Standard Drawing Index

City of Columbus, Ohio

Department of Public Service

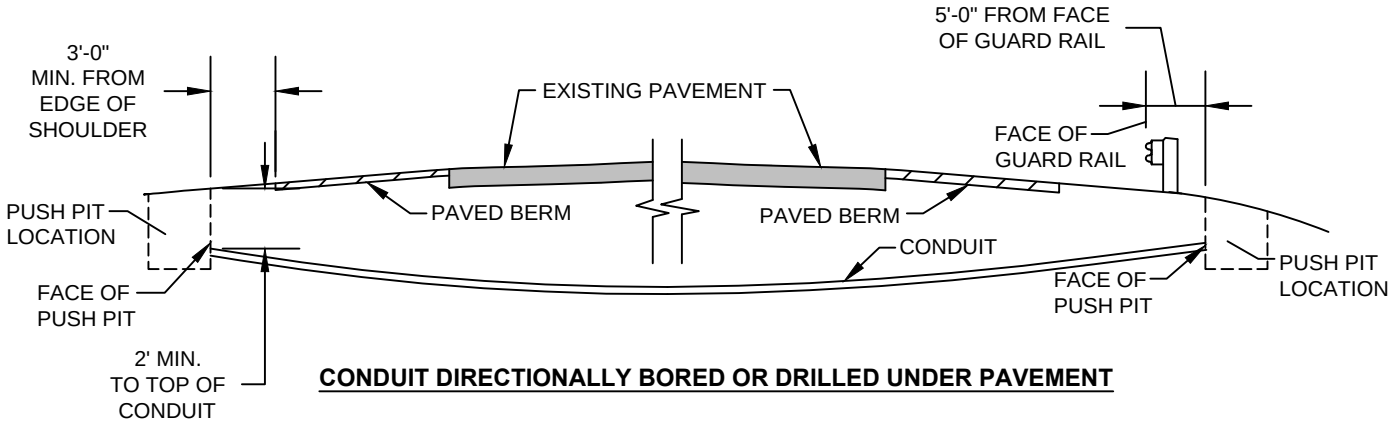
Division of Design and Construction

Reference Index of Standard Construction Drawings

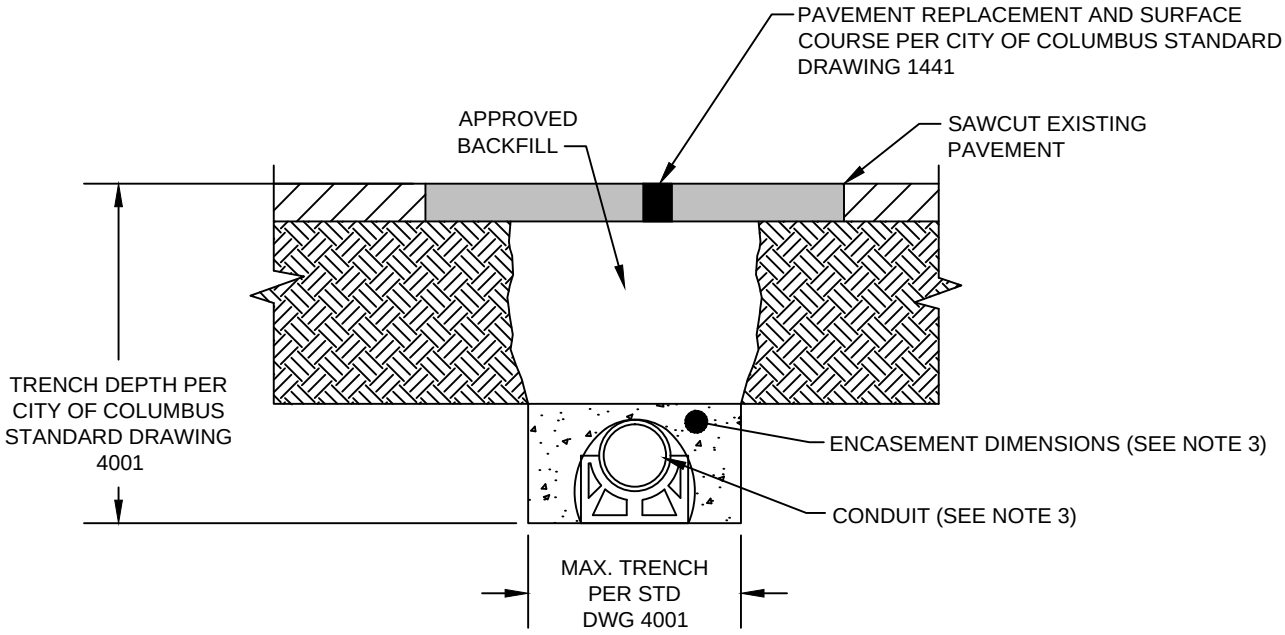
[4000-4333]

STANDARD DRAWING No.	STANDARD DRAWING TITLE	REVISION DATE
4000	Roadway Conduit Standards	08/10/2017
4001	Traffic Signal Conduit Bank Standards	08/01/2015
4002	Conduit Guard Rail Protection	05/01/2014
4020	Pull Box Underdrain	05/01/2014
4021	27” Pull Box	08/10/2017
4022	32” Pull Box	08/10/2017
4023	48” Pull Box	08/10/2017
4024	Loop pull box installed over IC duct bank	08/10/2017
4050	Signal Cable Conduit Riser Installation	08/10/2017
4051	Power Service Conduit Riser for Ground Mounted Cabinet	05/01/2014
4052	Power Service Conduit Riser for Pole Mounted Cabinet	05/01/2014
4100	5’ pedestal, Pushbutton Mounting	08/10/2017
4101	10.7’ pedestal – Pedestrian Signal Head Mountings	08/10/2017
4102	12.7’ pedestal – Vehicular Signal Head Mounting	08/10/2017
4103	17.5’ pedestal –Street Name Sign Mounting	08/10/2017
4104	21’ pedestal – Vehicular Signal Head Mounting	08/10/2017
4105	Transformer Base	08/10/2017
4106	10.7’ Decorative Pedestal	06/01/2018
4110	Detector Unit/Traffic Flow Monitor Bracket Arm	08/10/2017
4111	Traffic Flow Monitor	08/10/2017
4120	Standard City of Columbus Mast Arm	08/10/2017
4121	Decorative City of Columbus Mast Arm	08/10/2017
4122	Mechanical Dampening Device	05/01/2014
4160	Signal Support / Strain Pole Foundation	02/14/2018
4161	Pole Foundation In Sidewalk Area	08/01/2015
4162	Traffic Signal Controller Cabinet Foundation	08/10/2017
4163	Pedestal Foundation	06/01/2018
4170	Strain Pole	08/10/2017
4200	Pole Mountings standards	08/01/2015
4201	Overhead Signal Attachment Mast Arm	08/01/2015
4202	Overhead Signal Attachment Span Wire	08/10/2017
4205	Traffic Signal Backplate	05/01/2014
4230	Pushbutton and sign installation details	08/01/2015
4250	Sign Hanger Assembly, Span Wire	05/01/2014

STANDARD DRAWING No.	STANDARD DRAWING TITLE	REVISION DATE
4251	Sign Hanger Assembly, Mast Arm – Rigid Mounted	05/01/2014
4252	Sign Hanger Assembly, Mast Arm – Free Swinging	05/01/2014
4253	Sign Support Assembly, Pole Mounted	05/01/2014
4300	Vehicle Detector Standards	08/10/2017
4301	Bicycle Detector Markings	08/10/2017
4330	Messenger Wire Details 1	08/10/2017
4331	Messenger Wire Details 2	05/01/2014
4332	Left Turn Trap Prevention Cut-Out Relay	05/01/2014
4333	Inhibit Delay Relay	05/01/2014



CONDUIT DIRECTIONALLY BORED OR DRILLED UNDER PAVEMENT



TRENCH IN PAVED AREA

NOTES:

1. CONDUIT THAT IS DRILLED/DIRECTIONALLY BORED SHALL BE (725.052, EPEC-80-HDPE) OR 725.20 SCHEDULE 80. JACKED CONDUIT SHALL BE RIGID METAL CONDUIT (725.04).
2. THE CONTRACTOR WITH THE APPROVAL OF THE ENGINEER OR AT THE DIRECTION OF THE PLANS OR THE ENGINEER SHALL POTHOLE THE PROPOSED JACKING/BORED AREA.
3. FOR TRAFFIC SIGNAL CONDUIT BANK AND CONDUIT SEE CITY OF COLUMBUS STANDARD DRAWING 4001.

ROADWAY CONDUIT STANDARDS

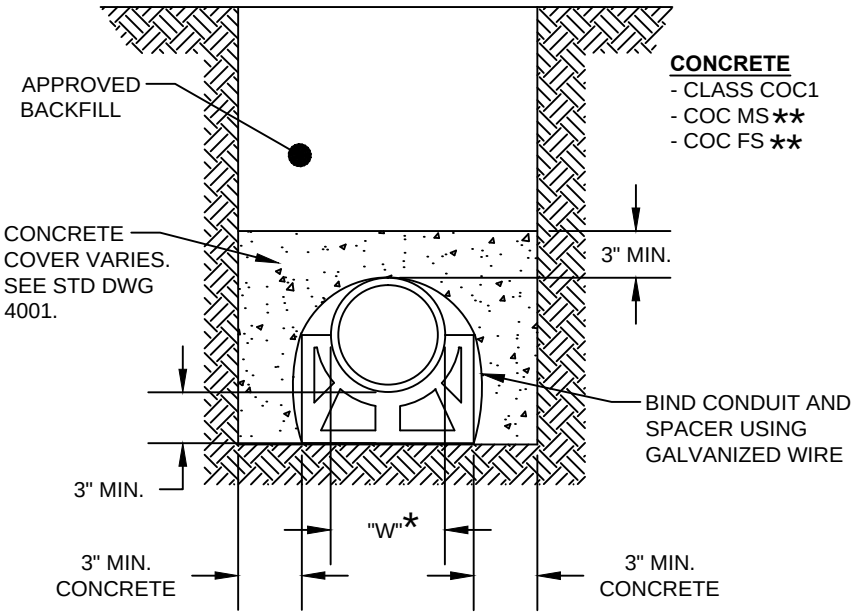
CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF DESIGN AND CONSTRUCTION

CITY ENGINEER

STD DWG
4000

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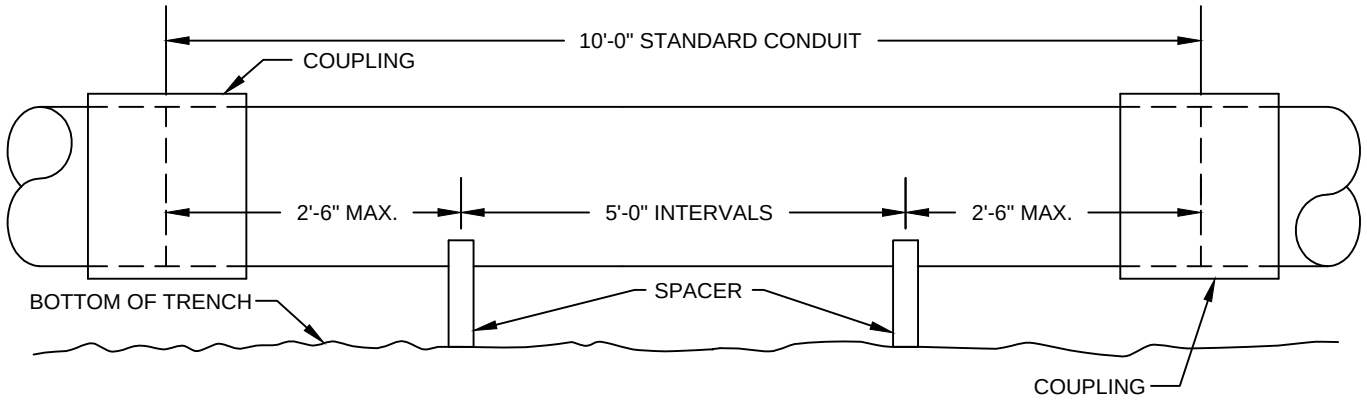
SHT 1 OF 2



*NOTE:
"W" IS WIDTH OF
CONDUIT.

** USE AS DIRECTED.

TRENCH SECTION
CONCRETE ENCASED CONDUIT



SIDE ELEVATION
CONCRETE ENCASED CONDUIT

ROADWAY CONDUIT STANDARDS

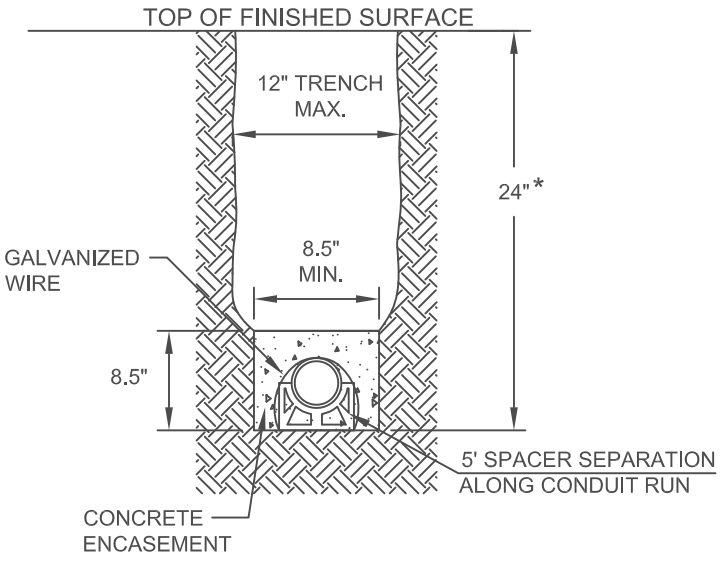
CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF DESIGN AND CONSTRUCTION

CITY ENGINEER

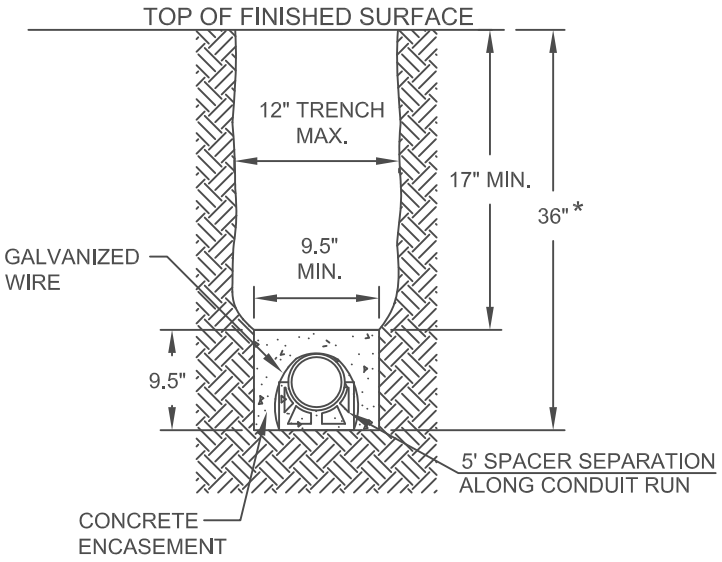
STD DWG
4000

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SHT 2 OF 2



ONE 2" CONDUIT ENCASED



ONE 3" CONDUIT ENCASED

* TRENCH DEPTH MAY VARY PER PLAN DETAILS

NOTE:

SMALLER DIAMETER CONDUITS MAY NEED WRAPPED SEPARATELY.

ENCASED CONDUIT

TRAFFIC SIGNAL CONDUIT BANK STANDARDS

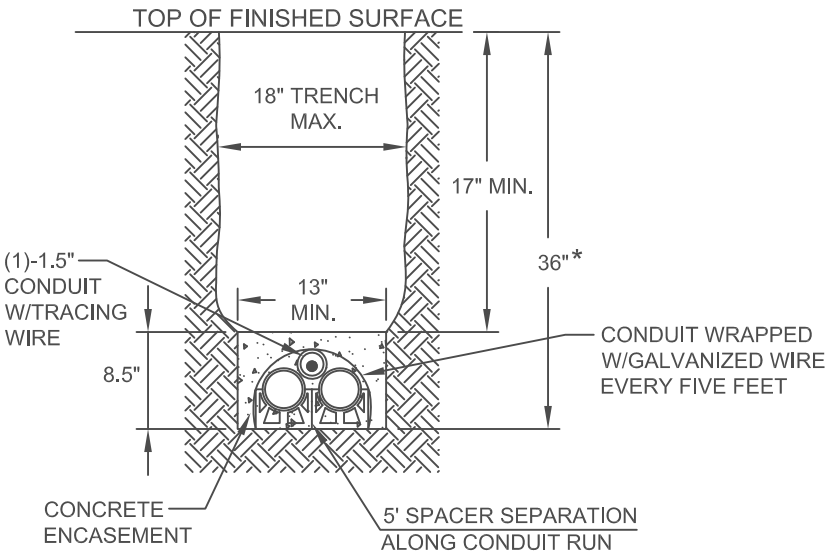
CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
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4001

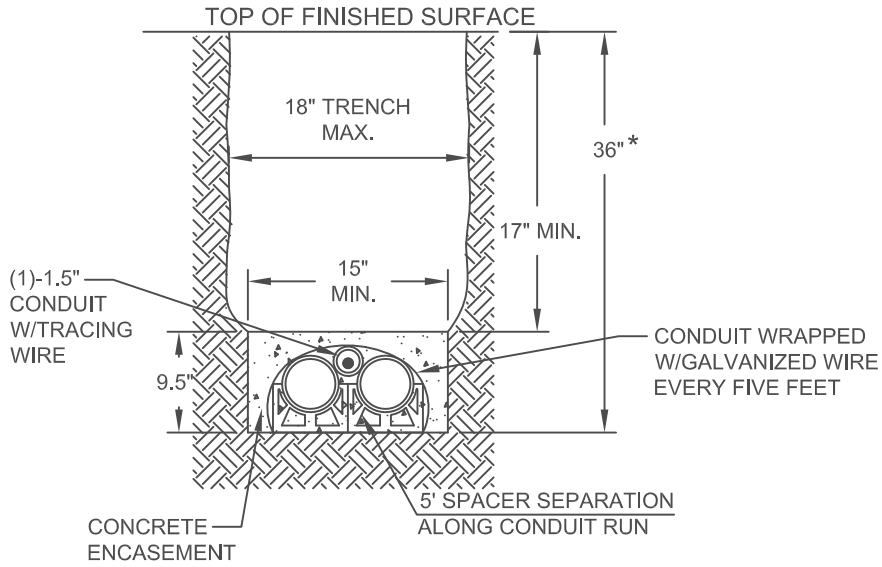
8/01/2015

CITY ENGINEER

SHT 1 OF 9



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



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

* TRENCH DEPTH MAY VARY PER PLAN DETAILS

CONDUIT BANK

NOTE:

SMALLER DIAMETER CONDUITS MAY NEED WRAPPED SEPARATELY.

TRAFFIC SIGNAL CONDUIT BANK STANDARDS

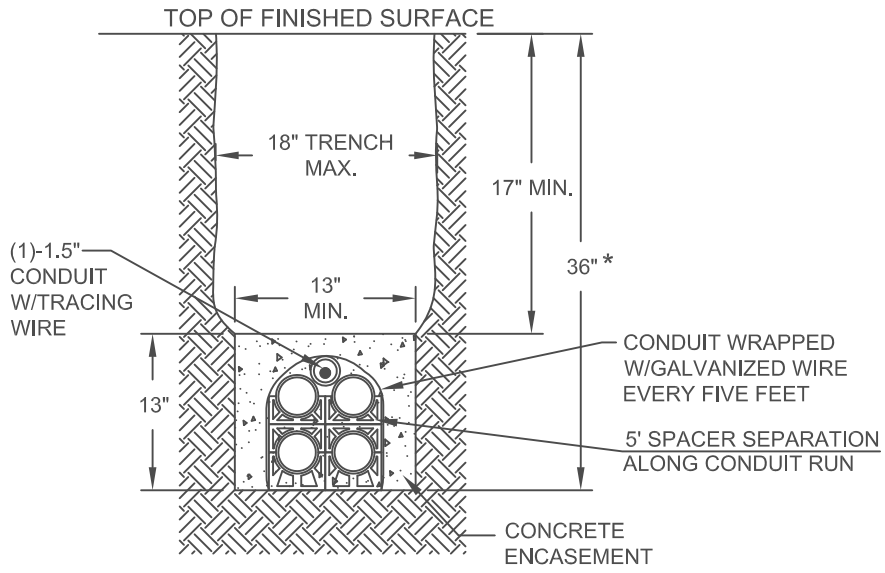
CITY OF COLUMBUS, OHIO
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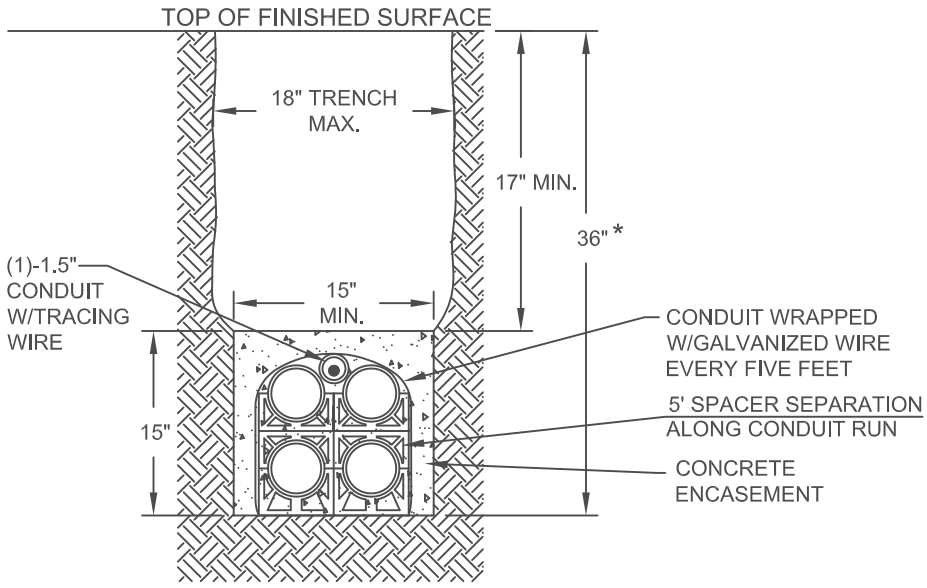
8/01/2015

CITY ENGINEER

SHT 2 OF 9



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



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

* TRENCH DEPTH MAY VARY PER PLAN DETAILS

NOTE:

SMALLER DIAMETER CONDUITS MAY NEED WRAPPED SEPARATELY.

CONDUIT BANK

TRAFFIC SIGNAL CONDUIT BANK STANDARDS

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

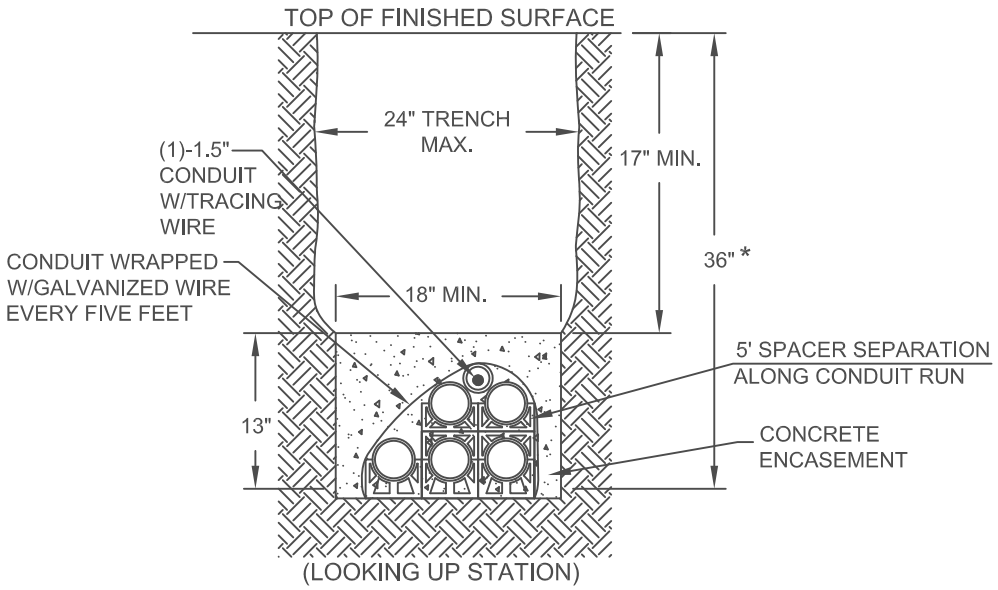
Hassan Zahra

CITY ENGINEER

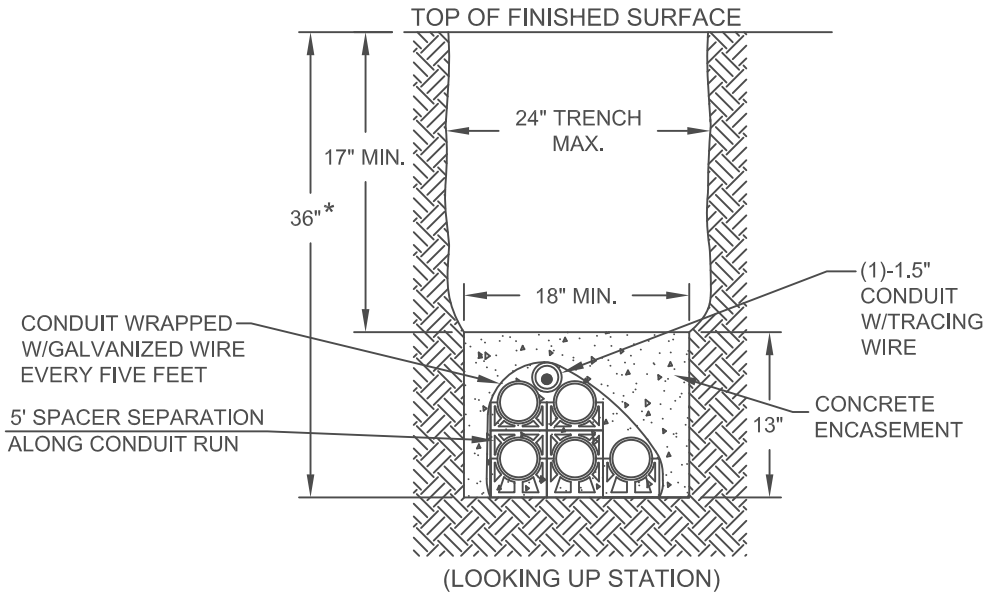
STD DWG
4001

8/01/2015

SHT 3 OF 9



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



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

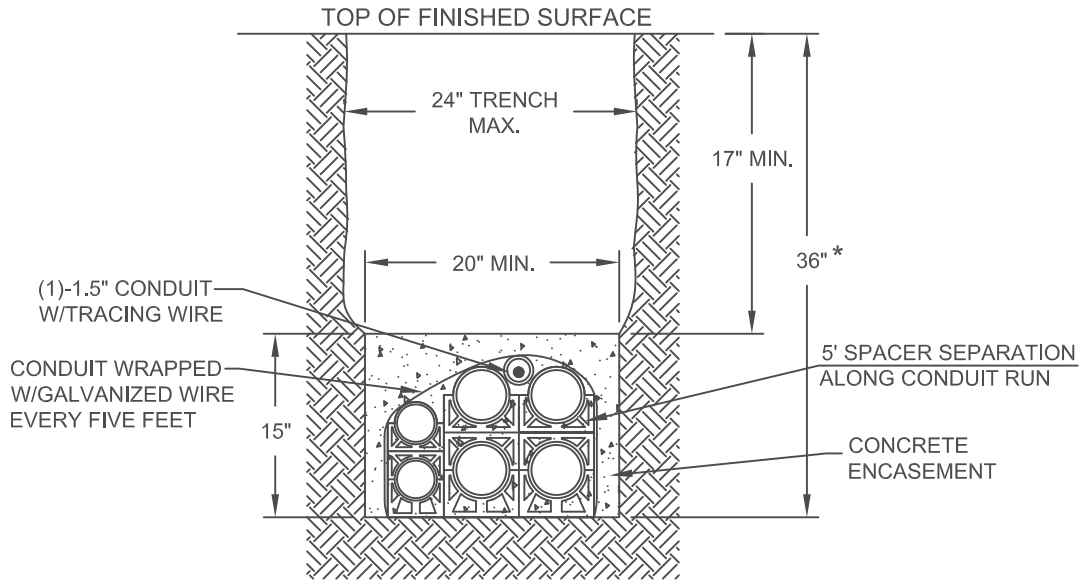
STD DWG
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Hassan Zahra

8/01/2015

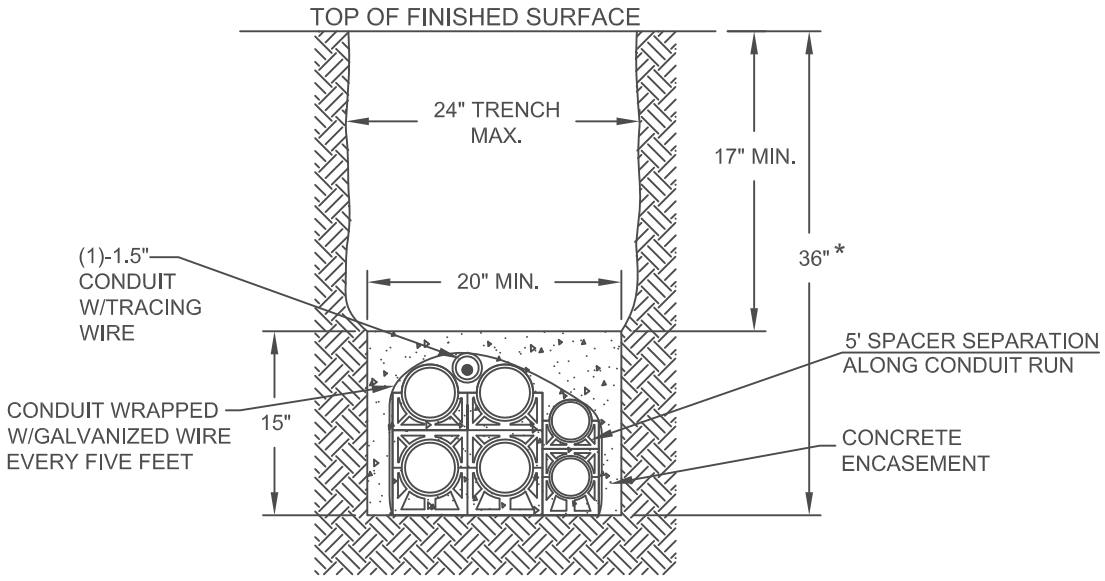
CITY ENGINEER

SHT 4 OF 9



(LOOKING UP STATION)

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



(LOOKING UP STATION)

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

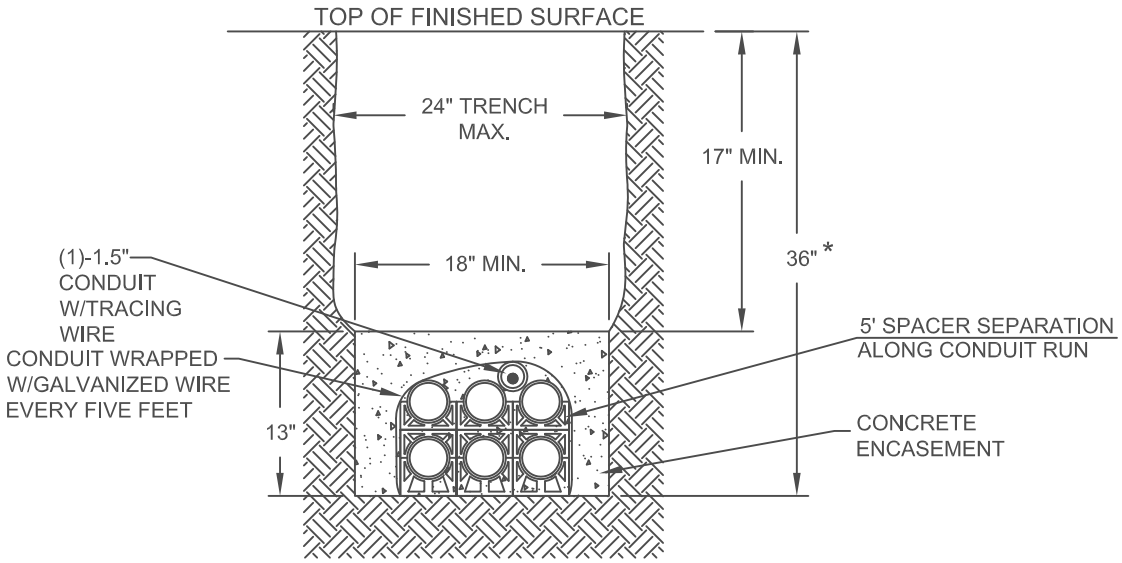
STD DWG
4001

Hassan Zahra

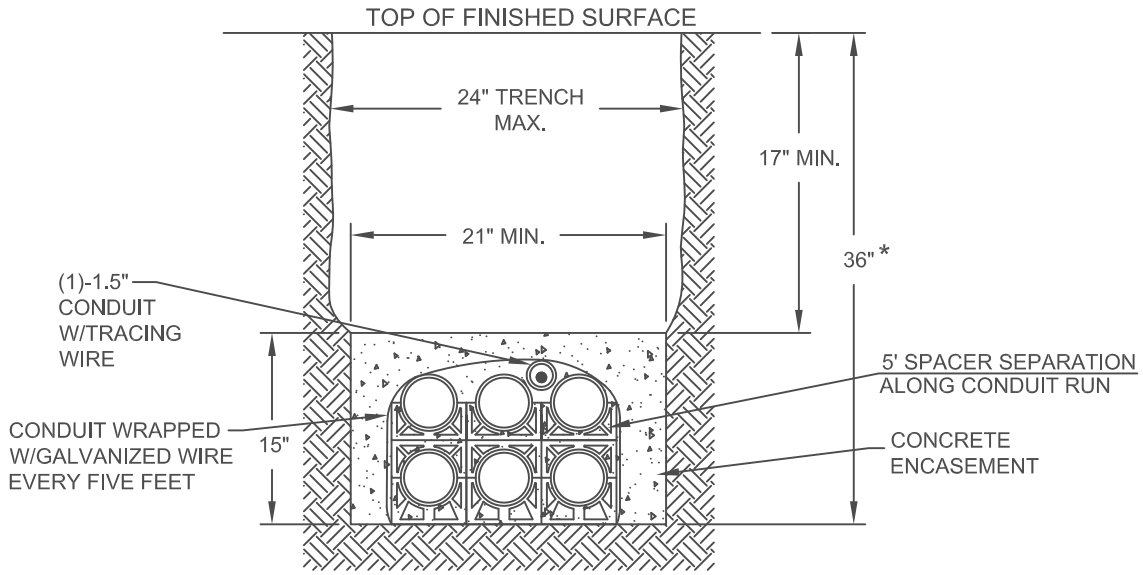
8/01/2015

CITY ENGINEER

SHT 5 OF 9



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



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

* TRENCH DEPTH MAY VARY PER PLAN DETAILS

NOTES:

ARRANGEMENT OF MULTICELL CONDUIT SHALL BE DETERMINED BY DESIGN.

SMALLER DIAMETER CONDUITS MAY NEED WRAPPED SEPARATELY.

CONDUIT BANK

TRAFFIC SIGNAL CONDUIT BANK STANDARDS

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

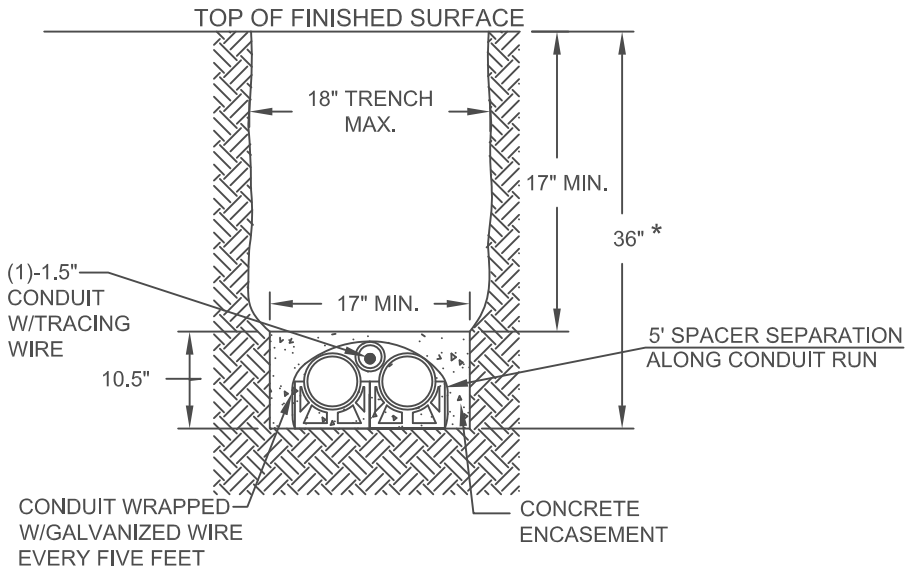
Hassan Zahra

CITY ENGINEER

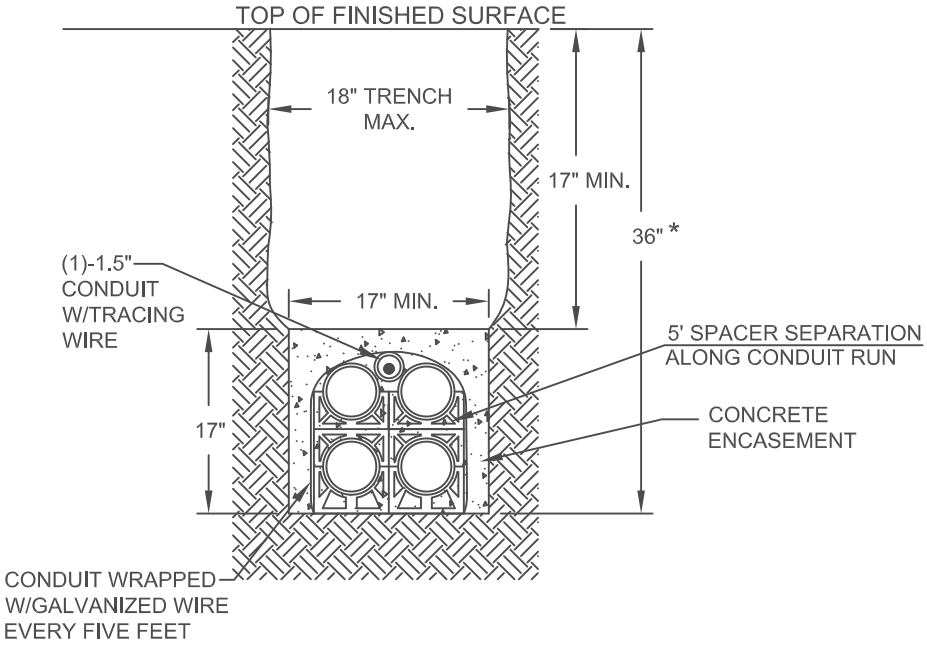
STD DWG
4001

8/01/2015

SHT 6 OF 9



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



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

* TRENCH DEPTH MAY VARY PER PLAN DETAILS

CONDUIT BANK

NOTES:

ARRANGEMENT OF MULTICELL CONDUIT SHALL BE DETERMINED BY DESIGN.

SMALLER DIAMETER CONDUITS MAY NEED WRAPPED SEPARATELY.

TRAFFIC SIGNAL CONDUIT BANK STANDARDS

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

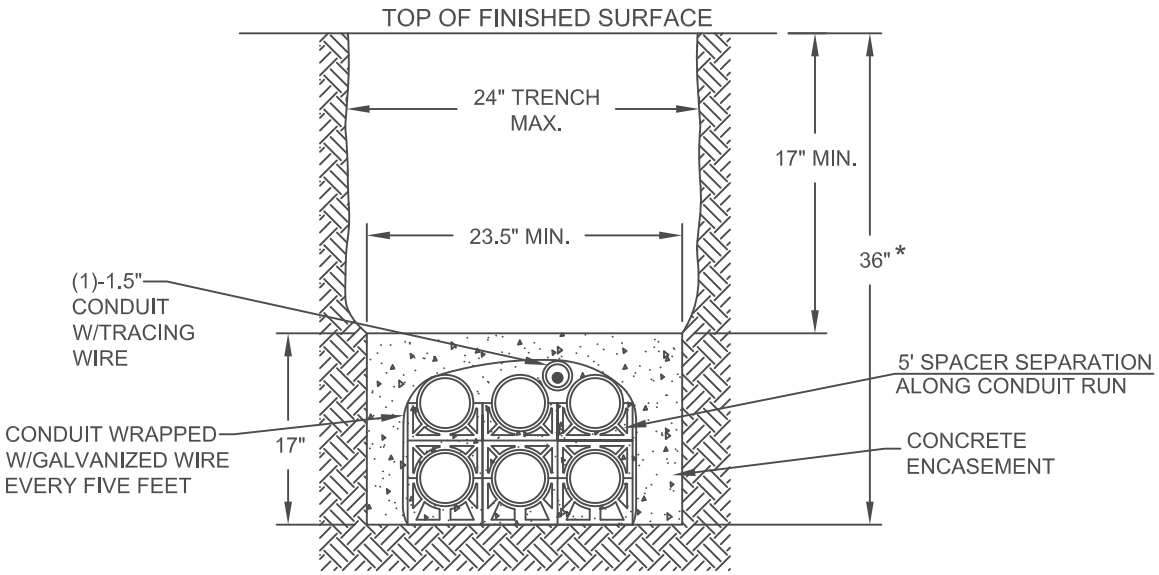
STD DWG
4001

Hassan Zahra

8/01/2015

CITY ENGINEER

SHT 7 OF 9



SIX 4" & ONE 1.5" CONDUIT BANK
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.

CONDUIT BANK

TRAFFIC SIGNAL CONDUIT BANK STANDARDS

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

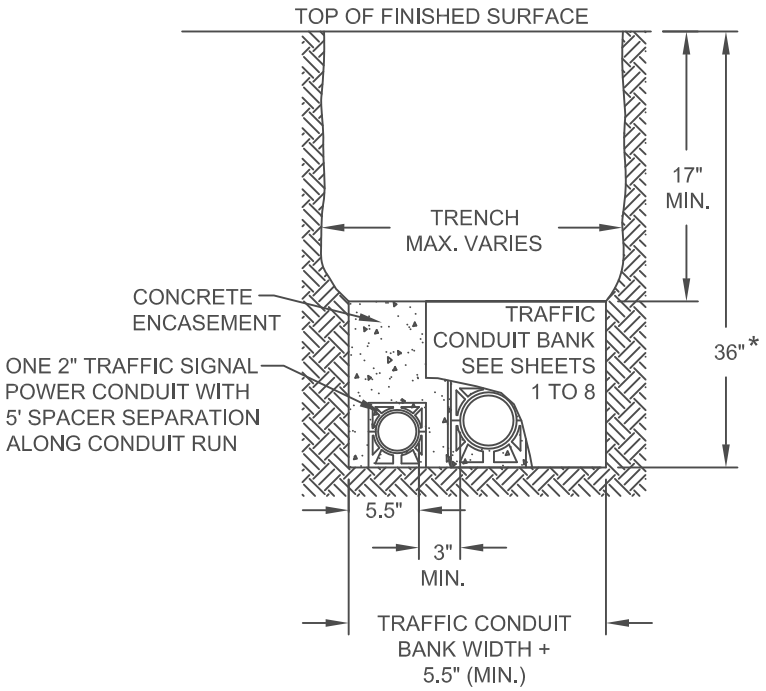
Hassan Zahra

CITY ENGINEER

STD DWG
4001

8/01/2015

SHT 8 OF 9



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 BANK

TRAFFIC SIGNAL CONDUIT BANK STANDARDS

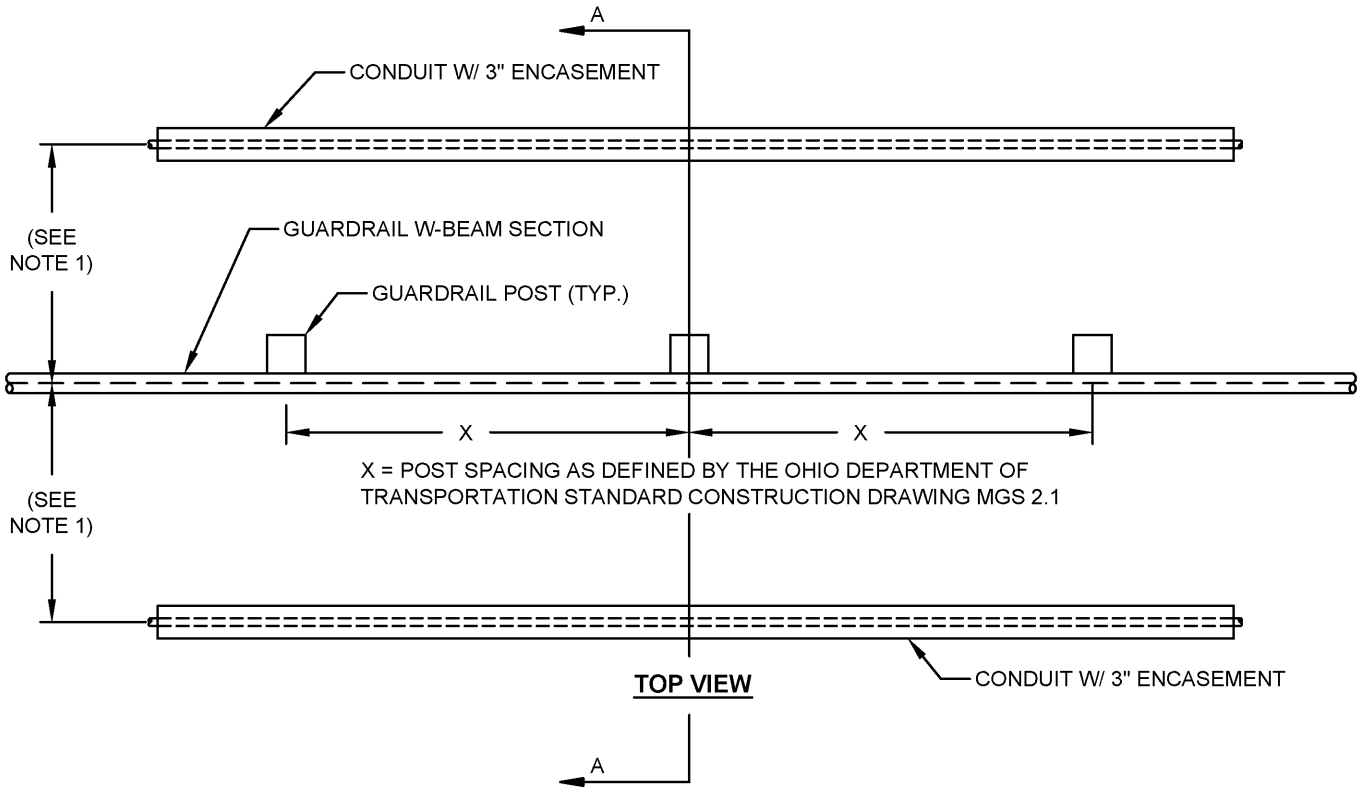
CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF DESIGN AND CONSTRUCTION

STD DWG
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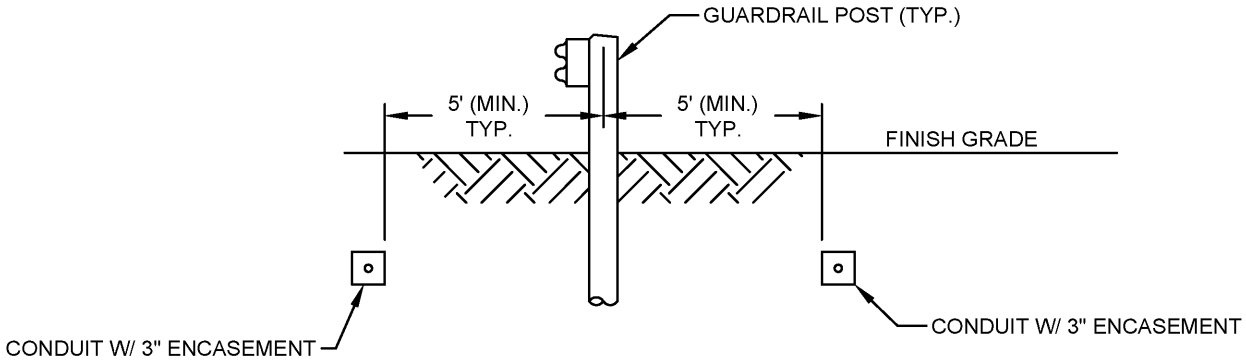
8/01/2015

CITY ENGINEER

SHT 9 OF 9



TOP VIEW



FRONT VIEW
SECTION A-A

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.

CONDUIT PARALLEL TO GUARDRAIL

CONDUIT GUARDRAIL PROTECTION

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

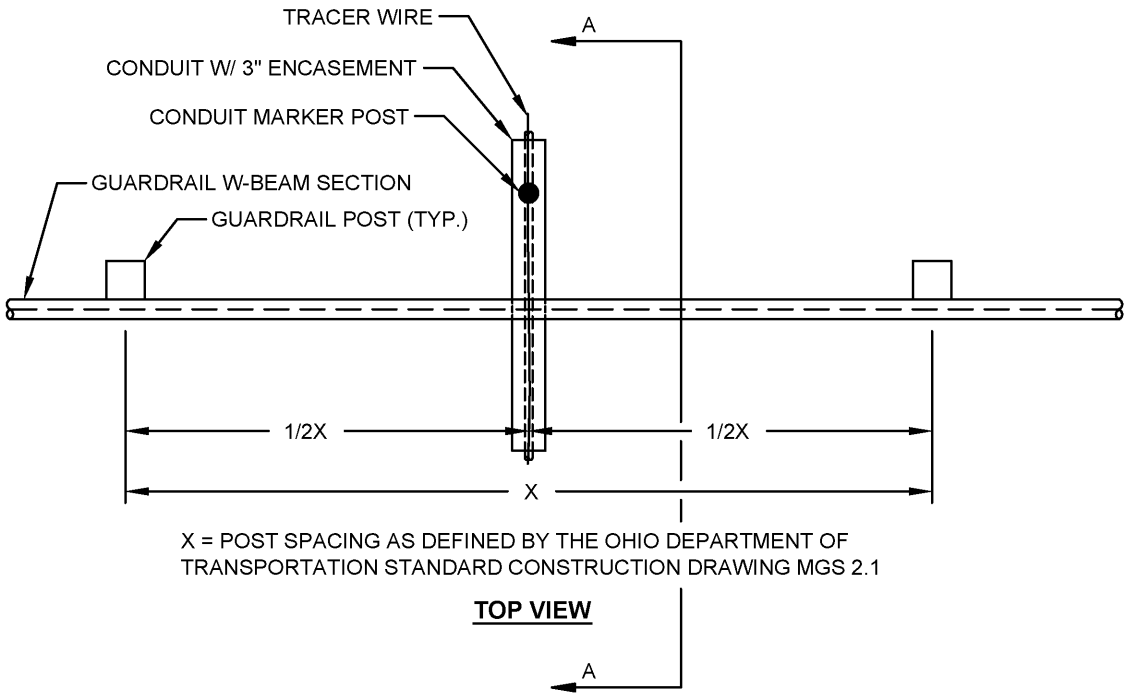
Hassan Zahra

CITY ENGINEER

STD DWG
4002

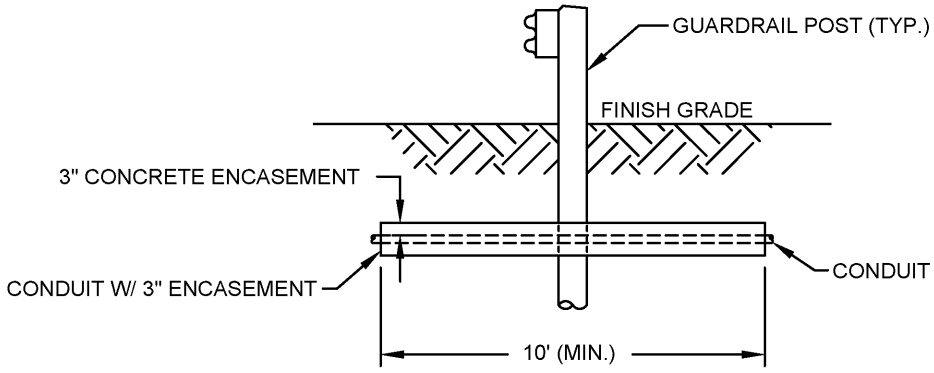
5/01/2014

SHT 1 OF 2



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

TOP VIEW



FRONT VIEW
SECTION A-A

CONDUIT CROSSING GUARDRAIL

CONDUIT GUARDRAIL PROTECTION

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

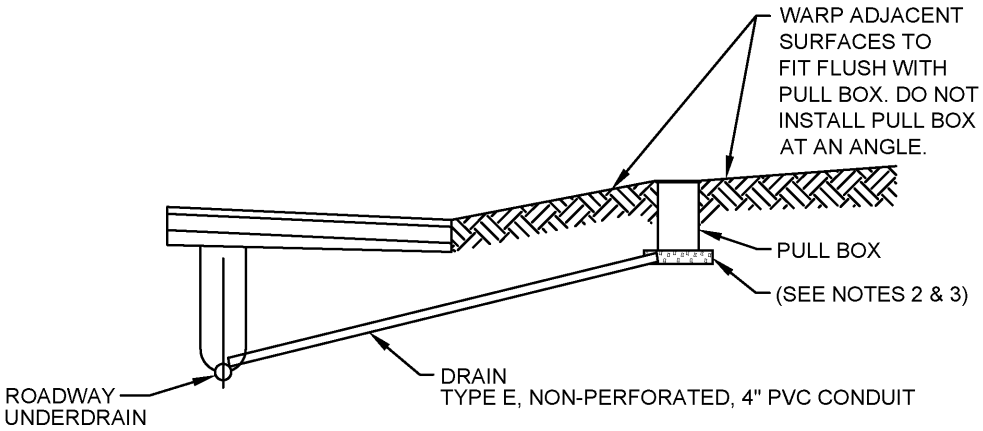
Hassan Zahra

CITY ENGINEER

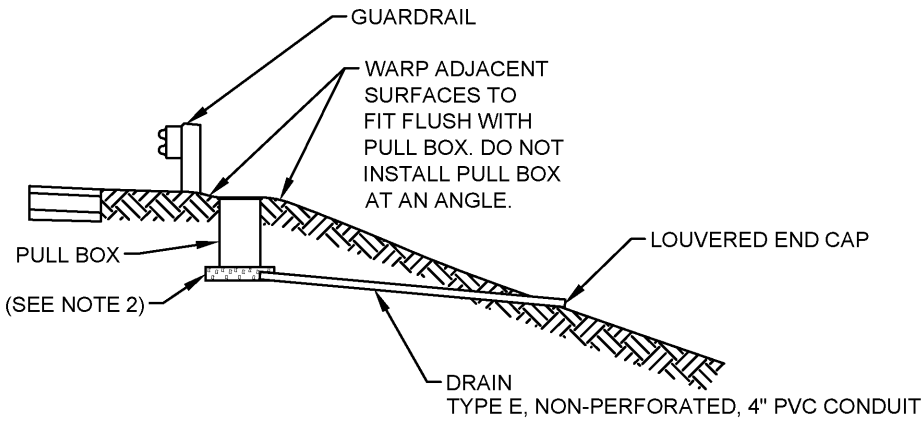
STD DWG
4002

5/01/2014

SHT 2 OF 2



INSTALLATION WITH CONNECTION TO ROADWAY UNDERDRAIN



INSTALLATION WITH INDEPENDENT DRAIN

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.

PULL BOX UNDERDRAIN DETAILS

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

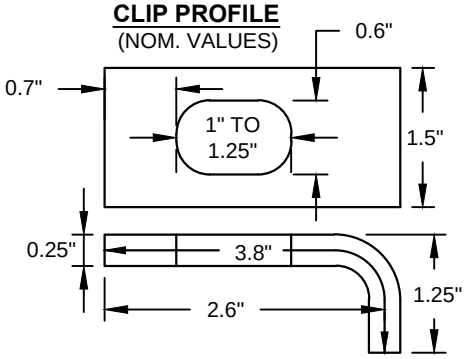
CITY ENGINEER

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4020

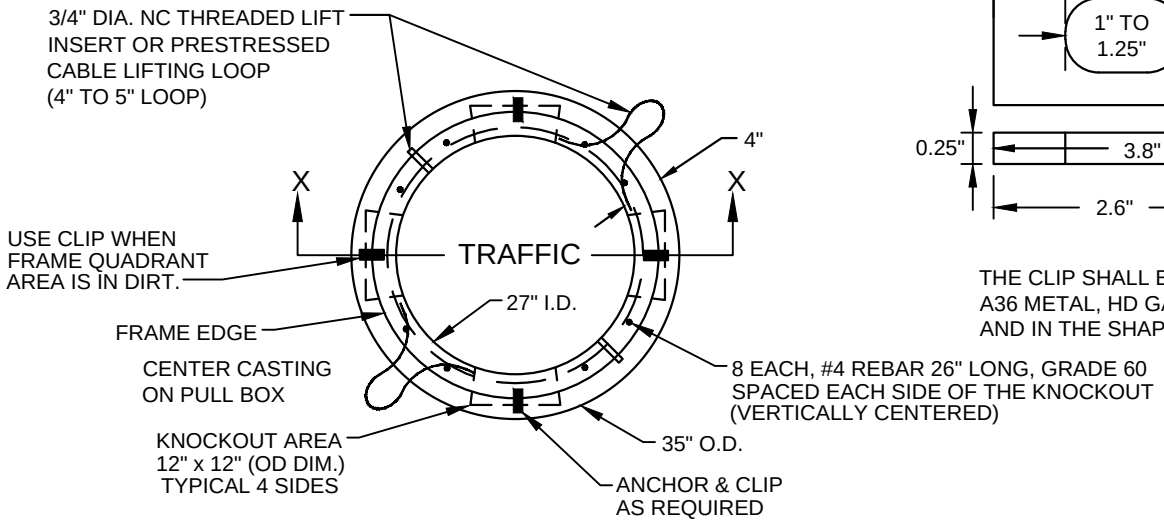
5/01/2014

SHT 1 OF 1

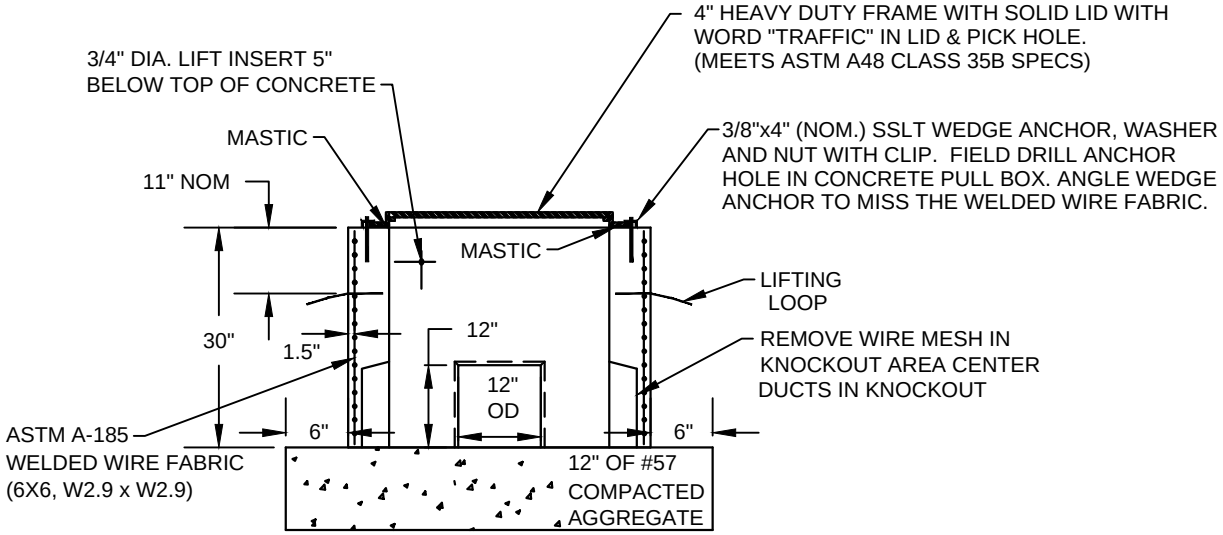
CLIP PROFILE
(NOM. VALUES)



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



TOP VIEW OF CONCRETE PULL BOX



SECTION X-X PULL BOX WITH FRAME AND LID

PULL BOX 27"

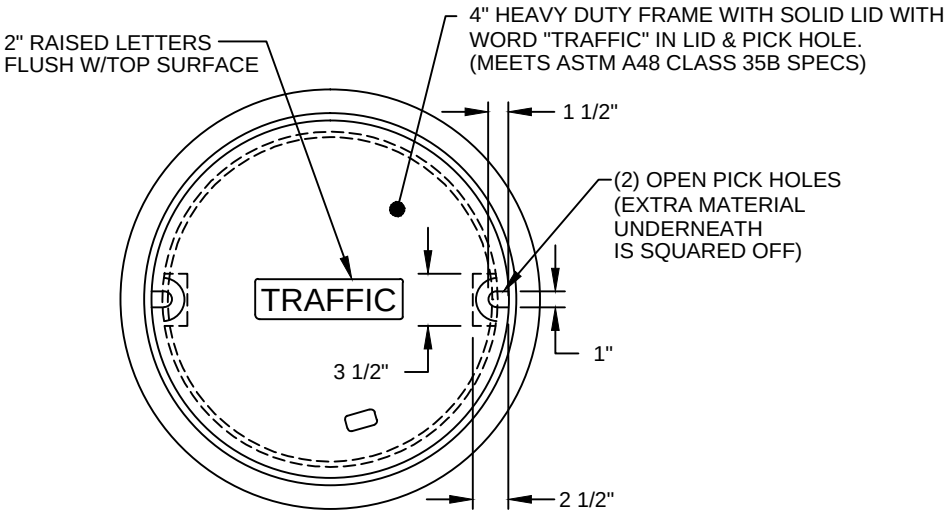
CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF DESIGN AND CONSTRUCTION

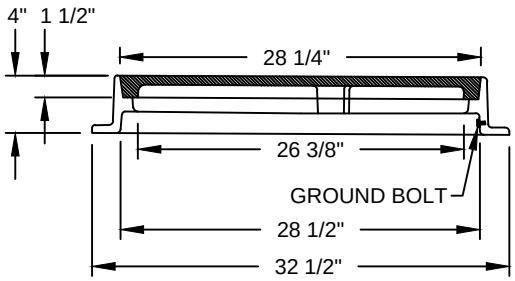
CITY ENGINEER

STD DWG
4021

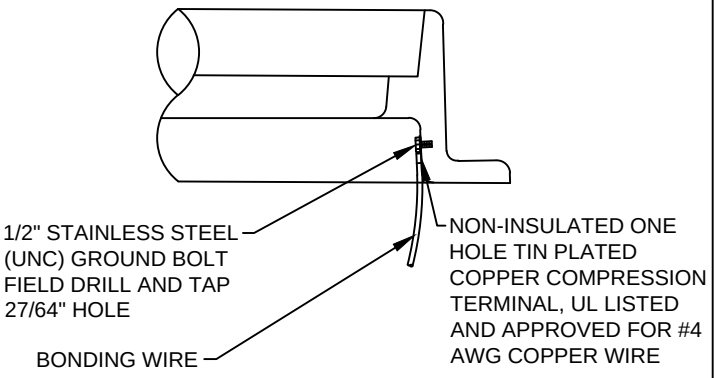
8/10/2017

SHT 1 OF 3





FRAME AND COVER DETAIL



GROUND BOLT INSTALLATION DETAIL

PULL BOX
27"

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

CITY ENGINEER

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4021

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SHT 2 OF 3

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.

PULL BOX
27"

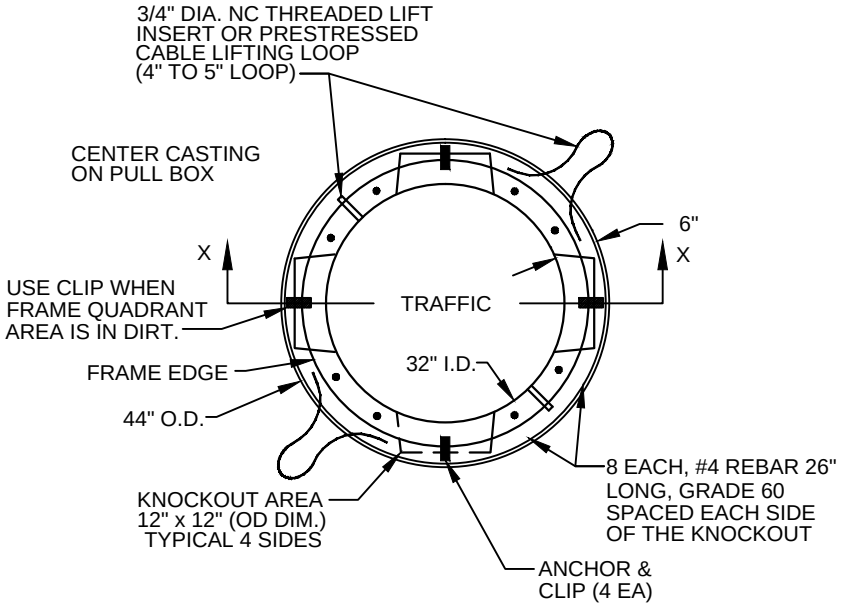
CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF DESIGN AND CONSTRUCTION

CITY ENGINEER

STD DWG
4021

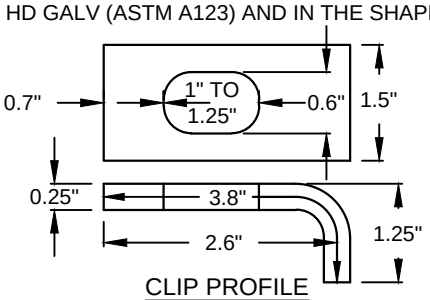
8/10/2017

SHT 3 OF 3

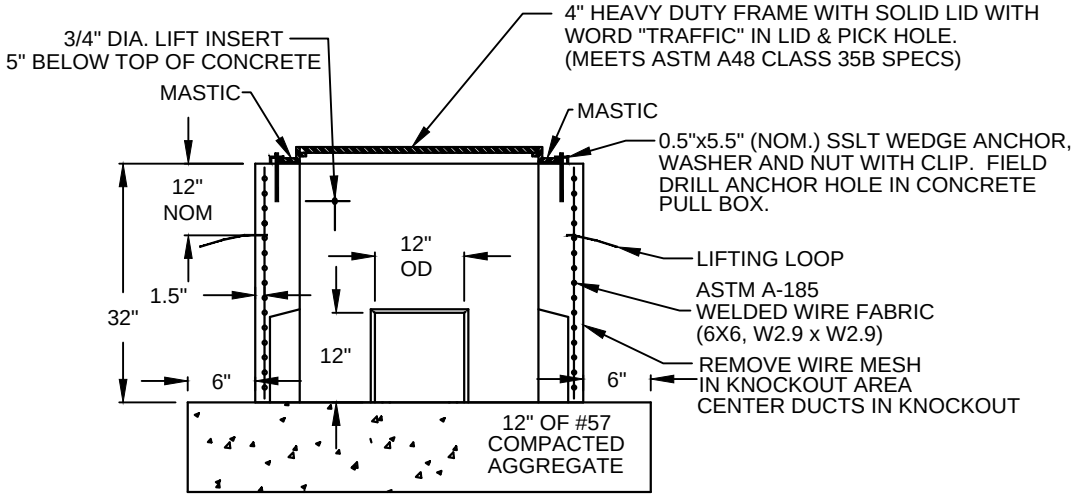


TOP VIEW OF CONCRETE PULL BOX

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



CLIP PROFILE
(NOM. VALUES)



SECTION X-X PULL BOX WITH FRAME AND LID

PULL BOX 32"

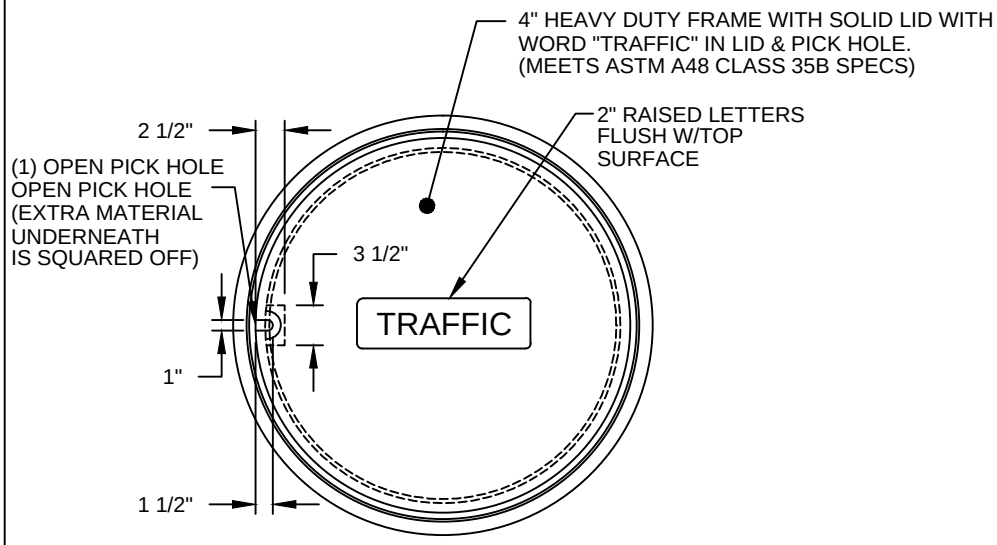
CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF DESIGN AND CONSTRUCTION

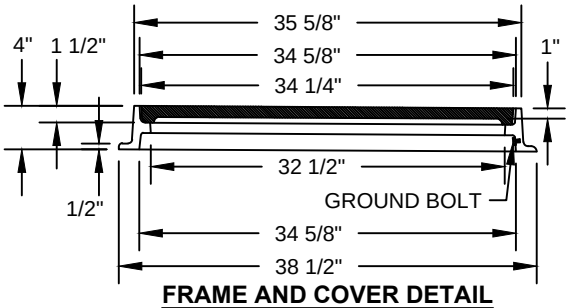
CITY ENGINEER

STD DWG
4022

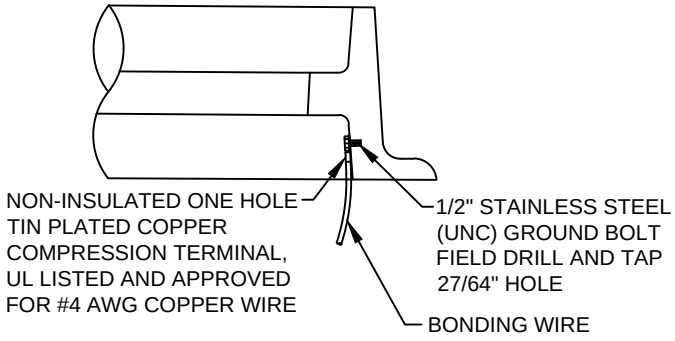
8/10/2017

SHT 1 OF 3





FRAME AND COVER DETAIL



GROUND BOLT INSTALLATION DETAIL

PULL BOX
32"

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

CITY ENGINEER

STD DWG
4022

8/10/2017

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.

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

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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.

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

PULL BOX
32"

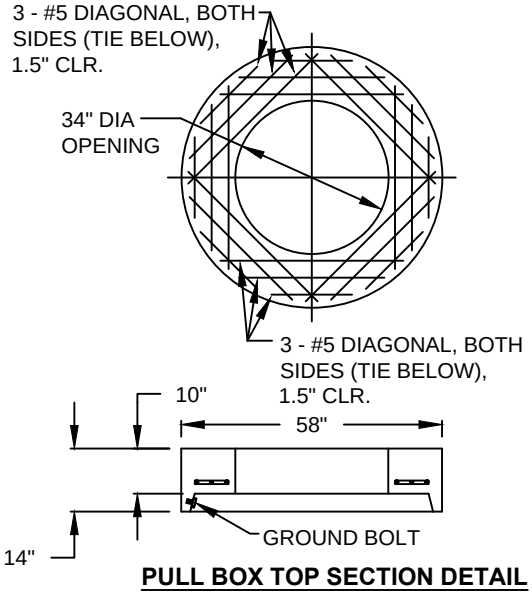
CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF DESIGN AND CONSTRUCTION

STD DWG
4022

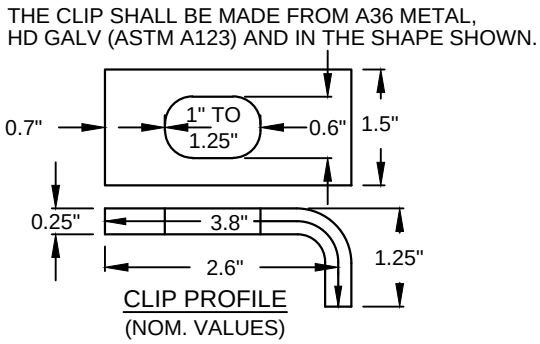
8/10/2017

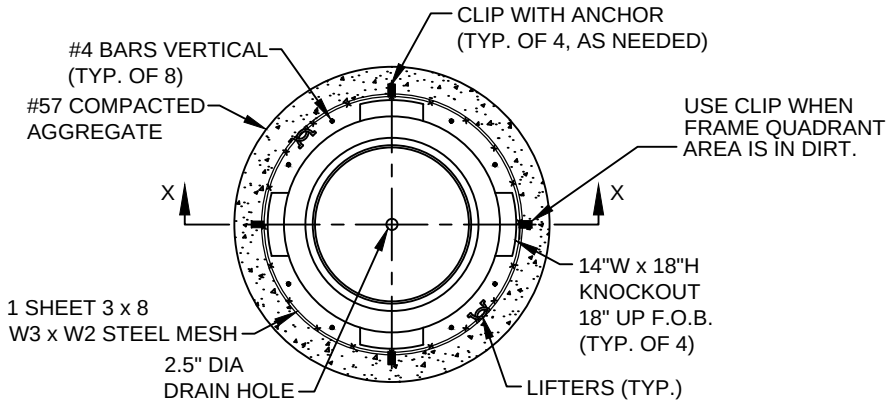
CITY ENGINEER

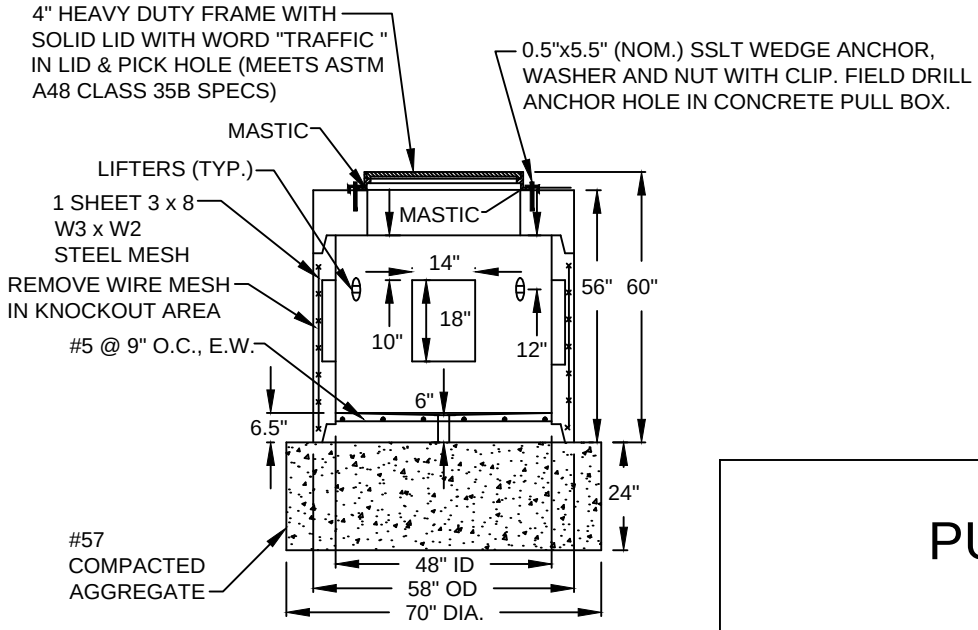
SHT 3 OF 3



PULL BOX TOP SECTION DETAIL







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

TYPE 1

PULL BOX 48"

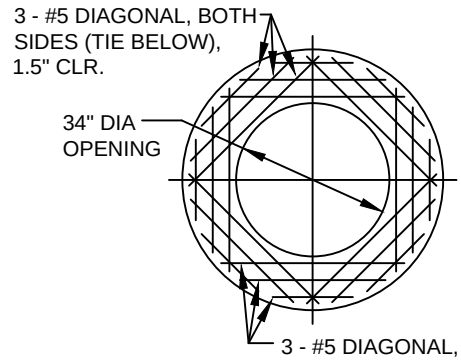
CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF DESIGN AND CONSTRUCTION

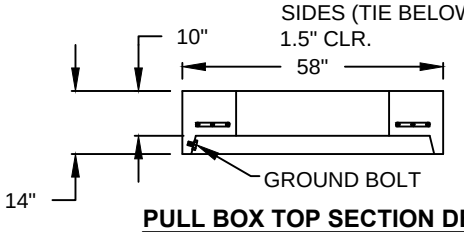
STD DWG
4023

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CITY ENGINEER

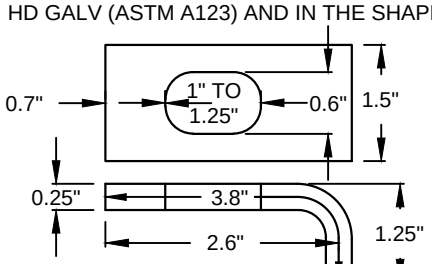
SHT 1 OF 4



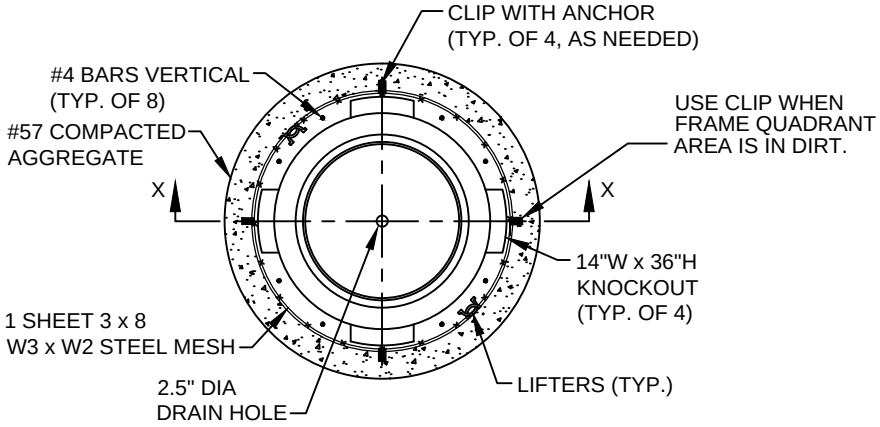


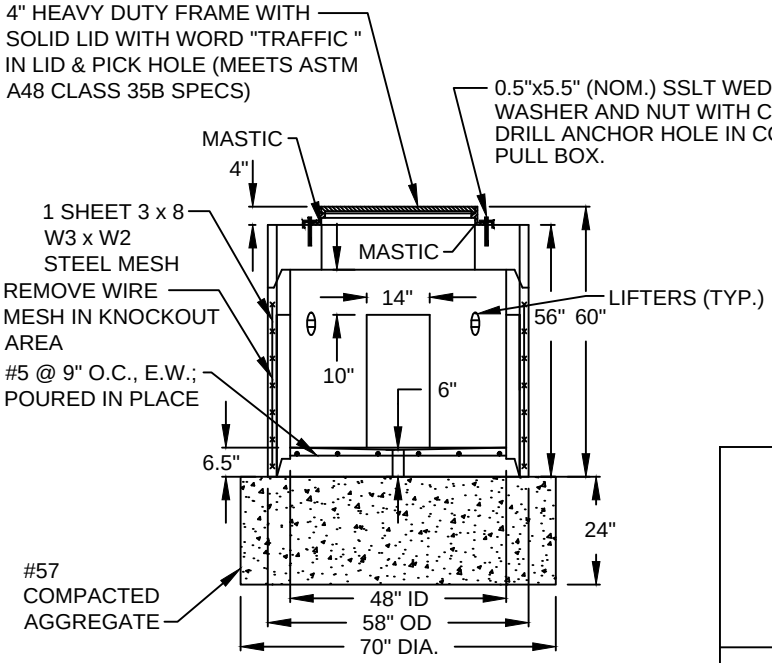
PULL BOX TOP SECTION DETAIL

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



CLIP PROFILE
(NOM. VALUES)





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

*USE WHEN PLACING PULL BOX OVER EXISTING CONDUITS

TYPE 2

PULL BOX 48"

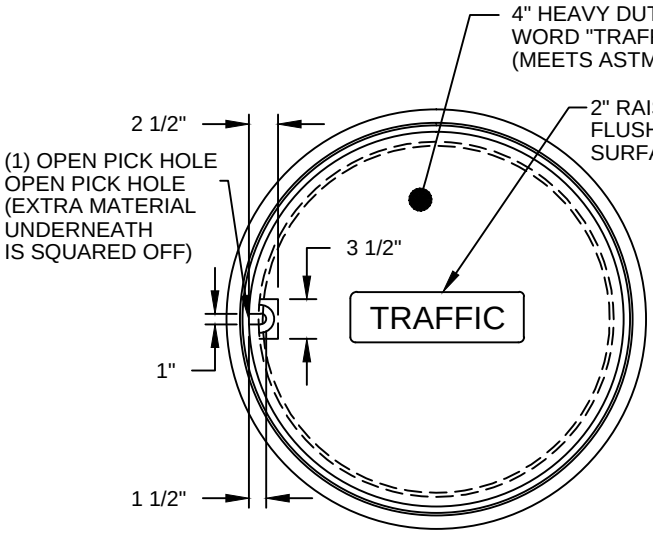
CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF DESIGN AND CONSTRUCTION

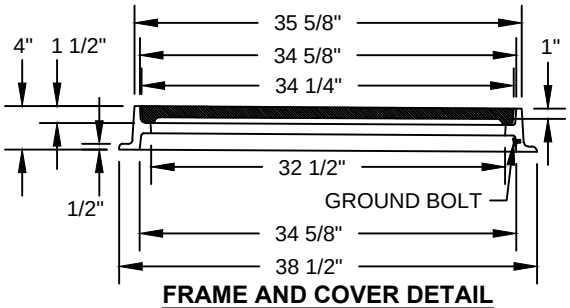
STD DWG
4023

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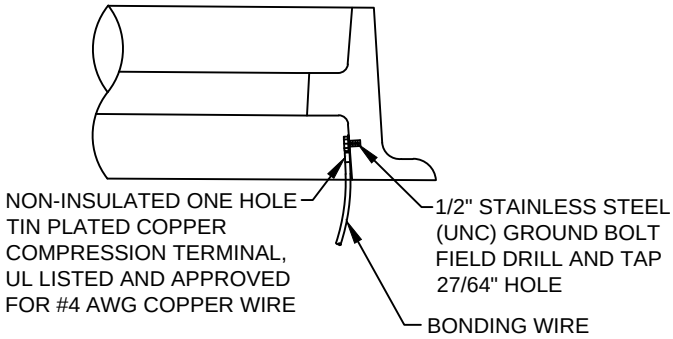
CITY ENGINEER

SHT 2 OF 4





FRAME AND COVER DETAIL



GROUND BOLT INSTALLATION DETAIL

PULL BOX
48"

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

CITY ENGINEER

STD DWG
4023

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SHT 3 OF 4

NOTES:

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

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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.

PULL BOX
48"

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

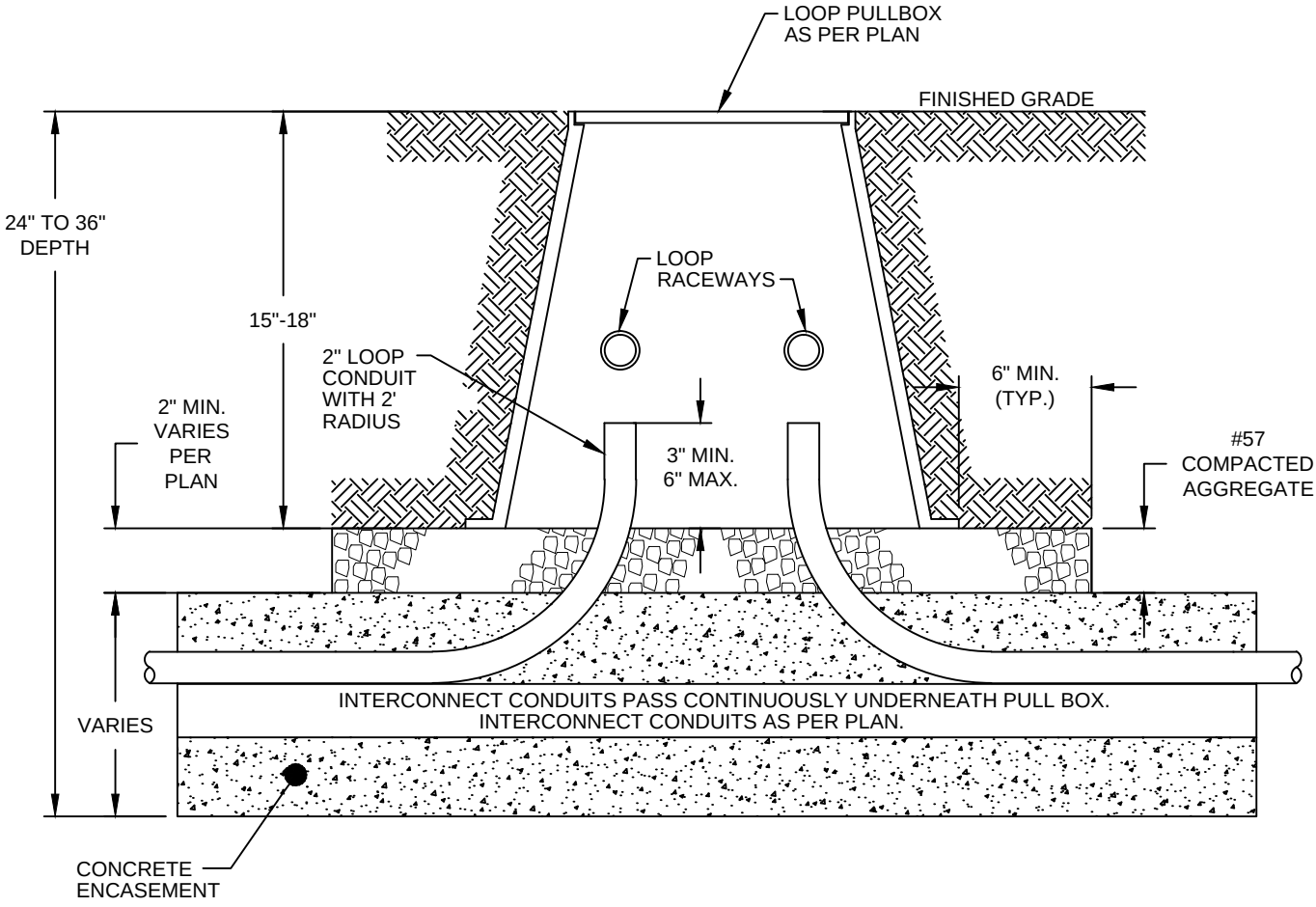


CITY ENGINEER

STD DWG
4023

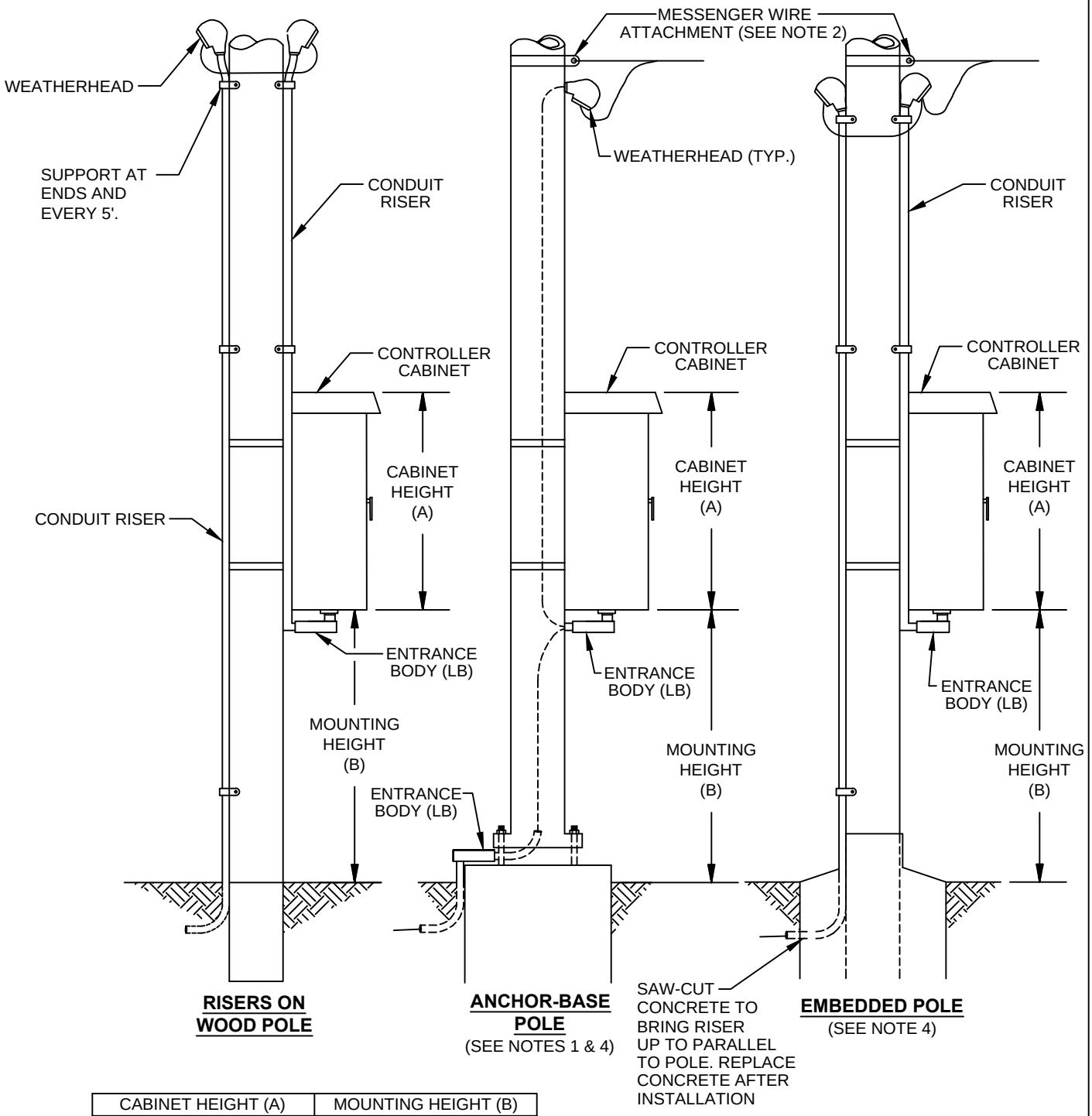
8/10/2017

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LOOP PULL BOX INSTALLED OVER INTERCONNECT CONDUIT BANK

CITY OF COLUMBUS, OHIO DEPARTMENT OF PUBLIC SERVICE DIVISION OF DESIGN AND CONSTRUCTION	STD DWG 4024
	8/10/2017
CITY ENGINEER	SHT 1 OF 1



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

NOTES:

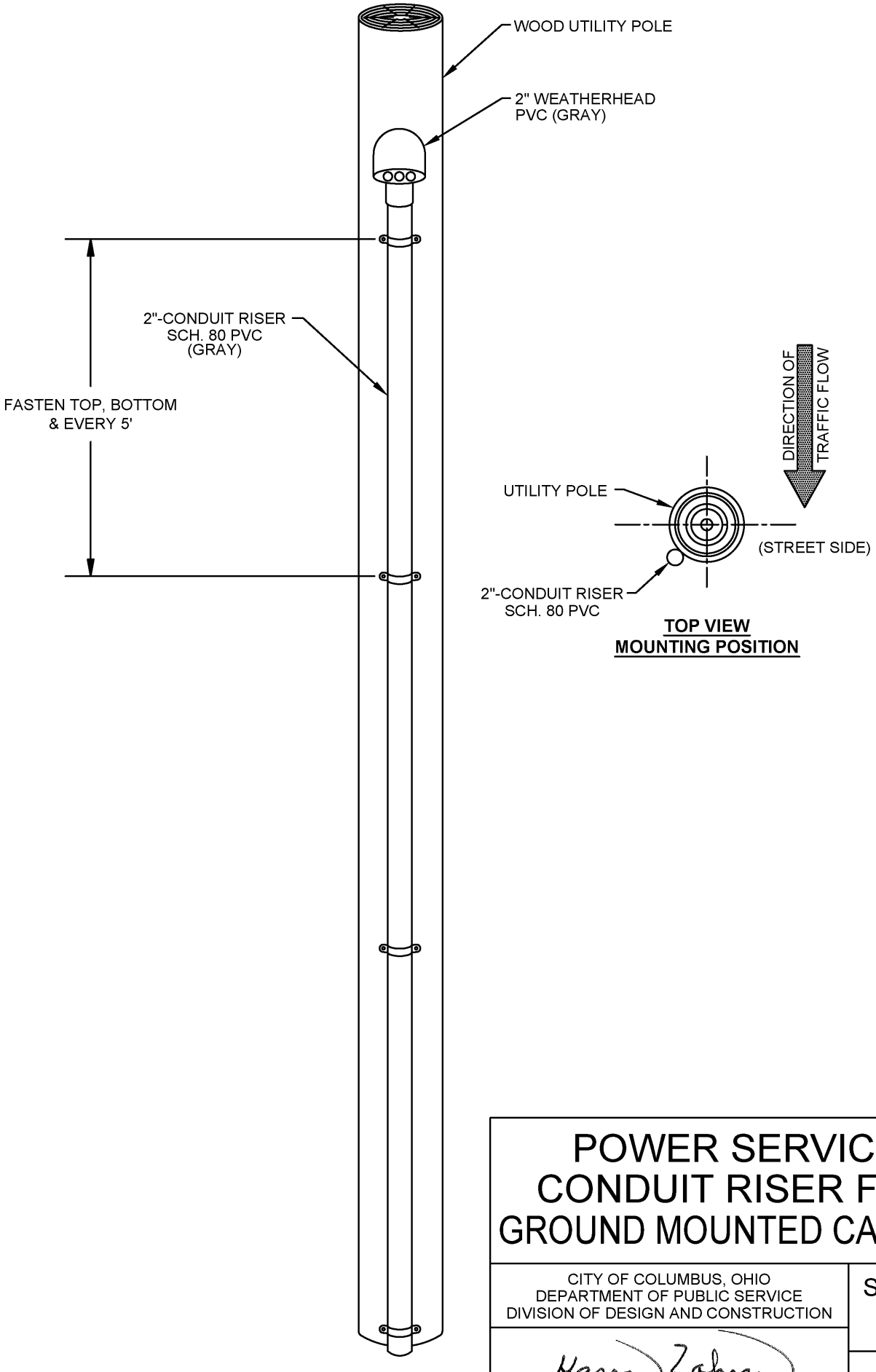
1. CONDUIT ENTRY AT BASE OF POLE SHOWN IN ANCHOR BASE APPLICATIONS SHALL ONLY BE PERMITTED IF SPECIFIED IN THE CONSTRUCTION PLANS.
2. SEE MESSENGER WIRE DETAILS ON CITY OF COLUMBUS STANDARD DRAWINGS 4330 AND 4331.
3. THESE ARE NOT APPLICABLE FOR POWER SERVICE. SEE CITY OF COLUMBUS STANDARD DRAWING 4052 FOR DETAILS.
4. EXISTING POLE ONLY WITH PRIOR APPROVAL FOR RETRO FIT APPLICATIONS.

SIGNAL CABLE CONDUIT RISER FOR POLE MOUNTED CABINET

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

CITY ENGINEER

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4050
8/10/2017
SHT 1 OF 1



POWER SERVICE CONDUIT RISER FOR GROUND MOUNTED CABINET

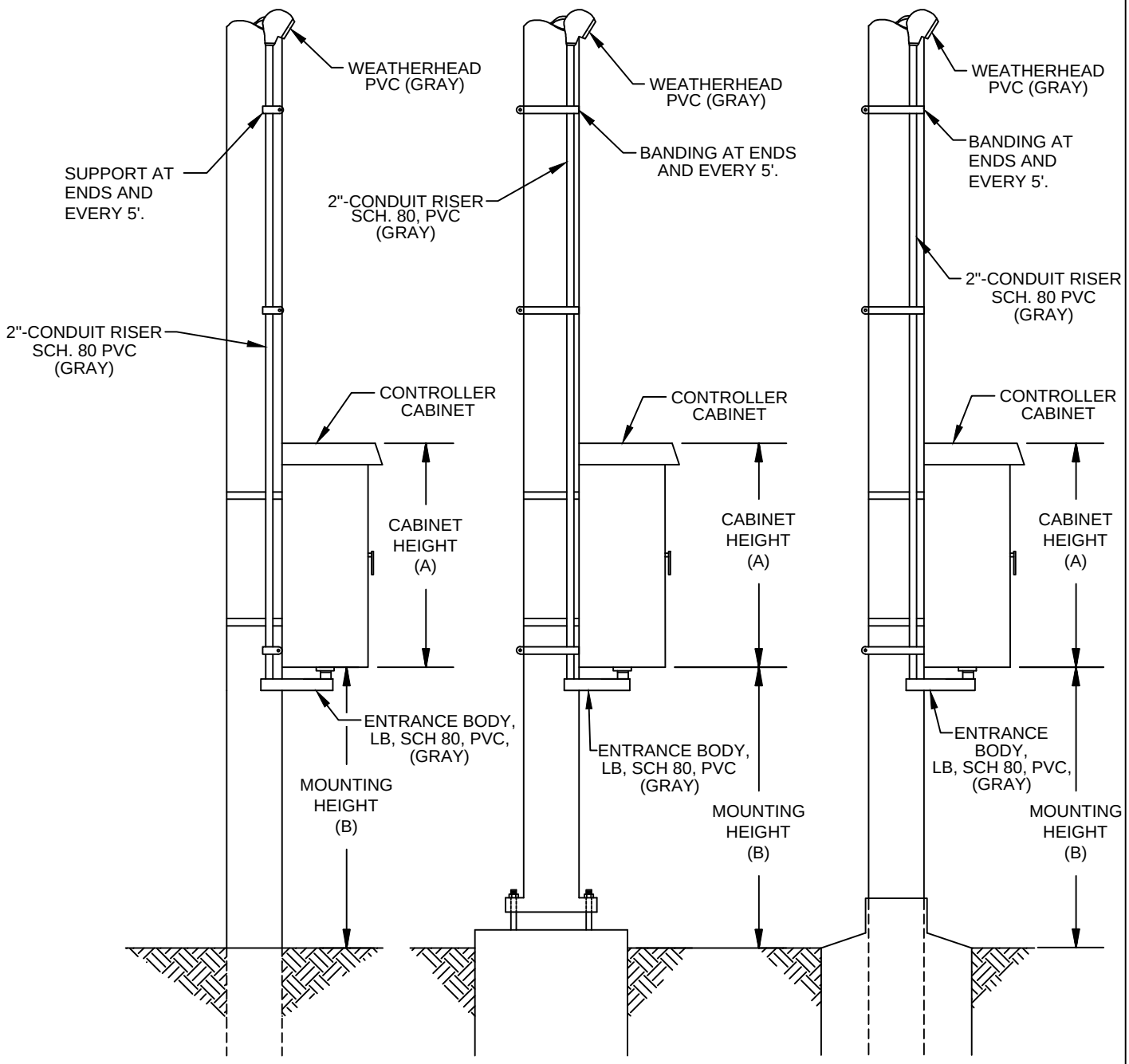
CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF DESIGN AND CONSTRUCTION

CITY ENGINEER

STD DWG
4051

5/01/2014

SHT 1 OF 1



WOOD POLE

ANCHOR-BASE POLE
(SEE NOTE 1)

EMBEDDED POLE
(SEE NOTE 1)

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.

POWER SERVICE CONDUIT RISER FOR POLE MOUNTED CABINET

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

CITY ENGINEER

STD DWG
4052

8/10/2017

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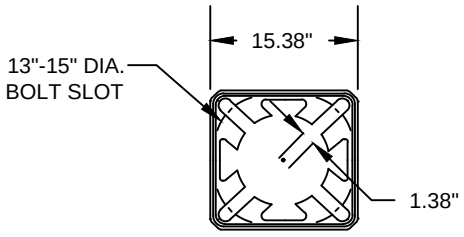
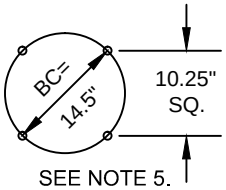
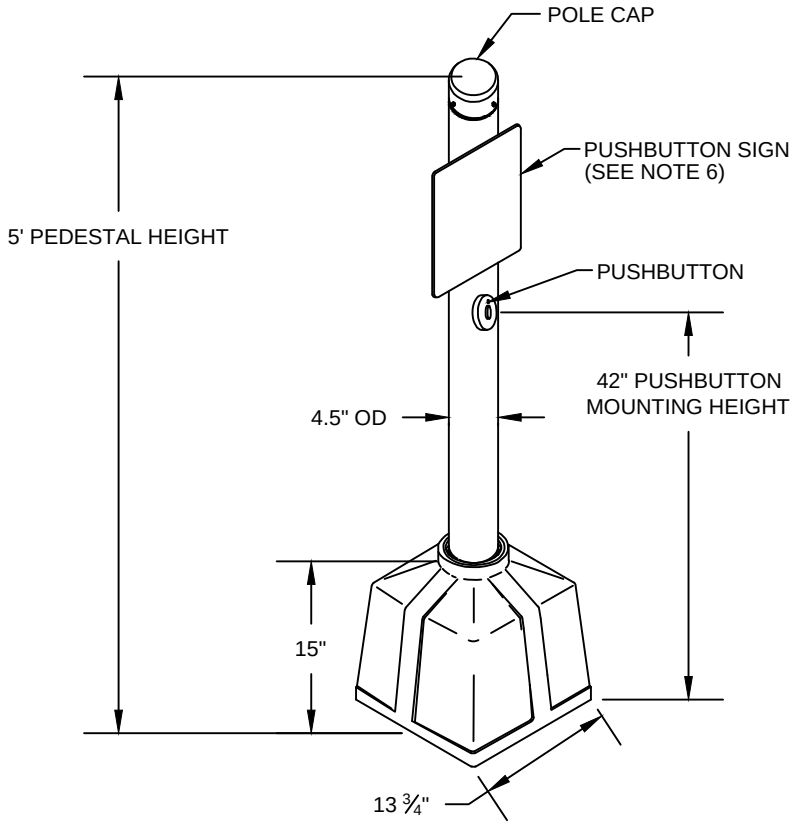


PLATE PEDESTAL BASE

ANCHOR BOLT PATTERN





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.

5' PEDESTAL PUSHBUTTON MOUNTING

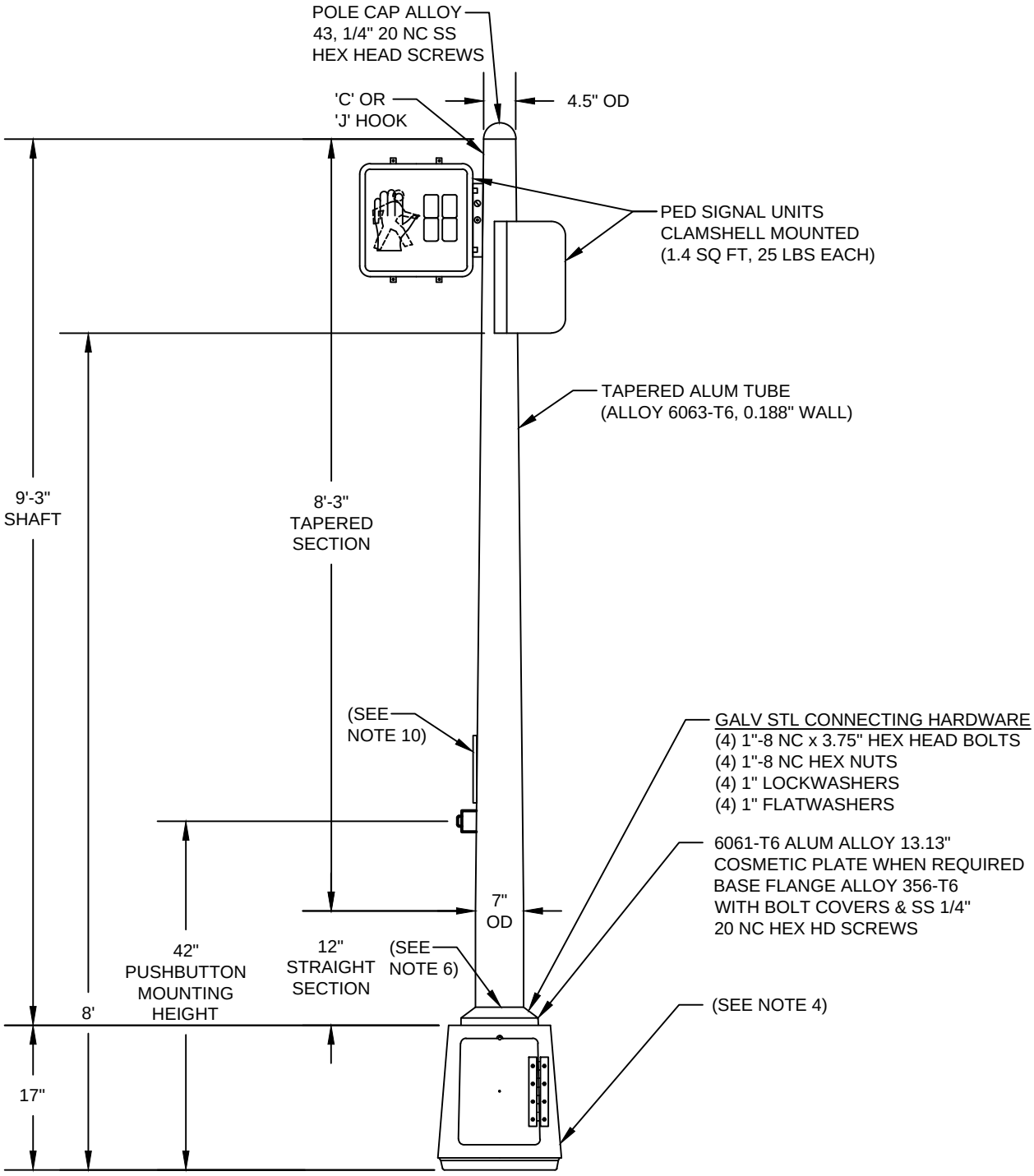
CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF DESIGN AND CONSTRUCTION

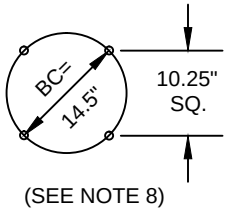
CITY ENGINEER

STD DWG
4100

8/10/2017

SHT 1 OF 1





(SEE NOTE 8)

ANCHOR BOLT PATTERN

10.7' PEDESTAL PEDESTRIAN SIGNAL HEAD MOUNTING

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

STD DWG
4101

8/10/2017

CITY ENGINEER

SHT 1 OF 2

NOTES:

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

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

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

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

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

6. THE POLE BASE SHALL TELESCOPE THE POLE SHAFT. THE BASE SHALL BE WELDED TO THE POLE SHAFT BY 2 CIRCUMFERENTIAL WELDS: ONE ON THE OUTSIDE OF THE POLE AT THE BASE TOP AND ONE ON THE INSIDE OF THE BASE AT THE POLE BOTTOM.

7. 4 BOLT COVERS AND A POLE CAP SHALL BE FURNISHED AND INSTALLED WITH EACH PEDESTAL. THE POLE BASE PLATE SHALL BE LARGE ENOUGH TO FIT OVER ALL OF THE T-BASE TOP OPENINGS. USING AN ALUMINUM FILLER PLATE ON TOP OF THE T-BASE TO COVER ANY OPENING IS ACCEPTABLE. THE FILLER PLATE SHALL BE MANUFACTURED TO FIT THE T-BASE TOP EXACTLY AND BE AT LEAST 1/8 INCH THICK AND MADE FROM 5052-H32 ALLOY. BOTH SIDES AND THE EDGES OF THE FILLER PLATE SHALL BE COATED TO MATCH THE POLE AND T-BASE.

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.

10.7' PEDESTAL PEDESTRIAN SIGNAL HEAD MOUNTING

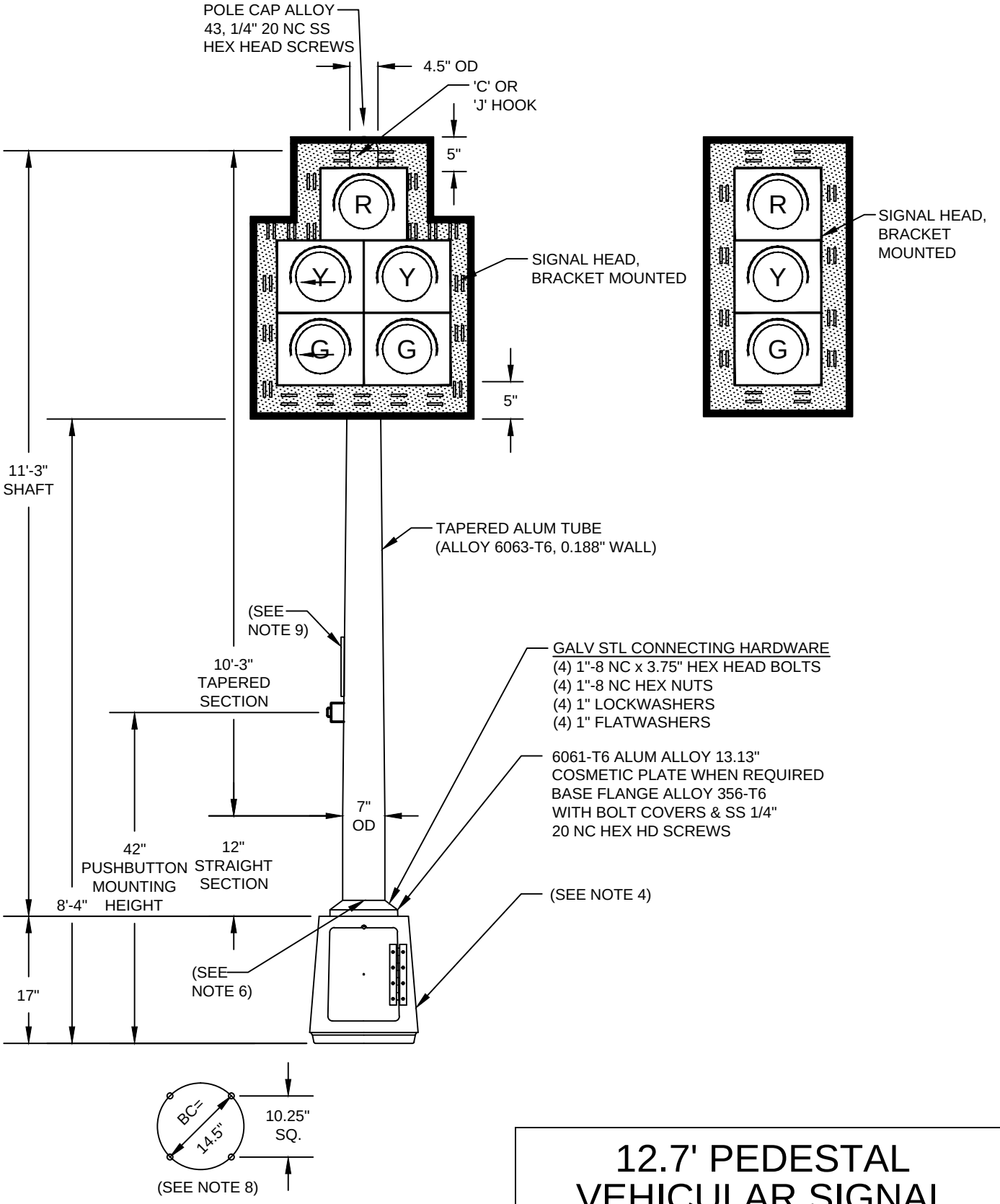
CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF DESIGN AND CONSTRUCTION

STD DWG
4101

8/10/2017

CITY ENGINEER

SHT 2 OF 2



ANCHOR BOLT PATTERN

12.7' PEDESTAL VEHICULAR SIGNAL HEAD MOUNTING

CITY OF COLUMBUS, OHIO DEPARTMENT OF PUBLIC SERVICE DIVISION OF DESIGN AND CONSTRUCTION	STD DWG 4102
	8/10/2017
CITY ENGINEER	SHT 1 OF 2

NOTES:

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

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

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

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

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

6. THE POLE BASE SHALL TELESCOPE THE POLE SHAFT. THE BASE SHALL BE WELDED TO THE POLE SHAFT BY 2 CIRCUMFERENTIAL WELDS: ONE ON THE OUTSIDE OF THE POLE AT THE BASE TOP AND ONE ON THE INSIDE OF THE BASE AT THE POLE BOTTOM.

7. 4 BOLT COVERS AND A POLE CAP SHALL BE FURNISHED AND INSTALLED WITH EACH PEDESTAL. THE POLE BASE PLATE SHALL BE LARGE ENOUGH TO FIT OVER ALL OF THE T-BASE TOP OPENINGS. USING AN ALUMINUM FILLER PLATE ON TOP OF THE T-BASE TO COVER ANY OPENING IS ACCEPTABLE. THE FILLER PLATE SHALL BE MANUFACTURED TO FIT THE T-BASE TOP EXACTLY AND BE AT LEAST 1/8 INCH THICK AND MADE FROM 5052-H32 ALLOY. BOTH SIDES AND THE EDGES OF THE FILLER PLATE SHALL BE COATED TO MATCH THE POLE AND T-BASE..

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.

12.7' PEDESTAL & VEHICULAR SIGNAL HEAD MOUNTING STANDARD

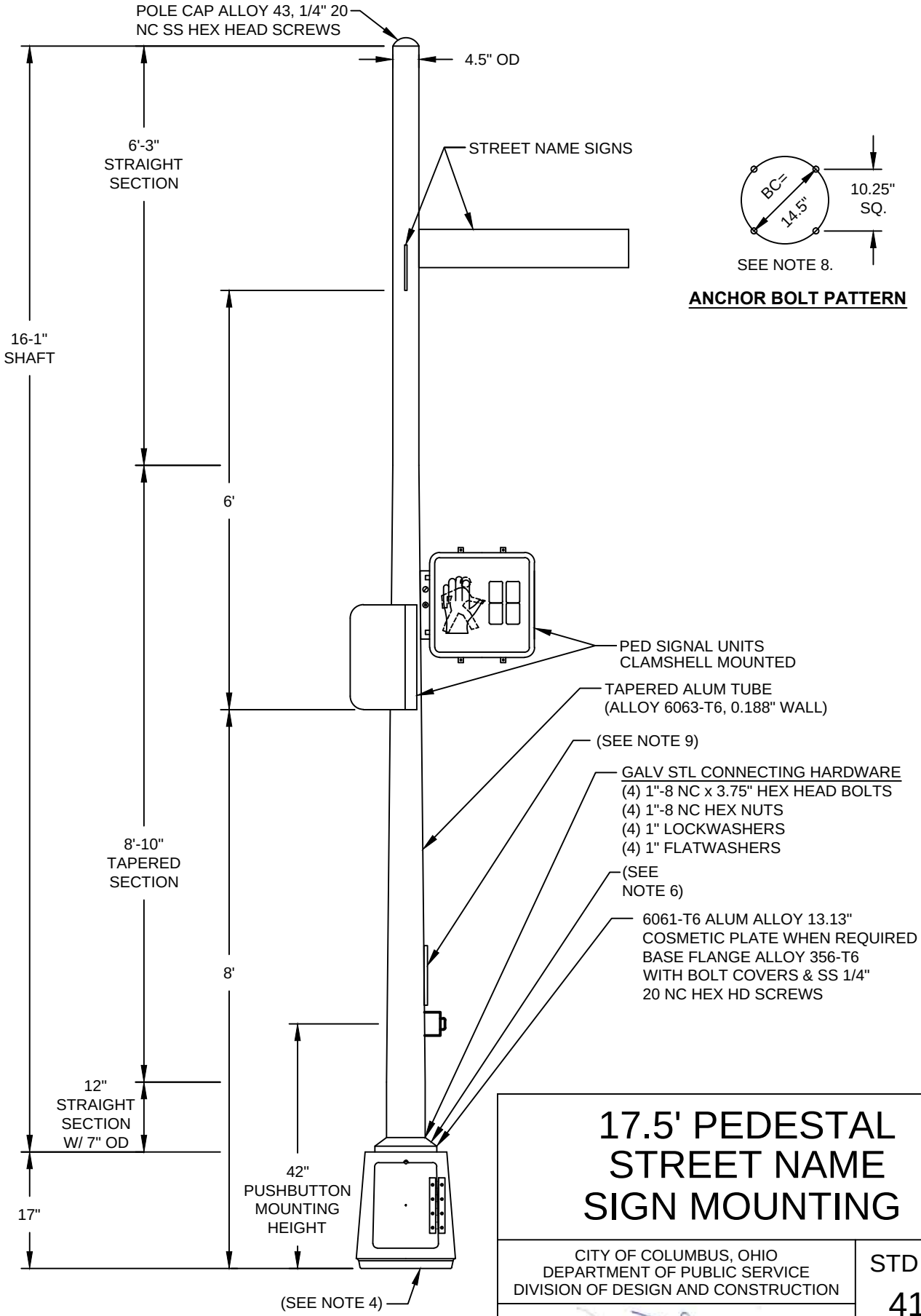
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DIVISION OF DESIGN AND CONSTRUCTION

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4102

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CITY ENGINEER

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17.5' PEDESTAL STREET NAME SIGN MOUNTING

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4103

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SHT 1 OF 2

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 4109.

5. THE PEDESTAL SHALL BE FURNISED 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.

6. THE POLE BASE SHALL TELESCOPE THE POLE SHAFT. THE BASE SHALL BE WELDED TO THE POLE SHAFT BY 2 CIRCUMFERENTIAL WELDS: ONE ON THE OUTSIDE OF THE POLE AT THE BASE TOP AND ONE ON THE INSIDE OF THE BASE AT THE POLE BOTTOM.

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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.

17.5' PEDESTAL STREET NAME SIGN MOUNTING

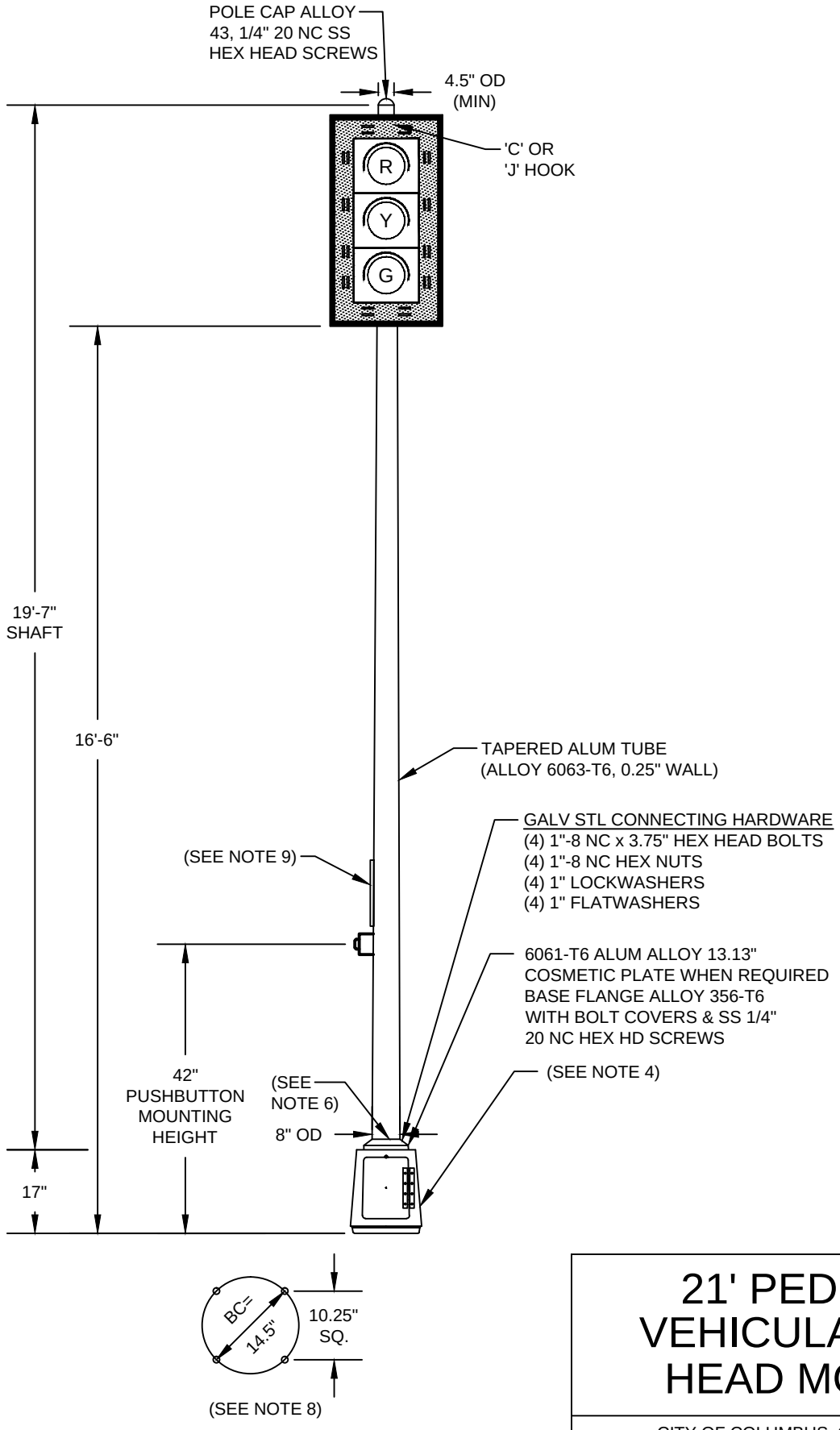
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4103

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ANCHOR BOLT PATTERN

21' PEDESTAL & VEHICULAR SIGNAL HEAD MOUNTING

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

CITY ENGINEER

STD DWG
4104

8/10/2017

SHT 1 OF 2

NOTES:

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

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

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

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

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

6. THE POLE BASE SHALL TELESCOPE THE POLE SHAFT. THE BASE SHALL BE WELDED TO THE POLE SHAFT BY 2 CIRCUMFERENTIAL WELDS: ONE ON THE OUTSIDE OF THE POLE AT THE BASE TOP AND ONE ON THE INSIDE OF THE BASE AT THE POLE BOTTOM.

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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

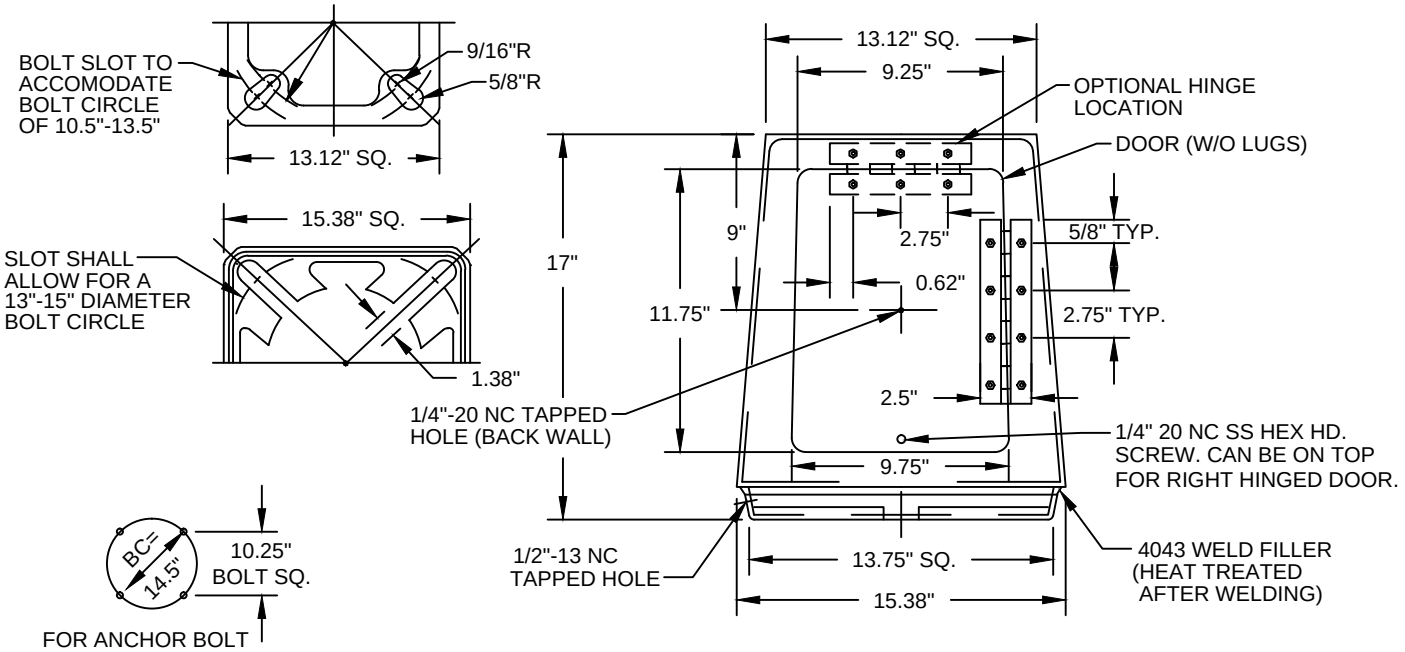
CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF DESIGN AND CONSTRUCTION

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4104

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CITY ENGINEER

SHT 2 OF 2



FOR ANCHOR BOLT SEE 4163.

DOOR SIZE

9.25"x9.75"x11.75"

BASE SUPPLIED WITH (8) STEEL WASHERS, 1/2" THICK X 2.75" DIA. (WASHERS MECHANICALLY GALVANIZED PER ASTM B454)

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

ALUMINUM TRANSFORMER BASE

SHAFT SIZE	BASE HEIGHT	TOP SQUARE	BOTTOM SQUARE	TOP BOLT CIRCLE	BOTTOM BOLT CIRCLE
7" & 8"	17"	13.12"	15.38"	10.5"-13.5"	14.5"

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.

TRANSFORMER BASE

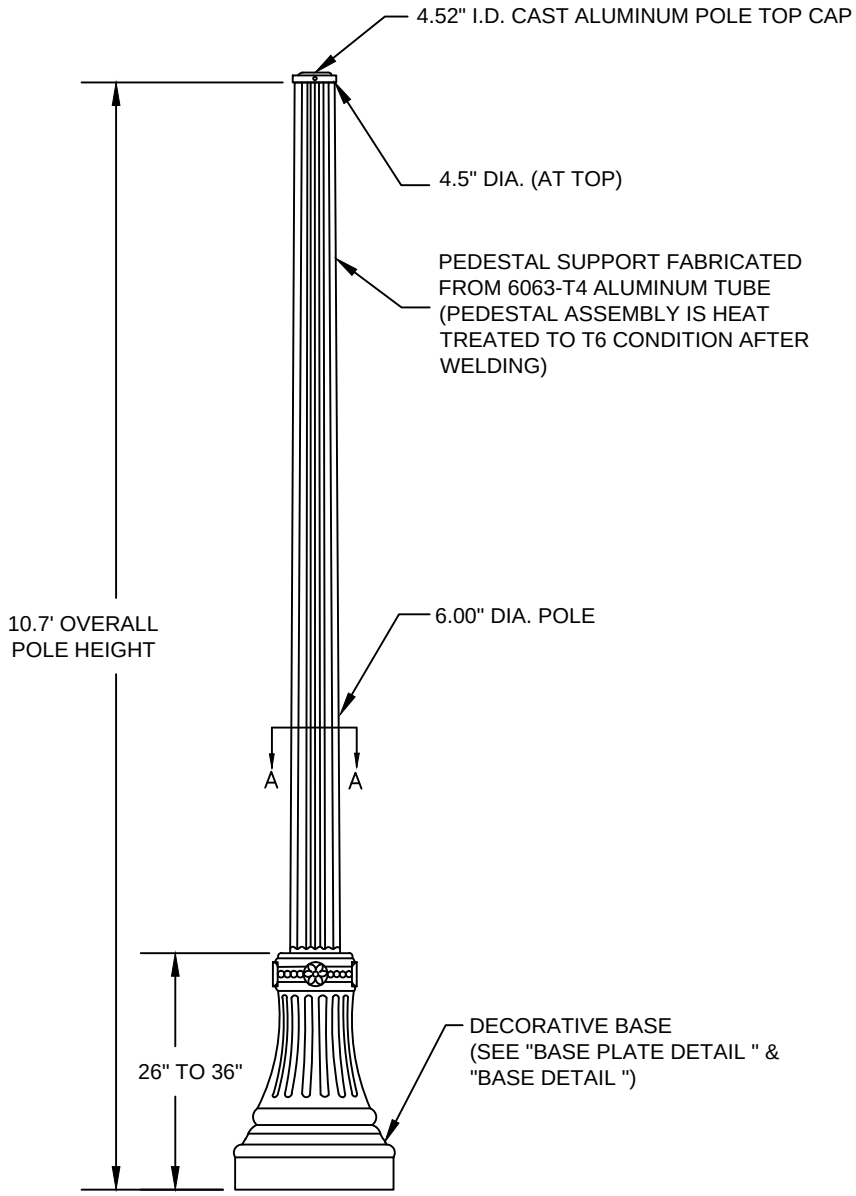
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DEPARTMENT OF PUBLIC SERVICE
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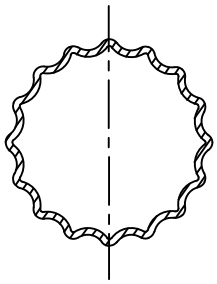
CITY ENGINEER

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4105

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SECTION A-A

10.7 ' DECORATIVE PEDESTAL

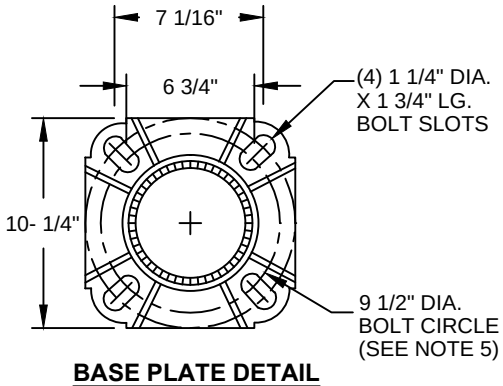
CITY OF COLUMBUS, OHIO
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DIVISION OF DESIGN AND CONSTRUCTION

STD DWG
4106

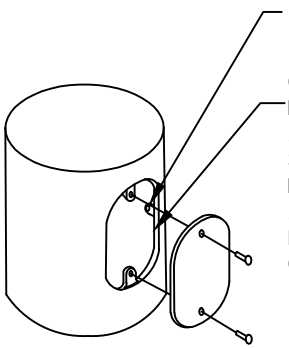
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CITY ENGINEER

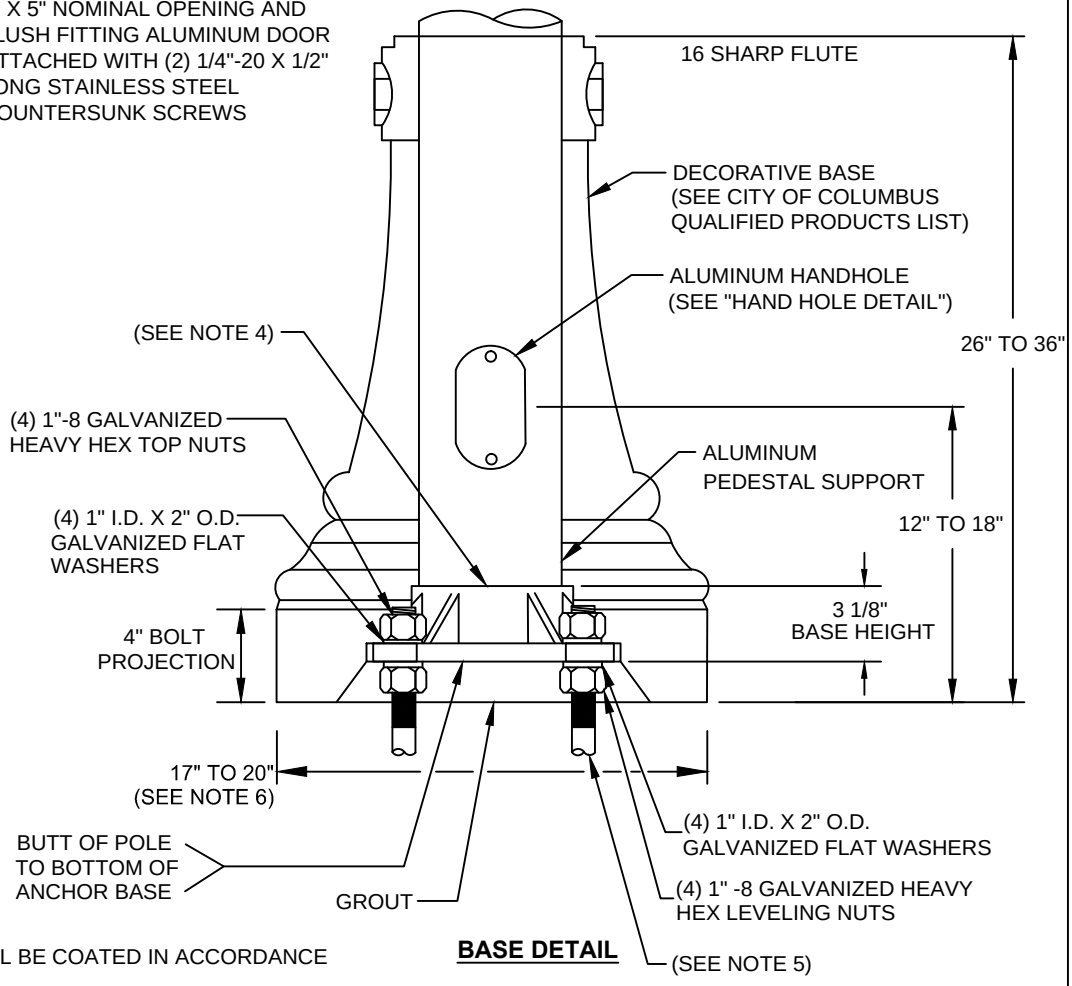
SHT 1 OF 2



BASE PLATE DETAIL



HANDHOLE DETAIL



BASE DETAIL

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.
4. THE POLE BASE SHALL TELESCOPE THE POLE SHAFT. THE BASE SHALL BE WELDED TO THE POLE SHAFT BY TWO CIRCUMFERENTIAL WELDS: ONE ON THE OUTSIDE OF THE POLE AT THE BASE TOP AND ONE ON THE INSIDE OF THE BASE AT THE POLE BOTTOM.
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

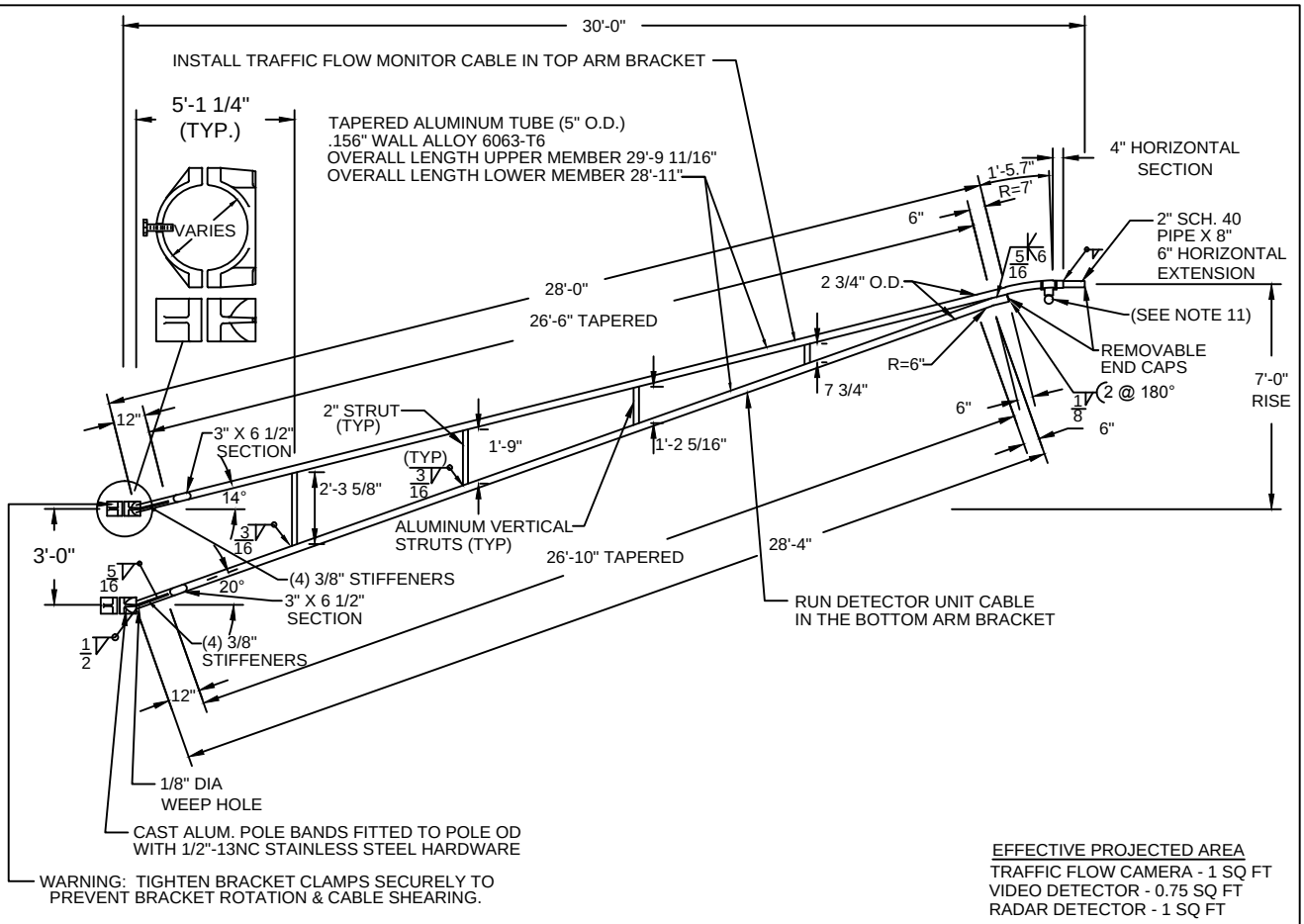
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4106

6/1/2018

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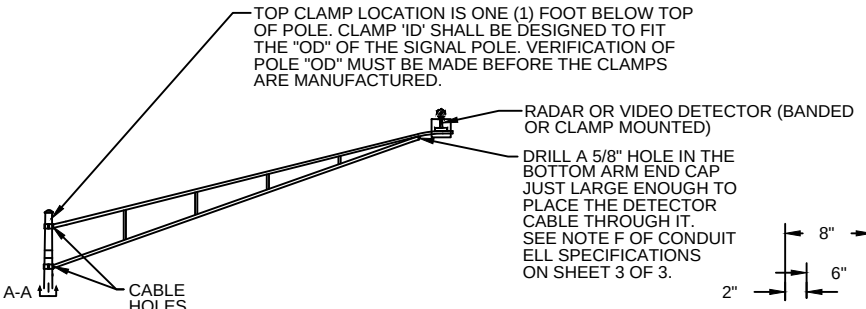


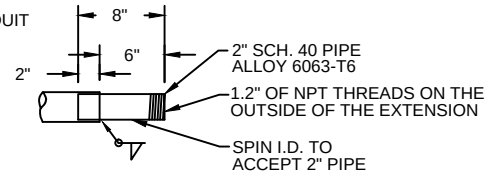
EFFECTIVE PROJECTED AREA
TRAFFIC FLOW CAMERA - 1 SQ FT
VIDEO DETECTOR - 0.75 SQ FT
RADAR DETECTOR - 1 SQ FT

WEIGHT IN POUNDS
TRAFFIC FLOW CAMERA - 20
VIDEO DETECTOR - 8
RADAR DETECTOR - 7

SAFETY FACTOR > 1.6

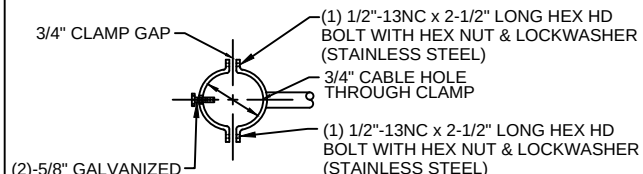
LOADING FACTORS





HORIZONTAL SLIPFITTER

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



VIEW A-A

VERIFY UPPER & LOWER ID DIMENSIONS. CLAMP SHALL BE SIZED TO ACCOMMODATE POLE OD.

30' - 0" BRACKET ARM

DETECTOR UNIT / TRAFFIC FLOW MONITOR BRACKET ARM

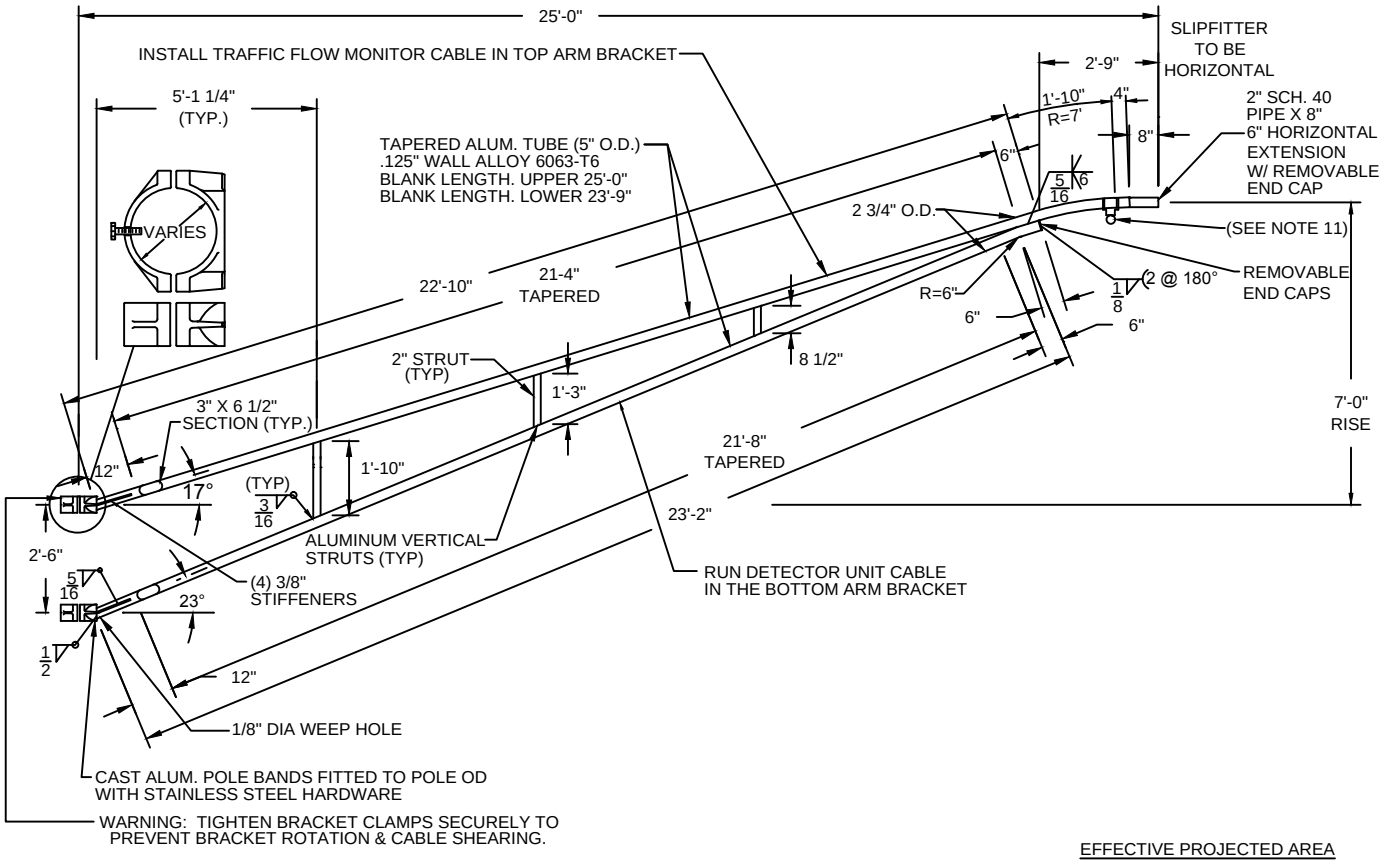
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4110

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CITY ENGINEER

SHT 1 OF 3

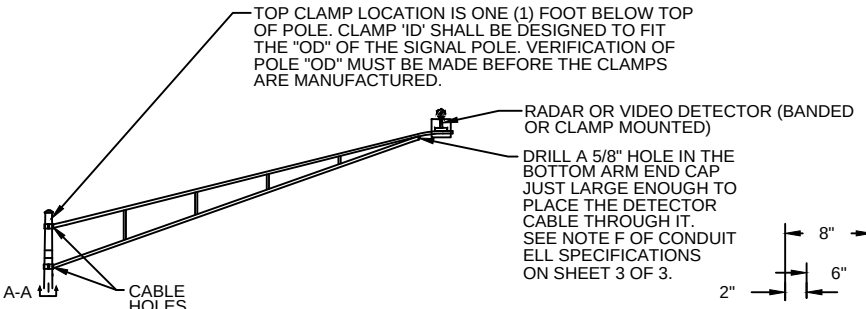


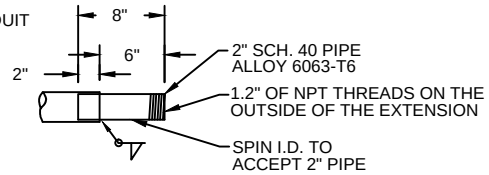
EFFECTIVE PROJECTED AREA
TRAFFIC FLOW CAMERA - 1 SQ FT
VIDEO DETECTOR - 0.75 SQ FT
RADAR DETECTOR - 1 SQ FT

WEIGHT IN POUNDS
TRAFFIC FLOW CAMERA - 20
VIDEO DETECTOR - 8
RADAR DETECTOR - 7

SAFETY FACTOR > 1.6

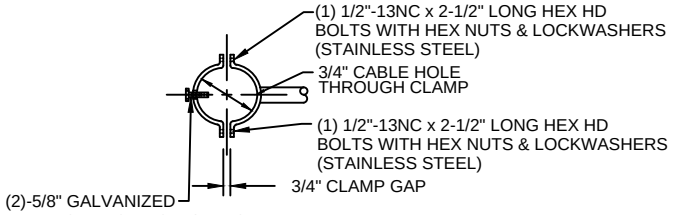
LOADING FACTORS





HORIZONTAL SLIPFITTER

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



VERIFY UPPER & LOWER ID DIMENSIONS. CLAMP SHALL BE SIZED TO ACCOMMODATE POLE OD.

VIEW A-A

25' - 0" BRACKET ARM

DETECTOR UNIT / TRAFFIC FLOW MONITOR BRACKET ARM

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

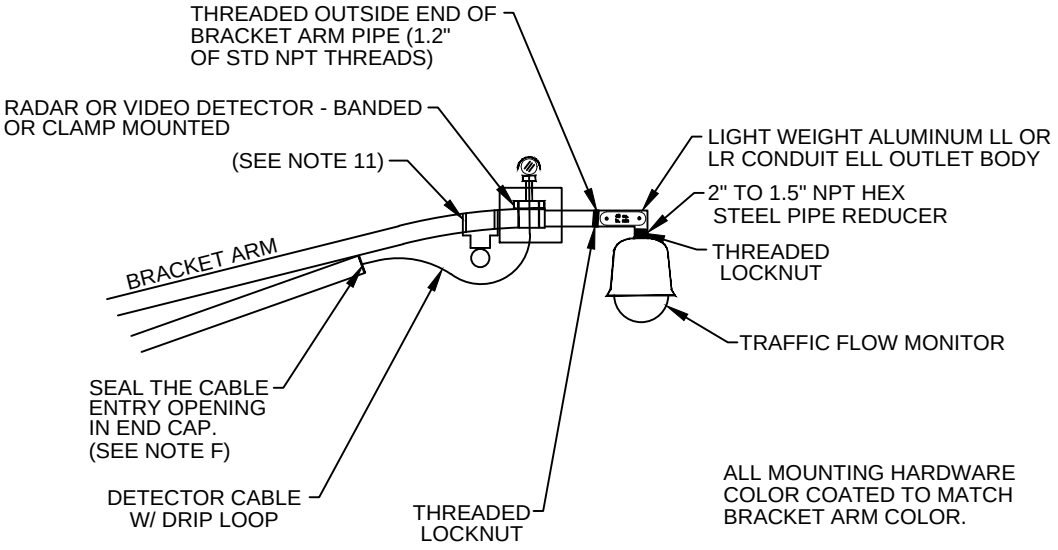
STD DWG
4110

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CITY ENGINEER

SHT 2 OF 3

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



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

LL/LR CONDUIT ELL SPECS

NOTES:

1. BRACKET ARMS SHALL BE INSTALLED PARALLEL OR PERPENDICULAR TO THE ROAD CENTERLINE AS PER PLAN.
2. ALL CABLES SHALL BE RUN INSIDE A BRACKET TUBE. ENTRY HOLES INTO THE SIGNAL POLE SHALL BE FIELD DRILLED.
3. BRACKET ARM, VIDEO DETECTOR AND/OR TRAFFIC FLOW MONITOR DOME SHALL BE COLOR COATED AS PER PLAN.
4. HEAT TREAT AFTER WELDING.
5. BRACKET ARMS SHALL BE COATED IN ACCORDANCE WITH THE PLANS TO MATCH THE SIGNAL SUPPORT OR STRAIN POLE STRUCTURE.
6. A TRUSS-STYLE DESIGN SHALL BE USED AND SHALL BE CAPABLE OF SUPPORTING A LUMINAIRE WEIGHING 75 POUNDS AND HAVING AN EFFECTIVE PROJECTED AREA OF 1.6 SQUARE FEET AND OR TRAFFIC DETECTOR AND/OR TRAFFIC FLOW MONITOR.
7. BRACKET ARMS SHALL BE DESIGNED FOR A 90 MPH WIND LOADING WITH APPROPRIATE GUST FACTOR.
8. THE CLAMP MOUNTED ARM SHALL COME WITH BOTH CLAMPS AND MOUNTING HARDWARE.
9. BRACKET ARMS SHALL BE DESIGNED TO FIT A MASTARM POLE SHAFT THAT HAS A NOMINAL TAPER OF 0.14 INCH PER FOOT AND A BOTTOM-OF-POLE OUTSIDE DIAMETER AS PER PLAN.
10. DETAILS AND DIMENSIONS ILLUSTRATED ON THESE DRAWINGS ILLUSTRATE AN ALUMINUM TRUSS ONLY. ALL STRUCTURAL COMPONENTS REMAIN THE RESPONSIBILITY OF THE MANUFACTURER.
11. FOR MECHANICAL DAMPENING DEVICE SEE STANDARD DRAWING 4122.

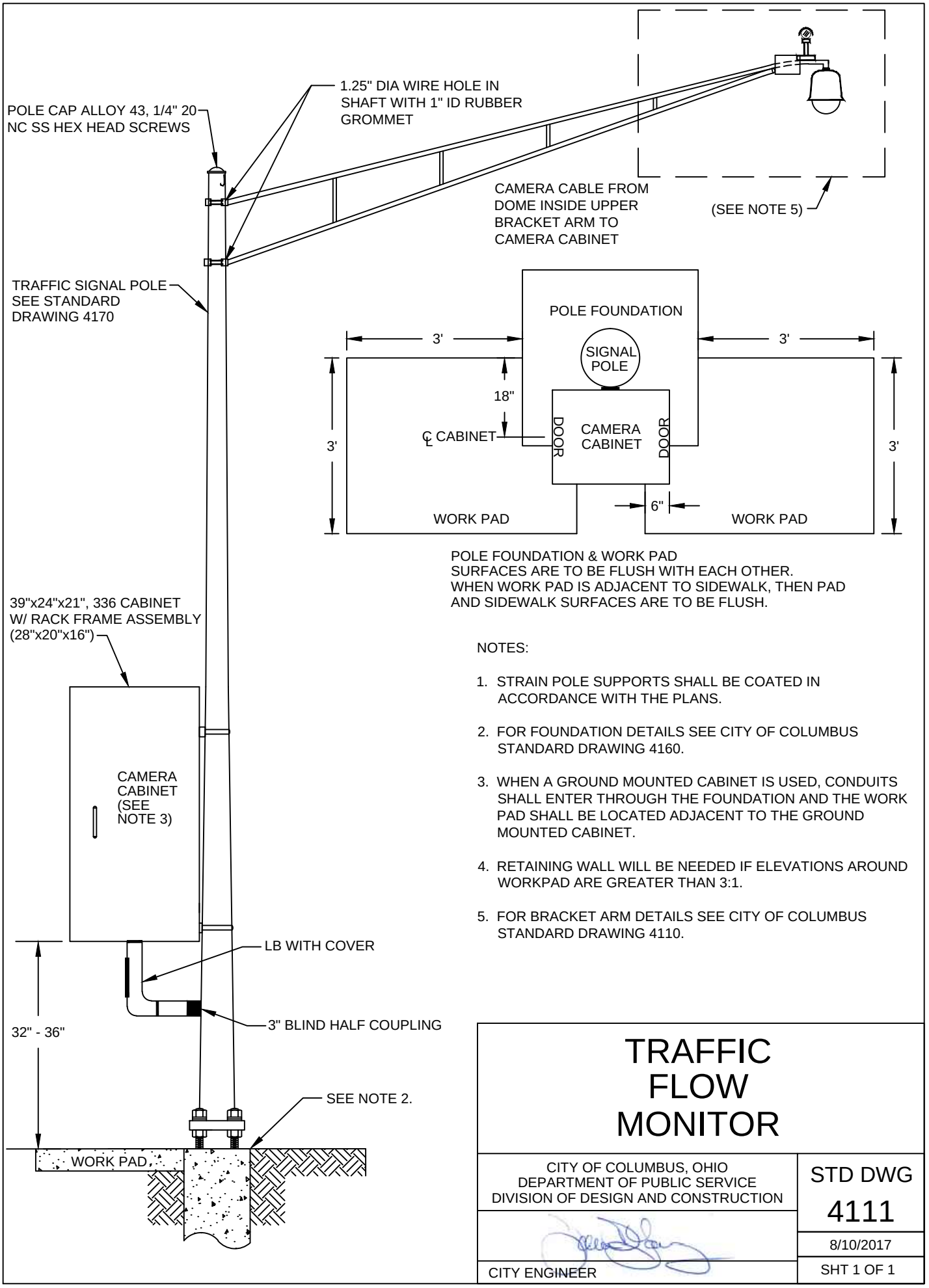
NOTES AND CONDUIT ELL SPECS

DETECTOR UNIT / TRAFFIC FLOW MONITOR BRACKET ARM

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

CITY ENGINEER

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SHT 3 OF 3



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 FLOW MONITOR

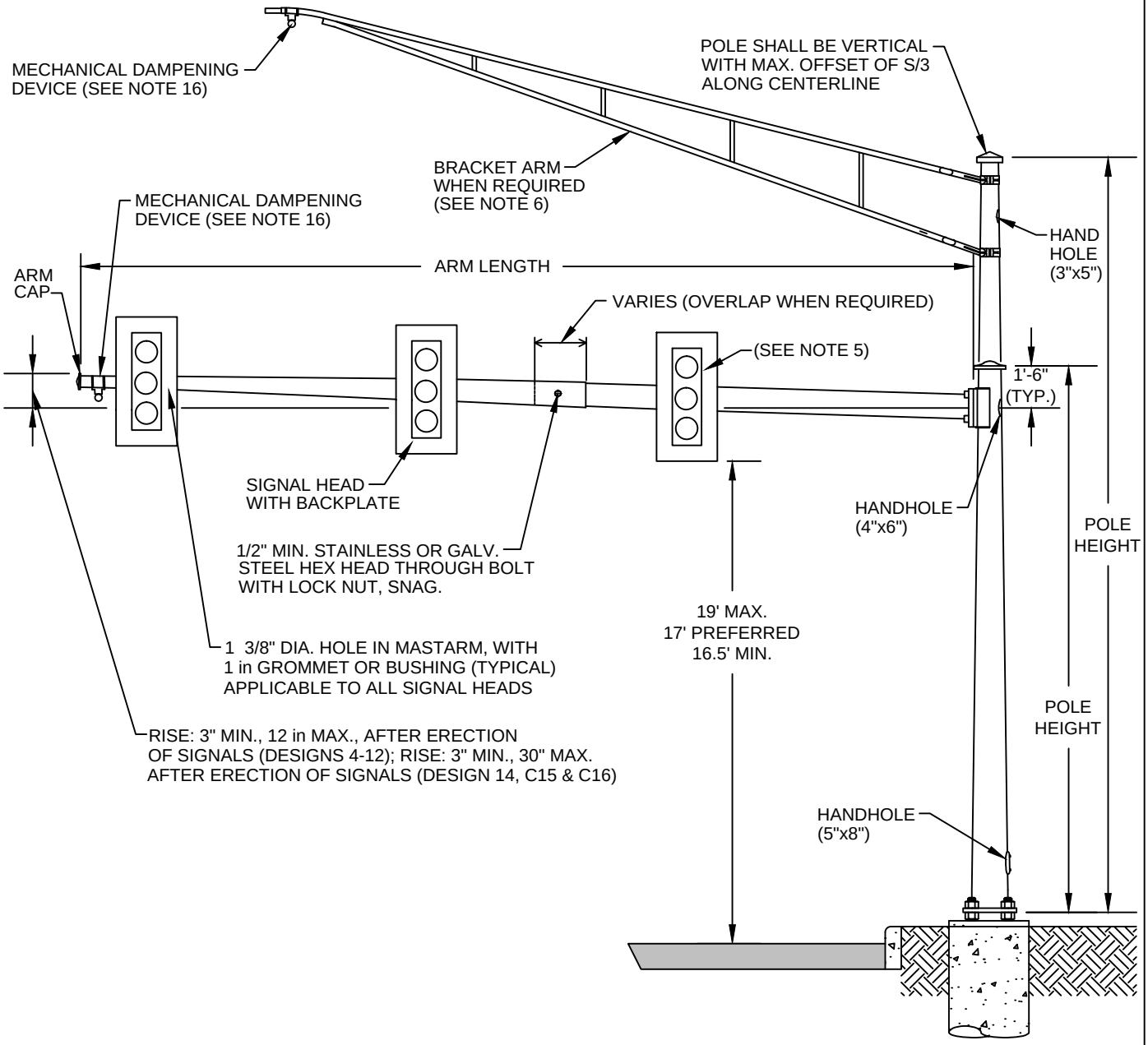
CITY OF COLUMBUS, OHIO
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4111

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STANDARD CITY OF COLUMBUS MAST ARM

CITY OF COLUMBUS, OHIO DEPARTMENT OF PUBLIC SERVICE DIVISION OF DESIGN AND CONSTRUCTION	STD DWG 4120
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TABLE 1 - PART A - POLE DIMENSIONS

DESIGN NO.	MAXIMUM DESIGN AREA SQ FT (NOTE A)	DESIGN DISTANCE FROM ℄ FT	POLE			ARM			
			TYPE	WALL THICK	SIZE	MAX LENGTH	TYPE	WALL THICK	SIZE
4	42	37.5	ROUND	.239	13x9.78x23'*	38'	ROUND	.239	10.32X5.00**
12	42	47.5	ROUND	.299	14x10.78x23'*	48'	ROUND	.299	11x8.62x17' +
								.179	9.19x4.68x32'-3"
13	40	59.5	ROUND	.299	16x12.78x23'*	60'	ROUND	.299	13x8.80x30' +
								.239	9.62x5.14x32'
14	38	69.5	ROUND	.299	17x13.78x23'*	70'	ROUND	.3125	14x9.1x35' +
								.239	9.90x4.42x37'
14	38	69.5	ROUND	.299	17x13.78x23'*	70'	ROUND	0.313	14x8.68x38' +
								0.250	9.50x4.74x34'
C15	50	78.5	ROUND	.313	18x14.22x23'*	79'	ROUND	.313	14.40x8.70x40.75' +
								.179	9.34x3.71x40.25'
C16 DOUBLE ARM	48 / 48	49.5 49.5	ROUND	.313	16x12.22x27'*	50'/50'	ROUND	.250	12.00x9.55x17.5' +
								.179	10.19x5.40x34.25'
								.250	12.00x9.55x17.5' +
								.179	10.19x5.40x34.25'

ALL DIMENSIONS ARE IN INCHES, UNLESS OTHERWISE NOTED.

*=POLE HEIGHT SHALL BE VERIFIED BASED OFF THE CRITICAL PAVEMENT AND FOUNDATION ELEVATIONS.

**=SINGLE PIECE ARM

TABLE 1 - PART B - POLE DIMENSIONS

DESIGN NO.	ARM ATTACHMENT								ANCHOR BASE					PLATE SKIRT	
	A	B	C	D	E	F	G	P	BOLT CIRCLE	S	J	T	H	M	K
4	16.50	14.50	12.50	9.50	1.50	2	1.25	0.25	18	18.50	12.75	2	2.13	6.75	7.75
12	16.50	14.50	12.50	9.50	1.75	2	1.50	0.31	20	20.50	14.13	2	2.38	7.5	8.5
13	19.50	16.50	15	12	1.50	2	1.50	0.31	22	23	15.56	2	2.38	7.5	8.5
14	19.50	16.50	15	12	2.00	2	2.00	0.38	22	23	15.56	2	2.38	7.5	8.5
C15	24	19	18	13	2.00	2	2.00	0.38	24	24	17	2	2.38	7.5	8.5
C16 DOUBLE ARM	19	15	14	10	1.75	2	1.50	0.31	22	23	15.56	2	2.38	7.5	8.5
	19	15	14	10	1.75	2	1.50	0.31							

ALL DIMENSIONS ARE IN INCHES, UNLESS OTHERWISE NOTED.

THESE DESIGNS USE FULL PENETRATION WELDS AT THE ARM AND BASE PLATE CONNECTIONS.

NOTES:

A. MAXIMUM DESIGN AREA IS BASED ON 90 MPH DESIGN WIND SPEED WITH A PRESSURE OF 25 PSF.

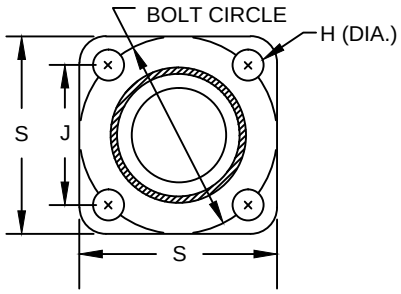
B. DIMENSION LOCATIONS ARE ILLUSTRATED ON SHEETS 3 & 6.

STANDARD CITY OF COLUMBUS MAST ARM

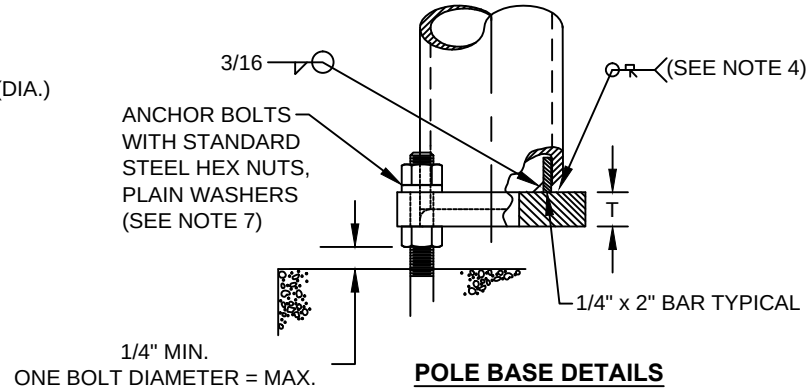
CITY OF COLUMBUS, OHIO
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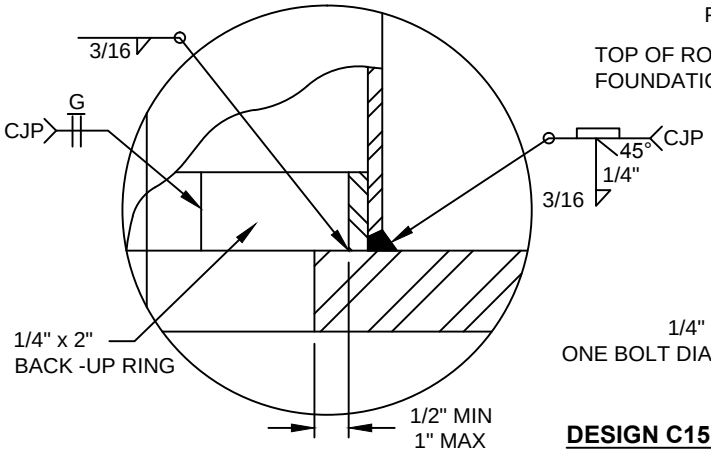


BASE PLATE



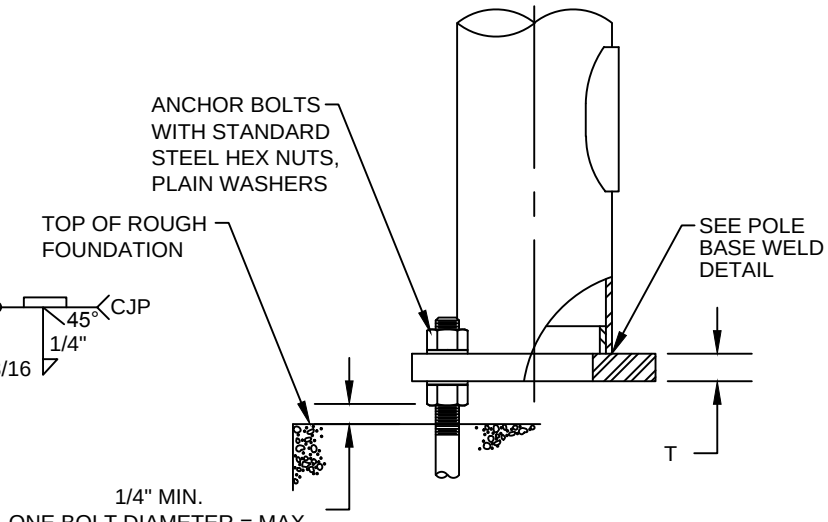
POLE BASE DETAILS

DESIGN 4, 12, 13, & 14



POLE BASE AND ARM FLANGE WELD DETAIL

DESIGN C15 & C16



POLE BASE DETAILS

BASE CONNECTION

STANDARD CITY OF COLUMBUS MAST ARM

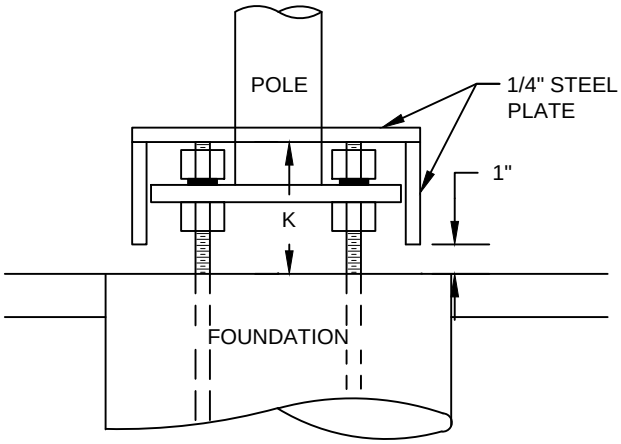
CITY OF COLUMBUS, OHIO
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DIVISION OF DESIGN AND CONSTRUCTION

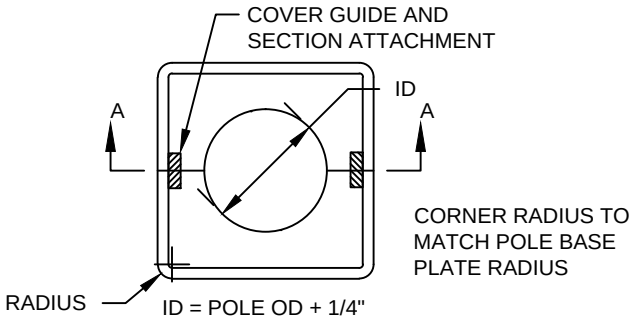
CITY ENGINEER

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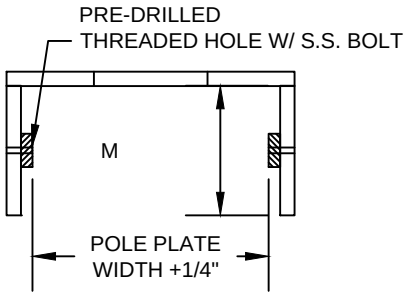
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TOP VIEW

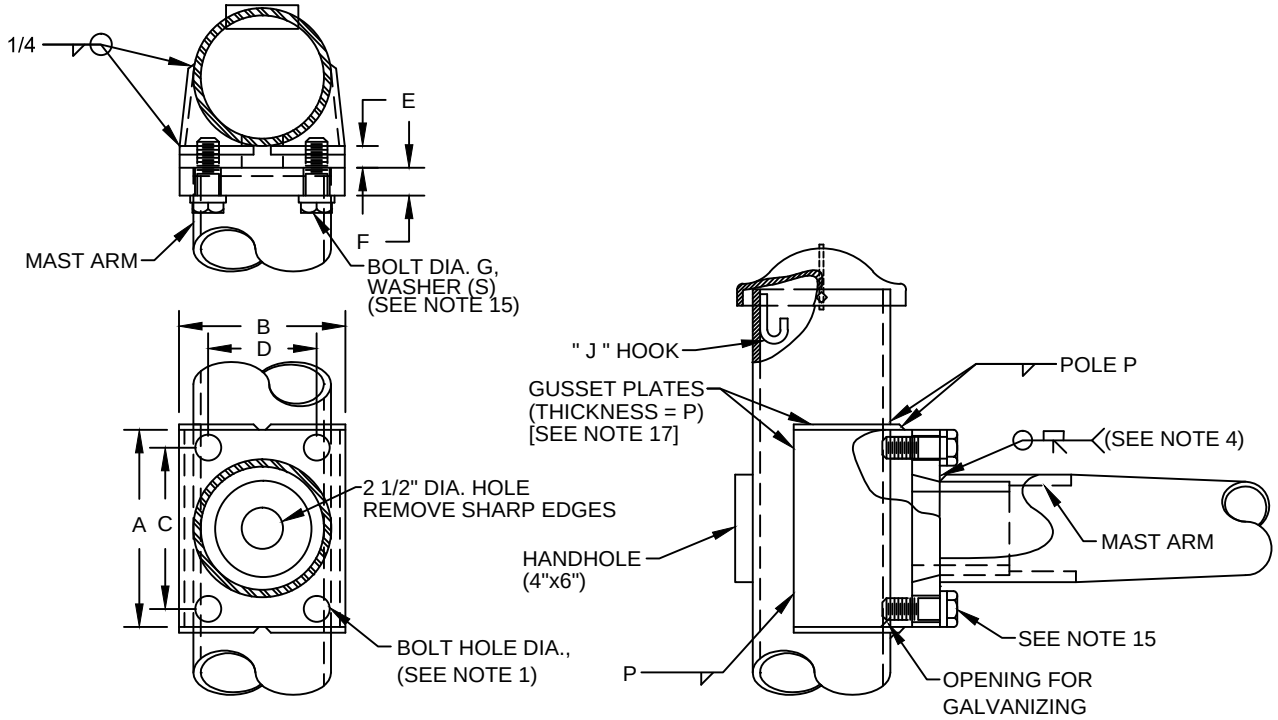


SECTION A-A
POLE PLATE SKIRT

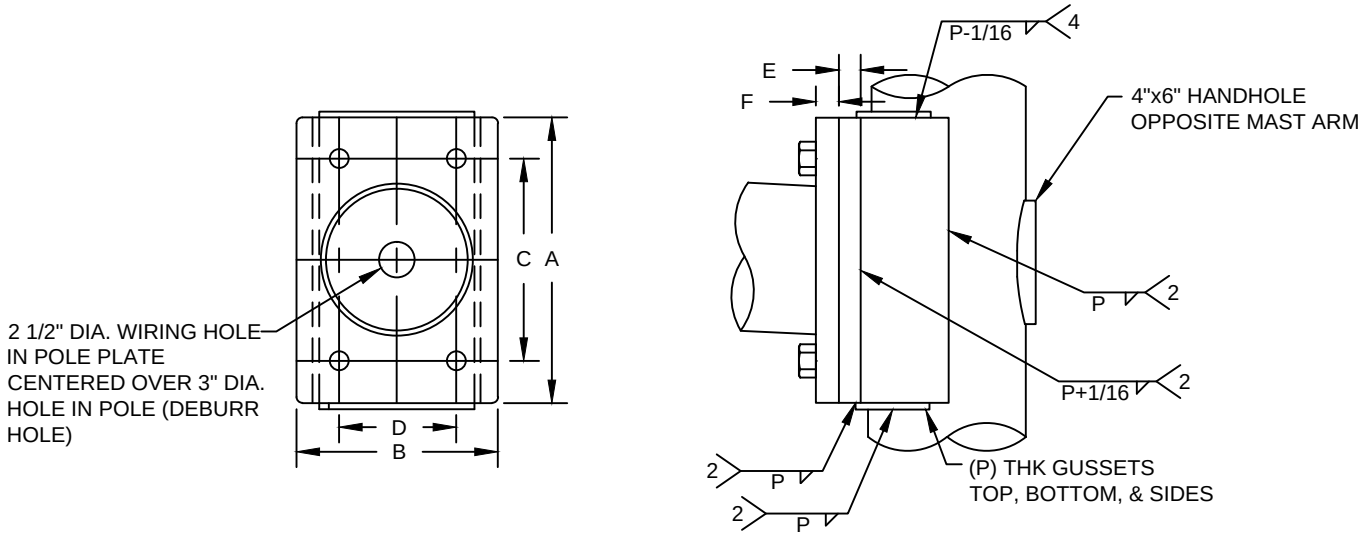
STEEL BASE COVER

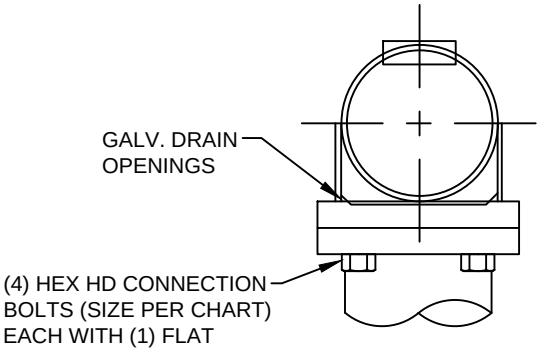
STANDARD CITY OF COLUMBUS MAST ARM

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ARM ATTACHMENT (TYP.)
DESIGN 4, 12, 13 & 14





ARM ATTACHMENT (TYP.)
DESIGN C15

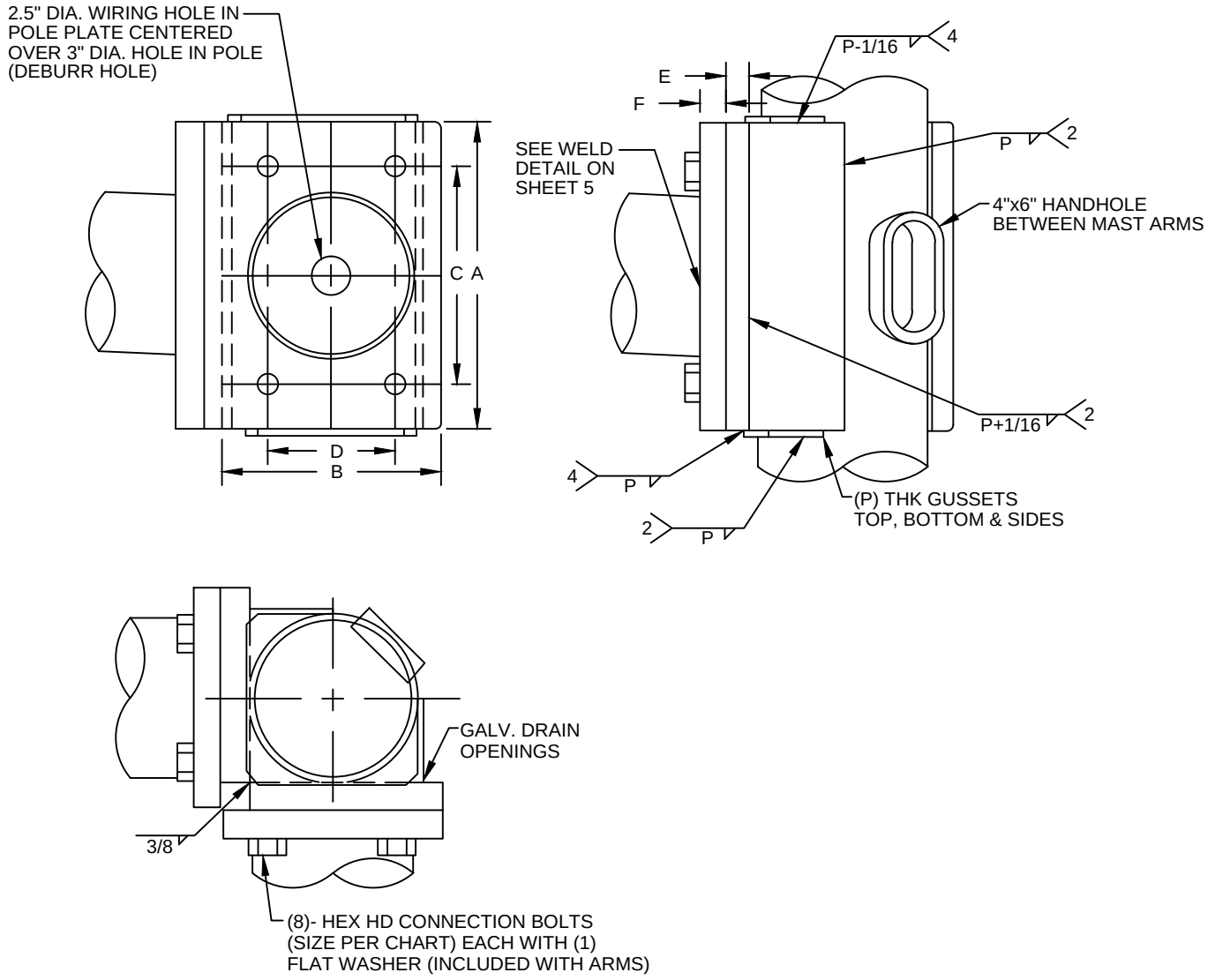
ARM ATTACHMENTS

STANDARD CITY OF COLUMBUS MAST ARM

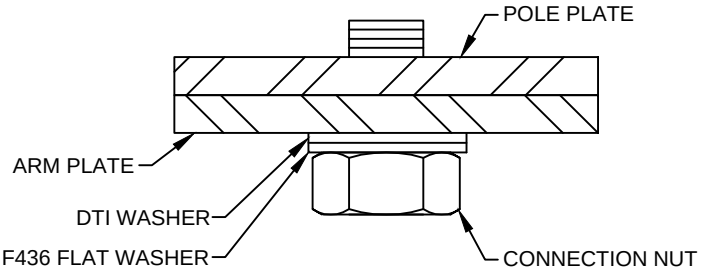
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ARM ATTACHMENT (TYP.)
DESIGN C16



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

ARM ATTACHMENTS/
DTI WASHER PLACEMENT

STANDARD CITY OF COLUMBUS MAST ARM

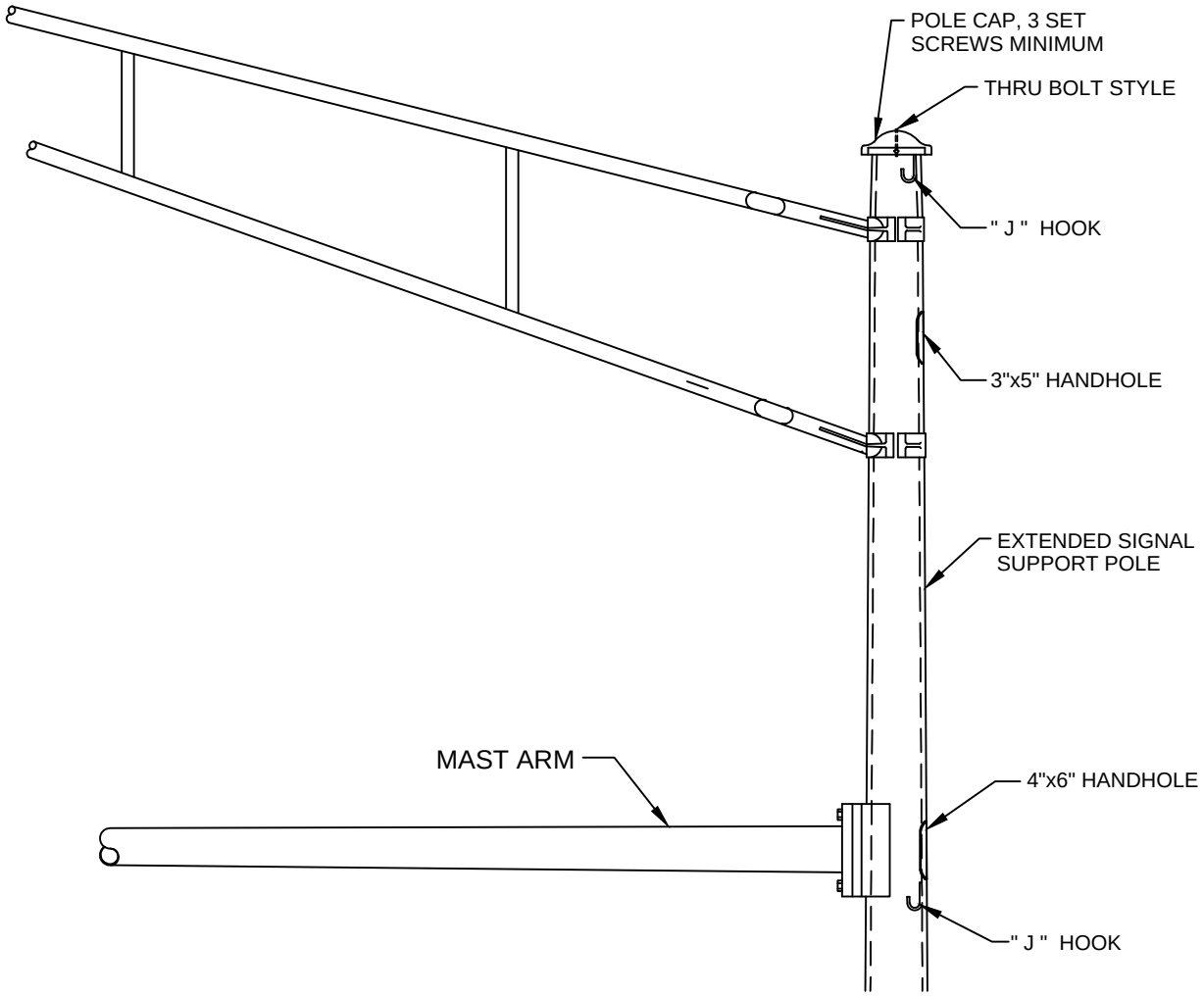
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POLE EXTENSION FOR BRACKET ARM

POLE EXTENSION

STANDARD CITY OF COLUMBUS MAST ARM

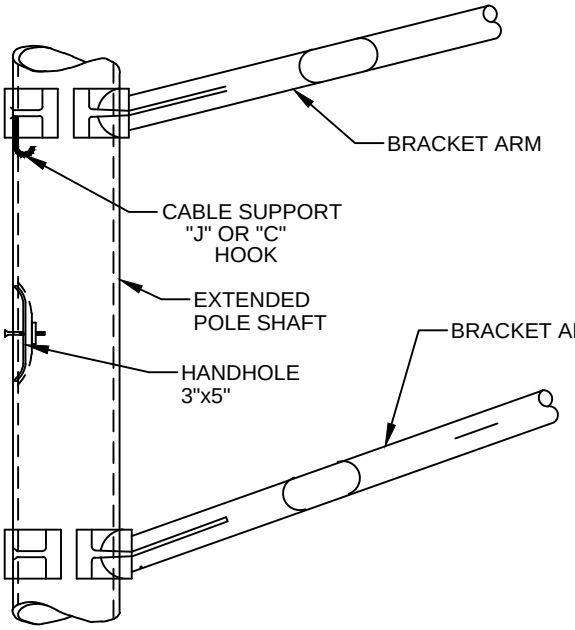
CITY OF COLUMBUS, OHIO
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CITY ENGINEER

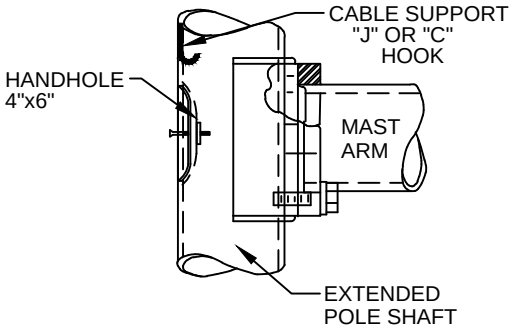
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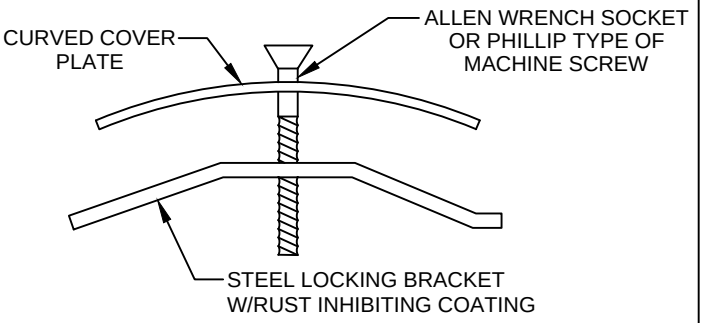
SHT 7 OF 10



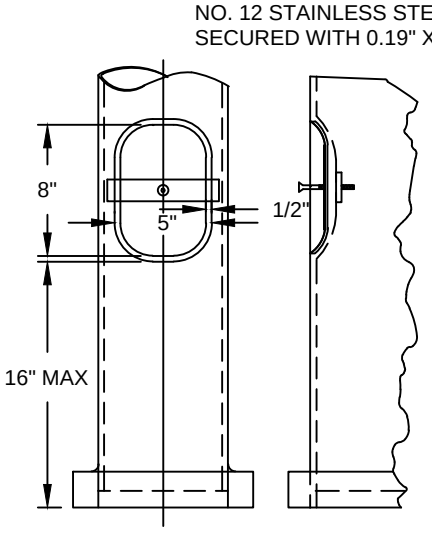
3"x5" HANDHOLE



4"x6" HANDHOLE

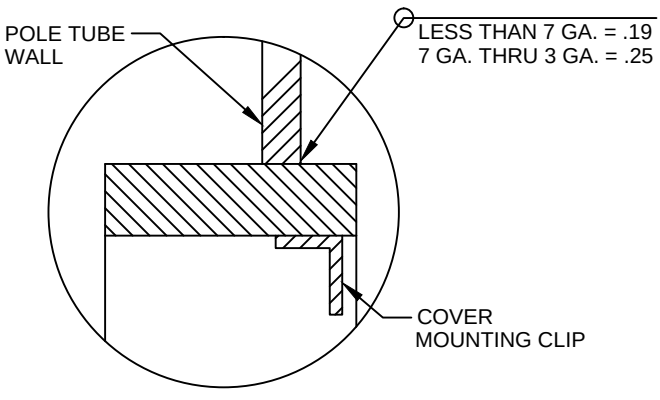


FLUSH HANDHOLE



5"x8" HANDHOLE

LOWER HANDHOLE



SECTION A-A

HANDHOLE

STANDARD CITY OF COLUMBUS MAST ARM

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NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

16. AN APPROVED DAMPING DEVICE SHALL BE INSTALLED AS CLOSE AS POSSIBLE TO THE END OF THE ARM. INSTALL IF DIRECTED BY THE PLANS OR THE ENGINEER. 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.

STANDARD CITY OF COLUMBUS MAST ARM

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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).

28. 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.

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

30. 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.

STANDARD CITY OF COLUMBUS MAST ARM

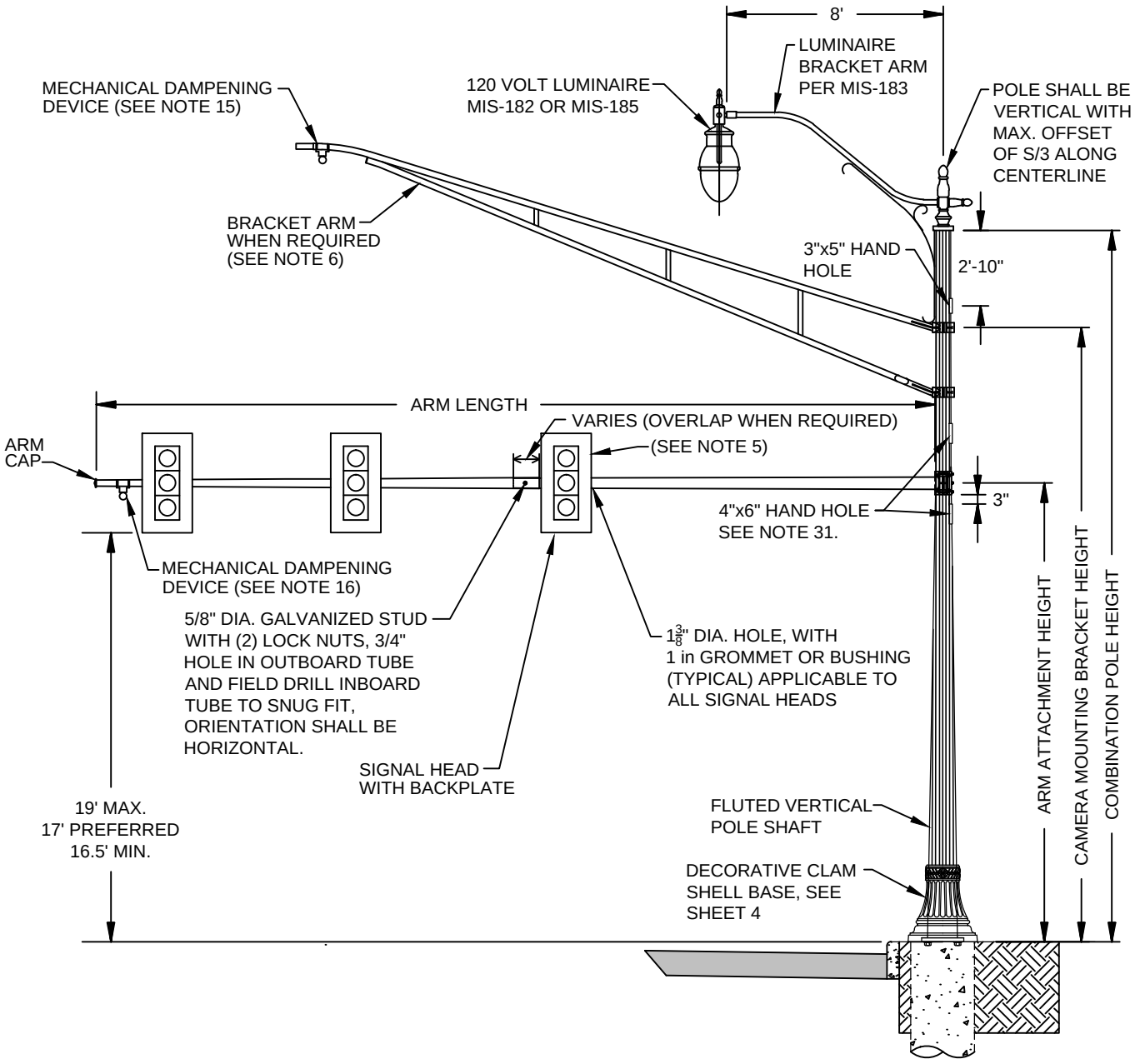
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DECORATIVE CITY OF COLUMBUS MAST ARM

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TABLE 1 - PART A - POLE DIMENSIONS

DESIGN NO.	MAXIMUM DESIGN AREA SQ FT (NOTE A)	DESIGN DISTANCE FROM CL FT	POLE			ARM			
			TYPE	WALL THICK	SIZE	MAX. LENGTH	TYPE	WALL THICK	SIZE
4	42	37.5	16-FLUTES	.250	13.00x8.94x29'*	38'	ROUND	.250	10.50x5.18x38'**
12	42	47.5	16-FLUTES	.250	14.50x10.44x29'*	48'	ROUND	.250	11.50x7.72x27' +
								.179	8.33x5.18x22.5'
13	40	59.5	16-FLUTES	.250	16.00x11.94x29'*	60'	ROUND	.313	11.50x7.72x27' +
								.179	8.33x3.47x34'
14	38	69.5	16-FLUTES	.313	15.50x11.44x29'*	70'	ROUND	.313	12.75x8.41x31' +
								.179	9.05x3.31x41'
C15	50	78.5	16-FLUTES	.313	18.00x13.94x29'*	79'	ROUND	.313	14.25x8.65x40' +
								.250	9.44x3.70x41'
C16 (DOUBLE ARM)	48 / 48	49.5 49.5	16-FLUTES	.313	15.50x11.30x30'*	50'/50'	ROUND	.250	12.00x9.62x17' +
								.179	10.26x5.40x34.75'
								.250	12.00x9.62x17' +
								.179	10.26x5.40x34.75'

ALL DIMENSIONS ARE IN INCHES, UNLESS OTHERWISE NOTED.

*=POLE HEIGHT SHALL BE VERIFIED BASED OFF THE CRITICAL PAVEMENT AND FOUNDATION ELEVATIONS.

**=SINGLE PIECE ARM

TABLE 1 - PART B - POLE DIMENSIONS

DESIGN NO.	ARM ATTACHMENT									ANCHOR BASE						
	A1	A2	B	C	D	E	F	G	U	BOLT CIRCLE	S	J	K	T	R	H
4	17.5	19.5	17.5	14	14	1.5	1.25	1.25	10	18	18.5	12.75	6	2	2	2.13
12	19	21	19	15	15	1.5	1.25	1.25	11	20	20.5	14.13	6	2	2	2.38
13	21	23	21	17	17	2	1.5	1.5	13	22	23	15.56	6	2	3.5	2.38
14	21	23	21	17	17	2	1.5	1.5	13	22	23	15.56	6	2	3.5	2.38
C15	25	27	25	20	20	2	2	2	16	24	24	17	8	2	2	2.38
C16 (DOUBLE ARM)	21	23	21	17	17	2	1.5	1.5	13	22	23	15.56	6	2	3.5	2.38
	21	23	21	17	17	2	1.5	1.5	13							

ALL DIMENSIONS ARE IN INCHES, UNLESS OTHERWISE NOTED.

THESE DESIGNS USE FULL PENETRATION WELDS AT THE ARM AND BASE PLATE CONNECTIONS.

NOTES:

A. MAXIMUM DESIGN AREA IS BASED ON 90 MPH DESIGN WIND SPEED WITH A PRESSURE OF 25 PSF.

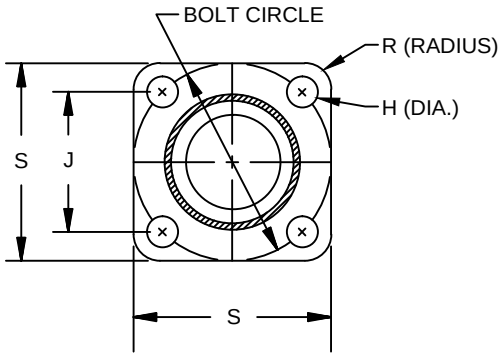
B. DIMENSION LOCATIONS ARE ILLUSTRATED ON SHEETS 3 & 5.

DECORATIVE CITY OF COLUMBUS MAST ARM

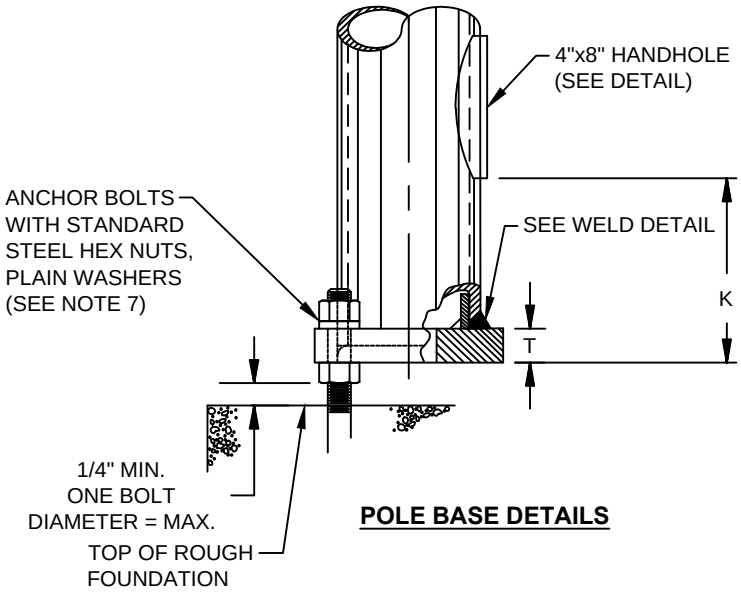
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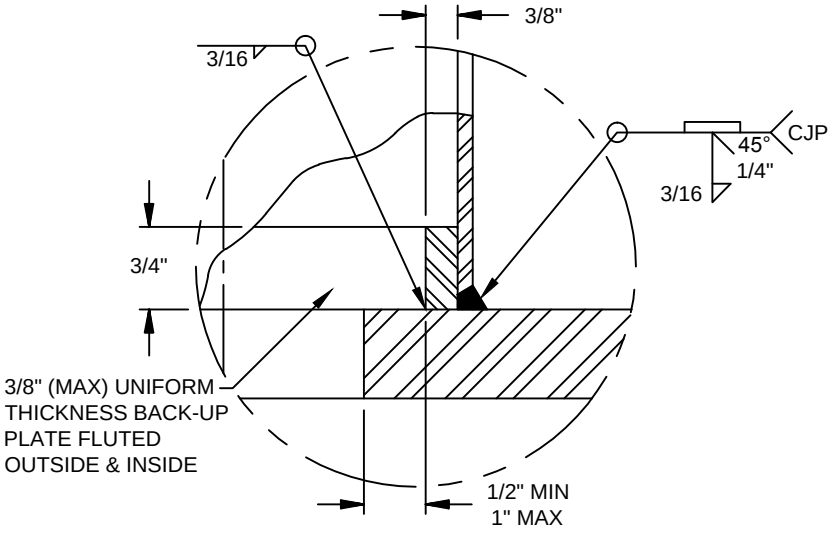
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BASE PLATE



POLE BASE DETAILS

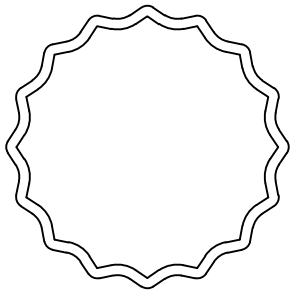


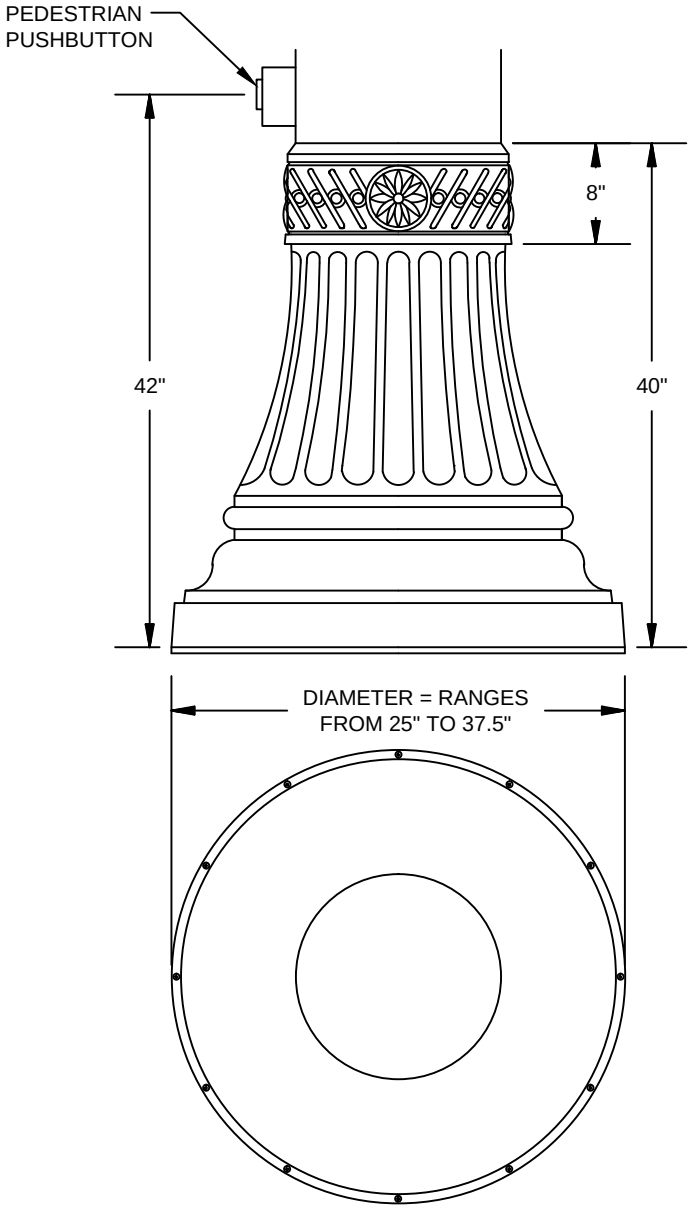
POLE BASE FLANGE WELD DETAIL

BASE CONNECTION

DECORATIVE CITY OF COLUMBUS MAST ARM

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DECORATIVE BASE

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.

DECORATIVE CITY OF COLUMBUS MAST ARM

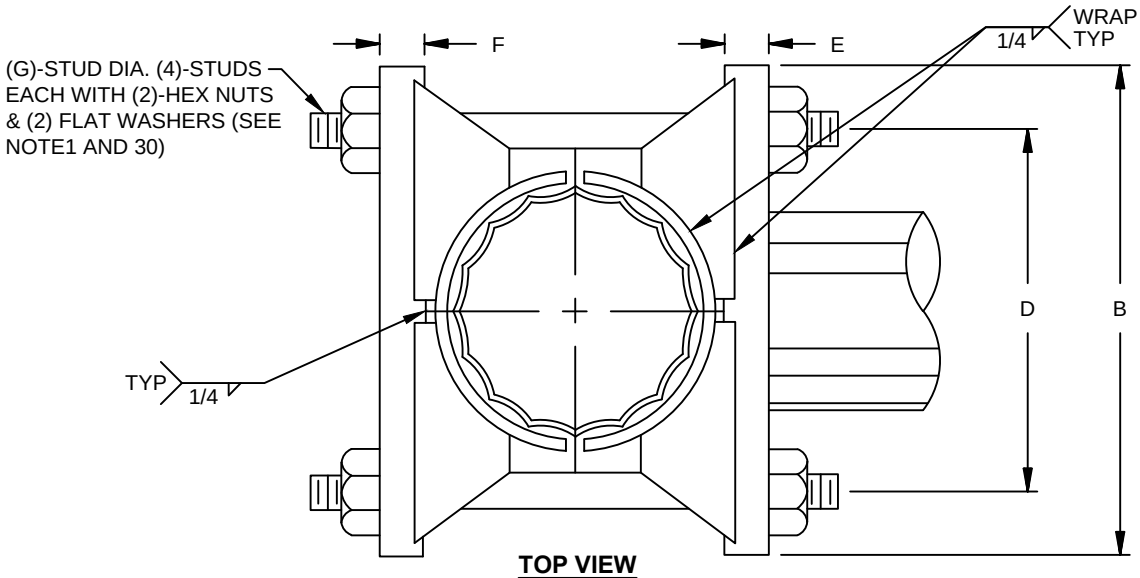
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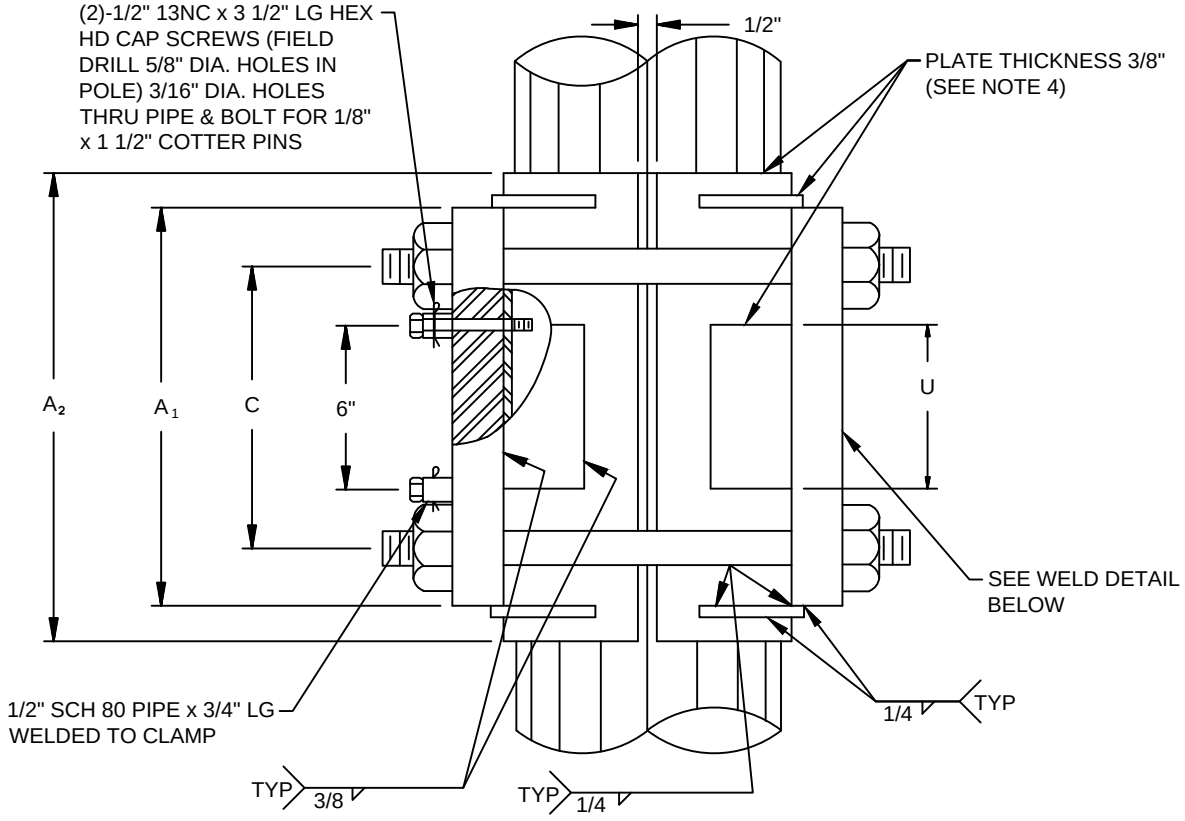
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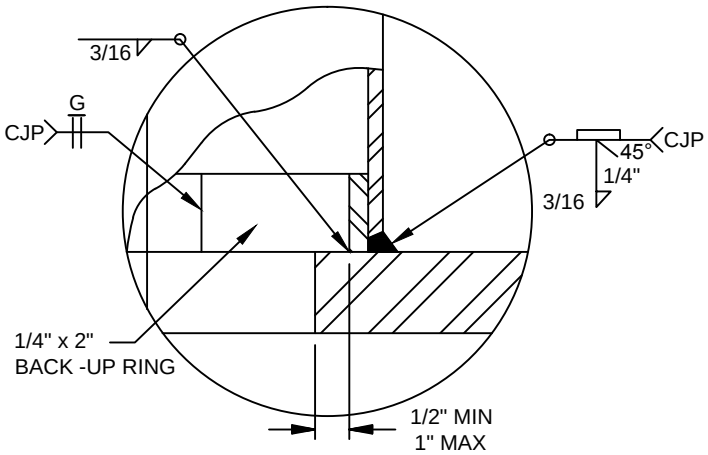
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TOP VIEW



SECTION VIEW



ARM FLANGE WELD DETAIL

MAST ARM CLAMP CONNECTION

DECORATIVE CITY OF COLUMBUS MAST ARM

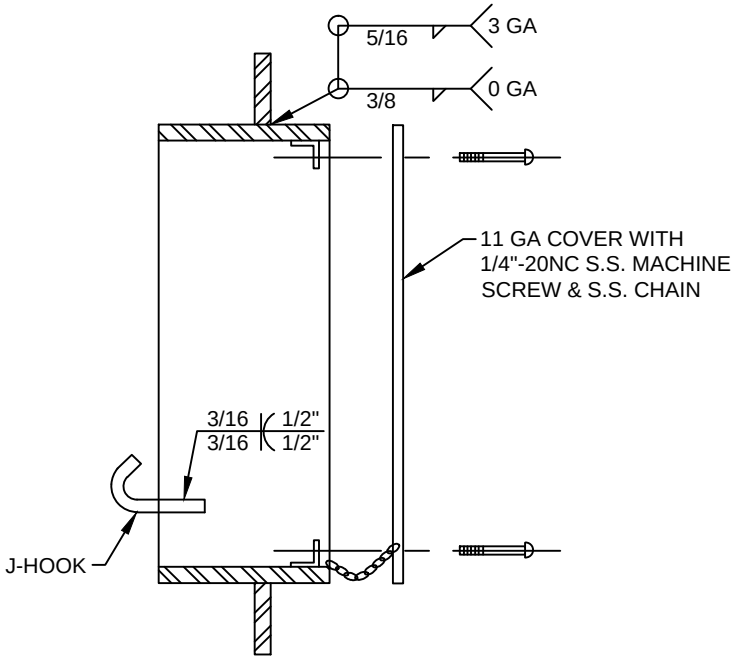
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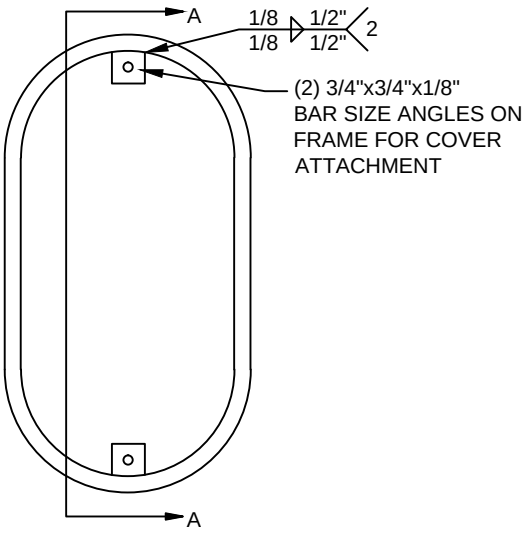
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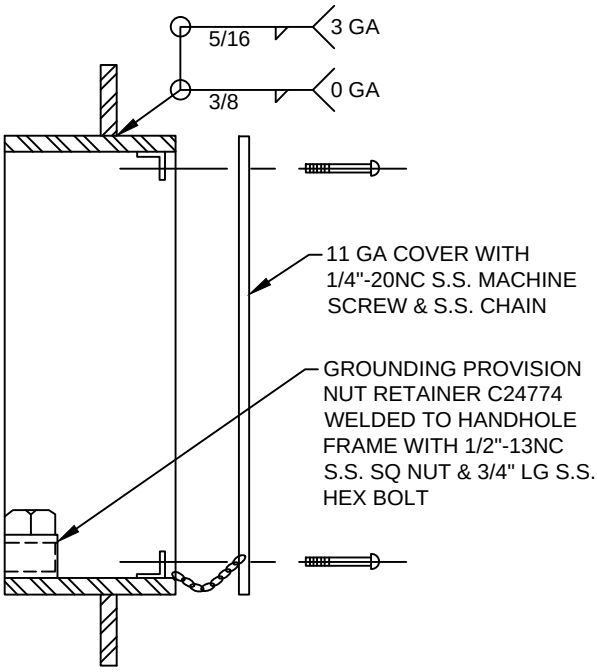


SECTION A-A

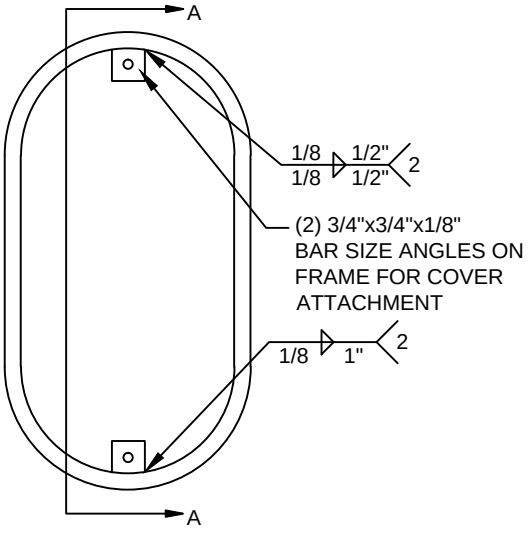


FRONT VIEW

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



SECTION A-A



FRONT VIEW

4" x 8" BOTTOM HANDHOLE FRAME DETAIL

HANDHOLE

DECORATIVE CITY OF COLUMBUS MAST ARM

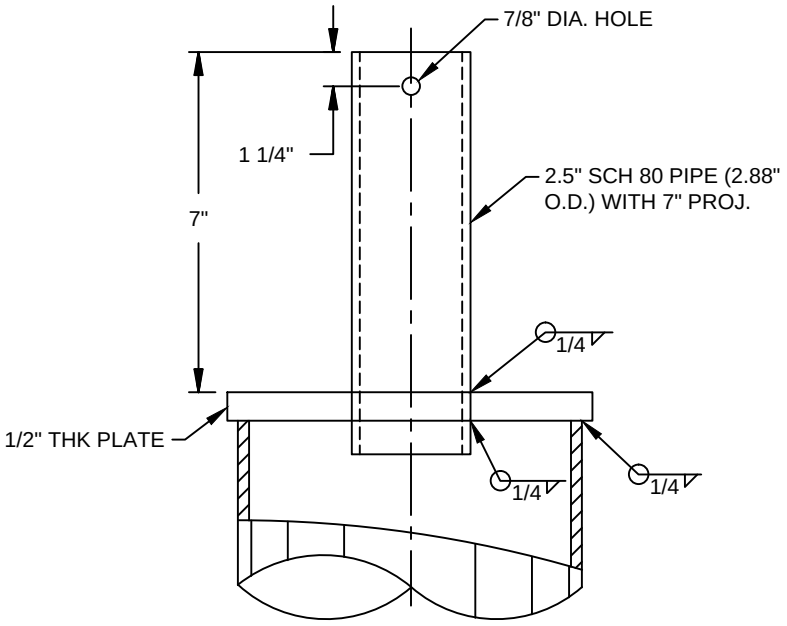
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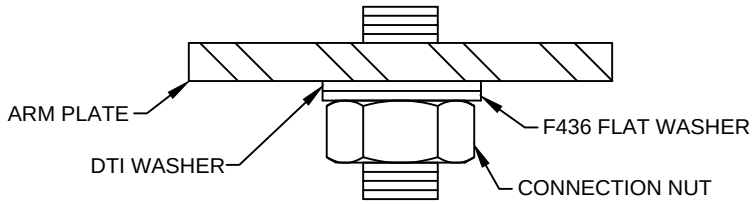
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TOP OF POLE DETAIL
(FOR POLES WITH LUMINAIRE ONLY)

LUMINAIRE BRACKET ARM NOT SHOWN FOR CLARITY. SEE MIS-183 FOR ADDITIONAL DETAILS.



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

POLE TENON / DTI WASHER PLACEMENT

DECORATIVE CITY OF COLUMBUS MAST ARM

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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. INSTALL IF DIRECTED BY THE PLANS OR THE ENGINEER. 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.

DECORATIVE CITY OF COLUMBUS MAST ARM

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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.

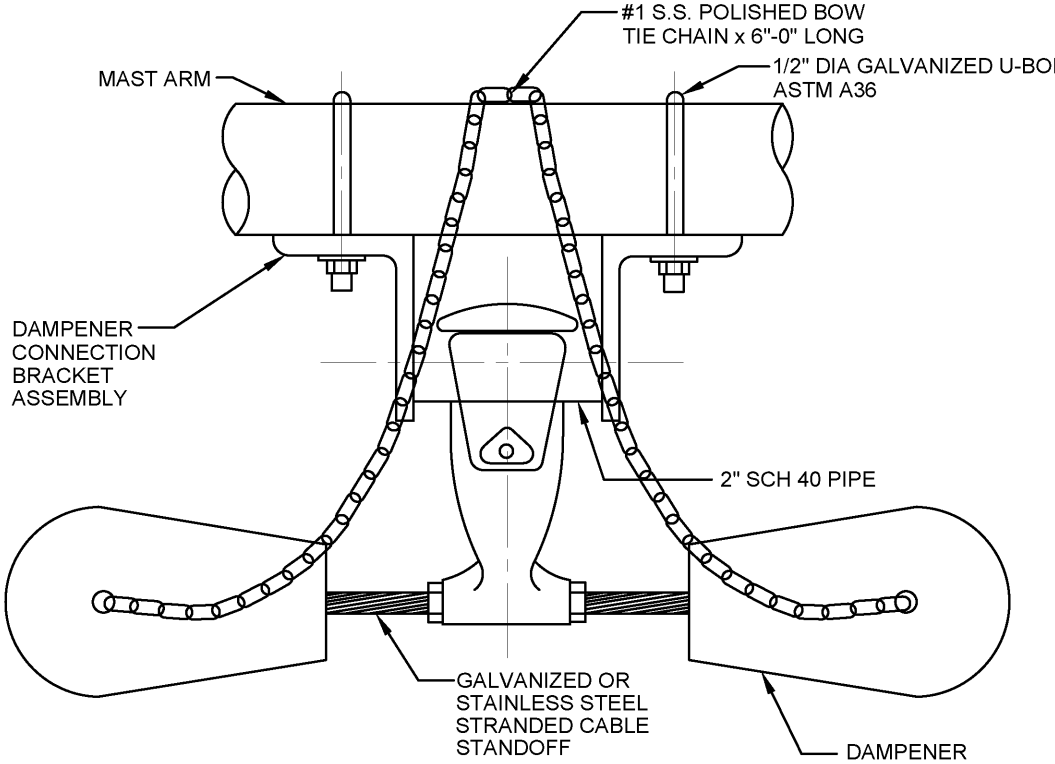
DECORATIVE CITY OF COLUMBUS MAST ARM

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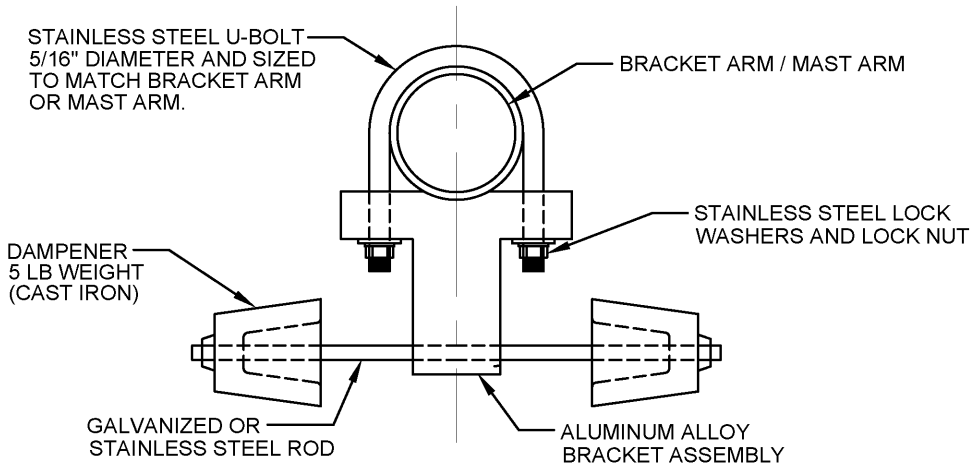
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MOUNTED ON MAST ARM (ALIGNED WITH ARM)



MOUNTED ON CAMERA BRACKET ARM (PERPENDICULAR TO ARM)

NOTE:

NON-STAINLESS STEEL ITEMS SHALL BE COATED TO MATCH BRACKET / MAST ARM.

MECHANICAL DAMPENING DEVICE

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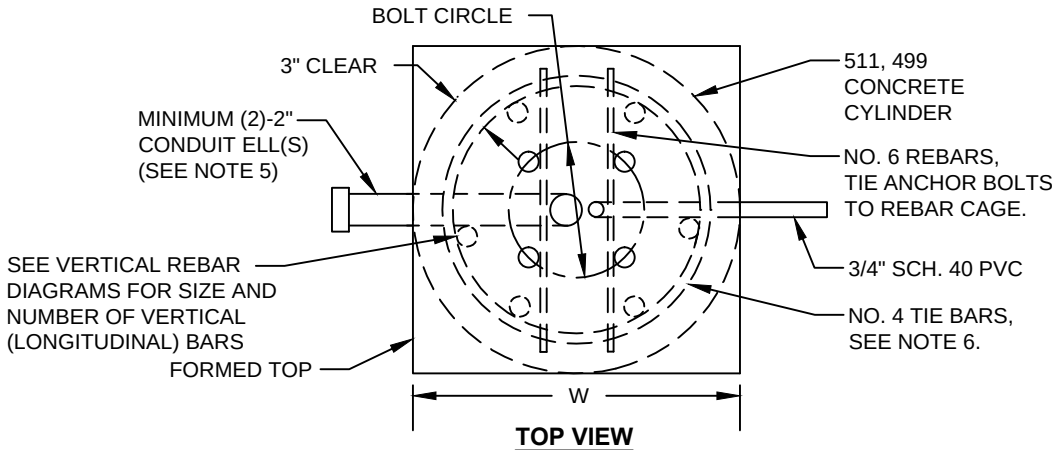
Hassan Zahra

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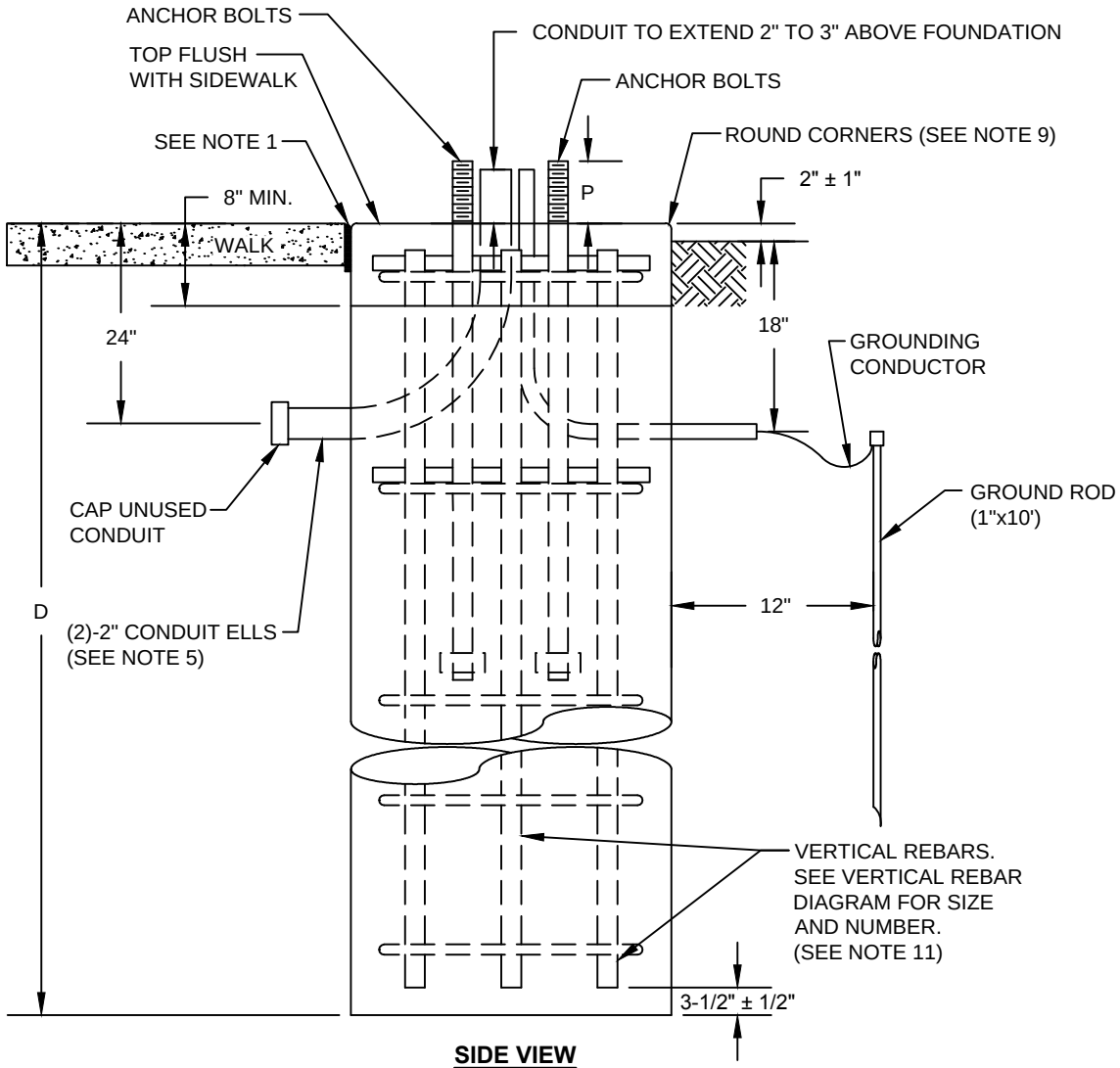
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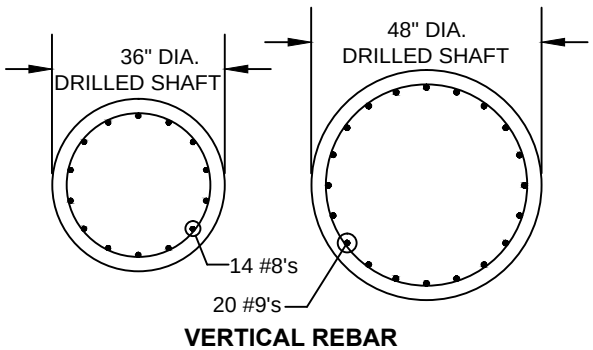
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TOP VIEW



SIDE VIEW



VERTICAL REBAR

SIGNAL SUPPORT/ STRAIN POLE FOUNDATIONS

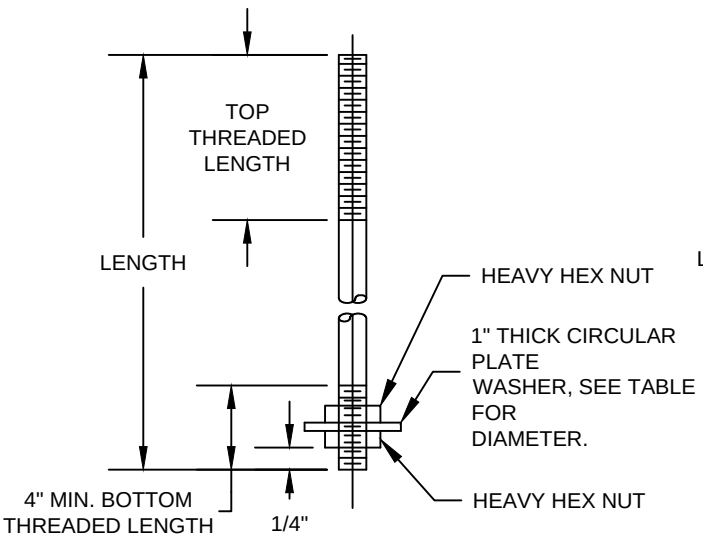
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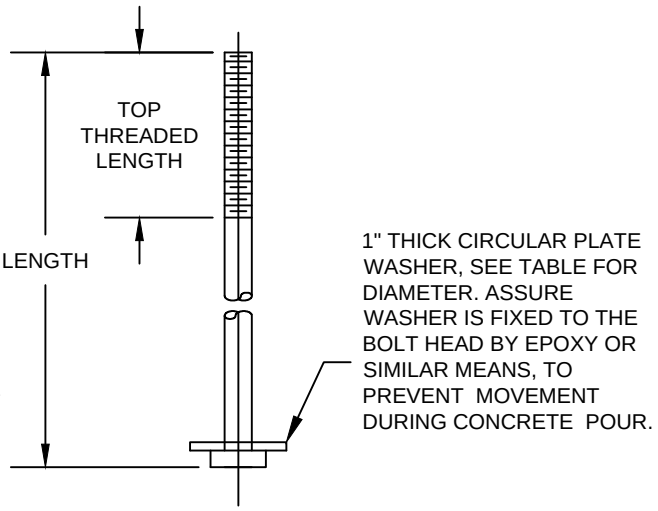
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HEX NUT ANCHOR BOLT OPTION



HEADED ANCHOR BOLT OPTION

ALL DIMENSIONS IN INCHES UNLESS OTHERWISE NOTED

CITY OF COLUMBUS 4120 & 4121 TYPE SUPPORTS					
DESIGN NO.	D (feet)	W	ANCHOR BOLTS		
			SIZE	CIRCLE	P
4	10	36	1.75 X 62	18	7.75
12	11	36	2 X 62	20	8.5
13	15	36	2 X 62	22	8.5
14	15	36	2 X 62	22	8.5
C15	15	36	2 X 62	24	8.5
C16	15	36	2 X 62	22	8.5

CITY OF COLUMBUS 4170 TYPE SUPPORTS					
DESIGN NO.	D (feet)	W	ANCHOR BOLTS		
			SIZE	CIRCLE	P
5	9	36	1.75 X 62	16	7.75
6	9	36	1.75 X 62	16	7.75
7	10	36	2 X 62	18	8.5
8	10	36	2 X 62	20	8.5
9	10	36	2 X 62	22	8.5
10	11	36	2.25 X 63	22	9
11	11	36	2.25 X 63	22	9
12	12	36	2.5 X 64	23.5	9.75
13	16	36	3 X 66	26	11.75
14	17	48	3 X 72	34	11.75

ANCHOR BOLTS

ALL DIMENSIONS IN INCHES UNLESS OTHERWISE NOTED

DIA.	TOP THREAD LENGTH	THREADS PER INCH	PLATE WASHER DIAMETER
1.25	8	7	3
1.5	9	6	3
1.75	9	5	4
2	9	4.5	4
2.25	10	4.5	5
2.5	10	4	5
3	12	4	6

SIGNAL SUPPORT/ STRAIN POLE FOUNDATIONS

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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.

4. AT LOCATIONS WHERE THE EXISTING SLOPE IS 6:1 OR GREATER, THE BURIED DEPTH OF FOUNDATION SHALL APPLY TO THE LOW SIDE OF THE SLOPE. SET THE TOP OF THE FOUNDATION 2" ABOVE THE EXISTING SURFACE ON THE HIGH SIDE OF THE SLOPE. THE ADDITIONAL DEPTH OF FOUNDATION NECESSARY TO MEET THESE REQUIREMENTS SHALL BE ADDED TO THE FORMED TOP.

5. THE SIZE, NUMBER (MINIMUM OF 2) AND ORIENTATION OF CONDUIT ELLS SHALL BE 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:

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

   <u>FOUNDATION LOCATED BEHIND CURB ASSOCIATED WITH CURB RAMP</u>
   TOP OF FOUNDATION SHALL BE FLUSH WITH TOP OF CURB AT BACK OF RAMP FOR A PARALLEL RAMP.

   <u>FOUNDATION LOCATED ADJACENT TO WALK OR CONCRETE AREA</u>
   TOP OF FOUNDATION SHALL BE FLUSH WITH WALK OR CONCRETE AREA FOR A PERPENDICULAR RAMP.

   <u>FOUNDATION LOCATED ADJACENT TO WALK OR CONCRETE WITH STEEP GRADE CHANGE (RISES STEEPLY BEHIND WALK)</u>
   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.

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.

4120 & 4121 TYPE SUPPORTS			4170 TYPE SUPPORTS		
DESIGN NO.	DEPTH OF ADJACENT UTILITY EXCAVATION		DESIGN NO.	DEPTH OF ADJACENT UTILITY EXCAVATION	
	3 FT	6 FT		3 FT	6 FT
4	D=18	D=22	5	D=15	D=19
12	D=18	D=22	6	D=15	D=19
13	D=18	D=22	7	D=15	D=19
14	D=18	D=22	8	D=15	D=19
C15	D=18	D=22	9	D=15	D=19
C16	SEE BELOW		10	D=15	D=19
SPECIAL FOUNDATION REQUIRED FOR UTILITY EXCAVATIONS ADJACENT TO C16.			11	D=20	D=24
			12	D=20	D=24
			13	D=20	D=24
			14	D=20	D=24

SIGNAL SUPPORT/ STRAIN POLE FOUNDATIONS

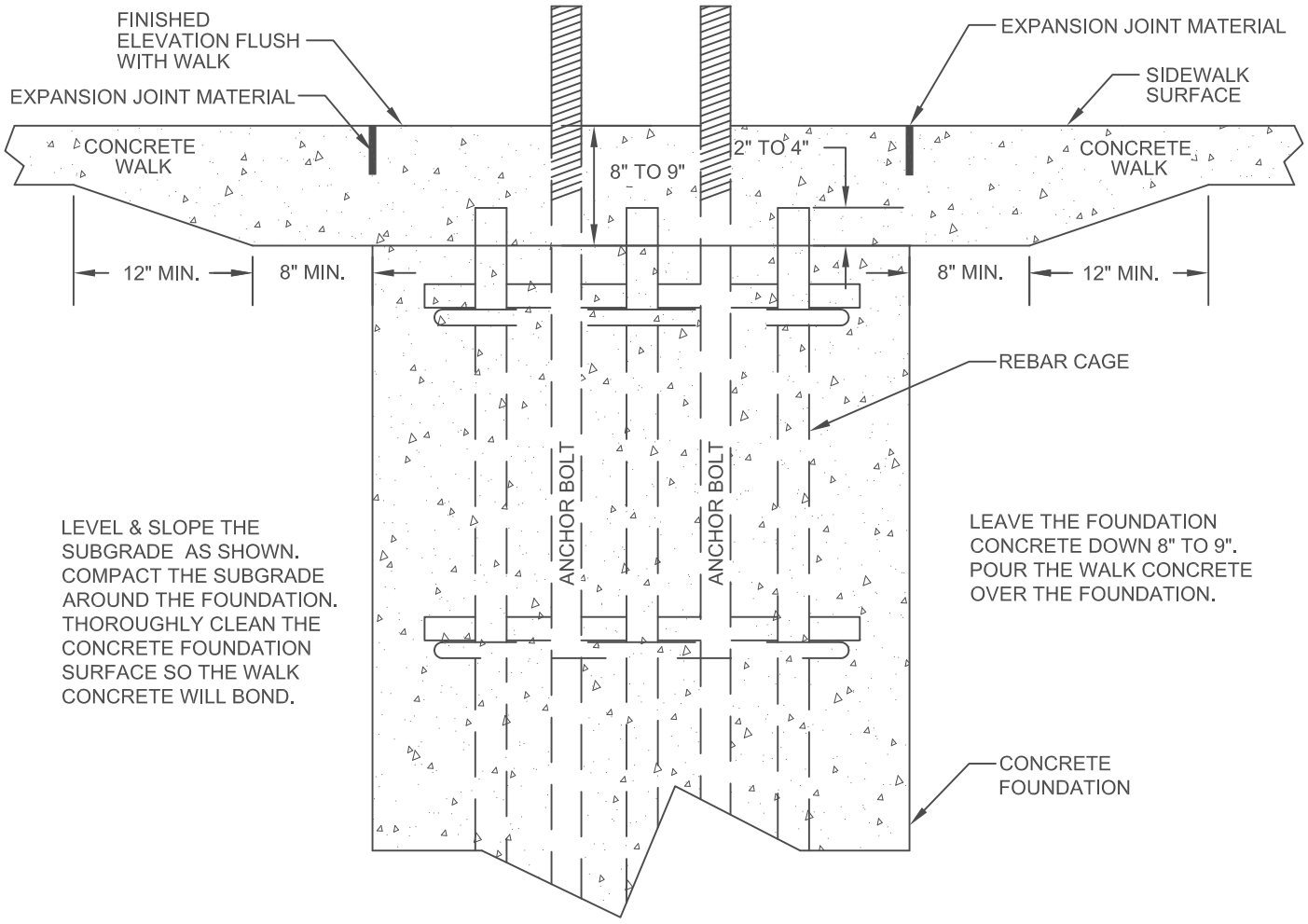
CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF DESIGN AND CONSTRUCTION

CITY ENGINEER

STD DWG
4160

2/14/2018

SHT 3 OF 3



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

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

NOTE:

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

POLE FOUNDATION IN SIDEWALK AREA

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

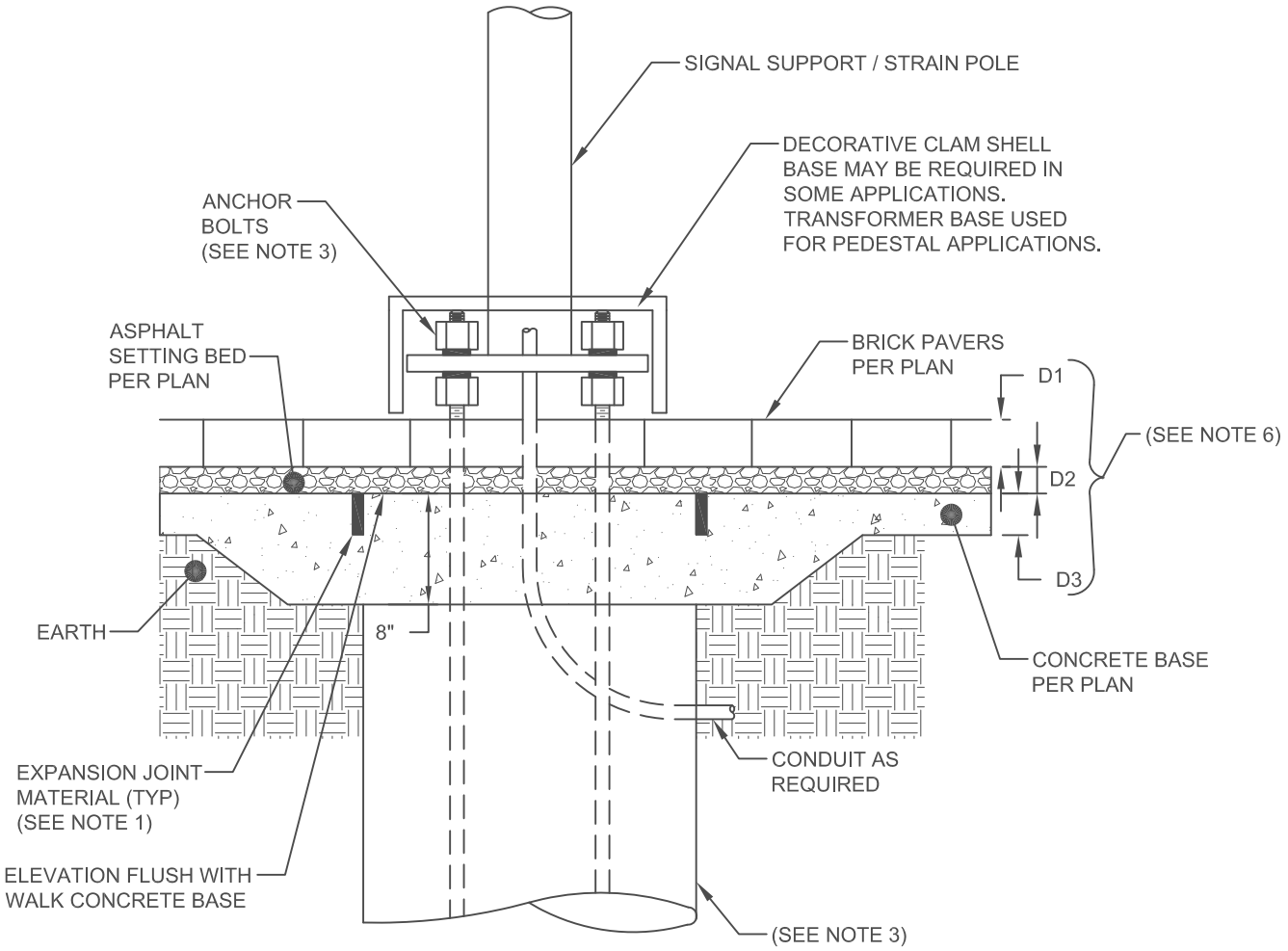
Hassan Zahra

CITY ENGINEER

STD DWG
4161

8/01/2015

SHT 1 OF 2



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.

3. ANCHOR BOLT EMBEDMENT DEPTH SHALL BE AS PER CITY OF COLUMBUS STANDARD DRAWINGS 4160/4163 AND SHALL BE MEASURED FROM THE TOP OF THE CONCRETE BASE SURFACE. ANCHOR BOLT EXPOSURE THROUGH THE ASPHALT SETTING BED AND BRICK AREA SHALL NOT BE CONSIDERED PART OF THE EMBEDMENT DEPTH. ANCHOR BOLT LENGTH SHALL BE INCREASED TO COMPENSATE FOR D1 AND D2.

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

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

6. PAVER AND SETTING BED DIMENSIONS SHALL BE PER CITY OF COLUMBUS STANDARD DRAWING 2301 OR PER PLAN.

POLE FOUNDATION IN SIDEWALK AREA

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

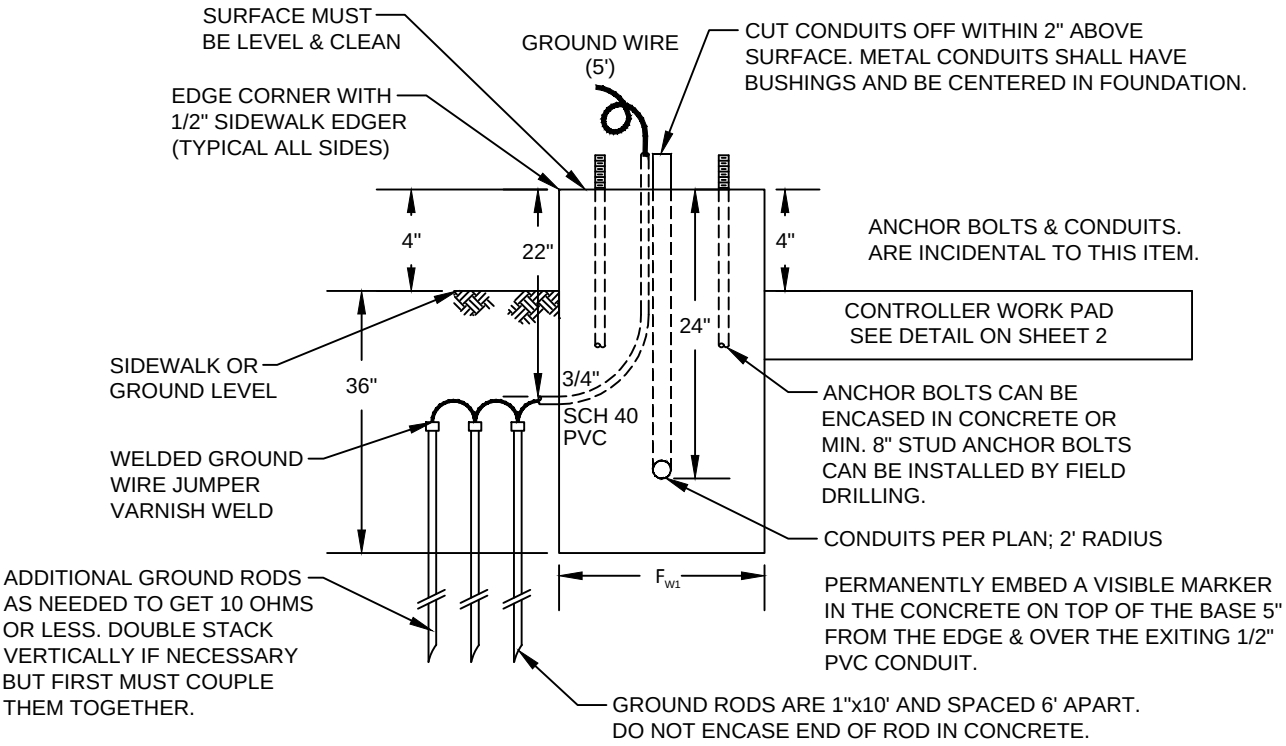
Hassan Zahra

CITY ENGINEER

STD DWG
4161

8/01/2015

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NOTE:

USE EXPANSION MATERIAL BETWEEN THE BASE CONCRETE & OTHER CONCRETE AREAS.

TRAFFIC SIGNAL CONTROLLER CABINET FOUNDATION

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

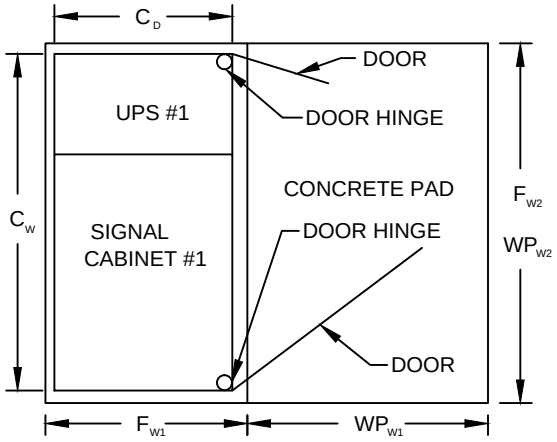
STD DWG
4162

8/10/2017

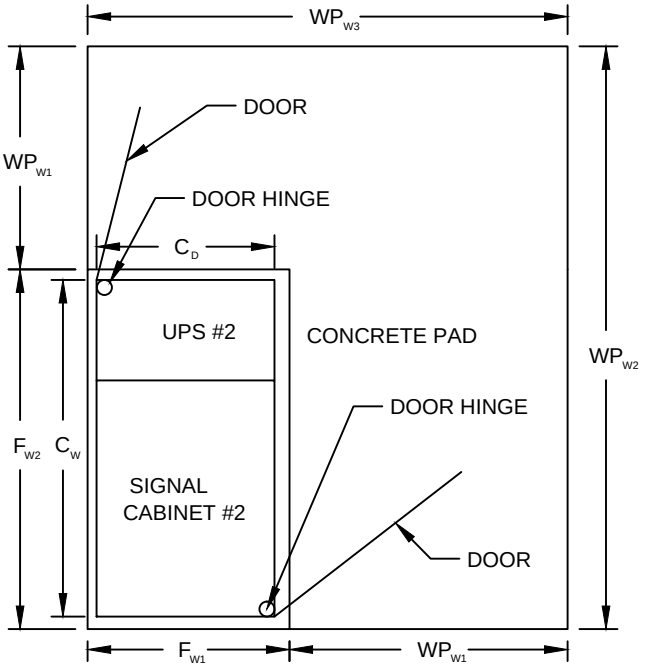
CITY ENGINEER

SHT 1 OF 2

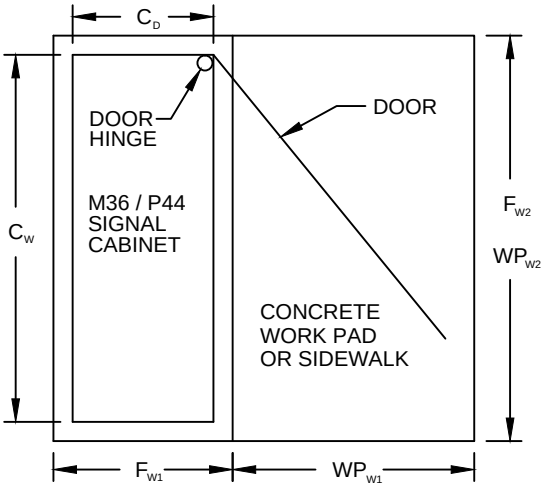
CONTROLLER CABINET AND FOUNDATION DIMENSIONS				
	M36 CABINET (IN.)	P44 CABINET (IN.)	P-UPS CABINET (#1) (IN.)	P-UPS CABINET (#2) (IN.)
C_D = CABINET DEPTH	17	26	26	29
C_W = CABINET WIDTH	36	44	60	58
F_{W1} = FOUNDATION WIDTH 1	30	30	30	33
F_{W2} = FOUNDATION WIDTH 2	48	48	64	62
WP_{W1} = WORK PAD WIDTH 1	36	36	36	36
WP_{W2} = WORK PAD WIDTH 2	48	48	64	98
WP_{W3} = WORK PAD WIDTH 3	N/A	N/A	N/A	69
WORK PAD DEPTH	4"	4"	4"	4"



UPS CABINET FOUNDATION / WORK PAD TYPE 1



UPS CABINET FOUNDATION / WORK PAD TYPE 2



STANDARD CABINET FOUNDATION / WORK PAD

NOTE:

BUILD-UP/STABILIZATION OF SURROUNDING AREA MAY BE REQUIRED BY ENGINEER AND IS INCIDENTAL TO THE INSTALLATION. THIS APPLIES TO ALL SLOPED AREA INSTALLATIONS.

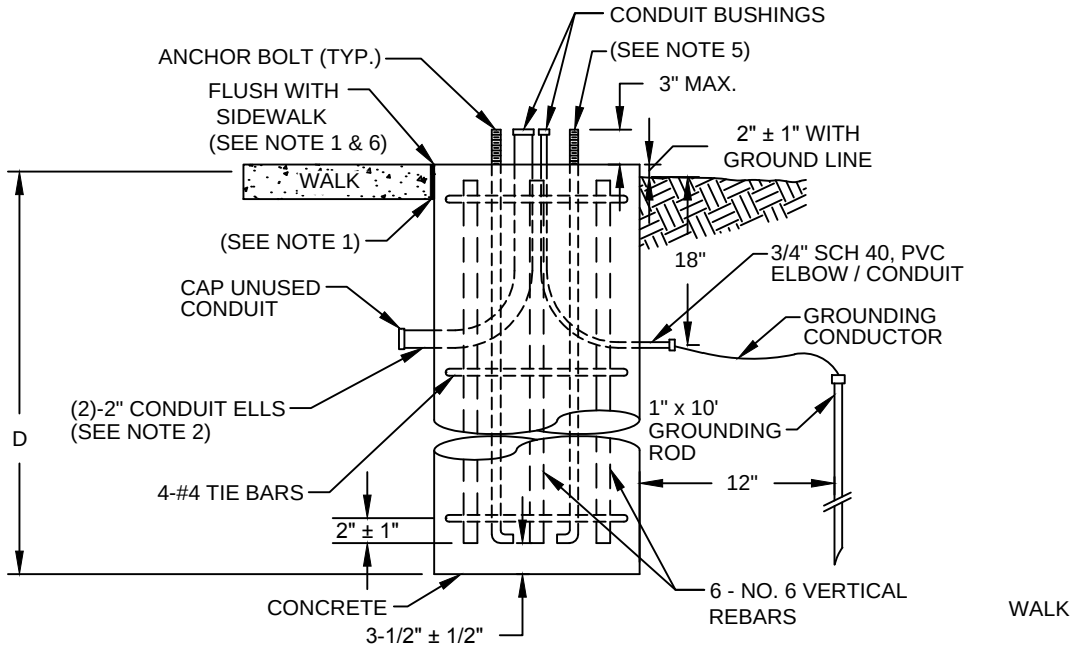
TRAFFIC SIGNAL CONTROLLER CABINET FOUNDATION

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

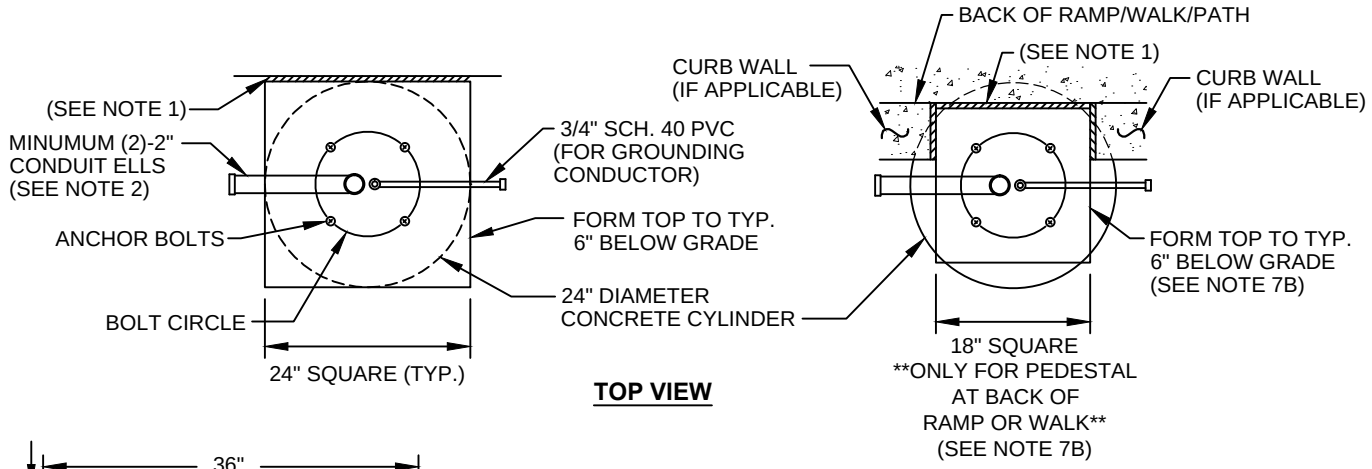
CITY ENGINEER

STD DWG
4162
8/10/2017
SHT 2 OF 2

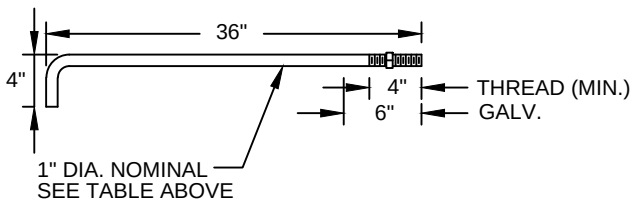
FOUNDATION DETAILS				
PEDESTAL TYPE (HT.)	DEPTH (D)	BOLT CIRCLE	REBAR REQUIRED	ANCHOR BOLT (DIA.)
STD. DWG 4100 (5')	3'	14.5"	NO	3/4"
STD. DWG 4101 (10.7')	3'	14.5"	NO	1"
STD. DWG 4102 (12.7')	4'	14.5"	YES	1"
STD. DWG 4103 (17.5')	4'	14.5"	YES	1"
STD. DWG 4104 (21')	4'	14.5"	YES	1"
STD. DWG 4106 (10.7' DECORATIVE)	4'	9.5"	NO	1"



SECTION VIEW



TOP VIEW



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) GALV STEEL LOCKWASHERS

PEDESTAL FOUNDATION

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

CITY ENGINEER

STD DWG
4163

6/1/2018

SHT 1 OF 2

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.

PEDESTAL FOUNDATION

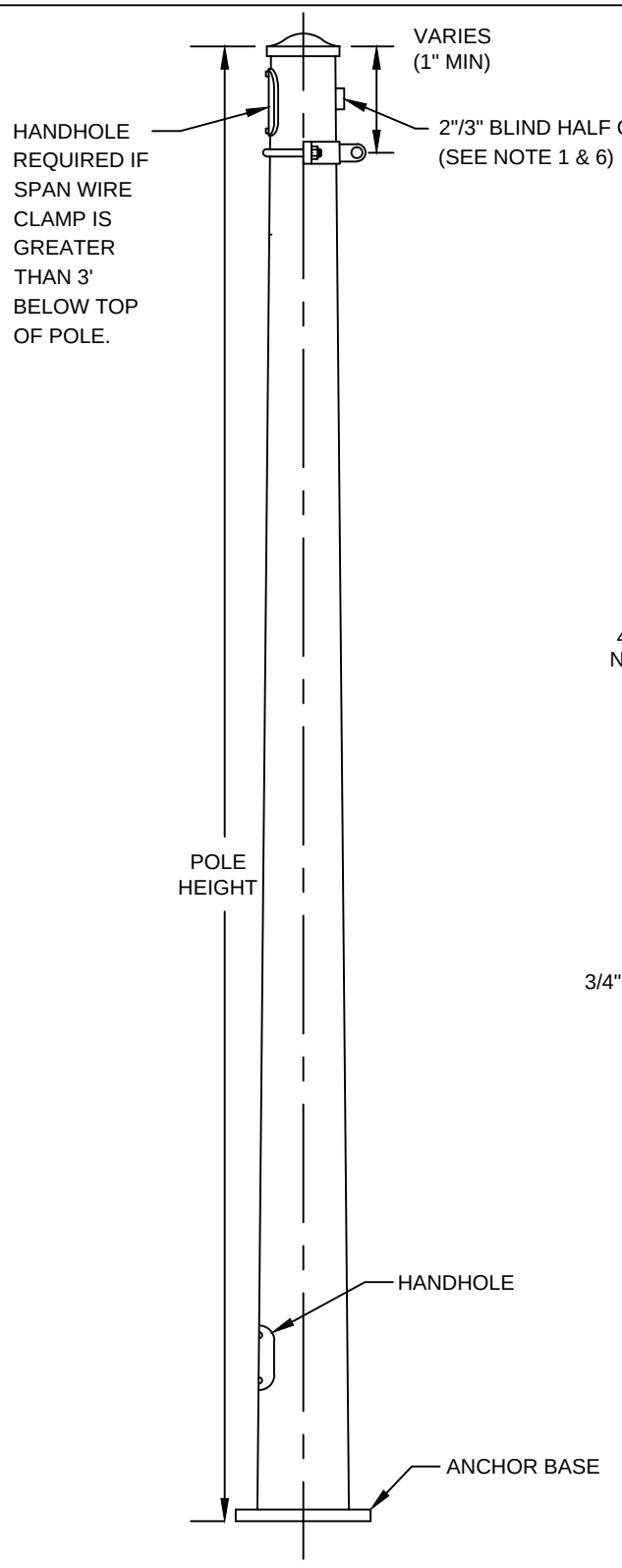
CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF DESIGN AND CONSTRUCTION

CITY ENGINEER

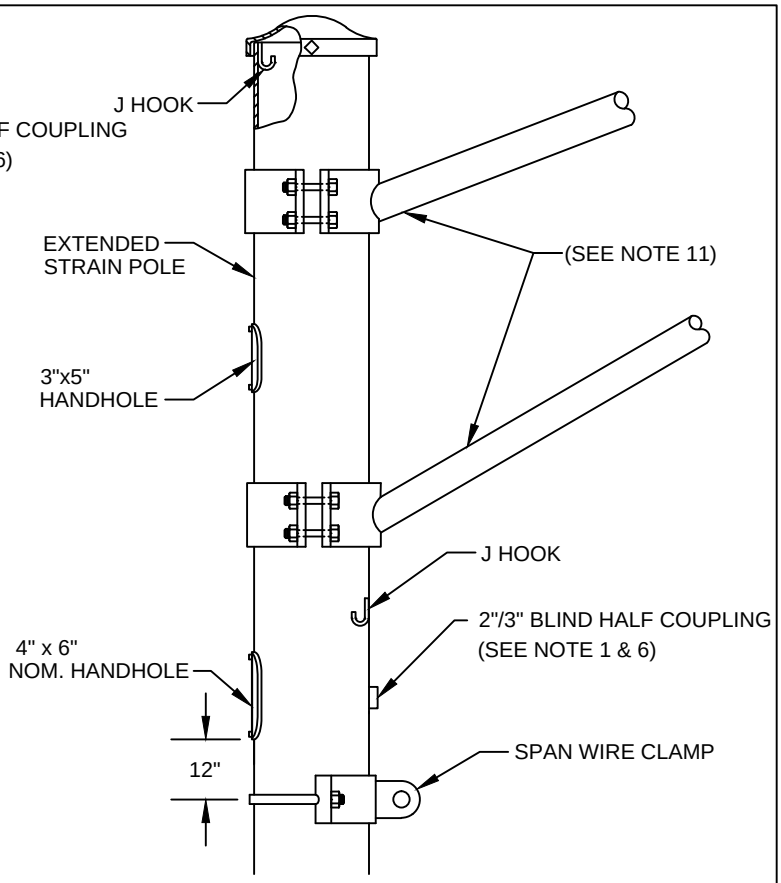
STD DWG
4163

6/1/2018

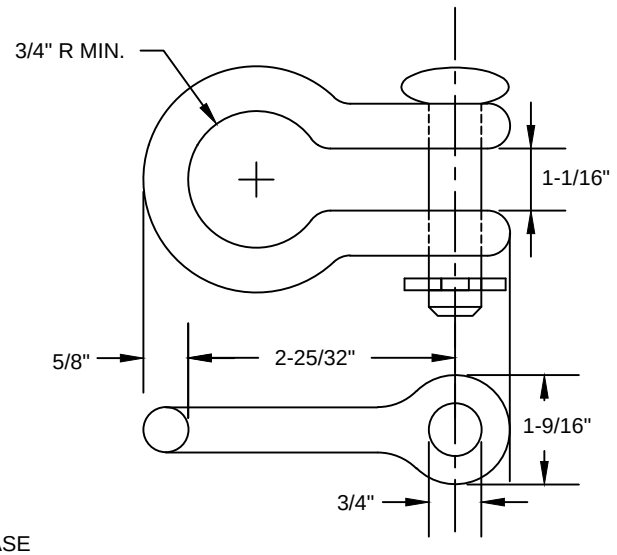
SHT 2 OF 2



TAPERED TUBE



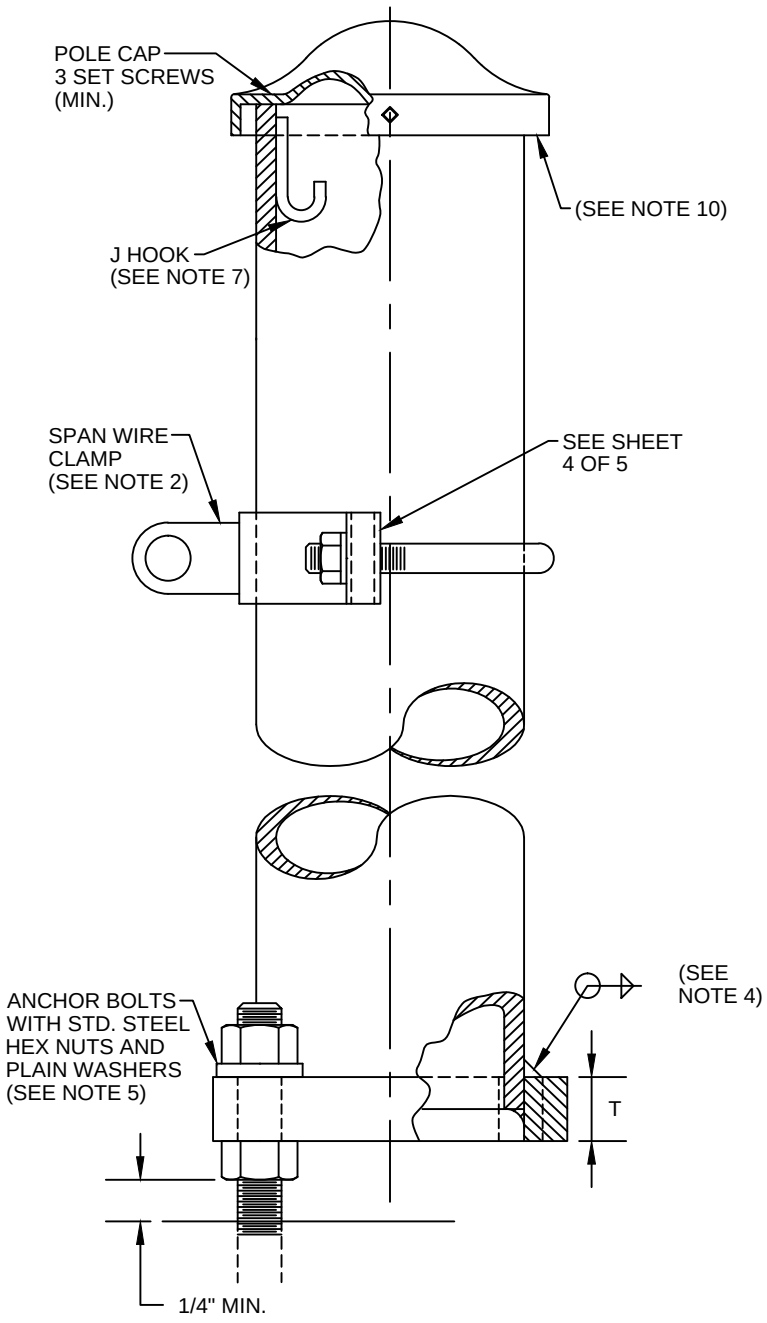
COMBINATION POLE



ANCHOR TYPE SHACKLE

STRAIN POLE

CITY OF COLUMBUS, OHIO DEPARTMENT OF PUBLIC SERVICE DIVISION OF DESIGN AND CONSTRUCTION	STD DWG 4170
CITY ENGINEER	8/10/2017 SHT 1 OF 6



POLE DETAILS

STRAIN POLE

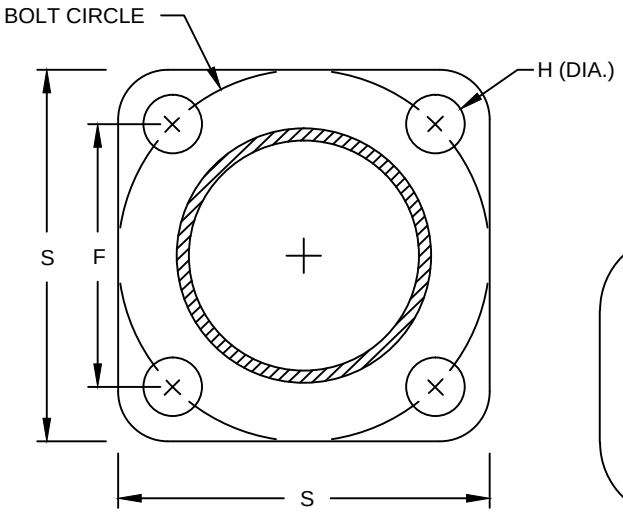
CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF DESIGN AND CONSTRUCTION

CITY ENGINEER

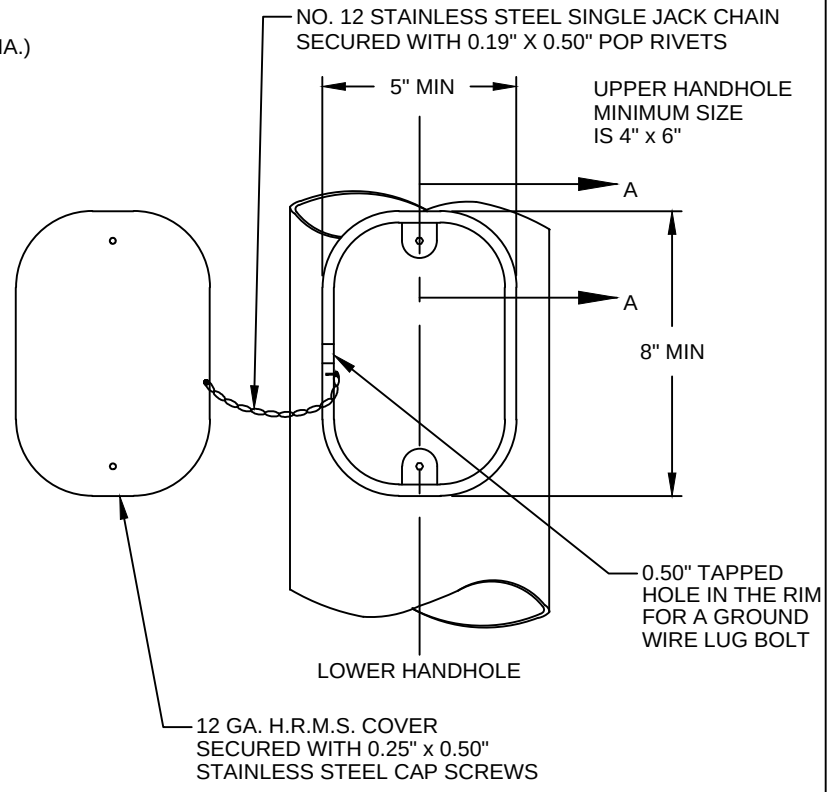
STD DWG
4170

8/10/2017

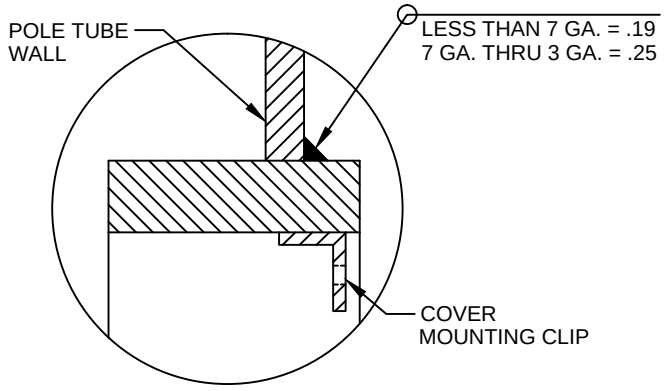
SHT 2 OF 6



BASE PLATE



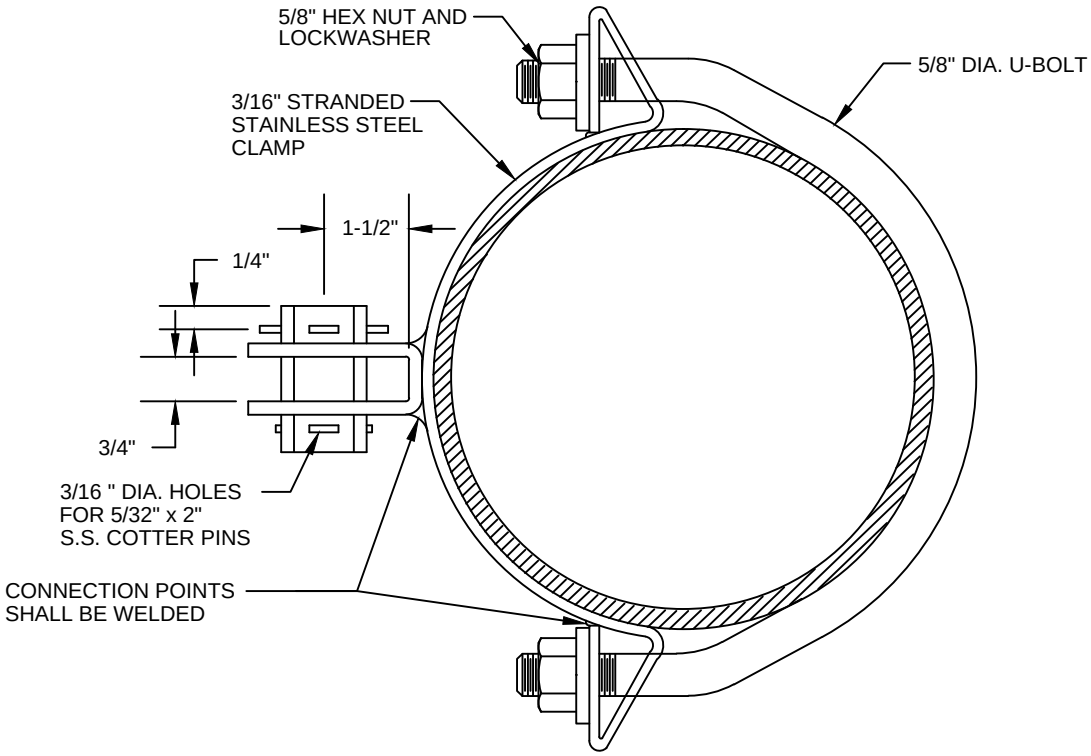
HANDHOLE

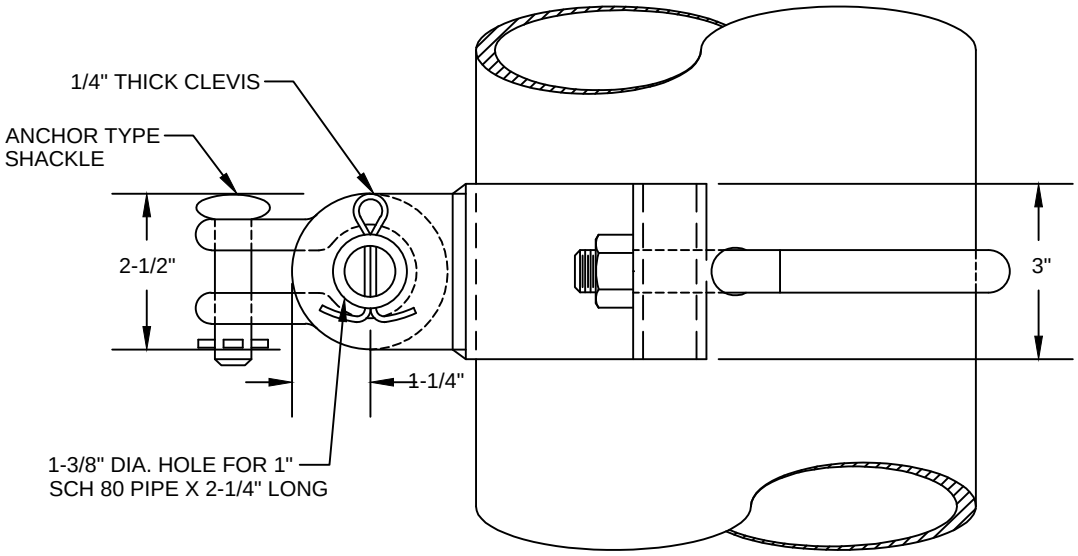


SECTION A-A

STRAIN POLE

CITY OF COLUMBUS, OHIO DEPARTMENT OF PUBLIC SERVICE DIVISION OF DESIGN AND CONSTRUCTION	STD DWG 4170
	8/10/2017
CITY ENGINEER	SHT 3 OF 6





SPAN WIRE CLAMP

STRAIN POLE

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

CITY ENGINEER

STD DWG
4170

8/10/2017

SHT 4 OF 6

ALL DIMENSIONS ARE IN INCHES, UNLESS OTHERWISE NOTED.

DESIGN NO.	MIN. POLE HEIGHT (feet)	BASE MOMENT AT YIELD (ft. kips)	MAX DESIGN BASE MOMENT (ft. kips) (NOTE C)	TAPERED (NOTE A)		TAPERED (NOTE B)			ANCHOR BASE				
				BASE DIA.	MIN. WALL THICKNESS	BASE DIA.	MIN. WALL THICKNESS	NO. OF SIDES	BOLT CIRCLE	F	S	T	H
5	30	121.0	-	12	.239	12	.239	NA	16	11.3125	17	2	2.125
6	30	149.0	-	12	.299	12	.250	10	16	11.3125	17	2	2.125
7	30	176.0	-	13	.299	13	.250	12	18	12.75	18.50	2	2.375
8	30	206.0	-	14	.299	15	.219	14	20	14.125	20.50	2	2.375
9	30	228.0	-	12	.478 (2 PLY)	14.75	.250	14	22	15.50	23	2.50	2.375
10	32	270.0	-	13	.478 (2 PLY)	16	.250	16	22	15.50	23	2.50	2.625
11	32	316.0	-	14	.478 (2 PLY)	15.50	.313	14	22	15.50	23	2.50	2.625
12	32	385.0	-	14	.598 (2 PLY)	17.25	.313	16	23.50	16.625	24.50	2.50	2.875
13	32	-	590	18	0.626	18	0.500	14	26	18.38	30	3.50	3.375
14	32	-	900	23	0.563	22	0.500	16	34	24.04	36.5	3.50	3.375

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 MINIUM OF 55,000 OR 65,000 PSI YIELD STRENGTH AFTER GALVANIZING, RESPECTIVELY.

C. DESIGN 13 AND 14 STRAIN POLES ARE AASHTO 1994 COMPLIANT.

STRAIN POLE

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

CITY ENGINEER

STD DWG
4170

8/10/2017

SHT 5 OF 6

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.

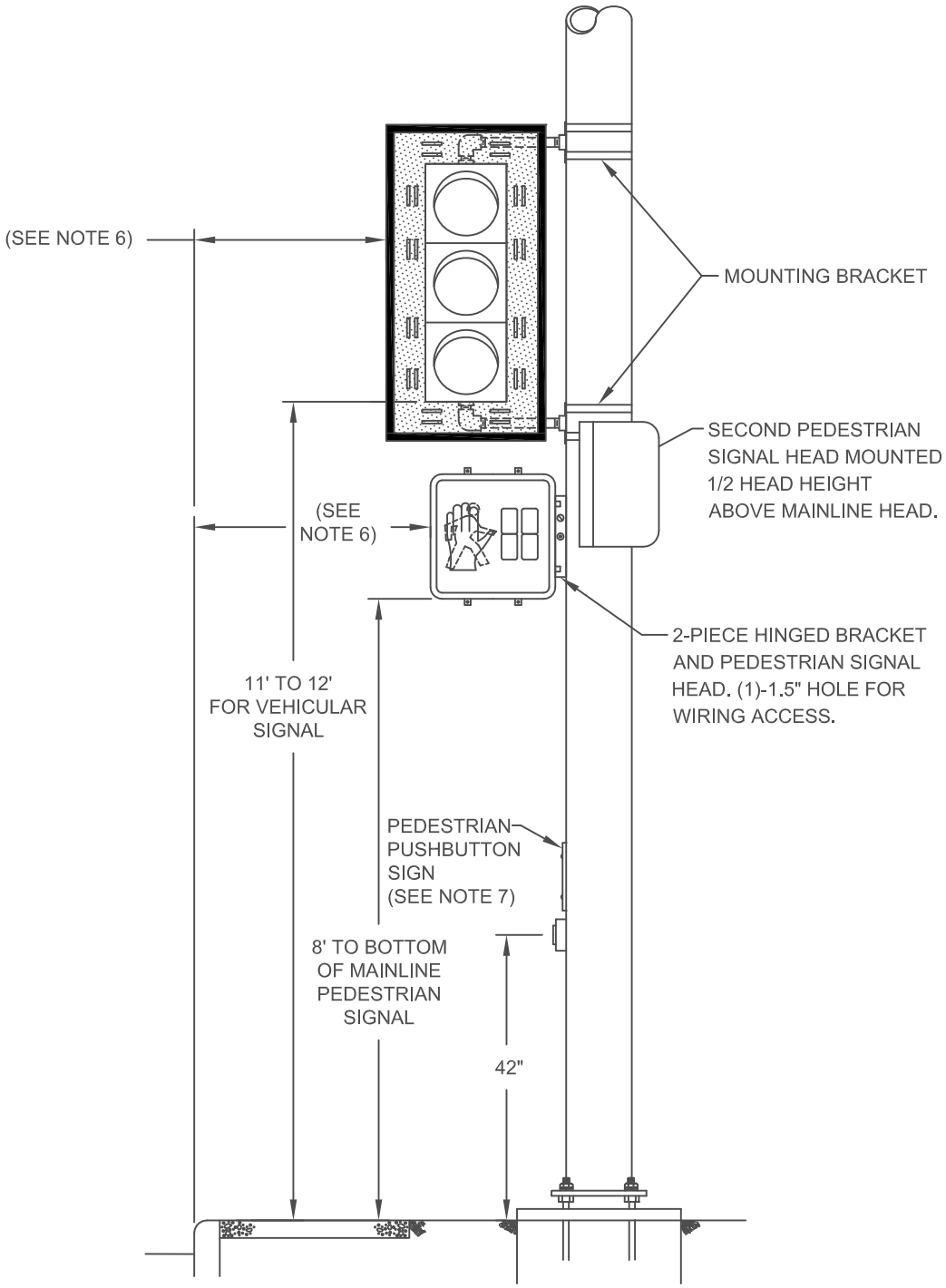
11. FOR BRACKET ARM DETAILS SEE CITY OF COLUMBUS STANDARD DRAWING 4110.

STRAIN POLE

CITY OF COLUMBUS, OHIO
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POLE MOUNTING STANDARD

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

STD DWG
4200

8/01/2015

CITY ENGINEER

SHT 1 OF 2

NOTES:

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

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

   A. HOLES FOR WIRE ACCESS SHALL BE FIELD DRILLED.

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

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

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

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

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

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

POLE MOUNTING STANDARD

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

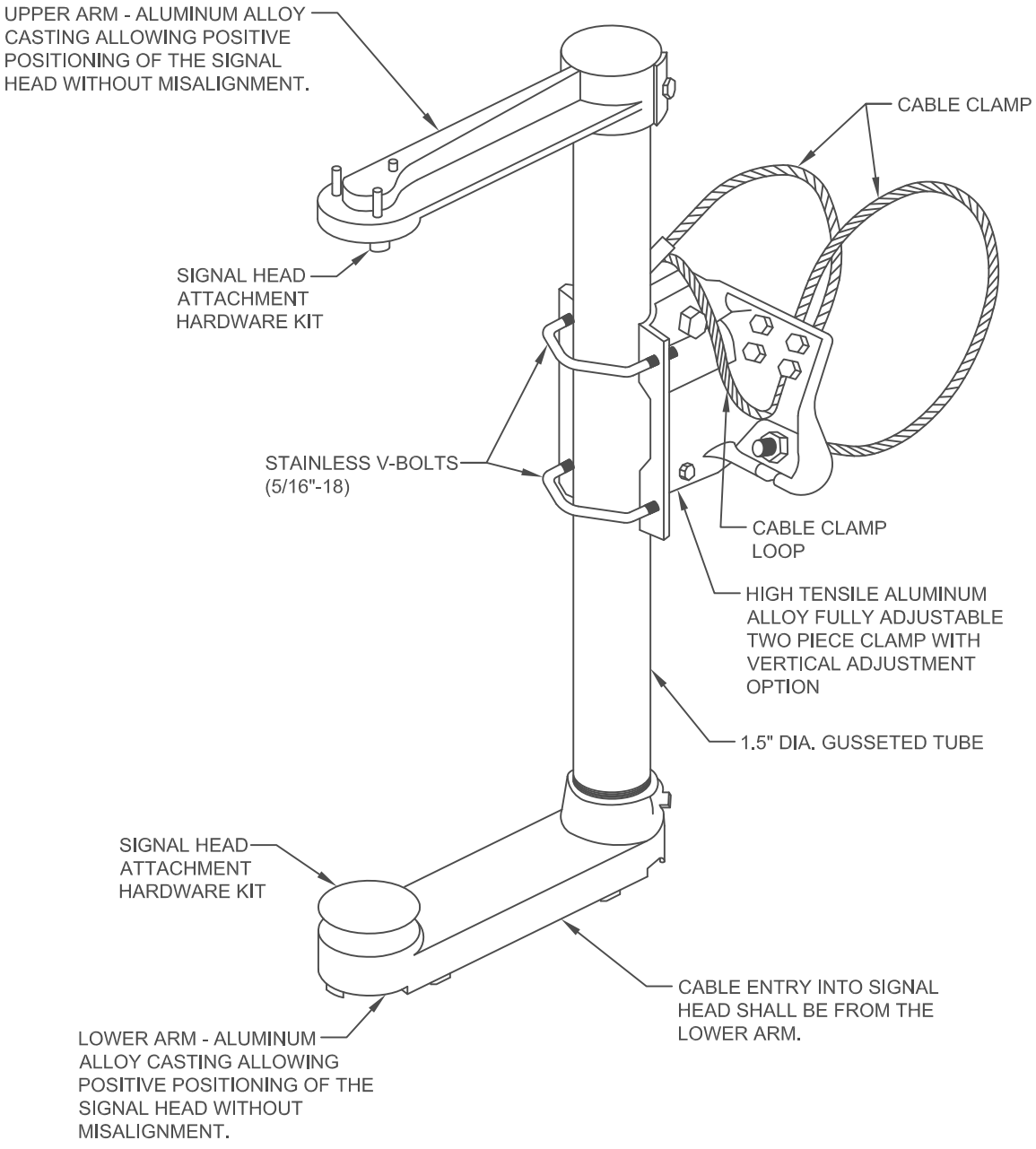
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RIGID SIGNAL HEAD MOUNTING FOR MAST ARMS

OVERHEAD SIGNAL ATTACHMENTS - MAST ARM

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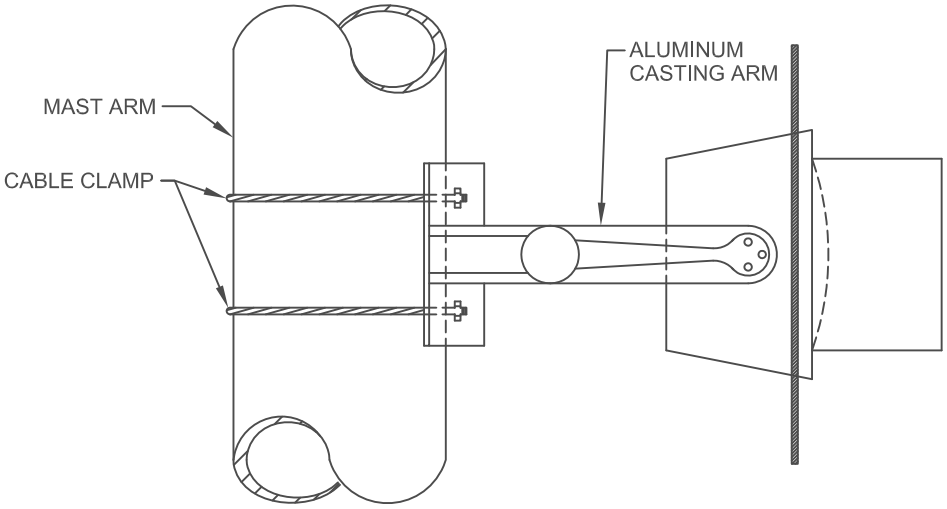
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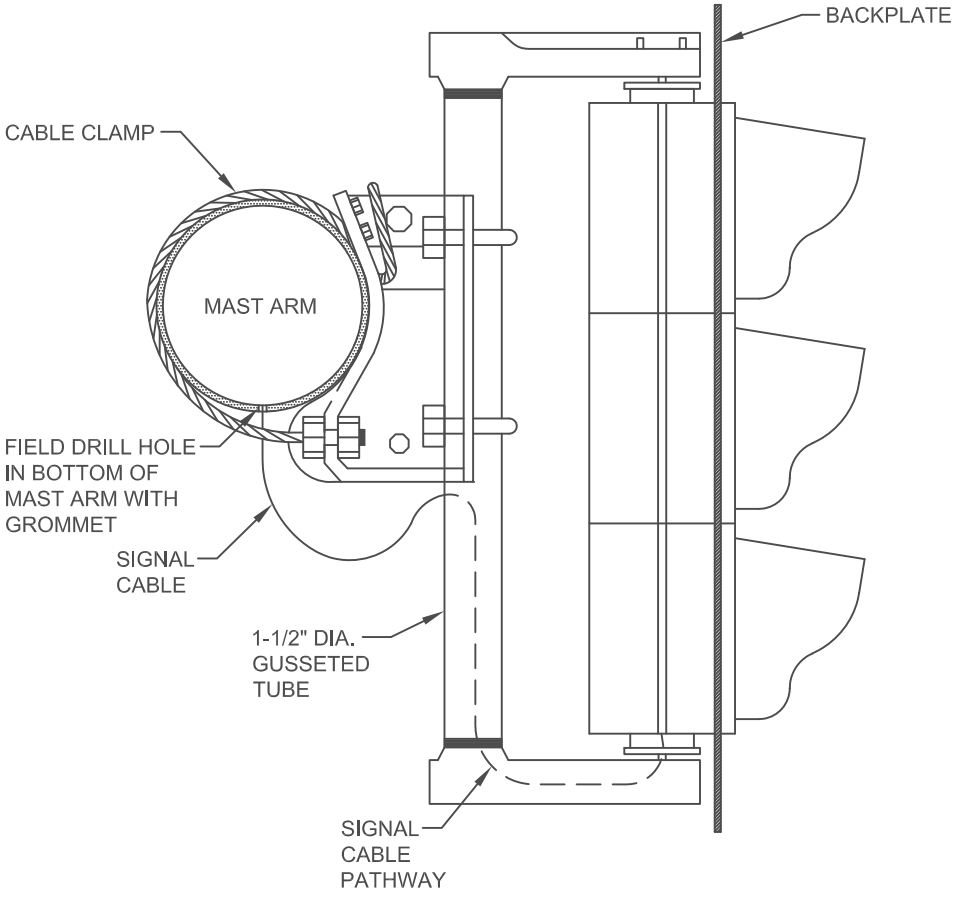
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TOP VIEW



SIDE VIEW

RIGID SIGNAL HEAD MOUNTING FOR MAST ARMS

OVERHEAD SIGNAL ATTACHMENTS - MAST ARM

CITY OF COLUMBUS, OHIO
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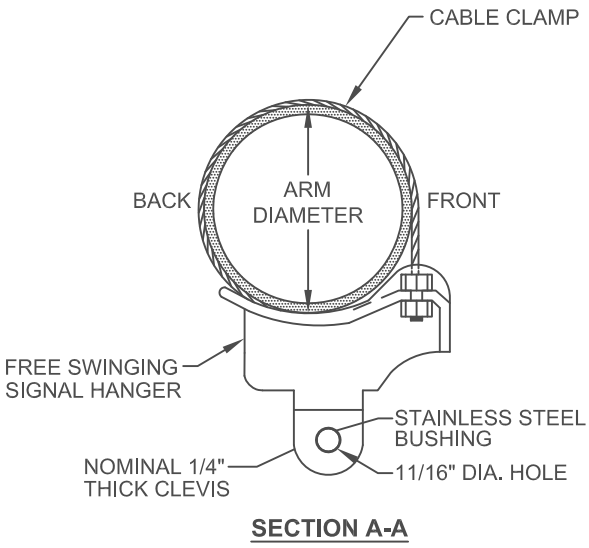
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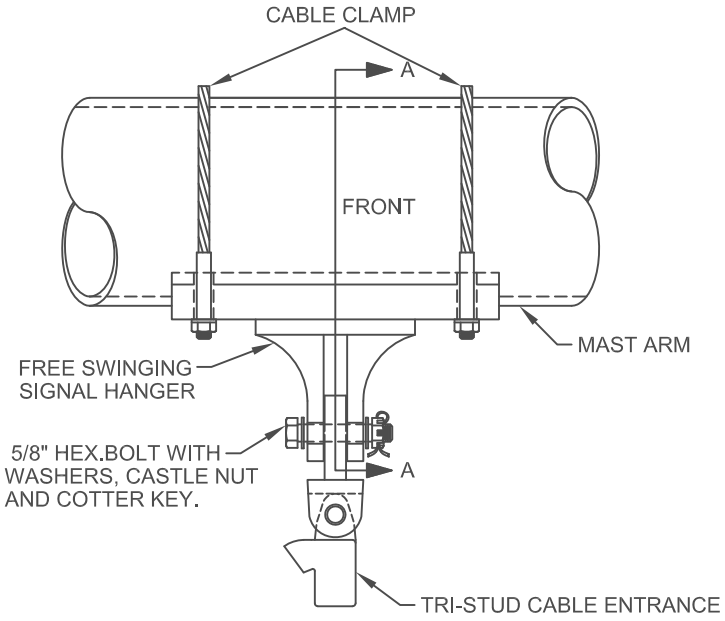
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SECTION A-A



FREE SWINGING SIGNAL HEAD
MOUNTING FOR MAST ARMS

OVERHEAD SIGNAL ATTACHMENTS - MAST ARM

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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 - MAST ARM

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

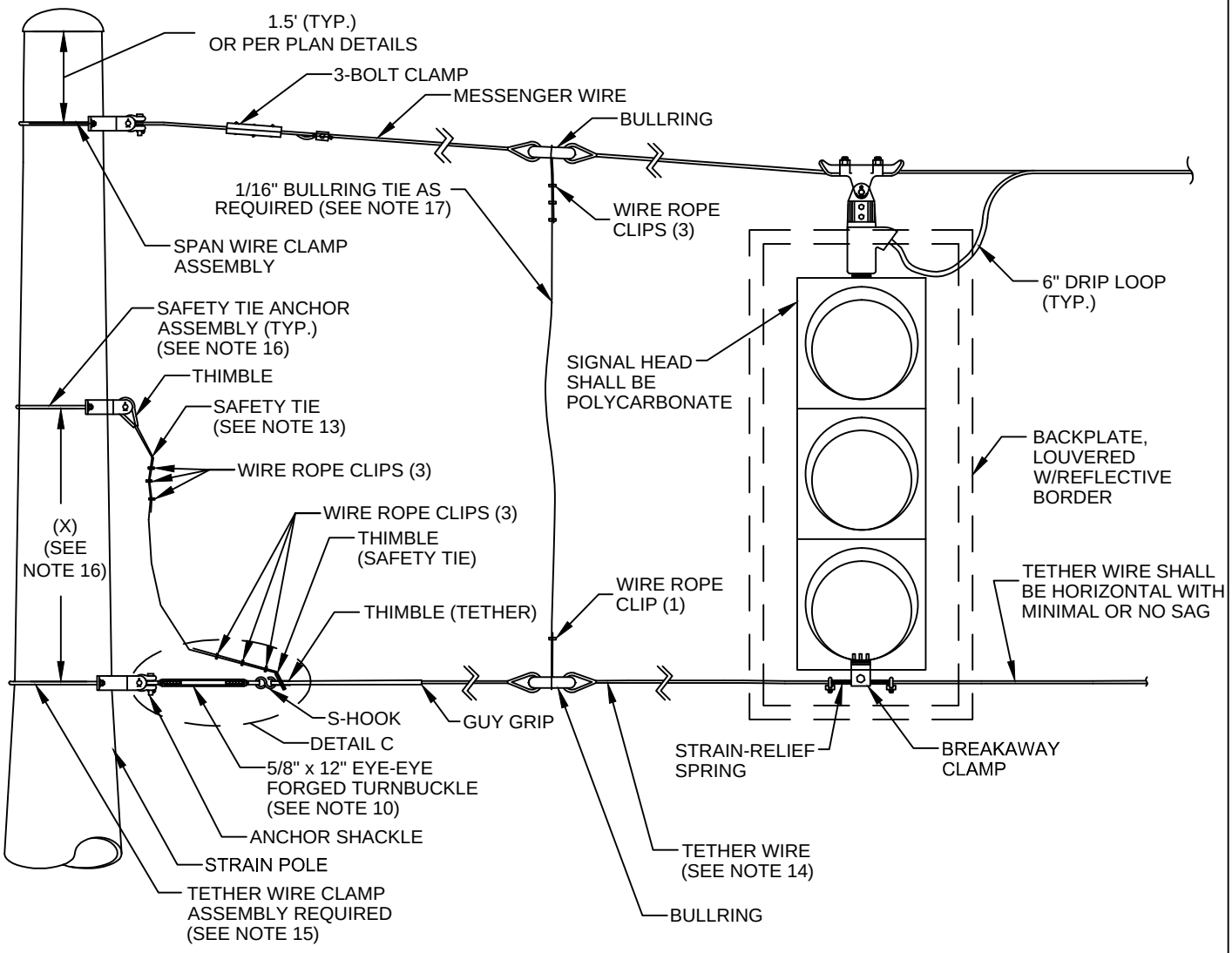
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OVERHEAD SIGNAL ATTACHMENTS - SPAN WIRE

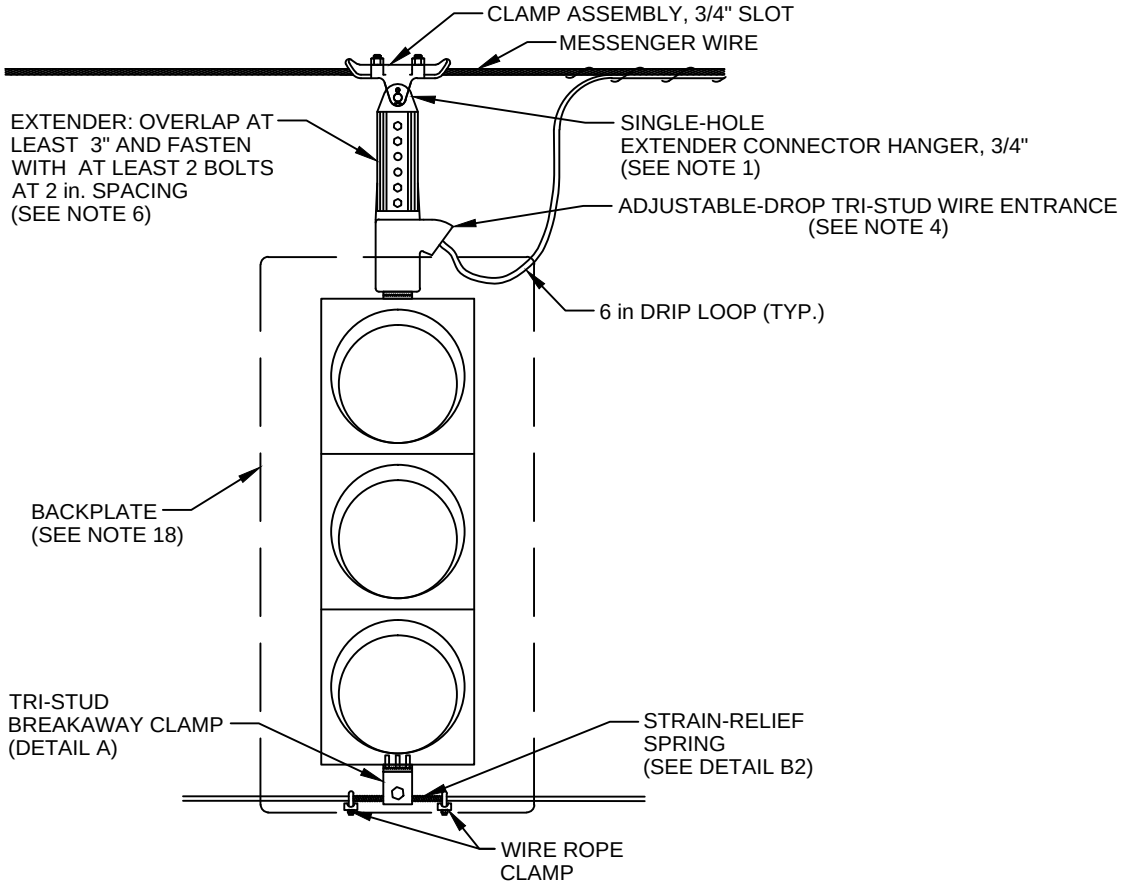
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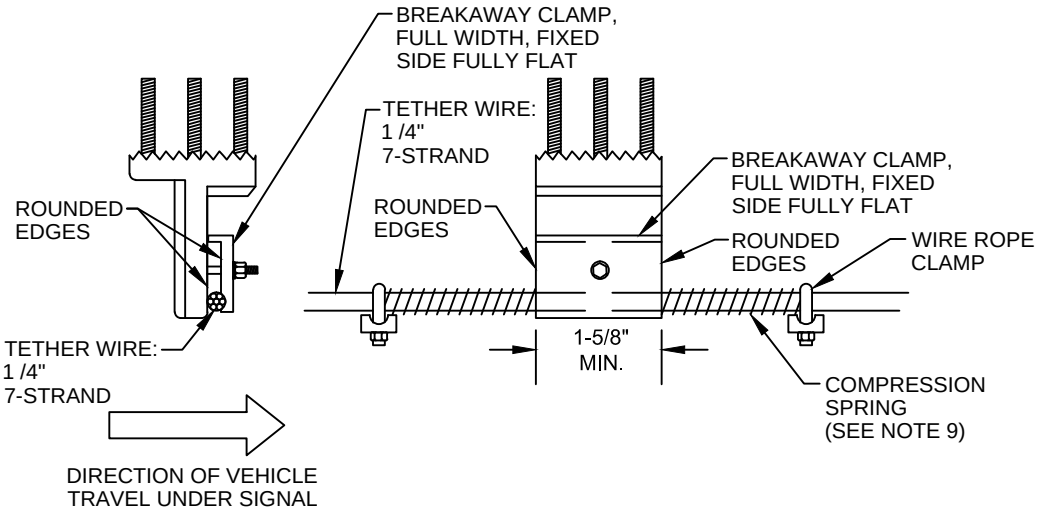
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3-SECTION SIGNAL HEAD SUSPENSION



DETAIL A: BREAKWAY TETHER ANCHOR
(TYPICAL, SEE NOTE 6)

OVERHEAD SIGNAL ATTACHMENTS - SPAN WIRE

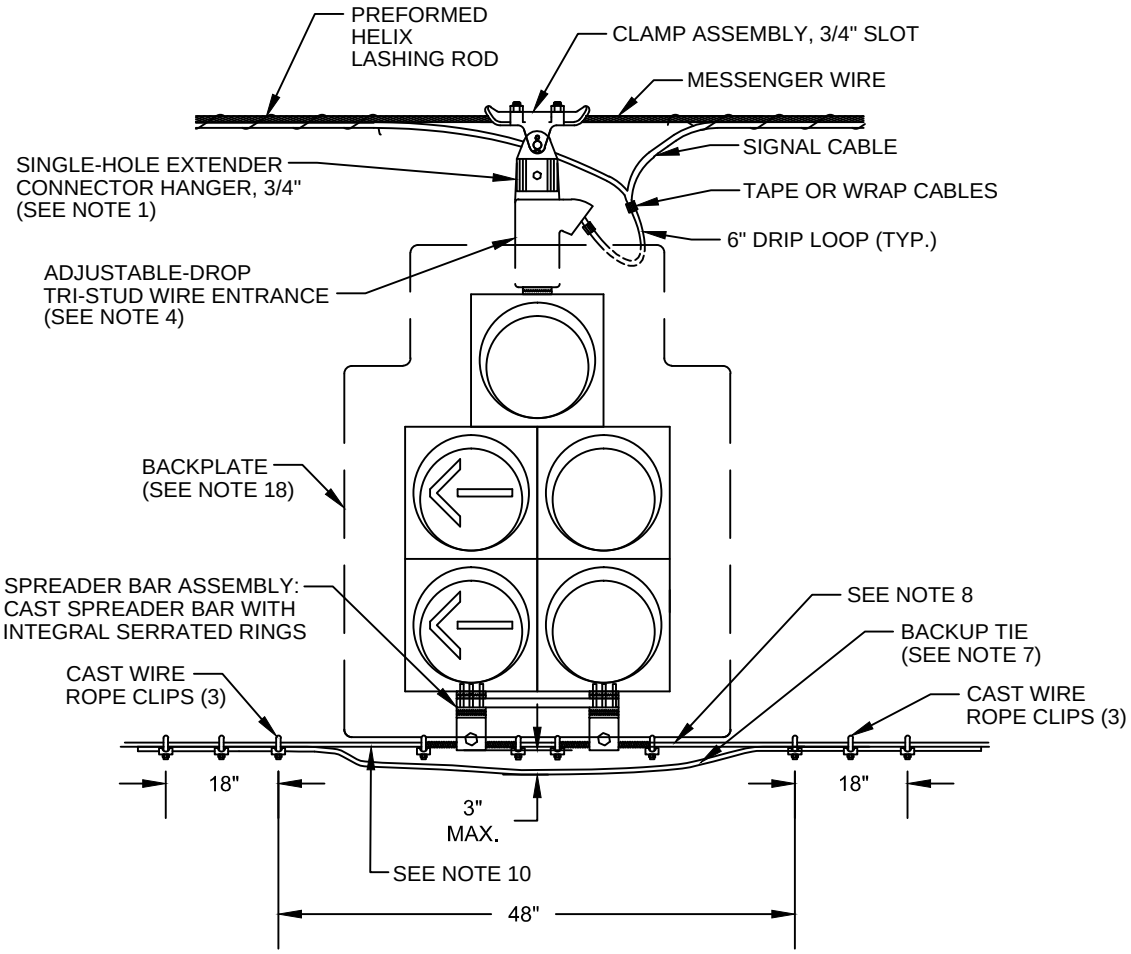
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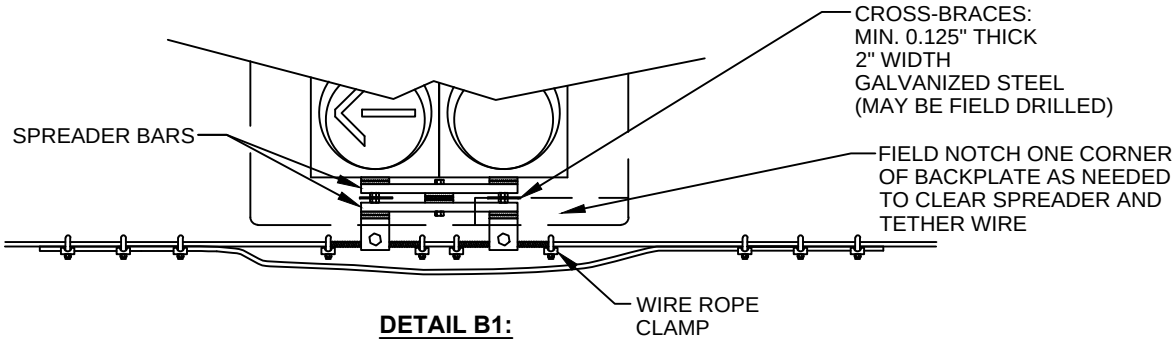
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5-SECTION SIGNAL HEAD SUSPENSION



DETAIL B1:
DOUBLE SPREADER BARS
AND CROSS-BRACING ON
SKEWED SPANS
(FRONT VIEW)

OVERHEAD SIGNAL ATTACHMENTS - SPAN WIRE

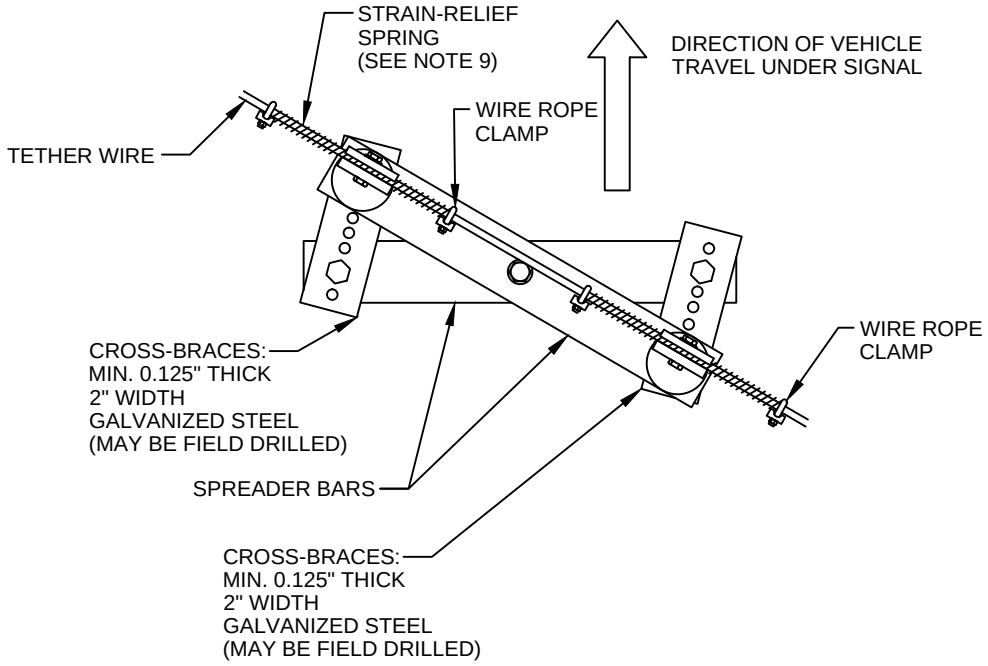
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DETAIL B2:
DOUBLE SPREADER BARS
AND CROSS-BRACING ON
SKEWED SPANS
(BOTTOM VIEW)

OVERHEAD SIGNAL ATTACHMENTS - SPAN WIRE

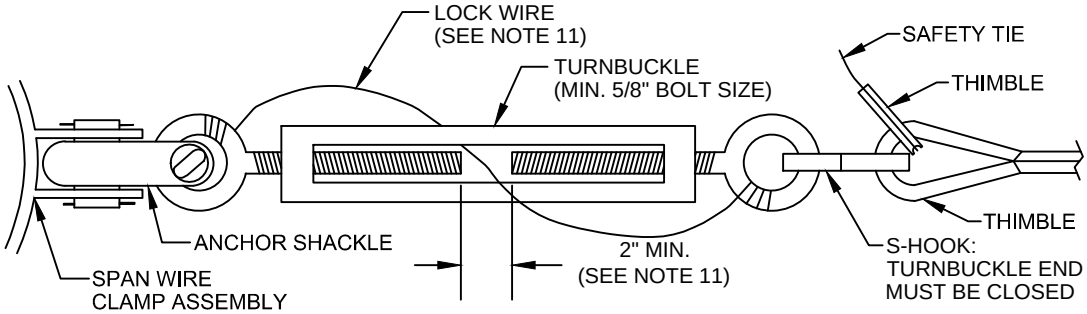
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DETAIL C
(TOP VIEW)

OVERHEAD SIGNAL ATTACHMENTS - SPAN WIRE

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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 PREFERED 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.

OVERHEAD SIGNAL ATTACHMENTS - SPAN WIRE

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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

Strain Pole Design No.	Galvanized Mild Steel S-Hook Wire Diameter (Inches)	S-hook yield point (+10%/-20%) (Pounds)
5 - 14	1/2	3300

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.

OVERHEAD SIGNAL ATTACHMENTS - SPAN WIRE

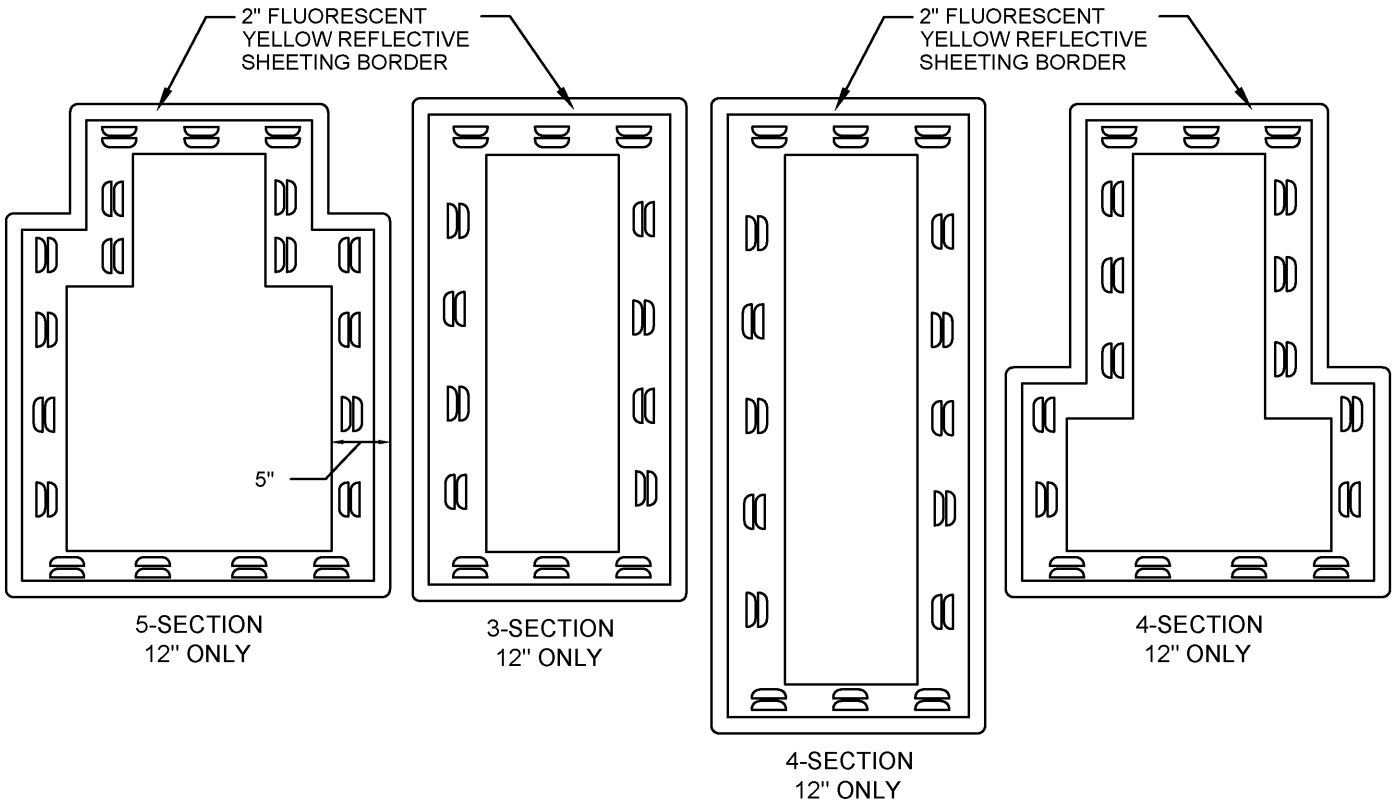
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BACKPLATE LOUVER CONFIGURATION
(SEE NOTE BELOW)

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.

TRAFFIC SIGNAL BACKPLATE

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DEPARTMENT OF PUBLIC SERVICE
DIVISION OF DESIGN AND CONSTRUCTION

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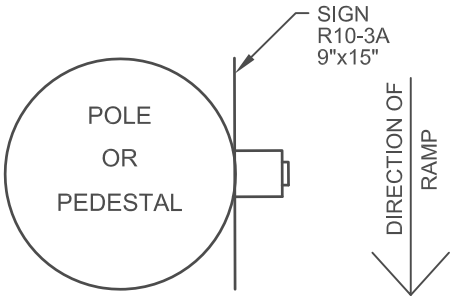
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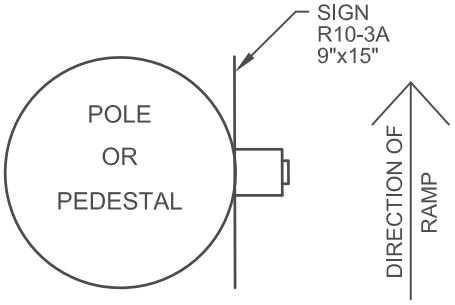
FOR PUSHBUTTON LOCATED AT THE SIDE OF A LANDING AREA





R10-3A-9 (L)
9"x15"

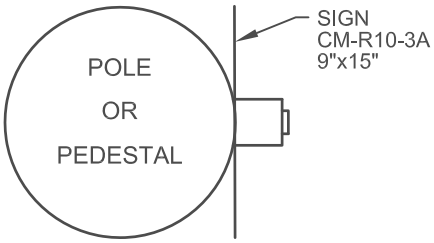
FOR PUSHBUTTON LOCATED AT THE SIDE OF A LANDING AREA





R10-3A-9 (R)
9"x15"

FOR PUSHBUTTON LOCATED AT THE BACK OF A LANDING AREA





CM-R10-3A-9
9"x15"
* Actual Street Name To Be Used

NOTE:

THE BOTTOM OF THE PUSHBUTTON SIGN SHALL BE MOUNTED JUST ABOVE THE TOP OF THE PUSHBUTTON.

Pedestrian Signal Heads Present

PUSHBUTTON & SIGN INSTALLATION DETAIL

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

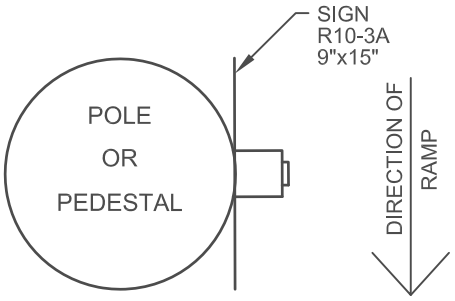
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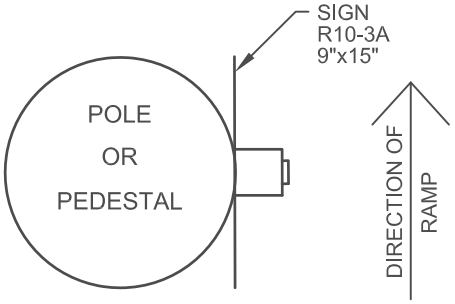
FOR PUSHBUTTON LOCATED AT THE SIDE OF A LANDING AREA





R10-4A-9 (L)
9"x15"

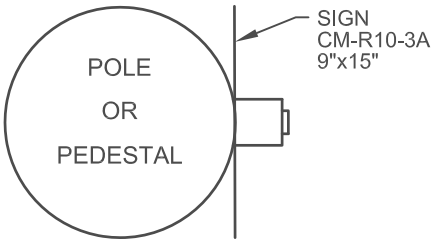
FOR PUSHBUTTON LOCATED AT THE SIDE OF A LANDING AREA





R10-4A-9 (R)
9"x15"

FOR PUSHBUTTON LOCATED AT THE BACK OF A LANDING AREA





CM-R10-4A-9
9"x15"
* Actual Street Name To Be Used

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

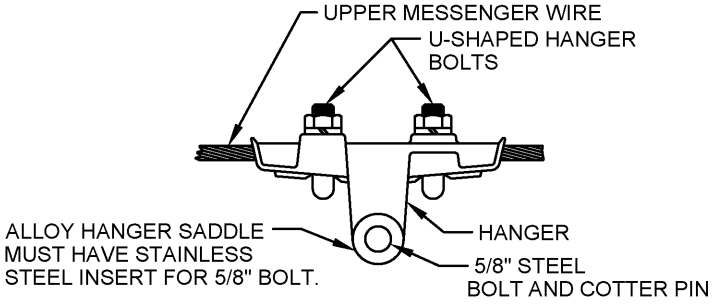
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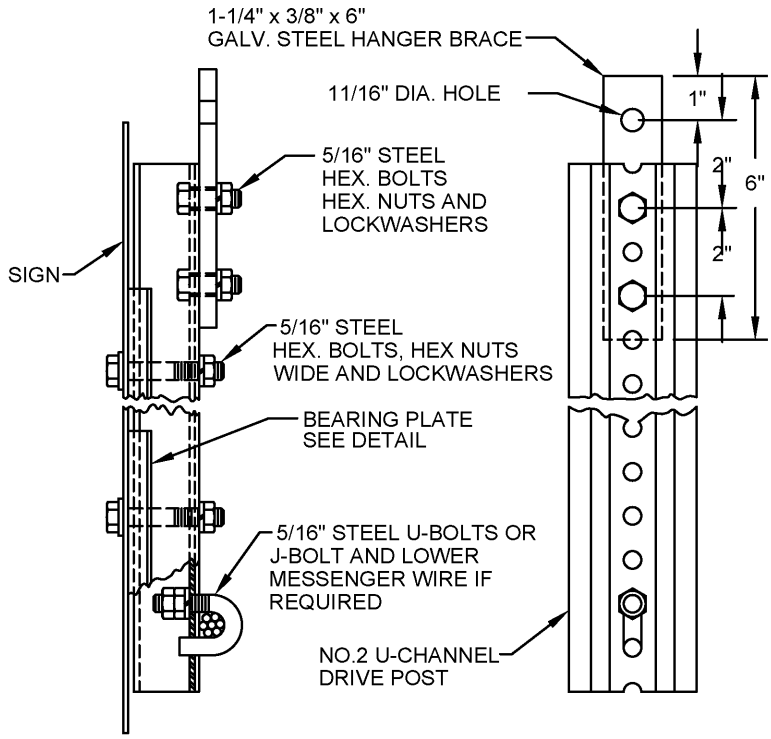
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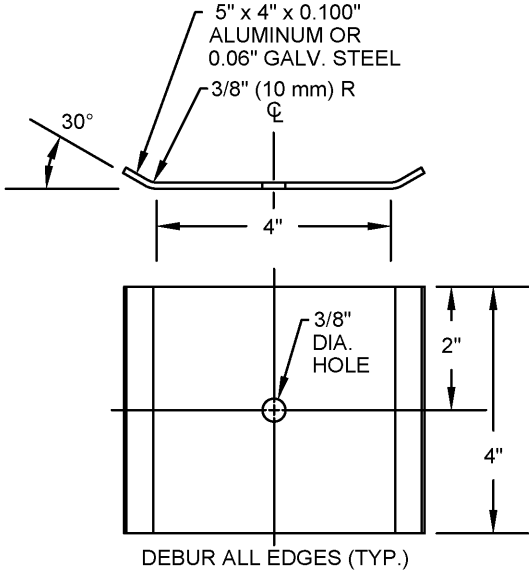
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SIGN WIRE CLAMP



SINGLE SIGN HANGER ASSEMBLY



BEARING PLATE

TYPE 1

SIGN HANGER ASSEMBLY SPAN WIRE

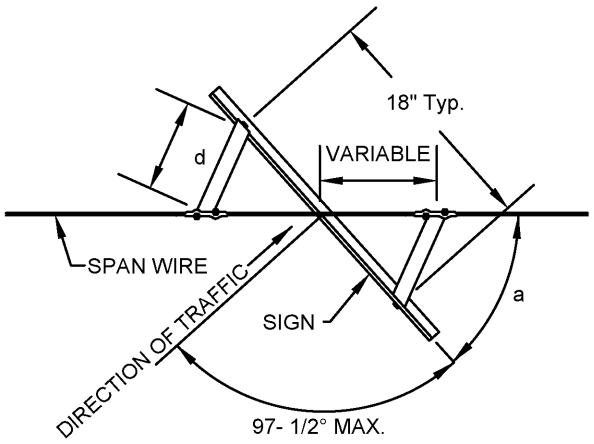
CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF DESIGN AND CONSTRUCTION

CITY ENGINEER

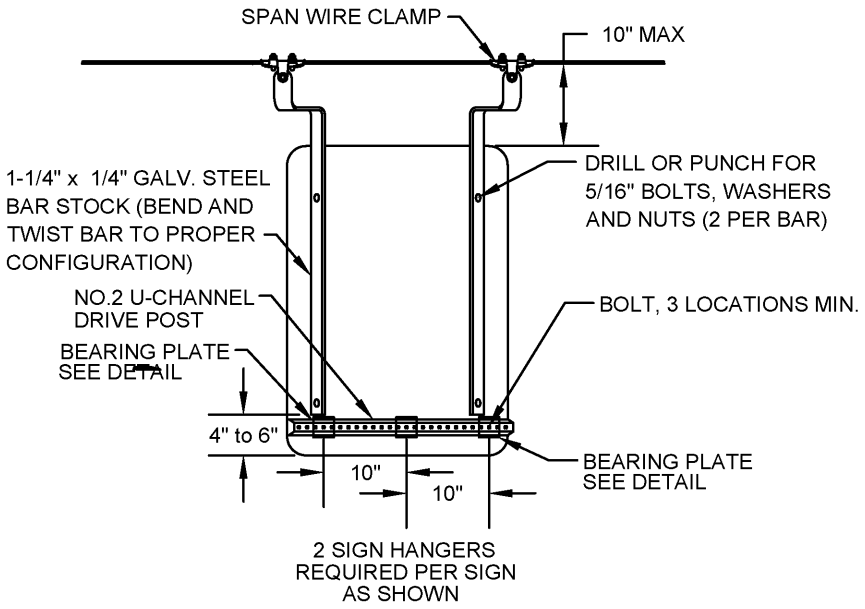
STD DWG
4250

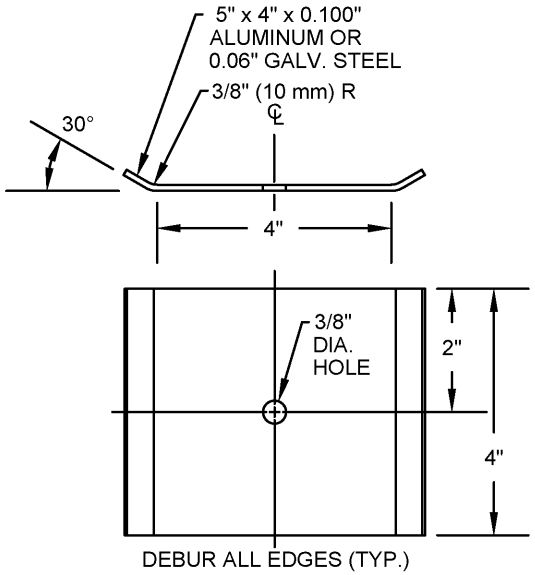
5/01/2014

SHT 1 OF 2



a	d (in)
0°	0
15°	2.4
30°	4.7
45°	6.9
60°	9





BEARING PLATE

TYPE 2

SIGN HANGER ASSEMBLY SPAN WIRE

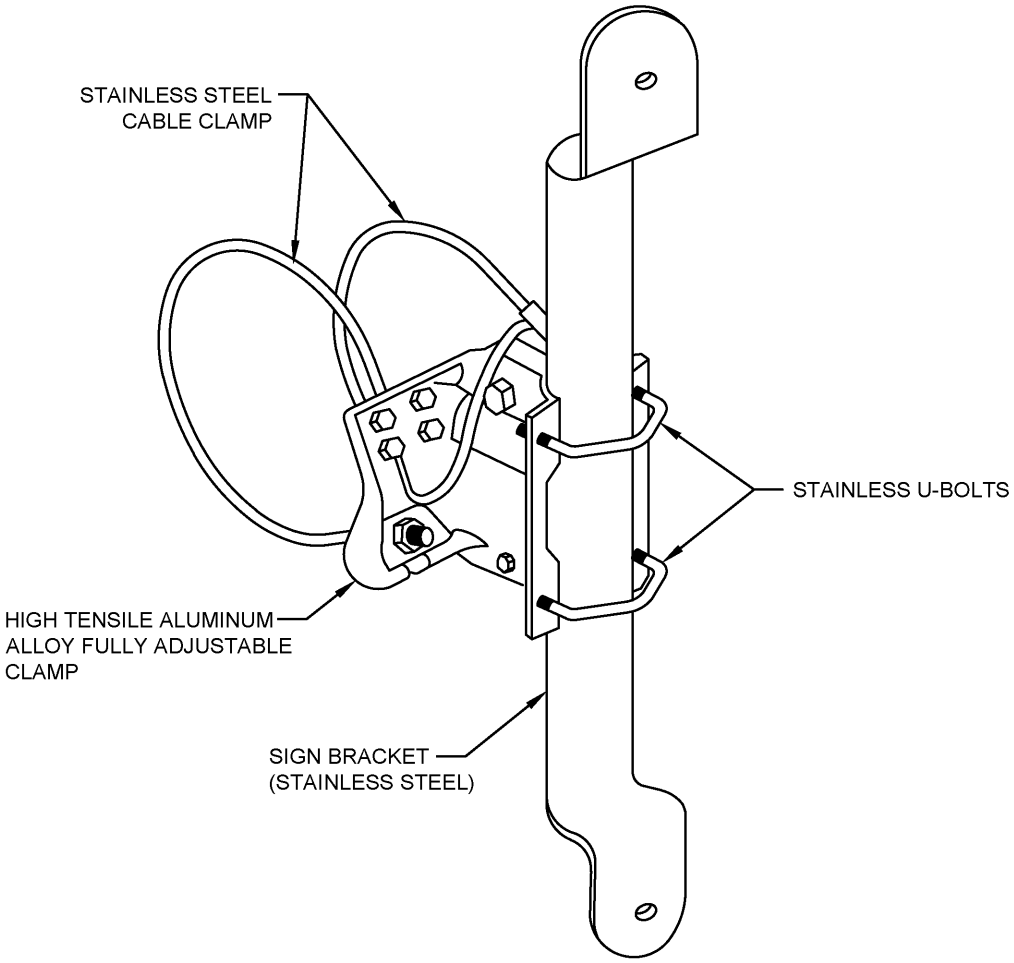
CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF DESIGN AND CONSTRUCTION

CITY ENGINEER

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.

SIGN HANGER ASSEMBLY MAST ARM RIGID MOUNTED

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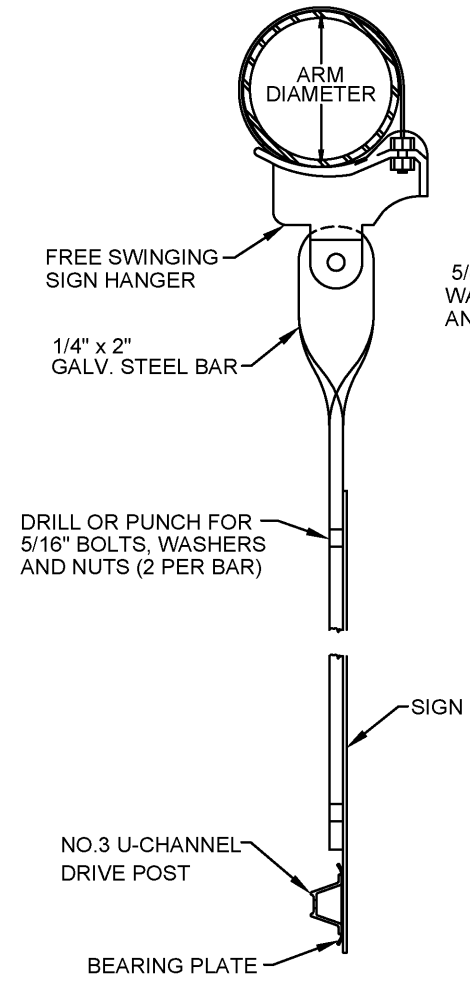
Hassa Zahra

CITY ENGINEER

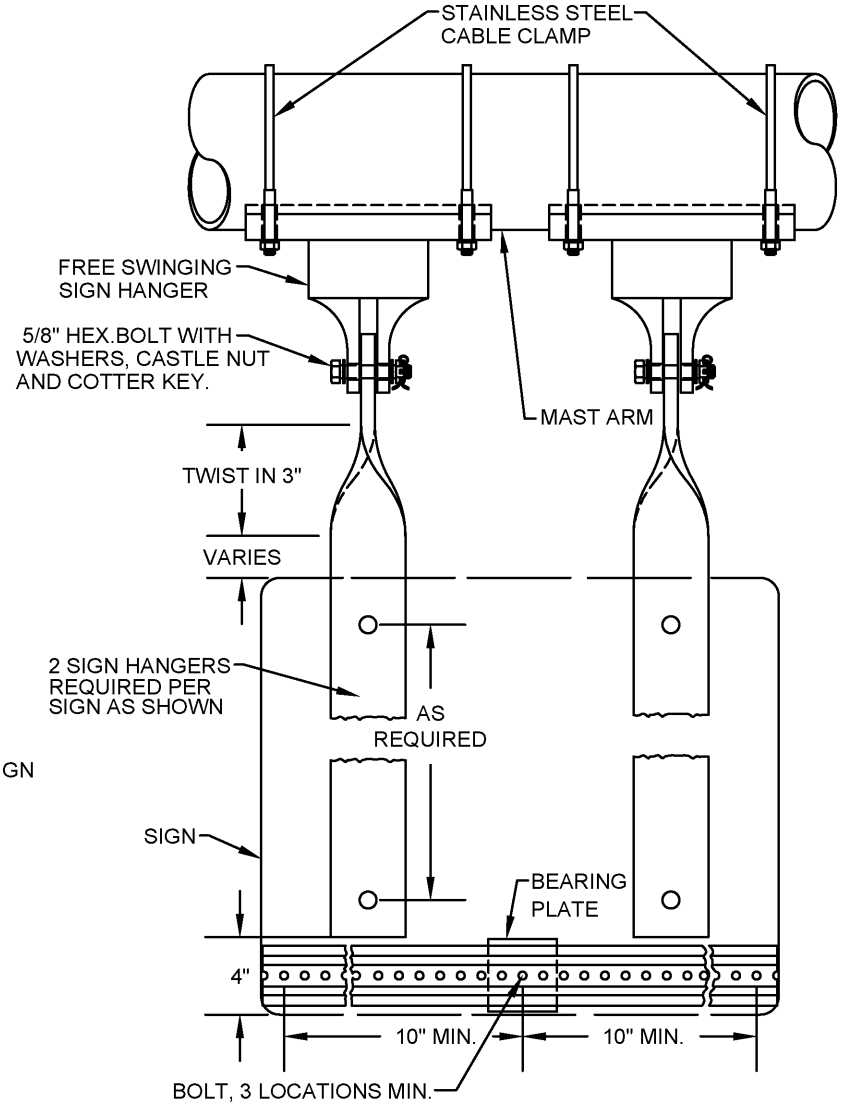
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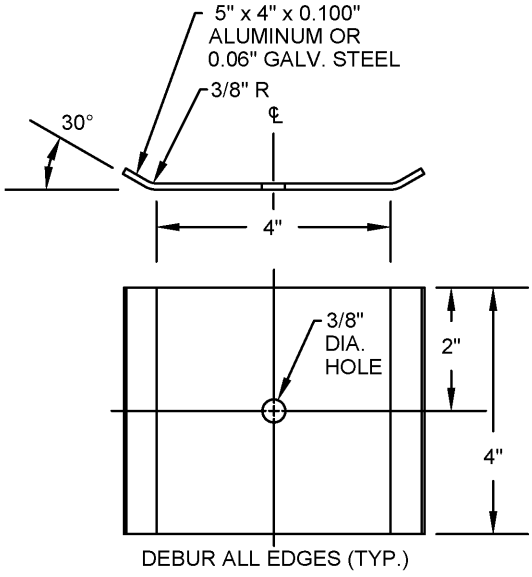
SHT 1 OF 1



SIDE VIEW



REAR VIEW



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

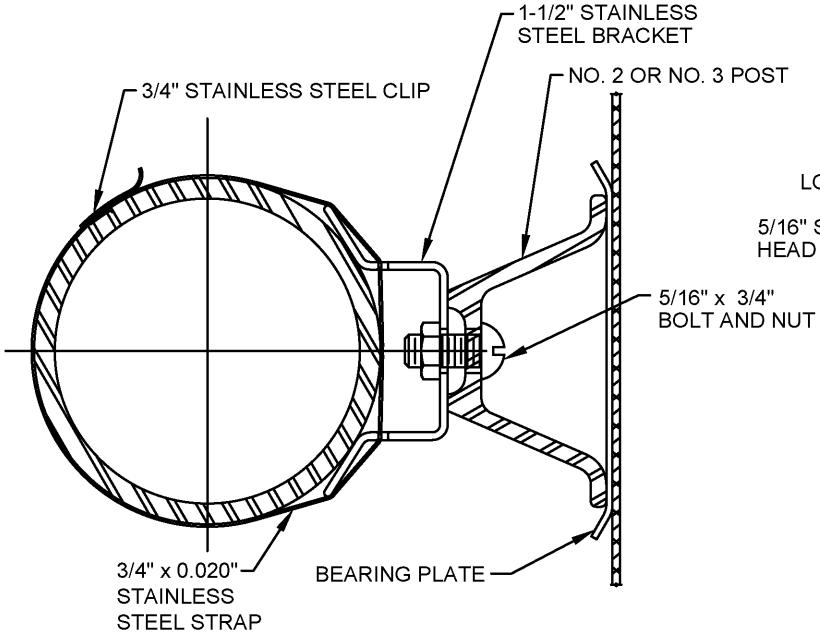
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CITY ENGINEER

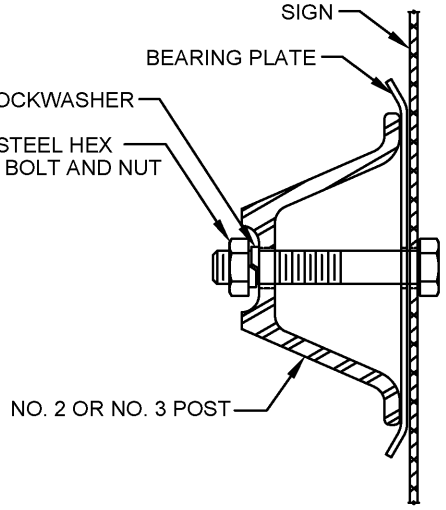
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5/01/2014

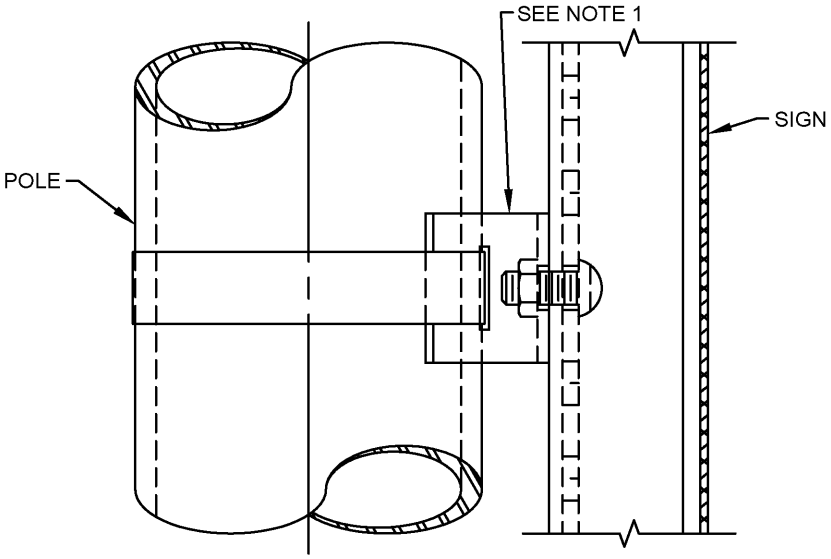
SHT 1 OF 1

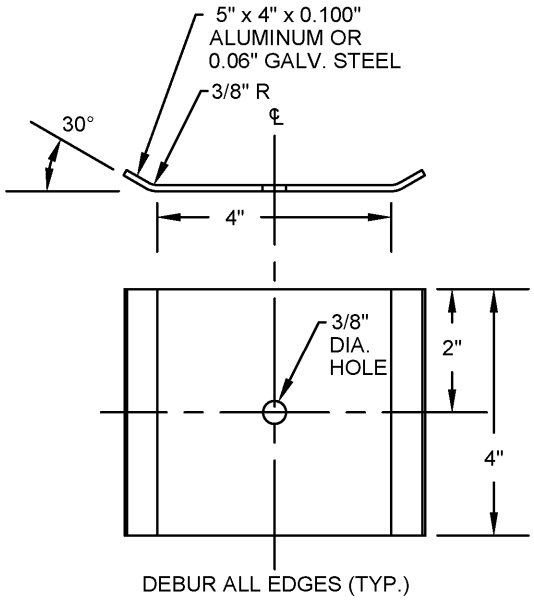


U-CHANNEL ATTACHMENT TO MAST ARM



SIGN TO U-CHANNEL ATTACHMENT





BEARING PLATE

NOTES:

1. USE A MINIMUM OF 2 BRACKETS (LOCATED 6" FROM TOP AND BOTTOM OF SIGN) PER INSTALLATION WITH MAXIMUM SPACING OF 3'.
2. ALL MOUNTING HARDWARE SHALL BE COATED TO MATCH SUPPORT STRUCTURE.
3. STAINLESS STEEL BANDING SHALL NOT BE PAINTED.

SIGN SUPPORT ASSEMBLY POLE MOUNTED

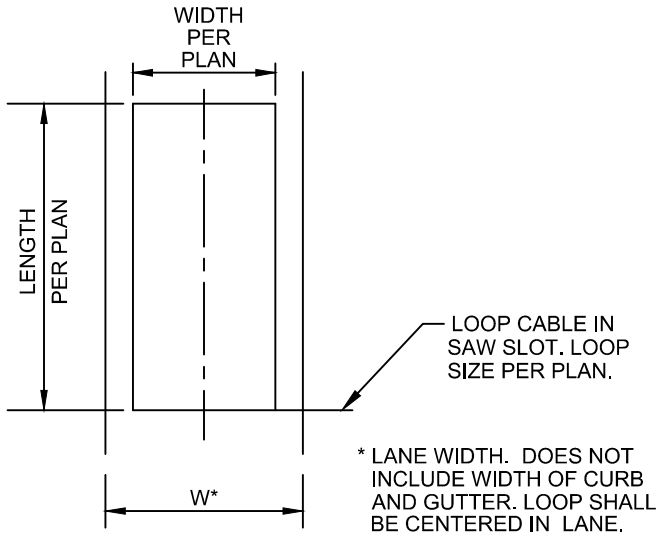
CITY OF COLUMBUS, OHIO
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CITY ENGINEER

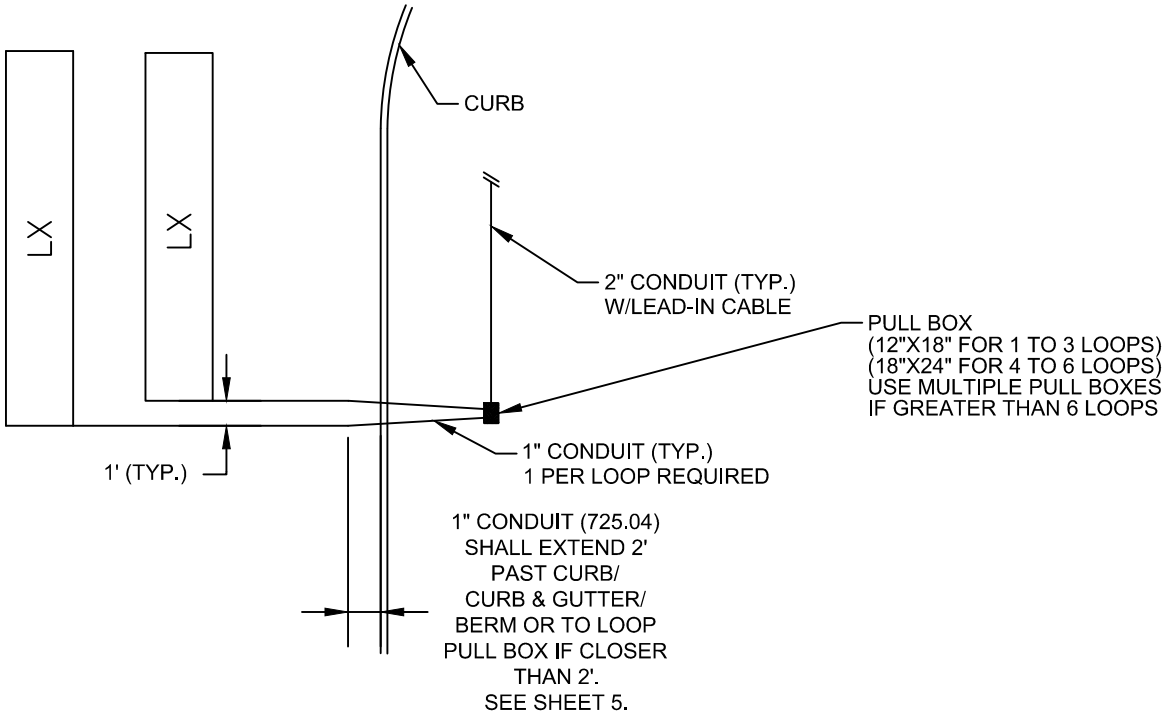
STD DWG
4253

5/01/2014

SHT 1 OF 1



VEHICULAR DETECTOR



MULTIPLE LOOP DETECTOR
INSTALLATION DETAIL

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 LOOPS SHALL EACH BE ON A SEPARATE DETECTOR UNIT CHANNEL.

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

VEHICULAR DETECTOR STANDARDS

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

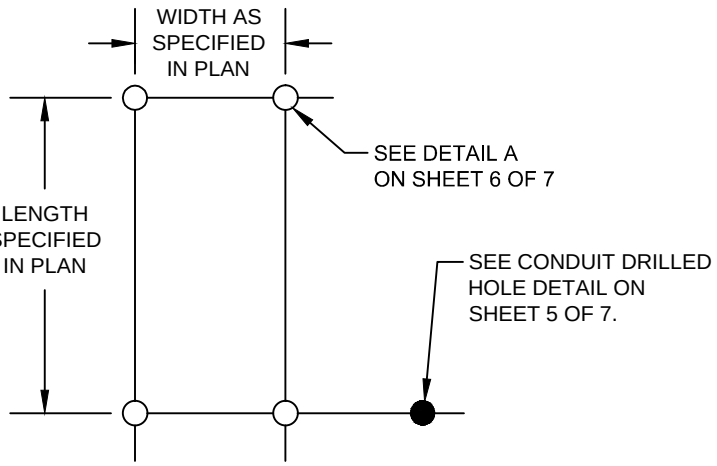
STD DWG
4300

8/10/2017

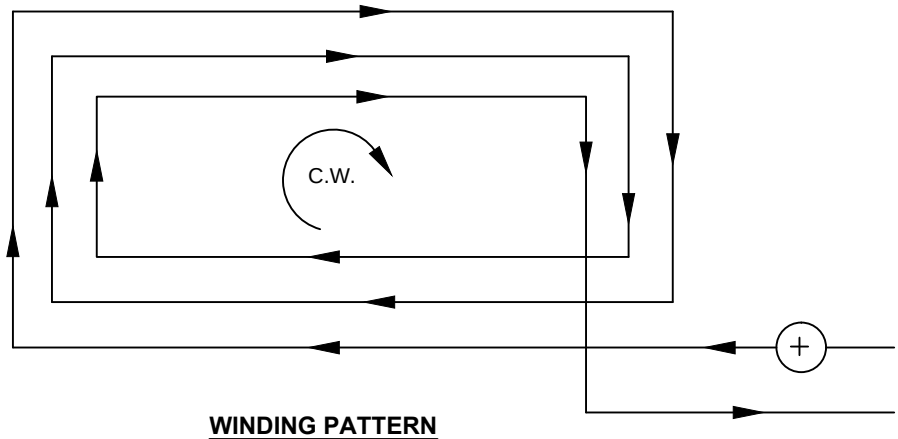
CITY ENGINEER

SHT 1 OF 7

RECTANGULAR DETECTOR LOOP DETAILS



SAW CUT LAYOUT



WINDING PATTERN

SEE TABLE FOR NUMBER OF TURNS

RECTANGULAR LOOP CONSTRUCTION	
LOOP TYPE	NUMBER OF TURNS
PRESENCE DETECTION LOOPS	3
ADVANCED DETECTION LOOPS (6'x6')	4

VEHICULAR DETECTOR STANDARDS

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

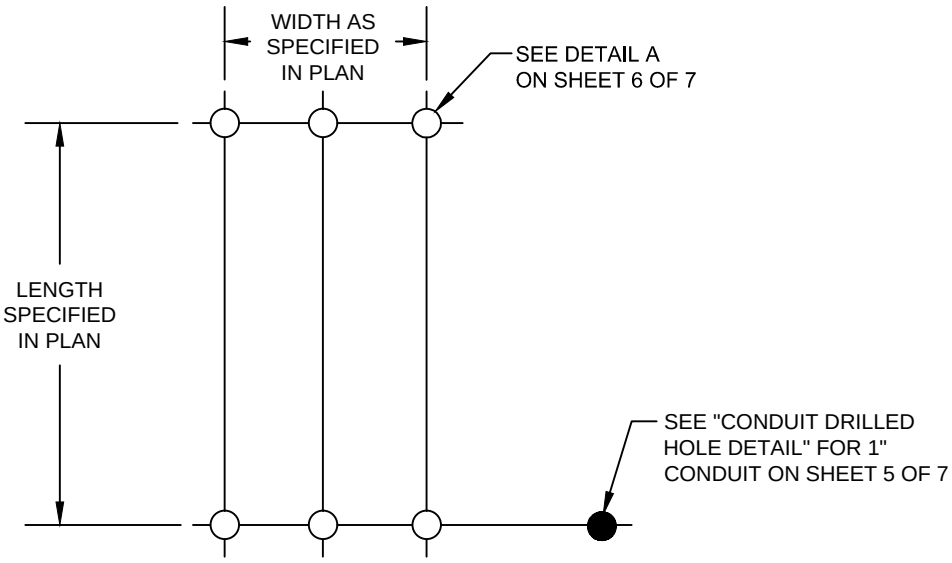
CITY ENGINEER

STD DWG
4300

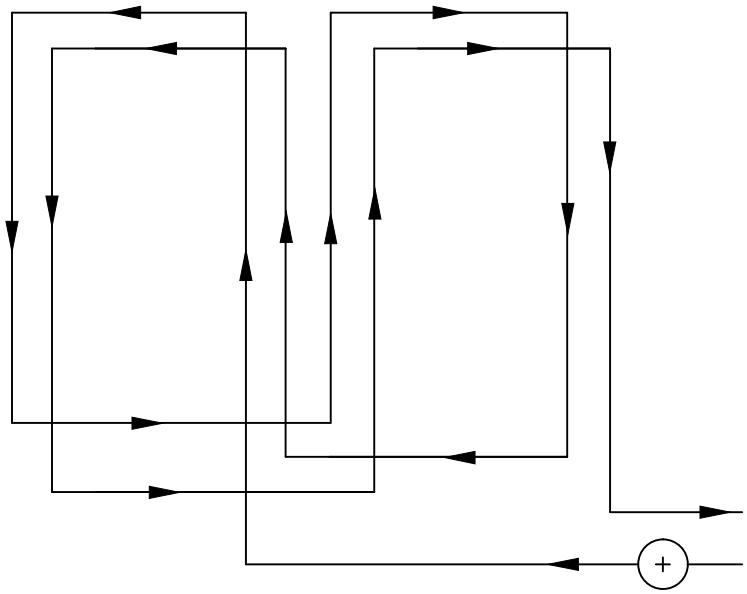
8/10/2017

SHT 2 OF 7

QUADRUPOLE LOOP DETAILS



SAW CUT LAYOUT



WINDING PATTERN

NUMBER OF TURNS IS 2-4-2

VEHICULAR DETECTOR STANDARDS

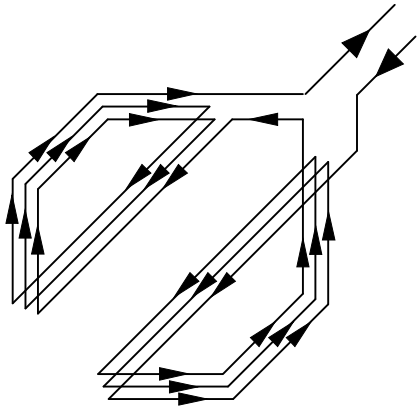
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CITY ENGINEER

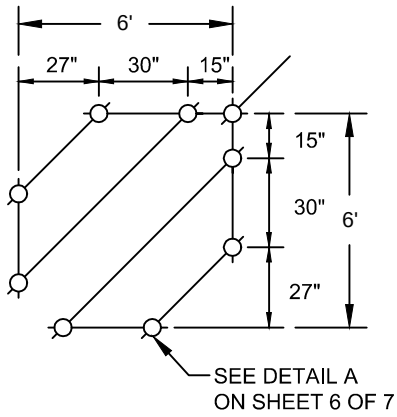
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8/10/2017

SHT 3 OF 7



WINDING DETAIL



SAWCUT DETAIL

BICYCLE ONLY LOOP DETECTOR INSTALLATION DETAIL

BICYCLE LOOP CONSTRUCTION	
LOOP TYPE	NUMBER OF TURNS
PRESENCE DETECTION LOOPS	3-3-3-3

VEHICULAR DETECTOR STANDARDS

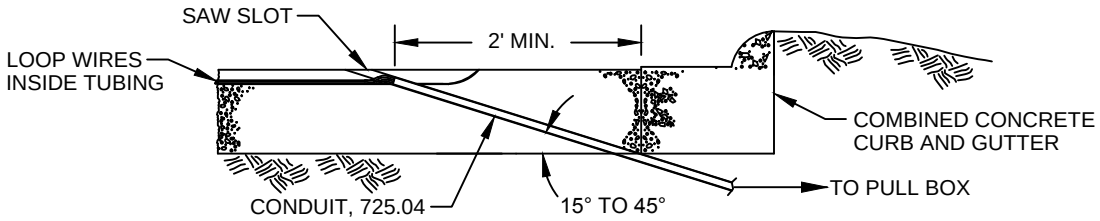
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DEPARTMENT OF PUBLIC SERVICE
DIVISION OF DESIGN AND CONSTRUCTION

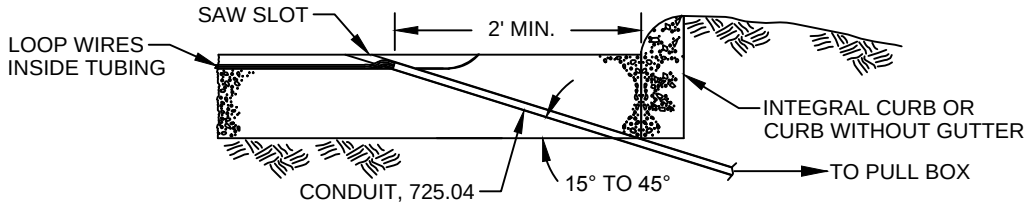
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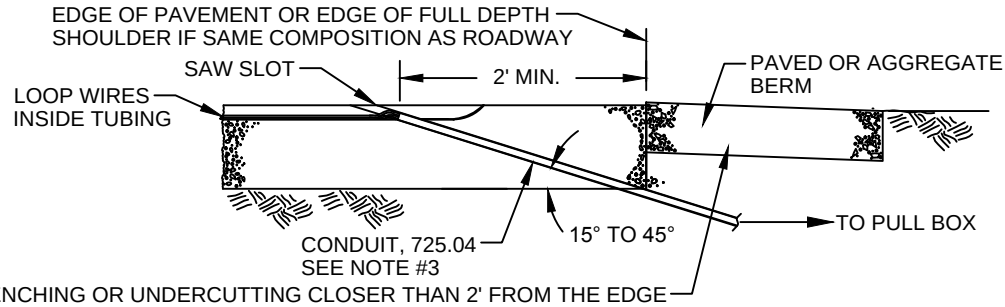
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CITY ENGINEER

SHT 4 OF 7



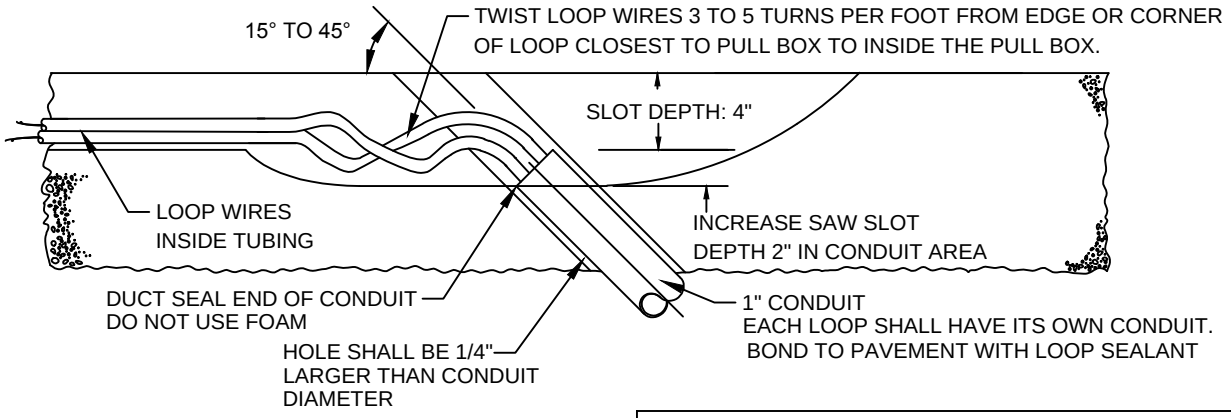




NOTES:

1. THE DRILLED HOLE SHALL BE LOCATED AS SHOWN ABOVE AND WITHIN THE FULL DEPTH PAVEMENT. IT SHALL NOT BE DRILLED OR CUT THROUGH THE PAVED BERM, CURB OR CURB AND GUTTER SECTION.
2. IN AREAS OF POOR PAVEMENT CONDITION, THE SAW SLOT DEPTH SHALL BE INCREASED TO INSURE ADEQUATE WIRE EMBEDMENT. ALL FIELD ADJUSTMENTS SHALL BE SUBJECT TO THE APPROVAL OF THE ENGINEER.
3. IF AN EXISTING PAVED BERM IS 4.5" THICK OR MORE, THE LOOP WIRE MAY BE INSTALLED IN A SAW SLOT CUT ACROSS THE BERM. WHEN PAVED BERM ARE LESS THAN 4.5" THICK, THE CONDUIT RACEWAY SHALL BE INSTALLED AS SHOWN.

TYPICAL DRILLED HOLE LOCATIONS FOR 1" CONDUIT



CONDUIT DRILLED HOLE DETAIL FOR 1" CONDUIT

VEHICULAR DETECTOR STANDARDS

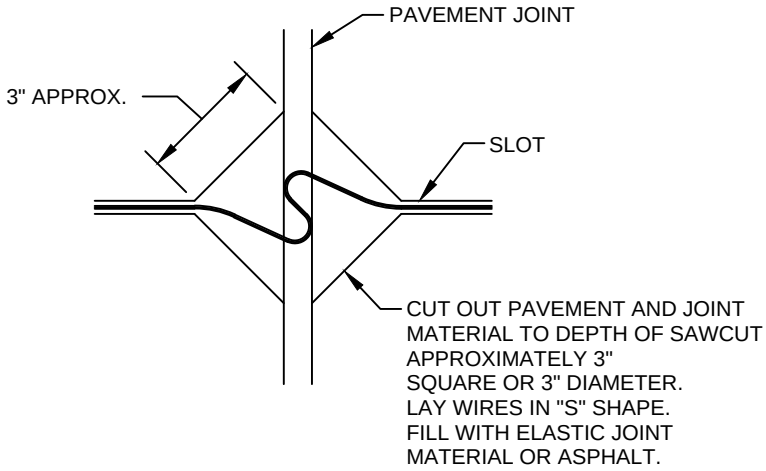
CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF DESIGN AND CONSTRUCTION

STD DWG
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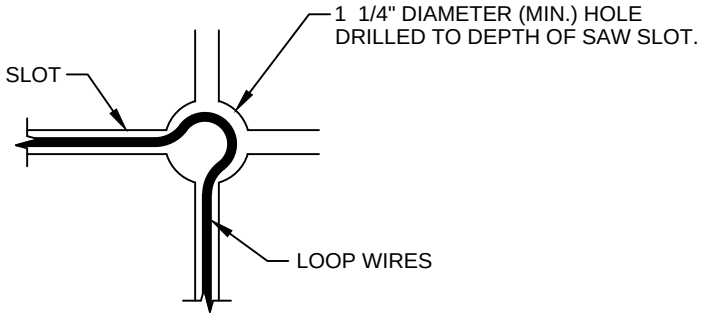
8/10/2017

CITY ENGINEER

SHT 5 OF 7



JOINT CROSSING DETAIL
IN PORTLAND CEMENT CONCRETE
PAVEMENTS



DETAIL A

VEHICULAR DETECTOR STANDARDS

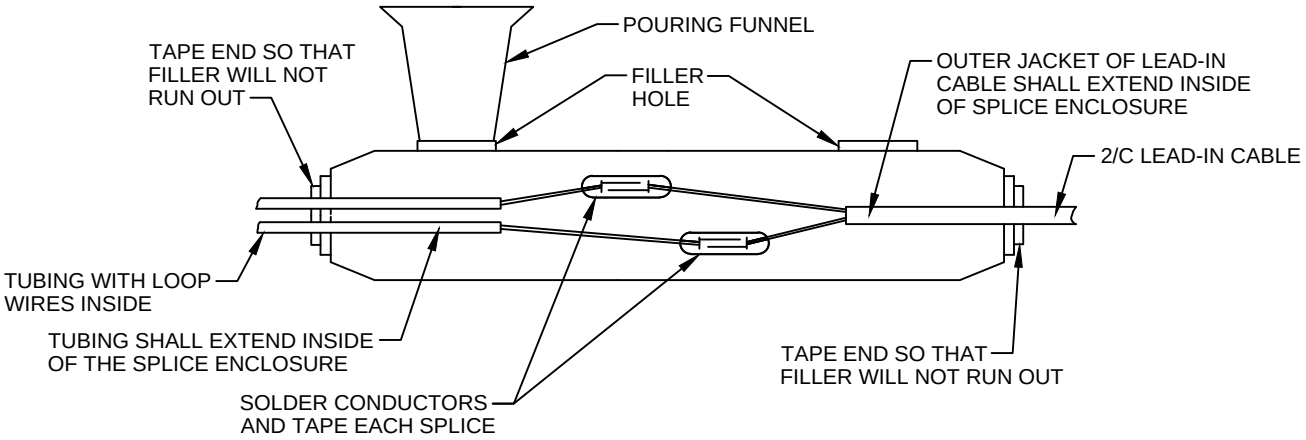
CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF DESIGN AND CONSTRUCTION

CITY ENGINEER

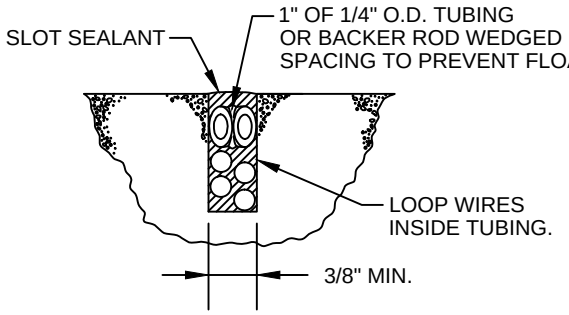
STD DWG
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8/10/2017

SHT 6 OF 7



SPLICE ENCLOSURE DETAIL



SLOT DETAIL

NOTES:

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.

VEHICULAR DETECTOR STANDARDS

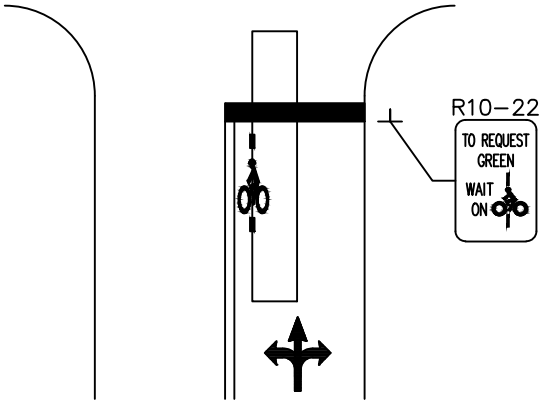
CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF DESIGN AND CONSTRUCTION

CITY ENGINEER

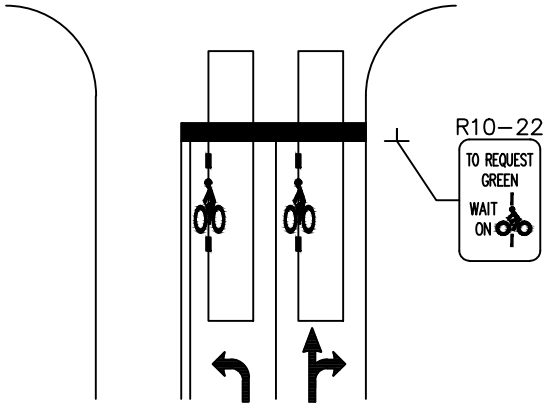
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8/10/2017

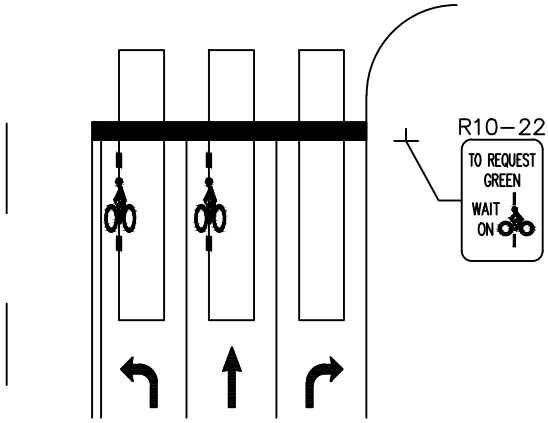
SHT 7 OF 7



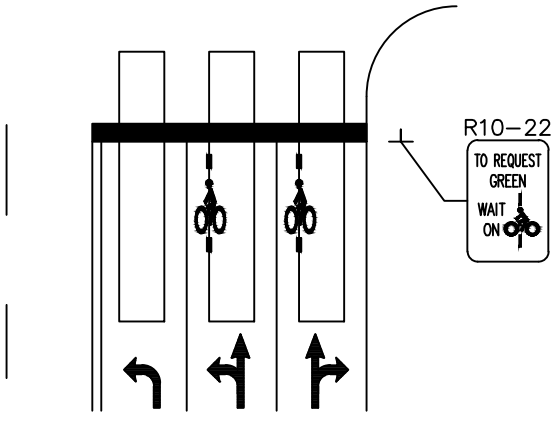
TWO-WAY CONDITION A



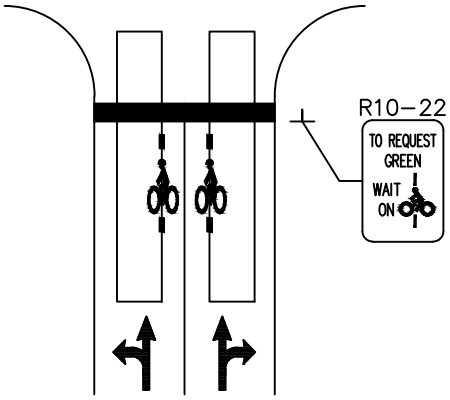
TWO-WAY CONDITION B



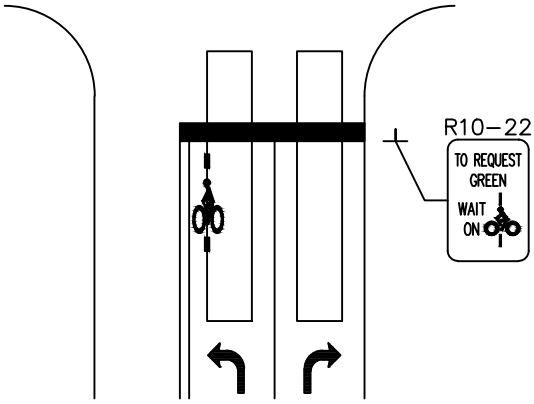
TWO-WAY CONDITION C



TWO-WAY CONDITION D



ONE-WAY CONDITION A



TWO-WAY CONDITION E

NOTES:

BICYCLE DETECTOR MARKINGS SHALL:
- BE USED WHEN A BICYCLE NEEDS TO ACTUATE A TRAFFIC SIGNAL PHASE IN ORDER TO PROCEED THROUGH AN INTERSECTION.
- NOT BE USED FOR RIGHT TURN ONLY LANES, WHEN RIGHT TURN ON RED IS PERMITTED.
- NOT BE USED FOR SECOND VEHICLE DETECTION.
- BE ACCOMPANIED BY A R10-22 BICYCLE DETECTOR SIGN.

PLACEMENT GUIDELINES:
- LOCATE NEAR THE STOP LINE.
- LOCATE TO AVOID CONFLICTS WITH OTHER MARKINGS.
- LOCATE IN THE RIGHT-MOST THROUGH LANE AND RIGHT-MOST LEFT TURN LANE.
- LOCATE ON THE LEFT SIDE OF AN INDUCTION LOOP, EXCEPT FOR THE LEFT LANE OF ONE-WAY STREETS.
- LOCATE ON THE RIGHT SIDE OF AN INDUCTIVE LOOP FOR THE LEFT LANE OF ONE-WAY STREETS.

INDUCTIVE LOOP DETECTOR APPLICATION

BIKE DETECTOR MARKINGS

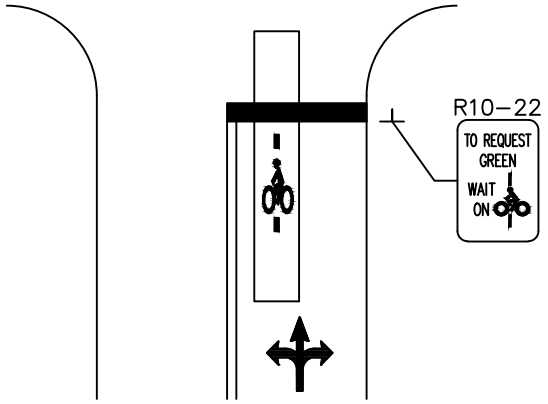
CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF DESIGN AND CONSTRUCTION

CITY ENGINEER

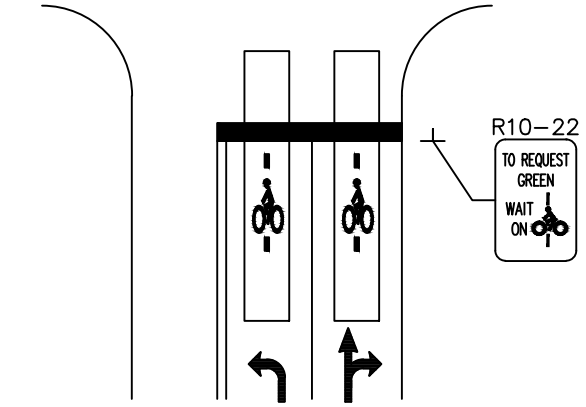
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8/10/2017

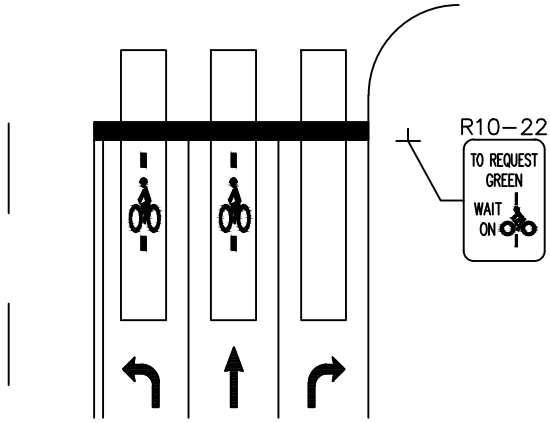
SHT 1 OF 2



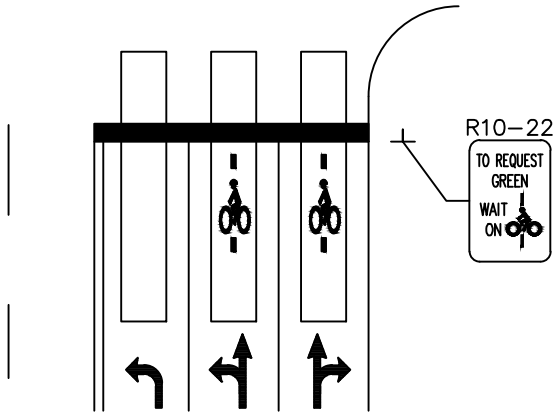
TWO-WAY CONDITION A



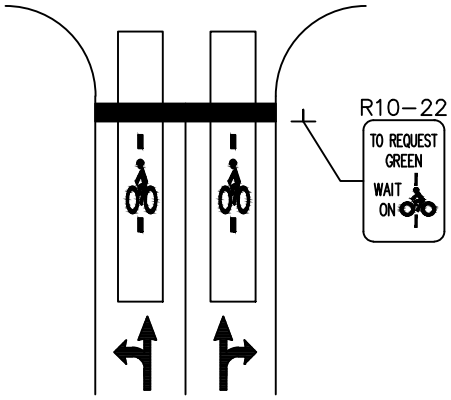
TWO-WAY CONDITION B



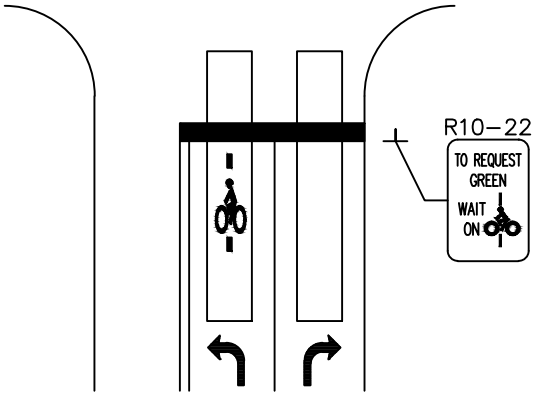
TWO-WAY CONDITION C



TWO-WAY CONDITION D



ONE-WAY CONDITION A



TWO-WAY CONDITION E

NOTES:

BICYCLE DETECTOR MARKINGS SHALL:
- BE USED WHEN A BICYCLE NEEDS TO ACTUATE A TRAFFIC SIGNAL PHASE IN ORDER TO PROCEED THROUGH AN INTERSECTION.
- NOT BE USED FOR RIGHT TURN ONLY LANES, WHEN RIGHT TURN ON RED IS PERMITTED.
- NOT BE USED FOR SECOND VEHICLE DETECTION.
- BE ACCOMPANIED BY A R10-22 BICYCLE DETECTOR SIGN.

PLACEMENT GUIDELINES:
- LOCATE NEAR THE STOP LINE.
- LOCATE TO AVOID CONFLICTS WITH OTHER MARKINGS.
- LOCATE IN THE RIGHT-MOST THROUGH LANE AND RIGHT-MOST LEFT TURN LANE.
- LOCATE IN THE HORIZONTAL CENTER OF A RADAR OR VIDEO DETECTION ZONE.

RADAR OR VIDEO DETECTION APPLICATION

BIKE DETECTOR MARKINGS

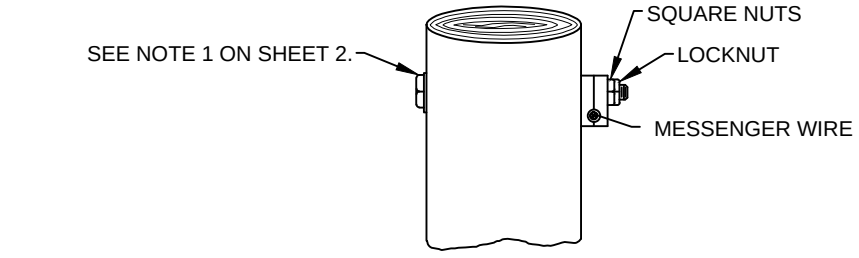
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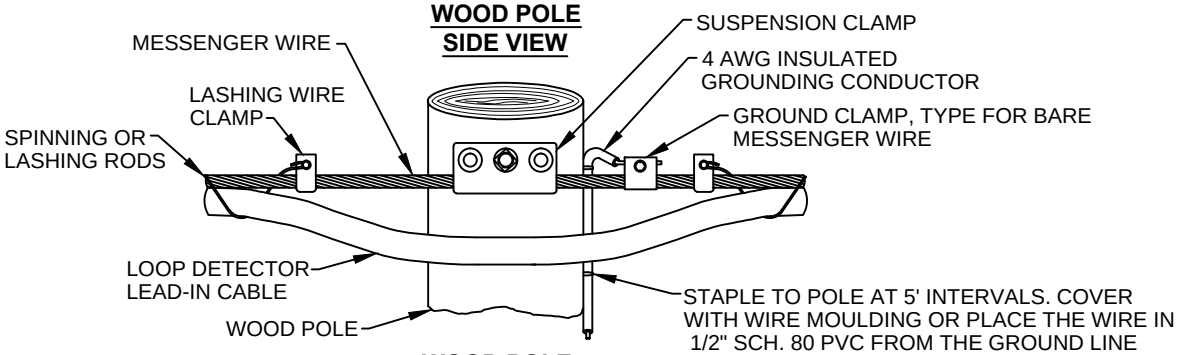
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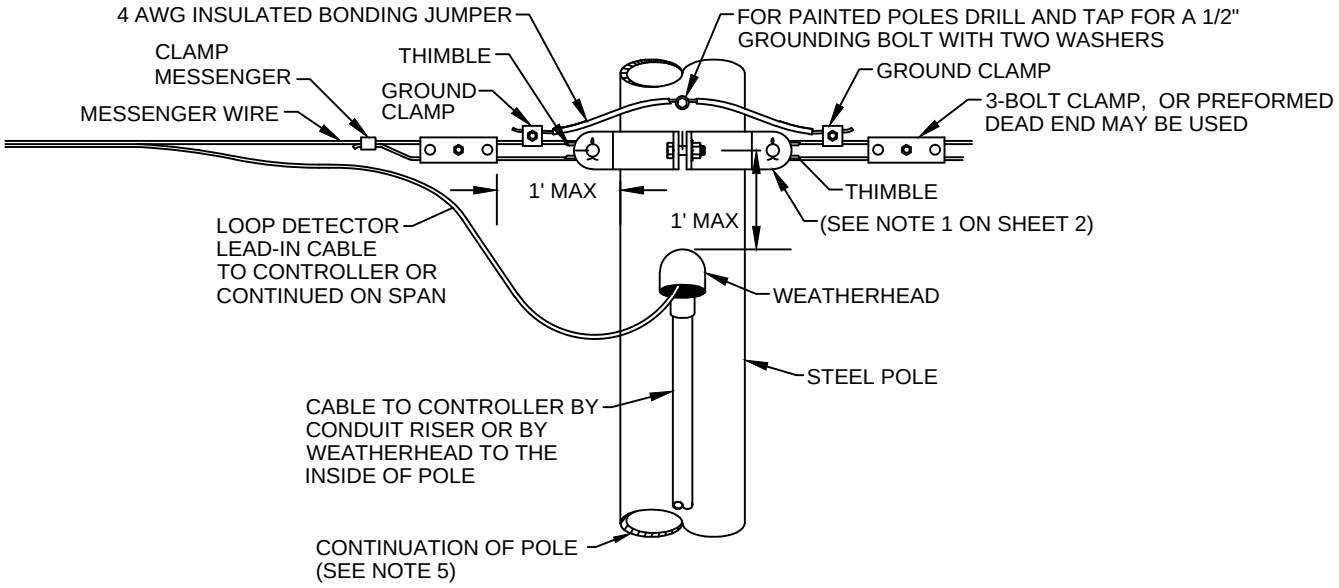
SHT 2 OF 2



WOOD POLE
SIDE VIEW



WOOD POLE
FRONT VIEW



LOOP DETECTOR
LEAD-IN ATTACHMENT
DETAILS

MESSENGER WIRE DETAILS I

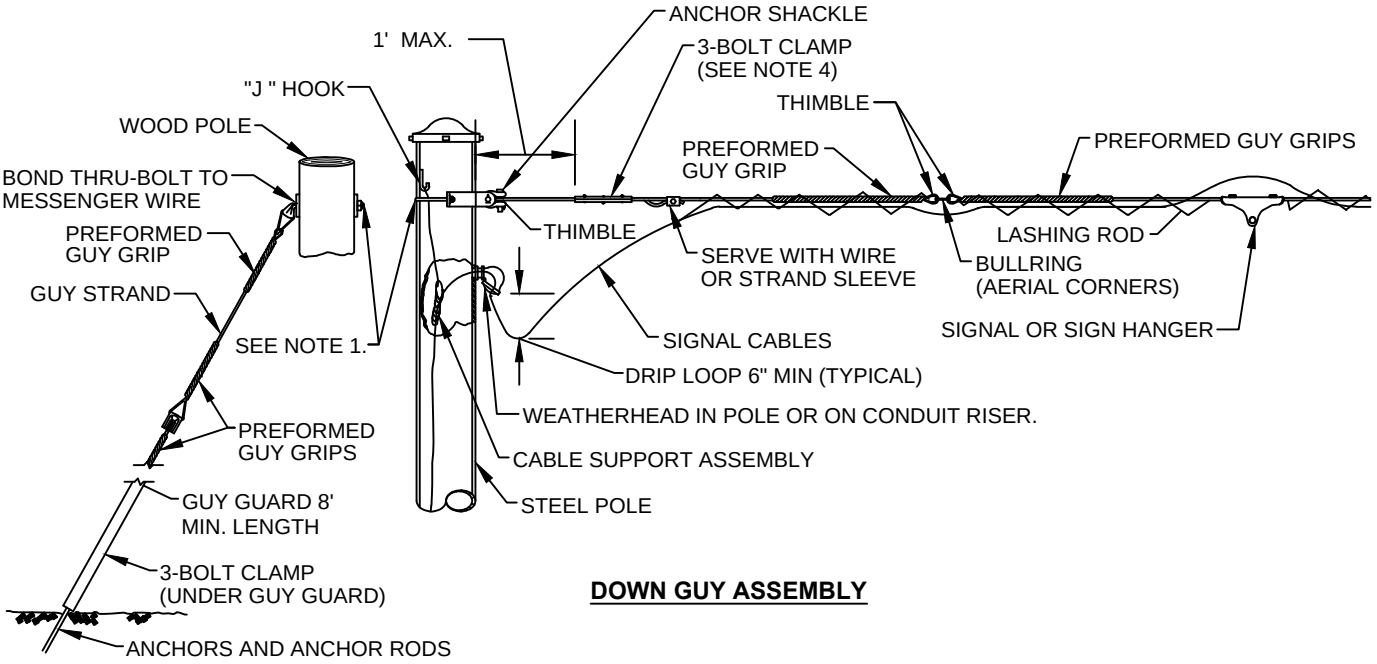
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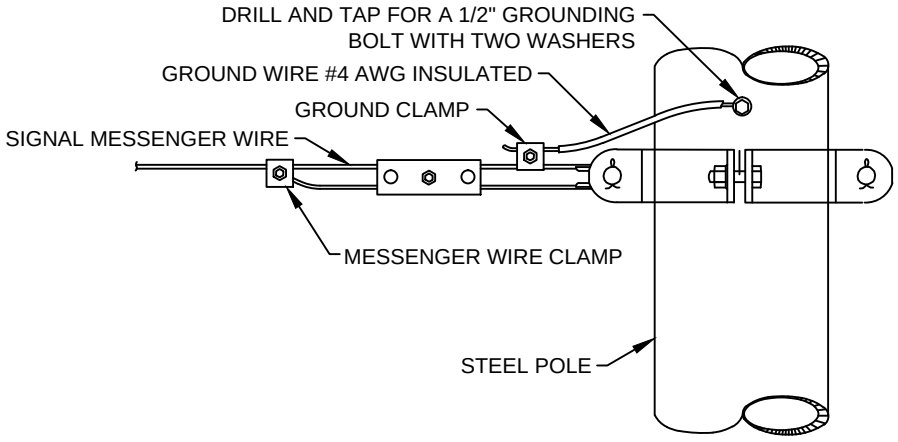
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SHT 1 OF 2



DOWN GUY ASSEMBLY



TRAFFIC SIGNAL MESSENGER WIRE GROUNDING DETAIL

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.

MESSENGER WIRE DETAILS I

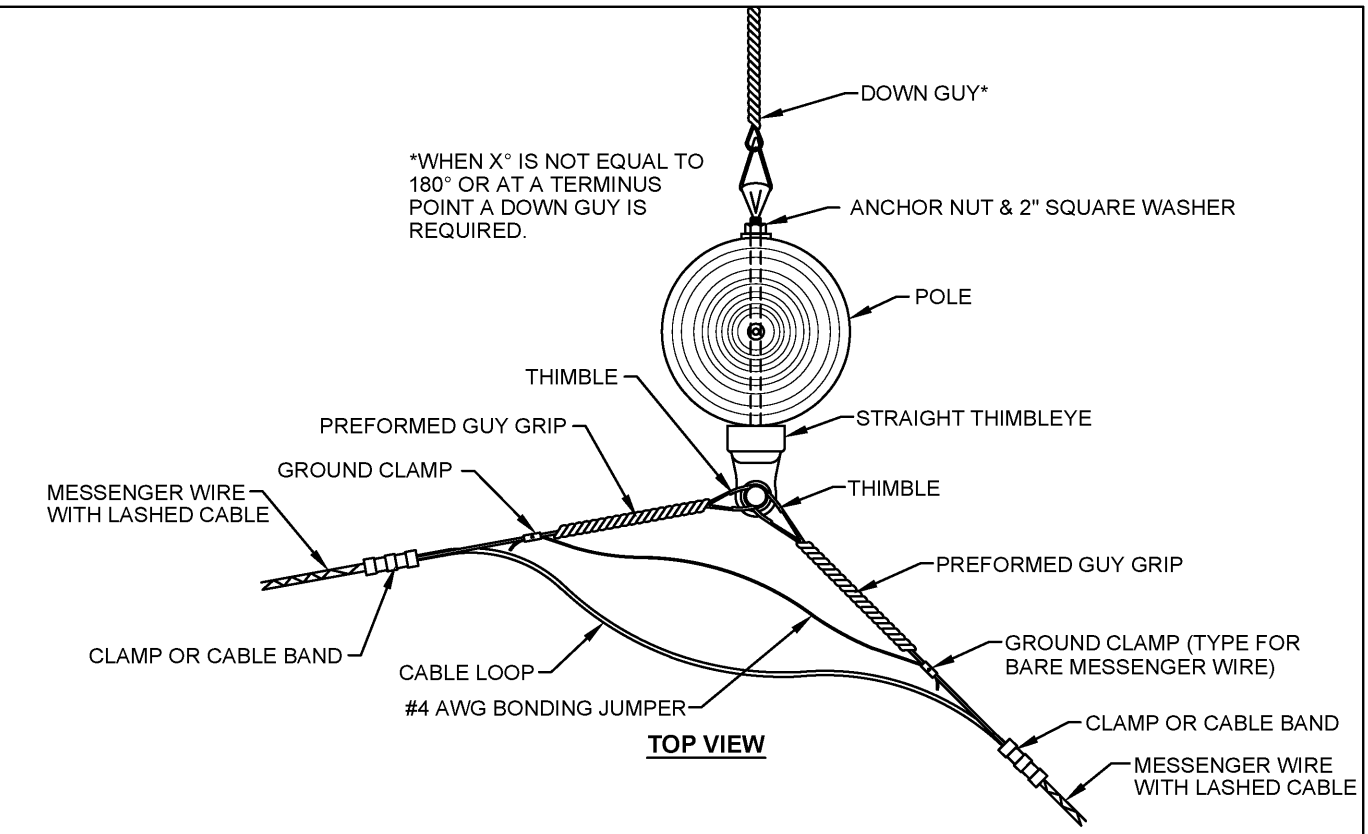
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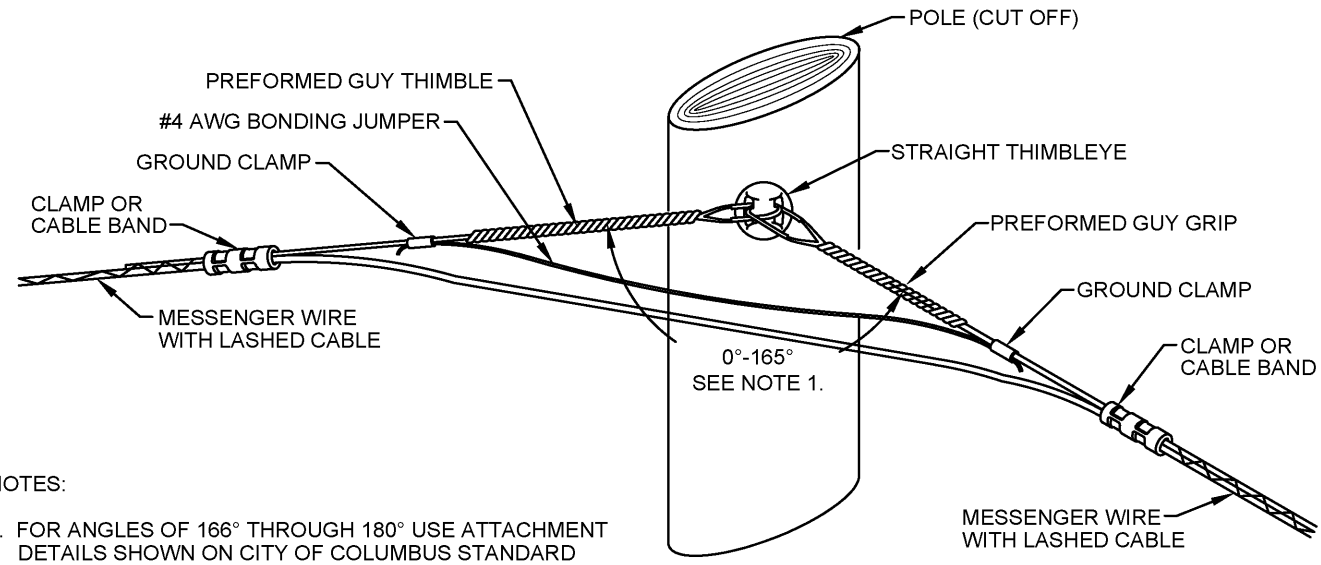
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TOP VIEW



FRONT VIEW

NOTES:

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 THIMBLEYE 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.

MESSENGER WIRE DETAILS II

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Hassan Zahra

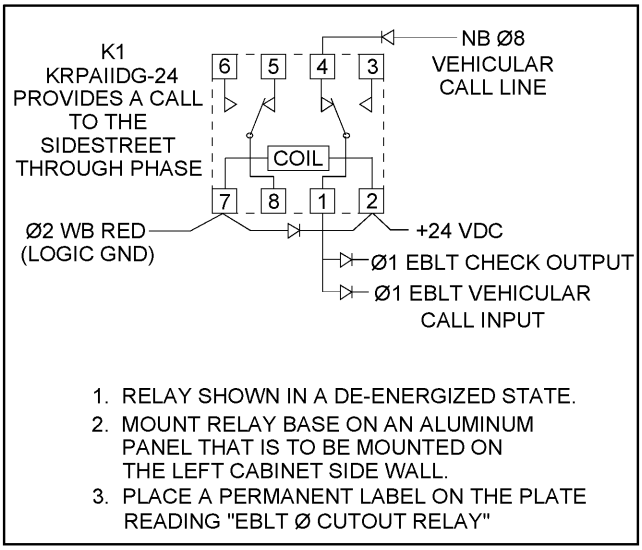
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5/01/2014

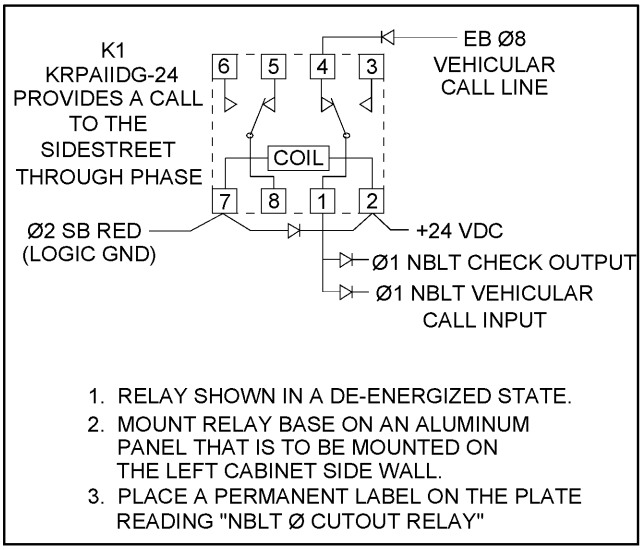
SHT 1 OF 1

MAINLINE PROTECTED ONLY LEFT TURN PHASE, LEADING LEFT TURN ONLY CIRCUIT



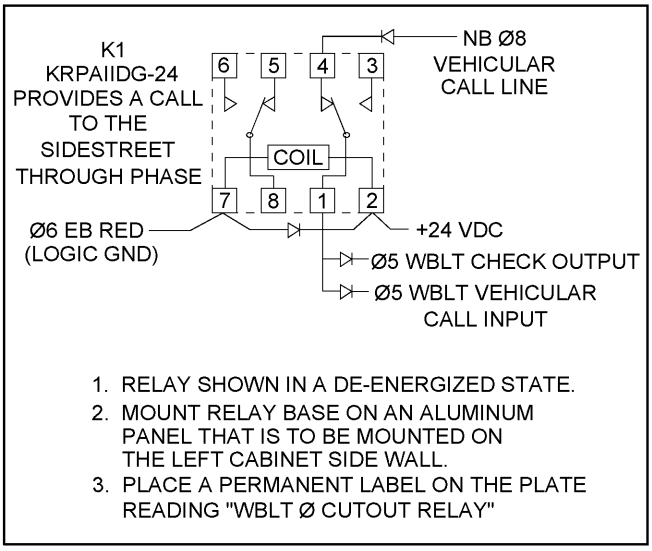
1. RELAY SHOWN IN A DE-ENERGIZED STATE.
2. MOUNT RELAY BASE ON AN ALUMINUM PANEL THAT IS TO BE MOUNTED ON THE LEFT CABINET SIDE WALL.
3. PLACE A PERMANENT LABEL ON THE PLATE READING "EBLT Ø CUTOUT RELAY"

EBLT PROTECTED ONLY PHASE



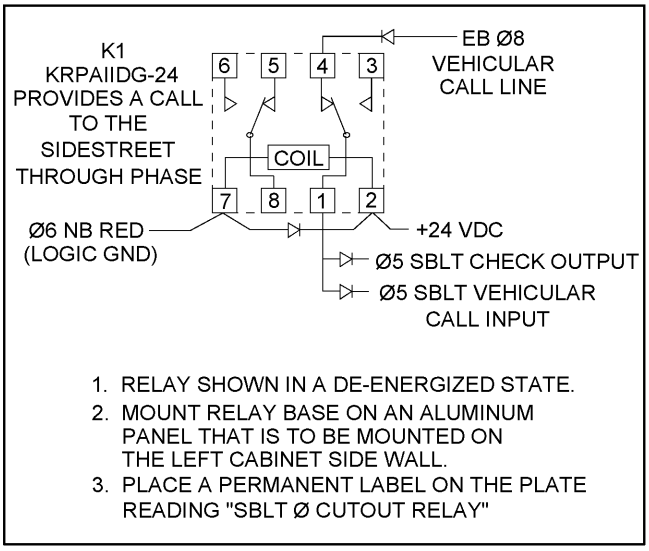
1. RELAY SHOWN IN A DE-ENERGIZED STATE.
2. MOUNT RELAY BASE ON AN ALUMINUM PANEL THAT IS TO BE MOUNTED ON THE LEFT CABINET SIDE WALL.
3. PLACE A PERMANENT LABEL ON THE PLATE READING "NBLT Ø CUTOUT RELAY"

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 "SBLT Ø CUTOUT RELAY"

SBLT PROTECTED ONLY PHASE

LEFT TURN TRAP PREVENTION CUT-OUT RELAY

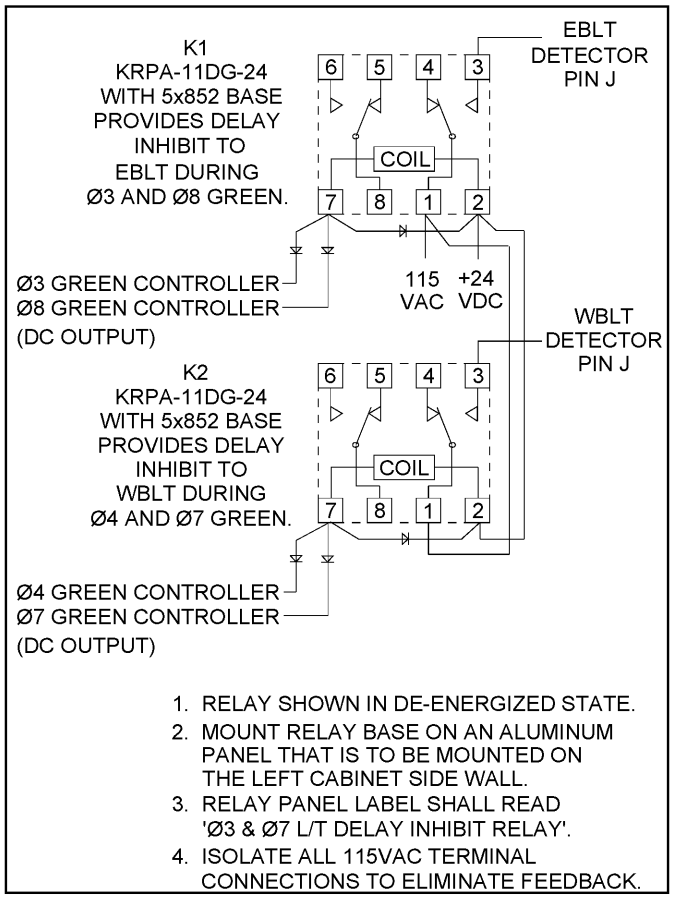
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4332

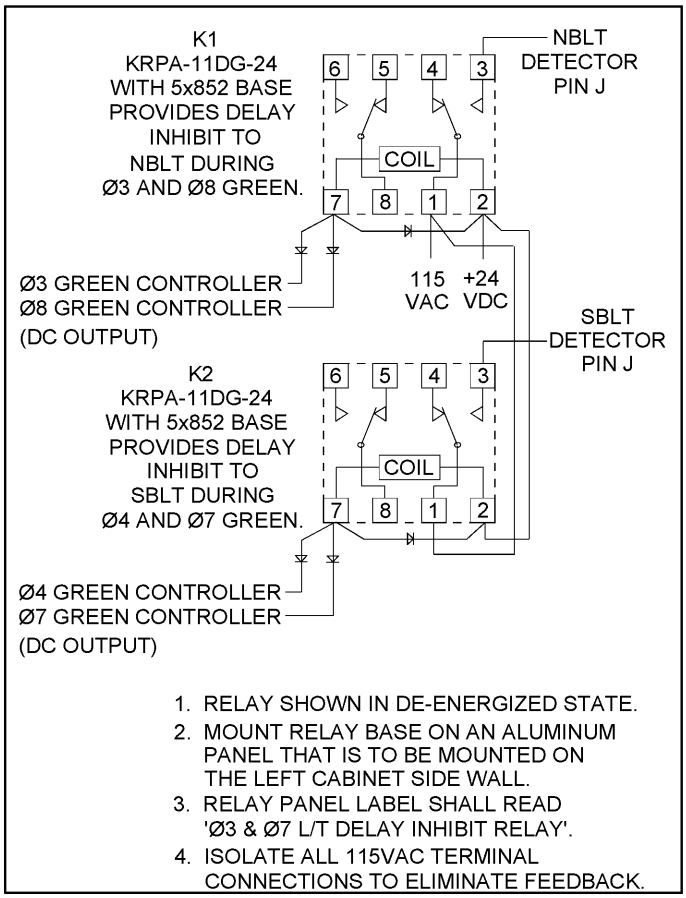
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1. RELAY SHOWN IN DE-ENERGIZED STATE.
2. MOUNT RELAY BASE ON AN ALUMINUM PANEL THAT IS TO BE MOUNTED ON THE LEFT CABINET SIDE WALL.
3. RELAY PANEL LABEL SHALL READ 'Ø3 & Ø7 L/T DELAY INHIBIT RELAY'.
4. ISOLATE ALL 115VAC TERMINAL CONNECTIONS TO ELIMINATE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

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



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 N/S SIDE STREETS

DELAY OVERRIDE RELAY LOGIC FOR SHELF MOUNTED DETECTOR UNITS

INHIBIT DELAY RELAY

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