

# UCI: Natural Sciences Unit 2

Irvine, California



**Tech Report 2:** Electrical Existing Conditions + Building Load Summary

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Lighting/Electrical Option  
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## Executive Summary

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The following is an analysis of the existing electrical conditions for Natural Sciences Unit 2, located on the campus of the University of California at Irvine. This five-story academic building is divided into two wings containing science laboratories and graduate student/faculty offices. A recently completed addition to the modern UCI campus, the building's electrical system is designed to be simple and efficient, while still allowing for future growth.

Contained in this report is a single-line diagram, illustrating the existing distribution of the entire electrical system for the building. Feeder sizes and equipment specifications are also included in the body of the report, including all emergency generation and distribution equipment. A detailed list of electrical loads has been compiled, and several methods for calculating service entrance size have been illustrated. Other important design issues such as environmental stewardship, communication systems, and special design complications have been addressed.

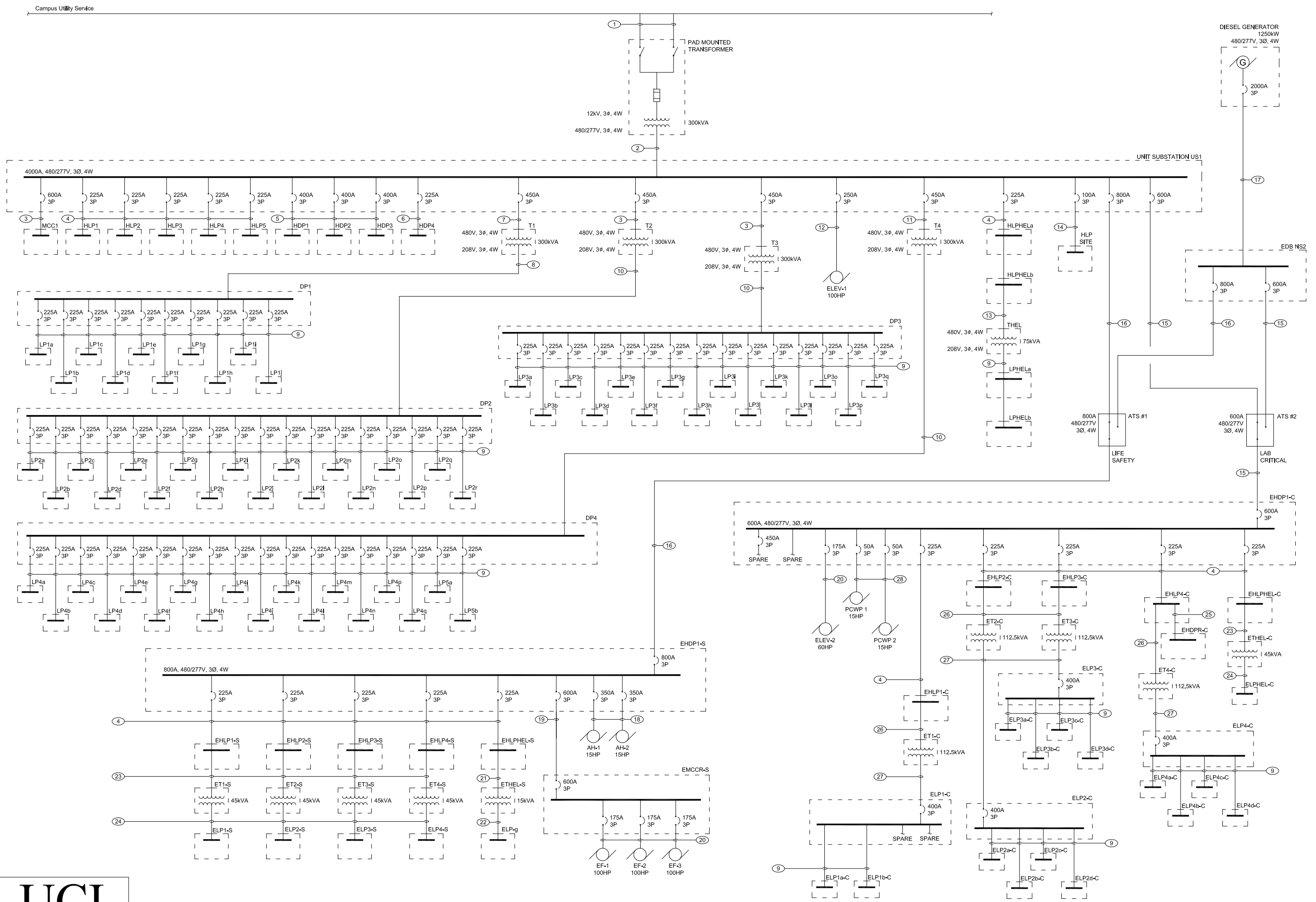
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### Single-Line Diagram Drawing List

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The following drawings were utilized to construct the single-line diagram for this building.

Drawing No.	Drawing Title
E-602	Single-Line Diagram, Normal Power (Part 1 of 2)
E-603	Single-Line Diagram, Normal Power (Part 2 of 2)
E-604	Electrical Single-Line, Emergency
E-605	Feeder & Transformer Schedules and Load Summary



FEEDER SCHEDULE															
Tag	From	To	No. of Sets	Conduit (Per Set)		Conductors (Per Set)									Size of Overcurrent Protection
				Phase Conductors			Neutral Conductors			Ground Conductors					
				Size	Type	No.	Size	Type	No.	Size	Type	No.	Size	Type	
1	UTILITY	XFMR	2	5"	EMT	2	500KCMIL	CU THWN	1	500KCMIL	CU THWN	1	4/0	CU THWN	-
2	XFMR	US1	11	4"	EMT	3	500KCMIL	CU THWN	1	500KCMIL	CU THWN	1	500KCMIL	CU THWN	4000A
3	US1	MCC1	2	3"	EMT	2	350KCMIL	CU THWN	-	-	CU THWN	1	#1	CU THWN	600A
3	US1	T2	2	3"	EMT	2	350KCMIL	CU THWN	-	-	CU THWN	1	#1	CU THWN	600A
3	US1	T3	2	3"	EMT	2	350KCMIL	CU THWN	-	-	CU THWN	1	#1	CU THWN	600A
4	US1	HLP1	1	2.5"	EMT	3	4/0	CU THWN	1	4/0	CU THWN	1	#4	CU THWN	225A
4	US1	HLP2	1	2.5"	EMT	3	4/0	CU THWN	1	4/0	CU THWN	1	#4	CU THWN	225A
4	US1	HLP3	1	2.5"	EMT	3	4/0	CU THWN	1	4/0	CU THWN	1	#4	CU THWN	225A
4	US1	HLP4	1	2.5"	EMT	3	4/0	CU THWN	1	4/0	CU THWN	1	#4	CU THWN	225A
4	US1	HLP5	1	2.5"	EMT	3	4/0	CU THWN	1	4/0	CU THWN	1	#4	CU THWN	225A
4	US1	HPHELa	1	2.5"	EMT	3	4/0	CU THWN	1	4/0	CU THWN	1	#4	CU THWN	225A
4	EHDP1-C	EHLPHL-C	1	2.5"	EMT	3	4/0	CU THWN	1	4/0	CU THWN	1	#4	CU THWN	225A
4	EHDP1-C	EHLPH4-C	1	2.5"	EMT	3	4/0	CU THWN	1	4/0	CU THWN	1	#4	CU THWN	225A
4	EHDP1-C	EHLPH3-C	1	2.5"	EMT	3	4/0	CU THWN	1	4/0	CU THWN	1	#4	CU THWN	225A
4	EHDP1-C	EHLPH2-C	1	2.5"	EMT	3	4/0	CU THWN	1	4/0	CU THWN	1	#4	CU THWN	225A
4	EHDP1-C	EHLPH1-C	1	2.5"	EMT	3	4/0	CU THWN	1	4/0	CU THWN	1	#4	CU THWN	225A
4	EHDP1-S	EHLPHL-S	1	2.5"	EMT	3	4/0	CU THWN	1	4/0	CU THWN	1	#4	CU THWN	225A
4	EHDP1-S	EHLPH1-S	1	2.5"	EMT	3	4/0	CU THWN	1	4/0	CU THWN	1	#4	CU THWN	225A
4	EHDP1-S	EHLPH2-S	1	2.5"	EMT	3	4/0	CU THWN	1	4/0	CU THWN	1	#4	CU THWN	225A
4	EHDP1-S	EHLPH3-S	1	2.5"	EMT	3	4/0	CU THWN	1	4/0	CU THWN	1	#4	CU THWN	225A
4	EHDP1-S	EHLPH4-S	1	2.5"	EMT	3	4/0	CU THWN	1	4/0	CU THWN	1	#4	CU THWN	225A
5	US1	HDP1	1	3"	EMT	2	500KCMIL	CU THWN	-	-	CU THWN	1	#3	CU THWN	400A
5	US1	HDP2	1	3"	EMT	2	500KCMIL	CU THWN	-	-	CU THWN	1	#3	CU THWN	400A
5	US1	HDP3	1	3"	EMT	2	500KCMIL	CU THWN	-	-	CU THWN	1	#3	CU THWN	400A
6	US1	HDP4	1	2.5"	EMT	2	4/0	CU THWN	-	-	CU THWN	1	#4	CU THWN	225A
7	US1	T1	2	2.5"	EMT	2	300KCMIL	CU THWN	-	-	CU THWN	1	#1	CU THWN	500A
8	T1	DP1	3	4"	EMT	3	350KCMIL	CU THWN	1	350KCMIL	CU THWN	1	2/0	CU THWN	1000A
9	DP1	LP1a	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	DP1	LP1b	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	DP1	LP1c	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	DP1	LP1d	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	DP1	LP1e	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	DP1	LP1f	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	DP1	LP1g	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	DP1	LP1h	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	DP1	LP1i	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	DP1	LP1j	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	DP2	LP2a	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	DP2	LP2b	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	DP2	LP2c	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	DP2	LP2d	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	DP2	LP2e	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	DP2	LP2f	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	DP2	LP2g	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	DP2	LP2h	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	DP2	LP2i	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A

FEEDER SCHEDULE (CONTINUED)															
Tag	From	To	No. of Sets	Conduit (Per Set)		Conductors (Per Set)									Size of Overcurrent Protection
				Size	Type	Phase Conductors			Neutral Conductors			Ground Conductors			
						No.	Size	Type	No.	Size	Type	No.	Size	Type	
9	DP2	LP2j	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	DP2	LP2k	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	DP2	LP2l	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	DP2	LP2m	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	DP2	LP2n	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	DP2	LP2o	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	DP2	LP2p	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	DP2	LP2q	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	DP2	LP2r	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	DP3	LP3a	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	DP3	LP3b	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	DP3	LP3c	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	DP3	LP3d	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	DP3	LP3e	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	DP3	LP3f	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	DP3	LP3g	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	DP3	LP3h	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	DP3	LP3i	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	DP3	LP3j	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	DP3	LP3k	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	DP3	LP3l	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	DP3	LP3o	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	DP3	LP3p	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	DP3	LP3q	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	DP4	LP4a	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	DP4	LP4b	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	DP4	LP4c	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	DP4	LP4d	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	DP4	LP4e	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	DP4	LP4f	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	DP4	LP4g	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	DP4	LP4h	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	DP4	LP4i	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	DP4	LP4j	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	DP4	LP4k	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	DP4	LP4l	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	DP4	LP4m	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	DP4	LP4n	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	DP4	LP4p	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	DP4	LP4q	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	DP4	LP5a	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	DP4	LP5b	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	ELP1-C	ELP1a-C	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	ELP1-C	ELP1b-C	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	ELP2-C	ELP2a-C	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	ELP2-C	ELP2b-C	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	ELP2-C	ELP2c-C	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A

FEEDER SCHEDULE (CONTINUED)															
Tag	From	To	No. of Sets	Conduit (Per Set)		Conductors (Per Set)									Size of Overcurrent Protection
				Size	Type	Phase Conductors			Neutral Conductors			Ground Conductors			
						No.	Size	Type	No.	Size	Type	No.	Size	Type	
9	ELP2-C	ELP2d-C	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	ELP3-C	ELP3a-C	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	ELP3-C	ELP3b-C	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	ELP3-C	ELP3c-C	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	ELP3-C	ELP3d-C	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	ELP4-C	ELP4a-C	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	ELP4-C	ELP4b-C	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	ELP4-C	ELP4c-C	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	ELP4-C	ELP4d-C	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
9	THEL	LPHEL a	1	2.5"	EMT	3	4/0	CU THWN	2	4/0	CU THWN	1	#4	CU THWN	225A
10	T2	DP2	4	3"	EMT	3	350KCMIL	CU THWN	2	350KCMIL	CU THWN	1	3/0	CU THWN	1200A
10	T3	DP3	4	3"	EMT	3	350KCMIL	CU THWN	2	350KCMIL	CU THWN	1	3/0	CU THWN	1200A
10	T4	DP4	4	3"	EMT	3	350KCMIL	CU THWN	2	350KCMIL	CU THWN	1	3/0	CU THWN	1200A
11	US1	T4	2	3.5"	EMT	3	500KCMIL	CU THWN	-	-	CU THWN	1	1/0	CU THWN	700A
12	US1	ELEV-1	1	2.5"	EMT	3	250KCMIL	CU THWN	-	-	CU THWN	1	#4	CU THWN	250A
13	HLPHELb	THEL	1	1.5"	EMT	3	#1	CU THWN	-	-	CU THWN	1	#6	CU THWN	125A
14	US1	HLP SITE	1	1.25"	EMT	3	#2	CU THWN	1	#2	CU THWN	1	#8	CU THWN	100A
15	US1	ATS #2	2	3"	EMT	3	#2	CU THWN	1	#2	CU THWN	1	#8	CU THWN	600A
15	EDB NS2	ATS #2	2	3"	EMT	3	#2	CU THWN	1	#2	CU THWN	1	#8	CU THWN	600A
15	ATS #2	EHDP1-C	2	3"	EMT	3	#2	CU THWN	1	#2	CU THWN	1	#8	CU THWN	600A
16	US1	ATS #1	2	4"	EMT	3	500KCMIL	CU THWN	1	500KCMIL	CU THWN	1	1/0	CU THWN	800A
16	EDB NS2	ATS #1	2	4"	EMT	3	500KCMIL	CU THWN	1	500KCMIL	CU THWN	1	1/0	CU THWN	800A
16	ATS #1	EHDP1-S	2	4"	EMT	3	500KCMIL	CU THWN	1	500KCMIL	CU THWN	1	1/0	CU THWN	800A
17	GENERATOR	EDB NS2	6	4"	EMT	3	500KCMIL	CU THWN	1	500KCMIL	CU THWN	1	250KCMIL	CU THWN	2000A
18	EHDP1-S	AH-1	1	3"	EMT	3	500KCMIL	CU THWN	-	-	CU THWN	1	#3	CU THWN	350A
18	EHDP1-S	AH-2	1	3"	EMT	3	500KCMIL	CU THWN	-	-	CU THWN	1	#3	CU THWN	350A
19	EHDP1-S	EMCCR-S	2	3"	EMT	3	500KCMIL	CU THWN	-	-	CU THWN	1	1/0	CU THWN	800A
20	EHDP1-S	ELEV-2	1	1.5"	EMT	3	2/0	CU THWN	-	-	CU THWN	1	#6	CU THWN	175A
20	EMCCR-S	EF-1	1	1.5"	EMT	3	2/0	CU THWN	-	-	CU THWN	1	#6	CU THWN	175A
20	EMCCR-S	EF-2	1	1.5"	EMT	3	2/0	CU THWN	-	-	CU THWN	1	#6	CU THWN	175A
20	EMCCR-S	EF-3	1	1.5"	EMT	3	2/0	CU THWN	-	-	CU THWN	1	#6	CU THWN	175A
21	EHLPHEL-S	ETHEL-S	1	3/4"	EMT	3	#10	CU THWN	-	-	CU THWN	1	#10	CU THWN	25A
22	ETHEL-S	ELP-g	1	1"	EMT	3	#4	CU THWN	1	#4	CU THWN	1	#10	CU THWN	60A
23	EHLPHEL-C	ETHEL-C	1	1"	EMT	3	#4	CU THWN	-	-	CU THWN	1	#8	CU THWN	70A
23	EHL P1-S	ET1-S	1	1"	EMT	3	#4	CU THWN	-	-	CU THWN	1	#8	CU THWN	70A
23	EHL P2-S	ET2-S	1	1"	EMT	3	#4	CU THWN	-	-	CU THWN	1	#8	CU THWN	70A
23	EHL P3-S	ET3-S	1	1"	EMT	3	#4	CU THWN	-	-	CU THWN	1	#8	CU THWN	70A
23	EHL P4-S	ET4-S	1	1"	EMT	3	#4	CU THWN	-	-	CU THWN	1	#8	CU THWN	70A
24	ETHEL-C	ELPHEL-C	1	2"	EMT	3	1/0	CU THWN	1	1/0	CU THWN	1	#6	CU THWN	150A
24	ET1-S	ELP1-S	1	2"	EMT	3	1/0	CU THWN	1	1/0	CU THWN	1	#6	CU THWN	150A
24	ET2-S	ELP2-S	1	2"	EMT	3	1/0	CU THWN	1	1/0	CU THWN	1	#6	CU THWN	150A
24	ET3-S	ELP3-S	1	2"	EMT	3	1/0	CU THWN	1	1/0	CU THWN	1	#6	CU THWN	150A
24	ET4-S	ELP4-S	1	2"	EMT	3	1/0	CU THWN	1	1/0	CU THWN	1	#6	CU THWN	150A
25	EHL P4-C	EHDPR-C	1	1"	EMT	3	#6	CU THWN	1	#6	CU THWN	1	#10	CU THWN	50A
26	EHL P2-C	ET2-C	1	1.5"	EMT	3	1/0	CU THWN	-	-	CU THWN	1	#6	CU THWN	150A
26	EHL P3-C	ET3-C	1	1.5"	EMT	3	1/0	CU THWN	-	-	CU THWN	1	#6	CU THWN	150A
26	EHL P4-C	ET4-C	1	1.5"	EMT	3	1/0	CU THWN	-	-	CU THWN	1	#6	CU THWN	150A
26	EHL P1-C	ET1-C	1	1.5"	EMT	3	1/0	CU THWN	-	-	CU THWN	1	#6	CU THWN	150A
27	ET1-C	ELP1-C	1	4"	EMT	3	500KCMIL	CU THWN	2	500KCMIL	CU THWN	1	#3	CU THWN	400A



FEEDER SCHEDULE (CONTINUED)															
Tag	From	To	No. of Sets	Conduit (Per Set)		Conductors (Per Set)									Size of Overcurrent Protection
						Phase Conductors			Neutral Conductors			Ground Conductors			
				Size	Type	No.	Size	Type	No.	Size	Type	No.	Size	Type	
27	ET2-C	ELP2-C	1	4"	EMT	3	500KCMIL	CU THWN	2	500KCMIL	CU THWN	1	#3	CU THWN	400A
27	ET3-C	ELP3-C	1	4"	EMT	3	500KCMIL	CU THWN	2	500KCMIL	CU THWN	1	#3	CU THWN	400A
27	ET4-C	ELP4-C	1	4"	EMT	3	500KCMIL	CU THWN	2	500KCMIL	CU THWN	1	#3	CU THWN	400A
28	EHDP1-C	PCWP 1	1	1"	EMT	3	#6	CU THWN	-	-	CU THWN	1	#10	CU THWN	50A
28	EHDP1-C	PCWP 2	1	1"	EMT	3	#6	CU THWN	-	-	CU THWN	1	#10	CU THWN	50A

**NOTES:**

- 1. REFER TO SINGLE-LINE DIAGRAM FOR FEEDER TAGS  
CU = COPPER

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### Summary Description of Distribution System

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The electrical distribution system is a primary selective configuration with a service entrance to the electrical room at the southeast corner of the main building. A 2500 KVA, 3 $\phi$ , 4W, pad-mounted transformer reduces the supply voltage from 12kV to 480/277V. A 4000A main switchboard distributes power to subsequent panel boards throughout the building. Emergency backup power is provided by a 1250 KW, 480/277V diesel generator located in the high energy lab building. The emergency power system feeds life safety and lab critical distribution panels for the building. Additional distribution information regarding loads can be found in the *Voltage Systems* section of this report.

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### Utility Company Information

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Natural Science Unit 2 is connected to the University of California Irvine utility distribution system. Underground utility tunnels feed into the electrical room on the first floor of the building. The university system as a whole is served by:

Southern California Edison  
P.O. Box 800  
Rosemead, CA 91770  
1-800-990-7788  
<http://www.sce.com/>

The rate structure that applies to the UCI campus is referred to as "TOU-8" by the utility company, characterized by a monthly registered demand of greater than 500kW. The time-of-use plan applies two separate rate schedules for summer and winter seasons, with maximum energy rates charged between noon and 6:00pm from the month of June through October. A detailed description of the schedule can be found on the Southern California Edison website.

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### Service Entrance

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Electrical power enters the building at the unit substation in room 1160 on the first floor of the building. A 15kV air switch and Kirk Key Interlock system is followed by a 2500kVA pad-mounted transformer to reduce the incoming voltage. All transformer and service entrance equipment is maintained by the university.

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### Voltage Systems

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Two 480/277V panel boards on each floor are fed directly from the main switchboard. One of these panels distributes power predominantly to lighting systems on that floor, and the other to mechanical equipment. In addition, a step-down transformer and 208/120V distribution panel is located on each floor. This panel feeds subsequent panels which operate at the reduced voltage, typically occupied by receptacles and special equipment loads (window shades, refrigerators, garbage disposals, etc.).

The emergency system is organized in a similar fashion, with some higher-voltage panels operating at 480Y/277V, and some lower-voltage loads requiring a step-down transformer.

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### **Emergency Power System**

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The 1250 KW, 480/277V diesel generator located in the high energy lab building provides backup power for the entire building. A 2000A 480/277V emergency distribution board then feeds two automatic transfer switches (ATS), one for life safety and one for lab critical systems.

The life safety ATS is rated at 800A and connects to a distribution panel serving egress lighting, exit signs, fire alarm systems, exhaust fans, and other life safety systems. The exhaust fans operate at 480V while the other systems require step down transformers to provide 208Y/120V power.

Lab critical loads include fume hoods, lab benches, ventilation, and dedicated receptacles which would damage equipment or cause major inconvenience if power was temporarily interrupted. The lab critical ATS is rated at 600A and the panel organization is similar to that of the life safety branch.

For more information regarding the organization of the emergency power system, see the single-line and riser diagrams included in this report.

### Locations of Switchgear

The electrical system of the building is carefully organized to provide equipment isolation for acoustics and safety, while still allowing for convenient access to panelboards for equipment runs and service. Most major equipment and distribution panelboards are located in designated electrical or mechanical spaces throughout the building, with several lighting panelboards located in the corridors. The following table lists major equipment and panelboard locations and general information.

<b>MAJOR EQUIPMENT</b>					
<b>Tag</b>	<b>Type of Equipment</b>	<b>Floor</b>	<b>Room No.</b>	<b>Room Name</b>	<b>Drawings</b>
US1	Unit Substation	1F	1160	Electrical	E-111B, E-400
G	Emergency Generator	1F	-	Generator Enclosure	E-401
ATS #1	Auto Transfer Switch	1F	-	Generator Enclosure	E-401
ATS #2	Auto Transfer Switch	1F	-	Generator Enclosure	E-401
DP1	Distribution Board	1F	1107	Electrical	E-400
DP2	Distribution Board	2F	2107	Electrical	E-400
DP3	Distribution Board	3F	3107	Electrical	E-400
DP4	Distribution Board	4F	4107	Electrical	E-400
EDB	Em. Distribution Board	1F	-	Generator Enclosure	E-401
EHDP1-S	Em. Distribution Board	1F	1160	Electrical	E-111B
EHDP1-C	Em. Distribution Board	1F	1160	Electrical	E-111B
MCC1	Motor Control Center	1F	1160	Electrical	E-111B, E-400
EMCCR-S	Em. Motor Control Center	1F	1160	Electrical	E-111B, E-400
T1	Transformer	1F	1107	Electrical	E-400
T2	Transformer	2F	2107	Electrical	E-400
T3	Transformer	3F	3107	Electrical	E-400
T4	Transformer	4F	4107	Electrical	E-400
THEL	Transformer	1F	1107	Electrical	E-400
ET1-S	Em. Transformer	1F	1107	Electrical	E-400
ET2-S	Em. Transformer	2F	2107	Electrical	E-400
ET3-S	Em. Transformer	3F	3107	Electrical	E-400
ET4-S	Em. Transformer	4F	4107	Electrical	E-400
ETHEL-S	Em. Transformer	1F	1160	Electrical	E-400
ET1-C	Em. Transformer	1F	1107	Electrical	E-400
ET2-C	Em. Transformer	2F	2107	Electrical	E-400
ET3-C	Em. Transformer	3F	3107	Electrical	E-400
ET4-C	Em. Transformer	4F	4107	Electrical	E-400
ETHEL-C	Em. Transformer	1F	1160	Electrical	E-400

<b>LIGHTING PANELBOARDS</b>						
<b>Tag</b>	<b>Voltage</b>	<b>Main Size</b>	<b>Floor</b>	<b>Room No.</b>	<b>Room Name</b>	<b>Drawings</b>
HLP-1	480/277V	225A	1F	1282	Electrical	E-111A
HLP-2	480/277V	225A	2F	2282	Electrical	E-112A
HLP-3	480/277V	225A	3F	3277	Electrical	E-113A
HLP-4	480/277V	225A	4F	4279	Electrical	E-114A
HLP-5	480/277V	225A	5F	5282	Electrical	E-115A
HDP-1	480/277V	225A	1F	1282	Electrical	E-111A
HDP-2	480/277V	225A	2F	2282	Electrical	E-112A
HDP-3	480/277V	225A	3F	3277	Electrical	E-113A
HDP-4	480/277V	225A	4F	4279	Electrical	E-114A
HDP-5	480/277V	225A	5F	5282	Electrical	E-115A
LP1a	208/120V	225A	1F	1126	Corridor	E-111B
LP1b	208/120V	225A	1F	1126	Corridor	E-111B
LP1c	208/120V	225A	1F	1126	Corridor	E-111B
LP1d	208/120V	225A	1F	-	Outdoor	E-111B
LP1e	208/120V	225A	1F	1116	Corridor	E-111B
LP1f	208/120V	225A	1F	1116	Corridor	E-111B
LP1g	208/120V	225A	1F	1116	Corridor	E-111B
LP1h	208/120V	225A	1F	1116	Corridor	E-111B
LP1i	208/120V	225A	1F	1282	Electrical	E-111A
LP1j	208/120V	225A	1F	1282	Electrical	E-111A
LP2a	208/120V	225A	2F	2100	Corridor	E-112B
LP2b	208/120V	225A	2F	2100	Corridor	E-112B
LP2c	208/120V	225A	2F	2100	Corridor	E-112B
LP2d	208/120V	225A	2F	2100	Corridor	E-112B
LP2e	208/120V	225A	2F	2100	Corridor	E-112B
LP2f	208/120V	225A	2F	2100	Corridor	E-112B
LP2g	208/120V	225A	2F	2100	Corridor	E-112B
LP2h	208/120V	225A	2F	2100	Corridor	E-112B
LP2i	208/120V	225A	2F	2100	Corridor	E-112B
LP2j	208/120V	225A	2F	2100	Corridor	E-112B
LP2k	208/120V	225A	2F	2100	Corridor	E-112B
LP2l	208/120V	225A	2F	2100	Corridor	E-112B
LP2m	208/120V	225A	2F	2100	Corridor	E-112B
LP2n	208/120V	225A	2F	2100	Corridor	E-112B
LP2o	208/120V	225A	2F	2100	Corridor	E-112B
LP2p	208/120V	225A	2F	2100	Corridor	E-112B
LP2q	208/120V	225A	2F	2282	Electrical	E-112A
LP2r	208/120V	225A	2F	2282	Electrical	E-112A
LP3a	208/120V	225A	3F	3100	Corridor	E-113B
LP3b	208/120V	225A	3F	3100	Corridor	E-113B
LP3c	208/120V	225A	3F	3100	Corridor	E-113B
LP3d	208/120V	225A	3F	3100	Corridor	E-113B
LP3e	208/120V	225A	3F	3100	Corridor	E-113B
LP3f	208/120V	225A	3F	3100	Corridor	E-113B
LP3g	208/120V	225A	3F	3100	Corridor	E-113B
LP3h	208/120V	225A	3F	3100	Corridor	E-113B
LP3i	208/120V	225A	3F	3100	Corridor	E-113B
LP3j	208/120V	225A	3F	3100	Corridor	E-113B

<b>LIGHTING PANELBOARDS (CONTINUED)</b>						
<b>Tag</b>	<b>Voltage</b>	<b>Main Size</b>	<b>Floor</b>	<b>Room No.</b>	<b>Room Name</b>	<b>Drawings</b>
LP3k	208/120V	225A	3F	3100	Corridor	E-113B
LP3l	208/120V	225A	3F	3100	Corridor	E-113B
LP3o	208/120V	225A	3F	3100	Corridor	E-113B
LP3p	208/120V	225A	3F	3277	Electrical	E-113A
LP3q	208/120V	225A	3F	3277	Electrical	E-113A
LP4a	208/120V	225A	4F	4100	Corridor	E-114B
LP4b	208/120V	225A	4F	4100	Corridor	E-114B
LP4c	208/120V	225A	4F	4100	Corridor	E-114B
LP4d	208/120V	225A	4F	4100	Corridor	E-114B
LP4e	208/120V	225A	4F	4100	Corridor	E-114B
LP4f	208/120V	225A	4F	4100	Corridor	E-114B
LP4g	208/120V	225A	4F	4100	Corridor	E-114B
LP4h	208/120V	225A	4F	4100	Corridor	E-114B
LP4i	208/120V	225A	4F	4100	Corridor	E-114B
LP4j	208/120V	225A	4F	4100	Corridor	E-114B
LP4k	208/120V	225A	4F	4100	Corridor	E-114B
LP4l	208/120V	225A	4F	4100	Corridor	E-114B
LP4m	208/120V	225A	4F	4100	Corridor	E-114B
LP4n	208/120V	225A	4F	4100	Corridor	E-114B
LP4p	208/120V	225A	4F	4279	Electrical	E-114A
LP4q	208/120V	225A	4F	4279	Electrical	E-114A
LP5a	208/120V	225A	5F	5282	Electrical	E-115A
LP5b	208/120V	225A	5F	5282	Electrical	E-115A
HLPHELa	208/120V	225A	1F	1282	Electrical	E-111A
HLPHELb	208/120V	225A	1F	1282	Electrical	E-111A
HLP SITE	208/120V	225A	1F	1282	Electrical	E-111A
LPHELa	208/120V	225A	1F	1116	Corridor	E-111B
LPHELb	208/120V	225A	1F	1116	Corridor	E-111B
EHL P1-S	480/277V	225A	1F	1116	Corridor	E-111B
EHL P2-S	480/277V	225A	2F	2100	Corridor	E-112B
EHL P3-S	480/277V	225A	3F	3100	Corridor	E-113B
EHL P4-S	480/277V	225A	4F	4100	Corridor	E-114B
EHL PHEL-S	480/277V	225A	1F	1116	Corridor	E-111B
ELP1-S	208/120V	225A	1F	1116	Corridor	E-111B
ELP2-S	208/120V	225A	2F	2100	Corridor	E-112B
ELP3-S	208/120V	225A	3F	3100	Corridor	E-113B
ELP4-S	208/120V	225A	4F	4100	Corridor	E-114B
ELPg	208/120V	60A	1F	1116	Corridor	E-111B
EHL P1-C	480/277V	225A	1F	1116	Corridor	E-111B
EHL P2-C	480/277V	225A	2F	2100	Corridor	E-112B
EHL P3-C	480/277V	225A	3F	3156	Equipment	E-113B
EHL P4-C	480/277V	225A	4F	4100	Corridor	E-114B
EHDPR-C	480/277V	100A	5F	-	Roof	E-115B
EHL PHEL-C	480/277V	225A	1F	1116	Corridor	E-111B
ELPHEL-C	208/120V	225A	1F	1116	Corridor	E-111B
ELP1a-C	208/120V	225A	1F	1116	Corridor	E-111B
ELP1b-C	208/120V	225A	1F	1116	Corridor	E-111B
ELP2a-C	208/120V	225A	2F	2100	Corridor	E-112B

<b>LIGHTING PANELBOARDS (CONTINUED)</b>						
<b>Tag</b>	<b>Voltage</b>	<b>Main Size</b>	<b>Floor</b>	<b>Room No.</b>	<b>Room Name</b>	<b>Drawings</b>
ELP2b-C	208/120V	225A	2F	2100	Corridor	E-112B
ELP2c-C	208/120V	225A	2F	2100	Corridor	E-112B
ELP2d-C	208/120V	225A	2F	2100	Corridor	E-112B
ELP3a-C	208/120V	225A	3F	3100	Corridor	E-113B
ELP3b-C	208/120V	225A	3F	3105	Spill Equipment	E-113B
ELP3c-C	208/120V	225A	3F	3156	Equipment	E-113B
ELP3d-C	208/120V	225A	3F	3156	Equipment	E-113B
ELP4a-C	208/120V	225A	4F	4100	Corridor	E-114B
ELP4b-C	208/120V	225A	4F	4100	Corridor	E-114B
ELP4c-C	208/120V	225A	4F	4100	Corridor	E-114B
ELP4d-C	208/120V	225A	4F	4100	Corridor	E-114B

### Over-Current Devices

Over-current protection throughout the building is provided by stationary circuit breakers. The table below shows typical specifications for over-current protection devices in the building. The typical lighting panelboard is protected by a 225A, 3-pole circuit breaker. For specific details regarding panelboards, please see the *Locations of Switchgear* section of this report.

<b>Equipment</b>	<b>Device</b>	<b>Type</b>	<b>A.I.C. Rating</b>
Main Service Entrance	Circuit Breaker	Bolt-On	65,000
Main Switchgear Branch	Circuit Breaker	Bolt-On	-
Typical Distribution Panel	Circuit Breaker	Bolt-On	22,000
Typical Lighting / Appliance Panel	Circuit Breaker	Bolt-On	-

### Transformers

Several transformers are located in the building. All are floor pad mounted and dry type, with the exception of the main 2500kVA transformer at the service entrance to the building. Transformers with tag designations beginning with “E” are a part of the emergency backup system.

<b>TRANSFORMERS</b>							
<b>Tag</b>	<b>Primary Voltage</b>	<b>Secondary Voltage</b>	<b>Size (kVA)</b>	<b>Type</b>	<b>Temp. Rise (°C)</b>	<b>Taps</b>	<b>Mounting</b>
PAD MTD. TRANF.	12,000V, 3PH, 4W	480Y/277V, 3PH, 4W	2500	Silicone	115	(4) 2.5%	Pad Mtd., Floor
T1	480V, 3PH, 4W	208Y/120V, 3PH, 4W	300	Dry	115	(4) 2.5%	Pad Mtd., Floor
T2	480V, 3PH, 4W	208Y/120V, 3PH, 4W	300	Dry	115	(4) 2.5%	Pad Mtd., Floor
T3	480V, 3PH, 4W	208Y/120V, 3PH, 4W	300	Dry	115	(4) 2.5%	Pad Mtd., Floor
T4	480V, 3PH, 4W	208Y/120V, 3PH, 4W	300	Dry	115	(4) 2.5%	Pad Mtd., Floor
THEL	480V, 3PH, 4W	208Y/120V, 3PH, 4W	75	Dry	115	(4) 2.5%	Pad Mtd., Floor
ET1-S	480V, 3PH, 4W	208Y/120V, 3PH, 4W	45	Dry	115	(4) 2.5%	Pad Mtd., Floor
ET2-S	480V, 3PH, 4W	208Y/120V, 3PH, 4W	45	Dry	115	(4) 2.5%	Pad Mtd., Floor
ET3-S	480V, 3PH, 4W	208Y/120V, 3PH, 4W	45	Dry	115	(4) 2.5%	Pad Mtd., Floor
ET4-S	480V, 3PH, 4W	208Y/120V, 3PH, 4W	45	Dry	115	(4) 2.5%	Pad Mtd., Floor
ETHEL-S	480V, 3PH, 4W	208Y/120V, 3PH, 4W	15	Dry	115	(4) 2.5%	Pad Mtd., Floor
ET1-C	480V, 3PH, 4W	208Y/120V, 3PH, 4W	112.5	Dry	115	(4) 2.5%	Pad Mtd., Floor
ET2-C	480V, 3PH, 4W	208Y/120V, 3PH, 4W	112.5	Dry	115	(4) 2.5%	Pad Mtd., Floor
ET3-C	480V, 3PH, 4W	208Y/120V, 3PH, 4W	112.5	Dry	115	(4) 2.5%	Pad Mtd., Floor
ET4-C	480V, 3PH, 4W	208Y/120V, 3PH, 4W	112.5	Dry	115	(4) 2.5%	Pad Mtd., Floor
ETHEL-C	480V, 3PH, 4W	208Y/120V, 3PH, 4W	45	Dry	115	(4) 2.5%	Pad Mtd., Floor

### Special Equipment

See *Emergency Power* section for description of emergency generator.



### Lighting Loads

The lighting in Natural Sciences Unit 2 is designed to be simple and efficient. Linear fluorescent fixtures are common throughout lab and office areas for general illumination. Some compact fluorescent downlights and wallwashers are used in public spaces and conference rooms. A few metal halide sources are used in the lobby, and also in the landscape lighting. Overall, the lighting system is intended to be very simple, and uses efficient sources to reduce energy consumption. The following table details load characteristics for the light sources used throughout the building.

<b>LIGHTING LOAD SCHEDULE</b>									
<b>TYPE</b>	<b>LAMP TYPE</b>	<b>LAMP WATTS</b>	<b># OF LAMPS</b>	<b>BALLAST TYPE</b>	<b>VOLTAGE</b>	<b>INPUT WATTS</b>	<b>BF</b>	<b>CURRENT (START, OPERATING)</b>	<b>POWER FACTOR</b>
A	T8 FLUOR.	32	2	ELECTRONIC	277	60	1.18	0.29	0.98
A1	T8 FLUOR.	32	2	ELECTRONIC	277	60	1.18	0.29	0.98
A2	T8 FLUOR.	32	2	ELECTRONIC	277	60	1.18	0.29	0.98
B	T8 FLUOR.	32	2	ELECTRONIC	277	60	1.18	0.29	0.98
D	T5 FLUOR.	28	2	ELECTRONIC	277	62	1.05	0.23	0.99
D1	T5 FLUOR.	28	2	ELECTRONIC	277	62	1.05	0.23	0.99
E	T5 FLUOR.	54	2	ELECTRONIC	277	120	1.05	0.43	0.98
E1	T5 FLUOR.	54	2	ELECTRONIC	277	120	1.05	0.43	0.98
E2	T5 FLUOR.	54	2	ELECTRONIC	277	120	1.05	0.43	0.98
F	T8 FLUOR.	32	2	ELECTRONIC	277	60	1.18	0.29	0.98
G	CFL	32	1	ELECTRONIC	277	36	0.98	0.14	0.98
H	CFL	32	1	ELECTRONIC	277	36	0.98	0.14	0.98
I	CFL	22	1	ELECTRONIC	277	22	0.98	0.14	0.98
J	T8 FLUOR.	32	1	ELECTRONIC	277	32	1.18	0.29	0.98
M	T5HO FLUOR.	54	2	ELECTRONIC	277	120	1.05	0.43	0.98
N	T8 FLUOR.	32	2	ELECTRONIC	277	63	1.18	0.29	0.98
O	T5 FLUOR.	28	1	ELECTRONIC	277	28	1.05	0.23	0.99
O1	T5 FLUOR.	17	1	ELECTRONIC	277	17	1.05	0.08	0.97
P	CFL	32	1	ELECTRONIC	277	36	0.98	0.14	0.98
P1	CFL	18	2	ELECTRONIC	277	36	0.98	0.14	0.98
Q	T5HO FLUOR.	54	2	ELECTRONIC	277	120	1.05	0.43	0.98
S	MH	400	1	ELECTRONIC	277	465	-	0.70, 1.72	0.90
V	T8 FLUOR.	32	2	ELECTRONIC	277	59	1.18	0.29	0.98
W	MH	250	1	PULSE START	277	298	-	0.43, 1.20	0.90
X	CFL	40	1	ELECTRONIC	277	40	0.98	0.14	0.98
Z	T5 FLUOR.	28	2	ELECTRONIC	277	59	1.05	0.23	0.99
AA	T5HO FLUOR.	54	2	ELECTRONIC	277	120	1.05	0.43	0.98
BB	CFL	32	1	ELECTRONIC	277	32	0.98	0.14	0.98
CC	CFL	42	2	ELECTRONIC	277	84	1.05	0.18	0.99
DD	CFL	32	1	ELECTRONIC	277	32	1.05	0.14	0.98
EE	CFL	32	1	ELECTRONIC	277	32	1.05	0.14	0.98
FF	MH	175	1	PULSE START	277	220	-	0.43, 0.87	0.90

### Mechanical and Other Loads

Mechanical loads for this building include several air handling units and related pieces of HVAC equipment. In addition, water pumps and plumbing equipment are included. The following table is a list of acquired mechanical loads and corresponding load information.

<b>MECHANICAL EQUIPMENT LOADS</b>									
Load Tag	Description	Magnitude	Units	Motor Amps	Voltage	Phase	Assumed PF	Equiv. KVA	Equiv. KW
AH-1	Air Handling Unit	125	HP	156.0	480	3	0.9	129.69	116.72
AH-2	Air Handling Unit	125	HP	156.0	480	3	0.9	129.69	116.72
AH-3	Air Handling Unit	100	HP	124.0	480	3	0.9	103.09	92.78
AH-4	Air Handling Unit	25	HP	34.0	480	3	0.9	28.27	25.44
EF-1	Exhaust Fan	100	HP	124.0	480	3	0.9	103.09	92.78
EF-2	Exhaust Fan	100	HP	124.0	480	3	0.9	103.09	92.78
EF-3	Exhaust Fan	100	HP	124.0	480	3	0.9	103.09	92.78
EF-4	Exhaust Fan	3	HP	4.8	480	3	0.8	3.99	3.19
EF-5	Exhaust Fan	30	HP	40.0	480	3	0.9	33.25	29.93
EF-6	Exhaust Fan	5	HP	7.6	480	3	0.8	6.32	5.05
EF-7	Exhaust Fan	0.5	HP	1.1	480	3	0.7	0.91	0.64
EF-8	Exhaust Fan	1.5	HP	3.0	480	3	0.8	2.49	2.00
EF-9	Exhaust Fan	0.25	HP	5.8	115	1	0.7	1.16	0.81
EF-10	Exhaust Fan	1.5	HP	3.0	480	3	0.8	2.49	2.00
EF-11	Exhaust Fan	1.5	HP	3.0	480	3	0.8	2.49	2.00
EF-12	Exhaust Fan	1.5	HP	3.0	480	3	0.8	2.49	2.00
HF-1	HEPA Filter Fan	1.25	HP	20.0	120	1	0.7	4.16	2.91
HF-2	HEPA Filter Fan	1.25	HP	20.0	120	1	0.8	4.16	3.33
HF-3	HEPA Filter Fan	1.25	HP	20.0	120	1	0.8	4.16	3.33
HF-4	HEPA Filter Fan	1.25	HP	20.0	120	1	0.8	4.16	3.33
HF-5	HEPA Filter Fan	1.25	HP	20.0	120	1	0.8	4.16	3.33
HHWP-1	Hot Water Pump	25	HP	34.0	480	3	0.9	28.27	25.44
HHWP-2	Hot Water Pump	25	HP	34.0	480	3	0.9	28.27	25.44
<b>PLUMBING EQUIPMENT LOADS</b>									
Load Tag	Description	Magnitude	Units	Motor Amps	Voltage	Phase	Assumed PF	Equiv. KVA	Equiv. KW
CP-1	Gen. Circulation Pump	1/12	HP	0.6	120	1	0.7	0.12	0.09
CP-2	Gen. Circulation Pump	1/12	HP	0.6	120	1	0.7	0.12	0.09
RO-1	Water Purification System	3	HP	10.6	208	3	0.8	3.82	3.05
ROP-1	Water Circulation Pump	15	HP	21.0	460	3	0.9	16.73	15.06
ROP-2	Water Circulation Pump	15	HP	21.0	460	3	0.9	16.73	15.06
ESP-1	Sump Pump	1/12	HP	0.6	120	1	0.7	0.12	0.09
ESP-2	Sump Pump	1/12	HP	0.6	120	1	0.7	0.12	0.09
VP-1	Vacuum Pump	15	HP	21.0	460	3	0.9	16.73	15.06
AD-1	Air Dryer	34.2	W	0.3	120	1	0.7	0.06	0.04

### Service Entrance Size

The following are calculations to approximate service entrance size at various stages of project design. The methods progress from loose conceptual estimates, to more precise, accurate numbers as the design phase advances. As the building is mixed-use, the lab and office areas of the building have been calculated separately and summed to produce an estimate for the entire building. The NEC loading method was higher than expected, which may be due mostly to the liberal 3.5W/ft<sup>2</sup> used for lighting loads. This method also underestimated the extensive receptacle loads required in laboratory areas.

#### Conceptual & Schematic Phases – Load per Square Foot:

Floor Level - Use	Floor Area (ft <sup>2</sup> )	VA/ft <sup>2</sup>	VA	Amps at 480V
1F – Office Building	15,000	12	18,000	21.7
2F – Office Building	15,000	12	18,000	21.7
3F – Office Building	15,000	12	18,000	21.7
4F – Office Building	15,000	12	18,000	21.7
5F – Office Building	15,000	12	18,000	21.7
1F – College Lab	17,800	30	534,000	642.3
2F – College Lab	17,800	30	534,000	642.3
3F – College Lab	17,800	30	534,000	642.3
4F – College Lab	17,800	30	534,000	642.3
<b>TOTAL BUILDING</b>	<b>146,200</b>	<b>-</b>	<b>2,226,000</b>	<b>2677.7</b>

#### Design Development – NEC Loading:

Load – Use	Floor Area (ft <sup>2</sup> )	VA/ft <sup>2</sup>	VA	Amps at 480V
Lighting - Office/Classroom	146,000	3.5	511,000	614.6
Receptacles	146,000	1	146,000	175.6
Exhaust Fans	146,000	2	292,000	351.2
Cooling	146,000	12	1,752,000	2107.3
Elevators (2)	-	50,000 ea.	100,000	120.3
<b>TOTAL BUILDING</b>	<b>146,000</b>	<b>-</b>	<b>2,801,000</b>	<b>3369.0</b>

#### Working Drawings – Actual Loading:

Load – Use	Demand Factor	Amps at 480V
Lighting	-	271.2
Receptacles	-	1281.0
Exhaust Fans	0.8	674.7
Cooling	-	
Elevators (2)	0.5	124.0
<b>TOTAL BUILDING</b>		<b>2350.9</b>

Note: Loads were taken from summary tables included with panelboard schedules in the drawings. Load types are broken up by panelboard, so mechanical loads are not separated into cooling and exhaust equipment, etc.

Summary Table:

Design Phase	Calculated kVA	Voltage System	Amps at 480V
Conceptual / Schematic	2,226	480	2677.7
Design Development	2,801	480	3369.0
Working Drawings	-	480	2350.9

---

### Environmental Stewardship Design

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Fluorescent and compact fluorescent lighting systems are used widely throughout the project. Stringent California building codes ensure that the lighting design is highly efficient. A Power Monitoring, Analysis and Control (PMAC) system has been installed to collect and diagnose data in order to optimize power and resource usage in the building. No information on LEED rating is available at this time.

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### Design Issues

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The design of the building required some special consideration due to its use. Since nearly half of the building consists of college laboratory spaces, availability and placement of electrical outlets was important. The building systems are chosen to meet stringent California code standards for energy use.

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### Communication Systems

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Voice/Data:

The building's main distribution frame in the first floor data room (rm. 1109) is connected to the campus utility tunnel system through underground conduit. Vertically stacked data rooms are located on each floor and act as access points for wiring and conduit. Combination voice/data outlets are located throughout the building.

Audio/Video:

Audiovisual systems are installed in the conference rooms on each floor. A projector is mounted on the ceiling with data input terminals near the south wall of each room. An automatic projection screen is operated by a switch on the south wall.

Fire Alarm:

The fire detection and suppression system features a central control center with interface panel. Fire sprinkler flow and tamper switches, elevator status, smoke fire dampers and relays can be monitored and controlled through the interface panel. Visible and audible cues are used to alert occupants in an emergency situation. The entire fire system is backed up by a dedicated battery system.

Notes:

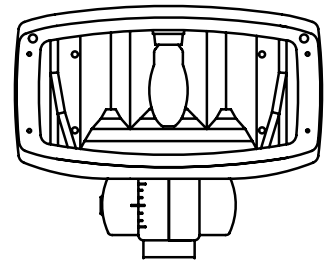
Job:

Type:



# DESIGNER FLOOD

## DF7 - 7" DIAMETER



**GENERAL DESCRIPTION:** The Gardco DF7 is a flood luminaire with a choice of (5) precision faceted optical systems. Each is designed to provide a specific distribution and sharp cutoff of stray light. The contemporary soft form diecast housing is available in a variety of finishes creating compatibility with most architectural and landscape elements. The high strength diecast aluminum knuckle features an integral splice compartment eliminating the need for a supplementary junction box and thereby permitting closer to grade mounting.

### ORDERING

PREFIX	MOUNTING	DISTRIBUTION	WATTAGE	VOLTAGE	FINISH	OPTIONS
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Enter the order code into the appropriate box above. Note: Gardco reserves the right to refuse a configuration. Not all combinations and configurations are valid. Refer to notes below for exclusions and limitations. For questions or concerns, please consult the factory.

### PREFIX

DF7

### MOUNTING (Omit if Ordering floodlight only)

C

Stub-up Conduit Mount. For direct mounting to (2) 1/2" (1.27cm) or 3/4" (1.91cm) GRC or IMC conduits. No j-box required. Must use factory supplied mounting insert when setting stub-ups.

J

J-Box Mount. For mounting into 1/2" (1.27cm) hub. Also suitable for direct surface mount to walls or ceilings when fed by EMT, BX, SJO, NM, etc. (For surface mount over outlet box, specify W or W90 mount).

W

Wall/Ceiling Canopy Mount. For mounting over (not to) a 4" recessed outlet box. When mounted on vertical surface, provides vertical aiming from straight down to 100° up from nadir. When mounted on a vertical surface, long axis of luminaire must be horizontal (+/-30°). Mounts directly to wall or ceiling. The surface structure must be suitable to support the luminaire. Only suitable for use on non-combustible surfaces.

WMB

Wall Mount with Bullhorn. For mounting over (not to) a 4" (10.16cm) recessed outlet box. Provides full axial 180° vertical and 358° rotational aiming range. Mounts direct to wall. Surface structure must be suitable to support the luminaire. When mounted in wet locations, luminaire must be mounted as shown in diagrams on opposite page.

W90

Wall Arm Mount. For mounting over (not to) a 4" (10.16cm) recessed outlet box. Provides full axial 180° vertical and 358° rotational aiming range. Mounts direct to wall. Surface structure must be suitable to support the luminaire. When mounted in wet locations, luminaire must be mounted as shown in diagrams on opposite page. In damp or dry locations, arm assembly may be inverted.

ST

Stanchion Mount. 18" (45.72cm) stanchion for in-ground concrete burial mounting.

SM

Surface Mount Stanchion. For mounting to 18" (45.72cm) stanchion pole assembly.

### DISTRIBUTION

HFL Horizontal Flood  
N/A w/250w

VFL Vertical Flood

HSP Horizontal Spot

NSP Narrow Spot

FLM Fluorescent Medium  
Available with fluorescent wattages only.

### WATTAGE

70HPS 70MH 26QF<sup>2,3</sup>

100HPS 100MH 32TRF<sup>2,3</sup>

150HPS 150MH 42TRF<sup>2,3</sup>

175MH 70CF<sup>2,3</sup>

250MH<sup>1</sup>

1. 250MH Uses ED-18 or T15 Mogul Base Lamps. N/A w/HFL Distribution, or PCB, POLY, F or ESB options.  
2. Available with FLM optic only.  
3. Fluorescent luminaires feature electronic ballasts that accept 120V through 277V, 50hz to 60hz, input. Specify "UNIV" voltage for 120V through 277V.

### VOLTAGE

120

208

240

277

347

UNIV

Not available in 250MH  
Fluorescent only.

### FINISH

BRP Bronze Paint

BLP Black Paint

WP White Paint

NP Natural Aluminum Paint

BGP Beige Paint

VP Verde Green Paint

OC

Optional Color Paint

Specify RAL designation  
ex: OC-RAL7024.

SC

Special Color Paint

Specify. Must supply color chip.

### OPTIONS

PCB<sup>4</sup> Button Type Photocontrol

BD<sup>5</sup> Barn Doors

CH<sup>6</sup> Cutoff Hood

POLY<sup>4,6</sup> Polycarbonate Shield

F<sup>4,7</sup> Fusing

ESB<sup>8</sup> Extended Splice Box

WG<sup>9</sup> Wire Guard

4. Not Available with 250w.  
5. Barn Doors (BD) and Cutoff Hoods (CH) are painted to match the luminaire. Either can be used concurrently with the POLY option.  
6. Not Available with WG option.  
7. 120V through 277V only.  
8. Supplied standard with 250w. Not available for use as additional splicing volume in 250w.  
9. Not Available with BD, CH and POLY options. Field Installable.

DF7 Splice Compartment Capacity			DF7 Pole Loading Data	
	Standard Units	Extended Splice Box	250 W Units	EPA
#12 AWG Conductors <sup>10</sup>	5	9	5	Single Luminaire on PTA Adapter 1.3 ft <sup>2</sup> /12m <sup>2</sup>
#10 AWG Conductors <sup>10</sup>	3	7	3	Twin Luminaires on PTA Adapter 1.9 ft <sup>2</sup> /18m <sup>2</sup>
<sup>10</sup> . Including ground				Twin Luminaires on TAB Adapter 2.8ft <sup>2</sup> /26m <sup>2</sup>

### ADDITIONAL MOUNTING ACCESSORIES:

PTA Pole top 2 3/8" (6.03cm) tenon adapter

TAB Twin arm bracket for use with ST or PTA

PT2 Pole top 2 3/8" (6.03cm) tenon adapter for twin back to back luminaire mounting.

Gardco Lighting 1611 Clovis Barker Road San Marcos, TX 78666 (800) 227-0758 (512) 753-1000 FAX: (512) 753-7855 www.sitelighting.com

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# DESIGNER FLOOD

## DF7- 7" DIAMETER

### SPECIFICATIONS

**HOUSING:** A single-piece aluminum housing is cast in a soft barrel form. A one piece extruded gasket mates with door frame.

**DOOR/LENS ASSEMBLY:** A heat and impact resistant 3/16" (.48cm) tempered glass lens and one piece silicone gasket are mechanically secured to door frame.

**KNUCKLE:** The diecast aluminum knuckle features an integral splice compartment. A single captive 3/16" (.48cm) stainless steel allen-head bolt and stainless steel nut securely lock the knuckle aiming teeth in 5° increments. An opposite cover plate is removable for access to splices. The knuckle assembly is fully gasketed.

**OPTICAL SYSTEM:** The wide flood, vertical flood and horizontal spot optical systems are homogenous sheet and extruded aluminum, electrochemically brightened, anodized and sealed. The narrow spot reflector is hydroformed faceted Alzak® aluminum.

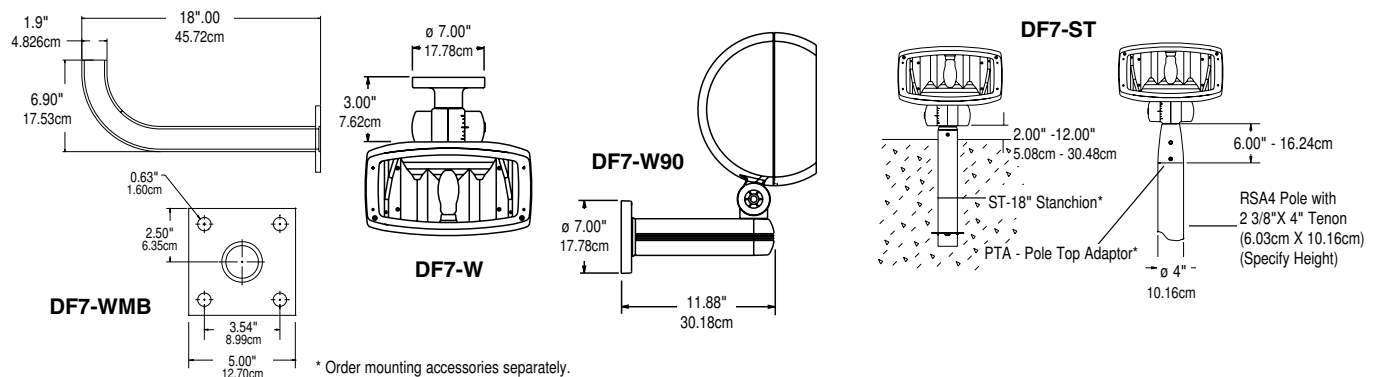
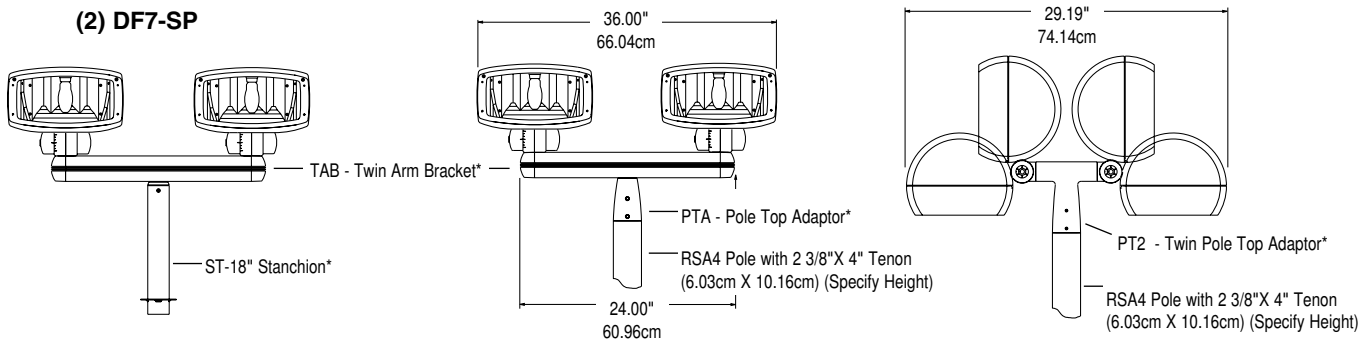
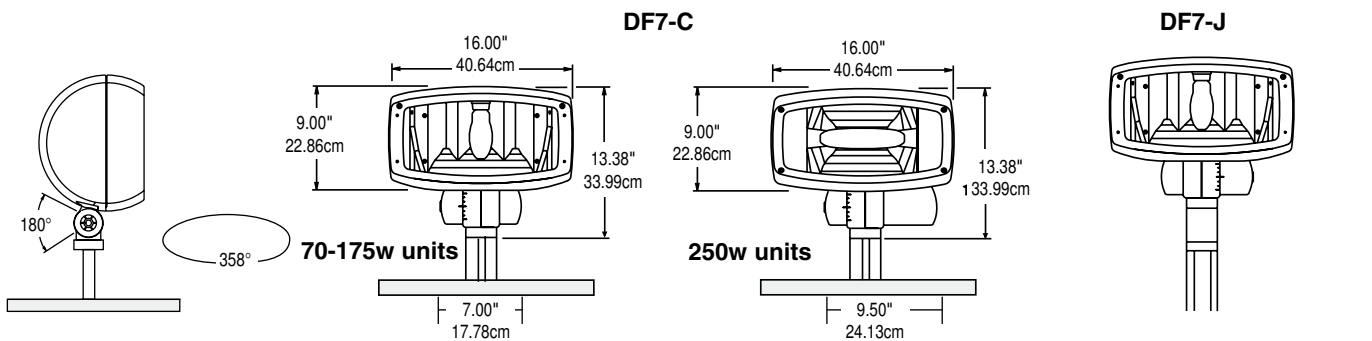
**ELECTRICAL:** HID UNITS: Each high power factor ballast is the separate component magnetic type capable of providing reliable lamp starting to -20°F/-29°C. FLUORESCENT UNITS: High power factor ballast standard. Accepts 26w Quad tube. 32w Triple Tube and 70w circular lamps

**LAMPHOLDER:** The pulse rated socket is glazed porcelain with nickle plated screw shell. All sockets are medium base except 250W metal halide units.

**FINISH:** Each luminaire receives a fade and abrasion resistant, electrostatically applied, thermally cured textured, polyester powdercoat finish.

**LABELS:** All luminaires bear UL or CUL (where applicable) Wet Location labels.

### DIMENSIONS AND MOUNTING DETAIL



\* Order mounting accessories separately.

Gardco Lighting 1611 Clovis Barker Road San Marcos, TX 78666 (800) 227-0758 (512) 753-1000 FAX: (512) 753-7855 [www.sitelighting.com](http://www.sitelighting.com)

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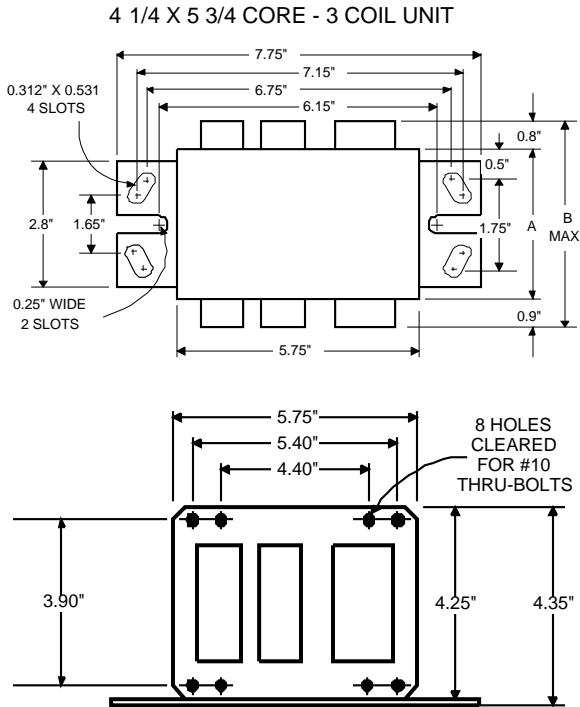


TYPE FF

**Metal  
Halide  
Lamp Ballast**

**Catalog Number 71A5534T  
For 175W M137 (Pulse Start)  
60 Hz REGULATED LAG  
Status: Active**

**DIMENSIONS AND DATA**



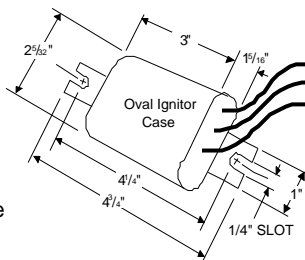
INPUT VOLTS	277			
CIRCUIT TYPE	REGULATED LAG			
POWER FACTOR (min)	90%			
REGULATION				
Line Volts	±10%			
Lamp Watts	±+4%.-6%			
LINE CURRENT (Amps)				
Operating.....	0.87			
Open Circuit.....	0.54			
Starting.....	0.43			
UL TEMPERATURE RATINGS				
Insulation Class	H(180°C)			
Coil Temperature Code	1029	A		
MIN. AMBIENT STARTING TEMP.	-40°F or -40°C			
NOM. OPEN CIRCUIT VOLTAGE	310			
INPUT VOLTAGE AT LAMP DROPOUT.....	195			
INPUT WATTS	220			
RECOMMENDED FUSE (Amps).....	2			
CORE and COIL				
Dimension (A)	1.70			
Dimension (B)	3.50			
Weight (lbs.)	12.5			
Lead Lengths	12"			
CAPACITOR REQUIREMENT				
Microfarads	17.0			
Volts (min.)	400			
Fault Current Withstand (amps)				
60 Hz TEST PROCEDURES (Refer to Advance Test Procedure for HID Ballasts - Form 1270)				
High Potential Test (Volts)				
1 minute	2000			
2 seconds	2500			
Open Circuit Voltage Test (Volts)	305-340			
Short-Circuit Current Test (Amps)				
Secondary Current	1.60-1.95			
Input Current.....	0.17	-	-	-
	0.30			

Capacitor: 7C170P40

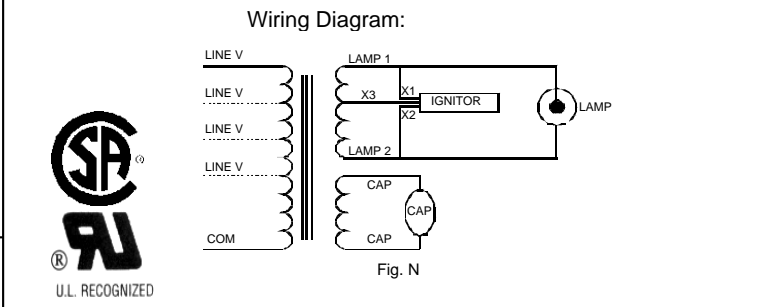


Capacitance: 17  
Dia/Oval Dim: 1.75  
Height: 3.75  
Temp Rating: 105°C

Ignitor: LI534-H5



Ballast to Lamp Distance (BTL) = 2 feet  
Temp Rating: 105°C



**Typical Ordering Information**

(please call Advance for suffix availability)

Order Suffix	Description
500D.	Ballast With Ignitor and Dry Film Capacitor
510D.	Ballast w/Welded Bracket, Ignitor, & Dry Film Capacitor
600.	Ballast and Ignitor, No Capacitor
610.	Ballast with Welded Bracket and Ignitor, No Capacitor

Data is based upon 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.

**ADVANCE**

O'HARE INTERNATIONAL CENTER · 10275 WEST HIGGINS ROAD · ROSEMONT, IL 60018  
Customer Support/Technical Service: Phone: 800-372-3331 · Fax: 630-307-3071  
Corporate Offices: Phone: 800-322-2086

10/24/01

# PH Artichoke

high intensity discharge

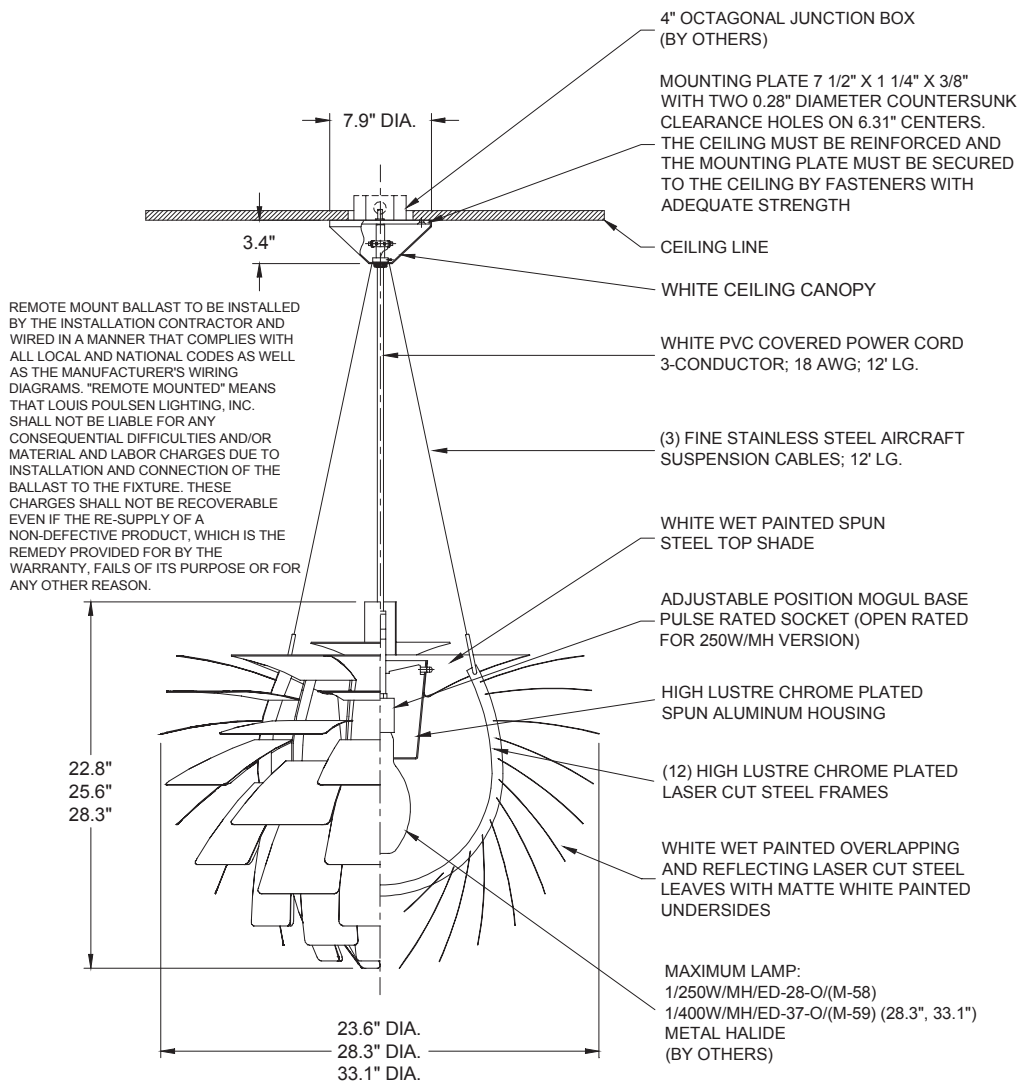
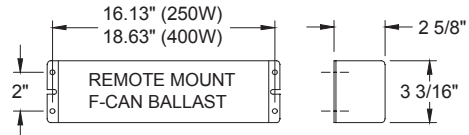
Design: Poul Henningsen

Type: S

Project:

Catalog Number:

FINISH: WHITE  
Min. suspension height: 24"

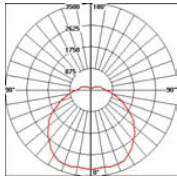




# PH Artichoke

pendants

high intensity discharge



Photometric Report: PHA-HID-White-400W-840.IES  
 Report No.: LP9583  
 Poulsen Report No.: PHA-HID-White-400W-840.IES  
 Luminaire: PH Artichoke, White-840  
 Lamp: 1/400W/ED37/MH/Clear  
 Efficiency: 34.9%  
 Description: This report can be used for calculation on all versions listed below. Use only actual lumen data when calculating

#### Candlepower Distribution

Vertical Angle	Candela
0	3224
5	3175
10	3179
25	3170
40	2665
55	2095
70	1335
85	724
90	581
120	280
150	76
180	46

#### Zonal Lumen Summary

Zone	Lumens	% Lamp	% Fixture
0-30	2638	6.9	19.9
0-40	4445	11.7	33.5
0-60	8215	21.6	61.9
0-90	11640	30.6	87.7
90-120	1244	3.3	9.4
90-130	1432	3.8	10.8
90-150	1588	4.2	12.0
90-180	1638	4.3	12.3
0-180	13278	34.9	100.0

#### Coefficients of Utilization - Zonal Cavity Method

Effective Floor Cavity Reflectance 20%	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
Ceiling Reflectance (%)																					
Wall Reflectance (%)																					
Room Cavity Ratio																					
0	41	41	41	41	39	39	39	39	36	36	36	34	34	34	32	32	32	31	31	31	31
1	36	34	33	31	35	33	32	30	31	30	28	29	28	27	27	26	25	24	24	24	24
2	33	30	27	25	31	28	26	24	27	25	23	25	23	22	23	22	21	20	20	20	20
3	30	26	23	20	28	26	22	20	23	21	19	22	20	18	20	19	17	16	16	16	16
4	27	23	19	17	26	22	19	17	20	18	16	19	17	15	18	16	15	14	14	14	14
5	25	20	17	14	24	19	16	14	18	16	14	17	15	13	16	14	12	12	12	12	12
6	23	18	15	12	22	17	15	12	16	14	12	15	13	11	15	12	11	10	10	10	10
7	21	16	13	11	20	16	13	11	15	12	10	14	12	10	13	11	10	9	9	9	9
8	20	15	12	10	19	14	11	9	14	11	9	13	10	9	12	10	9	8	8	8	8
9	18	14	11	9	18	13	10	8	12	10	8	12	10	8	11	9	8	7	7	7	7
10	17	12	10	8	16	12	9	8	11	9	7	11	9	7	10	8	7	6	6	6	6

#### Design

Poul Henningsen

#### Concept

PH Artichoke (1958) is a 360-degree glare free luminaire created by 72 leaves, which shield the light source, redirect and reflect the light onto the underlying leaves, giving distinct, unique illumination.

#### Finish

Copper or stainless steel, brushed and lacquered. White, wet painted.

#### Material

Leaves: Die cut copper, laser cut stainless steel or die cut steel. Top shade: White, spun steel. Frame: High lustre chrome plated, laser cut steel. Suspension: High lustre chrome plated, spun aluminum.

#### Mounting

Suspension type: 3x stainless steel aircraft cables. Suspension length: 12'. Canopy: White. Cord type: 3-conductor, 18 AWG PVC power cord. Cord color: Copper version: Black cord or stainless steel and white version: white cord. Cord length: 12'.

#### Weight

Max. 55 lbs.

#### Label

cUL, Dry location. IBEW.

Product code	Dimension	Light source	Voltage	Finish
PHA	18.9" 23.6" 28.3" 33.1"	1/150W/CMH/T-6 G12 1/250W/MH/ED-28-O mogul 1/400W/MH/ED-37 mogul 1/200W/A-23/CL medium 1/500W/PS-35/CL mogul	120/277V 120V	BR ST STEEL COP LAC WHT

#### Specification notes:

- 18.9" variant is available in 1/200W incandescent and CMH G12 light sources.
- CMH and MH variants provided with one remote mounted 120/277V F-can ballast.
- Incandescent variants only available in 120V.
- MH variants require an open rated lamp (by others)
- 1/400W/ED-37/MH mogul is not available in 23.6" or 18.9" diameter variants.

#### Info notes:

- MH variants require an open rated lamp (by others).
- The comparable EU version has the following classification: Ingress Protection Code: IP20.

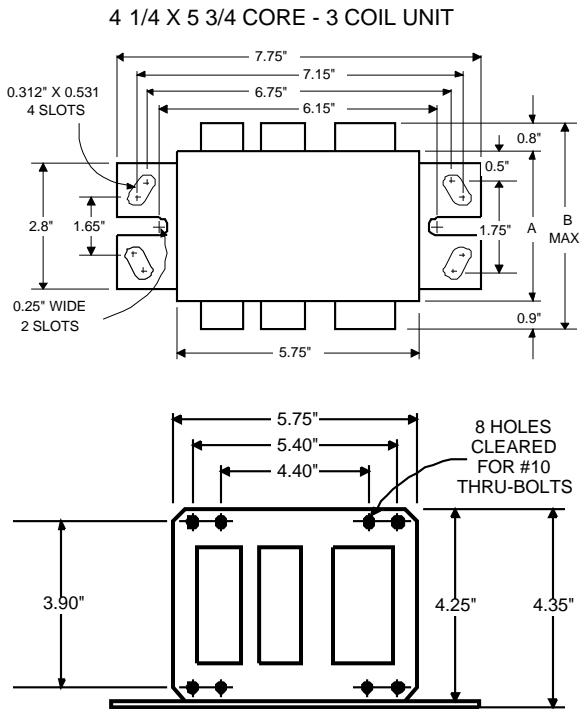


TYPE S

**Metal  
Halide  
Lamp Ballast**

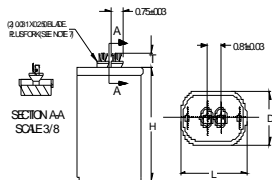
**Catalog Number 71A6034T  
For 400W M128/M135 (P. S.)  
60 Hz REGULATED LAG  
Status: Active**

**DIMENSIONS AND DATA**



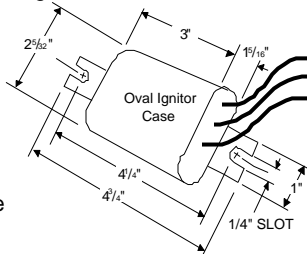
INPUT VOLTS	REGULATED LAG	277			
CIRCUIT TYPE	REGULATED LAG				
POWER FACTOR (min)	90%				
REGULATION					
Line Volts	±10%				
Lamp Watts	±7%				
LINE CURRENT (Amps)					
Operating.....	1.72				
Open Circuit.....	1.25				
Starting.....	0.70				
UL TEMPERATURE RATINGS					
Insulation Class	H(180°C)				
Coil Temperature Code	A				
MIN. AMBIENT STARTING TEMP.	-40°F or -40°C				
NOM. OPEN CIRCUIT VOLTAGE	315				
INPUT VOLTAGE AT LAMP DROPOUT.....	150				
INPUT WATTS	465				
RECOMMENDED FUSE (Amps).....	5				
CORE and COIL					
Dimension (A)	3.75				
Dimension (B)	5.50				
Weight (lbs.)	26				
Lead Lengths	12"				
CAPACITOR REQUIREMENT					
Microfarads	21.0				
Volts (min.)	500				
Fault Current Withstand (amps)					
60 Hz TEST PROCEDURES (Refer to Advance Test Procedure for HID Ballasts - Form 1270)					
High Potential Test (Volts)					
1 minute	2000				
2 seconds	2500				
Open Circuit Voltage Test (Volts)	285-345				
Short-Circuit Current Test (Amps)					
Secondary Current	3.30-4.05				
Input Current.....	0.20	-	-	-	-
	0.35				

Capacitor: MD2100-030



Capacitance: 21  
Dia/Oval Dim: 1.75  
Height: 3.9  
Temp Rating: 90°C

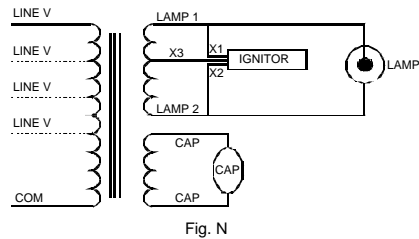
Ignitor: LI534-H5



Ballast to Lamp Distance (BTL) = 2 feet  
Temp Rating: 105°C



**Wiring Diagram:**



**Typical Ordering Information**

(please call Advance for suffix availability)

Order Suffix	Description
500.	Ballast with Ignitor and Oil Filled Capacitor
510.	Ballast w/Welded Bracket, Ignitor & Oil-Filled Capacitor
600.	Ballast and Ignitor, No Capacitor
610.	Ballast with Welded Bracket and Ignitor, No Capacitor

Data is based upon 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.

**ADVANCE**

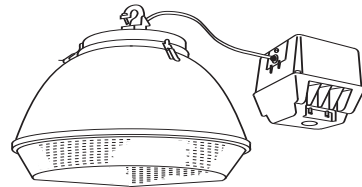
O'HARE INTERNATIONAL CENTER · 10275 WEST HIGGINS ROAD · ROSEMONT, IL 60018  
Customer Support/Technical Service: Phone: 800-372-3331 · Fax: 630-307-3071  
Corporate Offices: Phone: 800-322-2086

05/27/99

JOB NAME \_\_\_\_\_  
 TYPE \_\_\_\_\_

# LLR LOW BAY REMOTE

50-250 watt Metal Halide  
 50-250 watt High Pressure Sodium  
 150-250 watt Pulse Start Metal Halide



The LLR Low Bay Remote Luminaire features a remote mount ballast for critical mounting heights in general purpose retail, educational and industrial applications.

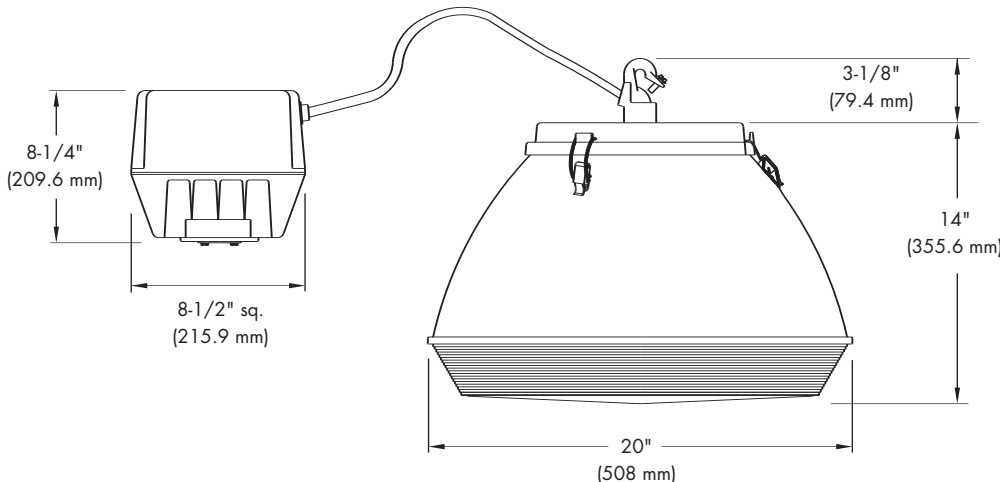
**Day-Brite Lighting**

## ORDERING MATRIX

SAMPLE CATALOG NUMBER: LLR250MMT-H LRA

<b>LLR</b>				-		-			-	
<b>BALLAST ASSEMBLY</b> LLR		<b>LAMP SOURCE</b> M - Metal Halide S - High Pressure Sodium P - Pulse Start Metal Halide (Ballast option must also be specified)			<b>OPTICAL MOUNTING OPTIONS</b> H - Suspension Hook Mounting C - Ceiling/Surface Mounting P - Pendant Mounting, 3/4" NPS			<b>OPTICAL ASSEMBLY</b> LRA - Acrylic Lens LRP - Polycarbonate Lens		
	<b>WATTAGE</b> 050 - 050 MED <sup>2</sup> 070 - 070 MED 100 - 100 MED 150M - 150M MED 150S - 150S MOG 175 - 175 MOG <sup>4</sup> 200 - 200 MOG <sup>31</sup> 250 - 250 MOG	<b>VOLTAGE</b> 12 - 120 20 - 208 24 - 240 27 - 277 34 - 347 48 - 480 <sup>32</sup> 2T - 208/277 DT-120/277 MT - 120/208 240/277 1N - 120V NPF (HPS only)			<b>OPTIONS (add as suffix)</b> CUL - UL Listing to meet CSA standards WEB - Pulse Start Electronic Ballast (150, 200, 250, watt only) Consult factory for available voltages and ambient temperature rating. HR - Hot Restrike (150W HPS only) PSC - Pulse Start CWA Ballast PSR - Pulse Start Reactor Ballast (150, 200, 250 watt, 277 volt only.) Q - Quartz Standby QEM - Quartz Emergency <sup>40</sup> QTD - Quartz Time Delay WDF - Wired Double Fuse <sup>45</sup> WSF - Wired Single Fuse <sup>46</sup>			<b>OPTICAL OPTIONS</b> CFWL - Charcoal Filter Wet Location		
	<b>ACCESSORIES (ORDER SEPARATELY)</b> CH - Cover Half for Power Hook (use with PB) PB - Power Box for Power Hook (use with CH) HP12 - Hook-Cord-Plug Assembly 120V HP25 - Hook-Cord-Plug Assembly 208-240V HP27 - Hook-Cord-Plug Assembly 277V HP48 - Hook-Cord-Plug Assembly 480V HMR - Suspension Hook Male LMR - Suspension Loop Male SCB3 - Ballast Retainer Chain 3' WGLRA - Wire Guard (Refer to Section 18000 for additional accessories.)									
										<b>Footnotes:</b> <sup>1</sup> Not available in High Pressure Sodium. <sup>2</sup> DT only. <sup>31</sup> Not available in standard Metal Halide. <sup>32</sup> Not available in 70 watt Metal Halide. <sup>40</sup> Requires 120 volt secondary power supply. <sup>45</sup> Use with 208, 240 and 480 volt. <sup>46</sup> Use with 120, 277 and 347 volt.  <b>General Notes:</b> All accessories are field installed. All options factory installed.  <b>Warning:</b> Refer to and follow the lamp manufacturer's warnings and instructions.

## DIMENSIONS



## ENERGY DATA

### HIGH PRESSURE SODIUM

HX BALLAST INPUT WATTS
50 watt-66 watts
70 watt-91 watts
100 watt-130 watts
150 watt-188 watts

### CWA BALLAST INPUT WATTS

200 watt-240 watts
250 watt-295 watts

### METAL HALIDE

HX BALLAST INPUT WATTS
50 watt-72 watts
70 watt-90 watts
100 watt-129 watts
150 watt-185 watts

### BALLAST INPUT WATTS

	CWA	WEB
150 watt	189 watts	163 watts
175 watt	210 watts	-
200 watt	232 watts	213 watts
250 watt	295 watts	263 watts

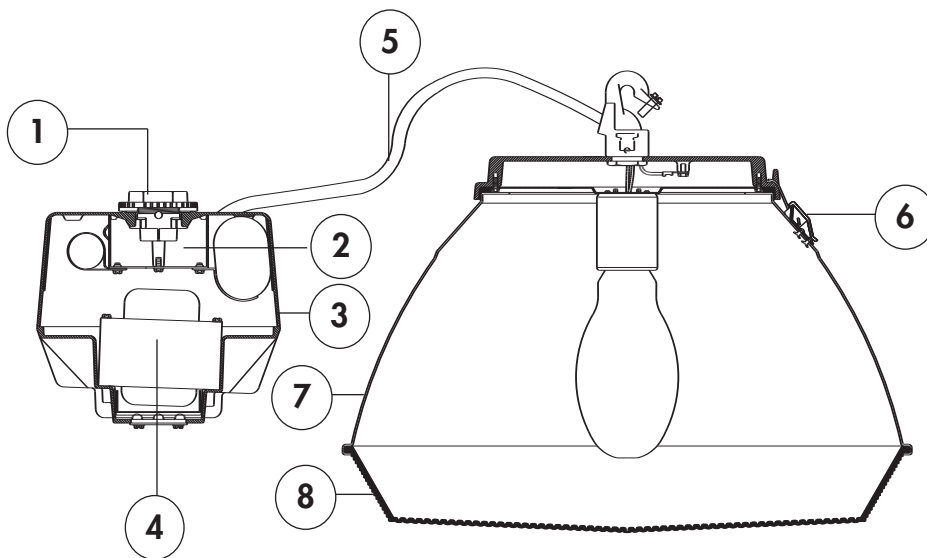
**LLR-LOW BAY REMOTE**

For complete photometric information on the remote mounted little low bay, please see specification sheet LB-11080.

PRODUCT FEATURES

UL 1598 Listed suitable for damp location and 40°C ambient for all lamp wattages listed with magnetic ballast. Consult factory for ambient temperature rating for electronic ballast (WEB option).

1. 3/4" threaded cast aluminum nut and hub for easy, positive mounting.
2. Large wiring access with captive retainer screw.
3. Heavy wall, two piece die cast aluminum housing with white polyester powder finish.
4. Day-Brite "Slant 2" ballast mounting for cooler operation. Ballast has high temperature class H insulation and a minimum starting temperature of -40°C (-40°F) for HPS and Pulse Start MH or -30°C (-20°F) for MH.
5. Three foot 16-3 Type SEO Cord.
6. Corrosion resistant stainless steel latches.
7. Precision spun heavy gauge aluminum reflector coated inside and out with highly reflective (90-92%) white polyester powder finish.
8. One piece injection molded lens; 3/16" minimum thickness of 100% virgin acrylic for excellent brightness control and high efficiency. UL Listed for Metal Halide arc tube containment.



Visit our web site at [www.daybritelighting.com](http://www.daybritelighting.com)

776 South Green Street Tupelo, MS 38804 Phone: 662-842-7212 Fax: 662-841-5501

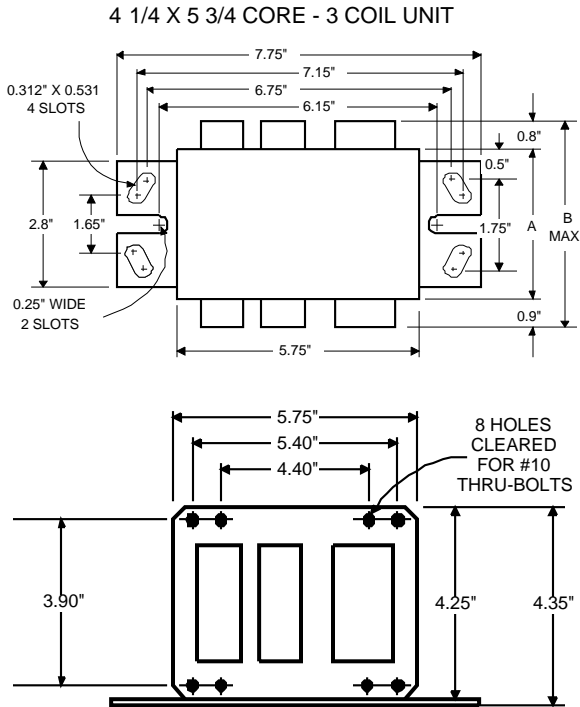


TYPE W

**Metal  
Halide  
Lamp Ballast**

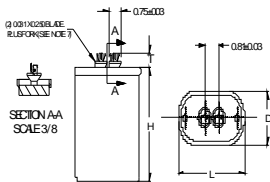
**Catalog Number 71A5734  
For 250W M138 (Pulse Start)  
60 Hz REGULATED LAG  
Status: Active**

**DIMENSIONS AND DATA**



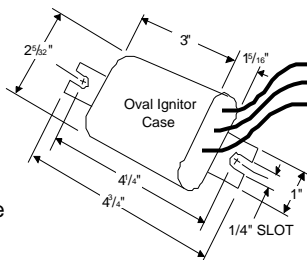
INPUT VOLTS	REGULATED LAG	277			
CIRCUIT TYPE	REGULATED LAG				
POWER FACTOR (min)	90%				
REGULATION					
Line Volts	±10%				
Lamp Watts	±+5%, -7%				
LINE CURRENT (Amps)					
Operating.....		1.20			
Open Circuit.....		1.00			
Starting.....		0.43			
UL TEMPERATURE RATINGS					
Insulation Class	H(180°C)				
Coil Temperature Code	1029	A			
MIN. AMBIENT STARTING TEMP.	-40°F or -40°C				
NOM. OPEN CIRCUIT VOLTAGE	305				
INPUT VOLTAGE AT LAMP DROPOUT.....		195			
INPUT WATTS	298				
RECOMMENDED FUSE (Amps).....		3			
CORE and COIL					
Dimension (A)	2.50				
Dimension (B)	4.13				
Weight (lbs.)	16				
Lead Lengths	12"				
CAPACITOR REQUIREMENT					
Microfarads	16.0				
Volts (min.)	480				
Fault Current Withstand (amps)					
60 Hz TEST PROCEDURES (Refer to Advance Test Procedure for HID Ballasts - Form 1270)					
High Potential Test (Volts)					
1 minute	2000				
2 seconds	2500				
Open Circuit Voltage Test (Volts)	290-355				
Short-Circuit Current Test (Amps)					
Secondary Current	2.00-2.50				
Input Current.....		0.20	-	-	-
		0.30			

Capacitor: MD1606-000

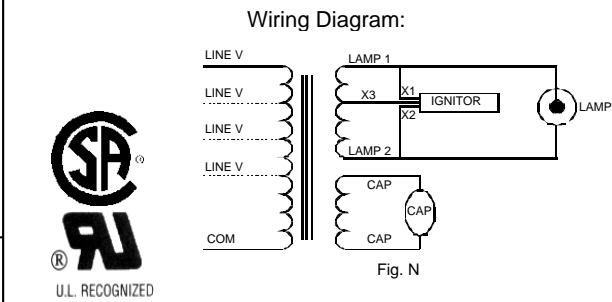


Capacitance: 16  
Dia/Oval Dim: 1.75  
Height: 3.4  
Temp Rating: 90°C

Ignitor: LI534-H5



Ballast to Lamp Distance (BTL) = 2 feet  
Temp Rating: 105°C



**Typical Ordering Information**

(please call Advance for suffix availability)

Order Suffix	Description
500.	Ballast with Ignitor and Oil Filled Capacitor
510.	Ballast w/Welded Bracket, Igniter & Oil-Filled Capacitor
600.	Ballast and Ignitor, No Capacitor
610.	Ballast with Welded Bracket and Ignitor, No Capacitor

Data is based upon 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.

**ADVANCE**

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09/03/97

Seal



Issue No.	Description	Issue Date
PACKAGE_A		November 25, 2002
PACKAGE_C		February 26, 2003
PACKAGE_D COORDINATION		April 10, 2003
PACKAGE_D FINAL		June 3, 2003
PACKAGE_D FOR APPROVAL		September 15, 2003
PACKAGE_D API		November 24, 2003
AS-BUILT		January 31, 2006

DESIGN PACKAGE D FINAL Nov 24, 2003  
**APPROVED FOR INSPECTION**  
  
 Clifford W. Seaman, P.E., Senior Architect  
 UCI Design & Construction Services

CJ Project Number: 4524.00  
 CAD File Name: E-602  
 Drawn By: JB  
 Reviewed By: PM  
 Scale: NO SCALE

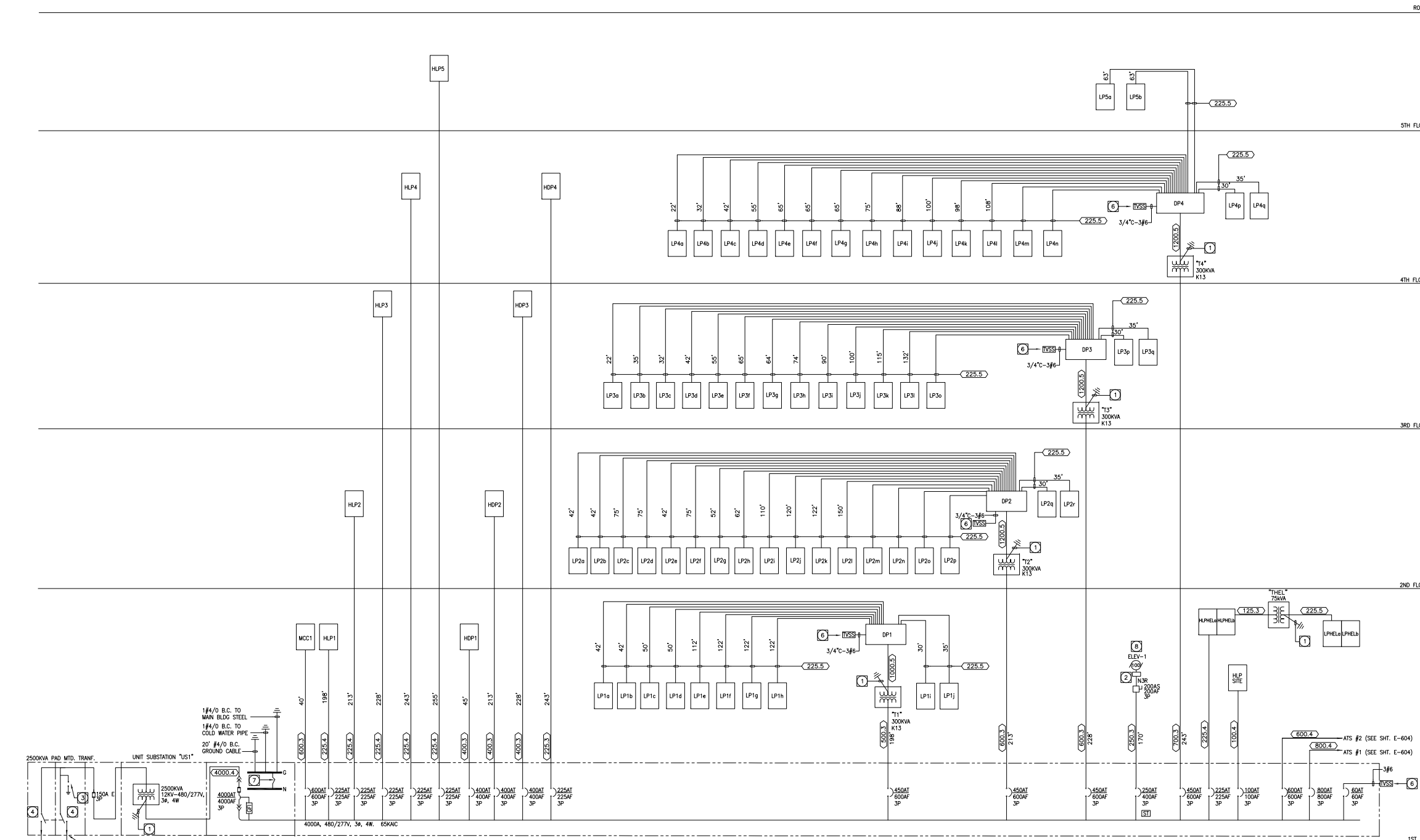
Original drawing sheet is 30" x 42"  
 Scale Accordingly if Reduced

100% CONSTRUCTION DOCUMENTS

SINGLE-LINE DIAG.  
 NORMAL POWER  
 (PART 1 OF 2)

DRAWING NUMBER

E-602



**GENERAL NOTES:**

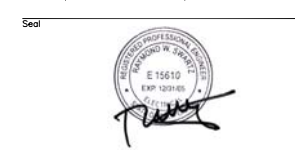
- PROVIDE ISOLATED GROUND BUS IN ALL 208/120V PANELBOARDS.
- ALL PANELBOARDS SHALL BE 42-CIRCUIT WITH AS MANY/AS REQUIRED CIRCUIT BREAKERS.
- PROVIDE 225A/3P MAIN CIRCUIT BREAKER IN ALL PANELBOARDS.
- ALL PANELBOARDS SHALL HAVE A BUS RATING OF 225 AMPS.

**SHEET NOTES:**

- PROVIDE GROUNDING PER NEC 250-26. SEE TRANSFORMER SCHEDULE FOR GEC SIZING INFORMATION.
- ELEVATOR CONTROLLER. SEE ELEVATOR ENLARGED ROOM.
- SURGE ARRESTOR.
- 15KV AIR SWITCH WITH KIRK KEY INTERLOCK
- EXISTING MANHOLE 250
- TVSS:  
 MAXIMUM SURGE CURRENT/PHASE 480/277V 208Y/120V  
 VOLTAGE CODE 80,000A 80,000A  
 MAX. CONTINUOUS OPERATING VOLTAGE 277 Y 120 Y  
 UL 1449 VOLTAGE RATING/MODE 320 150 Y  
 RESPONSE TIME 800V PK 400V PK  
 UL 1283 EM/IRI LISTING 0.5 N SEC 0.5 N SEC  
 JOULE RATING PER ANSI/IEEE C62.41 YES YES  
 CATEGORY C YES YES
- GROUND-TO-NEUTRAL REMOVABLE LINK.
- DURING NORMAL POWER OUTAGE ELEVATORS WILL AUTOMATICALLY RETURN TO FIRST FLOOR AND DISABLED FIRE MARSHALL SHALL OPERATE ONE ELEVATOR AT A TIME.

REFER TO FEEDER AND TRANSFORMER SCHEDULES ON SHEET E-605

1 SINGLE-LINE DIAGRAM - NORMAL POWER (PART 1 OF 2)  
 SCALE: NONE



Issue No.	Description	Issue Date
PACKAGE_A		November 25, 2002
PACKAGE_C		February 26, 2003
PACKAGE_D COORDINATION		April 10, 2003
PACKAGE_D FINAL		June 3, 2003
PACKAGE_D FOR APPROVAL		September 15, 2003
PACKAGE_D AFI		November 24, 2003
AS-BUILT		January 31, 2006

DESIGN PACKAGE D FINAL Nov 24, 2003  
 APPROVED FOR INSPECTION  
  
 Clifford W. Schein, Jr., Senior Architect  
 UCI Design & Construction Services

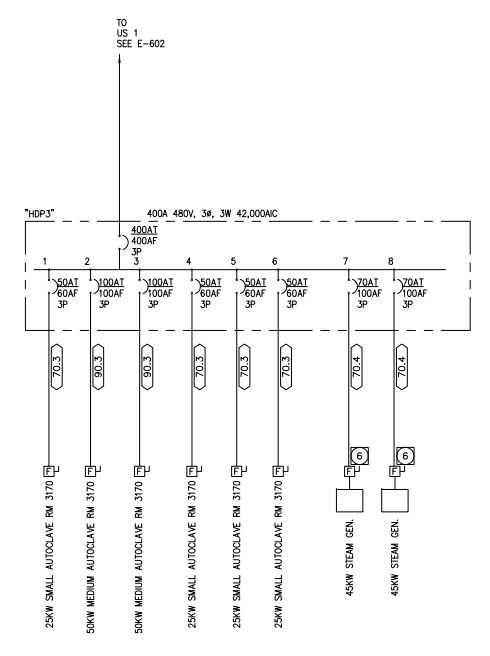
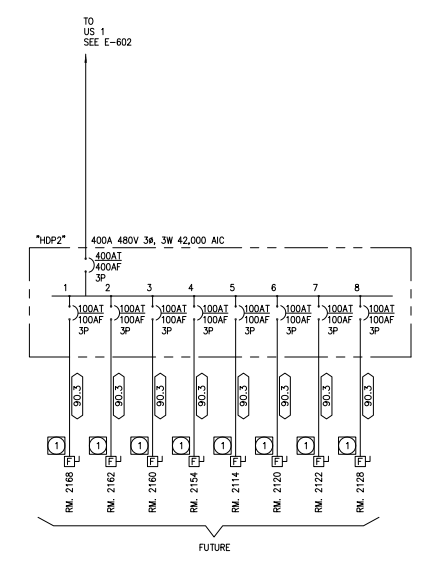
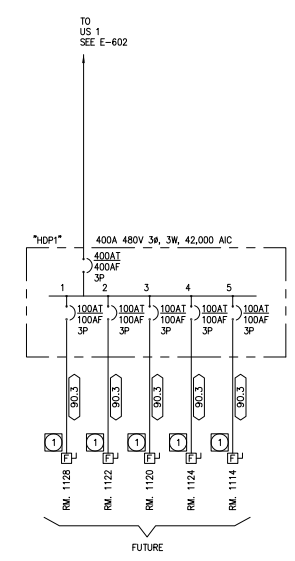
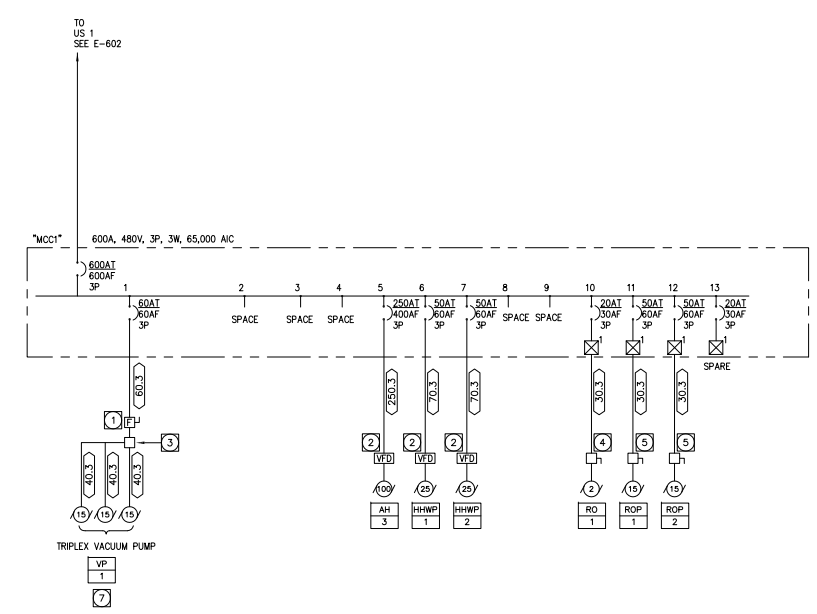
CJ Project Number: 4524.00  
 CAD File Name: E-603  
 Drawn By: MB  
 Reviewed By: GT  
 Scale: NO SCALE  
 Original drawing sheet is 30" x 42"  
 Scale Accordingly 1/2 Reduced

100% CONSTRUCTION DOCUMENTS

SINGLE-LINE DIAG.  
 NORMAL POWER  
 (PART 2 OF 2)

DRAWING NUMBER  
**E-603**

- KEY NOTES:
- 1 480V, 3ø, FUSED DISCONNECT, 100AS/100AF.
  - 2 VFD WITH DISCONNECT BY DIVISION 15.
  - 3 CONTROL PANEL BY DIVISION 15.
  - 4 480V, 3ø, FUSED DISCONNECT, 30AS/20AF.
  - 5 480V, 3ø, FUSED DISCONNECT, 30AS/30AF.
  - 6 480V, 3ø, FUSED DISCONNECT, 100AS/60AF.
  - 7 DIV. 15 TO PROGRAM PUMPS TO RUN AT A MAXIMUM OF 2 PUMPS AT A TIME.



1 SINGLE-LINE DIAGRAM - NORMAL POWER (PART 2 OF 2)  
 SCALE: NONE

REFER TO FEEDER AND TRANSFORMER SCHEDULES  
 ON SHEET E-605



Prepared for  
**NATURAL SCIENCES, UNIT 2**  
 University of California, Irvine  
 Design & Construction Services  
 5201 California Avenue, Suite 250  
 Irvine, CA 92617 UCI Project Number: 991010

ARCHITECTS:  
**GARRETT JOHNSON**

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IMA Design Landscape Architects  
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 Irvine, CA 92612  
 T 949/250-0023 F 949/250-0043

BFL Owen Structural Engineers  
 5 Goodyear Street  
 Irvine, CA 92618  
 T 949.860-4800 F 949.860-4814

GEM Engineering Mechanical/Pumbing Engineers  
 17065 Camino San Bernardo, Suite#200  
 San Diego, CA 92127  
 T 858-753-1000 F 858-753-1001

Konsortium1 Electrical Engineers  
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 Irvine, CA 92614  
 T 949/221-0432 F 949/221-0430

Anderson & Howard Electrical Contractor  
 1791 Reynolds Avenue  
 Irvine, CA 92614-5711  
 T 949/250-4555 F 949/250-1918

A. O. Reed Mechanical Contractor  
 4777 Rufner Street  
 San Diego, Ca. 92111  
 T 858/565-4131 F 858/292-6958

Dow Diversified Inc. Laboratory Contractor  
 1679 Plocentia  
 Costa Mesa, Ca. 92627  
 T 949/6500-9000 F 949/650-9001

Seal



Issue No.	Description	Issue Date
PACKAGE_A		November 25, 2002
PACKAGE_C		February 26, 2003
PACKAGE_D COORDINATION		April 10, 2003
PACKAGE_D FINAL		June 3, 2003
PACKAGE_D FOR APPROVAL		September 15, 2003
PACKAGE_D API		November 24, 2003
AS-BUILT		January 31, 2008

DESIGN PACKAGE D FINAL Nov 24, 2003  
 APPROVED FOR INSPECTION

Clifford W. Seaman, Jr., Senior Architect  
 UCI Design & Construction Services

CJ Project Number: 4524.00

CAD File Name: E-604

Drawn By: JB

Reviewed By: PM

Scale: NO SCALE

Original drawing sheet is 30" x 42"  
 Scale Accordingly 1/2 Reduced

100% CONSTRUCTION DOCUMENTS

ELECTRICAL  
 SINGLE-LINE  
 EMERGENCY

DRAWING NUMBER

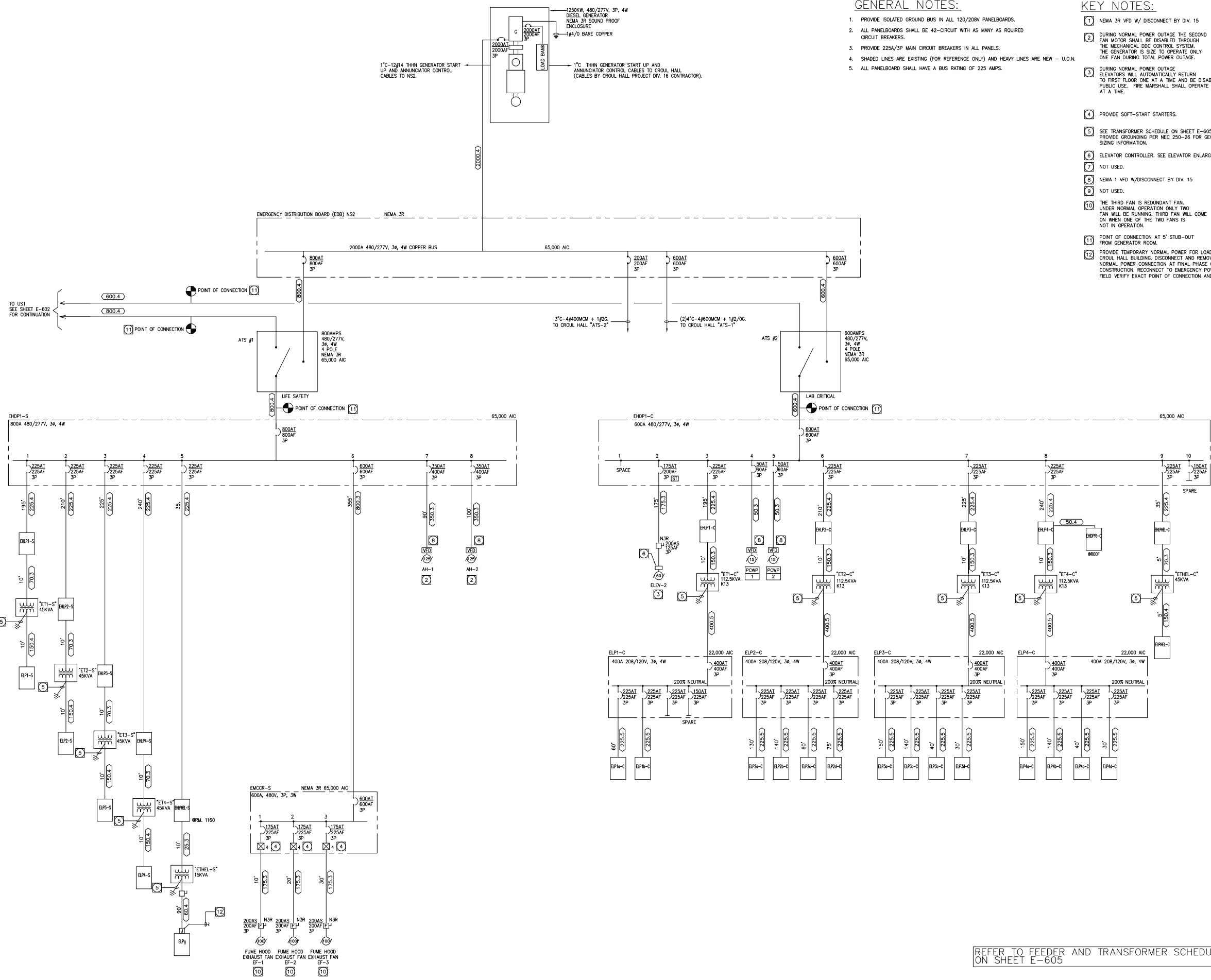
E-604

**GENERAL NOTES:**

1. PROVIDE ISOLATED GROUND BUS IN ALL 120/208V PANELBOARDS.
2. ALL PANELBOARDS SHALL BE 42-CIRCUIT WITH AS MANY AS REQUIRED CIRCUIT BREAKERS.
3. PROVIDE 225A/3P MAIN CIRCUIT BREAKERS IN ALL PANELS.
4. SHADED LINES ARE EXISTING (FOR REFERENCE ONLY) AND HEAVY LINES ARE NEW - U.O.N.
5. ALL PANELBOARD SHALL HAVE A BUS RATING OF 225 AMPS.

**KEY NOTES:**

- 1 NEMA 3R VFD W/ DISCONNECT BY DIV. 15
- 2 DURING NORMAL POWER OUTAGE THE SECOND FAN MOTOR SHALL BE DISABLED THROUGH THE MECHANICAL DDC CONTROL SYSTEM. THE GENERATOR IS SIZE TO OPERATE ONLY ONE FAN DURING TOTAL POWER OUTAGE.
- 3 DURING NORMAL POWER OUTAGE ELEVATORS WILL AUTOMATICALLY RETURN TO FIRST FLOOR ONE AT A TIME AND BE DISABLED FROM PUBLIC USE. FIRE MARSHALL SHALL OPERATE ONE ELEVATOR AT A TIME.
- 4 PROVIDE SOFT-START STARTERS.
- 5 SEE TRANSFORMER SCHEDULE ON SHEET E-605 PROVIDE GROUNDING PER NEG 250-26 FOR GEC SIZING INFORMATION.
- 6 ELEVATOR CONTROLLER. SEE ELEVATOR ENLARGED ROOM.
- 7 NOT USED.
- 8 NEMA 1 VFD W/DISCONNECT BY DIV. 15
- 9 NOT USED.
- 10 THE THIRD FAN IS REDUNDANT FAN. UNDER NORMAL OPERATION ONLY TWO FAN WILL BE RUNNING. THIRD FAN WILL COME ON WHEN ONE OF THE TWO FANS IS NOT IN OPERATION.
- 11 POINT OF CONNECTION AT 5' STUB-OUT FROM GENERATOR ROOM.
- 12 PROVIDE TEMPORARY NORMAL POWER FOR LOAD CENTER CROUL HALL BUILDING. DISCONNECT AND REMOVE NORMAL POWER CONNECTION AT FINAL PHASE OF CONSTRUCTION. RECONNECT TO EMERGENCY POWER AS SHOWN. FIELD VERIFY EXACT POINT OF CONNECTION AND REQUIREMENTS.



1 ELECTRICAL SINGLE-LINE - EMERGENCY  
 SCALE: NONE

REFER TO FEEDER AND TRANSFORMER SCHEDULES  
 ON SHEET E-605