

TRAFFIC STANDARD DETAILS INDEX

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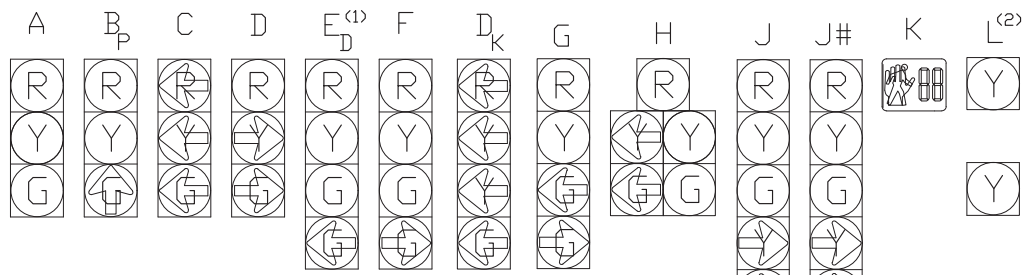
CHART A - SIGNAL SUMMARY			
SIGNAL FACE ARRANGEMENT	NO. SECTIONS (PER FACE)	MOUNTING TYPE	QUANTITY
A	3	RIGID MAST ARM	-
E _D *	4	RIGID MAST ARM	-
A	3	VERTICAL BRACKET	-
C	3	VERTICAL BRACKET	-
K	2	VERTICAL BRACKET	-
TOTAL			-

* SUBSCRIPT 'D' INDICATES DUAL-MODE GREEN/YELLOW ARROW SECTION

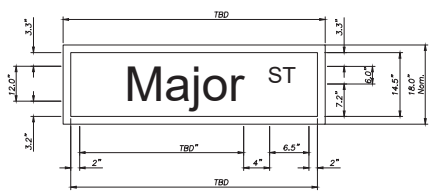
All signal indications shall be L.E.D. Type used must meet ETL verified certification program and be preapproved by the City of Olathe. All metal lens clips shall be re-placed with G.G.I. Quick Change Kits (QCK).

CHART B - TRAFFIC SIGNAL POLES							
POLE NUMBER	POLE SIZE	SIGNAL ARM SIZE	SIGNAL ARM MOUNTING HEIGHT	NO. OF SIGNALS ON ARM	SIGNAL SPACING	LUMINAIRE SUPPORT ARM SIZE	LUMINAIRE MOUNTING HEIGHT
1	27.5'	43	19'	3	16' - 28' - 41'	12'	28'
2a	15'	-	-	-	-	-	-
2b	15'	-	-	-	-	-	-
3	27.5'	48	19'	2	22' - 34'	12'	28'
4	10'	-	-	-	-	-	-

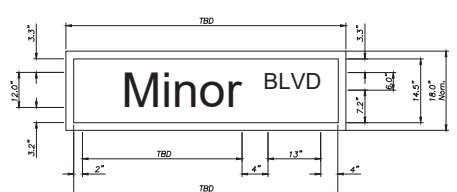
ALL POLES SHALL BE VALDMONT I.D. NO. 347196 BLACK AND CONFORM TO VALDMONT F-604 FINISH SPECIFICATIONS WITH A HOT DIPPED GALVANIZED BASE, AN ALIPHATIC ACRYLIC POLYURETHANE TOP COAT, AND TIED WITH EPOXY.



(1) SUBSCRIPT 'D' INDICATES DUAL-MODE GREEN/YELLOW ARROW SECTION
 (2) AMBER HEADS MOUNTED INDIVIDUALLY ON SCHOOL FLASHING BEACON ASSEMBLY
 ALL TRAFFIC SIGNAL HEADS (EXCLUDING PEDESTRIAN INDICATIONS AND SCHOOL BEACONS) SHALL BE FURNISHED WITH TWO TERMINAL BLOCKS



SIGN A



SIGN B

SIGN FEATURES:
 BACKLIT L.E.D. ILLUMINATED STREET SIGNS
 - WHITE ULTRABRITE LED ILLUMINATION
 - BLACK HOUSING FRAME
 - E-MODIFIED
 - LETTER HEIGHT: 12" U. CASE / 9" L. CASE
 - BACKBRACE MOUNT

COLOR INFORMATION:
 - 3M ELECTROCUIT FILM
 COLOR: EC FILM SERIES
 GREEN 1177

CHART C - OVERHEAD STREET NAME SIGNS			
SIGN	LEGEND	LENGTH	QUANTITY
* A	Major Street Name		-
* B	Minor Street Name		-
C	R10-12 / (Left turn signal)		-

* STREET NAME SIGNS - BACKLIT L.E.D. ILLUMINATED

ILLUMINATED SIGN LEGEND
 N.T.S.

BILL OF MATERIALS		
ITEM	UNIT	QUANTITY
PAD MOUNTED CONTROLLER & DUAL CABINET 332DBLPDA2	EACH	-
CONCRETE CONTROLLER PAD FOR DUAL CABINET	EACH	-
CONCRETE METER PAD	EACH	-
TRAFFIC SIGNAL HEAD (SEE CHART A) W/MNTG. HARDWARE	EACH	-
12 in. TRAFFIC SIGNAL L.E.D. - GREEN ###	EACH	-
12 in. TRAFFIC SIGNAL L.E.D. - YELLOW ###	EACH	-
12 in. TRAFFIC SIGNAL L.E.D. - RED ###	EACH	-
12 in. TRAFFIC SIGNAL L.E.D. THREE ROW ARROW - GREEN ###	EACH	-
12 in. TRAFFIC SIGNAL L.E.D. THREE ROW ARROW - YELLOW ###	EACH	-
12 in. TRAFFIC SIGNAL L.E.D. THREE ROW ARROW - RED ###	EACH	-
12 in. TRAFFIC SIGNAL L.E.D. DUAL MODE, THREE ROW - GREEN/YELLOW ##	EACH	-
16 INCH, SINGLE FACE, LED COUNT DOWN ASSEMBLY	EACH	-
G.G.I QCK (QUICK CHANGE KIT) - EACH KIT ACCOMMODATES 3 L.E.D.S	EACH	-
BACK PLATE 5' 3 SECTION	EACH	-
BACK PLATE 5' 4 SECTION	EACH	-
* CLARY BATTERY BACKUP SYSTEM (BBS) P.N. SP.1250LX	EACH	-
* APC BATTERY BACKUP SYSTEM (BBS) P.N. XU1KOLLXRCC	EACH	-
PUP METER PEDESTAL - USPAR-M2100-108C-OLA-AL	EACH	-
CIRCUIT BREAKER, TRAFFIC SIGNAL, 30 AMP.	EACH	-
CIRCUIT BREAKER, LUMINAIRE, 20 AMP.	EACH	-
TERMINAL BLOCK	EACH	-
CLASS 4, WOOD POLE	EACH	-
TRAFFIC SIGNAL POLE (SEE CHART B) STEEL	EACH	-
TRAFFIC SIGNAL PEDESTAL ALUMINUM (see CHART B)	EACH	-
CONCRETE FOOTING - POLE	EACH	-
CONCRETE FOOTING - PEDESTAL	EACH	-
GROUND ROD & CLAMP	EACH	-
POLARA BULLDOG PEDESTRIAN PUSH-BUTTON WITH CITY ETCHED LOGO P.N. BDSP-010-B	EACH	-
9X15 REVERSABLE COUNTDOWN SIGN R10-3E, OPTION T	EACH	-
POLARA PUSH BUTTON FRAME SPACER, BLACK P.N. PBF4.5X2-B	EACH	-
POLARA PUSH BUTTON FRAME EXTENSION, 6in or 12in, BLACK P.N. IN-EXT-06 or (12)	EACH	-
PUSH BUTTON BASE SIGN MOUNT P.N. PBF2-9X15-B	EACH	-
OVERHEAD STREET NAME SIGN (SEE CHART C)	EACH	-
L.E.D. BACKLIT STREETNAME SIGN ####	EACH	-
SKYBRACKET MASTARM MOUNTING BRACKET	EACH	-
SIDE-OF-POLE MOUNTING BRACKET	EACH	-
R10-10 SIGN (30" X 36")	EACH	-
R10-12 SIGN (30" X 36")	EACH	-
FYA SIGN (24" X 30")	EACH	-
SS-1 SIGN, 20 MPH (24" X 48")	EACH	-
SERVICE BOX - ROUND	EACH	-
SERVICE BOX, TYPE IV - DOUBLE LID	EACH	-
JUNCTION BOX, TYPE I - 12" x 12"	EACH	-
JUNCTION BOX, TYPE II - 12" x 18"	EACH	-
SOLAR PANEL, 100 WATT	EACH	-
LUMINAIRE - L.E.D.	EACH	-
LUMINAIRE PHOTOELECTRIC CONTROL	EACH	-
STREET LIGHT CONNECTOR KIT	EACH	-
POLE & BRACKET CABLE - NO. 14 AWG 4/c IMSA 19-1	LIN. FT.	-
LIGHTING DISTRIBUTION CABLE NO. 12 AWG 3/c IMSA 19-1	LIN. FT.	-
DETECTOR LOOP WIRE NO. 14 AWG 1/c	LIN. FT.	-
SHIELDED DETECTOR LEAD-IN NO. 18 AWG 4/c - # 4C18B70SF	LIN. FT.	-
LED STREET NAME SIGN WIRE PORTER CABLE 14 AWG 3/c, WHITE, BLACK, GREEN	LIN. FT.	-
MULTI-CONDUCTOR CABLE NO. 14 AWG 7/c	LIN. FT.	-
MULTI-CONDUCTOR CABLE NO. 8 AWG 1/c	LIN. FT.	-
IMSA 20-1 NO. 14 AWG 3/c	LIN. FT.	-
GROUND WIRE NO. 8 AWG 1/c GREEN, STRANDED	LIN. FT.	-
SDR 9 HDPE CONDUIT, 1 1/2" #	LIN. FT.	-
SDR 9 HDPE CONDUIT, 2" #	LIN. FT.	-
SDR 9 HDPE CONDUIT, 3" #	LIN. FT.	-

Shall be black with a red stripe, and have a #14 AWG brown tracer wire.
 ## To meet ITE Spec. #7-05, meet ETL verified certification program, and be pre-approved by the City of Olathe.
 ### To meet ITE Spec. #7-05, meet ETL verified certification program, LED front shell faces shall be tinted in color, have an incandescent look, be backed

MAJOR ITEMS OF ELECTRONIC EQUIPMENT			
ITEM	MODEL NO.	UNIT	QUANTITY
* CONTROLLER: 2070	ATC 2070	EACH	-
* ** CONTROLLER DUAL CABINET, PAD MOUNTED WITH 8' RISER	332DBLPDA2	EACH	-
* CONFLICT MONITOR	2010ECL	EACH	-
* REND A&E 2 CHANNEL VEHICLE DETECTOR	C-1103-SS	EACH	-
* DC ISOLATOR, 2 CHANNEL	242	EACH	-
* AUXILIARY OUTPUT FILE W/ OLATHE HARNESS	N/A	EACH	-
* FLASHER	204	EACH	-
* FLASH TRANSFER RELAY	430	EACH	-
* LOAD SWITCH	200 I/O	EACH	-
* CISCO SWITCH W/ DINRAIL MOUNT, 8 PORT & (2) 1G SFP's	1E. 3300	EACH	-
* CISCO AC POWER MODULE WITH IEC PLUG	PWR-IE65W-AC-IEC	EACH	-
* EDI 24V POWER SUPPLY	206L	EACH	-
* CLARY / APC BATTERY BACKUP SYSTEM (BBS)	-	EACH	-

* Will be purchased by the City of Olathe and finished to the contractor for installation.
 ** L.E.D. work light front and back, 9 outlet AC surge suppressor, print and manual drawer, 44 PIN Input file with RJ45 connectors, HS-P-SP-120A-60A-RI surge supsresser, and include an 8in. cabinet riser.

NOTE: All electrical devices shall be purchased within 90 days of installation.
 NOTE: The traffic signal system shall be complete and the contractor shall furnish and install all equipment and materials necessary for the satisfactory operation of all electrical apparatus and full operation of the traffic signal system, whether specifically mentioned or not. Questions may be directed to the Olathe signal tech supervisor at 913-971-5180.

CABINET & POLE TERMINATION RESPONSIBILITY	OLATHE	CONTRACTOR	X
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VIDEO OBSERVATION EQUIPMENT			
ITEM	MODEL NO.	UNIT	QUANTITY
* AXIS PTZ NETWORK CAMERA	Q6135-LE	EACH	-
* AXIS PTZ NETWORK CAMERA	Q6215-LE	EACH	-
* AXIS NETWORK CAMERA	P3719-PL	EACH	-
* AXIS POLE MOUNT (Q6135-LE)	T91L61	EACH	-
* AXIS POLE MOUNT (P3719-PL)	T91B67	EACH	-
* AXIS PENDANT MOUNT (P3719-PL)	T94N01	EACH	-
WAVENET SE WITH IEC-332-1	-	LIN. FT.	-
-	-	-	-

* Will be purchased by the City of Olathe and finished to the contractor for installation.

OPTICOM SYSTEM EQUIPMENT		
ITEM	UNIT	QUANTITY
* PHASE SELECTOR, MODEL 764	EACH	-
OPTICAL DETECTOR, MODEL 721	EACH	-
MOUNTING BRACKET, MODEL AB-0163-45-P33	EACH	-
MULTI-CONDUCTOR OPTICOM DETECTOR CABLE, # 20 AWG 3/C	LIN. FT.	-

WAVETRONIX MATRIX STOPBAR DETECTOR SYSTEM		
ITEM	UNIT	QUANTITY
* WX-SS-225, MATRIX STOP-BAR DETECTOR	EACH	-
* WX-SS-611-BLK, SMART SENSOR MOUNTING BRACKET	EACH	-
* WX-SS-704-100, 100' SMART SENSOR HARNESS	EACH	-
* WX-SS-710, INLINE TERMINAL BLOCK	EACH	-
* WX-CLK-114, 4 CHANNEL CONTACT CLOSURE CARD	EACH	-
* WX-SS-B02-0002, 4 SENSOR INTERFACE PANEL	EACH	-
SS-705-1000, HOME RUN CABLE	LIN. FT.	-
* WX-102-0451 (656) CABINET INTERFACE DEVICE WITH SDLC AND ETHERNET	EACH	-

WAVETRONIX ADVANCED DETECTOR SYSTEM		
ITEM	UNIT	QUANTITY
* WX-SS-200V, ADVANCED DETECTOR	EACH	-
* WX-SS-611-BLK, SMART SENSOR MOUNTING BRACKET	EACH	-
* WX-SS-704-100, 100' SMART SENSOR HARNESS	EACH	-
* WX-SS-710, INLINE TERMINAL BLOCK	EACH	-
* WX-CLK-114, 4 CHANNEL CONTACT CLOSURE CARD	EACH	-
* WX-SS-B02-0002, 4 SENSOR INTERFACE PANEL	EACH	-
SS-705-1000, HOME RUN CABLE	LIN. FT.	-
* WX-102-0451 (656) CABINET INTERFACE DEVICE WITH SDLC AND ETHERNET	EACH	-

-QUANTITIES FOR INFORMATION ONLY-
 THESE APPROXIMATE QUANTITIES WERE PREPARED FOR THE CONTRACTOR'S CONVENIENCE

REVISIONS		BY
NO.	DATE	DESCRIPTION

BILL OF MATERIALS
 XXXX & XXXX
 P.N. XXXXC

DESIGNED: XX DATE: XX/XX/XX
 DETAILED: XX SCALE: NONE
 CHECKED: XX APPROVED: XX

CITY OF OLATHE
 PUBLIC WORKS / TRAFFIC DIVISION
 P.O. BOX 768 OLATHE, KANSAS 66061

SHEET XX of XX

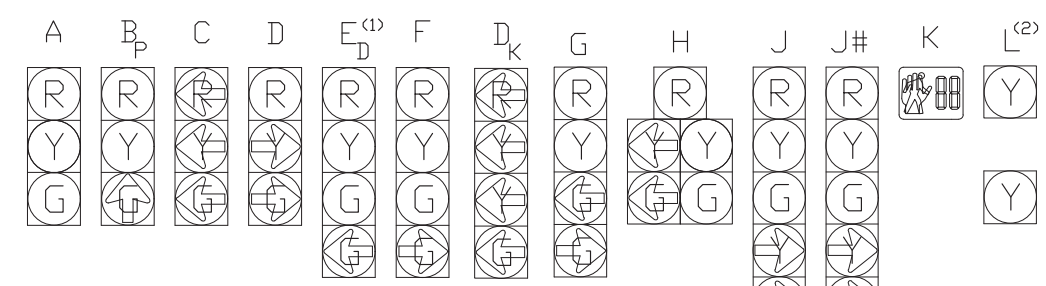
CHART A - SIGNAL SUMMARY			
SIGNAL FACE ARRANGEMENT	NO. SECTIONS (PER FACE)	MOUNTING TYPE	QUANTITY
A	3	RIGID MAST ARM	-
E*	4	RIGID MAST ARM	-
A	3	VERTICAL BRACKET	-
C	3	VERTICAL BRACKET	-
K	2	VERTICAL BRACKET	-
TOTAL			-

* SUBSCRIPT 'D' INDICATES DUAL-MODE GREEN/YELLOW ARROW SECTION

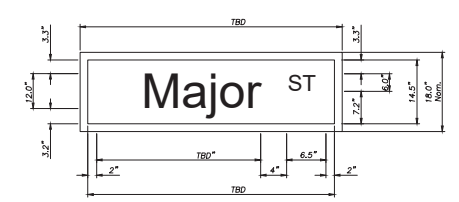
All signal indications shall be L.E.D. Type used must meet ETL verified certification program and be preapproved by the City of Olathe. All metal lense clips shall be re-placed with G.G.I. Quick Change Kits (QCK).

CHART B - TRAFFIC SIGNAL POLES							
POLE NUMBER	POLE SIZE	SIGNAL ARM SIZE	SIGNAL ARM MOUNTING HEIGHT	NO. OF SIGNALS ON ARM	SIGNAL SPACING	LUMINAIRE SUPPORT ARM SIZE	LUMINAIRE MOUNTING HEIGHT
1	27.5'	43	19'	3	16' - 28' - 41'	12'	28'
2a	15'	-	-	-	-	-	-
2b	15'	-	-	-	-	-	-
3	27.5'	48	19'	2	22' - 34'	12'	28'
4	10'	-	-	-	-	-	-

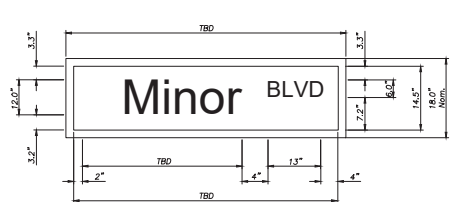
ALL POLES SHALL BE VALDMONT I.D. NO. 347196 BLACK AND CONFORM TO VALDMONT F-604 FINISH SPECIFICATIONS WITH A HOT DIPPED GALVANIZED BASE, AN ALIPHATIC ACRYLIC POLYURETHANE TOP COAT, AND TIED WITH EPOXY.



(1) SUBSCRIPT 'D' INDICATES DUAL-MODE GREEN/YELLOW ARROW SECTION
 (2) AMBER HEADS MOUNTED INDIVIDUALLY ON SCHOOL FLASHING BEACON ASSEMBLY
 ALL TRAFFIC SIGNAL HEADS (EXCLUDING PEDESTRIAN INDICATIONS AND SCHOOL BEACONS) SHALL BE FURNISHED WITH TWO TERMINAL BLOCKS



SIGN A



SIGN B

SIGN FEATURES:
 BACKLIT L.E.D. ILLUMINATED STREET SIGNS
 WHITE ULTRABRITE LED ILLUMINATION
 BLACK HOUSING FRAME
 E-MODIFIED
 LETTER HEIGHT: 12" U. CASE / 9" L. CASE
 BACKBRACE MOUNT

COLOR INFORMATION:
 3M ELECTROCRUT FILM
 COLOR: EC FILM SERIES
 GREEN 1177

CHART C - OVERHEAD STREET NAME SIGNS			
SIGN	LEGEND	LENGTH	QUANTITY
* A	Major Street Name		-
* B	Minor Street Name		-
C	R10-12 / (Left turn signal)		-

* STREET NAME SIGNS - BACKLIT L.E.D. ILLUMINATED

ILLUMINATED SIGN LEGEND
 N.T.S.

BILL OF MATERIALS		
ITEM	UNIT	QUANTITY
PAD MOUNTED CONTROLLER & DUAL CABINET 332DBLPDA2	EACH	-
CONCRETE CONTROLLER PAD FOR DUAL CABINET	EACH	-
CONCRETE METER PAD	EACH	-
TRAFFIC SIGNAL HEAD (SEE CHART A) W/MNTG. HARDWARE	EACH	-
12 in. TRAFFIC SIGNAL L.E.D. - GREEN ###	EACH	-
12 in. TRAFFIC SIGNAL L.E.D. - YELLOW ###	EACH	-
12 in. TRAFFIC SIGNAL L.E.D. - RED ###	EACH	-
12 in. TRAFFIC SIGNAL L.E.D. THREE ROW ARROW - GREEN ###	EACH	-
12 in. TRAFFIC SIGNAL L.E.D. THREE ROW ARROW - YELLOW ###	EACH	-
12 in. TRAFFIC SIGNAL L.E.D. THREE ROW ARROW - RED ###	EACH	-
12 in. TRAFFIC SIGNAL L.E.D. DUAL MODE, THREE ROW - GREEN/YELLOW ##	EACH	-
16 INCH, SINGLE FACE, LED COUNT DOWN ASSEMBLY	EACH	-
G.G.I. QCK (QUICK CHANGE KIT) - EACH KIT ACCOMMODATES 3 L.E.D.s	EACH	-
BACK PLATE 5' 3 SECTION	EACH	-
BACK PLATE 5' 4 SECTION	EACH	-
CLARY BATTERY BACKUP SYSTEM (BBS) P.N. SP.1250LX	EACH	-
APC BATTERY BACKUP SYSTEM (BBS) P.N. XUIKOLLXRRCC	EACH	-
PUP METER PEDESTAL - USPAR-M2100-108C-DLA-AL	EACH	-
CIRCUIT BREAKER, TRAFFIC SIGNAL, 30 AMP.	EACH	-
CIRCUIT BREAKER, LUMINAIRE, 20 AMP.	EACH	-
TERMINAL BLOCK	EACH	-
CLASS 4, WOOD POLE	EACH	-
TRAFFIC SIGNAL POLE (SEE CHART B) STEEL	EACH	-
TRAFFIC SIGNAL PEDESTAL ALUMINUM (see CHART B)	EACH	-
CONCRETE FOOTING - POLE	EACH	-
CONCRETE FOOTING - PEDESTAL	EACH	-
GROUND ROD & CLAMP	EACH	-
POLARA BULLDOG PEDESTRIAN PUSH-BUTTON WITH CITY ETCHED LOGO P.N. BDS-P-010-B	EACH	-
9X15 REVERSABLE COUNTDOWN SIGN R10-3E, OPTION T	EACH	-
POLARA PUSH BUTTON FRAME SPACER, BLACK P.N. PBF545X2-B	EACH	-
POLARA PUSH BUTTON FRAME EXTENSION, 6in or 12in, BLACK P.N. IN-EXT-06 or (12)	EACH	-
PUSH BUTTON BASE SIGN MOUNT P.N. PBF2-9X15-B	EACH	-
OVERHEAD STREET NAME SIGN (SEE CHART C)	EACH	-
L.E.D. BACKLIT STREETNAME SIGN ####	EACH	-
SKYBRACKET MASTARM MOUNTING BRACKET	EACH	-
SIDE-OF-POLE MOUNTING BRACKET	EACH	-
R10-10 SIGN (30" X 36")	EACH	-
R10-12 SIGN (30" X 36")	EACH	-
FYA SIGN (24" X 30")	EACH	-
SS-1 SIGN, 20 MPH (24" x 48")	EACH	-
SERVICE BOX - ROUND	EACH	-
SERVICE BOX, TYPE IV - DOUBLE LID	EACH	-
JUNCTION BOX, TYPE I - 12" x 12"	EACH	-
JUNCTION BOX, TYPE II - 12" x 18"	EACH	-
SOLAR PANEL, 100 WATT	EACH	-
LUMINAIRE - L.E.D.	EACH	-
LUMINAIRE PHOTOELECTRIC CONTROL	EACH	-
STREET LIGHT CONNECTOR KIT	EACH	-
POLE & BRACKET CABLE NO. 14 AWG 4/c IMSA 19-1	LIN. FT.	-
LIGHTING DISTRIBUTION CABLE NO. 12 AWG 3/c IMSA 19-1	LIN. FT.	-
DETECTOR LOOP WIRE NO. 14 AWG 1/c	LIN. FT.	-
SHIELDED DETECTOR LEAD-IN NO. 18 AWG 4/c - # 4C18B70SF	LIN. FT.	-
LED STREET NAME SIGN WIRE PORTER CABLE 14 AWG 3/c, WHITE, BLACK, GREEN	LIN. FT.	-
MULTI-CONDUCTOR CABLE NO. 14 AWG 7/c	LIN. FT.	-
MULTI-CONDUCTOR CABLE NO. 8 AWG 1/c	LIN. FT.	-
IMSA 19-1 NO. 14 AWG 3/c	LIN. FT.	-
GROUND WIRE NO. 8 AWG 1/c GREEN, STRANDED	LIN. FT.	-
SDR 9 HDPE CONDUIT, 1 1/2" #	LIN. FT.	-
SDR 9 HDPE CONDUIT, 2" #	LIN. FT.	-
SDR 9 HDPE CONDUIT, 3" #	LIN. FT.	-

Shall be black with a red stripe and have a #14 AWG brown tracer wire.
 ## To meet ITE Spec. #7-05, meet ETL verified certification program, and be pre-approved by the City of Olathe.
 ### To meet ITE Spec. #7-05, meet ETL verified certification program, LED front shell faces shall be tinted in color, have an incandescent look, be backed by a 15 year manufacturer's warranty, and be pre-approved by the City of Olathe.

MAJOR ITEMS OF ELECTRONIC EQUIPMENT			
ITEM	MODEL NO.	UNIT	QUANTITY
CONTROLLER: 2070	ATC 2070	EACH	-
** CONTROLLER DUAL CABINET, PAD MOUNTED WITH 8' RISER	332DBLPDA2	EACH	-
CONFLICT MONITOR	2010ECL 1P	EACH	-
RENO A&E 2 CHANNEL VEHICLE DETECTOR	C-1103-SS	EACH	-
DC ISOLATOR, 2 CHANNEL	242	EACH	-
AUXILIARY OUTPUT FILE W/ OLATHE HARNESS	N/A	EACH	-
FLASHER	204	EACH	-
FLASH TRANSFER RELAY	430	EACH	-
LOAD SWITCH	200 I/O	EACH	-
CISCO SWITCH W/ DINRAIL MOUNT, 8 PORT & (2) 1G SFP's	I.E. 3300	EACH	-
CISCO AC POWER MODULE WITH IEC PLUG	PWR-IE65W-AC-IEC	EACH	-
EDI 24V POWER SUPPLY	206L	EACH	-
CLARY / APC BATTERY BACKUP SYSTEM (BBS)	-	EACH	-

** L.E.D. work light front and back, 9 outlet AC surge suppressor, print and manual drawer, 44 PIN Input file with RJ45 connectors, HS-P-SP-120A-60A-RI surge suppressor, and include an Bin. cabinet riser.

NOTE: All electrical devices shall be purchased within 90 days of installation.

NOTE: The traffic signal system shall be complete and the contractor shall furnish and install all equipment and materials necessary for the satisfactory operation of electrical apparatus and for complete operation of the traffic signal system whether specifically mentioned or not. Questions may be directed to the Olathe signal tech supervisor at 913-971-5180.

CABINET & POLE TERMINATION RESPONSIBILITY	OLATHE	CONTRACTOR	X
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VIDEO OBSERVATION EQUIPMENT			
ITEM	MODEL NO.	UNIT	QUANTITY
AXIS PTZ NETWORK CAMERA	06135-LE	EACH	-
AXIS POLE MOUNT	T91L61	EACH	-
WAVENET SE WITH IEC-332-1	-	LIN. FT.	-
-	-	-	-

OPTICOM SYSTEM EQUIPMENT		
ITEM	UNIT	QUANTITY
PHASE SELECTOR, MODEL 764	EACH	-
OPTICAL DETECTOR, MODEL 721	EACH	-
MOUNTING BRACKET, MODEL AB-0163-45-P33	EACH	-
MULTI-CONDUCTOR OPTICOM DETECTOR CABLE, # 20 AWG 3/C	LIN. FT.	-

WAVETRONIX MATRIX STOPBAR DETECTOR SYSTEM		
ITEM	UNIT	QUANTITY
WX-SS-225, MATRIX STOP-BAR DETECTOR	EACH	-
WX-SS-611-BLK, SMART SENSOR MOUNTING BRACKET	EACH	-
WX-SS-704-20, 20' SMART SENSOR HARNESS	EACH	-
WX-SS-710, INLINE TERMINAL BLOCK	EACH	-
WX-CLK-114, 4 CHANNEL CONTACT CLOSURE CARD	EACH	-
WX-SS-B02-0002, 4 SENSOR INTERFACE PANEL	EACH	-
SS-705-1000, HOME RUN CABLE	LIN. FT.	-
WX-102-0451 (656) CABINET INTERFACE DEVICE WITH SDLC AND ETHERNET	EACH	-

WAVETRONIX ADVANCED DETECTOR SYSTEM		
ITEM	UNIT	QUANTITY
WX-SS-200V, ADVANCED DETECTOR	EACH	-
WX-SS-611-BLK, SMART SENSOR MOUNTING BRACKET	EACH	-
WX-SS-704-20, 20' SMART SENSOR HARNESS	EACH	-
WX-SS-710, INLINE TERMINAL BLOCK	EACH	-
WX-CLK-114, 4 CHANNEL CONTACT CLOSURE CARD	EACH	-
WX-SS-B02-0002, 4 SENSOR INTERFACE PANEL	EACH	-
SS-705-1000, HOME RUN CABLE	LIN. FT.	-
WX-102-0451 (656) CABINET INTERFACE DEVICE WITH SDLC AND ETHERNET	EACH	-

-QUANTITIES FOR INFORMATION ONLY-

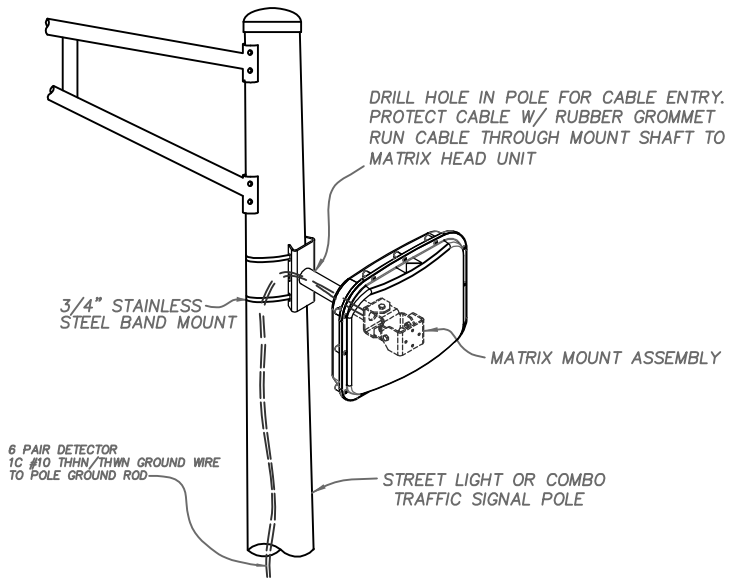
THESE APPROXIMATE QUANTITIES WERE PREPARED FOR THE CONTRACTOR'S CONVENIENCE AND ARE NOT GUARANTEED TO BE A COMPLETE LIST OF MATERIALS FOR THIS PROJECT.

REVISIONS	
NO.	DATE

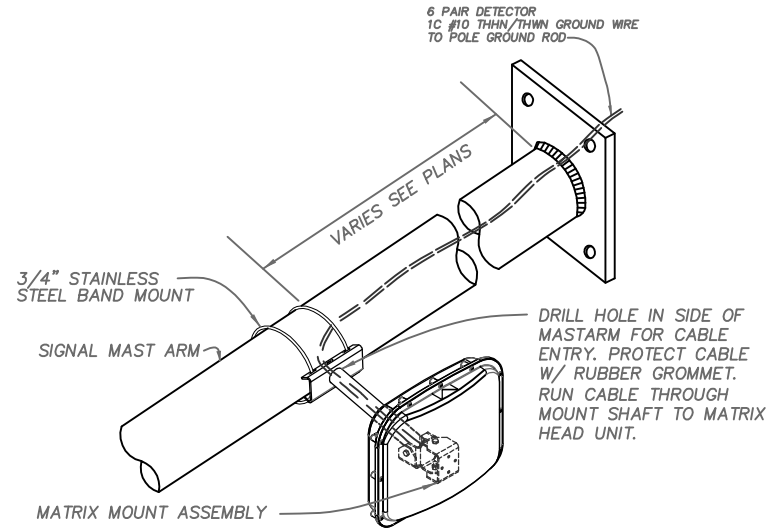
BILL OF MATERIALS
 XXXX & XXXX
 P.N. XXXXXC
 DESIGNED: XX DATE: XX/XX/XX
 DETAILED: XX SCALE: NONE
 CHECKED: XX APPROVED: XX

CITY OF OLATHE
 PUBLIC WORKS / TRAFFIC DIVISION
 P.O. BOX 768 OLATHE, KANSAS 66061

SHEET XX of XX

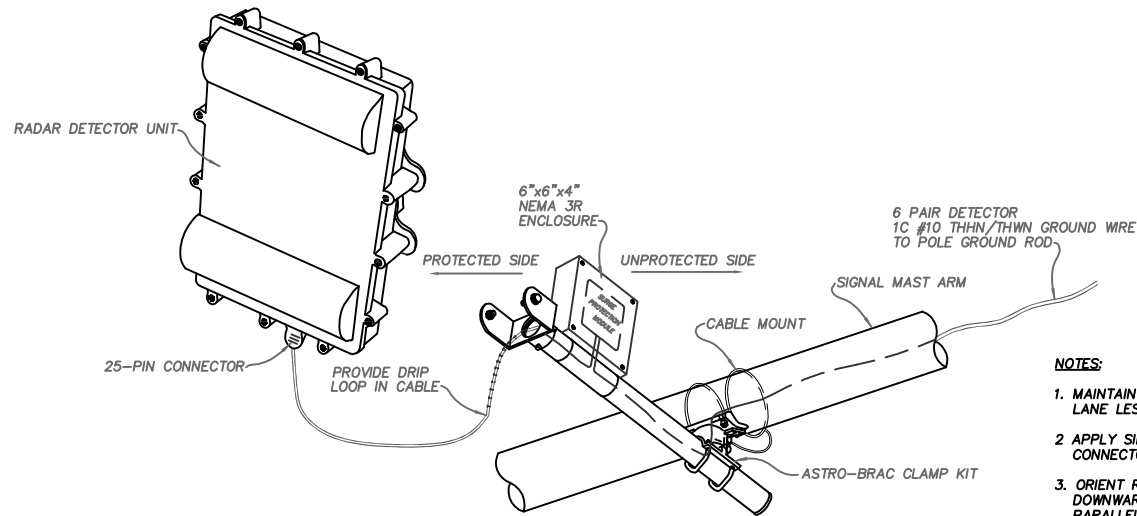


MATRIX DETECTION MOUNTING DETAIL
(SIDE OF POLE MOUNT)



MATRIX DETECTION MOUNTING DETAIL
(MAST ARM MOUNT)

MATRIX DETECTION SYSTEM

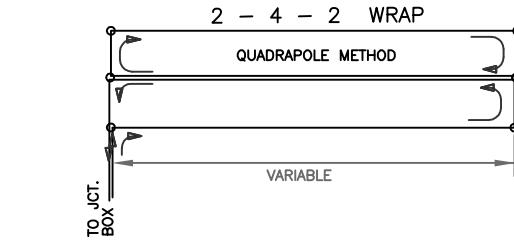


RADAR DETECTION MOUNTING DETAIL
(MAST ARM BRACKET ARM MOUNT)
NO SCALE

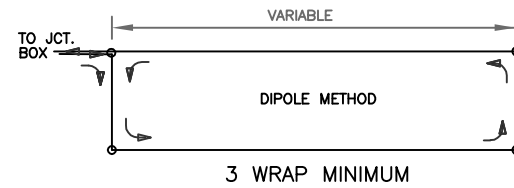
NOTES:

1. MAINTAIN OFFSETS FROM CENTER OF THE DESIRED LANE LESS THAN 24 FEET.
2. APPLY SILICON DIELECTRIC COMPOUND INTO THE CONNECTOR AT THE BASE OF THE RADAR DETECTOR
3. ORIENT RADAR DETECTOR STRAIGHT AHEAD WITH NO DOWNWARD TILT. BRACKET ARM SHOULD BE PARALLEL TO THE ROAD SURFACE.

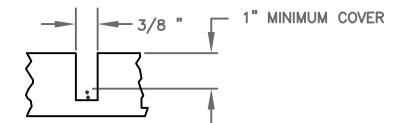
RADAR DETECTION SYSTEM



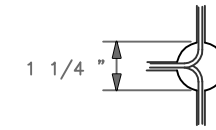
ALL LOOPS TO BE WOUND IN SAME DIRECTION WITH START AND END CLEARLY MARKED AT JUNCTION OR SERVICE BOX



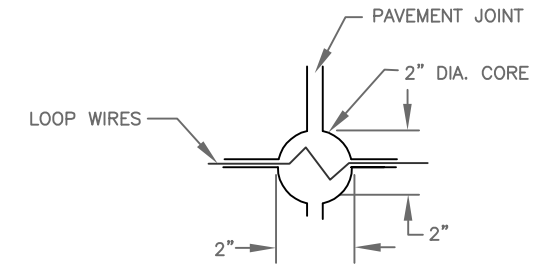
LOOP DETECTOR DETAILS



SLOT DETAIL

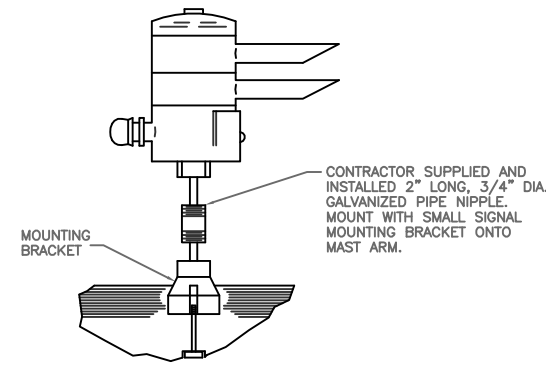


LOOP CORNER DETAIL



LOOP PAVEMENT JOINT DETAIL

LOOP DETECTORS

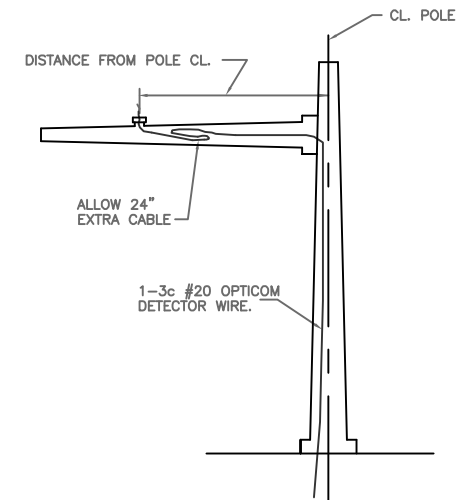


MAST ARM INSTALLATION



INSIDE VIEW OF BOTTOM COVER

NOTE: KNOCK OUT WEEPHOLE BEFORE INSTALLATION



PHASE SELECTION INSTALLATION DETAIL

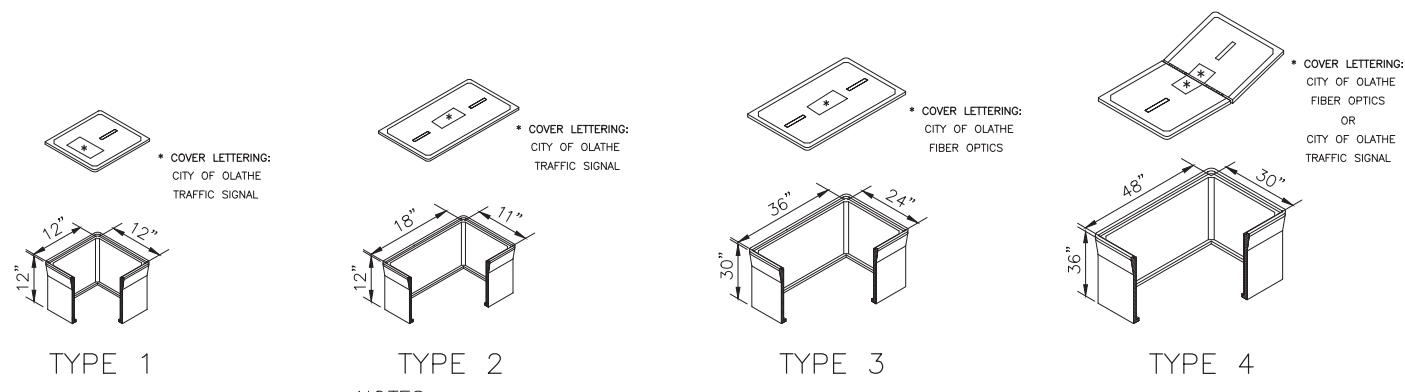
PHASE SELECTION SYSTEM

NO.	DATE	DESCRIPTION	BY

SIGNAL DETAILS 1 OF 3		DATE: XX/XX/XX
XXXX & XXXX		SCALE: NONE
P.N. XXXXXc		APPROVED: XX
DESIGNED: XX		
DETAILED: XX		
CHECKED: XX		

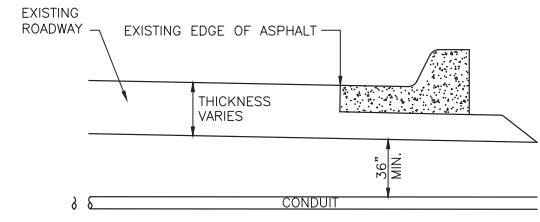
CITY OF OLATHE
PUBLIC WORKS / TRAFFIC DIVISION
P.O. BOX 768 OLATHE, KANSAS 66061

SHEET XX OF XX



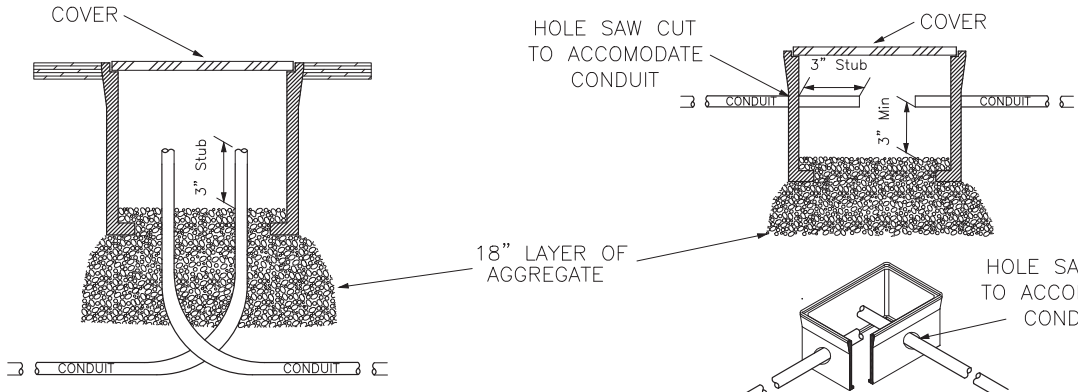
NOTES:
1. BOX AND COVER SHALL MEET OR EXCEED ANSI/SCTE-77, TIER 22.
2. REFER TO CURRENT TRAFFIC SIGNAL APPROVED MATERIAL LIST FOR CORRECT PART NUMBERS.

JUNCTION BOX DETAILS



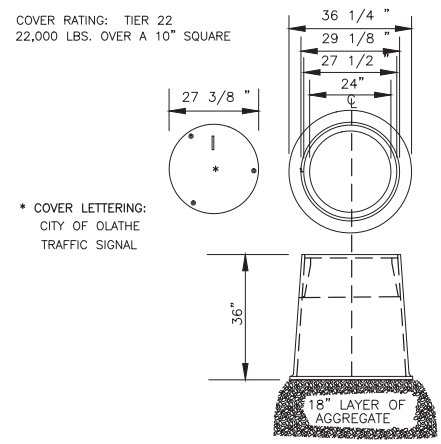
NOTE:
FOR ROADWAY CROSSING BY BORING METHOD, DISTANCE FROM EXISTING BOTTOM OF ROADWAY PAVEMENT TO TOP OF CONDUIT SHALL BE 36" MIN.

ROADWAY CONDUIT CROSSING DETAIL (BY PUNCH METHOD)

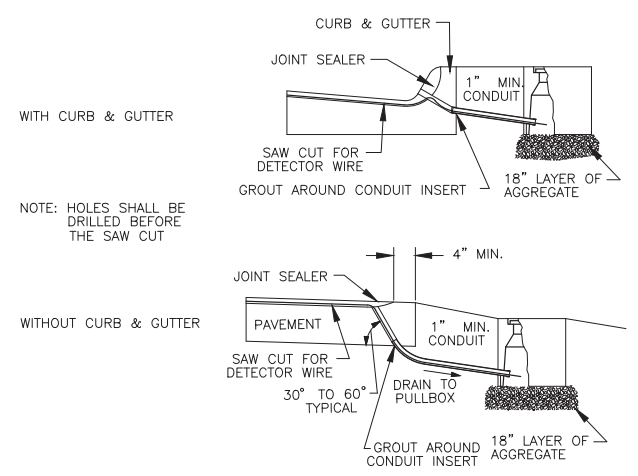


JUNCTION BOX CONDUIT ENTRY

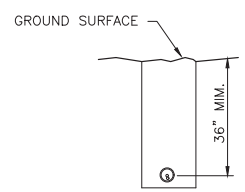
FIBER OPTIC JUNCTION BOX CONDUIT ENTRY



POLYMER CONCRETE SERVICE BOX

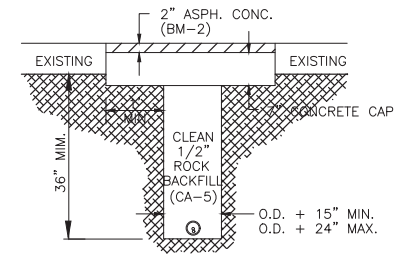


BOX INSTALLATION DETAILS



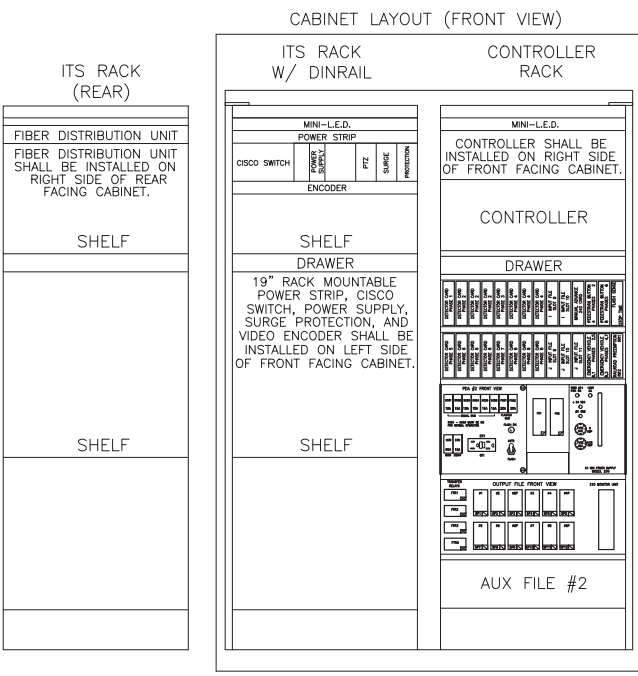
NOTE:
ALL WORK WITHIN RIGHT-OF-WAY SHALL CONFORM TO THE CITY OF OLATHE'S SPECIFICATIONS FOR UTILITY CONSTRUCTION WITHIN THE CITY RIGHT-OF-WAY.

TRENCH DETAIL

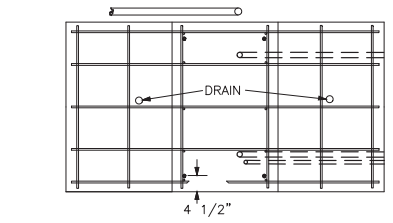


NOTE:
THE 1' EITHER SIDE OF ACUTAL TRENCH WIDTH SHALL NOT BE REMOVED UNTIL THE TRENCH HAS BEEN FILLED AND COMPACTED.

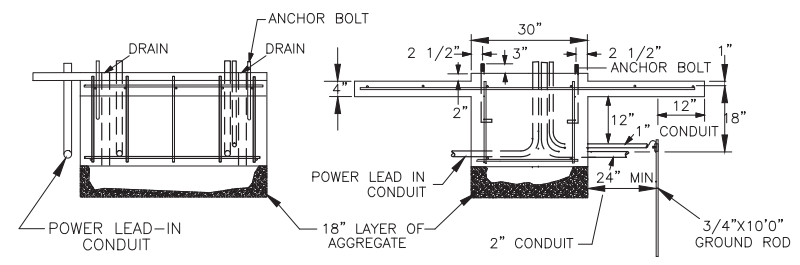
STREET PATCH DETAIL



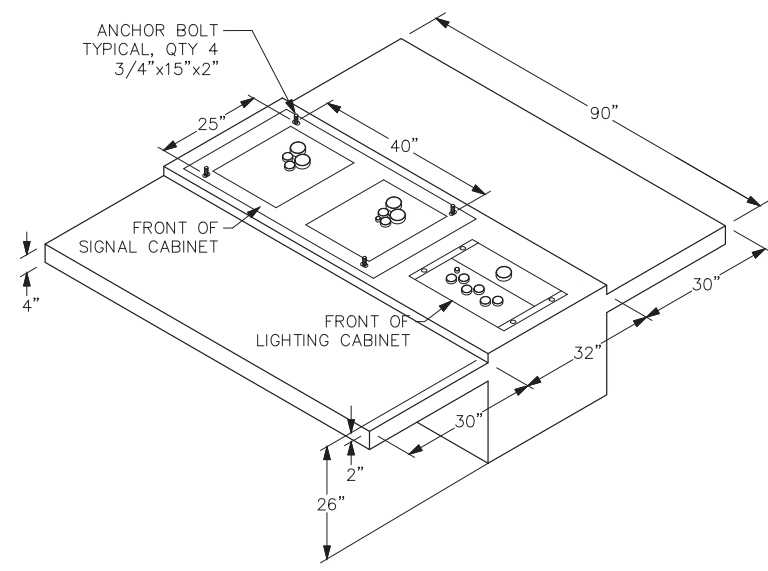
CABINET DETAIL INTERIOR COMPONENT PLACEMENT



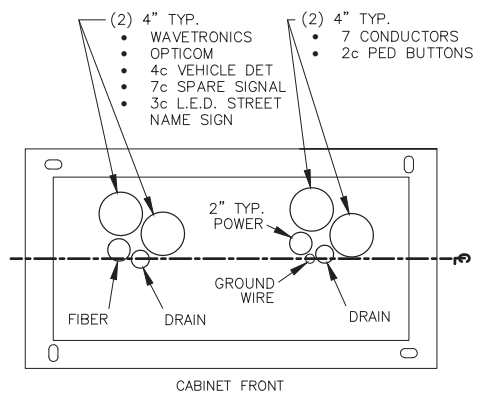
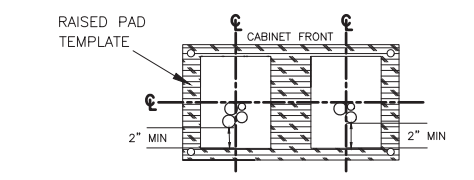
NOTES:
REBAR SHALL BE GRADE 40 MEETING THE REQUIREMENTS OF SUBSECTION 1601 IN THE STANDARD SPECIFICATIONS FOR STATE ROAD AND BRIDGE CONSTRUCTION, KANSAS DEPT. OF TRANSPORTATION.



332 DUAL CABINET PAD DETAILS



332 DUAL CABINET PAD DETAILS ISOMETRIC VIEW (NOT TO SCALE)



NOTES:
1. A MINIMUM OF 15' OF ADDITIONAL SLACK SHALL BE PULLED FOR EACH CABLE RUN INTO CABINET BASE.
2. ALL CONDUITS SHALL BE CUT FLUSH WITH CONCRETE.

CONDUIT ENTRY DETAILS

REVISIONS	
NO.	DESCRIPTION

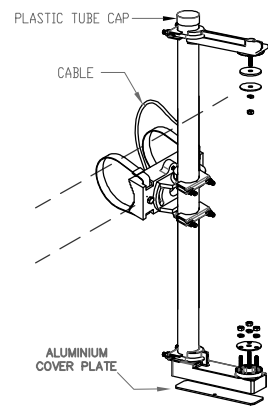
SIGNAL DETAILS 2 OF 3
XXXX & XXXX
P.N. XXXXC

DESIGNED: XX
CHECKED: XX

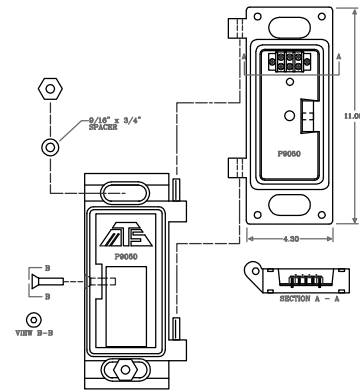
DATE: XX/XX/XX
SCALE: NONE
APPROVED: XX

CITY OF OLATHE
PUBLIC WORKS / TRAFFIC DIVISION
P.O. BOX 768 OLATHE, KANSAS 66061

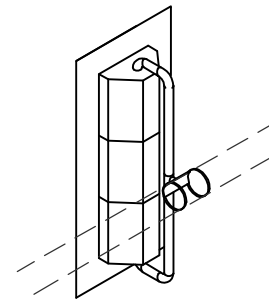
SHEET
XX OF
XX



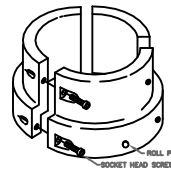
SKY-BRACKET
STANDARD 3 SECTION
(BAND CLAMP)



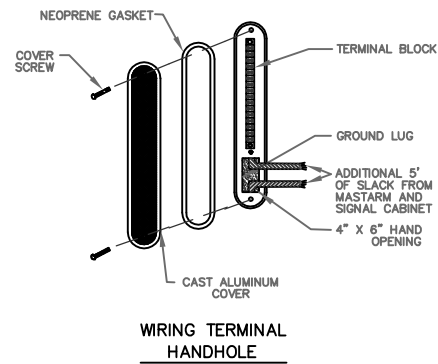
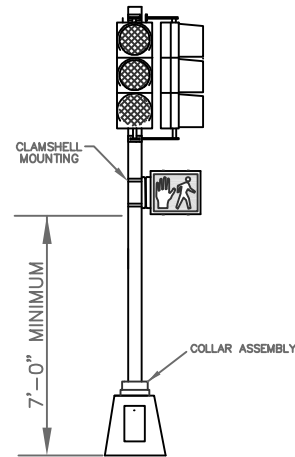
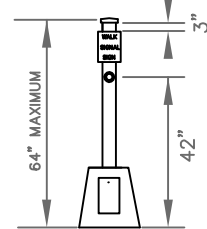
CLAMSHELL MOUNT
HARDWARE DETAIL



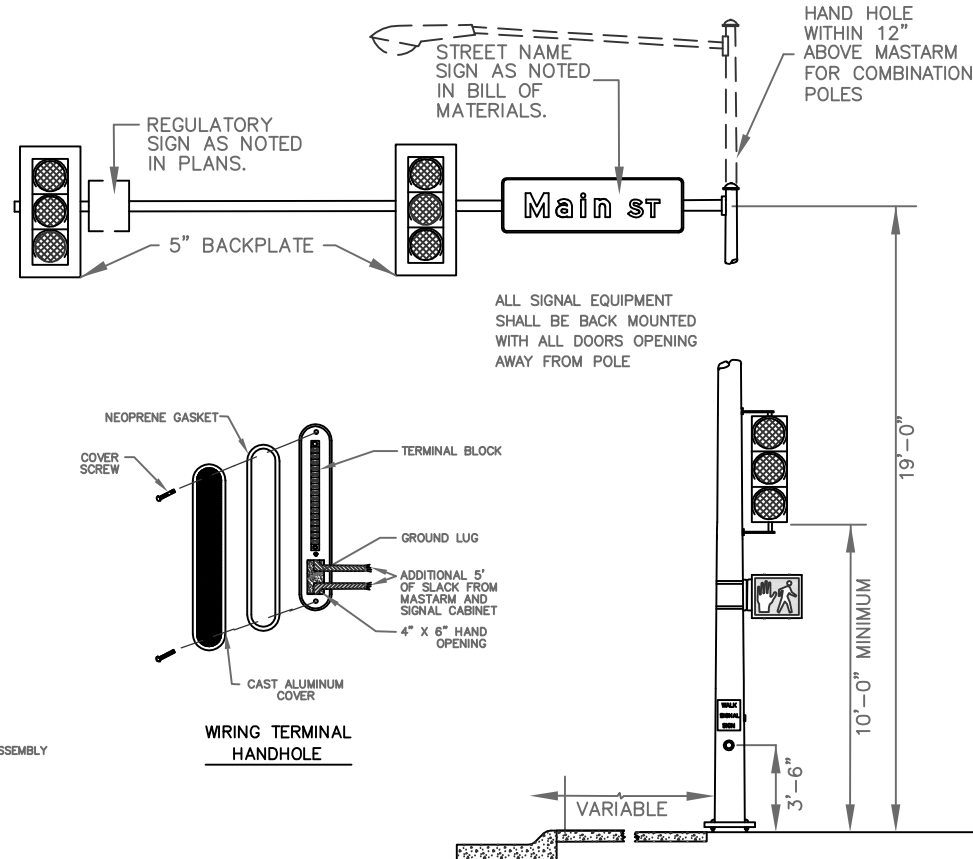
RIGID MOUNT
DETAIL



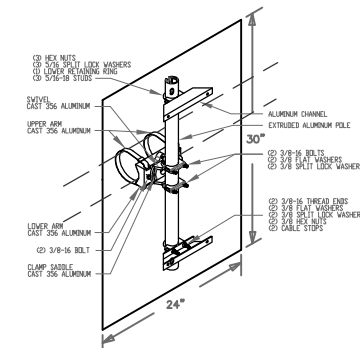
POLE AND BASE
COLLAR ASSEMBLY
DETAILS



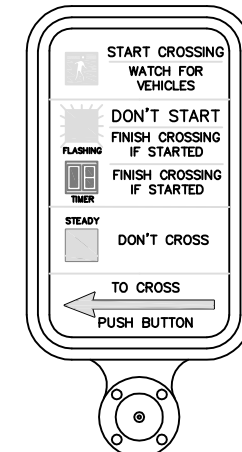
WIRING TERMINAL
HANDHOLE



ALL SIGNAL EQUIPMENT
SHALL BE BACK MOUNTED
WITH ALL DOORS OPENING
AWAY FROM POLE



SIGN MOUNT
DETAIL
SIGNS OVER 18\"/>

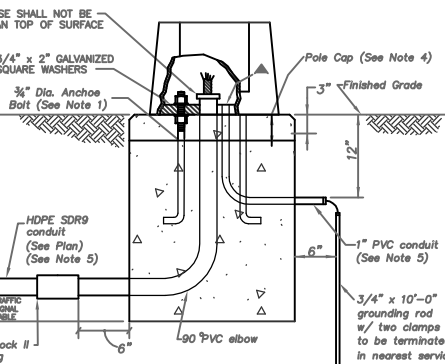
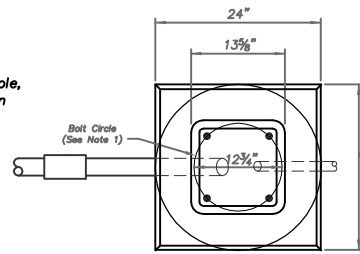


PEDESTRIAN
SIGN R10-3E
WITH FRAME AND
PUSH BUTTON

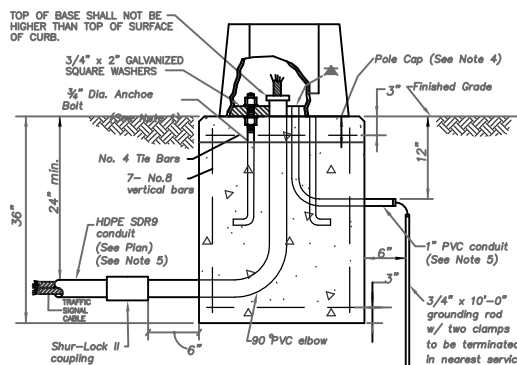
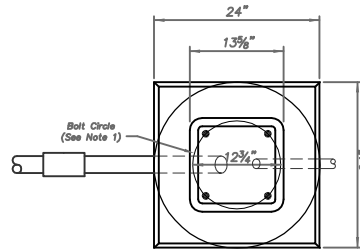
Pole Base Notes:

- Final pole, anchor bolt size, anchor bolt projection, and bolt circle shall be as per manufacturer's recommended practices.
- All conduits and anchor bolts for all the new pole bases shall be rigidly installed before concrete is placed. Anchor bolts shall be spaced by means of a factory certified template or drawing, the center of which shall coincide with the center of the base.
- All concrete pole bases shall be consolidated by an internal type vibrator.
- Final 6" of concrete foundation (pole cap) shall be formed square. Final top elevation shall match ADA sidewalk ramp.
- PVC conduit elbows in concrete foundations shall be connected to HDPE SDR9 conduit with Shur-lock II coupling.
- All concrete used in this work shall meet the requirements of the Olathe Municipal design criteria.
- Bare No. 6 solid copper ground conductor from internal pole grounding nut to clamp on ground rod.
- All piers for foundations shall be drilled and constructed in one pour.
- A minimum of 5' to 6' of additional signal cable from mastarm through hand hole, and from signal cabinet through hand hole, shall be pulled for proper connection at terminal block.

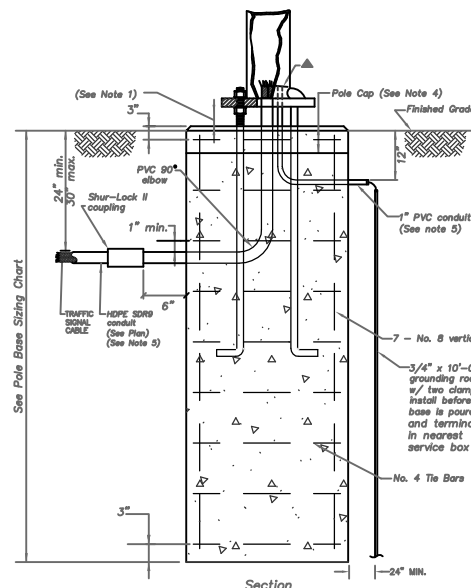
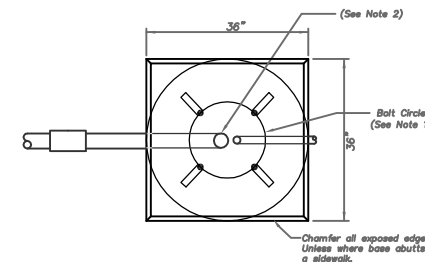
▲ NO. 6 BARE COPPER GROUND CONDUCTOR FROM GROUND ROD CLAMP ON GROUND ROD TO INTERNAL GROUNDING NUT. A CONNECTION SHALL BE MADE BETWEEN THE INTERNAL GROUNDING NUT AND THE SYSTEM NEUTRAL WITH NO. 6 BARE COPPER WIRE.



PUSHBUTTON PEDESTAL
& BASE DETAILS



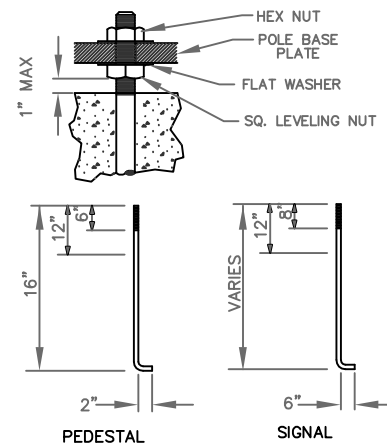
PEDESTAL & BASE
DETAILS



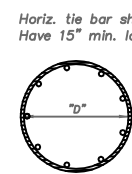
MAST ARM POLE & BASE DETAILS

Pole Base Sizing Chart	
Mastarm Length	Base Size
< 36'	8' - 0" base *
36' to 44'	10' - 0" base *
46' to 54'	12' - 0" base *
56' to 64'	15' - 0" base *
66' to 70'	18' - 0" base *
> 70'	Requires special design *

(* Unless otherwise noted in plans)

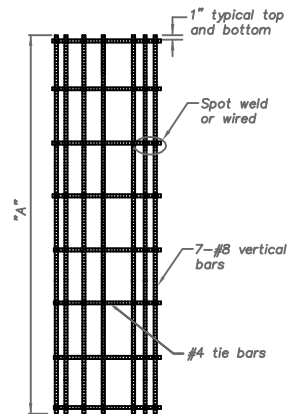


ANCHOR BOLT
DETAIL

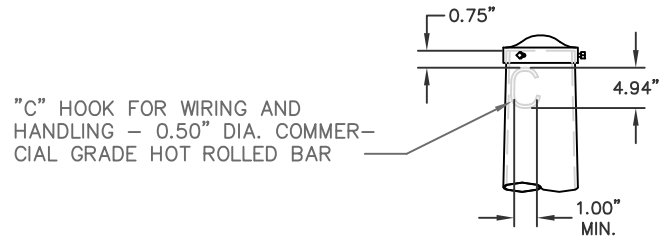


Vertical Rebar	
Pole Fnd. Depth	Length "A"
30"	2'-2"
8'-0"	7'-8"
10'-0"	9'-8"
12'-0"	11'-8"
15'-0"	14'-8"
18'-0"	17'-8"

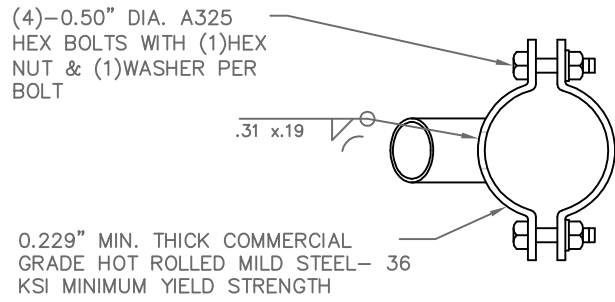
Horizontal Rebar			
Pole Fnd. Dia.	Pole Fnd. Dia.	Rebar Cir. "D"	Spacing
24"	30"	20"	12" MAX.
36"	8'-12'	30"	12" MAX.
36"	15'	30"	9" MAX.
36"	18'	30"	6" MAX.



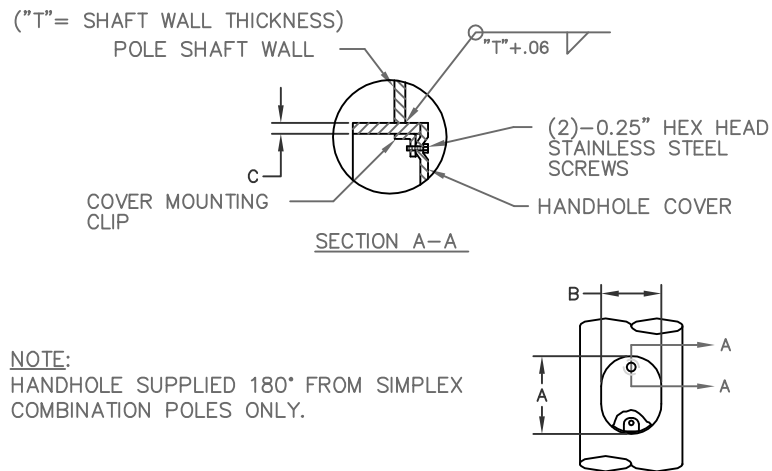
REBAR CAGE DETAILS



DETAIL 1: POLE TOP

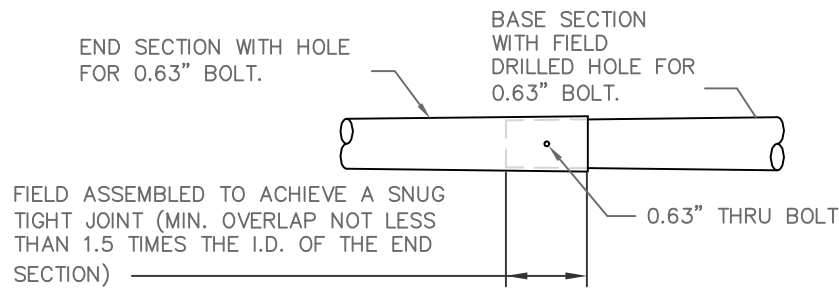


DETAIL 2: LUMINAIRE ARM ATTACHMENT



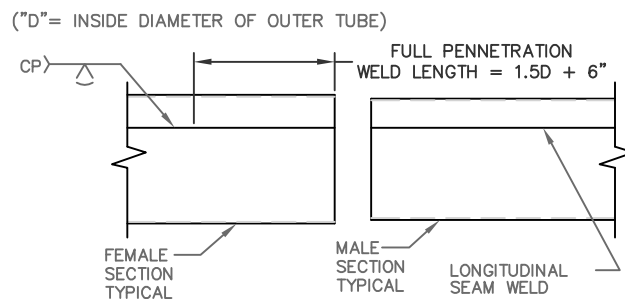
DETAIL 3: HANDHOLE

GAUGE OR THK. (IN)	A (IN)	B (IN)	C (IN)
5	7.56	5.19	0.280
0.250	7.31	5.63	0.432

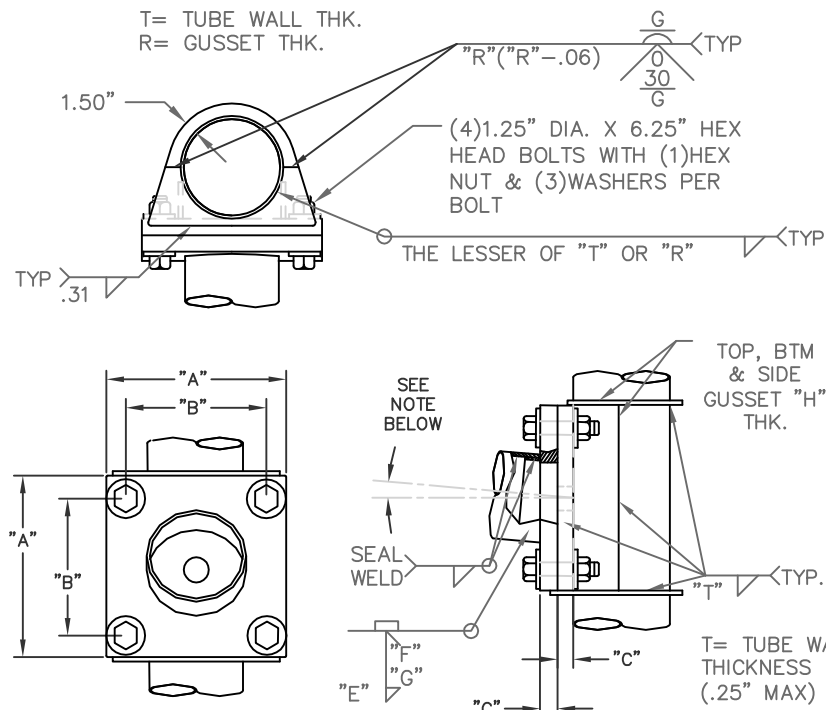


SPAN (FT)	BASE SECTION		END SECTION		
	LENGTH (FT)	THK. (IN)	BASE DIA. (IN)	LENGTH (FT)	GAUGE (IN)
52.00	38.50	0.239	8.26	15.60	7
55.00	38.50	0.239	8.26	18.60	7

DETAIL 4: 52'-55' SIGNAL ARM SLIP JOINT



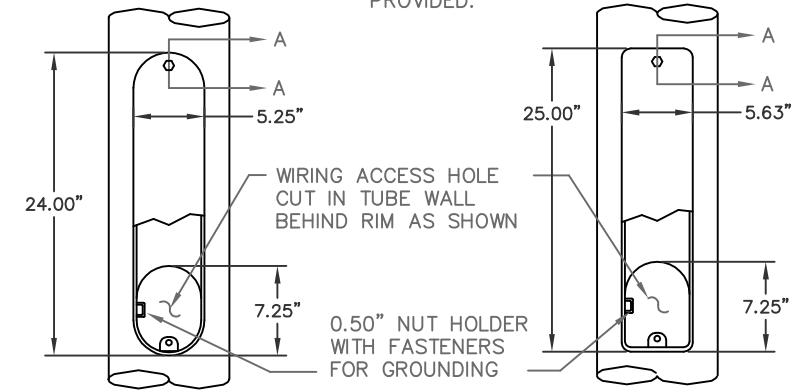
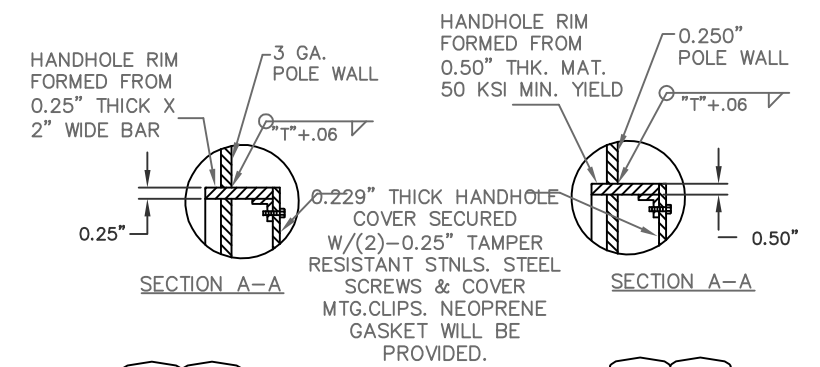
DETAIL 5: 52'-55' MAST ARM WELD REINFORCEMENT



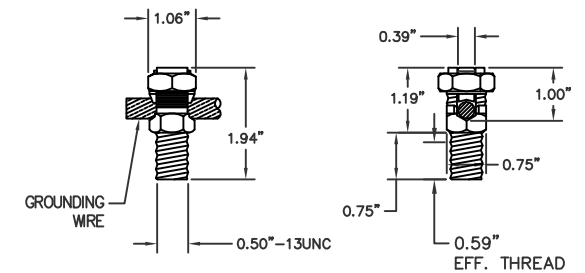
RISE NOTE:
RISE SHALL BE BUILT IN THE MOUNTING PLATE ATTACHED TO THE ARM, RISE IN MTG PLATES MAY VARY DEPENDING UPON POLE SIZE AND MAST ARM LOADING

ARM SHAFT WALL THK.	ARM-TO-PLATE WELD "E"	BEVEL "F" X "G"
ALL	(ARM THK. + .25") X ARM THK.	.19" X 30°

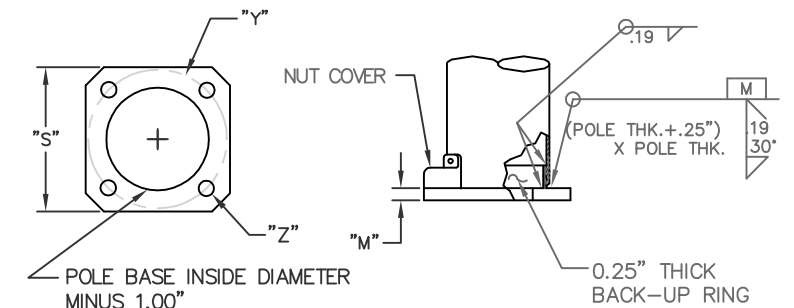
DETAIL 6: SIGNAL ARM ATTACHMENT



DETAIL 7: POLE BASE HANDHOLE



DETAIL 8: KC25 BURNDY GROUND LUG



DETAIL 9: POLE BASE

(4)-ANCHOR BOLTS WITH (2) HEX NUTS AND (2) WASHERS PER BOLT WITH THREADED END GALVANIZED AT LEAST 12.00".

DETAIL 10: ANCHOR BOLT

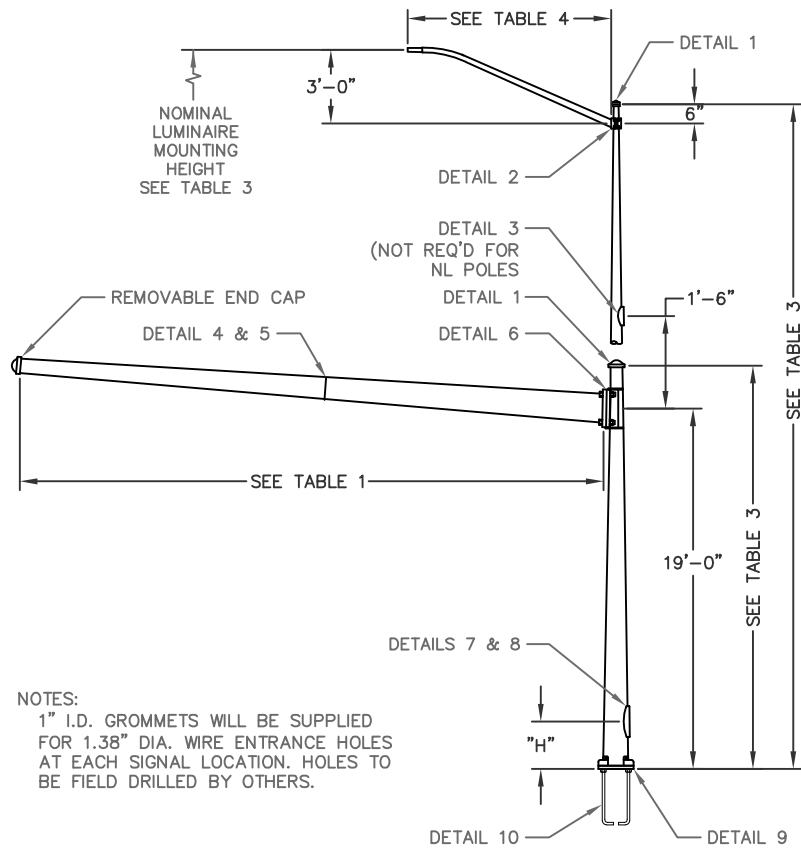
NO.	DATE	DESCRIPTION	BY

SIGNAL DETAILS 4 OF 5
XXXX & XXXX
P.N. XXXXXc

DESIGNED: XX DATE: XX/XX/XX
 DETAILED: XX SCALE: NONE
 CHECKED: XX APPROVED: XX

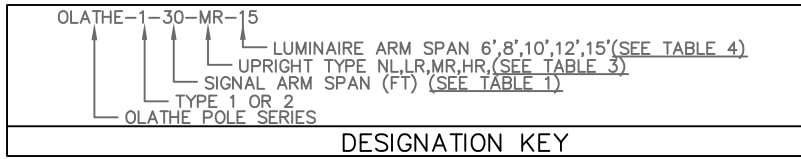
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P.O. BOX 768 OLATHE, KANSAS 66061

SHEET XX OF XX



NOTES:
1" I.D. GROMMETS WILL BE SUPPLIED FOR 1.38" DIA. WIRE ENTRANCE HOLES AT EACH SIGNAL LOCATION. HOLES TO BE FIELD DRILLED BY OTHERS.

OLATHE POLE SERIES

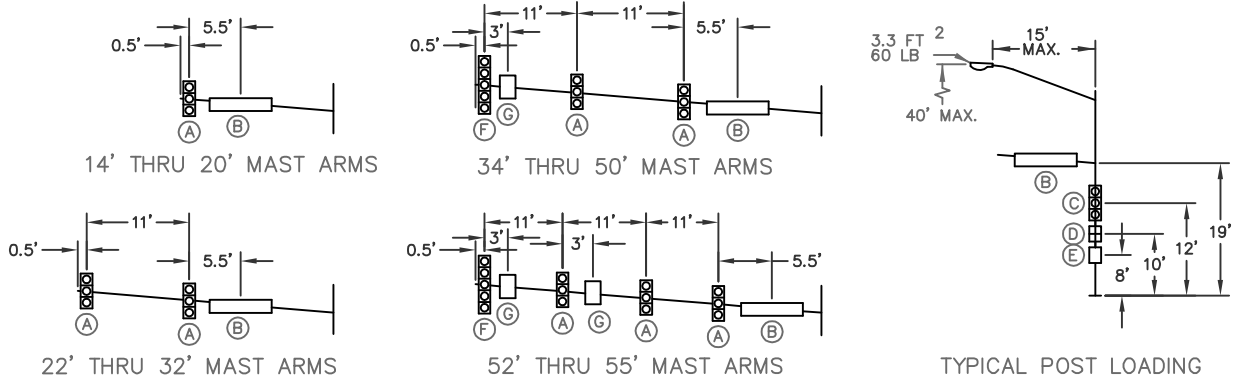


DESIGN CRITERIA:
THE MAST ARM TRAFFIC STRUCTURES SHOWN ON THIS DRAWING HAVE BEEN DESIGNED IN ACCORDANCE WITH THE LOADING AND THE ALLOWABLE STRESS REQUIREMENTS OF THE 2013 AASHTO "STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS", SIXTH EDITION, LTS-6. THE WIND LOADS WERE CALCULATED FROM A BASIC WIND VELOCITY OF 90 MPH WITH A RECURRENCE INTERVAL OF 50 YEARS, AND A FATIGUE CATEGORY OF 2. THE FATIGUE LOADS WERE CALCULATED ON THE REQUIREMENTS OF SECTION 11 OF THE CODE, AND THE FOLLOWING CONDITIONS:

- * STRUCTURES ARE DESIGNED TO RESIST NATURAL WIND GUSTS BASED ON THE YEARLY MEAN WIND VELOCITY OF 11.2 MPH.
- * STRUCTURES ARE NOT DESIGNED TO RESIST GALLOPING- INDUCED CYCLIC LOADS.
- * TRUCK-INDUCED GUST LOADS ARE EXCLUDED PER THE REQUIREMENTS OF THE CODE.

****NOTE:**
UPON INITIAL FIELD ASSEMBLY OF THE MAST-ARM'S FIRST SECTION'S BUTT PLATE TO THE MAST-ARM VERTICAL POLE'S BUTT PLATE, IF THE END USER DETERMINES THAT THERE IS A SUFFICIENT GAP AT A BOLT HOLE SUCH THAT THERE WILL NOT BE FACE-TO-FACE CONTACT BETWEEN THE TWO BUTT PLATES, THEN A WASHER SHALL BE INSERTED TO PROVIDE FACE-TO-FACE CONTACT BETWEEN THE TWO BUTT PLATES IN ACCORDANCE WITH SECTION 5.16 "BOLTED CONNECTIONS" OF THE 2013 EDITION OF AASHTO.

AASHTO 2013 SPECIFICATIONS



DEVICE	DESCRIPTION	PROJ. AREA (FT)	WEIGHT (LBS)
(A)	12"-3 SEC. SIGNAL WITH BACKPLATES	8.67	30
(B)	18" X 108" STREET NAME SIGN	13.50	30
(C)	12"-3 SEC. SIGNAL WITH NO BACKPLATES	4.08	30
(D)	DUAL-2 SEC. PEDESTRIAN SIGNAL	8.00	40
(E)	30" X 30" POLE MOUNTED SIGN	6.25	13
(F)	12"-5 SEC. SIGNAL WITH BACKPLATES	13.33	45
(G)	24" X 30" MAST ARM MOUNTED SIGN	5.00	10

LOADING INFORMATION

TABLE 2: MATERIAL DATA

COMPONENT	ASTM DESIGNATION	MIN. YIELD (KSI)
ALL TAPERED TUBES	A595 GR.A OR A572	55
BASE PLATE	A36	36
SIMPLEX PLATE	A36	36
ANCHOR BOLTS	F1554 GR.55	55
GALVANIZING-HARDWARE	F2329	--
GALVANIZING-HARDWARE	A36	36

ALTHOUGH RARE, VIBRATIONS SEVERE ENOUGH TO CAUSE DAMAGE CAN OCCASIONALLY OCCUR IN STRUCTURES OF ALL TYPES. BECAUSE THEY ARE INFLUENCED BY MANY INTERACTING VARIABLES, VIBRATIONS ARE GENERALLY UNPREDICTABLE. THE USER'S MAINTENANCE PROGRAM SHOULD INCLUDE OBSERVATION FOR EXCESSIVE VIBRATION AND EXAMINATION FOR ANY STRUCTURAL DAMAGE OR BOLT LOOSENING. THE VALMONT WARRANTY SPECIFICALLY EXCLUDES FATIGUE FAILURE OR SIMILAR PHENOMENA RESULTING FROM INDUCED VIBRATION, HARMONIC OSCILLATION OR RESONANCE ASSOCIATED WITH MOVEMENT OF AIR CURRENTS AROUND THE PRODUCT.

VIBRATION DISCLAIMER

FINISH DATA

STANDARD FINISH	OPTIONAL FINISH
SYSTEM: GALVANIZED (GV)	SYSTEM: V-PRO 54 (VP54) LIQUID (ALT)
BASE COAT: HOT-DIP GALVANIZED TO ASTM A123	BASE COAT: HOT-DIP GALVANIZED TO ASTM A123
PRIME COAT: NONE	PRIME COAT: POLYAMIDOAMINE OR POLYAMIDEE EPOXY
FINISH COAT: NONE	FINISH COAT: ALIPHATIC ACRYLIC POLYURETHANE WITH UV PACKAGE
COLOR: NONE	COLOR: BLACK
SPEC: F-1	SPEC: F-604

IN THE EVENT THAT DAMAGE TO THE POLE OR MASTARM FINISH OCCURS, THE CONTRACTOR SHALL USE THE BASE PRIMER AND FINISH COAT MATERIALS THAT ARE FURNISHED BY THE MANUFACTURER AND INCLUDED WITH THE STRUCTURE. NO OTHER PRODUCTS SHALL BE USED UNLESS APPROVED BY THE ENGINEER OR THEIR DESIGNEE.

FINISH REPAIR

TABLE 1: POLE AND MAST ARM DATA

POLE SERIES	POLE TYPE	DESIGNATION KEY		POLE TUBE			POLE BASE					ANCHOR BOLT				SIGNAL ARM TUBE				SIGNAL ARM ATTACHMENT DATA			
		TYPE	SPAN (FT)	BASE DIA. (IN)	LENGTH (FT)	GAUGE OR THK. (IN)	SQUARE "S" (IN)	BOLT CIRCLE "Y" (IN)	THICKNESS "M" (IN)	CENTER HOLE "P" (IN)	HOLE "Z" (IN)	DIAMETER (IN) "K"	LENGTH (IN) "J"	HOOK (IN) "H"	THREAD LENGTH (IN) "U"	FIXED END DIA. (IN)	FREE END DIA. (IN)	GAUGE OR THK. (IN)	LENGTH (FT)	SQUARE "A" (IN)	BOLT PATTERN "B" (IN)	THK "C" (IN)	CENTER HOLE "D" (IN)
OLATHE	1	NL,LR,MR,HR	(6) THRU (15)	12.50	SEE TABLE 3	5	17.50	17.00	2.00	11.00	1.75	1.50	54.00	6.00	8.00	8.00	6.04	7	14.00	17.25	14.00	2.00	6.64
																8.00	5.76	7	16.00	17.25	14.00	2.00	6.64
																8.00	5.48	7	18.00	17.25	14.00	2.00	6.64
																8.00	5.20	7	20.00	17.25	14.00	2.00	6.64
																8.00	4.92	7	22.00	17.25	14.00	2.00	6.64
																8.00	4.64	7	24.00	17.25	14.00	2.00	6.64
																8.00	4.36	7	26.00	17.25	14.00	2.00	6.64
																8.00	4.08	7	28.00	17.25	14.00	2.00	6.64
																8.00	3.80	7	30.00	17.25	14.00	2.00	6.64
																8.00	3.52	7	32.00	17.25	14.00	2.00	6.64
																9.00	4.24	7	34.00	17.25	14.00	2.00	7.64
																10.00	4.96	7	36.00	20.75	17.50	2.00	7.00
11.00	5.68	7	38.00	20.75	17.50	2.00	8.00																
11.00	5.40	7	40.00	20.75	17.50	2.00	8.00																
12.00	6.12	7	42.00	20.75	17.50	2.00	8.75																
12.00	5.84	7	44.00	20.75	17.50	2.00	8.75																
12.50	6.06	5	46.00	20.75	17.50	2.00	8.00																
12.50	5.78	5	48.00	20.75	17.50	2.00	8.00																
12.50	5.50	5	50.00	20.75	17.50	2.00	8.00																
13.00	7.61	SEE DET. 3	52.00	20.75	17.50	2.00	7.00																
13.00	8.61	SEE DET. 3	55.00	20.75	17.50	2.00	7.00																

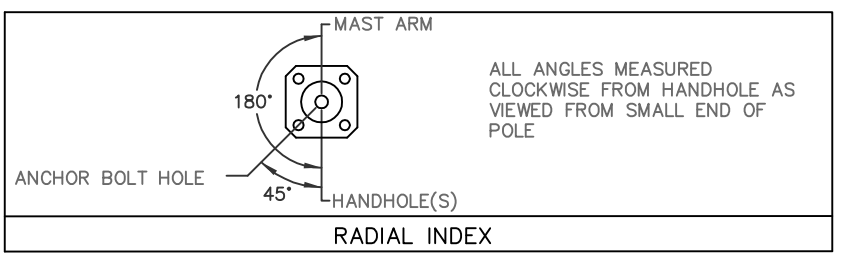


TABLE 3: ELEVATION DATA

ELEVATIONS	TYPE		
	NO LUMINAIRE (NL)	LOW RISE (LR)	MEDIUM RISE (MR)
LUM. MOUNTING HEIGHT	---	30'-0"	35'-0"
POLE LENGTH	20'-6"	27'-6"	32'-6"

SPAN	FIXED END DIA.	FREE END DIA.	GAUGE
6'	3.38"	2.40"	11
8'	3.62"	2.40"	11
10'	3.89"	2.40"	11
12'	4.16"	2.40"	11
15'	4.58"	2.40"	11

REVISIONS

NO.	DATE	DESCRIPTION	BY

SIGNAL DETAILS 5 OF 5
XXXX & XXXX
P.N. XXXXXc

DESIGNED: XX
DATE: XX/XX/XX
CHECKED: XX
SCALE: NONE
APPROVED: XX

CITY OF OLATHE
PUBLIC WORKS / TRAFFIC DIVISION
P.O. BOX 768 OLATHE, KANSAS 66061

SHEET XX OF XX

FIBER OPTIC EQUIPMENT

ITEM (***)	SIZE	MODEL	UNIT
Fiber Distribution Unit (Complete) - See Dlathe specifications	1U	ADC FDU 1U RMG	-
Factory Pigtail with connector (including splices)	-	From Factory	-
Splice enclosure - complete	24	Tyco FOSC 450	-
Splice enclosure - complete	48	Tyco FOSC 450	-
Splice enclosure - complete	96	Tyco FOSC 450	-
Patch cable SM duplex SC/LC	1 meter	-	-
Patch cable MM duplex ST/ST	1 meter	-	-
Fiber optic cable SM/MM 12/12	-	See Dlathe Spec.	-
Fiber optic cable SM 6	-	See Dlathe Spec.	-
Fiber optic cable SM 24	-	See Dlathe Spec.	-
Fiber optic cable SM 48	-	See Dlathe Spec.	-
Fiber optic cable SM 96	-	See Dlathe Spec.	-
Fiber optic junction box - Type III	24 x 36	-	Each
Fiber optic junction box - Type IV	30 x 48	-	Each
Tracer wire	-	See Dlathe Spec.	-
GILA Duct conduit (Interconnect)	2 Inch	See Dlathe Spec.	Lin Ft
Splices (FDU)	-	-	-
Splices (Enclosure)	-	-	-
-	-	-	-
-	-	-	-

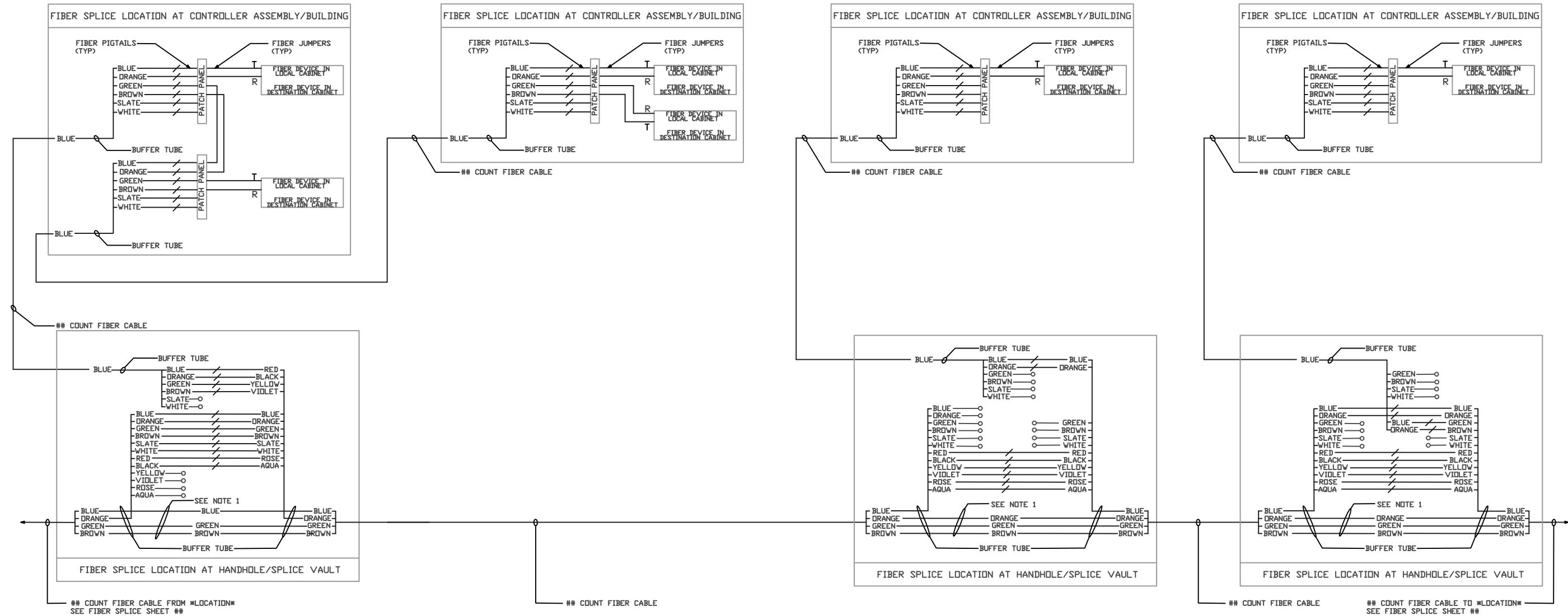
*** To include all jumpers & equipment for full operation.

NOTES

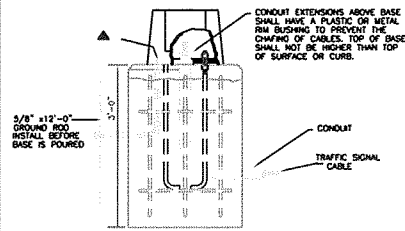
- UNUSED BUFFER TUBES SHALL PASS THROUGH SPLICE ENCLOSURE WITHOUT SPLICING, DO NOT BREAK OUT INDIVIDUAL FIBERS.
- UNTERMINATED FIBERS/BUFFER TUBES SHALL BE STORED IN SPLICE TRAYS.
- ALL PIGTAILS AND JUMPERS SHALL BE TERMINATED WITH ST STYLE CONNECTORS. PATCH PANELS (FIBER DISTRIBUTION UNITS) ARE TO BE CONFIGURED WITH ST STYLE CONNECTORS.
- FOR LOCATIONS WITH MULTIPLE SPLICE TRAYS, CONTRACTOR SHALL DENOTE ON DRAWINGS WHICH SPLICE TRAY EACH SPLICE IS STORED IN.
- NO-FIBER CONNECTIONS BETWEEN EQUIPMENT LOCATED WITHIN HANDHOLES/SPLICE VAULTS, WITHIN THE REGENERATION BUILDING, AND WITH CONTROLLER ASSEMBLES ARE NOT SHOWN.
- ALL FIBERS IN THE BUFFER TUBE(S) SHALL BE SPLICED IN THIS ENCLOSURE.

LEGEND

- FIBER SPLICE
- FIBER SPLICE OF EACH FIBER IN BUFFER TUBE
- UNTERMINATED FIBER
- T** TRANSMIT
- R** RECEIVE
- FIBER DEVICE IN LOCAL CABINET
- FIBER DEVICE IN DESTINATION CABINET
- FIBER SPLICE LOCATION AT CONTROLLER ASSEMBLY / BUILDING
- FIBER SPLICE LOCATION AT HANDHOLE / SPLICE VAULT

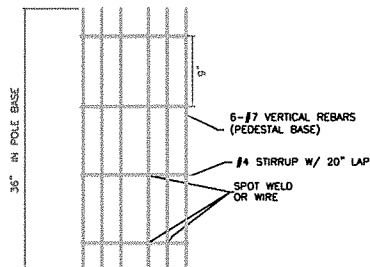
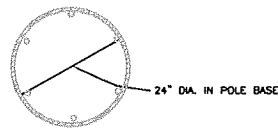


2 - BOLT CIRCLE PER POLE MANUFACTURER'S SPECIFICATIONS.

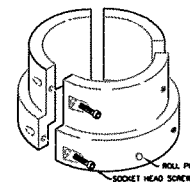


▲ NO. 6 BARE COPPER GROUND CONDUCTOR FROM GROUND ROD CLAMP ON GROUND ROD TO INTERNAL GROUNDING NUT. A CONNECTION SHALL BE MADE BETWEEN THE INTERNAL GROUNDING NUT AND THE SYSTEM NEUTRAL WITH NO. 6 BARE COPPER WIRE.

FOUNDATION DETAILS

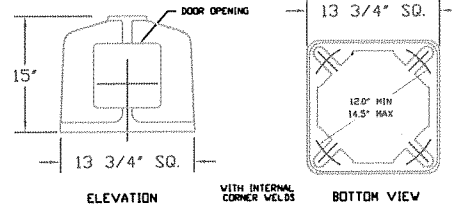


REBAR CAGE DETAILS

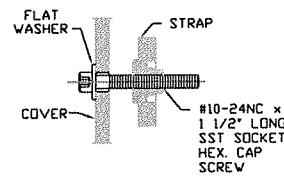


ROLL PIN AND SCREW CAP SOCKET HEAD SHALL BE STAINLESS STEEL

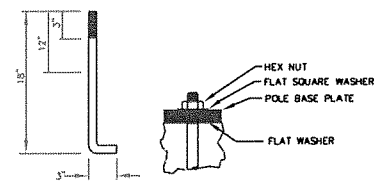
POLE AND BASE COLLAR ASSEMBLY DETAILS



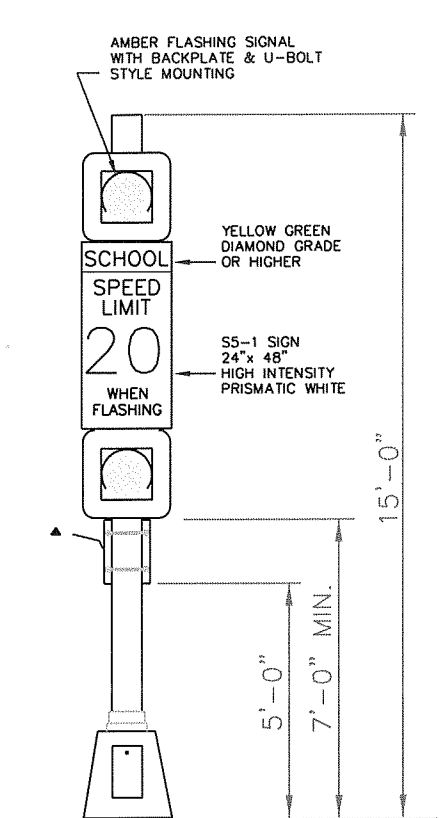
PEDESTAL & BASE DETAILS



DOOR SCREW DETAILS

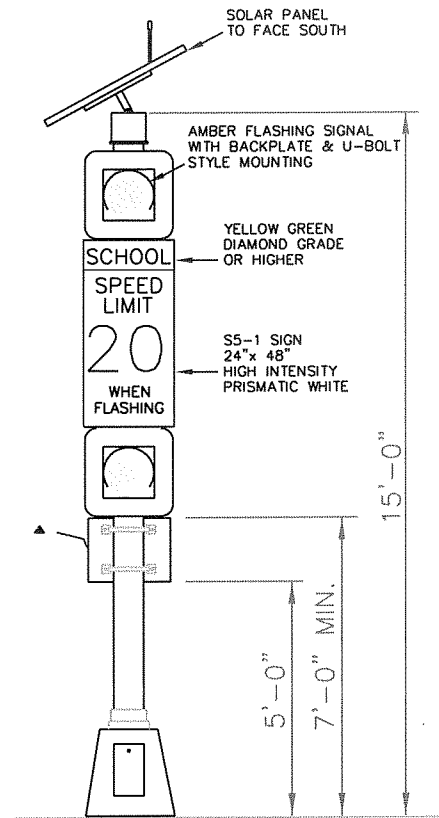


ANCHOR BOLT DETAILS



▲ FLASHER CONTROLLER ASSEMBLY, PELCO SE-1000 WITH RTC-CPR2102R RADIO PAGER TIME SWITCH

SCHOOL ZONE SIGNAL DETAIL



▲ FLASHER CONTROLLER ASSEMBLY, RTC 503649UB SOLAR CABINET WITH MK 100AMP HR BATTERY

SCHOOL ZONE SOLAR SIGNAL DETAIL

MATERIAL DATA

Component	Aluminum Alloy Designation	Specification
24 x 48, S5-1 High Intensity Sign	6062-H38	ASTM B26 or B108
Flashed Sign	356-T6 Cast	ASTM B26 or B108
Pole and Base Collar Assembly	PP-3323	ASTM B26 or B108
Pole Shaft	6063-T6, Drawn Seamless Tubing	ASTM B221 or B241
Ground Lug	6061-T6 or 6063-T6, Plate	ASTM B221
Handhole Cover	6063-T6	ASTM B26, B271 or B241
Pole Cap	306, Cast	ASTM B26 or B108
Anchor Bolts	NA	ASTM A-36 S146, Galvanized per ASTM A-153

TRAFFIC SIGNAL PEDESTALS.

Traffic signal pedestals shall consist of an aluminum shaft of the length specified in the Plans, a cast aluminum base, collar assembly, anchor bolts with nuts and washers, and be provided with a pole cap. All attachments to the pedestal shall be located in the field and all wire entrances into the pedestal shaft shall be drilled or punched in the field. All drilled or punched surfaces shall be carefully reamed to remove any sharp edges or burrs. Plastic or rubber bushings shall be installed at each opening before the wires are installed.

SHAFT

The shaft shall be of Type 6061-T6, 6063-T6 or 6063-T832 aluminum alloy, and shall be a single piece of drawn seamless tubing having a nominal 4.5 inch/110 mm outside diameter and .25 inch/6mm wall thickness. The shaft shall be threaded at one end for attaching the shaft to the base. The shaft shall have a uniform polished finish.

BASE

The pedestal base shall be A.A.S.H.T.O. certified and be cast of Type 356.0-T6 aluminum alloy. It shall have a threaded collar with a pole and base collar assembly, and plastic hand hole cover. Bases shall be bolted to the concrete foundation and lightened to the manufacturer's recommendations.

ANCHOR BOLTS

Galvanized steel anchor bolts with a 50,000 PSI minimum yield for traffic signal pedestals shall be of the dimensions detailed in the Plans and shall meet the requirements of the latest edition of A.S.T.M. A36. The top 10" minimum of the threaded ends of the anchor bolts shall be galvanized, and nuts and washers galvanized to ASTM A-153 standards shall be included with the anchor bolts. Anchor bolts for traffic signal pedestals will be visually accepted by the Engineer.

HARDWARE

All hardware (bolts, nuts, washers but not including anchor bolts) not otherwise specifically designated in the specifications or details shall be aluminum or 300-series passivated stainless steel. The post cap and hand hole cover provided with the pedestal shall be securely installed prior to acceptance of the signals.

SECTION 9200 - TRAFFIC SIGNAL

9201 DESCRIPTION

These specifications are intended to describe the equipment, material, and construction requirements for the lump sum bid item Traffic Signal Installation. The installation shall include all poles, foundations, conduit, pull boxes, wiring, signal heads, detectors, control equipment and such other miscellaneous parts and materials as shown in the Plans or as otherwise required by the Engineer.

9202 GENERAL CONSTRUCTION

The traffic signal installation shall be constructed per the following specifications, as directed by the Engineer, and the latest edition of the City of Olathe's General Provisions and Technical Specification (hereinafter referred to as "General Provisions" or "Technical Specifications"), the latest edition of the Kansas Department of Transportation Standard Specifications for State Road and Bridge Construction (hereinafter referred to as "Standard Specifications"), and the latest edition of the Kansas Department of Transportation Traffic Signal Specifications included in the standard details TE120A, TE120B, TE120C, and TE120D (hereinafter referred to as "KDOT Signal Specifications") that are either directly or by reference included herewith. All incidental parts which are not shown in the Plans or in the Specifications and which are necessary to complete the traffic signal installation shall be furnished and installed as though such parts are shown in the Plans or specified herein. The traffic signal system shall be complete and in operation to the satisfaction of the Engineer and the City at the time of acceptance of the work. All signs, signals, and markings shall conform to the latest edition of the Manual on Uniform Traffic Control Devices (MUTCD).

9203 COORDINATION OF TECHNICAL SPECIFICATIONS, PLANS, SPECIAL PROVISIONS, AND PROJECT SPECIAL PROVISIONS

Coordination of discrepancies between the Technical Specifications, Plans, and Special Provisions, shall be in accordance with the City of Olathe *Technical Specifications* and *Design Criteria for Public Improvements*. In the case of a discrepancy within the Plans, the plan notes shall govern over the standard installation details, and the installation details shall govern over these specifications.

9204 CERTIFICATION OF CONTRACTOR PERSONNEL

All traffic signal installation work shall be done by, or in the presence of and under the responsible charge of a Contractor with proof of International Municipal Signal Association (IMSA) Level II Traffic Signal Construction Certification.

A. Before starting work, the Contractor shall provide the City Engineer with the names and certification credentials of the Level II Traffic Signal Electricians and/or Level II Traffic Signal Technicians assigned to perform traffic signal related work. If the Level II Traffic Signal Electricians or Level II Traffic Signal Technicians are dismissed from the project, all traffic signal installation work shall cease until the names and photocopies of certification cards for replacement personnel are provided to the City Engineer.

9205 TRAFFIC SIGNAL PRODUCTS & MATERIAL LIST

Prior to commencing traffic signal installation, the Contractor shall submit a complete list of traffic signal products and materials proposed for the installation. All equipment supplied for the traffic signal installation shall be listed on the most recent edition of the City of Olathe's Approved Products List (APL). Products not included on the APL shall be tested and approved in accordance with Section 9227 of these specifications prior to construction.

9206 LOCATION OF UNDERGROUND UTILITIES

The location of underground utilities on the approved plans is not guaranteed. The Contractor shall have all underground utilities marked and located, potholing where necessary, before beginning any construction excavation, and shall work around any existing utilities located within the right-of-way which do not conflict with the proposed construction. The Contractor shall be responsible for all damages to underground utilities due to his failure to preserve the utility markings.

9207 NOTIFICATION OF LOCAL POWER COMPANY

The Contractor shall notify the local power company prior to beginning work to determine the proper type and method of hook-up. The Contractor shall be responsible for payment of any fees assessed by the power company for the power hook-up, regardless of whether these costs have been listed in the approved plans. The fees may include, but are not limited to, service connection fees, conduit, lead-in wire, service pole, meter landing, and power used during installation and testing, until the traffic signals are accepted.

9208 STAKING OF POLES, PEDESTALS, PULL BOXES, CONTROLLER, AND LOOP LOCATIONS

The locations for signal poles, pedestals, service boxes, junction boxes, controller and detector loops shall be staked by the Contractor. Staked locations shall be approved by the City Engineer prior to construction of each item.

9209 TRAFFIC SIGNAL IMPROVEMENT POLICIES

The work included in this project may involve replacement and/or modification of existing traffic signal equipment at a location which is presently controlled by operating traffic signals. The following policies are to be observed during the proposed modifications and improvements:

- A. Existing Operation. Unless otherwise noted in the approved plans, the Contractor shall provide continuous operation of the existing traffic signals during the signal modifications and improvements except for shutdowns as required for installation of the proposed improvements.
- B. Periods of Disruption. The Contractor shall coordinate any planned disruption of signal operations with the City Engineer and Traffic Operations staff (913-971-5180) at least forty-eight (48) hours in advance of such disruption of operations.
- C. Disruption Times. Planned disruption of signal operations shall be limited to the hours between 9:00 a.m. and 3:00 p.m., unless otherwise noted in the approved plans. Traffic control during signal disruptions shall be provided as directed by the City Engineer. The signal controls shall be operable during all other periods.
- D. Existing Wiring. All existing wiring within existing controller cabinets shall be identified by the Contractor and each conductor properly labeled, in accordance with the Standard Details and Section 9217 of these specifications, prior to de-energizing the existing controller.

9210 SALVAGED EQUIPMENT

- A. Reinstalled. When salvaged equipment is to be reinstalled, the Contractor shall furnish and install all necessary new materials and equipment including anchor bolts, nuts, washers, concrete, etc. required to install the salvaged equipment in the existing or new location.
- B. Non-Reinstalled. When salvaged equipment is not to be reinstalled, it shall be returned to the City of Olathe Traffic Operations Center (TOC) located at 309 N. Rogers Rd. The Contractor shall notify the TOC Supervisor within forty-eight (48) hours prior to delivery of the equipment. The stored equipment shall be the responsibility of the Contractor until it is delivered to the TOC.

9211 REMOVAL OF EXISTING FOUNDATIONS

Existing foundations for traffic signal poles, pedestals and controllers shall be removed a minimum of twenty-four (24) inches below finished grade, and the area backfilled in accordance with Section 7000 of the Technical Specifications.

9212 CONDUIT INSTALLATION

Conduit shall be installed in accordance with Section 9000 City of Olathe Technical Specifications and the Standard Details. The conduit shall be of the type indicated in the approved plans and shall be of one type from outlet to outlet.

- A. Conduit under existing pavement, sidewalk, or driveways shall be installed using an approved jacking or boring method.
- B. All conduit installed above ground shall be metallic. Conduit attached to bridges shall have expansion fittings installed at the end of the bridge and at each expansion joint on the bridge. Any attachments to bridges on the state highway system must be approved by the applicable regulatory agency.
- C. All metallic conduits shall be electrically bonded by a grounding bushing and ground wire as detailed in the approved plans.
- D. High Density Polyethylene (HDPE) SDR9 conduit joints shall be made with either a Shur-Lock II™ coupler or fusion welder.
- E. Polyethylene conduit shall be continuous from outlet to outlet, with no splices allowed. Bend radii shall not exceed the manufacturer's recommendations.

9213 PULL BOXES

Service box and junction box installations shall be per the Standard Details, and as noted below. The location of boxes may be adjusted during installation to clear obstructions and facilitate wiring as approved by the City Engineer but shall be installed no closer than twenty-four (24) inches from the back of curb. The quantity of boxes as shown in the approved plans may not be reduced. Additional boxes may be provided at the Contractor's expense. Boxes shall not be located in sidewalk ramps. All boxes shall be free of trash, wire scraps, etc.

- A. Bedding. An eighteen (18) inch thick layer of aggregate shall be provided under all pull boxes. The aggregate shall meet the requirements of PB-2 described in Subsection 1107 of the Standard Specifications and shall be visually accepted by the City Engineer.
- B. Conduit Entrances. The area around the conduit entrance in in-ground boxes shall not be larger than one (1) inch and shall be sealed with a mortar grout or a silicone sealant (Spray foam is not allowed).
- C. Cable Hooks. Cable hooks shall be installed in service boxes as detailed in the approved plans.
- D. Bridge Mounted. Junction boxes mounted to bridges shall be mounted with wedge anchor bolts of sufficient size and strength to safely secure the box to the structure. The surface of the

junction box which comes in contact with concrete shall be covered with aluminum colored butyl rubber sealant (caulking compound). Any attachments to bridges on the state highway system must be approved by the applicable regulatory agency.

9214 FOUNDATIONS

Concrete foundations for poles, pedestals and cabinets shall be constructed per the Standard Specifications, as modified below, and as detailed in the approved plans.

- A. Reinforcing steel shall meet the requirements of Section 1600 of the Standard Specifications, and shall be free of rust and dirt, and shall be of the size, quantity and dimensions shown in the approved plans.
- B. Before placing the concrete for the foundation, the Contractor shall ensure that the appropriate anchor bolts are placed in proper orientation, elevation and verticality. This may be accomplished by using positioning plates and/or tying or welding the anchor bolt assembly to the reinforcing steel cage. "Stabbing" of anchor bolts will not be permitted.
- C. The anchor bolt threads shall be protected from concrete fouling when the concrete is poured.
- D. All piers for foundations shall be drilled and constructed in one pour. The top six (6) inches of pole and pedestal foundations shall be formed in a square and shall be level with the adjacent sidewalk, or approximately two (2) inches above finished grade if no sidewalk is present. The work apron on the controller pad shall be level with the adjacent sidewalk or approximately one (1) inch above finished grade if no sidewalk is present.

9215 TRAFFIC SIGNAL POLES AND PEDESTALS

A. Traffic Signal Poles. The traffic signal poles shall be plumbed after the mast arm and other loads have been applied. Adjustment shall be made using the leveling nuts on the anchor bolts. The final distance between the top of the concrete foundation and the bottom of the leveling nuts shall not exceed 1 inch. The nuts shall be thoroughly tightened to the manufacturer's recommendations and covered with the nut covers provided with the poles. The handhole bolts provided with the poles shall be replaced with 1/4 - 20 x 1-inch hex head, stainless steel bolts.

1. The mast arm and luminaire arm(s) (on combination poles) shall be attached to the pole by a suitable mast arm connection. Clamp on connections will not be accepted. Connections shall be installed to the manufacturer's recommendations.
 2. All other attachments to the poles and mast arms shall be located in the field, and all wire entrances into the pole or mast arm shall be drilled or punched in the field. All drilled or punched surfaces shall be carefully reamed to remove any sharp edges or burrs before application of a field coat of organic zinc rich paint as described in Subsection 1801 of the Standard Specifications. The one (1) inch rubber grommets supplied with the poles shall be installed at all outlets for signal wiring before the wires are installed.
 3. Contractor shall provide a screen to keep rodents from entering the pole through the gap at the base. The screen material shall be a stiff, welded steel wire mesh with 1/4" square openings, and shall be wrapped around the pole anchor bolts, securing ends together with wire ties or other suitable banding material as approved by the City. The screen shall be wedged between the base of the pole and the surface of the foundation after the pole is plumb. Before signal is accepted, grouting, with 1/4-inch weep holes, will be required to fill the void between the base of the pole and foundation.
 4. The end caps provided with the poles shall be securely installed on the end of the arms and the top of the pole prior to acceptance of the signals.
- B. Pedestals. The cast aluminum pedestal bases shall be bolted to the concrete foundation using 3/4" by 2" galvanized square washers and tightened to the manufacturer's recommendations.
1. All attachments to the pedestal shall be located in the field and all wire entrances into the pedestal shaft shall be drilled or punched in the field. All drilled or punched surfaces shall be carefully reamed to remove any sharp edges or burrs. Plastic or rubber bushings shall be installed at each opening before the wires are installed.
 2. The post cap and hand hole cover provided with the pedestal shall be securely installed prior to acceptance of the signals.
 3. The pole shall be screwed into the pedestal base and have a pole and base collar assembly affixed, to prevent the pole from loosening.

9216 TRAFFIC SIGNAL HEAD INSTALLATION

- A. General. The faces of all signal heads shall be completely covered with orange mesh lens covers until signal turn-on. Signal heads shall not be installed more than ten (10) days prior to the signal turn-on, or before meter is installed at service, unless otherwise approved by the City Engineer. All heads shall be plumbed as viewed from the direction in which they face and in the vertical plane. The City Engineer shall direct the final positioning of the signal heads for optimum visibility.
- B. Mast Arm Mounting. Mast arm signal head assemblies shall be rigidly mounted in accordance with the approved plans. The brackets shall be securely attached to the mast arm according to the manufacturer's recommendations. All conductors shall be concealed within the assembly.

REVISIONS			
NO.	DATE	DESCRIPTION	BY
1	10/21		DG

SIGNAL TECH SPECS PAGE 1	PROJECT NAME	DATE: XX/XX/XX
	P.N. XXXXX	SCALE: NONE
		CHECKED: XX
		APPROVED: XX

CITY OF OLATHE
PUBLIC WORKS / TRAFFIC DIVISION
P.O. BOX 768 OLATHE, KANSAS 66061

SHEET
XX OF XX

REVISIONS		NO.	DATE	DESCRIPTION	BY
1	10/21				DG

SIGNAL TECH SPECS PAGE 2	PROJECT NAME P.N. XXXXXC	DATE: XX/XX/XX
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CITY OF OLATHE
PUBLIC WORKS / TRAFFIC DIVISION
P.O. BOX 768 OLATHE, KANSAS 66061

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1. All mast arm signal heads shall be attached to the mast arm at the time of mast arm installation to minimize the effects of vibration. Special care must be taken before drilling the arm for attaching the signal heads in order to assure that the signal heads will be in proper orientation over the intended traffic lanes.
 2. Mast arm mounted signal heads shall be installed at a height of 17 to 19 feet from the pavement to the bottom of the signal head, with 17 feet being the desirable minimum height.
- C. Side-Of-Pole Mounting. Side-of-pole signal heads shall be supported in accordance with the Standard Details. All members shall be either plumb or level, symmetrically arranged, and securely assembled. Mounting brackets shall be attached to the pole with heavy duty, black coated, stainless-steel banding and buckles. All conductors are concealed within the assembly.
1. Side-of-pole signal heads shall be mounted on the opposite side of the pole from the mast arm unless otherwise specified by the City Engineer. Signal head shall be oriented so that indication doors open away from pole, and if inverted, shall have weep holes plugged to prevent moisture from entering the head.
 2. Side-of-pole traffic signal heads shall be installed at a minimum height of 10 feet from the base of pole to the bottom of signal head.
 3. Pedestrian signal heads shall be mounted at a minimum height of 7 feet from the base of pole to the bottom of the signal head.

9217 WIRE AND CABLE INSTALLATION

- A. General. Wire and cable shall be installed per the Standard Specifications, as modified herein, and in accordance with the wiring diagram in the Plans. Cable runs for overhead mounted equipment including, but not limited to, L.E.D. street name signs, video observation equipment, Opticom, and Wavetronix units shall be a complete, continuous run back to the signal cabinet, without any splices. No splicing of wire/cable for the signal shall be allowed except for the following:
1. Loops. The ends of the wire forming each loop shall be spliced in the nearest junction box to a detector lead-in cable. Splices between loops and lead-in cables shall be twisted and secured with a wire nut, and the splice shall be waterproofed including the end of the loop wire tubing, using an approved loop splice kit. Taped splices will not be permitted. The splice shall be located in the upper seventy-five (75) percent of the box.
 2. Multi-conductor Cable in Pedestal Bases. Multi-conductor cable runs to pedestal bases shall be spliced in the pedestal base to the multi-conductor cables running up the pedestal shaft to the signal heads and/or pushbuttons. Each conductor shall be clearly labeled, as to its function, in accordance with the City of Olathe Color Code, and the splices shall be carefully waterproofed. The wires shall be arranged in the base to prevent the splices from coming into contact with the sides of the base or top of the foundation. Any unused conductors shall be taped.
- B. Pulling Wires and Cables through Conduit. Separate three (3) inch conduits shall be provided for both low and high voltage wire bundles. When pulling wires into the conduit, a pulling sock or other similar device shall be used to equalize pulling strain on the conductors.
- C. Excess Cable. A minimum of 6 feet of slack or excess multi-conductor cable, detector lead-in cable, loop detector wire, and lighting distribution wire shall be provided in each pull box. The excess cable in service boxes shall be logically grouped, taped, and neatly coiled and placed on the cable hooks. The excess cable in junction boxes shall be logically grouped, taped, and neatly coiled and placed in the bottom of the box. At least 6 feet of excess multi-conductor cable shall be left in each pole base to allow for connection to the terminal block.
- D. Termination of Field Wires In The Cabinet And Pole Bases. The Contractor shall clearly identify the function of each field wire entering the cabinet or pole base with a permanent label in accordance with the City of Olathe Color Code. Contractor shall leave 15 feet of slack in cabinet and 6 feet of slack in pole bases for termination.
- E. Pole Wiring. Each signal head shall have a separate run of multi-conductor cable from the terminal block in the pole base to the terminal block in the signal head. A separate seven-conductor cable shall run to each three-section signal head. A separate seven-conductor cable shall run to each four- or five-section signal head. A seven-conductor, or three-conductor cable shall run to each pair of pedestrian heads. A separate two-conductor cable shall run continuously, without splices, from the push-button to the field terminal in the cabinet. All four-section heads shall have their own neutral run back to the cabinet. The ends of any unused conductors shall be taped.
- F. City Of Olathe Color Code. The Contractor shall adhere to the following standardized color code: Westbound - Blue; Northbound - Red; Eastbound - Orange; Southbound - Green; Left Turn - White; Pedestrian - Yellow
- G. City Of Olathe Standard Phasing. The Contractor shall adhere to the following standardized phasing. Westbound - Ø2; Northbound - Ø4; Eastbound - Ø6; Southbound - Ø8; Westbound Left Turn - Ø5; Northbound Left Turn - Ø7; Eastbound Left Turn - Ø1; Southbound Left Turn - Ø3, unless otherwise specified by the City Engineer.

9218 GROUNDING / BONDING

The traffic signal system shall be grounded per the Standard Specifications and as specified herein.

All traffic signal poles, pedestals, controller cabinets, and service circuit breakers shall be grounded using a ground wire bolted to the inside of these devices with a 0.5-inch internal ground lug. All ground wires shall be attached to the ground rod with a ground clamp. Ground rods shall be installed as detailed in the Plans.

- A. The detector lead-in shielding and drain wire shall be electrically floating (not attached to earth ground) at the pull box. Grounding the cabinet shall be in accordance with the manufacturer's recommendations.

9219 DETECTOR LOOP INSTALLATION

- A. General. Detector loops shall be installed as close as practicable to the locations shown in the Plans. Loops shall be centered in their respective lanes; or if they cover more than one lane, they shall be centered over the width of the intended zone of detection. The longitudinal orientation of loops installed in concrete pavement shall be adjusted such that no loop begins or ends within 12 inches of a transverse joint.
- B. Pre-Formed Loops. Pre-formed loops shall be used in installations where lanes are being constructed from newly poured concrete, and in accordance with the manufacturer's recommendations. Special care must be taken to place the loops in their proper location in relation to the final lane configuration.
- C. Saw-Cut Loops. Saw-cut loops shall be installed in saw cuts as detailed in the Plans. The location of each loop shall be clearly marked on the pavement and approved by the City Engineer prior to loop installation. The Contractor shall drill 2-inch diameter holes centered on each point of intersection of the loop slots prior to cutting the slots. The slots shall be cut using a saw equipped with a depth gauge and horizontal guide to assure proper depth and alignment of the slot. The blade used for the saw cut shall provide a clean, straight, well-defined saw cut of the width and depth indicated in the Plans without damage to adjacent areas. Where the loop changes direction, the saw cuts shall be overlapped to provide full depth at all points of intersection.
1. Before installing the loop wire, the slots shall be checked for the presence of jagged edges or protrusions. Should these exist, they must be removed. The slots must be cleaned and dried to remove cutting dust, grit, oil, moisture, or other contaminants. Cleaning shall be achieved by flushing the slot with a high-pressure water jet stream. The slot shall then be cleared of water and dried using oil-free compressed air.
 2. Loop wire shall be installed in the slot using a dull edge wooden paddle or wheel to prevent damage to the loop jacket. Conductors of each loop shall be run continuously from the nearest junction box with no splices permitted. All loops shall be wound in the same direction with the start and end of each clearly marked with a permanent label at the junction box. The loop conductors running from the loop to the adjacent junction box shall be twisted a minimum of 3 turns per foot/10 turns per meter. In addition, each loop conductor shall be permanently identified by the loop number shown in the approved plans. Paired loops shall be joined in the junction box in series or parallel so that optimum sensitivity as recommended by the detector manufacturer is obtained at the sensor unit.
 3. After the conductors are installed in the slots, the loops shall be tested for continuity and shorts with a meg-ohm-meter set at 500 Volts. Any defective wire shall be replaced. After testing, the slots shall be filled with an approved loop sealant to within 0.125 inches of the pavement surface. Before setting, surplus sealant shall be removed from the adjacent road surfaces without the use of solvents.
- D. The loop conductors for each loop shall be spliced in the junction box to a detector lead-in cable in accordance with section 9217 of these specifications. The detector lead-in cable shall run continuously from the junction box to the field terminal in the cabinet with no splices permitted.

9220 SIGNS

- A. Overhead Street Name Signs. Street name signs shall be installed on mast arms after all other loads are applied to the mast arm. The signs shall be located in accordance with the plan details. Signs shall be mounted so that the legend is level. The final location shall be determined by the City Engineer.
1. L.E.D. Street Name Signs. LED street name signs shall have a separate 1-3c, No. 14 AWG cable and shall be a continuous run from the sign to the cabinet, without splices.
- B. Regulatory Signs. The R10-Series signs shall be mounted on the mast arm to the right of the left turn signal head using an approved sign mounting bracket as shown in the traffic signal installation details.
- C. R10-3E Pedestrian Push-Button Signs. Pedestrian push-button signs shall be mounted to the traffic signal pole above the appropriate pedestrian push-button. Mounting shall be accomplished using suitable stainless-steel banding, clamps and brackets capable of withstanding 100 mph winds. As an alternative, the pedestrian sign mounting bracket may be constructed integral to the pedestrian push-button assembly.

9221 PEDESTRIAN PUSH-BUTTONS

Pedestrian pushbuttons shall be installed on the poles or pedestals indicated in the approved plans. They shall be installed at a height of 3.5 ft above the adjacent sidewalk (or ground if no sidewalk is

present). The push-button shall be located on the side of pole nearest the pedestrian walkway, and perpendicular to the intended crossing direction. The push button shall be installed on a level landing area, not in an ADA ramp, and be located within 24" Maximum (12" Desirable) of the level landing area.

9222 TRAFFIC SIGNAL TURN-ON

- A. Flashing Operation. At locations without previous traffic signal control, the new traffic signals shall be flashed 2 to 3 business days prior to full signal system turn-on.
- B. System Turn-On. The signal system turn-on shall not occur on Mondays, Fridays, weekends, or holidays and shall be completed prior to 3:00 p.m. on the day of the turn-on.
- C. Supplier Representative. The supplier of control equipment shall have a representative present at the signal system turn-on.
- D. Traffic Engineering Notification. The Advanced Traffic Management System (ATMS) Supervisor shall be notified at least one week in advance of the date of signal turn-on.

9223 TEST PERIOD

Following completion of all electrical apparatus hook-ups and the system turn-on, the signals shall operate satisfactorily for 30 days under normal operation prior to acceptance by the City Engineer. During the test period, the signals shall operate trouble-free with no major failures of the controller or its components. Should any defect develop under normal and proper operating conditions during the testing period and prior to acceptance by the City Engineer, this malfunction shall be corrected by and at the expense of the Contractor, including all labor, materials, and associated costs. Minor failures such as lamp failures or loop detector re-tuning will not be the basis for starting a new test period, provided the failures are repaired immediately and the same failures do not recur during the remainder of the test period. A major malfunction or failure of the controller and its components will result in a new 30- day test period being implemented after the repairs have been made.

9224 GUARANTEE

All equipment furnished on a project by the Contractor shall be guaranteed against any imperfections in workmanship and materials. The customary manufacturers' warranties shall be assigned to the City.

9225 MANUALS

A minimum of 2 manuals shall be provided for each controller and shall include complete nomenclature, wiring diagrams, schematics showing test voltages, functional description of circuits, parts list and cross reference to standard part numbers, appropriate testing procedures, and other pertinent data.

9226 MATERIALS DESCRIPTION

These specifications cover the general materials and miscellaneous hardware for the installation of a traffic signal to be constructed in accordance with and at locations indicated in the contract, shown in the approved plans, or designated by the City Engineer.

9227 MATERIAL REQUIREMENTS

- A. General. All equipment supplied for the traffic signal installation shall be listed on the most recent edition of the City of Olathe's Approved Products List (APL). In the case of a discrepancy between the product specifications listed below and the APL, the APL shall govern over these specifications. All materials used in the fabrication or assembly of the items listed below shall be new, shall be of the best quality and workmanship, shall be the best standard product of a manufacturer regularly engaged in the production of this type of equipment and shall be of the manufacturer's latest approved design. Major items of electronic equipment installed under this contract shall be of the same type and consist of products supplied by the same supplier in order to secure uniformity, single responsibility, and most satisfactory service.
1. The traffic signal shall be complete, and the Contractor shall furnish and install all equipment necessary for the satisfactory operation of the signal system whether specifically mentioned or not.
 2. All electrical devices shall be purchased within 90 days of install
- B. Traffic Signal Control System
1. General. The traffic signal control system shall, as a minimum, conform to the CALTRANS C1 platform (33x type cabinet compatibility) and shall be NTCIP compliant. In addition, the design, manufacture, and testing of the system shall comply with the latest processes controlled by ISO quality standards.
 2. Responsible Parties. Any reference to the State, State of California, or Agency shall mean the local agency responsible for maintaining the traffic signal. Any reference to the Contractor shall mean equipment manufacturer or supplier.

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3. Cabinets. The pole mounted cabinets shall be Model 336A, and the pad mounted cabinets shall be either Model 332BPDA2 single cabinet or Model 332DBLPDA2 double cabinet, as per Bill of Materials, in accordance with Chapter 6 of the Caltrans Traffic Signal Control Equipment Specifications (TSCES) with the following additions or modifications.
 - a. Finish. The cabinet finish shall be natural aluminum.
 - b. Lift Eyes. The cabinet lift eyes shall be removable and shall be turned down after installation of the cabinet.
 - c. Light Fixtures. Cabinets shall be furnished with six (6) L.E.D. light fixtures, each having a length of 21.5 inches. Each of the four doors shall have a lamp installed near the top of its opening, which is controlled by a door-activated switch. The remaining two lamps shall be installed on swivels and mounted to provide illumination of the output file.
 - d. AC Surge Suppression. The cabinet shall be furnished with a RackPro™ 20Amp rack mounted AC surge suppressor model 35319 or equivalent. The unit shall be 1U in height and 19" wide, having a minimum 8 rear outlets and 1 front outlet.
 - e. Plan Drawer/Work Surface. A drawer shall be mounted in the EIA rack between the Controller and the top input file. It shall be mounted on sliding tracks having lockout and quick-disconnect features. The drawer shall extend a minimum of 14 inches and shall be capable of supporting a 40 lb load when fully extended. The drawer shall be provided with a hinged aluminum top covered with a chemical-proof, Formica-type plastic sheet that can be lifted to gain access to the interior of the drawer. The interior of the drawer shall have nominal dimensions of 1 inch high, 13 inches deep and 15.75 inches wide.
 - f. Additional Model 336 Requirements. The Model 336 cabinets shall be furnished with a continuously welded bottom of the same material as the rest of the cabinet, and all of the hardware necessary to accommodate mounting to a 12 inch outside diameter pole.
 - g. Additional Model 332 Requirements. The Model 332 cabinets shall be furnished with the power distribution assembly #2 in lieu of the power supply and power distribution #1 assemblies. The cabinets shall be supplied with the circuit breaker option per Section 6.4.3.9 of the Caltrans TSCES. The cabinet shall be furnished with anchor bolts, nuts, washers, and 8-inch riser.
 - h. Additional Output File #1 Requirement. The output file #1 supplied with the cabinet shall be modified to provide compatibility with the red monitoring features of the conflict monitor.
 4. Controller. The controller shall be in accordance with the City of Olathe Traffic Signal Approved Products List.
 5. Conflict Monitor. The conflict monitor shall be in accordance with the City of Olathe Traffic Signal Approved Products List.
 6. Flasher. The flasher shall meet the requirements of a Model 204 flasher per Chapter 3 of the Caltrans TSCES.
 7. Load Switch. The load switch shall have modular switches that can be easily replaced with the use of a screwdriver and meet the requirements of a Model 200 switch pack per Chapter 3 of the Caltrans TSCES and shall also be dual indication.
 8. Flash Transfer Relays. The flash transfer relays shall be heavy duty relays meeting the requirements of the Model 430 per Section 6.4.6 of the Caltrans TSCES.
 9. Surge Protector. The surge protector shall be as per City of Olathe Specifications.
 10. DC Isolator. The DC isolator shall meet the requirements of a Model 242, two-channel, DC isolator per Chapter 5 of the Caltrans TSCES.
 11. AC Isolator. The AC isolator shall meet the requirements of a Model 252, two-channel, AC isolator per Chapter 5 of the Caltrans TSCES.
 12. Detector. The detector sensor units provided shall be a Reno A&E Model C-1103-SS or approved equal.
- C. Battery Back-Up System
1. General. The Battery Back-Up System (BBS) / Uninterruptable Power Supply (UPS) shall be comprised as noted below and shall include, but not be limited to: inverter/charger (UPS), power transfer switch (PTS), batteries, a separate manually operated non-electronic bypass switch, 30-amp 4 prong external reverse service plug with weatherproof cover for connection to generator, and all necessary hardware and interconnect wiring.
 2. BBS Output Requirements. The BBS shall be capable of providing continuous, fully conditioned, regulated, sinusoidal (AC) power to selected devices such as: signal controller, modem, communication hub, NTCIP adapters, and video equipment, and be capable of powering the intersection in normal operation for a minimum of three (3) hours. Intersection loads shall be calculated to assess proper battery size and quantity to meet this requirement; 850 Watts for three (3) hours shall be the minimum allowed capacity. The system shall be capable of providing power for full run-time operation, flashing mode operation, and a combination of both full and flash mode operation of an intersection. The operation of the flash mode shall be field programmable to activate at various times, battery capacities, or alarm conditions locally using the pad or using a standard PC interface.
 3. BBS Relay. The BBS shall make available a minimum of four (4) dry contacts rated at 1 Amp @ 120 VAC. Each relay shall be programmable with a minimum being the following: "On Batt", "Low Batt" (40% remaining charge), "Timer", and "Alarm".

4. BBS Communications. The BBS shall have advanced communication features which allow monitoring, configuration, and control of the system over TCP/IP network communication.
 5. BBS Batteries. Batteries shall be hot-swappable and be comprised of extreme-temperature, deep-cycle, Absorbed Glass Mat/Valve Regulated Lead Acid (AGM/VRLA) batteries. Batteries shall be certified to operate at extreme temperatures from -40C to +74C. The batteries shall be provided with appropriate interconnect wiring and corrosion-resistant mounting trays and/or brackets appropriate for the cabinet in which they will be installed. The interconnect cable shall be protected with abrasion-resistant nylon sheathing and shall connect to the base module via a quick-release circular connector.
- D. Signal Heads. All signal heads on a project shall be supplied by one manufacturer. The signal heads shall be in general conformance with the latest edition of the Equipment and Materials Standards of the Institute of Transportation Engineers - Vehicle Traffic Control Signal Heads, and as specified below.
1. Standard Vehicle Traffic Signal Heads. The housing for each vehicle traffic signal section shall be made of a durable polycarbonate. The housing shall be black with black doors. The visors for each signal section shall be of the tunnel type and be made of a durable black polycarbonate of not less than 0.1 inch. /2.5 mm in thickness.
 - a) Arrow Indications. Shall have an incandescent look.
 2. Pedestrian Traffic Signal Heads. All pedestrian traffic signal heads shall include a countdown display (IDC Model LEDP-HMC-002 or approved equal). The housing shall be a one-piece polycarbonate, black with a black one-piece polycarbonate door, without the standard Z-Crate visor. Head units shall be installed with the clamshell 2 mounting (Model 4805). The pedestrian signal indications shall be in general conformance with the latest edition of the E.T.L. and Institute of Transportation Engineers - Pedestrian Traffic Control Signal Indications. Pedestrian lenses shall be rectangular, with a dimension of 16 x 18 inches. The message shall consist of a Don't Walk "HAND" symbol in Portland Orange, and a Walk "WALKING PERSON" symbol in Lunar White and have an incandescent look. The pedestrian symbols shall be a minimum of 9 inches high. The lens housing shall be designed to accommodate 16-inch LEDs.
 - a) Pedestrian Light Emitting Diodes (LED) Walk and Don't Walk indications, when specified on the plans, shall be sealed and the hand and walking man shall be filled completely. No outlines will be accepted.
- E. Signal Lamps. All red, yellow, and green vehicle traffic signal indications in each signal head shall be a 12-inch LED lens meeting the requirements of the ETL (<http://www.intertek.com/marks/etl/>) verified certification program and latest ITE Specifications for LEDs for Vehicle Traffic Signals. In addition, they shall be the product of one manufacturer and be pre-approved by the City of Olathe. All metal lens clips shall be replaced with G.G.I. Quick Change Kits (QCK).
- F. Signal Mounting Brackets.
1. Mast Arm Bracket. The mast arm signal mounting brackets shall be powder coated black, band-clamp style, Sky Brackets™. They shall provide for rigid mounting of the traffic signal heads while allowing signal aiming adjustment in all planes. The brackets shall be designed to strap to the mast arm using stainless steel banding and buckles, and they shall incorporate wiring channels so that after installation, all signal cables shall be protected from the effects of exposure to the weather.
 2. Side-Of-Pole Brackets. Side-of-pole signal mounting brackets shall be molded of black polycarbonate and shall incorporate a mounting arm and pole plate into a single member which shall include guides to correctly position the banding material on the pole plate. The dimensions of the mounting brackets shall be as required to provide proper signal head alignment. Each bracket shall have molded serrations to assure a positive lock with the signal head and allow positioning of the traffic signal heads in increments of 5 degrees. The bracket shall be designed to provide a wiring raceway for signal cable exiting the support pole and entering the signal head.
- G. Backplates. Backplates shall be of sufficient size to provide a minimum of 5 inches/125 mm of dark background for the signal indications. They shall be Pelco Aeroflex™ backplates that are compatible with the signal heads. Backplates shall be furnished with all necessary hardware to attach to the signal heads.
- H. Pedestrian Push-Button. The pedestrian push button assembly shall be a Polara Bulldog™, black in color, with a low-profile mount. It shall contain a silicone or neoprene cover-to-body gasket. Cover screws shall be stainless steel. The switch and actuator shall be protected from dust and moisture. Assembly shall not contain an L.E.D.
- I. Pedestrian Sign. The pedestrian information signs shall be MUTCD R10-3e as detailed in the Plans. The sign blank shall be constructed of minimum 0.075-inch-thick aluminum alloy. The sign face shall have a non-reflective black legend direct screened on white, high intensity prismatic sign sheeting. The sign shall be visually accepted by the City Engineer.
- J. Steel Traffic Signal Poles.
1. Tapered Tubular Shafts. Steel traffic signal pole and mast arm shafts shall conform to Division 1600 of the Standard Specifications and the requirements in the approved plans. All pole and mast arm shafts shall be constructed of one of the following methods:
 - a) No Transverse Welds. Pole and mast arm shafts shall be tapered tubular members made only of one length of structural steel sheet of not less than No. 7 Manufacturing Standard Gauge (Exception: Signal arms designed for lengths of 40 ft or greater may have arm extensions,

- of not less than No. 11 gauge steel, with bolted telescopic field joints so as to develop full strength of the adjacent shaft sections to resist bending action). Round (Type I) members shall meet the requirements of the latest edition of A.S.T.M. A595 Grade A or B. Multi-sided (Type II) members have a minimum of 12 sides and meet the requirements of the latest edition of A.S.T.M. A570 or A.S.T.M. A572 with a minimum yield strength of 55,000 psi and a maximum silicone content of 0.06 percent. Only one longitudinal weld, and no transverse welds, shall be permitted in the fabrication of the tubular members made only of one length of structural steel.
- b) Transverse Welds. Pole and mast arm shafts shall be fabricated from the best, hot rolled basic open hearth steel conforming to A.S.T.M. A570 for thickness' of No. 11 and No. 7 Manufacturing Standard Gauge, A283 Grade D for No. 3 gauge and A36 modified for 0 gauge. The shaft shall be longitudinally cold rolled to flatten the weld and increase the physical characteristics so that the metal will have minimum yield strength of 48,000 psi. Where transverse full penetration circumferential welds are used, the fabricator of the shaft shall furnish to the Engineer Certification: (1) that all such welds have been magnetic particle tested by an independent testing laboratory using a qualified Nondestructive Testing (NDT) Technician and (2) that the NDT equipment has been calibrated annually.
2. Poles. The poles shall include a suitable connection for attaching the mast arm to the pole shaft; a reinforced hand hole with gasket cover located near the bottom of the pole and oriented 180 degrees from the mast arm; a grounding lug in the hand hole or inside the pole near the hand hole; a J or C hook wire support inside the pole near the top of the pole; 4 nut covers; and a removable pole cap. The poles shall be pre-drilled for the mast arm attachments prior to galvanizing. Rubber grommets shall be furnished for all wire entrances into the pole. A clamp-on connector will not be approved.
 3. Combination Poles. When combination lighting and signal poles are specified in the Plans, the poles shall also have suitable clamps for attaching the luminaire arm to the pole shaft. The pole shaft shall be pre-drilled for the luminaire arm attachment prior to galvanizing, with the luminaire arm to be mounted in the same vertical plane as the signal arm. In addition, a reinforced nominal 3 inch by 5 inch hand hole shall be located 180 degrees from and just above the mast arm, and a J or C hook wire support shall be welded inside the pole just above the mast arm.
 4. Mast Arms. All signal mast arms shall have suitable attachment devices for attaching to the pole shaft, and a removable end cap. Clamp-on connectors will not be accepted. Rubber grommets shall be furnished for all wire entrances into the mast arm.
 5. Luminaire Arms. Luminaire arms shall be either single tube or truss-type arms as indicated in the plans. All luminaire arms shall have suitable clamp-on attachment devices for attachment to the pole shaft. Single tube arms shall be welded to one half of the luminaire arm clamp. Truss-type arms shall be furnished with two clamp-on simplex fittings as detailed in the plans.
 6. Galvanizing. The poles, mast arms, luminaire arms and all steel accessories shall be galvanized to the requirements of the latest edition of A.S.T.M. A123.
 7. Epoxy Coating. When epoxy coating for steel poles, mast arms, luminaire arms and all other steel accessories as specified in the Plans, the contractor shall conform to Valmont F-306, Rev. 1 specifications for epoxy topcoat. Contractor shall repair any damage to the finish of any structure with the base primer and finish coat materials that are furnished by the manufacturer and included with the structure. No other products shall be used unless approved by the City Engineer.
 8. Design Load. All traffic signal poles shall be designed to accommodate the standard signal head, signing, and luminaire arm loadings established by the Bureau of Traffic Engineering. The design shall conform to the latest edition of AASHTO Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals handbook with a wind load of 90 mph and minimum of 1.14 gust effect factor. The poles shall also accommodate wind loadings which may cause deflections of the mast arm in the vertical plane. These deflections shall never result in less than a 15-foot clearance between the roadway and the lowest point of the signal assembly.
 9. Anchor Bolts. High strength anchor bolts, washers, and nuts, conforming to Section 1615, Type II of the Standard Specifications shall be included. The leveling nuts may be either Heavy Square or Heavy Hex nuts. Anchor bolt washers conforming to the requirements of the latest edition of A.S.T.M. F436 will also be acceptable.
 10. Basis of Acceptance.
 - a) Standard Shop Drawings. All traffic signal poles shall be detailed by the manufacturer on shop drawings. The drawings shall include the pole, mast arm and luminaire arm (on combination poles) dimensions, arm attachment details, hand hole details, and anchor bolt details, along with the signal weight, projected areas, and mounting arrangement they are designed to accommodate. Design calculations shall be submitted along with the shop drawings. Approved shop drawings shall be included with the Pre-qualified Traffic Signal Materials List.
 - 1) For traffic signal poles that are not covered by the approved manufacturer's standard shop drawings, the Contractor shall submit three copies of detailed shop drawings and an electronic copy as a PDF, along with the design calculations to the City Engineer for approval.
 - b) Poles and Mast Arms. See Division 1600 of the Standard Specifications for the basis of acceptance.

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PUBLIC WORKS / TRAFFIC DIVISION
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- b) Poles and Mast Arms. See Division 1600 of the Standard Specifications for the basis of acceptance.
 - c) Anchor Bolts. See Division 1600 of the Standard Specifications for the basis of acceptance of anchor bolts for traffic signal poles. If Type "B" certification is not provided according to Division 2600 of the Standard Specifications, the City Engineer may require testing of an anchor bolt.
 - d) Traffic Signal Materials List. Along with the Traffic Signal Materials List, the Contractor shall submit the necessary traffic signal pole ordering information. The City Engineer will review the information for compliance with the plan dimensions for pole height, mast arm length and mounting height, and luminaire arm length and mounting height.
- K. Traffic Signal Pedestals. Traffic signal pedestals shall consist of an aluminum shaft of the length specified in the Plans, a cast aluminum base, anchor bolts with nuts and washers, and be provided with a pole cap.
1. Shaft. The shaft shall be of Type 6061-T6, 6063-T6 or 6063-T832 aluminum alloy, and shall be a single piece of drawn seamless tubing having a nominal 4.5 inch outside diameter and 0.25-inch wall thickness. The shaft shall be threaded at one end for attaching the shaft to the base. The shaft shall have a smooth, black, powder coat finish.
 2. Base. The pedestal base shall be AASHTO certified and be cast of Type 356.0-T6 aluminum alloy. It shall have a threaded collar with a set screw, and plastic hand hole cover. The base shall have a smooth, black, powder coat finish.
 3. Anchor Bolts. Anchor bolts for traffic signal pedestals shall be of the dimensions detailed in the approved plans and shall meet the requirements of the latest edition of A.S.T.M. A36. The threaded ends of the anchor bolts, nuts, and 3/4" x 2" square washers shall be galvanized. Anchor bolts for traffic signal pedestals will be visually accepted by the City Engineer.
- L. Terminal Block. Terminal blocks in the poles shall be U.L. recognized, barrier type or dead-front type terminal strips, with stainless steel screws, having terminals of sufficient size and quantity to connect the individual conductors run between the cabinet and the pole to the conductors run between the pole and the signal heads. They shall be rated for at least 30 amps current.
- M. Junction Boxes (In-Ground). The junction box shall be of sufficient size to facilitate the conduit and wiring as indicated in the approved plans. Junction boxes shall have nominal dimensions as shown on the approved plans. In-ground junction boxes, along with their covers, shall be in accordance with the City of Olathe Traffic Signal Approved Products List, and shall meet ANSI/SCTE-77, Tier 22 rating.
1. The cover shall bear the logo "TRAFFIC SIGNAL" clearly and permanently molded or etched into the cover.
 2. The cover of junction boxes, that are installed as part of the fiber optic interconnect, shall bear the logo "City of Olathe Fiber" clearly and permanently molded or etched into the cover.
- N. Junction Boxes (Above-Ground). Above ground junction boxes shall have the nominal dimensions of 12 inch by 12 inch by 6 inch. The junction box shall be made of minimum 0.075-inch-thick sheet metal (steel) with welded seams, knockouts, and a weatherproof screw cover. Boxes shall be hot dipped galvanized in accordance with ASTM A-123 after fabrication.
- O. Service Boxes. The service box shall have the minimum nominal internal dimensions of 24 inches diameter by 36 inches deep. Service boxes shall be provided with cable hooks as detailed in the plans. The box shall be constructed of polymer concrete with a polymer concrete cover. Service boxes, along with their covers, shall be in accordance with the City of Olathe Traffic Signal Approved Products List, and shall meet the current ANSI/SCTE 77, Tier 22 rating.
1. The cover shall bear the logo "TRAFFIC SIGNAL" clearly and permanently molded or etched into the cover.
- P. Luminaires. Luminaires shall be in accordance with Section 9000 of these specifications, and the City of Olathe Street Light Approved Products List.
- Q. Un-Fused Street Light Connector Kit. Un-fused connector kits shall be in accordance with Section 9000 of these specifications, and the City of Olathe Street Light Approved Products List.
- R. Fused Street Light Connector Kit. Fused connector kits shall be sized to the conductors specified in the approved plans and shall be in accordance with Section 9000 of these specifications, and the City of Olathe Street Light Approved Products List. Each connector shall include all parts and materials necessary to complete its installation, such as fuses, lubricating compound, and assembly devices.
1. Fuse. The fuse shall be a minimum of 8-amp cartridge type as recommended by the connector manufacturer.
- S. Overhead Street Name Signs. Overhead street name signs shall bear the message indicated in the approved plans. The legend shall be centered on the sign face. The border shall be 0.75 inch wide.
1. Sheeting. The sign faces shall be either direct-applied white enclosed lens high performance retro-reflective legend and borders on a green enclosed lens 3M high intensity prismatic

- sheeting background, or transparent green cuttable film over white enclosed lens 3M high intensity prismatic sheeting. The use of the transparent film shall in no way limit the manufacturer's warranty on the 3M prismatic sheeting over which it is applied. The green sheeting or film shall conform to Federal Color Standard 595A, Color No. 14109.
2. Lettering. Copy size for the legends shall be as follows: 8-inch series E-Modified upper case for ST, RD, BLVD, AVE; 12-inch upper case with 9-inch lower case series E-Modified for names; 12-inch series E-Modified for numerals.
 3. Acceptance. Before final fabrication and shipment, the manufacturer or supplier shall provide, for the Engineer's approval, a layout of each sign showing the exact street name lettering to be placed on the sign. The signs shall be visually accepted by the City Engineer.
- T. Regulatory Signs. The design details (color, letter height, and letter series) for all regulatory signs shall be as shown in the latest edition of the Standard Highway Signs Manual. Special signs not covered by the Standard Highway Signs Manual shall be as shown in the approved plans. Sign blanks shall be a minimum of 0.075-inch-thick aluminum alloy. The sign face shall be of 3M high intensity prismatic sheeting meeting the requirements of Subsection 2201 of the Standard Specifications.
1. Acceptance. Regulatory signs shall be accepted in accordance with Section 9228 of these specifications, with additional certification stating that the retro-reflective sheeting used to manufacture the signs is in accordance with Subsection 2201 of the Standard Specifications.
- U. Entrance Head. The entrance head shall be of cast aluminum and shall be of the clamp-on type for use with rigid conduit of the type specified in the approved plans. It shall be U.L. listed.
- V. Service Enclosure. The service enclosure shall be in accordance with Section 9000 of these specifications, and the City of Olathe Street Light Approved Products List.
- W. Circuit Breakers. The circuit breakers shall be standard plug-in, single pole, molded case, of the trip rating as shown in the approved plans.
- X. Ground Rod. The ground rod shall be 0.75-inch diameter by 10-foot-long copper bonded steel rod and bear the U.L. label.
- Y. Ground Rod Clamp. The ground rod clamp shall be a 0.75-inch clamp cast of high strength copper alloy and be U.L. listed for direct burial.
- Z. Service Wire. The service wire shall be Type USE-2 stranded, annealed, copper wire meeting the requirements of ASTM B-8, and be of the size specified in the approved plans.
- AA. Lighting Distribution Wire. The lighting distribution wire shall be Type USE-2 stranded, annealed, copper wire meeting the requirements of ASTM B-8, and be of the size specified in the approved plans.
- BB. Pole & Bracket Wire. The pole and bracket wire shall be in accordance with Section 9000 of these specifications, and the City of Olathe Street Light Approved Products List.
- CC. Ground Wire. The ground wire shall be No. 6 AWG solid bare copper wire meeting the requirements of ASTM B-3.
- DD. Multi-conductor Cable. The multi-conductor cable shall meet the requirements of IMSA 19-1. Conductors shall be stranded No. 14 AWG. The quantity of conductors shall be as indicated in the approved plans.
- EE. Shielded Detector Lead-In Cable. Shielded detector lead-in cable shall be a stranded, four conductor, No. 18 AWG, using water blocking tape with drain wire. Conductors shall be color coded red, green, black, and white. Wire shall not be gel filled and must be pre-approved by the City Engineer.
- FF. Detector Loop Wire. The detector loop wire shall meet the requirements of IMSA 51-5. The conductor shall be No. 14 AWG, and the tube shall be polyethylene.
- GG. Loop Sealant. The loop sealant shall be a one-part polyurethane, moisture curing, elastomeric compound requiring no mixing or measuring, prior to or during application. It shall be specifically designed for sealing and protecting detector loop wires in both asphalt and concrete pavements. It shall not chemically attack or damage the pavement yet shall sufficiently bond with the pavement to effectively seal the saw cut and prevent the infiltration of moisture into the slot. The cured loop sealant shall exhibit resistance to the normally encountered effects of weather, vehicular abrasion, motor oils, gasoline, antifreeze solution, brake fluid, deicing chemicals, and salt in such manner that the performance of the detector loop is not adversely affected. The loop sealant shall provide compressive yield strength to withstand normal vehicular traffic and prevent the intrusion of rocks, glass, and other road debris into the slot. It shall remain sufficiently flexible at all normally encountered temperatures to withstand normal movement in asphalt and concrete pavements while protecting the loop wire from fracture and shear.
- HH. Pre-Formed Loops. Pre-formed loops shall be factory assembled loops having the dimensions and number of turns of wire specified in the Plans. The loops shall be constructed of a minimum No. 16 AWG Type TFFN/THWN copper wire meeting the requirements of A.S.T.M. B-8 and encased in heavy duty tubing compatible with the paving material being used on the project. The tubing shall be completely filled with asphalt sealant material after the wire is installed. The loop tail shall be of flexible tubing of the length specified in the approved plans and shall also be filled with asphalt sealant material. The detector wire within the loop tail shall be twisted a minimum of 3 turns per foot/10 turns per meter.
- II. Conduit.

1. High Density Polyethylene (HDPE) Signal Conduit. Polyethylene conduit shall be coil-able, smooth wall, SDR 9 rating, high density polyethylene duct meeting the requirements of NEMA Standard TC-7. Conduit joints shall be made with either a Shur-Lock II™ coupler or a fusion welder. Conduit shall be black with a red stripe and be preapproved by the City Engineer.
 2. High Density Polyethylene (HDPE) Fiber Conduit. Fiber Conduit shall possess all qualities and standards as noted above for Signal conduit with the following exception: Conduit shall be black with an orange stripe and be preapproved by the City Engineer.
- JJ. Expansion Fittings. Expansion fittings shall be as detailed in the approved plans.

9228 BASIS OF ACCEPTANCE

Acceptance of materials furnished under these specifications will be based upon the following: Any product called for in the Bill of Materials in the approved plans that is being furnished for the project must be approved. A manufacturer or supplier intending to supply traffic signal materials under these specifications shall submit an original copy of any catalog cuts, shop drawings, drawings, and/or data sheets certifying that the material meets the applicable specifications. This information shall be submitted to the City Engineer for approval.

A. Visual Inspection. Items will be visually inspected by the City Engineer at the job site for condition and conformance with the requirements of these specifications.

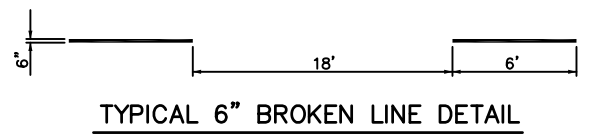
B. Additional Requirements. There are additional requirements noted for specific material requirements under Section 9227 of these specifications.

SUMMARY OF PAVEMENT MARKING QUANTITIES

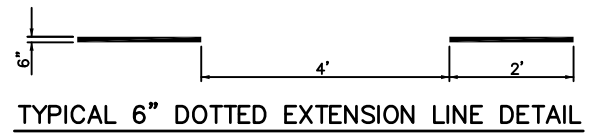
LOCATION OF PROJECT	6" Solid	4" Solid	6" Broken	4" Solid	4" Broken	6" Solid	12" Solid	12" Solid	12" Solid	6" Dotted	24" Solid	Left	Right	ONLY							
	White	White	White	Yellow	Yellow	White	White	Yellow	White	White	White	Arrow	Arrow								
	Lane Line	Edge Line	Lane Line	Line	Line	X-walk Line	X-walk Line	Diag. Line	Diag. Line	Extension Line	Stop Line	↩	↪								
	HPS - 8	HPS - 8	HPS - 8	HPS - 8	HPS - 8	PREFORMED THERMO	PREFORMED THERMO	PREFORMED THERMO	PREFORMED THERMO	HPS - 8 OR PREFORMED THERMO	PREFORMED THERMO	PREFORMED THERMO	PREFORMED THERMO	PREFORMED THERMO							
TOTALS																					

REVISIONS		
NO.	DATE	DESCRIPTION

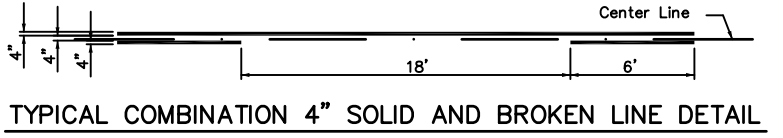
PAVEMENT MARKING DETAILS	
PROJECT NAME	P.N. XXXXXc
DESIGNED: XX	DATE: 11/24/14
DETAILED: XX	SCALE: NONE
CHECKED: XX	APPROVED: LGV



TYPICAL 6" BROKEN LINE DETAIL



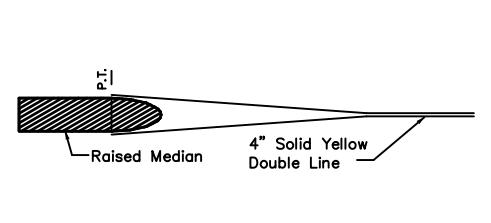
TYPICAL 6" DOTTED EXTENSION LINE DETAIL



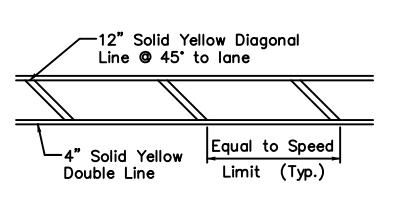
TYPICAL COMBINATION 4" SOLID AND BROKEN LINE DETAIL



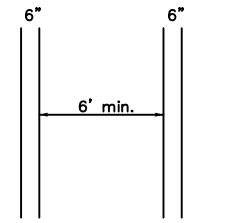
TYPICAL 4" SOLID YELLOW DOUBLE LINE DETAIL



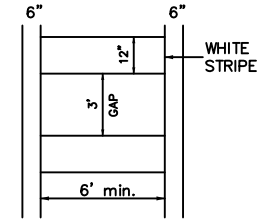
TYPICAL MEDIAN NOSE CENTERLINE TREATMENT



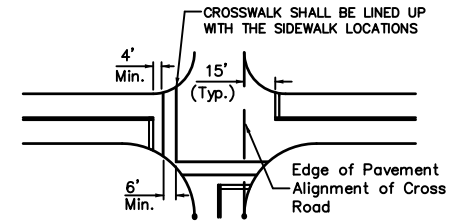
TYPICAL 18" SOLID YELLOW DIAGONAL LINE DETAIL



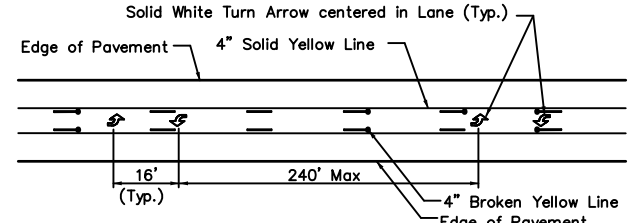
TYPICAL SOLID WHITE CROSSWALK LINE DETAIL



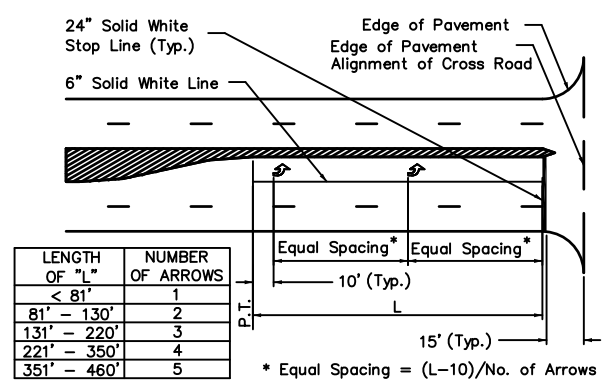
TYPICAL SCHOOL CROSSWALK LINE DETAIL



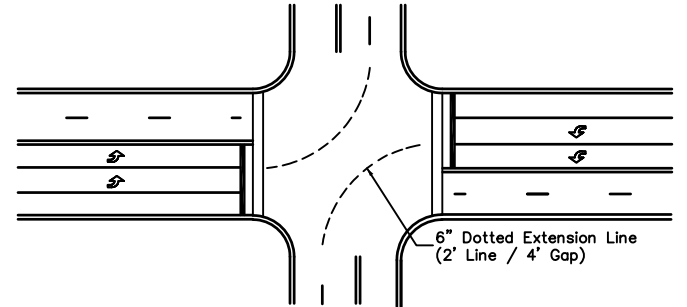
TYPICAL CROSSWALK MARKING AND STOP BAR LOCATION



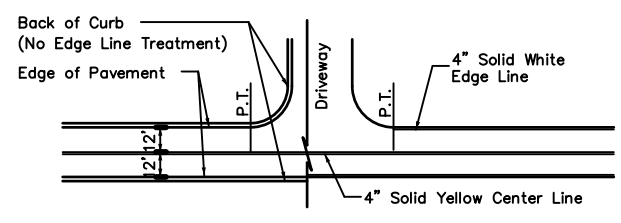
TWO-WAY LEFT TURN DETAIL FOR THREE-LANE ROADWAY



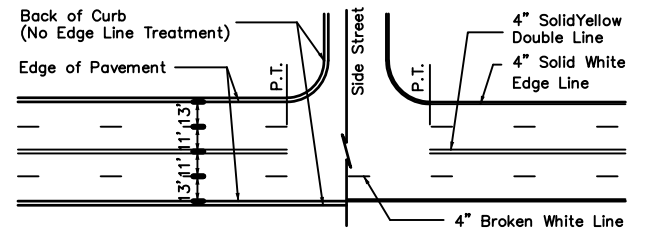
TYPICAL TURN LANE TREATMENT



TYPICAL MARKINGS FOR DUAL LEFT-TURN LANES



TYPICAL TWO-LANE MARKINGS IN COMBINATION WITH TYPICAL DRIVEWAY TREATMENT



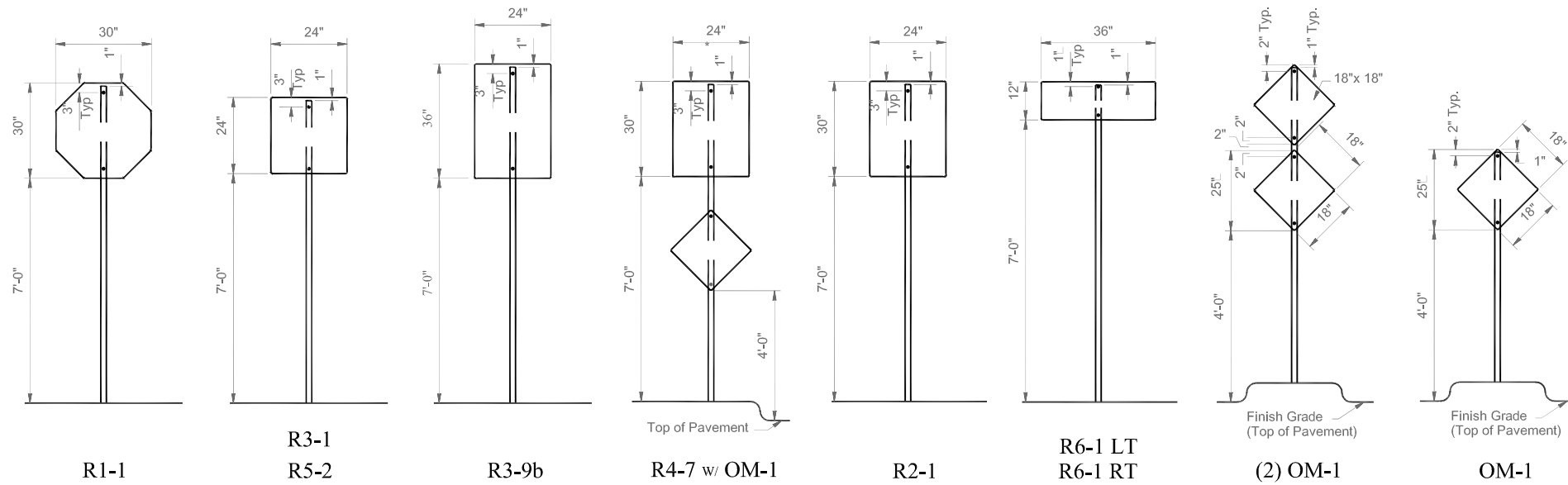
TYPICAL MARKINGS FOR FOUR-LANE ROADWAY IN COMBINATION WITH TYPICAL SIDE STREET TREATMENT

PAVEMENT MARKING NOTES:

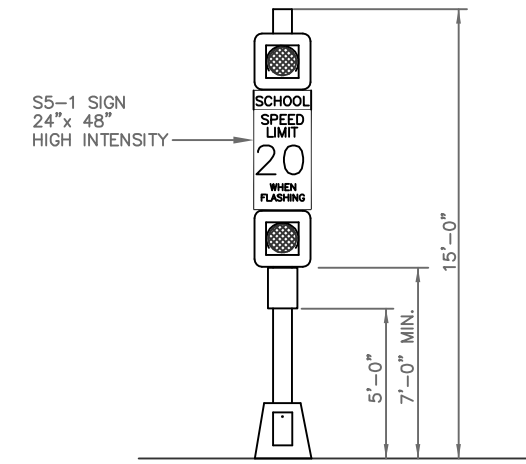
- ALL PAVEMENT MARKINGS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (M.U.T.C.D.).
- ALL TURN ARROWS AND LEGENDS SHALL BE CENTERED IN THEIR RESPECTIVE TRAFFIC LANES.
- ALL WORDS AND SYMBOLS SHALL CONFORM TO THE LATEST EDITION OF "STANDARD ALPHABETS FOR HIGHWAY SIGNS AND PAVEMENT MARKINGS" PRINTED BY THE U.S. DEPARTMENT OF TRANSPORTATION, FEDERAL HIGHWAY ADMINISTRATION.
- PAVEMENT MARKINGS, EITHER TEMPORARY OR PERMANENT, ARE REQUIRED AT ALL TIMES IF THE ROADWAY IS OPEN TO TRAFFIC. (SEE SPECIFICATIONS)
- ALL MARKINGS THAT CONFLICT WITH THE DESIRED MARKINGS SHALL BE COMPLETELY REMOVED. (SEE SPECIFICATIONS)
- ALL MARKINGS RUNNING PARALLEL WITH SEAMS IN ASPHALT SHALL BE OFFSET AS FAR AS POSSIBLE FROM THE SEAM.
- CITY OF OLATHE TRAFFIC DIVISION SHALL BE NOTIFIED A MINIMUM OF 24 HOURS IN ADVANCE OF ANY MARKINGS BEING DONE. CONTACT: JOSE GONZALES AT 913-223-1503, OR TRAVIS TOMISON AT 913-522-4616.

CITY OF OLATHE
PUBLIC WORKS / TRAFFIC DIVISION
P.O. BOX 768 OLATHE, KANSAS 66061

SHEET
XX OF XX

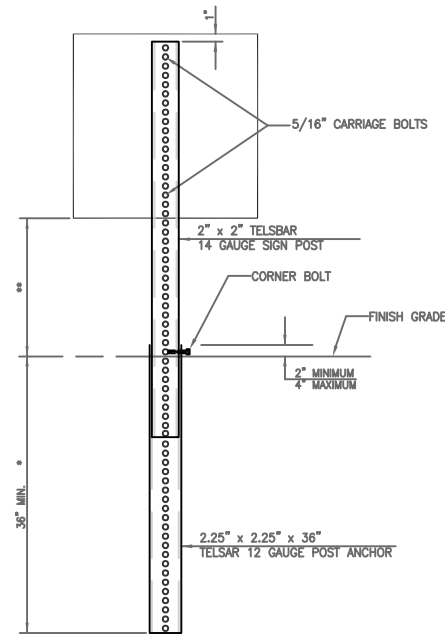


SIGN MOUNTING DETAILS



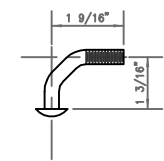
SCHOOL ZONE SIGNAL SIGN DETAIL

(NOT TO SCALE)

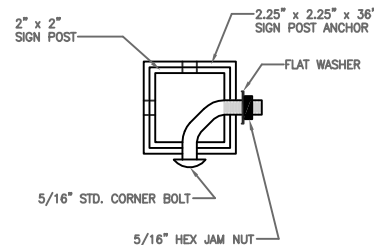


BREAK-AWAY SIGN POST DETAIL

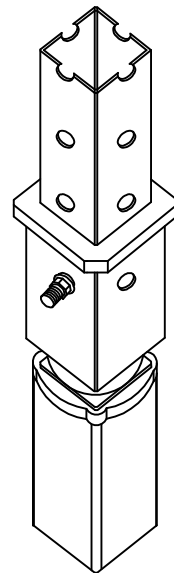
(NOT TO SCALE)



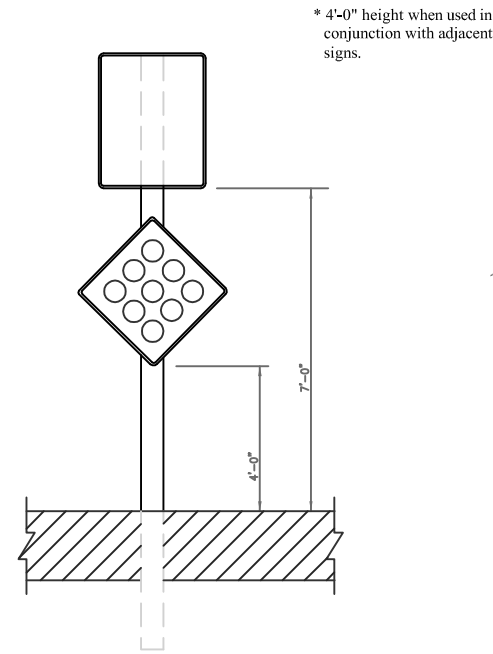
5/16" BOLT DETAIL (ALL BOLTS)



SECTION A-A

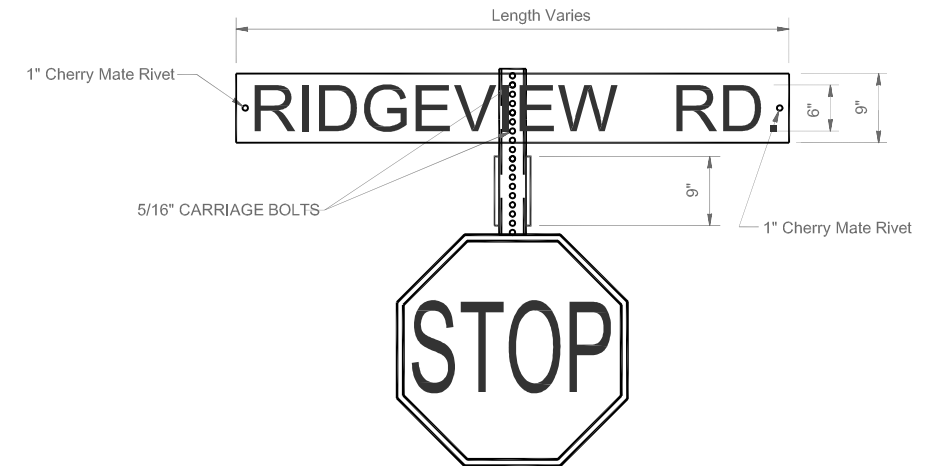


BREAK-OUT SQUARE
BREAK-AWAY COUPLING DETAIL



TYPICAL SIGN MOUNTING DETAIL

(NOT TO SCALE)



PAVEMENT INSTALLATION SEQUENCE

1. SIGN SUPPORT SHALL BE POURED INTO NEW CONCRETE INSTALLATIONS OR DRILLED INTO EXISTING LOCATIONS
2. ALL HARDWARE SHALL BE PROVIDED BY CITY OF OLATHE

GROUND INSTALLATION SEQUENCE

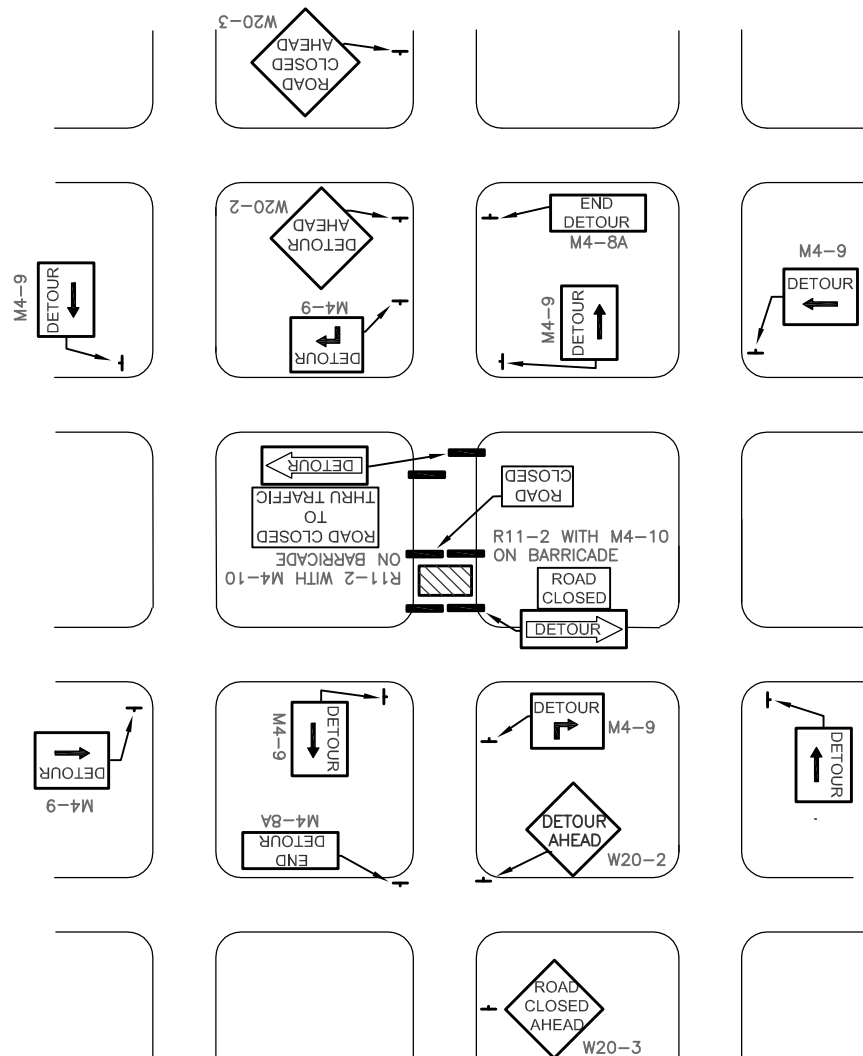
1. SIGN POST ANCHOR DRIVEN INTO THE GROUND.
2. INSERT SIGN POST INTO THE SIGN POST ANCHOR AND BOLT IN PLACE.

GENERAL INSTALLATION NOTES:

1. IN ALL INSTALLATIONS THE FIRST HOLE ABOVE THE FINISHED GRADE LEVEL IN ALL THREE UNITS MUST BE IN LINE FOR INSERTION OF THE CORNER BOLT.
2. ALL CORNER BOLTS AND NUTS FOR FASTENING THE SIGNS AND SIGN POST ASSEMBLY SHALL COMPLY WITH SECTION 1614B AND ALL WASHERS SHALL COMPLY WITH SECTION 1614D OF THE STANDARD SPECIFICATION FOR STATE ROAD AND BRIDGE CONSTRUCTION (1980 EDITION) AND SHALL BE SUBSIDIARY ITEMS.
* 12" MIN. WHEN SET IN CONCRETE.
** SEE SIGN MOUNTING DETAILS.
3. All signs shall be made on .080 aluminum.
4. Street signs shall be made with 6" White Highway Gothic C Letters with proper spacing on a green backing.
5. All signs shall be made with 3M High Intensity Sheeting; all inks or films used shall carry same warranty as sheeting.

GENERAL INSTALLATION NOTES CONTINUED:

6. Street signs will be mounted to top of Stop Signs or Yield Signs.
7. Street signs shall be printed on one side only and mounted on each side of post.
8. All street name signs shall be mounted with Cherry Mate Rivets.
9. All other signs shall be mounted with 5/16" Carriage Bolts.
10. All existing signs, except street signs, within the project limits shall be removed prior to construction and delivered to:
City of Olathe Traffic Operations Center
301 N. Rogers Rd.
Olathe, KS.



DETOUR SIGNING-STREET CONSTRUCTION IN A STREET GRID

STREET NAME SIGN (D-3) TO BE PLACED ABOVE THE DETOUR SIGN (M4-9) TO INDICATE THE NAME OF THE ROADWAY FOR WHICH THE DETOUR WAS ESTABLISHED.

FORMULAS FOR DETERMINING TAPER LENGTH

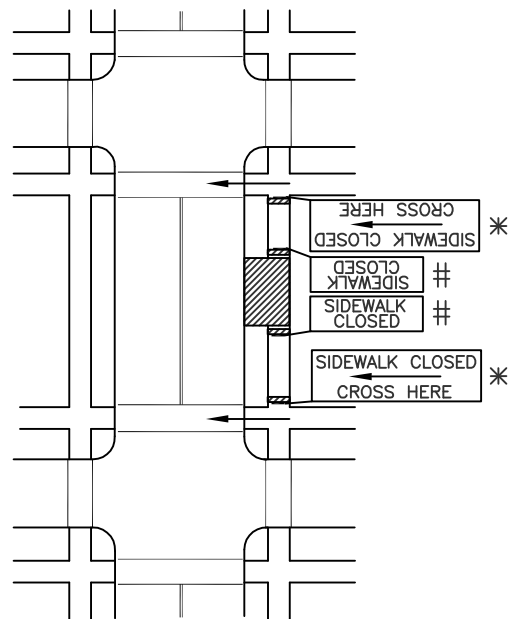
SPEED (S)	TAPER LENGTH (L) IN FEET
40 MPH OR LESS	$L = \frac{WS^2}{60}$
45 MPH OR MORE	$L = WS$

WHERE: L = TAPER LENGTH IN FEET
 W = WIDTH OF OFFSET IN FEET
 S = POSTED SPEED LIMIT PRIOR TO WORK STARTING

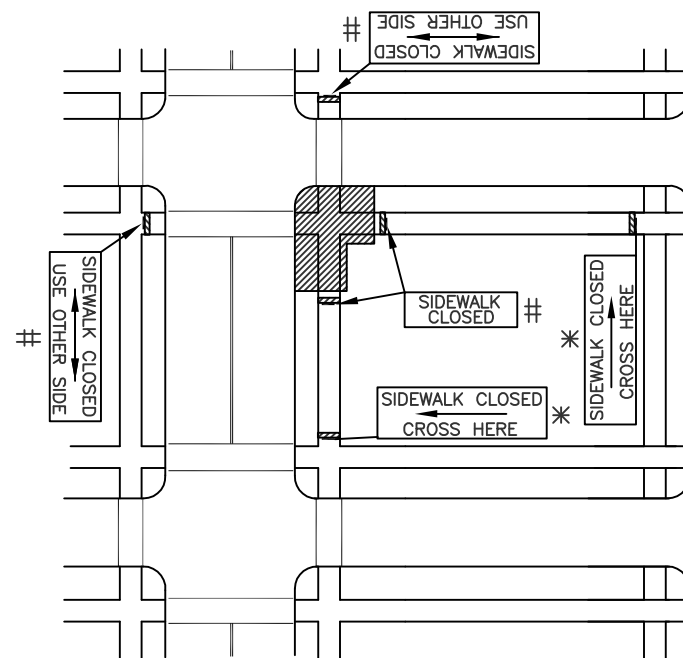
SPEED LIMIT	TAPER (L)	SIGN SPACING (X)
20	80'	100'
25	125'	100'
30	180'	100'
35	245'	100'
40	320'	100'
45	540'	350'

BASED ON W=12'

EXCEPT AS NOTED (DOWNSTREAM TAPER, FLAGGER OPERATIONS, YIELD OPERATION), SPACE CHANNELIZER @ SPEED LIMIT. IF SPEED LIMIT IS 40mph SET DEVICES AT 40'.



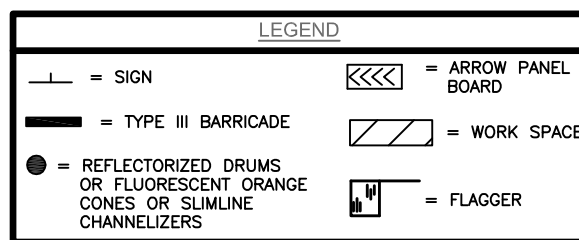
MID-BLOCK SIDEWALK CLOSURE WITH PEDESTRIAN DETOUR



CORNER SIDEWALK CLOSURE WITH PEDESTRIAN DETOUR

* ADVANCE SIGNS TO BE PLACED ON TYPE I OR TYPE II BARRICADES. PLACE SO THAT AT LEAST 48" OF SIDEWALK IS AVAILABLE FOR PEDESTRIAN USE.

SIGNS TO BE PLACED ON CONTINUOUS DETECTABLE DEVICES. DEVICE CAN BE TYPE I, TYPE II, TYPE III OR OTHER TYPE WALLS OR RAILS AS PER MUTCD. THEY WILL HAVE ORANGE AND WHITE STRIPES. THE BOTTOM EDGING WILL BE AT LEAST 6 INCHES IN WIDTH AND PLACED A MAXIMUM OF 2 1/2 INCHES ABOVE THE SIDEWALK, SO AS TO BE DETECTABLE BY PEDESTRIANS WITH LONG CANE.



GENERAL NOTES:

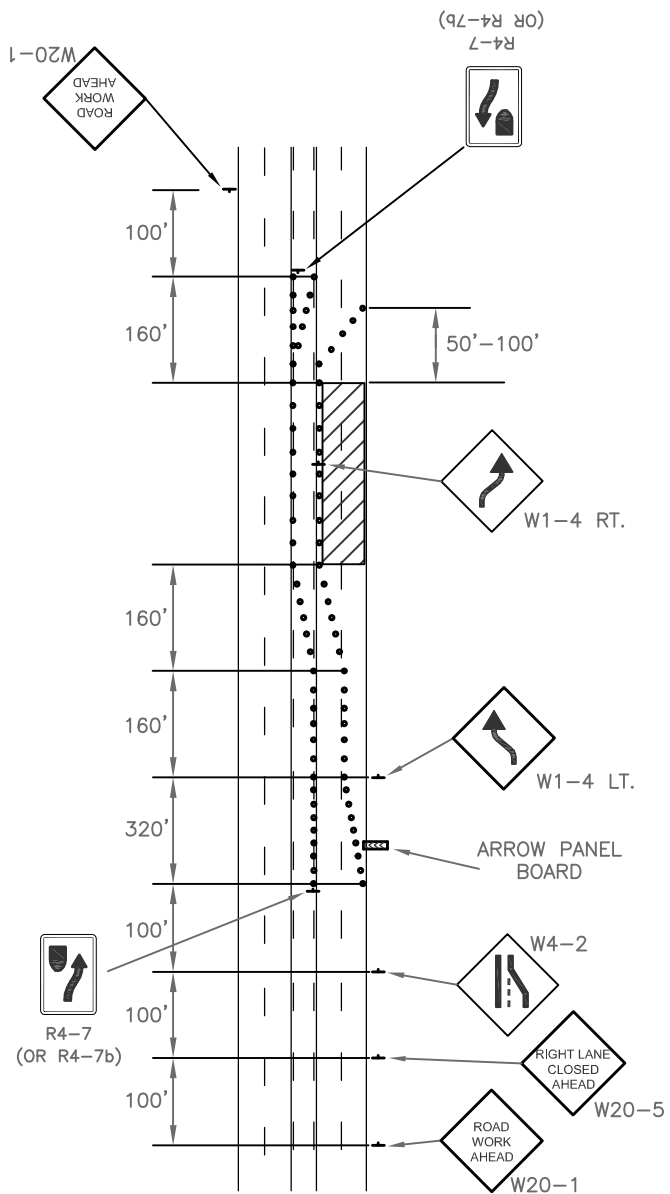
- AN APPROVED RIGHT-OF-WAY PERMIT IS REQUIRED FOR ALL WORK PERFORMED WITHIN THE CITY OF OLATHE RIGHT OF WAY.
- NOTIFY TRAFFIC OPERATIONS OF ANY WORK WITHIN THE RIGHT-OF-WAY AT 913-971-5180. 72 HOUR NOTICE IS REQUIRED IF TRAFFIC SIGNALS ARE TO BE MODIFIED AS PART OF TRAFFIC CONTROL.
- UNLESS OTHERWISE APPROVED, ON AN ARTERIAL ROADWAY THERE WILL BE NO LANE CLOSURES FROM 6:30 TO 8:30 AM AND FROM 4:00 TO 6:00PM.
- ALL DEVICES, THEIR INSTALLATION, AND MAINTENANCE SHALL COMPLY WITH THE 2009 EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).
- TRAFFIC CONTROL DEVICES SHALL MEET MASH 2009.
- ALL WORKERS SHALL WEAR HIGH VISIBILITY APPAREL MEETING ANSI 107-2010 CLASS 2 FOR DAY-TIME AND CLASS 3 FOR NIGHTTIME.
- THE TRAFFIC CONTROL REQUIREMENTS SHOWN ON THESE PLANS ARE MINIMUM REQUIREMENTS ONLY AND DO NOT ATTEMPT TO ADDRESS IN DEPTH THE VARIETY OF SITUATIONS THAT MAY OCCUR ONCE CONSTRUCTION HAS STARTED. IN NO WAY DO THE REQUIREMENTS SHOWN ON THE PLANS RELIEVE THE CONTRACTORS OF THEIR RESPONSIBILITY FOR SELECTING THE PROPER TRAFFIC CONTROL DEVICES. ANY ADDITIONAL QUANTITIES OF TRAFFIC CONTROL DEVICES NECESSARY TO COMPLETE THE CONTRACT OR AS ORDERED INSTALLED BY THE ENGINEER SHALL BE CONSIDERED SUBSIDIARY TO THE CONTRACT LUMP SUM BID PRICE.
- IF THE PLANS DO NOT INCLUDE A TRAFFIC CONTROL PLAN, OR SHOULD THE CONTRACTOR DESIRE TO CHANGE THE PLAN, A SPECIFIC TRAFFIC HANDLING PLAN THROUGH THE CONSTRUCTION AREA SHALL BE SUBMITTED BY THE CONTRACTOR AND APPROVED BY THE CITY OF OLATHE.
- SHEETING SHALL BE AS PER KDOT STANDARDS. ALL SIGNS SHALL BE RETROREFLECTIVE WITH A MATERIAL THAT HAS A SMOOTH, SEALED OUTER SURFACE. WHERE THE COLOR ORANGE IS REQUIRED, THE FLUORESCENT ORANGE COLOR SHALL BE USED. ALL ORANGE SIGNS SHALL HAVE FLUORESCENT ORANGE ASTM TYPE IV SHEETING. ALL OTHER SIGNS SHALL HAVE ASTM TYPE III SHEETING OF STANDARD COLORS. THE WHITE STRIPE ON SLIMLINE CHANNELIZERS SHALL BE ASTM TYPE III SHEETING; THE ORANGE STRIPES SHALL BE ASTM TYPE IV SHEETING. THE ENTIRE AREA OF BARRICADES RAILS, BOTH FRONT AND BACK, SHALL BE ASTM TYPE III SHEETING. THE WHITE STRIPES ON TUBULAR MARKERS SHALL BE ASTM TYPE III SHEETING. THE ENTIRE AREA OF VERTICAL PANELS, BOTH FRONT AND BACK, SHALL HAVE ASTM TYPE III SHEETING.
- UNLESS OTHERWISE NOTED, ALL TRAFFIC CONTROL DEVICES SHALL BE PROVIDED AND MAINTAINED BY THE CONTRACTOR.
- SIGNS AND TRAFFIC CONTROL DEVICES NEED TO BE PROPERLY MAINTAINED FOR CLEANLINESS, VISIBILITY, AND CORRECT POSITIONING.
- CONTRACTOR SHALL OBTAIN UTILITY LOCATES PRIOR TO INSTALLING SIGNPOSTS.
- ALL SIGNS SHALL TO BE REMOVED, COVERED, OR TURNED AWAY FROM TRAFFIC WHEN NOT IN USE.
- ALL EXISTING PERMANENT SPEED LIMIT SIGNS AND OTHER CONFLICTING SIGNS SHALL BE COVERED WITH AN OPAQUE WEATHERPROOF MATERIAL OR REMOVED.
- SIGNS LEFT IN PLACE THREE OR FEWER DAYS CAN BE MOUNTED AT ONE FOOT ABOVE THE ROADWAY. SIGNS LEFT IN PLACE GREATER THAN THREE DAYS NEED TO BE MOUNTED AT SEVEN (7) FEET. IF THERE ARE NO SIDEWALKS, NO PEDESTRIANS, AND NO PARKING, MOUNTING HEIGHT CAN BE REDUCED TO FIVE FEET. IF SECONDARY SIGN IS NEEDED MINIMUM MOUNTING HEIGHT MAY BE ONE FOOT LOWER.
- ARROW PANEL BOARD IS NOT REQUIRED IF LANE CLOSURE IS TWO (2) HOURS OR LESS IN DURATION.
- CONTRACTOR MAY BE REQUIRED TO ADD CONSTRUCTION FENCE TO PROHIBIT PEDESTRIANS FROM ENTERING THE WORK AREA. FENCING SHOULD NOT CREATE A SIGHT DISTANCE RESTRICTION FOR ROAD USERS.
- WHEN ROAD WORK CREATES A DIFFERENCE IN ELEVATION BETWEEN ADJACENT LANES THAT ARE OPEN TO TRAVEL, UNEVEN LANE SIGNS (W8-11) 36"x36" SHALL BE ADDED. THEY SHALL BE PLACED AT BEGINNING AND AT INTERVALS EQUAL TO APPROXIMATELY 1000', BOTH DIRECTIONS IF APPLICABLE.
- A BUMP SIGN (W8-1) 36"x36" SHALL BE INSTALLED TO GIVE WARNING OF A 2" OR MORE RISE OR DEPRESSION IN THE PROFILE OF THE ROADWAY. USE AT BEGINNING AND END OF MILLING EVEN IF WEDGE IS IN PLACE.

NO.	DATE	DESCRIPTION	BY

General Notes and Pedestrians
 1 OF 4
 XXXX & XXXX
 P.N. XXXXC
 DESIGNED: XX DATE: XX/XX/XX
 DETAILED: XX SCALE: NONE
 CHECKED: XX APPROVED: XX

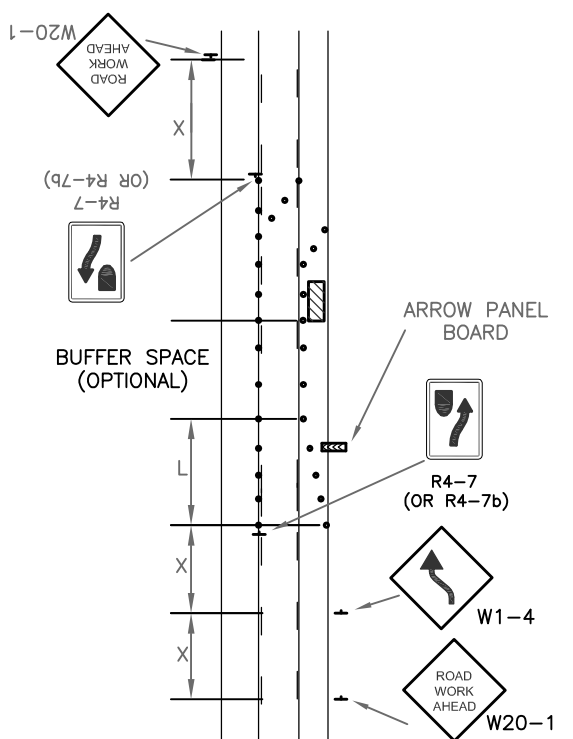
CITY OF OLATHE
 PUBLIC WORKS / TRAFFIC DIVISION
 P.O. BOX 768 OLATHE, KANSAS 66061

SHEET
 XX OF XX

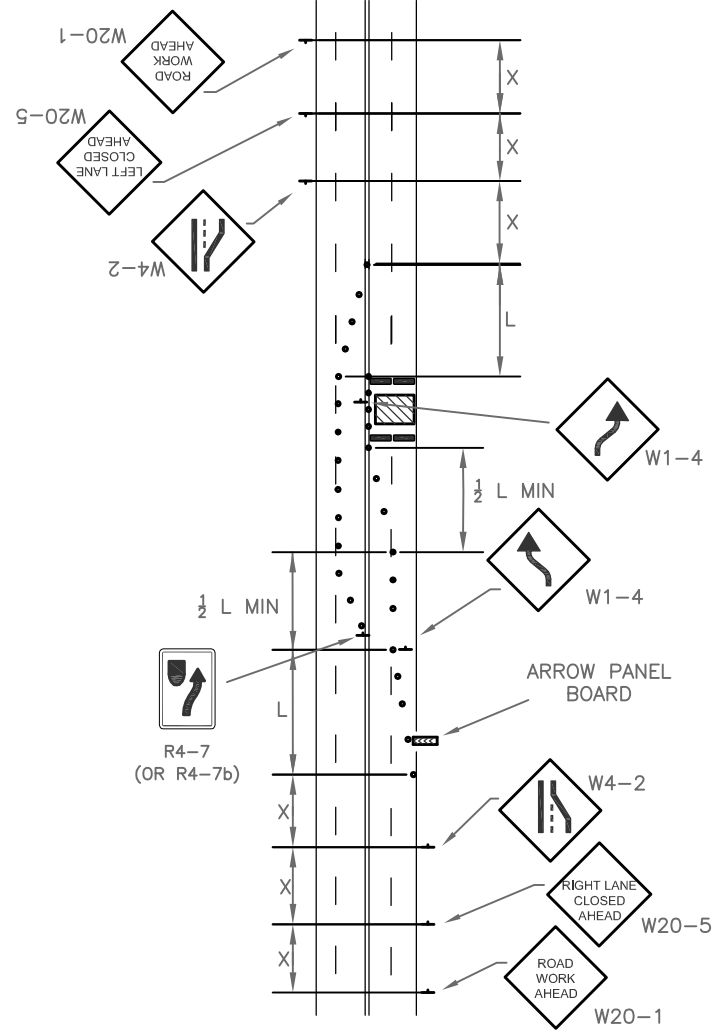


**FIVE LANE ROADWAY
w/ TWO LANES CLOSED**

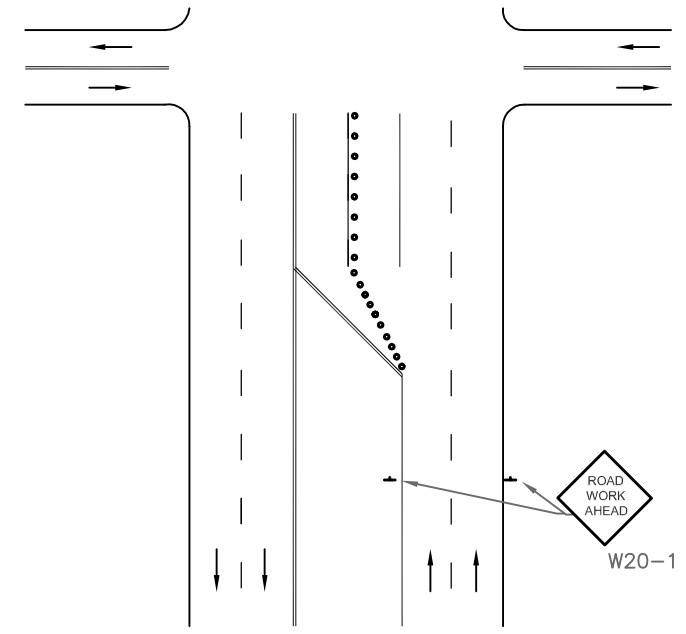
(BASED ON SPEED LIMIT OF 40mph
AND LANE WIDTH OF 12')



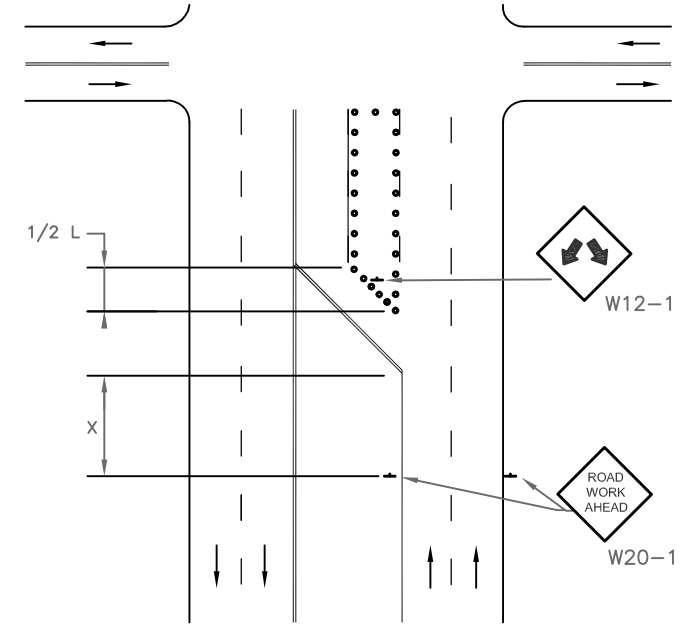
**LANE CLOSURE WITH
TWO-WAY LEFT TURN LANE**



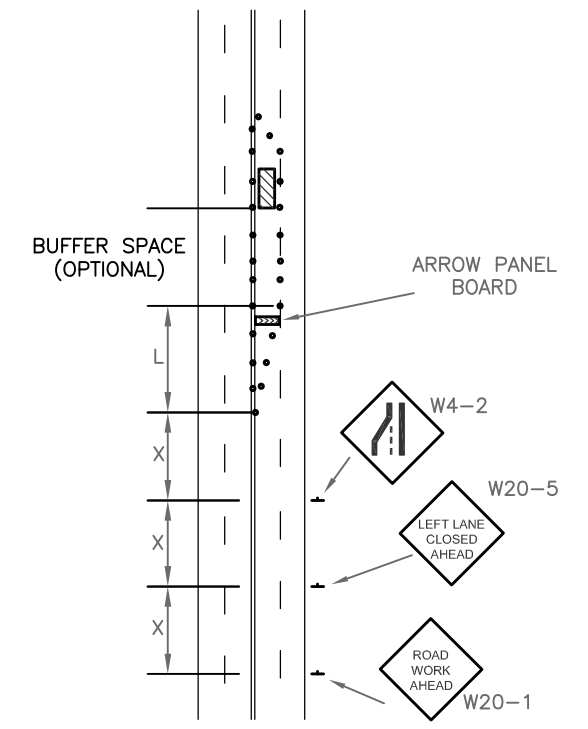
**4-LANE UNDIVIDED ROADWAY-HALF
ROADWAY IS CLOSED**



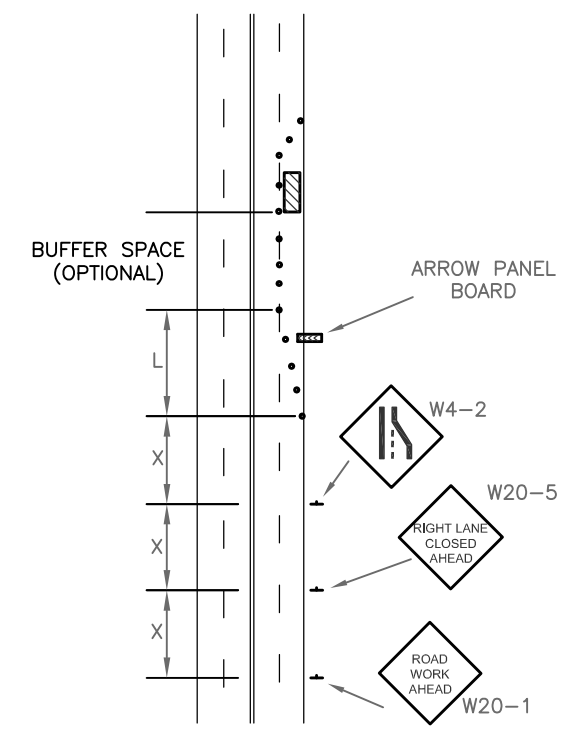
**CLOSURE INSIDE LEFT TURN LANE
WITH DUAL LEFT TURN LANES**



**CLOSURE OUTSIDE LEFT TURN LANE
WITH DUAL LEFT TURN LANES**



**LEFT LANE CLOSURE
ON 4-LANE ROADWAY**



**RIGHT LANE CLOSURE
ON 4-LANE ROADWAY**

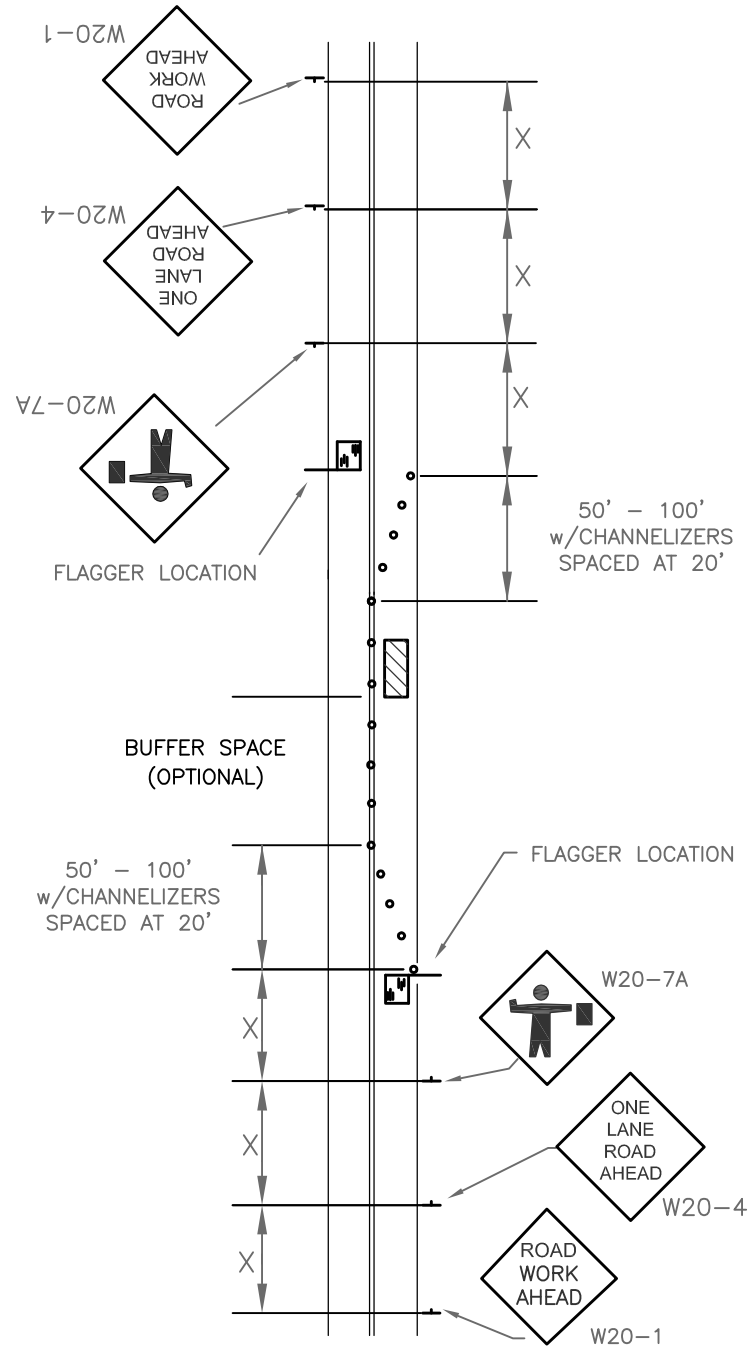
NO.	DATE	DESCRIPTION	BY

Traffic Control Details 3 Of 4
 XXXX & XXXX
 P.N. XXXXXc

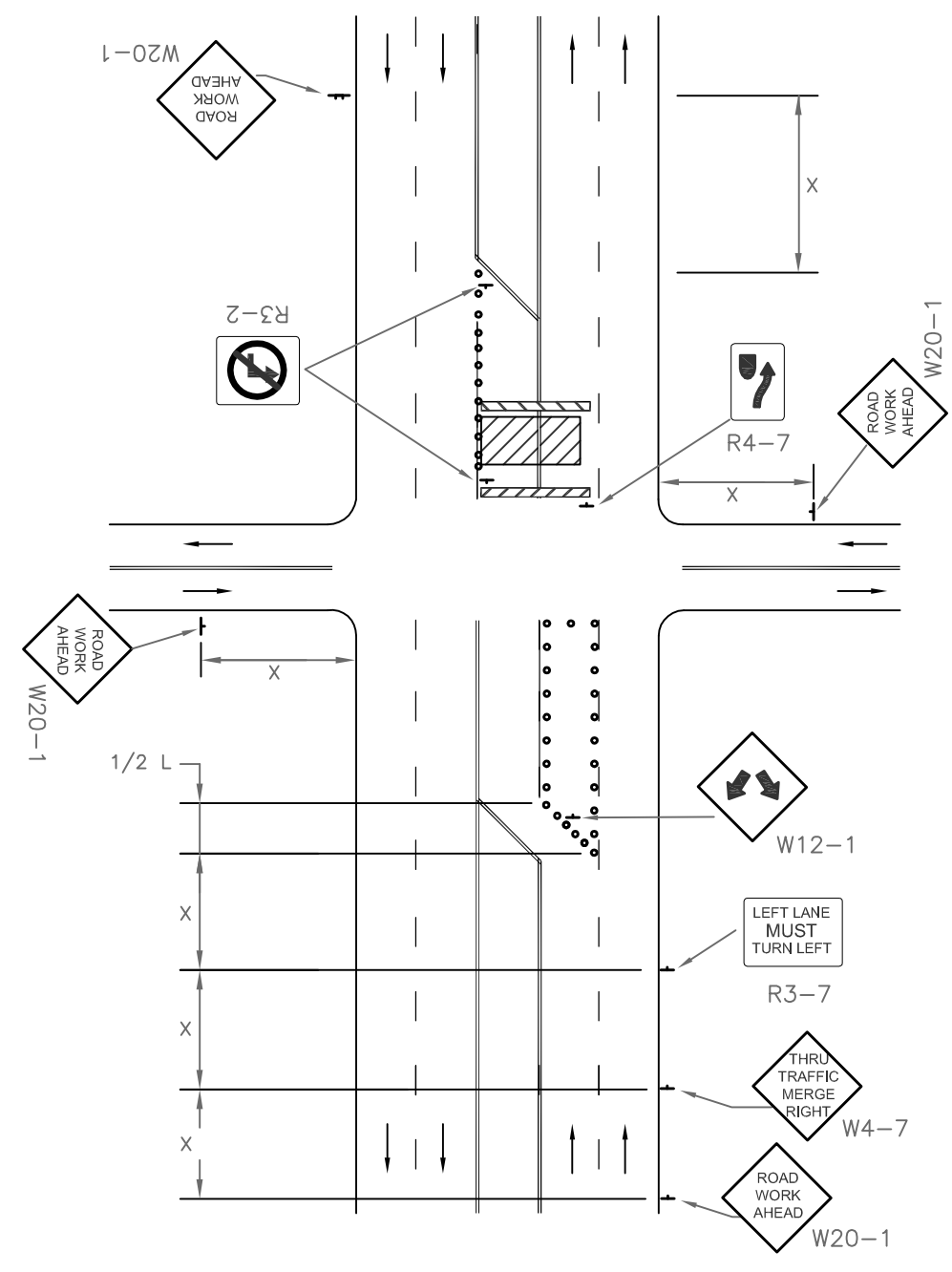
DESIGNED: XX	DATE: XX/XX/XX
DETAILED: XX	SCALE: NONE
CHECKED: XX	APPROVED: XX

CITY OF OLATHE
 PUBLIC WORKS / TRAFFIC DIVISION
 P.O. BOX 768 OLATHE, KANSAS 66061

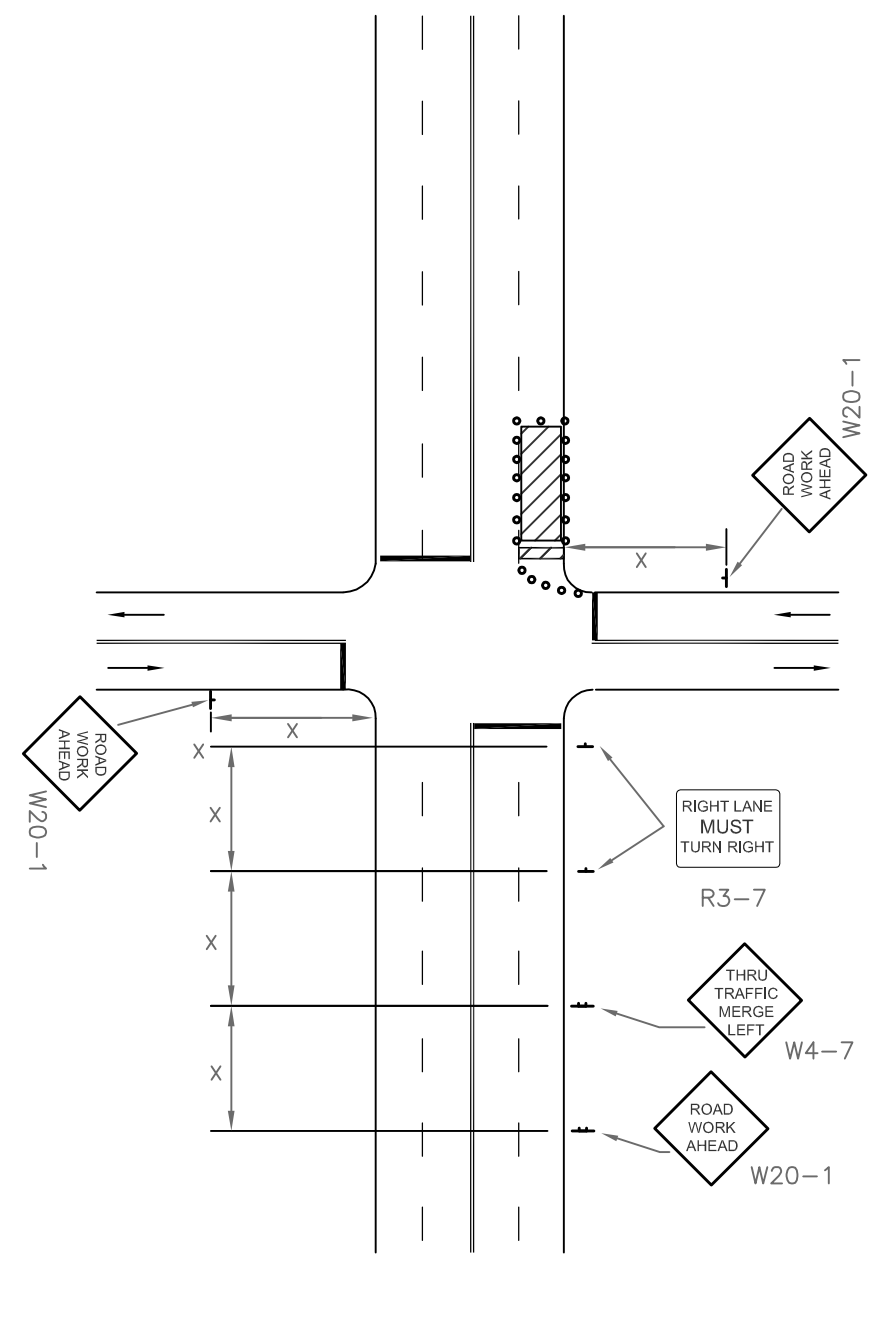
SHEET **XX** OF **XX**



**LANE CLOSURE ON TWO-LANE ROAD
W/ FLAGGER, DAYTIME ONLY**



**MULTIPLE LANE CLOSURE AT AN
INTERSECTION**



**RIGHT-HAND LANE CLOSURE ON THE
FAR SIDE OF AN INTERSECTION**

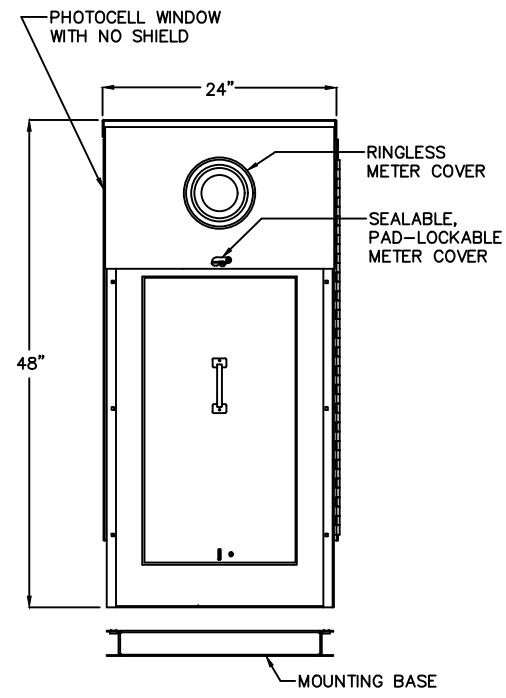
Traffic Control Details 4 Of 4
XXXX & XXXX
P.N. XXXXXc

CITY OF OLATHE
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P.O. BOX 768 OLATHE, KANSAS 66061

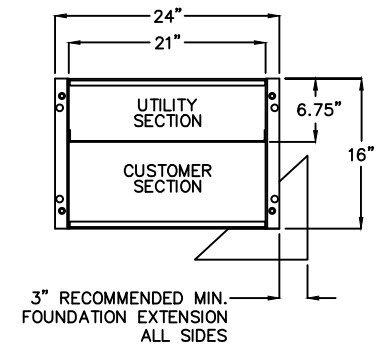
SHEET XX OF XX

NO.	DATE	DESCRIPTION	BY

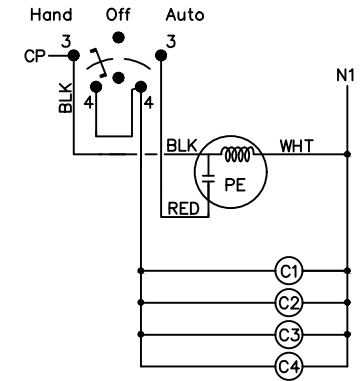
DESIGNED: XX	DATE: XX/XX/XX
DETAILED: XX	SCALE: NONE
CHECKED: XX	APPROVED: XX



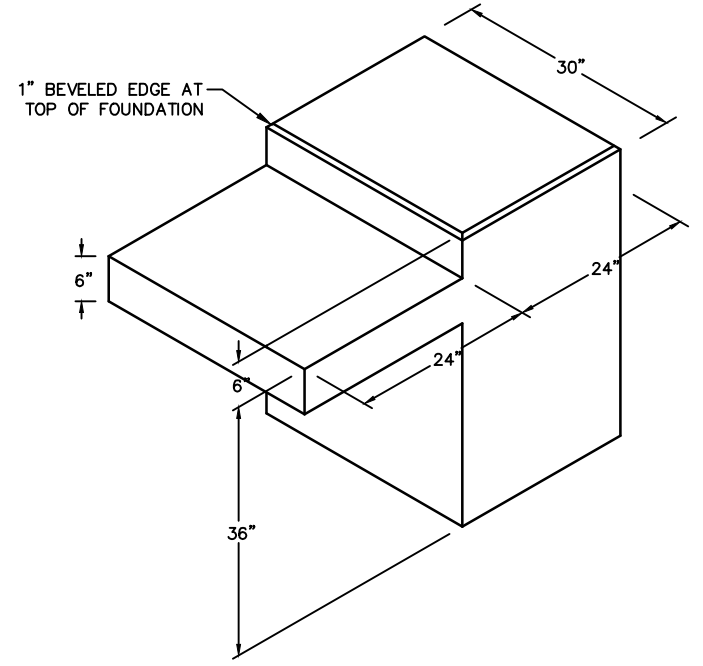
CABINET - REAR VIEW



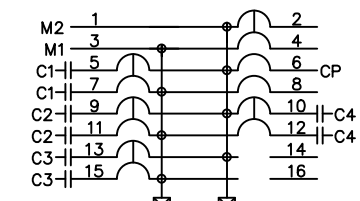
MOUNTING BASE DETAIL



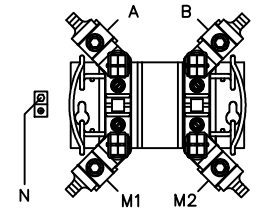
CONTROL WIRING



ISOMETRIC VIEW



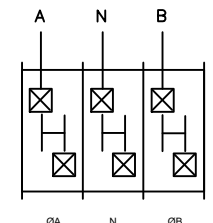
LOAD CENTER



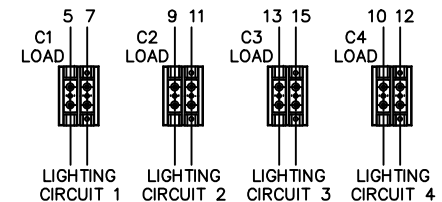
METER SOCKET

CIRCUIT DIRECTORY			
NO.	DESCRIPTION	AMP	POLE
1,3	SPACE NOT AVAILABLE		
2,4	MAIN	200	2
5,7	CONTACTOR 1	40	2
6	CONTROL	20	1
8	OPEN	20	1
9,11	CONTACTOR 2	40	2
10,12	CONTACTOR 4	40	2
13,15	CONTACTOR 3	40	2
14	SPACE AVAILABLE		1
16	SPACE AVAILABLE		1

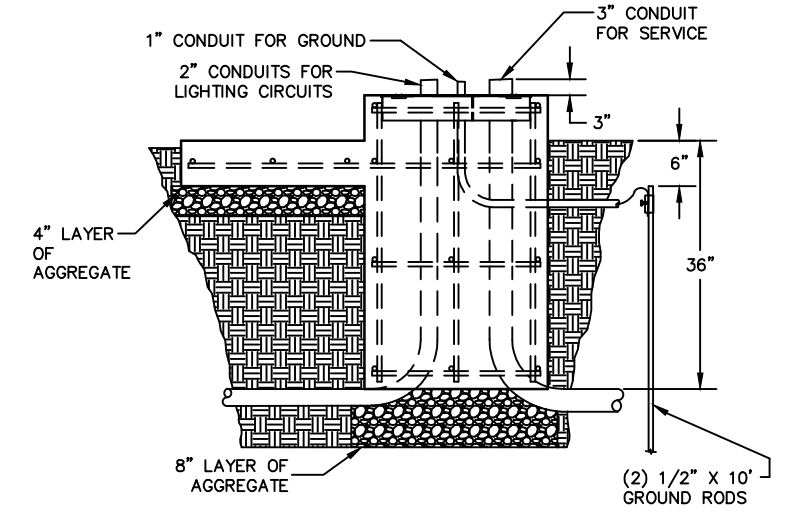
- NOTES:
- 200 AMPS CONTINUOUS
 - HORN BY-PASS STYLE USED FOR ALL SERVICES



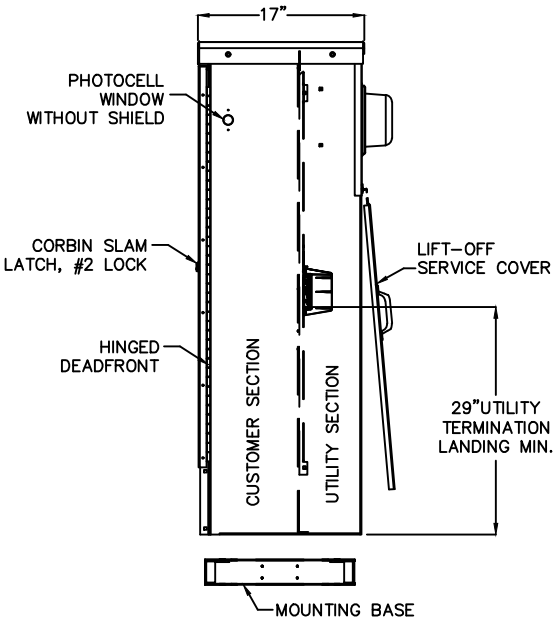
SERVICE TERMINATION



TERMINAL BLOCKS



SIDE VIEW NOT TO SCALE



CABINET - SIDE VIEW

- NOTES:
- FOR INSTALLATIONS WHERE A METER PEDESTAL IS REQUIRED, STREETLIGHT CONTROL CABINET WILL NOT HAVE A METER SOCKET.
 - MATERIAL SUBMITTALS MUST BE APPROVED BY CITY OF OLATHE STREETLIGHT SUPERVISOR PRIOR TO CONTROL CABINET INSTALLATION.
 - FOUNDATION FOR CONTROL CABINET MUST BE ACCEPTED BY STREETLIGHT INSPECTOR PRIOR TO POURING CONCRETE.

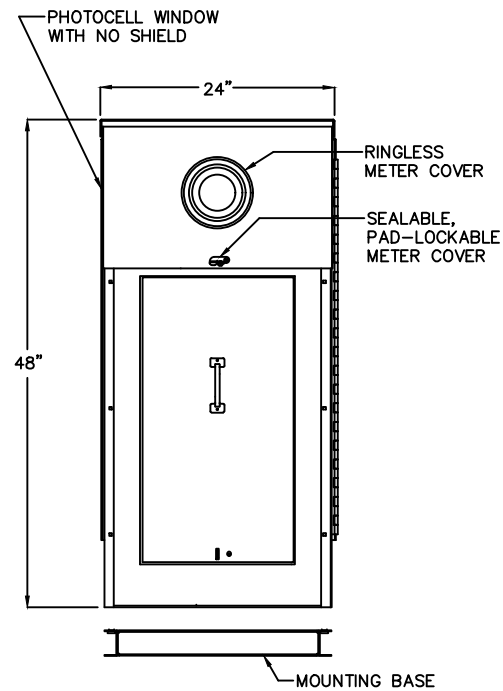
PAD MOUNTED STREETLIGHT CONTROL CABINET

- NOTES:
- 120/240 VAC, 1-PHASE, 60 Hz, 3-WIRE
 - C1-C4 - ELECTRICALLY HELD, 60 AMP, 2 POLE CONTACTORS W/120V COIL.
 - LIGHTING CONTROL PHOTOCELL PROVIDED BY OTHERS; 10A MAX. LOAD.
 - NO PHOTOCELL LIGHT SHIELD.
 - TERMINAL BLOCKS ARE 2 POSITION, AND ABLE TO ACCEPT #14-#2 AWG
 - CONNECTIONS MAY BECOME LOOSE DURING SHIPPING, TIGHTEN ALL CONNECTIONS PRIOR TO ENERGIZING.

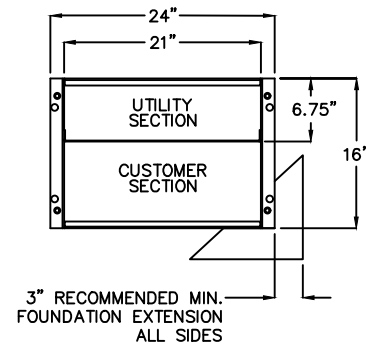
CONTROL CABINET WIRING DETAILS

- NOTES:
- REBAR SHALL BE GRADE 40, MEETING THE REQUIREMENTS OF SUBSECTION 1601 IN THE STANDARD SPECIFICATIONS FOR STATE ROAD AND BRIDGE CONSTRUCTION, KANSAS DEPARTMENT OF TRANSPORTATION.
 - PROVIDE (2) GROUND RODS AS REQUIRED BY N.E.C. TO GROUND.
 - FOUNDATION FOR CONTROL CABINET MUST BE ACCEPTED BY STREETLIGHT INSPECTOR PRIOR TO POURING CONCRETE.
 - CONCRETE SLAB TO PROVIDE SEMI-DRY WORKING AREA IN FRONT OF CABINET.

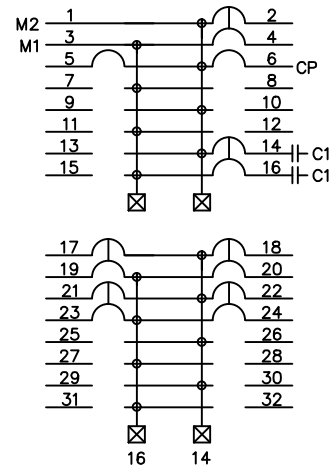
CONCRETE FOUNDATION FOR CONTROL CABINET



CABINET - REAR VIEW

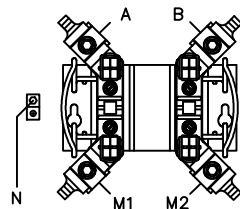


MOUNTING BASE DETAIL



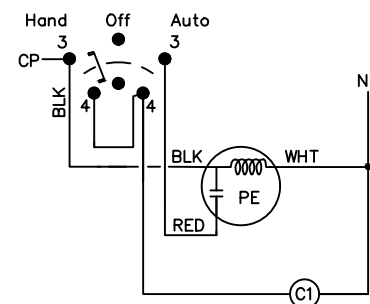
LOAD CENTER

CIRCUIT DIRECTORY			
LOAD CENTER 1			
NO.	DESCRIPTION	AMP	POLE
1,3	SPACE NOT AVAILABLE		
2,4	MAIN	200	2
5	TRAFFIC SIGNAL	40	1
6	CONTROL	20	1
14,16	CONTACTOR - LC2	150	2
LOAD CENTER 2			
17,19	LIGHTING 1	40	2
18,20	LIGHTING 2	40	2
21,23	LIGHTING 3	40	2
22,24	LIGHTING 4	40	2

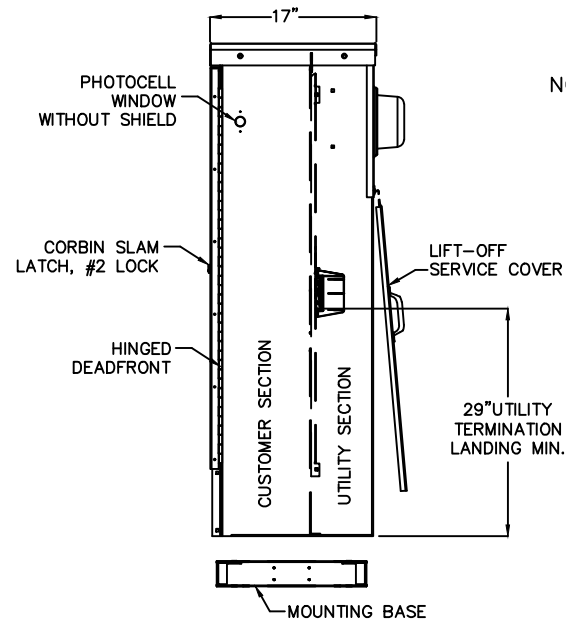


- NOTES:
- 200 AMPS CONTINUOUS
 - HORN BY-PASS STYLE USED FOR ALL SERVICES

METER SOCKET



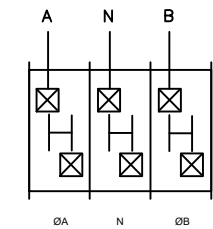
CONTROL WIRING



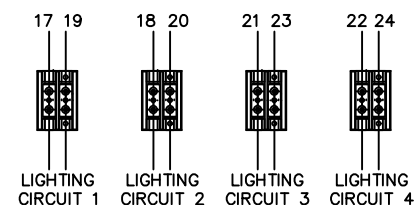
CABINET - SIDE VIEW

- NOTES:
- FOR INSTALLATIONS WHERE A METER PEDESTAL IS REQUIRED, CONTROL CABINET WILL NOT HAVE A METER SOCKET.
 - MATERIAL SUBMITTALS MUST BE APPROVED BY CITY OF OLATHE STREETLIGHT SUPERVISOR PRIOR TO CONTROL CENTER INSTALLATION.
 - FOUNDATION FOR CONTROL CENTER MUST BE ACCEPTED BY STREETLIGHT INSPECTOR PRIOR TO POURING CONCRETE.

PAD MOUNTED STREETLIGHT CONTROL CABINET



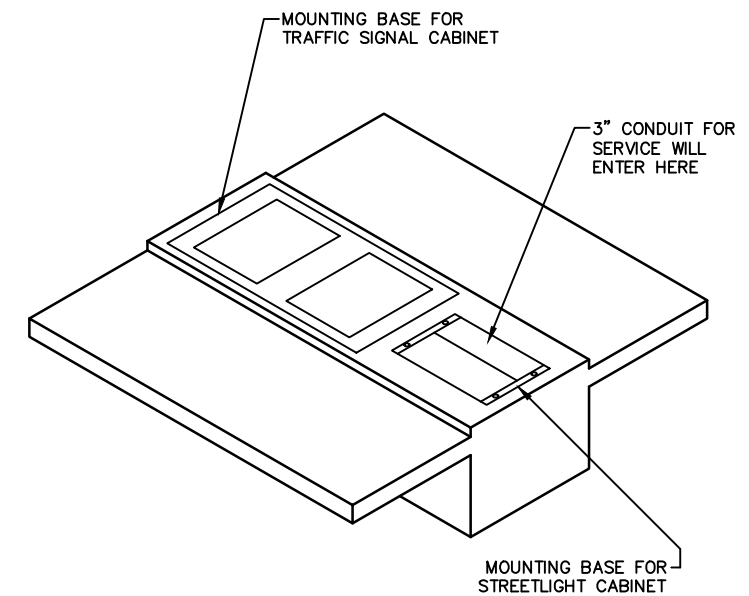
SERVICE TERMINATION



TERMINAL BLOCKS

- NOTES:
- 120/240 VAC, 1-PHASE, 60 Hz, 3-WIRE.
 - C1 - 200 AMP, 2 POLE CONTACTOR, ELECTRICALLY HELD W/120V COIL.
 - LIGHTING CONTROL PHOTOCELL PROVIDED BY OTHERS; 10A MAX. LOAD.
 - NO PHOTOCELL LIGHT SHIELD.
 - TERMINAL BLOCKS ARE 2 POSITION, AND ABLE TO ACCEPT #14-#2 AWG CONNECTIONS MAY BECOME LOOSE DURING SHIPPING, TIGHTEN ALL CONNECTIONS PRIOR TO ENERGIZING.

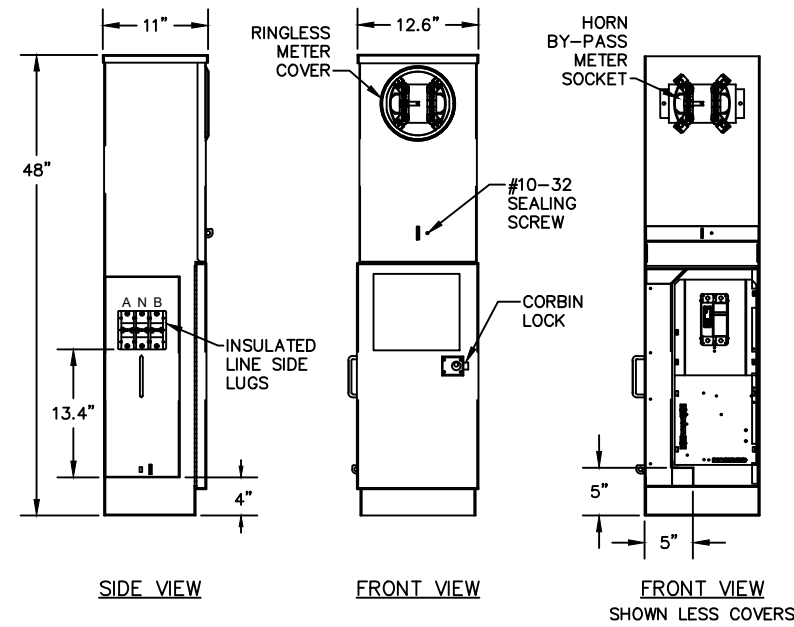
STREETLIGHT CONTROL CABINET WIRING DETAILS



ISOMETRIC VIEW
NOT TO SCALE

- NOTES:
- REFER TO SIGNAL DETAIL SHEETS FOR MORE INFORMATION ABOUT CABINET FOUNDATION.
 - STREETLIGHT CABINET SHALL BE ORIENTED SO THAT PHOTOCELL WINDOW FACES AWAY FROM TRAFFIC SIGNAL CABINET AND METER FACES TOWARD STREET.
 - FOUNDATION FOR CABINETS MUST BE ACCEPTED BY STREETLIGHT INSPECTOR AND TRAFFIC SIGNAL INSPECTOR PRIOR TO POURING CONCRETE.
 - CABINET SHALL BE GROUNDED USING (2) GROUND RODS AS REQUIRED BY N.E.C.

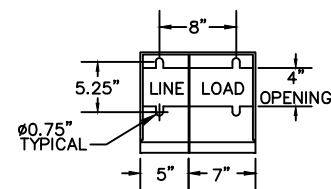
CONCRETE FOUNDATION FOR STREETLIGHT CABINET & TRAFFIC SIGNAL CABINET



SIDE VIEW

FRONT VIEW

FRONT VIEW SHOWN LESS COVERS



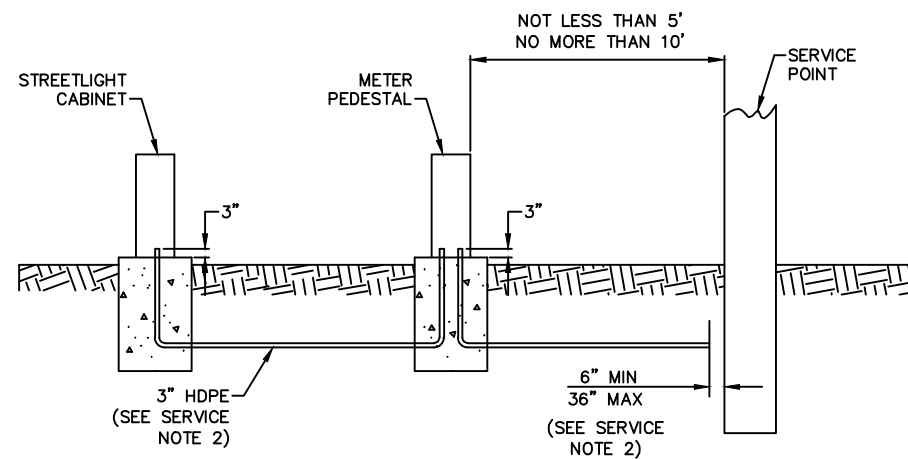
BASE DETAIL

CIRCUIT DIRECTORY			
NO.	DESCRIPTION	AMP	POLE
0-0	SERVICE DISCONNECT	200	2

NOTES:

- 120/240 VAC, 1-PHASE, 60 Hz, 3-WIRE
- MATERIAL SUBMITTALS MUST BE APPROVED BY CITY OF OLATHE STREET LIGHT SUPERVISOR PRIOR TO METER PEDESTAL INSTALLATION.
- CONNECTIONS MAY BECOME LOOSE DURING SHIPPING, TIGHTEN ALL CONNECTIONS PRIOR TO ENERGIZING.

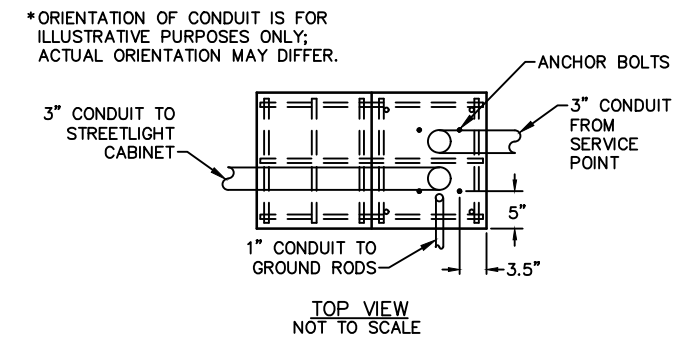
METER PEDESTAL FOR STREETLIGHT INSTALLATIONS (WHERE NECESSARY)



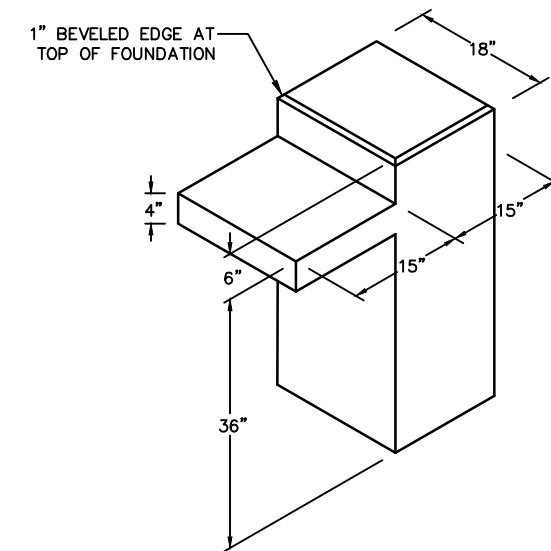
SERVICE NOTES:

- METER PEDESTALS SHALL BE USED FOR INSTALLATIONS WHERE THE SOURCE OF POWER IS MORE THAN TWENTY (20) FEET FROM THE STREETLIGHT CONTROL CABINET.
- PER CURRENT POWER COMPANY SPECS.
- IN THE EVENT THAT EVERGY DETERMINES THAT SERVICE CABLE MUST BE PROVIDED AND INSTALLED BY THE CONTRACTOR, THE CABLE SHALL HAVE AN AMPACITY RATING NOT LESS THAT 80 PERCENT OF THE MAXIMUM RATING OF THE CONTROL CENTER.

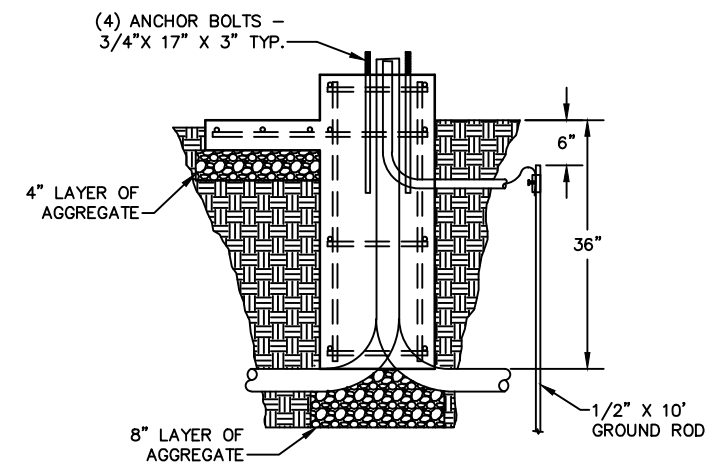
SERVICE TO STREET LIGHT CONTROL CABINET



TOP VIEW NOT TO SCALE



ISOMETRIC VIEW

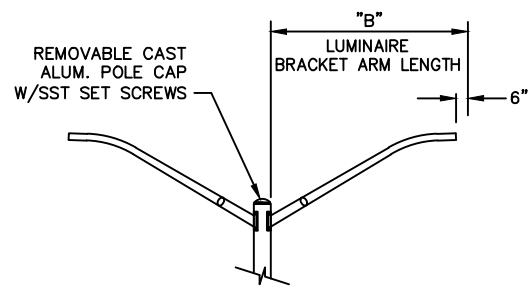


SIDE VIEW NOT TO SCALE

NOTES:

- REBAR SHALL BE GRADE 40, MEETING THE REQUIREMENTS OF SUBSECTION 1601 IN THE STANDARD SPECIFICATIONS FOR STATE ROAD AND BRIDGE CONSTRUCTION, KANSAS DEPARTMENT OF TRANSPORTATION.
- PROVIDE (2) GROUND RODS AS REQUIRED BY N.E.C. TO GROUND.
- CONCRETE SLAB TO PROVIDE SEMI-DRY WORKING AREA IN FRONT OF METER PEDESTAL.
- FOUNDATION MUST BE ACCEPTED BY STREETLIGHT INSPECTOR PRIOR TO POURING CONCRETE.

CONCRETE FOUNDATION FOR METER PEDESTAL



TWIN LUMINAIRE ARMS

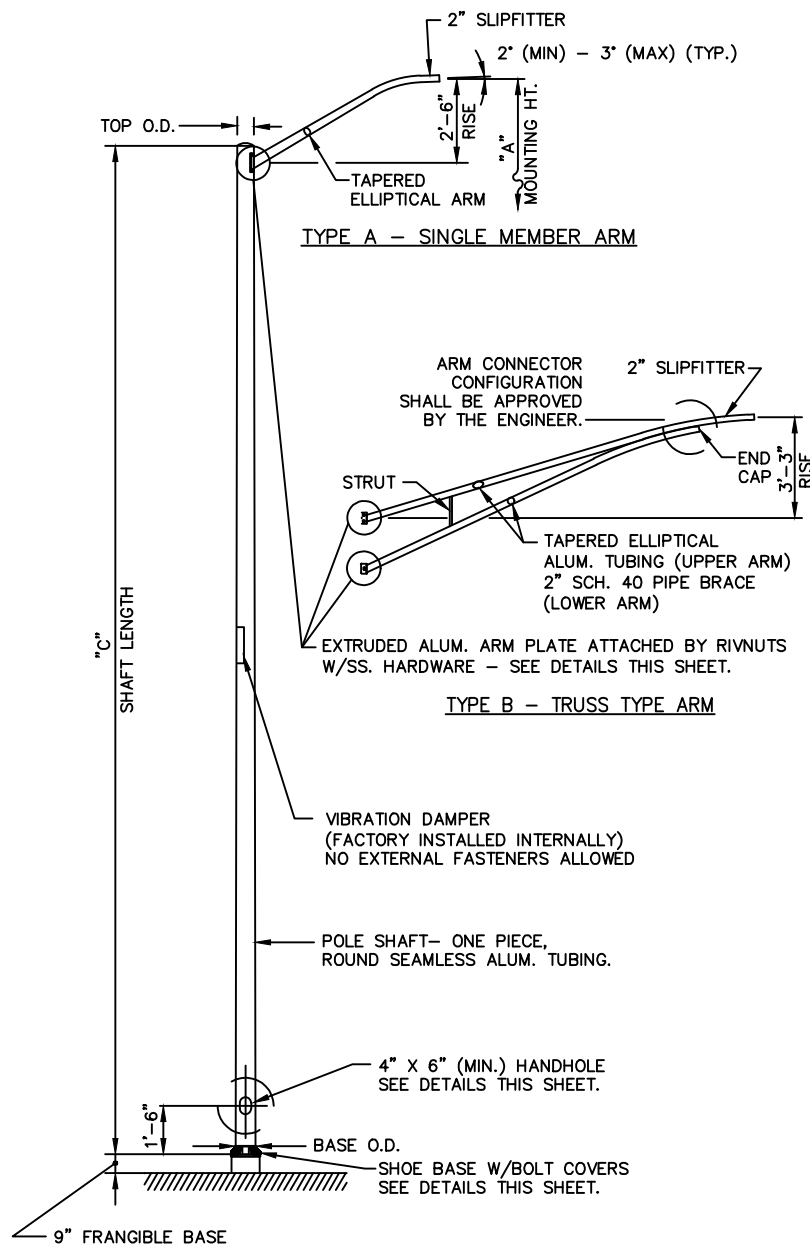
TYPE A OR B

GENERAL NOTES:

1. ALL POLES, ARMS, AND MISCELLANEOUS EQUIPMENT SHALL CONFORM TO THESE DETAILS AND AS SPECIFIED IN THE LATEST EDITION OF THE STREET LIGHTING SPECIFICATION. THE POLES AND ARMS SHALL BE DIMENSIONED TO ENABLE INTERCHANGEABILITY.
2. THE ALUMINUM LIGHTING STANDARD INCLUDING ANCHORAGE WITH LUMINAIRE PROPERLY INSTALLED SHALL BE IN ACCORDANCE WITH THE CURRENT EDITION OF THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO) STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS.
3. THE INTENT OF THESE MATERIAL RESTRICTIONS IS TO PROVIDE INTERCHANGEABILITY OF BOTH TYPES OF LUMINAIRE ARMS FOR MOUNTING ON EITHER THE 30' OR 40' POLE.
4. ANCHOR BOLTS/THREADED STUDS SHALL PROJECT ABOVE THE FOUNDATION AS PER MANUFACTURER'S RECOMMENDED PRACTICES - 2.5" TO 3".

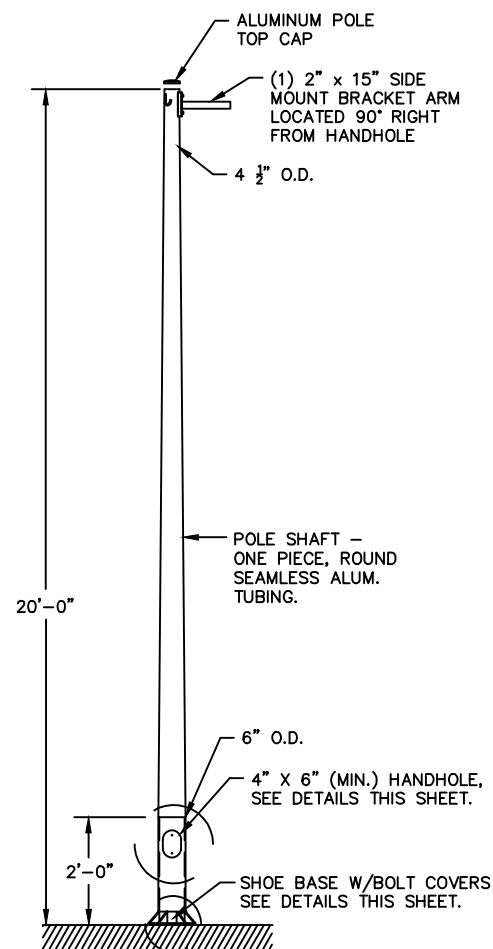
Designation	Mounting Height (A)	Luminaire Arm(s)		Type	Pole Shaft			Shoe Base		Anchor Bolt			
		Length (B)			Base O.D.	Top O.D.	Min. Wall Thickness	Shaft Length (C)	Square (S)	Bolt Circle (BC)	Diameter	Length	Hook
		Arm 1	Arm 2										
OL14	-	-	-	-	6"	3.0"	.0156"	14'-0"	10.25	9.50"	0.75"10NC	25"	3"
OL20	19.5	15"	-	-	6"	4.5"	.0156"	20'-0"	10.25	9.50"	0.75"10NC	25"	3"
OL301	30	6/8	-	A	7"	4.5"	.0156"	27'-6"	11.25	10.50"	1.00" 8NC	36"	4"
OL302	30	10	-	B	8"	6.0"	0.156"	26'-8"	12.00"	11.50"	1.00" 8NC	36"	4"
OL303	30	8	8	A	8"	4.5"	0.156"	27'-6"	12.00"	11.50"	1.00" 8NC	36"	4"
OL401	40	6/8	8	A	8"	4.5"	0.219"	37'-6"	12.00"	11.50"	1.00" 8NC	36"	4"
OL402	40	10/12	-	B	8"	6.0"	0.219"	36'-8"	12.00"	11.50"	1.00" 8NC	36"	4"
OL403	40	8/12	8/12	B	10"	6.0"	0.219"	36'-8"	13.00"	14.00"	1.00" 8NC	48"	4"

TABLE 1 - LUMINAIRE ARM, POLE, SHOE BASE & ANCHOR BOLT DATA



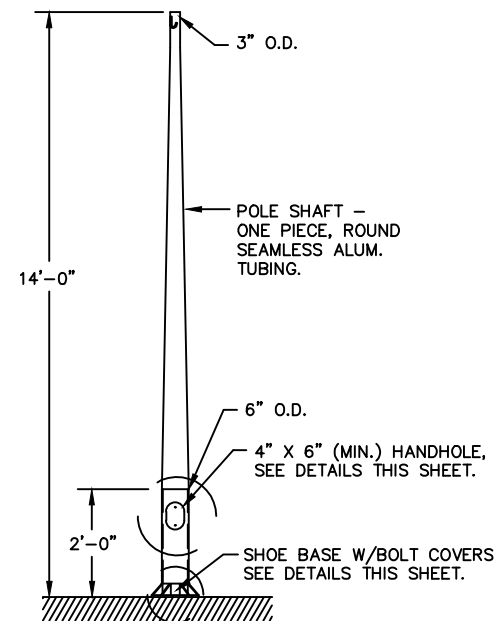
30' & 40' POLE ELEVATION

(SEE TABLE 1 FOR DESIGNATIONS & DIMENSIONS)



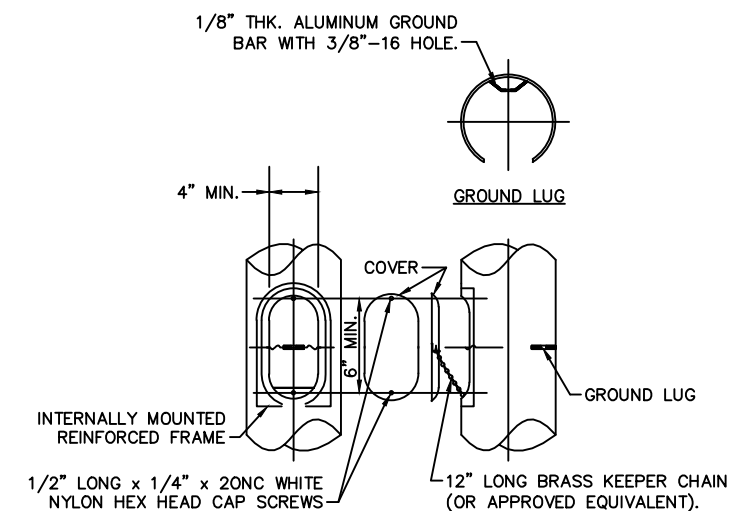
20' POLE ELEVATION

(SEE TABLE 1 FOR DESIGNATIONS & DIMENSIONS)

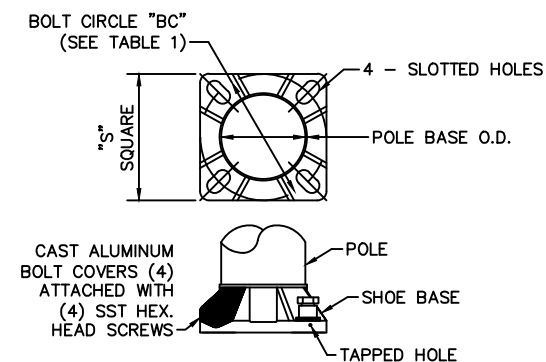


14' POLE ELEVATION

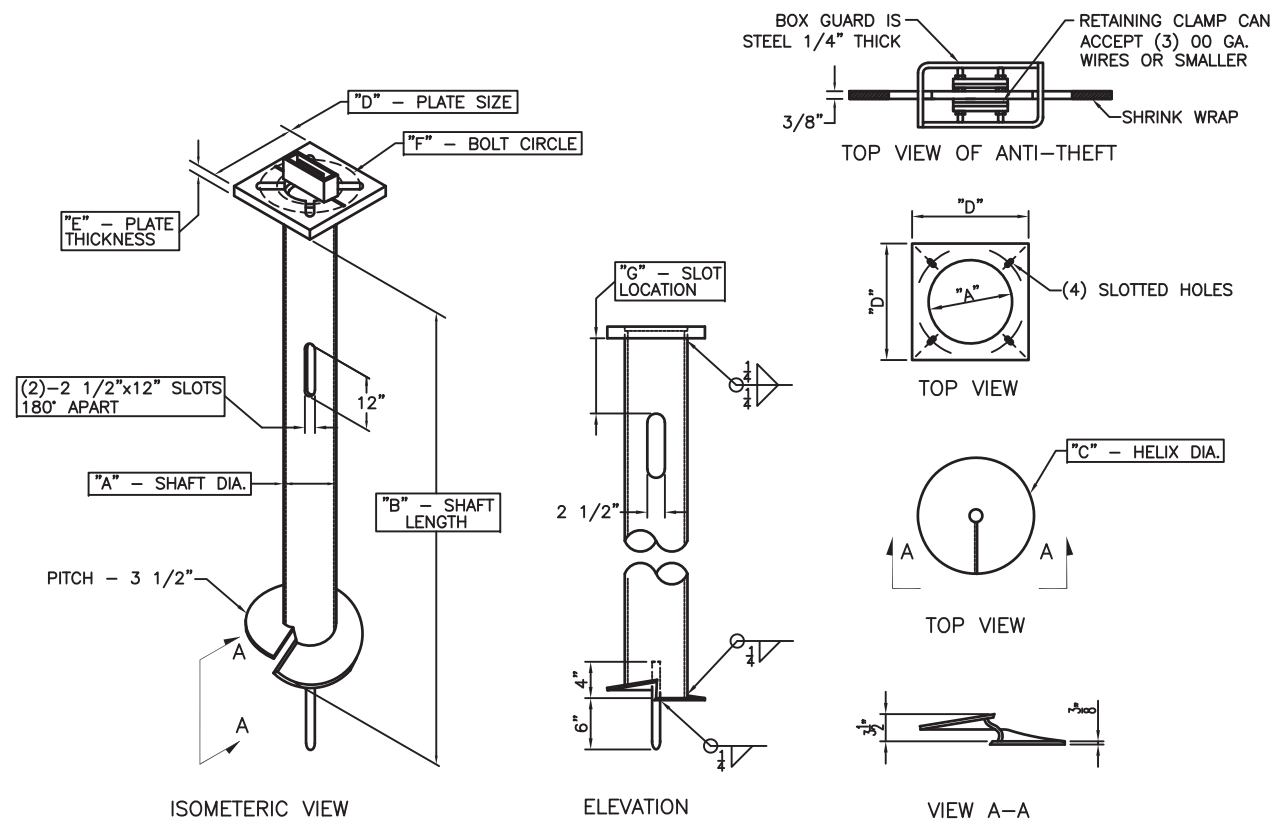
(SEE TABLE 1 FOR DESIGNATIONS & DIMENSIONS)



HANDHOLE



SHOE BASE

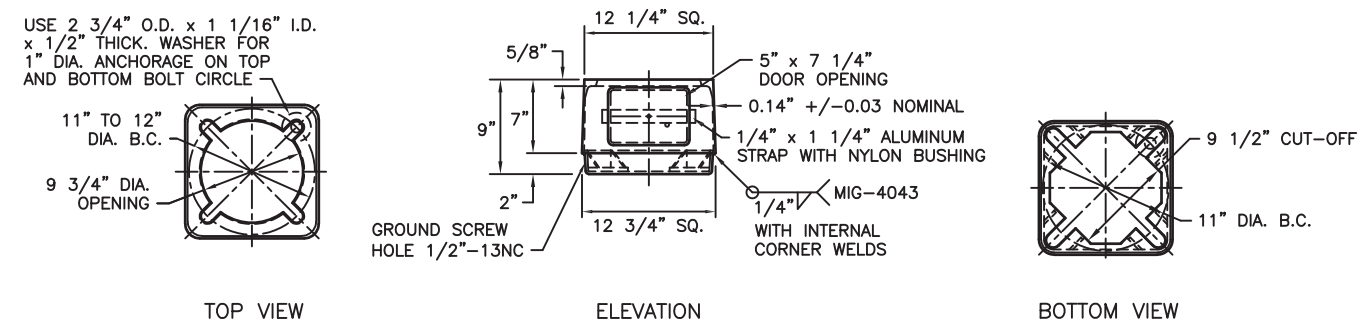


SCREW-IN POLE FOUNDATION

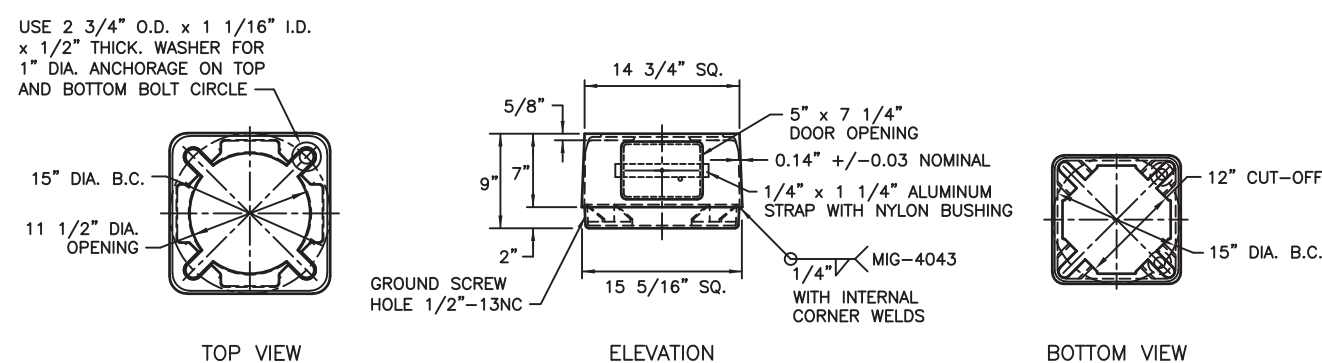
TYPE	POLE TYPE(S)	MAXIMUM TORQUE RATING (lbs ft)	A SHAFT DIA.	B SHAFT LENGTH	C HELIX DIA.	D PLATE SIZE	E PLATE THICKNESS	F BOLT CIRCLE	G SLOT LOCATION
R	OL14, OL20	15,000	6"	48"	12"	10"	0.75"	9.5"	12"
T1S	OL301, OL302, OL303	15,000	6"	60"	12"	12"	1.0"	9"-12"	18"
F1/2S	OL401, OL402, OL403	20,000	8"	60"	14"	15"	1.0"	11"-15"	18"

NOTES:

- FINISH: HOT DIP GALVANIZE PER ASTM-A123 (LATEST REVISION).
- BASEPLATE TO BE PERPENDICULAR TO SHAFT AXIS (± 1) AND HOLE AND CONCENTRIC (± 188 I.D. FIM) TO SHAFT AXIS
- ALL BASES SHALL BE IDENTIFIED BY THE MANUFACTURER'S INITIALS AND THE ANCHOR TYPE (1,2 & 3) PERMANENTLY STAMPED INTO THE TOP PLATE WITH 1/2" LETTERS. THE JULIAN DATE OF MANUFACTURE SHALL BE PERMANENTLY STAMPED IN 1/4" NUMERALS.
- PILOT POINT AND SHAFT AXES TO BE CONCENTRIC (± 125 FIM) AND IN LINE (± 2).
- PREHEAT (ROOM TEMPERATURE 70°F), TUMBLEBLAST, HANDGRIND, AND CLEAN BASEPLATE, HELIX, AND CORE ON ALL WELD AREAS.
- FLAMECUT IRREGULARITIES PERMISSIBLE:
 - VALLEYS NOT TO EXCEED 3/32 IN. BELOW NOMINAL SURFACE LEVEL.
 - PEAKS OR POSITIVE IRREGULARITIES NOT TO EXCEED 1/32 IN. ABOVE NOMINAL SURFACE LEVEL OR INTERSECTIONS OF NOMINAL SURFACES.
- MANUFACTURER TO HAVE IN EFFECT INDUSTRY RECOGNIZED WRITTEN QUALITY CONTROL FOR ALL MATERIALS AND MANUFACTURING PROCESSES.
- ALL MATERIAL IS TO BE NEW, UNUSED AND MILL TRACEABLE MEETING THE FOLLOWING SPECIFICATIONS:
 - BASEPLATE: ASTM A36-(LATEST REVISION) HOT ROLLED STEEL PLATE
 - SHAFT: STEEL PIPE PILES, SEAMLESS OR STRAIGHT WELDED, GRADE 2 PER ASTM A252. ALTERNATE MATERIAL PIPE TYPE E OR S, GRADE B PER ASTM A53.
 - HELIX: ASTM A635-(LATEST REVISION) HOT ROLLED STEEL PLATE
 - PILOT POINT: ASTM A575-(LATEST REVISION) HOT ROLLED STEEL
 - AISI C 1045 HOT ROLLED STEEL.
 - BOLTS: 1" DIAMETER HOT DIP GALVANIZED HEX HEAD BOLT (TYPE R) OR CARRIAGE BOLT (T1S, F1/2S). BOLTS SHALL INCLUDE ONE HEX NUT AND ONE EACH LOCK AND FLAT WASHER
 - ANTI-THEFT BOLTS: STAINLESS HEX HEAD MACHINE BOLTS, 1/4-20-UNC2A PER ASTM A276.
 - NUTS: HEAVY HEX NUTS PER ASTM A194 GRADE 2H OR ASTM A563 GRADE DH, MEETING THE SUPPLEMENTARY REQUIREMENTS OF ASTM A563, 1-8UNC-2B PER ANSI B18.2.2.
 - ANTI-THEFT CLAMP ASSEMBLY: STEEL PER ASTM A36 STRUCTURAL STEEL
 - RUBBER PADS: ELASTOMER PER CLASS 4 RUBBER BLANKET, MINIMUM OF 40 DUROMETER.
- THE DESIGN AND PERFORMANCE INTEGRITY OF THE FOUNDATION SHALL BE VERIFIED BY FULL-SCALE TESTS BY QUALIFIED ENGINEERS INDEPENDENT OF THE MANUFACTURER. CERTIFIED TEST REPORTS SHALL BE PROVIDED UPON REQUEST.
- FLAME CUT NOTCH OR PROJECTION WILL BE ON BASE PLATE TO INDICATE SLOT ORIENTATION.



CS-300 FRANGIBLE BASE (OL301, OL302, OL303, OL401, OL402 POLES)



CS-370 FRANGIBLE BASE (OL403 POLE)

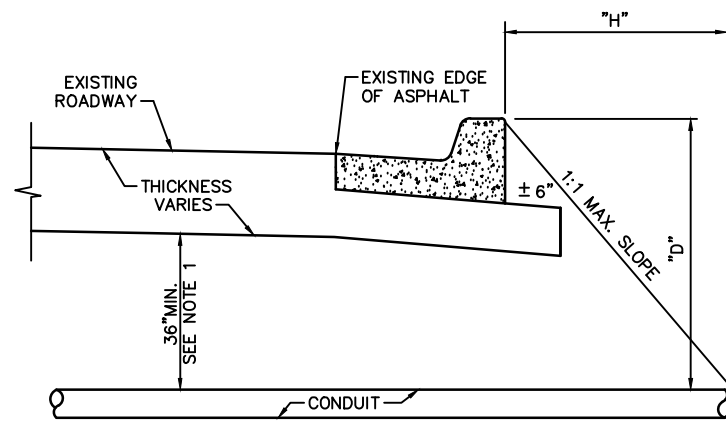
MATERIAL DATA

COMPONENT	ALUMINUM ALLOY DESIGNATION	SPECIFICATION
Shoe Base	356-T6, Cast	ASTM B26 or B108
Bolt Covers	356 or 360, Cast	ASTM B26 or B108
Pole Shaft	6063-T6, Extruded	ASTM B221 or B241
Ground Lug	6061-T5 or 6063-T6, Plate	ASTM B221
Reinforced Handhole Frame	356-T6 or 6061-T6	ASTM B26, B208 or B221
Handhole Cover	6063-T6	ASTM B209, B221 or B241
Luminaire Arm & Tubing Pipes *	6063-T6	ASTM B221, B241 or B429
Luminaire Arm Plate	6061-T6 or 6063-T6 Extruded	ASTM B221
Luminaire Arm Strut* & Arm Connector*	6061-T6 or 6063-T6 Extruded	ASTM B221, B241 or B429
Pole Cap	356, Cast	ASTM B26 or B108

* TRUSS-TYPE LUMINAIRE ARMS (TYPE B) ONLY.

NOTES:

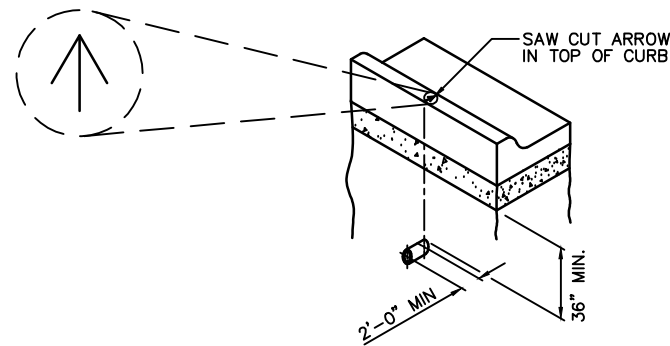
- POLE SHAFT SHALL HAVE A SATIN GROUND FINISH UNLESS OTHERWISE SPECIFIED BY CITY ENGINEER.
- ALL HARDWARE (BOLTS, NUTS, WASHERS BUT NOT INCLUDING ANCHOR BOLTS) NOT OTHERWISE SPECIFICALLY DESIGNATED IN THE SPECIFICATIONS OR DETAILS SHALL BE ALUMINUM OR 300-SERIES PASSIVATED STAINLESS STEEL.



ROADWAY CONDUIT CROSSING
NOT TO SCALE

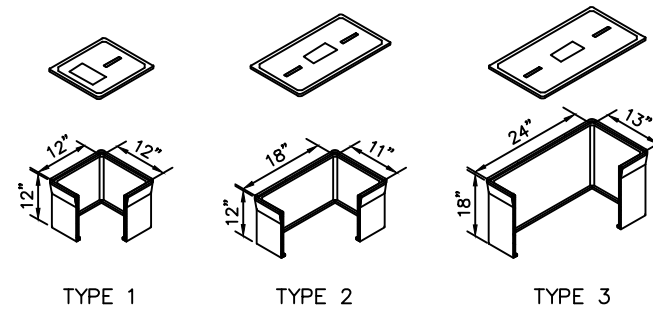
CONDUIT CROSSING NOTES:

1. DEPTH SHOWN BELOW THE EXISTING PAVEMENT REPRESENTS MINIMUM DISTANCE ALLOWED. CONTRACTOR MAY NEED TO INCREASE THIS DISTANCE DEPENDING ON CONDITIONS AND SIZE OF CONDUIT. DISTANCE BELOW PAVEMENT MAY BE REDUCED TO 30" FOR RESIDENTIAL STREET CROSSINGS. CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE RESULTING FROM HIS OPERATION. CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING AND SETTLEMENT OR DAMAGE THAT OCCURS WITHIN 2 YEARS OF INSTALLATION.
2. FOR THE PUNCH METHOD, THE COMPACTION HEAD SIZE IS LIMITED TO 4".



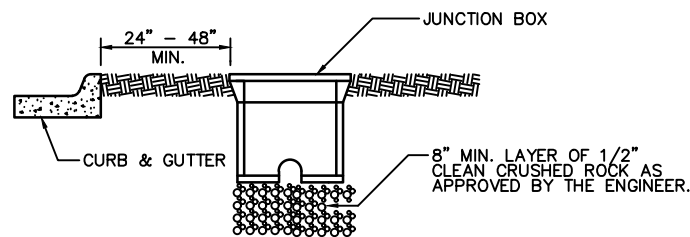
CONDUIT SHALL BE PLACED 36" MIN BELOW EXISTING ROADWAY AND SHALL EXTEND 2'-0" MINIMUM BEYOND THE BACK OF CURB. CONDUIT SHALL BE INSTALLED TO DRAIN. A SAWCUT ARROW SHALL BE PLACED IN THE TOP OF THE CURB DIRECTLY OVER THE CONDUIT.

CONDUIT MARKING DETAIL
NOT TO SCALE

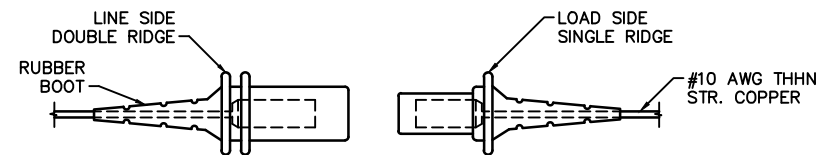


- NOTES:
1. BOX AND COVER SHALL MEET OR EXCEED ANSI/SCTE-77, TIER 22.
 2. BOX SHALL BE MANUFACTURED FROM A LIGHTWEIGHT POLYMER/COMPOSITE.

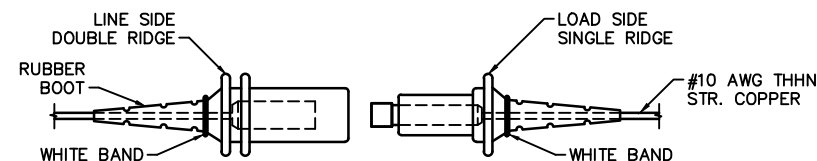
JUNCTION BOX DETAILS
NOT TO SCALE



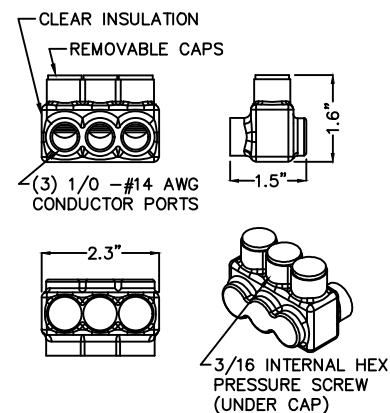
JUNCTION BOX INSTALLATION DETAIL
NOT TO SCALE



FUSED CONNECTOR

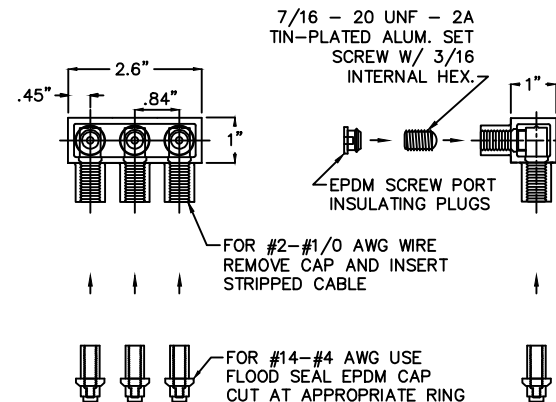


UNFUSED CONNECTOR



- NOTES:
1. CONNECTOR PRE-FILLED W/ OXIDE INHIBITOR.
 2. CONNECTOR MANUFACTURED FROM 6061-T6511 ALUM. ALLOY.

POLARIS CONNECTOR



SUBMERSIBLE CONNECTOR

SUMMARY OF STREET LIGHTING QUANTITIES *		
ITEM	UNIT	QUANTITY
40' ALUMINUM POLE (OL401-6)	EACH	
40' ALUMINUM POLE (OL401-8)	EACH	
40' ALUMINUM POLE (OL401-8-8)	EACH	
40' ALUMINUM POLE (OL402-10)	EACH	
40' ALUMINUM POLE (OL402-12)	EACH	
40' ALUMINUM POLE (OL403-12-12)	EACH	
40' ALUMINUM POLE (DESIGNATION)	EACH	
40' ALUMINUM POLE (DESIGNATION)	EACH	
30' ALUMINUM POLE (OL301-6)	EACH	
30' ALUMINUM POLE (OL301-8)	EACH	
30' ALUMINUM POLE (OL302-10)	EACH	
30' ALUMINUM POLE (OL303-8-8)	EACH	
30' ALUMINUM POLE (DESIGNATION)	EACH	
30' ALUMINUM POLE (DESIGNATION)	EACH	
30' ALUMINUM POLE (DESIGNATION)	EACH	
30' ALUMINUM POLE (DESIGNATION)	EACH	
20' ALUMINUM POLE (OL20)	EACH	
14' ALUMINUM POLE (OL14)	EACH	
CS-300 FRANGIBLE BASE	EACH	
CS-370 FRANGIBLE BASE	EACH	
TYPE R SCREW IN FOUNDATION	EACH	
TYPE T1S SCREW IN FOUNDATION	EACH	
TYPE F1/2S SCREW IN FOUNDATION	EACH	
LED LUMINAIRE*** (PART NUMBER)	EACH	
LED LUMINAIRE*** (PART NUMBER)	EACH	
LED LUMINAIRE*** (PART NUMBER)	EACH	
SHORTING CAP	EACH	
POST TOP LUMINAIRE, HOLOPHANE #PTU15AHP24BG3S	EACH	
STREETLIGHT CONTROL CABINET - PAD MOUNTED***	EACH	
STREETLIGHT CONTROL CABINET FOUNDATION	EACH	
STREETLIGHT CONTROL CABINET GROUND ROD	EACH	
PHOTO CELL (DELAY TYPE)	EACH	
METER PEDESTAL - PAD MOUNTED***	EACH	
METER PEDESTAL FOUNDATION	EACH	
METER PEDESTAL GROUND ROD	EACH	
TYPE 1 JUNCTION BOX	EACH	
TYPE 2 JUNCTION BOX	EACH	
TYPE 3 JUNCTION BOX	EACH	
3" HDPE SCHEDULE 40	LN. FT.	
2" HDPE SCHEDULE 40	LN. FT.	
3-1c No. 4 TYPE USE DISTRIBUTION CABLE**	LN. FT.	
1c No. 10 TYPE THHN POLE & BRACKET CABLE	LN. FT.	
CONNECTOR KIT, FUSED	EACH	
CONNECTOR KIT, UNFUSED	EACH	
POLARIS CONNECTORS	EACH	
SUBMERSIBLE CONNECTORS	EACH	

* THESE APPROXIMATE QUANTITIES WERE PREPARED SOLELY FOR THE CONTRACTOR'S CONVENIENCE AND ARE NOT GUARANTEED TO BE A COMPLETE LIST OF MATERIALS FOR THIS PROJECT.

** FOR TOTAL LINEAL FOOTAGE OF 1c No. 4, MULTIPLY THIS QUANTITY BY 3

*** SEE CURRENT STREET LIGHT PRE-APPROVAL LIST

CITY OF OLATHE TECHNICAL SPECIFICATIONS SECTION 9000 - STREET LIGHTING

9001 SCOPE

This section applies to all street light construction and shall consist of furnishing all labor, materials and equipment for the complete installation of street lighting systems. A complete list of pre-approved street lighting materials is available on the City of Olathe public website at www.olatheks.org.

9002 GENERAL

The standard street light details that accompany these specifications shall be considered a part thereof. These standard details are available on the City of Olathe public website at www.olatheks.org.

When a conflict arises with the plans or specifications and the proposed work, the Contractor shall immediately notify the City Engineer. The City Engineer will review the plans and provide direction to the Contractor.

All incidental parts which are not shown on the plans or specified herein and which are necessary to complete the street lighting system shall be furnished and installed as though such parts were shown on the plans or specified herein. All systems shall be complete and in operation to the satisfaction of the City Engineer at the time of acceptance of the work.

All appurtenances shall be located as shown on the plans. Any deviations must be approved by the City Engineer.

The Contractor shall have a **signed** copy of the plans and specifications at the job location at all times.

Prior to the acceptance of the work, the Contractor shall submit an "as-built" or corrected plan showing in detail all construction changes, especially location and depth of conduit. As-builts shall be provided in Adobe pdf format.

9003 GRADES

All work shall conform to line, elevation and grades as shown on the plans.

9004 REGULATIONS AND CODE

All electrical equipment shall conform to the standards of the National Electrical Manufacturers Association (NEMA). In addition to the requirement of these specifications, the plans and the lighting specifications, all material and work shall conform to the requirements of the National Electric Code (NEC), the Standards of the American Society for Testing Materials (ASTM), the American Standards Association (ASA), the Illuminating Engineering Society (IES), and all local ordinances.

The approved plans and applicable codes adopted at the time of advertisement for bids shall govern the work unless otherwise required by the City Engineer.

9005 PRELIMINARY SCHEDULE OF EQUIPMENT AND MATERIAL

Within twenty (20) days following the date of the approval of a final plan, the Contractor shall submit a complete schedule of materials and equipment proposed for installation. This schedule shall include catalog cuts, diagrams, drawings, and other data as may be required. In the event any material or equipment contained in the schedule fail to comply with specification requirements, such items may be rejected.

In lieu of submitting catalog cuts, the Contractor may utilize pre-approved materials as shown on the City of Olathe Approved Materials List. The Contractor shall then list the materials from the pre-approved list that are proposed for use and submit to the City for approval.

9006 REJECTED MATERIALS

Rejected materials shall be immediately and permanently removed from the project site by the Contractor. Work shall be commenced and continued at such points as may be approved by the City Engineer and shall be carried on diligently and without unnecessary or unreasonable delay.

9007 EXISTING UTILITIES

The Contractor shall locate all utilities, whether above, on, or below the ground, and shall be responsible for any and all damages arising from his negligence to protect existing utilities.

No new fixture shall be constructed which is in conflict with any existing utility facilities or the approved plans, unless otherwise approved by the City Engineer.

9008 PERMITS

The Contractor shall have a set of plans signed by the City Engineer before the commencement of any work, which will authorize the Contractor to work within the right-of-way.

9009 NOTIFICATION

The Contractor shall notify the City Engineer (5) days before beginning work on the project. The Contractor shall provide the City Engineer weekly, or more frequent as requested, written progress reports with estimated completion dates. The City Engineer may require any work completed without inspection to be dismantled for inspection and reassembled as required.

9010 PROTECTION OF WORK AND CLEANUP

The Contractor shall be responsible for all work until final completion and acceptance by the City. All damage done to existing infrastructure shall be repaired by the Contractor. The Contractor shall remove all surplus material and rubbish from the work site as it accumulates and before the contractor makes application for the acceptance of the work.

9011 TRAFFIC CONTROL

All traffic control shall be in conformance with the General Provisions of the City of Olathe *Technical Specifications and Design Criteria for Public Improvement Projects*.

9012 TURN ON AND TESTING

The Contractor shall contact the City of Olathe, Public Works Department, for an electrical inspection as soon as the control center(s) is/are installed. Prior to the inspection, the Contractor shall coordinate with the electrical service provider to ensure electric service is available to energize the system.

All street lighting system elements shall function properly as a complete system for a minimum period of fifteen (15) consecutive days before acceptance by the City. Any malfunction observed or recorded shall stop the test period as of the time of the malfunction, and the test period shall not resume until all components are satisfactorily operating.

9013 BONDING

The Contractor shall submit a performance and maintenance bond on all projects before beginning construction. The amount of the bond shall be for the full amount of the project and shall remain in effect for a period of two (2) years after the date of completion and acceptance by the City Council.

9014 MAINTENANCE

During a period of two (2) years from the date of project acceptance by the City, the Contractor shall make all needed repairs resulting from defective workmanship or materials. If within ten (10) days after providing written notification the Contractor neglects to make or to undertake with due diligence the required repairs, the City shall make such repairs at Contractor's expense. In case of an emergency where, in the judgment of the City Engineer, delaying the repair would cause serious loss, hazard, or damage, repairs may be made without notifying the Contractor, at Contractor's expense.

9015 GENERAL MATERIAL SPECIFICATIONS

All materials used in the fabrication or assembly of the items listed below shall comply with approved plans and Standard Details.

All lighting equipment shall be new and shall be approved by the City Engineer.

9016 ALUMINUM STANDARDS

All poles located on arterial roadways shall be powder coated black. The type of pole and length of luminaire arm (if any) shall be as specified on the approved plans. This pole specification is in addition to the Standard Details, which describes the material specifications and pertinent design details.

20', 30' and 40' Poles

1. **Shaft.** The aluminum lighting shaft assembly shall be constructed from one piece of seamless tubing with a mechanical strength of not less than T6 temper. The cross section of the pole shall be round, and the shaft shall be fabricated in a continuous true taper from at least 6" above the handhole to the top of the shaft. The shaft shall have no longitudinal or circumferential welds, except to join the shaft to the base. The assembly shall be tire wrapped with a non-staining paper during shipping.

Pole dimensions shall be as specified on the Standard Details. It is the responsibility of the fabricator to verify and attest that the poles are structurally adequate and in full compliance with this specification and the Standard Details.

2. **Handhole.** Each shaft shall be equipped with a minimum 4" x 6" (clear opening) handhole with frame and cover, and a grounding lug located opposite the handhole. The handhole opening shall be clear of any interference from the handhole reinforcing framing.
3. **Shoe Base.** The shoe base shall be a permanent mold casting. The base shall be free of cracks, pits, and blow holes and of sufficient size and strength to withstand full design loads. The base shall telescope the shaft, and one weld shall be on the inside of the base at the end of the shaft, while another weld shall be on the outside at the top of the base. The shoe base and the two (2) welds shall develop the full strength of the pole assembly.

The base shall be cast with four (4) slotted holes to receive the anchor bolts-threaded studs and tapped holes for attaching the four (4) cast aluminum alloy removable bolt covers provided for each pole. The bolt covers shall attach to the upright portion of the body of the base. The bolt circle is provided in the Standard Details.

4. **Luminaire Arm.** The single member arm shall be tapered by cold working from round tubing. After tapering, the member shall be flattened to produce an elliptical cross-section with the major diameter in the vertical plane, perpendicular to the wind. The outboard end of the arm shall remain round with a 2-inch slipfitter for mounting the luminaire. The single member arm shall be designed to meet all design factors and mounting dimensions.

The truss type member arm assembly shall be a one piece welded assembly consisting of an upper arm and lower arm (brace) securely joined by a vertical strut and a connector or weld at the outboard end of the arm assembly. The upper arm shall be tapered by cold working from round tubing. After tapering, the upper arm shall then be flattened to produce an elliptical cross-section with the major diameter in the horizontal plane, parallel to the wind. The outboard end of the upper arm shall remain round with a 2-inch slipfitter for mounting the luminaire. The outboard end of the lower arm (brace) shall be covered by an end cap.

The luminaire arm for all 20' poles shall be specified within the most recent approved products list for streetlights.

5. **Breakaway Support.** All 30 foot and 40 foot poles shall be equipped with breakaway supports. The support shall be a frangible base approximately (9) inches tall with a door on one side for both single and double arm poles.

14' Pole

1. **Shaft.** The 14' aluminum lighting shaft shall be spun from one piece of seamless tubing and shall have mechanical strength of not less than T6 temper. The cross section of the pole shall be round, and the shaft shall be fabricated in a continuous true taper from at least six

(6) inches above the handhole to the top of the shaft. The shaft shall have no longitudinal or circumferential welds, except to join the shaft to the base. The shaft shall be tire wrapped with a not-staining paper during shipping.

Pole dimensions shall be as specified on the Standard Details. It is the responsibility of the fabricator to verify and attest that the proposed poles are structurally adequate and in full compliance with this specification and Standard Details.

The pole shall have a (3) inch outside diameter (O.D.) slipfitter end, without a tenon, for mounting the post-top luminaire.

1. **Handhole.** Each shaft shall be equipped with a minimum 4" x 6" (clear opening) handhole with frame and cover, and a grounding lug located opposite the handhole. The handhole opening shall be clear of any interference from the handhole reinforcing framing.
2. **Shoe Base.** The aluminum shoe base shall be a permanent mold casting. The base shall be solution heat-treated and artificially aged to produce a final T6 temper. The base shall be free of cracks, pits, and blow holes and of sufficient size and strength to withstand full design loads. The base shall telescope the shaft; and one weld shall be on the inside of the base at the end of the shaft while another shall be on the outside at the top of the base. The shoe base and the two (2) welds shall develop the full strength of the pole assembly.

The base shall be cast with four (4) slotted holes to receive the anchor bolts-threaded studs and tapped holes for attaching the four (4) cast aluminum alloy removable bolt covers provided for each pole. The bolt covers shall attach to the upright portion of the body of the base. The bolt circle is provided in the Standard Details.

9017 ILLUMINATION EQUIPMENT

LED Roadway Luminaire

LED luminaires with shorting caps shall be installed on all collector and arterial roadways in accordance with the Approved Materials List.

Post-Top Luminaires

Post-top luminaires shall be in accordance with the Approved Materials List.

Lamp

Lamps shall be in accordance with the Approved Materials List.

150 watt instant restrike lamps shall be HPS, rated 16,000 lumens, with a 40,000 hour rated life.

9018 ELECTRICAL MATERIAL

Secondary Cable and Power Lead-in Cable

Power lead-in cable shall be 2/0 A.W.G. and secondary cable shall be #4 A.W.G. stranded annealed copper, ground wire clearly marked entire length for operation at 600 volts maximum. All power lead-in cable shall be installed in 3-inch inside diameter (I.D.) conduit conforming to the Standard Details and these specifications. All secondary cable shall be installed in a 2-inch inside diameter (I.D.) conduit conforming to the Standard Details and these specifications. Material shall meet the applicable requirements of I.P.C.E.A. Standard S-19-81, with thermoplastic insulation of GRS-Rubber base meeting Appendix K (A) of I.P.C.E.A. and listed by U.L. as Type U.S.E. for direct burial; or material shall meet the applicable requirements of I.P.C.E.A. Standard S-66-524, interim standard #2, with thermo setting insulation of cross link polyethylene meeting requirements of Column "A" of I.P.C.E.A. and listed by U.L. as Type U.S.E. RHW-75°C.

Pole and Bracket Cable

Pole and bracket cable above the handhole in pole to luminaire(s) shall be single conductor with minimum 600 volt rating, No. 10 A.W.G. Type THHN/THWN. The conductor shall be stranded annealed copper.

Control Center and Service Disconnect Pedestal

Control centers and service disconnect pedestals shall be in accordance with the Approved Materials List

1. **Control Center.** The control center (street light cabinet) shall be an underground service type, rated for 200 amps (as specified on the plans), and 240 volts. The pedestal shall be heavy-gauge aluminum raintight construction with an individual meter, panel, conductor, and rear service pull compartments. The panel compartments shall have piano-hinged doors and include a Corbin Lock accessible with a #2 Traffic Signal key. The meter base shall be of the type used by the local utility. The panelboard shall have a copper bus and shall accept a minimum of twelve 1-inch plug-in breakers in accordance with the Standard Details. The panelboard compartment shall contain a photocell and test switch. All factory installed wire shall be copper. The control center shall be U.L. listed. The pedestal finish shall be natural aluminum.
2. **Service Disconnect Pedestal.** The service disconnect pedestal (meter pedestal) shall be an underground service type, rated for 200 amps and 240 volts, in accordance with the Standard Details.

Conduit

Rigid nonmetallic conduit shall be High Density Polyethylene (HDPE) Schedule 40 and Schedule 40 polyvinyl chloride (PVC) conduit. PVC will only be permitted for use for sweeping 90-degree bends at pole bases, control centers, and boxes. All nonmetallic conduits shall be Gray, Black, or Red in color. The conduit shall bear an Underwriters' Laboratories label and shall conform to Federal Specification WC-1094A (latest version).

9019 EXCAVATION

The contractor shall perform all excavations for installing underground conduits, cable, boxes and pole bases to the depths indicated on the drawings unless otherwise approved by the City Engineer. During excavation, material suitable for backfilling shall be stockpiled in accordance with Section 4000. All excavated materials not required or unsuitable for backfill shall be removed from the site by Contractor.

9020 BACKFILLING

All areas excavated shall be backfilled and compacted in accordance with the City of Olathe *Technical Specifications and Design Criteria for Public Improvement Projects*, Section 4000.

9021 SODDING

All areas will be sodded in accordance with the City of Olathe *Technical Specifications and Design Criteria for Public Improvement Projects*, Section 7200.

9022 REPLACING DAMAGED IMPROVEMENTS

Improvements such as sidewalks, curbs, gutters, Portland cement concrete and asphaltic concrete pavement, bituminous surfacing base material and any other improvements removed, broken or damaged by Contractor shall be replaced or reconstructed with the same kind of materials as found on site or with materials of equal quality. The replaced improvements shall be left in a serviceable condition satisfactory to City Engineer. Whenever a part of a square or slab of existing concrete sidewalk, driveway or pavement is damaged, the entire square or slab shall be removed and replaced at the Contractor's expense.

9023 FOUNDATION ANCHORS

Screw-in foundation anchors shall be in accordance with the Standard Details. All anchors shall include an integral theft device. The anchors shall be screwed into the ground; pre-drilling holes for the anchor shall not be permitted. During installation, the foundation shall be plumbed with a level and the base plate shall be level.

Minor leveling adjustments on poles shall be made with the use of leveling shims or washers. Shims and washers shall be galvanized or cadmium-plated steel no more than 1/4-inch thick. Only one (1) shim or washer shall be allowed at any one anchor bolt, with a maximum of two (2) on any pole.

If installation of a screw-in foundation anchor is not feasible for any reason, concrete foundations shall be installed at Contractor's expense.

9024 CONCRETE FOUNDATIONS

The bottom of the concrete foundations shall rest on firm ground, and foundations shall be poured monolithically. The exposed portions shall be formed and finished to present a neat appearance and shall be true to line and grade. The top of footing elevation shall be established using the finished curb or sidewalk unless otherwise directed by City Engineer. Forms shall be rigid and securely braced in place. Conduit ends and anchor bolts shall be placed in proper position to proper heights, and held in place by means of a template until the concrete sets. Anchor bolts shall be provided with hex head nut, flat washer and lock washer. The forms and ground which will contact the concrete shall be thoroughly moistened before placing concrete.

Concrete for pole base and control center foundations shall be KDOT Grade 4.0 AE.

Concrete shall not be placed until forms and reinforcing steel have been approved by the City Engineer. Placement of concrete shall be inspected by the City Engineer during construction.

Concrete pole bases shall be consolidated by an internal-type vibrator. The vibrator shall operate at frequencies of vibration not less than 4,500 cycles per minute under load. The amplitude of vibration shall be adequate to properly consolidate concrete. The concrete shall be cured with an approved moisture barrier such as wet burlap, polyethylene, etc., for a period of seventy-two (72) hours. Cold weather curing shall be such that the concrete temperature shall be maintained above freezing for the entire curing period. Forms shall not be removed until the concrete is thoroughly set.

Control center foundation shall have four (4) conduits for exiting cable. The direction of the exiting conduit and the orientation of the control center shall be determined by the City Engineer.

9025 CONDUIT

Conduit shall be of a rigid type conforming to the provisions and diameters specified in the approved plans. Installation shall conform to the appropriate articles of the National Electric Code. All street lighting cable shall be installed in (2) inch Schedule 40 HDPE except (2) Schedule 40 PVC may be used for sweeping 90-degree bends at pole bases, control centers, and boxes. Where conduits connect from more than one direction, they should terminate in a Type II junction box in accordance with the Standard Details.

It shall be the option of the Contractor, at his own expense, to use larger size conduit if desired; and where larger size conduit is used, it shall be for the entire length of the run. No reducing couplings will be permitted.

The ends of all conduits shall be well reamed to remove burrs and rough edges. Field cuts shall be made square and true so that the ends will butt together throughout the entire circumference of the joint. Slip joints will not be permitted for coupling conduit. All couplings shall be fitted and tightened until the ends of the conduits are firmly joined.

The location of street crossings of all conduits installed or used on the project shall be marked by a saw cut arrow placed in the face of curb, gutter, or wall, directly above the conduit in accordance with the Standard Details.

All joints in PVC conduit shall be glued. HDPE to PVC adapters shall be used to connect HDPE and PVC conduits.

Conduit bends, except factory bends, shall have a radius of not less than six (6) times the inside diameter of the conduit. Where factory bends are not used, conduit bends shall be made without crimping or flattening, using the longest radius practicable.

Conduit shall be jacked under pavement sections at a depth of thirty-six (36) inches below bottom of pavement. Conduit installed in trenches in unpaved areas, shall be laid to depth of thirty-six (36) inches below natural ground level.

Conduit shall be placed under existing pavement by approved jacking or drilling methods. Pavement shall not be disturbed without the written permission of City Engineer. Jacking or drilling pits shall maintain two (2) feet clear distance from the edge of any type of pavement. Excessive use of water shall not be permitted.

Conduit set in standard bases shall extend vertically approximately three (3) inches above the foundation. Conduit entering through the bottom of a junction box shall be located near the ends to leave the major portion of the box clear. Conduit entering service boxes shall terminate two (2) inches inside the box wall and shall be sloped to facilitate pulling of cable. At all outlets, conduit shall enter from the direction of the run.

Conduit entering junction boxes shall be continuous into the box, and conduit elbows shall be provided to bring the conduit up into the box.

Wherever the end of a conduit is installed within five (5) feet of another conduit or junction or service box, the conduit shall be made continuous between the conduits or into the box.

Existing underground conduit to be incorporated into a new system shall be cleaned with a mandrel or blown out with compressed air.

The location of conduit runs shown on the plans are for bidding purposes only and may be changed with permission of City Engineer to avoid underground obstructions.

9026 SERVICE AND JUNCTION BOXES

Service boxes and junction boxes shall be installed at the locations shown on the plans in accordance with the Standard Details. The Contractor may install, at his own expense, additional boxes with written approval from the City Engineer.

Service boxes and junction boxes shall be installed on eighteen (18) inches and eight (8) inches of KDOT PB-2 aggregate, respectively, as shown on the plans or as directed by the City Engineer. Boxes shall be installed so that the covers are level with the curb or sidewalk grade, or level with the surrounding ground when no grade is established.

9027 WIRING

Roadway lighting conductor cables shall be installed inside conduit, suitable for a 240 volt system in accordance with the approved plans. Wiring shall conform to the appropriate articles of the National Electric Code. Cable shall be laid to a minimum depth of thirty-six (36) inches below bottom of the pavement or the natural ground level, whichever is applicable, and be installed in continuous lengths. No splices of cable will be permitted in conduit or outside of service boxes, junction boxes or pole bases.

Powdered soapstone, talc or other approved lubricant shall be used when inserting conductors in conduit. All cable to be installed in one conduit shall be pulled by the contractor in one operation, and all ends shall be taped until the splices are made or terminal appliances attached. Ends of spare conductors shall be taped.

All splices in junction boxes and service boxes shall be made with appropriate water tight splice connectors in accordance with the Standard Details.

One foot of slack shall be left at all control centers, junction boxes and service boxes for splicing and connecting wires. Wiring within boxes shall be neatly arranged and laced. Wires shall be color-coded (Black=hot, green=ground) and circuits permanently identified in accordance the approved plans.

All splices in light pole bases shall be made with multiple tap molded connectors. The Contractor shall install in-line fused disconnects in each pole base. Fuseholders in all poles shall be crimped. Fuses shall be KTK, or approved equal, high interrupting fuses. Eight (8) amp fuses shall be used in poles with twin luminaires and five (5) amp fuses shall be used in poles with a single luminaire. The multiple tap connectors and fuseholders shall be installed convenient to the handhole at the base of the pole. One (1) foot of surplus cable shall be coiled at the line side of the multiple tap connector, between the multiple tap connector and the fused disconnect, and on the load side of the fused disconnect. The unfused connectors for the ground shall be installed with the female end of the connector on the line side.

Luminaires not equipped with terminal blocks shall be connected to the pole and bracket cable with the appropriate wire nut connectors.

9028 GROUNDING

All poles shall be bonded to form a continuous system. At each multiple service point, two (2) grounding electrodes shall be installed at least six (6) feet apart. The electrodes shall be a copper rod not less than one-half (1/2) inch in diameter and ten (10) feet in length, unless otherwise noted on the plans, driven to a depth so the top is six (6) inches below the surface of the ground. The service equipment shall be bonded to the driven ground rods by a No. 4 A.W.G. copper wire enclosed in a one (1) inch diameter conduit.

9029 LOCATION

Unless otherwise noted on the plans, or otherwise approved by the City Engineer, equipment shall be located as follows:

- A. Cable shall be kept a minimum of two (2) feet and a maximum of four (4) feet behind the back-of-curb.
- B. Street light poles shall be installed on property lines at a distance of three (3) feet, plus or minus one (1) foot, behind the back-of-curb.
- C. Junction boxes shall be installed a minimum of two (2) feet and a maximum of four (4) feet behind the back-of-curb and no closer than two (2) feet to any street light pole.
- D. Control centers shall be located adjacent to the sidewalk or a minimum of five (5) feet and a maximum of six (6) feet behind the back-of-curb if no sidewalk exists.

9030 STREET LIGHTING COMPLETION TIME

The street lights shall be installed and accepted prior to issuance of any occupancy permits.