

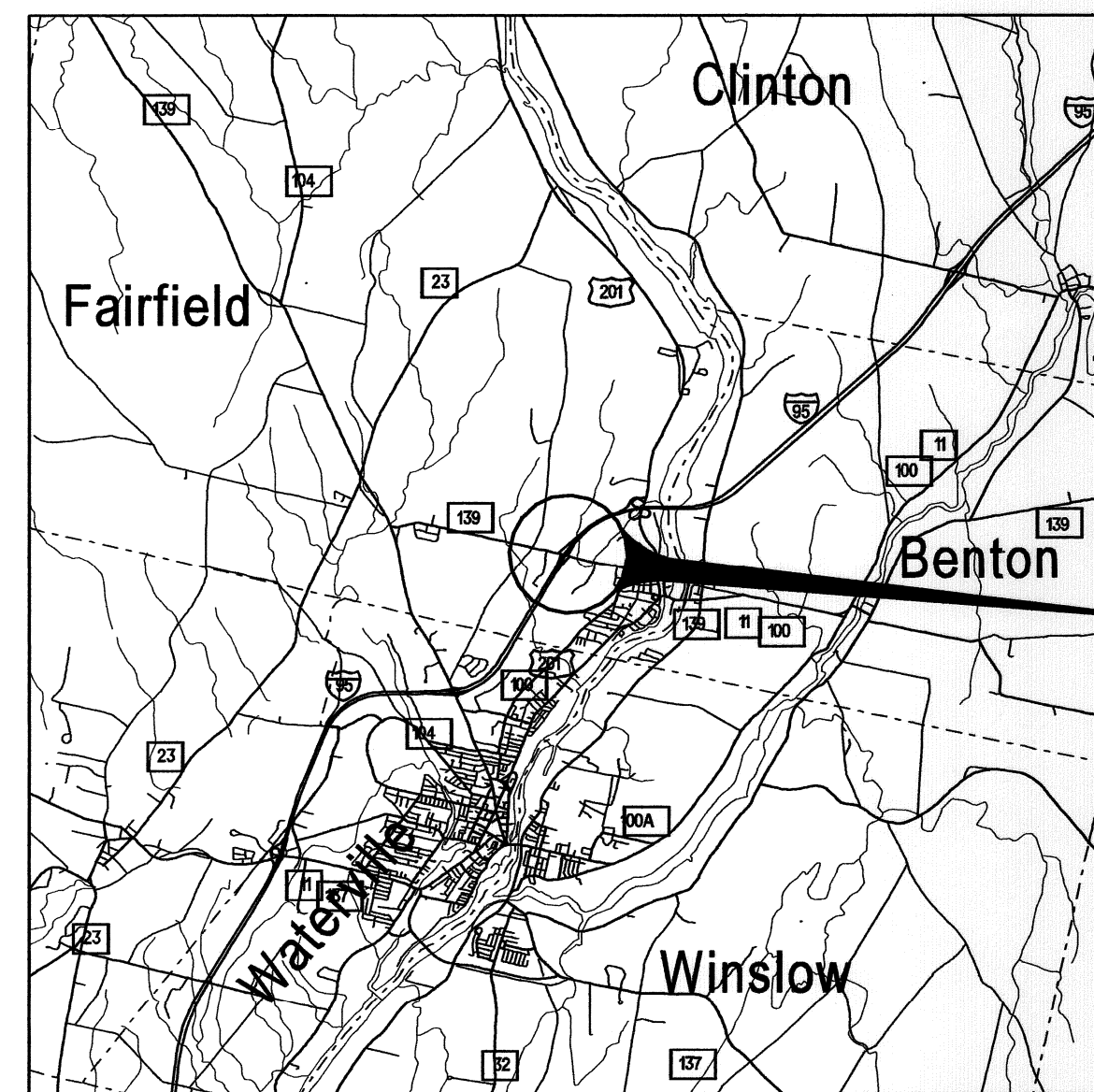
STATE OF MAINE  
DEPARTMENT OF TRANSPORTATION



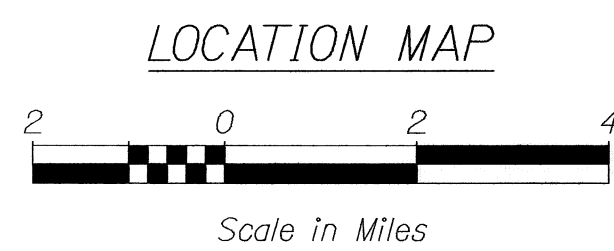
**FAIRFIELD**  
**SOMERSET COUNTY**  
**I - 95 at EXIT 132**  
**IM - 1778(200)E**  
**Highway Lighting**

INDEX OF SHEETS

Description	Sheet No.
Title Sheet	1
Plans and Details	2 - 4



Project Area  
Fairfield  
EXIT 132  
IM - 1778(200)E

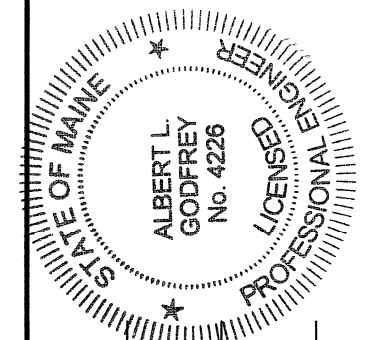


IM - 1778(200)E WIN 17782.00

FAIRFIELD  
I - 95 at EXIT 132  
TITLE SHEET

PROGRAM AREA: TRAFFIC ENGINEERING  
SCOPE OF WORK: HIGHWAY LIGHTING  
LIGHT POLES  
FOUNDATIONS  
LUMINAIRES  
CONDUIT

SHEET NUMBER  
**1**  
OF 4



SIGNATURE: *Albert L. Godfrey*  
4226  
P.E. NUMBER  
DATE: SEPTEMBER 20, 2012

PROJECT INFORMATION	
PROGRAM	TRAFFIC
PROJECT MANAGER	B. KEEZER
DESIGNER	AL GODFREY R. LETTENEY
CONSULTANT	TERRA MAGNA SERVICES, INC
PROJECT RESIDENT	
CONTRACTOR	
PROJECT COMPLETION DATE	

STATE OF MAINE  
DEPARTMENT OF TRANSPORTATION  
APPROVED: *[Signature]*  
COMMISSIONER: *[Signature]*  
DATE: 9/25/12  
CHIEF ENGINEER: *[Signature]*

**GENERAL NOTES - HIGHWAY LIGHTING**

- SCOPE OF WORK - INSTALL HIGHWAY LIGHTING AS SHOWN ON THIS PLAN. INSTALL NEW ELECTRIC SERVICE PANEL, CONDUIT, WIRING, FOUNDATIONS, POLES, DETECTORS, LIGHTING CONTROLLER AND CABINET, L.E.D. LUMINAIRES AND RELATED HARDWARE AND SOFTWARE. REMOVE EXISTING LIGHTING AS NOTED.
- EXISTING INTERCHANGE LIGHTING SHALL REMAIN ACTIVE UNTIL THE NEW LIGHTING SYSTEM IS APPROVED BY MAINE DOT TO BE ACTIVATED.
- EXISTING LIGHT POLES AND LUMINAIRES SHALL BE CAREFULLY REMOVED AND DELIVERED TO MAINE DOT AFTER ACTIVATION OF THE NEW SYSTEM. EXISTING FOUNDATIONS AND LIGHTING CONTROL CABINET SHALL BE REMOVED AS DIRECTED. ABANDON EXISTING CONDUIT.
- ALL MATERIALS AND WORKMANSHIP SHALL CONFORM TO APPLICABLE PROVISIONS OF THE MAINE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS AND STANDARD DETAILS, NATIONAL ELECTRICAL CODE AND ANY REQUIREMENTS OF CENTRAL MAINE POWER COMPANY.
- THE CONTRACTOR SHALL FIELD VERIFY POLE LOCATIONS TO AVOID NATURAL AND BUILT SITE FEATURES THAT WOULD CONFLICT WITH PROPER INSTALLATION OF POLE FOUNDATIONS.
- THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO BIDDING TO ENSURE AWARENESS OF SITE CONDITIONS THAT COULD AFFECT THE BID.
- STATIONING SHOWN FOR LIGHTING RELATED ITEMS IS APPROXIMATE AND MAY BE ADJUSTED BY THE RESIDENT IN THE FIELD. BASELINE STATIONING IS FROM PROJECTS I-95-6(21), I-95-6(31), I-95-6(58), S-0232(2), AND S-0232(6).
- ALL LIGHTING CIRCUITS ARE TO BE TRAFFIC AND PHOTOCELL ACTIVATED. TRAFFIC DETECTORS AND LUMINAIRES SHALL BE WIRED TO A CONTROLLER PROGRAMMED TO TURN ON INDIVIDUAL LIGHTING GROUP CIRCUITS WHEN ACTIVATED BY THEIR ASSOCIATED TRAFFIC DETECTORS, TO SET INITIAL DURATIONS FOR ACTIVATED LIGHTING GROUPS TO REMAIN ON, TO EXTEND LIGHTING DURATION WHEN ADDITIONAL TRAFFIC IS DETECTED WHILE THE LIGHTING GROUP IS ON, AND TO TURN OFF THE LIGHTING GROUP WHEN THE INITIAL DURATION AND ANY RELATED EXTENSIONS TIME OUT WITHOUT FURTHER TRAFFIC ACTIVATION. THE CONTROLLER SHALL BE PROGRAMMED TO TURN ON LIGHTING GROUPS ONLY WHEN ACTIVATED ALSO BY PHOTOCELL. LIGHTING CIRCUITS SHALL REST IN "OFF" POSITION UNTIL TURNED ON BY BOTH PHOTOCELL AND TRAFFIC DETECTION.
- ILLUMINATION DURATIONS STATED ON THE PLANS ARE PRELIMINARY. BEFORE FINAL ACCEPTANCE, ILLUMINATION ACTIVATION SHALL BE OBSERVED UNDER ACTUAL NIGHT TRAFFIC CONDITIONS. DURATION SETTINGS IN THE CONTROLLER SHALL BE MODIFIED IF DIRECTED BY THE RESIDENT AFTER OBSERVATION OF FIELD OPERATIONS.

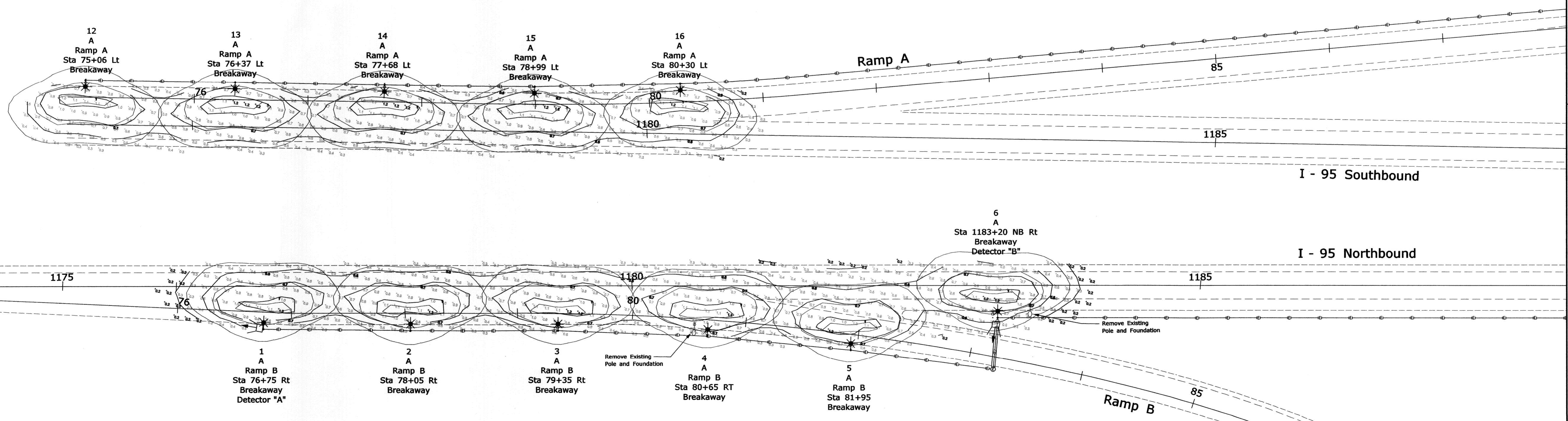
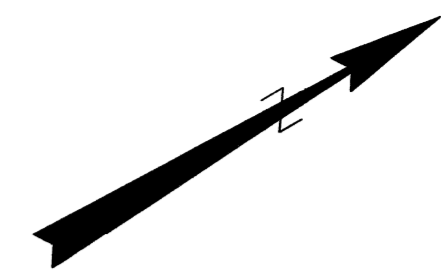
**GENERAL NOTES - Continued**

- ADVANCE RADAR DETECTORS NOTED ON THE PLANS FOR INSTALLATION FOR INTERSTATE 95 TRAFFIC SHALL BE WAVETRONIX "SMARTSENSOR ADVANCE-EXTENDED RANGE" DIGITAL WAVE RADAR, OR APPROVED EQUAL EXTENDED RANGE ADVANCE DETECTION RADAR MODEL.
- ADVANCE RADAR DETECTORS NOTED ON THE PLANS FOR ROUTE 139 TRAFFIC SHALL BE WAVETRONIX "SMARTSENSOR ADVANCE" DIGITAL WAVE RADAR, OR APPROVED EQUAL ADVANCE DETECTION RADAR MODEL.
- RAMP PASSAGE DETECTORS SHALL BE WAVETRONIX "SMARTSENSOR V" DIGITAL WAVE RADAR, OR APPROVED EQUAL SIDE-FIRE RADAR MODEL.
- RADAR DETECTORS AND CONTROLLER SHALL BE CAPABLE OF COLLECTING AND STORING TRAFFIC VOLUME, SPEED AND CLASSIFICATION DATA IN ADDITION TO PROVIDING DETECTION FOR LIGHTING ACTIVATION.
- CONTRACTOR SHALL PROVIDE SURGE PROTECTION IN THE CONTROLLER CABINET FOR THE DETECTOR SYSTEM AS RECOMMENDED BY THE DETECTOR MANUFACTURER.
- ALL DETECTORS MUST BE INDIVIDUALLY GROUNDED.
- LIGHTING FIXTURE VOLTAGE SHALL BE 480 VOLTS.
- LIGHTING FIXTURES SHALL BE IES FULL CUTOFF, INDIRECT VIEW LIGHT EMITTING DIODE (LED) FIXTURES, IES DISTRIBUTION TYPE 3.
- INSTALL LIGHTING FIXTURES ON 40-FOOT POLES WITH A MINIMAL LENGTH HORIZONTAL 2" DIAMETER PIPE TENON. POLES MAY BE EITHER ALUMINUM OR GALVANIZED STEEL.
- ALL FIXTURES SHALL BE GASKETED, HAVE AN EXTENDED LIFE DRIVER, SURGE PROTECTION, A DOUBLE FUSE KIT, 480V TWIST-OFF PHOTO CONTROL, AND A NEMA TWIST OFF PHOTO CONTROL RECEPTACLE. ALL FIXTURES SHALL BE GRAY. THE LIGHTING LAYOUT WAS DONE USING HOLOPHANE LEDGEND LED ROADWAY LIGHTING LUMINAIRES, CATALOG NUMBERS:  
LEDG 120 35 6K AH G L3 EL P48 R F2; 22 - TYPE 3 FIXTURES  
LEDG 084 35 6K AH G L3 EL P48 R F2; 11 - TYPE 3 FIXTURES

IF DIFFERENT FIXTURES ARE PROPOSED, THEY SHALL BE IES FULL CUTOFF, TYPE 3 IES DISTRIBUTION, INDIRECT VIEW LED LUMINAIRES. THE CONTRACTOR MUST DEMONSTRATE THAT THE PROPOSED FIXTURES WILL REASONABLY EQUAL THE LIGHT LEVELS AND DISTRIBUTIONS SHOWN ON THE PLANS, IN THE OPINION OF MAINE DOT.

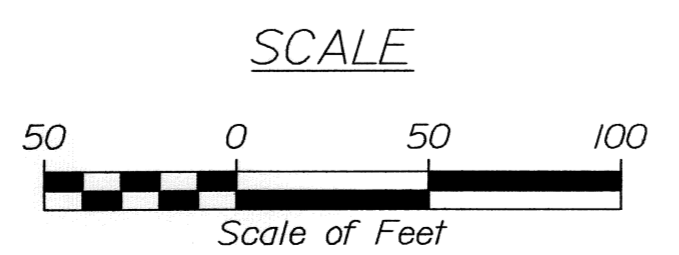
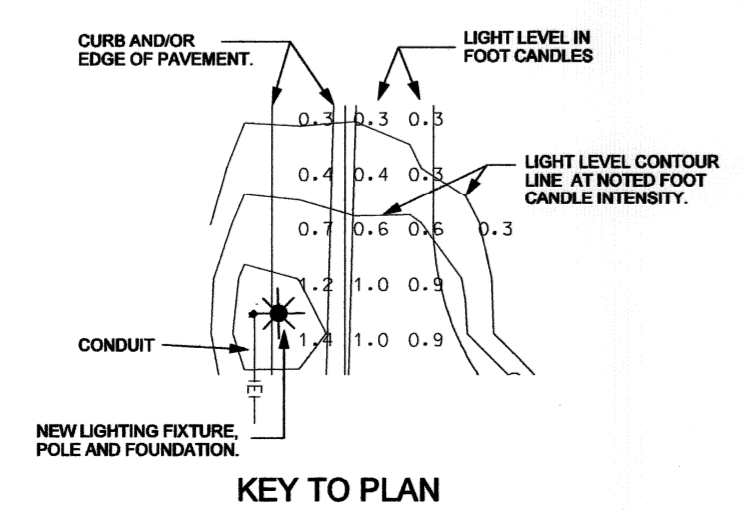
**GENERAL NOTES - Continued**

- EVALUATION BY MAINE DOT OF ALTERNATIVE LED LUMINAIRES THAT MAY BE PROPOSED BY THE CONTRACTOR FOR SUBSTITUTION WILL REQUIRE SUBMITTAL OF THE FOLLOWING, AT MINIMUM: IES LM-79-08 ABSOLUTE TESTING REPORT FOR THE PROPOSED ALTERNATIVE LUMINAIRE; IES LM-80-08 TESTING REPORT FOR LED CHIPS TO BE USED IN THE ALTERNATIVE LUMINAIRE, DOCUMENTING TESTING FOR A MINIMUM OF 8500 HOURS; IES TM-21-11 REPORT FOR PROJECTED LONG TERM LUMEN MAINTENANCE, INCLUDING INCREMENTAL LUMEN DEPRECIATION TABLE AT 25 DEGREES CELSIUS TO A MINIMUM OF 50,000 HOURS; IES PHOTOMETRIC FILE FROM THE MANUFACTURER FOR THE PROPOSED ALTERNATIVE LUMINAIRE; PHOTOMETRIC PLOT, OVERLAID ON THE LAYOUT OF THE LUMINAIRE LOCATIONS FOR THIS SPECIFIC PROJECT, SHOWING LIGHT CONTOURS, ILLUMINATION STATISTICS FOR EACH OF THE LIGHTING GROUPS, AND VALUE OF LIGHT LOSS FACTOR USED IN THE ANALYSIS; VALUES OF LLD, LDD, BALLAST FACTOR AND OTHER FACTORS USED FOR CALCULATION OF THE ASSUMED LIGHT LOSS FACTOR; SPECIFICATION DATA REGARDING OPTICS, CHROMATIC COLOR TEMPERATURE, DRIVER, PHOTOCONTROL, SURGE PROTECTION, HOUSING AND GASKETING.
- CONDUIT SHALL BE 2" MINIMUM, PVC SCHEDULE 40. CONDUIT UNDER PAVEMENT SHALL BE SCHEDULE 80. MINIMUM BURIAL DEPTH FOR CONDUIT SHALL BE 36".
- THERE SHALL BE NO SPLICES OR JUNCTION BOXES BETWEEN POLES EXCEPT AS SHOWN. INSTALL JUNCTION BOXES (PULL BOXES) ONLY AS NECESSARY IN LONG CONDUIT RUNS. WIRE IN THE CONDUIT SHALL BE CONTINUOUS BETWEEN POLES.
- UPON COMPLETION OF THIS PROJECT, THE CONTRACTOR SHALL FURNISH TO MAINE DOT A SET OF AS-BUILT PLANS FOR FUTURE REFERENCE AND SYSTEM MAINTENANCE.
- IF STRUCTURAL ROCK IS ENCOUNTERED DURING INSTALLATION OF FOUNDATIONS, PAYMENT FOR EXCAVATION AND DOWELING REINFORCING INTO ROCK SHALL BE CONSIDERED INCIDENTAL TO FOUNDATION ITEMS.
- BREAKAWAY DEVICES FOR LIGHT POLES SHALL CONFORM TO THE LATEST VERSION OF "AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS" AND NCHRP REPORT 350. THE BREAKAWAY DEVICE SHALL BE DESIGNED SO THAT THE ANCHOR BOLTS WILL NOT BEND WHEN A VEHICLE HITS THE POLE. A FRANGIBLE COUPLING SUCH AS TRANSPO POLE-SAFE 5000 SERIES (WITH A FEMALE ANCHOR), THE MANITOBA SAFETY BASE WITH REACTION PLATE, OR APPROVED EQUAL SHALL BE USED. BREAKAWAY DEVICES SHALL BE INSTALLED ON ALL POLES EXCEPT THOSE LOCATED MORE THAN 4' BEHIND GUARDRAIL.
- PAYMENT UNDER ITEM 634.16, HIGHWAY LIGHTING, WILL INCLUDE ALL MATERIALS, LABOR AND EQUIPMENT NECESSARY TO PROVIDE A FULLY FUNCTIONING HIGHWAY LIGHTING SYSTEM, EXCEPT THOSE ITEMS TO BE PAID UNDER OTHER RELATED BID ITEMS IN THE CONTRACT.
- ALL LIGHT BASES SHALL HAVE A GROUND ROD, LOCATED IN THE FOUNDATION, THAT IS BONDED TO THE GROUNDING CONDUCTOR. PAYMENT FOR THE GROUND ROD SHALL BE INCLUDED IN ITEM 634.16, HIGHWAY LIGHTING.
- PAYMENT UNDER ITEM 634.21, CONVENTIONAL LIGHT STANDARD, WILL INCLUDE BUT NOT BE LIMITED TO NEW POLES, TRANSFORMER BASES AND BREAKAWAY DEVICES.
- INSTALL SERVICE POLE AS SHOWN IN THE STANDARD DETAILS. THE CONTRACTOR SHALL INSTALL A NEMA 3R METER DISCONNECT ENCLOSURE BETWEEN THE METER AND LIGHTING CONTROL CABINET (EXTERNAL FROM CABINET).



**LEGEND for LIGHTING**

- Light Fixture on a 40 Foot Pole and Foundation
- Lighting Conduit
- Junction Box
- Existing Light Pole
- Under Pavement Duct
- SmartSensor Vehicle Detector



STATE OF MAINE  
DEPARTMENT OF TRANSPORTATION

IM - 1778(200)E

WIN  
17782.00

HIGHWAY PLANS

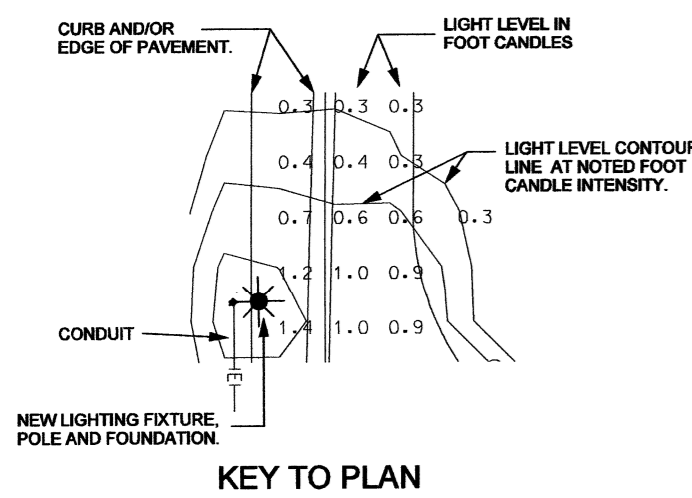
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DESIGN-DETAILED	ALG	Sept. 2012	 ALBERT L. GODFREY No. 4226 SEPTEMBER 20, 2012
CHECKED-REVIEWED	ALG	Sept. 2012	
DESIGN-REVIEWED	ALG	Sept. 2012	
DESIGN-DETAILED	ALG	Sept. 2012	
REVISIONS 1			P.E. NUMBER
REVISIONS 2			4226
REVISIONS 3			DATE
REVISIONS 4			SEPTEMBER 20, 2012
FIELD CHANGES			

FAIRFIELD  
I - 95 at EXIT 132

LIGHTING PLANS

SHEET NUMBER  
**2**

OF 4

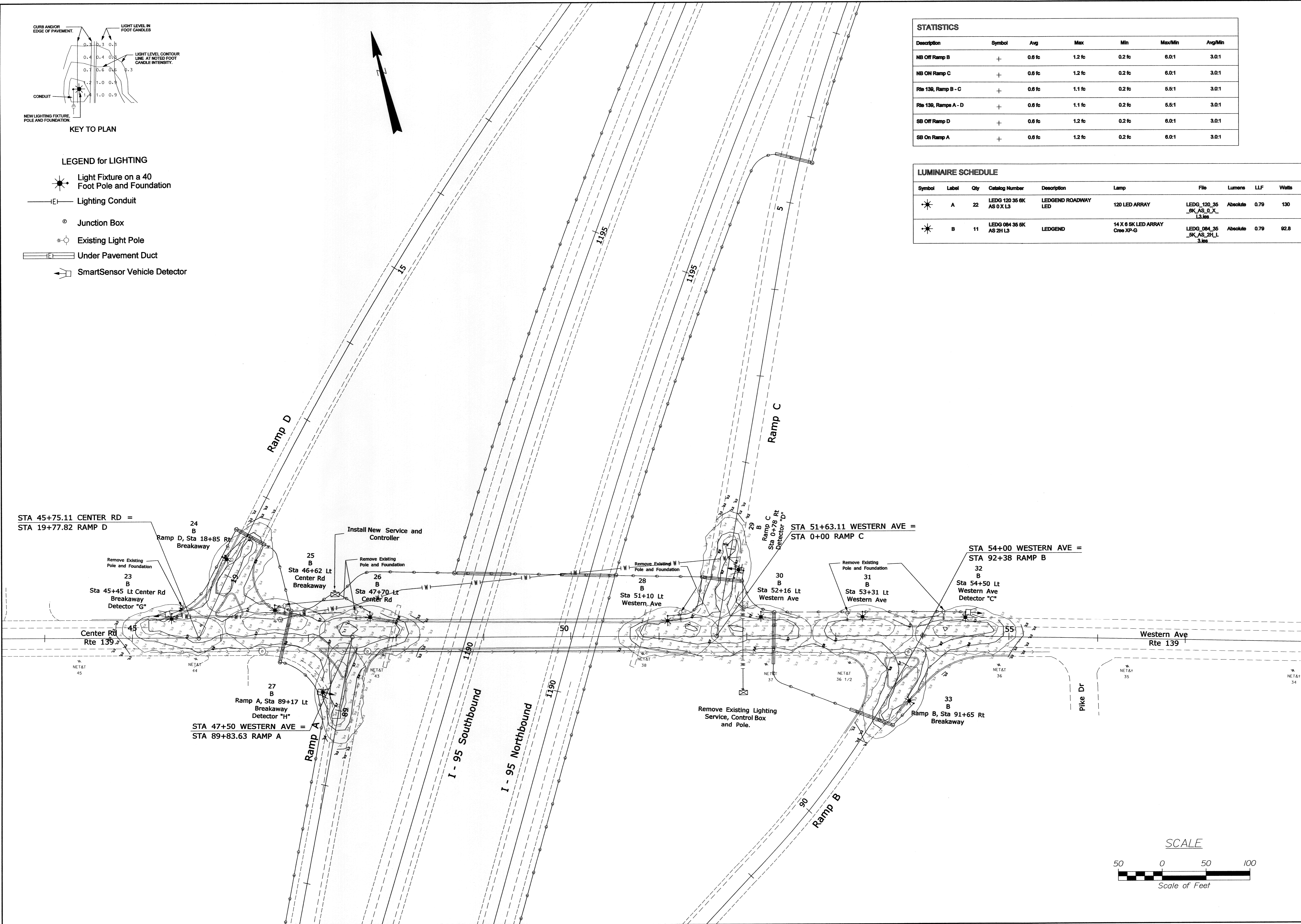


LEGEND for LIGHTING

- Light Fixture on a 40 Foot Pole and Foundation
- Lighting Conduit
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- Existing Light Pole
- Under Pavement Duct
- SmartSensor Vehicle Detector

STATISTICS						
Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
NB Off Ramp B	+	0.6 fc	1.2 fc	0.2 fc	6.0:1	3.0:1
NB ON Ramp C	+	0.6 fc	1.2 fc	0.2 fc	6.0:1	3.0:1
Rte 139, Ramp B - C	+	0.6 fc	1.1 fc	0.2 fc	5.5:1	3.0:1
Rte 139, Ramps A - D	+	0.6 fc	1.1 fc	0.2 fc	5.5:1	3.0:1
SB Off Ramp D	+	0.6 fc	1.2 fc	0.2 fc	6.0:1	3.0:1
SB On Ramp A	+	0.6 fc	1.2 fc	0.2 fc	6.0:1	3.0:1

LUMINAIRE SCHEDULE									
Symbol	Label	Qty	Catalog Number	Description	Lamp	File	Lumens	LLF	Watts
	A	22	LEDG 120 35 BK AS 0 X L3	LEDGEND ROADWAY LED	120 LED ARRAY	LEDG_120_35_BK_AS_0_X_L3.lvs	Absolute	0.79	130
	B	11	LEDG 084 35 BK AS 2H L3	LEDGEND	14 X 6 BK LED ARRAY Cree XE-G	LEDG_084_35_BK_AS_2H_L3.lvs	Absolute	0.79	92.8



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WIN 17782.00  
HIGHWAY PLANS

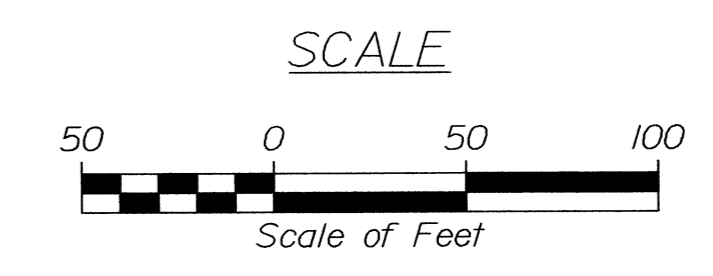
STATE OF MAINE  
ALBERT L. GODFREY  
No. 4226  
LICENSED PROFESSIONAL ENGINEER

SIGNATURE  
4226  
P.E. NUMBER  
SEPTEMBER 20, 2012  
DATE

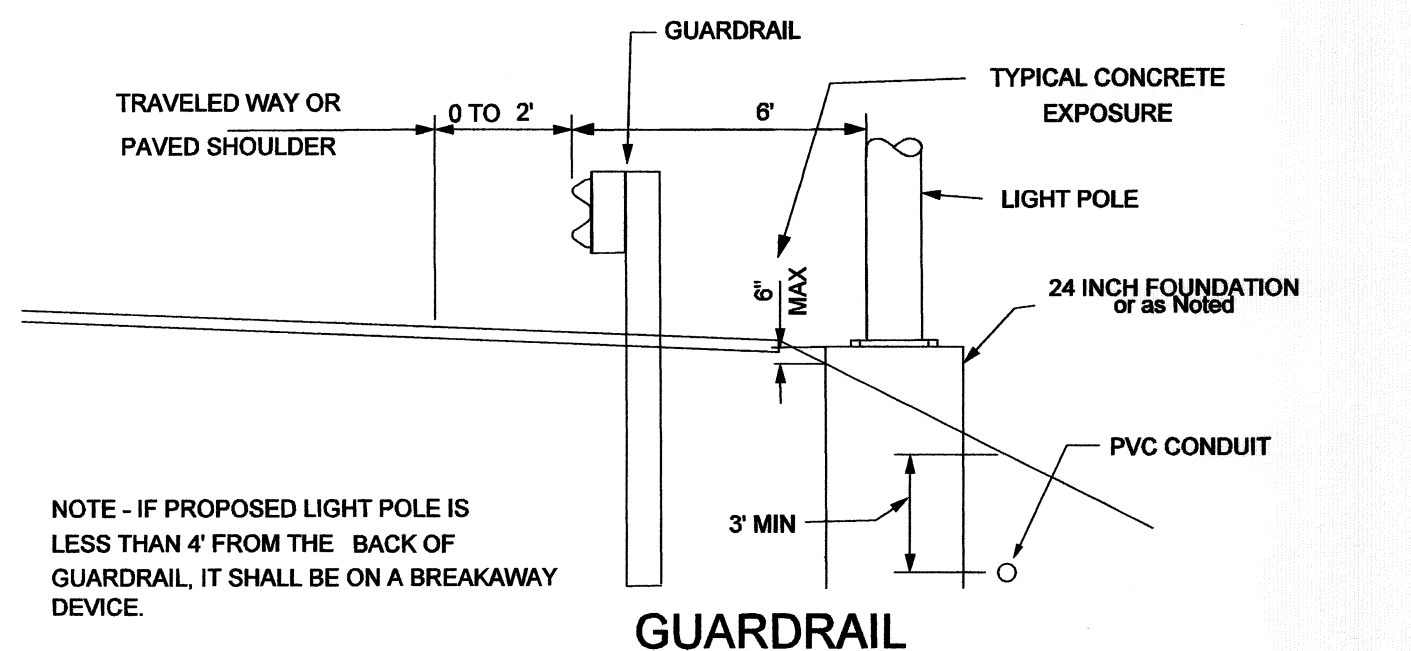
PROJ. MANAGER	DATE	BY
B. KEZZER	Sept. 2012	RAL
DESIGN-DETAILED	Sept. 2012	ALC
CHECKED-REVIEWED		ALC
DESIGN-DETAILED		
REVISIONS 1		
REVISIONS 2		
REVISIONS 3		
REVISIONS 4		
FIELD CHANGES		

FAIRFIELD  
I - 95 at EXIT 132  
LIGHTING PLANS

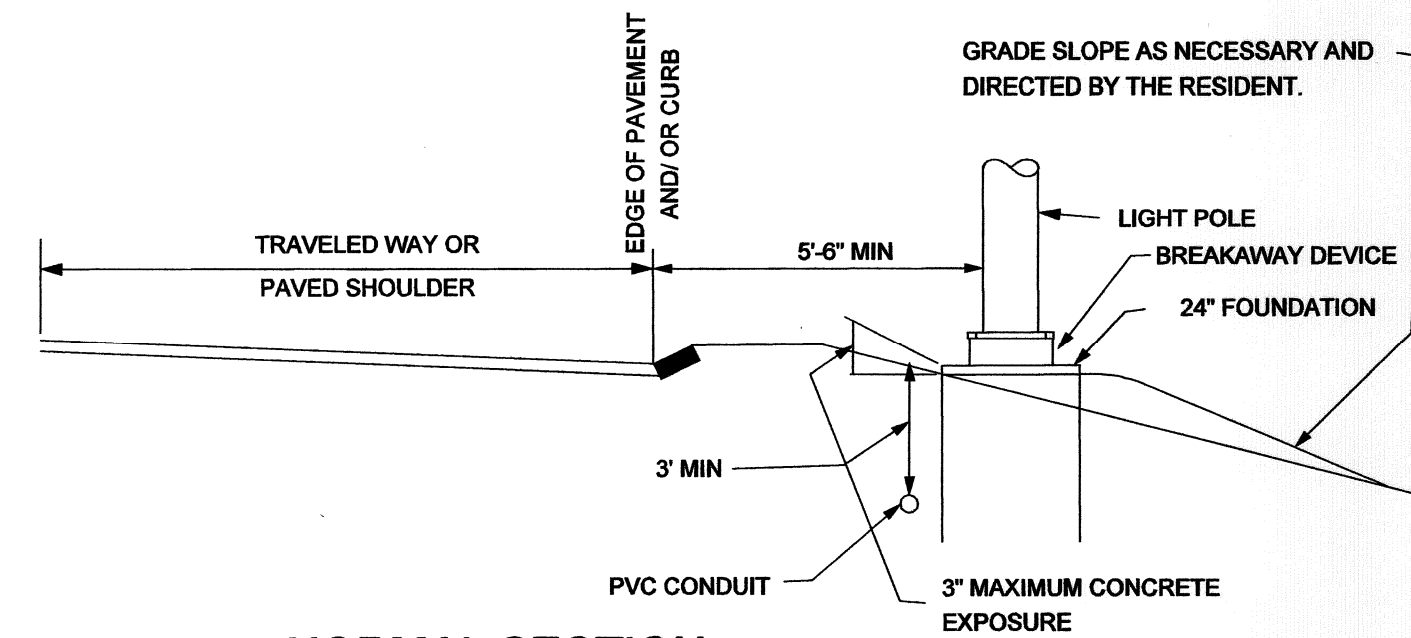
SHEET NUMBER  
3  
OF 4



TYPICAL SECTIONS - PLACEMENT OF POLES



NOTE - IF PROPOSED LIGHT POLE IS LESS THAN 4' FROM THE BACK OF GUARDRAIL, IT SHALL BE ON A BREAKAWAY DEVICE.



NORMAL SECTION

CONDUIT SUMMARY

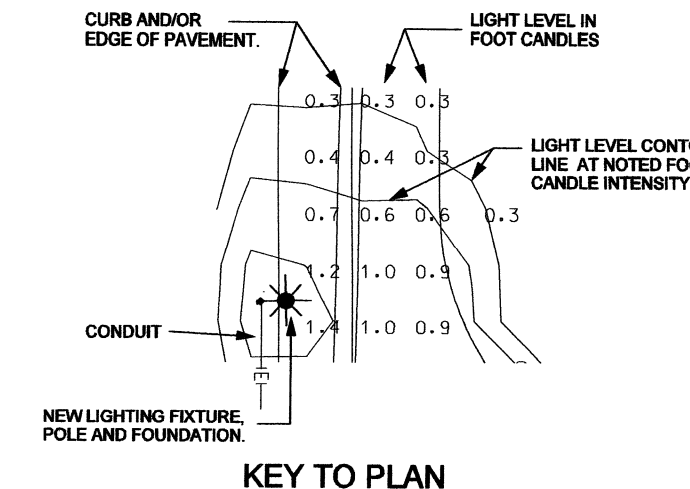
CIRCUIT 2, Western Ave & Ramps B - C				Wire Size	Remarks
Station	Pole	Breakaway	Distance	#12 Stranded Copper XHHW-2	
47+30 Lt Ctr Rd	Controller	---	145		Also in Conduit - Circuits 1, 3, 5
1190+86 SB Lt	JB	---	190		Detectors A, B, C, D, E, F
1191+45 NB Rt	JB	---	100		Circuit 3, Detectors A, B, C, D
0+65 Lt Ramp C	JB	---	45		Detectors C, D
0+65 Rt Ramp C	JB	---	55		Detector C
52+30 Lt Western	JB	---	215		
91+35 Rt Ramp B	JB	---	30		
91+65 Rt Ramp B	33	Yes			
52+30 Lt Western	JB	---	101		Detector C
53+31 Lt Western	31	No	130		Detector C
54+50 Lt Western	32	No			
52+30 Lt Western	JB	---			
52+16 Lt Western	30	No	15		
0+65 Rt Ramp C	JB	---			
0+78 Rt Ramp C	29	No	13		Detector D
0+65 Lt Ramp C	JB	---			
51+10 Lt Western	28	No	60		

CONDUIT SUMMARY, Continued

CIRCUIT 4, Center Rd & Ramps A - D				Wire Size	Remarks
Station	Pole	Breakaway	Distance	#12 Stranded Copper XHHW-2	
47+30 Lt Ctr Rd	Controller	---	55		Also in Conduit, Circuit 6
46+80 Lt Ctr Rd	JB	---	60		Detectors G, H
46+70 Rt Ctr Rd	JB	---	55		Circuit 6, Detector H
89+17 Lt Ramp A	27	Yes			Circuit 6, Detector H
46+80 Lt Ctr Rd	JB	---	18		
46+62 Lt Ctr Rd	25	Yes			
46+80 Lt Ctr Rd	JB	---	120		Detector G
18+50 Rt Ramp D	JB	---	35		Detector G
18+85 Rt Ramp D	24	Yes	105		Detector G
45+45 Lt Ctr Rd	23	Yes			
47+30 Lt Ctr Rd	Controller	---			
46+70 Lt Ctr Rd	26	No	45		
89+17 Lt Ramp A	27	Yes	887		
80+30 Lt Ramp A	16	Yes	131		
78+99 Lt Ramp A	15	Yes	131		
77+68 Lt Ramp A	14	Yes	131		
76+37 Lt Ramp A	13	Yes	131		
75+06 Lt Ramp A	12	Yes	131		

CONDUIT SUMMARY, Continued

CIRCUIT 1, NB Off Ramp B from JB				Wire Size	Remarks
Station	Pole	Breakaway	Distance	#12 Stranded Copper XHHW-2	
1191+45 NB Rt	JB	---	825		Detector A, B
1183+20 NB Rt	6	Yes	50		Detector A
83+20 Rt Ramp B	JB	---	125		Detector A
81+95 Rt Ramp B	5	Yes	130		Detector A
80+65 Rt Ramp B	4	Yes	130		Detector A
79+35 Rt Ramp B	3	Yes	130		Detector A
78+05 Rt Ramp B	2	Yes	130		Detector A
76+75 Rt Ramp B	1	Yes	130		Detector A
1191+45 NB Rt	JB	---	555		
5+50 Rt Ramp C	JB	---	715		
12+65 Rt Ramp C	7	Yes	130		
13+85 Rt Ramp C	8	Yes	130		
15+25 Rt Ramp C	9	Yes	130		
16+55 Rt Ramp C	10	Yes	130		
17+85 Rt Ramp C	11	Yes	130		
1190+86 SB Lt	JB	---	934		Detector E, F
8+25 Rt Ramp D	JB	---	60		Detector E
7+20 Rt Ramp D	18	Yes	105		Detector E
5+91 Rt Ramp D	19	Yes	129		Detector E
4+60 Rt Ramp D	20	Yes	131		Detector E
3+29 Rt Ramp D	21	Yes	131		Detector E
1+98 Rt Ramp D	22	Yes	131		Detector E



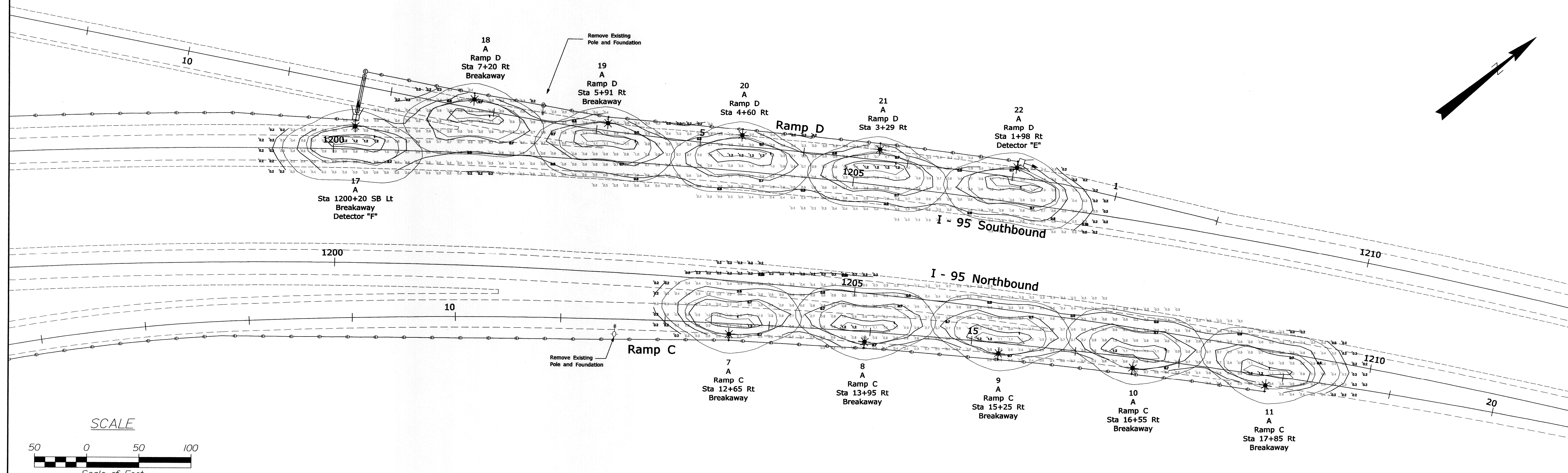
LEGEND for LIGHTING

- Light Fixture on a 40 Foot Pole and Foundation
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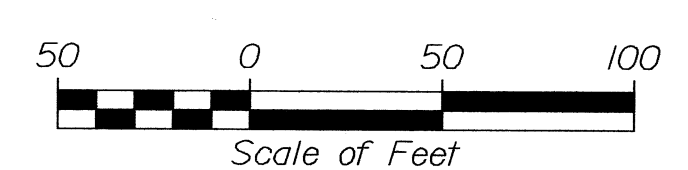
Detectors

Detector	Location, Pole #	Detector Type	Mounting Height		Detection Range		Initial Duration, Seconds	Extension, Seconds	Switches/Fixtures	Circuit
			Min	Max	Min	Max				
A	1	SmartSensor Advance Extended Range	17'	30'	50'	725'	25	15	1 - 6	1
B	6	SmartSensor V	15'	20'	---	---	60	23 - 33	2 & 4	
C	32	SmartSensor Advance	17'	30'	50'	250'	60	60	23 - 33	2 & 4
D	29	SmartSensor V	9'	15'	---	---	60	60	7 - 11	3
E	22	SmartSensor Advance Extended Range	17'	30'	50'	900'	25	15	17 - 22	5
F	17	SmartSensor V	12'	18'	---	---	60	60	23 - 33	2 & 4
G	23	SmartSensor Advance	17'	30'	50'	250'	60	60	23 - 33	2 & 4
H	27	SmartSensor V	12'	18'	---	---	60	60	12 - 16	6

Note - All Detectors Shall Be Wavetronic, SmartSensor, Digital Wave Radar or Approved Equal.



SCALE



STATE OF MAINE  
DEPARTMENT OF TRANSPORTATION  
IM - 1778(20)E  
WIN 17782.00  
HIGHWAY PLANS

STATE OF MAINE  
ALBERT L. GODFREY  
No. 4226  
PROFESSIONAL ENGINEER

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FAIRFIELD  
I - 95 at EXIT 132  
LIGHTING PLANS

SHEET NUMBER  
4  
OF 4