

**LEGEND**

GSC	GALVANIZED STEEL CONDUIT
PVCC	POLYVINYL CHLORIDE CONDUIT
RECC	REMOVE ELECTRIC CABLE FROM CONDUIT
RRECC	REMOVE AND REINSTALL ELECTRIC CABLE FROM CONDUIT
T & BKFL (SPL)	TRENCH & BACKFILL FOR ELECTRICAL WORK (SPECIAL)
UD-#4	UNIT DUCT, 600V, 2-1C NO.4, 1/C NO.4 GROUND, (XLP-TYPE USE), 1" DIA. POLYETHYLENE
UD-#6	UNIT DUCT, 600V, 2-1C NO.6, 1/C NO.6 GROUND, (XLP-TYPE USE), 1" DIA. POLYETHYLENE
UD-#2	UNIT DUCT, 600V, 2-1C NO.2, 1/C NO.2 GROUND, (XLP-TYPE USE), 1 1/4" DIA. POLYETHYLENE
	EXISTING SIGNAL POST
	EXISTING TRAFFIC SIGNAL MAST ARM
	EXISTING HANDHOLE
	EXISTING DOUBLE HANDHOLE
	EXISTING DETECTOR LOOP
	EXISTING CONTROLLER
	EXISTING UNIT-DUCT, SIZE SPECIFIED
	EXISTING CONDUIT
	EXISTING LIGHTING CONDUIT
	EXISTING STREET NAME SIGN/TRAFFIC SIGN
	EXISTING SERVICE INSTALLATION
	EXISTING LIGHT POLE/FOUNDATION
	PROPOSED SIGNAL HEAD WITH BACKPLATE, MAST ARM MOUNTED
	PROPOSED HANDHOLE
	PROPOSED DOUBLE HANDHOLE
	PROPOSED DETECTOR LOOP
	PROPOSED CONTROLLER
	PROPOSED CONDUIT: "T" TRENCH, "P" PUSH, SIZE SPECIFIED
	PROPOSED PUSHED LIGHTING CONDUIT, SIZE SPECIFIED
	PROPOSED UNIT-DUCT, SIZE SPECIFIED
	PROPOSED STREET NAME SIGN/TRAFFIC SIGN
	PROPOSED SERVICE INSTALLATION
	PROPOSED SIGNAL POST
	RELOCATED LIGHT POLE W/ PROPOSED FOUNDATION
	CABLE SPLICE (SEE GENERAL NOTES)

**TRAFFIC SIGNAL GENERAL NOTES**

- ALL VEHICLE AND PEDESTRIAN SIGNAL HEADS SHALL HAVE 12" SECTIONS. MOUNTING HARDWARE SHALL BE UNPAINTED ALUMINUM. ALL BOLTS, SCREWS, NUTS AND WASHERS SHALL BE STAINLESS STEEL. ANTI-SEIZE PASTE COMPOUND SHALL BE USED ON ALL MOUNTING HARDWARE FIELD CONNECTIONS.
- BACKPLATES SHALL BE ABS PLASTIC.
- THE CONTROLLER CABINET SHALL BE UNPAINTED ALUMINUM.
- THE LOCATION OF MAST ARM SUPPORTS SHALL BE APPROVED BY THE ENGINEER BEFORE FOUNDATIONS ARE CONSTRUCTED. MAST ARM POLES SHALL BE LOCATED A MINIMUM OF 10 FEET FROM THE EDGE OF PAVEMENT OR 2 FEET FROM THE EDGE OF SHOULDER, WHICHEVER DISTANCE IS GREATER. IN CURBED SECTIONS, THE MAST ARM POLES SHALL BE LOCATED A MINIMUM OF 10 FEET FROM THE EDGE OF PAVEMENT OR 2 FEET FROM THE EDGE OF SHOULDER, WHICHEVER DISTANCE IS GREATER. IN CURBED SECTIONS, THE MAST ARM POLES SHALL BE LOCATED A MINIMUM OF 5 FEET FROM THE FACE OF THE CURB. THESE DISTANCES ARE TO THE NEAR FACE OF THE MAST ARM POLE.
- ALL TRAFFIC SIGNAL CABLES SHALL BE #14 AWG STRANDED COPPER UNLESS OTHERWISE SPECIFIED. TERMINAL ENDS SHALL HAVE CRIMPED-ON RING TONGUE CONNECTORS.
- THE LOCATION OF ALL DETECTOR LOOPS SHALL BE APPROVED BY THE ENGINEER BEFORE ANY SLOTS ARE SAWS IN THE PAVEMENT.
- DETECTOR LOOP LEAD-IN SPLICES SHALL BE MADE IN A HANDHOLE PER SECTION 873 OF THE STANDARD SPECIFICATIONS. CONDUCTORS SHALL BE SPLICED IN A RIGID MOLD FILLED WITH NON-HARDENING EPOXY FILLER. ROSIN-CORE SOLDER SHALL BE USED.
- CALL CARRY-OVER SHALL FUNCTION ONLY WHEN THE RELATED PHASES ARE IN THE GREEN MODE.
- ALL INDUCTIVE LOOP DETECTORS SUPPLIED FOR THIS PROJECT SHALL HAVE THE CAPACITY OF OPERATING WITH BOTH DELAY AND EXTENSION MODES ACTIVE, IF A TIME SETTING IS PROGRAMMED. THEY SHALL BE RACK MOUNTED.
- ALL HANDHOLES SHALL BE CAST-IN-PLACE PORTLAND CEMENT CONCRETE (PER ARTICLE 814.03(c)). THE CAST IN PLACE LEGEND IN THE COVER SHALL BE "TRAFFIC SIGNALS". SLOPE HANDHOLE COVERS TO MATCH PROPOSED GRADE ELEVATIONS.
- LOCATE UNDERGROUND CABLES PRIOR TO ATTEMPTING TO CONSTRUCT THIS PROJECT.
- ESTIMATED DEPTHS OF THE CONCRETE FOUNDATIONS FOR THE MAST ARM SUPPORT POLES ARE AS FOLLOWS:  
-EASTPARK PLAZA DRIVE/FOURNIE LANE  
N-E CORNER: 13'-0" DEEP W/ 36" DIA.  
N-W CORNER: 13'-0" DEEP W/ 36" DIA.  
0.75 TSF MUST BE VERIFIED PRIOR TO CONSTRUCTION FOR:  
S-E CORNER: 15'-0" DEEP W/ 36" DIA.  
S-W CORNER: 23'-0" DEEP W/ 36" DIA.
- ABANDON UNUSED EXISTING CONDUITS AND CABLES IN PLACE.
- THE CONTRACTOR SHALL FABRICATE, DELIVER AND INSTALL STREET NAME SIGNS AT THE SPECIFIED LOCATIONS. THE SIGNS AND INSTALLATION SHALL CONFORM TO SECTION 720 OF THE STANDARD SPECIFICATIONS AND STANDARDS 720001 AND 720016.
- A 1/4" NYLON PULL ROPE SHALL BE INSTALL IN ALL CONDUIT RUNS. THE COST OF THIS ROPE SHALL BE INCLUDED IN THE PROPOSED UNIT PRICE OF CABLE INSTALLATION/RE-INSTALLATION ASSOCIATED WITH THAT CONDUIT.

**LIGHTING GENERAL NOTES**

- DUE TO THE PROPOSED HORSESHOE LAKE ROAD REVISIONS, INSTALL UNIT DUCT AND CONDUIT BETWEEN LIGHT POLES X10 AND D1, AND LIGHT POLES D1 AND X12, AND X10 AND X12, AS SHOWN ON THE PLANS.
- SPLICING OF CONDUCTORS SHALL BE IN POLE BASES, ONLY. SPLICES BELOW GRADES WILL NOT BE PERMITTED.
- BREAKAWAY DEVICES SHALL BE INSTALLED FOR PLUMBING THE POLES. ALL POLES SHALL BE ERECTED PLUMB.
- TO INSURE EVEN DISTRIBUTION OF STRESSES ON BREAKAWAY COUPLINGS, ANCHOR NUTS SHALL NOT BE TIGHTENED UNTIL THE BREAKAWAY COUPLINGS ARE EVENLY AND FIRMLY TIGHTENED AGAINST THE BOTTOM OF THE POLE BASE PLATE.
- UNLESS LOCATED ON STRUCTURES, BEHIND GUARDRAIL, BARRIERS CURBS, OR OTHERWISE PROTECTED FROM COLLISION, LIGHT POLES SHALL HAVE BREAKAWAY DEVICES.
- THE COST OF NUTS AND WASHERS REQUIRED FOR MOUNTING LIGHT POLES ON NEW FOUNDATIONS SHALL BE INCLUDED IN THE UNIT PRICE FOR "RELOCATE EXISTING LIGHTING UNIT".
- A SURGE PROTECTOR SHALL BE INSTALLED IN THE PROPOSED LIGHT POLE, AS SHOWN ON THE PLANS. THE LIGHT POLE UNIT PRICE SHALL INCLUDE THIS ITEM AND WORK.
- THE OFFSET DISTANCE FOR THE LIGHT POLES SHALL BE THE DISTANCE FROM THE EDGE OF PAVEMENT TO THE CENTER OF THE POLE FOUNDATION.
- ALL LIGHT POLE FOUNDATIONS SHALL BE CONCRETE.
- TRENCHED CABLES SHALL RUN IN A STRAIGHT LINE BETWEEN TERMINAL POINTS WHERE FEASIBLE, OR UNLESS SHOWN ON THE PLANS. TO PREVENT EROSION OF THE EMBANKMENTS INVOLVING HIGH FILLS AND STEEP SIDE SLOPES, THE CONTRACTOR SHALL NOT TRENCH DIRECTLY FROM POLE TO POLE. RATHER THE TRENCH SHALL EXTEND FROM THE POLE STRAIGHT DOWN THE SIDE SLOPE, RUN ALONG THE TOE OF THE SLOPE, AND THEN STRAIGHT UP THE SIDE SLOPE TO THE NEXT POLE. THE CONTRACTOR MAY BE DIRECTED BY THE ENGINEER TO USE THIS PROCEDURE AT ADDITIONAL LOCATIONS, IF FIELD CONDITIONS WARRANT SUCH TREATMENT.
- ALL CONDUIT TO BE TRENCHED UNDER PROPOSED PAVEMENT SHALL BE INSTALLED AT A MINIMUM DEPTH OF 42" TO AVOID CONFLICTS WITH UNDERGROUND APPURTENANCES. UNIT DUCT SHALL BE PLACED A MINIMUM DEPTH OF 30" BELOW THE FLOWLINE OF ROADSIDE DRAINAGE DITCHES AND MINIMUM DEPTH OF 24" BELOW THE FINAL ELEVATION OF OTHER LOCATIONS.
- PROPOSED LUMINAIRES SHALL BE 480 VOLTS.
- THE LIGHT POLE LUMINAIRES SHALL BE FACTORY COATED DARK BRONZE TO MATCH THEIR ASSOCIATED POLE.
- LIGHT POLE SHAFTS, TRANSFORMER BASE AND ALL MOUNTING HARDWARE SHALL HAVE A DARK BRONZE POWDER COAT.
- THE REMOVED LIGHT POLE SHALL REMAIN DEPARTMENT PROPERTY.

**DETECTOR LOOP REQUIREMENTS AND CALCULATIONS FOR HORSESHOE LAKE ROAD AND I-255 RAMPS 3 AND 4**

LOOP	PHASE (Ø)	LOOP SIZE(FT)	REQUIRED # OF TURNS	CALCULATED INDUCTANCE MICROHENRIES (µH)	CALCULATED RESISTANCE OHMS (Ω)
1. EB-CCO-A	6	6 X 6	7	526.3	4.1
2. EB-CCO-B	6	6 X 6	7	526.2	4.0
3. EB-LT-CD	1	6 X 50 0	3-6-3	825.3	2.7
4. EB-THRU-CD	6	6 X 50 0	3-6-3	833.1	2.7
5. WB-CCO	2	6 X 6	7	431.8	1.9
6. WB-CCO	2	6 X 6	7	429.0	1.9
7. WB-THRU-CD	2	6 X 50 0	3-6-3	802.5	1.6
8. WB-RT-CD	2	6 X 50 0	3-6-3	795.0	1.8
9. SB-CCO-A	6	6 X 6	7	460.8	2.8
10. SB-CCO-B	6	6 X 6	7	460.8	2.8
11. SB-LT-CD	6	6 X 50 0	3-6-3	810.5	2.8
12. SB-RT-CD	6	6 X 50 0	3-6-3	831.5	2.8

THE ABOVE VALUES ARE CALCULATED OF COMBINED LOOP AND LEAD-IN INDUCTANCE AND RESISTANCE. ACTUAL MEASURED VALUES SHOULD BE WITHIN +/- 20% OF THESE VALUES.

**DETECTOR LOOP REQUIREMENTS AND CALCULATIONS FOR HORSESHOE LAKE ROAD AND EASTPORT PLAZA DRIVE/FOURNIE LANE**

LOOP	PHASE (Ø)	LOOP SIZE(FT)	REQUIRED # OF TURNS	CALCULATED INDUCTANCE MICROHENRIES (µH)	CALCULATED RESISTANCE OHMS (Ω)
1. EB-CCO-A	6	6 X 6	7	485.9	3.1
2. EB-CCO-B	6	6 X 6	7	483.1	3.1
3. EB-CCO-C	6	6 X 6	7	480.0	3.0
4. EB-LT-CD	1	6 X 50 0	3-6-3	825.6	2.5
5. EB-THRU-CD	6	6 X 50 0	3-6-3	822.5	2.4
6. EB-RT-CD	6	6 X 50 0	3-6-3	825.8	2.5
7. NB-LT-CD	4	6 X 50 0	3-6-3	858.8	3.2
8. NB-THRU-CD	4	6 X 50 0	3-6-3	855.3	3.2
9. NB-RT-CD	4	6 X 50 0	3-6-3	854.4	3.1
10. WB-CCO	2	6 X 6	7	487.3	3.2
11. WB-LT-CD	5	6 X 50 0	3-6-3	826.3	2.5
12. WB-THRU-CD	2	6 X 50 0	3-6-3	823.8	2.5
13. SB-THRU-CD	2	6 X 50 0	3-6-3	798.0	1.9
14. SB-RT-CD	2	6 X 50 0	3-6-3	421.8	1.1

THE ABOVE VALUES ARE CALCULATED OF COMBINED LOOP AND LEAD-IN INDUCTANCE AND RESISTANCE. ACTUAL MEASURED VALUES SHOULD BE WITHIN +/- 20% OF THESE VALUES.