

NOTE:  
ABBREVIATIONS USED ON DRAWINGS IN GENERAL ARE LISTED BELOW. REFER TO CSI SECTION 01420 FOR ANY ABBREVIATIONS LISTED ON THE DRAWINGS BUT ARE NOT LISTED BELOW.

A	AMPS
AC	AIR CONDITIONING
AFB	ABOVE FINISH FLOOR
APG	ABOVE FINISH GRADE
BRKR	BREAKER
C	CONDUIT
CH	CABINET HEATER
CKT	CIRCUIT
DISTR	DISTRIBUTION
EF	EXHAUST FAN
ELEC	ELECTRICAL
EM	EMERGENCY
EMT	ELECTRICAL METALLIC TUBING
ER	EXISTING DEVICE TO BE REMOVED
EX	EXISTING DEVICE TO REMAIN
F	FUSE
F5	FUSIBLE SWITCH
G	GROUND
GFI	GROUND FAULT INTERRUPTING PROTECTION
GRG	GALVANIZED RIGID CONDUIT
HP	HORSEPOWER
J	JUNCTION BOX
KVA	KILOVOLT AMPERE
KW	KILOWATTS
MECH	MECHANICAL
MTD	MOUNTED
NE	NEW LOCATION OF EXISTING RELOCATED DEVICE
NIC	NOT IN CONTRACT
NL	NIGHTLIGHT
NTS	NOT TO SCALE
O/C	ON CENTER
P	POLE
FNL	PANEL
PH	PHASE
RR	REMOVE AND RELOCATED EXISTING DEVICE
SW	SWITCH
TYP	TYPICAL
UON	UNLESS OTHERWISE NOTED
V	VOLTS
VIF	VERIFY IN FIELD
W	WATTS
WP	WEATHERPROOF TYPE DEVICE
WG	WIRE GUARD
F4I	FURNISH AND INSTALL

Diagram illustrating a single-line diagram for a power system. The diagram shows a horizontal line representing a power bus. Labels and their corresponding parts are as follows:

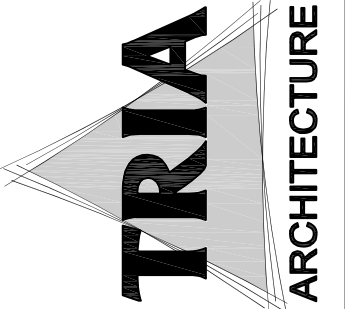
- PP-1** and **13.5**: Labels pointing to the bus on the left side.
- PHASE CONDUCTOR(S), SWITCH LEG OR GO-BETWEEN**: Label pointing to the top of the bus.
- NEUTRAL CONDUCTOR(S)**: Label pointing to the middle of the bus.
- GROUND CONDUCTOR(S)**: Label pointing to the bottom of the bus.
- ALL CONDUCTORS #12 AWG UNLESS OTHERWISE NOTED**: Label pointing to the bus on the right side.
- PANEL DESIGNATION**: Label pointing to the bus on the right side.
- CIRCUIT NO. DESIGNATION**: Label pointing to the bus on the right side.

1. NOTES:  
ALL WIRING SHALL BE #2 AWG, UNLESS OTHERWISE NOTED.
2. MINIMUM CONDUIT SIZE SHALL BE 3/4" EXCEPT FOR THREE (3) WIRES OR LESS, OR CONTROL WIRING WITHIN BUILDINGS, WHICH MAY BE 1/2" CONDUIT.
3. 1/2" FLEXSTEEL, GREENFIELD OR SEALITE SHALL BE THE MINIMUM SIZE INSTALL.

Diagram illustrating the door power supply and wiring connections:

- DOOR POWER SUPPLY MOUNTED ABOVE THE CEILING. FURNISH BY THE DOOR HARDWARE SUPPLIER AND INSTALLED BY THE ELECTRICAL CONTRACTOR. INTERFACE UNIT TO THE CARD ACCESS SYSTEM TO CONTROL AND MONITOR DOORS.
- ELECTRICAL CONNECTION PROVIDED FOR THE DOOR POWER SUPPLY, REFER TO THE PLAN FOR CIRCUIT INFORMATION.
- LOW VOLTAGE WIRING ROUTED TO THE CARD ACCESS SYSTEM TO CONTROL.
- LOW VOLTAGE WIRING ROUTED TO THE SECURITY SYSTEM TO MONITOR.
- CEILING LINE
- ROUTE 3/4" C. CONDUIT FROM DOOR POWER SUPPLY TO THE DOOR MULLION.
- ROUTE 3/4" C. CONDUIT FROM THE ACCESSIBLE CEILING TO THE DOOR MULLION.
- 15'-0" WIRING HARNESS ROUTED FROM THE DOOR LOCK TO THE POWER SUPPLY ABOVE THE CEILING. FURNISHED BY THE DOOR HARDWARE SUPPLIER AND INSTALLED BY THE ELECTRICAL CONTRACTOR.
- SYM DC (Symbol for Door Control)
- SYM CA (Symbol for Card Access)

<p>A. WORK SHALL COMPLY WITH LOCAL, STATE AND NATIONAL ELECTRICAL CODES, AMERICANS WITH DISABILITIES ACT.</p>	<p>M. COORDINATE NEW INSTALLATIONS WITH EXISTING SYSTEMS. RELOCATE EXISTING LIGHTING, CONDUIT, EQUIPMENT, ETC., AS NECESSARY FOR NEW INSTALLATIONS.</p>	<p>DD. WIRE COLOR CODING SHALL BE COORDINATED THROUGHOUT THE ENTIRE PROJECT/BUILDING FOR NEW AND EXISTING SYSTEMS.</p>
<p>B. THE PANEL SCHEDULES ARE PROVIDED FOR ASSISTANCE ONLY IN UNDERSTANDING THE LOADING ON THE VARIOUS CIRCUITS AND THE CIRCUIT DESIGNATIONS DESIRED FOR THE PANEL DIRECTORIES. THE PANEL SCHEDULES MUST BE BALANCED UPON COMPLETION OF THE PROJECT TO COMPLY WITH CODE. IN ADDITION, THE PANEL SCHEDULES DO NOT IDENTIFY THE TYPES OF CIRCUIT BREAKERS TO BE USED (SUCH AS GFCI, HACR, SHUNT TRIP UNITS, ETC.) NOR DO THE SCHEDULES IDENTIFY CIRCUIT BREAKERS REQUIRED WIRING (SUCH AS FEEDING LARGE PROTECTION UNITS). REFER TO THE REST OF THE DRAWINGS AND THE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS AND DETAILED INFORMATION.</p>	<p>N. PROVIDE NEW PANEL DIRECTORIES IN EXISTING MODIFIED PANELBOARDS AND NEW PANELBOARDS TO CORRECTLY IDENTIFY EXISTING AND NEW LOADS. FINAL DIRECTORIES SHALL BE TYPE WRITTEN.</p> <p>O. EXISTING LIGHTING FIXTURES, ELECTRICAL DEVICES, CONDUIT, ETC., SHALL BE REMOVED AS NOTED ON DRAWINGS AND AS REQUIRED TO MEET NEW SCOPE OF WORK. SUCH REMOVED ELECTRICAL EQUIPMENT SHALL REMAIN PROPERTY OF THE OWNER AND SHALL BE PROPERLY STORED ON SITE, OR DESIGNATED TO BE ABANDONED AND REMOVED FROM SITE AS DIRECTED BY OWNER.</p>	<p>EE. IF MORE THAN THREE (3) PHASE (UNGROUND) CONDUCTORS ARE RUN IN THE SAME RACEWAY, CONDUCTOR AMPACITY SHALL BE DERATED IN ACCORDANCE WITH NEC ARTICLE 310.</p> <p>FF. CONDUIT, LIGHTING, EQUIPMENT, ETC. SHALL NOT BE SUPPORTED FROM THE BOTTOM CHORD OF ENGINEERED JOISTS WITHOUT WRITTEN APPROVAL FROM THE STRUCTURAL ENGINEER. CONDUITS, ROUTED THROUGH AREAS WITH NO CEILING, SHALL BE RIGIDLY FASTENED WITHIN THE WEBBING OF THE JOISTS AND SHALL NOT BE ROUTED BELOW THE BOTTOM CHORD OF THE JOIST.</p>
<p>C. COORDINATE EQUIPMENT ELECTRICAL REQUIREMENTS (VOLTAGES, PHASE, LOAD, ETC.) TO AVOID CONFLICTS.</p>	<p>P. PERFORM CUTTING AND PATCHING OF EXISTING FLOOR SLABS AND WALLS AS REQUIRED FOR THE INSTALLATION OF ELECTRICAL SYSTEMS.</p>	<p>GG. SMOKE OR HEAT DETECTORS SHALL BE SURFACE MOUNTED TO CEILING, ROOF DECK MATERIALS, ETC. IN LIEU OF MOUNTING TO BOTTOM CHORD OF ENGINEERED JOIST OR ANY OTHER COMPONENTS NOT AN INTEGRAL PART OF THE HORIZONTAL CEILING.</p>
<p>D. EXCAVATION NECESSARY FOR COMPLETION OF WORK SHALL BE PROVIDED. COORDINATE WITH ONE ANOTHER TO SHARE TRENCHES WHEREVER POSSIBLE.</p>	<p>Q. EXISTING ELECTRICAL DEVICES (RECEPTACLES, SWITCHES, OUTLET BOXES, CONDUIT, ETC.) WITHIN WALLS TO BE REMOVED SHALL BE DISCONNECTED COMPLETELY. REROUTE CIRCUITRY AS REQUIRED TO MAINTAIN CIRCUIT INTEGRITY FOR ALL REMAINING DEVICES/EQUIPMENT. VERIFY EXACT CONDITIONS AND REQUIREMENTS IN FIELD.</p>	<p>HH. VERIFY EXISTING AND NEW MECHANICAL, ELECTRICAL AND FIRE PROTECTION SYSTEMS PRIOR TO START OF NEW CONSTRUCTION. COORDINATE AND ADJUST NEW WORK AS REQUIRED TO AVOID CONFLICTS WITH EXISTING SERVICES AND NEW SERVICES PROVIDED.</p>
<p>E. REFER TO THE PLANS FOR ADDITIONAL ELECTRICAL WORK AND REQUIREMENTS. FURNISH, INSTALL AND LOCATE DISCONNECT SWITCHES AT EQUIPMENT/MOTOR LOCATION, AS REQUIRED, AND IN ACCORDANCE WITH CODE.</p>	<p>R. WHERE NEW CIRCUIT BREAKERS, FUSES AND SWITCHES ARE TO BE ADDED TO EXISTING PANELBOARDS, SWITCHBOARDS, ETC., THEY SHALL BE OF THE SAME MANUFACTURER AND DESIGN AS THE EXISTING BREAKERS OR SWITCHES IF NOT OBSOLETE AND SHALL BE OF THE SIZES AS INDICATED. REARRANGE CIRCUIT BREAKERS WITHIN THE EXISTING EQUIPMENT TO ACCOMMODATE THE NEW CIRCUIT BREAKERS OR SWITCHES. BRANCH CIRCUIT NUMBERS ASSIGNED TO EXISTING PANELBOARDS ARE ARBITRARY AND ARE INTENDED TO INDICATE BRANCH CIRCUIT REQUIREMENTS ONLY. ACTUAL PANEL NUMBER ASSIGNMENTS FOR DESIGNATED BRANCH CIRCUITS SHALL BE ADJUSTED TO MEET FIELD CONDITIONS. PROVIDE ADDITIONAL BUS, BUS EXTENSION, BOLTS AND HARDWARE, ENCLOSURE MODIFICATIONS, DIRECTORY MODIFICATIONS, ETC., AS REQUIRED TO ACCOMPLISH THE WORK.</p>	<p>II. WIRING DEVICES SHOWN BACK-TO-BACK IN WALLS SHALL BE SEPARATED BY 8" MINIMUM.</p>
<p>F. COORDINATE PHASING OF WORK AND PROVIDE TEMPORARY POWER AND SERVICES AS REQUIRED FOR THE IMPLEMENTATION OF WORK WHILE MAINTAINING SERVICES TO PORTIONS OF BUILDING TO REMAIN OCCUPIED.</p>	<p>S. PROVIDE BALLASTS OR WIRE FIXTURES IN TANDEM AS REQUIRED TO ACCOMPLISH THE SWITCHING ARRANGEMENT AS INDICATED ON DRAWINGS. PROVIDE MULTIPLE BALLASTS PER FIXTURE WHERE INDICATED BY MULTIPLE SWITCHES PER FIXTURE ON PLANS. GENERALLY, WHERE MULTIPLE BALLASTS ARE SPECIFIED, PROVIDE MULTIPLE SWITCHES AS REQUIRED TO CONTROL EACH BALLAST IN A FIXTURE SEPARATELY.</p>	<p>JJ. UNLESS OTHERWISE NOTED, DEVICE ELEVATIONS REFER TO CENTER LINE OF JUNCTION BOX. VERIFY JUNCTION BOX LOCATIONS WITH FINAL EQUIPMENT LAYOUT PRIOR TO ROUGHING IN SAME.</p>
<p>G. SCHEDULE WORK TO AVOID DOWNTIME AND INCONVENIENCE TO OWNER. OWNER'S EXISTING FACILITY SHALL REMAIN IN OPERATION AT ALL TIMES, INCLUDING F/A AND OTHER SPECIAL SYSTEMS, ELECTRICAL POWER DISTRIBUTION, ETC. REQUIRED SHUTDOWN OF EXISTING FACILITY UTILITIES SHALL BE SCHEDULED WITH OWNER'S OPERATING PERSONNEL.</p>	<p>T. VERIFY CEILING STYLES/FRAMES AND TYPES BEFORE ORDERING FIXTURES AND CEILING MOUNTED DEVICES. PROVIDE APPROPRIATE STYLES/FRAMES AS REQUIRED TO MATCH CEILING STYLE AND TYPES.</p> <p>U. COORDINATE LIGHTING LAYOUTS WITH CEILING REGISTERS, GRILLES, DIFFUSERS, SPRINKLER HEADS AND CEILING GRID (SEE ARCHITECTURAL REFLECTED CEILING PLAN). VERIFY LOCATION WITH OWNER'S REPRESENTATIVE IN FIELD PRIOR TO INSTALLATION.</p>	<p>KK. FURNISH AND INSTALL A GREEN GROUND WIRE IN POWER CONDUITS (NOT LIGHTING). ALL DEVICES, EQUIPMENT, FIXTURES AND THE LIKE, MUST BE GROUNDED. MECHANICAL/ELECTRICAL BONDS OF THE METALLIC RACEWAY SYSTEM SHALL BE MAINTAINED.</p>
<p>H. LAYOUT IS DIAGRAMMATIC AND INSTALL DEVICES, CONDUIT AND EQUIPMENT TO MEET ACTUAL FIELD CONDITIONS. REVIEW PROJECT SPECIFICATIONS BEFORE STARTING WORK AND SUBMIT COMPLETE SHOP DRAWINGS AS PER SPECIFICATIONS.</p>	<p>V. PROVIDE PLENUM RATED LIGHT FIXTURES IN PLENUM CEILING AREAS WHERE REQUIRED BY LOCAL OR NATIONAL CODES.</p>	<p>LL. PROVIDE CONDUIT AND WIRE AND MAKE FINAL POWER CONNECTIONS AS REQUIRED TO EXHAUST FANS AND MISCELLANEOUS EQUIPMENT FURNISHED WITH MOTORIZED BACKDRAFT DAMPERS. DAMPERS SHALL BE CONNECTED TO EQUIPMENT 120 VOLT POWER CIRCUIT SO AS TO INTERLOCK THE MOTORIZED DAMPER WITH THE EXHAUST FAN. FOR THREE PHASE MOTORS, PROVIDE AN ADDITIONAL 120 VOLT CIRCUIT ROUTED THROUGH AN AUXILIARY CONTACT IN THE MOTOR STARTER.</p>
<p>VISIT SITE PRIOR TO BID TO DETERMINE AND VERIFY EXISTING INTERIOR AND EXTERIOR ELECTRICAL SYSTEMS TO VERIFY QUANTITIES AND LOCATIONS OF EXISTING SYSTEMS TO DETERMINE FULL EXTENT OF WORK. INCLUDE THE NECESSARY MODIFICATIONS TO THE EXISTING CONDITIONS (INCLUDING CEILINGS, WALLS, FLOORS, PIPES, CONDUIT, ROOF WORK, ETC.) AS REQUIRED, TO ALLOW FOR PROPER INSTALLATION OF WORK. ADJUST RETAILATIONS TO MEET FIELD CONDITIONS AS REQUIRED FOR A COMPLETE AND PROPER INSTALLATION. NO EXTRAS WILL BE ALLOWED AFTER BIDDING FOR ANY REWORK OF EXISTING FIELD CONDITIONS TO RESOLVE CONFLICTS OR NOT FULLY UNDERSTANDING THE SCOPE OF THE WORK REQUIRED. EXISTING EQUIPMENT, CONDUIT, PIPING, ETC. SHALL BE REMOVED AS NOTED ON DRAWINGS AND AS REQUIRED TO MEET NEW SCOPE OF WORK.</p>	<p>W. SOME CEILING SPACES ARE RETURN AIR PLENUMS. EXAMINE PLENUM BEFORE CEILING IS INSTALLED (OR REPLACED) AND SEAL ALL OPENINGS AROUND CONDUIT, CABLE, ETC. PROVIDE PLENUM RATED CABLE (UNLESS IN CONDUIT), DEVICES AND EQUIPMENT PER CODE.</p> <p>X. AIM AND ADJUST FIXTURES WITH ADJUSTMENT CAPABILITIES (I.E. TRACK LIGHTING, HIGH BAY LIGHTING, EXTERIOR FIXTURES, ETC.) TO THE SATISFACTION OF THE OWNER'S REPRESENTATIVE.</p>	<p>MM. MODIFY EXISTING FIRE ALARM SYSTEM AS INDICATED ON DRAWINGS AND SPECIFICATIONS AND AS REQUIRED FOR A COMPLETE, CODE COMPLIANT INSTALLATION. FURNISH AND INSTALL INTERFACE WIRING INTEGRAL TO THE FIRE ALARM SYSTEM AS WELL AS INTERFACE TO NEW ELEVATOR CONTROL PANEL. BUILDING AUTOMATION SYSTEM, ETC. SHALL BE COMPLETE AND OPERATING INSTALLATION. QUESTIONS REGARDING THE REQUIREMENTS OF THE FIRE ALARM SYSTEM OR THE INTENT OF THE CODE SHALL BE DIRECTED TO THE ARCHITECT/ENGINEER FOR REVIEW PRIOR TO BID.</p>
<p>J. HIDDEN CONDITIONS IDENTIFIED THROUGH THE COURSE OF CONSTRUCTION SHALL BE IMMEDIATELY BROUGHT TO ATTENTION IN WRITTEN FORM FOR REVIEW AND DIRECTION. FAILURE TO DO SO SHALL REQUIRE THE CHANGES AND COSTS TO CORRECT SAID HIDDEN CONDITION TO BE COMPLETED AT NO COST. EXISTING EQUIPMENT NOT IDENTIFIED SHALL BE BROUGHT TO ATTENTION FOR REVIEW AND DIRECTION TO WHETHER THE EQUIPMENT SHALL REMAIN AND BE RECONNECTED TO THE NEW SERVICES, BE RELOCATED, BE ABANDONED, ETC.</p>	<p>Y. THE MINIMUM DISTANCE BETWEEN SMOKE OR HEAT DETECTORS AND CEILING MOUNTED SUPPLY DIFFUSERS SHALL BE A MINIMUM OF 4 FEET AND WALL MOUNTED DIFFUSERS SHALL BE 10 FEET.</p> <p>Z. WHERE INDICATED ON THE DRAWINGS IN UNFINISHED SPACES, RUN EXPOSED RACEWAYS PARALLEL WITH OR AT RIGHT ANGLES TO WALL.</p>	<p>NN. CONDUIT INSTALLED FOR LOW VOLTAGE SYSTEMS SHALL BE COORDINATED WITH THE LOW VOLTAGE INSTALLER IN FIELD. PRIOR TO ROUGH-IN, SUCH CONDUIT SHALL BE ROUTED TO MINIMIZE CABLE LENGTH AND COMPLY WITH LOW VOLTAGE CABLING DISTANCE LIMITATIONS.</p> <p>OO. THE FLASH RATES FOR FIRE ALARM STROBES SHALL BE SYNCHRONIZED, COORDINATE ADDITIONAL REQUIREMENTS WITH NFPA 12.</p>
<p>K. REMOVE AND REINSTALL EXISTING CEILINGS NOT BEING REPLACED (INCLUDING LIGHTS, MOTION SENSORS, FIRE ALARM DEVICES AND ANY OTHER ELECTRICAL DEVICES AS REQUIRED) WHERE NECESSARY TO REPAIR WORK. THIS ALSO INCLUDES EXISTING CEILINGS OF PLASTER, DRYWALL, ETC. COORDINATE WORK IN CEILING SPACE SO AS TO MINIMIZE THE AMOUNT OF CEILINGS WHICH MUST BE REMOVED AND REINSTALLED. REVIEW THE ENTIRE SET OF CONTRACT DOCUMENTS IN ORDER TO FULLY UNDERSTAND AND INCLUDE CEILING WORK NECESSARY FOR WORK ON THE PROJECT. WHEN THE CEILING WORK IS COMPLETED, CEILING SPACE, REINSTALL EXISTING CEILING DEVICES AND EQUIPMENT AND REPAIR DAMAGE AS REQUIRED TO COMPLETELY MATCH EXISTING CONDITIONS. REPAIR OR REPLACE ANY DAMAGE CAUSED TO EXISTING CEILING AREAS.</p>	<p>AA. NO RACEWAYS SHALL BE INSTALLED WITHIN 6" OF HOT WATER PIPES OR SIMILAR HEAT PRODUCING APPLIANCES.</p> <p>BB. PROVIDE FULL WIRE IN EACH RACEWAY IN WHICH WIRING IS NOT INSTALLED.</p>	<p>PP. REWORK EXISTING ELECTRICAL FEEDERS, CONDUIT AND LOW VOLTAGE WIRING AS REQUIRED FOR INSTALLATION OF NEW STRUCTURAL COMPONENTS REQUIRED TO SUPPORT NEW ROOF MOUNTED EQUIPMENT. FURNISH AND INSTALL ALL CONDUIT, WIRING AND SPLICE BOXES TO MAINTAIN CONTINUITY.</p>
<p>L. REMOVE EXISTING CONSTRUCTION AS REQUIRED AT EXISTING WALLS, FLOORS, FIRE CHIMNEYS, SURFACES FINISHES, ETC. WHICH ARE AFFECTED. REPAIR EXISTING SURFACES AFFECTED TO MATCH EXISTING SURFACE OF EQUAL OR BETTER QUALITY TO THE SATISFACTION OF THE OWNER'S REPRESENTATIVE.</p>	<p>CC. COVERS OF JUNCTION OR PULL BOXES SHALL BE ACCESSIBLE AND IDENTIFY THE LOCATION OF THE FIRE ALARM SYSTEM. JUNCTION BOXES SHALL BE PAINTED</p>	



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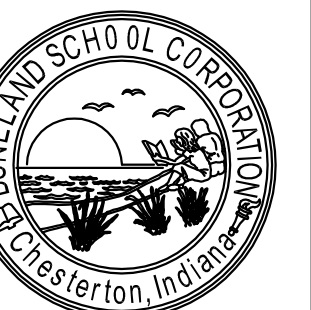
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PROJECT MANAGER: SKR	✓
DRAWN BY:	✓
	✓
	✓
ISSUED FOR BIDDING: 04/20/2015	✓

## SCHEDULES, DETAILS AND DIAGRAMS



E301

