

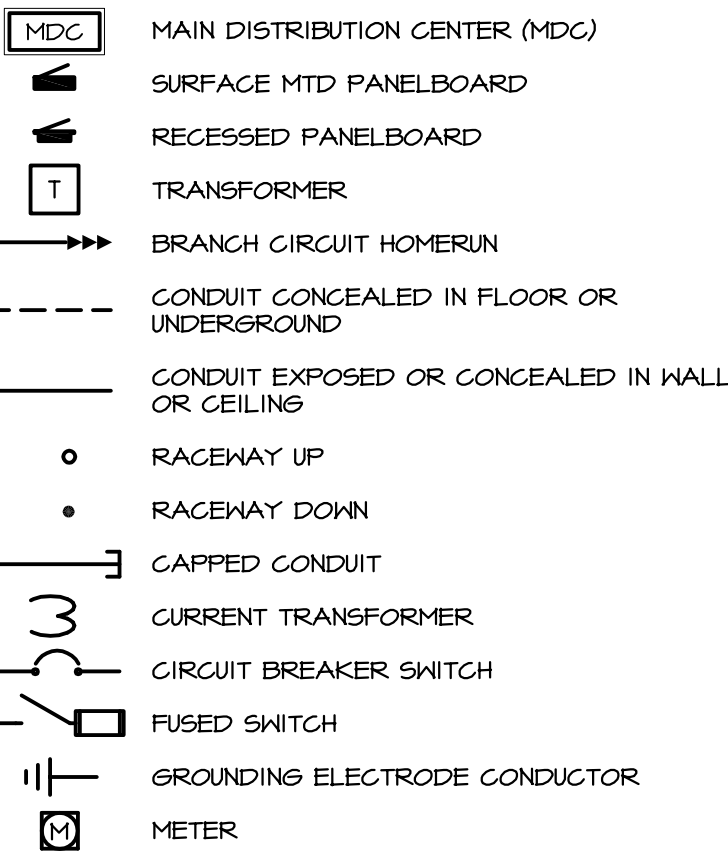
NOTES:

- WHERE MULTIPLE LINE VOLTAGE DEVICES ARE SHOWN ADJACENT TO EACH OTHER, THEY ARE ALL TO SHARE THE SAME JUNCTION BOX, UP TO FOUR GANGS.
- WHERE MORE THAN FOUR DEVICES ARE SHOWN ADJACENT TO EACH OTHER, DEVICES ARE TO STACK VERTICALLY ABOVE ONE ANOTHER IN TWO ROWS IN AS SMALL OF GANG BOXES AS POSSIBLE. I.E. SIX DEVICES WILL USE TWO THREE GANG BOXES, FIVE DEVICES WILL USE ONE THREE GANG AND ONE TWO GANG BOX.
- SEPARATELY GANGED DEVICES ARE NOT ALLOWED TO BE INSTALLED ADJACENT TO ONE ANOTHER HORIZONTALLY WITHIN THE SAME STUD BAY.
- AUDIBLE/VISUAL FIRE ALARM DEVICES SHOWN ARE TO BE MOUNTED AT 90" OR 6" BELOW CEILING, WHICHEVER IS LOWER. ADA STROBES TO BE MOUNTED AT 80" AFF OR 6" BELOW CEILING, WHICHEVER IS LOWER.
- THE E.G. SHALL REFER TO INTERIOR DESIGN ELEVATIONS TO COORDINATE ALL COUNTER HEIGHTS. ALL "AC" DEVICES SHALL HAVE BOTTOM OF BACK-BOX MOUNTED 4" ABOVE THE BACK/SIDE SPLASH.

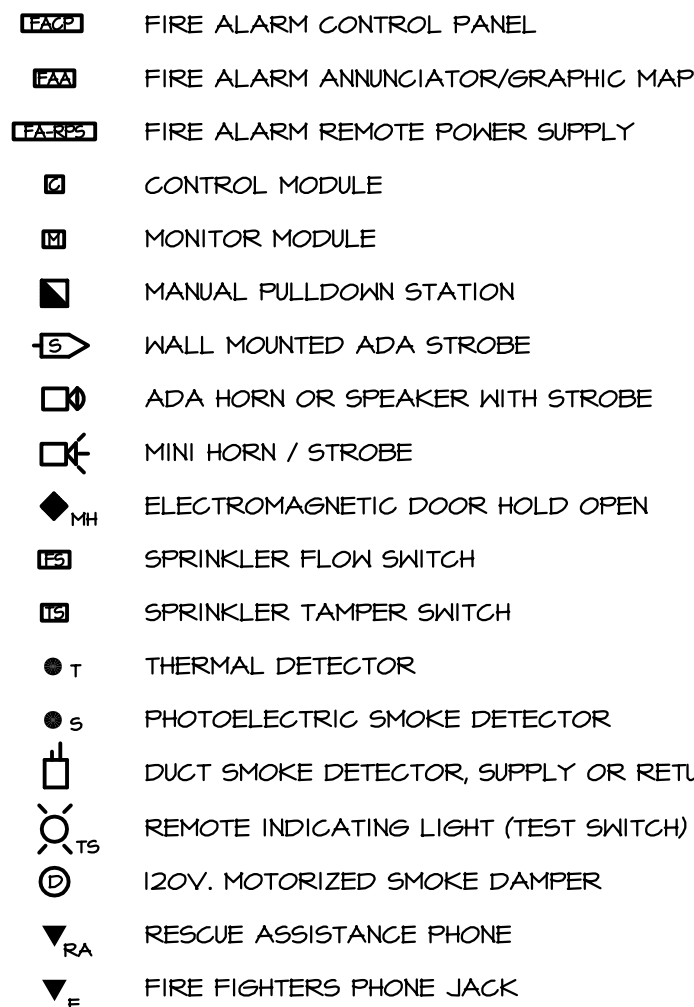
1 | MOUNTING HEIGHTS DETAIL

E0.1 SCALE: N.T.S.

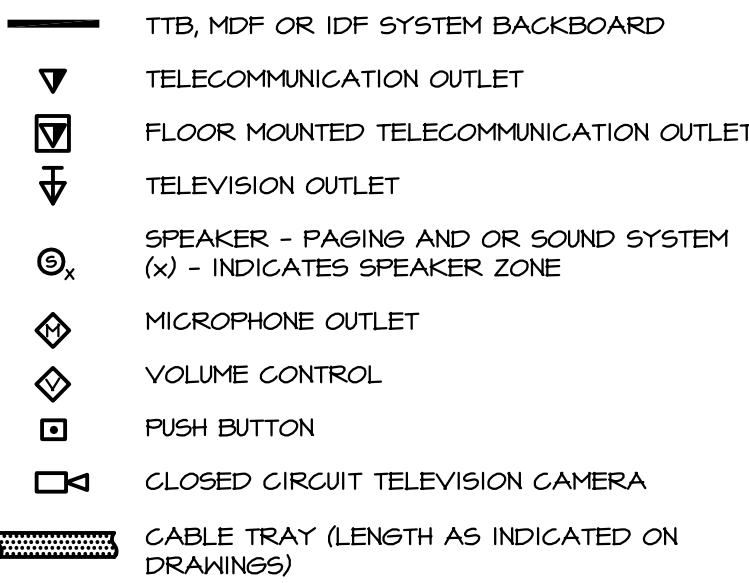
DISTRIBUTION AND RACEWAY



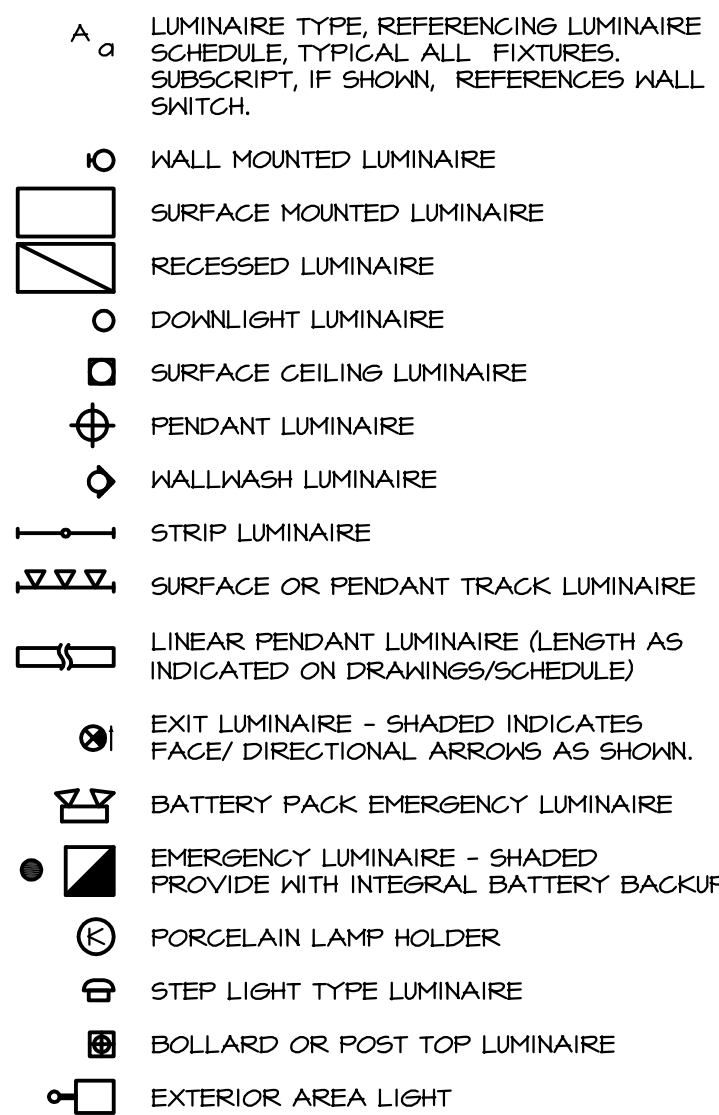
FIRE ALARM



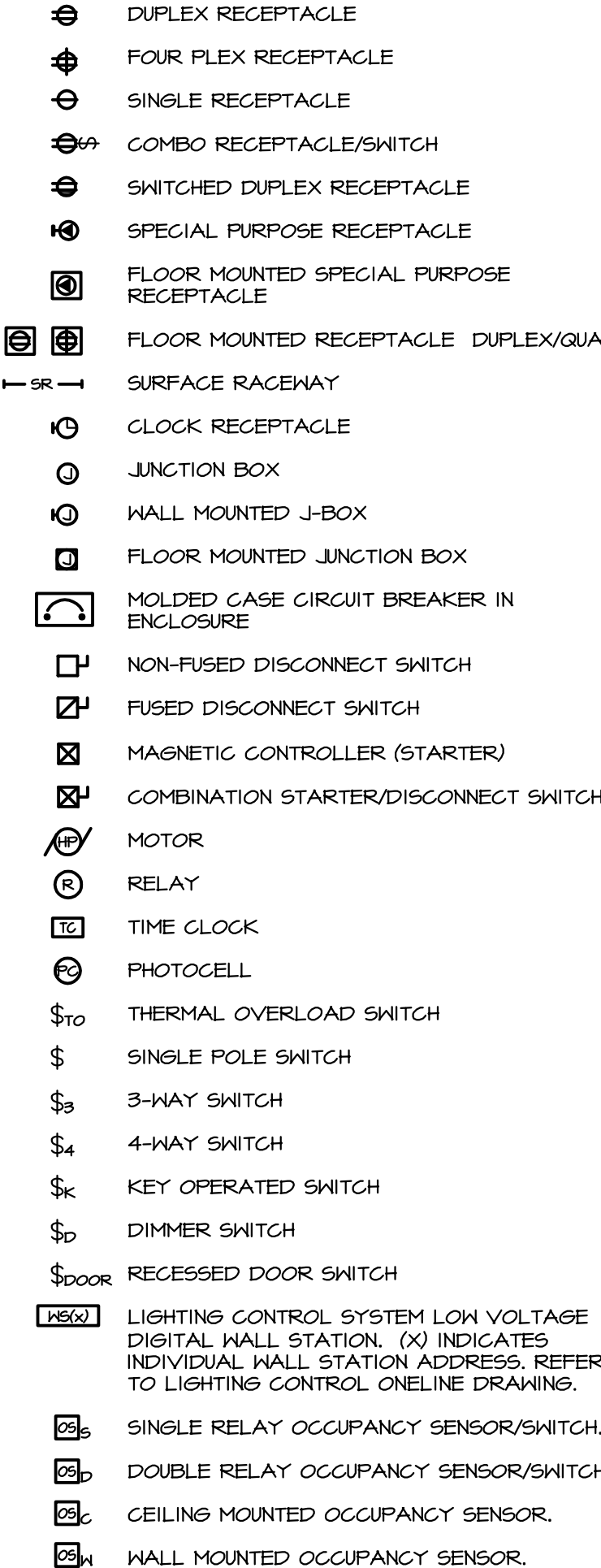
SYSTEMS



LIGHTING FIXTURES



WIRING DEVICES



ABBREVIATIONS AND SYMBOLS

A	AMPERE(S)
AC	ABOVE COUNTER
AFF	ABOVE FINISHED FLOOR
AFB	ABOVE FINISHED GRADE
AHJ	AUTHORITY HAVING JURISDICTION
AIC	AMPERES INTERRUPTING CAPACITY
ATS	AUTOMATIC TRANSFER SWITCH
BFF	BELOW FINISHED FLOOR
C	CONDUIT
CATV	CABLE TELEVISION
CB	CIRCUIT BREAKER
CT	CURRENT TRANSFORMER
DISC	DISCONNECT
DH	DISHWASHER
DWG(S)	DRAWING(S)
(E)	EXISTING TO REMAIN
EC	ELECTRICAL CONTRACTOR
EF	EXHAUST FAN
(ER)	EXISTING TO BE RELOCATED
EM	EMERGENCY
EPO	EMERGENCY POWER OFF
EWK	ELECTRIC WATER COOLER
(R)	EXISTING TO BE REMOVED
F	FUSE
FLA	FULL LOAD AMPS
FD	GARBAGE DISPOSAL
G	GROUND
GC	GENERAL CONTRACTOR
GFI	GROUND FAULT CIRCUIT INTERRUPTER
HP	HORSEPOWER
IDF	INTERMEDIATE DISTRIBUTION FACILITY
IG	ISOLATED GROUND
ISC	SHORT CIRCUIT CURRENT
KVA	KILOVOLT AMPERE(S)
KH	KILOHATT(S)
LTS	LIGHTING
MCA	MINIMUM CIRCUIT AMPERE(S)
MCB	MAIN CIRCUIT BREAKER
MDP	MAIN DISTRIBUTION CENTER
MDF	MAIN DISTRIBUTION FACILITY
MLO	MAIN LUGS ONLY
MTS	MANUAL TRANSFER SWITCH
MH	MICROWAVE
NC	NORMALLY CLOSED
NL	NIGHT LIGHT - SEE GENERAL NOTES
NO	NORMALLY OPEN
OAE	OR APPROVED EQUAL
OH	OVERHEAD
P	POLE
PART	PARTIAL CIRCUIT
PH, Ø	PHASE
PNL	PANEL
RCPT	RECEPTACLE
REF	REFRIGERATOR
(RL)	RELOCATED
SPD	SURGE PROTECTION DEVICE
UC	UNDER COUNTER/CABINET
UG	UNDERGROUND
UON	UNLESS OTHERWISE NOTED
V	VOLT(S)
W	WATT(S) OR WIRE
WG	WIRE GUARD
WP	WEATHERPROOF
XFMR	TRANSFORMER
	POOL EQUIPMENT SCHEDULE NOTATION
	KITCHEN EQUIPMENT SCHEDULE NOTATION
	MECHANICAL EQUIPMENT SCHEDULE NOTATION
	DETAIL NOTE
	DELTA REVISION NOTE
	ELECTRICAL WIRE SIZE

ELECTRICAL GENERAL NOTES

- THE CONTRACTOR SHALL PROVIDE ALL LABOR AND MATERIAL NECESSARY FOR A COMPLETE AND FUNCTIONING ELECTRICAL SYSTEM.
- MATERIALS AND INSTALLATION SHALL COMPLY WITH CODES, LAWS AND ORDINANCES OF FEDERAL, STATE AND LOCAL GOVERNING BODIES HAVING JURISDICTION.
- MATERIALS AND EQUIPMENT SHALL BE LISTED AND/OR LABELED BY UL, ETL, CSA OR ANOTHER RECOGNIZED TESTING LAB.
- ALL WORK REQUIRED FOR THE INSTALLATION AS SHOWN ON DRAWINGS INCLUDING LABOR, EQUIPMENT AND MATERIALS SHALL BE IN STRICT COMPLIANCE WITH THE BUILDING STANDARDS, EXCEPT AS NOTED OTHERWISE.
- THE CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS, GOVERNMENTAL FEES, TAXES AND LICENSES NECESSARY FOR THE PROPER EXECUTION AND COMPLETION OF THE ELECTRICAL WORK.
- THE CONTRACTOR SHALL PREPARE AND SUBMIT TO GOVERNMENTAL AGENCIES AND UTILITY COMPANIES SHOP DRAWINGS, WHICH ARE REQUIRED BY THESE AGENCIES, FOR THEIR APPROVAL.
- THE CONTRACTOR SHALL NOTIFY THE ARCHITECT/ENGINEER/OWNER OF ANY MATERIALS OR APPARATUS BELIEVED TO BE INADEQUATE, UNSUITABLE, IN VIOLATION OF LAWS, ORDINANCES, RULES OR REGULATIONS OF AUTHORITIES HAVING JURISDICTION.
- FOR ALL JOBS THAT INCLUDE DEMOLITION WORK BY THE ELECTRICAL CONTRACTOR, DURING AND AFTER DEMOLITION, EC SHALL MAINTAIN CIRCUIT CONTINUITY TO ALL EXISTING DEVICES THAT ARE TO REMAIN. EC SHALL REMOVE, RELOCATE, AND/OR REWORK ANY CONDUIT AND WIRING TO FACILITATE THE NEW CONSTRUCTION SCOPE OF WORK. FOR A LUMINAIRE THAT ARE EXISTING TO REMAIN OR EXISTING TO BE RELOCATED, EC SHALL CLEAN LENSES AND REPLACE ALL EXTINGUISHED LAMPS, UON.
- THE CONTRACTOR SHALL CAREFULLY EXAMINE THE CONTRACT DOCUMENTS, VISIT THE SITE, AND THOROUGHLY BECOME FAMILIAR WITH THE BUILDING STANDARDS AND LOCAL CONDITIONS RELATING TO THE WORK. FAILURE TO DO SO WILL NOT RELIEVE THE CONTRACTOR OF THE OBLIGATIONS OF THE CONTRACT.
- ALL MATERIALS, AND EQUIPMENT SHALL BE ERECTED, INSTALLED, CONNECTED, CLEANED, ADJUSTED, TESTED, CONDITIONED, AND PLACED IN SERVICE IN ACCORDANCE WITH THE MANUFACTURER'S DIRECTIONS AND RECOMMENDATIONS.
- ALL CUTTING, DRILLING AND PATCHING OF MASONRY, STEEL OR IRON WORK BELONGING TO THE BUILDING MUST BE DONE BY THIS CONTRACTOR. ALL WORK MUST BE PROPERLY INSTALLED, BUT UNDER NO CONDITIONS MAY STRUCTURAL WORK BE CUT, EXCEPT AT THE DIRECTION OF THE ARCHITECT-DESIGNER OR THEIR REPRESENTATIVE.
- E.G. IS TO REFER TO ARCHITECTURAL PLANS AND SPECIFICATIONS FOR ALL FIRE RATED PENETRATION INSTALLATION REQUIREMENTS. E.G. IS TO NOTIFY ENGINEER AND ARCHITECT PRIOR TO INSTALLING ANY FIXTURES WITHIN A FIRE RATED CEILING OR WALL. FIRE RATINGS MUST BE MAINTAINED FOR THIS TYPE OF INSTALLATION WITH DRYWALL TENTING.
- E.G. SHALL PROVIDE COORDINATION STUDY OF NEW AND/OR NEW GEAR COMBINED WITH EXISTING GEAR DURING THE SUBMITTAL PROCESS.
- SHOP DRAWINGS SHALL INCLUDE MANUFACTURER'S NAMES, CATALOG NUMBERS, CUTS, DIAGRAMS AND OTHER SUCH DESCRIPTIVE DATA AS MAY BE REQUIRED TO IDENTIFY AND REVIEW THE EQUIPMENT. SUBMITTALS SHALL BE IN LOGICAL GROUPS, FOR EXAMPLE, ALL LIGHTING FIXTURES, PARTIAL SUBMITTALS WILL NOT BE REVIEWED.
- SUBMIT (3) COPIES OF THE FOLLOWING SHOP DRAWINGS FOR REVIEW:
 - SWITCH BOARD, PANELBOARDS, AND METERING EQUIPMENT
 - DISCONNECTS
 - FIRE ALARM SYSTEM
 - LIGHT FIXTURES
 - LIGHTING CONTROLS
 - TRANSFORMERS
 - PROVIDE "AS-BUILT" DRAWINGS AND SUBMIT TO ARCHITECT/DESIGNER.
- ALL MATERIAL, EQUIPMENT, WIRING DEVICES, ETC. SHALL BE NEW, UNLESS SPECIFICALLY INDICATED AS EXISTING TO BE REUSED.
- CONTRACTOR SHALL OBTAIN AND VERIFY EXACT UTILITY COMPANY DRAWINGS AND REQUIREMENTS. ELECTRICAL CONTRACTOR IS TO SUBMIT A COMPLETE CONSTRUCTION DRAWING SET TO THE ELECTRICAL UTILITY COMPANY WITHIN 10 DAYS OF AWARD OF CONTRACT. COORDINATE TIMELINE OF THE REVIEW, APPROVAL, ALL ASSOCIATED DOWN TIME, CONSTRUCTION SCHEDULING, DELIVERY, AND INSTALLATION OF THE UTILITY TRANSFORMER. NOTIFY OWNER OF SCHEDULING CONFLICTS.
- ALL NEW CIRCUIT BREAKERS FOR NEW OR EXISTING PANELBOARDS SHALL MATCH EXISTING BUILDING PANELBOARD MANUFACTURER AND BREAKER TYPE. THE CONTRACTOR SHALL PROVIDE NEW TYPE PARTIAL PANEL DIRECTORIES FOR ALL NEW PANELS AND EXISTING PANELS WHICH HAVE CHANGED. PANELBOARD SHALL BE MARKED WHERE THE SOURCE OF POWER SUPPLY ORIGINATES, AND IF SERIES COMBINATION SYSTEMS ARE UTILIZED AND THEIR LISTED AMPERE RATINGS.
- DO NOT SHARE NEUTRAL CONDUCTORS FOR MULTIWIRE BRANCH CIRCUITS. WHERE THE E.G. PROPOSES THE USE OF SHARED NEUTRAL CONDUCTORS OR SHARED NEUTRAL CONDUCTORS ARE REQUIRED (SUCH AS POWERED FURNITURE SYSTEMS), HANDLE TIES SHALL BE PROVIDED ON THE CIRCUIT BREAKERS, WITH SHARED NEUTRALS, SUCH THAT IT WILL SIMULTANEOUSLY DISCONNECT ALL UNSHARED CONDUCTORS. ALL HANDLE TIES ARE REQUIRED TO BE INDICATED ON THE PANELBOARD SHOP DRAWINGS.
- SHOULD ACTUAL FIELD CONDITIONS REQUIRE INDICATED CIRCUIT DESIGNATIONS TO VARY, INDICATE THE CIRCUIT NUMBER USED ON THE AS-BUILT DRAWINGS.
- ALL SERVICE EQUIPMENT (OTHER THAN IN DWELLING UNITS) SHALL BE LEGIBLY MARKED IN THE FIELD BY THE ELECTRICAL CONTRACTOR WITH THE MAXIMUM AVAILABLE FAULT CURRENT AS INDICATED WITHIN THESE DOCUMENTS. THE FIELD MARKING(S) SHALL COMPLY WITH ELECTRICAL SPECIFICATIONS FOR READABILITY AND DURABILITY.
- PROVIDE COMPLETE METAL RACEWAY SYSTEMS AND ENCLOSURES FOR ALL WIRING THROUGHOUT THE EXTENT OF THE REQUIRED DISTRIBUTION SYSTEM.
 - UTILIZE RIGID POLYVINYL CHLORIDE CONDUIT (PVC) IN THE FOLLOWING LOCATIONS:
 - UNDERGROUND
 - UTILIZE ELECTRICAL METALLIC TUBING (EMT), MINIMUM SIZE OF 3/4", IN THE FOLLOWING LOCATIONS:
 - SERVICE AND FEEDERS
 - POWER CIRCUIT HOMERUN
 - BRANCH CIRCUITS IN CONCEALED OR EXPOSED LOCATIONS
 - TELEPHONE/DATA/CATV ROUGH-IN
 - UTILIZE METAL-GLAD CABLE (MGC) IN THE FOLLOWING LOCATIONS:
 - BRANCH CIRCUIT IN CONCEALED LOCATIONS
 - FINAL CONNECTION TO RECESSED LIGHTING FIXTURES
 - FINAL CONNECTION TO STEP-DOWN TRANSFORMERS
- ALL NEW CIRCUITS SHALL HAVE A GROUND WIRE INSTALLED.
- ALL WIRING NOT INSTALLED IN CONDUIT AND INSTALLED IN THE CEILING SPACE SHALL BE FLEMUM RATED.
- ELECTRICAL CONTRACTOR SHALL PROVIDE ALL SPECIAL OUTLET BOXES THAT MAY BE REQUIRED TO ENCLOSE RECEPTABLES.
- EACH SWITCH, LIGHT, RECEPTACLE AND OTHER MISCELLANEOUS DEVICE SHALL BE PROVIDED WITH A GALVANIZED OR PRESSURE STEEL OUTLET BOX TYPE OF NOT LESS THAN NO. 14 LBS. GAUGE STEEL. CONDUITS SHALL BE FASTENED WITH LOCKNUTS AND BUSHINGS AND ALL UNUSED KNOCKOUTS MUST BE LEFT SEALED. THERE MUST BE SUFFICIENT ROOM FOR WIRES AND BUSHINGS AND DEEP BOXES SHALL BE INSTALLED WHERE REQUIRED. BOXES SHALL BE SECURELY AND ADEQUATELY SUPPORTED.
- IN SUSPENDED CEILINGS, SUPPORT CONDUIT AND JUNCTION BOXES DIRECT FROM THE STRUCTURAL SLAB, DECK, OR FRAMING PROVIDED FOR THAT PURPOSE. LIGHTING BRANCH CIRCUIT CONDUITS SHALL NOT BE CLIPPED TO THE CEILING SUPPORT WIRES OR SPLINE UNLESS THE CEILING SYSTEM HAS BEEN SPECIFICALLY DESIGNED FOR THAT PURPOSE.
- WHERE FLOOR FITTINGS REQUIRE PENETRATION OF THE FLOOR SLAB, THEY SHALL BE STANDARD DEVICE LISTED BY UL FOR THE PURPOSE AND HAVE A UL FIRE RATINGS EQUAL TO THE FLOOR RATING. FLOOR SERVICE BOXES SHALL BE MODULAR, ADJUSTABLE FLANGE TYPE, DUAL SERVICE UNITS SUITABLE FOR WIRING METHOD USED. COMPARTMENT BARRIERS SHALL SEPARATE POWER FROM LOW VOLTAGE CABLING. PROVIDE RECTANGULAR SERVICE PLATE WITH SATIN FINISH.
- ALL RECEPTABLES SHALL BE SPECIFICATION GRADE NEMA 5-20R, UNLESS OTHERWISE NOTED.
- ALL LIGHT SWITCHES SHALL BE SPECIFICATION GRADE, QUIET OPERATION RATED 120/277 VOLT, 20 AMPS, UNLESS OTHERWISE NOTED.
- ALL FACE PLATE AND DEVICE COLORS SHALL BE APPROVED BY ARCHITECT OR OWNER/LEASEE.
- PROVIDE LUMINAIRES SHOWN AS SHADED WITH EMERGENCY BATTERY BALLASTS. EMERGENCY LUMINAIRES SHALL SENSE UNSWITCHED POWER TO THE UPRAID AND OPERATED AUTOMATICALLY UPON LOSS OF NORMAL POWER. ALL SHADED LUMINAIRES WITH 2' AND 4' LAMPS OR LONG BIAx LAMPS SHALL HAVE ONE (1) 40 MINUTE, TWO LAMP, 1400 LUMEN EMERGENCY BALLAST. ALL SHADED LUMINAIRES WITH COMPACT FLUORESCENT LAMPS SHALL HAVE A FACTORY INSTALLED 40 MINUTE EMERGENCY BALLAST. ALL EMERGENCY LUMINAIRES SHALL HAVE REMOTE TEST SWITCHES AND VISIBLE INDICATING LIGHTS. CONNECT THE EMERGENCY BATTERY BALLAST TO THE UN-SWITCHED LEG OF THE LIGHTING CIRCUIT INDICATED.
- ALL BATTERY BACKUP EMERGENCY LIGHTING AND EXIT LIGHTS SHALL BE WIRED AHEAD OF ANY LOCAL SWITCHING, UON.
- UNLESS OTHERWISE NOTED, LUMINAIRES DESIGNATED AS NIGHT LIGHT (NL) SHALL BE CONNECTED AHEAD OF LOCAL SWITCHING AND REMAIN ON 24 HOURS A DAY.
- ALL DIMMED LIGHTING CIRCUITS ARE TO RECEIVE DEDICATED NEUTRALS. DO NOT SHARE NEUTRALS ON DIMMED LIGHTING CIRCUITS.
- WHERE DUAL LEVEL SWITCHING IS INDICATED, THE SWITCH CLOSEST TO THE DOOR SHALL CONTROL ALL OUTER LAMPS IN THE INDICATED LUMINAIRE AND THE ADJACENT SWITCH SHALL CONTROL ALL INNER LAMPS IN THE INDICATED LUMINAIRE, UON.
- PROVIDE OWNER WITH A COMPLETE LISTING OF ALL LAMPS UTILIZED ON THE PROJECT INCLUDING MANUFACTURER AND CATALOG INFORMATION. PROVIDE A SUGGESTED SOURCE, INCLUDING CONTACT NAME AND PHONE NUMBER, FOR REORDERING.
- THE CONTRACTOR SHALL VERIFY THE CEILING TYPE BEFORE ORDERING LIGHTING FIXTURES.
- ROUGH-IN FOR MECHANICAL EQUIPMENT SHALL ONLY OCCUR AFTER MECHANICAL EQUIPMENT SUBMITTALS ARE THOROUGHLY REVIEWED FOR CHANGES. NOTIFY ENGINEER OF ANY DISCREPANCIES.
- FINAL LAYOUT AND QUANTITY OF ALL FIRE ALARM DEVICES SUBJECT TO APPROVAL OF LOCAL AUTHORITY HAVING JURISDICTION.
- COORDINATE ELECTRIC WATER COOLER RECEPTACLE PLACEMENT SUCH THAT THE RECEPTACLE IS ACCESSIBLE, YET CONCEALED BY COOLER, RECEPTACLE TO BE GFCI TYPE.
- THE POWER AND CONTROL REQUIREMENTS FOR ALL EQUIPMENT CONNECTIONS SHALL BE CONFIRMED WITH APPROVED SHOP DRAWINGS PRIOR TO ELECTRICAL ROUGH-IN. FINAL POWER REQUIREMENTS, DIMENSIONED ROUGH-IN LOCATIONS, LOW VOLTAGE SYSTEM CONNECTIONS, ETC. SHALL BE CONFIRMED AND MODIFIED AS REQUIRED.
- ALL DEVICES IN OR ABOVE COUNTERS SHALL HAVE LOCATIONS AND MOUNTING HEIGHTS CONFIRMED WITH ARCHITECTURAL ELEVATIONS 4 WEEKS PRIOR TO ROUGH-IN. ANY ADJUSTMENTS TO MOUNTING HEIGHTS REQUIRED BY LACK OF COORDINATION WILL BE AT THE CONTRACTOR'S EXPENSE.
- ALL EXISTING ELECTRICAL SERVICES NOT SPECIFICALLY INDICATED TO BE REMOVED OR ALTERED SHALL REMAIN AS THEY PRESENTLY EXIST.
- E.G. SHALL INCLUDE IN HIS COST THE REMOVAL OF ALL EXISTING ELECTRICAL DEVICES, CONDUITS, FIXTURES AND EQUIPMENT. TURN EQUIPMENT OVER TO OWNER AS INDICATED OR RECYCLE/DISCARD ALL EQUIPMENT AS REQUIRED. E.G. SHALL BE RESPONSIBLE FOR DISCONNECTING PRIMARY SERVICE AND TEMPORARY POWER.
- WHERE EXISTING CEILINGS ARE REVISED FROM ACCESSIBLE TO NON-ACCESSIBLE, CONTRACTOR IS TO INCLUDE IN HIS BID THE COSTS ASSOCIATED WITH RELOCATING ALL ELECTRICAL EQUIPMENT REQUIRING ACCESS ABOVE THE EXISTING CEILING TO A NEW ACCESSIBLE CEILING LOCATION APPROVED BY ARCHITECT AND ENGINEER. THE USE OF ACCESS PANELS IN THE NEW CEILING TO AVOID RELOCATION OF THIS EQUIPMENT IS NOT ACCEPTABLE.
- CONTRACTOR TO CONDUCT FUNCTIONAL TESTING OF LIGHTING CONTROLS EQUIPMENT AS REQUIRED BY IECC 2012/2015, SECTION 4405.9. AFTER THIS TESTING IS OBSERVED AND COMPLETED, THE REGISTERED DESIGN PROFESSIONAL OR COMMISSIONING AUTHORITY SHALL PROVIDE DOCUMENTATION TO THE AHJ THAT CERTIFIES THAT THE DOCUMENTED PERFORMANCE CRITERIA OF SECTION 4405.9

ELECTRICAL DEMOLITION REQUIREMENTS

- THE BASIS OF THESE DRAWINGS WERE SITE OBSERVATIONS, ORIGINAL BUILDING DRAWINGS AND VARIOUS OTHER SOURCES. EVERY ATTEMPT HAS BEEN MADE TO DOCUMENT THE ACTUAL CONDITIONS. HOWEVER, THE CONTRACTOR SHALL CAREFULLY EXAMINE THE CONTRACT DOCUMENTS, VISIT THE SITE, AND THOROUGHLY BECOME FAMILIAR WITH THE BUILDING STANDARDS, THE BUILDING'S EXISTING CONDITION AND LOCAL CONDITIONS RELATING TO THE WORK. FAILURE TO DO SO WILL NOT RELIEVE THE CONTRACTOR OF THE OBLIGATIONS OF THE CONTRACT.
- THE ELECTRICAL CONTRACTOR SHALL NOTIFY THE ARCHITECT/ENGINEER/OWNER OF ANY MATERIALS OR APPARATUS BELIEVED TO BE INADEQUATE, UNSUITABLE, IN VIOLATION OF LAWS, ORDINANCES, RULES OR REGULATIONS OF AUTHORITIES HAVING JURISDICTION.
- THE ELECTRICAL CONTRACTOR SHALL INCLUDE IN HIS COST THE REMOVAL OF ALL EXISTING ELECTRICAL DEVICES, CONDUITS, FIXTURES AND EQUIPMENT. DISCARD ALL EQUIPMENT AS REQUIRED, UNLESS NOTED OTHERWISE.
- EXISTING DEVICES NOT NOTED AS EXISTING (E) OR INDICATED ON PLANS SHALL REMAIN, AS THEY PRESENTLY EXIST. FOR DEMOLISHED DEVICES IN WALLS WHICH ARE TO REMAIN, THE ELECTRICAL CONTRACTOR SHALL INSTALL A BLANK FACE PLATE ON THE BACKBOX. FOR DEMOLISHED DEVICES INSTALLED IN THE FLOOR, THE ELECTRICAL CONTRACTOR SHALL CUT THE FLOOR BOX FLUSH WITH THE FLOOR AND FILL WITH CONCRETE, COORDINATE WITH THE GENERAL CONTRACTOR.
- THE DEMOLITION OF SOME DEVICES MAY INTERRUPT POWER TO DEVICES DOWN STREAM, THE ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR REWORKING THESE CIRCUITS TO MAINTAIN POWER TO THE DOWN STREAM DEVICES WHICH WILL REMAIN.
- ALL UNENERGIZED/DEMOLISHED CIRCUITRY SHALL HAVE THE CONDUCTORS REMOVED FROM THE CONDUIT AND THE CONDUIT SHALL BE MARKED "EMPTY" WITH INDELIBLE MARKER.

File:

NOTICE: DUTY OF COOPERATION
Release of these plans contemplates further cooperation among the owner, his or her contractor, and the architect. Design and construction are complex. Although the architect and his/her consultants have performed their services with due care and diligence, they cannot guarantee perfection. Communication is imperfect and every contingency cannot be anticipated. Any ambiguity or discrepancy discovered by the use of these plans shall be reported immediately to the architect. Failure to notify the architect compounds misunderstanding and increases construction costs. A failure to cooperate by a simple notice to the architect shall relieve the architect from responsibility for all consequences. Changes made from the plans without the consent of the architect are unauthorized and shall relieve the architect from all consequences arising out of such changes.

Permit Set
Date: 08/02/2016
Revisions:

First Universalist Church of Denver
Addition and Renovation
4101 East Hampden Avenue Denver, CO 80202



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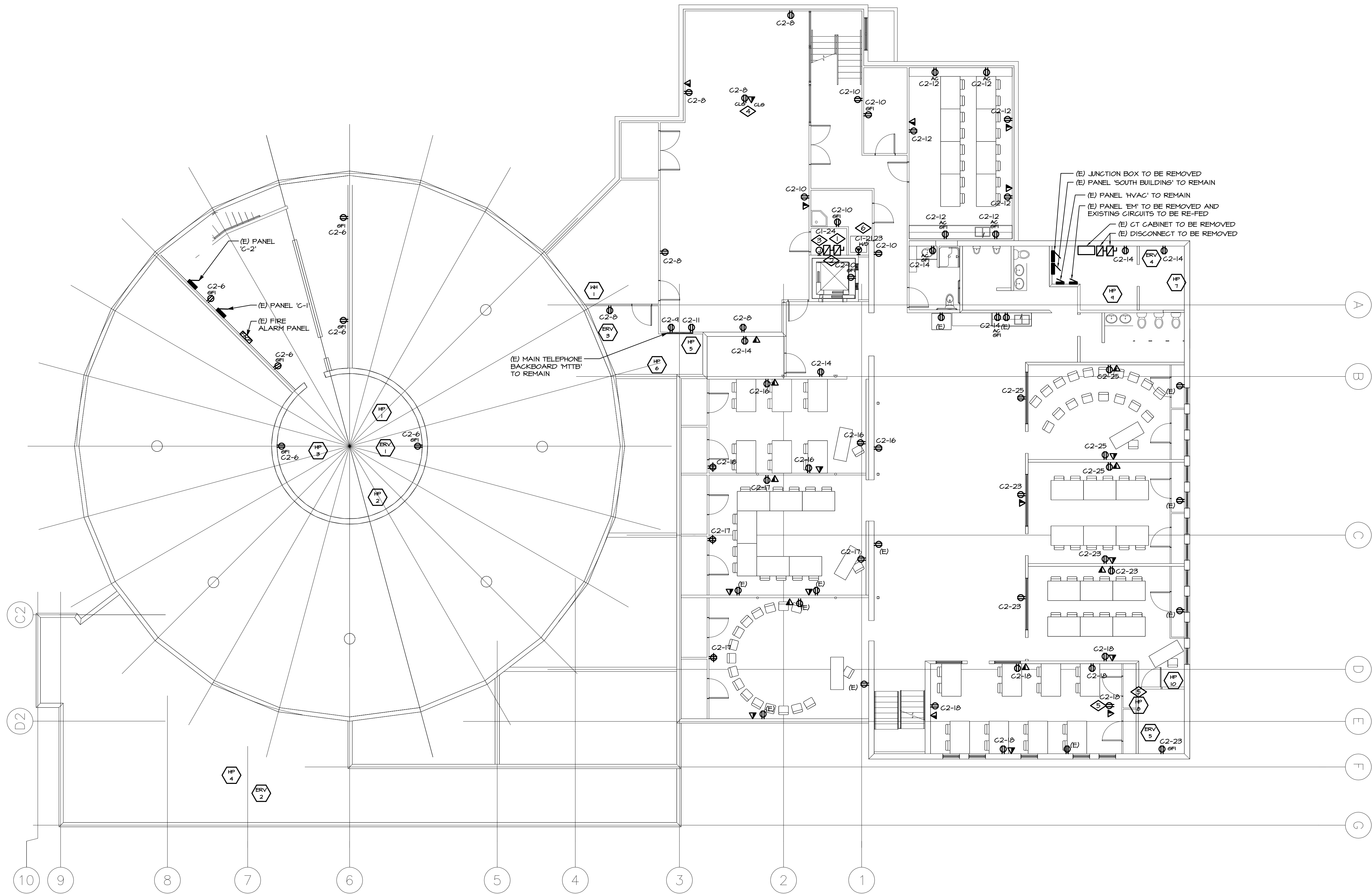
ELECTRICAL
COVER SHEET

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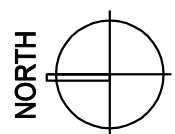
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AE DESIGN
Integrated Lighting and Electrical Solutions
1900 Wazee Street #350 | Denver, CO 80202 | 303.296.3034
aedesign-inc.com Project #3251.00

Sheet: _____ of: _____
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1 | ELECTRICAL LOWER LEVEL POWER PLAN
E2.0 SCALE: 1/8" = 1'-0"



GENERAL NOTES	
A.	DEVICES CIRCUITED TO BRANCH PANEL: C1-## - PANEL C-1 C2-## - PANEL C-2
B.	SEE MECHANICAL SCHEDULE ON DRAWING E50 FOR ALL MECHANICAL LOAD AND BRANCH CIRCUITING.

KEYNOTE LEGEND	
KEY VALUE	
◇	
1.	ELEVATOR ALL-IN-ONE CONTROL SWITCH, CONFIRM VOLTAGE AND RATING, EATON SERIES #ES.
2.	PROVIDE LOCKABLE OVERCURRENT DISCONNECT FOR CAB LIGHTING AND FAN. COORDINATE WITH ELEVATOR VENDOR.
3.	JUNCTION BOX FOR LOW VOLTAGE COMMUNICATIONS CABLING CONNECTION TO THE ELEVATOR CONTROLLER. PROVIDE (1) CAT6 CABLE IN 3/4" G FROM TELEPHONE BACKBOARD PUNCH DOWN BLOCKS AND TERMINATE AT ELEVATOR CONTROLLER.
4.	EC TO RELOCATE AND RE-INSTALL ONE EXISTING SCREEN AND PROJECTOR SYSTEM TO THE COLVIN COMMONS SPACE. WORK TO INCLUDE NEW RECEPTACLE IN CEILING, INSTALLATION OF SPEAKER SYSTEM, AND OTHER WORK AS REQUIRED BY OWNER.
5.	COORDINATE WITH ARCHITECTURAL AND MECHANICAL PLANS REGARDING EXPANSION OF SOUTH EAST MECHANICAL ROOM.
6.	EC SHALL PROVIDE SPECIALTY RECEPTACLE NEMA 6-30R FOR CONNECTION TO ELECTRIC CLOTHES DRYER. EC SHALL VERIFY ELECTRICAL REQUIREMENTS WITH MANUFACTURER BEFORE ROUGH-IN.

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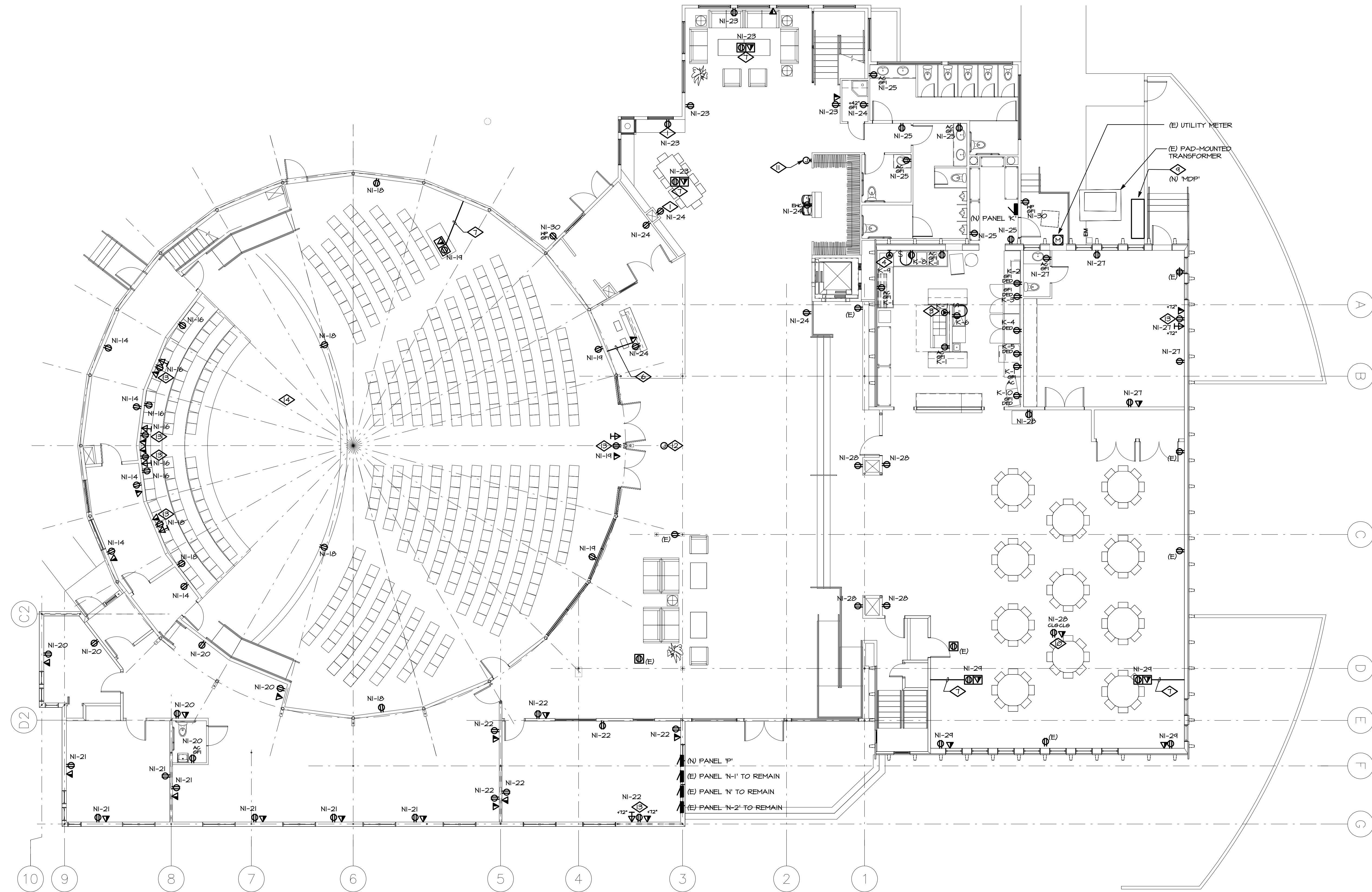
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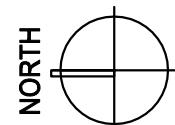
ELECTRICAL
LOWER LEVEL POWER PLAN

Drawing Number:

E2.0



1 | ELECTRICAL MAIN LEVEL POWER PLAN
E2.1 SCALE: 1/8" = 1'-0"



GENERAL NOTES	
A.	ADDITIONAL COORDINATION WITH SELECTED AV AND IT VENDOR NEEDED, BUT THE FOLLOWING SPACES ARE EXPECTED TO HAVE NEW SYSTEMS: -SANCTUARY SPACE TO HAVE ALL NEW RECESSED SPEAKERS IN CEILING, HEAR LOOP SYSTEM, CAMERAS, TV SCREENS, AND WIRELESS SYSTEM. -THROUGHOUT THE BUILDING IS TO RECEIVE WIRELESS ACCESS POINTS, AT THE CEILING. -FRIENDSHIP HALL, FLEX GATHERING, AND NURSERY/TODDLER SPACES ARE TO HAVE A SPEAKER SYSTEM CAPABLE OF PROJECTING THE SANCTUARY AUDIO.
B.	A NEW SECURITY SYSTEM IS TO BE INSTALLED FOR THE BUILDING. THIS SYSTEM IS TO INCLUDE EXTERIOR AND INTERIOR ACCESS CONTROL, INTERIOR MOTION SENSORS, EXTERNAL CAMERAS AT THE THREE MAIN ENTRANCES.

KEYNOTE LEGEND	
KEY	VALUE
◇	1. EC SHALL COORDINATE RECEPTACLE LOCATION WITH SHELVING MANUFACTURER.
	2. NOT USED.
	3. CONNECTION TO KITCHEN RANGE. EC SHALL VERIFY ELECTRICAL REQUIREMENTS WITH MANUFACTURER PRIOR TO ROUGH-IN.
	4. CONNECTION TO RACK-STYLE DISHWASHER. EC SHALL VERIFY ELECTRICAL REQUIREMENTS WITH MANUFACTURER PRIOR TO ROUGH-IN.
	5. ALL RECEPTACLES IN NURSERY LOCATED BELOW 5'-0" AFF MUST BE TAMPER RESISTANT.
	6. EC SHALL PROVIDE 1"Ø FOR POWER AND 3/4"Ø FOR DATA TO WELCOME DESK. EC SHALL COORDINATE RECEPTACLE LOCATIONS WITH WELCOME DESK MANUFACTURER PRIOR TO ROUGH-IN.
	7. EC SHALL PROVIDE 1"Ø FOR POWER AND 3/4"Ø FOR DATA TO FLOOR BOX LOCATION. FLOORBOX SPECIFICATION TBD.
	8. EXISTING UTILITY METER SOCKET TO REMAIN, TO BE RECONNECTED TO NEW MDP.
	9. NEW MAIN ELECTRICAL PANEL "MDP". COORDINATE LOCATION IN FIELD.
	10. EC TO RELOCATE ONE EXISTING PROJECTOR AND PROJECTION SCREEN FROM WITHIN THIS SPACE TO NEW LOCATION SHOWN.
	11. EC TO COORDINATE WITH AV VENDOR AND PROVIDE JUNCTION BOX AND 3/4" CONDUIT TO ABOVE ACCESSIBLE CEILING FOR SPEAKER.
	12. EC TO PROVIDE CONNECTION AT CEILING FOR MOTORIZED SCREEN AND SOUND SYSTEM.
	13. EC TO PROVIDE CONNECTIONS TO WALL MOUNTED TV/AUDIO SYSTEM.
	14. EC TO COORDINATE AV REQUIREMENTS AT DAIS AND PROVIDE (3) 1" CONDUITS FROM DAIS TO SOUND BOARD.

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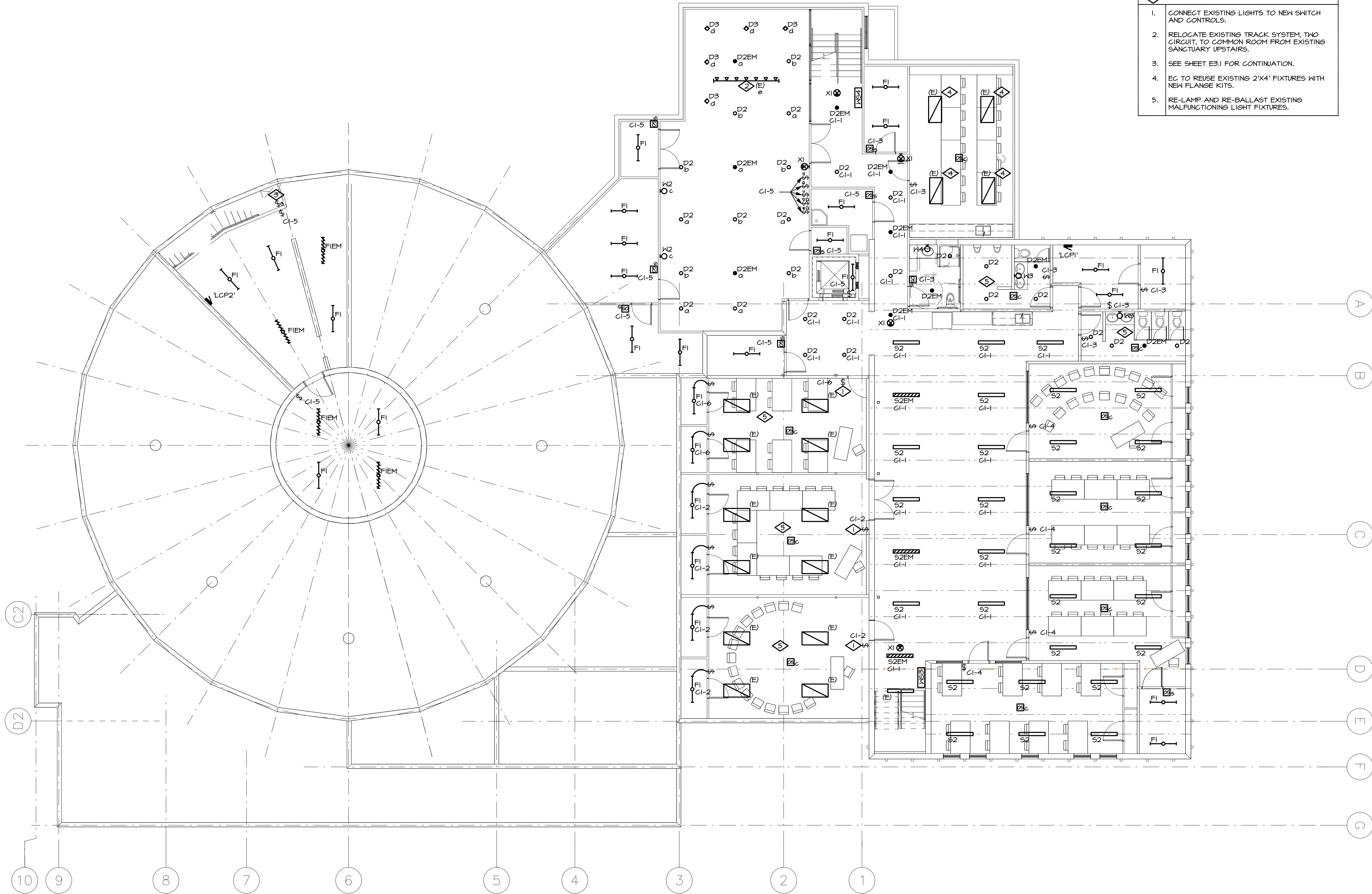


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ELECTRICAL
MAIN LEVEL POWER PLAN

Drawing Number:

E2.1



1 | ELECTRICAL LOWER LEVEL LIGHTING PLAN

E3.0 | SCALE: 1/8" = 1'-0"

GENERAL NOTES	
A.	ALL CORRIDOR, COMMON, STAIR, ETC. SPACES TO BE CONNECTED TO NEW LIGHTING RELAY PANEL.

KEYNOTE LEGEND	
KEY	VALUE
◇	
1.	CONNECT EXISTING LIGHTS TO NEW SWITCH AND CONTROLS.
2.	RELOCATE EXISTING TRACK SYSTEM, TWO CIRCUIT, TO COMMON ROOM FROM EXISTING SANCTUARY UPSTAIRS.
3.	SEE SHEET E3.1 FOR CONTINUATION.
4.	EC TO REUSE EXISTING 2'X4' FIXTURES WITH NEW FLANGE KITS.
5.	RE-LAMP AND RE-BALLAST EXISTING MALFUNCTIONING LIGHT FIXTURES.

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ELECTRICAL
LOWER LEVEL LIGHTING PLAN

Drawing Number:

E3.0

File:
NOTICE: DUTY OF COOPERATION
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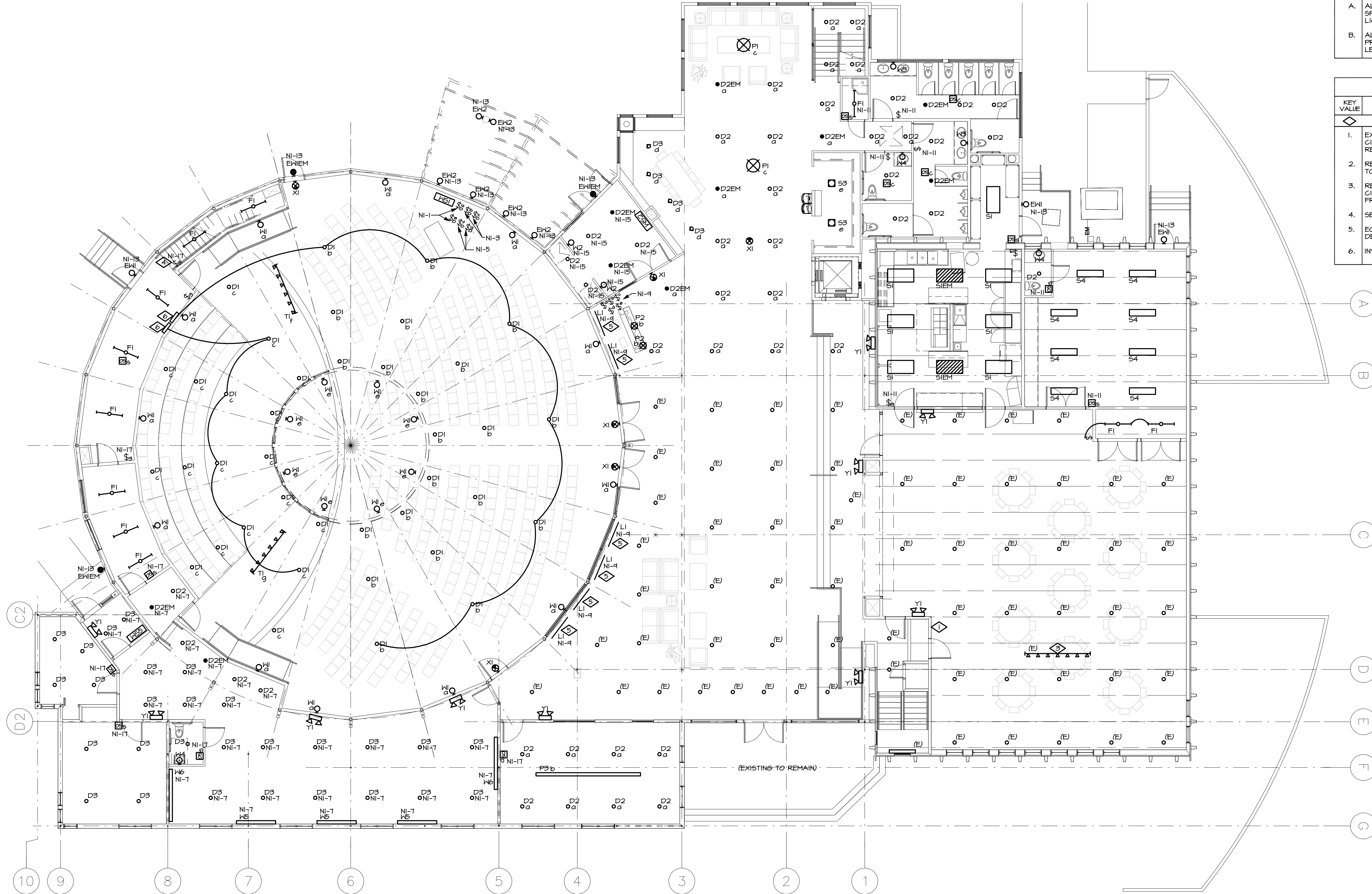
Permit Set
Date: 08/02/2016
Revisions:

GENERAL NOTES

- A. ALL CORRIDOR, COMMON, STAIR, ETC. SPACES TO BE CONNECTED TO NEW LIGHTING RELAY PANEL.
- B. ALL EXISTING RECESSED DOWNLIGHTS TO BE PROVIDED WITH NEW 100W REPLACEMENT LED PAR LAMPS.

KEYNOTE LEGEND

- | KEY VALUE | |
|-----------|----------------------------------------------------------------------------------------------------|
| 1. | EXISTING LIGHTING CONTROLS TO REMAIN, CIRCUITS TO BE ROUTED THROUGH NEW RELAY PANEL. |
| 2. | RELOCATE EXISTING SUSPENDED DOWNLIGHTS TO LOCATIONS SHOWN. |
| 3. | RELOCATE EXISTING TRACK SYSTEM, TWO CIRCUIT, TO FLEX PERFORMANCE PLATFORM FROM EXISTING SANCTUARY. |
| 4. | SEE SHEET E3.0 FOR CONTINUATION. |
| 5. | EC TO UNINSTALL CAREFULLY BEFORE DEMOLITION. |
| 6. | INVERTER LOCATION. |



1 ELECTRICAL MAIN LEVEL LIGHTING PLAN
E3.1 SCALE: 1/8" = 1'-0"

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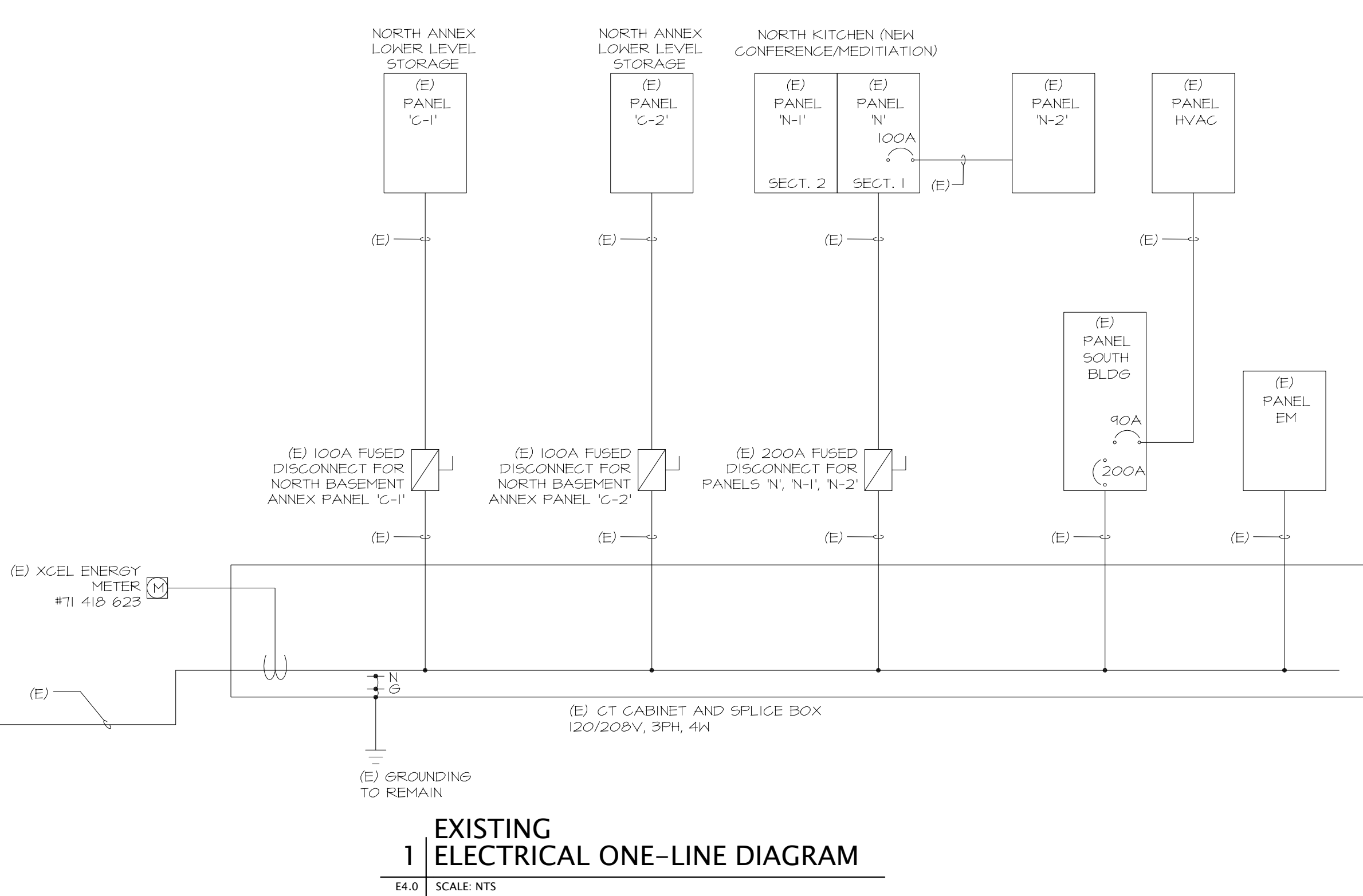
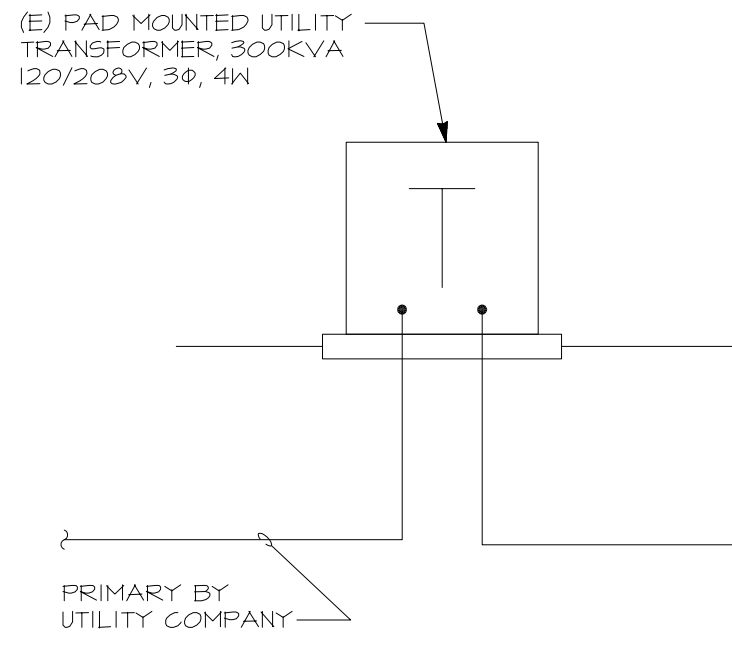
ELECTRICAL
MAIN LEVEL LIGHTING PLAN
Drawing Number:

File: **NOTICE: DUTY OF COOPERATION**
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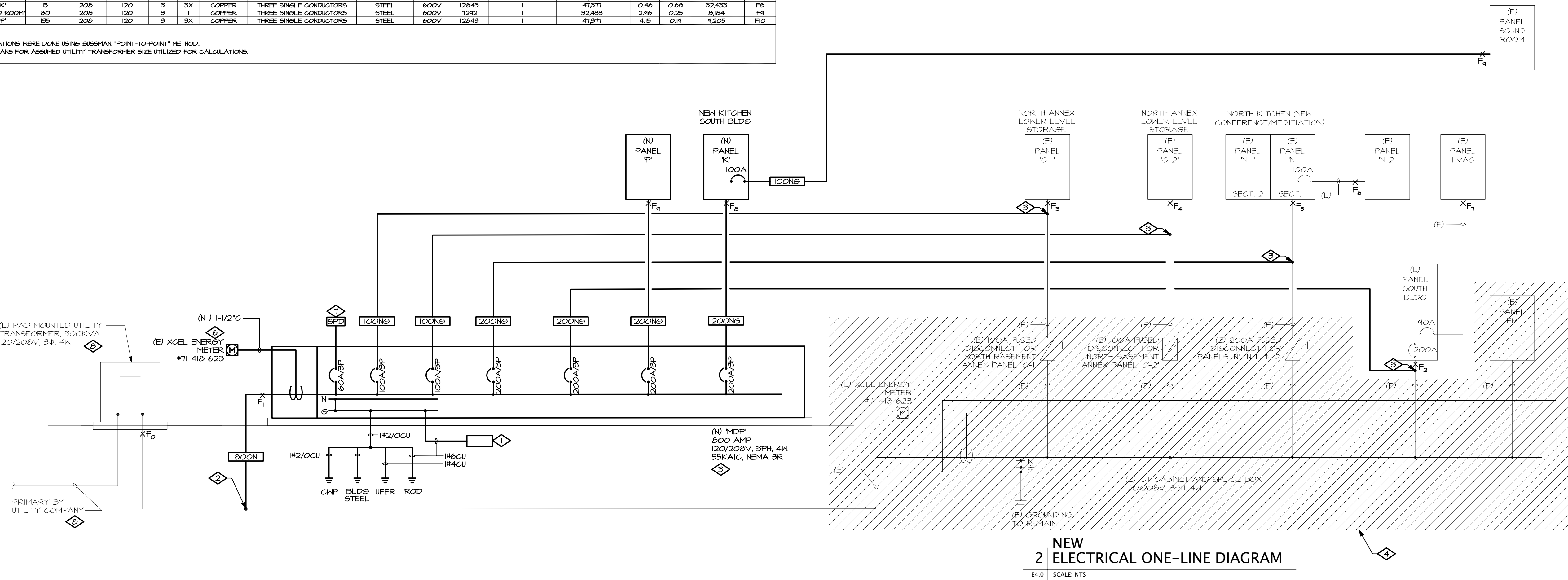
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FEEDER SCHEDULE			
KEY/ SERVICE ENTRANCE	FEEDER CONDUIT AND CONDUCTORS	KEY/ SDS XFMR FEEDERS (NOTE 1)	FEEDER CONDUIT AND CONDUCTORS
400N	2(4#3/0, 2" C)	30S	4#10, #12, 3/4" C
600N	2(4#3/0, 3" C)	50S	4#6, #12, 1-1/4" C
800N	2(4#500, 3-1/2" C)	100S	4#1, #16, 1-1/2" C
1000N	3(4#400, 3-1/2" C)	150S	4#1/2, #16, 2" C
1200N	4(4#350, 3" C)	250S	4#250, #12, 3" C
1600N	3(4#400, 3-1/2" C)	400S	2(4#3/0, #12, 2" C)
2000N	6(4#400, 3-1/2" C)	500S	2(4#250, #10, 3" C)
2500N	4(4#500, 3-1/2" C)	800S	2(4#500, #12, 3-1/2" C)
3000N	6(4#500, 3-1/2" C)	1000S	3(4#400, #14, 3" C)
3500N	10(4#500, 3-1/2" C)	1600S	3(4#400, #16, 3-1/2" C)
4000N	1(4#500, 3-1/2" C)	2500S	1(4#500, #1500, 3-1/2" C)
EQUIPMENT FEEDERS			
20NS	4#12, #12, 3/4" C	20S	3#12, #12, 3/4" C
30NS	4#10, #10, 3/4" C	30S	3#10, #10, 3/4" C
40NS	4#8, #10, 1" C	40S	3#8, #10, 1" C
50NS	4#6, #10, 1-1/4" C	50S	3#6, #10, 1" C
60NS	4#4, #10, 1-1/4" C	60S	3#4, #10, 1" C
70NS	4#4, #12, 1-1/4" C	70S	3#4, #12, 1-1/4" C
80NS	4#3, #12, 1-1/4" C	80S	3#3, #12, 1-1/4" C
90NS	4#2, #12, 1-1/2" C	90S	3#2, #12, 1-1/4" C
100NS	4#1, #12, 1-1/2" C	100S	3#1, #12, 1-1/2" C
110NS	4#1, #16, 2" C	110S	3#1, #16, 1-1/2" C
120NS	4#1/2, #16, 2" C	120S	3#1/2, #16, 1-1/2" C
150NS	4#1/2, #16, 2" C	150S	3#1/2, #16, 1-1/2" C
175NS	4#2/0, #16, 2" C	175S	3#2/0, #16, 2" C
200NS	4#3/0, #16, 2-1/2" C	200S	3#3/0, #16, 2" C
225NS	4#4/0, #16, 2-1/2" C	225S	3#4/0, #16, 2" C
250NS	4#250, #16, 3" C	250S	3#250, #16, 2-1/2" C
300NS	4#350, #16, 3" C	300S	3#350, #16, 2-1/2" C
350NS	4#500, #16, 3-1/2" C	350S	3#500, #16, 3" C
400NS	2(4#3/0, #16, 2-1/2" C)	400S	2(3#3/0, #16, 2" C)
450NS	2(4#4/0, #16, 2-1/2" C)	450S	2(3#4/0, #16, 2" C)
500NS	2(4#250, #16, 3" C)	500S	2(3#250, #16, 2-1/2" C)
600NS	2(4#350, #16, 3" C)	600S	2(3#350, #16, 2-1/2" C)
700NS	2(4#500, #16, 3-1/2" C)	700S	2(3#500, #16, 3" C)
800NS	2(4#500, #16, 3-1/2" C)	800S	2(3#500, #16, 3" C)
1000NS	3(4#400, #12, 3-1/2" C)	1000S	3(3#400, #12, 3" C)
1200NS	4(4#350, #10, 3" C)	1200S	4(3#350, #10, 3" C)
1600NS	5(4#400, #14, 3-1/2" C)	1600S	5(3#400, #14, 3" C)
2000NS	6(4#400, #12, 3-1/2" C)	2000S	6(3#400, #12, 3" C)
GROUNDING CONDUCTORS			
60	#12, 3/4" C	MECH	SEE MECH SCHEDULE
66	#16, 3/4" C	XFMR	SEE XFMR SCHEDULE
64	#14, 3/4" C		
62	#12, 3/4" C		
610	1-1/0, 3/4" C		
620	1-2/0, 3/4" C		
630	1-3/0, 3/4" C		
NOTES:			
1. FEEDER FOR SECONDARY OF SEPARATELY DERIVED SYSTEM (SDS). GROUND SIZE PER NEC 250.66.			
2. ALL CONDUCTORS ARE SINGLE CONDUCTOR COPPER UNLESS NOTED OTHERWISE. AMPACITY BASED ON NEC TABLE 310.16.			
3. ALL CONDUITS ARE EMT UNLESS NOTED OTHERWISE, FILL RATIOS BASED ON NEC ANNEX C TABLE C1.			

GENERAL NOTES	
A.	EXISTING (E) SHOWN IN LIGHT LINE WEIGHT, NEW (N) WORK IS IN HEAVY LINE WEIGHT, REMOVAL SHOWN AS HATCHED OR (R).
B.	COPPER CONDUCTORS UNLESS NOTED OTHERWISE.
KEYNOTE LEGEND	
KEY	VALUE
◇	1. EXTERNAL TELEPHONE BONDING BRIDGE, SIMILAR TO ARLINGTON #88850.
	2. EC TO INTERCEPT EXISTING UNDERGROUND UTILITY SERVICE AND EXTEND TO NEW MDP LOCATION ON EXTERIOR OF BUILDING. COORDINATE LOCATION IN FIELD WITH OWNER.
	3. EC TO INTERCEPT EXISTING FEEDERS AND EXTEND TO NEW PANEL MDP LOCATION. DO NOT SPLICE WHERE POSSIBLE.
	4. NEW MAIN ELECTRICAL PANEL COORDINATION LOCATION ON BUILDING IN FIELD AND CONNECT TO NEW GROUNDING SYSTEM AS NOTED.
	5. EXISTING ELECTRICAL EQUIPMENT IN LOWER LEVEL ELECTRICAL ROOM TO BE REMOVED BACK TO UPSTREAM CONNECTION LOCATION, INCLUDING ALL CONDUCTORS AND CONDUITS.
	6. EC TO RE-USE EXISTING REMOTE METER SOCKET AND CONNECT TO NEW CT AT PANEL MDP.
	7. EC TO PROVIDE 120/208V, 3-PHASE SURGE PROTECTION DEVICE: 160KA PER PHASE. PROVIDE 4#6, #10, 1" C.
	8. EC TO COORDINATE WITH XCEL ENERGY ON BUILDING RENOVATION WITH THE HELP OF THE ENGINEERING AND DESIGN TEAM TO DETERMINE IF THE EXISTING TRANSFORMER IS ADEQUATELY SIZED FOR THE BUILDING RENOVATION.
	4. XCEL ENERGY IS TO RE-LOCATE THE EXISTING UNDERGROUND PRIMARY FEEDER DUE TO BUILDING ADDITION CONSTRUCTION INTERCEPTING THAT FEEDER. EC TO COORDINATE APPLICATION AND WORK WITH XCEL ENERGY.



FAULT CURRENT CALCULATION SCHEDULE																	
POINT	LOCATION DESCRIPTION	LENGTH (L) (ft)	VOLTAGE (EL-L)	VOLTAGE (EL-N)	PHASE	WIRE SIZE	CONDUCTOR MATERIAL	CONDUCTOR TYPE	CONDUIT MATERIAL	VOLTAGE CLASS	C VALUE	# OF PARALLEL RUNS	Isc AVAILABLE UPSTREAM	F L-L	M L-L	Isc AT EQUIP (80V OR (L-L))	POINT
F0	UTILITY XFMR									600V	22185	2	52000	0.10	0.91	52000	F0
F1	NEW MDP	10	208	120	3	500	COPPER	THREE SINGLE CONDUCTORS	STEEL	600V	12443	1	41371	0.12	0.11	36.244	F1
F2	PANEL 'SOUTH BLDG'	10	208	120	3	3X	COPPER	THREE SINGLE CONDUCTORS	STEEL	600V	12443	1	41371	0.12	0.11	36.244	F2
F3	PANEL 'C-1'	150	208	120	3	1	COPPER	THREE SINGLE CONDUCTORS	STEEL	600V	1242	1	41371	0.12	0.11	51.971	F3
F4	PANEL 'C-2'	155	208	120	3	1	COPPER	THREE SINGLE CONDUCTORS	STEEL	600V	1242	1	41371	0.12	0.11	50.948	F4
F5	PANEL 'N'	135	208	120	3	3X	COPPER	THREE SINGLE CONDUCTORS	STEEL	600V	12443	1	41371	0.12	0.11	36.244	F5
F6	PANEL 'N-2'	5	208	120	3	1	COPPER	THREE SINGLE CONDUCTORS	STEEL	600V	1242	1	41371	0.12	0.11	51.971	F6
F7	PANEL 'HVAC'	5	208	120	3	2	COPPER	THREE SINGLE CONDUCTORS	STEEL	600V	1242	1	41371	0.12	0.11	51.971	F7
F8	PANEL 'K'	15	208	120	3	3X	COPPER	THREE SINGLE CONDUCTORS	STEEL	600V	12443	1	41371	0.12	0.11	36.244	F8
F9	PANEL 'SOUND ROOM'	80	208	120	3	1	COPPER	THREE SINGLE CONDUCTORS	STEEL	600V	1242	1	41371	0.12	0.11	51.971	F9
F10	PANEL 'P'	135	208	120	3	3X	COPPER	THREE SINGLE CONDUCTORS	STEEL	600V	12443	1	41371	0.12	0.11	36.244	F10
NOTES:																	
1. ALL CALCULATIONS WERE DONE USING BUSMAN "POINT-TO-POINT" METHOD.																	
2. REFER TO PLANS FOR ASSIGNED UTILITY TRANSFORMER SIZE UTILIZED FOR CALCULATIONS.																	

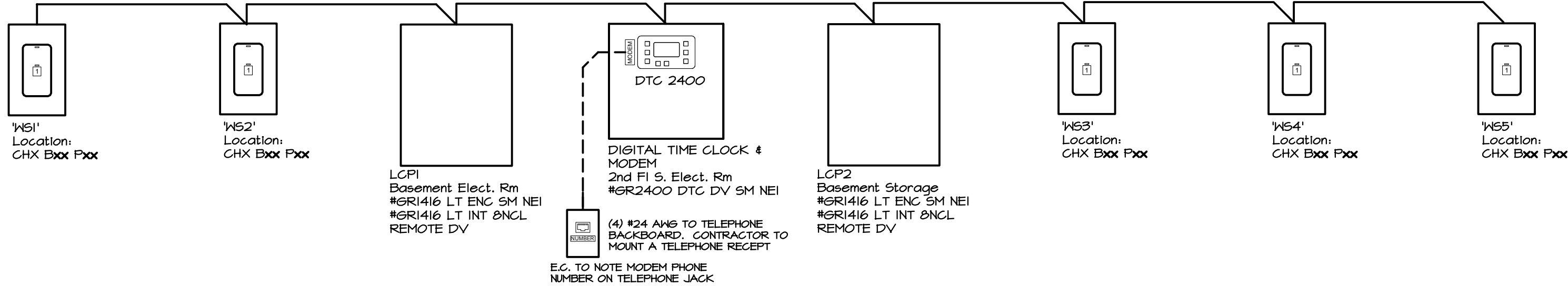


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NOTICE: DUTY OF COOPERATION

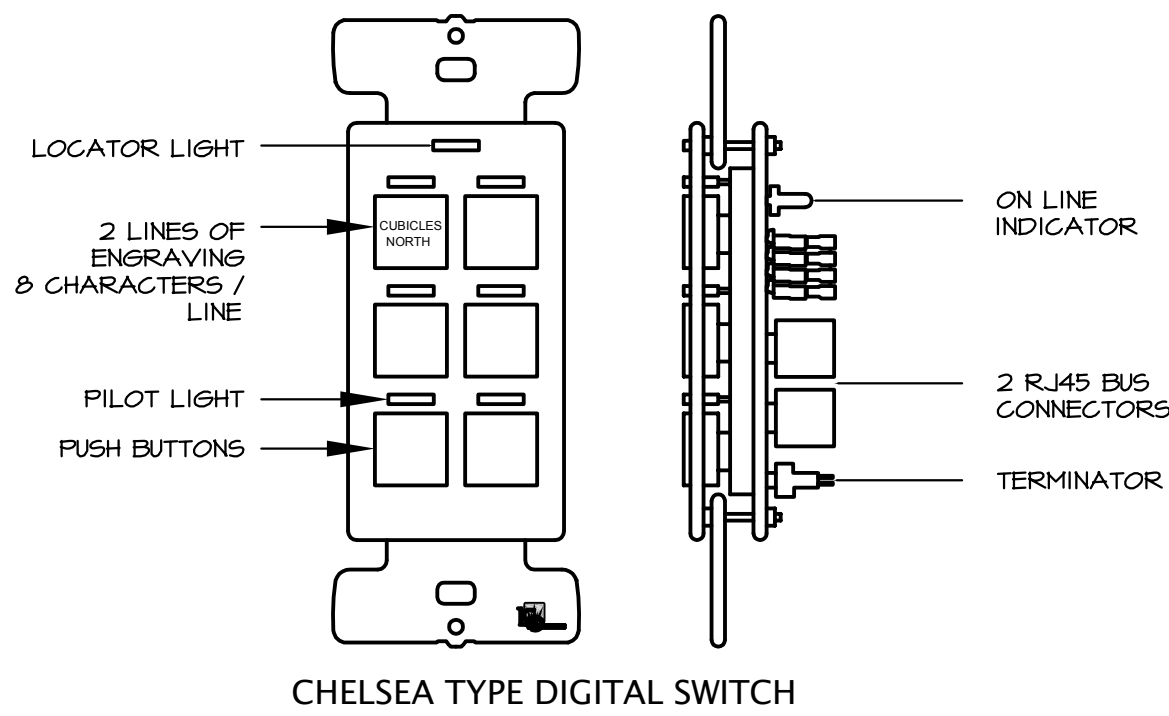
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Permit Set
Date: 08/02/2016
Revisions:



1 LIGHTING CONTROL ONE-LINE DIAGRAM

E6.0 SCALE: NONE



SWITCH NOTES

- LIGHTING CONTROL SYSTEM SHALL BE DIGITAL AND CONSIST OF A MASTER LCP WITH SLAVE PANEL CONNECTION. SWITCH BUTTONS SHALL BE FACTORY ENGRAVED.
- PUSH BUTTONS MAY CONTROL ANY RELAY(S) IN ANY COMBINATION.
- LED PILOT LIGHTS INDICATE STATUS.
- SWITCH LINKED TO THE GR 1400 DIGITAL BUS VIA CAT. 5 PATCH CABLE WITH RJ45 CONNECTORS.
- PROVIDE KEYENABLE DIGITAL KEY SWITCH FOR LOCATIONS AS INDICATED.
- DECORA STYLE FACE PLATE BY CONTRACTOR.

2 DIGITAL SWITCH DETAIL

E6.0 SCALE: N/A

GENERAL NOTES: BUILDING WIDE LIGHTING CONTROL SYSTEM

- LIGHTING CONTROL SYSTEM SHALL BE DIGITAL AND CONSIST OF A MASTER LCP WITH 16 INDIVIDUAL RELAYS, DIGITAL SWITCHES AND DIGITAL INTERFACE CARDS. THERE WILL ALSO BE THREE ADDITIONAL 16 RELAY PANELS THAT WILL ALL COMMUNICATE WITH EACH OTHER. EACH RELAY SHALL BE SWITCHABLE. ALL SYSTEM COMPONENTS SHALL CONNECT IN A "DAISY CHAIN" STYLE CONFIGURATION AND BE CONTROLLED VIA CATEGORY 5 PATCH CABLE WITH RJ45 CONNECTORS, PROVIDING REAL-TIME TWO-WAY COMMUNICATION WITH EACH SYSTEM COMPONENT. ANALOG SYSTEMS ARE NOT ACCEPTABLE. ALL CABLES SUPPLIED BY CONTRACTOR.
- RELAY PANELS SHALL BE PRE-WIRED, PRE-ASSEMBLED, PREPROGRAMMED AND LISTED TO UL 916 (NORMAL) OR ETL LISTED TO UL924 (EMERGENCY). PANELS SHALL BE PROVIDED WITH DUAL VOLTAGE POWER SUPPLY AND 16 GAGE BARRIERS TO SEPARATE HIGH AND LOW VOLTAGE, NORMAL AND EMERGENCY POWER.
- ELECTRICAL CONTRACTOR SHALL COORDINATE PRE-PROGRAMMING SCHEDULE OF OPERATION WITH OWNER PRIOR TO PREPARING SUBMITTALS.
- STANDARD RELAYS SHALL HAVE NORMALLY CLOSED (NC) CONTACTS RATED FOR 120/277V 20A TUNGSTEN, BALLAST OR HID. STANDARD RELAYS SHALL BE ZERO-CROSS TYPE. NO EXCEPTIONS. OPTIONAL 600V, 2-POLE RELAY, NO OR NC, AND 34T SINGLE POLE RELAY SHALL BE AVAILABLE.
- ALL INCANDESCENT LIGHTING CIRCUITS SHALL BE CONTROLLED BY A NC/SOFTSTART RELAY. NO EXCEPTIONS.
- RELAY PANEL ELECTRONICS SHALL PROVIDE CURRENT VISUAL STATUS AND CONTROL OF EACH RELAY OR ZONE. ALL SYSTEM CONTROL ELECTRONICS SHALL STORE PROGRAMMING IN A NON-VOLATILE MEMORY AND PROVIDE 10 YEAR BATTERY BACK UP FOR TIME OF DAY.
- LIGHTING CONTROL SYSTEM SHALL CONSIST OF MASTER AND SLAVE PANEL(S) CONTROLLED BY A 32-CHANNEL DIGITAL TIME CLOCK (DTC) THAT CONTROLS AND PROGRAMS THE ENTIRE LIGHTING CONTROL SYSTEM. THE DTC SHALL SUPPLY ALL TIME FUNCTIONS AND ACCEPT OTHER INPUTS. THE DTC SHALL ACCEPT CONTROL LOCALLY USING BUILT IN BUTTON PROMPTS AND USE OF AN 8 LINE 21-LETTER DISPLAY, FROM A COMPUTER, MODEM, ETHERNET OR INTERNET. ALL COMMANDS SHALL BE IN PLAIN ENGLISH. HELP PAGES SHALL DISPLAY ON THE DTC SCREEN.
- ALL SWITCHES SHALL COMMUNICATE VIA RS 485, CAT 5 PATCH CABLE WITH RJ45 CONNECTORS. CONTACT CLOSURE STYLE SWITCHES ARE NOT ACCEPTABLE. ANY SWITCH BUTTON FUNCTION SHALL BE ABLE TO BE CHANGED LOCALLY (AT THE DTC OR A PC) OR REMOTELY, VIA MODEM, ETHERNET OR INTERNET. REFER TO SINGLE LINE DIAGRAM FOR WIRING DETAILS. SWITCHES WHICH CANNOT BE PROGRAMMED REMOTELY SHALL NOT BE ACCEPTABLE.
- LIGHTING CONTROL SYSTEM INTERFACES TO INCLUDE A DRY CONTACT INPUT INTERFACE, BMS INTERFACE, DIMMING SYSTEM INTERFACE, ETHERNET/INTERNET INTERFACE AND AN INTERFACE TO SMARTBREAKER PANEL BOARDS. VERIFY AND INSTALL ONLY THOSE INTERFACES INDICATED ON THE PLANS.
- TELEPHONE FACTORY DIAL-UP SUPPORT SHALL BE AVAILABLE AT NO ADDITIONAL COST TO THE EC OR OWNER BOTH DURING AND AFTER THE 3 YEAR WARRANTY PERIOD. FACTORY TO PREPROGRAM THE LIGHTING CONTROL SYSTEM PER PLANS AND APPROVED SUBMITTAL. THE LIGHTING CONTROL MANUFACTURER, AT NO ADDED COST, SHALL PROVIDE ADDITIONAL PROGRAMMING VIA MODEM AS REQUIRED BY THE EC OR OWNER FOR THE OPERATIONAL LIFE OF THE SYSTEM. MANUFACTURER WARRANTIES THAT THE DTC SOFTWARE CAN BE UPGRADED AND MONITORED REMOTELY. NO EXCEPTIONS.
- SHOP DRAWINGS: SUBMIT DIMENSIONED DRAWINGS OF LIGHTING CONTROL SYSTEM AND ACCESSORIES INCLUDING, BUT NOT NECESSARILY LIMITED TO, RELAY PANELS, SWITCHES, DTC, PHOTOCELLS AND OTHER INTERFACES. DRAWINGS SHALL INDICATE EXACT LOCATION AND PROGRAMMING OF EACH DEVICE. INDICATE ALL TIME SCHEDULES AND SWITCH BUTTON ENGRAVINGS.
- BUILDING LIGHTING CONTROL SYSTEM SHALL INCLUDE A MINIMUM OF 4 HOURS OF MANUFACTURER'S REPRESENTATIVE TIME ON SITE FOR SYSTEM CHECK-OUT AND OWNER TRAINING. ELECTRICAL CONTRACTOR SHALL VIDEO TAPE TRAINING SESSION AND PROVIDE COPY OF THAT VIDEO TO OWNER AS PART OF PROJECT COMPLETION SUBMITTALS.

LIGHTING RELAY PANEL SCHEDULE

PANEL NAME: LCP2			MANUFACTURER: WATTSTOPPER, LC4D, OR EQUAL					
PANEL LOCATION: BASEMENT SANCTUARY STORAGE			CATALOG #:					
SUPPLY CIRCUIT:								
CONT	LINE FEED	LOAD DESCRIPTION	RELAY TYPE	RELAY NUMBER	RELAY TYPE	LOAD DESCRIPTION	LINE FEED	CONT
SEQ								SEQ
CI	NI-3	SANCTUARY SEATING	120V/POLE	1	2	120V/POLE	SANCTUARY Dais	NI-3
CI	NI-1	OUTER CEILING LIGHTS	120V/POLE	3	4	120V/POLE	INNER CEILING LIGHTS	NI-1
CI	NI-5	TRACK HOUSE LEFT	120V/POLE	5	6	120V/POLE	TRACK HOUSE RIGHT	NI-5
		SPARE	120V/POLE	7	8	120V/POLE	SPARE	
		SPARE	120V/POLE	9	10	120V/POLE	SPARE	
		SPARE	120V/POLE	11	12	120V/POLE	SPARE	
		SPARE	120V/POLE	13	14	120V/POLE	SPARE	
		SPARE	120V/POLE	15	16	120V/POLE	SPARE	

NOTES:

CONTROL SEQUENCE
CI ON AT 6AM, OFF AT 10PM. CONFIRM WITH OWNER.

LIGHTING RELAY PANEL SCHEDULE

PANEL NAME:		LCPI	MANUFACTURER:			WATTSTOPPER, LC4D, OR EQUAL		
PANEL LOCATION:		BASEMENT MECH/ELEC ROOM	CATALOG #:					
SUPPLY CIRCUIT:								
CONT	LINE FEED	LOAD DESCRIPTION	RELAY TYPE	RELAY NUMBER	RELAY TYPE	LOAD DESCRIPTION	LINE FEED	CONT
SEQ								SEQ
C2	NI-5	ENTRY VESTIBULE	120V/POLE	1	2	120V/POLE	FRIENDSHIP HALL	EXISTING
CI	NI-4	LOUNGE/LIBRARY	120V/POLE	3	4	120V/POLE	BASEMENT CORRIDOR	C2-12
CI	NI-4	LOUNGE/LIBRARY EM	120V/POLE	5	6	120V/POLE	BASEMENT CORRIDOR EM	C2-12
CI	C2-12	EDUCATION CENTER	120V/POLE	7	8	120V/POLE	OPEN OFFICE/WORK ALCOVE	NI-1
CI	C2-12	EDUCATION CENTER EM	120V/POLE	9	10	120V/POLE	OPEN OFFICE EM	NI-1
		SPARE	120V/POLE	11	12	120V/POLE	SPARE	
		SPARE	120V/POLE	13	14	120V/POLE	SPARE	
		SPARE	120V/POLE	15	16	120V/POLE	SPARE	

NOTES:

CONTROL SEQUENCE
CI ON AT 6AM, OFF AT 10PM. CONFIRM WITH OWNER.
C2 ON AT DUSK, OFF AT DAWN.



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ELECTRICAL
LIGHTING CONTROLS

Drawing Number:

E6.0

File:

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ELECTRICAL
LIGHTING CONTROLS

Drawing Number:

E6.1

Sheet: of:
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COMcheck Software Version 4.0.3.0 Interior Lighting Compliance Certificate

Section 1: Project Information

Energy Code: **2009 IECC**
Project Title:
Project Type: Alteration
Construction Site: Owner/Agent: Designer/Contractor:

Section 2: Interior Lighting and Power Calculation

A Area Category	B Floor Area (ft ²)	C Allowed Watts /ft ²	D Allowed Watts (B x C)
101-Sanctuary (Religious Building)	23306	1.3	30298
Total Allowed Watts =			30298

Section 3: Interior Lighting Fixture Schedule

A Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixtures	D Fixture Watt.	E (C X D)
101-Sanctuary (Religious Building 23306 sq.ft.)				
LED 1: D1: High Ceiling LED Downlight; Other:	1	39	41	1599
LED 4: W1: Ceiling wash; Other:	1	20	75	1500
LED 2: D2: Recessed Gen DL; Other:	1	90	16	1440
LED 3: D3: Recessed Wallwasher; Other:	1	9	16	144
LED 5: W5: 6" LINEAR WALL MOUNT; Other:	1	3	33	99
LED 6: W6: 8" LINEAR WALL MOUNT; Other:	1	2	44	88
LED 7: D4: SURFACE DOWNLIGHT; Other:	1	28	10	280
Linear Fluorescent 1: F1: 4' Fluor Strip: 48" T8 32W (Super T8); Electronic:	2	43	67	2881
Incandescent 2: P2: Deco Recept; Incandescent 75W:	1	2	75	150
LED 16: L1: Linear Wall wash; Other:	1	6	24	144
LED 17: (E): 18W LED Par replacement; Other:	1	31	18	558
Incandescent 3: W2: Deco wall sconce; Incandescent 100W:	1	7	100	700
Linear Fluorescent 9: P3: 4' section D11 linear pendant: 48" T8 32W; Electronic:	1	4	32	128
Linear Fluorescent 5: S1: Kitchen Light: 48" T8 32W (Super T8); Electronic:	3	9	100	900
Incandescent 7: (E): 100W Can Light; Incandescent 100W:	1	31	100	3100
Incandescent 8: (E): 60W Can Light; Incandescent 60W:	1	2	60	120
Linear Fluorescent 6: S2: Surface Mount, Volumetric; 48" T8 32W (Super T8); Electronic:	2	32	67	2144
Linear Fluorescent 9: S4: 2x4 Surface Mount: 48" T8 32W (Super T8); Electronic:	2	6	67	536
Linear Fluorescent 11: W4: 24" Bath vanity: 24" T8 17W; Electronic:	1	2	18	36
Linear Fluorescent 10: W3: 48" Bath vanity: 48" T8 32W (Super T8); Electronic:	1	4	34	136
Linear Fluorescent 10: (E): Existing 2x4, 4x32T8: 48" T8 32W (Super T8); Magnetic:	4	16	131	2096
Incandescent 1: P1: Deco Library Lounge; Incandescent 100W:	1	2	100	200
Compact Fluorescent 1: S3: Surface Mount, Coat: Quad 4-pin 13W; Electronic:	2	2	32	64
Total Proposed Watts =			19043	

Section 4: Requirements Checklist

Interior Lighting PASSES	
Lighting Wattage:	
<hr/>	
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COMcheck Software Version 4.0.3.0 Exterior Lighting Compliance Certificate

Section 1: Project Information

Energy Code: **2009 IECC**
Project Title:
Project Type: Alteration
Exterior Lighting Zone: 2 (Residential mixed use area)
Construction Site: Owner/Agent: Designer/Contractor:

Section 2: Exterior Lighting Area/Surface Power Calculation

A Exterior Area/Surface	B Quantity	C Allowed Watts / Unit	D Tradable Wattage	E Allowed Watts (B x C)	F Proposed Watts
Entry Canopy (Entry canopy)	409 ft2	0.25	Yes	102	128
Entry Doors (Other door (not main entry))	12 ft of door width	20	Yes	240	81
Total Tradable Watts* =				342	210
Total Allowed Watts =				342	
Total Allowed Supplemental Watts** =				600	

* Wattage tradeoffs are only allowed between tradable areas/surfaces.
** A supplemental allowance equal to 600 watts may be applied toward compliance of both non-tradable and tradable areas/surfaces.

Section 3: Exterior Lighting Fixture Schedule

A Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixtures	D Fixture Watt.	E (C X D)
Entry Canopy (Entry canopy 409 ft2); Tradable Wattage				
LED 1: EW1: Other:	1	1	20.4	20.4
LED 2: EW2: Other:	1	6	18	108
Entry Doors (Other door (not main entry) 12 ft of door width); Tradable Wattage				
LED 4: EW1: Other:	1	4	20.4	81.6
Total Tradable Proposed Watts =			210	

Section 4: Requirements Checklist

Lighting Wattage:
<input type="checkbox"/> 1. Within each non-tradable area/surface, total proposed watts must be less than or equal to total allowed watts. Across all tradable areas/surfaces, total proposed watts must be less than or equal to total allowed watts. Compliance: Passes.

Controls, Switching, and Wiring:

- ☐ 2. All exemption claims are associated with fixtures that have a control device independent of the control of the nonexempt lighting.
- ☐ 3. Lighting not designated for dusk-to-dawn operation is controlled by either a a photosensor (with time switch), or an astronomical time switch.
- ☐ 4. Lighting designated for dusk-to-dawn operation is controlled by an astronomical time switch or photosensor.
- ☐ 5. All time switches are capable of retaining programming and the time setting during loss of power for a period of at least 10 hours.

Exterior Lighting Efficacy:

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- ☐ 1. Total proposed watts must be less than or equal to total allowed watts.

Allowed Watts	Proposed Watts	Complies
30298	19043	Passes

Controls, Switching, and Wiring:

- ☐ 2. Daylight zones under skylights more than 15 feet from the perimeter have lighting controls separate from daylight zones adjacent to vertical fenestration.
- ☐ 3. Daylight zones have individual lighting controls independent from that of the general area lighting.
- Exceptions:
- ☐ Contiguous daylight zones spanning no more than two orientations are allowed to be controlled by a single controlling device.
- ☐ Daylight spaces enclosed by walls or ceiling height partitions and containing two or fewer light fixtures are not required to have a separate switch for general area lighting.
- ☐ 4. Independent controls for each space (switch/occupancy sensor).

- Exceptions:
- ☐ Areas designated as security or emergency areas that must be continuously illuminated.
- ☐ Lighting in stairways or corridors that are elements of the means of egress.
- ☐ 5. Master switch at entry to hotel/motel guest room.
- ☐ 6. Individual dwelling units separately metered.
- ☐ 7. Medical task lighting or art/history display lighting claimed to be exempt from compliance has a control device independent of the control of the nonexempt lighting.
- ☐ 8. Each space required to have a manual control also allows for reducing the connected lighting load by at least 50 percent by either controlling all luminaires, dual switching of alternate rows of luminaires, alternate luminaires, or alternate lamps, switching the middle lamp luminaires independently of other lamps, or switching each luminaire or each lamp.

- Exceptions:
- ☐ Only one luminaire in space.
- ☐ An occupant-sensing device controls the area.
- ☐ The area is a corridor, storeroom, restroom, public lobby or sleeping unit.
- ☐ Areas that use less than 0.6 Watts/sq.ft.
- ☐ 9. Automatic lighting shutoff control in buildings larger than 5,000 sq.ft.

- Exceptions:
- ☐ Sleeping units, patient care areas; and spaces where automatic shutoff would endanger safety or security.
- ☐ 10. Photocell/astronomical time switch on exterior lights.

- Exceptions:
- ☐ Lighting intended for 24 hour use.
- ☐ 11. Tandem wired one-lamp and three-lamp ballasted luminaires (No single-lamp ballasts).

- Exceptions:
- ☐ Electronic high-frequency ballasts; Luminaires on emergency circuits or with no available pair.

Section 5: Compliance Statement

Compliance Statement: The proposed lighting alteration project represented in this document is consistent with the building plans, specifications and other calculations submitted with this permit application. The proposed lighting alteration project has been designed to meet the 2009 IECC, Chapter 8, requirements in COMcheck Version 4.0.3.0 and to comply with the mandatory requirements in the Requirements Checklist.

Name - Title Signature Date

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- ☐ 6. All exterior building grounds luminaires that operate at greater than 100W have minimum efficacy of 60 lumen/watt.

- Exceptions:
- ☐ Lighting that has been claimed as exempt and is identified as such in Section 3 table above.
- ☐ Lighting that is specifically designated as required by a health or life safety statute, ordinance, or regulation.
- ☐ Emergency lighting that is automatically off during normal building operation.
- ☐ Lighting that is controlled by motion sensor.

Section 5: Compliance Statement

Compliance Statement: The proposed exterior lighting design represented in this document is consistent with the building plans, specifications and other calculations submitted with this permit application. The proposed lighting system has been designed to meet the 2009 IECC requirements in COMcheck Version 4.0.3.0 and to comply with the mandatory requirements in the Requirements Checklist.

Name - Title Signature Date