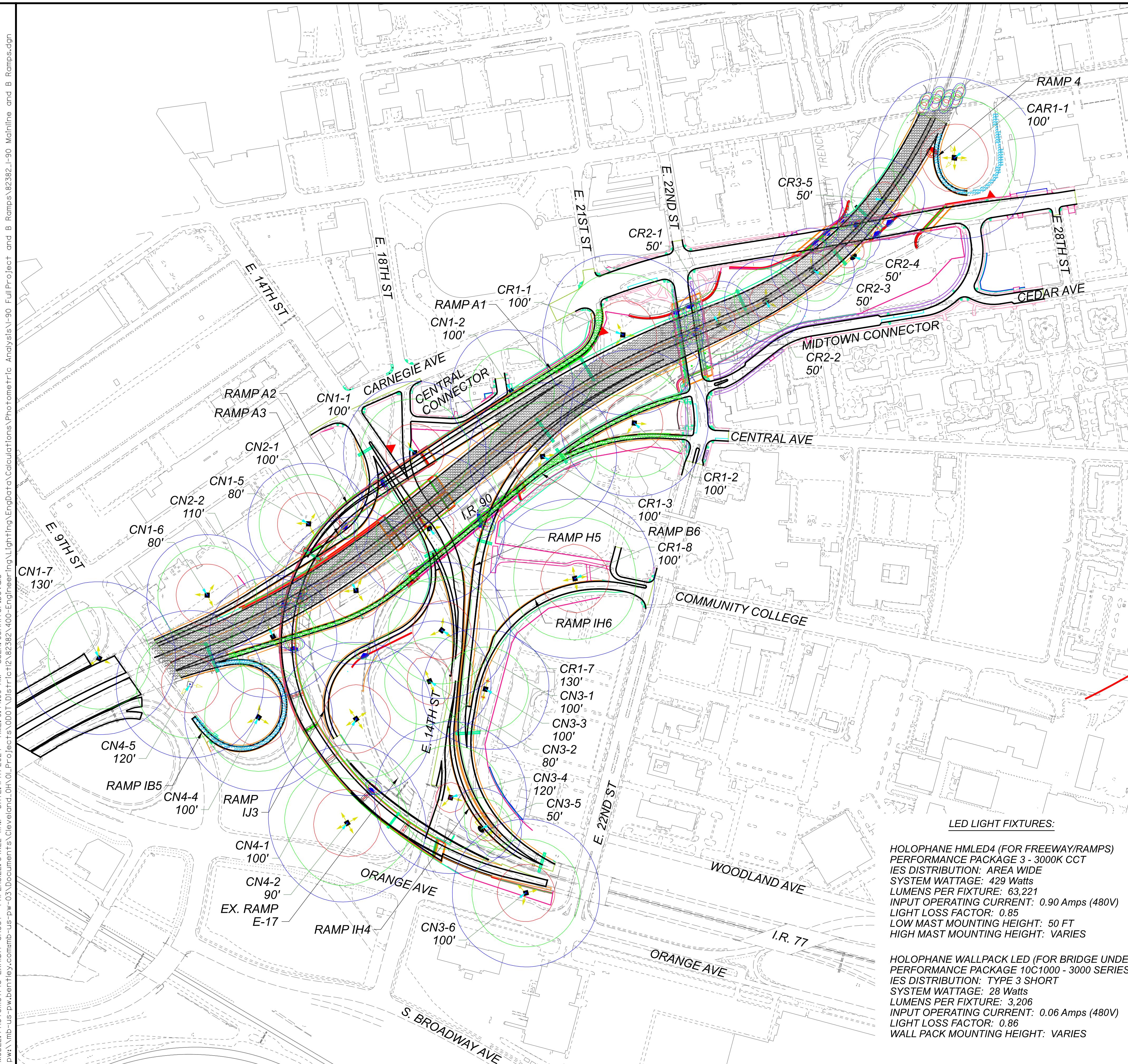


**EXHIBIT D: CCG3A PHOTOMETRIC ANALYSIS
I-90 MAINLINE AND B RAMPS**

A vertical scale bar with horizontal tick marks at 0 and 200 feet. The text "HORIZONTAL SCALE IN FEET" is written vertically to the left of the scale bar.

11

DESIGN AGENCY		
Michael Baker		
INTERNATIONAL		
DESIGNER		
JLD		
REVIEWER		
SM	---	
PROJECT ID		
82382		
HEET	TOTAL	
-		-



ILLUMINANCE CRITERIA (ODOT TEM TABLE 1197-4)

AVERAGE	MINIMUM	UNIFORMITY (AVG/MIN)
0.9	0.3	3.0:1

SUMMARY OF ROADWAY PHOTOMETRICS I-90 MAINLINE AND B RAMPS

SEGMENT	AVERAGE	MINIMUM	UNIFORMITY (AVG/MIN)	UNIFORMITY (MAX/MIN)
PR. I-90 E. 9TH TO E. 14TH	1.1	0.4	2.8:1	8.8:1
PR. I-90 E. 14TH TO E. 22ND	0.9	0.3	3.0:1	6.7:1
PR. I-90 UNDER E. 22ND	1.0	0.3	3.3:1	10.3:1
PR. I-90 E. 22ND TO CARNEGIE	1.2	0.5	2.4:1	4.0:1
PR. I-90 UNDER CARNEGIE	1.0	0.3	3.3:1	16.3:1
PR. I-90 CARNEGIE TO PROSPECT	0.9	0.4	2.3:1	5.3:1
PR. RAMP IB5 I-90 EB TO E. 9TH	1.0	0.5	2.0:1	2.8:1
PR. RAMP B6 I-90 EB TO E. 14TH	1.0	0.3	3.3:1	4.7:1
PR. RAMP B6 E. 14TH TO E. 22ND	1.0	0.4	2.5:1	4.0:1
PR. RAMP A1 I-90 GORE TO CARNEGIE	1.0	0.6	1.7:1	2.7:1
PR. RAMP 4	0.9	0.3	3.0:1	5.3:1

LEGEND

**PROPOSED HIGH MAST TOWERS
W 2, 3 OR 4 LED LUMINAIRES
(NO SHIELDS)**

PROPOSED HIGH MAST TOWERS W/ 2 LED LUMINAIRES (180-DEGREE SHIELDS)

*LOW MAST POLE
W/ 1 LED LUMINAIRE
(NO SHIELDS)*

*LOW MAST POLE
W/ 1 LED LUMINAIRE
(180-DEGREE SHIELDS)*

*PROPOSED UNDERPASS LED
LUMINAIRE*

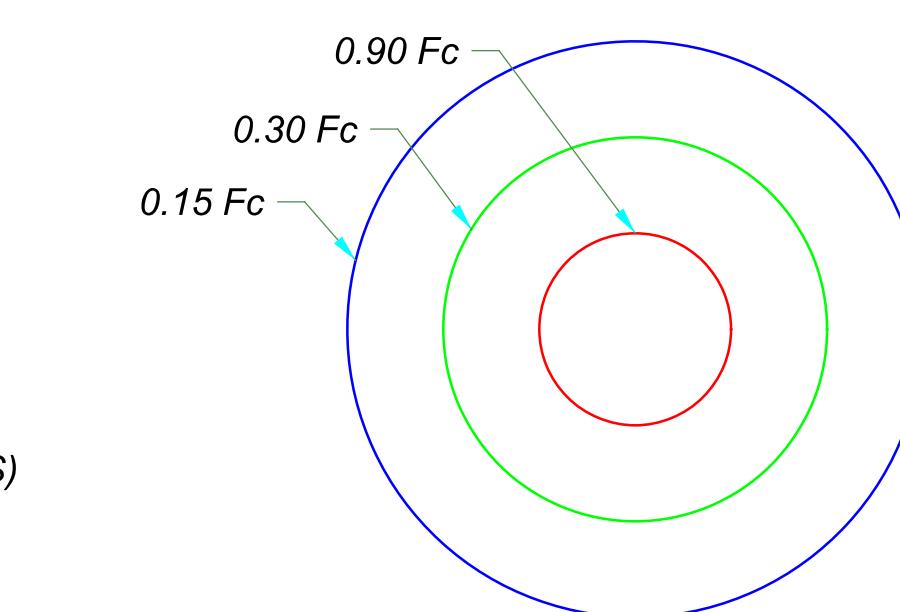
EXISTING HIGH MAST TOWERS TO REMAIN

LED LIGHT FIXTURES

**HOLOPHANE HMLED4 (FOR FREEWAY/RAMPS)
PERFORMANCE PACKAGE 3 - 3000K CCT
IES DISTRIBUTION: AREA WIDE
SYSTEM WATTAGE: 429 Watts
LUMENS PER FIXTURE: 63,221
INPUT OPERATING CURRENT: 0.90 Amps (480V)
LIGHT LOSS FACTOR: 0.85
LOW MAST MOUNTING HEIGHT: 50 FT
HIGH MAST MOUNTING HEIGHT: VARIES**

**HOLOPHANE WALLPACK LED (FOR BRIDGE UNDERPASSES
PERFORMANCE PACKAGE 10C1000 - 3000 SERIES CCT
IES DISTRIBUTION: TYPE 3 SHORT
SYSTEM WATTAGE: 28 Watts
LUMENS PER FIXTURE: 3,206
INPUT OPERATING CURRENT: 0.06 Amps (480V)
LIGHT LOSS FACTOR: 0.86
WALL PACK MOUNTING HEIGHT: VARIES**

TYPICAL CONTOUR VALUES

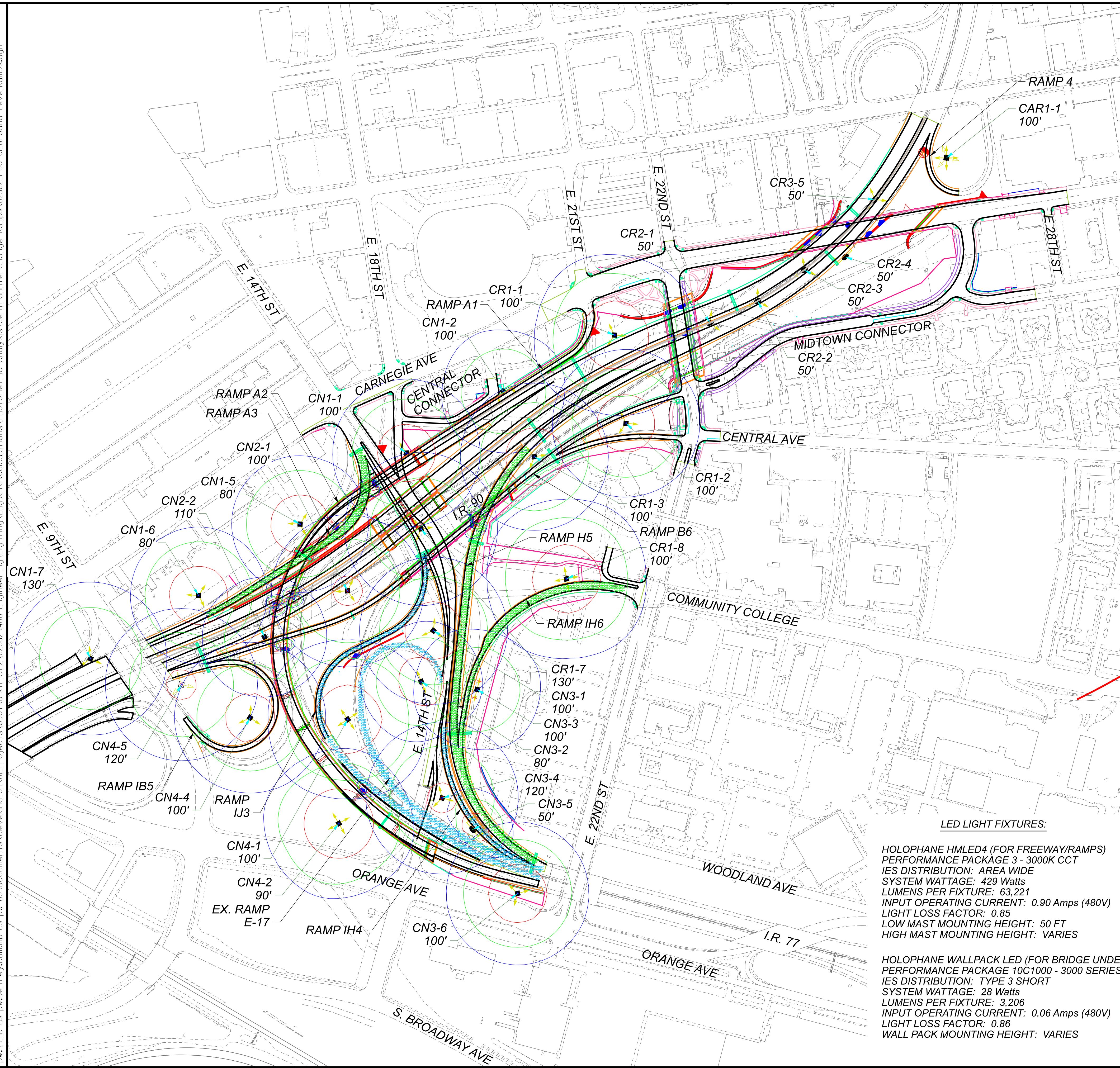


CUY-90-16.28

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CUY-90-16.28

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ILLUMINANCE CRITERIA (ODOT TEM TABLE 1197-4)

AVERAGE	MINIMUM	UNIFORMITY (AVG/MIN)
0.9	0.3	3.0:1

SUMMARY OF ROADWAY PHOTOMETRICS
CENTRAL INTERCHANGE GROUND LEVEL RAMPS

SEGMENT	AVERAGE	MINIMUM	UNIFORMITY (AVG/MIN)	UNIFORMITY (MAX/MIN)
EX. RAMP E-17 I-77 NB TO E. 14TH SB	1.1	0.6	1.8:1	3.5:1
PR. HYBRID RAMP H5 I-77 NB TO I-90 EB	0.9	0.3	3.0:1	6.7:1
PR. RAMP IH4 I-77 NB TO E. 14TH NB	1.1	0.5	2.2:1	4.6:1
PR. RAMP IH6 I-77 NB TO COMMUNITY COLLEGE	1.0	0.4	2.5:1	4.8:1
PR. RAMP IJ3 E. 14TH SB TO I-77 SB	0.9	0.4	2.3:1	4.3:1
PR. RAMPA3 E. 14TH SB TO I-90 WB	0.9	0.3	3.0:1	8.0:1

EXHIBIT D: CCG3A PHOTOMETRIC ANALYSIS
I-90 / I-77 INTERCHANGE - GROUND LEVEL RAMPS

DESIGN AGENCY
Michael Baker
INTERNATIONAL

DESIGNER JLD
REVIEWER SM

PROJECT ID 82382
SHEET TOTAL -



HORIZONTAL SCALE IN FEET
0 100 200 400

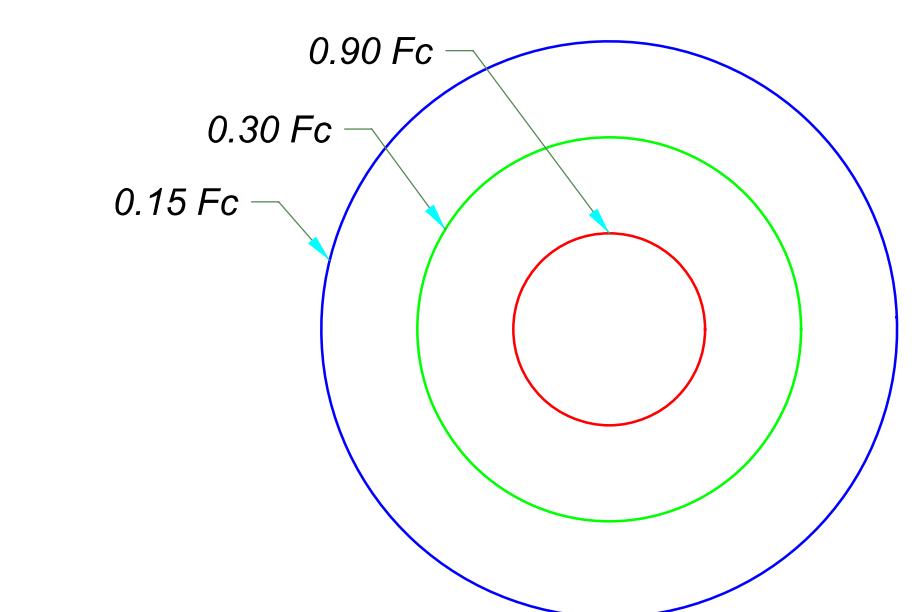
- LEGEND
- -
 -
 -
 -
 -

LED LIGHT FIXTURES:

HOLOPHANE HMLED4 (FOR FREEWAY/RAMPS)
PERFORMANCE PACKAGE 3 - 3000K CCT
IES DISTRIBUTION: AREA WIDE
SYSTEM WATTAGE: 429 Watts
LUMENS PER FIXTURE: 63,221
INPUT OPERATING CURRENT: 0.90 Amps (480V)
LIGHT LOSS FACTOR: 0.85
LOW MAST MOUNTING HEIGHT: 50 FT
HIGH MAST MOUNTING HEIGHT: VARIES

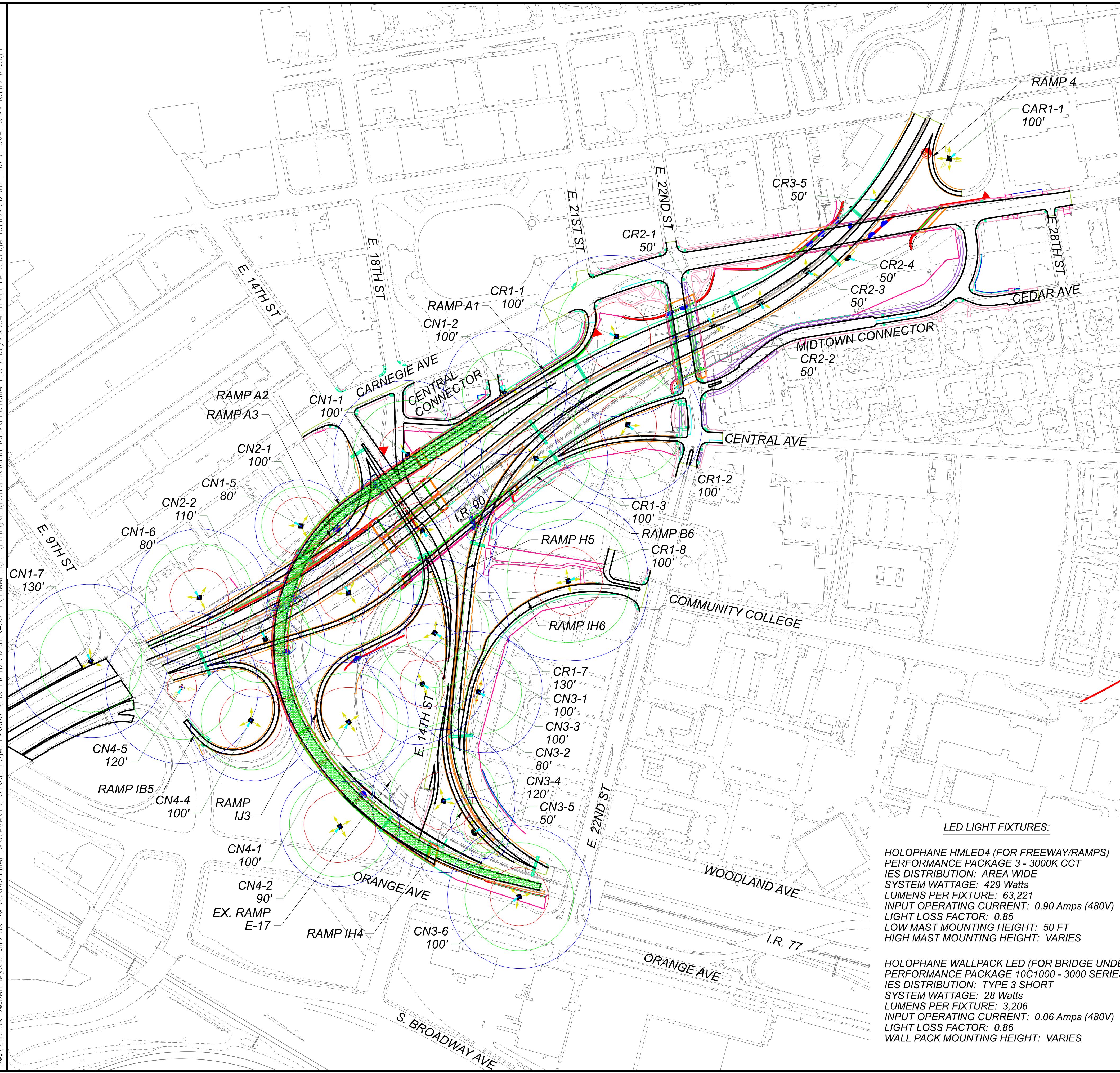
HOLOPHANE WALLPACK LED (FOR BRIDGE UNDERPASSES)
PERFORMANCE PACKAGE 10C1000 - 3000 SERIES CCT
IES DISTRIBUTION: TYPE 3 SHORT
SYSTEM WATTAGE: 28 Watts
LUMENS PER FIXTURE: 3,206
INPUT OPERATING CURRENT: 0.06 Amps (480V)
LIGHT LOSS FACTOR: 0.86
WALL PACK MOUNTING HEIGHT: VARIES

TYPICAL CONTOUR VALUES



CUY-90-16.28

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ILLUMINANCE CRITERIA (ODOT TEM TABLE 1197-4)

AVERAGE	MINIMUM	UNIFORMITY (AVG/MIN)
0.9	0.3	3.0:1

SUMMARY OF ROADWAY PHOTOMETRICS
CENTRAL INTERCHANGE OVERPASS RAMP A2

SEGMENT	AVERAGE	MINIMUM	UNIFORMITY (AVG/MIN)	UNIFORMITY (MAX/MIN)
PR. RAMP A2 I-90 WB TO I-77 SB	0.9	0.3	3.0:1	13.0:1

EXHIBIT D: CCG3A PHOTOMETRIC ANALYSIS
I-90 / I-77 INTERCHANGE - OVERPASS RAMP A2

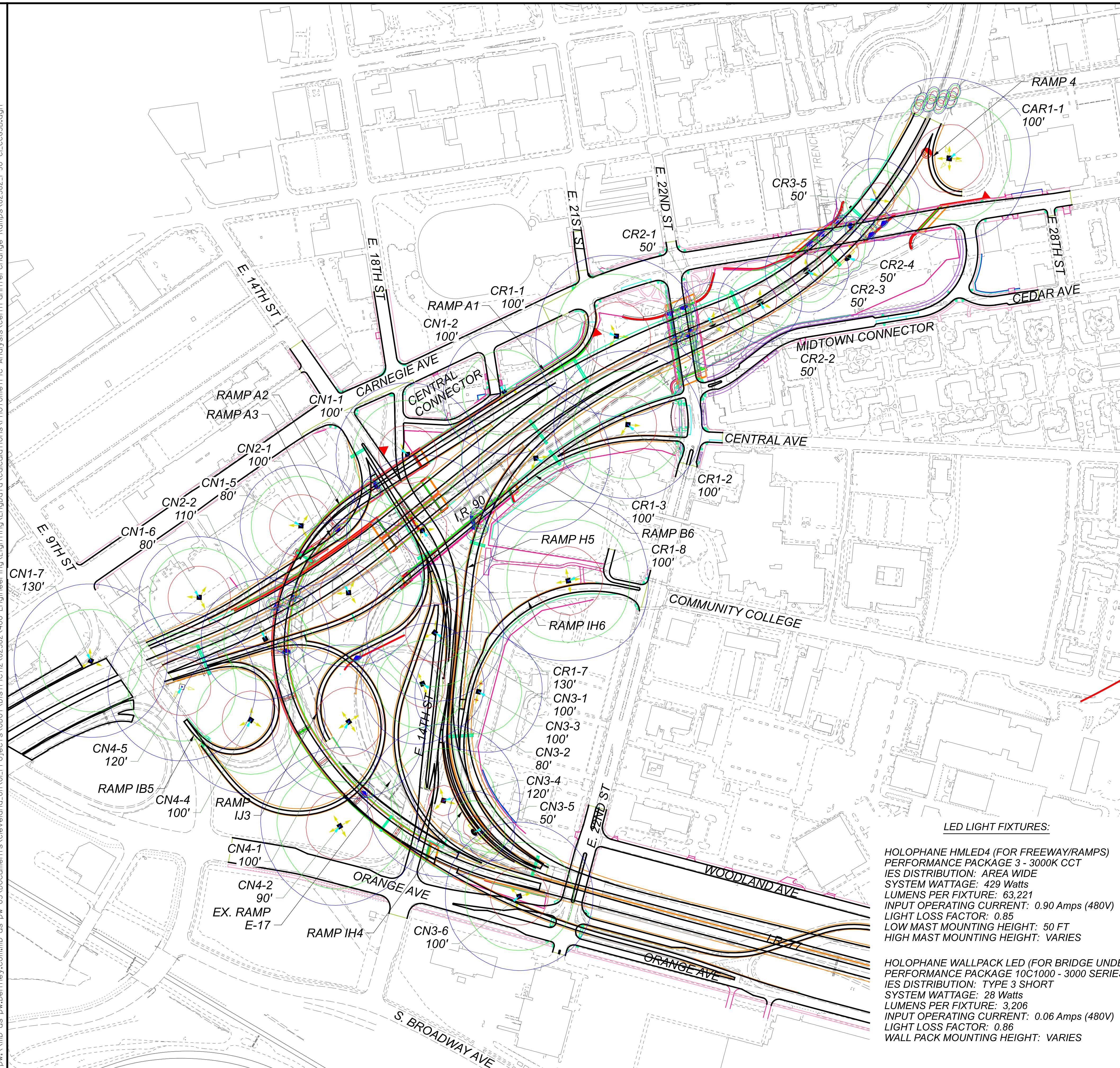
DESIGN AGENCY
Michael Baker
INTERNATIONAL
DESIGNER JLD
REVIEWER SM
PROJECT ID 82382
SHEET TOTAL -

HORIZONTAL SCALE IN FEET
0 100 200 400

CUY-90-16.28

MODEL: Photometric Exhibit Sheet PAPER SIZE: 34x22 (In.) DATE: 1/17/2024 TIME: 06:07 AM USER: Jennifer.Dovae

DWG: Vmb-psw.bentley.commo-us-psw-33\Documents\Cleveland_OH\Projects\82382\400-Engineering\Lighting\EngData\Calculations\Photometric Analysis\CentralInterchange_Ramps\82382_1-90_C1.CCG3B.dwg

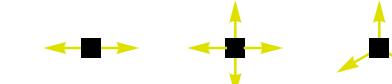
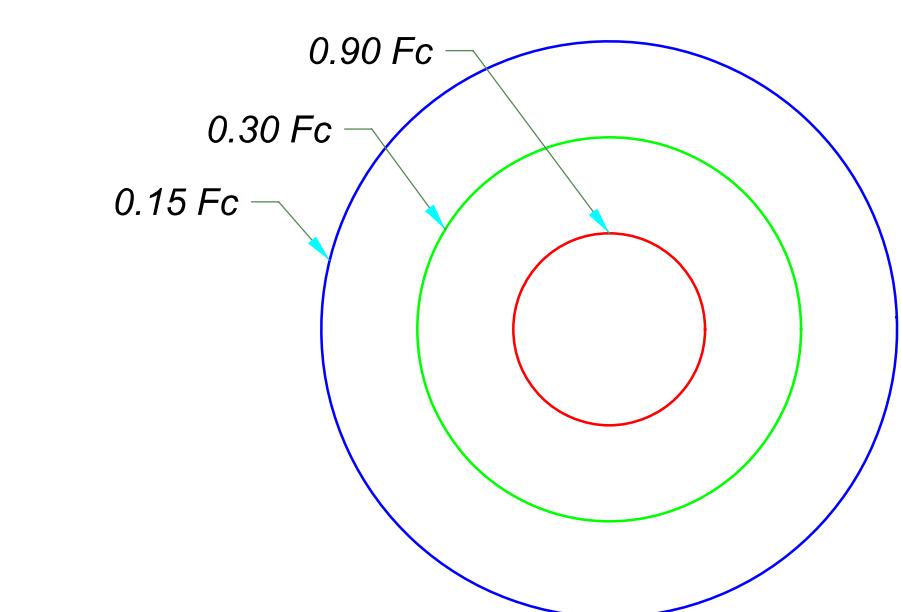


ILLUMINANCE CRITERIA (ODOT TEM TABLE 1197-4)

AVERAGE	MINIMUM	UNIFORMITY (AVG/MIN)
0.9	0.3	3.0:1



HORIZONTAL
SCALE IN FEET
0 100 200 400

LEGENDPROPOSED HIGH MAST TOWERS
W/ 2, 3 OR 4 LED LUMINAIRES
(NO SHIELDS)PROPOSED HIGH MAST TOWERS
W/ 2 LED LUMINAIRES
(180-DEGREE SHIELDS)LOW MAST POLE
W/ 1 LED LUMINAIRE
(NO SHIELDS)LOW MAST POLE
W/ 1 LED LUMINAIRE
(180-DEGREE SHIELDS)PROPOSED UNDERPASS LED
LUMINAIREEXISTING HIGH MAST TOWERS
TO REMAIN**TYPICAL CONTOUR VALUES**

DESIGN AGENCY

Michael Baker
INTERNATIONAL

DESIGNER JLD

REVIEWER SM

PROJECT ID 82382

SHEET TOTAL