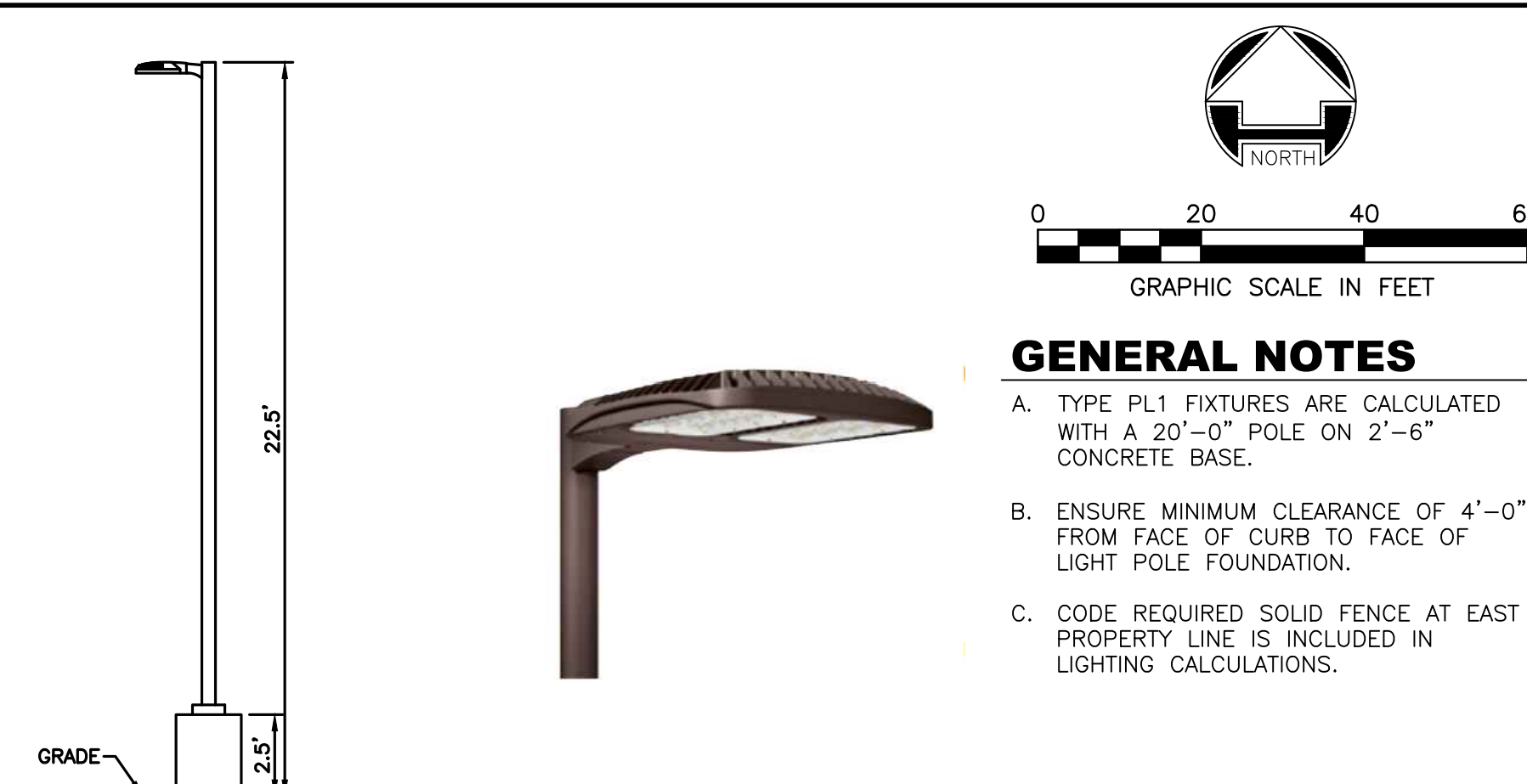
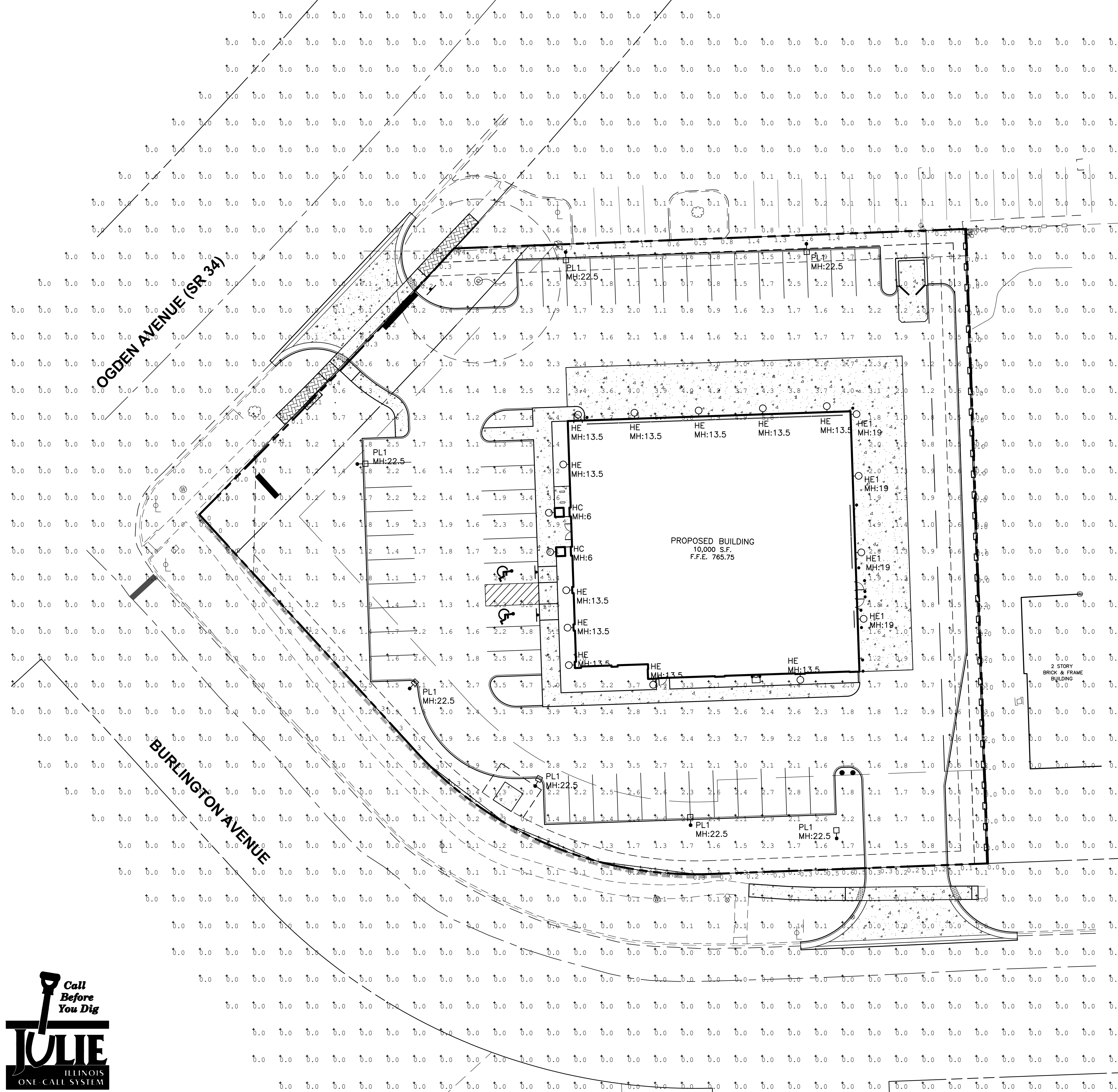
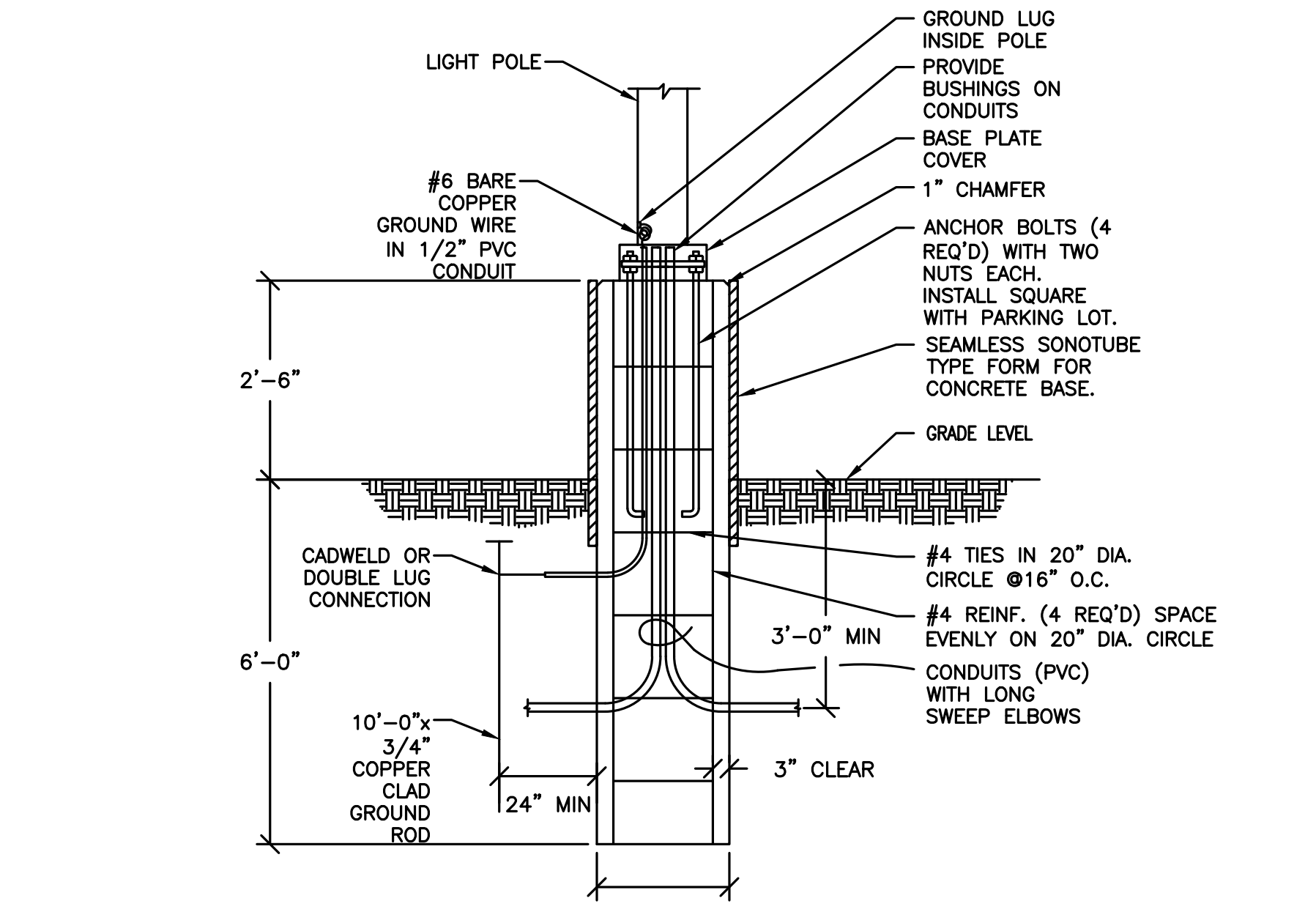


Layout Tab Name: C700, Images: CREE OSQ MEDIUM.PNG, Xrefs: 80835-x.dwg, 80835-TBLK.dwg, 80835-ITC.dwg Plotted By: Daughton, Phyllis Plotted: July 15, 2020, 1:45:44 PM
 Last Saved By: Daughton, 7/14/2020 4:57:55 PM
 G:\DE\clients\Enright_Architects\80835 - Belle Tire - Naperville\4.0 Disciplines\Civil\Cadd\Cad\80835-ITC.dwg



2 POLE LIGHT FIXTURE
SCALE: NTS



1 LIGHTING POLE BASE DETAIL
SCALE: NTS

LIGHTING FIXTURE SCHEDULE						
PLAN TYPE	MANUFACTURER	MOUNTING	LAMPS		VOLTAGE	DESCRIPTION/REMARKS
			NO.	WATTS		
HC	LUMINAIRE #SPC846-90F-50W-5000K-120/277-OP-BRZ-WET	WALL MOUNT	1	50	LED 5,647	DECORATIVE WALL SCONCE, LED, RATED FOR WET LOCATIONS. CALCULATION LLF: 0.8
HE	CREE #XSPW-B-WM-3ME-4L-57K-UL-BZ	WALL MOUNT	1	42	LED 4,270	LED ARCHITECTURAL WALL PACK WITH CUTOFF TYPE III MEDIUM OPTICS. FIXTURE FINISH TO BE BRONZE. CALCULATION LLF: 0.8
HE1	CREE #XSPW-B-WM-3ME-2L-57K-UL-BZ	WALL MOUNT	1	19	LED 2,490	LED ARCHITECTURAL WALL PACK WITH CUTOFF TYPE III MEDIUM OPTICS. FIXTURE FINISH TO BE BRONZE. CALCULATION LLF: 0.8
PL1	KIM #1A-AR4P35-80LSK120-DB-SF-VSF	POLE MOUNT	1	95	LED 10,692	LED ARCHITECTURAL AREA LUMINAIRE WITH CUTOFF TYPE IV OPTICS. POLE AND FIXTURE FINISHES TO BE BRONZE. CALCULATION LLF: 0.8

Calculation Summary						
Label	CalcType	Units	Avg	Max	Min	Avg/Min
Overall	Illuminance	Fc	0.47	8.1	0.0	N.A.
East Property Line @ Grade	Illuminance	Fc	0.00	0.0	0.0	N.A.
North Property Line @ Grade	Illuminance	Fc	1.01	1.7	0.1	10.10
South Property Line @ Grade	Illuminance	Fc	0.23	0.5	0.0	N.A.
West Property Line @ Grade	Illuminance	Fc	0.17	0.5	0.0	N.A.
General Parking and Pedestrian	Illuminance	Fc	2.42	6.3	0.7	3.46
Vehicle Use Area	Illuminance	Fc	1.19	3.1	0.4	2.98

CITY OF NAPERVILLE, IL LIGHTING REQUIREMENTS

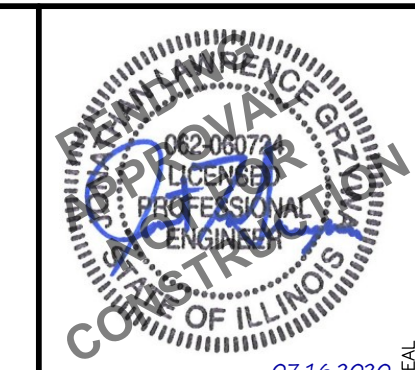
3.25 - POLES SUPPORTING LIGHTS SHALL BE NO TALLER THAN TWENTY-THREE (23) FEET IN A RESIDENTIAL DISTRICT, TWENTY-FIVE (25) FEET IN A COMMERCIAL DISTRICT, A COMMERCIAL PART OF A RESIDENTIAL PLANNED UNIT DEVELOPMENT, OR IN OFFICE/BUSINESS PARK DISTRICTS, AND THIRTY-TWO (32) FEET IN ANY INDUSTRIAL DISTRICT.

3.3.2 - GENERAL PARKING AND PEDESTRIAN AREA, MEDIUM ACTIVITY LEVEL REQUIRES AN AVERAGE OF 2.4FC, MINIMUM OF 0.6FC AND A 4:1 UNIFORMITY RATIO. VEHICLE USE AREA REQUIRES AN AVERAGE OF 1.0FC, MINIMUM OF 0.33FC AND A 3:1 UNIFORMITY RATIO.

3.3.3 - EXTERIOR LIGHTING SHALL BE DESIGNED AT OR BELOW THE FOLLOWING AVERAGE MAINTAINED FOOT-CANDELES AT THE PROPERTY LINE: NONRESIDENTIAL TO NONRESIDENTIAL (NORTH PROPERTY LINE): 2.0FC; NONRESIDENTIAL TO RESIDENTIAL (EAST PROPERTY LINE): 0.10FC; INTENSITY AT ADJOINING RIGHT-OF-WAY (WEST AND SOUTH PROPERTY LINES): 0.50FC

3.3.4 - THE LIGHT LOSS FACTOR (LLF) SHALL BE A MINIMUM OF 0.75 TO A MAXIMUM OF 0.8 FOR ALL USES.

PLAN PREPARER CERTIFICATION STATEMENT
 THE EXTERIOR LIGHTING DEPICTED ON THIS PLAN COMPLIES WITH THE REQUIREMENTS OF TITLE 6, CHAPTER 14: ZONING REGULATIONS - PERFORMANCE STANDARDS OF THE MUNICIPAL CODE OF NAPERVILLE, ILLINOIS.



REVISION	No.	DATE

PROJECT No: 80835
 DATE: 07/16/20
 DES. BY: ATD
 DR. BY: ATD
 CKD. BY: ARS

1815 South Meyers Road
 Suite 950
 Oakbrook Terrace, IL 60181
 630.424.9080
 FAX: 630.495.3731

BELLE TIRE NAPERVILLE

1126 EAST OGDEN AVENUE
 NAPERVILLE, ILLINOIS 60563

LIGHTING PLAN

SHEET NO. **C700**

SECTION 16000 - ELECTRICAL SPECIFICATIONS

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS:

- A. ALL WORK SHALL BE IN ACCORDANCE WITH NATIONAL ELECTRICAL CODE, LATEST EDITION, AND ALL LOCAL AND STATE AUTHORITIES HAVING JURISDICTION THEREOF.
- B. ALL EQUIPMENT SHALL BE SPECIFICATION GRADE AND SHALL HAVE UL LABEL FOR INTENDED USE.
- C. ELECTRICAL SYSTEMS SHALL BE COMPLETE IN EVERY DETAIL, INCLUDING ALL INCIDENTAL ITEMS FOR A PROPER AND FUNCTIONING INSTALLATION SUBJECT TO FINAL APPROVAL OF ARCHITECT/ENGINEER.
- D. ALL REQUIRED PERMIT AND INSPECTIONS SHALL BE OBTAINED BY CONTRACTOR AND SUCH COSTS SHALL BE INCLUDED IN BID PRICE FOR THIS WORK.
- E. PROVIDE UL LISTED SYSTEM FOR FIRE STOPPING PENETRATIONS THROUGH FIRE RATED ASSEMBLIES, PROVIDE SYSTEM WITH EQUAL OR GREATER RATING THAN ASSEMBLY. REFER TO ARCHITECTURAL DOCUMENTS FOR RATINGS FOR RATINGS AND LOCATIONS OF ASSEMBLIES.
- F. EXAMINATION OF SITE IS MANDATORY. CONTRACTOR IS HEREBY HELD TO HAVE EXAMINED THE SITE AND HAVE INCLUDED IN HIS BID PRICE ALL COSTS DUE TO SITE AND FIELD CONDITIONS.
- G. COMPLETE IDENTIFICATION OF PROJECT ELECTRICAL COMPONENTS IS REQUIRED. IDENTIFY ALL PANELS, DISCONNECTS, CONTROL DEVICES, ETC., WITH THE NOMENCLATURE INDICATED ON THE DOCUMENTS AND WITH POWER SOURCE AND ELECTRICAL RATINGS USING PLASTIC LAMINATE NAMEPLATE. INSTALL TYPEWRITTEN DIRECTORIES OF ALL CIRCUITS ON INSIDE OF PANELS. IDENTIFY WIRING DEVICE COVERPLATES WITH PANELBOARD AND BRANCH CIRCUIT NUMBER SERVING DEVICE. E.G. "A-15". PROVIDE 1/4" MACHINE-WRITTEN BLACK LETTERING ON CLEAR PLASTIC ADHESIVE TAPE. LOCATE ON BOTTOM FRONT OF COVERPLATE. CENTERED OVER WIRING DEVICES. SUBMIT SAMPLE OF LABELED TAPE WITH WIRING DEVICE COVERPLATE SUBMITTAL. SAMPLE MAY BE ADHERED TO PAPERWORK IN SUBMITTAL, RATHER THAN TO A COVERPLATE.
- H. PROVIDE TEMPORARY POWER AND LIGHTING DURING CONSTRUCTION. REMOVE TEMPORARY WIRING UPON COMPLETION OF THE PROJECT. TEMPORARY SERVICES SHALL BE AS REQUIRED, BY N.E.C. AND OSHA.
- I. GROUND CONTINUITY SHALL BE MAINTAINED THROUGHOUT THE ELECTRICAL SYSTEM. INSTALL EQUIPMENT GROUNDING CONDUCTOR WITH EVERY CIRCUIT.
- J. COORDINATE SIZE AND LOCATION OF ANY REQUIRED ACCESS PANELS IN WALLS OR FINISHED CEILINGS WITH ARCHITECT PRIOR TO INSTALLATION.

1.02 WARRANTY:

- A. UNLESS A LONGER PERIOD IS SPECIFIED IN INDIVIDUAL PARAGRAPHS, PROVIDE A MINIMUM OF A ONE YEAR WARRANTY ON ALL ELECTRICAL WORK BEGINNING THE DATE OF FINAL ACCEPTANCE OF THE PROJECT BY THE OWNER.

1.03 SUBMITTALS

- A. SUBMIT SHOP DRAWINGS FOR ALL MAJOR COMPONENTS OR SYSTEMS OF THE PROJECT. SUBMIT ADDITIONAL SHOP DRAWINGS IF REQUESTED BY ENGINEER.
- B. NO APPARATUS OR EQUIPMENT SHALL BE SHIPPED FROM STOCK OR FABRICATED UNTIL SHOP DRAWINGS FOR SAME HAVE BEEN STAMPED "REVIEWED" OR "REVIEWED AS NOTED". SUBMIT DATA REQUIRED FOR TRANSFORMERS SUCH AS EFFICIENCY, REGULATION, CORE LOSS AND SOUND LEVELS. (SEE APPLICABLE SECTIONS).
- C. SUBMIT SYSTEM COMPONENTS, PRODUCT DATA AND SHOP DRAWINGS COMPLETE FOR EACH SYSTEM UNDER ONE SUBMITTAL. DO NOT BREAK OUT EQUIPMENT FOR ONE SYSTEM BETWEEN MULTIPLE SUBMITTALS.
- D. ALL SHOP DRAWINGS MUST BE CLEARLY MARKED TO SHOW EQUIPMENT SUBMITTED AND ANY DEVIATIONS FROM SPECIFICATIONS SHALL BE NOTED THEREON. DO NOT INCLUDE ONLY MODEL NUMBERS TO INDICATE SUBMITTED EQUIPMENT. STRIKE OUT ANY INFORMATION ON PRODUCT DATA THAT IS NOT PROJECT SPECIFIC, AND EDIT RELEVANT INFORMATION TO SHOW ACTUAL EQUIPMENT SUBMITTED. ELECTRICAL CONTRACTOR MUST SIGN AND APPROVE ALL SHOP DRAWINGS PRIOR TO SUBMITTAL.
- E. UNIQUELY NUMBER EACH PAGE IN SUBMITTAL.
- F. IF DIFFERENT SYSTEMS ARE INCLUDED IN ONE SUBMITTAL, CLEARLY SEPARATE INFORMATION AND PROVIDE DIFFERENT SUB-NUMBERING OF SYSTEMS. SHOP DRAWINGS THAT ARE INCOMPLETE, UNSIGNED AND NOT PLAINLY MARKED WILL NOT BE REVIEWED.

1.07 INDIANA ENERGY CONSERVATION CODE:

- A. THIS IS A PERFORMANCE BASED DESIGN-BUILD SPECIFICATION.
- B. THE INTENT OF THIS SPECIFICATION ITEM IS FOR FULL COMPLIANCE WITH THE REQUIREMENTS OF THE MICHIGAN UNIFORM ENERGY CODE AND RELATED AMENDMENTS AS THEY APPLY TO THE ASHRAE 90.1-2007 STANDARD. AUTOMATIC CONTROL APPLIES TO NEW AND TO EXISTING TO REMAIN FIXTURES.
- C. DESIGN AND PROVIDE A COMPLETE LIGHTING CONTROL SYSTEM PER MANUFACTURER'S RECOMMENDATION. INDICATE ALL COMPONENTS ON AS-BUILT DOCUMENTATION. COORDINATE WITH ARCHITECTURAL TRADES TO PROVIDE CEILING ACCESS PANELS WHERE REQUIRED.
- D. PROVIDE OCCUPANCY SENSOR(S) IN EVERY ROOM OR SPACE (EXCEPT WHERE LIGHTING RELAY PANEL IS INDICATED) TO AUTOMATICALLY SHUTOFF ALL NON-EMERGENCY LIGHTING WITHIN ITS SPACE WITH ADJUSTABLE TIME DELAY UP TO 30 MINUTES, WHERE INDICATED, CONTROL LIGHTING THROUGH LIGHTING RELAY PANEL (LRP). PROVIDE LIGHTING CONTROLLED VIA RELAYS AS REQUIRED FOR QUANTITY OF CIRCUITS CONTROLLED.
- E. OCCUPANCY SENSORS SHALL BE OF UL TRASONIC, INFRARED OR MULTI-TECHNOLOGY TYPE AS RECOMMENDED BY MANUFACTURER FOR EACH SPACE/APPLICATION CEILING MOUNTED.
- F. OCCUPANCY SENSORS, POWER PACKS AND ACCESSORIES ARE NOT SPECIFICALLY INDICATED. CONTRACTOR TO DESIGN GROUPING OF BRANCH CIRCUITS REQUIRED AND PROVIDE ACCORDINGLY.
- G. PROVIDE LOCAL WALL SWITCHES ON-OFF TYPE IN ADDITION TO OCCUPANCY AND TIME CLOCK/CONTACTOR CONTROL.
- H. PROVIDE UNIVERSAL VOLTAGE POWER SWITCHES (RELAY) PACKS WITH LOAD CONTACT RATED 20A ((SYMBOL)) 120/277V FOR EACH SENSOR AS REQUIRED TO ACHIEVE THE LIGHTING CONTROL INTENDED. COORDINATE WITH SWITCH LEGS SHOWN ON PLANS. PROVIDE AUXILIARY CONTACT FOR CONTROL OF HVAC EQUIPMENT ON EACH RELAY PACK. MOUNT COMPONENTS CONCEALED ABOVE FINISHED CEILINGS WHEN PRESENT. PROVIDE ACCESS PANELS FOR NON-ACCESSIBLE CEILINGS. WHEN NO FINISHED CEILINGS ARE PRESENT, MOUNT COMPONENTS CONCEALED IN SHEET METAL ENCLOSURE WITH HINGED COVER. SIZE ENCLOSURE TO ACCOMMODATE COMPONENTS AND WIRING, AND COORDINATE LOCATION WITH ARCHITECT.
- I. PROVIDE FIXTURES WITH TANDEM WIRED BALLASTS AS REQUIRED TO COMPLY WITH ASHRAE 90.1.
- J. REFER TO THE LIGHTING DRAWINGS FOR COORDINATION WITH FIXTURES, CIRCUITING, AND SWITCHING, AND OBTAIN ALL APPROVALS FOR A COMPLETE SYSTEM.

2.18 LIGHTING CONTROL RELAY PANEL:

- A. PROVIDE A STANDALONE LIGHTING CONTROL RELAY PANEL AND LCD DISPLAY IN A SURFACE MOUNTED ENCLOSURE, SUITABLE FOR OPERATION ON 120VAC CONTROL POWER. PROVIDE LOCKABLE FRONT COVER. TURN OVER MINIMUM TWO KEYS TO OWNER.
- B. PANEL SHALL CONTAIN INTEGRAL ASTRONOMICAL TIME CLOCK WITH AUTOMATIC DAYLIGHT SAVINGS, LEAP YEAR ADJUSTMENTS, AND CAPABILITY TO PROGRAM SITE LOCATION INFORMATION INTO TIME CLOCK FOR USE WITH SUNRISE/SUNSET SETTINGS.
- C. REFER TO MICHIGAN UNIFORM ENERGY CODE, THIS SECTION, AND TO PLAN DRAWINGS FOR LOADS CONTROLLED BY RELAY PANEL.
- D. COORDINATE QUANTITY OF RELAYS AND PANELS WITH CIRCUITS BEING CONTROLLED. PANELS MAY BE OF THE SINGLE FEED TYPE WITH BRANCH CIRCUITS AS REQUIRED OR OF THE MULTIPLE FEED TYPE: ONE FOR EACH CIRCUIT NOTED ON THE DRAWINGS AT THE OPTION OF THE CONTRACTOR.
- E. COORDINATE VOLTAGE OF RELAYS WITH CIRCUITS BEING CONTROLLED. PROVIDE 1-POLE RELAYS FOR 120V AND 277V APPLICATIONS, AND 2-POLE RELAYS FOR 208V APPLICATIONS. PROVIDE VOLTAGE BARRIER FOR SEPARATION OF RELAYS CONTROLLING DIFFERENT VOLTAGES.
- F. PANEL IS TO INCLUDE CIRCUITRY FOR SWITCHING FULL LOAD AT THE ZERO-CROSSING OF THE AC CURRENT WAVEFORM. RELAYS ARE TO BE NORMALLY OPEN.
- G. PROVIDE LOW VOLTAGE SWITCHES, OCCUPANCY SENSORS AND PHOTOELECTRIC CONTROLS WHICH ARE COMPATIBLE WITH CONTACTOR PANEL. IDENTIFY LOW VOLTAGE SWITCH COVERPLATES AS SPECIFIED IN SECTION 16010, "IDENTIFICATION" EXCEPT ADD A SECOND LINE OF IDENTIFICATION TO INDICATE CONTROL THROUGH RELAY PANEL. (E.G. "LP-1A-3" AND "VIA RELAY PANEL")
- H. PROVIDE LOW VOLTAGE AUTOMATIC CONTROL OVERRIDE MASTER SWITCHES WHERE INDICATED WITH OPERATION AS SPECIFIED. COORDINATE COMPATIBILITY OF SWITCH WITH PANEL AND WITH OPERATION AS SPECIFIED. LABEL SWITCH COVERPLATE AS SPECIFIED FOR WIRING DEVICES. EXCEPT INDICATE RELAY PANEL CONTROLLED AND GEOGRAPHIC LOCATION OF CIRCUITS CONTROLLED. E.G. "RELAY PANEL R-11, MASTER SWITCH" OR APPLICABLE BUILDING WING. PROGRAM RELAY PANEL TO OPERATE WITH LOW VOLTAGE AUTOMATIC CONTROL OVERRIDE SWITCH AS FOLLOWS.
 - 1. OVERRIDE ON: PRESSING THE MASTER SWITCH WITH CIRCUITS OFF WILL TURN ON ALL RELAY-CONTROLLED BRANCH CIRCUITS IN THE PANEL FOR A MAXIMUM OF FOUR HOURS, AND THEN AUTOMATICALLY SHUT CIRCUITS OFF AFTER TIME EXPIRES. CIRCUITS WILL REMAIN OFF UNTIL THE SWITCH IS PRESSED AGAIN, OR UNTIL THE NEXT PROGRAMMED AUTOMATIC ON-TIME OCCURS.

THE PROGRAMMED CONTROL OF THE CIRCUITS ABOVE IS TO OPERATE INDEPENDENTLY OF ANY LOCAL SPACE CONTROL.

- I. PROGRAM PANEL TO FLASH LIGHTS PRIOR TO AUTOMATICALLY TURNING THEM OFF.
- J. COORDINATE QUANTITY OF CIRCUITS REQUIRED AND APPLICATION OF LOW VOLTAGE SWITCHES AS SPECIFIED IN MICHIGAN UNIFORM ENERGY CODE, THIS SECTION.
- K. INCLUDE CONTROL PANEL STARTUP/COMMISSIONING AND TRAINING BY MANUFACTURER'S FACTORY-TRAINED PERSONNEL. IN ADDITION TO OTHER STARTUP REQUIREMENTS, MANUFACTURER'S FACTORY REPRESENTATIVE IS TO OBTAIN OWNER'S DESIRED OPERATIONAL SCHEDULE FOR EACH CIRCUIT, PROGRAM PANEL WITH SITE-SPECIFIC INFORMATION, AND CONTROL LIGHTING FIXTURES PER OWNER'S SCHEDULE IN COMPLIANCE WITH MICHIGAN UNIFORM ENERGY CODE.
- L. PROVIDE OWNER WITH A MINIMUM OF 2 HOURS OF TRAINING AT JOBSITE BY MANUFACTURER'S FACTORY REPRESENTATIVE.
- M. MANUFACTURERS
 - 1. LEVITON EZ-MAX PLUS.

PART 2 - PRODUCTS

2.01 ELECTRICAL EQUIPMENT AND DEVICES:

- A. RECEPTACLES SHALL BE SPECIFICATION GRADE, GROUNDING TYPE, 3-POLE, 3-WIRE, AND POLARIZED. RECEPTACLES IN GENERAL SHALL BE 15A, 125V, HUBBELL #HBL3282 OR EQUAL MOUNTED 18" AFF EXCEPT AT COUNTERS WHERE THEY SHALL BE 6" ABOVE COUNTER AND IN TOILET ROOMS AT 48" AFF. RECEPTACLES ON SINGLE CIRCUIT SHALL BE 20 AMPERES, HUBBELL #HBL3362. HIGH AMPERE RATINGS AND VOLTAGES ARE INDICATED ON DRAWINGS.
- B. RECEPTACLES DESIGNATED "GFP" SHALL BE GROUND FAULT RECEPTACLES, SIMILAR TO HUBBELL #GF-53R2. FOR OUTDOOR OR WET LOCATIONS, PROVIDE WEATHERPROOF BOX AND GASKETED COVER PLATE. WIRE "GRP" RECEPTACLES FOR SELF PROTECTION AND NOT DOWNSTREAM PROTECTION OF OTHER WIRING DEVICES.
- C. SWITCHES SHALL BE SINGLE POLE, TWO POLE, OR THREE-WAY, AS INDICATED, TOGGLE TYPE, 20A, 120/277V, QUIET TYPE, HUBBELL #1221/1222/1223 OR EQUAL. PILOT TYPE SWITCHES HUBBELL #1251, BLACK COLOR
- D. WIRING DEVICE COLORS SHALL BE WHITE OR AS SELECTED BY THE OWNER/ARCHITECT.
- E. DEVICE COVER PLATES SHALL BE OF TYPE AND NUMBER OF GANGS FOR DEVICES INSTALLED, SILVER / STAINLESS COLOR.
- F. PROVIDE TELEPHONE DATA OUTLETS AND STUBS AS INDICATED. TELEPHONE DATA OUTLETS SHALL CONSIST OF TWO GANG OUTLET BOX WITH PLASTER RING AND NO COVER PLATE. JACK AND COVER PLATE ARE SUPPLIED BY OTHERS. HEIGHT OF OUTLET FOR DESK PHONE IS 16" AFF AND FOR WALL PHONE 48" AFF. TELEPHONE DATA OUTLETS SHALL CONTAIN OF 1" CONDUIT FROM OUTLET TO AN ACCESSIBLE PORTION OF CEILING SPACE. TERMINATE WITH INSULATING BUSHING.
- G. TIME SWITCHES SHALL BE ELECTRONIC, PROGRAMMABLE, TWO CHANNEL, FULL YEAR OR SEVEN DAY PROGRAMMING, N-CAD BATTERY BACK-UP WITH CHARGER, 365 DAY ASTRO DIAL AND MOMENTARY FEATURE FOR ALL CIRCUITS, WITH AUTOMATIC DAYLIGHT SAVINGS AND LEAP YEAR ADJUSTMENT AND SEASONAL PROGRAMMING, TORX DZS-200A GENERAL PURPOSE.
- H. ELECTRICIAN TO SUPPLY LABELS AT EVERY OUTLET, SWITCH, ELECTRICAL DEVICE, EQUIPMENT, ETC., INDICATING THE PANEL AND CIRCUIT SERVING EACH DEVICE

2.03 CONDUCTORS:

- A. ALL CONDUCTORS SHALL BE SOFT-DRAWN COPPER OF SIZES INDICATED ON THE DRAWINGS. ALL CONDUCTORS SHALL BE INSULATED FOR 600 VOLTS AND WITH 75 DEGREES (CENTIGRADE) CODE GRADE INSULATION.
- B. CONDUCTORS SIZED #10 AND SMALLER SHALL BE SOLID. ALL CONDUCTORS LARGER THAN #10 SHALL BE MADE UP OF STRANDED SINGLE CONDUCTOR CABLE. CONDUCTORS SHALL HAVE THWN OR THHM INSULATION AS APPLICABLE. CONDUCTORS IN UNDERGROUND CONDUIT AND FOR SERVICE ENTRANCE CONDUCTOR SHALL HAVE XHHW OR THWN INSULATION.
- C. #12 AWG SHALL BE THE MINIMUM WIRE SIZE ALLOWED EXCEPT #14 AWG MAY BE USED FOR CONTROL WIRING.
- D. TYPICAL BRANCH CIRCUITS FROM 20A, 1-POLE BRANCH OVERCURRENT DEVICES ARE 1/2"C, 2 #12 AND 1 #12G.
- E. METAL CLAD (MC) TYPE CABLES MAY BE USED AS PERMITTED BY THE NATIONAL ELECTRIC CODE UNLESS OTHERWISE NOTED. WILLILL

2.04 STARTERS, SAFETY SWITCHES, FUSES, AND HEATERS:

- A. MANUAL MOTOR STARTERS SHALL BE 600V TOGGLE TYPE WITH THERMAL OVERLOAD ELEMENT FOR MOTOR PROTECTION STAINLESS STEEL COVER PLATE AND PILOT LIGHT; FLUSH IN ALL AREAS EXCEPT IN UNFINISHED SPACES. CONTRACTOR TO COORDINATE AND PROVIDE QUANTITY OF BRANCH CIRCUIT AND LOAD SERVED. MANUAL MOTOR SWITCHES SHALL BE THE SAME AS MANUAL STARTERS EXCEPT WITHOUT OVERLOADS AND USED AS DISCONNECTING MEANS.
- B. MAGNETIC MOTOR STARTERS SHALL BE 600 VOLT 3-PHASE WITH 3 THERMAL OVERLOAD ELEMENTS, HOA SWITCH AND RESET BUTTON IN COVER AND GREEN RUNNING PILOT LIGHT. NEMA ENCLOSURE AND SIZE AS INDICATED. COMBINATION STARTERS SHALL HAVE BUILT IN FUSED DISCONNECT. PROVIDE START-STOP PUSH BUTTONS FOR USE IN HAND (MANUAL) MODE.
- C. PROVIDE THERMAL ALLOY MELTING TYPE HEATER ELEMENTS FOR ALL MOTORS BASED ON MOTOR NAMEPLATE DATA.
- D. SAFETY AND DISCONNECT SWITCHES SHALL BE 250 OR 600 VOLTS AS REQUIRED, HEAVY DUTY, TWO OR THREE POLE, "QUICK-MAKE", "QUICK-BREAK" SWITCH MECHANISM AND COVER INTERLOCK. SWITCHES SHALL BE FUSED OR UNFUSED AS INDICATED AND SHALL HAVE PAD LOCK PROVISIONS, WITH NEMA TYPE ENCLOSURE FOR LOCATION USED. SWITCHES SHALL BE SQUARE "D" CLASS 3110 OR APPROVED EQUAL.
- E. PROVIDE ALL NECESSARY FUSES AND REPLACE ALL THOSE BLOWN DURING CONSTRUCTION. ALL FUSES SHALL BE TIME LAG, DUAL ELEMENT, BUSSMAN "LOW PEAK YELLOW" OR EQUAL.
- F. OBTAIN ALL APPROVALS FOR A COMPLETE SYSTEM.

2.05 PANEL BOARDS:

- A. LIGHTING PANELS SHALL BE OF VOLTAGE, PHASE, SERVICE AND NUMBER OF WIRES INDICATED ON THE DRAWINGS. BREAKERS SHALL BE THERMAL MAGNETIC, TRIP FREE, SINGLE OR MULTIPLE, BOLTED DESIGN, MOLDED CASE, MINIMUM 10,000 A.I.C. AT 240 VOLTS. DEVICES SHALL BE AS INDICATED ON THE DRAWINGS OR AS SCHEDULED.
- B. LIGHTING PANELS RATED FOR 120/208V, 3-PHASE, 4-WIRE SERVICE SHALL BE SQUARE D TYPE "NOOD" OR EQUAL.
- C. CONTRACTOR, MANUFACTURER MAY RE-ARRANGE CIRCUIT ORDER IN PANELS, HOWEVER CIRCUIT NUMBERS FROM PANELBOARD SCHEDULES IN CONTRACT DOCUMENTS MUST BE INDICATED ON ANY SUBMITTED PANELBOARD ELEVATIONS, DRAWINGS, TABLES, AND SCHEDULES.
- C. MAIN DISTRIBUTION PANEL SHALL BE 120/208 VOLT, 3 PHASE, 4 WIRE SWITHG AND FUSE OR CIRCUIT BREAKER TYP. CLASS 1 CONSTRUCTION, SERVICE ENTRANCE LABELED, FULL HEIGHT BUSSING (WITH PROVISIONS FOR UTILITY COMPANY CTS) SQUARE-D I-LINE, CUTLER HAMMER, SIEMENS OR GENERAL ELECTRIC. PROVIDE WHITE PHENOLIC LABEL WITH BLACK LETTERING FOR EACH SWITCH WITH 3/8" LETTERS INDICATING PANEL NAME AND FOR EACH SWITCH INDICATING ITME SERVED.

2.06 LIGHTING SPECIFICATIONS

- A. FLUORESCENT BALLASTS SHALL BE UNIVERSAL VOLTAGE 120V THROUGH 277V, PROGRAMMED RAPID START, MAXIMUM 10% THD IN ALL AREAS WITH OCCUPANCY SENSORS. OSRAM SYLVANIA QTP SERIES, OR APPROVED EQUAL BY ADVANCE, GE, LUTRON OR MCGRAW-HILL.
- B. FLUORESCENT LAMPS SHALL BE MINIMUM 80 COLOR RENDERING INDEX, 4000K COLOR TEMPERATURE, LOW MERCURY TCLP-COMPLIANT TYPE.
- C. EMERGENCY BATTERY BALLASTS INTEGRAL TO FIXTURES SHALL BE 5 YEAR WARRANTY. LIGHT AND TEST SWITCH INTEGRAL TO FIXTURE. BODINE B50 OR APPROVED EQUAL. PROVIDE EXIT AND EMERGENCY LIGHTING UNITS WITH MAINTENANCE-FREE N-CAD OR LEAD CALCIUM BATTERY, AND WITH UNIVERSAL VOLTAGE INPUT - 120V THROUGH 277V. REQUIREMENTS SPECIFIED HERE TAKE PRECEDENCE OVER SCHEDULED INFORMATION.
- D. PROVIDE FACTORY INSTALLED FUSING IN EACH FIXTURE.
- E. PROVIDE PHOTO-METRIC CALCULATIONS FOR ANY FIXTURE SUBSTITUTIONS PROPOSED, INCLUDING FIXTURES SUBMITTED AS EQUAL, IF REQUESTED BY THE A/E.
- F. SUBMIT LAMP AND BALLAST PRODUCT DATA WITH EACH FIXTURE TYPE.
- G. INCLUDE IN BASE BID AS A SEPARATE ITEM INSTALLATION OF ADDITIONAL EMERGENCY AND EXIT LIGHTS IF REQUIRED BY FIRE MARSHALL AS INDICATED BELOW.
 - (5) EXIT LIGHTS.
 - (5) EMERGENCY LIGHTING UNITS. CREDIT SHOULD BE ISSUED TO OWNER IF NOT USED.

2.07 FIRE ALARM SPECIFICATIONS:

- A. PROVIDE COMPLETE FIRE ALARM COVERAGE FOR THE NEW ADDITION AS WELL AS RENOVATED AREA AS AN EXTENSION OF THE BUILDING FIRE ALARM SYSTEM. PROVIDE ALL MONITORING, POWER SUPPLIES, INITIATING DEVICES, INDICATING APPLIANCES, CONTROL, MODULES AND WIRING AS REQUIRED BY AUTHORITIES HAVING JURISDICTION. DEVICES ARE NOT INDICATED ON THESE PLANS. SYSTEM SHALL BE LAYED OUT ON A PERFORMANCE BASIS. CONTRACTOR SHALL SUBMIT DRAWINGS AS REQUIRED BY A/E AND OBTAIN ALL APPROVALS FOR A COMPLETE SYSTEM.

LIGHTING PANEL LP-A SCHEDULE

120/208V-3P-4W + GROUND
MAIN: 200 A MILO

LOAD DESCRIPTION	TRIP	C.B.	PANEL PHASES			LOAD DESCRIPTION	TRIP	C.B.	PANEL PHASES		
			A	B	C				A	B	C
SERVICE BAY LIGHTING VIA LRP-1 R1	20A	1	1409			RECEPTACLES	20A	2	400		
SERVICE BAY LIGHTING VIA LRP-1 R2	20A	3	1033			PARKING LOT AND FLAGPOLE LIGHTING VIA LRP-1 R7	20A	4	467		
SPARE	20A	5					6			467	
MEZZ LIGHTING VIA LRP-1 R4	20A	7	1032			GROUND SIGN VIA LRP R8	20A	8	1850		
MEZZ LIGHTING VIA LRP-1 R5	20A	9	1437			BUILDING LIGHTING VIA LRP-1 R10	20A	10			
MEZZ LIGHTING VIA LRP-1 R6	20A	11		1712		RECEPTACLES	20A	12		600	
SPARE	20A	13				RECEPTACLES	20A	14	1200		
SALES LIGHTING VIA LRP-1 R3	20A	15	1004			RECEPTACLES	20A	16		1200	
SPARE	20A	17				RECEPTACLES	20A	18		1200	
RECEPTACLES	20A	19	1000			RECEPTACLES	20A	20	1000		
RECEPTACLES	20A	21	400			RECEPTACLES	20A	22		1000	
VENDING MACHINE	20A	23		1000		COFFEE MAKER	20A	24		1200	
RECEPTACLES	20A	25	600			EVC	20A	26	500		
ROOF GFPS	20A	27	688			RECEPTACLES	20A	28		800	
SIGN	20A	29		600		RECEPTACLES	20A	30		1000	
SIGN	20A	31	1000			RECEPTACLES	20A	32	1000		
220V, 30A OUTLET	30A	33		1200		RECEPTACLES	20A	34		800	
220V, 30A OUTLET	30A	35		2000		SPARE	20A	36			
220V, 30A OUTLET	30A	37	2000			RECEPTACLES	20A	37	500		2000
220V, 30A OUTLET	30A	39		2000		WATER HEATER	40A			2000	
220V, 30A OUTLET	30A	41		2000		RECEPTACLES	20A	42		2000	
TOTAL			7041	5832		TOTAL			7100	6883	6467
CONNECTED KW	42					CONNECTED KW	57				
CONNECTED AMPS	117					CONNECTED AMPS	158				
DEMAND KW	38					DEMAND KW	36				
DEMAND AMPS	106					DEMAND AMPS	99				

LIGHTING PANEL LP-B SCHEDULE

120/208V-3P-4W + GROUND
MAIN: 200 A MILO

LOAD DESCRIPTION	TRIP	C.B.	PANEL PHASES			LOAD DESCRIPTION	TRIP	C.B.	PANEL PHASES		
			A	B	C				A	B	C
LIFTS	30A	1	2620			REFRIGERATION	20A	2	1000		
SUMP PUMP	20A**	5		2620		MICROWAVE	20A	4		1200	
RECEPTACLES	20A	7	1200		1152	RECEPTACLES	20A	6		800	
LIFTS	30A	9		2620		BENCH GRINDER, PARTS CLEANER	20A	8	1000		
LIFTS	30A	11		2620	2620	BRAKE LATHE	20A	10		2040	
LIFTS	30A	13	2620			EWC	20A	12		500	
CORD REELS	20A	17		2620		WHEEL BALANCER	30A	14	2080		
RECEPTACLES	20A	19	1000			WHEEL BALANCER	30A	16	2080		
EF-1	20A	21		540		RECEPTACLES	20A	22		1200	
CONVEYOR	20A	23		1920		IFH-1, 1FH-2, 1FH-3	20A	24		936	
EF-2	20A	25	500			RECEPTACLES	20A	26	1200		
FIRE PROTECTION ALARM / CO DETECTOR	20A*	27		300		RECEPTACLES	20A	28		1000	
RECEPTACLES	20A	29		1000		RECEPTACLES	20A	30		1200	
AIR MACHINE	20A	31	720			RECEPTACLES	20A	32	1000		
RECEPTACLES	20A	33		1000		TIRE MACHINE	30A	34	2080		
RECEPTACLES	20A	35		800		RECEPTACLES	20A	36		2080	
FREE AIR RECEPTACLE	20A	37	500			RECEPTACLES	20A	38	400		1000
SPARE	20A	39				RECEPTACLES	20A	40		1000	
SPARE	20A	41				RECEPTACLES	20A	42		800	
TOTAL			9160	9700	8032	TOTAL			8760	10800	8396
CONNECTED KW	57					CONNECTED KW	158				
CONNECTED AMPS	158					CONNECTED AMPS	36				
DEMAND KW	36					DEMAND KW	99				
DEMAND AMPS	99					DEMAND AMPS	99				

MDP

120/208V-3P-4W + GROUND
MAIN: 400 A MIAN SWITCH / FUSE (OR BREAKERS)

CIRC NO	SW	FU	LOAD INFORMATION		FEEDER	CONN	DEM
			LOCATION / DESCRIPTION	CODE			
1	200	3	200	LP-A	AS SPECIFIED	117	106
2	200	3	200	LP-B	AS SPECIFIED	150	117
3	100	3	70	RT-1	AS SPECIFIED	58.3	46.6
4	30	3	20	EF-3	AS SPECIFIED	7.5	6.0
5	60	3	35	AIR COMPRESSOR 7.5 HP	AS SPECIFIED	24.2	19.4