TRAFFIC SIGNAL LEGEND

(30') MAST ARM POLE (LENGTH)

(30') COMBINATION POLE (TRAFFIC SIGNAL AND STREET LIGHT)

PEDESTAL POLE

PEDESTRIAN PUSHBUTTON POLE

TRAFFIC SIGNAL HEAD

TRAFFIC SIGNAL HEAD W/BACKPLATE

PEDESTRIAN SIGNAL INDICATION

EVP DETECTOR

ADVANCE RADAR DETECTOR

PRESENCE RADAR DETECTOR

TYPE 1 SERVICE BOX

TYPE 2 SERVICE BOX

FO TYPE 1 FIBER OPTIC SERVICE BOX

FO TYPE 2 FIBER OPTIC SERVICE BOX

J TYPE 1 JUNCTION BOX

J TYPE 2 JUNCTION BOX

TRAFFIC SIGNAL CONTROLLER CABINET (STRETCH HYBRID)

TRAFFIC SIGNAL CONTROLLER CABINET (DOUBLE WIDE HYBRID)

OP ADVANCE LOOP DETECTOR, OPTCS LOOP

PRESENCE LOOP DETECTOR

PRESENCE DETECTION ZONE

SNS ILLUMINATED STREET NAME SIGN

VIDEO DETECTION CAMERA

CLOSED CIRCUIT TV (CCTV) CAMERA

CNG GENERATOR CABINET (SHADED PORTION SHOWS EXHAUST SIDE OF CABINET)

GM GAS METER

FO HDPE FIBER OPTIC CONDUIT WITH LOCATING CABLE (SIZED AS NOTED)

PVC CONDUIT (SIZE AS NOTED)

1" HDPE CONDUIT

1.5" HDPE CONDUIT

2" HDPE CONDUIT

3" HDPE CONDUIT

4" HDPE CONDUIT

REFER TO WIRING DIAGRAM FOR CLARIFICATION

ELECTRICAL SERVICE

100W POST-TOP LUMINAIRE W/14' POLE

150W POST-TOP LUMINAIRE W/14' POLE

CLASS D LED COBRA-HEAD W/30' LIGHT POLE

CLASS C LED COBRA-HEAD W/30' LIGHT POLE

CLASS B LED COBRA-HEAD W/30' LIGHT POLE

CLASS A LED COBRA-HEAD W/30' LIGHT POLE

CLASS D LED COBRA-HEAD W/40' LIGHT POLE

CLASS C LED COBRA-HEAD W/40' LIGHT POLE

CLASS B LED COBRA-HEAD W/40' LIGHT POLE

CLASS A LED COBRA-HEAD W/40' LIGHT POLE

CLASS D LED COBRA-HEAD W/COMBINATION POLE

CLASS C LED COBRA-HEAD W/COMBINATION POLE

CLASS B LED COBRA-HEAD W/COMBINATION POLE

CLASS A COBRA-HEAD W/COMBINATION POLE

2 CONSTRUCTION NOTE

2 POLE NUMBER

2 SERVICE BOX NUMBER

4 VEHICULAR SIGNAL HEAD NO.

8P2 PEDESTRIAN SIGNAL HEAD NO.

42 LOOP DETECTOR NO. (VIDEO OR RADAR DETECTION ZONE NO.)

FLAT SHEET STREET NAME SIGN

FLAT SHEET TRAFFIC SIGN

EXISTING EQUIPMENT REMOVAL SUMMARY

LOCATION	DESCRIPTION OF ITEM	QUANTITY

TRAFFIC SIGNAL GENERAL NOTES

1. THE CONTRACTOR SHALL STAKE THE LOCATIONS FOR ALL POLES, CONTROLLERS, SERVICE BOXES AND JUNCTION BOXES TO BE INSTALLED. THE STATIONS AND OFFSETS PROVIDED ARE TO THE CENTER OF THE TRAFFIC SIGNAL EQUIPMENT. ELEVATIONS SHALL BE PROVIDED. IF OBSTRUCTIONS ARE ENCOUNTERED DURING INSTALLATION, THE CONTRACTOR WILL RE-STAKE THOSE LOCATIONS AFFECTED BY THE OBSTRUCTION. THE TRAFFIC SIGNAL INSPECTOR SHALL INSPECT THE STAKING PRIOR TO ANY EXCAVATION/CONSTRUCTION.
2. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES, IF SHOWN, ARE APPROXIMATE LOCATION ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING ALL UTILITY COMPANIES FOR LOCATIONS OF ALL UNDERGROUND LINES PRIOR TO EXCAVATION AND BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES, WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.
3. THE CITY OF LAWRENCE IS ON THE ONECALL SYSTEM. THE CONTRACTOR SHALL CALL TO OBTAIN LOCATES FOR STREETLIGHTING, TRAFFIC SIGNAL, AND FIBER OPTIC CONDUITS/CABLES.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING EXISTING EQUIPMENT AS NOTED AND DELIVERING ALL SALVAGEABLE EQUIPMENT TO THE CITY OF LAWRENCE MUNICIPAL SERVICES AND OPERATIONS STORAGE FACILITY NEAR 1900 WAKARUSA DRIVE. THE CONTRACTOR SHALL CONTACT TRAFFIC OPERATIONS AT (785)832-3035 TO COORDINATE DELIVERY (AT LEAST 24-HOUR ADVANCE NOTICE SHALL BE PROVIDED). ALL RETURNED EQUIPMENT SHALL BE DISASSEMBLED PER THE INSTRUCTIONS OF TRAFFIC OPERATIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE OR LOSS OF SALVAGEABLE EQUIPMENT.
5. ALL CONDUIT TRENCHES AND PRE-DRILLED HOLES WITHIN ROCK/SHALE SHALL BE BACKFILLED WITH SUITABLE MATERIAL AND COMPACTED IN ACCORDANCE WITH THE SPECIFICATIONS.
6. CONDUITS SHALL BE INSTALLED UNDER ALL STREETS, DRIVES AND SIDEWALKS PRIOR TO PAVING WITHIN THE LIMITS OF THE STREET IMPROVEMENTS. THE CONDUIT PLACEMENT SHALL BE COORDINATED WITH THE PAVING OPERATION, IF APPLICABLE, AND INSPECTED BY THE CITY TRANSPORTATION INSPECTOR. ALL TRENCHES FOR CONDUIT UNDER PROPOSED PAVED SURFACES (DRIVES, STREETS, AND SIDEWALKS) SHALL BE BACKFILLED WITH FLOWABLE FILL UNLESS OTHERWISE DIRECTED, TO BELOW THE PROPOSED PAVEMENT SURFACE.
7. THE CONDUIT SHALL BE INSTALLED UNDER ANY EXISTING UNDERDRAIN PIPE CROSSINGS AND UNDERDRAIN BLANKETS. WHERE POLE FOUNDATIONS ARE TO BE INSTALLED THROUGH AN EXISTING UNDERDRAIN BLANKET, THE BLANKET SHALL BE PRE-CUT TO PREVENT DAMAGE OF THE BLANKET. IN THE EVENT THE BLANKET IS DAMAGED, THE FABRIC SHALL BE REPLACED.
8. HDPE CONDUIT SHALL BE INSTALLED CONTINUOUSLY BETWEEN ALL TRAFFIC SIGNAL APPURTENANCES. CONDUIT SPLICES BETWEEN APPURTENANCES SHALL NOT BE ALLOWED UNLESS FUSION COUPLINGS OR OTHER FUSION METHODS ARE USED
9. ALL CABLE SPLICES FROM LOOP DETECTOR CABLE TO LEAD-IN CABLE AT JUNCTION BOXES SHALL BE WATERTIGHT.
10. DAMAGE TO ANY EXISTING TRAFFIC SIGNAL EQUIPMENT DUE TO THE CONSTRUCTION SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL REPORT ANY OPERATIONAL PROBLEMS TO TRAFFIC OPERATIONS (832-3035). THE EQUIPMENT SHALL BE REPLACED OR REPAIRED (AS DIRECTED BY THE CITY) WITH APPROVED MATERIALS IN CONFORMANCE WITH THE CURRENT STANDARD DETAILS, SPECIFICATIONS, PRACTICES AND POLICIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY STORED EXISTING MATERIALS (REMOVED FOR CONSTRUCTION) TO BE RE-INSTALLED.
11. ALL EXISTING TRAFFIC SIGNAL EQUIPMENT IS TO BE USED IN PLACE (U.I.P.) UNLESS OTHERWISE NOTED IN THE PLANS.
12. ALL AREAS DISTURBED BY CONSTRUCTION SHALL BE SODDED AS DIRECTED BY THE CONSTRUCTION REPRESENTATIVE. THE MEDIANS SHALL BE SEEDED OR BRICK MEDIANS RESTORED, UNLESS OTHERWISE NOTED OR DIRECTED. SIDEWALK DAMAGED BY CONSTRUCTION OR REMOVED DUE TO CONSTRUCTION SHALL BE REPLACED.
13. FORMS (INCLUDING REBAR CAGES, ETC.) CONDUIT AND ANCHOR BOLTS SHALL BE INSTALLED AND IN PLACE FOR REVIEW BY THE CITY OR CONSTRUCTION REPRESENTATIVE A MINIMUM OF 24 HOURS IN ADVANCE OF THE PROPOSED CONCRETE PLACEMENT THAT SAME DAY. NO CONCRETE PLACEMENT SHALL BEGIN AFTER 3:00 P.M.
14. LUMINAIRE ARMS SHALL BE ORIENTED IN THE SAME VERTICAL PLANE AS THE MAST ARM UNLESS OTHERWISE INDICATED IN THE PLANS.
15. TURN-ON OF THE TRAFFIC SIGNAL SYSTEM SHALL BE IN ACCORDANCE WITH CITY TURN-ON PROCEDURES.
16. ALL CONSTRUCTION OF THE TRAFFIC SIGNAL THAT WILL RESULT IN TAKING THE EXISTING TRAFFIC SIGNAL OUT OF OPERATION SHALL BE PERFORMED ON BETWEEN 9:00 A.M. AND 3:00 P.M. AND COMPLETED THAT SAME DAY, UNLESS OTHERWISE DIRECTED BY THE ENGINEER. THE CITY OF LAWRENCE POLICE DEPARTMENT SHALL PROVIDE OFFICER CONTROL OF THE INTERSECTION WHEN THE SIGNAL IS OUT OF OPERATION. THE CONTRACTOR SHALL NOTIFY THE POLICE DEPARTMENT AND THE CITY TRAFFIC OPERATIONS AT LEAST 72 HOURS IN ADVANCE. THE TRAFFIC SIGNAL INSPECTOR AND THE TRAFFIC SIGNAL SPECIALIST SHALL BE PRESENT DURING THIS TIME (UNLESS OTHERWISE DIRECTED BY THE ENGINEER).
17. THE TRAFFIC SIGNAL CONTRACTOR SHALL NOTIFY CITY OF LAWRENCE TRAFFIC OPERATIONS, (785)832-3035, OF THE EXACT CONSTRUCTION SCHEDULE SO THAT INSPECTION OF THE TRAFFIC SIGNAL INSTALLATION CAN BE MADE OF ALL PHASES, INCLUDING CONDUIT INSTALLATIONS.
19. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE INCURRED TO ANY EXISTING UNDERGROUND SPRINKLER SYSTEM DURING CONSTRUCTION. ALL AFFECTED PIPES OR FITTINGS SHALL BE RESTORED TO THEIR ORIGINAL CONDITION AND LOCATION AND NEW MATERIALS USED SHALL BE SIMILAR TO THOSE OF THE EXISTING SYSTEM. ALL RESTORATION WORK SHALL BE ACCEPTABLE TO THE ENGINEER AND OWNER THEREOF.
20. THE CONTRACTOR SHALL BE REQUIRED TO SUBMIT CATALOG CUTS OR SHOP DRAWINGS FOR ALL EQUIPMENT TO BE INSTALLED ON THIS PROJECT. ALL MATERIALS SHALL BE FROM THE CITY OF LAWRENCE PRE-APPROVED MATERIALS LIST AVAILABLE IN THE SPECIFICATIONS.
21. ALL SIGNAL CABLE SHALL BE POSITIVELY IDENTIFIED AT THE CONTROLLER AND EACH POLE WITH PHASE NUMBERS AND COLORED ELECTRICAL TAPE AS FOLLOWS:

DIRECTION	COLOR	PHASE	PEDESTRIAN
NB	RED	Ø4 & Ø7	Ø4
EB	ORANGE	Ø2 & Ø5	Ø2
SB	GREEN	Ø8 & Ø3	Ø8
WB	BLUE	Ø6 & Ø1	Ø6

22. THE CONTRACTOR SHALL POSITIVELY IDENTIFY THE DETECTOR LOOP CABLES IN THE JUNCTION BOXES, WHERE THEY COME IN FROM THE STREET, WITH APPROVED LABELS AND SHRINKWRAP. THE CABLES SHOULD BE IDENTIFIED ACCORDING TO LANE AND CORRECT NUMBER AS INDICATED ON THE PLAN SHEET.
23. WITHIN THE TRAFFIC SIGNAL CONTROLLER, THE CONTRACTOR SHALL USE PLASTIC TIE-WRAP IDENTIFICATION TAGS WITH PERMANENT MARKER TO IDENTIFY ALL OF THE VEHICULAR AND PEDESTRIAN HEADS THAT ARE SERVED BY EACH CABLE. THE NUMBERING OF THE SIGNAL HEADS SHALL CONFORM TO THE PLAN SHEETS.
24. THE CONTRACTOR, OR THEIR SUPPLIER, SHALL, AT THE CONTRACTOR'S EXPENSE, SUBMIT A CONCRETE MIX DESIGN FOR APPROVAL BY THE KANSAS CITY METRO MATERIALS BOARD (KCMMB) PRIOR TO PLACEMENT OF ANY CONCRETE. ADDITIONAL INFORMATION REGARDING KCMMB APPROVED CONCRETE MIX DESIGNS IS AVAILABLE ON THE FOLLOWING WEBSITE: WWW.KCMMB.ORG
25. ALL NON-FUNCTIONING TRAFFIC SIGNAL HEADS SHALL BE COVERED WITH APPROVED OPAQUE COVERINGS SPECIFICALLY MANUFACTURED FOR TRAFFIC SIGNAL HEADS. THE COLOR OF THE COVERINGS SHALL BE AS FOLLOWS:
    - -ORANGE AT LOCATIONS OF NEW TRAFFIC SIGNALS
    - -BLACK AT LOCATIONS OF SIGNAL MODIFICATIONS SUCH THAT THE COVERINGS DO NOT DETRACT FROM THE FUNCTIONING SIGNAL HEADS.
26. ALL EXISTING TRAFFIC SIGNALS SHALL REMAIN IN OPERATION AND BE USED IN PLACE UNTIL THE PERMANENT TRAFFIC SIGNAL INSTALLATION IS COMPLETE AND IN OPERATION. REFER TO THE TRAFFIC CONTROL PLANS FOR ADDITIONAL REQUIREMENTS. THE CONTRACTOR SHALL COORDINATE THE DISCONNECTION OF SERVICE WITH EVERGY FOR THE EXISTING SIGNAL SYSTEM.
27. ALL TEMPORARY TRAFFIC SIGNALS INSTALLED BY THE CONTRACTOR SHALL BE EQUIPPED WITH A NEMA CONTROLLER PROVIDED BY THE CONTRACTOR FOR COMPATIBILITY WITH THE CITY'S SIGNAL SYSTEM.
28. CONTRACTOR SHALL USE A POLYMER LUBRICATING AGENT TO FACILITATE CONDUIT BORES UNDER PAVED STREETS. FAILURE TO DO SO WILL RESULT IN A DENIAL TO RETRIEVE BORE HEAD BY EXCAVATION METHODS, IN THE CASE OF LOSS, UNDER ANY PAVED STREET.
29. THE ENDS OF ALL CONDUIT IN SERVICE/JUNCTION BOXES AND IN THE CONTROLLER CABINET SHALL BE PLUGGED WITH DUCT SEAL.
30. ALL EXISTING CONCRETE FOUNDATIONS, SHOWN TO BE REMOVED, SHALL BE REMOVED A MINIMUM OF 24" BELOW FINAL GRADE.
31. THE CONTRACTOR SHALL BE REQUIRED TO INSTALL INVENTORY STICKERS ON THE BACK OF ALL SIGNS INSTALLED ON SIGNAL POLES, OR MAST ARMS ON THE PROJECT, AND RECORD EACH RESPECTIVE BAR CODE NUMBER ON THE PLAN SHEET ADJACENT TO THE CORRESPONDING SIGN, FOR DELIVERY TO THE PROJECT INSPECTOR. INVENTORY STICKERS WILL BE PROVIDED BY THE CITY.
32. IF THE FINAL COMBINATION SIGNAL/STREETLIGHT POLE IS LESS THAN TEN (10) FEET AWAY FROM THE NEAREST OVERHEAD POWER LINE, THE CONTRACTOR SHALL CONTACT EVERGY AND REQUEST THEM TO SLEEVE THEIR LINE PRIOR TO POLE INSTALLATION. ALL ASSOCIATED COSTS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
33. THE CONTRACTOR SHALL BE REQUIRED TO HAVE ALL TREE BRANCHES THAT OBSTRUCT CCTV CAMERAS, RADAR DETECTION SENSORS OR TRAFFIC SIGNAL HEADS TRIMMED BY A LICENSED ARBORIST.
34. ANY EQUIPMENT THE CITY PRE-ORDERED PRIOR TO THE CONTRACT SHALL BE PICKED UP AT THE APPLICABLE CITY MAINTENANCE FACILITY AT THE CONTRACTOR'S EXPENSE. ALL THE ITEMS MUST BE PICKED UP AT ONE TIME.

TRAFFIC SIGNAL SALVAGE NOTES

1. THE FOLLOWING IS A LIST OF TRAFFIC SIGNAL EQUIPMENT WHICH SHALL BE SALVAGED AND RETURNED TO THE CITY OF LAWRENCE, UNLESS OTHERWISE INSTRUCTED BY THE INSPECTOR. THE CITY MAINTAINS THE FIRST RIGHT OF REFUSAL OF ANY OF THE EQUIPMENT LISTED. THE PROJECT INSPECTOR WILL MAKE AN ON-SITE ASSESSMENT TO DETERMINE IF THE EQUIPMENT SHOULD BE SALVAGED OR DISPOSED. ANY EQUIPMENT THAT WILL NOT BE SALVAGED SHALL BECOME OF THE PROPERTY OF THE CONTRACTOR.
2. EMERGENCY VEHICLE PRE-EMPTION (EVP) DETECTOR UNITS, VIDEO DETECTION CAMERAS, RADAR DETECTORS, CCTV CAMERAS, PEDESTRIAN PUSHBUTTONS AND ANY OTHER EQUIPMENT MUST BE REMOVED FROM THE MAST ARMS OR POLES AND RETURNED.
3. ALL VEHICULAR TRAFFIC SIGNAL HEADS AND PEDESTRIAN SIGNAL HEADS SHALL BE REMOVED FROM THE MAST ARMS OR POLES AND BE RETURNED. ALL LED INDICATIONS MUST BE REMOVED FROM THE VEHICULAR SIGNAL AND OR PEDESTRIAN SIGNAL HEADS AND BOXED PRIOR TO RETURNING. LAMPS, VISORS AND BACKPLATES SHOULD REMAIN ATTACHED TO THE VEHICULAR AND PEDESTRIAN SIGNAL HEADS.
4. MOUNTING BRACKETS AND SIGNAL HEAD MOUNTING ARMS SHOULD BE REMOVED FROM THE SIGNAL HEADS. MOUNTING BRACKET CABLES SHALL NOT BE CUT FOR REMOVAL, UNLESS THEY ARE CRACKED OR DAMAGED.
5. ALL SIGNAL POLES, PEDESTAL POLES, MAST ARMS AND LUMINAIRE ARMS SHALL BE RETURNED. ANCHOR BOLT COVERS AND POLE CAPS MUST BE BOXED AND OR BAGGED AND RETURNED WITH THE EQUIPMENT. MAST ARMS AND LUMINAIRE ARMS SHALL BE REMOVED FROM POLES PRIOR TO DELIVERY. THE CONTRACTOR SHALL BE REQUIRED TO REMOVE AND DISCARD ALL INCLUDED CABLE EXCEPT WIRING HARNESSES FOR RADAR DETECTION SENSORS WHICH SHALL BE RETURNED WITH THE EQUIPMENT.
6. SECONDARY SERVICE PEDESTAL ENCLOSURES OR BATTERY BACKUP ENCLOSURES SHALL BE REMOVED FROM THE TRAFFIC SIGNAL CONTROLLER CABINET AND RETURNED.
7. TRAFFIC SIGNAL CONTROLLER CABINET AND ALL INTERNAL COMPONENTS SHALL BE RETURNED. ANY TRAFFIC SIGNAL CONTROLLER CABINET HARDWARE THAT IS NOT ATTACHED TO THE CABINET MUST BE BOXED AND OR BAGGED AND RETURNED WITH THE EQUIPMENT. FIELD WIRE CONNECTIONS ON RETURNED SIGNAL CONTROLLER CABINETS SHALL BE UNSCREWED AT THE TERMINALS INSTEAD OF CUT OFF.
8. REMOVE AND RETURN ALL JUNCTION BOX AND SERVICE BOX COVERS. BOXES WILL NOT BE SALVAGED.
9. DISASSEMBLY OF ANY STREETLIGHT EQUIPMENT THAT IS ATTACHED TO THE TRAFFIC SIGNAL EQUIPMENT SHALL FOLLOW THE GUIDELINES AS STATED IN THE "INSTRUCTIONS FOR DISASSEMBLY AND RETURN OF SALVAGED STREETLIGHTING EQUIPMENT".
10. DISASSEMBLY OF ANY TRAFFIC SIGN EQUIPMENT ATTACHED TO THE TRAFFIC SIGNAL EQUIPMENT SHALL FOLLOW THE GUIDELINES AS STATED IN THE "INSTRUCTIONS FOR DISASSEMBLY AND RETURN OF SALVAGED TRAFFIC SIGN EQUIPMENT".
11. ALL TRAFFIC SIGNAL EQUIPMENT, EXCLUDING SIGNAL POLES AND MAST ARMS, TO BE RETURNED SHALL BE RETURNED IN THE SAME CONDITION AS IT WAS PRIOR TO REMOVAL. DISASSEMBLY OF EQUIPMENT SHALL BE DONE PRIOR TO RETURNING THE EQUIPMENT TO THE CITY.

TRAFFIC SIGNAL TURN ON PROCEDURE

1. TURN-ON SHOULD NOT BE SCHEDULED UNTIL POWER IS ACTUALLY AVAILABLE AT THE SERVICE PEDESTAL AND ALL OTHER EQUIPMENT AND HARDWARE IS INSTALLED.
2. AT LEAST TWO WORKING DAYS PRIOR TO SCHEDULED SIGNAL ACTIVATION, ALL TESTING SHOULD BE COMPLETED AND SUCCESSFUL, ALL DEFECTS AND DEFICIENCIES CORRECT, ALL INDICATIONS OPERATIONAL AND PROPERLY AIMED, CABLES TAGGED, CONTROLLER FULLY OPERATIONAL PERFORMING ALL TIMING FUNCTIONS REQUIRED, ALL OTHER ITEMS OF WORK ASSOCIATED WITH THE SIGNAL COMPLETED, AND ALL SIGNS AND PAVEMENT MARKINGS PROPERLY INSTALLED UNLESS OTHERWISE APPROVED BY THE ENGINEER.
3. THE CITY INSPECTOR AND SIGNAL TECHNICIAN WILL CONDUCT A FULL INSPECTION OF THE SIGNAL SYSTEM WITHIN THESE SAME TWO DAYS. UPON SATISFACTORY CONDITIONS OF THE SIGNAL SYSTEM, THE TURN-ON SCHEDULE WILL BE CONFIRMED. ANY DEFICIENCIES FOUND DURING THE FINAL INSPECTION SHALL RESULT IN THE RESCHEDULING OF THE ACTIVATION.
4. IF THE TRAFFIC SIGNAL IS A NEW INSTALLATION WHERE PREVIOUSLY NONE EXISTED, THE CONTRACTOR SHALL SET THE SIGNALS TO FLASH FOR APPROXIMATELY ONE (1) WEEK PRIOR TO FULL OPERATION. PRIOR TO PUTTING SIGNAL INTO FULL OPERATION INSTALL "SIGNAL AHEAD" (W3-3) AND "NEW" (W16-15P) WARNING SIGNS WITH ORANGE BACKGROUND AND YELLOW TYPE B FLASHING BEACONS ADVISING THE MOTORISTS OF THE SIGNAL ACTIVATION. SIGNS MAY BE INSTALLED PRIOR TO PUTTING THE SIGNAL INTO OPERATION AND COVERED UNTIL SUCH TIME AS THE SIGNAL IS PLACED INTO FULL OPERATION.
5. ACTUAL ACTIVATION SHALL CONSIST OF THE FOLLOWING STEPS:
    - 5A) INSTALLATION OF ALL REQUIRED EQUIPMENT IN THE CONTROLLER CABINET
    - 5B) TESTING OF INSTALLED EQUIPMENT
    - 5C) UNBAGGING OF ALL SIGNAL HEADS AND SIGNS IF APPLICABLE
    - 5D) ACTIVATION OF THE SIGNAL WITH THE CONTRACTOR'S FLAGGER STOPPING ALL TRAFFIC MOMENTARILY AS THE SIGNAL IS TURNED ON.
    - 5E) MINOR RE-AIMING OF SIGNAL HEADS, IF NECESSARY
    - 5F) UNCOVER THE SIGNAL AHEAD SIGN AND TURN ON FLASHING BEACON
6. ACTIVATION OF THE TRAFFIC SIGNAL SHALL NOT BE SCHEDULED FOR WEEKENDS, FRIDAYS OR DAYS RIGHT BEFORE PUBLIC HOLIDAYS. ACTIVATION SHALL TAKE PLACE IN THE MORNING HOURS ONLY AFTER 9:00 A.M.
7. THE CONTRACTOR SHALL REMOVE THE "SIGNAL AHEAD" (W3-3) AND "NEW" (W16-15P) WARNING SIGNS AND FLASHING BEACONS AFTER ONE WEEK OF OPERATION.
8. ASSUMPTION OF MAINTENANCE OPERATIONS RELATED TO EQUIPMENT OR SIGNAL TIMINGS WITHIN THE TRAFFIC SIGNAL CABINET WILL BE THE RESPONSIBILITY OF THE CITY OF LAWRENCE AND SHALL OCCUR AFTER SUCCESSFUL TURN-ON TO FULL OPERATION. THIS APPLIES TOTRAFFIC SIGNAL MODIFICATIONS AND NEW TRAFFIC SIGNAL INSTALLATIONS AND APPLIES TO NORMAL MAINTENANCE OPERATIONS OR EMERGENCY CALLOUTS TO TAKE CORRECTIVE ACTION TO RETURN THE SIGNAL BACK TO FULL OPERATING CONDITION. FINAL ACCEPTANCE BY THE CITY IS CONDITIONAL UNTIL THE CONTRACTOR HAS CORRECTED ALL DEFECTS AND PUNCH LIST ITEMS. IF A TRAFFIC SIGNAL MALFUNCTION OCCURS BETWEEN SUCCESSFUL TURN-ON AND FINAL ACCEPTANCE AND THE SIGNAL MALFUNCTION IS DUE TO FAULTY WORK BY THE CONTRACTOR, THE CITY OF LAWRENCE WILL TAKE CORRECTIVE ACTION AND HAS THE DISCRETION TO BILL THE CONTRACTOR FOR ALL RELATED EXPENSE, INCLUDING OVERHEAD.

2022 EDITION

SHEET _____ OF _____

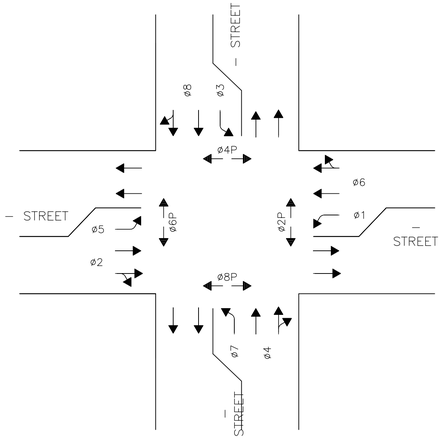
DATE	BY	REVISION
05-01-22	LJM	REPLACES ALL PREVIOUS VERSIONS OF TRAFFIC SIGNAL DETAILS
03-01-21	LJM	REPLACES ALL PREVIOUS VERSIONS OF TRAFFIC SIGNAL DETAILS

City of Lawrence
MUNICIPAL SERVICES & OPERATIONS

STANDARD DETAILS FOR
TRAFFIC SIGNAL
GENERAL NOTES

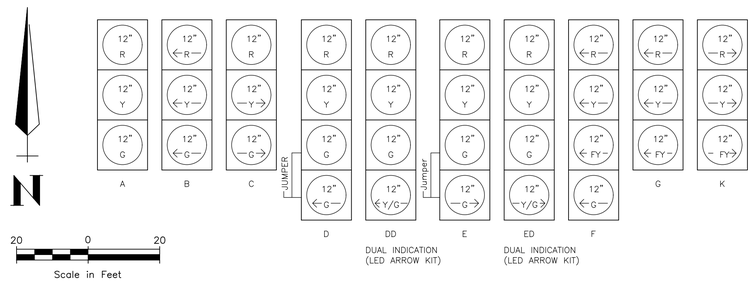
DAVID P. CRONIN
CITY ENGINEER

CRAIG S. OWENS
CITY MANAGER

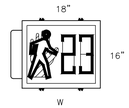


SIGNAL PHASING

ø1–WBLT ø2–EB
ø3–SBLT ø4–NB
ø5–EBLT ø6–WB
ø7–NBLT ø8–SB



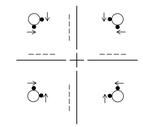
SIGNAL FACES



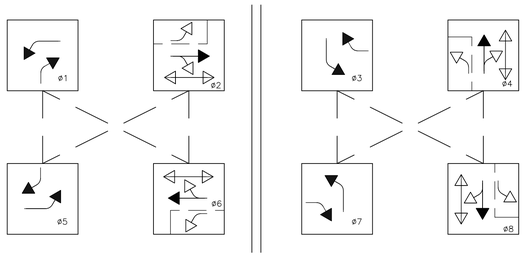
OVERLAPPED SYMBOLS

PHASE TIMINGS PLAN								
OPTION	PHASE							
	1	2	3	4	5	6	7	8
PHASE MINIMUM GREEN								
PHASE WALK								
PHASE PEDESTRIAN CLEAR								
PHASE PASSAGE								
PHASE PASSAGE 2								
PHASE MAXIMUM 1								
PHASE MAXIMUM 2								
PHASE YELLOW CHANGE								
PHASE RED CLEAR								

FLASHING OPERATIONS	
– – – – –	FR
– – – – –	FR
PEDESTRIAN HEADS	DARK
– LEFT	– –
– LEFT	– –



PED. PUSHBUTTON DETAIL



PHASING DIAGRAM

LEGEND

PERMISSIVE PHASE
PROTECTED PHASE
PEDESTRIAN PHASE
OL OVERLAP PHASE

CONSTRUCTION NOTES:

1.
2.
3.

2022 EDITION SHEET _____ OF _____

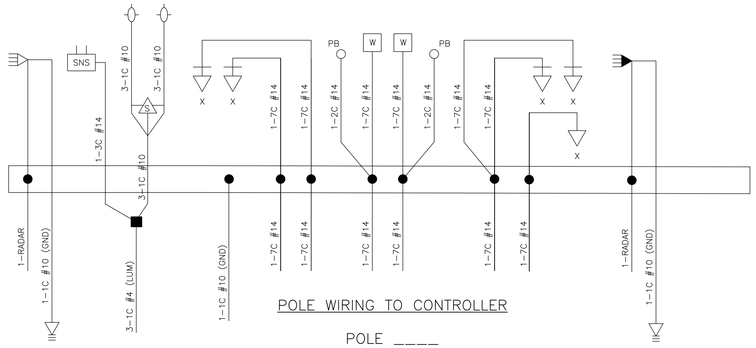
DATE	BY	REVISION
05–01–22	LJM	REPLACES ALL PREVIOUS VERSIONS OF TRAFFIC SIGNAL DETAILS
03–01–21	LJM	REPLACES ALL PREVIOUS VERSIONS OF TRAFFIC SIGNAL DETAILS

City *of* Lawrence
MUNICIPAL SERVICES & OPERATIONS

STANDARD DETAILS FOR
TRAFFIC SIGNAL
PLAN SHEET

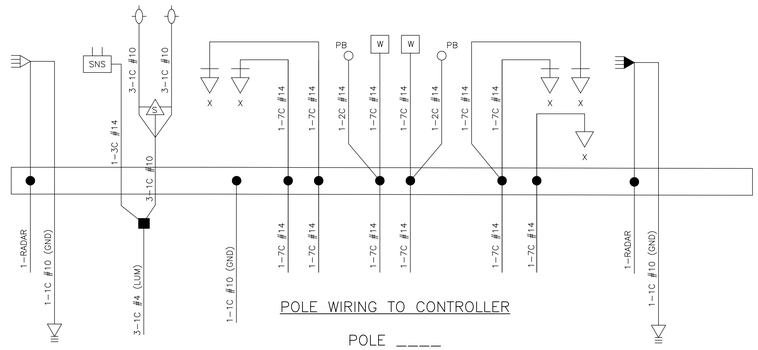
DAVID P. CRONIN
CITY ENGINEER

CRAIG S. OWENS
CITY MANAGER



POLE WIRING TO CONTROLLER

POLE ____

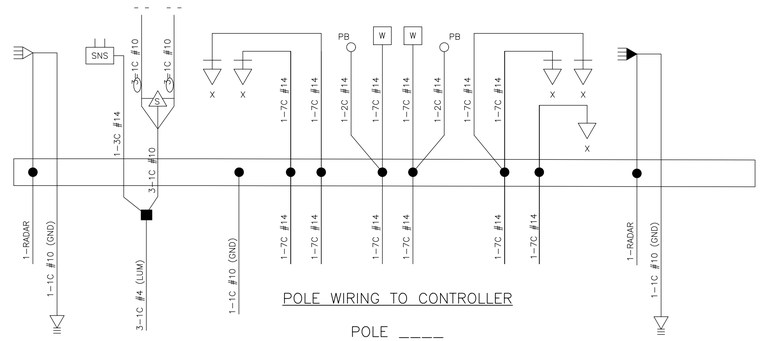


POLE WIRING TO CONTROLLER

POLE ____

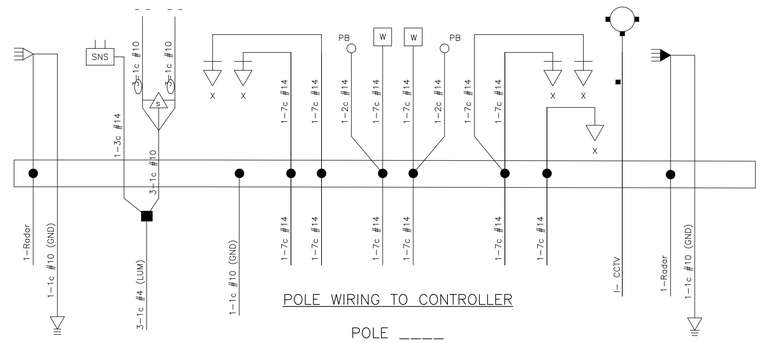
LEGEND

- ADVANCE RADAR DETECTOR
- PRESENCE RADAR DETECTOR
- CLOSED CIRCUIT TV (CCTV) CAMERA
- SNS — ILLUMINATED STREET NAME SIGN
- STREETLIGHT
- TRAFFIC SIGNAL HEAD
- W — PEDESTRIAN SIGNAL HEAD
- PB — PEDESTRIAN PUSHBUTTON
- STREETLIGHT ELECTRICAL CONNECTORS
- SPLICE KIT
- CONNECTION IN POLE BASE



POLE WIRING TO CONTROLLER

POLE ____

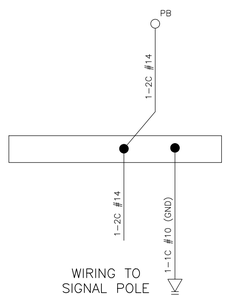


POLE WIRING TO CONTROLLER

POLE ____

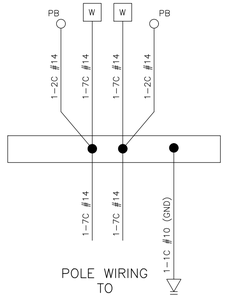
NOTES:

1. THE GROUPS OF WIRES SHALL BE TAPED TOGETHER WITH WIRE NUTS OR CONNECTORS AT THE BASE OF EACH SIGNAL POLE.
2. WIRING FOR CCTV SHALL BE CONTINUOUS WITH NO SPLICES TO THE CONTROLLER.
3. PIGTAIL CONNECTORS FROM THE RADAR DETECTION SENSORS TO THE BASE OF THE POLE SHALL BE PERFORMED BY THE SUPPLIER. CONNECTIONS TO THE HOME RUN CABLE SHALL BE MADE WITH SELF-STRIPPING GEL-FILLED ELECTRICAL PIGTAIL CONNECTORS.



WIRING TO SIGNAL POLE

POLE WIRING TO CONTROLLER



POLE WIRING TO CONTROLLER

Pole # ____

POLE WIRING DETAILS

NO SCALE

2022 EDITION

SHEET _____ OF _____

DATE	BY	REVISION
05-01-22	LJM	REPLACES ALL PREVIOUS VERSIONS OF TRAFFIC SIGNAL DETAILS
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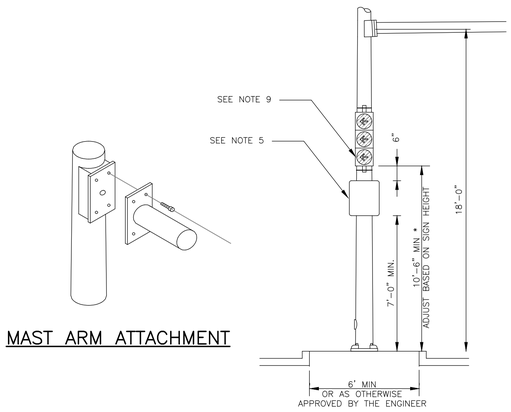
City *of* Lawrence
MUNICIPAL SERVICES & OPERATIONS

STANDARD DETAILS FOR
TRAFFIC SIGNAL
WIRING

DAVID P. CRONIN
CITY ENGINEER

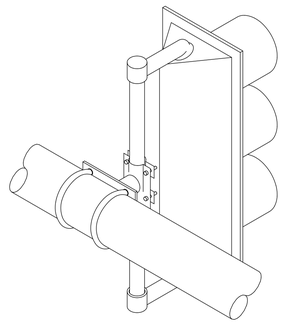
CRAIG S. OWENS
CITY MANAGER



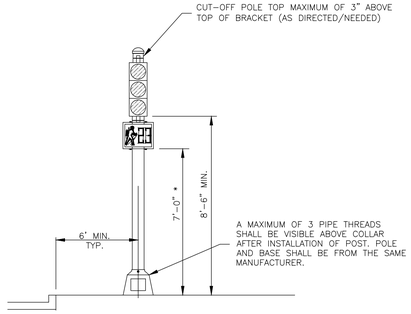
MAST ARM ATTACHMENT

*NOTE:
MOUNT VEHICULAR SIGNAL HEAD AT 8'-6" IF NO TRAFFIC SIGN SPECIFIED.

MEDIAN MOUNTED STEEL OR STEEL COMBINATION STREET LIGHTING & SIGNAL POLE

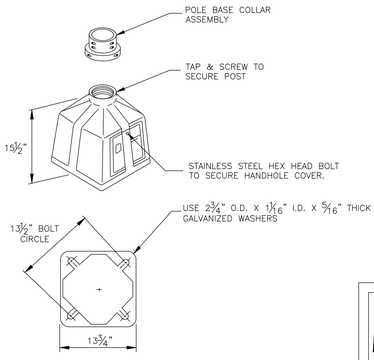


MAST ARM SIGNAL MOUNTING BRACKET (CABLE MOUNT ASSEMBLY)

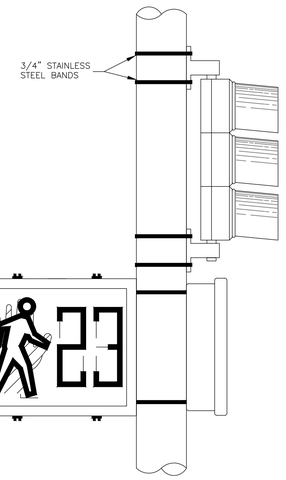


*NOTE:
MOUNT PEDESTRIAN HEAD AT 7'-4" IF NO VEHICLE HEADS. OTHERWISE MAINTAIN 7'-0" MOUNTING AS SHOWN.

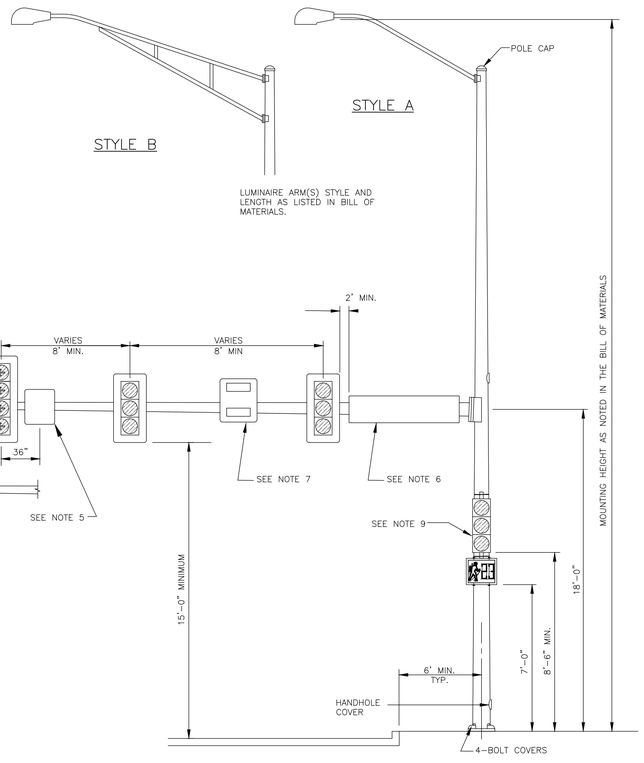
ALUMINUM SIGNAL PEDESTAL POLE



PEDESTAL POLE BASE DETAIL



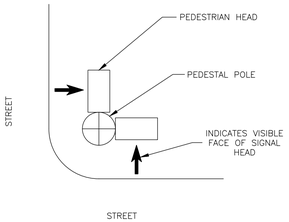
POLE BAND AND BRACKET MOUNTING DETAIL



STEEL COMBINATION STREETLIGHTING & SIGNAL POLE

NOTES:

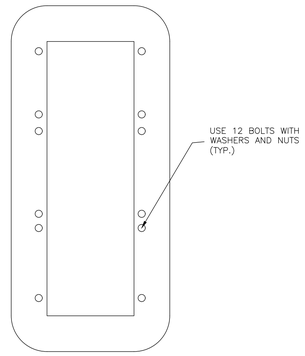
1. DETAIL APPLIES WHEN THERE ARE ONLY PEDESTRIAN SIGNAL HEADS.
2. WHEN VEHICULAR SIGNAL HEADS ARE MOUNTED ON THE SAME POLE AS PEDESTRIAN SIGNAL HEADS, THEY SHALL BOTH BE MOUNTED IN THE SAME VERTICAL PLANE WITH THE PEDESTRIAN SIGNAL HEAD MOUNTED BELOW THE VEHICLE SIGNAL HEAD.



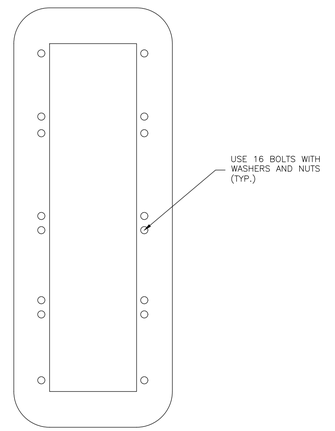
PEDESTRIAN SIGNAL HEAD ORIENTATION DETAIL

NOTES:

1. BOLT COVERS, HANDHOLE COVER, AND MAST ARM & POLE CAPS SHALL BE SHIPPED WITH THE POLES AND BE INSTALLED PRIOR TO FINAL ACCEPTANCE OF THE TRAFFIC SIGNAL SYSTEM.
2. INSTALL CORRESPONDING COLORS OF SIGNAL HEADS AT THE SAME ELEVATION – ADJUST FOR MAST ARM RAKE.
3. EACH VEHICULAR SIGNAL HEAD (MAST ARM AND/OR POLE MOUNTED) SHALL BE COVERED WITH A BLACK OR ORANGE (UNLESS OTHERWISE NOTED) SIGNAL HEAD COVER DURING CONSTRUCTION UNTIL THE SYSTEM IS MADE OPERATIONAL.
4. THE SIDE OF POLE SIGNAL HEAD MOUNTING HEIGHTS SHOWN ARE TO THE BOTTOM OF THE HOUSING AND NOT TO THE BRACKETS.
5. ALL R10-11B, R10-17A, R10-FYA, OR R3-4 SIGNS TO BE MOUNTED ON THE TRAFFIC SIGNAL POLES OR MAST ARMS SHALL BE PROVIDED AND INSTALLED BY THE CONTRACTOR. ALL SIGNS SHALL CONFORM TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION FOR COLOR, SIZE, LETTER AND LEGEND. (SEE SIGN DETAILS AND SPECIFICATIONS)
6. CONTRACTOR TO PROVIDE AND INSTALL OVERHEAD STREET NAME SIGN. (SEE MOUNTING DETAIL AND OVERHEAD STREET NAME SIGN DETAIL.)
7. VEHICLE ADVANCE RADAR DETECTION UNIT SHALL BE MOUNTED AS CLOSE TO THE CENTER OF THE THROUGH TRAFFIC LANE(S) PER MANUFACTURER'S RECOMMENDATION.
8. ALL HARDWARE NOT SPECIFICALLY SHOWN IN THE DETAILS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATION. ANY DEVIATIONS SHALL BE SUBMITTED FOR APPROVAL.
9. MINOR ADJUSTMENTS IN THE LOCATION OF TRAFFIC SIGNAL POLES OR SIGNAL CONTROLLER CABINET SHOULD BE MADE IN THE FIELD DURING CONSTRUCTION IN ORDER TO MAINTAIN A MINIMUM 4'-0" CLEARANCE FROM THE CENTERLINE OF ANY FIRE HYDRANT TO THE FACE OF POLE OR CABINET.
10. ALL TRAFFIC SIGNAL HEADS SHALL HAVE TWO ¼"DIAMETER DRAIN HOLES DRILLED IN THE BOTTOM HOUSING



3-SECTION BACKPLATE



4-SECTION BACKPLATE

TRAFFIC SIGNAL BACKPLATES

2022 EDITION

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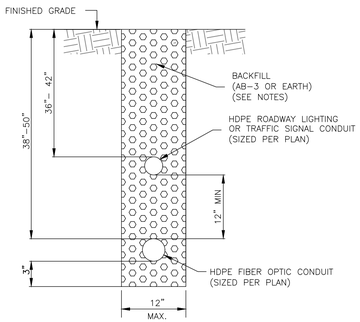
City of Lawrence
MUNICIPAL SERVICES & OPERATIONS

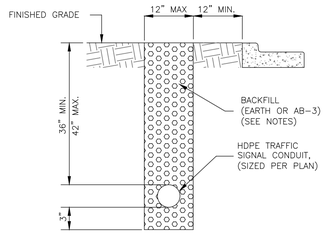
STANDARD DETAILS FOR
TRAFFIC SIGNAL POLE

DAVID P. CRONIN
CITY ENGINEER

CRAIG S. OWENS
CITY MANAGER



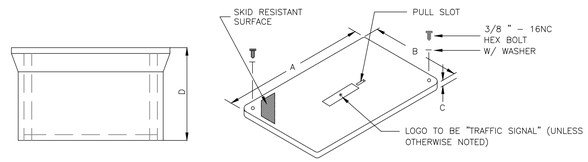
TRENCH W/ MULTIPLE CONDUITS



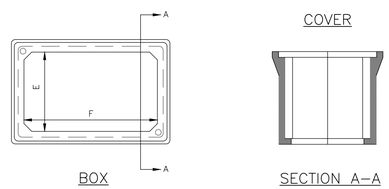
TRENCH W/ SINGLE CONDUIT

NOTE:
1. ALL TRENCHES FOR CONDUIT UNDER PROPOSED PAVED SURFACES SHALL BE BACKFILLED WITH FLOWABLE FILL.
2. BACKFILL IN UNPAVED AREAS SHALL BE FREE OF RUBBLE AND ROCK.
3. IF MULTIPLE CONDUITS ARE INSTALLED, THEY SHALL HAVE A MINIMUM OF 12" HORIZONTAL OR VERTICAL CLEARANCE BETWEEN THEM.

TRENCHING DETAILS IN UNPAVED AREAS



COVER



BOX

SECTION A–A

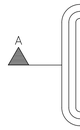
TYPE	APPROXIMATE DIMENSION (INCHES)					
	A	B	C	D	E	F
1 – JUNCTION	12 7/8"	12 7/8"	3/4"	12 3/4"	9 3/4"–10 1/2"	9 3/4"–10 1/2"
2 – JUNCTION	18"–18 1/2"	11 1/4"–11 1/2"	2"	12"	9 1/2"–10 1/4"	16 1/2"–17 1/4"
1 – SERVICE	35 5/8"	24"	3"	24"	22 1/4"	33 1/8"
2 – SERVICE (5)	47 5/8"	30 1/8"	3"	24"	28 1/8"	45 5/8"

BOX NOTES:

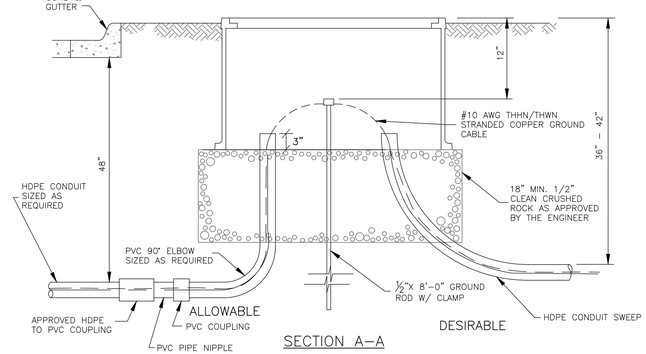
1. JUNCTION BOXES SHALL BE STACKABLE FOR EXTRA DEPTH.
2. ALL JUNCTION BOXES, SERVICES BOXES, AND COVERS SHALL BE RATED AT NO LESS THAN 22,500 LBS. TEST LOAD (TIER 15) ANSI/SCTE–77.
3. MATERIAL TO BE AN AGGREGATE CONSISTING OF SAND AND GRAVEL BOUND TOGETHER WITH A POLYMER AND REINFORCED WITH CONTINOUS WOVEN GLASS STRANDS. IT SHALL HAVE THE FOLLOWING PROPERTIES:

   COMPRESSIVE STRENGTH – 11,000 PSI ASTM C–109/D–3410
   TENSILE STRENGTH – 1,700 PSI ASTM C–496/D–638/D–2343
   FLEXURAL STRENGTH – 7,500 PSI ASTM C–580/D–790
4. ATTACH 1C #10 THHN STRANDED COPPER SYSTEM GROUND TO ½"X 8'–0" GROUND ROD IN SERVICE BOX. MULTIPLE #10 GROUND CABLES INTRODUCED AT SIGNAL POLES SHALL BE TERMINATED AT GROUND ROD WITH AN ADDITIONAL CLAMP.
5. THE TYPE 2 SERVICE BOX SHALL HAVE A TWO–PIECE OVERLAPPING COVER.

FIBERGLASS REINFORCED POLYMER CONCRETE JUNCTION & SERVICE BOX DETAILS



PLAN



SECTION A–A

SERVICE BOX DETAIL

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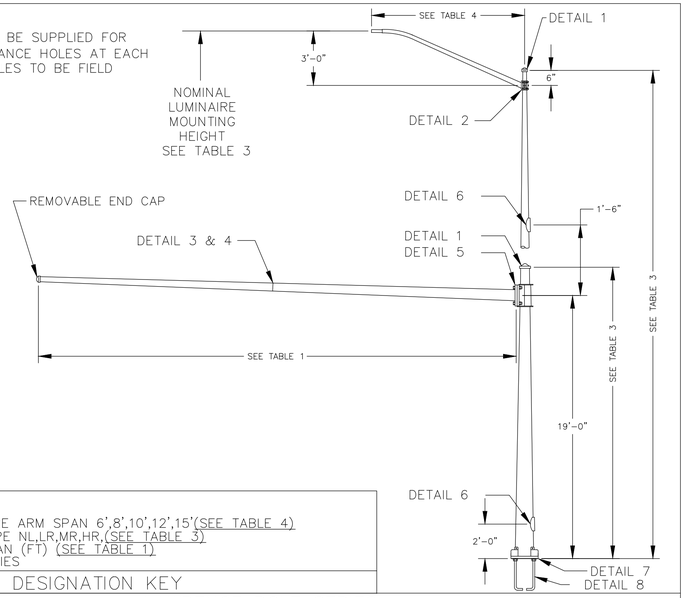
City *of* Lawrence
MUNICIPAL SERVICES & OPERATIONS

STANDARD DETAILS FOR
TRAFFIC SIGNAL
CONDUIT AND BOX

DAVID P. CRONIN
CITY ENGINEER

CRAIG S. OWENS
CITY MANAGER

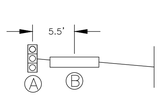
NOTE:
1.1" I.D. GROMMETS WILL BE SUPPLIED FOR 1.38" DIA. WIRE ENTRANCE HOLES AT EACH SIGNAL LOCATION. HOLES TO BE FIELD DRILLED BY OTHERS.



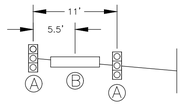
LAW-32-MR-10
- LAWRENCE POLE SERIES
- SIGNAL ARM SPAN (FT) (SEE TABLE 1)
- UPRIGHT TYPE NL,LR,MR,HR,(SEE TABLE 3)
- LUMINAIRE ARM SPAN 6',8',10',12',15'(SEE TABLE 4)

DESIGNATION KEY

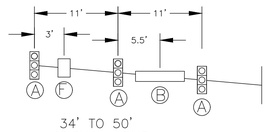
LAWRENCE POLE SERIES



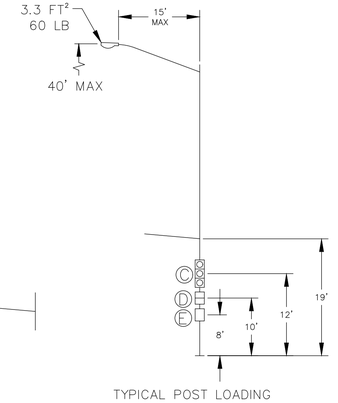
14' TO 20'
SIGNAL ARMS



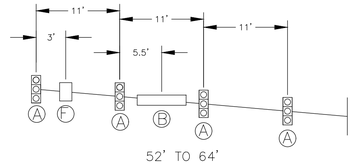
22' TO 32'
SIGNAL ARMS



34' TO 50'
SIGNAL ARMS



TYPICAL POST LOADING



52' TO 64'
SIGNAL ARMS

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 SUPORTS 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^2)	WEIGHT (LBS)
(A)	12"-3 SEC. SIGNAL WITH BACK PLATES	8.67	30
(B)	18" X 72" STREET NAME SIGN	9.00	20
(C)	12"-3 SEC. SIGNAL WITH NO BACK PLATES	4.08	30
(D)	DUAL-2 SEC. PEDESTRIAN SIGNAL	8.00	40
(E)	30" X 30" POLE MOUNTED SIGN	6.25	13
(F)	24" X 30" SIGNAL ARM MOUNTED SIGN	5.00	10

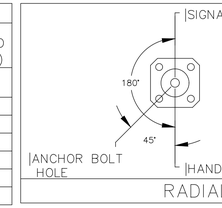
MAXIMUM LOADING INFORMATION

TABLE 1: POLE AND SIGNAL ARM DATA

DESIGNATION KEY				POLE DATA			POLE BASE					ANCHOR BOLT DATA				SIGNAL ARM DATA			
POLE SERIES	SIGNAL ARM SPAN (FT)	LUMINAIRE ARM (IF ANY) TYPE	LUMINAIRE ARM (IF ANY) SPAN (FT)	BASE DIA. (IN)	LENGTH (FT)	GAUGE OR THK. (IN)	SQUARE "S" (IN)	BOLT CIRCLE "Y" (IN)	THK. "M" (IN)	CENTER HOLE "P" (IN)	HOLE DIA. "Z" (IN)	DIA. "K" (IN)	LENGTH "J" (IN)	HOOK "H" (IN)	THREAD LENGTH "U" (IN)	FIXED END DIA. (IN)	FREE END DIA. (IN)	GAUGE OR THK. (IN)	LENGTH (FT)
LAW	14.00	NL,LR, MR,HR	(6)THRU(15)	13.00	SEE TABLE 3	5	18.00	17.00	2.00	11.50	1.75	1.50	54.00	6.00	8.00	9.00	7.04	7	14.00
	16.00															9.00	6.76	7	16.00
	18.00															9.00	6.48	7	18.00
	20.00															9.00	6.20	7	20.00
	22.00															9.00	5.92	7	22.00
	24.00															9.00	5.64	7	24.00
	26.00															9.00	5.36	7	26.00
	28.00															9.00	5.08	7	28.00
	30.00															9.00	4.80	7	30.00
	32.00															9.00	4.52	7	32.00
	34.00															9.00	4.24	7	34.00
	36.00															9.00	3.96	7	36.00
LAW	38.00	NL,LR, MR,HR	(6)THRU (15)	16.50	SEE TABLE 3	0.219	21.50	21.00	2.00	14.75	2.00	1.75	84.00	6.00	8.00	11.00	5.68	7	38.00
	40.00															11.00	5.40	7	40.00
	42.00															12.00	6.12	7	42.00
	44.00															12.00	5.84	7	44.00
	46.00															12.00	5.56	7	46.00
	48.00															12.00	5.28	7	48.00
	50.00															12.00	5.00	7	50.00
	52.00															13.00	6.08	SEE DET. 3	52.00
	54.00															13.00	5.80		54.00
	56.00															13.00	5.52		56.00
	58.00															13.00	5.24		58.00
	60.00															13.00	4.68		60.00
	62.00															14.50	6.18		62.00
	64.00															14.50	5.90		64.00

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-STRUCTURES	A123	--
GALVANIZING-HARDWARE	HOT DIP ZINC	--
LUMINAIRE ARM CLAMP	A36	36



ALL ANGLES MEASURED CLOCKWISE FROM LOWER HANDHOLE AS VIEWED FROM SMALL END OF POLE

RADIAL INDEX

FINISH DATA

STANDARD FINISH	OPTIONAL FINISH
SYSTEM: GALVANIZED (GV)	SYSTEM: FINISH PAINT/GALVANIZED (FPGV)
BASE COAT: HOT-DIP GALVANIZED TO ASTM A123	BASE COAT: HOT-DIP GALVANIZED TO ASTM A123
PRIME COAT: NONE	PRIME COAT: NONE
FINISH COAT: NONE	FINISH COAT: TGIC OR URETHANE POLYESTER POWDER
COLOR: NONE	COLOR: ????
SPEC: F-1	SPEC: F-283????

TABLE 3: ELEVATIONS

ELEVATIONS	TYPE			
	NO LUMINAIRE (NL)	LOW RISE (LR)	MEDIUM RISE (MR)	HIGH RISE (HR)
LUM. MOUNTING HEIGHT	---	30'-0"	35'-0"	40'-0"
POLE LENGTH	20'-6"	27'-6"	32'-6"	37'-6"

TABLE 4: LUMINAIRE ARM DATA

SPAN (FT)	FIXED END DIAMETER (IN)	FREE END DIAMETER (IN)	GAUGE
6.00	3.40	2.38	11
8.00	3.63	2.38	11
10.00	3.89	2.38	11
12.00	4.16	2.38	11
15.00	4.57	2.38	11

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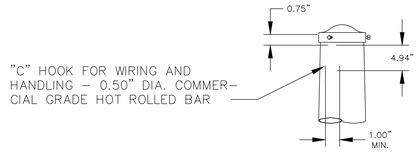
City of Lawrence
MUNICIPAL SERVICES & OPERATIONS

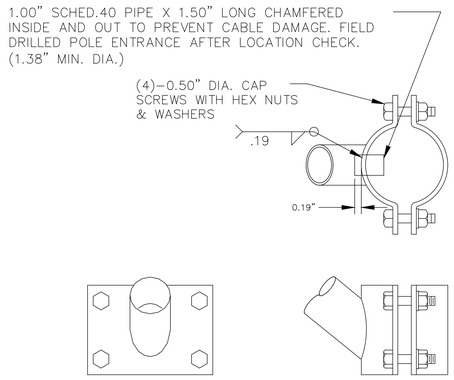
STANDARD DETAILS FOR
TRAFFIC SIGNAL
STRUCTURE (1 OF 2)

DAVID P. CRONIN
CITY ENGINEER

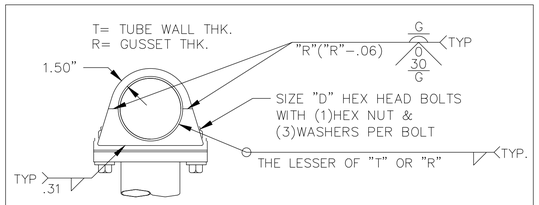
CRAIG S. OWENS
CITY MANAGER

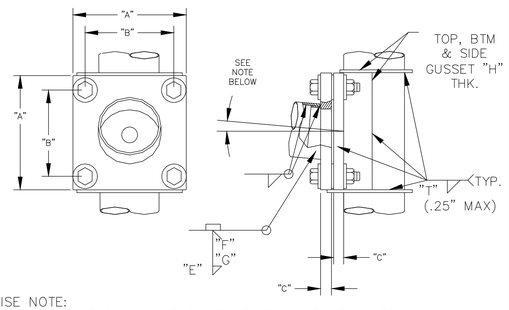


DETAIL 1 | POLE TOP



DETAIL 2 | LUMINAIRE ARM ATTACHMENT

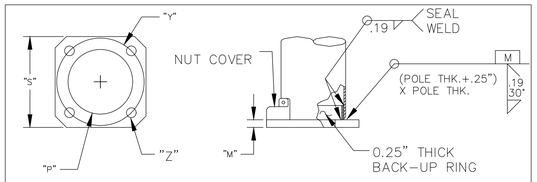




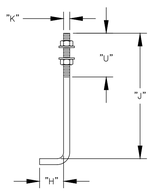
RISE NOTE:
RISE SHALL BE BUILT IN THE MOUNTING PLATE ATTACHED TO THE ARM. RISE IN MTG PLATES MAY VARY DEPENDING UPON POLE SIZE AND MAST ARM LOADING.

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

DETAIL 5 | SIGNAL ARM ATTACHMENT



DETAIL 7 | POLE BASE

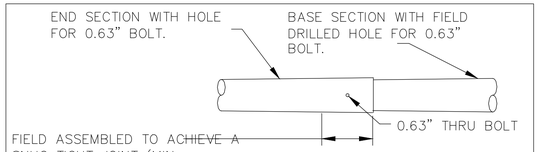


(4)–ANCHOR BOLTS WITH (2) HEX NUTS AND (2) WASHERS PER BOLT WITH THREADED END GALVANIZED AT LEAST 12".

DETAIL 8 | ANCHOR BOLT

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.

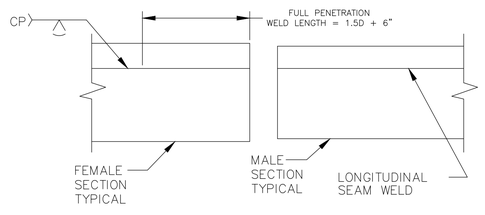
VIBRATION DISCLAIMER



SPAN (FT)	BASE SECTION		END SECTION		
	LENGTH (FT)	GAUGE OR THK. (IN)	BASE DIA. (IN)	LENGTH (FT)	GAUGE OR THK. (IN)
52.00	40.00	5	8.05	14.08	7
54.00	40.00	5	8.05	16.08	7
56.00	38.50	3	8.26	19.60	7
58.00	38.50	3	8.26	21.60	7
60.00	38.50	3	8.26	23.60	7
62.00	23.00	0.219	12.00	41.58	7
64.00	23.00	0.219	12.00	43.58	7

DETAIL 3 | SIGNAL ARM SLIP JOINT

("D"= INSIDE DIAMETER OF OUTER TUBE)



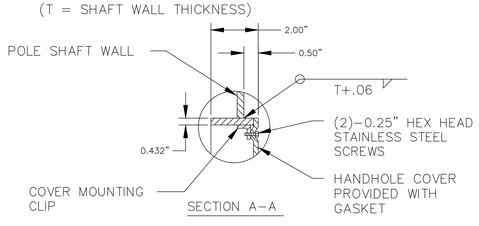
52'THRU 64'MAST ARM WELD REINFORCEMENT

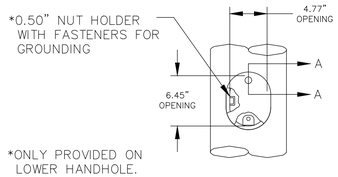
DETAIL 4 | MAST ARM WELD REINFORCEMENT

SIGNAL ARM ATTACHMENT DATA

ARM BASE DIA. (IN)	POLE BASE DIA. (IN)	"A" (IN)	"B" (IN)	"C" (IN)	"D" (IN)	CENTER HOLE DIA. (IN)	"H" (IN)
9.00	13.00	17.75	14.50	2.00	1.25 X 6.25	7.64	0.38
11.00	16.50	21.75	18.50	2.00	1.25 X 6.25	7.00	0.38
12.00	16.50	21.75	18.50	2.00	1.25 X 6.25	8.25	0.38
13.00	16.50	21.75	18.50	2.00	1.25 X 6.25	7.00	0.38
14.50	16.50	21.75	18.50	2.00	1.25 X 6.25	8.50	0.38

(T = SHAFT WALL THICKNESS)





DETAIL 6 | HANDHOLE

2022 EDITION

SHEET _____ OF _____

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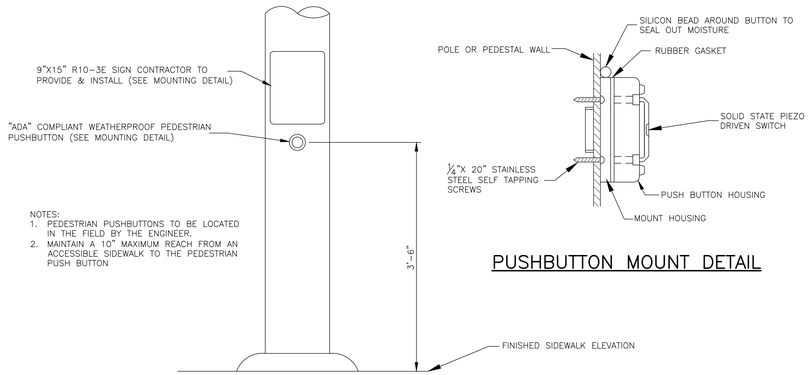
05–01–22	LJM	REPLACES ALL PREVIOUS VERSIONS OF TRAFFIC SIGNAL DETAILS
03–01–21	LJM	REPLACES ALL PREVIOUS VERSIONS OF TRAFFIC SIGNAL DETAILS

City of Lawrence
MUNICIPAL SERVICES & OPERATIONS

STANDARD DETAILS FOR
TRAFFIC SIGNAL
STRUCTURE (2 OF 2)

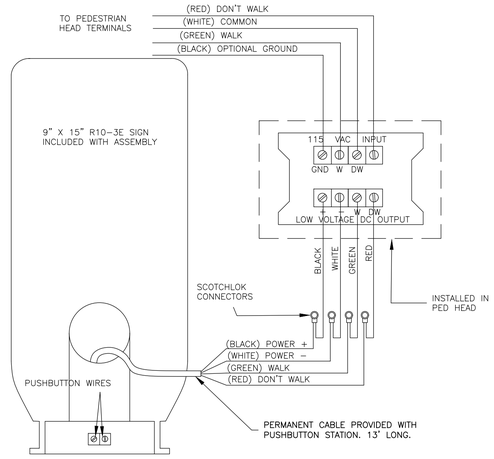
DAVID P. CRONIN
CITY ENGINEER

CRAIG S. OWENS
CITY MANAGER



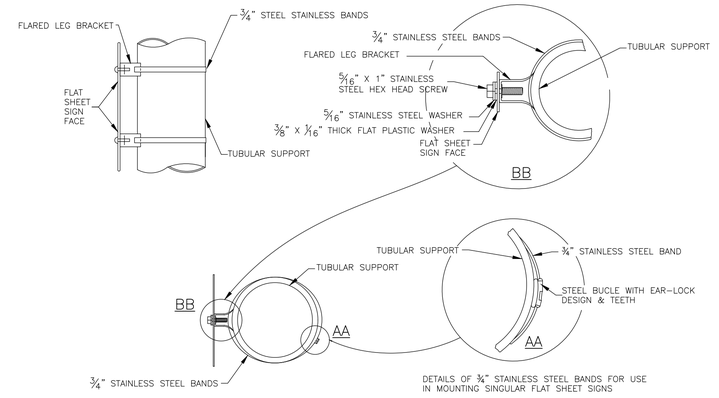
PEDESTRIAN PUSHBUTTON

PUSHBUTTON MOUNT DETAIL

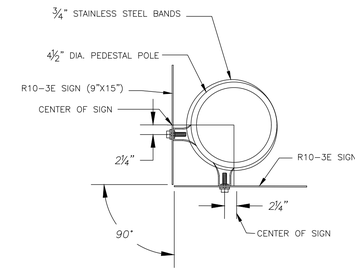


AUDIBLE PEDESTRIAN PUSHBUTTON WIRING DIAGRAM

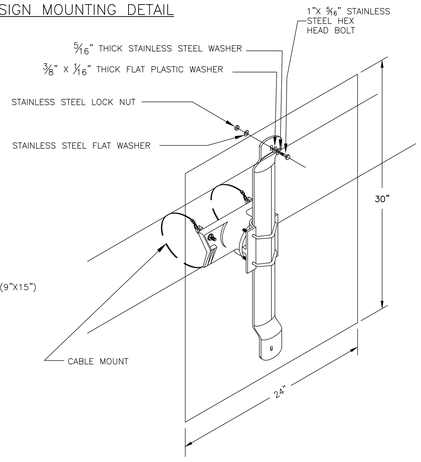
NOTE: REQUIRES POLE ADAPTER WHEN MOUNTING TWO UNITS ON THE SAME PEDESTAL POLE.



SIDE OF POLE SIGN MOUNTING DETAIL



PEDESTAL POLE SIGN MOUNTING DETAIL



MAST ARM SIGN MOUNTING BRACKET DETAIL

SIGN MOUNTING NOTES:
1. SIGNS ON SIDE OF POLE SHALL BE ATTACHED WITH TWO (2) BRACKETS AND STAINLESS STEEL BANDS.
2. HOLES IN SIGN FOR ATTACHMENT TO THE MOUNTING BRACKETS SHALL BE OFFSET A MINIMUM OF 2" FROM THE EDGE OF SIGN.
3. HOLES IN SIGN SHALL BE LOCATED SUCH THAT THE SIGN IS PLUMB AND LEVEL.
4. THIS DETAIL IS NOT INTENDED FOR R10 SERIES SIGNS ATTACHED TO SIGNAL MAST ARMS.
5. WHEN ONLY ONE R10-3E SIGN IS USED ON THE PEDESTAL POLE, MOUNT WITH THE BOLTS CENTERED ON THE SIGN.

SIGN MOUNTING DETAILS

PEDESTRIAN PUSHBUTTON POST DETAIL
SEE DETAIL AT RIGHT

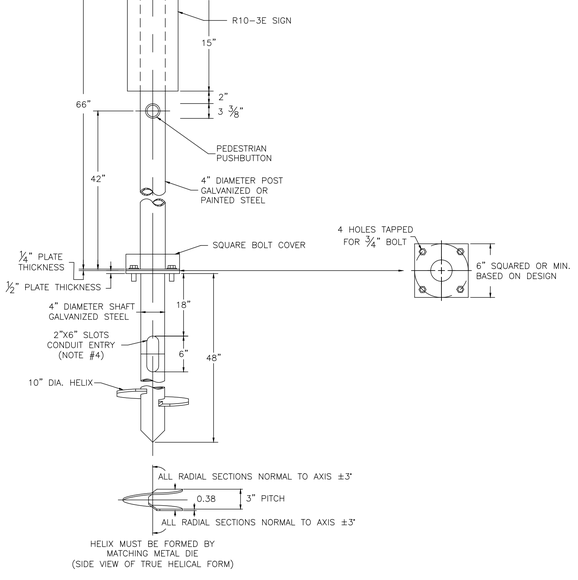
PUSHBUTTON POST NOTES:

1. HOT DIP GALVANIZED PER ASTM A153-(LATEST REVISION). FINISH TO SMOOTH SURFACE.
2. PIPE MATERIAL PER ASTM A500 GRADE B OR ASTM A618 GRADE III.
3. A POLE BASE COVER IS TO BE PROVIDED WITH THIS POLE. SEE THE PRE-APPROVED MATERIALS LIST FOR ACCEPTABLE ITEMS.

SCREW IN FOUNDATION DETAIL
SEE DETAIL AT RIGHT

SCREW-IN-FOUNDATION NOTES:

1. FINISH:HOT DIP GALVANIZE PER ASTM-A153 (LATEST REVISION).
2. BASEPLATE TO BE PERPENDICULAR TO SHAFT AXIS (±1°) AND HOLE CENTERLINE CONCENTRIC (±.188) TO SHAFT AXIS.
3. STENCIL MINIMUM ½ INCH LETTERS MANUFACTURER'S NUMBER AFTER GALVANIZING.
4. FLAME CUT TWO SLOTS IN SHAFT PERPENDICULAR TO THE BASEPLATE.
5. PREHEAT, TUMBLEBLAST, HANDGRIND, AND CLEAN BASEPLATE, HELIX, AND PILOT POINT ON ALL WELDED AREAS.
6. FLAMECUT IRREGULARITIES PERMISSIBLE:
   (1) VALLEYS NOT TO EXCEED $\frac{3}{32}$ INCH BELOW NOMINAL SURFACE LEVEL,
   (2) PEAKS OR POSITIVE IRREGULARITIES NOT TO EXCEED $\frac{1}{32}$ INCH ABOVE NOMINAL SURFACE LEVEL OR INTERSECTIONS OF NOMINAL SURFACES.
7. MANUFACTURER TO HAVE IN EFFECT INDUSTRY RECOGNIZED WRITTEN QUALITY CONTROL FOR ALL MATERIALS AND MANUFACTURING PROCESSES.
8. 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 TUBING, PER ASTM 500 GRADE B STRUCTURAL.
   HELIX: ASTM A635-(LATEST REVISION) ⅜" THICK HOT ROLLED STEEL PLATE OR COIL.
9. BASEPLATE PERMANENTLY MARKED TO INDICATE CABLEWAY OPENINGS IN SHAFT.
   T1121363 INCLUDES:
   (4) .75"X3.5" SAE J429 GR.5 HEX HEAD BOLTS
   (4) ROUND FLAT WASHERS
   (4) LOCK WASHERS



PEDESTRIAN PUSHBUTTON POST AND FOUNDATION DETAIL

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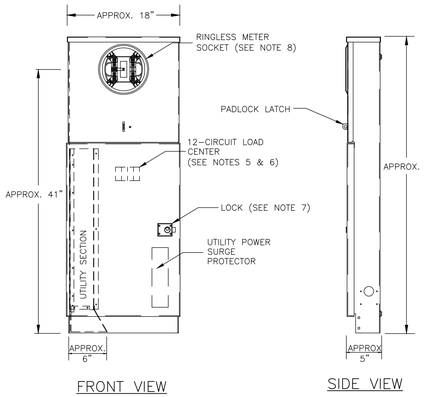
City of Lawrence
MUNICIPAL SERVICES & OPERATIONS

STANDARD DETAILS FOR
TRAFFIC SIGNAL
MISCELLANEOUS MOUNTING AND WIRING

DAVID P. CRONIN, CITY ENGINEER
CRAIG S. OWENS, CITY MANAGER

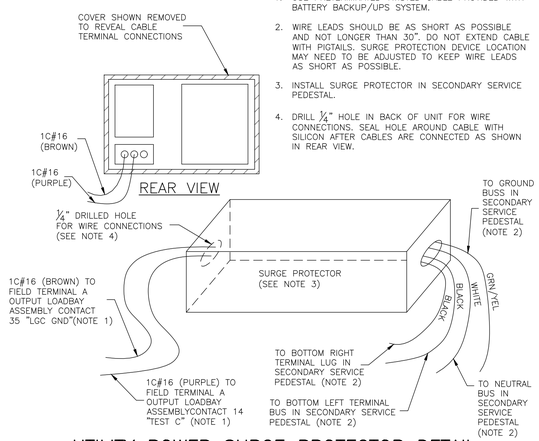


FRONT VIEW SIDE VIEW

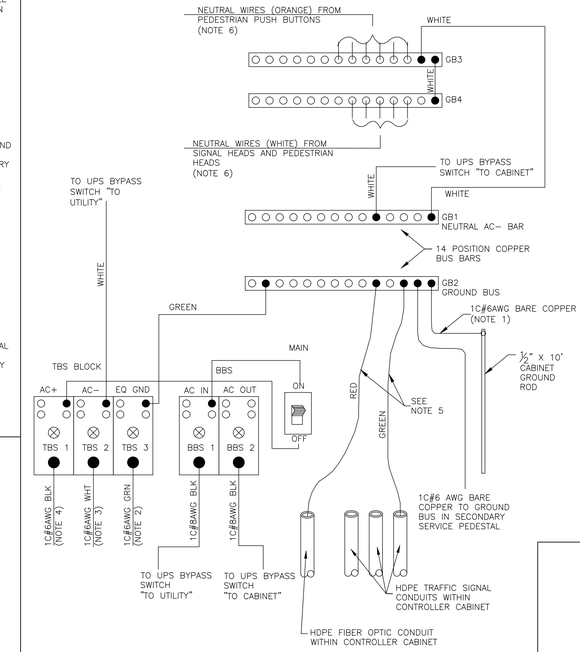
NOTES:
1. ENCLOSURE TO BE 0.125 INCH CORROSION RESISTANT ALUMINUM BUILT TO U.L. SPECIFICATION (NEMA 3R)
2. ALL FACTORY INSTALLED WIRE TO BE COPPER WITH 600V INSULATION.
3. SERVICE TERMINATIONS TO ACCOMMODATE 6 AWG TO 250 MCM AWG COPPER/ALUMINUM.
4. FINISH: NATURAL ALUMINUM.
5. 30 AMP CIRCUIT BREAKER FOR SIGNALS.
6. 15 AMP CIRCUIT BREAKER FOR CNG GENERATOR, IF APPLICABLE.
7. TAPERED LATCH & CORBIN NO. 2 LOCK.
8. EXPOSED 200 AMP, 120V 5 TERMINAL METER SOCKET W/HORN BYPASS AND RINGLESS COVER.
9. MOUNT UTILITY POWER SURGE PROTECTION DEVICE TO INSIDE OF SECONDARY SERVICE PEDESTAL.

STANDARD SECONDARY SERVICE ENCLOSURE DETAIL

NOTES:
1. USE PRETERMINATED TWISTED CABLE PROVIDED WITH BATTERY BACKUP/UPS SYSTEM.
2. WIRE LEADS SHOULD BE AS SHORT AS POSSIBLE AND NOT LONGER THAN 30". DO NOT EXTEND CABLE WITH PIGTAILS. SURGE PROTECTION DEVICE LOCATION MAY NEED TO BE ADJUSTED TO KEEP WIRE LEADS AS SHORT AS POSSIBLE.
3. INSTALL SURGE PROTECTOR IN SECONDARY SERVICE PEDESTAL.
4. DRILL ¼" HOLE IN BACK OF UNIT FOR WIRE CONNECTIONS. SEAL HOLE AROUND CABLE WITH SILICON AFTER CABLES ARE CONNECTED AS SHOWN IN REAR VIEW.



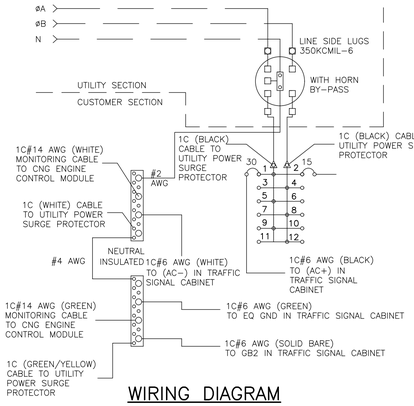
UTILITY POWER SURGE PROTECTOR DETAIL



CONTROLLER CABINET GROUNDING NOTES:

1. THE CONTRACTOR SHALL INSTALL A 1C#6 AWG BARE COPPER GROUND WIRE CONTINUOUS FROM THE GROUND BUS BAR GB2 TO THE 1/2" X 10' LONG CABINET GROUND ROD.
2. THE CONTRACTOR SHALL INSTALL A 1C#6 AWG GROUND WIRE FROM THE GROUND BUS BAR IN THE SECONDARY SERVICE ENCLOSURE TO THE EQ GND (POWER TERMINAL TBS 3 BLOCK).
3. THE CONTRACTOR SHALL INSTALL A 1C#6 AWG NEUTRAL WIRE FROM THE NEUTRAL BUS BAR IN THE SECONDARY SERVICE ENCLOSURE TO THE AC- (POWER TERMINAL TBS 2 BLOCK).
4. THE CONTRACTOR SHALL INSTALL A 1C#6 AWG POSITIVE WIRE FROM THE 30A BREAKER IN THE SECONDARY SERVICE ENCLOSURE TO THE AC+ (POWER TERMINAL TBS 1 BLOCK).
5. THE CONTRACTOR SHALL PROVIDE 1C#10 THNN/THWN STRANDED COPPER GROUND WIRE (GREEN) FROM THE GROUND BUS GB2 THROUGH THE TRAFFIC SIGNAL CONDUIT SYSTEM AND A 1C#10THHN/THWN STRANDED LOCATING WIRE (RED) FROM THE GROUND BUS GB2 THROUGH THE FIBER OPTIC CONDUIT SYSTEM.
6. THE CONTRACTOR SHALL INSTALL THE NEUTRAL WIRES (WHITE) FOR THE TRAFFIC SIGNAL CABLES TO THE NEUTRAL BUS BAR GB4 AND THE NEUTRAL WIRES (ORANGE) FOR THE PEDESTRIAN PUSH BUTTONS TO THE NEUTRAL BUS BAR GB3.

CONTROLLER CABINET GROUNDING DETAIL



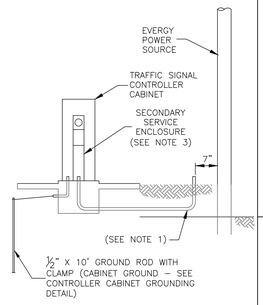
WIRING DIAGRAM

CIRCUIT DIRECTORY			
NO.	DESCRIPTION	AMP	POLE
	METERED		
1	SIGNALS	30	1
2	GENERATOR	15	1
3	SPACE		
4	SPACE		
5	SPACE		
6	SPACE		
7	SPACE		
8	SPACE		
9	SPACE		
10	SPACE		
11	SPACE		
12	SPACE		

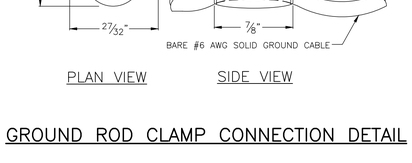
SERVICE CONNECTION NOTES:

POWER

1. CONTRACTOR SHALL INSTALL 2" SCHEDULE 40 PVC (GRAY) CONDUIT. THE CONDUIT SHALL BE INSTALLED 36" TO 36" DEEP WITH 36" RADIUS 90° PVC ELBOW TO WITHIN 7" OF THE BASE OF THE POWER SOURCE AND AT THE CONTROLLER CABINET. THE END OF THE CONDUIT SWEEP SHALL BE TEMPORARILY EXPOSED UNTIL EVERGY COMPLETES THE SERVICE HOOK-UP. A LIGHTED TYPE 1 BARRICADE SHALL BE PLACED AT THE EXCAVATION OR THE AREA BLOCKED OFF BY ORANGE SAFETY FENCING.
2. CONTRACTOR SHALL INSTALL ELECTRICAL SERVICE POWER CABLE FROM SECONDARY SERVICE PEDESTAL TO THE EVERGY POWER SOURCE. CONTRACTOR SHALL CONNECT CABLES TO THE METER LUGS & COIL ENOUGH SLACK AT THE POWER SOURCE TO EXTEND UP THE POWER POLE OR TO CONNECT IN THE POWER PEDESTAL.
3. ALUMINUM SECONDARY SERVICE ENCLOSURE IS A COMBINATION METER CAN/BREAKER BOX (SEE PLANS).

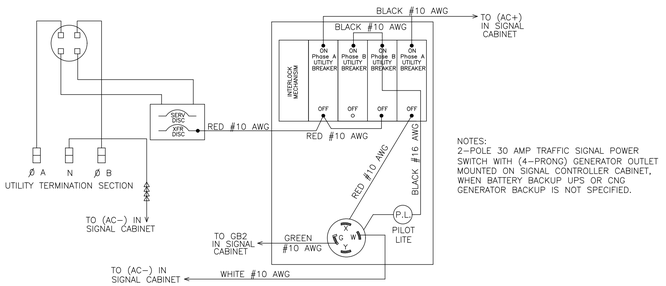


SERVICE CONNECTION DETAILS



PLAN VIEW SIDE VIEW

GROUND ROD CLAMP CONNECTION DETAIL



NOTES:
2-POLE 30 AMP TRAFFIC SIGNAL POWER SWITCH WITH (4-PRONG) GENERATOR OUTLET MOUNTED ON SIGNAL CONTROLLER CABINET, WHEN BATTERY BACKUP UPS OR CNG GENERATOR BACKUP IS NOT SPECIFIED.

POWER TRANSFER SWITCH WIRING DIAGRAM

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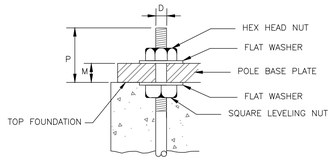
City of Lawrence
MUNICIPAL SERVICES & OPERATIONS

STANDARD DETAILS FOR
TRAFFIC SIGNAL CABINET WIRING

DAVID P. CRONIN, CITY ENGINEER
CRAIG S. OWENS, CITY MANAGER

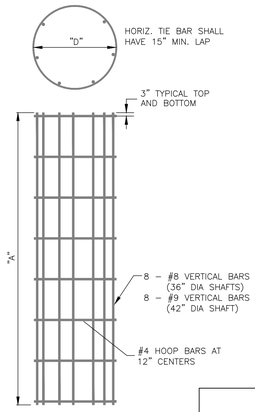
TABLE 1 – ANCHOR BOLT PROJECTION DIMENSIONS		
BOLT DIAMETER	PLATE THICKNESS "M"	BOLT PROJECTION "P"
1.50"	2.00"	6 ¼" ± ¼"
1.75"	2.00"	6 ¾" ± ¼"
1.75"	2.25"	7" ± ¼"
2.00"	2.25"	7 ½" ± ¼"



ANCHOR BOLT DETAIL

POLE FOUNDATION NOTES:

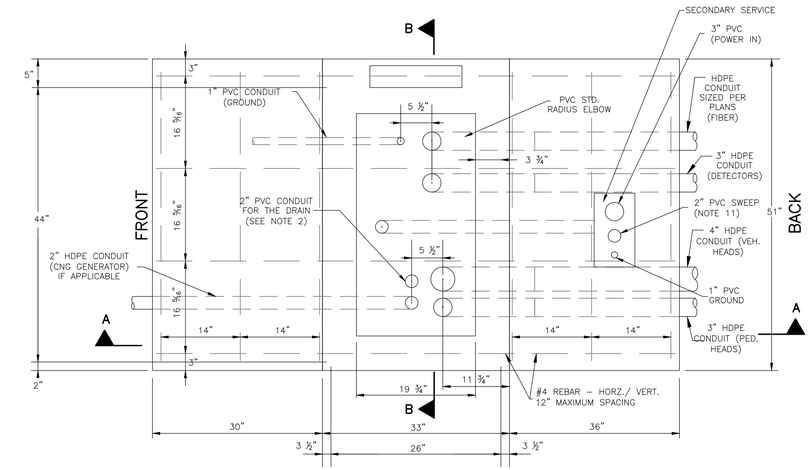
1. FINAL POLE, ANCHOR BOLT SIZE, ANCHOR BOLT PROJECTION, AND BOLT CIRCLE SHALL BE AS PER MANUFACTURER'S RECOMMENDED PRACTICES (SEE TABLE 1).
2. ALL CONDUITS AND ANCHOR BOLTS FOR ALL THE NEW POLE BASES SHALL BE RIGIDLY INSTALLED BEFORE CONCRETE IS PLACED. ANCHOR BOLTS SHALL BE SPACED BY MEANS OF A FACTORY CERTIFIED TEMPLATE OR DRAWING, THE CENTER OF WHICH SHALL COINCIDE WITH THE CENTER OF THE BASE.
3. ALL CONCRETE USED IN THIS WORK SHALL MEET THE REQUIREMENTS OF THE LAWRENCE MUNICIPAL CODE AND SHALL BE KCMMB4K CONCRETE (F'_c = 4,000 PSI). POLES SHALL NOT BE ERECTED UNTIL CONCRETE HAS REACHED 3,400 PSI.
4. REINFORCING STEEL SHALL HAVE 60 KSI YIELD STRENGTH; MAINTAIN 1 ½" MINIMUM CLEARANCE FROM REINFORCING STEEL TO EDGE OF HOLE OR FORM.
5. THE DRILLED SHAFT FOUNDATION DETAILS PRESENTED HEREIN ARE INTENDED FOR INSTALLATION INTO SOIL FOUNDATIONS. A SPECIAL FOUNDATION INVESTIGATION AND DESIGN SHALL BE CONDUCTED FOR RESIDUAL SOILS WITH AN "N" VALUE OF 4 OR LESS OR CHARACTERIZED AS VERY SOFT TO SOFT CLAY.
6. THESE STANDARD DESIGNS ASSUME A MINIMUM COMPACTIVE EFFORT OF 90% OF STANDARD OR MODIFIED PROCTOR FOR COHESIVE FILL MATERIAL.
7. IN THE EVENT EXCAVATION FOR THE DRILLED SHAFT ENCOUNTERS SOUND LIMESTONE SHORT OF THE REQUIRED LENGTH SHOWN IN THE TABLE OF DIMENSIONS, THE SHAFT MAY BE SHORTENED TO A MINIMUM LENGTH OF 8 FEET WITH A MINIMUM INCLUSIVE ROCK SOCKET OF 3 FEET.
8. SHALE FOUNDATION MATERIAL WILL BE CONSIDERED AS A STIFF CLAY. DRILLED SHAFTS IN SHALE MUST SATISFY THE DIMENSIONS ON TABLE 2.
9. ALL CONCRETE POLE BASES SHALL BE CONSOLIDATED BY AN INTERNAL TYPE VIBRATOR.
10. FINAL 6" OF CONCRETE FOUNDATION (POLE CAP) SHALL BE FORMED SQUARE. THE CAP SHALL BE FORMED AND POURED AFTER THE MAST ARM IS ERECTED AND THE POLE PLUMB. POLE CAP FOR PEDESTAL POLE SHALL BE REQUIRED AT INSPECTOR DISCRETION. FINAL TOP ELEVATION SHALL MATCH ADA SIDEWALK RAMP.
11. PVC CONDUIT ELBOWS IN CONCRETE FOUNDATIONS SHALL BE CONNECTED TO HDPE CONDUIT WITH PVC PIPE NIPPLE AND APPROVED PVC TO HDPE COUPLINGS. ALL PVC PIPE NIPPLES, ELBOWS, AND COUPLINGS SHALL BE CONSIDERED SUBSIDIARY TO THE TRAFFIC SIGNAL POLE BASE.
12. BARE NO. 6 SOLID COPPER GROUND CONDUCTOR SHALL BE CONNECTED FROM INTERNAL POLE GROUNDING NUT WITH A RING TERMINAL TO THE CLAMP ON THE GROUND ROD.
13. ALL REINFORCING STEEL SHALL BE ASTM A615 GR60.



REBAR CAGE DETAIL

HORIZONTAL REBAR			
POLE FND. DIA.	POLE FND DEPTH	REBAR CIR. "D"	SPACING
24"	30"	20"	12" MAX.
36"	11'–13'	30"	12" MAX.
42"	15'–21'	36"	12" MAX.

VERTICAL REBAR	
POLE FND. DEPTH	LENGTH "A"
30"	2'–3"
11'–0"	10'–9"
12'–0"	11'–9"
13'–0"	12'–9"
15'–0"	14'–9"
17'–0"	16'–9"



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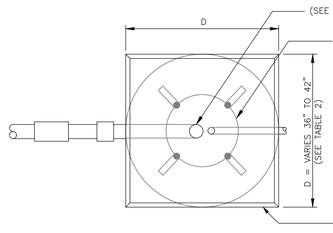

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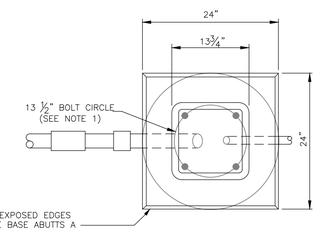

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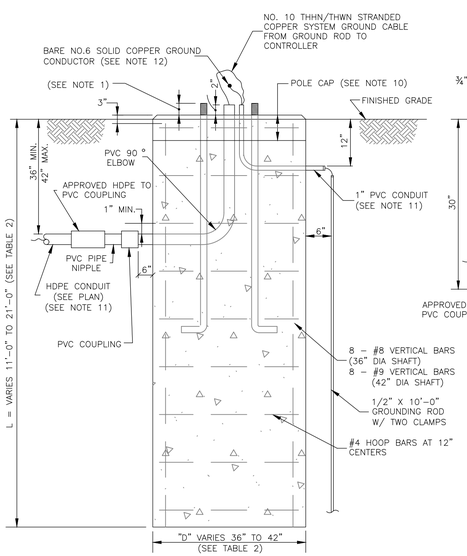
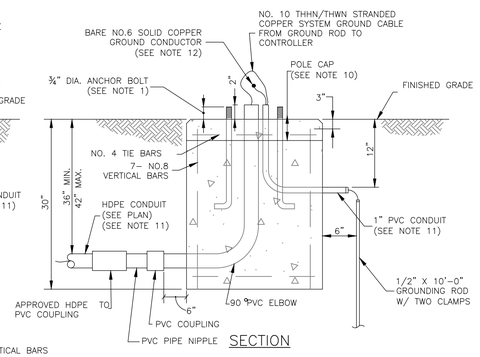


SECTION

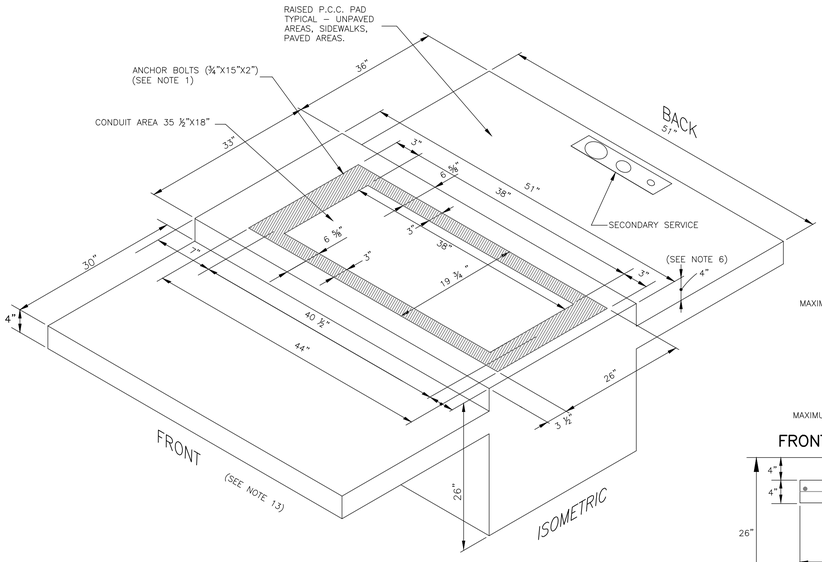


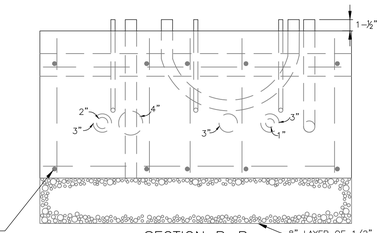
SECTION

PEDESTAL POLE FOUNDATION

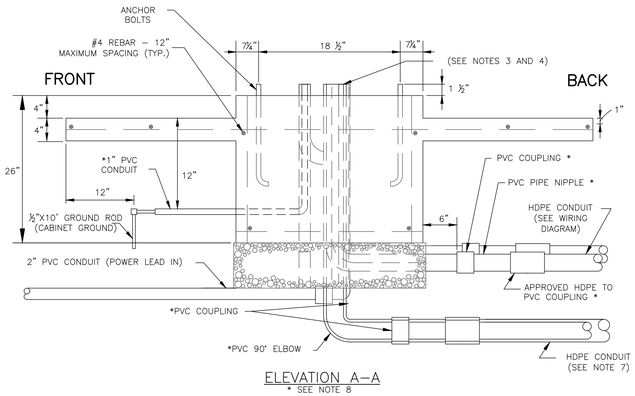
TABLE 2 SIGNAL POLE FOUNDATIONS DRILLED SHAFT DIMENSIONS		
LENGTH OF MAST ARM	"D" DIAMETER	"L" LENGTH
< 22'	36"	11'
22' TO 28'	36"	12'
30' TO 36'	36"	13'
38' TO 50'	42"	15'
52' TO 58'	42"	17'
60' TO 70'	42"	21'
> 70'	REQUIRES SPECIAL DESIGN	

TRAFFIC SIGNAL POLE FOUNDATION





SECTION B–B



ELEVATION A–A
* SEE NOTE 8

CONTROLLER CABINET PAD DETAILS (DOUBLE WIDE HYBRID)

SIGNAL CONTROLLER PAD NOTES:

1. ALL CONDUITS AND ANCHOR BOLTS SHALL BE RIGIDLY INSTALLED BEFORE CONCRETE IS PLACED.
2. TOP OF PAD TO BE SLOPED TO DRAIN TOWARD PVC DRAIN. DRAIN CAN BE RELOCATED AS NECESSARY TO MATCH CONDITIONS.
3. A 1–C#10 THHN/THWN STRANDED COPPER SYSTEM GROUND CABLE SHALL BE INSTALLED THROUGH ONE OF THE HDPE CONDUITS BETWEEN THE CONTROLLER AND CLOSET SERVICE BOX (SEE CONTROLLER CABINET GROUNDING DETAIL).
4. DUCT SEAL SHALL BE APPLIED AT ALL CONDUIT ENTRANCES AFTER CABLE INSTALLATION.
5. A WATERTIGHT SEAL SHALL BE APPLIED ALONG THE INSIDE AND OUTSIDE EDGES OF THE CABINET WHERE IT ABUTS TO THE CONCRETE PAD AND AROUND THE SECONDARY SERVICE ENCLOSURE WHERE IT ABUTS TO THE CABINET.
6. 4" IS NOMINAL DIMENSION. 2"X4" FORMS ARE ACCEPTABLE EXCEPT WHERE OTHERWISE NOTED OR DIRECTED (EXPOSED CONCRETE SURFACES SHALL BE FORMED BY OTHER MEANS FOR AN ACCEPTABLE FINISHED APPEARANCE). MEANS FOR AN ACCEPTABLE FINISHED APPEARANCE).
7. HDPE CONDUIT (ORANGE IN COLOR) WITH A #10 AWG STRANDED COPPER LOCATING CABLE AND POLYPROPYLENE PULL ROPE SIZED PER PLAN.
8. PVC CONDUIT ELBOWS IN CONCRETE FOUNDATIONS SHALL BE CONNECTED TO HDPE CONDUIT WITH PVC PIPE NIPPLE AND APPROVED PVC TO HDPE COUPLINGS. ALL PVC PIPE NIPPLES, ELBOWS AND COUPLINGS SHALL BE CONSIDERED SUBSIDIARY TO THE TRAFFIC SIGNAL CONTROLLER PAD.
9. CONTRACTOR TO INSTALL CONCRETE ANCHORS AND BOLTS PER MANUFACTURER'S RECOMMENDATION TO ANCHOR SECONDARY SERVICE ENCLOSURE TO CONCRETE FOUNDATION. ALSO ANCHOR TO SIGNAL CABINET WITH SHEET METAL SCREWS.
10. CONTRACTOR SHALL INSTALL A 36" RADIUS, LARGE SWEEP 90° ELBOW AT EACH END OF POWER LEAD–IN CONDUIT. MATERIAL SHALL BE SCHEDULE 40 PVC (GRAY)
11. CONTRACTOR SHALL INSTALL 180° PVC CONDUIT SWEEPS FROM SECONDARY SERVICE PEDESTAL SWEEPING UP INTO THE CONTROLLER CABINET.
12. CONTRACTOR TO PROVIDE GROUND ROD(S) AS REQUIRED FOR MAXIMUM OF 25 OHMS RESISTANCE TO GROUND. CONTRACTOR SHALL BE REQUIRED TO TEST WITH THE INSPECTOR PRESENT.
13. CABINET SHALL BE ORIENTED SUCH THAT WHEN THE TECHNICIAN IS FACING THE FRONT OF THE CABINET, HE CAN LOOK OVER THE TOP AND SEE THE INTERSECTION AHEAD OF THEM.
14. ALL REINFORCING STEEL SHALL BE ASTM A615 GR60.

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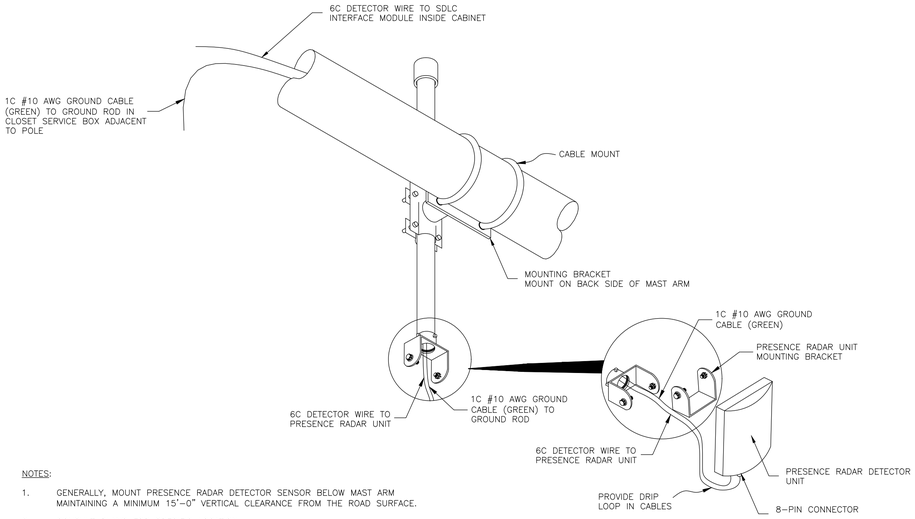
03–01–21	LJM	REPLACES ALL PREVIOUS VERSIONS OF TRAFFIC SIGNAL DETAILS

City of Lawrence
MUNICIPAL SERVICES & OPERATIONS

STANDARD DETAILS FOR
TRAFFIC SIGNAL
POLE AND CABINET FOUNDATION

DAVID P. CRONIN
CITY ENGINEER

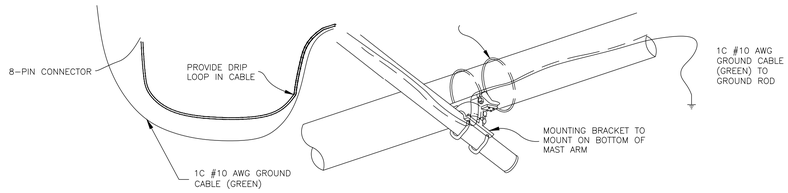
CRAIG S. OWENS
CITY MANAGER



NOTES:

1. GENERALLY, MOUNT PRESENCE RADAR DETECTOR SENSOR BELOW MAST ARM MAINTAINING A MINIMUM 15'-0" VERTICAL CLEARANCE FROM THE ROAD SURFACE.
2. CONSULT PLANS FOR SPECIFIC LOCATION.
3. MOUNTING BRACKET ARM SHALL BE VERTICAL TO ROAD SURFACE.
4. INSTALL THE 1C#10 AWG GROUND CABLE FROM THE SENSOR TO THE GROUND ROD IN THE CLOSEST SERVICE BOX ADJACENT TO THE POLE THE SENSOR IS MOUNTED ON. USE A SEPARATE GROUND ROD CLAMP FOR EACH SENSOR.

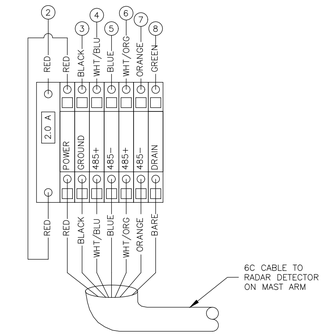
PRESENCE RADAR DETECTION MOUNTING DETAIL
(MAST ARM BRACKET ARM MOUNT)



ADVANCE RADAR DETECTION MOUNTING DETAIL
(MAST ARM BRACKET ARM MOUNT)

NOTES:

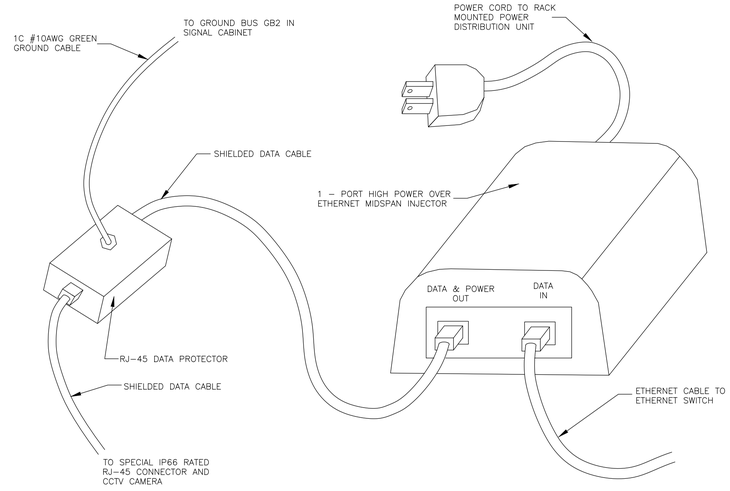
1. MAINTAIN OFFSETS FROM CENTER OF THE DESIRED LANE LESS THAN 24 FEET.
2. APPLY SILICON DIELECTRIC COMPOUND INTO THE CONNECTOR AT THE BASE OF THE RADAR DETECTOR
3. ORIENT ADVANCE RADAR DETECTOR STRAIGHT AHEAD WITH NO DOWNWARD TILT. BRACKET ARM SHOULD BE PARALLEL TO THE ROAD SURFACE.
4. INSTALL PRESENCE RADAR DETECTOR BELOW MAST ARM AND ORIENT AS INDICATED FOR MAXIMUM DETECTION. BRACKET ARM SHOULD BE PERPENDICULAR TO THE ROAD SURFACE. MAINTAIN A MINIMUM OF 15' CLEARANCE FROM SENSOR TO THE SURFACE.
5. MOUNTING BRACKET ARM SHALL BE HORIZONTAL TO ROAD SURFACE.
6. INSTALL THE 1C#10 AWG GROUND CABLE FROM THE SENSOR TO THE GROUND ROD IN THE CLOSEST SERVICE BOX ADJACENT TO THE POLE THE SENSOR IS MOUNTED ON. USE A SEPARATE GROUND ROD CLAMP FOR EACH SENSOR.



RADAR DETECTION NOTES:

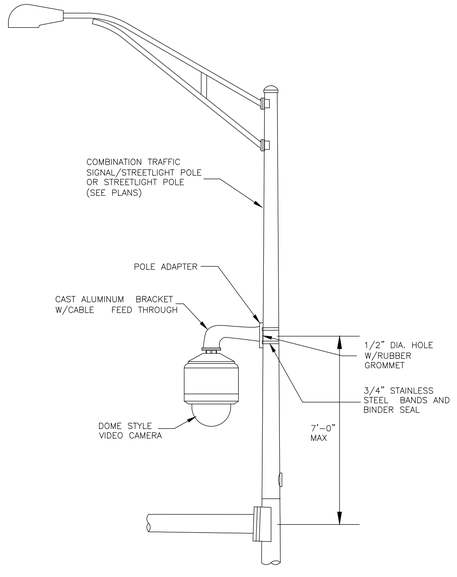
1. PLUG CABLE CONNECTION INTO THE SDLC CABINET INTERFACE MODULE.
2. ONE CONNECTION IS REQUIRED FOR EVERY PRESENCE AND ADVANCE SENSOR.

RADAR DETECTION RACK WIRING DIAGRAM



WARNING
FOLLOW DIRECTIONS FOR RJ-45 CONNECTOR INSTALLATION

CCTV CAMERA CONNECTION DETAIL



CCTV CAMERA MOUNTING DETAIL

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MUNICIPAL SERVICES & OPERATIONS

STANDARD DETAILS FOR
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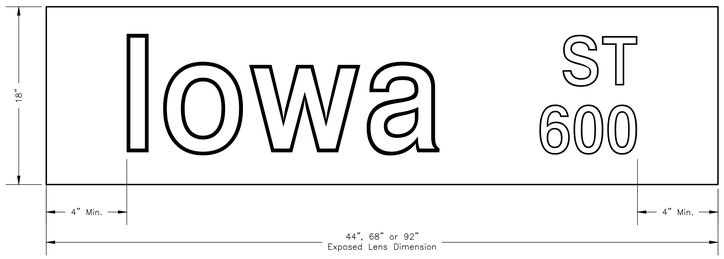
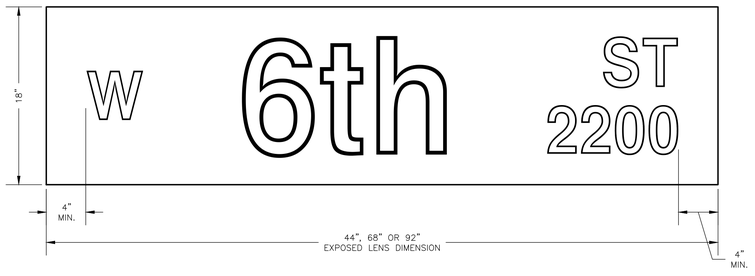
DETECTOR WIRING AND MOUNTING

DAVID P. CRONIN
CITY ENGINEER

CRAIG S. OWENS
CITY MANAGER





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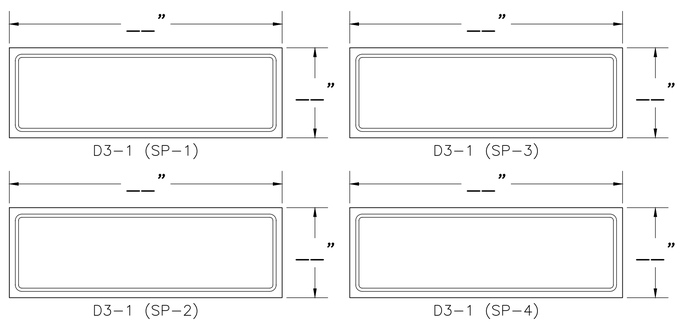
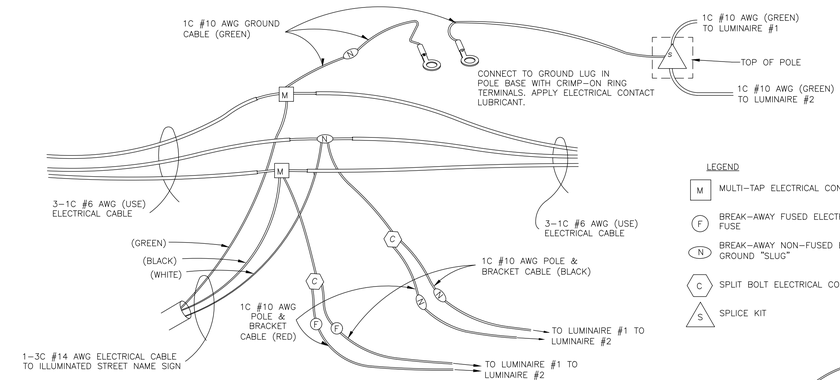
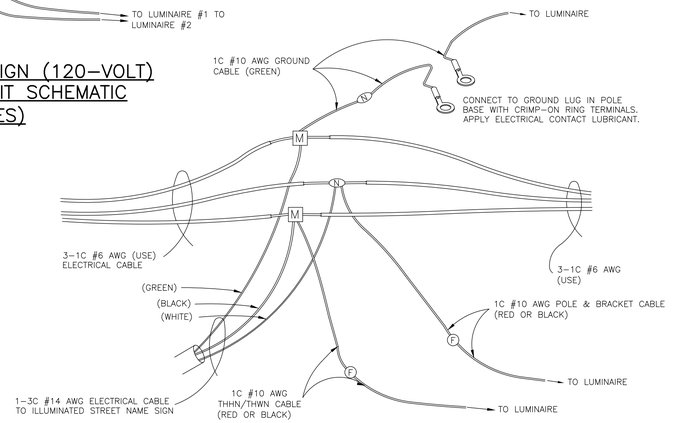


PROJECT SIGN DETAILS
(SHOWN WITH ACTUAL SIGN HOUSING DIMENSIONS)



ILLUMINATED STREET NAME SIGN (120-VOLT)
ELECTRICAL CONNECTOR KIT SCHEMATIC
(TWIN LUMINAIRES)

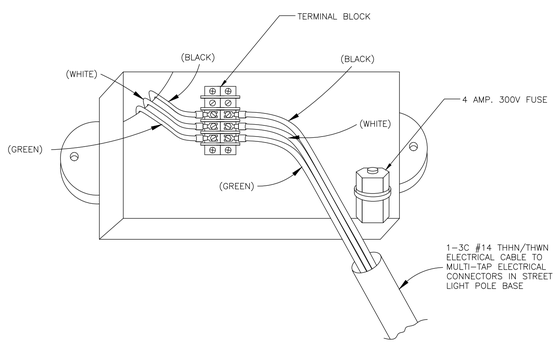
NOTES:
1. SIGNS SHALL BE ONE SIDED.
2. SIGNS SHALL BE RIGID MOUNTED TOP AND BOTTOM WITH ASTRO BRAC.
3. SIGNS SHALL BE MOUNTED WITH THE SIGN CENTERED VERTICALLY ON AND APPROXIMATELY LEVEL WITH THE MAST ARM.
4. SHEETING REQUIREMENTS: TRANSLUCENT MICRO-ENCAPSULATED RETRO-REFLECTIVE SHEETING (TYPE XI) WITH ELECTRO CUTABLE FILM.
   LEGEND AND BORDER: WHITE
   BACKGROUND: GREEN
5. TEXT SERIES: HIGHWAY "D" SIZED AS INDICATED IN THE EXAMPLES.
6. POWER SUPPLY SHALL BE SELF-SENSING 120/240 VOLT.
7. THE CONTRACTOR SHALL SUBMIT A DETAILED SHOP DRAWING INDICATING THE LEGEND AND SIGN SPACING FOR APPROVAL PRIOR TO FABRICATION.
8. RED CABLES SHALL BE CONNECTED TO WEST AND NORTH ORIENTED LUMINAIRES. BLACK CABLES SHALL BE CONNECTED TO EAST AND SOUTH ORIENTED LUMINAIRES.



ILLUMINATED STREET NAME SIGN (120-VOLT)
ELECTRICAL CONNECTOR KIT SCHEMATIC
(SINGLE LUMINAIRE)

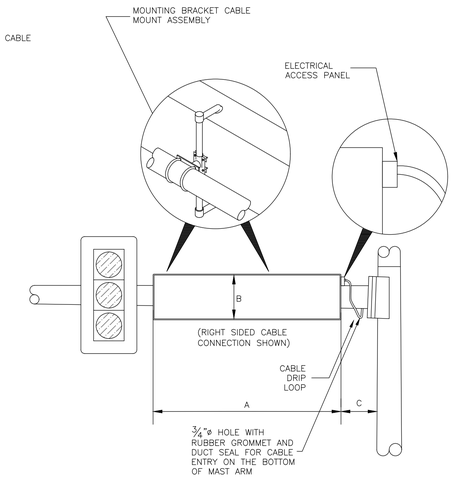
ILLUMINATED STREET NAME SIGN SUMMARY CHART						
POLE #	SIGN DESIGN	A	B	C	CABLE SIDE	
					LEFT	RIGHT
	SP-1					
	SP-2					
	SP-3					
	SP-4					

SIGN HOUSING DIMENSIONS
DIMENSION A IS EITHER 19" OR 24"
DIMENSION B IS EITHER 48", 72", OR 96"



ELECTRICAL ACCESS PANEL IN
ILLUMINATED STREET NAME SIGN

TABLE 1 (ALPHA STREETS)	
STANDARD ABBREVIATION LIST	
AVENUE	AVE
BOULEVARD	BLVD
CIRCLE	CIR
COURT	CT
CREEK	CRK
DRIVE	DR
HIGHWAY	HWY
LANE	LN
PARKWAY	PKWY
PLACE	PL
PLAZA	PLZ
ROAD	RD
STREET	ST
TERRACE	TER
TRAIL	TR
WAY	WAY
TABLE 2 (NUMBERED STREETS)	
STANDARD ABBREVIATION LIST	
FIRST	ST
SECOND	ND
THIRD	RD
FOURTH TO NINTH	TH



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