

CORPORATE CLAM SHELL BASE, SEE SHEET 4

ARM MOUNTING BRACKET HEIGHT

COMBINATION POLE HEIGHT

MECHANICAL DAMPENING DEVICE (SEE NOTE 15)

MECHANICAL DAMPENING DEVICE (SEE NOTE 15)

1 5/8" DIA. HOLE, WITH 1 in GROMMET OR BUSHING (TYPICAL) APPLICABLE TO ALL SIGNAL HEADS

CONE HEAD WITH BACKPLATE

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.

ARM ATTACHMENT HEIGHT

3" x 5" HAND HOLE

4" x 6" HAND HOLE (SEE NOTE 31)

3" POLE SHAFT WITH BACKPLATE

VARIES (OVERLAP WHEN REQUIRED) (SEE NOTE 5)

ARM LENGTH

19' MAX, 17' PREFERRED 16.5' MIN.

ARM CAP

10/01/2018

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

CITY ENGINEER

STD DWG
4121

SHT 1 OF 9
### TABLE 1 - PART A - POLE DIMENSIONS

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<thead>
<tr>
<th>DESIGN NO.</th>
<th>MAXIMUM DESIGN AREA (SQ FT) (NOTE A)</th>
<th>DESIGN DISTANCE FROM CL FT</th>
<th>POLE TYPE</th>
<th>WALL THICKNESS</th>
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*ALL DIMENSIONS ARE IN INCHES, UNLESS OTHERWISE NOTED.*

### TABLE 1 - PART B - POLE DIMENSIONS

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<th>DESIGN NO.</th>
<th>ARM ATTACHMENT</th>
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*ALL DIMENSIONS ARE IN INCHES, UNLESS OTHERWISE NOTED.*

**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 & 5.
BASE PLATE

BOLT CIRCLE

R (RADIUS)

H (DIA.)

BASE PLATE

DECORATIVE
CITY OF COLUMBUS
MAST ARM

BASE CONNECTION

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

STD DWG
4121

10/01/2018

CITY ENGINEER

SHT 3 OF 9
NOTES:

THE HANDHOLE IN DECORATIVE BASE SHALL BE ALIGNED WITH THE HANDHOLE IN THE SUPPORT POLE.

DECORATIVE BASE MATERIAL SHALL BE AS SPECIFIED PER PLAN.
(G)-STUD DIA. (4)-STUDS EACH WITH (2)-HEX NUTS & (2) FLAT WASHERS (SEE NOTE 1 AND 30)

(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

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

1/4" x 2" BACK-UP RING

1/2" MIN 1" MAX

ARM FLANGE WELD DETAIL

PLATE THICKNESS 3/8" (SEE NOTE 4)

SEE WELD DETAIL BELOW

MAST ARM CLAMP CONNECTION

DECORATIVE CITY OF COLUMBUS MAST ARM

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

CITY ENGINEER

STD DWG 4121

10/01/2018 SHT 5 OF 9
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

(2) 3/4"x3/4"x1/8" BAR SIZE ANGLES ON FRAME FOR COVER ATTACHMENT

SECTION A-A
4" x 8" BOTTOM HANDHOLE FRAME DETAIL

FRONT VIEW

3" x 5" HANDHOLE NEAR BRACKET ARM FRAME DETAIL
4" x 6" HANDHOLE NEAR MAST ARM FRAME DETAIL

SECTION A-A
4" x 8" BOTTOM HANDHOLE FRAME DETAIL

HANDHOLE

DECORATIVE
CITY OF COLUMBUS
MAST ARM

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

STD DWG
4121

10/01/2018
SHT 6 OF 9
2.5" SCH 80 PIPE (2.88" O.D.) WITH 7" PROJ.

1/2" THK PLATE

7/8" DIA. HOLE

TOP OF POLE DETAIL
(FOR POLES WITH LUMINAIRE ONLY)

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

ARM PLATE

DTI WASHER

F436 FLAT WASHER

CONNECTION NUT

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

POLE TENON / DTI WASHER PLACEMENT
NOTES:
1. ARM PLATE HOLE DIAMETER SHALL BE BOLT DIAMETER PLUS 1/8". (SEE SHEET 1)
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 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 SHEETS 1 AND 6.)
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 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.)
16. A TENON SHALL BE PROVIDED TO ACCOMMODATE THE LUMINAIRE BRACKET ARM. (SEE SHEET 7).
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 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.
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 6.)

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 4.

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).

27. The arm shall have a removable end-of-arm cap attached by a minimum of 3 stainless steel set screws. This will be the only attachment method acceptable. The inside diameter of the end-of-arm cap shall be equal to the end-of-arm outside diameter plus two times the arm taper.

28. The arm shall not have pre-drilled holes for signal head cable entry. The contractor shall field drill these holes.

29. The supports shall be designed using the 2009 Edition of the AASHTO Standard Specifications for Highway Signs, Luminaires, and Traffic Signals. The following criteria shall be used for the design: Basic Wind Speed - 90 MPH, Design Life - 25 Years, Fatigue Category III. Additionally, the support designs shall not include galloping or truck induced gust loading.

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 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 Sheets 5 and 7).

31. The 4”x6” hand hole 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.
SIGNAL SUPPORT/STRAIN POLE FOUNDATIONS

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

CITY ENGINEER

36" DIA. DRILLED SHAFT
14 #8's
20 #9's (48")
18 #8's (42")

42" - 48" DIA. DRILLED SHAFT

VERTICAL REBAR

3/4" SCH. 40 PVC
NO. 6 REBARS, TIE ANCHOR BOLTS TO REBAR CAGE.

NO. 4 TIE BARS, SEE NOTE 6.

CONCRETE CYLINDER

MIXTURE OF 1:2:4 (Cement:Sand:Gravel)

MINIMUM (2)-2" CONDUIT ELL(S) (SEE NOTE 5)
FORMED TOP

CAP UNUSED CONDUIT

(2)-2" CONDUIT ELLS (SEE NOTE 5)

BOLT CIRCLE

3" CLEAR

CONDUIT TO EXTEND 2" TO 3" ABOVE FOUNDATION

ANCHOR BOLTS
TOP FLUSH WITH SIDEWALK

8" MIN. WALK

12" GROUNDING CONDUCTOR
GROUND ROD (1"x10')

18" GROUND ROD

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

10/01/2018

14 #8's
20 #9's (48")
18 #8's (42")
HEX NUT ANCHOR BOLT OPTION

HEADED ANCHOR BOLT OPTION

**ANCHOR BOLTS**

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

**ALL DIMENSIONS IN INCHES UNLESS OTHERWISE NOTED**

**CITY OF COLUMBUS 4120 & 4121 TYPE SUPPORTS**

<table>
<thead>
<tr>
<th>DESIGN NO.</th>
<th>D (feet)</th>
<th>W</th>
<th>ANCHOR BOLTS</th>
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<td></td>
<td></td>
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<td>SIZE</td>
</tr>
<tr>
<td>4</td>
<td>10</td>
<td>36</td>
<td>1.75 X 62</td>
</tr>
<tr>
<td>12</td>
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<td>15</td>
<td>36</td>
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<td>15</td>
<td>36</td>
<td>2 X 62</td>
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<tr>
<td>C15</td>
<td>15</td>
<td>36</td>
<td>2 X 62</td>
</tr>
<tr>
<td>C16</td>
<td>15</td>
<td>36</td>
<td>2 X 62</td>
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**CITY OF COLUMBUS 4170 TYPE SUPPORTS**

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</tr>
<tr>
<td>12</td>
<td>12</td>
<td>36</td>
<td>2.5 X 64</td>
</tr>
<tr>
<td>13</td>
<td>16</td>
<td>42 or 48</td>
<td>3 X 66</td>
</tr>
<tr>
<td>14</td>
<td>17</td>
<td>48</td>
<td>3 X 72</td>
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</table>

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

**SIGNAL SUPPORT/STRAIN POLE FOUNDATIONS**

**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>DEPTH OF ADJACENT UTILITY EXCAVATION</strong></td>
<td><strong>DEPTH OF ADJACENT UTILITY EXCAVATION</strong></td>
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<tr>
<td><strong>DESIGN NO.</strong></td>
<td>3 FT</td>
</tr>
<tr>
<td>D=18</td>
<td>D=22</td>
</tr>
<tr>
<td>D=18</td>
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<td>C15</td>
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</tr>
<tr>
<td>C16</td>
<td>SEE BELOW</td>
</tr>
<tr>
<td>SPECIAL FOUNDATION REQUIRED FOR UTILITY EXCAVATIONS ADJACENT TO C16.</td>
<td>12</td>
</tr>
<tr>
<td>13</td>
<td>D=20</td>
</tr>
<tr>
<td>14</td>
<td>D=20</td>
</tr>
</tbody>
</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.
NOTES:

1. WHEN POURING THE CONCRETE WALK BASE, EMBED 1/2" THICK EXPANSION JOINT FILLER (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. 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 AS 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)

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

GROUND WIRE (5')

ANCHOR BOLTS & CONDUITS. ARE INCIDENTAL TO THIS ITEM.

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.
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.
FOUNDATION DETAILS

<table>
<thead>
<tr>
<th>PEDESTAL TYPE (HT.)</th>
<th>DEPTH (D)</th>
<th>BOLT CIRCLE</th>
<th>REBAR REQUIRED</th>
<th>ANCHOR BOLT (DIA.)</th>
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<tr>
<td>STD. DWG 4100 (5')</td>
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<td>3/4&quot;</td>
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<td>STD. DWG 4101 (10.7')</td>
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<td>14.5&quot;</td>
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<td>STD. DWG 4102 (12.7')</td>
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<td>14.5&quot;</td>
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<tr>
<td>STD. DWG 4103 (17.5')</td>
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<td>14.5&quot;</td>
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<tr>
<td>STD. DWG 4106 (10.7' DECORATIVE)</td>
<td>4'</td>
<td>9.5&quot;</td>
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<td>1&quot;</td>
</tr>
</tbody>
</table>

ANCHOR BOLT (TYP.)
3/4" SCH 40, PVC
GALV.
PER ASTM A153, "L" SHAPED (4"L)
(4) GALV STEEL LOCKWASHERS

CONCRETE
3-1/2" ± 1/2"
6 - NO. 6 VERTICAL REBARS
WALK
24" DIAMETER CONCRETE CYLINDER
FORM TOP TO TYP. 6" BELOW GRADE
3/4" SCH. 40 PVC (FOR GROUNDING CONDUCTOR)
(SEE NOTE 2)
(2) 2" CONDUIT ELLS
(SEE NOTE 2)
MINIMUM (2)-2" CONDUIT ELLS
(SEE NOTE 2)
ANCHOR BOLTS
BOLT CIRCLE
24" SQUARE (TYP.)
4-#4 TIE BARS
(SEE NOTE 1)
WALK FLUSH WITH SIDEWALK
(SEE NOTE 1 & 6)
CAP UNUSED CONDUIT
18" SQUARE
**ONLY FOR PEDESTAL AT BACK OF RAMP OR WALK**
(SEE NOTE 7B)
BACK OF RAMP/WALK/PATH
CURB WALL (IF APPLICABLE)
FORM TOP TO TYP. 6" BELOW GRADE
(SEE NOTE 7B)
CURB WALL (IF APPLICABLE)

PEDESTAL ANCHOR BOLT
ANCHOR BOLT PROJECTS 2.75" ABOVE BASE

(4) 36"-8 NC GALV. STEEL
ANCHOR BOLTS, ASTM A307, TOP 10"
GALV. PER ASTM A153, "L" SHAPED (4"L)
(4) 8 NC GALV STEEL HEX NUTS
(4) 8 NC 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

      THE FORMED TOP SHALL BE 18"X18" SQUARE (APPLIES TO 5' AND 10.7' TALL PEDESTALS ONLY). THE
      TOP OF FOUNDATION SHALL BE FLUSH WITH ADJACENT WALK OR CONCRETE AREA. WHERE CURB
      WALL IS UTILIZED AT THE BACK OF WALK, THE TOP OF THE FOUNDATION SHALL BE FLUSH WITH
      THE TOP OF THE CURB WALL. THE FACE OF FOUNDATION ADJACENT TO THE BACK OF THE WALK
      SHALL MATCH THE PROFILE OF ADJACENT CURB WALL.

   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

      THE BACK SIDE OF THE FOUNDATION SHALL MATCH THE GROUND SLOPE AND THE STREET SIDE OF
      THE FOUNDATION SHALL BE ABOVE THE SIDEWALK OR CONCRETE AREA AND COMPLETELY OUT OF
      THE SIDEWALK OR CONCRETE AREA.
ANCHOR BASE

HANDHOLE

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

EXTENDED STRAIN POLE

J HOOK

SPAN WIRE CLAMP

COMBINATION POLE

3/4" R MIN.

1-1/16"

5/8"

2-25/32"

1-9/16"

3/4"

HANDHOLE

12"

HANDHOLE

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

POLE HEIGHT

TAPERED TUBE

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

STRAIN POLE

ANCHOR TYPE SHACKLE

STANDARD DRAWING

4170

10/01/2018

CITY ENGINEER
STEEL BASE COVER

STRAIN POLE

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

STD DWG
4170

10/01/2018

CITY ENGINEER

SHT 3 OF 7
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

UPPER HANDHOLE
MINIMUM SIZE
IS 4" x 6"

LOWER HANDHOLE

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

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

HANDHOLE

POLE TUBE
WALL

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

SECTION A-A

COVER MOUNTING CLIP

STRAIN POLE

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

STD DWG
4170

10/01/2018

CITY ENGINEER
SHT 4 OF 7
ANCHOR TYPE

SHACKLE

5/8" DIA. U-BOLT

5/8" HEX NUT AND LOCKWASHER

3/16" STRANDED STAINLESS STEEL CLAMP

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

CONNECTION POINTS SHALL BE WELDED

1/4" THICK CLEVIS

ANCHOR TYPE SHACKLE

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

SPAN WIRE CLAMP

STRAIN POLE
ALL DIMENSIONS ARE IN INCHES, UNLESS OTHERWISE NOTED.

<table>
<thead>
<tr>
<th>DESIGN NO.</th>
<th>BASE MOMENT AT YIELD (ft. kips)</th>
<th>TAPERED (NOTE A)</th>
<th>TAPERED (NOTE B)</th>
<th>ANCHOR BASE</th>
<th>PLATE SKIRT</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.
RIGID SIGNAL HEAD MOUNTING FOR MAST ARMS

OVERHEAD SIGNAL ATTACHMENTS - MAST ARM

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

STD DWG
4201

8/1/2015

SHT 1 OF 4
RIGID SIGNAL HEAD MOUNTING FOR MAST ARMS

OVERHEAD SIGNAL ATTACHMENTS - MAST ARM
FREE SWINGING SIGNAL HEAD
MOUNTING FOR MAST ARMS

OVERHEAD SIGNAL
ATTACHMENTS -
MAST ARM

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

CITY ENGINEER

STD DWG 4201
8/1/2015
SHT 3 OF 4
GENERAL

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

ALL SIGNAL HEADS SHALL BE INSTALLED WITH THEIR LOWEST PART (INCLUDING BACKBRACING AND BACKPLATES) WITH A CLEARANCE ABOVE PAVEMENT ELEVATION AT THE HIGHEST POINT OF THE ROADWAY OF 16.5' MINIMUM, 19' MAXIMUM. HOWEVER, 17' IS THE PREFERRED HEIGHT. IT IS INTENDED THAT THIS CLEARANCE BE OBTAINED BY ATTACHMENT HEIGHTS, ARM RISE, 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 WILL POTENTIALLY NOT BE IN COMPLIANCE WITH THIS RANGE PRIOR TO INSTALLATION.

SIGNAL HEAD ROTATION SHALL BE PREVENTED BY THE USE OF SERRATED RINGS, SET SCREWS OR OTHER POSITIVE LOCKING DEVICES INCORPORATED IN THE SIGNAL HOUSING AND AT CRITICAL LOCATIONS IN THE SUPPORTING HARDWARE.

SIGNAL HEAD MOUNTING BRACKETS AND FITTINGS SHALL BE COATED TO MATCH THE MAST ARM. ATTACHMENT HARDWARE SHALL BE COATED IN ACCORDANCE WITH THE PLANS.

RIGID SIGNAL HEAD MOUNTING FOR MAST ARMS:

THE MAST ARM CLAMP SHALL HAVE A MINIMUM STRENGTH AT YIELD TO SUPPORT A 200 POUND LOAD WITH 90 MPH WIND.

FOR A 3-SECTION SIGNAL, SIGNAL CABLE SHALL ENTER THE GREEN SECTION SIGNAL HEAD. FOR A 5-SECTION HEAD, ENTER HOUSING THROUGH GREEN BALL SECTION AND ROUTE CABLE THROUGH RED SECTION TO ACCESS THE TURN ARROW SECTION.

TERMINAL BLOCK SHALL BE LOCATED IN GREEN SECTION FOR RIGID MOUNTED SIGNAL HEADS.

CABLE CLAMPS SHALL BE STAINLESS STEEL CABLE ONLY. CABLE CLAMPS TO BE PROVIDED WITH APPROPRIATE LENGTH. ANY ADDITIONAL CABLE WILL BE SECURELY COILED IN PLACE AND NOT CUT.

FREE SWINGING SIGNAL HEAD MOUNTING FOR MAST ARMS:

THE CLEVIS SHALL HAVE A NOMINAL 11/16” DIAMETER HOLE WHICH WILL ACCEPT A 5/8” DIAMETER X 2” LONG STAINLESS STEEL CLEVIS PIN.

A 1” LONG X 1/8” DIAMETER STAINLESS STEEL COTTER PIN SHALL BE FURNISHED WITH EACH CLAMP.

THE HANGER SHALL HAVE A MINIMUM STRENGTH AT YIELD TO SUPPORT A 1000-POUND LOAD.

A 90 DEGREE CLEVIS HANGER THAT HAS A STAINLESS STEEL BUSHING AND IS CONNECTED TO A WIRE ENTRANCE HEAD SHALL BE USED.

SIGNAL CABLE SHALL ENTER THE RED SECTION.

TERMINAL BLOCK SHALL BE LOCATED IN RED SECTION.
OVERHEAD SIGNAL ATTACHMENTS - SPAN WIRE

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

CITY ENGINEER

STD DWG
4202
8/10/2017
SHT 2 OF 7

CLAMP ASSEMBLY, 3/4" SLOT
MESSENGER WIRE

SINGLE-HOLE EXTENDER CONNECTOR HANGER, 3/4" (SEE NOTE 1)

ADJUSTABLE-DROP TRI-STUD WIRE ENTRANCE (SEE NOTE 4)

6 in DRIP LOOP (TYP.)

BACKPLATE (SEE NOTE 18)

TRI-STUD BREAKAWAY CLAMP (DETAIL A)

3-SECTION SIGNAL HEAD SUSPENSION

BREAKAWAY CLAMP, FULL WIDTH, FIXED SIDE FULLY FLAT

TETHER WIRE: 1/4" 7-STRAND

DESCRIPTION

TETHER WIRE: 1/4" 7-STRAND

DIRECTION OF VEHICLE TRAVEL UNDER SIGNAL

BREAKAWAY CLAMP, FULL WIDTH, FIXED SIDE FULLY FLAT

WIRE ROPE CLAMP

WIRE ROPE CLAMP

TETHER WIRE:

1-5/8" MIN.

ROUND EDGES

ROUND EDGES

ROUND EDGES

ROUND EDGES

WIRE ROPE CLAMP

COMPRESSION SPRING (SEE NOTE 9)

TETHER WIRE:

1/4" 7-STRAND

DETAIL A: BREAKAWAY TETHER ANCHOR (TYPICAL, SEE NOTE 6)
DETAIL B2: DOUBLE SPREADER BARS AND CROSS-BRACING ON SKewed SPANS (BOTTOM VIEW)

OVERHEAD SIGNAL ATTACHMENTS - SPAN WIRE

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

STD DWG 4202

8/10/2017

CITY ENGINEER
OVERHEAD SIGNAL ATTACHMENTS - SPAN WIRE

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

STD DWG 4202
8/10/2017
SHT 5 OF 7

CITY ENGINEER

DETAIL C
(TOP VIEW)

LOCK WIRE
(SEE NOTE 11)

TURNBUCKLE
(MIN. 5/8" BOLT SIZE)

S-HOOK:
TURNBUCKLE END
MUST BE CLOSED

SAFETY TIE

THIMBLE

THIMBLE

2" MIN.
(SEE NOTE 11)

SPAN WIRE
CLAMP ASSEMBLY

ANCHOR SHACKLE
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 COMPRESS 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**

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<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>
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<td>5 - 14</td>
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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 & 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
UPPER MESSENGER WIRE
U-SHAPED HANGER
BOLTS

ALLOY HANGER SADDLE
MUST HAVE STAINLESS
STEEL INSERT FOR 5/8" BOLT.

SIGN WIRE CLAMP

1-1/4" x 3/8" x 6"
GALV. STEEL HANGER BRACE

11/16" DIA. HOLE

5/16" STEEL
HEX. BOLTS
HEX. NUTS AND
LOCKWASHERS

5/16" STEEL
HEX. BOLTS, HEX NUTS
WIDE AND LOCKWASHERS

BEARING PLATE
SEE DETAIL

5/16" STEEL U-BOLTS OR
J-BOLT AND LOWER
MESSENGER WIRE IF
REQUIRED

NO.2 U-CHANNEL
DRIVE POST

SIGN

30°

4" 4"

5" x 4" x 0.100"
ALUMINUM OR
0.06" GALV. STEEL
3/8" (10 mm) R

DEBUR ALL EDGES (TYP.)

3/8" DIA.
HOLE

SIGN HANGER
ASSEMBLY
SPAN WIRE

TYPE 1

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

STD DWG 4250

5/01/2014

SHT 1 OF 2
**TYPE 2**

**SIGN HANGER ASSEMBLY**

**SPAN WIRE**

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1-1/4" x 1/4" GALV. STEEL BAR STOCK (BEND AND TWIST BAR TO PROPER CONFIGURATION)

NO. 2 U-CHANNEL DRIVE POST

BEARING PLATE

DRILL OR PUNCH FOR 5/16" BOLTS, WASHERS AND NUTS (2 PER BAR)

BOLT, 3 LOCATIONS MIN.

2 SIGN HANGERS REQUIRED PER SIGN AS SHOWN

5" x 4" x 0.100" ALUMINUM OR 0.06" GALV. STEEL

3/8" (10 mm) R

DEBUR ALL EDGES (TYP.)

BEARING PLATE

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

STD DWG 4250

5/01/2014

SHT 2 OF 2
NOTES:

ALL MOUNTING HARDWARE SHALL BE COATED TO MATCH SUPPORT STRUCTURE.

STAINLESS STEEL CABLE SHALL BE NEATLY COILED AFTER FINAL TENSIONING AND SECURELY PLACED WITHOUT CUTTING.
FREE SWINGING SIGN HANGER
1/4" x 2" GALV. STEEL BAR

DRILL OR PUNCH FOR 5/16" BOLTS, WASHERS AND NUTS (2 PER BAR)

NO.3 U-CHANNEL DRIVE POST

BEARING PLATE

SIDE VIEW

FREE SWINGING SIGN HANGER
5/8" HEX BOLT WITH WASHERS, CASTLE NUT AND COTTER KEY.

TWIST IN 3"

VARES

2 SIGN HANGERS REQUIRED PER SIGN AS SHOWN

AS REQUIRED

BEARING PLATE

10" MIN

BOLT, 3 LOCATIONS MIN.

REAR VIEW

5" x 4" x 0.100" ALUMINUM OR 0.06" GALV. STEEL

3/8" R

30°

4"

DEBUR ALL EDGES (TYP.)

BEARING PLATE

NOTES:

ALL MOUNTING HARDWARE SHALL BE COATED TO MATCH SUPPORT STRUCTURE.

STAINLESS STEEL CABLE CLAMP SHALL NOT BE PAINTED.

SIGN HANGER
ASSEMBLY MAST ARM
FREE SWINGING

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

STD DWG
4252

5/01/2014
SHT 1 OF 1
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.
NOTES:

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

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.

DETECTOR LOOP WIRES SHALL EACH BE ON A SEPARATE DETECTOR UNIT CHANNEL.

ALL CONDUIT FROM THE LOOP DETECTOR TO THE PULL BOX SHALL BE 725.04.
WIDTH AS SPECIFIED IN PLAN

LENGTH SPECIFIED IN PLAN

SAW CUT LAYOUT

SEE DETAIL A ON SHEET 6 OF 7

SEE CONDUIT DRILLED HOLE DETAIL ON SHEET 5 OF 7.

RECTANGULAR DETECTOR
LOOP DETAILS

WINDING PATTERN
SEE TABLE FOR NUMBER OF TURNS

RECTANGULAR LOOP CONSTRUCTION

<table>
<thead>
<tr>
<th>LOOP TYPE</th>
<th>NUMBER OF TURNS</th>
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<tr>
<td>PRESENCE DETECTION LOOPS</td>
<td>3</td>
</tr>
<tr>
<td>ADVANCED DETECTION LOOPS (6’x6’)</td>
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VEHICULAR DETECTOR STANDARDS
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

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

STD DWG 4300
8/10/2017
SHT 3 OF 7
## BICYCLE LOOP CONSTRUCTION

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

### BICYCLE ONLY LOOP DETECTOR INSTALLATION DETAIL

#### WINDING DETAIL

#### SAWCUT DETAIL

SEE DETAIL A ON SHEET 6 OF 7

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**VEHICULAR DETECTOR STANDARDS**

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

STD DWG 4300  
8/10/2017  
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

CONDUIT DRILLED HOLE DETAIL FOR 1" CONDUIT

VEHICULAR DETECTOR STANDARDS

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

STD DWG 4300

8/10/2017

CITY ENGINEER

SHT 5 OF 7
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.

JOINT CROSSING DETAIL IN PORTLAND CEMENT CONCRETE PAVEMENTS

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

DETAIL A
SPLICE ENCLOSURE DETAIL

NOTE:

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

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.

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

LOOP SLOT DEPTH SHALL BE 4 IN.

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

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

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

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 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.
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.
MESSENER WIRE
DETAILS I

SHEET 1 OF 2

4330

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

CITY ENGINEER

8/10/2017

SHT 1 OF 2
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.
1. For angles of 166° through 180° use attachment details shown on City of Columbus Standard Construction Drawing 4330. Messenger wire pole attachment shall be by a pole clamp on steel poles and by a 5/8 inch thru-bolt or thimble eye bolt with 2" square washers on wood poles.

2. Power service messenger 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 messenger wire shall be grounded by bonding to existing signal ground wire or connection to a 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. 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.
**Mainline Protected Only Left Turn Phase, Leading Left Turn Only Circuit**

1. Relay shown in a de-energized state.
2. Mount relay base on an aluminum panel that is to be mounted on the left cabinet side wall.
3. Place a permanent label on the plate reading "EBLT ø Cutout Relay".

**EBLT Protected Only Phase**

1. Relay shown in a de-energized state.
2. Mount relay base on an aluminum panel that is to be mounted on the left cabinet side wall.
3. Place a permanent label on the plate reading "NBLT ø Cutout Relay".

**NBLT Protected Only Phase**

1. Relay shown in a de-energized state.
2. Mount relay base on an aluminum panel that is to be mounted on the left cabinet side wall.
3. Place a permanent label on the plate reading "WBLT ø Cutout Relay".

**WBLT Protected Only Phase**

1. Relay shown in a de-energized state.
2. Mount relay base on an aluminum panel that is to be mounted on the left cabinet side wall.
3. Place a permanent label on the plate reading "WBLT ø Cutout Relay".

**SBLT Protected Only Phase**

1. Relay shown in a de-energized state.
2. Mount relay base on an aluminum panel that is to be mounted on the left cabinet side wall.
3. Place a permanent label on the plate reading "SBLT ø Cutout Relay".

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**Left Turn Trap Prevention Cut-Out Relay**

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

STD DWG 4332

5/01/2014

City Engineer

SHT 1 OF 1
1. RELAY SHOWN IN DE-ENERGIZED STATE.
2. MOUNT RELAY BASE ON AN ALUMINUM PANEL THAT IS TO BE MOUNTED ON THE LEFT CABINET SIDE WALL.
3. RELAY PANEL LABEL SHALL READ 'Ø3 & Ø7 L/T DELAY INHIBIT RELAY'.
4. ISOLATE ALL 115VAC TERMINAL CONNECTIONS TO ELIMINATE FEEDBACK.

Ø3/Ø7 LEFT TURN INHIBIT DELAY RELAY
USE FOR E/W SIDE STREETS

DELAY OVERRIDE RELAY LOGIC FOR SHELF MOUNTED DETECTOR UNITS