











APPENDIX A: Luminaire Schedule & Relevant Data






Lighting Schedule

Light Loss Factors

Power Density Analysis

LIGHTING SCHEDULE: SPEC FIXTURES FOR REDESIGN

TAG	IMAGE	DESCRIPTION	MOUNTING	LAMP	WATTS	VOLTS	SPACE	QUANTITY	MANUFACTURER	CATALOG NO.	BALLAST
A		6" Square Downlight	Ceiling Recessed	Triple Tube CFL - CF32DT/E/IN/830/ECO	32	277	Academic Center	18	Kurt Versen	H8643	VEZ-1T42-M2-BS
B		4' Wall Washer / Accent Light	Ceiling Recessed	(2) Pentron T5 - FP39/830/HO/ECO	40	277	Academic Center	14	Lightolier	Walmaster WMRL244277SB	ICN-2S39
C		Pendant	Suspended (11'-0")	Triple Tube CFL - CF32DT/E/IN/830/ECO	32	277	Academic Center	21	Omega	GER1032PLT-PW-CS-A-T-U	VEZ-1T42-M2-BS
D		4' Linear Pendant	Suspended (10'-6")	(1) Pentron T5 - FP28/830/ECO	28	277	Academic Center	20	se'lux	NEOS-1T5-OD-C-004-SE-277	ICN-2S28
E		Wall Sconce	Surface	(1) BX18 - CF18DD/830/ECO	18	277	Academic Center	17	Focal Point	FMEC-1-1BX18-1C-277-S-WM-TS	H-1Q18-TP-BLS
F		Pendant	Suspended (11'-0")	(2) F32T8 - FO32/830/XPS/ECO	32	277	Academic Center	6	Mark Architectural	ECT-2T8-4-IND	IOP-3P32HL90CSC
G		Wall Sconce	Surface	(1) T7.5 150W MH - MC150T7.5/U/G12/830	150	277	Exterior Façade Entry Lobby	20	énergie	DID-70-277	IMH-150-H
H		4.5" Square Downlight	Recessed	(1) T6 70W MH - MC70T6/U/G12/830PB	70	277	Exterior Façade	16	Kurt Versen	H8406	IMH-70-A-BLS-ID
I		Lensed Wall Washer	Recessed	(1) E17 50W MH - MCP50/C/U/MED/830PB	50	277	Exterior Façade	32	Kurt Versen	T4517	IMH-50-A
J		Pendant	Suspended (height varies)	(1) CFL 2G11 - FT80DL/830/ECO	70	277	Entry Lobby	42	Deco Lighting	D910-1-70C-CF-277-OR-CXX-DB	ICF-2S70-M4-BS

K		4" Round Downlight	Recessed	(1) MR16 Halogen GU5.3 Bipin - 50MR16/B/SP10	50	277	Entry Lobby	9	Ardee Lighting	M3.401WH-R-BK	N/A
L		6" Light Tape	Surface	N/A	1 W / Ft	110	Entry Lobby	200'	Electro-LuminX	LT-600	PS-SD-8000
M		4' Cove Uplight	Surface	(1) F32T8 - FO32/830/XPS/ECO	32	277	Dining Room	36	Focal Point	FCV47-1T8-1C-277-E-CV-L830-HW	VEL-2P32-SC
N		4' Wall Waser	Recessed	(1) F40T8 - F40T8/TL830/ALTO	40	277	Dining Room	8	Litecontrol	G-D-1014T8-CWM-ELB-EF-277	VEL-2P32-HL-SC
O		7" Round Downlight	Recessed	(2) T4 26W CFL - CF26DT/E/IN/830/ECO	26	277	Dining Room	60	Kurt Versen	P634	VEZ-2Q26-M2-LD
P		4' Downlight	Recessed	(1) F32T8 - FO32/830/XPS/ECO	32	277	Dining Room	34	se'lux	M1R2-1T8-SD-SH-004-WH-277	VEL-2P32-SC

LIGHT LOSS FACTORS: REDESIGN						
FIXTURE	CATEGORY	BF	LLD	LDD	RSDD	TOTAL
A	IV	0.98	0.86	0.923	0.98	0.762
B	IV	1.00	0.93	0.923	0.98	0.841
C	IV	0.98	0.86	0.923	0.98	0.762
D	III	1.00	0.93	0.937	0.975	0.850
E	V	1.00	0.86	0.915	0.94	0.740
F	IV	1.00	0.95	0.923	0.94	0.824
G	V	1.00	0.80	0.915	0.94	0.688
H	IV	1.00	0.80	0.923	0.98	0.724
I	IV	1.00	0.70	0.923	0.98	0.633
J	V	1.00	0.86	0.915	0.975	0.767
K	IV	1.00	0.95	0.923	0.98	0.859
L	-	-	-	-	-	-
M	VI	1.00	0.95	0.888	0.90	0.759
N	IV	1.00	0.93	0.923	0.98	0.841
O	IV	1.00	0.86	0.923	0.98	0.778
P	IV	1.00	0.95	0.923	0.98	0.859
Assume Clean Environment, Six Month Cleaning						
RCR Values:		Academic Center (1.84)				
		Façade (N/A)				
		Entry Lobby (1.83)				
		Dining Room (1.49)				

POWER DENSITY ANALYSIS

SPACE	AREA (SF)	EXISTING WATTS	REDESIGN WATTS	LESS THAN EXISTING	ALLOWABLE LPD (W/SF)	REDESIGN LPD (W/SF)	% OF ALLOWABLE	ALLOWABLE WATTS	ASHRAE ACCEPTABLE ?
Academic Center	4000	3694	3788	NO	1.4	0.947	68%	5303	YES
Exterior Façade	2830	5970	3520	YES	0.2	1.244	622%	704	NO
Lobby	10230	5912	3990	YES	3.3	0.390	12%	13167	YES
Dining Room	8120	6520	5680	YES	1.4	0.700	50%	7952	YES

APPENDIX B: Lighting Plans

Academic Center and Study Lounge

Athletic Dining Room

Exterior Façade

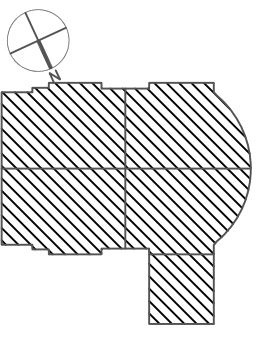
Entry Lobby



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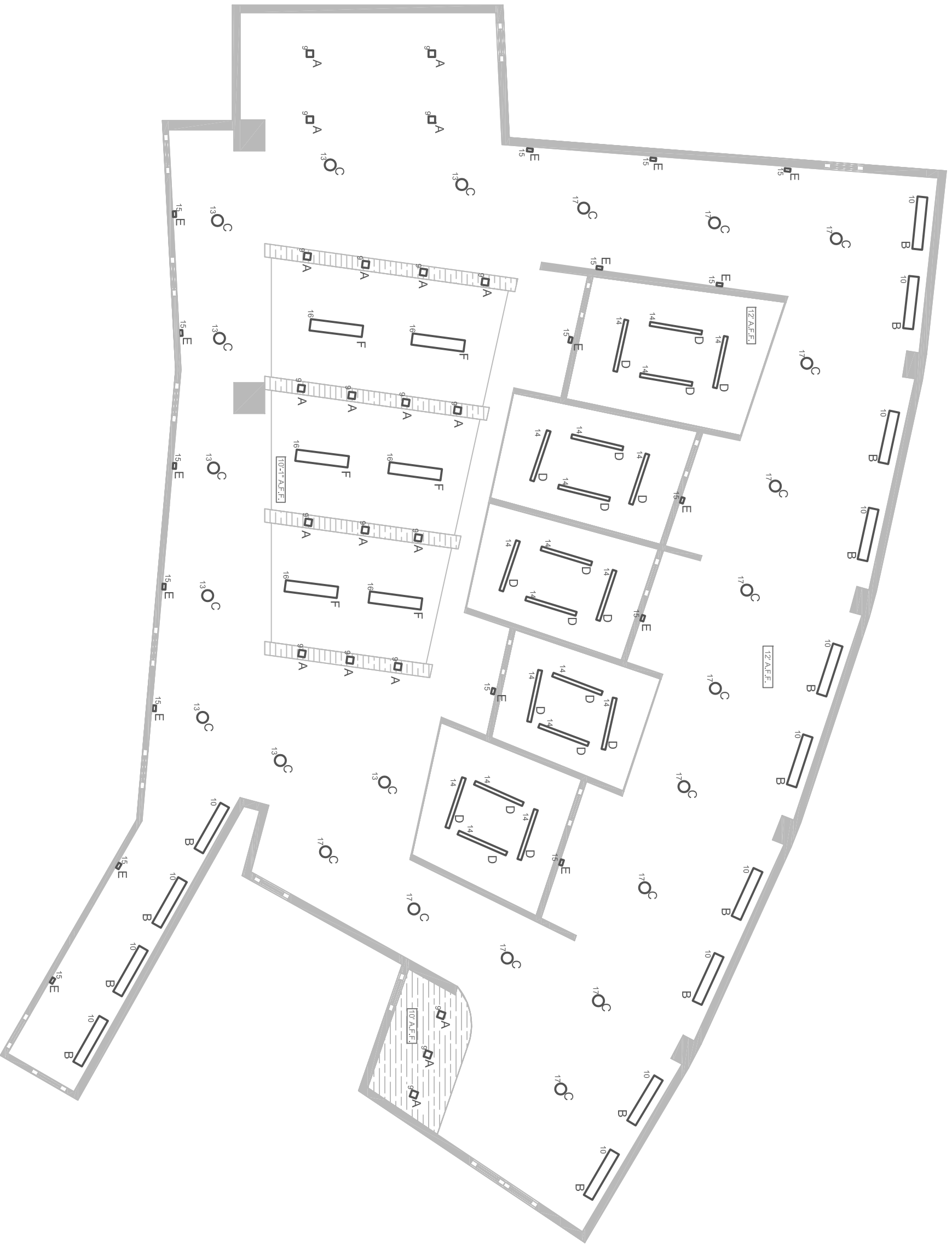


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ACADEMIC CENTER
LIGHTING PLAN

SCALE: 1/8" = 1'-0"

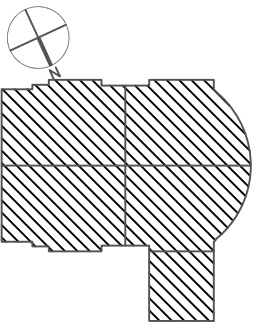




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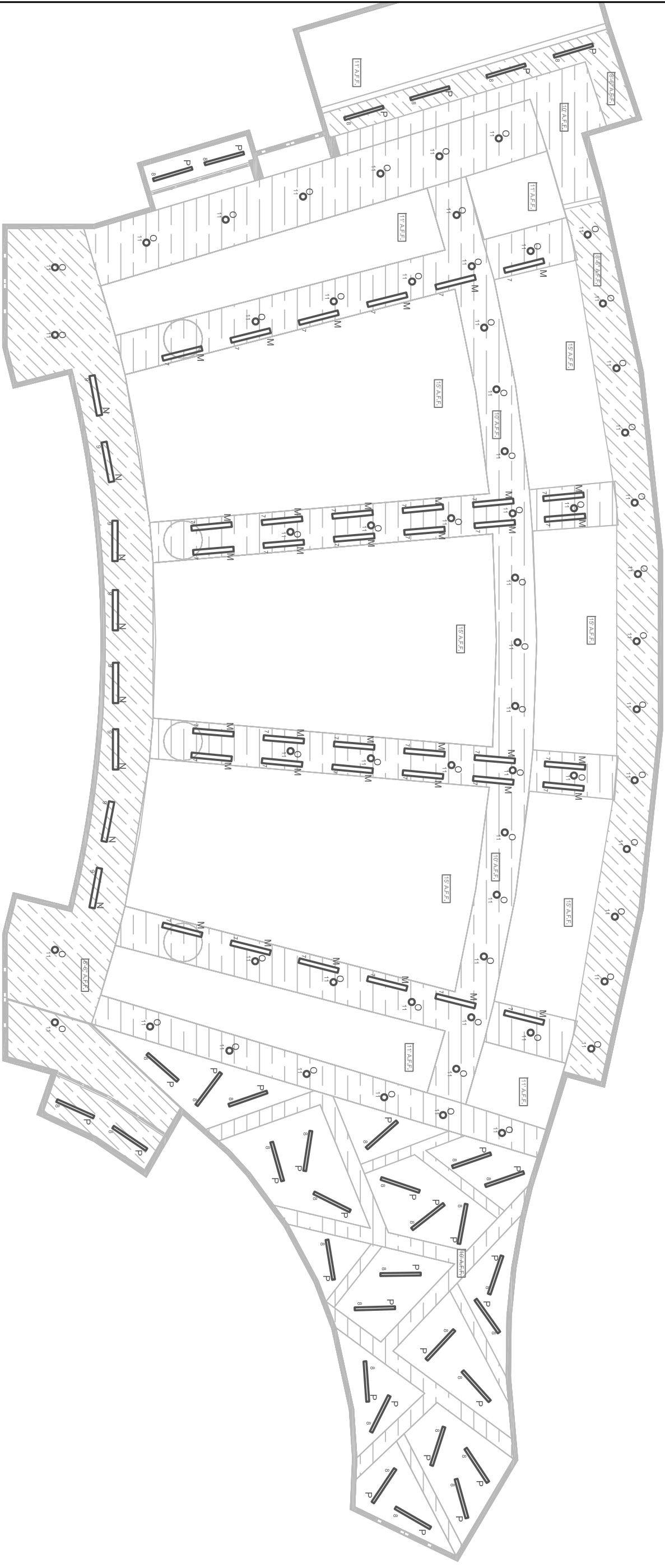


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DINING ROOM
LIGHTING PLAN

SCALE: 3/32" = 1'-0"

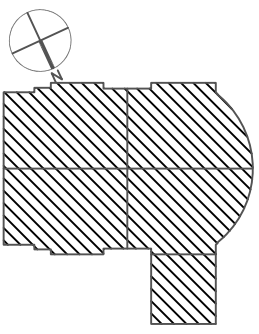




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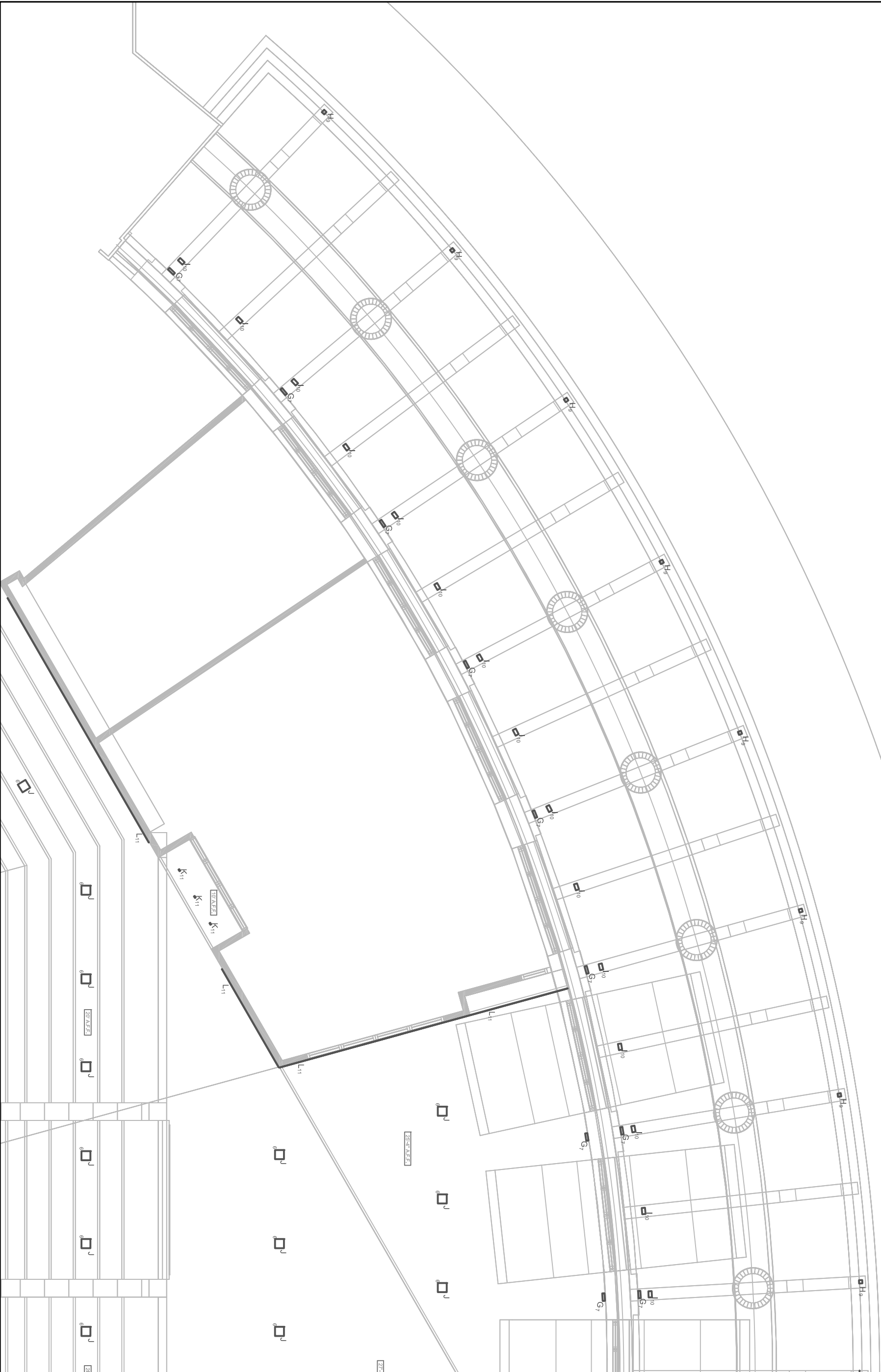


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EXTERIOR FACADE
LIGHTING PLAN
SHEET 1 OF 2

SCALE: 3/32" = 1'-0"

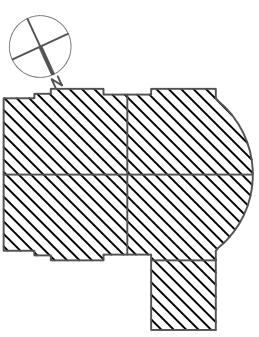




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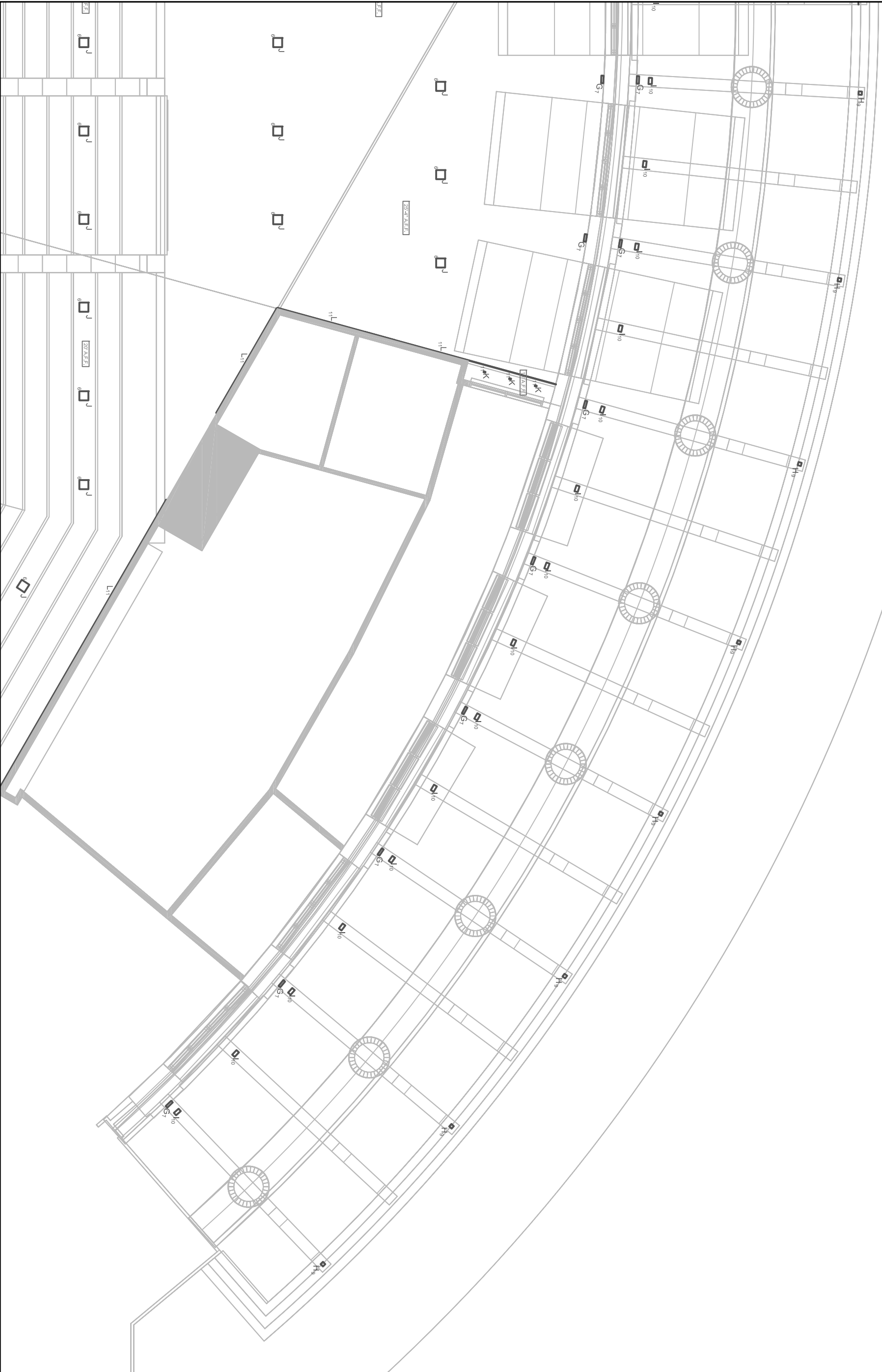


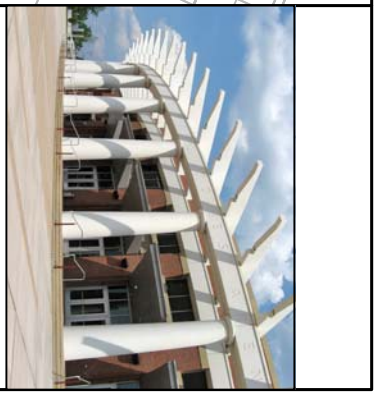
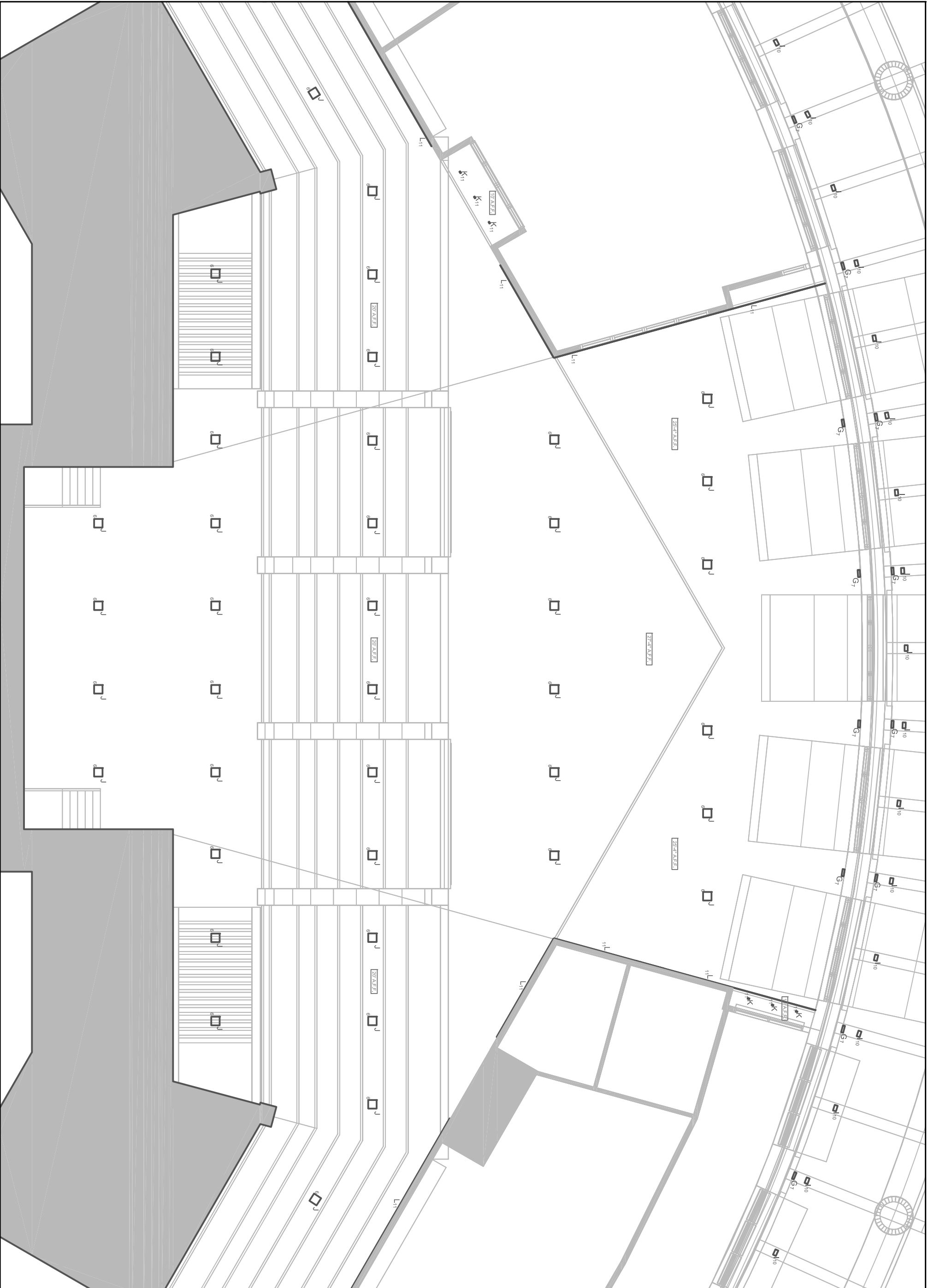
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EXTERIOR FACADE
LIGHTING PLAN
SHEET 2 OF 2

SCALE: 3/32" = 1'-0"

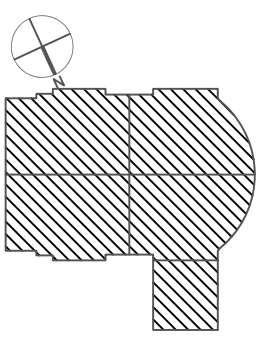




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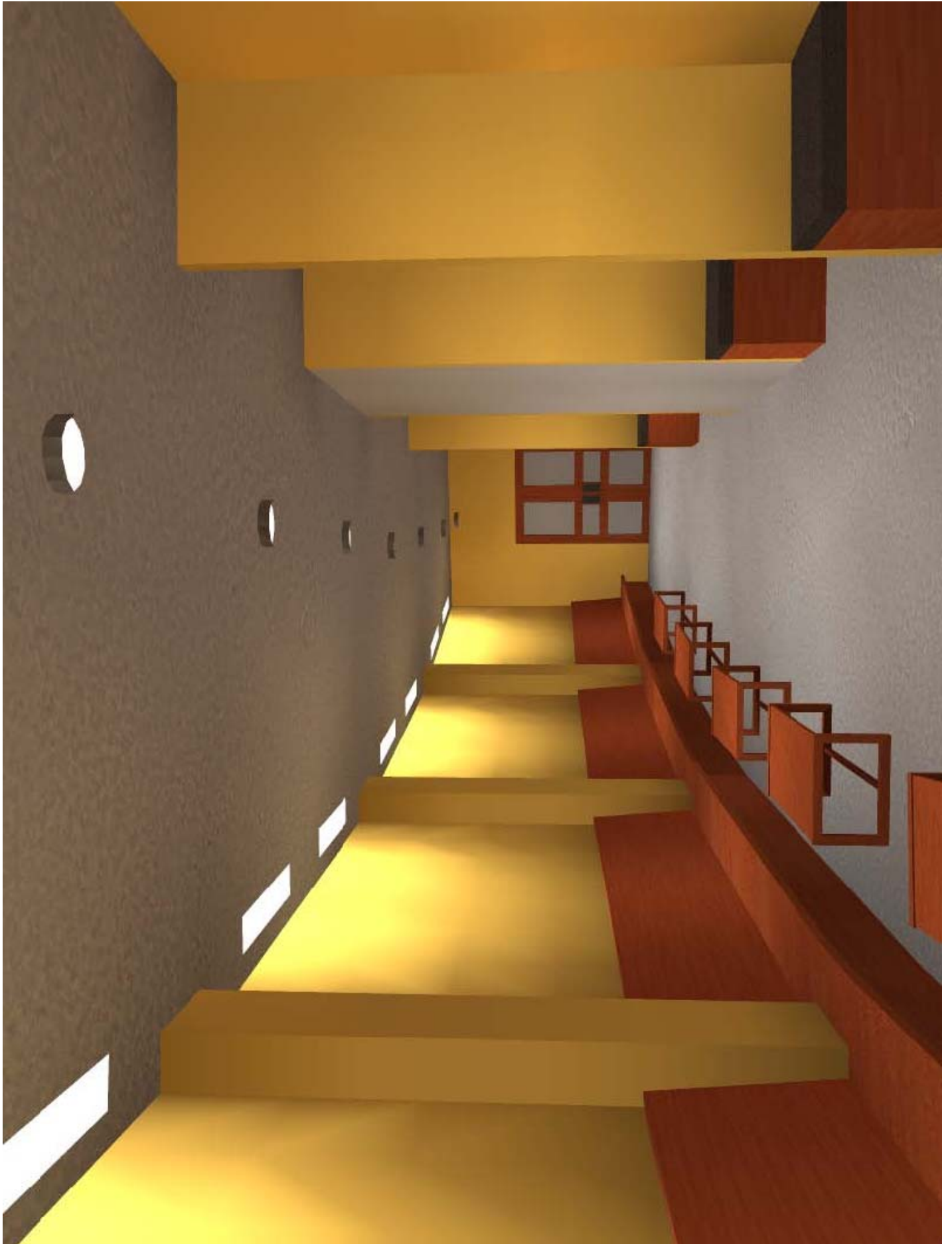
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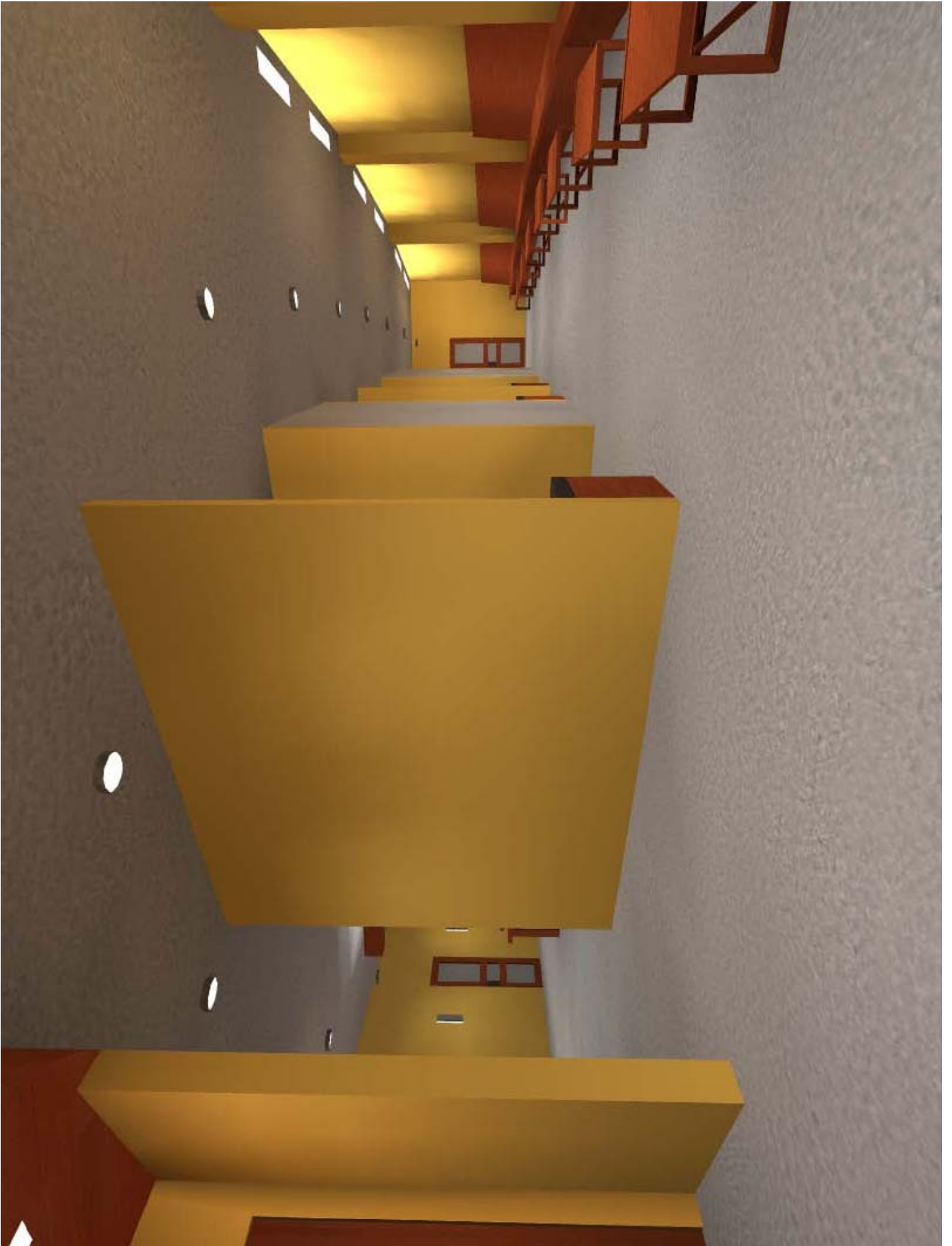
ENTRY LOBBY
LIGHTING PLAN

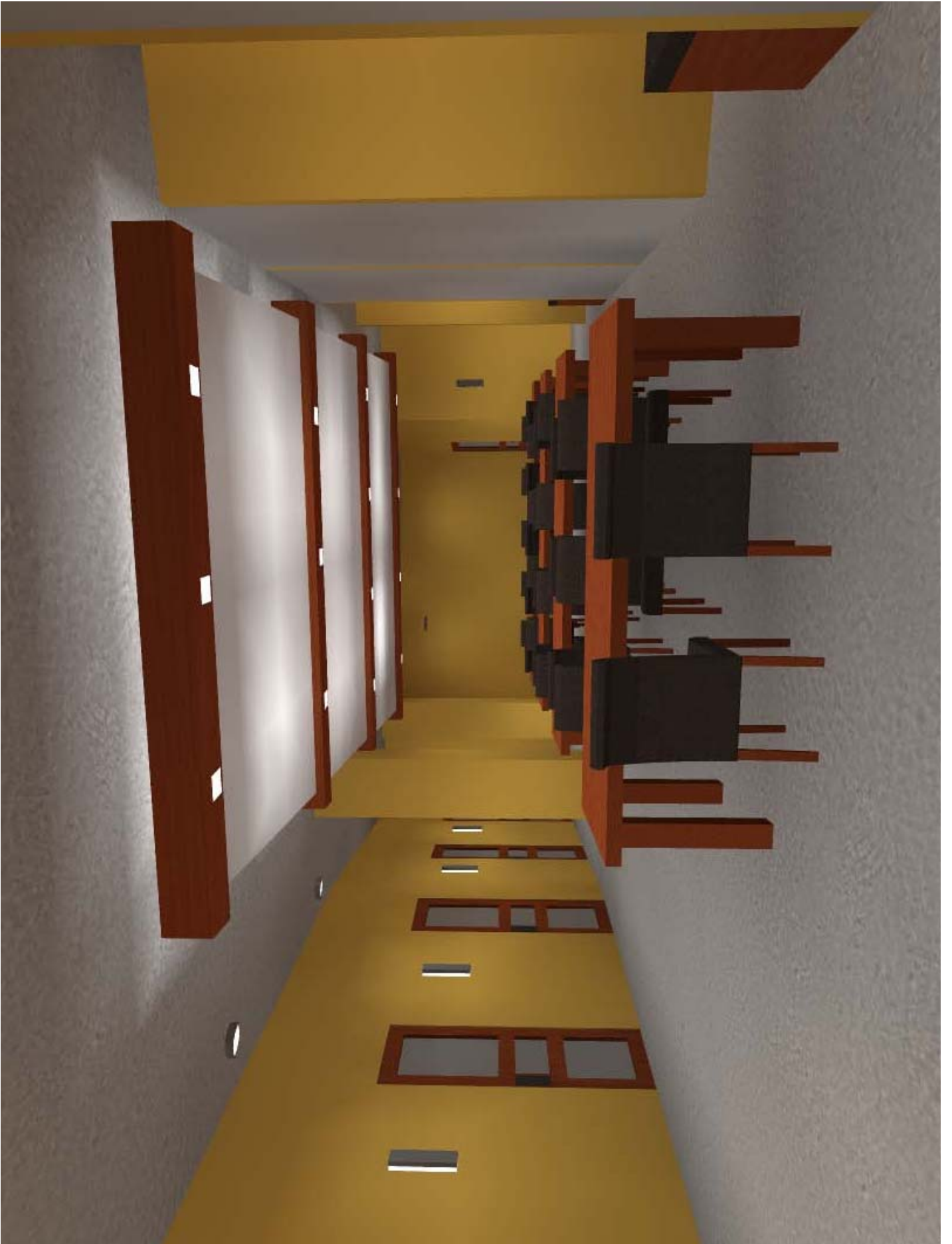
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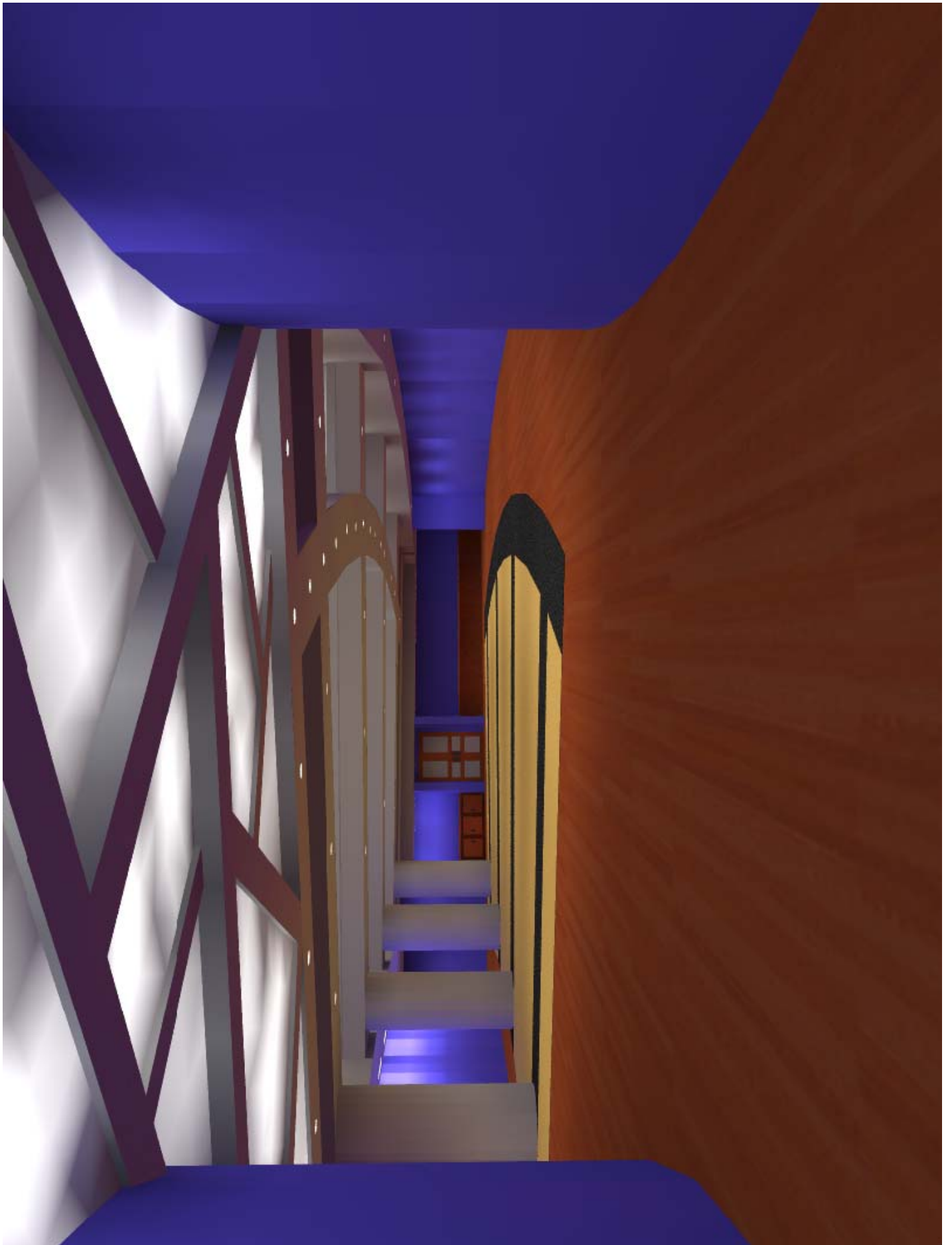
APPENDIX C: Lighting Renderings

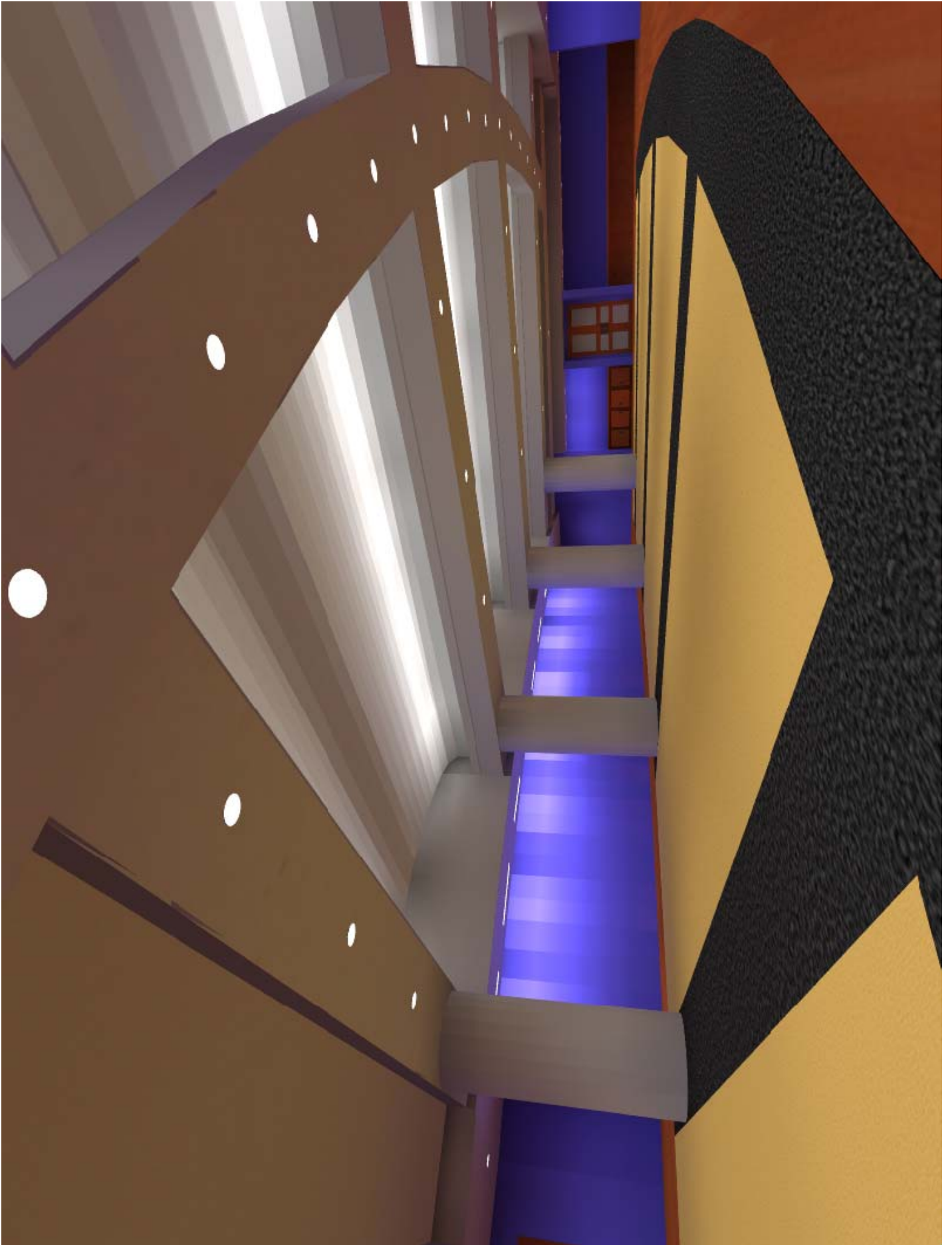




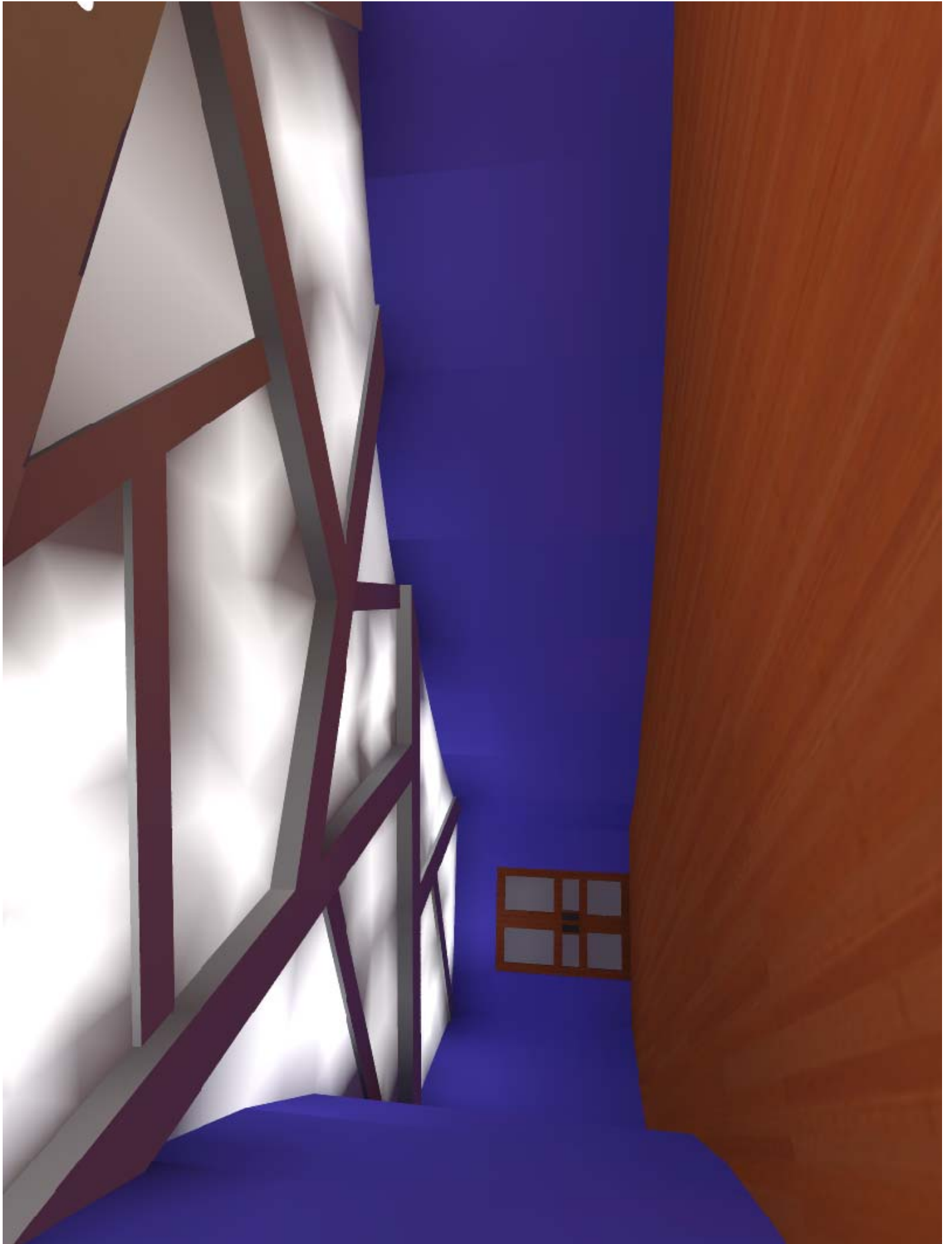


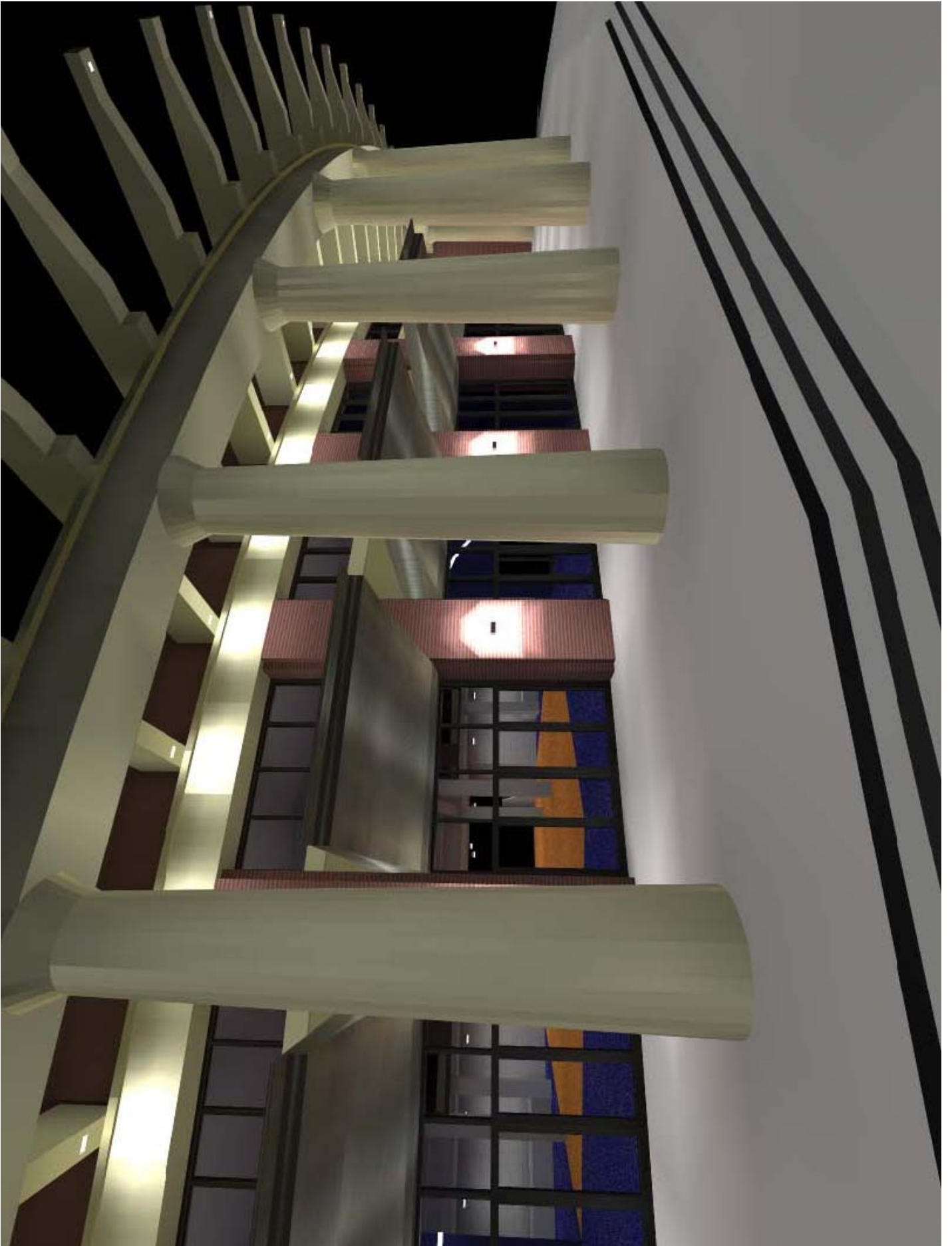






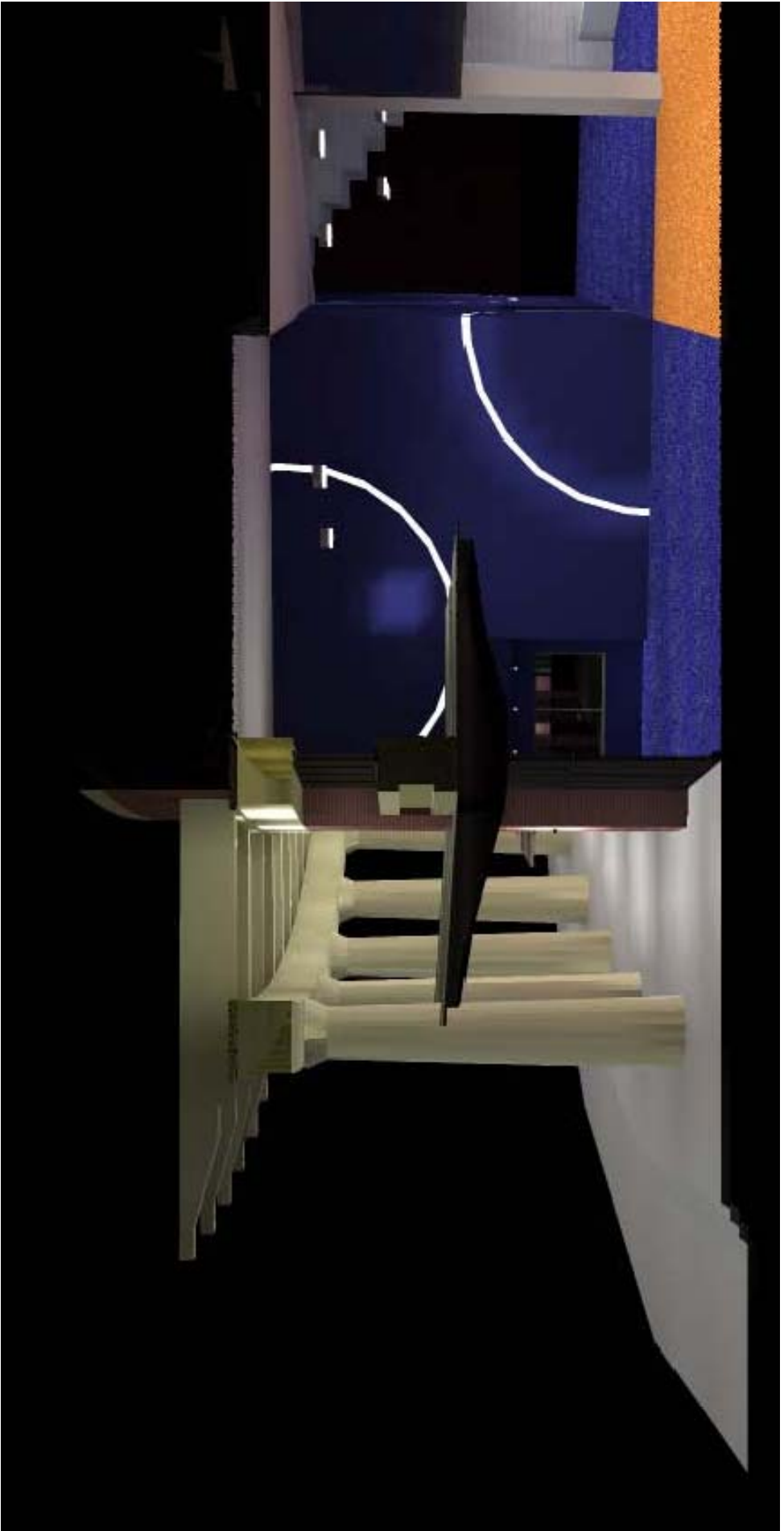


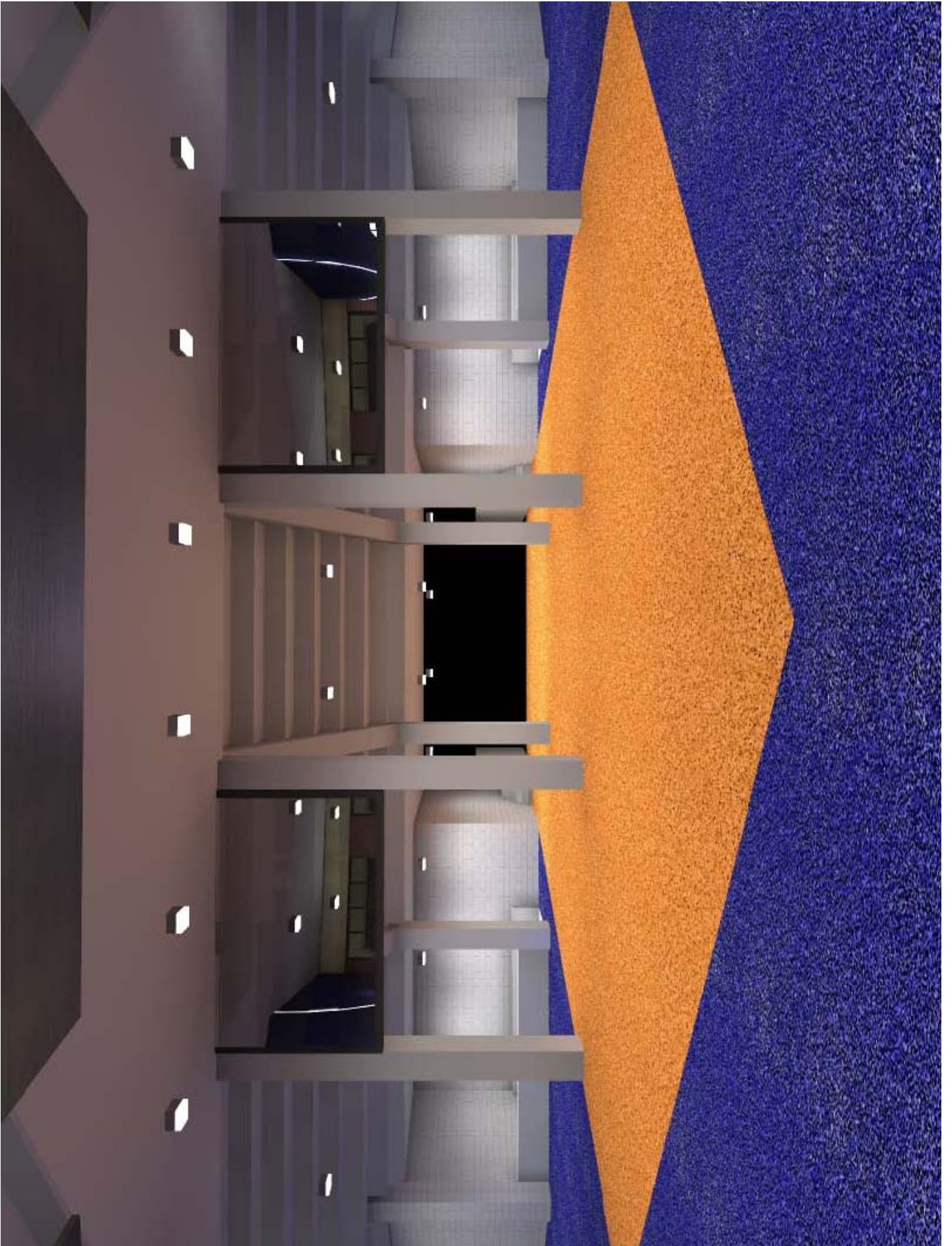




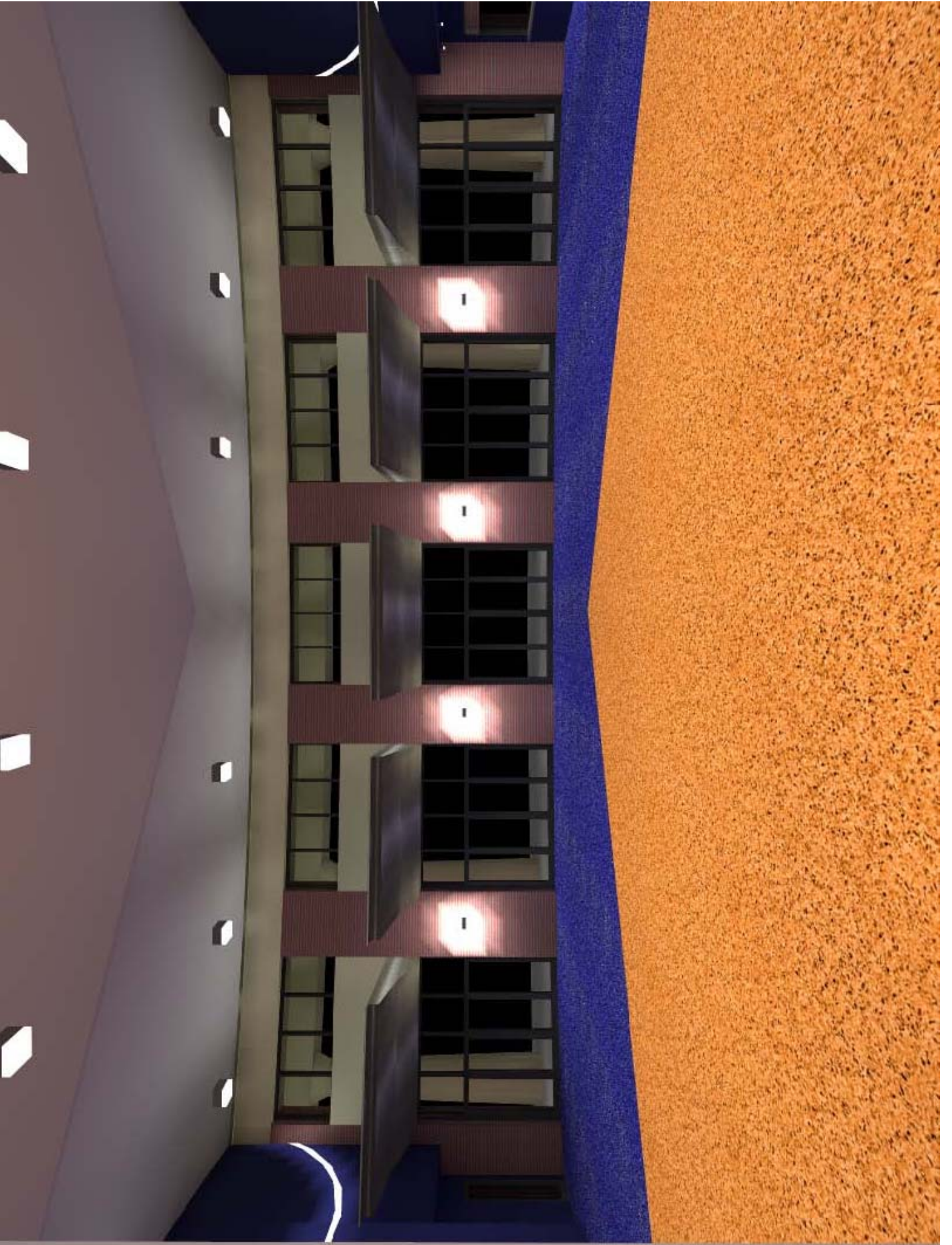












APPENDIX D: Lighting Product Specifications

Luminaire Cut Sheets

Lamp Catalogues

Ballast Cut Sheets



FIXTURE A-C-O

DULUX® D/E 4-PIN ECOLOGIC® COMPACT FLUORESCENT LAMPS

Nominal Wattage	Bulb	MOL		Base	Product Number	Ordering Abbreviation	NEMA Generic Designation	Pkg Qty	Avg Rated Life (hrs)	CCT (K)	CRI	Approx Lumens		Symbols & Footnotes
		(in)	(mm)									Initial @25°C/77°F	Mean @77°C/170°F	
26	T (T4)	5.2	124	GX24Q-3	20767	CF26DT/E/827/ECO	CFTR26W/GX24Q/827	50	12000	2700	82	1800	1548	1,2,5,6,7,12,20
					20995	CF26DT/E/835/ECO/BL/1	CFTR26W/GX24Q/835	50	12000	3500	82	1800	1548	1,2,5,6,7,12,20
32	T (T4)	5.8	147	GX24Q-3	20768	CF32DT/E/827/ECO	CFTR32W/GX24Q/827	50	12000	2700	82	2400	2064	1,2,5,6,7,12,18,20

DULUX T/E/IN AMALGAM, 4-PIN ECOLOGIC COMPACT FLUORESCENT LAMPS

For electronic ballast for high and low temperature applications. Lamps have End-of-Lamp Life (EOL) Protection

Nominal Wattage	Bulb	MOL		Base	Product Number	Ordering Abbreviation	NEMA Generic Designation	Pkg Qty	Avg Rated Life (hrs)	CCT (K)	CRI	Approx Lumens		Symbols & Footnotes
		(in)	(mm)									Initial @25°C/77°F	Mean @95°C/203°F	
18	T (T4)	4.4	111	GX24Q-2	20875	CF18DT/E/IN/827/ECO	CFTR18W/GX24Q/827	50	12000	2700	82	1164	1001	1,2,5,6,7,12,20,21
					20876	CF18DT/E/IN/830/ECO	CFTR18W/GX24Q/830	50	12000	3000	82	1164	1001	1,2,5,6,7,12,20,21
					20877	CF18DT/E/IN/835/ECO	CFTR18W/GX24Q/835	50	12000	3500	82	1164	1001	1,2,5,6,7,12,20,21
					20878	CF18DT/E/IN/841/ECO	CFTR18W/GX24Q/841	50	12000	4100	82	1164	1001	1,2,5,6,7,12,20,21
26	T (T4)	5.0	126	GX24Q-3	20879	CF26DT/E/IN/827/ECO	CFTR26W/GX24Q/827	50	12000	2700	82	1746	1501	1,2,5,6,7,12,20,21
					20880	CF26DT/E/IN/830/ECO	CFTR26W/GX24Q/830	50	12000	3000	82	1746	1501	1,2,5,6,7,12,20,21
					20881	CF26DT/E/IN/835/ECO	CFTR26W/GX24Q/835	50	12000	3500	82	1746	1501	1,2,5,6,7,12,20,21
					20882	CF26DT/E/IN/841/ECO	CFTR26W/GX24Q/841	50	12000	4100	82	1746	1501	1,2,5,6,7,12,20,21
32	T (T4)	5.6	142	GX24Q-3	20883	CF32DT/E/IN/827/ECO	CFTR32W/GX24Q/827	50	12000	2700	82	2328	2002	1,2,5,6,7,12,18,20,21
					20884	CF32DT/E/IN/830/ECO	CFTR32W/GX24Q/830	50	12000	3000	82	2328	2002	1,2,5,6,7,12,18,20,21
					20885	CF32DT/E/IN/835/ECO	CFTR32W/GX24Q/835	50	12000	3500	82	2328	2002	1,2,5,6,7,12,18,20,21
					20886	CF32DT/E/IN/841/ECO	CFTR32W/GX24Q/841	50	12000	4100	82	2328	2002	1,2,5,6,7,12,18,20,21
42	T (T4)	6.5	163	GX24Q-4	20887	CF42DT/E/IN/827/ECO	CFTR42W/GX24Q/827	50	12000	2700	82	3104	2670	1,2,5,6,7,12,18,20,21
					20888	CF42DT/E/IN/830/ECO	CFTR42W/GX24Q/830	50	12000	3000	82	3104	2670	1,2,5,6,7,12,18,20,21
					20871	CF42DT/E/IN/835/ECO	CFTR42W/GX24Q/835	50	12000	3500	82	3104	2670	1,2,5,6,7,12,18,20,21
					20890	CF42DT/E/IN/841/ECO	CFTR42W/GX24Q/841	50	12000	4100	82	3104	2670	1,2,5,6,7,12,18,20,21
57	T (T4)	7.76	197	GX24Q-5	20895	CF57DT/E/IN/827/ECO	CFTR57W/GX24Q/827	50	12000	2700	82	4171	3587	1,2,5,6,12,18,20,21
					20896	CF57DT/E/IN/830/ECO	CFTR57W/GX24Q/830	50	12000	3000	82	4171	3587	1,2,5,6,12,18,20,21
					20897	CF57DT/E/IN/835/ECO	CFTR57W/GX24Q/835	50	12000	3500	82	4171	3587	1,2,5,6,12,18,20,21

COMPACT FLUORESCENT

FLUORESCENT

PENTRON® T5 FLUORESCENT LAMPS
PENTRON® High Output, High Performance T5 Lamps

Nominal Wattage	Bulb	Nominal Length (in)	MOL (in)	Base	Product Number	Ordering Abbreviation	Pkg Qty	Avg Rated Life @3hrs/start (@12hrs/start)	CCT (K)	CRI	Approx Lumens Initial @25°C/77°F	Approx Lumens Mean @35°C/95°F	Symbols & Footnotes			
54	T5	48	45.8	Mini Bipin	20903	FP54/830/HO/ECO	40	25000 (35000)	3000	85	4450 5000	4138 4650	31,33,38,48, 74,76			
					20904	FP54/835/HO/ECO	40	25000 (35000)	3500	85	4450 5000	4138 4650	31,33,38,48, 74,76			
					21020	FP54/835/HO/ECO/SL	40	25000 (35000)	3500	85	4316 4850	4014 4510	31,33,38,48, 74,76,96,98			
					20906	FP54/841/HO/ECO	40	25000 (35000)	4100	85	4450 5000	4138 4650	31,33,38,48, 74,76			
					21021	FP54/841/HO/ECO/SL	40	25000 (35000)	4100	85	4316 4850	4014 4510	31,33,38,48, 74, 76,96,98			
					20949	FP54/850/HO/ECO	40	25000 (35000)	5000	85	4375 4900	4069 4557	31,33,38,48, 74,76			
					21022	FP54/850/HO/ECO/SL	40	25000 (35000)	5000	85	4243 4753	3946 4420	31,33,38,48, 74, 76,96,98			
					20862	FP54/865/HO/ECO	40	25000 (35000)	6500	85	4050 4750	3766 4418	31,33,38,48, 74,76			
					20997	FP54/RED/HO	40	20000							3300	15,31,33,38,48,74
					20998	FP54/GREEN/HO	40	20000							5550	15,31,33,38,48,74
20999	FP54/BLUE/HO	40	20000							1150	15,31,33,38,48,74					
24	T5	24	22.2	Mini Bipin	20928	FP24/830/HO/ECO	40	20000	3000	85	1750 2000	1627	31,33,38,48, 74,76			
					20929	FP24/835/HO/ECO	40	20000	3500	85	1750 2000	1627	31,33,38,48, 74,76			
					20931	FP24/841/HO/ECO	40	20000	4100	85	1750 2000	1627	31,33,38,48, 74,76			
39	T5	36	34	Mini Bipin	20932	FP39/830/HO/ECO	40	20000	3000	85	3100 3500	2883	31,33,38,48, 74,76			
					20933	FP39/835/HO/ECO	40	20000	3500	85	3101 3500	2883	31,33,38,48, 74,76			
					20934	FP39/841/HO/ECO	40	20000	4100	85	3102 3500	2883	31,33,38,48, 74,76			
80	T5	60	57.6	Mini Bipin	20935	FP80/830/HO/ECO	40	20000	3000	85	6150 7000	5719 6510	31,33,38,48, 74,76			
					20936	FP80/835/HO/ECO	40	20000	3500	85	6151 7000	5720 6510	31,33,38,48, 74,76			
					20937	FP80/841/HO/ECO	40	20000	4100	85	6152 7000	5721 6510	31,33,38,48, 74,76			

PENTRON® High Output, Wide Temperature Range T5 Lamps

Nominal Wattage	Bulb	Nominal Length (in)	MOL (in)	Base	Product Number	Ordering Abbreviation	Pkg Qty	Avg Rated Life @3hrs/start (@12hrs/start)	CCT (K)	CRI	Approx Lumens Initial @25°C/77°F	Approx Lumens Mean @35°C/95°F	Symbols & Footnotes
54	T5	48	45.8	Mini Bipin	21042	FP54/835/C/HO/ECO	40	25000 (35000)	3500	85	4900 4900	4655 4655	31,33,38,48, 74,76
					21043	FP54/841/C/HO/ECO	40	25000 (35000)	4100	85	4900 4900	4655 4655	31,33,38,48, 74,76
					21044	FP54/850/C/HO/ECO	40	25000 (35000)	5000	85	4800 4800	4560 4560	31,33,38,48, 74,76

PENTRON® T5 FLUORESCENT LAMPS

PENTRON® T5 lamps are designed to operate on dedicated electronic programmed rapid start (also know as programmed start) ballasts only. These lamps are globally standardized and are designed to operate with their peak light output at 35°C (95°F) ambient temperature. For comparison purposes and to accommodate existing lamp measurement standards, ratings are given at both 25°C (77°F) and 35°C (95°F). The new lamp dimensions allow for innovative fixture designs and improved fixture performance

PENTRON® High Performance T5 Lamps

Nominal Wattage	Bulb	Nominal Length (in)	MOL (in)	Base	Product Number	Ordering Abbreviation	Pkg Qty	Avg Rated Life @3hrs/start (@12hrs/start)	CCT (K)	CRI	Approx Lumens Initial @25°C/77°F	Approx Lumens Mean @35°C/95°F	Symbols & Footnotes
28	T5	48	45.8	Mini Bipin	20868	FP28/830/ECO	40	20000	3000	85	2600	2418	81, 33, 33, 48, 74, 76
					20901	FP28/835/ECO	40	20000	3500	85	2600	2418	81, 33, 33, 48, 74, 76
					20902	FP28/841/ECO	40	20000	4100	85	2600	2418	81, 33, 33, 48, 74, 76
					22203	FP28/850/ECO	40	20000	5000	85	2545	2367	81, 33, 33, 48, 74, 76
					20990	FP28/865/ECO	40	20000	6500	85	2400	2232	81, 33, 33, 48, 74, 76
					20977	FP28RED 40/CS 1/SKU	40	20000			2100		15, 31, 33, 33, 48, 74
					20978	FP28GREEN 40/CS 1/SKU	40	20000			3500		15, 31, 33, 33, 48, 74
					20986	FP28BLUE 40/CS 1/SKU	40	20000			700		15, 31, 33, 33, 48, 74
14	T5	24	22.2	Mini Bipin	20907	FP14/830/ECO	40	20000	3000	85	1200	1116	81, 33, 33, 48, 74, 76
					20908	FP14/835/ECO	40	20000	3500	85	1200	1116	81, 33, 33, 48, 74, 76
					20914	FP14/841/ECO	40	20000	4100	85	1200	1116	81, 33, 33, 48, 74, 76
					20988	FP14/865/ECO	40	20000	6500	85	1100	1045	81, 33, 33, 48, 74, 76
21	T5	36	34	Mini Bipin	20919	FP21/830/ECO	40	20000	3000	85	1900	1767	81, 33, 33, 48, 74, 76
					20921	FP21/835/ECO	40	20000	3500	85	1900	1767	81, 33, 33, 48, 74, 76
					20924	FP21/841/ECO	40	20000	4100	85	1900	1767	81, 33, 33, 48, 74, 76
					20989	FP21/865/ECO	40	20000	6500	85	1750	1662	81, 33, 33, 48, 74, 76
35	T5	60	57.6	Mini Bipin	20925	FP35/830/ECO	40	20000	3000	85	3300	3069	81, 33, 33, 48, 74, 76
					20926	FP35/835/ECO	40	20000	3500	85	3300	3069	81, 33, 33, 48, 74, 76
					20927	FP35/841/ECO	40	20000	4100	85	3300	3069	81, 33, 33, 48, 74, 76

PENTRON® PREMIER™ High Performance T5 Lamps

Nominal Wattage	Bulb	Nominal Length (in)	MOL (in)	Base	Product Number	Ordering Abbreviation	Pkg Qty	Avg Rated Life @3hrs/start (@12hrs/start)	CCT (K)	CRI	Approx Lumens Initial @25°C/77°F	Approx Lumens Mean @35°C/95°F	Symbols & Footnotes
28	T5	48	45.8	Mini Bipin	20948	FP28/830PM/ECO	40	20000	3000	85	2730	2594	81, 33, 33, 48, 74, 76
					20943	FP28/835PM/ECO	40	20000	3500	85	2730	2594	81, 33, 33, 48, 74, 76
					20944	FP28/841PM/ECO	40	20000	4100	85	2730	2594	81, 33, 33, 48, 74, 76



FIXTURE E

DULUX S/E 4-PIN COMPACT FLUORESCENT LAMPS

for Dimming and Electronic Ballast. Lamps have End-of-lamp Life (EOL) Protection

Nominal Wattage	Bulb	MOL		Base	Product Number	Ordering Abbreviation	NEMA Generic Designation	Pkg Qty	Avg Rated Life (hrs)	CCT (K)	CRI	Approx Lumens @25°C/77°F		Symbols & Footnotes
		(in)	(mm)									Initial	Mean	
5	S (T4)	3.4	85	2G7	20311	CF5DS/E/827	CFT5W/2G7/827	50	10000	2700	82	230	198	1,2,5,12,16,20
					20315	CF5DS/E/841	CFT5W/2G7/841	50	10000	4100	82	230	198	1,2,5,12,16,20
7	S (T4)	4.5	115	2G7	20312	CF7DS/E/827	CFT7W/2G7/827	50	10000	2700	82	400	344	1,2,5,12,16,20
					20316	CF7DS/E/841	CFT7W/2G7/841	50	10000	4100	82	400	344	1,2,5,12,16,20
9	S (T4)	5.7	145	2G7	20313	CF9DS/E/827	CFT9W/2G7/827	50	10000	2700	82	580	499	1,2,5,12,20
					20317	CF9DS/E/841	CFT9W/2G7/841	50	10000	4100	82	580	499	1,2,5,12,20
13	S (T4)	6.2	157	2GX7	20314	CF13DS/E/827	CFT13W/2GX7/827	50	10000	2700	82	800	688	1,2,5,12,20
					20284	CF13DS/E/830	CFT13W/2GX7/830	50	10000	3000	82	800	688	1,2,5,12,20
					20318	CF13DS/E/841	CFT13W/2GX7/841	50	10000	4100	82	800	688	1,2,5,12,20

DULUX D PREHEAT 2-PIN ECOLOGIC® COMPACT FLUORESCENT LAMPS

With starter in Lamp Base for Magnetic Ballast

Nominal Wattage	Bulb	MOL		Base	Product Number	Ordering Abbreviation	NEMA Generic Designation	Pkg Qty	Avg Rated Life (hrs)	CCT (K)	CRI	Approx Lumens @25°C/77°F		Symbols & Footnotes
		(in)	(mm)									Initial	Mean	
9	D (T4)	4.3	110	G23-2	20537	CF9DD/827/RP/ECO	CFQ9W/G23/827	10	10000	2700	82	525	452	1,4,6,11,12,20,22
					20689	CF9DD/827/ECO	CFQ9W/G23/827	50	10000	2700	82	525	452	1,4,6,11,12,20,22
					20783	CF9DD/830/ECO	CFQ9W/G23/830	50	10000	3000	82	525	452	1,4,6,11,12,20,22
					20690	CF9DD/835/ECO	CFQ9W/G23/835	50	10000	3500	82	525	452	1,4,6,11,12,20,22
13	D (T4)	4.6	118	GX23-2	20691	CF13DD/827/ECO	CFQ13W/GX23/827	50	10000	2700	82	780	671	1,4,6,11,12,20,22
					20705	CF13DD/830/ECO	CFQ13W/GX23/830	50	10000	3000	82	780	671	1,4,6,11,12,20,22
					20692	CF13DD/835/ECO	CFQ13W/GX23/835	50	10000	3500	82	780	671	1,4,6,11,12,20,22
					20708	CF13DD/841/ECO	CFQ13W/GX23/841	50	10000	4100	82	780	671	1,4,6,11,12,20,22
18	D (T4)	6.0	153	G24D-2	20676	CF18DD/827/ECO	CFQ18W/G24D/827	50	10000	2700	82	1150	989	1,4,6,11,12,20,22
					20709	CF18DD/830/ECO	CFQ18W/G24D/830	50	10000	3000	82	1150	989	1,4,6,11,12,20,22
					20677	CF18DD/835/ECO	CFQ18W/G24D/835	50	10000	3500	82	1150	989	1,4,6,11,12,20,22
					20678	CF18DD/841/ECO	CFQ18W/G24D/841	50	10000	4100	82	1150	989	1,4,6,11,12,20,22
26	D (T4)	6.8	173	G24D-3	20679	CF26DD/827/ECO	CFQ26W/G24D/827	50	10000	2700	82	1710	1470	1,4,6,11,12,20,22
					20710	CF26DD/830/ECO	CFQ26W/G24D/830	50	10000	3000	82	1710	1470	1,4,6,11,12,20,22
					20680	CF26DD/835/ECO	CFQ26W/G24D/835	50	10000	3500	82	1710	1470	1,4,6,11,12,20,22
					20681	CF26DD/841/ECO	CFQ26W/G24D/841	50	10000	4100	82	1710	1470	1,4,6,11,12,20,22

COMPACT FLUORESCENT

OCTRON® AND OCTRON® CURVALUME® FLUORESCENT LAMPS

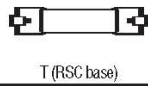
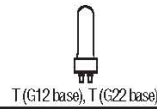
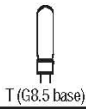
OCTRON® lamps are T8 fluorescent lamps designed to be operated on dedicated magnetic rapid start or electronic instant start or programmed rapid start (also known as programmed start) ballasts. For details on various lamp/ballast system combinations, please refer to the Systems Performance Guide in the "SYLVANIA QUICKTRONIC® Ballast Technology and Specification Guide".

OCTRON® 800 XPS® Lamps

Nominal Wattage	Bulb	Nominal Length (in)	MOL (in)	Base	Product Number	Ordering Abbreviation	Pkg Qty	Avg Rated Life @3hrs/start (@12hrs/start)	CCT (K)	CRI	Approx Lumens Initial @25°C/77°F	Approx Lumens Mean @25°C/77°F	Symbols & Footnotes
32	T8	48	47.78	Med Bipin	21680	F032/830/XPS/ECO	30	36000 (42000)	3000	85	3100	2945	19,31,23,48, 52,76,94
					21697	F032/835/XPS/ECO	30	36000 (42000)	3500	85	3100	2945	19,31,23,48, 52,76,94
					21681	F032/841/XPS/ECO	30	36000 (42000)	4100	85	3100	2945	19,31,23,48, 52,76,94
					21660	F032/850/XPS/ECO	30	36000 (42000)	5000	80	3000	2850	19,31,23, 48,52,76,94
					21659	F032/865/XPS/ECO	30	36000 (42000)	6500	80	2900	2750	19,31,23, 48,52,76,94
17	T8	24	23.78	Med Bipin	22150	F017/830/XPS/ECO	30	30000	3000	85	1400	1330	21,33,48,52, 76,93,94
					22151	F017/835/XPS/ECO	30	30000	3500	85	1400	1330	21,33,48,52, 76,93,94
					22152	F017/841/XPS/ECO	30	30000	4100	85	1400	1330	21,33,48,52, 76,93,94
25	T8	36	35.78	Med Bipin	22153	F025/830/XPS/ECO	30	30000	3000	85	2200	2090	31,33,48,52, 76,93,94
					22154	F025/835/XPS/ECO	30	30000	3500	85	2200	2090	31,33,48,52, 76,93,94
					22155	F025/841/XPS/ECO	30	30000	4100	85	2200	2090	31,33,48,52, 76,93,94

OCTRON® 800 XP® 4 Foot SUPERSAVER® Lamps

Nominal Wattage	Bulb	Nominal Length (in)	MOL (in)	Base	Product Number	Ordering Abbreviation	Pkg Qty	Avg Rated Life @3hrs/start (@12hrs/start)	CCT (K)	CRI	Approx Lumens Initial @25°C/77°F	Approx Lumens Mean @25°C/77°F	Symbols & Footnotes
25		48	47.78	Med Bipin	22232	F032/25W/830/XP/SS/ECO	30	36000 (42000)	3000	85	2475	2350	3,16,17,18, 20,31,33,76,94
					22233	F032/25W/835/XP/SS/ECO	30	36000 (42000)	3500	85	2475	2350	3,16,17,18, 20,31,33,76,94
					22234	F032/25W/841/XP/SS/ECO	30	36000 (42000)	4100	85	2475	2350	3,16,17,18, 20,31,33,76,94
					22235	F032/25W/850/XP/SS/ECO	30	36000 (42000)	5000	85	2300	2185	3,16,17,18, 20,31,33,76,94
					28	T8	48	47.78	Med Bipin	22177	F028/830/XP/SS/ECO	30	36000 (42000)
					22178	F028/835/XP/SS/ECO	30	36000 (42000)	3500	85	2725	2590	3,16,20,23, 31,23,44,76,94,95
					22179	F028/841/XP/SS/ECO	30	36000 (42000)	4100	85	2725	2590	3,16,20,23, 31,23,44,76,94,95
					22184	F028/850XP/SS/ECO	30	36000 (42000)	5000	80	2600	2470	3,16,20, 23,31,33,76,94,95



FIXTURE G-H

POWERBALL® CERAMIC METALARC® TUBULAR SINGLE-ENDED High CRI, Pulse Start, UV Stop – Enclosed Fixtures Only

Watts	Bulb	Base	Product Number	Ordering Abbreviation	ANSI Code	Pkg Qty	Lamp Finish	Operating Position	Fix Req	Avg Rated Life (hrs)	Approx Lumens (initial)	Approx Lumens (mean)	CRI	CCT (K)	Symbols & Footnotes
20	T4.5	G8.5	64882	MC20TC/U/G8.5/830PB	M156/E	12	Clear	Universal	E	12000	1700	1275	83	3000	1,4,18,24,25,30,48
39	T4.5	G8.5	64791	MC39TC/U/G8.5/830PB	M130/E	12	Clear	Universal	E	12000	3400	2720	82	3000	1,4,18,24,25,30,48
	T6	G12	64363	MC39T6/U/G12/830PB	M130/E	12	Clear	Universal	E	12000	3400	2720	82	3000	1,4,18,24,25,30,48
			64325	MC39T6/U/G12/940PB	M130/E	12	Clear	Universal	E	12000	3300	2640	90	4200	1,4,18,24,25,26,30,48
70	T4.5	G8.5	64825	MC70TC/U/G8.5/930PB	M139/E, M98/E	12	Clear	Universal	E	12000	6300	5040	95	3000	1,4,18,24,25,26,30,48
	T6	G12	64361	MC70T6/U/G12/830PB	M139/E, M98/E	12	Clear	Universal	E	12000	7000	5600	87	3000	1,4,18,24,25,26,30,48
			64200	MC70T6/U/G12/930PB	M139/E, M98/E	12	Clear	Universal	E	12000	6400	5120	95	3000	1,4,18,24,25,26,30,48
			64338	MC70T6/U/G12/940PB	M139/E, M98/E	12	Clear	Universal	E	12000	6700	5360	93	4200	1,4,18,24,25,26,30,48
150	T7.5	G12	64359	MC150T7.5/U/G12/830	M102/E, M142/E	12	Clear	Universal	E	12000	15500	12400	89	3000	1,4,18,24,30,31,48
			64337	MC150T7.5/U/G12/940PB	M102/E, M142/E	12	Clear	Universal	E	12000	14500	11600	95	4200	1,4,18,24,30,31,48
250	T9	G22	64167	MC250T9/U/G22/830PB	M80/E	10	Clear	Universal	E	12000	24500	19600	86	3000	1,4,18,24,30,31,48

POWERBALL® CERAMIC METALARC® TUBULAR DOUBLE-ENDED

Watts	Bulb	Base	Product Number	Ordering Abbreviation	ANSI Code	Pkg Qty	Lamp Finish	Operating Position	Fix Req	Avg Rated Life (hrs)	Approx Lumens (initial)	Approx Lumens (mean)	CRI	CCT (K)	Symbols & Footnotes
70	T6	RX7s RSC	64793	MC70T6/DE/830PB	M139/E, M85/E, M98/E	12	Clear	HOR ± 45°	E	12000	6900	5520	88	3000	1,4,18,25,26,30,35,48
150	T7.5	RX7s RSC	64794	MC150T7.5/DE/830PB	M102/E, M142/E, M81/E	12	Clear	HOR ± 45°	E	12000	14800	11840	91	3000	1,4,18,30,37,48

POWERBALL® CERAMIC METALARC® PAR High CRI, Pulse Start, UV Stop – Open or Enclosed Fixtures

Watts	Bulb	Base	Product Number	Ordering Abbreviation	ANSI Code	Pkg Qty	Beam Type	Beam Angle	Operating Position	Fix Req	Avg Rated Life (hrs)	Approx Lumens (initial)	Approx Lumens (mean)	CRI	CCT (K)	Symbols & Footnotes
20	PAR30LN	E26 Med	64879	MCP20PAR30LN/U/830/SP/ECOPB	M156/O	6	SP	10°	Universal	O	12000	24000	1200	82	3100	1,4,7,17,24,30,48
			64878	MCP20PAR30LN/U/830/FL/ECOPB	M156/O	6	FL	30°	Universal	O	12000	4000	1200	82	3100	1,4,7,17,24,30,48
39	PAR20	E26 Med	64824	MCP39PAR20/U/830/SPPB	M130/O	12	SP	10°	Universal	O	12000	20000	2000	87	3000	1,4,17,24,25,30,48
			64826	MCP39PAR20/U/830/FLPB	M130/O	12	FL	30°	Universal	O	12000	5000	2000	87	3000	1,4,17,24,25,30,48
	PAR30LN	E26 Med	64880	MCP39PAR30LN/U/830/SP/ECOPB	M130/O	6	SP	10°	Universal	O	12000	39600	2300	85	3000	1,4,7,17,24,25,30,48
			64881	MCP39PAR30LN/U/830/FL/ECOPB	M130/O	6	FL	30°	Universal	O	12000	8000	2300	85	3000	1,4,7,17,24,25,30,48



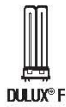
FIXTURE I

POWERBALL® CERAMIC METALARC® PAR High CRI, Pulse Start, UV Stop – Open or Enclosed Fixtures

Watts	Bulb	Base	Product Number	Ordering Abbreviation	ANSI Code	Pkg Qty	Beam Type	Beam Angle	Operating Position	Fix Req	Avg Rated Life (hrs)	MBCP	Approx Lumens (initial)	CRI	CCT (K)	Symbols & Footnotes
39	PAR30LN	E26 Med	64885	MCP39PAR30LN/U/830/WFL/ECOPB	M130/O	6	VWFL	46°	Universal	O	12000	3500	2300	85	3000	1,4, 7,17,24,25,31,48
70	PAR30LN	E26 Med	64201	MCP70PAR30LN/U/930/SP/ECOPB	M139/O, M98/O	6	SP	12°	Universal	O	12000	42000	3600	95	3000	1,4, 7,17,25,26,30,48
			64202	MCP70PAR30LN/U/930/FL/ECOPB	M139/O, M98/O	6	FL	30°	Universal	O	12000	12000	3600	95	3000	1,4, 7,17,25,26,30,48
	PAR38	E26 Med Skt	64749	MCP70PAR38/U/830/SP/ECOPB	M139/O, M98/O	6	SP	15°	Universal	O	12000	40000	4300	88	3000	1,4,7, 17,26,30,38,48
			64750	MCP70PAR38/U/830/FL/ECOPB	M139/O, M98/O	6	FL	25°	Universal	O	12000	16000	4300	88	3000	1,4,7, 17,26,30,38,48
			64751	MCP70PAR38/U/WFL/830/ECOPB	M139/O, M98/O	6	VWFL	65°	Universal	O	12000	3500	4300	88	3000	1,4,7, 17,26,30,38,48
100	PAR38	E26 Med Skt	64752	MCP100PAR38/U/830/SP/ECOPB	M90/O, M140/O	6	SP	15°	Universal	O	12000	58000	6500	88	3000	1,4,7, 17,27,30,38,48
			64753	MCP100PAR38/U/830/FL/ECOPB	M90/O, M140/O	6	FL	25°	Universal	O	12000	25000	6500	88	3000	1,4,7, 17,27,30,38,48
			64754	MCP100PAR38/U/830/WFL/ECOPB	M90/O, M140/O	6	VWFL	60°	Universal	O	12000	6000	6500	88	3000	1,4,7, 17,27,30,38,48
150	PAR38	E26 Med Skt	64841	MCP150PAR38/U/830/SP/ECOPB	M102/O, M142/O	6	SP	15°	Universal	O	12000	50000	9100	88	3000	1,4,7, 17,31,38,48
			64842	MCP150PAR38/U/830/FL/ECOPB	M102/O, M142/O	6	FL	25°	Universal	O	12000	28000	9100	88	3000	1,4,7, 17,31,38,48
			64843	MCP150PAR38/U/830/WFL/ECOPB	M102/O, M142/O	6	VWFL	65°	Universal	O	12000	6500	9100	88	3000	1,4,7, 17,31,38,48

POWERBALL® CERAMIC METALARC® E17 & HIGH WATTAGE High CRI, Pulse Start – Open or Enclosed Fixtures

Watts	Bulb	Base	Product Number	Ordering Abbreviation	ANSI Code	Pkg Qty	Lamp Finish	Operating Position	Fix Req	Avg Rated Life (hrs)	Approx Lumens (initial)	(mean)	CRI	CCT (K)	Symbols & Footnotes
50	E17	E26 Med	64840	MCP50/U/MED/830PB	M110/O, M148/O	12	Clear	Universal	O	12000	4100	2850	88	3000	1,4,17, 30,48
			64849	MCP50/C/U/MED/830PB	M110/O, M148/O	12	Coated	Universal	O	12000	3800	2640	88	2900	1,4,17, 30,48
70	E17	E26 Med	64739	MCP70/U/MED/830PB	M139/O, M98/O	12	Clear	Universal	O	16000	5900	4365	88	3000	1,4,17, 26,30,48
			64740	MCP70/C/U/MED/830PB	M139/O, M98/O	12	Coated	Universal	O	16000	5500	3900	88	3000	1,4,17, 26,30,48
			64193	MCP70/U/MED/940PB	M139/O, M98/O	12	Clear	Universal	O	12000	6000	4800	93	4000	1,4,17,26,30,48
			64194	MCP70/C/U/MED/940PB	M139/O, M98/O	12	Coated	Universal	O	12000	5600	4480	93	3800	1,4,17,26,30,48
100	E17	E26 Med	64743	MCP100/U/MED/830PB	M90/O, M140/O	12	Clear	Universal	O	16000	9000	6660	88	3000	1,4,17,27, 30,48
			64744	MCP100/C/U/MED/830PB	M90/O, M140/O	12	Coated	Universal	O	16000	8100	5994	88	3000	1,4,17,27, 30,48
			64322	MCP100/U/MED/940PB	M90/O, M140/O	12	Clear	Universal	O	20000	8200	6150	93	4000	1,4,17, 27,30,48
			64315	MCP100/C/U/MED/940PB	M90/O, M140/O	12	Clear	Universal	O	20000	7500	5625	90	4000	1,4,17,27,48



FIXTURE J

DULUX® L HIGH LUMEN ECOLOGIC® COMPACT FLUORESCENT LAMPS

Nominal Wattage	Bulb	MOL		Base	Product Number	Ordering Abbreviation	NEMA Generic Designation	Pkg Qty	Avg Rated Life (hrs)	CCT (K)	CRI	Approx Lumens @25°C/77°F		Symbols & Footnotes	
		(in)	(mm)									Initial	Mean		
50	L (T5)	22.6	573	2G11	20280	FT50DL/830/RS/ECO	FT50W/2G11/RS/830	10	14000	3000	82	4300	3655	1,2,5,12,20	
55	L (T5)	21.1	535	2G11	20590	FT55DL/830/ECO	FT55W/2G11/830	10	12000	3000	82	4800	4128	1,2,5,12,17,20	
					20726	FT55DL/930/ECO	FT55W/2G11/30	10	12000	3000	90	4800	4128	1,2,5,12,17,20	
					20591	FT55DL/835/ECO	FT55W/2G11/835	10	12000	3500	82	4800	4128	1,2,5,12,17,20	
					20592	FT55DL/841/ECO	FT55W/2G11/841	10	12000	4100	82	4800	4128	1,2,5,12,17,20	
					20725	FT55DL/954/ECO	FT55W/2G11/50	10	12000	5400	90	4800	4128	1,2,5,12,17,20	
80	L (T5)	22.6	4.5	2G11	20572	FT80DL/830/ECO	FT80W/2G11/830	10	12000	3000	82	6000	5160	1,2,5,12,17,20	
				573	2G11	20622	FT80DL/835/ECO	FT80W/2G11/835	10	12000	3500	82	6000	5160	1,2,5,12,17,20
				4.5	2G11	20624	FT80DL/841/ECO	FT80W/2G11/841	10	12000	4100	82	6000	5160	1,2,5,12,17,20

DULUX F FLAT COMPACT FLUORESCENT LAMPS

Nominal Wattage	Bulb	MOL		Base	Product Number	Ordering Abbreviation	NEMA Generic Designation	Pkg Qty	Avg Rated Life (hrs)	CCT (K)	CRI	Approx Lumens @25°C/77°F		Symbols & Footnotes
		(in)	(mm)									Initial	Mean	
18	F (T5)	4.8	122	2G10	20551	CF18DF/830	CFM18W/2G10/830	10	10000	3000	82	1100	946	1,2,5,12,19,20
					20552	CF18DF/841	CFM18W/2G10/841	10	10000	4100	82	1100	946	1,2,5,12,19,20
24	F (T5)	6.7	171	2G10	20553	CF24DF/830	CFM24W/2G10/830	10	10000	3000	82	1700	1462	1,2,5,12,19,20
					20558	CF24DF/841	CFM24W/2G10/841	10	10000	4100	82	1700	1462	1,2,5,12,19,20
36	F (T5)	8.5	217	2G10	20559	CF36DF/830	CFM36W/2G10/830	10	10000	3000	82	2800	2408	1,2,5,12,19,20
					20560	CF36DF/841	CFM36W/2G10/841	10	10000	4100	82	2800	2408	1,2,5,12,19,20

DULUX EL SELF-BALLASTED COMPACT FLUORESCENT LAMPS

Mini Twist Compact Fluorescent Lamps

Nominal Wattage	Bulb	MOL		Base	Product Number	Ordering Abbreviation	Voltage	Pkg Qty	Avg Rated Life (hrs)	CCT (K)	CRI	Approx Lumens @25°C/77°F		Symbols & Footnotes
		(in)										Initial	Mean	
7	MINITWIST	4.4	Medium	2G10	29451	CF7EL/MINI/827	120	6	8000	2700	82	375	300	1,3,8,9,12,14,20
					29379	CF7EL/MINI/830	120	6	8000	3000	82	375	300	1,3,8,9,12,14,20
					29371	CF7EL/MINI/830/BL	120	6	8000	3000	82	375	300	1,3,8,9,12,14,20
		4.2	Medium	2G10	29697	CF7EL/SUPER/830/BL	120	6	10000	3000	82	375	300	1,3,8,9,12,14,20
11	MINITWIST	4.2	Medium	2G10	29766	CF11EL/SUPER/830/BL	120	6	10000	3000	82	600	480	1,3,8,9,12,14,20
					29378	CF11EL/MINI/830	120	6	8000	3000	82	600	480	1,3,8,9,12,14,20
					29364	CF11EL/MINI/830/BL	120	6	8000	3000	82	600	480	1,3,8,9,12,14,20
13	MINITWIST	4.6	Medium	2G10	29409	CF13EL/MINI/827	120	6	10000	2700	82	800	640	1,3,8,9,12,14,20



FIXTURE K

TUNGSTEN HALOGEN

TRU-AIM TITAN® MR16 LAMPS

UV Filter capsule with axial filament in covered constant color, hard coated dichroic reflector.

Watts	Bulb	Base	Product Number	Symbols & Footnotes	Ordering Abbreviation	Volts	Pkg Qty	Beam Type	Class & Filament	Avg Rated Life(hrs)	Lumens CCT	CBCP	Beam Angle	MOL (in)
50	MR16	GU5.3 Bipin	58310	62,65,91, 93,145	50MR16/T/WFL60/C(FM)	12	20	WFL	C, AXIAL	4000	3000	1100	60	1.75
			58500	62,65,91, 93,145	50MR16/T/DAY/NFL25/C	12	10	NFL	C, AXIAL	4000	3050	2650	25	1.75
65	MR16	GU5.3 Bipin	58311	62,65,92, 93	65MR16/T/SP10/C(FPA)	12	20	SP	C, AXIAL	4000	3000	13300	10	1.75
			58312	62,65,92, 93	65MR16/T/NFL25/C(FPC)	12	20	NFL	C, AXIAL	4000	3000	3800	25	1.75
			58313	62,65,92, 93	65MR16/T/FL35/C(FPB)	12	20	FL	C, AXIAL	4000	3000	2000	35	1.75

TRU-AIM BRILLIANT® MR16 LAMPS

UV Filter capsule with axial filament in constant color, aluminized reflector.

A suitable protective shield, screening technique or both shall be used to protect people and surroundings from the possibility of a lamp shattering.

Watts	Bulb	Base	Product Number	Symbols & Footnotes	Ordering Abbreviation	Volts	Pkg Qty	Beam Type	Class & Filament	Avg Rated Life(hrs)	Lumens CCT	CBCP	Beam Angle	MOL (in)
20	MR16	GU5.3 Bipin	58314	33,62,91, 117	20MR16B/SP10	12	20	SP	C, AXIAL	4000	3000	5000	10	1.75
			58315	33,62,91, 117	20MR16B/FL35	12	20	FL	C, AXIAL	4000	3000	780	35	1.75
35	MR16	GU5.3 Bipin	58316	33,62,92, 117	35MR16B/SP10	12	20	SP	C, AXIAL	4000	3000	9100	10	1.75
			58317	33,62,92, 117	35MR16B/FL35	12	20	FL	C, AXIAL	4000	3000	1500	35	1.75
50	MR16	GU5.3 Bipin	58319	33,62,92, 117	50MR16B/SP10	12	20	SP	C, AXIAL	4000	3000	12500	10	1.75
			58320	33,62,92, 117	50MR16B/NFL25	12	20	NFL	C, AXIAL	4000	3000	4400	25	1.75
			58321	33,62,92, 117	50MR16B/FL35	12	20	FL	C, AXIAL	4000	3000	2200	35	1.75

TRU-AIM® MR16 LAMPS

UV Filter capsule with axial filament in covered dichroic reflector.

Watts	Bulb	Base	Product Number	Symbols & Footnotes	Ordering Abbreviation	Volts	Pkg Qty	Beam Type	Class & Filament	Avg Rated Life(hrs)	Lumens CCT	CBCP	Beam Angle	MOL (in)
20	MR16	GU5.3 Bipin	54305	45,62,91, 93,145	20MR16/SP10/C(ESX)	12	20	SP	C, AXIAL	2000	3000	3000	10	1.75
			54306	45,62,91, 93,145	20MR16/FL35/C(BAB)	12	20	FL	C, AXIAL	2000	3000	510	35	1.75
35	MR16	GU5.3 Bipin	54307	45,62,92, 93,145	35MR16/SP10/C(FRB)	12	20	SP	C, AXIAL	2000	3000	6000	10	1.75
			58322	45,62,92, 93,145	35MR16/NFL25/C	12	20	NFL	C, AXIAL	2000	3000	2000	25	1.75
			58324	45,62,92, 93,145	35MR16/FL35/C(FVW)	12	20	FL	C, AXIAL	2000	3000	1000	35	1.75
50	MR16	GU5.3 Bipin	58325	45,62,92, 93,145	50MR16/SP10/C(EXT)	12	20	SP	C, AXIAL	2000	3000	7800	10	1.75



F40T8 TL830 ALTO

Product family description
T8 Medium Bi-Pin.

Notes

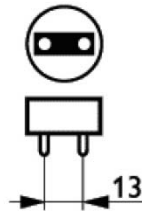
- Rated average life under specified test conditions with lamps turned off and restarted no more frequently than once every 3 operating hours. Lamp life is appreciably longer if lamps are started less frequently. (202)
- Approximate Initial Lumens. The lamp lumen output is based upon lamp performance after 100 hours of operating life, when the output is measured during operation on a reference ballast under standard laboratory conditions. (203)
- For expected lamp lumen output, commercial ballast manufacturers can advise the appropriate Ballast Factor for each of their ballasts when they are informed of the designated lamp. The Ballast Factor is a multiplier applied to the designated lamp lumen output. (204)
- Design Lumens are the approximate lamp lumen output at 40% of the lamp's Rated Average Life. This output is based upon measurements obtained during lamp operation on a reference ballast under standard laboratory conditions. (208)

Product data	
Product Number	368316
Full product name	F40T8 TL830 ALTO
Ordering Code	F40T8/TL830/ALTO
Pack type	1 Lamp
Pieces per Sku	1
Skus/Case	25
Pack UPC	046677368319
EAN2US	
Case Bar Code	50046677368314
Successor Product number	
Base	Medium Bi-Pin [Medium Bi-Pin Fluorescent]
Base Information	Green Base
Bulb	T8
Packing Type	1LP [1 Lamp]
Packing Configuration	25
Type	F40T8
Feature	ALTO®
Rated Avg. Life [3 hr Start]	20000 hr
Ordering Code	F40T8/TL830/ALTO

Product data	
Pack UPC	046677368319
Case Bar Code	50046677368314
Energy Saving	Energy Saving
Watts	40W
Mercury (Hg) Content	3.5 mg
Picogram per Lumen Hour	50 p/LuHr
Color Code	TL830 [CCT of 3000K]
Color Rendering Index	86 Ra8
Color Designation	TL830
Color Temperature	3000 K
Initial Lumens	3775 Lm
Design Mean Lumens	3500 Lm
Nominal Length [inch]	60
Product Number	368316



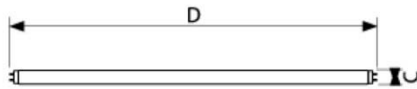
F-T8-RS Med Bipin/GB



Base Medium Bi-Pin



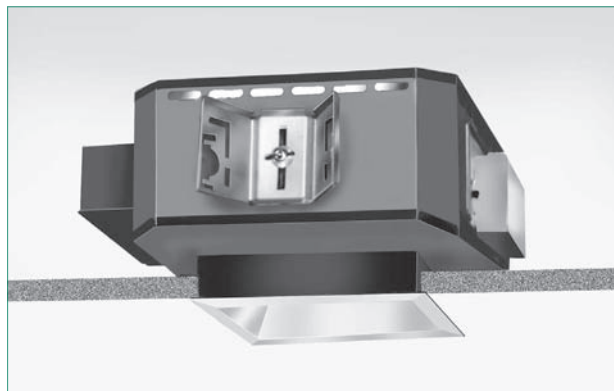
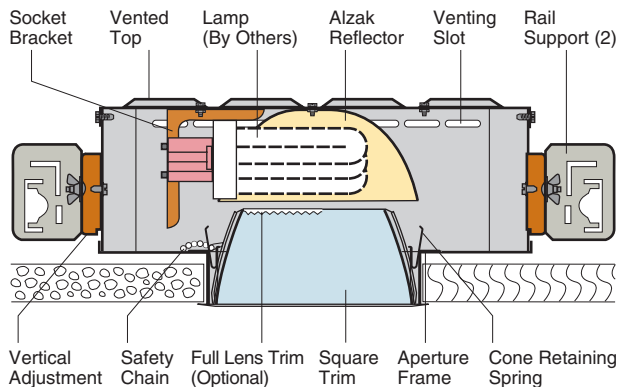
Energy Saving Energy Saving



F-T8-RS Med Bipin

H8643

Shallow Depth, Wide Beam Downlight
One 26-32-42W Triple Tube Compact Fluorescent
6" Square Parabolic Trim



Optics and Applications

The socket is mounted horizontally in an ellipsoidal primary reflector for wide distribution and reduced recess depth in shallow plenums. Use in low to medium height ceilings for corridors, entries and for general and area lighting.

Design Features

A steel housing protects and aligns reflectors and lamps. The socket and ballast will accept all triple tube wattages interchangeably. The square trim is stabilized by a proprietary steel web to prevent racking and is held to the ceiling by constant pressure springs. Maximum ceiling thickness 1 1/2". Ballast and lamp service from below.

Finish

Housings and structural parts are painted matte black to suppress stray light leaks. Standard trims are anodized Softglow® clear. Special finishes, textures and colors are available, see below under Accessories.

Trim Textures

Textured trims create a subtle new aperture appearance. Select among different embossed patterns to match the ambiance of the space being illuminated. Refer to Squares brochure for descriptive photos.

Ballasts

Fully electronic, microprocessor controlled with programmed start to assure rated lamp life. Input voltage ranges from 120V through 277V. Operates 26, 32 or 42W lamps interchangeably. Power factor .98, starting temperature 0°F (-18°C), THD<10%. Pre-heat start < 1.0 second. End of lamp life protection. Rated for > 50,000 starts.

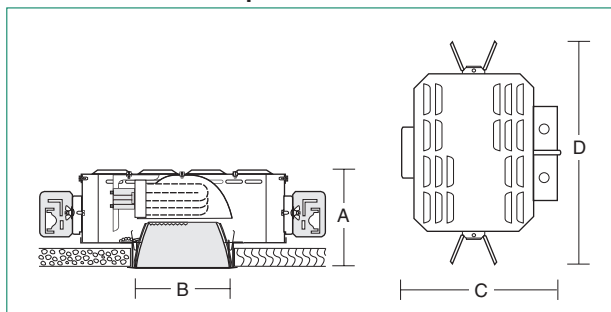
General

Fixtures are pre-wired, UL and C-UL listed for eight wire 75°C branch circuit wiring. Union made IBEW. Luminaire Efficiency Rating (LER) data is in the photometric directory located in Section Z.

Accessories

- R2 26" support rails.
 - R5 52" support rails.
 - SB Softglow black.
 - SG Softglow gold.
 - SH Softglow mocha.
 - SP Softglow graphite.
 - ST Softglow titanium.
 - SW Softglow wheat.
 - SY Softglow pewter.
 - SZ Softglow bronze.
 - BR Bright trim finish.
 - FR Frosting on lens.
 - F Fuse.
 - EM Emergency power includes integral charger light and test switch visible through aperture. Battery operation for 90 minutes.
 - FLT6 Full lens trim, specify lens type, e.g. H8643-FLT6LL.
 - WRL Wattage restriction label, specify wattage.
 - WT White trim flange.
 - WHT White complete trim.
 - BP Ball Peen texture.
 - CG Corrugated texture.
 - DS Distressed texture.
 - WV Woven texture.
 - LL Linear spread lens.
 - LP Large prism lens.
 - MP Microprism lens.
 - V347 347 volt ballast.
 - FC Four cell cross baffle.
 - DM Dimming ballast.
- Specify watts and volts.

Dimensions and Lamps



Number	A Depth	B Aperture	C Width	D Length	Lamps
H8643	6 1/2" 165mm	6" sq. 153mm	13 1/2" 343mm	19" 483mm	26-32-42W TripleTube compact fluorescent

Brightness

Number	Lamps	Beam Angle				
		85°	75°	65°	55°	45°
H8643	32W T/E Osram/Syl	31	97	203	1221	10019
	32W PL-T Philips	37	108	218	6698	13729
	42W PL-T Philips	40	151	273	6857	19941
	42W T/E Osram/Syl	53	185	367	4566	17420

Data in footlamberts. Photometer readings, Maximum Brightness Method.

Matching Square Units *

- Vertical lamp fluorescent [Page H22](#)
- Low voltage [Pages H5, H6](#)
- PAR lamps [Pages H7, H8, H9](#)
- Directional [Page H9](#)
- Halogena, A lamps [Page H10](#)
- Tungsten halogen [Page H11](#)
- Metal halide [Pages H26, H27, H28](#)
- Wall washer [Page H37](#)

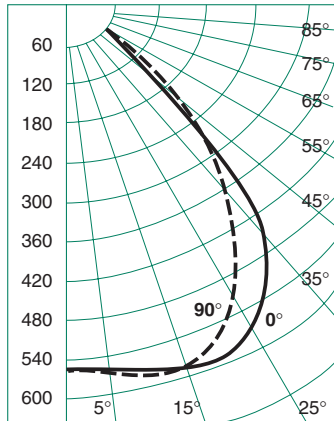
* Click for link to pages in blue.

H23 H8643

Performance Datachart

Single Unit Initial Footcandles, 30° Work Plane						Ceiling to Floor		Multiple Units Initial Footcandles, 30° Work Plane			
H8643 One 32W Philips Triple Tube Read Top Data								Ceiling 80% Walls 50% Floor 20%			
H8643 One 42W Philips Triple Tube Read Bottom Data								Spacing is Maximum Over Work Plane			
Nadir		10°		20°		30°					
FC	Diam	FC	Diam	FC	Diam			Spacing	RCR 1	RCR 3	RCR 8
19	2'	18	2'	16	4'	10	6'	7'	23	19	15
29	2'	27	2'	21	4'	13	6'	6'	38	32	21
21	2'	13	2'	11	5'	7	8'	8'	16	14	11
18	2'	19	2'	15	5'	10	8'	7'	27	23	15
10	3'	10	3'	8	5'	5	9'	9'	12	10	8
16	3'	14	3'	11	5'	7	9'	8'	20	17	11
8	3'	8	3'	7	6'	4	10'	10'	10	8	6
12	3'	11	3'	9	6'	6	10'	9'	16	14	9
6	3'	6	3'	5	7'	3	11'	12'	8	6	5
10	3'	9	3'	7	7'	4	11'	10'	13	11	7

Candlepower Distribution

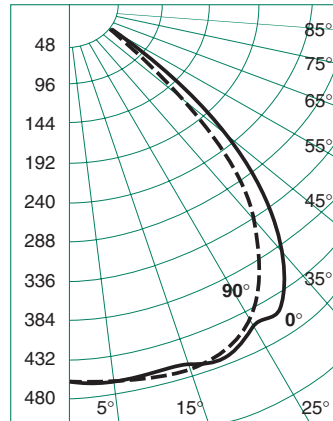


H8643 One 32W Triple Tube Philips
Eff. 39% S/M 0° 1.30 S/M 90° 1.14

Candelas

°	0°	90°
	2400*	2400*
0	560	560
5	561	565
10	568	579
15	585	581
20	588	567
25	558	516
30	521	431
35	455	359
40	358	283
45	256	194
50	165	124
55	92	59
60	22	21
65	9	12
70	0	0
75	0	0
80	0	0
85	0	0
90	0	0

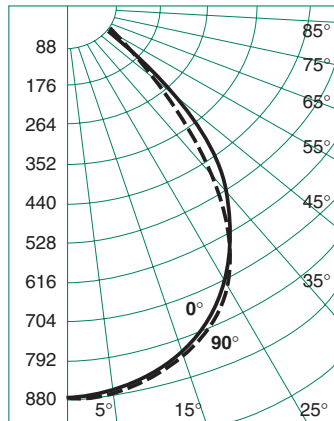
° Vertical Angles
* Initial Lamp Lumens



H8643 One 32W Triple Tube Osram Sylvania
Eff. 33% S/M 0° 1.36 S/M 90° 1.24

°	0°	90°
	2400*	2400*
0	457	457
5	466	460
10	464	470
15	469	476
20	475	473
25	448	452
30	457	399
35	396	337
40	316	255
45	233	170
50	136	99
55	52	34
60	13	14
65	8	9
70	6	7
75	0	0
80	0	0
85	0	0
90	0	0

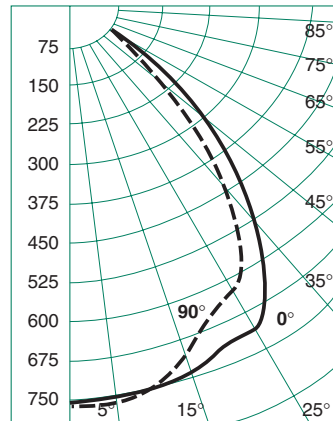
° Vertical Angles
* Initial Lamp Lumens



H8643 One 42W Triple Tube Philips
Eff. 38% S/M 0° 1.07 S/M 90° 1.06

°	0°	90°
	3200*	3200*
0	880	880
5	866	869
10	842	843
15	813	816
20	768	781
25	694	710
30	619	602
35	508	461
40	386	322
45	266	235
50	172	173
55	107	113
60	50	50
65	19	17
70	0	0
75	0	0
80	0	0
85	0	0
90	0	0

° Vertical Angles
* Initial Lamp Lumens



H8643 One 42W Triple Tube Osram Sylvania
Eff. 35% S/M 0° 1.21 S/M 90° 1.13

°	0°	90°
	3200*	3200*
0	757	757
5	750	761
10	751	741
15	746	704
20	725	647
25	718	625
30	632	569
35	529	454
40	408	315
45	288	194
50	185	128
55	102	81
60	40	36
65	15	15
70	0	0
75	0	0
80	0	0
85	0	0
90	0	0

° Vertical Angles
* Initial Lamp Lumens

Notes

- Softglow® cone multipliers: Gold x .89, Wheat x .87, Pewter x .73, Mocha x .75, Graphite x .70, Titanium x .70, Bronze x .68.
- Single unit Datachart pattern diameters are determined by the number of degrees from each side of nadir. Therefore a 20° diameter represents a total 40° pattern width at the work plane 30" above the floor. Footcandle values are at the edge of that diameter.
- Datachart spacing is rounded off to the nearest foot.
- Data by IES methods. Compact fluorescent data vary due to lamp lumen differences, power input, burning position, ambient temperature and ballast characteristics. A modification factor should be applied.
- Brightness data from the Average Luminance Method are inaccurate for small aperture downlights. They are theoretical calculations derived for large surfaces such as troffers. For a complete discussion refer to section Z brochure Z1.

Coefficients of Utilization

Ceiling	80%				70%		50%		30%		0
	70	50	30	10	50	10	50	10	50	10	0
Wall %	Zonal Cavity Method - Floor Reflectance 20%										
RCR	Zonal Cavity Method - Floor Reflectance 20%										
1	.43	.41	.40	.39	.41	.39	.39	.38	.38	.36	.35
2	.40	.38	.36	.35	.37	.34	.36	.34	.35	.33	.31
3	.38	.35	.33	.31	.34	.31	.33	.30	.32	.30	.29
4	.35	.32	.30	.28	.32	.28	.31	.27	.30	.27	.26
5	.33	.29	.27	.25	.29	.25	.28	.25	.28	.24	.24
6	.31	.27	.25	.23	.27	.23	.26	.22	.26	.22	.22
7	.29	.25	.23	.21	.25	.21	.24	.21	.24	.20	.20
8	.28	.23	.21	.19	.23	.19	.23	.19	.22	.19	.18
9	.26	.22	.19	.18	.22	.18	.21	.17	.21	.17	.17
10	.25	.20	.18	.16	.20	.16	.20	.16	.20	.16	.16

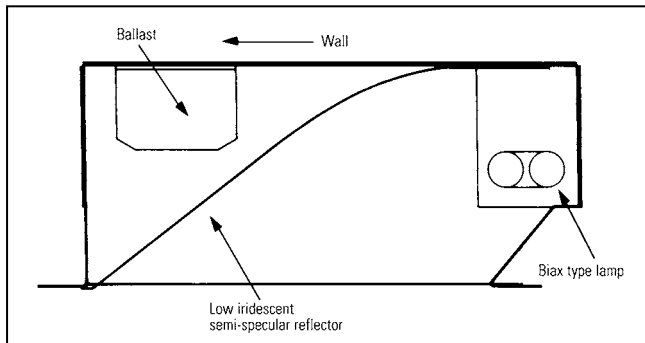
See notes 2, 3 and 4.

Features

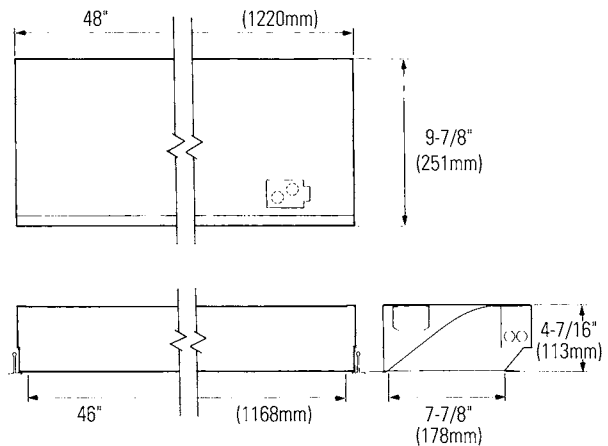
- Low iridescent semi-specular reflective system for precise controlled light output.
- Evenly lights vertical surfaces or displays (no scallops).
- 87% energy savings vs. incandescent.
- Less than 3:1 maximum to minimum wall illumination when installed 6 feet on center.
- 20,000 hours lamp life requires less maintenance than incandescent.
- Can be installed only 2 feet from wall to farthest edge of fixture (3' maximum).
- Fits all standard and narrow grid ceiling systems.
- One-piece body and integral hanger for easy, quick installation.
- UL-Listed access plate.
- Meets NYC Code requirements.



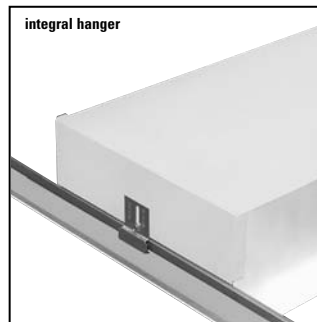
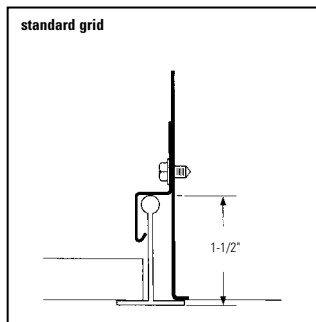
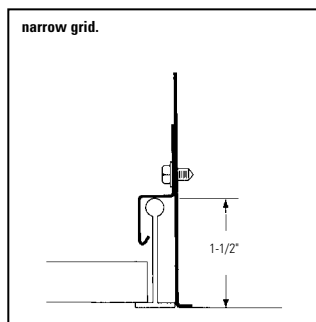
Features



Dimensions



Mounting Methods



Job Information	Type:
Job Name:	
Cat. No.:	
Lamp(s):	
Volts/Ballast:	

Lightolier a Genlyte Company www.lightolier.com
 Technical Information: (978) 657-7600 • Fax (978) 658-0595
 631 Airport Road, Fall River, MA 02720 • (508) 679-8131 • Fax (508) 674-4710
 We reserve the right to change details of design, materials and finish.
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Walmaster WMRL244120SB

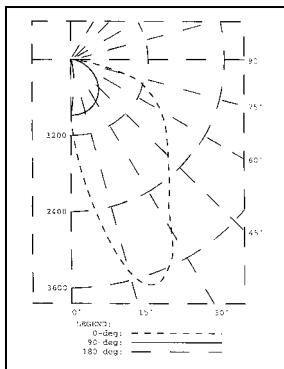
High Performance, 4', Recessed Wallwasher/Accent Light Two Twin Tube TT5 Lamps

Photometry

Model No. WMRL244120SB

LER = FP - 51.6 IW - 86.7 BF - 0.95

Comparative yearly lighting energy cost per 1000 lumens = \$4.65



Coefficients of utilization — zonal cavity method

	RF	20			20			20		
	RC	80			50			30		
	RW	70	50	30	50	30	10	50	30	10
room cavity ratio	1	81	77	74	72	70	68	70	67	66
	2	73	67	62	63	59	55	60	57	54
	3	67	59	52	55	50	46	53	49	45
	4	61	52	45	49	43	39	47	42	38
	5	56	46	39	44	38	33	42	37	33
	6	51	41	34	39	33	29	38	33	29
	7	48	37	31	35	30	26	34	29	25
	8	44	34	27	32	27	23	31	26	23
	9	41	31	25	30	24	20	29	24	20
	10	39	29	22	27	22	18	27	22	18

FOOTCANDLES ON WALL Fixtures 3 feet from wall to outside trim on lamp side of fixture

Ceiling	INDIVIDUAL WALMASTER								MULTIPLE UNITS							
	0'	1'	2'	3'	4'	5'	6'	7'	← 6' →							
8'	116	88	51	30	19	13	10	08	135	109	77	67	77	110	137	
7'	119	102	71	45	28	18	14	11	142	130	108	88	109	133	147	
6'	92	83	64	45	31	22	16	12	117	114	104	99	105	117	123	
5'	69	64	53	40	30	22	16	13	95	95	92	90	94	99	192	
4'	52	50	43	35	27	21	17	13	79	80	79	79	81	84	86	
3'	40	39	35	30	24	19	15	13	66	67	67	69	70	71	72	
2'	32	31	29	25	21	17	15	12	56	57	58	59	60	61	61	
1'	26	25	23	21	18	15	13	12	47	49	50	51	51	52	52	
Floor																

Ceiling	MULTIPLE UNITS								CONTINUOUS ROW									
	← 8' →								0'	1'	2'	3'	4'	5'	6'	7'	8'	
8'	124	97	61	43	37	43	61	97	124	151	134	119	139	162	140	122	140	162
7'	128	113	85	65	58	65	85	113	128	166	167	164	176	186	178	170	178	186
6'	102	95	80	67	62	67	80	96	102	142	149	152	159	164	162	159	162	164
5'	80	77	69	62	59	62	70	77	80	119	126	131	136	139	139	139	139	139
4'	64	63	60	56	54	56	60	63	64	100	106	112	115	117	118	119	118	117
3'	52	52	51	49	47	49	51	52	52	85	90	94	97	99	100	101	100	99
2'	43	44	43	42	42	42	43	44	43	73	77	80	83	85	86	86	86	85
1'	35	36	36	36	36	36	36	36	36	63	66	68	70	72	72	73	72	72
Floor																		

Ordering Information

Explanation of Catalog Number. Example: WMRL244120SBGLR

WM	R	L	2	4				
Walmaster: Low iridescent semi-specular wallwash	Recessed	Reflector: L = Low iridescent semi-specular aluminum	Lamps	Length: 4=48"	Watts: 1=18 Watts 2=24 Watts 4=40 Watts 5=50 Watts 6=55 Watts	Voltage: 120 or 277	Ballast Type: <20THD <10THD	Options: Add appropriate suffix to catalog no., ie: (GLR)

Options/Accessories

Fusing: Internal fast-blow fusing. Suffix: **GLR**.

Internal slow-blow fusing. Suffix: **GMF**.

Radio Interference Filter: To order one RIF per fixture, Suffix: **R**.

To order one RIF per ballast, Suffix: **B**.

Electrical/Wiring Options: Consult factory.

Fluorescent Emergency Lighting System: Factory-installed emergency power battery pack with charger and inverter. Suffix: **EM**.

Drywall Frame: Catalog Number: **WL4DF/UNV**.

Specifications

Materials: Chassis parts are die-formed 20 gauge cold rolled steel with integral adjustable hanger clamp. **Reflectors**—low iridescent semi-specular aluminum are standard.

Finish: Chassis exterior—phosphate undercoating, baked white acrylic enamel. **Reflector**—low iridescent semi-specular IS standard.

Electrical: Rapid start HPF, thermally protected class "P" ballast (Biax type). If K.O. is within 3" of ballast, use wire suitable for at least 90°.

Labels: I.B.E.W./UL and ULc Listed.



optional drywall frame WL4DF/UNV.

Job Information

Type:

Lightolier a Genlyte Company

www.lightolier.com

Technical Information: (978) 657-7600 • Fax (978) 658-0595

631 Airport Road, Fall River, MA 02720 • (508) 679-8131 • Fax (508) 674-4710

We reserve the right to change details of design, materials and finish.

© 2005 a Genlyte company

Section5/Folio K10-16 Rev. A

LIGHTOLIER®

GER

COMPACT FLUORESCENT - OPAQUE PENDANT

OPAQUE

Application Concept...General and task lighting that offers a unique solution to lower glare without compromising visual comfort. Intended for use in hospitality, corporate and retail environments that require more than the usual aesthetics and performance.

Finish

Metalized finishes or painted.

Reflectors

Precision crafted and anodized .050 aluminum.

Mounting

Surface - Accommodates standard 3.5" or 4" octagonal junction box
 Recessed - Precision stamped 16 gauge galvanized steel.
 Accommodates ceilings up to 1-3/8" thick.

UL Listed

UL Listed Damp Location. IBEW union made.



aperture REQUIRED	lamp REQUIRED	fixture finish REQUIRED	interior reflector finish REQUIRED	exterior reflector finish OPTIONAL	suspension method REQUIRED	decorative element REQUIRED	electrical options OPTIONAL	voltage REQUIRED
GER10	57PLT 42PLT 32PLT 26PLT 18PLT Socket Type CFM57W/GX24q-5 CFM42W/GX24q CFM32W/GX24q CFM26W/GX24q CFM18W/GX24q	GR graphite PW pewter TI titanium CO copper PC patina copper BR bronze RU iron oxide BQ baroque BK black (paint) WH white (paint) AL aluminum (paint) finish applied to all exterior metal parts. for custom RAL colors consult factory	CS clear specular CSS clear semi-specular HZ haze	A anodized anodized option leaves the exterior of reflector as an anodized finish matching the interior finish specified, creating greater contrast between fixture components	C cord black standard white cord supplied with white fixtures standard length is 120" and can be field modified A aircraft cable black coiled cord, stainless cable - white cord is supplied with white fixtures standard length is 120" of pre-coiled cord and yields an effective suspension length of 12" to 48" S stem stem finish to match fixture standard length is 24" —for other requirements consult factory	FXB flat cross baffle FLD floating luminous disk FLR floating luminous ring T flange trim T option can be ordered with the FXB, FLD, FLR. example: FXBT	F1 fuse 120 F2 fuse 277 F3 fuse 347 EM emergency-remote battery may be installed a maximum of 48" from fixture. consult factory for specific design solutions. consult factory for other ballast option	U 120-277V CFL electronic ballast 3 347V CFL DL1 Dimming, Lutron Compact SE, 120v DL2 Dimming, Lutron Compact SE, 277v DX1 Dimming, Advance Mark X, 120v DX2 Dimming, Advance Mark X, 277v dimming is Lutron Compact SE 5% standard.

Omega Lighting 5 Year Limited Warranty
 U.L. and C.U.L. listed damp location. For Wet Location and Wet Location Covered Ceiling, consult factory.
 IBEW union made.
 Due to the natural aging process of Origins Rust, Patina Copper, and Baroque metalized finishes, variations may exist between fixtures.



CAT NO.: _____
 TYPE: _____
 PROJECT: _____

ORI-7.1

8/08

OMEGA LIGHTING: 776 South Green St., Tupelo, MS 38804 Phone 662.842.7212 FAX 662.841.5501

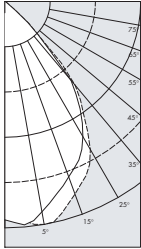
Omega Lighting is a Philips group brand

PHILIPS

photometric data

— 0° (parallel)
 - - - 90° (normal)

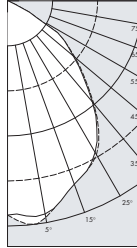
Additional photometric test files are available at www.originslighting.com



DEGREES	CANDELA		FOOT LAMBERTS
	AT 0°	AT 90°	
90	0	0	
85	1	1	66
75	2	3	56
65	6	6	82
55	18	19	186
45	259	262	2122
35	769	736	
25	1078	982	
15	1231	1119	
5	1233	1258	
0	1225	1225	

1032PLT-CS

Report number: 25483
 Lamp: CFT32W
 Total Lumens: 2400
 Fixture Efficiency: 69.2%
 S/MH: 1.2, 1.1
 IES file: F25483.IES
 Beam Angle: 79.48

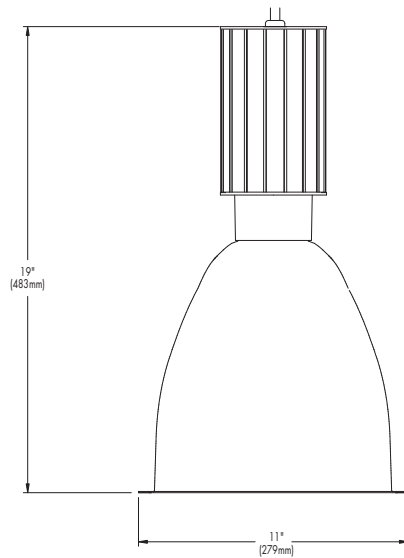


DEGREES	CANDELA		FOOT LAMBERTS
	AT 0°	AT 90°	
90	1	1	
85	2	2	132
75	8	8	178
65	61	63	845
55	478	479	4805
45	755	739	6085
35	1099	1076	
25	1295	1297	
15	1421	1430	
5	1550	1493	
0	1481	1481	

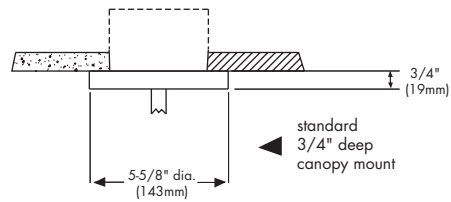
1057PLT-CS

Report number: 25496
 Lamp: CFT57W
 Total Lumens: 4300
 Fixture Efficiency: 67.2%
 S/MH Ratio: 1.2, 1.2
 IES file: F25496.IES
 Beam Angle: 89.95

dimensions



canopy mount dimensions



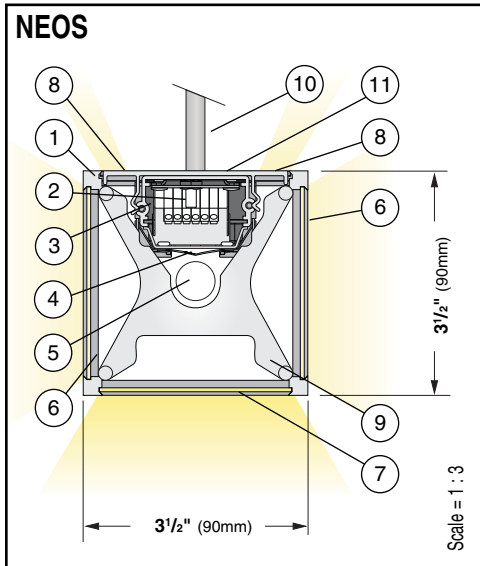
NEO[®] Linear Fluorescent Pendant



Project: _____ Type: _____ Qty: 0

NEOS	1T5					120	
Fixture Series	Lamp Type	Bottom Shielding	Mounting	Nominal Length	Endplates*	Voltage	
Options							

Series	Lamp Type	Bottom Shielding	Mounting	Nominal Length	Endplates	Voltage	Options
NEOS NEO [®] Pendant	1T5 F21T5 (3') F28T5 (4')	MI Microprismatic Diffuser Lens	C Cable RS 4' Rigid Stem	003 3 foot ind.	SE* Short Endplates	120 277	DM Dimming (ECO10)
		OD Opal Lens		004 4 foot ind.	LE* Long Endplates		SIGN Full-Color Signage ¹
				RUN! Runs and Closed Configs. Select "RUN!" on PDF pull down list to access RUN CONFIGURATOR	* for individual fixtures only (003 and 004). Use RUN CONFIGURATOR, to specify endplates and joiners for runs and configurations. (see PART LIST on p.8 for joiner & endplate specifications)	LCAN Ø5" canopy covers at all non-feed suspension points (cable mount runs only, stem mount and all individuals supplied standard with Ø5" canopy covers)	
							¹ Consult factory for details.



- Housing** - Sharp cornered polished, high-quality extruded aluminum, clean seams and machined flush glass .
 - Ballast** - Electronic, high power factor, pre-wired, class "P", type "A" sound rating. Specify 120v or 277v. Must be low-profile ballasts with Dimming option, consult factory for details.
 - Gear Tray** - Extruded aluminum, with white painted finish. Gear tray installed as a complete electrical unit and held in place with quick disconnects.
 - Reflector** - Specular, high quality aluminum reflector to direct light toward working surface.
 - Lamp** - 21W T5 for nominal 3 ft. luminaires, or 28W T5 for nominal 4 ft. luminaires. (lamps supplied by others)
 - Side Shielding** - Machined flush glass with Opal Lens inserts on sides provides for mostly direct lighting with a distinctive amount of indirect and side-light, and with excellent glare control in longitudinal, lateral, and all diagonal planes.
 - Bottom Shielding** - Machined flush glass with choice of Opal Lens insert or Microprismatic Diffuser Lens insert. Allows uniform light distribution on working plane.
 - Top Shielding** - Satine diffuser lens on sides of gear tray. Allows soft, indirect light distribution.
 - Inner Support Bracket** - Supplied nominally every foot.
 - Suspensions** - Cable suspensions or 1/2" O.D. stems are 4' from ceiling to top of luminaire and may be cut in field. Assembly should be fed as per NEC through 4 x 4 junction box (supplied and installed by others). Polished aluminum Ø5" canopy supplied for all stem mount locations and feed locations with cable mount; polished aluminum Ø2" canopy supplied at all non-feed locations with cable mount.
 - Gear Tray Access System** - (not shown) Allows for easy access and removal of ballast and gear tray. Handle slips inside fixture when not in use.
- Interior Luminaire Finish** - Highly polished aluminum body, with white gear trays and inner support brackets.

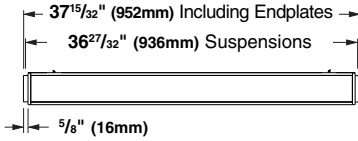
SELUX Corp. © 2008
 TEL: (845) 691-7723
 FAX: (845) 691-6749
 www.selux.com/usa
 NEOS_0209 (ss1.2)

NRTL Listed (i.e. UL, CSA)
 Union Made Affiliated
 with **IBEW Local 363**

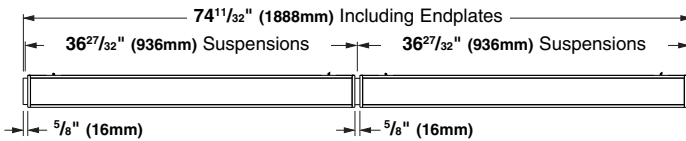
In a continuing effort to offer the best product possible, we reserve the right to change, without notice, specifications or materials that in our opinion will not alter the function of the product. Specification sheets found at www.selux.com/usa are the most recent versions and supercede all other printed or electronic versions.

NEOS 3' Layout Dimensions

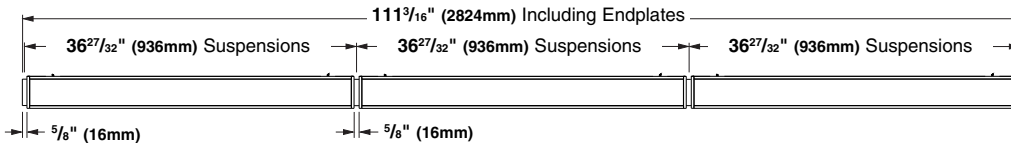
NEO suspended - 3 foot individual w/ Short Endplates



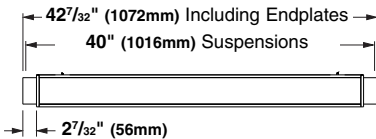
NEO suspended - 6 foot nominal w/Short Straight Bar joiner and Short Endplates



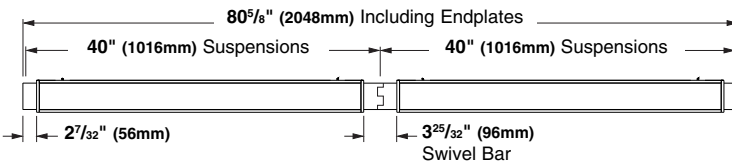
NEO suspended - 9 foot nominal w/Short Straight Bar joiners and Short Endplates



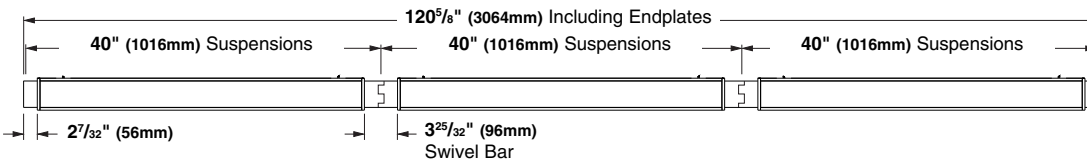
NEO suspended - 3 foot individual w/ Long Endplates



NEO suspended - 6 foot nominal w/ Swivel Bar joiner and Long Endplates



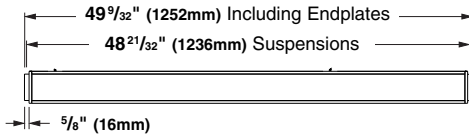
NEO suspended - 9 foot nominal w/ Swivel Bar joiners and Long Endplates



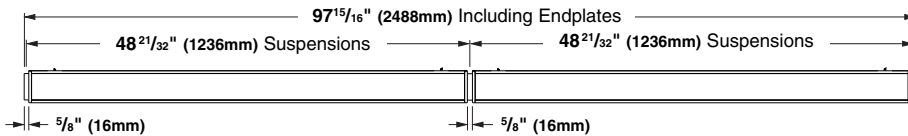
For continuous runs, use the "Run Configurator" included with PDF spec sheet (page 1) and is accessed by choosing "RUN!" from the "Length" pull down list. For other configurations please contact SELUX customer service or applications engineering for assistance (1-800-SELUX-CS).

NEOS 4' Layout Dimensions

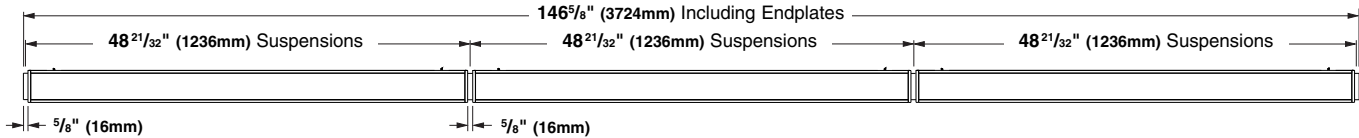
NEO suspended - 4 foot individual w/ Short Endplates



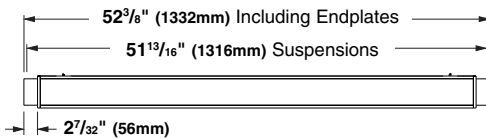
NEO suspended - 8 foot nominal w/Short Straight Bar joiner and Short Endplates



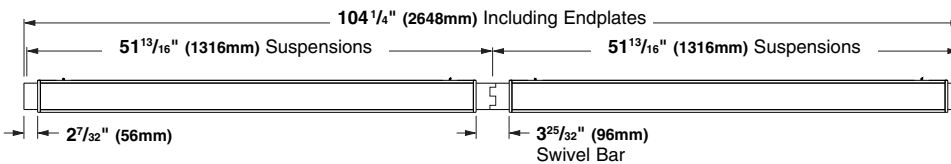
NEO suspended - 12 foot nominal w/Short Straight Bar joiners and Short Endplates



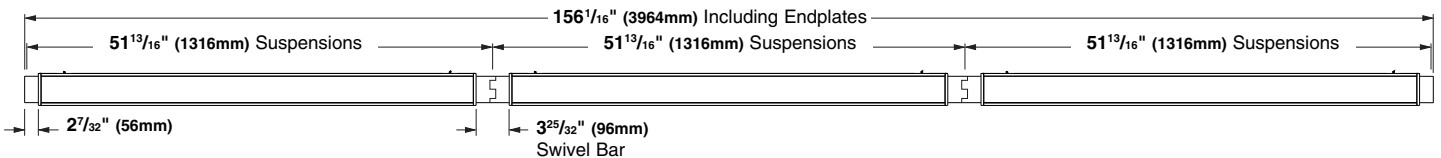
NEO suspended - 4 foot individual w/ Long Endplates



NEO suspended - 8 foot nominal w/ Swivel Bar joiner and Long Endplates



NEO suspended - 12 foot nominal w/ Swivel Bar joiners and Long Endplates



For continuous runs, use the "Run Configurator" included with PDF spec sheet (page 1) and is accessed by choosing "RUN!" from the "Length" pull down list. For other configurations please contact SELUX customer service or applications engineering for assistance (1-800-SELUX-CS).

Standard Endplates

Extended Endplate



Overall Dimensions:
3 1/2" (90mm) x 2 3/16" (56mm) x 5/8" (16mm)

Available with Cable and Rigid Stem Mount on outside endplates for single and multiple configurations. *Rigid Stem Mount shown.*

Order code: LE

Short Endplate



Overall Dimensions:
3 1/2" (90mm) x 5/8" (16mm) x 5/8" (16mm)

Available with Cable (non-feed ends only) and Rigid Stem Mount on outside endplates for single and multiple configurations. *Cable Mount shown.*

Order code: SE

Joiners

Swivel Bar



Overall Dimensions:
3 1/2" (90mm) x 3 13/16" (96mm) x 5/8" (16mm)

Available with Cable and Rigid Stem Mount for multiple configurations only. Variable corner bar allows up to 90° horizontal rotation in either direction. *Rigid Stem Mount shown.*

Order code: CB

Short Straight Bar



Overall Dimensions:
3 1/2" (90mm) x 5/8" (16mm) x 5/8" (16mm)

Available with Cable and Rigid Stem Mount for multiple configurations only. *Cable Mount shown.*

Order code: SB

Shielding

Microprismatic Diffuser Lens

Available for bottom (direct) side only, the specially designed acrylic Microprismatic Diffuser Lens directs more light onto task and work areas.

Order code: MI



Opal Lens

Provides a soft, diffuse light source for general lighting applications. Opal Lens is provided standard on lateral sides, and is optionally available on bottom (direct) side.

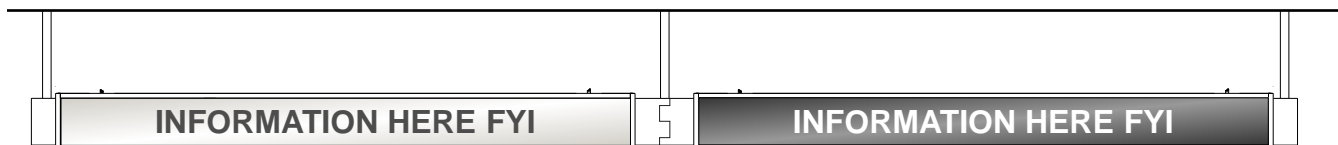
Order code: OD



Options

Signage Option

Full color signage option with text or logos on lateral sides. Consult factory for details.

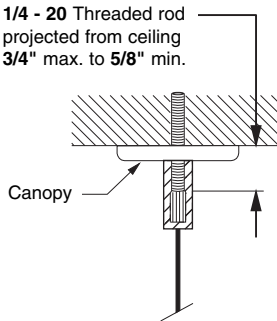


Cable Suspensions

Ordering Code: **C**

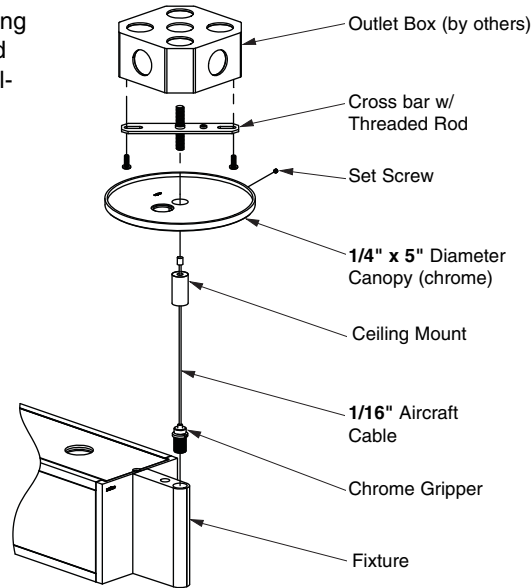
48" max. suspension from ceiling to top of luminaire and are field adjustable. Other lengths available, consult factory.

1/4 - 20 Threaded rod projected from ceiling 3/4" max. to 5/8" min.

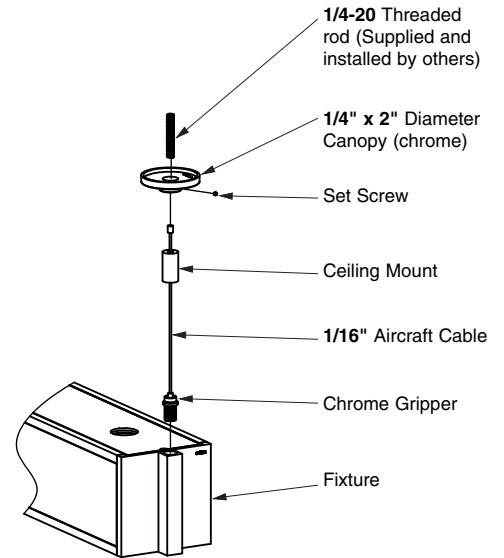


Feed Locations

18-5 Straight Feed Cord (Not Shown), Clear



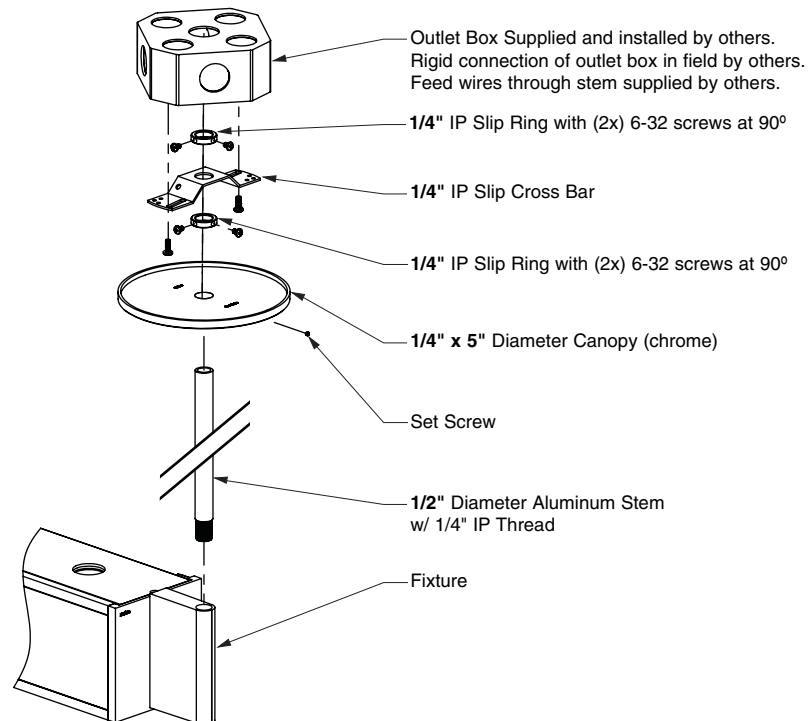
Non-Feed Locations



Rigid Stem Suspension

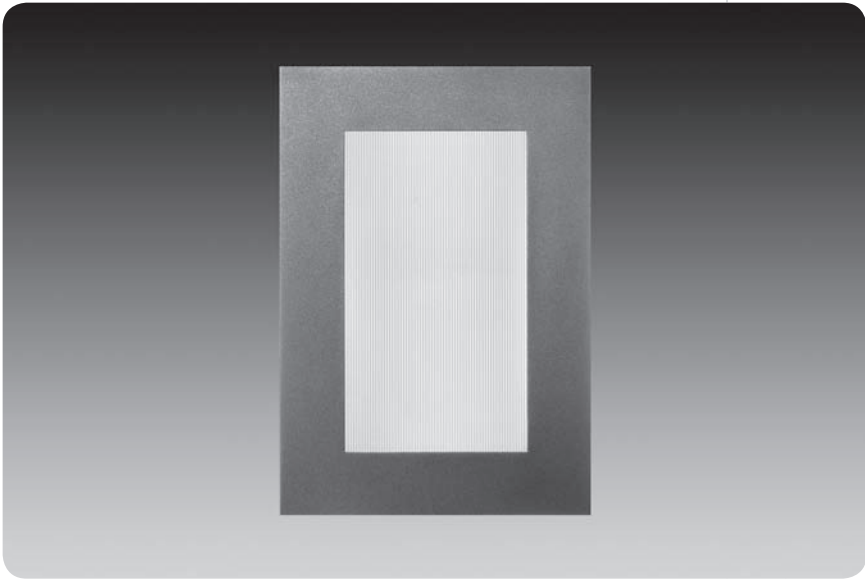
Ordering Code: **RS**

48" max. suspension from ceiling to top of luminaire. Other lengths available, consult factory.



In a continuing effort to offer the best product possible, we reserve the right to change, without notice, specifications or materials that in our opinion will not alter the function of the product. Specification sheets found at www.selux.com/usa are the most recent versions and supersede all other printed or electronic versions.

SCONCE
metro™



features

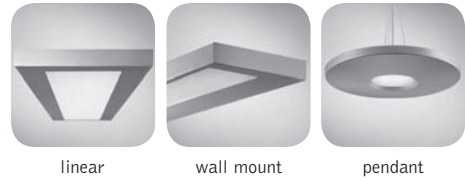
ADA compliant wall sconce that compliments entire Metro™ family.

1', 2', 3' and 4' nominal lengths provide endless design capabilities

Soft glow around luminaire creates perception of a floating luminous diffuser.

Metro™ makes an exceptional aesthetic statement in conference rooms, private or open offices, reception areas or other high-end applications.

companion luminaire



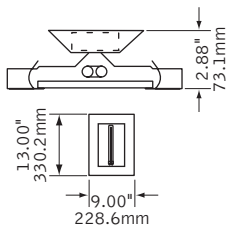
linear

wall mount

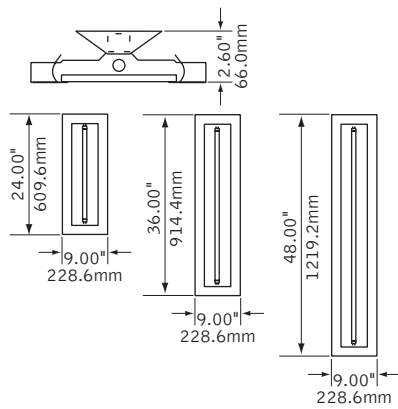
pendant

dimensional data

1' fixture



2', 3' & 4' fixtures



lamping options

1' fixture

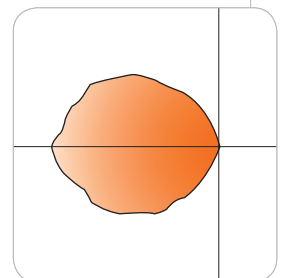


2', 3' & 4' fixtures



performance

1-Lamp 18W BiAx
78.7% Efficiency
345 cd @ 90°

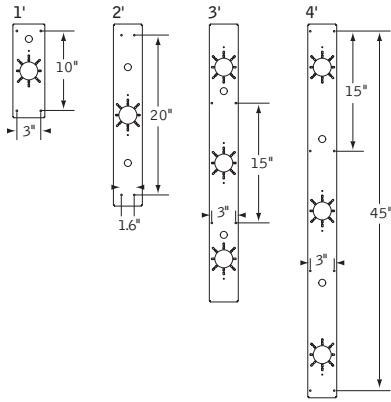


Visit focalpointlights.com for complete photometric data.

fixture:

project:

mounting information



specifications

construction

Three piece ballast channel and frame fabricated from 20 Ga. die-formed C.R.S. Standard sizes available in nominal 1', 2', 3' and 4' lengths. Hinged door allows for easy lamp access.

- 1' unit weight: 5 lbs.
- 2' unit weight: 8 lbs.
- 3' unit weight: 12 lbs.
- 4' unit weight: 16 lbs.

optic

Reflector fabricated of low iridescent, specular aluminum. Luminous diffuser constructed of optical grade acrylic with linear diffusing pattern. Acrylic diffuser for (1') 4.75W x 8.75"L, (2') 4.75W x 19.5"L, (3') 4.75W x 32.8"L and (4') 4.75W x 43.5"L.

electrical

All ballasts are thermally protected and have a Class "P" rating. UL and cUL listed.

finish

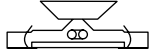
Polyester powder coat applied over a 5-stage pre-treatment. Mounting bracket finished to match housing.

ordering

luminaire series		<u>FMEC</u>
Metro	FMEC	_____
profile		_____
1' Length	1	_____
2' Length	2	_____
3' Length	3	_____
4' Length	4	_____
lamping		_____
1' Length Only		_____
1 Lamp 18 Watt Biax	1BX18	_____
2', 3' & 4' Lengths Only		_____
1 Lamp T5HO	1T5HO	_____
circuit		<u>1C</u>
Single Circuit	1C	_____
voltage		_____
120 Volt	120	_____
277 Volt	277	_____
347 Volt	347	_____
<small>(Consult factory for availability)</small>		
ballast		_____
Electronic Program start <10% THD	S	_____
Electronic Dimming Ballast*	D	_____
<small>(Not available on 1' luminaire)</small>		
Mounting		<u>WM</u>
Wall Mount	WM	_____
factory options		_____
Emergency Battery Pack*	EM	_____
<small>(4' unit only)</small>		
HLR/GLR Fuse	FU	_____
Include 3000K Lamp	L830	_____
Include 3500K Lamp	L835	_____
Include 4100K Lamp	L841	_____
finish		_____
Titanium Silver	TS	_____
Matte Satin White	WH	_____

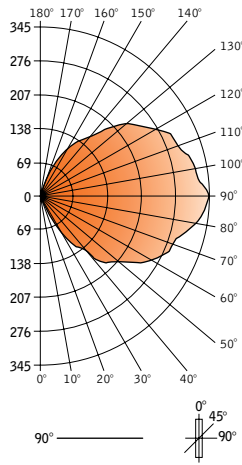
* for more information see Reference section.

metro™



Filename: FMEC11BX18.IES
Catalog #: FMEC-1-1BX18-1C-120-S-WM-TS
Efficiency: 78.7%
Test #: 11831.0

CANDLEPOWER DISTRIBUTION



Vertical Angle	Horizontal Angle				Zonal Lumens
	0°	22.5°	45°	67.5°	
0°	3	3	3	3	3
5°	7	5	7	8	6
15°	7	5	9	14	17
25°	5	5	8	15	37
35°	1	6	4	14	55
45°	5	5	4	15	78
55°	2	4	7	13	99
65°	4	4	6	15	112
75°	3	5	5	15	120
85°	2	5	5	15	132
90°	6	5	6	15	133
95°	2	3	5	14	125
105°	6	4	3	13	121
115°	4	4	0	11	113
125°	2	3	2	9	95
135°	1	2	2	8	76
145°	2	3	4	9	53
155°	1	2	2	11	33
165°	0	2	2	14	12
175°	5	5	8	7	9
180°	0	0	0	0	0

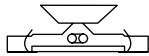
LUMEN SUMMARY

Zone	Lumens	% Lamp	% Fixt
0°-30°	23	1.9	2.4
0°-90°	502	40.2	51.0
90°-130°	373	29.8	37.9
90°-180°	482	38.5	49.0
Total Luminaire	984	78.7	100.0

Numbers indicate percentage values of reflectivity.

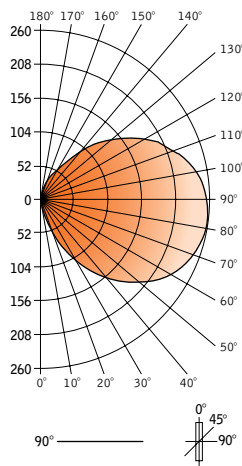
Go to www.focalpointlights.com for additional photometric data.

metro™



Filename: FMEC41T5H.IES
Catalog #: FMEC-4-1T5H0-1C-S-120-WM-TS
Efficiency: 55%
Test #: 14085.0

CANDLEPOWER DISTRIBUTION



Vertical Angle	Horizontal Angle				Zonal Lumens
	0°	22.5°	45°	67.5°	
0°	2	2	2	2	2
5°	2	0	2	6	11
15°	5	3	5	8	43
25°	9	7	7	10	88
35°	13	11	10	15	137
45°	16	14	11	18	180
55°	17	16	13	21	215
65°	20	17	16	24	240
75°	21	18	16	25	253
85°	22	20	17	26	256
90°	21	19	16	25	252
95°	21	19	16	26	247
105°	21	19	16	25	229
115°	19	16	15	22	200
125°	17	15	14	20	162
135°	15	13	12	17	118
145°	10	9	8	12	70
155°	9	6	6	10	38
165°	5	3	5	7	22
175°	1	0	1	5	7
180°	2	2	2	2	2

LUMEN SUMMARY

Zone	Lumens	% Lamp	% Fixt
0°-30°	68	1.4	2.4
0°-90°	1397	27.9	50.5
90°-130°	1072	21.4	38.8
90°-180°	1369	27.4	49.5
Total Luminaire	2766	55.3	100.0

Numbers indicate percentage values of reflectivity.

Go to www.focalpointlights.com for additional photometric data.



The Eclipse 1 Series



Product Features

- Connectors (in continuous rows) and die-cast aluminum ends assure a straight and consistent profile.
- Die-cast ends are regressed to maintain a shallow, floating appearance.
- 4-ft. and 8-ft. housings are available for either T8 or T5 lamps.

The Eclipse 1 Series

Specification Data

Housing: Nominal 4-ft. and 8-ft. housings fabricated from 20-gauge, cold-rolled steel.

Suspension: Pendant mounted. Stainless steel cable with vinyl power feed. 15' length provided as standard. Gripper fitting provides for quick length adjusting at job site.

Shielding: Perforated side windows with soft white acrylic overlays.

Ends and *Connectors: Die-cast aluminum. Connectors are steel (* intermediate hanging point).

Reflector: Die-formed, cold-rolled steel sides with 89% reflectance white finish.

Finish: Standard finish: matte white. Please specify other finishes.

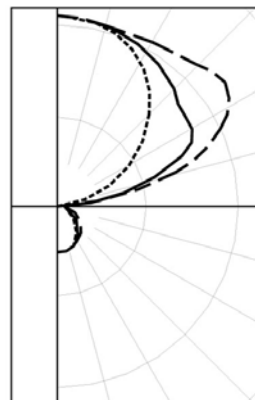
Lamps (in cross section): (2) T8; (2) T5; (2) T5HO. Lamps provided by others.

Ballast: Electronic. Please specify voltage.

Certification: U.L. listed, I.B.E.W. (Local 3) Union made in the U.S.A.

Photometrics

Floor	20%											
	80%				70%				50%			
Ceiling												
Walls	70%	50%	30%	10%	70%	50%	30%	10%	50%	30%	10%	
0	.85	.85	.85	.85	.74	.74	.74	.74	.54	.54	.54	
1	.77	.73	.70	.67	.67	.64	.62	.59	.47	.46	.44	
2	.70	.64	.59	.55	.61	.56	.52	.49	.41	.39	.36	
3	.64	.56	.50	.46	.56	.49	.44	.40	.36	.33	.31	
4	.58	.50	.43	.38	.51	.44	.38	.34	.32	.29	.26	
5	.53	.44	.37	.33	.46	.39	.33	.29	.29	.25	.22	
6	.49	.39	.33	.28	.43	.35	.29	.25	.26	.22	.19	
7	.45	.35	.29	.24	.39	.31	.26	.22	.23	.19	.17	
8	.42	.32	.25	.21	.36	.28	.23	.19	.21	.17	.15	
9	.39	.29	.23	.19	.34	.25	.20	.17	.19	.15	.13	
10	.36	.26	.20	.17	.31	.23	.18	.15	.17	.14	.11	



Catalog Number:
EC1-2T8-4-IND

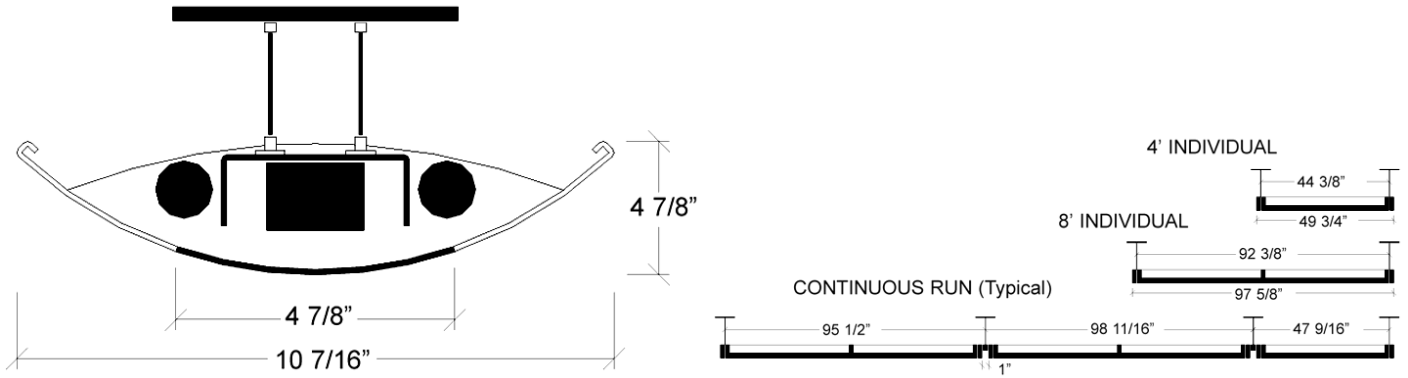
Report Number:
ITL47647

Lamps:
(2) F32T8/SPX35 each rated
2950 lumens

Total Efficiency:
85.8%

The Eclipse 1 Series

Fixture Details (Schematic)





The Eclipse 1 Series

Ordering Info

<input type="text"/>	Product Family EC1 - Eclipse 1	<input type="text"/>	Length 4 - 4 ft. Nominal 8 - 8 ft. Nominal
<input type="text"/>	Mounting CG - 15' Cable and Gripper CGPF - 15' Cable, Gripper, and Power Feed	<input type="text"/>	Wattage (consult factory for other lamps) 2T8 - (2) T8 lamps 2T5 - (2) T5 lamps 2T5HO - (2) T5HO lamps
<input type="text"/>	Designation IND - individual BOR - Beginning of Row INT - Intermediate EOR - End of Row	<input type="text"/>	Voltage 277 - 277V 120 - 120V
		<input type="text"/>	Ballast EB - Electronic EDB - Electronic Dimming Ballast
<input type="text"/>	Options EMPK - Emergency Battery Pack		

Company Name _____

Project Name _____

Fixture Type _____

DUPLO INDIRECT/DIRECT



Catalog Number

FIXTURE

DID – Duplo Indirect / Direct

LAMPING

26 – 26W compact fluorescent
32 – 32W compact fluorescent
42 – 42W compact fluorescent
57 – 57W compact fluorescent
70 – 70W metal halide
150 – 150W metal halide

VOLTAGE

120 – 120 Volt
277 – 277 Volt

OPTIONS

WIN – Reflecting diffuser wing

EXAMPLE: DID-42-120

Specifications

CONSTRUCTION

Fixture is constructed of corrosion-resistant die-cast aluminum alloy.

SHIELDING

Lamp is shielded with tempered glass plates. Inner reflectors constructed of pure aluminum with diffusing finish. Reflectors direct approximately 50% of the light output upward and 50% downward – see reverse for detail.

An optional reflecting diffuser wing may be specified – see reverse for detail.

FINISH

Fixture is finished in polyester powdercoat, RAL 9006.

ELECTRICAL

Specify 120 or 277 volt. Fixture and all electrical components are U.L./C.U.L.

WET LOCATION LISTED. Fixture supplied

with internal electronic ballast.

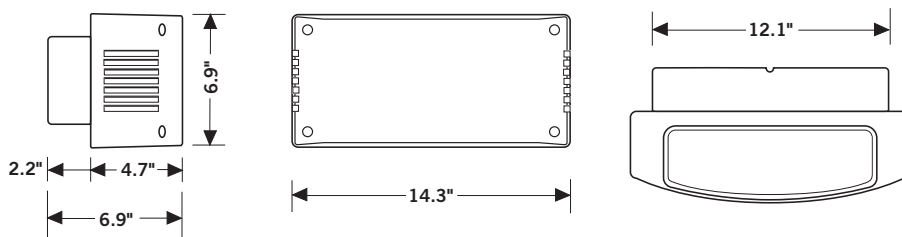
LAMPING

Choice of 26W, 32W, 42W, or 57W 4 pin compact fluorescent lamp or 70W or 150W single-ended T6 metal halide lamp with G12 base. Lamp not included.

MOUNTING

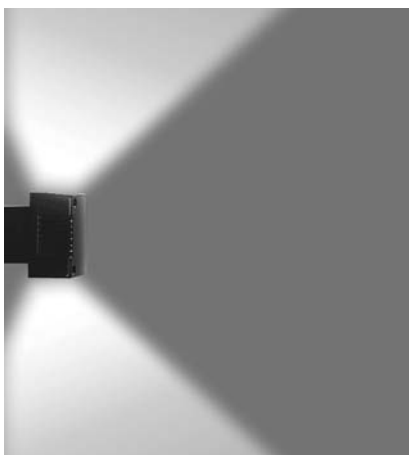
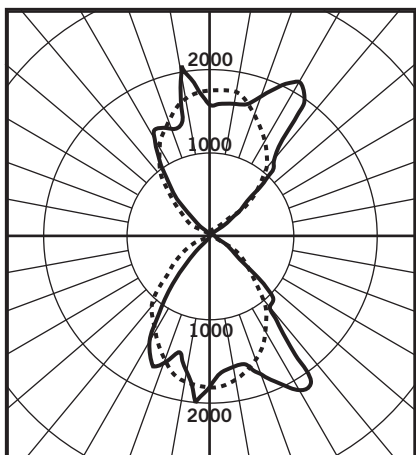
Fixture mounts to standard junction box.

Dimensions



DUPLO INDIRECT/DIRECT

Photometrics



LUMINAIRE

Description: Duplo Indirect/Direct with (1) 150 watt metal halide lamp.

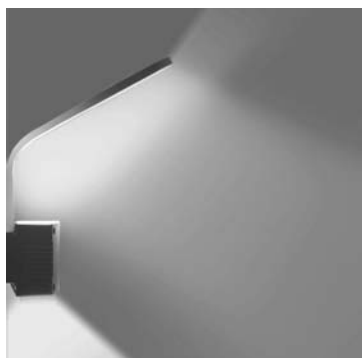
Catalog Number: DID-150-120

Efficiency: 61.2%

ZONAL LUMEN SUMMARY

ZONE	LUMENS	% LAMP	% FIXT
0 - 30	1393.1	12.7	20.7
0 - 40	2294.9	20.9	34.1
0 - 60	3285.8	29.9	48.8
60 - 90	76.7	0.7	1.1
0 - 90	3362.5	30.6	49.9
90 - 180	3369.8	30.6	50.1
0 - 180	6732.3	61.2	100.0

Details

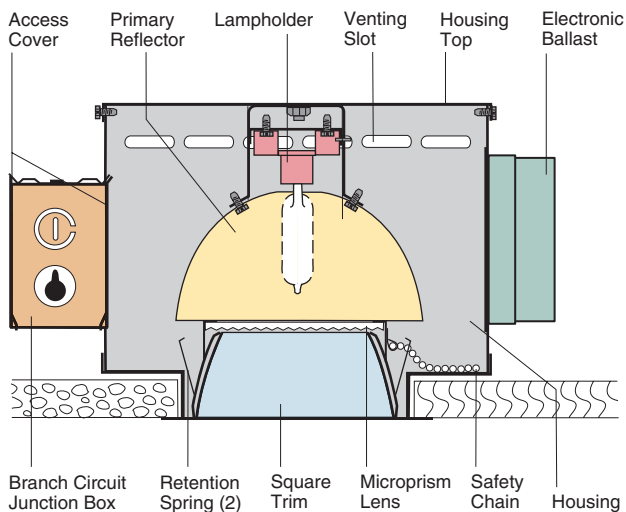


DIFFUSER WING

Optional diffuser wing mounts on top of luminaire. Specified with option code WIN.

Installation instructions may be found at www.energielighting.com.

H8406



Downlight
39-70W Metal Halide T-6 Lamps
4 1/2" Square Parabolic Trim

Optics and Applications

Vertical mounting in a multi-contoured hydroformed reflector produce a medium distribution pattern. A microprism spread lens is supplied to satisfy code requirements and for brightness control. Use for general or task lighting in low to medium height ceilings. Suitable for protected damp locations.

Design Features

A sturdy steel housing protects the optical system and assures proper focal position. The trim is stabilized to prevent racking and is held to the ceiling by constant pressure springs. Maximum ceiling thickness 7/8". Top or bottom service.

Finish

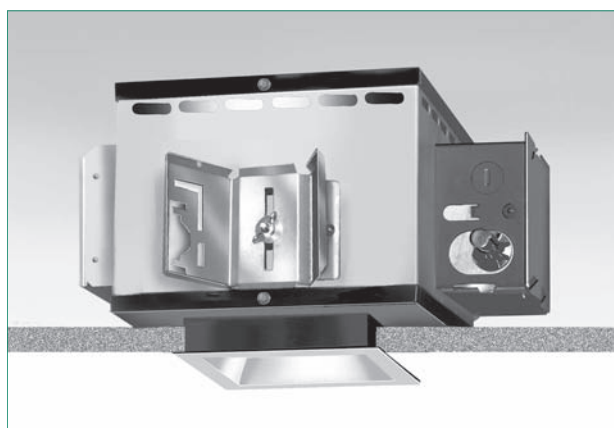
Housing and structural parts are painted matte black to suppress stray light leaks. Standard trim is anodized Softglow® clear. Special finishes, textures and colors are available, see below under Accessories.

Ballast

Electronic metal halide ballasts provide more constant lumen and wattage output. They feature thermal protection with auto reset, fast restrike, quiet operation and automatic shutdown at end of life.

Trim Textures

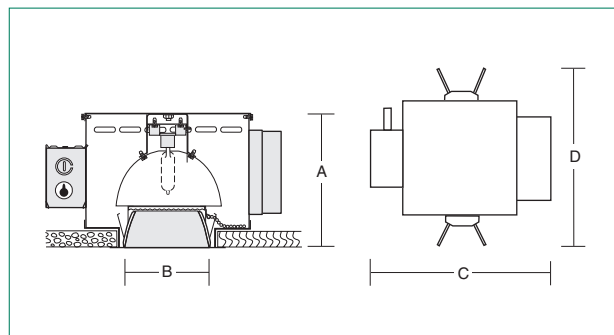
Textured trims create a subtle new aperture appearance. Select among different embossed patterns to match the ambiance of the space being illuminated. Refer to Squares brochure for descriptive photos.



General

Fixtures are pre-wired, thermally protected, UL and C-UL listed for eight wire 75°C branch circuit wiring. Union made IBEW. Luminaire Efficiency Rating (LER) data is in the photometric directory located in Section Z.

Dimensions and Lamps



Number	A Depth	B Aperture	C Width	D Length	Lamps*
H8406	7 1/2" 191mm	4 1/2" sq. 114mm	12 1/2" 318mm	14" 356mm	39-70W T-6 Metal halide bi-pin base

*To specify add watts and volts for proper ballast, e.g. H8406-39277.

Accessories

- | | |
|---|---|
| SB Softglow black. | R2 26" support rails. |
| SG Softglow gold. | R5 52" support rails. |
| SH Softglow mocha. | WT White trim flange. |
| SP Softglow graphite. | BR Bright trim finish. |
| ST Softglow titanium. | BP Ball Peen texture. |
| SW Softglow wheat. | CG Corrugated texture. |
| SY Softglow pewter. | DS Distressed texture. |
| SZ Softglow bronze. | WV Woven texture. |
| F Fuse. | LL Linear lens. |
| FC Four cell cross baffle. | LP Large prism lens. |
| V347 347 volt ballast, contact the factory. | FR Frosting on lens, specify lens type. |
| EC Emergency circuit with mini-can socket and leads. | |
| AOE1 Electronic ballast Auto-On restrike system 120V. For 277V contact the factory. | |

Matching Square Units *

- | | |
|------------------------|-------------------|
| Compact fluorescent | Page H21 |
| Tungsten halogen | Page H4 |
| Par lamp metal halide | Page H24 |
| Low voltage | Page H1 |
| Directional downlights | Pages H1, H2, H24 |
| Wall washer | Page H36 |

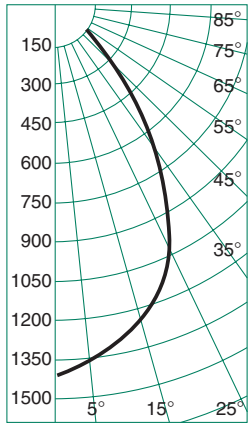
* Click for link to pages in blue.

H25 H8406

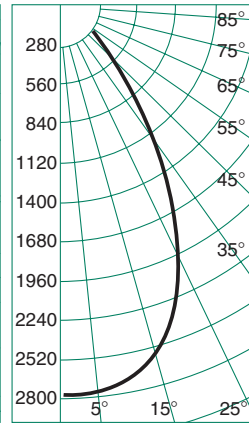
Performance Datachart

Single Unit, Initial Footcandles, 30° Work Plane						Ceiling to Floor	Multiple Units, Initial Footcandles, 30° Work Plane			
H8406 39W T-6 MH Clear Read Top Data						8'	Ceiling 80% Walls 50% Floor 20%			
H8406 70W T-6 MH Clear Read Bottom Data							Spacing is Maximum Over Work Plane			
Nadir	15°		25°		35°		Spacing	RCR 1	RCR 3	RCR 8
FC	FC	Diam	FC	Diam	FC	Diam				
46	37	3'	26	5'	11	8'	6'	59	50	34
92	75	3'	53	5'	22	8'	6'	118	99	67
25	20	4'	14	7'	6	11'	8'	32	27	18
50	41	4'	29	7'	12	11'	8'	64	53	36
15	12	5'	9	9'	4	13'	10'	20	17	11
31	25	5'	18	9'	7	13'	10'	40	33	22
11	8	6'	6	11'	2	16'	12'	13	12	8
21	17	6'	12	11'	5	16'	12'	27	23	15
8	6	7'	4	13'	2	19'	14'	10	8	6
15	13	7'	9	13'	4	19'	14'	20	16	11

Candlepower Distribution



H8406 39W T-6 MH
Eff. 50% S/M 1.0



H8406 70W T-6 MH
Eff. 54% S/M 1.0

Candelas

	39W	70W
o	3300*	6200*
0	1387	2796
5	1378	2773
10	1319	2669
15	1237	2537
20	1176	2430
25	1050	2171
30	825	1700
35	588	1214
40	401	827
45	264	553
50	165	344
55	91	187
60	41	83
65	16	33
70	10	22
75	4	10
80	0	0
85	0	0
90	0	0

o Vertical Angles
* Initial Lamp Lumens

Coefficients of Utilization

Ceiling	80%				70%		50%		30%		0
Wall %	70	50	30	10	50	10	50	10	50	10	0
RCR	Zonal Cavity Method - Floor Reflectance 20%										
1	.56	.54	.53	.52	.53	.51	.51	.49	.49	.48	.45
2	.53	.50	.48	.46	.49	.45	.47	.44	.46	.43	.41
3	.49	.46	.43	.41	.45	.41	.44	.40	.43	.39	.38
4	.46	.42	.39	.37	.42	.37	.41	.36	.40	.36	.35
5	.44	.39	.36	.33	.39	.33	.38	.33	.37	.33	.32
6	.41	.36	.33	.31	.36	.30	.35	.30	.34	.30	.29
7	.39	.34	.30	.28	.33	.28	.33	.28	.32	.28	.27
8	.37	.31	.28	.26	.31	.26	.31	.26	.30	.26	.25
9	.35	.29	.26	.24	.29	.24	.29	.24	.28	.24	.23
10	.33	.28	.24	.22	.27	.22	.27	.22	.26	.22	.21

H8406 39W T-6 MH x 1.00
H8406 70W T-6 MH x 1.08

Brightness

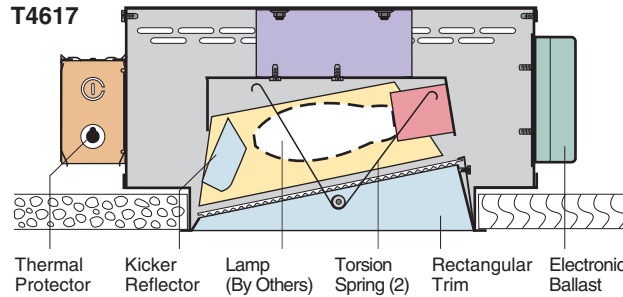
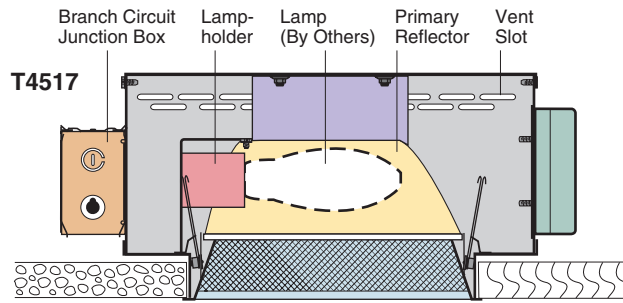
Number	Lamps	85°	75°	65°	55°	45°
H8406	39W T-6 MH	46	281	892	14776	44230
	70W T-6 MH	88	541	1766	26872	85750

Data in footlamberts. Photometer readings. Maximum Brightness Method. See note 5.

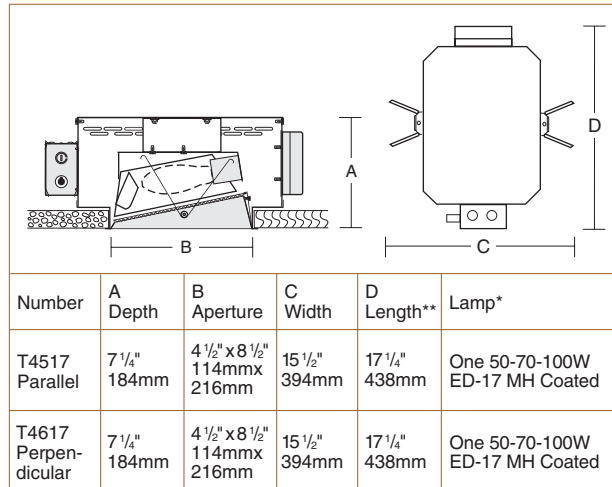
Notes

- All data with standard trim, Softglow® clear.
- Datachart degree headings measure one side from nadir. Diameter data includes both sides. Therefore the 15° column value describes a 30° pattern diameter at the work plane 30" above the floor. Footcandle values are at the diameter edge.
- Datachart spacing is rounded off to the nearest foot.
- Colored trim multipliers: Gold x .90, Wheat x .85, Mocha x .80, Pewter x .80, Graphite x .75, Titanium x .75, Bronze x .70, Black x .70.
- Average Luminance Method brightness data are inaccurate for downlights. They are theoretical calculations for large surfaces such as troffer lenses. Our brightness data derives from direct photometer readings which approximate what the eye perceives when evaluating glare. For a complete discussion refer to Z section brochure Z1.





Dimensions and Lamps



* Specify watts and volts for proper ballast, e.g. T4517-50277.
 **Length for 100W model is 18 1/4", 464 mm.

Matching Rectangular Units

- PAR lamp directional downlight
- Tungsten halogen downlight
- Low voltage directional downlight
- Compact fluorescent downlight
- Metal halide downlights
- PAR lamp wall washers
- Tungsten halogen wall washers
- Compact fluorescent wall washers

- Page T1
- Page T2
- Page T3
- Page T4
- Pages T5, T6
- Page T21
- Page T22
- Page T23

*** Click for link to pages in blue.

T4517 Parallel to Wall
T4617 Perpendicular to Wall

Lens Wall Washers
Rectangular Parabolic Splay Trims
One 50-70-100W ED-17 Metal Halide Lamp
4 1/2" x 8 1/2" Aperture

Optics and Applications

Heavy gauge extruded reflectors and microprism spread lenses provide even illumination from ceiling to floor. The lateral spread allows wider fixture spacing while retaining uniformity. Choice of parallel or perpendicular version to match adjacent downlights.

Design Features

Steel housings protect and align fixture components. Air flow design assures cool lamp temperature for rated lamp life. The trim is retained by torsion springs. Maximum ceiling thickness 7/8". Top or bottom ballast and lamp service.

Finish

Housing and structural parts are painted matte black. The aperture trim is Softglow® clear. A variety of special finishes, textures and colors is available.

Trim Textures

Kurt Versen has developed a selection of textured rectangular trims. All textured surfaces are available in anodic special colors. See Accessories.

Ballast

Electronic metal halide ballasts provide more constant lumen and wattage output. They feature thermal protection with auto reset, quiet operation and automatic shutdown at end of life. Energy savings compared to magnetic ballasts average over 10%.

General

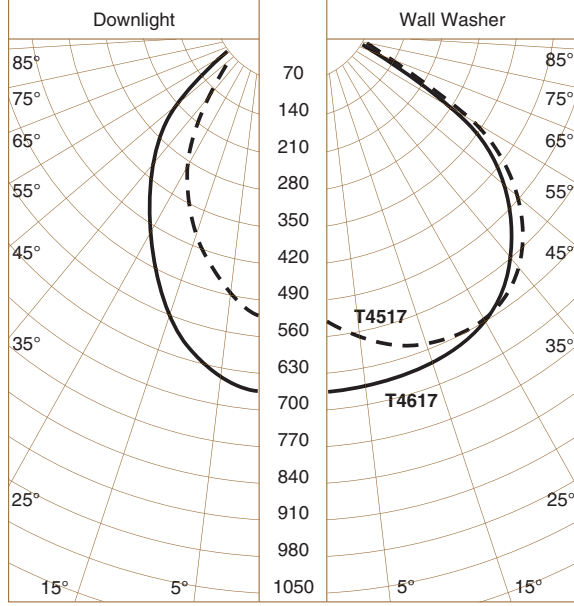
Fixtures are pre-wired, thermally protected, UL and C-UL listed for eight wire 75°C branch circuit wiring. All products are union made IBEW. Luminaire Efficiency Ratings (LER) do not apply to wall washers.

Accessories

- SB Softglow black trim.
 - SG Softglow gold trim.
 - SH Softglow mocha trim.
 - SP Softglow graphite trim.
 - ST Softglow titanium trim.
 - SW Softglow wheat trim.
 - SY Softglow pewter trim.
 - SZ Softglow bronze trim.
 - BR Bright finish.
 - F Ballast fuse.
 - EC Emergency circuit with mini-can socket and leads.
 - AOE1 Electronic ballast Auto-On restrike system 120V.*
 - AOE2 Electronic ballast Auto-On restrike system 277V.*
 - R2 26" support rails.
 - R5 52" support rails.
 - WT White trim flange.
 - WHT White complete trim.
 - BP Ball Peen texture.
 - CG Corrugated texture.
 - DS Distressed texture.
 - VV Woven texture.
 - V347 347 volt ballast, contact factory.
- *Use open rated 60W max. auxiliary incandescent lamp.

T25 T4517 T4617

Candlepower Distribution Curves

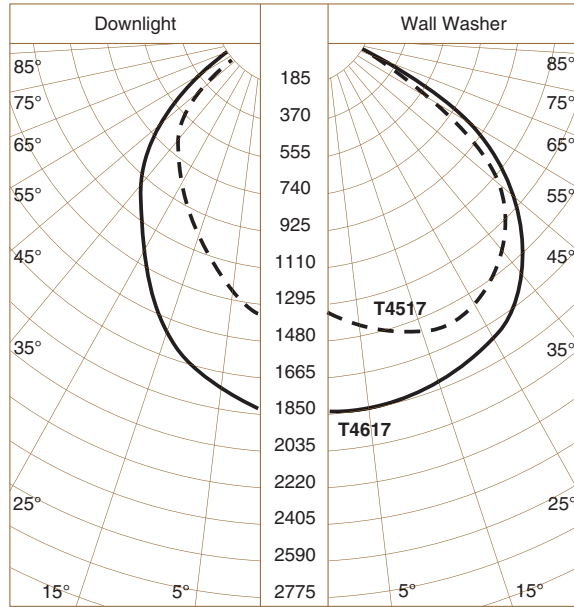


T4517 50W ED-17 MH/C Dotted Line
T4617 50W ED-17 MH/C Solid Line

Multiple Units Footcandles

From Ceiling	2' from wall				3' from wall				4' from wall			
	2' Centers		3' Centers		3' Centers		4' Centers		4' Centers		6' Centers	
	CL	Mid	CL	Mid	CL	Mid	CL	Mid	CL	Mid	CL	Mid
1'	49	46	39	28	12	12	11	7	4	4	3	2
	36	31	32	18	9	7	8	4	4	3	3	1
2'	67	67	48	43	28	27	23	18	12	12	10	6
	56	54	42	34	22	21	18	13	9	8	8	4
3'	51	51	34	33	30	30	24	22	17	16	13	10
	44	44	31	28	26	25	20	17	14	13	11	7
4'	35	35	23	23	26	26	19	19	17	17	12	11
	31	31	21	20	22	22	18	16	15	14	11	8
5'	25	25	16	16	20	20	15	15	15	15	11	10
	22	22	15	14	18	18	14	14	13	14	10	8
6'	18	18	12	12	15	16	12	12	13	13	9	9
	16	16	11	10	14	14	11	11	12	12	8	7
7'	13	13	9	9	12	12	9	9	11	10	7	7
	12	12	8	8	11	11	8	8	10	10	7	6
8'	10	10	7	7	9	9	7	7	9	9	6	6
	9	9	6	6	9	8	7	7	8	8	5	5
9'	8	8	5	5	7	7	6	6	7	7	5	5
	7	7	5	5	7	7	5	5	7	6	4	4
10'	6	6	4	4	6	6	5	5	6	6	4	4
	6	6	4	4	6	5	4	4	5	5	4	4

T4517 50W ED-17 MH/C Read Top Data
T4617 50W ED-17 MH/C Read Bottom Data



T4517 100W ED-17 MH/C Dotted Line
T4617 100W ED-17 MH/C Solid Line

From Ceiling	2' from wall				3' from wall				4' from wall			
	2' Centers		3' Centers		3' Centers		4' Centers		4' Centers		6' Centers	
	CL	Mid	CL	Mid	CL	Mid	CL	Mid	CL	Mid	CL	Mid
1'	117	105	97	63	31	28	27	16	10	9	8	4
	101	85	88	49	25	21	23	11	10	7	9	3
2'	153	151	113	96	65	63	54	42	29	27	23	14
	155	151	117	94	61	58	51	37	25	21	21	10
3'	116	116	79	76	70	64	55	50	39	38	30	22
	121	122	86	79	71	70	57	48	38	36	29	20
4'	81	81	54	54	60	60	46	44	40	39	29	24
	86	85	57	57	62	62	49	45	40	40	30	23
5'	57	57	38	38	47	48	36	36	36	36	25	23
	61	61	41	40	50	50	38	37	37	37	27	23
6'	41	42	27	28	37	37	28	28	30	30	21	20
	45	45	30	29	39	39	30	29	32	32	22	21
7'	30	31	20	21	29	29	22	22	25	25	17	17
	34	34	22	22	30	30	23	23	27	26	18	18
8'	23	24	16	16	23	23	17	17	21	21	14	14
	26	26	17	17	24	24	19	18	22	22	15	15
9'	15	15	10	10	14	15	11	11	14	14	10	10
	17	17	11	11	16	16	12	12	15	15	10	10
10'	10	10	6	6	10	10	8	8	10	10	7	7
	11	11	7	7	11	11	8	8	11	10	7	7

T4517 100W ED-17 MH/C Read Top Data
T4617 100W ED-17 MH/C Read Bottom Data

Brightness

Number	Lamps	85°	75°	65°	55°	45°
T4517	50W ED-17 MH/C	33	120	267	5517	16517
	100W ED-17 MH/C	42	153	340	7028	21040
T4617	50W ED-17 MH/C	74	555	1838	7915	22165
	100W ED-17 MH/C	102	762	2526	10879	29664

Data in footlamberts. Photometer readings, Maximum Brightness Method. For a complete discussion refer to Z section brochure Z1.

Notes

- Increasing the spacing between fixtures will decrease wall illumination. Decrease equals table spacing divided by new spacing times table average.
- To increase wall illumination level, decrease spacing between fixtures. Increase equals table spacing divided by new spacing times table average.
- Above data measures output of the wall washers only. No contribution from adjacent downlights or ceiling, floor or wall reflectances is included. Total illumination on the wall will increase with the contribution from other sources.
- Data is cosine corrected to the plane of the wall. Uncorrected data is substantially higher and depends upon the angle of incidence to the wall which varies with the mounted distance from the wall.
- Data collected using coated lamps. Fixtures except ED-17 or B-17 lamps.
- For 70W ED-17 MH/C multiply 100W data by .60.

Indoor HID lighting

D910

Orion - Glass High Bay

Job Information

Type:

Catalog #:

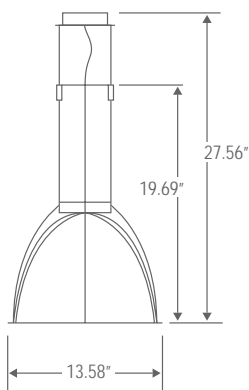
Project:

Comments:

Prepared by:



Dimensions



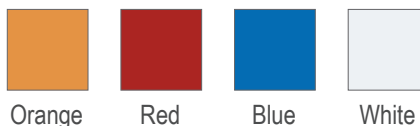
Application

The architectural solution for the illumination of large scale interiors. Orion is especially suited to commercial interiors with high open ceilings such as automotive retailers, public halls, restaurants, and airport terminals.

Description

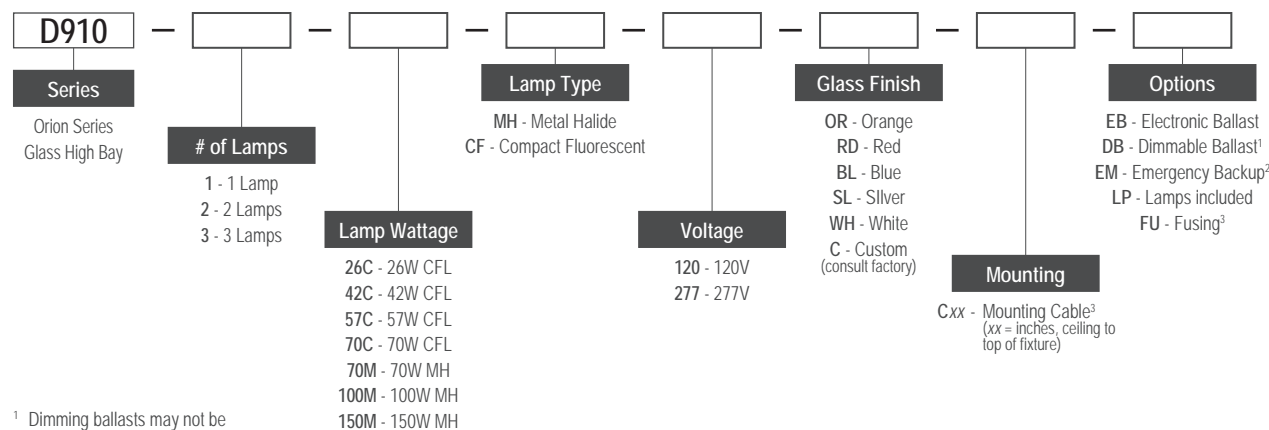
Deco's Orion suspended glass high bay luminaire is constructed of extruded and cast aluminum with integrated cooling channels that serve as the ideal housing for electronic ballasts. With a range of light control options including prismatic refractors and high purity aluminum reflectors this unique luminaire provides lighting solutions for a multitude of architectural interiors. Suspended by twin aircraft cables (adjustable lengths from 8"-120" are provided), Orion provides flexibility for evolving commercial environments.

Colors

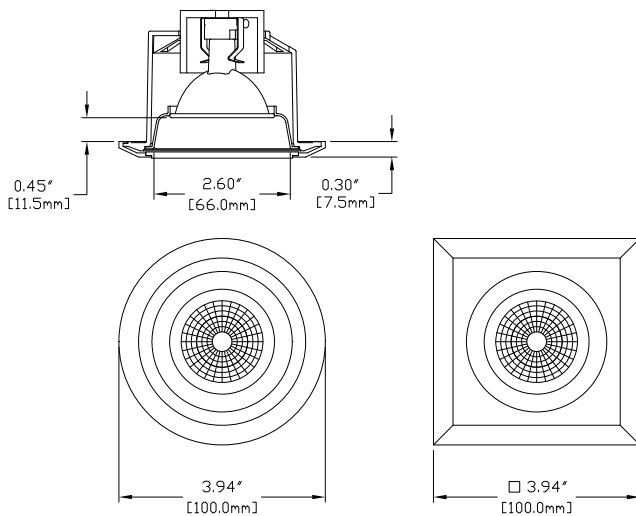


ORDERING INFORMATION:

Example: (D910-1-26C-CF-120-OR-C60-DB)



¹ Dimming ballasts may not be available for all CFL/HID lamp sizes
² Fluorescent models only
³ Verify cable lengths with the factory
⁴ Please specify voltage (eg. 120V)



SPECIFICATIONS:

3.9" die cast trim (2.6" aperture) MR16 halogen fixed lamp cabinet light with shallow regressed reflector.

Trim Body

- Die cast aluminum trim body construction with external spring clips to secure trim body to rough-in. Internal spring clips secure reflector to trim body.

Reflector

- Spun aluminum deep regressed reflector.
- Powder coat painted (white and black) and plated (matte chrome, chrome, and polished gold) finishes.

Trims

- 4" round or square trim shapes offered with powder coat painted (white, black, and metallic silver) and plated (chrome, polished gold, and satin nickel) finishes.
- Die cast aluminum construction with interlocking attachment to trim body.

Trim Accessories

- A choice of 10, interchangeable glass and decorative trim accessories have interlocking flange design for integral attachment to die cast trims.
- Protective, clear tempered glass supplied with fixture.

Electrical:

- Ceramic socket with pre-wired high temperature wire leads and miniature enclosed terminal block connector provided.

Lamping:

- 12 volt, MR 16 halogen, 35 watt max. Ordered separately

Compliances:

- UL and cUL Listed for use in non-ceiling plenum and millwork applications, 35 watt max.
- Suitable for use in damp location or wet location for select trim accessories.

Ordering Information

To specify a complete catalog number, choose one item from the selection available in each module.

Example: M3.401MC – RWH – 00

M3 . 4 01 _____ **--** _____ **--** _____

Series	Lamping	Optic Style	Optic Finish	Trim Shape	Trim Finish	Trim Accessory
M3 .	4 – MR16 halogen	01 – shallow reflector	WH – white BK - black MC – matte chrome CH – chrome	R – round S - square	WH - white BK - black MS – metallic silver CH - chrome GD – polished gold SN – satin nickel	00 (provided std.), 01, 02, 03, 04, 06, 07, 08, 09, 10

Wet location available for the following trim accessories: 00, 01, 02, 03, 06, 07, 08, 09, 10. To order wet location option, add "W" after the trim accessory code, i.e. -03W.

Ardee Lighting reserves the right to change product specifications without prior notification.

Ardee Lighting		
PO Box 1769 · 639 Washburn Switch Rd · Shelby · NC 28151 T 704. 482.2811 F 800.275.1544 E ardee@jjishelby.com www.ardeelighting.com		
2/16/2007		222260

BRING YOUR IMAGINATION TO LIGHT WITH

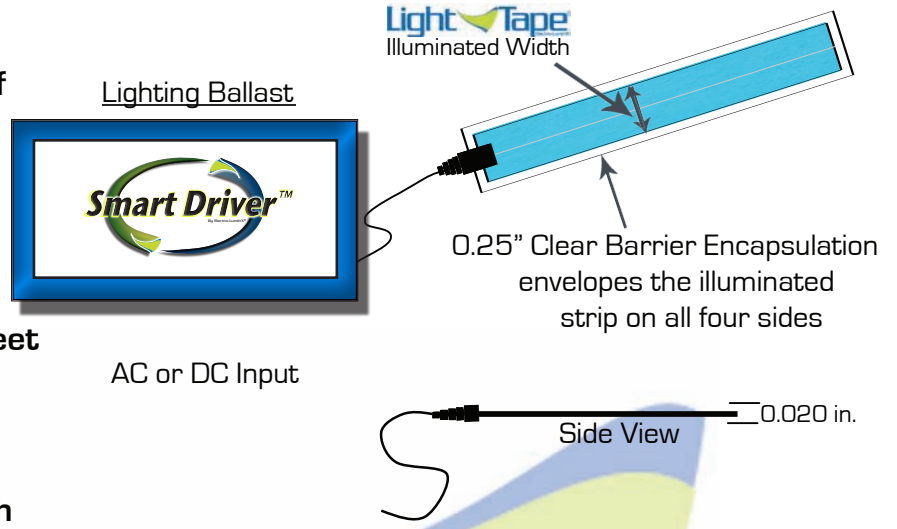
Light Tape[®]

Electro-LuminX[®]

www.lighttape.com

Light Tape[®]

- Continuous light for hundreds of feet with one connection.
- Dimmable
- Extremely energy efficient
- UV and moisture resistant for indoors and outdoors
- Available in lengths up to 300 feet (see footage guide)
- Highly visible through smoke
- Thinner than a credit card
- Generates no heat, cool to touch
- Easy to install and maintain



NOTE: Please see connector and lighting ballast information for further details on specifications

Honeywell



Light Tape [®] Standard Widths (In.)			
LT-025	0.25" (0.75")	LT-200	2" (2.5")
LT-050	0.5" (1")	LT-300	3" (3.5")
LT-100	1" (1.5")	LT-400	4" (4.5")
LT-150	1.5" (2")	LT-600	6" (6.5")

* Note: Illuminated Width (Finished Width After Encapsulation)

HOW TO ORDER LIGHT TAPE[®]:

When ordering, please specify: Illuminated Width, Interior or Exterior, Color, Length of Segment(s)

- Example: 1" Indoor Orange Light Tape[®] 20 feet long = LT100, INT, Orange, 1 in. @ 20 ft.

Normal Brightness Settings	27 cd/m ² (L), 125 cd/m ² (M), 200 cd/m ² (H) [candelas per meter ²]
Light Tape [®] Current Consumption	0.30 to 0.90 milliamps per inch ² depending on service hours
Light Tape [®] Power Consumption	0.2 to 1 watt per linear foot based on brightness setting
Power Source	E-LLC Smart Driver [™] Ballasts - AC or DC Input
Lamp Lifetime	Lifetime is 10,000 to 40,000 hours. See lifetime guideline on page 31

covelight™ 47/58



features

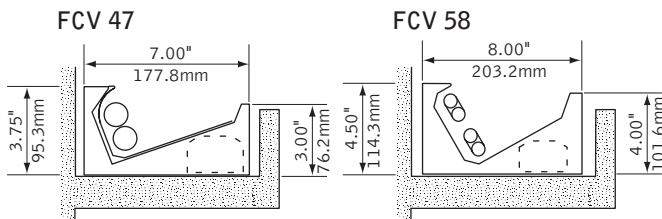
High performance indirect luminaire designed for concealed cove applications.

Multiple lamp configurations provide maximum flexibility.

Continuous run lengths may be configured with combinations of luminaire lengths up to 8'.

Covelight™ provides pleasing and even illumination that highlights architectural details.

dimensional data



lamping options

fcv 47



T8 LAMPS



BIAX LAMPS

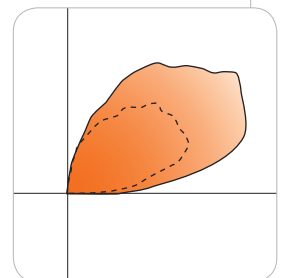
fcv 58



BIAX LAMPS

performance

1-Lamp T8
72.5% Efficiency
1254 cd @ 125°



Visit focalpointlights.com for complete photometric data.

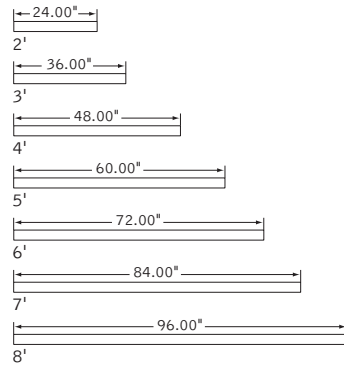
fixture:

project:

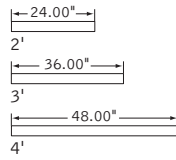
details

fixture lengths

fcv47



fcv58



specifications

construction

20 Ga. steel housing.
 20 Ga. steel socket bridges and end caps.
 Luminaires are available up to 8' nominal lengths.

4' unit weight: 13 lbs
 8' unit weight: 23 lbs

optic

Die-formed .02" specular aluminum reflector.

electrical

Luminaires are individually wired for specified circuits.
 Electronic ballasts are thermally protected and have a Class "P" rating.
 Consult factory for dimming specifications and availability.
 UL and cUL listed.

finish

Polyester powder coat applied over a 5-stage pre-treatment.
 Standard luminaire housing finished in High Reflectance White.

ordering

luminaire series FCV
 CoveLight FCV

profile _____
 4" x 7" 47
 5" x 8" 58

lamping _____

40 Watt Biax BX40
 50 Watt Biax BX50
 55 Watt Biax BX55
 (4" x 7" one lamp only)
 (5" x 8" two lamp only)
 One Lamp T8 1T8
 Two Lamp T8 2T8
 (T8 available on 4" x 7" only)

circuit _____

Single Circuit 1C
 Dual Circuit 2C
 (Two lamps only)

voltage _____

120 Volt 120
 277 Volt 277
 347 Volt 347

ballast _____

Electronic Instant Start <20% THD E
 Electronic Program Start <10% THD S
 Electronic Dimming Ballast* D

mounting CV

Cove CV

factory options

Emergency Circuit* EC
 Emergency Battery Pack* EM
 HLR/GLR Fuse FU
 Include 3000K Lamp L830
 Include 3500K Lamp L835
 Include 4100K Lamp L841

finish HW

High Reflectance White HW

luminaire length

Designate length in feet XX'
 (Nominal lengths: 2', 3', 4', 5', 6', 7', 8')

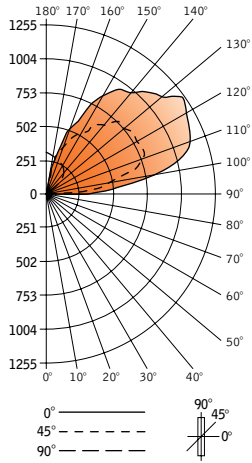
* for more information see Reference section.

covelight™ 47/58



Filename: FCV471T8.IES
 Catalog #: FCV-47-1T8-1C-120-E-HW-4'
 Efficiency: 72.5%
 Test #: 8968.2

CANDLEPOWER DISTRIBUTION



Vertical Angle	Horizontal Angle				Zonal Lumens
	0°	22.5°	45°	67.5°	
0°	0	0	0	0	0
5°	0	0	0	0	0
15°	0	0	0	0	0
25°	0	0	0	0	0
35°	0	0	0	0	0
45°	0	0	0	0	0
55°	0	0	0	0	0
65°	0	0	0	0	0
75°	0	0	0	0	0
85°	78	56	9	0	15
90°	238	211	139	47	0
95°	440	411	324	181	8
105°	805	766	644	364	35
115°	1175	1109	840	425	77
125°	1254	1114	819	448	120
135°	1121	1021	788	463	166
145°	921	849	673	440	208
155°	760	701	579	408	240
165°	570	540	469	375	262
175°	376	364	336	309	272
180°	283	283	283	283	283

LUMEN SUMMARY

Zone	Lumens	% Lamp	% Fixt	
90°-120°	883	31.0	42.7	
90°-130°	1253	44.0	60.7	
90°-150°	1786	62.7	86.4	
90°-180°	2051	72.5	99.3	
Total Luminaire	0°-180°	2066	72.5	100.0

covelight standard run length

Continuous Runs consist of standard fixture lengths. Some fixtures may exceed nominal length consult individual cut sheets for details.

Example: 31' run = three 8' fixtures and one 7' fixture.

nominal run length (in feet)	standard fixture lengths required	lamp sizes	nominal run length (in feet)	standard fixture lengths required	lamp sizes
2	2	2	32	8 8 8 8	4 4 4 4 4 4 4 4
3	3	3	33	8 8 8 6 3	4 4 4 4 4 4 3 3 3
4	4	4	34	8 8 8 6 4	4 4 4 4 4 4 4 3 3
5	5	5	35	8 8 8 8 3	4 4 4 4 4 4 4 4 3
6	6	3 3	36	8 8 8 8 4	4 4 4 4 4 4 4 4 4
7	7	4 3	37	8 8 8 6 7	4 4 4 4 4 4 4 3 3 3
8	8	4 4	38	8 8 8 8 6	4 4 4 4 4 4 4 4 3 3
9	6 3	3 3 3	39	8 8 8 8 7	4 4 4 4 4 4 4 4 4 3
10	6 4	3 3 4	40	8 8 8 8 8	4 4 4 4 4 4 4 4 4 4
11	8 3	4 4 3	41	8 8 8 8 6 3	4 4 4 4 4 4 4 4 3 3 3
12	8 4	4 4 4	42	8 8 8 8 6 4	4 4 4 4 4 4 4 4 4 3 3
13	7 6	4 3 3 3	43	8 8 8 8 8 3	4 4 4 4 4 4 4 4 4 4 3
14	8 6	4 4 3 3	44	8 8 8 8 8 4	4 4 4 4 4 4 4 4 4 4 4
15	8 7	4 4 4 3	45	8 8 8 8 7 6	4 4 4 4 4 4 4 4 4 3 3 3
16	8 8	4 4 4 4	46	8 8 8 8 8 6	4 4 4 4 4 4 4 4 4 4 3 3
17	8 6 3	4 4 3 3 3	47	8 8 8 8 8 7	4 4 4 4 4 4 4 4 4 4 4 3
18	8 6 4	4 4 4 3 3	48	8 8 8 8 8 8	4 4 4 4 4 4 4 4 4 4 4 4
19	8 8 3	4 4 4 4 3	49	8 8 8 8 8 6 3	4 4 4 4 4 4 4 4 4 4 3 3 3
20	8 8 4	4 4 4 4 4	50	8 8 8 8 8 7 3	4 4 4 4 4 4 4 4 4 4 4 3 3
21	8 7 6	4 4 4 3 3 3			
22	8 8 6	4 4 4 4 3 3			
23	8 8 7	4 4 4 4 4 3			
24	8 8 8	4 4 4 4 4 4			
25	8 8 6 3	4 4 4 4 3 3 3			
26	8 8 6 4	4 4 4 4 4 3 3			
27	8 8 8 3	4 4 4 4 4 4 3			
28	8 8 8 4	4 4 4 4 4 4 4			
29	8 8 7 6	4 4 4 4 4 3 3 3			
30	8 8 8 6	4 4 4 4 4 4 3 3			
31	8 8 8 7	4 4 4 4 4 4 4 3			



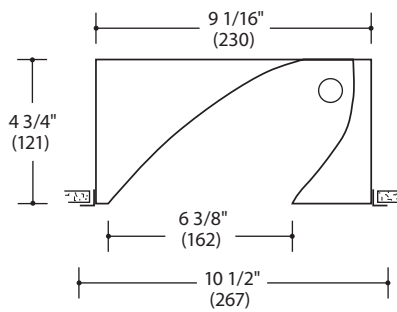
Type:
Project:

Recessed Wall/Wash™

G-D-1000

Asymmetric Recessed Direct

Specifications



U.S. Patent No. D351,039

HOUSING. Die-formed and welded steel finished in baked Matte White enamel. Ends are notched to allow installation in exposed inverted T-bar grid ceiling (NEMA type GF) with main T-bars at 2'-0" OC or 4'-0" OC. Exposed flanges along the sides of the fixture support the ceiling tiles. The housing ends are provided with 7/8" diameter knockouts (1/2" trade size). The top of the housing has an access opening covered by a plate containing two 7/8" diameter knockouts.

REFLECTOR. Die-formed specular aluminum .

LAMPING. Available in one- and two-lamp 40- or 50-watt twin-tube compact fluorescent lamps; one- and two-lamp T8.

BALLAST. Electronic Ballast (ELB), high power factor, thermally protected Class P, Sound Rated A, manufactured by a UL Listed manufacturer, as available, determined by Litecontrol. Ballasts with a voltage range of 120 to 277 will be used when fixture configuration and ballast availability allow. The minimum number of ballasts will be used.

MOUNTING. The fixture is intended for installation in standard exposed inverted T-bar grid ceiling (NEMA type GF) with main T-bars at 2'-0" OC or 4'-0" OC. Exposed flanges along the side of the fixture support the tiles. T-bar safety clips at the end of the fixture shall be attached at the factory prior to shipping. 1/4" diameter holes have been provided, positioned at 90° to each other, along the upper edges of the housing for installation of supplementary chain or wire support as may be required by local codes. Estimated installed weight of 4-foot fixture is 20 lbs. For drywall or plaster ceiling installations, a ceiling trim conversion kit is available. Consult factory.

CERTIFICATION. Fixture and electrical components shall be UL Listed and shall bear the I.B.E.W., A.F. of L. label.

Note: Litecontrol reserves the right to change specifications without notice for product development and improvement.

Ordering guide

Product, lamping, & length						Options				
G -	D -	10	1	4	T8 -	CWM -	ELB -	EF -	120	
Mounting	Distribution	Series	Lamp Count	Nominal Length(ft)	Lamp Type	Finish	Ballast	Other options	Volts	
G Grid	D Direct	10	1, 2 →	2 →	T8	CWM (Matte White) is standard	ELB is standard	EF F T2M T2S	120 277	
			1, 2 →	4 →						
			1 →	2 →						BX40
			2 →	4 →						BX50
			see notes				see Ballast options	see Other options		

notes:

Lamp Count = total number of lamps in the fixture

For Ordering guide information in shaded areas, choose selection by reading ACROSS the shaded areas for correct specifications.

Cross-section lamping

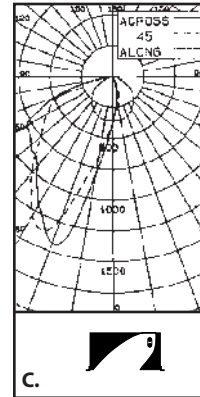
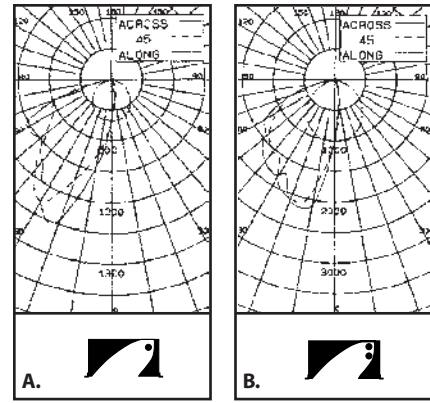


G-D-1014T8-CWM-ELB-EF-120 is a typical catalog number for a 1-lamp (1 lamp in cross-section), 4-foot long T8 fixture, Matte White finish, electronic ballast, emergency fluorescent ballast, 120 volts.

Questions to Ask

1. 120 or 277 volt?
2. Other options?
3. Ceiling type?

Photometric data



A. G-D-1014T8 68.0% Efficiency
Litecontrol Certified Test Report #18911000

B. G-D-1024T8 56.7% Efficiency
Litecontrol Certified Test Report #18921002

C. G-D-1012BX40 58.1% Efficiency
Litecontrol Certified Test Report #18910000

For complete photometric information,
see website.

Ballast options

Specify in place of **ELB**, contact factory for availability/compatibility with lampping:

- DA/ELB** Advance Mark VII Dimming Ballast.
- HEL/ELB** Osram Sylvania Helios Dimming Ballast.
- ECO/ELB** Lutron ECO-10 Dimming Ballast.

Options

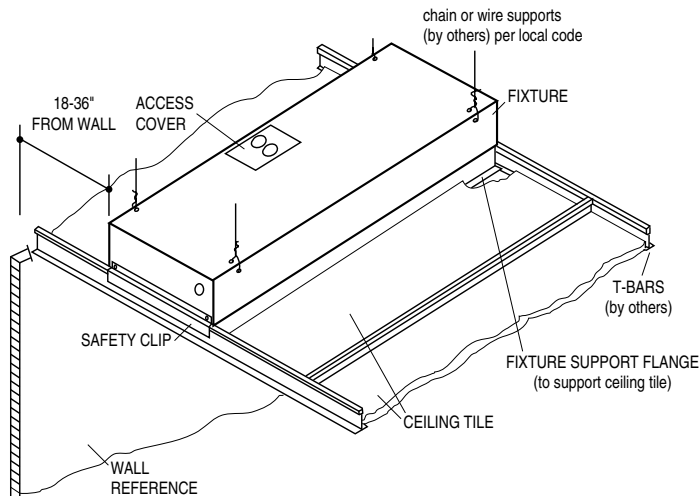
- EF** Emergency Fluorescent Ballast. Battery-powered ballast from a UL Listed manufacturer will operate one T8 lamp for 1 1/2 hours.
- F** Fuse. Slow or fast blow, determined by Litecontrol.
- T2M, T2S** Master/slave ballasting. For energy considerations combine **T2M** (Master) with **T2S** (Slave).
 - T2M** - Fixture contains one two-lamp ballast.
 - T2S** - Fixture does not contain a ballast.

Planning for installation

Lift fixture diagonally through the opening above ceiling grid. Rest the fixture on the T-bars so that safety clips straddle T-bars, and fixture support flanges (which support ceiling tiles) are positioned between T-bars.

Loosen access cover screws and remove cover using keyhole openings. Remove one knockout in cover and attach flexible conduit feed (supplied by electrical contractor). Remove tape holding fixture wires and make wiring connections. Push wire connections back into housing and reinstall access cover.

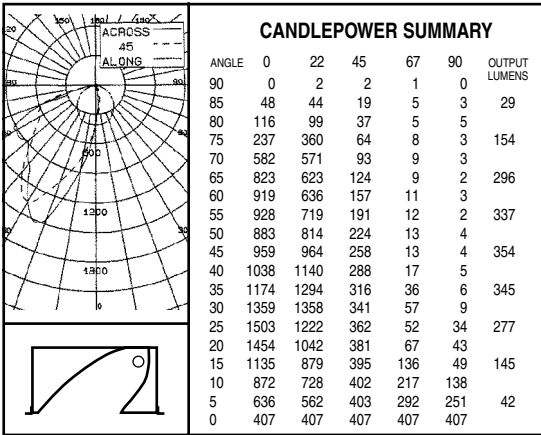
NOTE: For drywall or plaster ceiling installations, a ceiling trim conversion kit is available. Consult factory.



LITECONTROL ... an employee owned company

100 Hawks Avenue Hanson MA 02341 781 294 0100 FAX 781 293 2849 info@litecontrol.com litecontrol.com

PHOTOMETRIC DATA

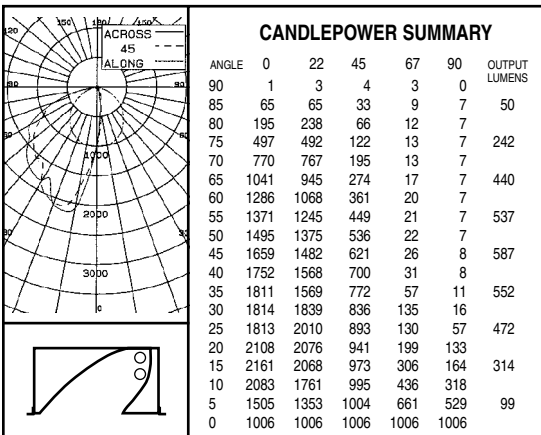


		G-D-1014T8 68.0 % Efficiency Litecontrol Certified Test Report #18911000																				
RCC	RW	80				70				50				30				10				0
		70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	50	30	10	0
R	C																					
0	0	.81	.81	.81	.81	.79	.79	.79	.79	.76	.76	.76	.76	.72	.72	.72	.72	.69	.69	.69	.68	
1	1	.74	.71	.68	.66	.73	.70	.67	.65	.67	.65	.63	.64	.62	.61	.62	.61	.62	.60	.59	.58	
2	2	.68	.62	.58	.54	.66	.61	.57	.53	.58	.55	.52	.56	.53	.51	.54	.52	.54	.52	.50	.48	
3	3	.62	.55	.49	.45	.60	.53	.48	.44	.52	.47	.44	.50	.46	.43	.48	.45	.42	.41			
4	4	.56	.48	.42	.38	.55	.47	.42	.37	.46	.41	.37	.44	.40	.36	.42	.39	.36	.34			
5	5	.51	.42	.36	.31	.50	.41	.35	.31	.40	.35	.31	.39	.34	.30	.37	.33	.30	.29			
6	6	.47	.37	.31	.27	.45	.37	.31	.27	.35	.30	.26	.34	.30	.26	.33	.29	.26	.24			
7	7	.43	.33	.27	.23	.42	.33	.27	.23	.32	.26	.23	.31	.26	.22	.30	.26	.22	.21			
8	8	.39	.30	.24	.20	.38	.29	.24	.20	.28	.23	.19	.28	.23	.19	.27	.22	.19	.18			
9	9	.36	.27	.21	.17	.35	.26	.21	.17	.25	.20	.17	.25	.20	.16	.24	.20	.16	.15			
10	10	.33	.24	.18	.15	.33	.24	.18	.15	.23	.18	.15	.22	.18	.14	.22	.17	.14	.13			

Floor Cavity Reflectance 20

ZONE	LUMENS	% LAMP	% LUMINAIRE
180-90°	0	0.0	0.0
90-0°	1973	68.05	100.00
180-0°	1973	68.05	100.00

ANGLE	0	45	90	135	180
45°	2023	2033	541	27	9
55°	2413	1869	495	30	6
65°	2902	2198	435	31	8
75°	1367	2071	368	46	19
85°	820	758	328	83	58

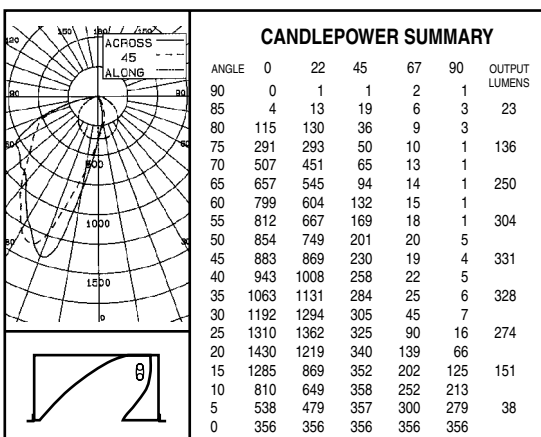


		G-D-1024T8 56.7 % Efficiency Litecontrol Certified Test Report #18921002																				
RCC	RW	80				70				50				30				10				0
		70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	50	30	10	0
R	C																					
0	0	.67	.67	.67	.67	.66	.66	.66	.66	.63	.63	.63	.63	.60	.60	.60	.60	.58	.58	.58	.57	
1	1	.62	.60	.57	.55	.61	.58	.56	.54	.56	.54	.53	.54	.52	.51	.52	.51	.49	.49			
2	2	.57	.52	.49	.45	.55	.51	.48	.45	.49	.46	.44	.47	.45	.43	.46	.44	.42	.41			
3	3	.52	.46	.42	.38	.50	.45	.41	.38	.44	.40	.37	.42	.39	.37	.41	.38	.36	.35			
4	4	.48	.41	.36	.32	.46	.40	.36	.32	.39	.35	.32	.37	.34	.31	.36	.33	.31	.30			
5	5	.43	.36	.31	.27	.42	.35	.31	.27	.34	.30	.27	.33	.29	.27	.32	.29	.26	.25			
6	6	.40	.32	.27	.24	.39	.32	.27	.23	.31	.26	.23	.30	.26	.23	.29	.25	.23	.22			
7	7	.37	.29	.24	.21	.36	.29	.24	.20	.28	.23	.20	.27	.23	.20	.26	.23	.20	.19			
8	8	.34	.26	.21	.18	.33	.25	.21	.18	.25	.21	.18	.24	.20	.17	.23	.20	.17	.16			
9	9	.31	.23	.19	.15	.30	.23	.18	.15	.22	.18	.15	.22	.18	.15	.21	.18	.15	.14			
10	10	.29	.21	.17	.13	.28	.21	.17	.13	.20	.16	.13	.20	.16	.13	.19	.16	.13	.12			

Floor Cavity Reflectance 20

ZONE	LUMENS	% LAMP	% LUMINAIRE
180-90°	0	0.0	0.0
90-0°	3288	56.69	100.00
180-0°	3288	56.69	100.00

ANGLE	0	45	90	135	180
45°	3499	3125	1305	54	17
55°	3564	3236	1163	54	19
65°	3673	3333	963	61	26
75°	2864	2827	703	77	39
85°	1119	1102	569	151	117



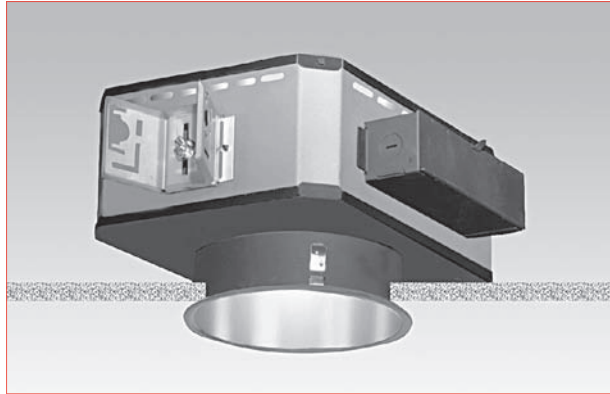
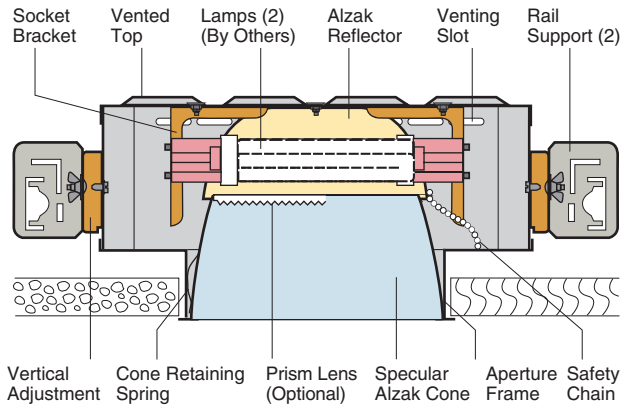
		G-D-1012BX40 58.1 % Efficiency Litecontrol Certified Test Report #18910000																				
RCC	RW	80				70				50				30				10				0
		70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	50	30	10	0
R	C																					
0	0	.69	.69	.69	.69	.68	.68	.68	.68	.65	.65	.65	.65	.62	.62	.62	.62	.59	.59	.59	.58	
1	1	.64	.61	.59	.57	.62	.60	.58	.56	.57	.56	.54	.55	.54	.52	.53	.52	.51	.50			
2	2	.58	.54	.50	.47	.57	.53	.49	.46	.51	.48	.45	.49	.46	.44	.47	.45	.43	.42			
3	3	.53	.47	.43	.39	.52	.46	.42	.39	.45	.41	.38	.43	.40	.37	.42	.39	.37	.36			
4	4	.49	.42	.37	.33	.48	.41	.37	.33	.40	.36	.33	.39	.35	.32	.37	.34	.32	.31			
5	5	.45	.37	.32	.29	.43	.37	.32	.28	.36	.31	.28	.34	.31	.28	.33	.30	.27	.26			
6	6	.41	.33	.28	.25	.40	.33	.28	.24	.32	.27	.24	.31	.27	.24	.30	.26	.24	.23			
7	7	.38	.30	.25	.21	.37	.29	.24	.21	.28	.24	.21	.27	.24	.21	.27	.23	.20	.19			
8	8	.35	.27	.22	.19	.34	.26	.22	.18	.26	.21	.18	.25	.21	.18	.24	.21	.18	.17			
9	9	.32	.24	.19	.16	.31	.24	.19	.16	.23	.19	.16	.23	.19	.16	.22	.18	.16	.15			
10	10	.30	.22	.17	.14	.29	.22	.17	.14	.21	.17	.14	.21	.17	.14	.20	.16	.14	.13			

Floor Cavity Reflectance 20

ZONE	LUMENS	% LAMP	% LUMINAIRE
180-90°	0	0.0	0.0
90-0°	1830	58.11	100.00
180-0°	1830	58.11	100.00

ANGLE	0	45	90	135	180
45°	3759	698	975	81	15
55°	4260	3500	884	94	6
65°	4677	3882	665	99	8
75°	3382	3401	574	120	14
85°	122	463	644	203	106





P633 Two 18W Quad Tube Lamps
P634 Two 26W Quad Tube Lamps

Wide Beam
7 1/4" Conoid Apertures

Optics and Applications

The primary reflectors maximize the output of two energy efficient quad tube lamps. The parabolic shielding cones offer low brightness visual comfort from all normal viewing angles. Use in entries, corridors, transient spaces, and for task lighting in low to medium height ceilings.

Design Features

Construction allows easy access to all components. Efficient air flow design and extensive heat testing assure cool fixture temperature for optimal lamp performance. Steel housings protect the reflectors and assure their proper relationship for maximum performance. Maximum ceiling thickness 2". Ballast and lamp service from below.

Finish

Specular clear Alzak cones are standard. Optional colors and Softglow® finishes are available. Housings and structural parts are painted optical matte black to suppress stray light leaks. Steel parts are phosphate conditioned for corrosion resistance before painting.

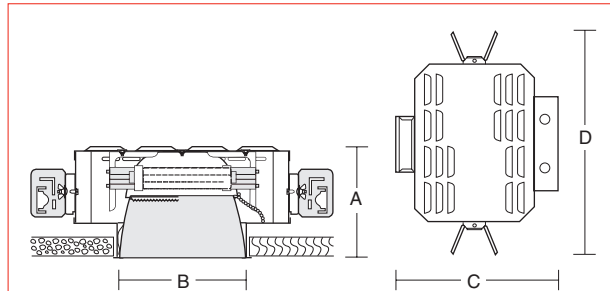
Ballasts

Fully electronic, microprocessor controlled with variable starting current for inrush protection to assure rated lamp life. Input voltage range from 120V through 277V. Power factor .98, starting temperature 0°F (-18°C), THD < 10%. Pre-heat start < 1.0 second. End of lamp life protection. Rated for > 50,000 starts.

General

Fixtures are pre-wired, UL and C-UL listed for eight wire 75°C branch circuit wiring. Union made IBEW. Luminaire Efficiency Rating (LER) data is in the photometric directory located in Section Z.

Dimensions and Lamps



Number	A Depth	B Aperture	C Width	D Length*	Lamps
P633	6 1/2" 165mm	7 1/4" 184mm	13 1/2" 343mm	19" 483mm	Two 18W Quad Tube
P634	6 1/2" 165mm	7 1/4" 184mm	13 1/2" 343mm	19" 483mm	Two 26W Quad Tube

*Length increases to 24" with EM accessory.

Accessories

- R2 26" support rails. WT White trim flange.
- R5 52" support rails. WHT White complete trim.
- G Gold cone. DCE Double circuiting.
- H Mocha cone. V347 347 volt ballast.
- P Graphite cone. LS Lamp shield, acrylic.
- T Titanium cone. LP Prism lens, acrylic.
- W Wheat cone. F Fuse.
- Y Pewter cone.
- Z Bronze cone.
- S Softglow® finishes: add S before color letters. e.g. SW for Softglow® wheat cone, SC for Softglow® clear cone.

- DM Dimming ballast. Specify watts and volts.
- EM Emergency power includes integral charger light and test switch visible through aperture. Single lamp operation for 90 minutes. Specify volts.

Matching Units

- Medium beam downlight [Page P3](#)
- Wall washers [Pages P31, P32](#)
- Cross baffled downlights [Pages P21, P24](#)
- Surface cylinders [Page P41](#)

** Click for link to pages in blue.

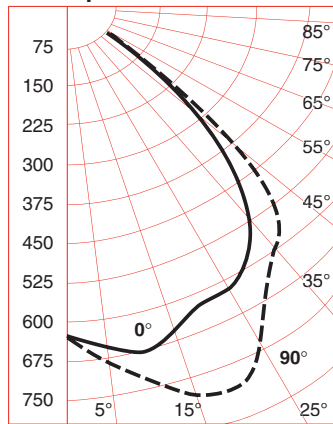
P4 P633 P634

Performance Datachart

Single Unit Initial Footcandles, 30" Work Plane						Ceiling to Floor		Multiple Units Initial Footcandles, 30" Work Plane					
P633 Two 18W Quad Tube lamps Read Top Data								Ceiling 80% Walls 50% Floor 20%					
P634 Two 26W Quad Tube lamps Read Bottom Data								Spacing is Maximum Over Work Plane					
Nadir		15°		25°		35°							
FC	FC	Diam	FC	Diam	FC	Diam			Spacing	RCR 1	RCR 3	RCR 8	
22	21	3'	16	5'	11	8'	8'		7'	24	20	13	
32	32	3'	24	5'	16	8'			8'	34	29	19	
16	15	3'	12	6'	8	9'	9'		9'	18	15	9	
23	23	3'	17	6'	12	9'			9'	24	20	13	
12	12	4'	9	7'	6	11'	10'		10'	13	11	7	
17	17	4'	13	7'	9	11'			11'	18	15	10	
7	7	5'	5	9'	4	13'	12'		13'	8	7	4	
11	11	5'	8	9'	5	13'			13'	11	10	6	
5	5	6'	4	11'	2	16'	14'		16'	6	5	3	
7	7	6'	6	11'	4	16'			16'	8	7	4	

See notes 4, 5 and 6.

Candlepower Distribution



P633 Two 18W Quad Tube lamps
Eff. 50% S/M 0° 1.3 S/M 90° 1.4

Candelas

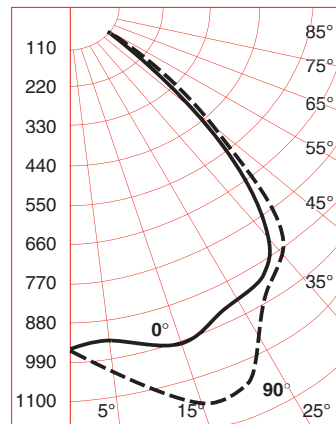
°	0°	90°
	2500*	2500*
0	657	657
5	664	679
10	688	728
15	672	762
20	613	770
25	613	715
30	592	611
35	528	600
40	412	556
45	241	429
50	149	184
55	40	87
60	9	23
65	5	5
70	0	0
75	0	0
80	0	0
85	0	0
90	0	0

° Vertical Angles
* Initial Lamp Lumens

Coefficients of Utilization

Ceiling	80%				70%		50%		30%		0
	70	50	30	10	50	10	50	10	50	10	0
Wall %	Zonal Cavity Method - Floor Reflectance 20%										
RCR	Zonal Cavity Method - Floor Reflectance 20%										
1	.58	.56	.55	.53	.55	.53	.53	.51	.51	.49	.47
2	.54	.51	.49	.47	.50	.46	.49	.45	.47	.44	.42
3	.51	.47	.44	.41	.46	.41	.45	.40	.43	.40	.38
4	.48	.43	.39	.37	.42	.37	.41	.36	.40	.36	.34
5	.44	.39	.36	.33	.39	.33	.38	.33	.37	.32	.31
6	.42	.36	.32	.30	.36	.30	.35	.29	.34	.29	.28
7	.39	.33	.29	.27	.33	.27	.32	.27	.31	.26	.25
8	.36	.31	.27	.24	.30	.24	.30	.24	.29	.24	.23
9	.34	.28	.25	.22	.28	.22	.27	.22	.27	.22	.21
10	.32	.26	.23	.20	.26	.20	.26	.20	.25	.20	.19

P633 Two 18W Quad Tube lamps
P634 Two 26W Quad Tube lamps



P634 Two 26W Quad Tube lamps
Eff. 52% S/M 0° 1.3 S/M 90° 1.4

°	0°	90°
	3600*	3600*
0	980	980
5	971	1033
10	982	1091
15	995	1145
20	912	1145
25	924	1037
30	909	950
35	800	942
40	592	811
45	364	503
50	175	284
55	65	132
60	19	34
65	5	9
70	0	0
75	0	0
80	0	0
85	0	0
90	0	0

° Vertical Angles
* Initial Lamp Lumens

Corridor Footcandles

P633 Two 18W Quad Tube lamps Read Top Data												
P634 Two 26W Quad Tube lamps Read Bottom Data												
Ceiling Height	Reflectances: Ceiling 80% Walls 50% Floor 20%											
	8' Centers				12' Centers							
	C/L	2'	4'	6'	C/L	C/L	2'	4'	6'	8'	10'	C/L
8'	19	20	20	20	19	14	14	13	12	13	14	14
	28	31	29	31	28	21	22	18	18	18	22	21
9'	18	18	18	18	18	12	12	12	11	12	12	12
	26	27	27	27	26	17	18	18	17	18	18	17
10'	16	16	17	16	16	10	11	12	10	12	11	10
	24	24	25	24	24	15	17	17	16	17	17	15

Initial footcandles. Readings on the floor. 5' corridor width.

Notes

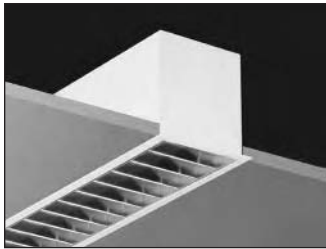
- Data on all charts calculated with a clear specular cone finish.
- Specular cone multipliers: Wheat x .97, Pewter x .88, Mocha x .88, Graphite x .85, Titanium x .85, Bronze x .80, Black x .50.
- Softglow® cone multipliers: Clear x .97, Wheat x .87, Pewter x .73, Mocha x .69, Graphite x .68, Titanium x .68, Bronze x .68.
- Single unit Datachart pattern diameters are determined by the number of degrees from each side of nadir. Therefore a 15° diameter represents a total 30° pattern width at the work plane 30" above the floor. Footcandle values are at the edge of that diameter.
- Datachart spacing is rounded off to the nearest foot.
- Data by IES methods. Compact fluorescent data vary due to lamp lumen differences, power input, burning position, ambient temperature and ballast characteristics. A modification factor should be applied.
- Brightness data from the Average Luminance Method are inaccurate for small aperture downlights. They are theoretical calculations derived for large surfaces such as troffers. For a complete discussion refer to section Z brochure Z1.

Brightness

Number	Lamps	Plane	85°	75°	65°	55°	45°
P633	Two 18W Quad Tube	0°	2	13	57	1390	7045
		90°	3	18	46	4311	7050
P634	Two 26W Quad Tube	0°	2	17	72	1801	8821
		90°	4	25	68	6349	10401

Data in footlamberts. Photometer readings, Maximum Brightness Method. See note 7.

M100 Recessed Linear Fluorescent Flanged Extrusion



Project: _____ Type: _____ Qty: _____

Fixture Series	Lamp Type	Shielding	Mounting	Nominal Length	Finish	Voltage

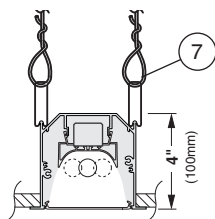
Options (refer to separate data sheets for ordering codes and details)

Fixture Series	Lamp Type	Shielding	Mounting	Nominal Length	Finish	Voltage	Options
M1R1 M100 Recessed Continuous Flange (Flanged Extrusion/ Flanged Endcaps)	1T5 F28T5	SA Specular Parabolic	SH Suspension Clips	004 4 foot	WH White	120	TB Lengths to Fit 2' Grid, T-Bar Ceiling System ¹ (qty.)EM Stand-by Battery Pack ² (prefix quantity, i.e. - 5EM) FS Single Fusing DM Dimming ¹ (specify system) DMA Digital Addressable Dimming ¹ SI Satine Acrylic Inlay ³ FW Flex Whip (standard) FW1 Flex Whip (dimming) Track Eutrac Standard ⁴ DL Suitable for Damp Locations CCEA Chicago Plenum Downlights (See MR16 spec sheets, pp.98-99)
	2T5 (2x)F28/T5	MA Matte Parabolic	TS 1" Studs (factory installed)	008 8 foot	BK Black	277	
	1T5HO F54T5HO	MP Silky Specular Parabolic	RC Rotating Crossbars	012 12 foot	SV Silver	347	
M1R2 M100 Recessed Flush End (Flanged Extrusion/ Flangeless Endcaps)	1T8 F032/T8	PL Matte Perforated Parabolic	PM Perimeter Mount	For actual lengths see following page. For other lengths, configurations indicate nominal length rounded to the next highest foot. Factory will supply layout drawings. Individual fixtures cannot be field joined.			
		SD Satine Lens			SP Specify RAL#		
		OD Extra Diffuse Lens					
		X None					

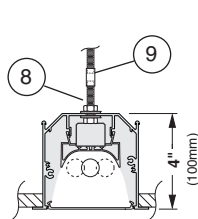
¹T5 & T5HO lamps only, consult factory for other lamps. ²Must be low profile ballasts (1 1/2" W x 1 3/16" H); consult factory for details. ³SA, MA, MP & PL shieldings only. ⁴Consult factory for details.

Mounting Diagrams

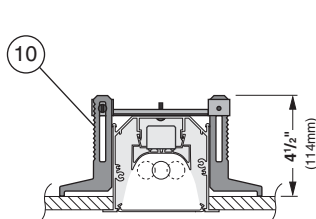
Suspension Clips (SH)



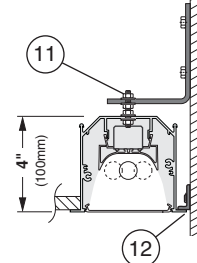
Pre-installed Rod (TS)



Rotating Crossbars (RC)



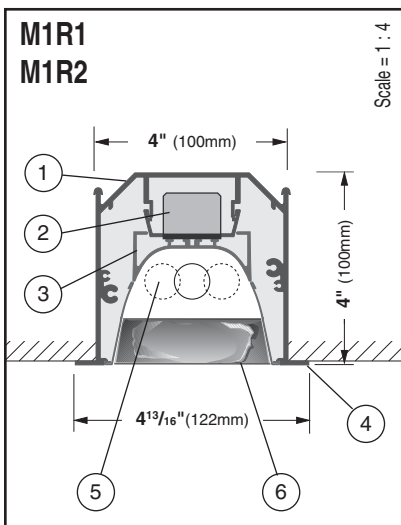
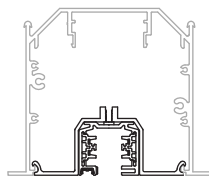
Perimeter Mount (PM)



Scale = 1 : 8

Track

Track insert including track available for all configurations, consult factory for details.



Scale = 1 : 4

1. Housing - Continuous, 6063-T5 extruded aluminum profile up to 16 feet long. Joined with Connector Plus Joining System for ease of installation and to assure a uniform appearance.

2. Ballast - Electronic, high power factor, class "P", type "A" sound rating. Specify 120v, 277v, or 347v. Ballast is factory pre-wired with leads to one end of fixture. Consult factory for ballast options.

3. Gear Tray - Extruded aluminum, with white painted finish. Gear tray installed as a complete electrical unit and is held in place with knurled dress nuts. It is fully accessible from below ceiling.

4. Flange - 1/2" (12mm) wide flange runs full lengths of both sides and is part of the main extruded body. Specify continuous flange (M1R1) or flush end (M1R2).

5. Lamps - As noted (by others). Other lamp lengths or wattages available, consult factory.

6. Shielding - Louvers offer excellent glare control in longitudinal, lateral, and all diagonal planes. High quality aluminum louvers and acrylic shielding allow true freedom of layout for today's modern spaces.

7. Spring Steel Suspension Clips - Supplied two places, located nominally every 4 ft. Support wires supplied and installed by others.

8. Pre-installed 1" 1/4-20 Stud - Attached to fixture every nominal 4 feet.

9. Coupling and Threaded Rod to Structure - Supplied and installed by others.

10. Rotating Crossbar - For inaccessible ceilings, adjustable for ceiling thicknesses from 1/4" to 2". Support required nominally every 4'.

11. Steel Wall Bracket and 1/4-20 Rod - Supplied nominally every 4 ft. Fasteners to wall and wall anchors by others.

12. Aluminum Wallbracket - Secured to wall (fasteners and wall anchors by others) and runs entire length of fixture. Also supplied for width of fixtures when supplied with continuous flange. Allows for 1/8" gap between flange and wall to create shadow line allowing for unevenness of wall.

Interior Luminaire Finish - Standard interior colors are White (WH), Black (BK) and Silver (SV). RAL colors (SP) are available, please specify RAL#.

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 FAX: (845) 691-6749
 www.selux.com/USA
 M1R1-01 (v5.1)



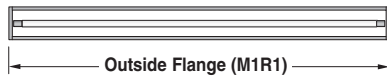
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In a continuing effort to offer the best product possible, we reserve the right to change, without notice, specifications or materials that in our opinion will not alter the function of the product. Specification sheets found at www.selux.com/usa are the most recent versions and supersede all other printed or electronic versions.

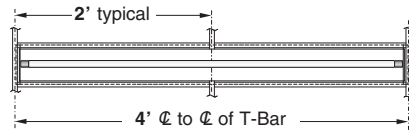
M1R1 and M1R2 Layout Dimensions

Specify T5 lamps when using in grid ceiling systems where 24" or 48" light openings are required.

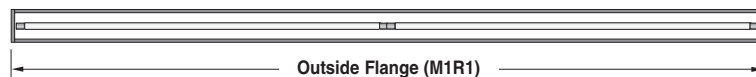
M1R1 Recessed - nominal 4 foot individual



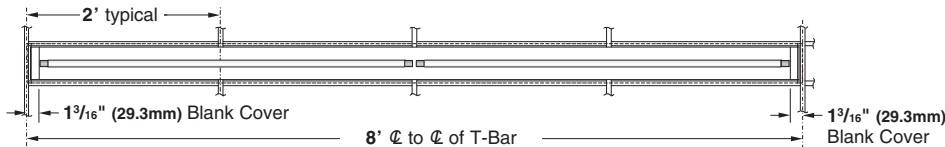
M1R1 Recessed - T-Bar Length - nominal 4 foot individual



M1R1 Recessed - nominal 8 foot individual



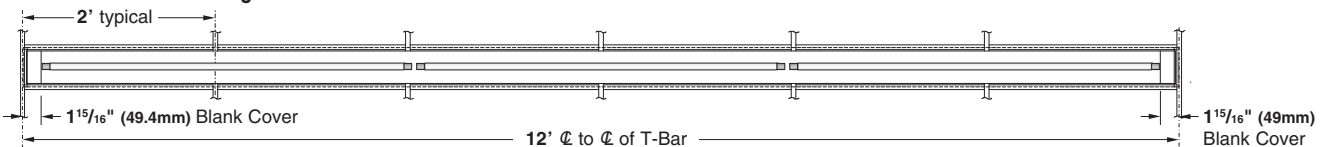
M1R1 Recessed - T-Bar Length - nominal 8 foot individual



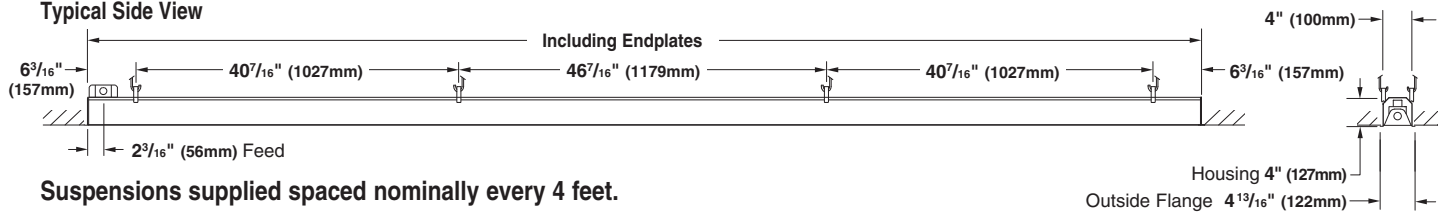
M1R1 Recessed - nominal 12 foot individual



M1R1 Recessed - T-Bar Length - nominal 12 foot individual



Typical Side View



Suspensions supplied spaced nominally every 4 feet.

Fixture supplied with 7/8 knockout located 2³/₁₆" from end in top of fixture.

	T5 (1 or 2 lamp)				T8 (1 lamp)	
	M1R1/M1R2 Including Endplates	M1R1 Outside Flange	M1R1/M1R2 - TB Including Endplates	M1R1 - TB Outside Flange	M1R1/M1R2 Including Endplates	M1R1 Outside Flange
4 foot individual	46.81" (1186mm)	47.58" (1209mm)	47.03" (1195mm)	47.91" (1216mm)	48.33" (1228mm)	49.20" (1250mm)
8 foot individual	93.21" (2365mm)	94.00" (2388mm)	95.03" (2414mm)	95.91" (2436mm)	96.37" (2448mm)	97.24" (2470mm)
12 foot individual	139.65" (3544mm)	140.41" (3567mm)	143.03" (3633mm)	143.91" (3655mm)	144.41" (3668mm)	145.28" (3690mm)

For other lengths, lamping, continuous runs or configurations please specify overall length (in feet), accessories desired and sketch/drawing of configuration. SELUX will detail project drawings upon order and supply submittal drawings for approval. Individual fixtures cannot be field joined. If you have any questions please contact SELUX customer service or applications engineering for assistance (1-800-SELUX-CS).

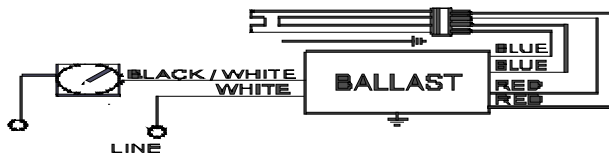
VEZ-1T42-M2-BS

Brand Name	MARK 10 POWERLINE
Ballast Type	Electronic Dimming
Starting Method	Programmed Start
Lamp Connection	Series
Input Voltage	277
Input Frequency	60 HZ
Status	Active

Electrical Specifications

Lamp Type	Num. of Lamps	Rated Lamp Watts	Min. Start Temp (°F/C)	Input Current (Amps)	Input Power (Watts) (min/max)	Ballast Factor (min/max)	MAX THD %	Power Factor	Lamp Current Crest Factor	B.E.F.
CFQ26W/G24Q	1	26	50/10	0.11	08/31	0.05/1.05	10	0.98	1.6	3.39
CFTR26W/GX24Q	1	26	50/10	0.11	08/31	0.05/1.05	10	0.98	1.6	3.39
* CFTR32W/GX24Q	1	32	50/10	0.14	09/38	0.05/1.05	10	0.98	1.6	2.76
CFTR42W/GX24Q	1	42	50/10	0.18	10/49	0.05/1.05	10	0.99	1.6	2.14

Wiring Diagram

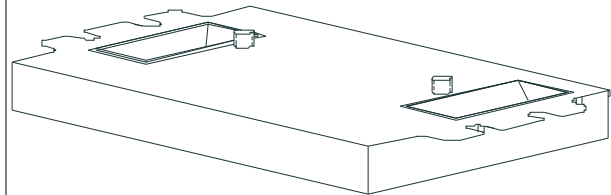


Diag. 134

The wiring diagram that appears above is for the lamp type denoted by the asterisk (*)

Standard Lead Length (inches)

Enclosure



Enclosure Dimensions

OverAll (L)	Width (W)	Height (H)	Mounting (M)
4.98 "	3.00 "	1.29 "	2.00 "
4 49/50	3	1 29/100	2
12.6 cm	7.6 cm	3.3 cm	5.1 cm

Revised 09/10/2002



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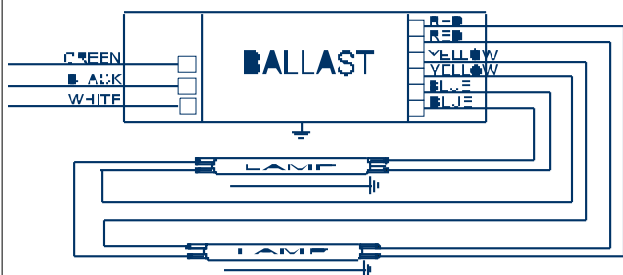
Customer Support/Technical Service: 800-372-3331 · OEM Support: 866-915-5886

Electrical Specifications

ICN-2S39@277V	
Brand Name	CENTIUM T5
Ballast Type	Electronic
Starting Method	Programmed Start
Lamp Connection	Series
Input Voltage	277
Input Frequency	50/60 HZ
Status	Active

Lamp Type	Num. of Lamps	Rated Lamp Watts	Min. Start Temp (°F/C)	Input Current (Amps)	Input Power (ANSI Watts)	Ballast Factor	MAX THD %	Power Factor	MAX Lamp Current Crest Factor	B.E.F.
F39T5/HO	1	39	0/-18	0.16	43	1.02	10	0.98	1.7	2.37
* F39T5/HO	2	39	0/-18	0.31	85	1.00	10	0.98	1.7	1.18

Wiring Diagram

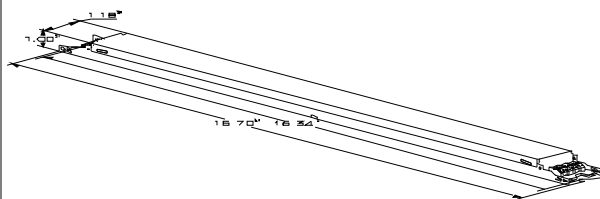


The wiring diagram that appears above is for the lamp type denoted by the asterisk (*)

Standard Lead Length (inches)

	in.	cm.		in.	cm.
Black	0	0	Yellow/Blue	0	0
White	0	0	Blue/White	0	0
Blue	0	0	Brown	0	0
Red	0	0	Orange	0	0
Yellow	0	0	Orange/Black	0	0
Gray	0	0	Black/White	0	0
Violet	0	0	Red/White	0	0

Enclosure



Enclosure Dimensions

OverAll (L)	Width (W)	Height (H)	Mounting (M)
16.70 "	1.18 "	1.00 "	16.34 "
16 7/10	1 9/50	1	16 17/50
42.4 cm	3 cm	2.5 cm	41.5 cm

Revised 09/01/2004



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ICN-2S39@277V	
Brand Name	CENTIUM T5
Ballast Type	Electronic
Starting Method	Programmed Start
Lamp Connection	Series
Input Voltage	277
Input Frequency	50/60 HZ
Status	Active

Electrical Specifications

Notes:

Section I - Physical Characteristics

- 1.1 Ballast shall be physically interchangeable with standard electromagnetic or standard electronic ballasts, where applicable.
- 1.2 Ballast shall be provided with integral leads or poke-in wire trap connectors color-coded per ANSI C82.11.

Section II - Performance Requirements

- 2.1 Ballast shall be Programmed Start.
- 2.2 Ballast shall contain auto restart circuitry in order to restart lamps without resetting power.
- 2.3 Ballast shall operate from 50/60 Hz input source of _____ (120V through 277V or 347V through 480V) with sustained variations of +/- 10% (voltage and frequency) with no damage to the ballast.
- 2.4 Ballast shall be high frequency electronic type and operate lamps at a frequency above 42 kHz to avoid interference with infrared devices and eliminate visible flicker.
- 2.5 Ballast shall have a Power Factor greater than 0.98 for primary lamp.
- 2.6 Ballast shall have a minimum ballast factor of 1.00 for primary lamp application.
- 2.7 Ballast shall provide for a Lamp Current Crest Factor of 1.7 or less in accordance with lamp manufacturer recommendations.
- 2.8 Ballast input current shall have Total Harmonic Distortion (THD) of less than 20% for Standard models and THD of less than 10% for Centium models when operated at nominal line voltage with primary lamp.
- 2.9 Ballast shall have a Class A sound rating.
- 2.10 Ballast shall have a minimum starting temperature of _____ {-18C (0F) or -29C (-20F)} for primary lamp. Consult lamp manufacturer for temperature versus light output characteristics.
- 2.11 Ballast shall provide Lamp EOL Protection Circuit.
- 2.12 Ballast shall tolerate sustained open circuit and short circuit output conditions without damage.
- 2.13 Ballast shall have a hi-low switching option when operating (4) F54T5/HO lamps to allow switching from 4-2 lamps, 3-2 lamps or 3-1 lamp.
- 2.14 Four-lamp ballast shall have semi-independent lamp operation.

Section III - Regulatory Requirements

- 3.1 Ballast shall not contain any Polychlorinated Biphenyl (PCB).
- 3.2 Ballast shall be Underwriters Laboratories (UL) listed, Class P and Type 1 Outdoor; and Canadian Standards Association (CSA) certified where applicable.
- 3.3 Ballast shall comply with ANSI C62.41 Category A for Transient protection.
- 3.4 Ballast shall comply with ANSI C82.11 where applicable.
- 3.5 Ballast shall comply with the requirements of the Federal Communications Commission (FCC) rules and regulations, Title 47 CFR part 18, Non-Consumer (Class A) for EMI/RFI (conducted and radiated).
- 3.6 Ballast shall comply with UL Type CC rating.

Section IV - Other

- 4.1 Ballast shall be manufactured in a factory certified to ISO 9002 Quality System Standards.
- 4.2 Ballast shall carry a five-year warranty from date of manufacture against defects in material or workmanship, including replacement, for operation at a maximum case temperature of 70C. Ballasts with a "90C" designation in their catalog number shall also carry a three-year warranty at a maximum case temperature of 90C.
- 4.3 Manufacturer shall have a fifteen-year history of producing electronic ballasts for the North American market.

Revised 09/01/2004



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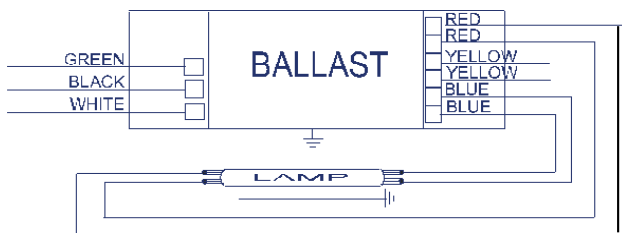
ICN-2S28@277

Brand Name	CENTIUM T5
Ballast Type	Electronic
Starting Method	Programmed Start
Lamp Connection	Series
Input Voltage	277
Input Frequency	50/60 HZ
Status	Active

Electrical Specifications

Lamp Type	Num. of Lamps	Rated Lamp Watts	Min. Start Temp (°F/C)	Input Current (Amps)	Input Power (ANSI Watts)	Ballast Factor	MAX THD %	Power Factor	MAX Lamp Current Crest Factor	B.E.F.
F14T5	1	14	0/-18	0.07	19	1.07	20	0.90	1.7	5.63
F14T5	2	14	0/-18	0.13	34	1.06	10	0.98	1.7	3.12
F21T5	1	21	0/-18	0.10	26	1.03	15	0.95	1.7	3.96
F21T5	2	21	0/-18	0.17	48	1.02	10	0.98	1.7	2.13
* F28T5	1	28	0/-18	0.12	33	1.04	10	0.98	1.7	3.15
F28T5	2	28	0/-18	0.23	63	1.03	10	0.99	1.7	1.63
F35T5	1	35	0/-18	0.15	41	1.01	10	0.98	1.7	2.46
F35T5	2	35	0/-18	0.28	77	1.00	10	0.99	1.7	1.30

Wiring Diagram



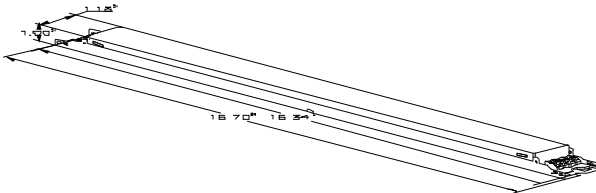
For 1 lamp operation, do not use yellow leads

The wiring diagram that appears above is for the lamp type denoted by the asterisk (*)

Standard Lead Length (inches)

	in.	cm.		in.	cm.
Black	0	0	Yellow/Blue	0	0
White	0	0	Blue/White	0	0
Blue	0	0	Brown	0	0
Red	0	0	Orange	0	0
Yellow	0	0	Orange/Black	0	0
Gray	0	0	Black/White	0	0
Violet	0	0	Red/White	0	0

Enclosure



Enclosure Dimensions

OverAll (L)	Width (W)	Height (H)	Mounting (M)
16.70 "	1.18 "	1.00 "	16.34 "
16 7/10	1 9/50	1	16 17/50
42.4 cm	3 cm	2.5 cm	41.5 cm

Revised 03/03/2009



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ICN-2S28@277	
Brand Name	CENTIUM T5
Ballast Type	Electronic
Starting Method	Programmed Start
Lamp Connection	Series
Input Voltage	277
Input Frequency	50/60 HZ
Status	Active

Electrical Specifications

Notes:

Section I - Physical Characteristics

- 1.1 Ballast shall be physically interchangeable with standard electromagnetic or standard electronic ballasts, where applicable.
- 1.2 Ballast shall be provided with integral leads or poke-in wire trap connectors color-coded per ANSI C82.11.

Section II - Performance Requirements

- 2.1 Ballast shall be Programmed Start.
- 2.2 Ballast shall contain auto restart circuitry in order to restart lamps without resetting power.
- 2.3 Ballast shall operate from 50/60 Hz input source of _____ (120V through 277V or 347V through 480V) with sustained variations of +/- 10% (voltage and frequency) with no damage to the ballast.
- 2.4 Ballast shall be high frequency electronic type and operate lamps at a frequency above 42 kHz to avoid interference with infrared devices and eliminate visible flicker.
- 2.5 Ballast shall have a Power Factor greater than 0.98 for primary lamp.
- 2.6 Ballast shall have a minimum ballast factor of 1.00 for primary lamp application.
- 2.7 Ballast shall provide for a Lamp Current Crest Factor of 1.7 or less in accordance with lamp manufacturer recommendations.
- 2.8 Ballast input current shall have Total Harmonic Distortion (THD) of less than 20% for Standard models and THD of less than 10% for Centium models when operated at nominal line voltage with primary lamp.
- 2.9 Ballast shall have a Class A sound rating.
- 2.10 Ballast shall have a minimum starting temperature of _____ {-18C (0F) or -29C (-20F)} for primary lamp. Consult lamp manufacturer for temperature versus light output characteristics.
- 2.11 Ballast shall provide Lamp EOL Protection Circuit.
- 2.12 Ballast shall tolerate sustained open circuit and short circuit output conditions without damage.
- 2.13 Ballast shall have a hi-low switching option when operating (4) F54T5/HO lamps to allow switching from 4-2 lamps, 3-2 lamps or 3-1 lamp.
- 2.14 Four-lamp ballast shall have semi-independent lamp operation.

Section III - Regulatory Requirements

- 3.1 Ballast shall not contain any Polychlorinated Biphenyl (PCB).
- 3.2 Ballast shall be Underwriters Laboratories (UL) listed, Class P and Type 1 Outdoor; and Canadian Standards Association (CSA) certified where applicable.
- 3.3 Ballast shall comply with ANSI C62.41 Category A for Transient protection.
- 3.4 Ballast shall comply with ANSI C82.11 where applicable.
- 3.5 Ballast shall comply with the requirements of the Federal Communications Commission (FCC) rules and regulations, Title 47 CFR part 18, Non-Consumer (Class A) for EMI/RFI (conducted and radiated).
- 3.6 Ballast shall comply with UL Type CC rating.

Section IV - Other

- 4.1 Ballast shall be manufactured in a factory certified to ISO 9002 Quality System Standards.
- 4.2 Ballast shall carry a five-year warranty from date of manufacture against defects in material or workmanship, including replacement, for operation at a maximum case temperature of 70C. Ballasts with a "90C" designation in their catalog number shall also carry a three-year warranty at a maximum case temperature of 90C.
- 4.3 Manufacturer shall have a fifteen-year history of producing electronic ballasts for the North American market.

Revised 03/03/2009



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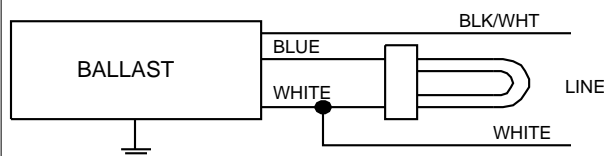
Customer Support/Technical Service: 800-372-3331 · OEM Support: 866-915-5886

VH-1Q18-TP-BLS	
Brand Name	COMPACT-HPF
Ballast Type	Magnetic
Starting Method	Pre-Heat
Lamp Connection	Series
Input Voltage	277
Input Frequency	60 HZ
Status	Active

Electrical Specifications

Lamp Type	Num. of Lamps	Rated Lamp Watts	Min. Start Temp (°F/C)	Input Current (Amps)	Starting Current (Amps)	Open Circuit (Amps)	Input Power (Watts)	Ballast Factor	MAX THD %	Power Factor
CFM18W/GX24D	1	18	50/10	0.10	0.27	0.16	23	1.02	25	0.83
* CFQ18W/G24D	1	18	50/10	0.10	0.27	0.16	23	1.00	30	0.91
CFS16W/GR8	1	16	25/-04	0.10	0.26	0.16	22	1.05	25	0.87

Wiring Diagram



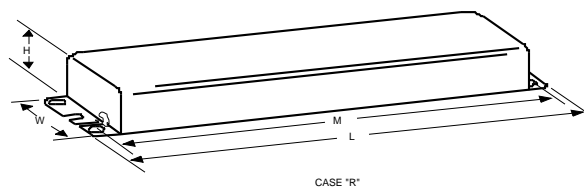
Diag. 47

The wiring diagram that appears above is for the lamp type denoted by the asterisk (*)

Standard Lead Length (inches)

	in.	cm.		in.	cm.
Black		0	Yellow/Blue		0
White	7	17.8	Blue/White		0
Blue	7	17.8	Brown		0
Red		0	Orange		0
Yellow		0	Orange/Black		0
Gray		0	Black/White	7	17.8
Violet		0	Red/White		0

Enclosure



Enclosure Dimensions

OverAll (L)	Width (std)/(TP)	Height (H)	Mounting (M)
4.75 "	2.21875 "/0 "	1.625 "	4.375 "
4 3/4	2 7/32 / 0	1 5/8	4 3/8
12.1 cm	5.6 cm / 0 cm	4.1 cm	11.1 cm

Revised 07/01/1999



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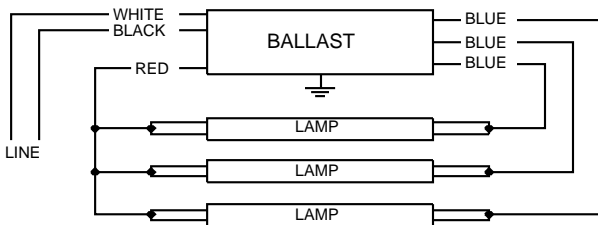
IOP3P32HL90CSC@277

Brand Name	OPTANIUM 2.0
Ballast Type	Electronic
Starting Method	Instant Start
Lamp Connection	Parallel
Input Voltage	277
Input Frequency	50/60 HZ
Status	Active

Electrical Specifications

Lamp Type	Num. of Lamps	Rated Lamp Watts	Min. Start Temp (°F/C)	Input Current (Amps)	Input Power (ANSI Watts)	Ballast Factor	MAX THD %	Power Factor	MAX Lamp Current Crest Factor	B.E.F.
* F32T8	2	32	-20/-29	0.29	79	1.38	10	0.98	1.7	1.75
F32T8	3	32	-20/-29	0.29	107	1.18	10	0.98	1.6	1.10

Wiring Diagram



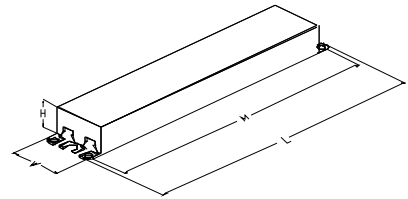
Diag. 65

The wiring diagram that appears above is for the lamp type denoted by the asterisk (*)

Standard Lead Length (inches)

	in.	cm.		in.	cm.
Black	25	63.5	Yellow/Blue		0
White	25	63.5	Blue/White		0
Blue	31	78.7	Brown		0
Red	37	94	Orange		0
Yellow		0	Orange/Black		0
Gray		0	Black/White		0
Violet		0	Red/White		0

Enclosure



Enclosure Dimensions

OverAll (L)	Width (W)	Height (H)	Mounting (M)
9.50 "	1.7 "	1.18 "	8.90 "
24.1 cm	4.3 cm	3 cm	22.6 cm

Revised 08/23/2006



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IOP3P32HL90CSC@277	
Brand Name	OPTANIUM 2.0
Ballast Type	Electronic
Starting Method	Instant Start
Lamp Connection	Parallel
Input Voltage	277
Input Frequency	50/60 HZ
Status	Active

Electrical Specifications

Notes:

Section I - Physical Characteristics

- 1.1 Ballast shall be physically interchangeable with standard electromagnetic or standard electronic ballasts, where applicable.
- 1.2 Ballast shall be provided with integral leads color-coded per ANSI C82.11.

Section II - Performance Requirements

- 2.1 Ballast shall be _____ (Instant or Programmed) Start.
- 2.2 Ballast shall provide Independent Lamp Operation (ILO) for Instant Start ballasts allowing remaining lamp(s) to maintain full light output when one or more lamps fail.
- 2.3 Ballast shall contain auto restart circuitry in order to restart lamps without resetting power.
- 2.4 Ballast shall operate from 50/60 Hz input source of 120V through 277V with sustained variations of +/- 10% (voltage and frequency) with no damage to the ballast.
- 2.5 Ballast shall be high frequency electronic type and operate lamps at a frequency between 42 kHz and 52 kHz to avoid interference with infrared devices, eliminate visible flicker and avoid Article Surveillance System, such as anti-theft devices.
- 2.6 Ballast shall have a Power Factor greater than 0.98 for primary lamp.
- 2.7 Ballast shall have a minimum ballast factor for primary lamp application as follows: 0.77 for Low Watt, 0.87 for Normal Light Output, and 1.18 for High Light for Instant Start ballasts or 0.71 for Low Watt and 0.88 for Normal Light Output for Programmed Start ballasts.
- 2.8 Ballast shall provide for a Lamp Current Crest Factor of 1.7 or less in accordance with lamp manufacturer recommendations.
- 2.9 Ballast input current shall have Total Harmonic Distortion (THD) of less than 10% when operated at nominal line voltage with primary lamp.
- 2.10 Ballast shall have a Class A sound rating for all 4-foot lamps and smaller.
- 2.11 Ballast shall have a minimum starting temperature of -20F (-29C) on Instant Start Ballasts or 0F (-18C) Programmed Start ballasts for standard T8 lamps and 60F (16C) for energy-saving T8 lamps. Consult lamp manufacturer for temperature versus light output characteristics.
- 2.12 Ballast shall tolerate sustained open circuit and short circuit output conditions without damage.
- 2.13 Ballast shall contain an anti-striation circuitry to reduce striation on energy-saving T8 lamps.
- 2.14 Programmed Start ballasts shall provide lamp EOL protection circuitry.
- 2.15 Ballast can be Remote or Tandem wired as follows:
 Instant Start ballasts - Remote or Tandem wiring allowed to a maximum of 20 feet between ballast and lamp socket. For Tandem wiring, any lamp can be remote mounted.
 Programmed Start 2-lamp ballast - Remote or Tandem wiring allowed to a maximum of 10 feet between ballast and lamp socket for energy-saving T8 lamps or 20 feet for standard T8 lamps. For Tandem wiring, BLUE lamp must be in same fixture as the ballast.
 Programmed Start 3 & 4-lamp (Normal Light) ballast - Remote or Tandem wiring allowed to a maximum of 10 feet between ballast and lamp socket for energy-saving T8 lamps or 20 feet for standard T8 lamps. For Tandem wiring, RED and YELLOW lamps must be in the same fixture as the ballast.
 Programmed Start 3 & 4-lamp (Low Watt) ballast - Remote or Tandem wiring allowed to a maximum of 10 feet between ballast and lamp socket for all T8 lamps. For Tandem wiring, RED and YELLOW lamps must be in the same fixture as the ballast.

Section III - Regulatory Requirements

- 3.1 Ballast shall not contain any Polychlorinated Biphenyl (PCB).
- 3.2 Ballast shall be Underwriters Laboratories (UL) listed, Class P and Type 1 Outdoor; and Canadian Standards Association (CSA) certified where applicable.
- 3.3 Ballast shall comply with ANSI C62.41 Category A for Transient protection.
- 3.4 Ballast shall comply with ANSI C82.11 where applicable.
- 3.5 Ballast shall comply with the requirements of the Federal Communications Commission (FCC) rules and regulations, Title 47 CFR part 18,

Non-Consumer (Class A) for EMI/RFI (conducted and radiated).

3.6 Ballast shall comply with UL Type CC rating (with the exception of IOPA models).

3.7 Ballast shall meet NEMA/CEE High Performance T8 Lighting System Specifications.

Section IV - Other

4.1 Ballast shall be manufactured in a factory certified to ISO 9002 Quality System Standards.

4.2 Ballast shall carry a five-year warranty from date of manufacture against defects in material or workmanship, including replacement, for operation at a maximum case temperature of 70C. Ballasts with a 90 C designation in their catalog number shall also carry a three-year warranty at a maximum case temperature of 90 C.

4.3 Manufacturer shall have a fifteen-year history of producing electronic ballasts for the North American market.

4.4 Ballast shall be Advance part # _____ or approved equal.

NOTE: The use of Optanium IOP and ICN-2P32-N models is recommended to reduce striation in energy-saving T8 lamps (25W, 28W or 30W). Remote or tandem wiring of energy-saving T8 lamps (25W, 28W or 30W) is only recommended for Optanium 2.0 (IOP) models.

Consult lamp manufacturer for applications with Ballast Factor > 1.2

Revised 08/23/2006



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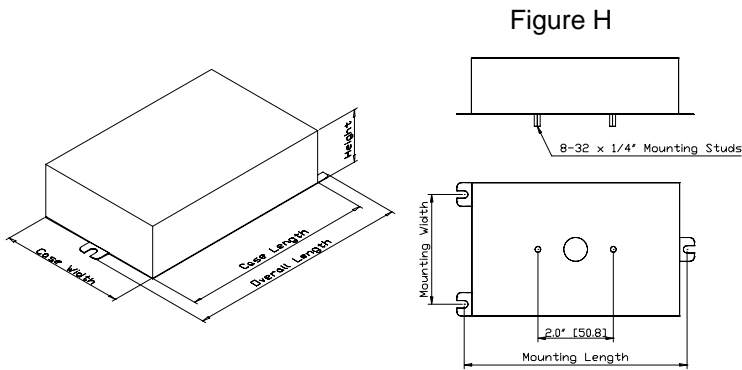


e-Vision® Electronic Ballast for Metal Halide Lamps

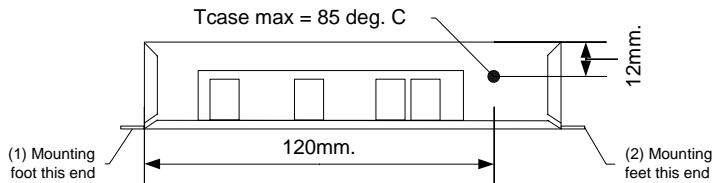
Catalog Number IMH-150-H
 For 150W Metal Halide Lamps
 ANSI M142, M102
 120-277V 50/60Hz Electronic
 Status: Released

DIMENSIONS AND DATA

Lamp Data		Input Volts	Catalog Number*	Line Current (Amps)	Input Power (W)	Ballast Factor	Max THD (%)	Min Power Factor	Wiring Dia	Figure	Weight (lb)	Max Distance to Lamp (ft)
Number	Watts											
150W Watt Lamp, ANSI Code M142, M102 Minimum Starting Temp -30°C/-20°F												
1	150	120	IMH-150-H-xxx	1.38	165	1.0	10%	0.90	3	H	1.9	5
		277		0.69	161							



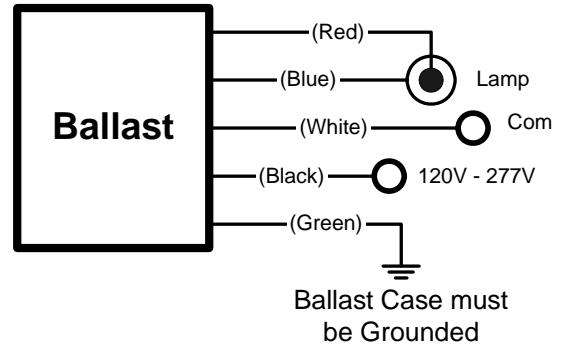
CASE LENGTH = 5.67" [144mm]
 MOUNTING LENGTH = 6.0" [152mm]
 MOUNTING WIDTH = 2.87" [73mm]
 OVERALL LENGTH = 6.34" [161mm]
 CASE WIDTH = 3.62" [92mm]
 HEIGHT = 1.5" [38mm]



Case Temperature Measurement Location

INSTALLATION & APPLICATION NOTES:

1. Maximum allowable case temperature is 85°C. See figure above for measurement location
2. Ignition pulse is 4 kV max
3. All leads are 12 inches long
4. Ballast output will shutdown after 20 minutes if lamp fails to ignite
5. Power must be cycled off – then on, after replacing lamp
6. Connect the red lead to the center terminal of the lamp when using screw base lamps



Wiring Diagram 3



*Ordering Information

Order Suffix	Description
-LF	Ballast with side exit leads and mounting feet
-BLS	Ballast with bottom exit leads and mounting studs

Data is based on tests performed by Advance transformer in a controlled environment and representative of relative performance. Actual performance can vary depending on operating conditions. Specifications are subject to change without notice. All specifications are nominal unless otherwise noted.



e-Vision® Electronic Ballast for Metal Halide Lamps

Catalog Number IMH-70-A-BLS-ID
 For 70W Metal Halide Lamps
 ANSI M98, M143 or M139
 120-277V 50/60Hz Electronic
 Status: Released

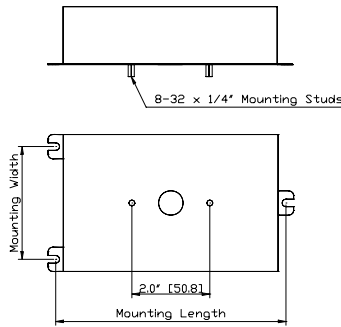
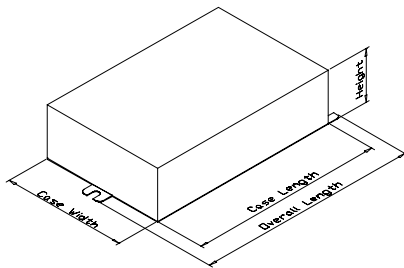
DIMENSIONS AND DATA

Lamp Data		Input Volts	Catalog Number*	Line Current (Amps)	Input Power (W)	Ballast Factor	Max THD (%)	Min Power Factor	Wiring Dia	Figure	Weight (lb)	Max Distance to Lamp (ft)
Number	Watts											

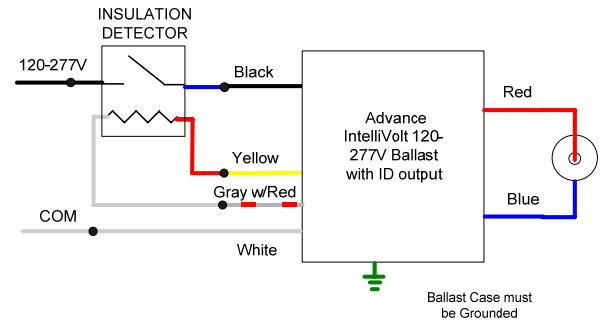
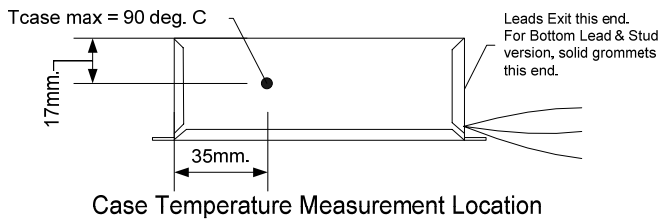
70W Watt Lamp, ANSI Code M98, M143 or M139 Minimum Starting Temp -30°C/-20°F

1	70	120	IMH-70-A-xxx-ID	0.72	86	1.0	18%	0.9	8	A	1.5	5
		277		0.31	84							

Figure A



CASE LENGTH = 4.72" [120mm]
 MOUNTING LENGTH = 5.20" [132mm]
 MOUNTING WIDTH = 2.87" [73mm]
 OVERALL LENGTH = 5.51" [140mm]
 CASE WIDTH = 3.62" [92mm]
 HEIGHT = 1.50" [38mm]



Wiring Diagram 8

Ballast will not operate if Insulation Detector is Absent, Shorted or Failed Open



INSTALLATION & APPLICATION NOTES:

1. Use with any Thermal Protector having equivalent resistive value 5k to 25k ohm (4 wire versions only)
2. Open Circuit voltage across ID output approx 270VDC
3. Maximum allowable case temperature is 90°C. See figure above for measurement location
4. Ignition pulse is 4 kV max
5. All leads are 12 inches long
6. Ballast output will shutdown after 20 minutes if lamp fails to ignite
7. Power must be cycled off – then on, after replacing lamp

*Ordering Information

Order Suffix	Description
-BLS	Ballast with bottom exit leads and mounting studs

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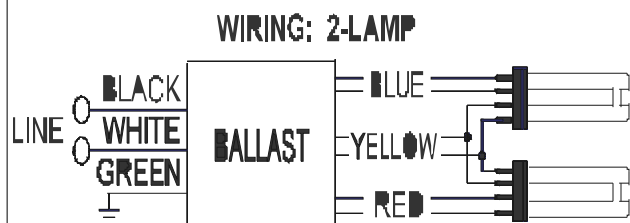
ICF-2S70-M4-BS@277

Brand Name	SMARTMATE
Ballast Type	Electronic
Starting Method	Programmed Start
Lamp Connection	Series
Input Voltage	120-277
Input Frequency	50/60 HZ
Status	Active

Electrical Specifications

Lamp Type	Num. of Lamps	Rated Lamp Watts	Min. Start Temp (°F/C)	Input Current (Amps)	Input Power (ANSI Watts)	Ballast Factor	MAX THD %	Power Factor	MAX Lamp Current Crest Factor	B.E.F.
* CFQ70W/GX24Q	2	70	0/-18	1.30	156	1.00	10	0.99	1.7	0.64
CFTR57W/GX24Q	2	57	0/-18	0.46	126	1.00	10	0.98	1.7	0.79
CFTR70W/GX24Q	2	70	0/-18	1.30	156	1.00	10	0.99	1.7	0.64

Wiring Diagram



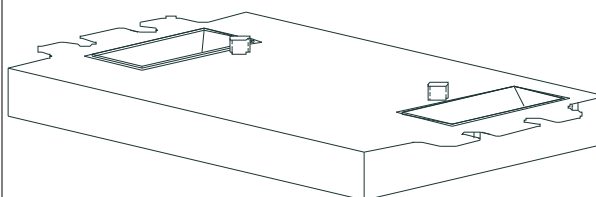
Green Terminal must be Grounded

The wiring diagram that appears above is for the lamp type denoted by the asterisk (*)

Standard Lead Length (inches)

	in.	cm.		in.	cm.
Black	0	0	Yellow/Blue		0
White	0	0	Blue/White		0
Blue	0	0	Brown		0
Red	0	0	Orange		0
Yellow	0	0	Orange/Black		0
Gray		0	Black/White		0
Violet		0	Red/White		0

Enclosure



Enclosure Dimensions

OverAll (L)	Width (W)	Height (H)	Mounting (M)
7.79 "	3.0 "	1.31 "	2.0 "
7 79/100	3	1 31/100	2
19.8 cm	7.6 cm	3.3 cm	5.1 cm

Revised 08/05/2008



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Customer Support/Technical Service: 800-372-3331 · OEM Support: 866-915-5886

ICF-2S70-M4-BS@277	
Brand Name	SMARTMATE
Ballast Type	Electronic
Starting Method	Programmed Start
Lamp Connection	Series
Input Voltage	120-277
Input Frequency	50/60 HZ
Status	Active

Electrical Specifications

Notes:

Section I - Physical Characteristics

- 1.1 Ballast shall be physically interchangeable with standard electromagnetic or standard electronic ballasts, where applicable.
- 1.2 Ballast shall be available in a plastic/metal can or all metal can construction to meet all plenum requirements.
- 1.3 Ballast shall be provided with poke-in wire trap connectors color coded per ANSI C82.11.

Section II - Performance Requirements

- 2.1 Ballast shall be Programmed Start except for ballasts with -QS suffix, which shall be Rapid Start.
- 2.2 Ballast shall contain auto restart circuitry in order to restart lamps without resetting power.
- 2.3 Ballast shall operate from 50/60 Hz input source of 120V through 277V with sustained variations of +/- 10% (voltage and frequency) with no damage to the IntelliVolt ballast. RCF models shall operate from 60 Hz input source of 120V with sustained variations of +/- 10% (voltage and frequency) with no damage to the ballast.
- 2.4 Ballast shall be high frequency electronic type and operate lamps at a frequency above 42 kHz to avoid interference with infrared devices and eliminate visible flicker.
- 2.5 Ballast shall have a Power Factor greater than 0.98 for primary lamp.
- 2.6 Ballast shall have a minimum ballast factor of 1.00 for primary lamp application.
- 2.7 Ballast shall provide for a Lamp Current Crest Factor of 1.7 or less in accordance with lamp manufacturer recommendations.
- 2.8 Ballast input current shall have Total Harmonic Distortion (THD) of less than 10% when operated at nominal line voltage with primary lamp.
- 2.9 Ballast shall have a Class A sound rating.
- 2.10 Ballast shall have a minimum starting temperature of -18C (0F) for primary lamp. Ballasts for PL-H lamps shall have a minimum starting temperature of -30C (-20F) for primary lamp.
- 2.11 Ballast shall provide Lamp EOL Protection Circuit.
- 2.12 Ballast shall tolerate sustained open circuit and short circuit output conditions without damage.

Section III - Regulatory Requirements

- 3.1 Ballast shall not contain any Polychlorinated Biphenyl (PCB).
- 3.2 Ballast shall be Underwriters Laboratories (UL) listed, Class P and Type 1 Outdoor; and Canadian Standards Association (CSA) certified where applicable.
- 3.3 Ballast shall be rated for use in air-handling spaces.
- 3.4 Ballast shall comply with ANSI C62.41 Category A for Transient protection.
- 3.5 Ballast shall comply with ANSI C82.11 where applicable.
- 3.6 Ballast shall comply with the requirements of the Federal Communications Commission (FCC) rules and regulations, Title 47 CFR part 18, Non-Consumer (Class A) for EMI/RFI (conducted and radiated).

Section IV - Other

- 4.1 Ballast shall be manufactured in a factory certified to ISO 9002 Quality System Standards.
- 4.2 Ballast shall carry a five-year warranty from date of manufacture against defects in material or workmanship, including replacement, for operation at a maximum case temperature of 75C and three-years for a maximum case temperature of 85C (90C 3year warranty for ICF1H120-M4-XX, ICF2S42-90C-M2-XX and ICF2S70-M4-XX models).
- 4.3 Manufacturer shall have a fifteen-year history of producing electronic ballasts for the North American market.

Revised 08/05/2008



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Lighting Ballast Sizing Guidelines

Smart Driver[™] Lighting Ballasts are designed to illuminate specific surface areas. Light Tape[®] will achieve maximum performance and lifetime by selecting the appropriate ballast to supply power to the application. All you need to do is determine the total surface area of Light Tape[®] that you are using for your installation. Refer to the following Quick Guide to determine which power supply is suitable.

We recommend when operating multiple segments off one Smart Driver[™] that the shortest segment is 50% of the minimum rated load. For instance, the SD-4000 recommended operating range is 2000 to 4000 square inches. Therefore, the 50% threshold for the shortest segment would be 1000 square inches. If one segment of the installation goes out, please balance the load. Prolonged use with an unbalanced load may result in failure at connection.

Smart Driver[™] Quick Guide (English: Square Inches / Metric: Square Centimeters)

Width: Inches/Centimeters

		0.25"/0.635 cm	0.5"/1.27 cm	1"/2.54 cm	1.5"/3.8 cm	2"/5.08 cm	3"/7.52 cm	4"/10.16 cm	6"/15.24 cm
Length: Feet/ Meters	10'/3m	30/194	60/387	120/774	180/1161	240/1548	360/2323	480/3097	720/4645
	20'/6m	60/197	120/774	240/1548	360/2323	480/3097	720/4645	960/6194	1440/9290
	30'/9m	90/581	180/1161	360/2323	480/3484	720/4645	1080/6968	1440/9290	2160/13935
	40'/12m	120/774	240/1548	480/3097	720/4645	960/6194	1440/9290	1920/12387	2880/18581
	50'/15m	150/968	300/1935	600/3871	900/5806	1200/7742	1880/11613	2400/15484	3600/23226
	60'/18m	180/1161	360/2323	720/4645	1080/6968	1440/9290	2160/13935	2880/18581	4320/27871
	70'/21m	210/1355	420/2710	840/5419	1260/8129	1680/10839	2520/16258	3360/21677	5040/32516
	80'/24m	240/1548	480/3097	960/6194	1440/9290	1920/12387	2880/18581	3840/24744	5760/37161
	90'/27m	270/1742	540/3484	1080/6968	1620/10452	2160/13935	3240/20903	4320/27871	6480/41806
	100'/30m	300/1935	600/3871	1200/7742	1800/11613	2400/15484	3600/23226	4800/30968	7200/46452
	125'/38m	375/2419	750/4839	1500/9677	2250/14516	3000/19355	4500/29032	6000/38710	9000/58064
	150'/45m	450/2309	900/5806	1800/11613	2400/17419	3600/23266	5400/34839	7200/46452	10800/69677
	175'/53m	525/3387	1050/6774	2100/13548	3150/20323	4200/27097	6300/40645	8400/54193	12600/81290
	200'/61m	600/3871	1200/7742	2400/15484	3600/23226	4800/30968	7200/46452	9600/61935	14400/92903
	225'/70m	675/4355	1350/8710	2700/17419	4050/26129	5400/34839	8100/52258	10800/69677	16200/104516
	250'/76m	750/4839	1500/9677	3000/19355	4500/29032	6000/38710	9000/58064	12000/77419	18000/116129
	275'/84m	825/5323	1650/10645	3300/21290	4950/31935	6600/42581	9900/63871	13200/85161	19800/127742
	300'/94m	900/5806	1800/11613	3600/23226	5400/34839	7200/46452	10800/69677	14400/92903	21600/139355

Recommended Ballast
per Range:

Light Blue
Yellow
Light Blue

PS-SD-150
PS-SD-400
PS-SD-1000

Green
Orange

PS-SD-2000
PS-SD-4000

Red
Grey

PS-SD-8000
Over range for one ballast

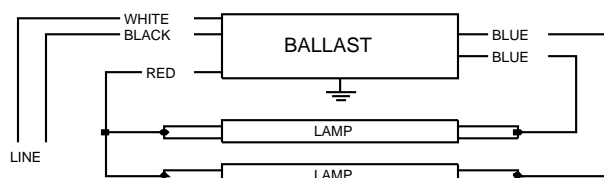
VEL-2P32-SC

Brand Name	STANDARD ELEC
Ballast Type	Electronic
Starting Method	Instant Start
Lamp Connection	Parallel
Input Voltage	277
Input Frequency	60 HZ
Status	Active

Electrical Specifications

Lamp Type	Num. of Lamps	Rated Lamp Watts	Min. Start Temp (°F/C)	Input Current (Amps)	Input Power (ANSI Watts)	Ballast Factor	MAX THD %	Power Factor	MAX Lamp Current Crest Factor	B.E.F.
F17T8	2	17	0/-18	0.13	34	0.92	30	0.91	1.7	2.71
F25T8	1	25	0/-18	0.13	30	1.10	30	0.90	1.7	3.67
F25T8	2	25	0/-18	0.17	46	0.90	25	0.96	1.7	1.96
* F32T8	1	32	0/-18	0.14	38	1.10	25	0.95	1.7	2.89
F32T8	2	32	0/-18	0.21	58	0.88	20	0.98	1.7	1.52
F32T8/ES (30W)	1	30	60/16	0.13	35	1.10	25	0.93	1.7	3.14
F32T8/ES (30W)	2	30	60/16	0.20	54	0.87	20	0.98	1.7	1.61

Wiring Diagram



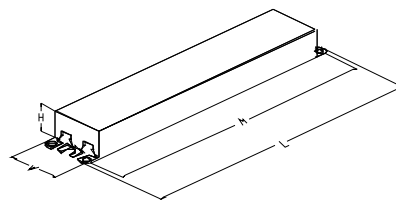
Diag. 64

The wiring diagram that appears above is for the lamp type denoted by the asterisk (*)

Standard Lead Length (inches)

	in.	cm.		in.	cm.
Black	25L	63.5	Yellow/Blue		0
White	25L	63.5	Blue/White		0
Blue	31R	78.7	Brown		0
Red	37L	94	Orange		0
Yellow		0	Orange/Black		0
Gray		0	Black/White		0
Violet		0	Red/White		0

Enclosure



Enclosure Dimensions

OverAll (L)	Width (W)	Height (H)	Mounting (M)
9.50 "	1.7 "	1.18 "	8.90 "
9 1/2	1 7/10	1 9/50	8 9/10
24.1 cm	4.3 cm	3 cm	22.6 cm

Revised 08/21/2002



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VEL-2P32-SC	
Brand Name	STANDARD ELEC
Ballast Type	Electronic
Starting Method	Instant Start
Lamp Connection	Parallel
Input Voltage	277
Input Frequency	60 HZ
Status	Active

Electrical Specifications

Notes:

Section I - Physical Characteristics

- 1.1 Ballast shall be physically interchangeable with standard electromagnetic or standard electronic ballasts, where applicable.
- 1.2 Ballast shall be provided with integral leads color-coded per ANSI C82.11.

Section II - Performance Requirements

- 2.1 Ballast shall be _____ (Instant or Rapid) Start.
- 2.2 Ballast shall provide Independent Lamp Operation (ILO) for Instant Start ballasts allowing remaining lamp(s) to maintain full light output when one or more lamps fail.
- 2.3 Ballast shall contain auto restart circuitry in order to restart lamps without resetting power.
- 2.4 Ballast shall operate from 60 Hz input source of 120V, 277V or 347V as applicable with sustained variations of +/- 10% (voltage and frequency) with no damage to the ballast.
- 2.5 Ballast shall be high frequency electronic type and operate lamps at a frequency between 20 kHz and 30 kHz or above 42 kHz to avoid interference with infrared devices and eliminate visible flicker.
- 2.6 Ballast shall have a Power Factor greater than 0.98 for primary lamp.
- 2.7 Ballast shall have a minimum ballast factor for primary lamp application as follows: 0.75 for Low Watt, 0.85 for Normal Light Output, and 1.20 for High Light.
- 2.8 Ballast shall provide for a Lamp Current Crest Factor of 1.7 or less in accordance with lamp manufacturer recommendations.
- 2.9 Ballast input current shall have Total Harmonic Distortion (THD) of less than 20% for Standard models (with the exception of the VEL-3P32-HL-SC which has a THD of <10%) and THD of less than 10% for Centium models when operated at nominal line voltage with primary lamp.
- 2.10 Ballast shall have a Class A sound rating for all 4-foot lamps and smaller.
- 2.11 Ballast shall have a minimum starting temperature of _____ [-18C (0F) for standard T8 lamps, 10C (50F) for T8/HO, standard T12, Slimline T12 and Long Twin Tube lamps, 0C (32F) for Slimline T8, -29C (-20F) for T12/HO lamps,] for primary lamp application. Ballast shall have a minimum starting temperature of 60F (16C) for energy-saving T8 and T12 lamps.
- 2.12 Ballast shall tolerate sustained open circuit and short circuit output conditions without damage.

Section III - Regulatory Requirements

- 3.1 Ballast shall not contain any Polychlorinated Biphenyl (PCB).
- 3.2 Ballast shall be Underwriters Laboratories (UL) listed, Class P and Type 1 Outdoor; and Canadian Standards Association (CSA) certified where applicable.
- 3.3 Ballast shall comply with ANSI C62.41 Category A for Transient protection.
- 3.4 Ballast shall comply with ANSI C82.11 where applicable.
- 3.5 Ballast shall comply with the requirements of the Federal Communications Commission (FCC) rules and regulations, Title 47 CFR part 18, Non-Consumer (Class A) for EMI/RFI (conducted and radiated).

Section IV - Other

- 4.1 Ballast shall be manufactured in a factory certified to ISO 9002 Quality System Standards.
- 4.2 Ballast shall carry a five-year warranty from date of manufacture against defects in material or workmanship, including replacement, for operation at a maximum case temperature of 70C.
- 4.3 Manufacturer shall have a fifteen-year history of producing electronic ballasts for the North American market.

NOTE: The use of Optanium (IOP) and ICN-2P32-N models is recommended to reduce striation in energy-saving T8 lamps (25W, 28W or 30W). Remote or tandem wiring of energy-saving T8 lamps (25W, 28W or 30W) is only recommended for Optanium (IOP) models.

Revised 08/21/2002



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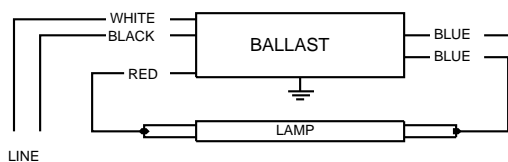
Customer Support/Technical Service: 800-372-3331 · OEM Support: 866-915-5886

Electrical Specifications

VEL-2P32-HL-SC	
Brand Name	STANDARD ELEC
Ballast Type	Electronic
Starting Method	Instant Start
Lamp Connection	Parallel
Input Voltage	277
Input Frequency	50/60 HZ
Status	Active

Lamp Type	Num. of Lamps	Rated Lamp Watts	Min. Start Temp (°F/C)	Input Current (Amps)	Input Power (ANSI Watts)	Ballast Factor	MAX THD %	Power Factor	MAX Lamp Current Crest Factor	B.E.F.
F17T8	2	17	0/-18	0.16	43	1.26	20	0.96	1.7	2.93
F25T8	1	25	0/-18	0.14	38	1.43	20	0.95	1.7	3.76
F25T8	2	25	0/-18	0.21	61	1.24	20	0.98	1.7	2.03
F32T8	1	32	0/-18	0.18	47	1.41	20	0.98	1.7	3.00
F32T8	2	32	0/-18	0.28	77	1.20	20	0.98	1.7	1.56
F32T8/ES (25W)	2	25	60/16	0.24	60	1.19	20	0.99	1.6	1.98
F32T8/ES (28W)	2	28	60/16	0.26	65	1.19	20	0.99	1.6	1.83
F32T8/ES (30W)	1	30	60/16	0.17	45	1.41	20	0.98	1.7	3.13
F32T8/ES (30W)	2	30	60/16	0.26	72	1.20	20	0.98	1.7	1.67
* F40T8	1	40	32/00	0.21	58	1.38	20	0.98	1.7	2.38

Wiring Diagram



Diag. 68

Insulate unused blue lead for 1000V

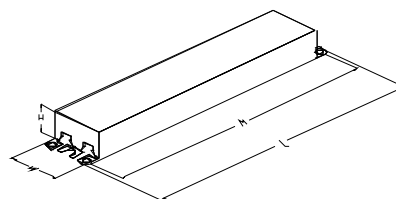
The wiring diagram that appears above is for the lamp type denoted by the asterisk (*)

Standard Lead Length (inches)

	in.	cm.
Black	25.0	
White	25.0	
Blue	31.0	
Red	37.0	
Yellow		
Gray		
Violet		

	in.	cm.
Yellow/Blue		
Blue/White		
Brown		
Orange		
Orange/Black		
Black/White		
Red/White		

Enclosure



Enclosure Dimensions

OverAll (L)	Width (W)	Height (H)	Mounting (M)
9.50 "	1.7 "	1.18 "	8.90 "
9 1/2	1 7/10	1 9/50	8 9/10
24.1 cm	4.3 cm	3 cm	22.6 cm

Revised 02/11/2008



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VEL-2P32-HL-SC	
Brand Name	STANDARD ELEC
Ballast Type	Electronic
Starting Method	Instant Start
Lamp Connection	Parallel
Input Voltage	277
Input Frequency	50/60 HZ
Status	Active

Electrical Specifications

Notes:

Section I - Physical Characteristics

- 1.1 Ballast shall be physically interchangeable with standard electromagnetic or standard electronic ballasts, where applicable.
- 1.2 Ballast shall be provided with integral leads color-coded per ANSI C82.11.

Section II - Performance Requirements

- 2.1 Ballast shall be _____ (Instant or Rapid) Start.
- 2.2 Ballast shall provide Independent Lamp Operation (ILO) for Instant Start ballasts allowing remaining lamp(s) to maintain full light output when one or more lamps fail.
- 2.3 Ballast shall contain auto restart circuitry in order to restart lamps without resetting power.
- 2.4 Ballast shall operate from 60 Hz input source of 120V, 277V or 347V as applicable with sustained variations of +/- 10% (voltage and frequency) with no damage to the ballast.
- 2.5 Ballast shall be high frequency electronic type and operate lamps at a frequency between 20 kHz and 30 kHz or above 42 kHz to avoid interference with infrared devices and eliminate visible flicker.
- 2.6 Ballast shall have a Power Factor greater than 0.98 for primary lamp.
- 2.7 Ballast shall have a minimum ballast factor for primary lamp application as follows: 0.75 for Low Watt, 0.85 for Normal Light Output, and 1.20 for High Light.
- 2.8 Ballast shall provide for a Lamp Current Crest Factor of 1.7 or less in accordance with lamp manufacturer recommendations.
- 2.9 Ballast input current shall have Total Harmonic Distortion (THD) of less than 20% for Standard models (with the exception of the VEL-3P32-HL-SC which has a THD of <10%) and THD of less than 10% for Centium models when operated at nominal line voltage with primary lamp.
- 2.10 Ballast shall have a Class A sound rating for all 4-foot lamps and smaller.
- 2.11 Ballast shall have a minimum starting temperature of _____ [-18C (0F) for standard T8 lamps, 10C (50F) for T8/HO, standard T12, Slimline T12 and Long Twin Tube lamps, 0C (32F) for Slimline T8, -29C (-20F) for T12/HO lamps,] for primary lamp application. Ballast shall have a minimum starting temperature of 60F (16C) for energy-saving T8 and T12 lamps.
- 2.12 Ballast shall tolerate sustained open circuit and short circuit output conditions without damage.

Section III - Regulatory Requirements

- 3.1 Ballast shall not contain any Polychlorinated Biphenyl (PCB).
- 3.2 Ballast shall be Underwriters Laboratories (UL) listed, Class P and Type 1 Outdoor; and Canadian Standards Association (CSA) certified where applicable.
- 3.3 Ballast shall comply with ANSI C62.41 Category A for Transient protection.
- 3.4 Ballast shall comply with ANSI C82.11 where applicable.
- 3.5 Ballast shall comply with the requirements of the Federal Communications Commission (FCC) rules and regulations, Title 47 CFR part 18, Non-Consumer (Class A) for EMI/RFI (conducted and radiated).

Section IV - Other

- 4.1 Ballast shall be manufactured in a factory certified to ISO 9002 Quality System Standards.
- 4.2 Ballast shall carry a five-year warranty from date of manufacture against defects in material or workmanship, including replacement, for operation at a maximum case temperature of 70C.
- 4.3 Manufacturer shall have a fifteen-year history of producing electronic ballasts for the North American market.

NOTE: The use of Optanium (IOP) and ICN-2P32-N models is recommended to reduce striation in energy-saving T8 lamps (25W, 28W or 30W). Remote or tandem wiring of energy-saving T8 lamps (25W, 28W or 30W) is only recommended for Optanium (IOP) models.

Revised 02/11/2008



Data is based upon tests performed by Philips Lighting Electronics N.A. in a controlled environment and is representative of relative performance. Actual performance can vary depending on operating conditions. Specifications are subject to change without notice. All specifications are nominal unless otherwise noted.

PHILIPS LIGHTING ELECTRONICS N.A.

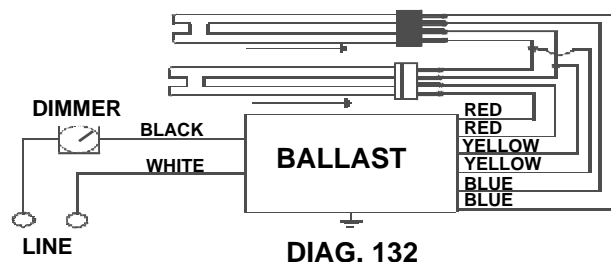
10275 WEST HIGGINS ROAD · ROSEMONT, IL 60018
 Tel: 800-322-2086 · Fax: 888-423-1882 · www.philips.com/advance
 Customer Support/Technical Service: 800-372-3331 · OEM Support: 866-915-5886

Electrical Specifications

VEZ-2Q26-M2-LD	
Brand Name	MARK 10 POWERLINE
Ballast Type	Electronic Dimming
Starting Method	Programmed Start
Lamp Connection	Series
Input Voltage	277
Input Frequency	60 HZ
Status	Active

Lamp Type	Num. of Lamps	Rated Lamp Watts	Min. Start Temp (°F/C)	Input Current (Amps)	Input Power (Watts) (min/max)	Ballast Factor (min/max)	MAX THD %	Power Factor	Lamp Current Crest Factor	B.E.F.
CFQ26W/G24Q	2	26	50/10	0.21	16/58	0.05/1.00	10	0.98	1.6	1.72
* CFTR26W/GX24Q	2	26	50/10	0.21	16/58	0.05/1.00	10	0.98	1.6	1.72

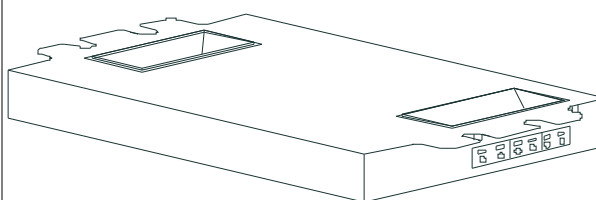
Wiring Diagram



The wiring diagram that appears above is for the lamp type denoted by the asterisk (*)

Standard Lead Length (inches)

Enclosure



Enclosure Dimensions

OverAll (L)	Width (W)	Height (H)	Mounting (M)
4.98 "	3.00 "	1.29 "	4.60 "
4 49/50	3	1 29/100	4 3/5
12.6 cm	7.6 cm	3.3 cm	11.7 cm

Revised 08/17/2006



Data is based upon tests performed by Philips Lighting Electronics N.A. in a controlled environment and is representative of relative performance. Actual performance can vary depending on operating conditions. Specifications are subject to change without notice. All specifications are nominal unless otherwise noted.

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APPENDIX E: Electrical Plans

Academic Center and Study Lounge

Athletic Dining Room

Exterior Façade

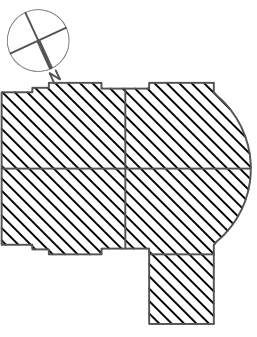
Entry Lobby



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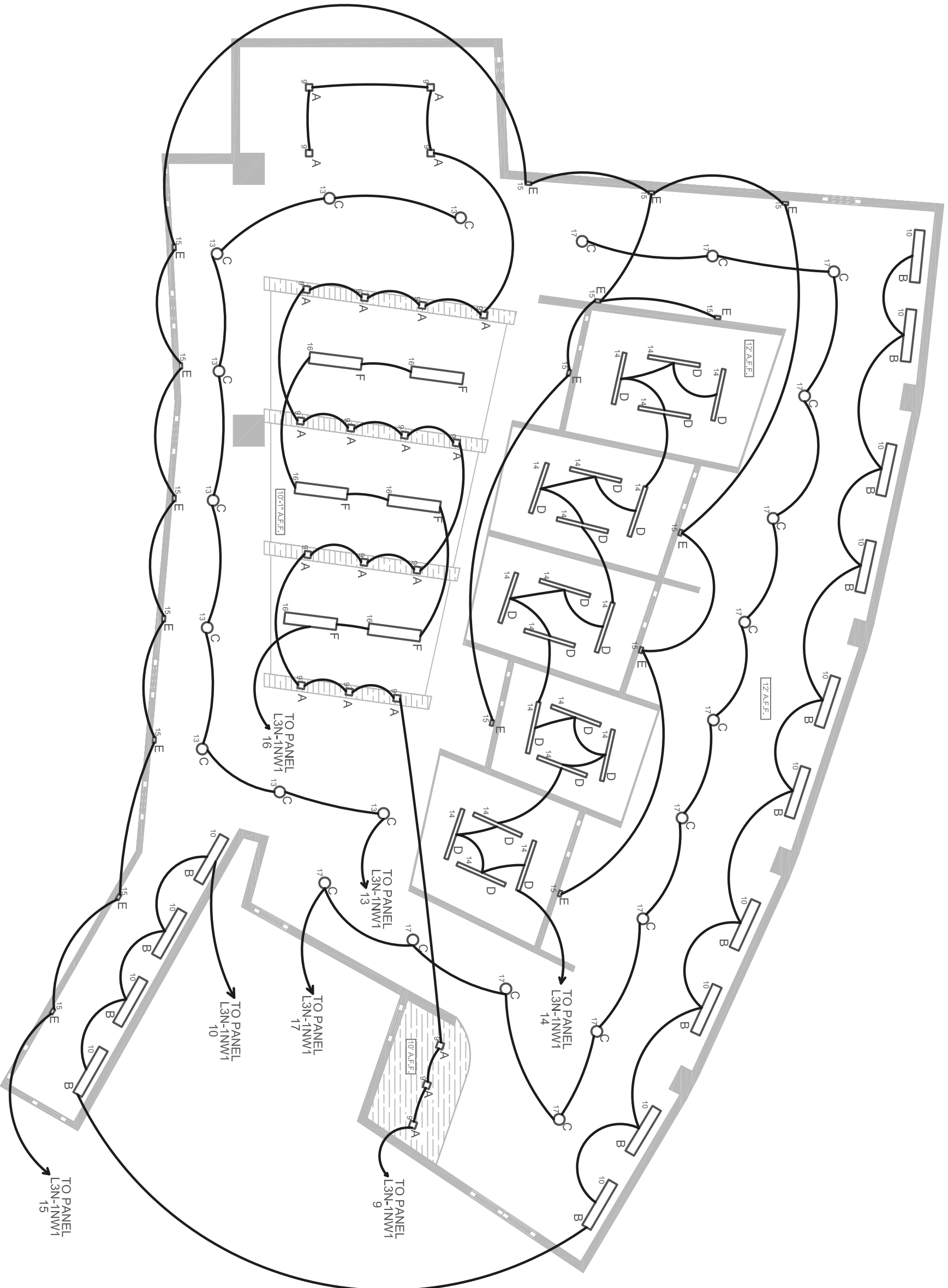


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ACADEMIC CENTER
ELECTRICAL PLAN

SCALE: 1/8" = 1'-0"

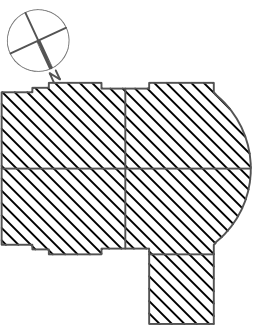




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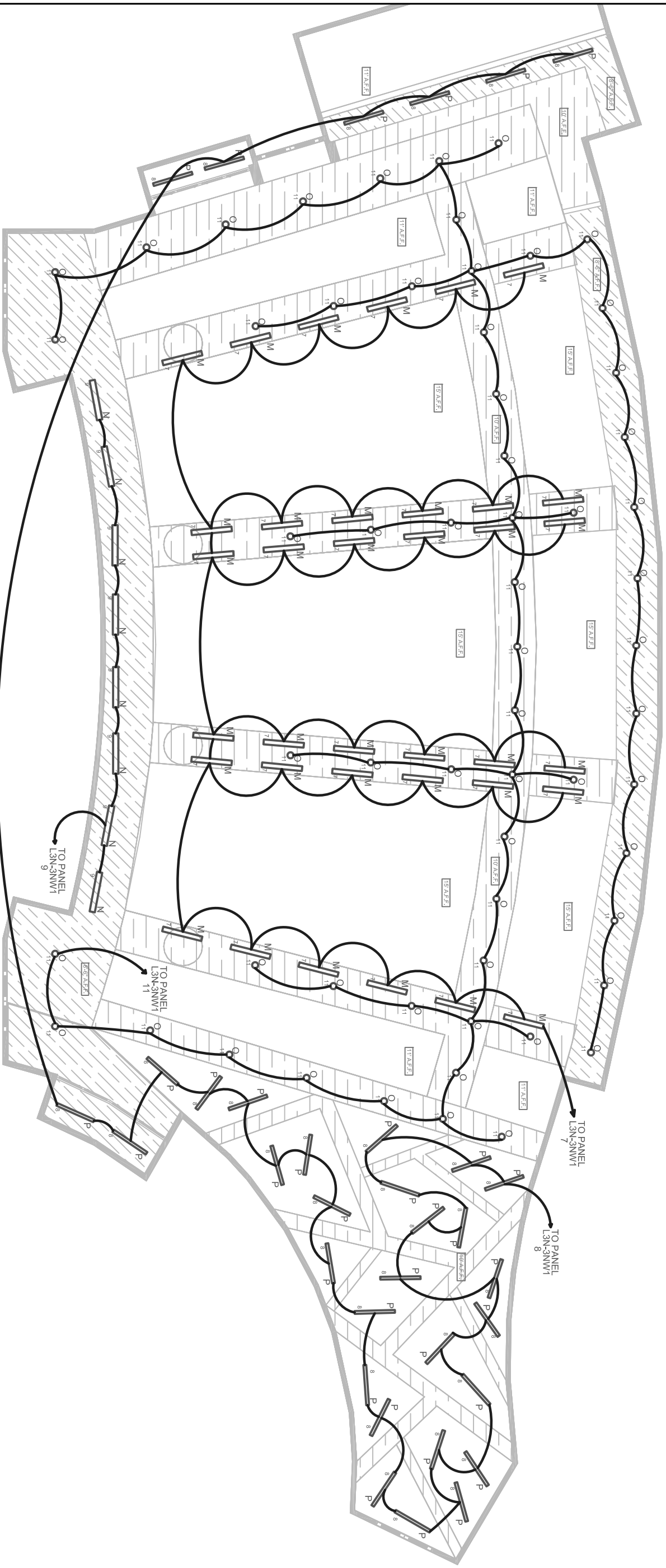


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DINING ROOM
ELECTRICAL PLAN

SCALE: 3/32" = 1'-0"

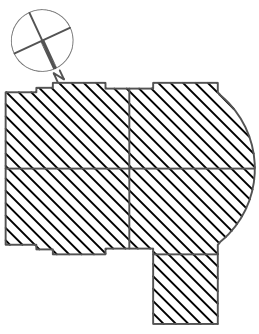




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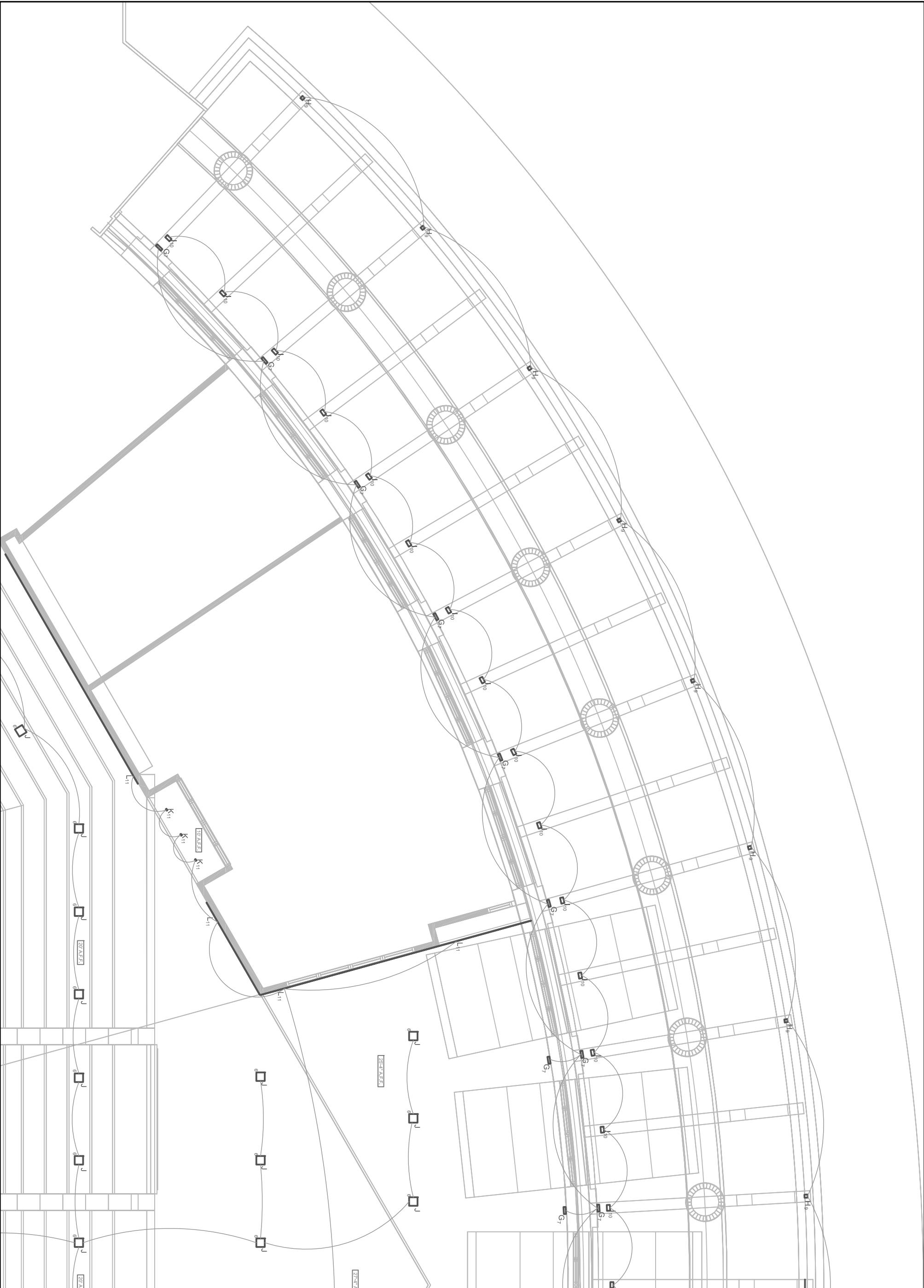


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EXTERIOR FACADE
ELECTRICAL PLAN
SHEET 1 OF 2

SCALE: 3/32" = 1'-0"

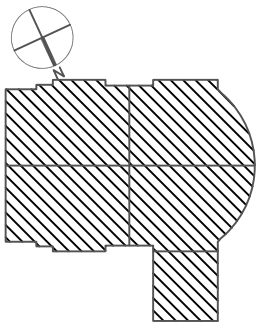




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SENIOR THESIS

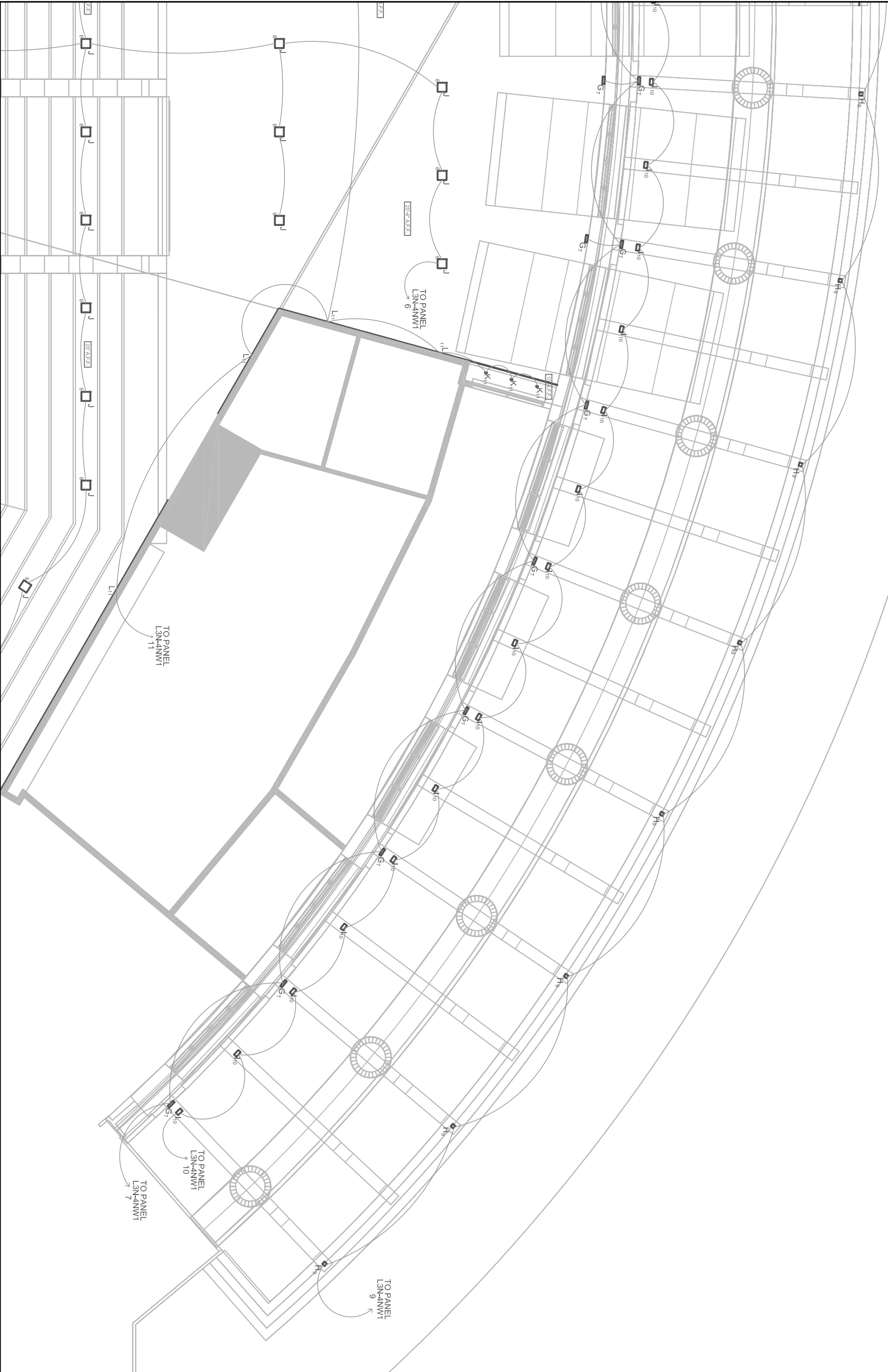


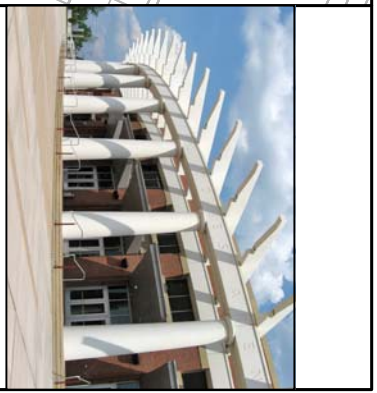
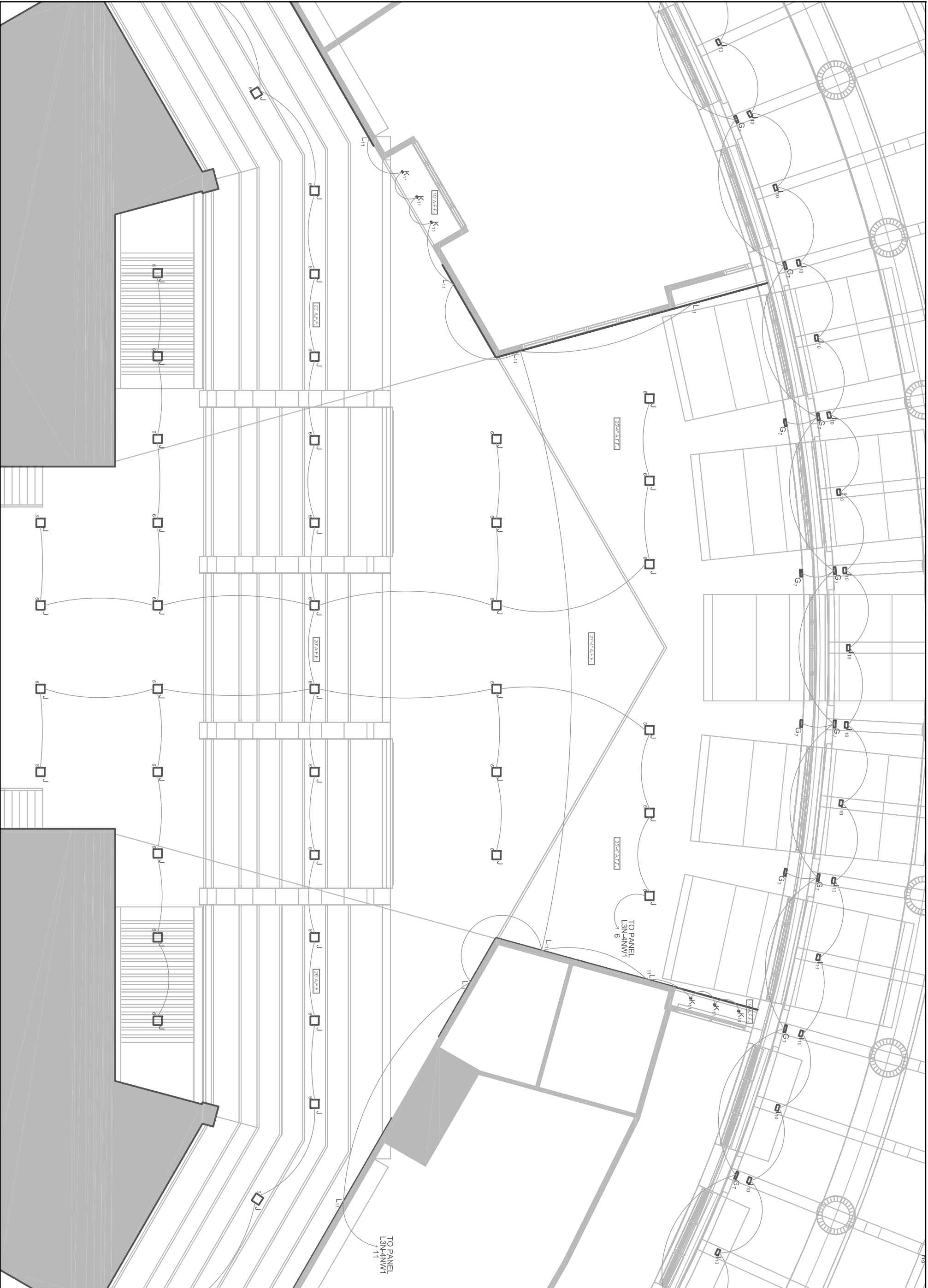
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EXTERIOR FACADE
ELECTRICAL PLAN
SHEET 2 OF 2

SCALE: 3/32" = 1'-0"

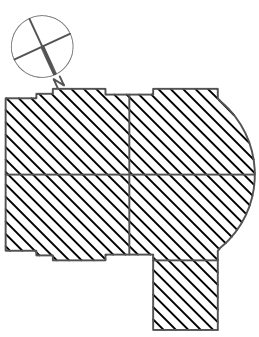




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ENTRY LOBBY
ELECTRICAL PLAN

SCALE: 3/32" = 1'-0"

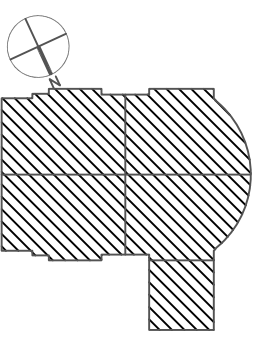
APPENDIX F: Single Line Diagrams



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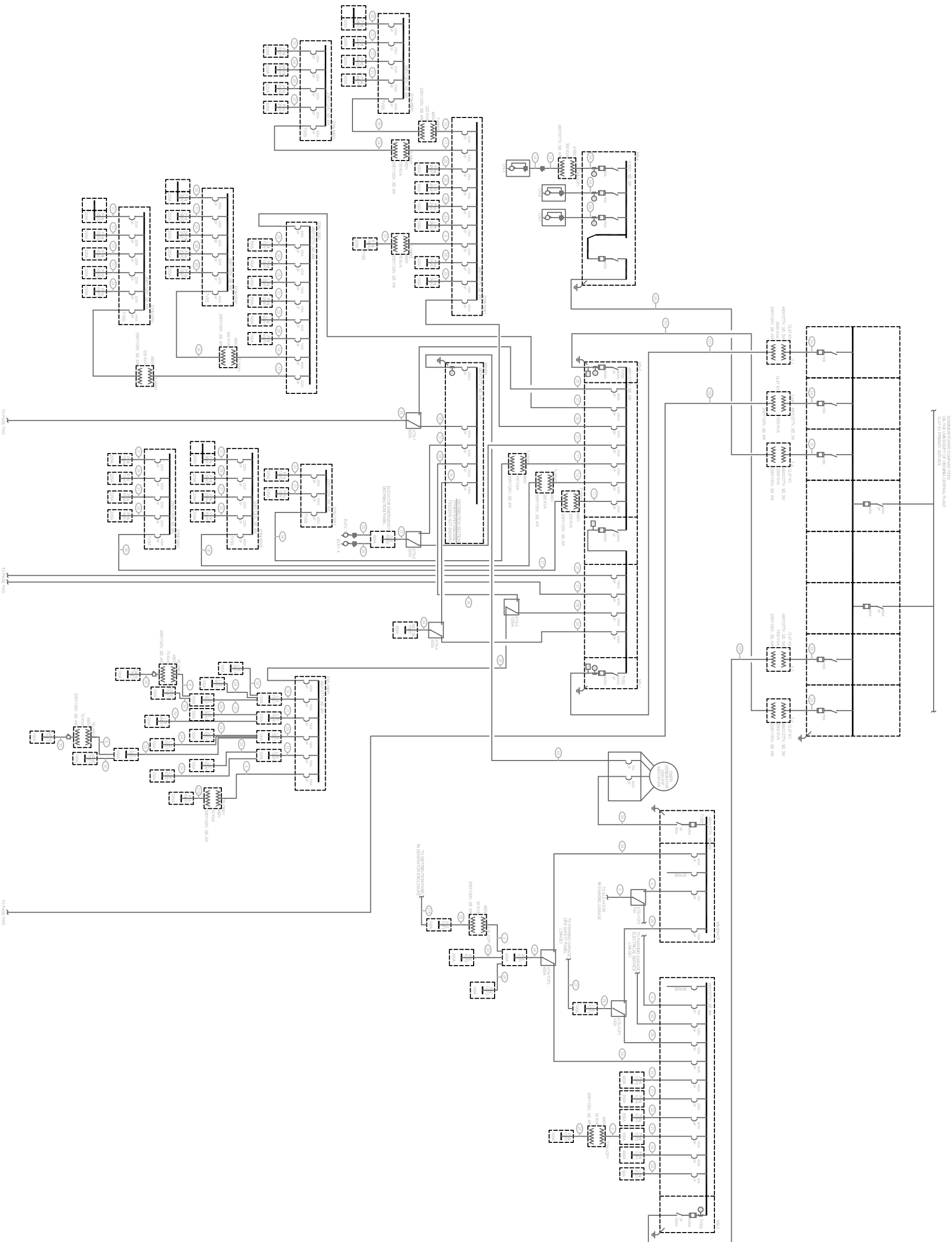


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SINGLE LINE
DIAGRAM
SHEET 1 OF 2

SCALE: NTS

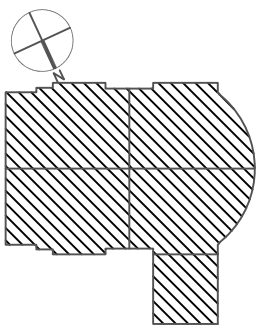




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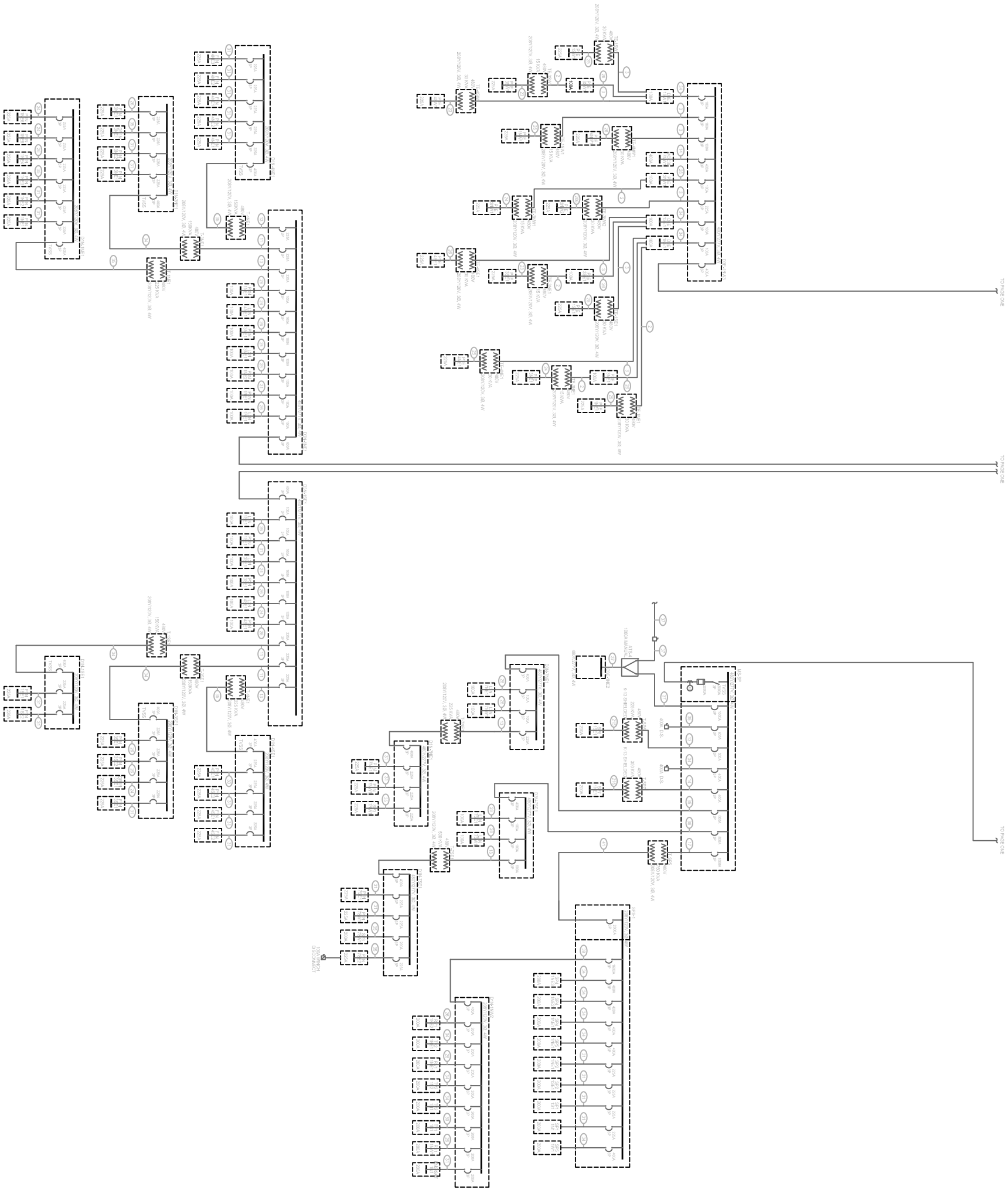


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**SINGLE LINE
DIAGRAM
SHEET 2 OF 2**

SCALE: NTS



APPENDIX G: Architectural Plans

Proposed Green Roof Areas

Building Sections

Green Roof Section

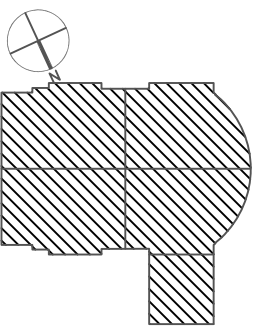
Green Roof Drain Section



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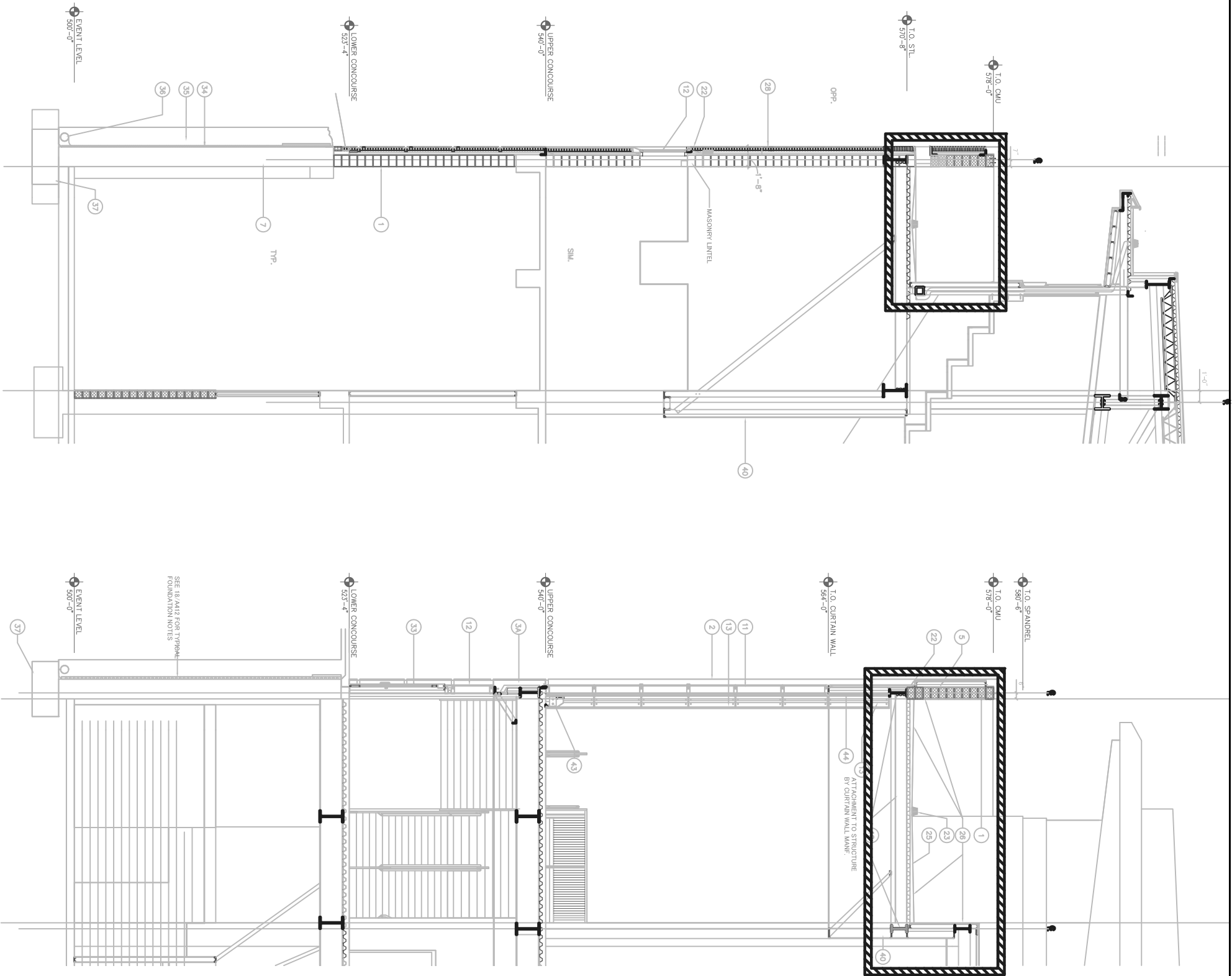


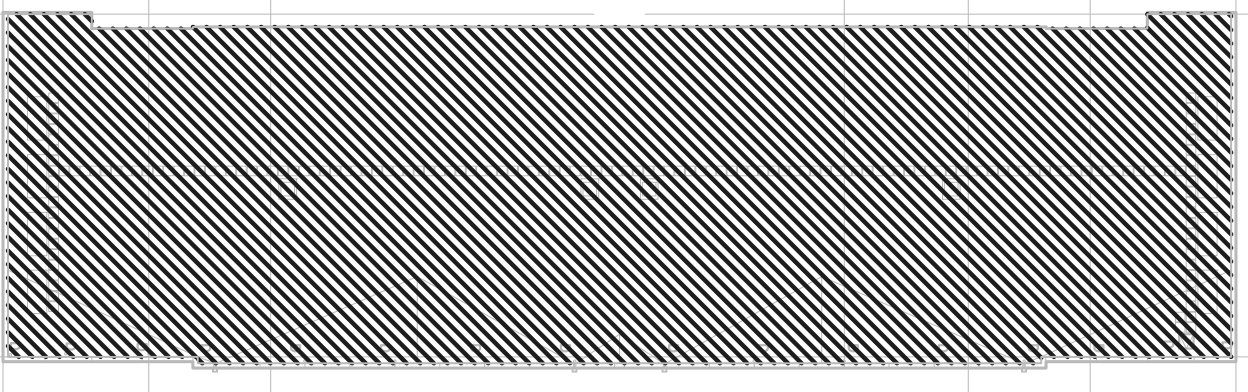
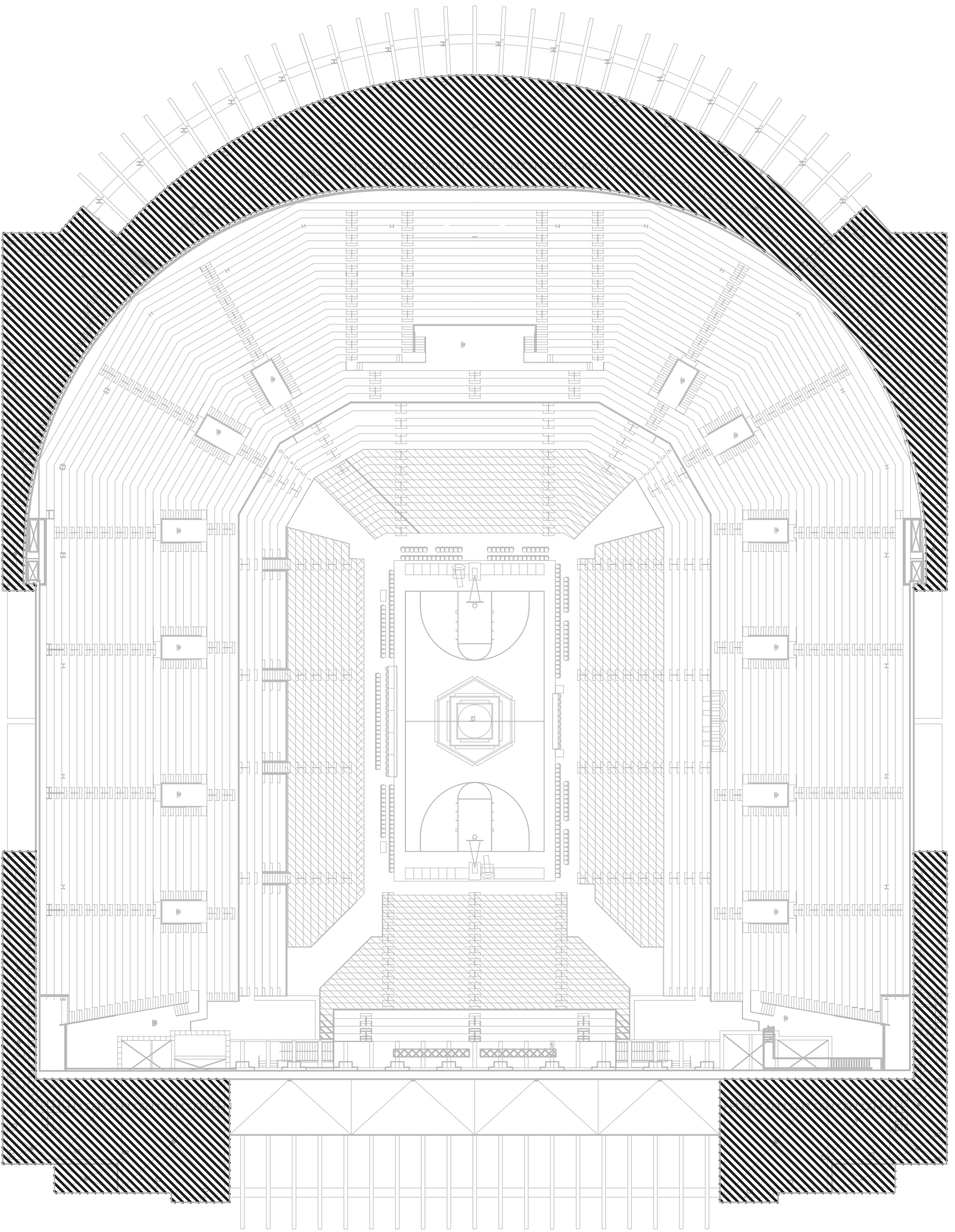
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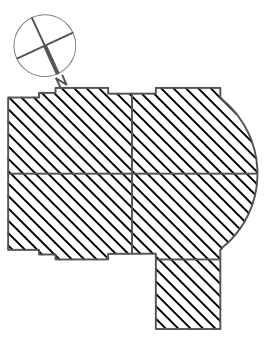
BUILDING SECTIONS
WITH PROPOSED
GREEN ROOF AREA

SCALE: NTS





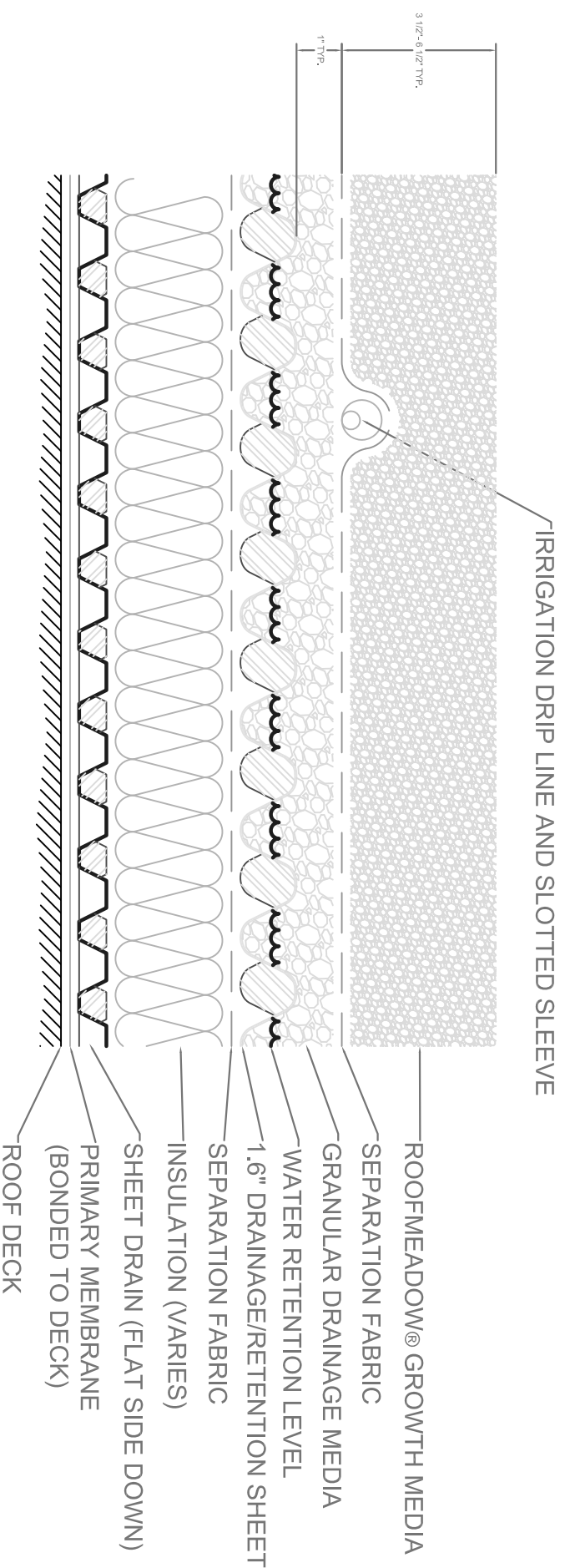
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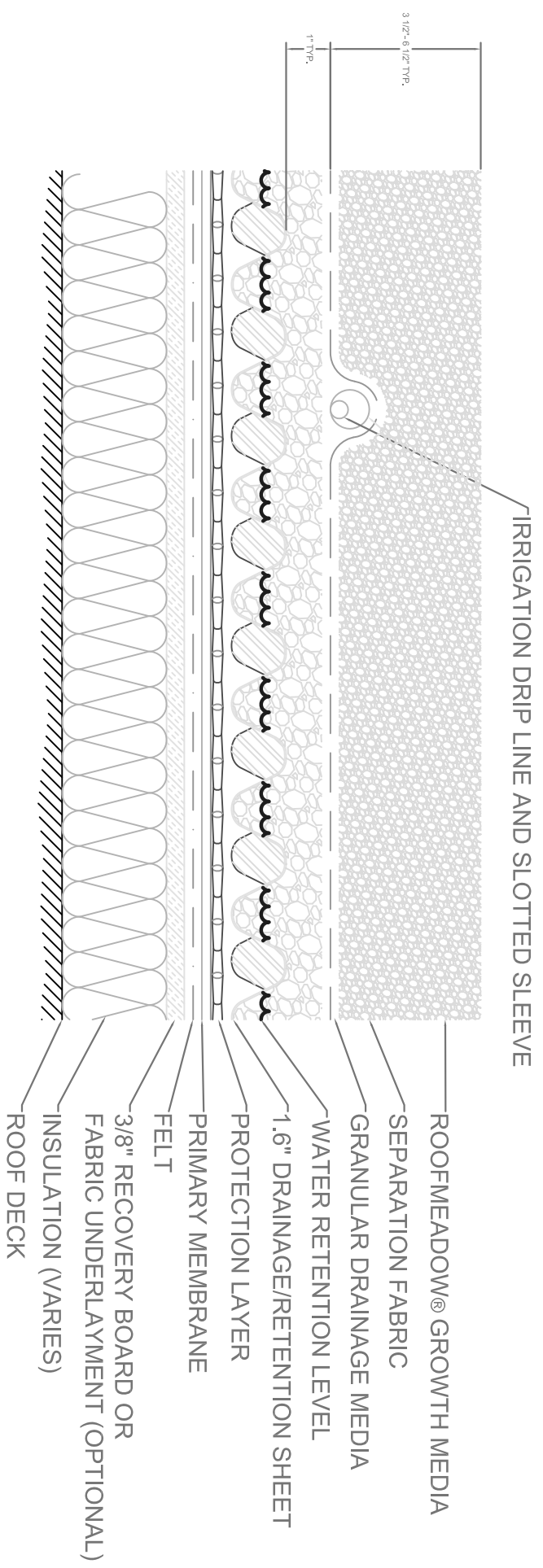
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PROPOSED GREEN
 ROOF LOCATIONS

SCALE: NTS



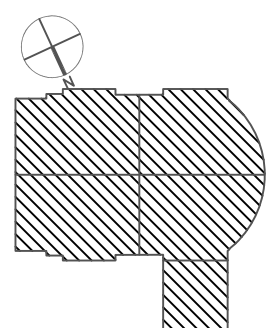
2 ROOFMEADOW® HEATH
PRM CONFIGURATION



3 ROOFMEADOW® HEATH
PRM CONFIGURATION



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GREEN ROOF
SECTIONS

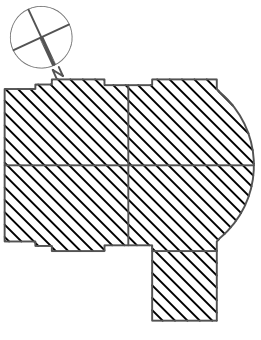
SCALE: NTS



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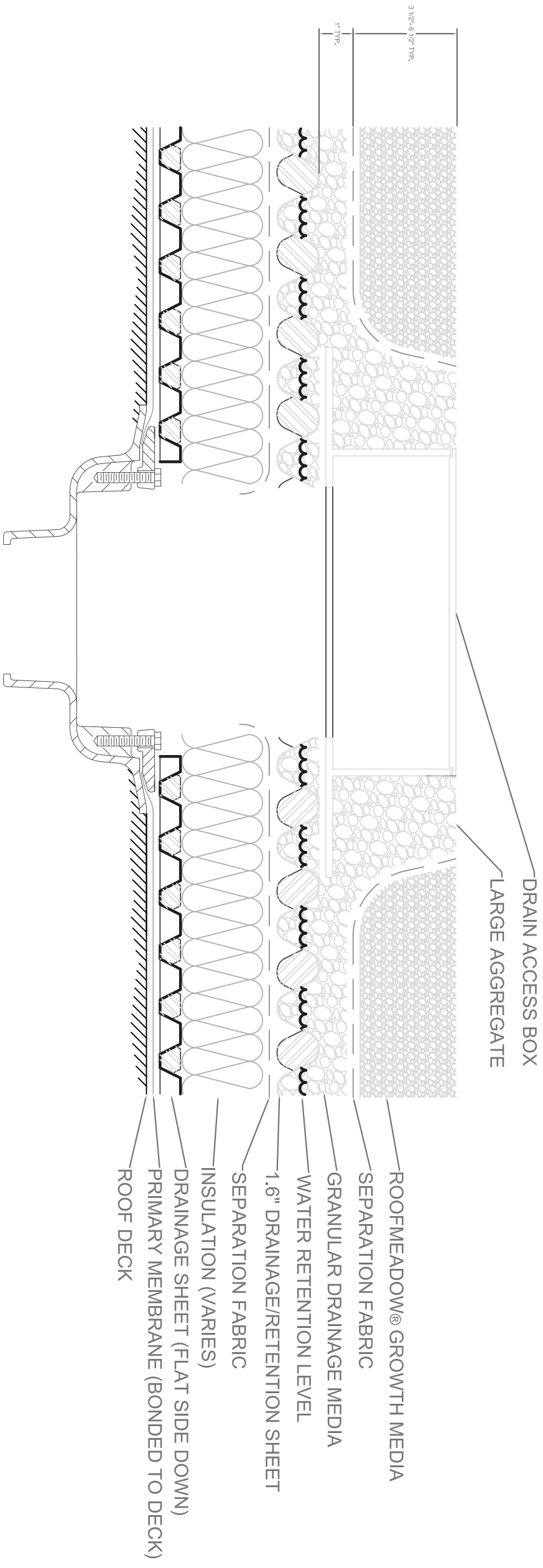


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GREEN ROOF
SECTIONS

SCALE: NTS



1 ROOFMEADOW® DRAIN DETAIL

PRM CONFIGURATION

APPENDIX H: Structural Plans

Existing Roof

Existing Mechanical Floor

Existing Upper Concourse

Existing Lower Concourse

Redesign of Roof

Redesign of Mechanical Floor

Redesign of Upper Concourse

Redesign of Lower Concourse

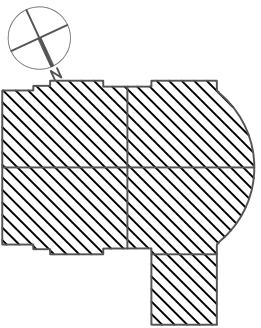


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STRUCTURAL
SYSTEM REDESIGN
FOR GREEN ROOF

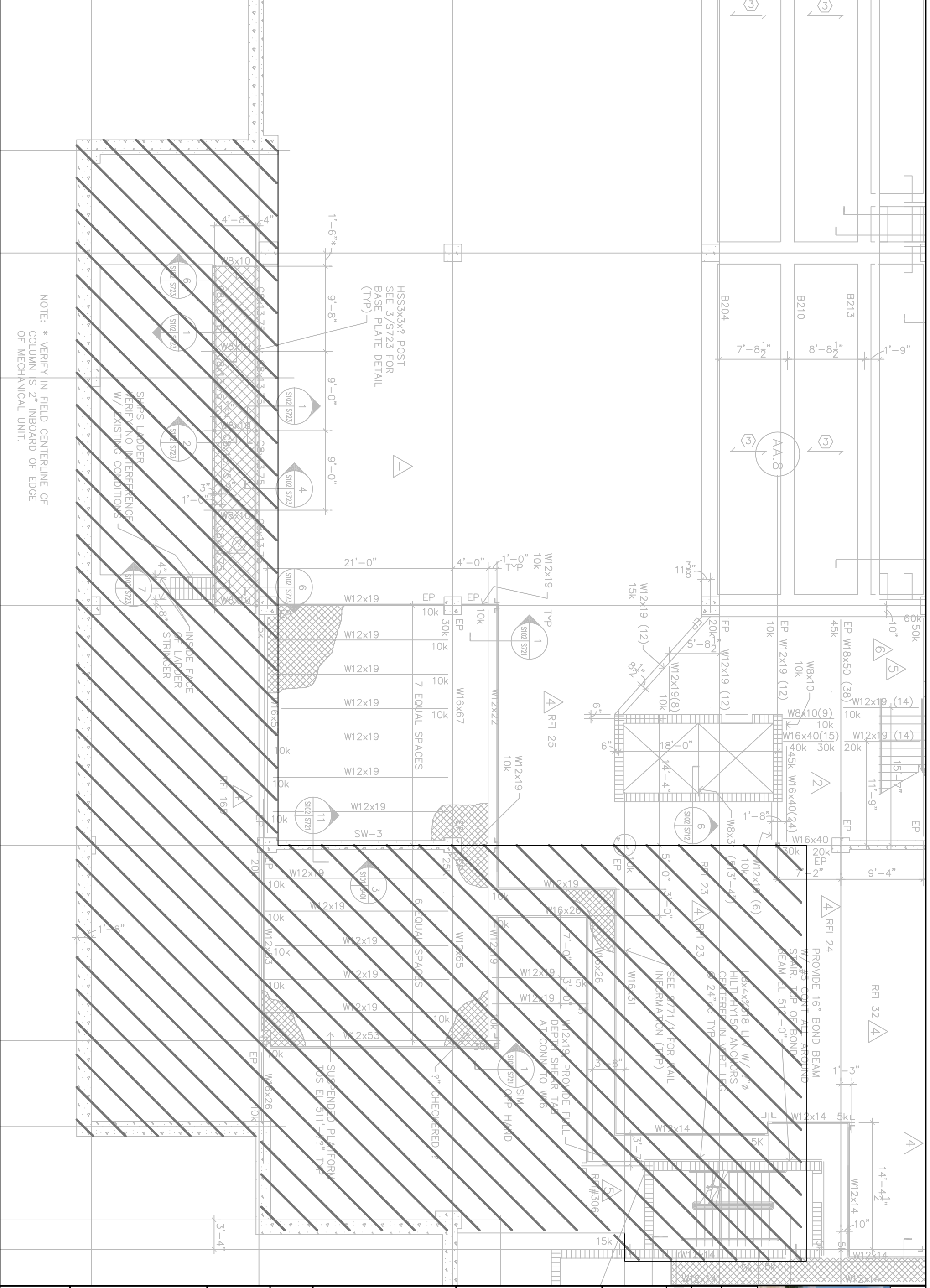


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MECHANICAL PLAN
EXISTING DESIGN

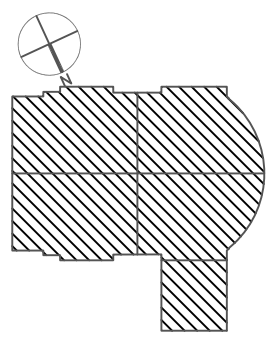
SCALE: 3/32" = 1'-0"





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STRUCTURAL
 SYSTEM REDESIGN
 FOR GREEN ROOF



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UPPER CONCOURSE
 EXISTING DESIGN

SCALE: 3/32" = 1'-0"



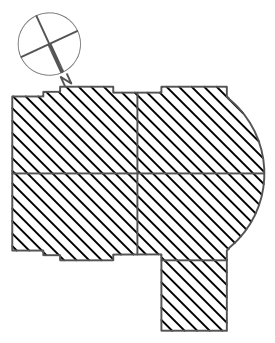


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LOWER CONCOURSE
EXISTING DESIGN

SCALE: 3/32" = 1'-0"



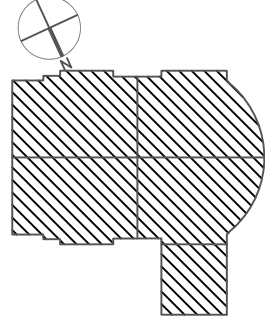


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SYSTEM REDESIGN
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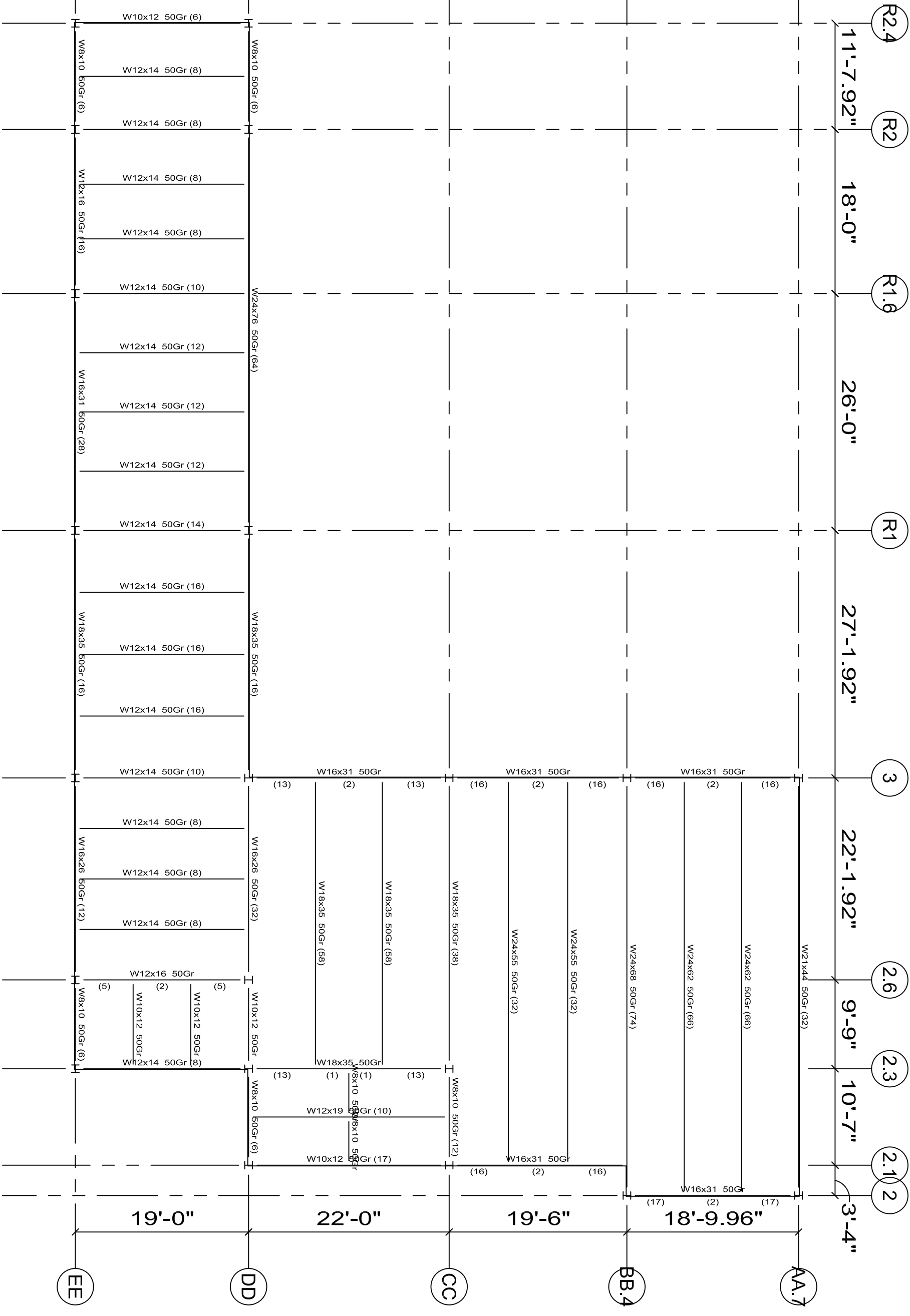


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ROOF PLAN
REDESIGN

SCALE: 3/32" = 1'-0"



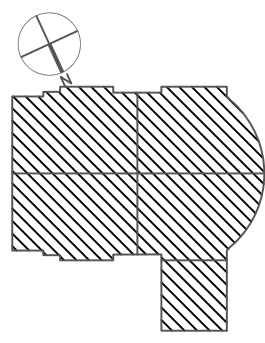


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STRUCTURAL
SYSTEM REDESIGN
FOR GREEN ROOF

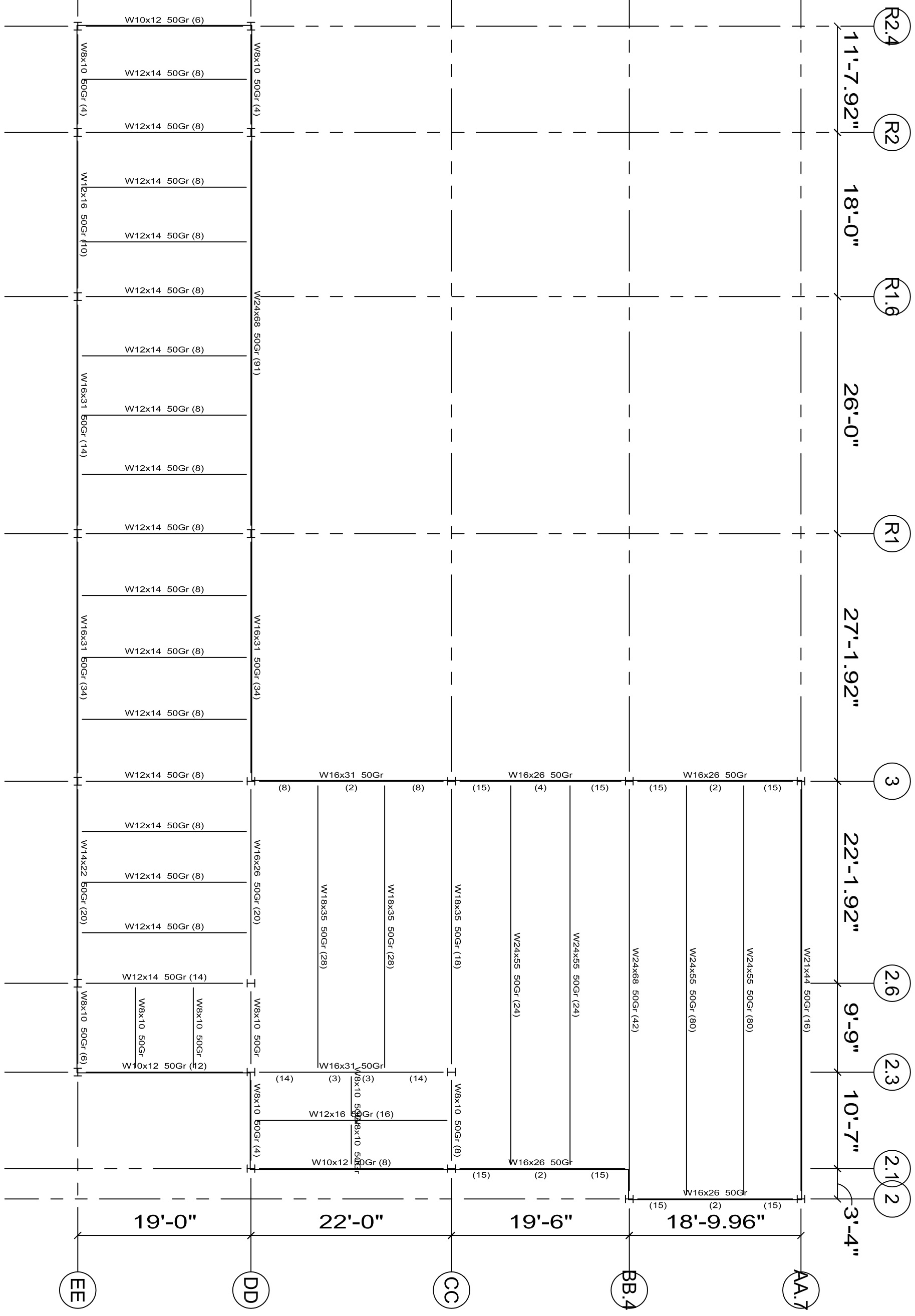


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MECHANICAL LEVEL
REDESIGN

SCALE: 3/32" = 1'-0"



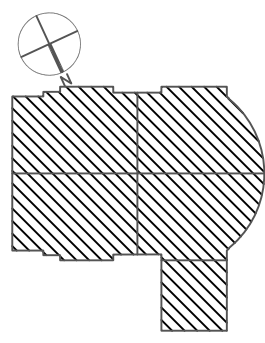


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STRUCTURAL
SYSTEM REDESIGN
FOR GREEN ROOF

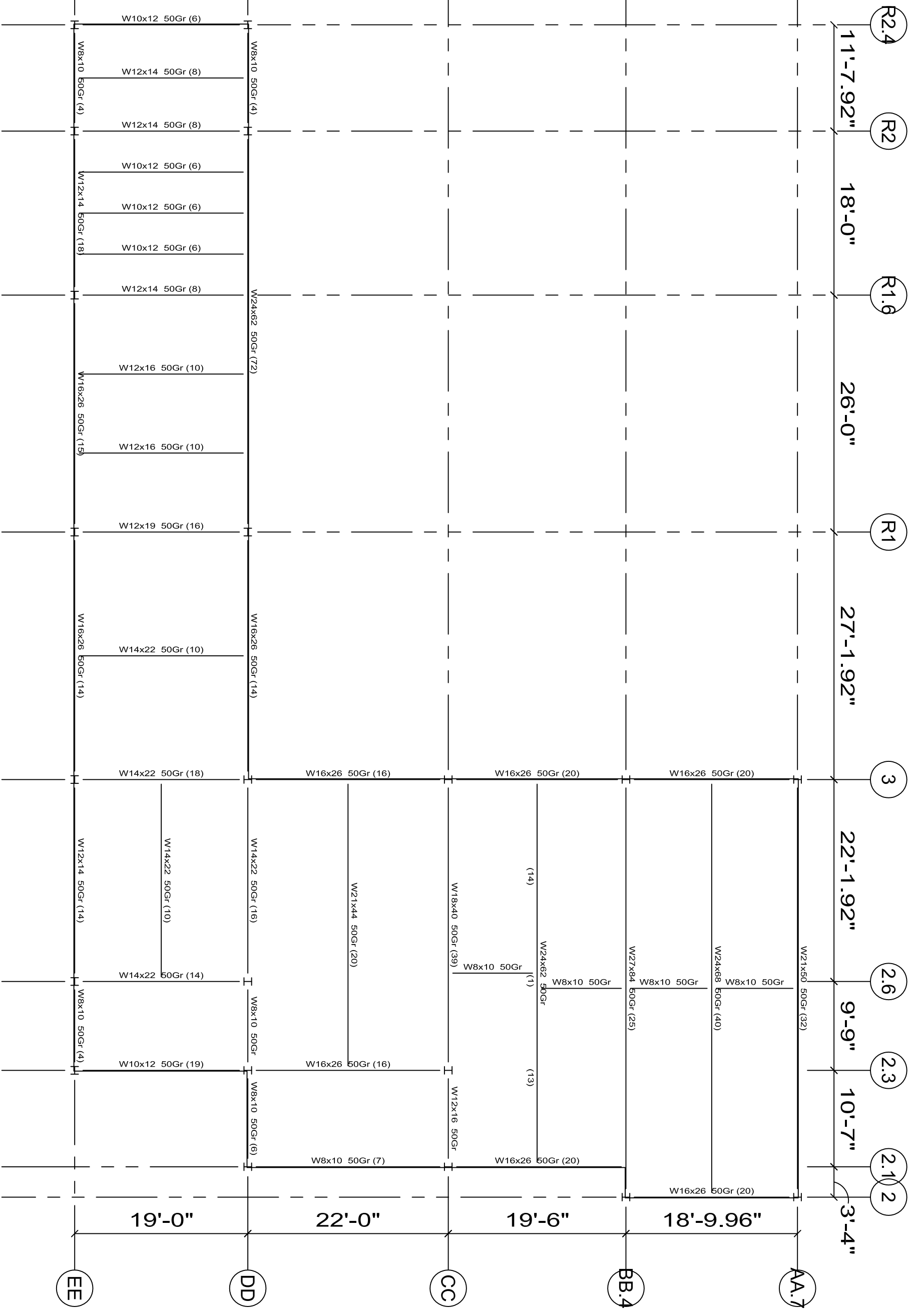


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UPPER CONCOURSE
REDESIGN

SCALE: 3/32" = 1'-0"



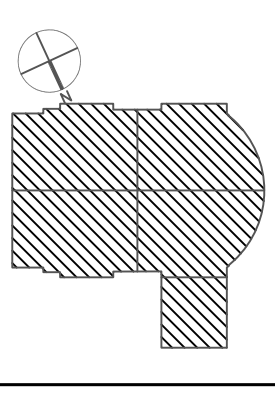


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STRUCTURAL
SYSTEM REDESIGN
FOR GREEN ROOF

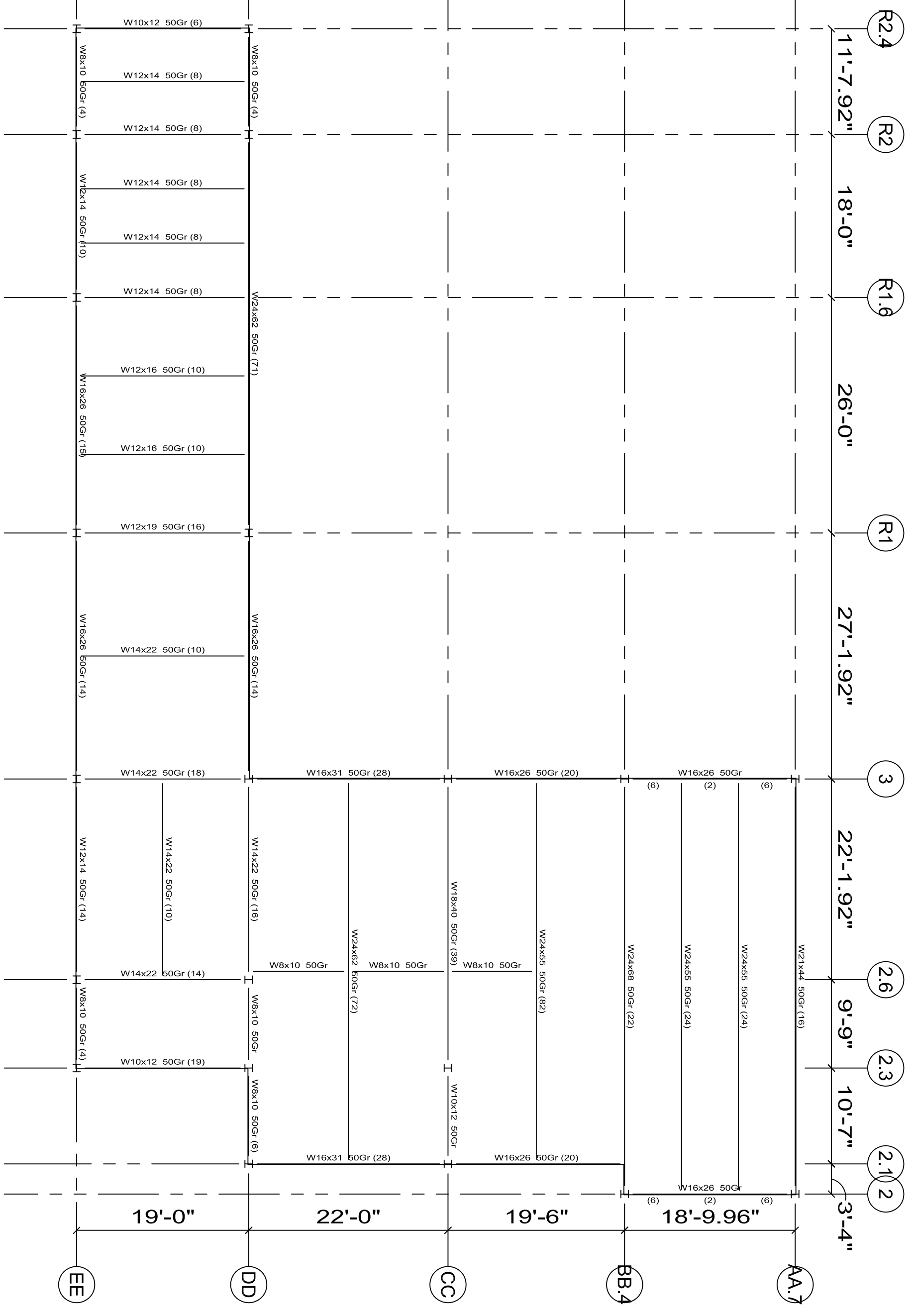


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LOWER CONCOURSE
REDESIGN

SCALE: 3/32" = 1'-0"



APPENDIX I: Additional Documents

Green Roof Specifications

Structural System Beam Summary

TYPE V: HEATH: 40mm Panel
EXTENSIVE and SEMI-INTENSIVE VEGETATED ROOF COVER

This is the only assembly type that includes a synthetic retention panel. This system described in this specification has identical characteristics to system provided by American Hydrotech using the FD40 retention panel. For information on assemblies offered as equivalents to the American Hydrotech systems based on the FD25 (i.e., 1-inch panel) or FD60 (i.e., 2.4-inch) panels, please contact Roofscapes, Inc.

Roofmeadow® system components are available only in conjunction with a complete Roofmeadow® system installation.

SECTION 02931

VEGETATED ROOF COVERINGS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section specifies all labor, materials, transportation, equipment and services necessary to assemble a complete Roofmeadow® vegetated roof cover, as provided by Roofscapes, Inc. and shown on the Drawings and described herein. This system shall be installed in conjunction with a compatible roof waterproofing system.
- B. Related requirements specified elsewhere include:
 - 1. Roof deck insulation - Section 07220.
 - 2. Roofing - Section 07530.

1.02 REFERENCES

- A. Referenced standards and abbreviations
 - 1. System Provider's specifications and recommendations.
 - 2. *American Standard Testing Method Standards* – abbreviated as “ASTM.”
 - 3. *Guidelines for the Planning, Development and Maintenance of Green Roofs; Appendix – Determination of Apparent Density, Maximum Water Capacity, and Water Permeability* (English version): *Richtlinien für die Planung, Ausführung und Pflege von Dachbegrünung*, Forschungsgesellschaft Landschaftsentwicklung Landschaftsbau e.V., 1995 - abbreviated as “FLL.”
 - 4. *Methods of Soil Analysis*, American Society of Agronomy (1996) - abbreviated as “MSA.”
 - 5. *Test Methods for the Examination of Composting and Compost* (latest) – abbreviated as “TMECC.”
 - 6. *Recommended Chemical Soil Testing Procedures, North Central Region Publication #221* – abbreviated as “RCSTP.”
 - 7. *USDA Handbook #60* – abbreviated as “USDA.”

1.03 DEFINITIONS

- A. **Drain Access Chamber:** Open-ended box or cylinder that covers drains and/or scuppers. The chamber must be designed to admit water freely at the base. It must also have a removable lid to prevent debris from entering the chamber. The choice of chamber type will depend on the type of deck drain or scupper in use. See 1.05 Submittals.
- B. **Drainage Media:** A granular mineral material layer used to: 1) promote aerated conditions in the overlying growth media layer, and 2) manage rainfall runoff and convey it to the roof drains, and 3) augment the root volume for the plants.
- C. **Retention/Drainage Sheet:** Deformed plastic sheet, designed to retain water in receptacles or reservoirs on its upper surface and provide free drainage on the underside of the sheet.
- D. **Growth Media Layer:** An engineered soil-like material designed to retain moisture, manage plant nutrients, and support vigorous growth of the foliage.
- E. **EFVM (Electric Field Vector Mapping):** A leak location technique that relies on the electrical conductivity of the cover material (moist media) and electrical insulating properties of the waterproofing membrane. The compatibility of EFVM with a specific waterproofing system must be established in advance by the EFVM service provider.
- F. **Root-Barrier:** A thermoplastic membrane designed to prevent root penetration of the underlying waterproofing and to retain moisture in the root zone.
- G. **System Provider:** Company that provides or certifies all materials required for installation of the vegetated roof cover, furnishes on-site coordination and inspection, and offers long-term support and warranty protections for the completed green roof assembly. This company shall be Roofscapes, Inc.
- H. **Water Proofing Provider:** Company that provides or certifies all materials required for installation of the building waterproofing, furnishes on-site coordination and inspection, and offers long-term support and warranty protections for the completed waterproofing, including flashings, counter-flashings, coping, and deck drains.

1.04 SYSTEM DESCRIPTION

A. Design Requirements

1. The vegetated cover shall be a two-media system, consisting of a ___-inch growth media layer installed over a 40 mm (1.6 in) drainage/retention panel that is filled with granular drainage media. The granular material must completely fill the reservoirs in the sheet and extend 1-inch above the top of the panel asperites.

[Note: Turf systems must include include at least 6 inches of growth media, the upper 2 inches of which may consist of commercial sod]

2. This Roofmeadow® assembly is intended to be used in conjunction with a drip irrigation system. However it may also be used in the passive mode, depending entirely on rainfall to replenish the water retention layer. When used with turf grass, active irrigation is required
3. This assembly is compatible with a wide range of plants including grass turf.
4. This assembly is suitable for roofs with pitches ranging from zero to 1:12.

B. Performance Requirements: Vegetated roof covering system shall:

1. Support a perennial vegetated ground cover;
2. Provide efficient drainage of moisture that is in excess of that required for the vigorous growth of the installed vegetation;
3. Protect roof waterproofing materials from damage caused by exposure to ultraviolet radiation, physical abuse, and rapid temperature fluctuations;
4. Retain ___ inches of moisture at Maximum Water Capacity, in accordance with the referenced FLL or **ASTM E-2399** standards, including water retained in the reservoirs of the drainage/retention panel.
5. The wet dead weight of this system shall not exceed ___ pounds per square foot (**ASTM E-2397**).¹
6. Continue to perform as designed for the duration of the warranty period, without a requirement to amend or refresh the media.

1.05 SUBMITTALS

A. Product Data (included with bid response):

1. System Provider's technical literature showing compliance with specified requirements.
2. System Provider's statement indicating that proposed use is appropriate for each product.
3. System Provider's statement that it has reviewed and approved the details for the associated waterproofing system, including deck drains, flashings, penetrations, and coping.

B. Shop Drawings (provided prior to contract initiation):

¹ Covers composed of standard materials typically will weigh about 6.75 psf per inch thickness of media [**ASTM E-2397**]. This estimate includes allowances for media at maximum water retention, any captured water, synthetic layers, and mature plants. Lighter cover systems can be provided. Costs may vary.

1. Details of installation, showing conditions at terminations, transitions, and penetrations;
2. Layout for the internal drain conduit;
3. A profile schematic, in 1/2 scale, showing thickness of all materials;
4. Fabrication detail or System Provider's information for drain access chambers. *Note:* Preparation of these details requires, as a pre-requisite, that the Waterproofing Provider provide a detailed description to the System Provider for all roof drains, scuppers and overflows, including accurate dimensions and geometric configurations. To use standard drain access chambers, deck drains and scuppers must conform to Roofscapes, Inc. requirements (for more information contact Roofscapes, Inc., cmiller@roofmeadow.com). As required, customized drain access chambers may be fabricated to conform to specific site conditions.

C. Samples

1. 4-by-4-inch square of each for each of the following:
 - a. Root-barrier (if a suitable root-barrier is not included as a part of the waterproofing system),
 - b. Protection layer,
 - c. Synthetic sheet components, including fabrics, sheet drains, reinforcing materials, and wind protection materials.
 - d. Retention sheet
 2. 12-inch length of drainage conduit.
 3. 6-ounce sample of both drainage and growth medias for initial approval of the Architect.
- D. Statement of existing conditions that must be both achieved and present to begin installation of the vegetated roof covering system.
- E. Statement of method for protecting the surface from wind disturbances until the foliage layer is established.
- F. *Optional, for projects that are part of a site stormwater management program:* Computational summary predicting the runoff properties of the vegetated cover system for one or more design rainfall events specified by the Owner. (not available in all regions of the country)

1.06 CONTRACT CLOSEOUT

- A. Signed warranty documents.
- B. Maintenance program.

1.07 QUALITY ASSURANCE

- A. **System Certification:** Signed by the System Provider, certifying that the submitted vegetated roof covering system
1. complies with the specified system requirements (See 1.04 System Description),
 2. is eligible for the specified warranty required of the System Provider.
- B. **Waterproofing Certification:** Signed by the Waterproofing Provider, certifying that
1. the proposed vegetated roof cover system is fully compatible with the waterproofing assembly;
 2. the waterproofing assembly being supplied shall be separately warranted by the Waterproofing Provider, independent of any other warranties offered by the System Provider.
- C. **Comprehensive or ‘Single-Source’ Responsibility (optional):** In some instances, the System Provider may be required to offer a comprehensive ‘single-source’ warranty to the Owner that includes both the waterproofing and the vegetated cover system. In these cases, warranty documentation and service shall be coordinated by the System Provider.
- D. **Warranty:** A copy of the standard system warranty shall be attached as an exhibit to the contract agreement.
- E. **Integration:** All scope items related directly or indirectly to the vegetated roof cover shall be provided by one contractor. Tasks in addition to those specifically mentioned in this Specification may include the installation of
1. patio and railing systems,
 2. planters,
 3. paths and walkways.
- F. **System Provider’s Field Supervision:** The System Provider shall furnish a quality control specialist to observe critical aspects of the installation.
- G. **Laboratory:** Tests shall be conducted by an independent laboratory with the experience and capability to conduct the tests indicated. These may include, but are not limited to:
1. A & L Great Lakes Laboratories, Inc. 3504 Conestoga Drive, Fort Wayne, IN 46808-4413 [260-483-4759]
 2. *For specified FLL or ASTM test procedures:* Agricultural Analytical Services Laboratory, Penn State University, Tower Road, University Park, PA 16802 [814-863-0841]
 - 3.. *For specified FLL or ASTM test procedures:* Valley Forge Laboratories, Inc. 6 Berkeley Road, Devon, PA 19333-1397 [610-688-8517]
- I. **Affidavit:** Signed by the System Provider, stating that the installation contractor is certified by the System Provider to install the assembly.

1.08 SEQUENCE

- A. Description of work sequence with attention to preventing deterioration of installed roofing by minimizing the use of newly constructed roof deck for storage, walking surface, and equipment.

1.09 MAINTENANCE

- A. A 2-year establishment period maintenance contract for plantings.
- B. *For consideration by the Owner:* a long-term inspection and maintenance contract that includes all of the system components, media, and plantings specified within this section.

PART 2 - MATERIALS

2.01 ROOT-BARRIER SUBSYSTEM

(Required, if a suitable root barrier is not included as part of the waterproofing system)

- A. Roofmeadow® root-barrier subsystem shall be installed immediately above the completed waterproofing (or thermal insulation, if this is project incorporates an IRMA configuration).
- B. The subsystem consists of a 30-mil polyvinyl chloride, polypropylene, or polyethylene membrane.
- C. The membrane shall be continuously hot-air welded at the seams, according to the recommendations of the System Provider, in order to provide a watertight surface.
- D. The completions at terminations shall be according to the recommendations of the System Provider.

2.02 BASE FABRIC

- A. Non-woven polypropylene fabric, satisfying

Weight (ASTM-D3776) ≥ 16 oz/sy

Puncture Resistance (ASTM-D4833) ≥ 270 lb

2.03 RETENTION/DRAINAGE SHEET

- A. Roofmeadow® Plastic Retention/Drainage Sheet. Two sheets are available, depending on the water retention and height requirements. The shallower sheet satisfies:

Height ≥ 1.6 in

Water Retention (before infilling with media) ≥ 0.23 gal/ft²

Media retention volume	$\geq 0.059 \text{ ft}^3/\text{ft}^2$
Transmissivity (before infilling with media)	$\geq 30 \text{ gal}/\text{min}/\text{ft}$
Compressive Strength	$\geq 2,925 \text{ lb}/\text{ft}^2$

2.04 GRANULAR DRAINAGE MEDIA

Roofmeadow® Type A Granular Drainage Media. This is a mineral product that satisfies the following specifications:

Density at Maximum Water Capacity (FLL or ASTM-E2399)	$\leq 60 \text{ lb}/\text{ft}^3$
Saturated Hydraulic Conductivity (ASTM-E2396)	$\geq 25 \text{ in}/\text{min}$
Total Organic Matter, by loss on ignition method (MSA)	$\leq 1\%$
Abrasion Resistance (ASTM-C131-96)	$\leq 25\% \text{ loss}$
Soundness (ASTM-C88 or T103 or T103-91)	$\leq 5\% \text{ loss}$
Porosity (ASTM-C29)	$\geq 25\%$
Alkalinity, CaCO ₃ equivalents (MSA)	$\leq 1\%$
Grain-Size Distribution (ASTM-C136)	
Pct. Passing US#18 sieve	$\leq 1\%$
Pct. Passing 1/4-inch sieve	$\leq 30\%$
Pct. Passing 3/8-inch sieve	$\geq 80\%$

2.05 SEPARATION FABRIC

Root-permeable needled non-woven needled polypropylene geotextile fabric. The fabric may not be heat calendared. This component shall satisfy the following specifications:

Unit Weight (ASTM-D3776)	$\leq 4.25 \text{ oz}/\text{yd}^2$
Grab tensile (ASTM-D4632)	$\leq 90 \text{ lb}$
Mullen Burst Strength (ASTM-D4632)	$\geq 135 \text{ lb}/\text{in}$
Permittivity (ASTM-D4491)	$\geq 2 \text{ sec}^{-1}$

2.06 GROWTH MEDIA LAYER

A. Roofmeadow® Type M3 Standard-Weight Single Two-Layer Growth Media².

² Lighter-weight formulations can be provided upon request.

This material is a mixture of mineral and organic components that satisfies the following specifications:

Non-capillary Pore Space Ratio at Field Capacity, 0.333 bar (TMECC 03.01, A)	≥ 15% (vol)
Moisture Content at Field Capacity (TMECC 03.01, A)	≥ 15% (vol)
Non-Capillary Pore Space Ratio at Maximum Water Capacity (FLL or ASTM-E2399)	≥ 6%
Maximum Water Capacity (FLL or ASTM-E2399)	≥ 40% (vol)
Density at Maximum Water Capacity (FLL or ASTM-E2399)	≤ 85 lb/ft ³
Saturated Hydraulic Conductivity (FLL or ASTM-E2399)	≥ 0.1 in/min
Alkalinity, Ca CO ₃ equivalents (MSA)	≤ 2.5%
Total Organic Matter, loss on ignition method (MSA)	≤ 3-8% (dry wt.)
pH (RCSTP)	6.5-8.0
Soluble Salts (DTPA saturated media extraction) (RCSTP)	≤ 6 mmhos/cm
Organic Supplements (compost, peat moss, etc.) combined respiration rate (TMECC 05.08, B)	≤ 1 mg CO ₂ /g TOM/d
Cation exchange capacity (MSA)	≥ 10 meq/100g
Grain-size distribution of the mineral fraction (ASTM-D422)	
Clay fraction (2 micron)	≤ 3%
Pct. Passing US#200 sieve (i.e., silt fraction)	5-15%
Pct. Passing US#60 sieve	10-25%
Pct. Passing US#18 sieve	20 - 50%
Pct. Passing 1/8-inch sieve	55 - 95%
Pct. Passing 3/8-inch sieve	90 -100%

Chemical Analysis

Clopyralid (latest assay published by Dow Agriservices)	none detected
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Nitrogen, NO ₃ (RCSP)	25-100 ppm
Phosphorus, P ₂ O ₅ (RCSP)	20-200 ppm
Potassium, K ₂ O (RCSP)	≥ 150 ppm

Other macro- and micro-nutrients shall be incorporated in the formulation in initial proportions suitable for support the specified planting.

- B. Thoroughly blend at a batch facility. Moisten, as required, to prevent separation and excessive 'dusting' during installation

2.07 WIND PROTECTION

A. *When establishing plants from plugs or pots*

1. Roofmeadow® photo-degradable wind blanket, satisfying the following specifications:

Aperture ≥ 0.04 in,
and ≤ 0.125 inch

Tensile strength (ASTM D4632) ≥ 20 lb

Satisfies smolder resistance criteria (FTMA-CCC-%-191B)

2. Tackifier emulsion (*alternative*)

Consult System Provider Roofscapes, Inc. for application rate. Typically, tackifier must be re-applied during the establishment period in order to secure the media surface.

B. *When establishing plants from cuttings and/or seed*

1. Bio-degradable jute mesh, satisfying the following specifications:

Aperture ≥ 0.375 in
and ≤ 1.0 in

Weight ≤ 20 oz/ft²

Tensile strength (ASTM D4632) ≥ 20 lb

Elongation at failure (ASTM D-4595) ≥ 25%

2. Hydro-mulch (*alternative*)

After distributing the seed and/or cuttings, seal the surface of the media using a wood-fiber hydro-mulch with tackifier. Consult the System Provider Roofscapes, Inc. for binder specifications and coverage rates.

3. Tackifier emulsion (*alternative*)

Consult System Provider Roofscapes, Inc. for application rate. Typically,

tackifier must be re-applied during the establishment period in order to secure the media surface.

2.08 BORDER UNITS

To allow free flow across edges, these units should be installed on top of strips of sheet drain.

A. Edge Elements

The are used to separate gravel margins from the green roof proper.

Roofmeadow® cantilever (i.e., 'L-shaped') border units (These are available in fiber-reinforced cement, stainless steel, recycled polyethylene, or aluminum). These are typically non-perforated.

Height	≥ 0.25 inch higher than the top of the growth media layer
Base Length	greater of 6 inches, or 1.5 times the height of the element

Note: Gravel margins are not necessary on many projects. Furthermore, on roofs with pitches less than 1 inch per foot, a separation fabric diaphragm may be used in lieu of rigid boundary units.

B. Eave Baskets

These are used to contain gravel at the margin in eave areas. The units are designed to resist the down-slope forces of green roof materials. They are required for roofs with pitches in excess of 1 inch per foot. Roofmeadow® eave baskets are 'U-shaped' border units (These are available in perforated stainless steel or perforated aluminum).

2.09 DRAIN ACCESS CHAMBERS

A. These are designed to enclose roof drains and scuppers. They prevent intrusion of media and protect the drains from clogging by wind-blown paper, leaves, etc. Drain access chambers are typically 12 inches square (or 12 inches in diameter). In order to use these chambers, the drains must finished in accordance with the Roofscapes, Inc. requirements (see 1.05 Submittals). Drain access chambers are available in a variety of forms and materials, including aluminum, stainless steel, plastic, and fiber-reinforced cement.

2.10 ROOFMEADOW® SHEET DRAIN

A. Roofmeadow® polyethylene or polystyrene drain sheet. This sheet is used as an underlayment for border units to promote free flow. The sheet is a dimpled membrane sheet, satisfying the following specifications:

Membrane thickness (ASTM D-751)	≥ 20 mil
Height (ASTM D-1777)	≥ 0.75 in

Compressive strength	$\geq 5,200 \text{ lb/ft}^2$
Transmissivity (between platens)	$\geq 40 \text{ gal/min/ft}$

PART 3 – EXECUTION

3.01 INSPECT WATERPROOFING

- A. Examine the completed waterproofing system, with the Roofing Applicator present, for compliance with drawings, installation tolerances, and other conditions affecting performance.
 - 1. For the record, prepare a written report, endorsed by the Roofing Applicator and the Vegetated Cover Installer. As appropriate, list conditions that may be detrimental to the performance of the work.
 - 2. Proceed only after unsatisfactory conditions have been corrected.
- B. The Owner shall delineate material and equipment laydown areas on the roof. The Owner shall also specify the maximum aggregate load permitted within each laydown area.

3.02 PREPARE SURFACE

- A. The surface of the waterproofing system shall be swept and washed.
- B. Until the drainage media course is installed, traffic over the working area shall be strictly controlled and limited to essential personnel, only.
- C. Heavily traveled areas (e.g., corridors for transporting media to the working areas) must be protected in a manner approved by the waterproofing installer.
- D. Suitably protect laydown areas using ½-inch plywood or particle board over 1-inch sheets of expanded polystyrene (EPS), or similar sheathing material.

3.03 INSTALL ROOT-BARRIER SUBSYSTEM

For waterproofing systems that are not root resistant

- A. Roll out root-barrier membrane. The layout should minimize the aggregate seam length. Overlap adjoining sheets by a minimum of 2 inches. Allow slack to accommodate contraction during cold weather.
- B. Weld seams using hot-air welding equipment (Leister, or equivalent)
- C. One-hundred percent of all seams shall be tested by one of the following methods:
 - 1. Electrical field vector mapping (available through Roofscapes, Inc.)
 - 2. Air lance

3. Hand scribe

3.04 INSTALL BASE FABRIC

- A. Roll out the base fabric layer on top of the completed waterproofing system or root-barrier..
- B. Overlap seams a minimum of 6 inches.

3.05 INSTALL RETENTION/DRAINAGE SHEET

- A. Layout the retention/drainage panels. Butt the panels together at seams. Do not overlap.

3.06 INSTALL DRAIN ACCESS CHAMBERS AND BORDER UNITS, ETC.

- A. Assemble edge elements and/or eave baskets on top of 2-foot wide strips of sheet drain. Cover the sheet drain and border units with separation fabric to prevent intrusion of media.
- B. Immediately place granular media, stone, or coarse aggregate (as appropriate) to stabilize the border units.
- C. Wrap drain access chambers with separation fabric to prevent intrusion of media.

3.07 PLACE GRANULAR DRAINAGE MEDIA

- A. Begin to place the granular drain media layer into the retention/drainage sheet. Fill the sheet until the top of the asperities are covered. Then continue to fill the until the level of the media is 1 inch above the asperities. The *effective* thickness of the media, including media filling the reservoirs will be 1.7 inches.
- B. The media shall be dispensed at the roof level in a manner that will not suddenly increase the load to the roof. Spread to a depth sufficient to cover the roof ripples.
- C. Immediately cover with separation fabric. As necessary, protect from wind using temporary ballast.

3.08 INSTALL DRIP IRRIGATION SYSTEM

- A. Assemble the drip irrigation system on top of the separation fabric.
- B. Before continuing test the system to insure that the water is evenly distributed.
- C. Provide an as-built drawings showing the locations of all irrigation components.

3.09 PLACE GROWTH MEDIA

- A. Place the growth media layer. The media shall be dispensed at the roof level in a manner that will not suddenly increase the load to the roof. It shall be immediately spread to the specified thickness, plus 10 percent. Unless otherwise approved,

compaction shall be using a 4-foot wide lawn roller with a total load of not less than 200 lbs and not more than 300 lbs.

- B. Install Roofmeadow® wind blanket and secure (Unless an alternative wind protection method is selected, e.g., jute mat, tackifier emulsion, or hydro-mulch); in which case wind protection will applied after completion of planting activities.
- C. Thoroughly soak with water using a sprinkler or hand sprayer. Assumed 1 gallon per cubic foot of media.

3.10 PLANT VEGETATION

A. *Direct Seeding Method*

1. The planting mixture should include species that will generate a continuous ground cover. .
2. Seed Mixtures should include a minimum of five perennial varieties. Consult with the System Provider, Roofscapes, Inc. for recommendations concerning the incorporation of grasses in planting mixtures. For seeding rates and seasonal restrictions consult the seed provider. Prepared Roofmeadow® seed mixtures are available that are tailored to different climatic zones. In no case shall the seeding rates be less than 250 seed/square yard (all species combined).
3. If more than 24 hours has elapsed since installing and soaking the growth media, thoroughly resoak the growth media prior to commencing the broadcast distribution of seed or cuttings.
4. Immediately cover with the wind protection system.
5. As required, soak the prepared seed bed at the completion of planting operations.
6. Depending on the season that plants are established and plants included, periodic watering may be required during the first growing season.

B. *Plug Installation*

1. Varieties should be selected that are adapted to the specific growing conditions.
2. Plant installation may occur April-October.
3. Plants should be established from 72-cell plugs propagated in sterile nursery medium, according to the plant provider's recommendations. Plugs larger than this can be used. However, the establishment rate is typically better with the smaller plants. The recommended minimum planting rate is one plant per square foot.
4. Thoroughly soak the growth media prior to commencing planting
5. As required. Make cuts in the wind blanket to insert the plugs. The plugs should be set into the media to their full depth and the media pressed firmly around the

installed plug. At the end of each day, soak those areas that have been newly planted.

6. Unless a Roofmeadow® wind blanket has been previously installed, install the wind protection system now.
7. Depending on the season that plants are established and plants included, periodic watering may be required during the first growth season.
8. Do not mulch.

C. *Installation of Sod*

Consult the System Provider for Instructions.

D. *Pre-vegetated Mats*

Consult the System Provider for information about type and availability of pre-vegetated mats.

3.11 PROVIDE 2-YEAR MAINTENANCE SERVICE

The green roof installer shall offer a two-year maintenance service. This service will include:

- A. Hand weeding and/or chemical weeding and fertilization, as required to maintain the health and vigor of the plants.
- B. The installer shall guarantee an 80 percent cover rate at the end of 24 months. As necessary, plants shall be replanted to achieve this requirement.

NOTICE

No warranty expressed or implied is offered for any work based on the information provided herein, unless

1) Roofscapes, Inc. is provide supervisory role in the construction of the vegetated roof cover, and

2) Installation and maintenance of the vegetated cover is provide by a contractor that is trained and licensed by Roofscapes, Inc.

Roofscapes, Inc. will not assume any responsibility for the inclusion of this material in specifications or documents published by others.



Beam Summary

STEEL BEAM DESIGN SUMMARY:

Floor Type: Roof

Bm #	Length ft	+Mu kip-ft	-Mu kip-ft	Mn kip-ft	Fy ksi	Beam Size	Studs
24	19.00	41.9	0.0	101.2	50.0	W10X12	6
23	11.66	50.5	0.0	86.5	50.0	W8X10	6
25	11.66	50.5	0.0	86.5	50.0	W8X10	6
58	19.00	81.3	0.0	141.7	50.0	W12X14	8
29	19.00	82.5	0.0	141.7	50.0	W12X14	8
22	18.00	107.2	0.0	213.0	50.0	W12X16	16
26	44.00	680.4	0.0	1410.6	50.0	W24X76	64
56	19.00	83.6	0.0	141.7	50.0	W12X14	8
57	19.00	83.6	0.0	141.7	50.0	W12X14	8
30	19.00	87.1	0.0	155.4	50.0	W12X14	10
21	26.00	252.4	0.0	461.4	50.0	W16X31	28
53	19.00	90.6	0.0	167.6	50.0	W12X14	12
54	19.00	90.6	0.0	167.6	50.0	W12X14	12
55	19.00	90.6	0.0	167.6	50.0	W12X14	12
28	19.00	92.6	0.0	178.6	50.0	W12X14	14
20	27.16	275.1	0.0	463.1	50.0	W18X35	16
27	27.16	275.1	0.0	463.1	50.0	W18X35	16
50	19.00	94.6	0.0	189.1	50.0	W12X14	16
51	19.00	94.6	0.0	189.1	50.0	W12X14	16
52	19.00	94.6	0.0	189.1	50.0	W12X14	16
18	19.00	85.9	0.0	155.4	50.0	W12X14	10
19	22.16	182.9	0.0	316.7	50.0	W16X26	12
17	22.00	265.3	0.0	455.2	50.0	W16X31	13, 2, 13
16	22.16	245.7	0.0	415.4	50.0	W16X26	32
35	31.91	285.3	0.0	630.3	50.0	W18X35	58
36	31.91	285.3	0.0	630.3	50.0	W18X35	58
10	19.50	275.1	0.0	471.1	50.0	W16X31	16, 2, 16
11	31.91	271.2	0.0	562.8	50.0	W18X35	38
33	42.49	445.8	0.0	918.9	50.0	W24X55	32
34	42.49	445.8	0.0	918.9	50.0	W24X55	32
3	18.83	276.6	0.0	468.7	50.0	W16X31	16, 2, 16
4	45.82	560.4	0.0	1220.7	50.0	W24X68	74
31	45.82	500.7	0.0	1173.8	50.0	W24X62	66
32	45.82	500.7	0.0	1173.8	50.0	W24X62	66
1	45.82	270.3	0.0	698.0	50.0	W21X44	32
46	19.00	77.3	0.0	141.7	50.0	W12X14	8
47	19.00	77.3	0.0	141.7	50.0	W12X14	8
48	19.00	77.3	0.0	141.7	50.0	W12X14	8
14	19.00	99.3	0.0	180.9	50.0	W12X16	5, 2, 5
13	9.75	11.9	0.0	78.9	50.0	W8X10	6



Beam Summary

RAM Steel v12.1
 DataBase: New Structure
 Building Code: IBC

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 Steel Code: AISC360-05 ASD

Bm #	Length	+Mu	-Mu	Mn	Fy	Beam Size	Studs
41	9.75	23.2	0.0	52.1	50.0	W10X12	
42	9.75	23.2	0.0	52.1	50.0	W10X12	
15	9.75	25.0	0.0	52.1	50.0	W10X12	
12	19.00	61.7	0.0	151.8	50.0	W12X14	8
9	22.00	305.3	0.0	520.7	50.0	W18X35	13, 1, 1, 13
8	10.58	48.3	0.0	86.1	50.0	W8X10	6
40	5.29	0.0	0.0	35.3	50.0	W8X10	
6	10.58	61.9	0.0	111.9	50.0	W8X10	12
38	22.00	99.6	0.0	189.3	50.0	W12X19	10
39	5.29	0.0	0.0	35.3	50.0	W8X10	
7	22.00	51.2	0.0	154.8	50.0	W10X12	17
5	19.50	275.1	0.0	462.5	50.0	W16X31	16, 2, 16
2	18.83	276.3	0.0	466.8	50.0	W16X31	17, 2, 17

Floor Type: Mechanical

Bm #	Length ft	+Mu kip-ft	-Mu kip-ft	Mn kip-ft	Fy ksi	Beam Size	Studs
24	19.00	35.3	0.0	101.2	50.0	W10X12	6
23	11.66	42.2	0.0	72.8	50.0	W8X10	4
25	11.66	42.3	0.0	72.9	50.0	W8X10	4
58	19.00	68.1	0.0	141.7	50.0	W12X14	8
29	19.00	69.1	0.0	141.7	50.0	W12X14	8
22	18.00	89.8	0.0	178.7	50.0	W12X16	10
26	44.00	608.7	0.0	1379.6	50.0	W24X68	91
56	19.00	70.1	0.0	141.7	50.0	W12X14	8
57	19.00	70.1	0.0	141.7	50.0	W12X14	8
30	19.00	73.0	0.0	141.7	50.0	W12X14	8
21	26.00	211.5	0.0	379.5	50.0	W16X31	14
53	19.00	75.9	0.0	141.7	50.0	W12X14	8
54	19.00	75.9	0.0	141.7	50.0	W12X14	8
55	19.00	75.9	0.0	141.7	50.0	W12X14	8
28	19.00	77.6	0.0	141.7	50.0	W12X14	8
20	27.16	230.8	0.0	488.9	50.0	W16X31	34
27	27.16	230.8	0.0	488.9	50.0	W16X31	34
50	19.00	79.2	0.0	141.7	50.0	W12X14	8
51	19.00	79.2	0.0	141.7	50.0	W12X14	8
52	19.00	79.2	0.0	141.7	50.0	W12X14	8
18	19.00	72.0	0.0	141.7	50.0	W12X14	8
19	22.16	153.3	0.0	302.7	50.0	W14X22	20
17	22.00	227.4	0.0	405.8	50.0	W16X31	8, 2, 8
16	22.16	210.4	0.0	355.1	50.0	W16X26	20
35	31.91	243.9	0.0	524.6	50.0	W18X35	28
36	31.91	243.9	0.0	524.6	50.0	W18X35	28
10	19.50	240.2	0.0	420.5	50.0	W16X26	15, 4, 15
11	31.91	230.3	0.0	457.1	50.0	W18X35	18



Beam Summary

Bm #	Length	+Mu	-Mu	Mn	Fy	Beam Size	Studs
33	42.49	388.8	0.0	847.2	50.0	W24X55	24
34	42.49	388.8	0.0	847.2	50.0	W24X55	24
3	18.83	241.6	0.0	412.1	50.0	W16X26	15, 2, 15
4	45.82	509.4	0.0	1124.5	50.0	W24X68	42
31	45.82	437.1	0.0	1114.2	50.0	W24X55	80
32	45.82	437.1	0.0	1114.2	50.0	W24X55	80
1	45.82	228.5	0.0	579.1	50.0	W21X44	16
46	19.00	64.8	0.0	141.7	50.0	W12X14	8
47	19.00	64.8	0.0	141.7	50.0	W12X14	8
48	19.00	64.8	0.0	141.7	50.0	W12X14	8
14	19.00	83.2	0.0	178.6	50.0	W12X14	14
13	9.75	9.9	0.0	78.9	50.0	W8X10	6
41	9.75	19.4	0.0	36.5	50.0	W8X10	
42	9.75	19.4	0.0	36.5	50.0	W8X10	
15	9.75	21.0	0.0	36.5	50.0	W8X10	
12	19.00	51.7	0.0	147.6	50.0	W10X12	12
9	22.00	267.3	0.0	474.1	50.0	W16X31	14, 3, 3, 14
8	10.58	40.4	0.0	72.7	50.0	W8X10	4
40	5.29	0.0	0.0	35.3	50.0	W8X10	
6	10.58	51.9	0.0	91.5	50.0	W8X10	8
38	22.00	83.4	0.0	203.8	50.0	W12X16	16
39	5.29	0.0	0.0	35.3	50.0	W8X10	
7	22.00	42.8	0.0	114.2	50.0	W10X12	8
5	19.50	239.8	0.0	412.2	50.0	W16X26	15, 2, 15
2	18.83	241.5	0.0	403.6	50.0	W16X26	15, 2, 15

Floor Type: Upper Concourse

Bm #	Length ft	+Mu kip-ft	-Mu kip-ft	Mn kip-ft	Fy ksi	Beam Size	Studs
24	19.00	28.5	0.0	101.2	50.0	W10X12	6
23	11.66	34.2	0.0	72.9	50.0	W8X10	4
25	11.66	34.2	0.0	72.9	50.0	W8X10	4
48	19.00	55.0	0.0	141.7	50.0	W12X14	8
29	19.00	48.8	0.0	141.6	50.0	W12X14	8
22	18.00	81.8	0.0	208.4	50.0	W12X14	18
26	44.00	439.8	0.0	1209.4	50.0	W24X62	72
49	19.00	42.5	0.0	101.8	50.0	W10X12	6
50	19.00	42.5	0.0	101.8	50.0	W10X12	6
51	19.00	42.5	0.0	101.8	50.0	W10X12	6
30	19.00	62.0	0.0	141.6	50.0	W12X14	8
21	26.00	151.9	0.0	333.6	50.0	W16X26	15
52	19.00	81.5	0.0	167.9	50.0	W12X16	10
53	19.00	81.5	0.0	167.9	50.0	W12X16	10
28	19.00	103.5	0.0	226.0	50.0	W12X19	16
20	27.16	185.7	0.0	334.0	50.0	W16X26	14



Beam Summary

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Bm #	Length	+Mu	-Mu	Mn	Fy	Beam Size	Studs
27	27.16	186.3	0.0	334.2	50.0	W16X26	14
54	19.00	122.1	0.0	229.0	50.0	W14X22	10
18	19.00	164.1	0.0	279.4	50.0	W14X22	18
19	22.16	61.7	0.0	175.6	50.0	W12X14	14
47	22.16	120.7	0.0	229.3	50.0	W14X22	10
17	22.00	205.5	0.0	345.4	50.0	W16X26	16
16	22.16	128.4	0.0	269.4	50.0	W14X22	16
44	31.91	269.1	0.0	622.1	50.0	W21X44	20
10	19.50	215.7	0.0	365.3	50.0	W16X26	20
11	31.91	256.1	0.0	623.0	50.0	W18X40	39
36	42.49	419.1	0.0	971.7	50.0	W24X62	14, 1, 13
3	18.83	216.2	0.0	364.5	50.0	W16X26	20
4	45.82	500.8	0.0	1338.7	50.0	W27X84	25
31	45.82	470.3	0.0	1170.7	50.0	W24X68	40
1	45.82	267.3	0.0	775.6	50.0	W21X50	32
43	9.75	0.0	0.0	21.0	50.0	W8X10	
14	19.00	150.9	0.0	256.7	50.0	W14X22	14
13	9.75	0.3	0.0	72.6	50.0	W8X10	4
15	9.75	13.6	0.0	36.5	50.0	W8X10	
39	9.75	0.0	0.0	21.0	50.0	W8X10	
33	9.41	0.0	0.0	22.2	50.0	W8X10	
32	9.42	0.0	0.0	22.2	50.0	W8X10	
12	19.00	46.8	0.0	162.8	50.0	W10X12	19
9	22.00	204.8	0.0	352.4	50.0	W16X26	16
8	10.58	32.1	0.0	79.1	50.0	W8X10	6
6	10.58	46.1	0.0	83.8	50.0	W12X16	
7	22.00	1.2	0.0	88.0	50.0	W8X10	7
5	19.50	215.7	0.0	365.3	50.0	W16X26	20
2	18.83	216.0	0.0	363.7	50.0	W16X26	20

Floor Type: Lower Concourse

Bm #	Length ft	+Mu kip-ft	-Mu kip-ft	Mn kip-ft	Fy ksi	Beam Size	Studs
24	19.00	28.5	0.0	101.2	50.0	W10X12	6
23	11.66	34.2	0.0	72.9	50.0	W8X10	4
25	11.66	34.2	0.0	72.9	50.0	W8X10	4
31	19.00	55.0	0.0	141.7	50.0	W12X14	8
29	19.00	55.8	0.0	141.7	50.0	W12X14	8
22	18.00	72.7	0.0	165.6	50.0	W12X14	10
26	44.00	440.7	0.0	1209.4	50.0	W24X62	71
33	19.00	56.6	0.0	141.7	50.0	W12X14	8
34	19.00	56.6	0.0	141.7	50.0	W12X14	8
30	19.00	69.0	0.0	141.7	50.0	W12X14	8
21	26.00	151.9	0.0	333.6	50.0	W16X26	15
35	19.00	81.5	0.0	167.9	50.0	W12X16	10



Beam Summary

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Bm #	Length	+Mu	-Mu	Mn	Fy	Beam Size	Studs
36	19.00	81.5	0.0	167.9	50.0	W12X16	10
28	19.00	103.5	0.0	226.0	50.0	W12X19	16
20	27.16	185.7	0.0	334.0	50.0	W16X26	14
27	27.16	186.3	0.0	334.2	50.0	W16X26	14
37	19.00	122.1	0.0	229.0	50.0	W14X22	10
18	19.00	164.1	0.0	279.4	50.0	W14X22	18
19	22.16	61.7	0.0	175.6	50.0	W12X14	14
38	22.16	120.7	0.0	229.3	50.0	W14X22	10
17	22.00	267.9	0.0	453.9	50.0	W16X31	28
16	22.16	128.4	0.0	269.4	50.0	W14X22	16
40	42.49	463.5	0.0	1214.9	50.0	W24X62	72
10	19.50	214.9	0.0	365.3	50.0	W16X26	20
11	31.91	256.4	0.0	623.0	50.0	W18X40	39
50	42.49	417.1	0.0	1145.3	50.0	W24X55	82
3	18.83	184.8	0.0	330.6	50.0	W16X26	6, 2, 6
4	45.82	430.2	0.0	980.5	50.0	W24X68	22
52	45.82	334.2	0.0	846.9	50.0	W24X55	24
53	45.82	334.2	0.0	846.9	50.0	W24X55	24
1	45.82	186.3	0.0	579.1	50.0	W21X44	16
44	11.00	0.0	0.0	17.4	50.0	W8X10	
43	11.00	0.0	0.0	17.4	50.0	W8X10	
51	9.75	0.0	0.0	21.0	50.0	W8X10	
14	19.00	150.9	0.0	256.7	50.0	W14X22	14
13	9.75	0.3	0.0	72.6	50.0	W8X10	4
15	9.75	13.6	0.0	36.5	50.0	W8X10	
12	19.00	46.8	0.0	162.8	50.0	W10X12	19
8	10.58	16.2	0.0	79.1	50.0	W8X10	6
6	10.58	30.2	0.0	52.1	50.0	W10X12	
7	22.00	267.9	0.0	453.9	50.0	W16X31	28
5	19.50	214.9	0.0	365.3	50.0	W16X26	20
2	18.83	184.8	0.0	330.6	50.0	W16X26	6, 2, 6

* after Size denotes beam failed stress/capacity criteria.

after Size denotes beam failed deflection criteria.

u after Size denotes this size has been assigned by the User.