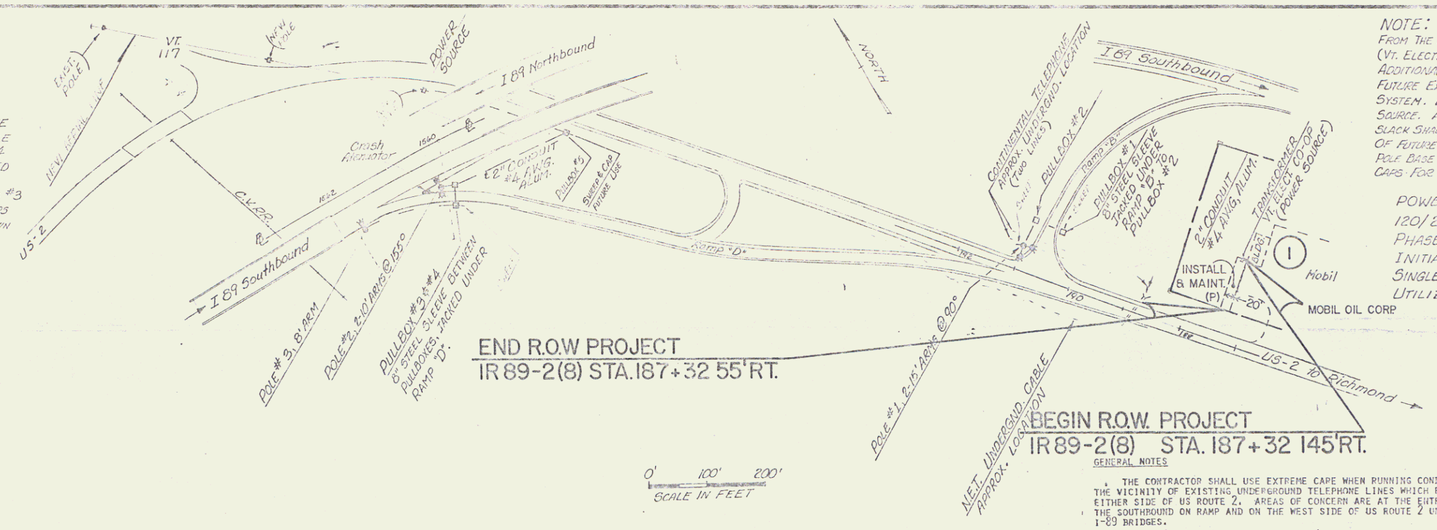
NOTE:
FROM THE POWER SOURCE (GREEN MOUNTAIN POWER) ON US ROUTE 2 NEAR THE I-89 BRIDGE TO POLE #3, INSTALL AN ADDITIONAL #4 A.W.G. WIRE TO BE USED AS NOTED IN NOTE TO THE FAR RIGHT. AT POLE BASE #3 AND PULLBOXES #3 AND #5, INSTALL 2" CONDUIT SWEEPS WITH CAPS FOR FUTURE USE AS SHOWN ON THE PLANS.

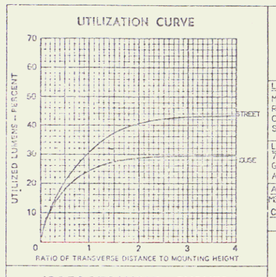


0' 100' 200'
SCALE IN FEET

NOTE:
FROM THE POWER SOURCE AT THE MOBIL STATION, (VT. ELECTRIC CO-OP) TO POLE #1, INSTALL AN ADDITIONAL #4 A.W.G. WIRE TO BE USED FOR FUTURE EXPANSION TO A 3-WIRE DISTRIBUTION SYSTEM. DO NOT CONNECT THIS WIRE TO A POWER SOURCE. AT PULLBOXES AND POLE BASES, SUFFICIENT SLACK SHALL BE LEFT IN THE WIRES FOR CONNECTION OF FUTURE LIGHT CIRCUITS. AT PULLBOX #1 AND POLE BASE #1, INSTALL 2" CONDUIT SWEEPS WITH CAPS FOR FUTURE USE AS SHOWN ON THE PLANS.

POWER SOURCE
120/240 VOLT, 3-WIRE, SINGLE PHASE CIRCUIT.
INITIALLY A 120 VOLT, 2 WIRE, SINGLE PHASE CIRCUIT WILL BE UTILIZED AT BOTH POWER SOURCES.

POLE NO.	LOCATION OFF-SET	LENGTH OF POLE	ARM	LUMINAIRE WATTS TYPE	MOUNTING HEIGHT	REMARKS	WALL THICKNESS
1	190+93 RT. 40'	28'	15'	200 w. III	30'	BRACKET ARMS @ 90°	.250"
2	1560+16 LT. 71'	28'	18'	150 w. III	30'	BRACKET ARMS @ 155°	.219"
3	1561+68 LT. 70'	28'	8'	150 w. III	30'	ACTUAL POLE LENGTH TO BE DETERMINED IN THE FIELD. 4' BACK OF FACE OF RAIL TO NEAR EDGE OF POLE.	.188"



GENERAL ELECTRIC
PHOTOMETRIC DATA
LIGHTING SYSTEMS BUSINESS DEPARTMENT
HENDERSONVILLE, N. C. U.S.A. 28739

PER 1000 LAMP LUMENS

LUMINAIRE
M-250A2 CUTOFF
REFLECTOR 35-212433-01
CLEAR FLAT GLASS
SOCKET POSITION 1 1/2 B

LAMP
70-150 WATT HPS
GE NO. LU70, LU100 OR LU150
ANSI NO. S62, S54 OR S55

ANSI/IES TYPE 1972
MEDIUM CUT-OFF III
CIE TYPE
CUT-OFF

GENERAL INFORMATION

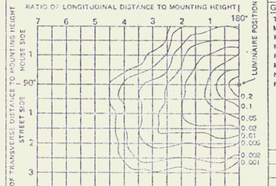
TEST DISTANCE	7.0 METERS
MAX CANDELA	347.3
MAX CONE	72.5
MAX VERTICAL PLANE	57.5/ 302.5
MAX CANDELA AT 90°	1.2
MAX CANDELA AT 80°	18.5
NADIR FOOTCANDLES	0.2780
NADIR CANDELA	250.3

MULTIPLY ALL LUMEN, CANDELA, AND FOOTCANDLE VALUES BY THIS RATIO
RATIO - ACTUAL LAMP LUMENS / 1000
PHOTOMETRIC TEST IN ACCORDANCE WITH IES GUIDE

LIGHT FLUX VALUES

	LUMENS	PERCENT OF LAMP
DOWNWARD STREET SIDE	413	41.3
UPWARD STREET SIDE	0	0.0
DOWNWARD HOUSE SIDE	286	28.6
UPWARD HOUSE SIDE	0	0.0
TOTAL	699	69.9

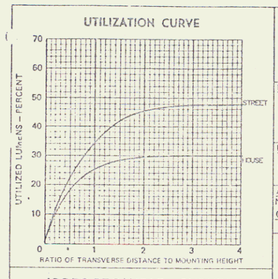
TESTED 7-22-82 DATE 7-22-82
APPROVED [illegible] DATE [illegible]



MOUNTING HEIGHT CORRECTION FACTORS FOR OTHER THAN 30 FEET
USE TABLE BELOW OR FACTOR = 30/M.H.²

MOUNTING HEIGHT - FEET	20	25	30	35	40	45	50
FACTOR	2.25	1.44	1.00	0.73	0.56	0.44	0.36

35-177285



GENERAL ELECTRIC
PHOTOMETRIC DATA
LIGHTING SYSTEMS BUSINESS DEPARTMENT
HENDERSONVILLE, N. C. U.S.A. 28739

PER 1000 LAMP LUMENS

LUMINAIRE
M-250A2 CUTOFF
REFLECTOR 35-212433-03
REFRACTOR FLAT GLASS
SOCKET POSITION 1

LAMP
200 - 250 WATT HPS
LU200 OR LU250
S56 OR S50

ANSI/IES TYPE 1972
MEDIUM CUT-OFF III
CIE TYPE
CUT-OFF

GENERAL INFORMATION

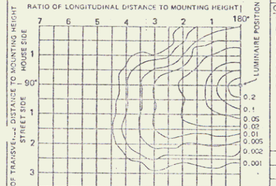
TEST DISTANCE	7.0 METERS
MAX CANDELA	416.3
MAX CONE	72.5
MAX VERTICAL PLANE	62.5/ 297.5
MAX CANDELA AT 90°	0.0
MAX CANDELA AT 80°	8.5
NADIR FOOTCANDLES	0.2782
NADIR CANDELA	251.3

MULTIPLY ALL LUMEN, CANDELA, AND FOOTCANDLE VALUES BY THIS RATIO
RATIO - ACTUAL LAMP LUMENS / 1000
PHOTOMETRIC TEST IN ACCORDANCE WITH IES GUIDE

LIGHT FLUX VALUES

	LUMENS	PERCENT OF LAMP
DOWNWARD STREET SIDE	467	46.7
UPWARD STREET SIDE	0	0.0
DOWNWARD HOUSE SIDE	291	29.1
UPWARD HOUSE SIDE	0	0.0
TOTAL	758	75.8

TESTED 7-22-82 DATE 7-22-82
APPROVED [illegible] DATE [illegible]



MOUNTING HEIGHT CORRECTION FACTORS FOR OTHER THAN 30 FEET
USE TABLE BELOW OR FACTOR = 30/M.H.²

MOUNTING HEIGHT - FEET	20	25	30	35	40	45	50
FACTOR	2.25	1.44	1.00	0.73	0.56	0.44	0.36

35-177304

STREET LIGHTING - GENERAL NOTES

CONCRETE BASES
THE OFFSET FOR BASES WILL BE AS INDICATED ON THE PLANS.
WHEN BASES ARE INSTALLED IN SLOPING GROUND, THE GREATEST EXPOSED HEIGHT TO KEEP ALL OF THE TOP ABOVE GROUND MUST BE DOUBLED AND THEN ADDED TO THE MINIMUM DEPTH FOR THE TOTAL BASE HEIGHT. THE BASE SIZE SHALL BE 2'X5' FOR 4' to 8' ARMS AND 2½'X 8' FOR ARMS LONGER THAN 8'.
CARE SHOULD BE TAKEN WHERE BASES, DRAINAGE STRUCTURES, OR UTILITIES ARE CLOSE TOGETHER.

CONDUIT
2½ INCH CONDUIT SHALL BE USED FOR ROAD CROSSINGS. 2" MINIMUM CONDUIT SHALL BE USED AT ALL OTHER LOCATIONS UNLESS OTHERWISE NOTED. ALL CONDUIT SHALL BE AT LEAST SCHEDULE 40 GALVANIZED STEEL ELECTRICAL CONDUIT.
THE MINIMUM DEPTH OF CONDUIT SHALL BE 2 FEET EXCEPT UNDER ROADWAYS WHERE 5 FOOT DEPTH IS MINIMUM OR AS DIRECTED BY THE ENGINEER.
A 6" WIDE YELLOW MARKING TAPE (PLASTIC) SHALL BE INSTALLED 6" TO 12" BELOW FINISH GRADE OVER THE CONDUIT RUNS.

CONDUIT SLEEVE
MINIMUM WALL THICKNESS FOR AN 8" DIAMETER STEEL PIPE SLEEVE SHALL BE 3/8" WHEN USED FOR ASSEMING AND/OR JACKING UNDER A ROADWAY. ELECTRICAL CONDUIT RUNS UNDER ROADWAYS SHALL BE ENCLOSED IN A STEEL SLEEVE. THE SLEEVE SHALL EXTEND TO WITHIN 2' OF THE SIDE OF A BASE OR PULL BOX. ACTUAL LENGTH OF SLEEVE AND LOCATION OF PULLBOXES TO BE DETERMINED BY THE RESIDENT ENGINEER IN THE FIELD.

GROUNDING
IN ADDITION TO A GROUND ROD AT POLE BASE, A CONTINUOUS GROUNDING CIRCUIT SHALL BE RUN BACK TO A CIRCUIT PROTECTIVE DEVICE AT THE TRANSFORMER.
ALUMINUM WIRE SHALL NOT BE USED FOR GROUND WIRE.

POLES, ANCHOR BASES AND ARMS
NO POLE SHAFT WALL THICKNESS SHALL BE LESS THAN 0.188" AND SHALL HAVE A MINIMUM 8" O.D. BOTTOM DIMENSION.
ALL NEW STREET LIGHT POLES AND LUMINAIRE ARMS SHALL BE ALUMINUM IN ACCORDANCE WITH SUBSECTION 753.01 (B).
POLES #1 & #2 SHALL HAVE A BREAKAWAY FEATURE ADDED.

WIRE
ALL WIRING BETWEEN THE METER AND THE FIRST POLE OR PULLBOX AND BETWEEN POLES AND/OR PULLBOXES SHALL BE ALUMINUM, SIZE AS INDICATED ON THE PLANS.
USE #10 A.W.G. STRANDED COPPER WIRES IN EACH POLE BETWEEN THE POLE BASE AND THE LUMINAIRE.
ALL CONDUIT MUST INCLUDE A GROUND CONDUCTOR AND ACT AS ONE.
VOLTAGE LOSSES GREATER THAN 3% IN THE SECONDARY CIRCUIT REQUIRE LARGER WIRE.
ALL WIRING SHALL HAVE TYPE XHHW INSULATION OR EQUIVALENT.

PULLBOXES
FOR DETAILS SEE STANDARD SHEET E-39.

LUMINAIRES
LUMINAIRES SHALL BE DESIGNED FOR STREET LIGHTING AND THE INDICATED LIGHT DISTRIBUTION. THEY SHALL INCLUDE AN ALUMINUM HOUSING WITH EASY ACCESS TO THE BALLAST ASSEMBLY, A PHOTO-ELECTRIC CONTROL, FILTERED OPTICAL ASSEMBLY, MEDIUM CUTOFF DISTRIBUTION AND REGULATOR BALLAST FOR 120 VOLT HIGH PRESSURE SODIUM LAMPS.
LIGHT DISTRIBUTION IS BASED ON GENERAL ELECTRIC PHOTOMETRIC DATA DRAWINGS # 35-177285, MEDIUM CUTOFF TYPE III DISTRIBUTION, DATED 3-26-85 AND DRAWING #35-177304, MEDIUM CUTOFF TYPE III DISTRIBUTION, DATED 4-24-85. THE ABOVE PHOTOMETRIC DATA DRAWINGS WERE USED FOR ILLUMINATION CALCULATIONS ONLY.
INSTALLED LUMINAIRE LIGHT UTILIZATION AND MINIMUM FOOTCANDLES ON THE ROAD AND SHOULDER SHALL BE AT LEAST AS GREAT AS INDICATED BY THE ABOVE PHOTOMETRICS.

GENERAL NOTES

1. THE CONTRACTOR SHALL USE EXTREME CARE WHEN RUNNING CONDUIT IN THE VICINITY OF EXISTING UNDERGROUND TELEPHONE LINES WHICH EXIST ON EITHER SIDE OF US ROUTE 2. AREAS OF CONCERN ARE AT THE ENTRANCE OF THE SOUTHBOUND ON RAMP AND ON THE WEST SIDE OF US ROUTE 2 UNDER THE I-89 BRIDGES.

ALSO THE LIGHT BASES AT THE SOUTHBOUND OFF RAMP ARE VERY CLOSE TO EXISTING DRAINAGE STRUCTURES. THE SLEEVE TO BE JACKED UNDER RAMP "D" MAY HAVE TO BE MOVED FROM THE LOCATION SHOWN ON THE PLANS DUE TO EXISTING DRAINGAGE. LOCATION TO BE DETERMINED BY THE RESIDENT ENGINEER.

DISCONNECT PLUGS SHALL BE USED FOR THE CONNECTIONS IN ALL POLE BASES. THE HOT LEAD TO THE LUMINAIRE SHALL BE FUSED AT (3) THREE TIMES THE RATED LOAD.

GENERAL

ALL ELECTRICAL MATERIAL AND INSTALLATION SHALL MEET THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE, STATE AND LOCAL CODES AND THE LOCAL UTILITY COMPANY IF NECESSARY.
ALL STREET LIGHT POLES SHALL HAVE A METAL TAG ATTACHED TO THE HAND HOLE WITH THE POLE NUMBER, WATTAGE, AND TYPE OF LAMP. EXAMPLE, #2-150W.- H.P.S., (HPS = HIGH PRESSURE SODIUM). MINIMUM LETTER SIZE 1/2" HIGH. PAYMENT FOR TAGS WILL BE SUBSIDIARY TO ITEM 679.15, STREET LIGHTING.
THE LOAD ON EACH BRANCH OF A THREE WIRE CURCUIT SHALL BE AS BALANCED AS POSSIBLE, LOAD TO NEUTRAL.
THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTENANCE OF THE COMPLETED LIGHTING SYSTEM UNTIL FINAL ACCEPTANCE OF THE PROJECT.

STREET LIGHTING DESIGN PARAMETERS
AVERAGE MAINTAINED ILLUMINATION: PROJECT - 0.7 TO 1.0 FC. MIN.
EXISTING - NONE

FILTERED LUMINAIRE: 0.95
LAMP DEPRECIATION: 0.73 @ 24,000 HOURS
COMBINED LAMP FACTOR: 0.7
MOUNTING HEIGHT FACTOR: (30/M.H.)2
UNIFORMITY RATIO: *N/A*
MINIMUM FOOTCANDLES ON ROADWAY: *N/A*

WORK TO BE PERFORMED BY THE CONTRACTOR
THE CONTRACTOR SHALL:
1) INSTALL NEW CONCRETE BASES, CONDUIT, POLES, LUMINAIRES, WIRING, PULLBOXES, POLE RISER, WEATHERHEAD, STUBPOLE, METER SOCKET, RAIN TIGHT BOX WITH OVERLOAD DISCONNECTS FOR EACH CIRCUIT, MAIN SAFETY SWITCH, GROUND RODS AND OTHER RELATED MATERIAL AND HARDWARE.
2) JACK OR AUGER AN 8" MINIMUM DIAMETER STEEL SLEEVE UNDER RAMP "B" & "D" APPROXIMATELY AT THE LOCATION AS SHOWN ON THE PLAN SHEET OR AT THE DISCRETION OF THE RESIDENT ENGINEER, IN ACCORDANCE WITH STANDARD SHEET D-20.
3) INSTALL METAL TAGS TO THE HANDHOLE OF THE NEW POLES WITH THE INFORMATION AS NOTED ON THE PLANS.
4) MAKE CONTACT WITH AND PERFORM WORK IN COMPLIANCE WITH VERMONT ELECTRIC CO-OP AND GREEN MOUNTAIN POWER CO. AT THE TWO POWER SOURCES.

PAYMENT FOR THE ABOVE WORK WILL BE SUBSIDIARY TO ITEM 679.15, STREET LIGHTING.

LEGEND

- PROPOSED NEW POLE & LUMINAIRE
- PROPOSED PULLBOX
- EXISTING TRANSFORMER @ MOBIL STA.
- PROPOSED CONDUIT
- EXISTING UNDERGROUND UTILITIES

RICHMOND INTERCHANGE R.O.W. PLANS

STREET LIGHTING DESIGN CRITERIA AND GENERAL NOTES

SURVEYED BY _____ DATE _____
DRAWN BY R. DAVIS DATE 6-85
TRACED BY _____ DATE _____

RICHMOND
IR 89-2 (3)
3 OF 3

3