

DUNELAND SCHOOL CORPORATION

BUS BARN FIRE ALARM RENOVATION

1012 N. OLD STATE RD. 49, CHESTERTON, IN 46304

TRIA PROJECT#: 16-026

GENERAL BUILDING CODE REQUIREMENTS

BUILDING CODES REFERENCED:

2012 INTERNATIONAL BUILDING CODE WITH 2014 INDIANA AMENDMENTS

2006 INTERNATIONAL PLUMBING CODE 2ND EDITION AMENDED INDIANA 2012

2008 NATIONAL ELECTRICAL CODE WITH 2009 INDIANA AMENDMENTS

2012 INTERNATIONAL MECHANICAL CODE WITH 2014 INDIANA AMENDMENTS

INDIANA ENERGY CONSERVATION CODE 2010

2012 INTERNATIONAL FIRE CODE WITH 2014 INDIANA AMENDMENTS

2012 INTERNATIONAL FUEL GAS CODE 2ND EDITION WITH 2014 INDIANA AMENDMENTS

OCCUPANCY CLASSIFICATION:

MIXED USE BUSINESS GROUP B AND
LOW HAZARD STORAGE GROUP S-2

TYPE OF CONSTRUCTION

ADMINISTRATION / MAINTENANCE BUILDING - TYPE III-B
EAST BUS BARN - TYPE III-B
WEST BUS BARN - III-B

DESIGN FIRM REGISTRATION:

THOMAS R. SZURGOT
INDIANA LICENSE NUMBER: #A10000173

DRAWING INDEX

T1.00 TITLE SHEET, SITE LOCATION MAP, INDEX, AND GENERAL BUILDING
CODE REQUIREMENTS

ELECTRICAL

E01.0 ADMINISTRATION / MAINTENANCE BUILDING FIRST FLOOR PLAN

-POWER

E01.1 ADMINISTRATION / MAINTENANCE BUILDING LOFT FLOOR PLAN

-POWER

E01.2 EAST AND WEST BUS BARN FLOOR PLANS -POWER

E01.3 ELECTRICAL SPECIFICATIONS

E01.4 FIRE ALARM SPECIFICATIONS

E01.5 ELECTRICAL SYMBOL LIST AND FIRE ALARM SCHEMATIC RISER
DIAGRAM

ARCHITECT:

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M.E.P. CONSULTANT:

MILLIES ENGINEERING GROUP

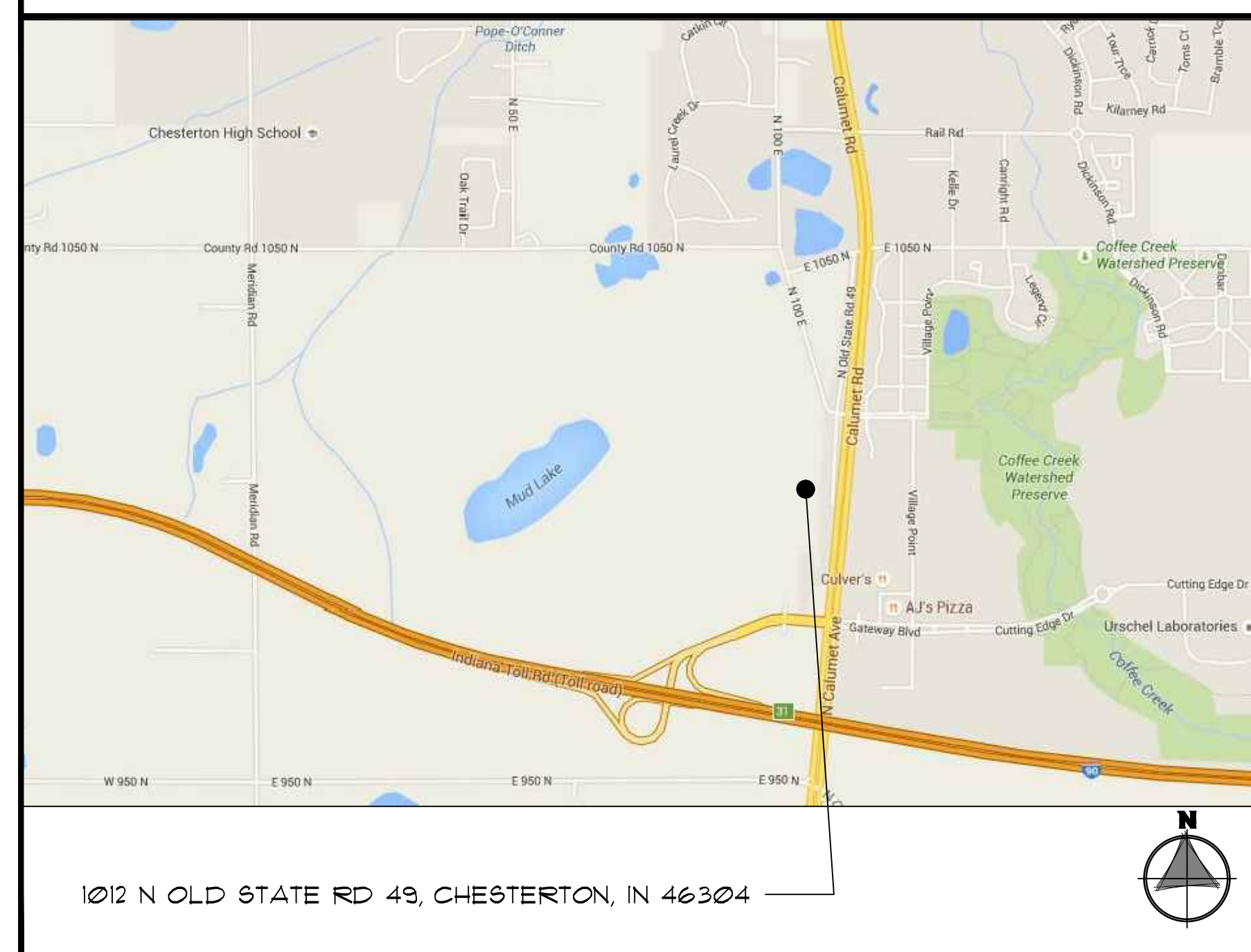
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Munster, Indiana 46321

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www.milliesengineeringgroup.com

SITE LOCATION MAP



GENERAL NOTES

1. ALL THROUGH WALLS AND FLOORS PENETRATIONS SHALL BE
FIRE STOPPED.

ISSUED FOR PROPOSAL:

JUNE 3, 2016

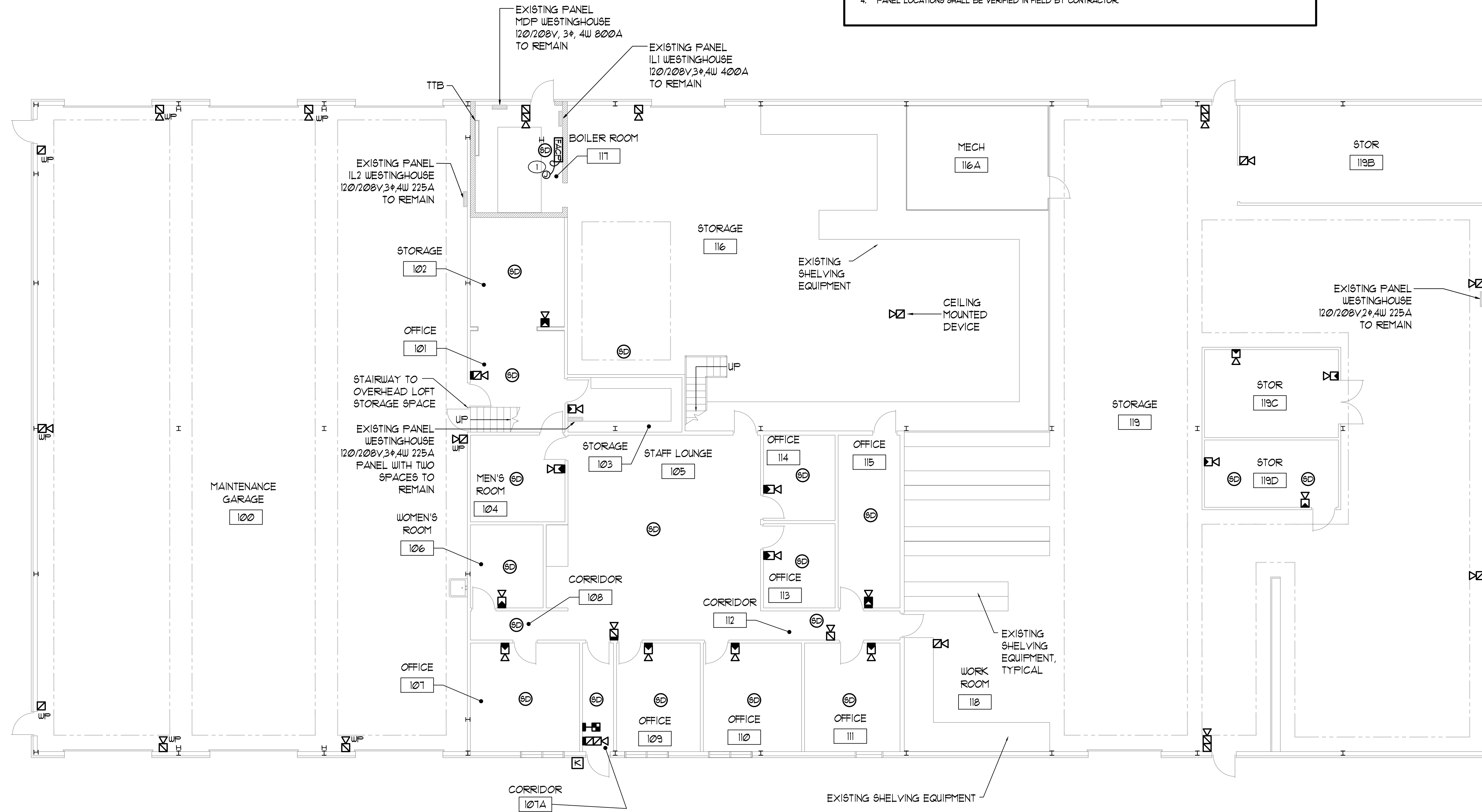
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REVISIONS:

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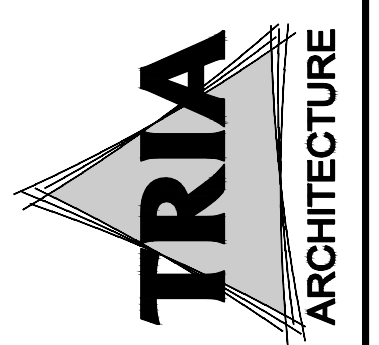
1 ADMINISTRATION/MAINTENANCE BUILDING - FIRST FLOOR PLAN- POWER
1/8" = 1'-0"

GENERAL NOTES

1. ALL DEVICES IN UNFINISHED STORAGE AND GARAGE SPACES SHALL BE MOUNTED TO STEEL FRAMING ONLY. HOLES SHALL NOT BE CUT INTO THE METAL BUILDING.
2. SURFACE MOUNTED RACEWAYS SHALL BE PROVIDED AT ALL OCCUPIED SPACES - COLOR TO BE SELECTED BY ARCHITECT.
3. SURFACE MOUNTED CONDUIT AND KNOCK BOXES ARE TO BE PROVIDED AT ALL STORAGE AND GARAGE SPACES.
4. PANEL LOCATIONS SHALL BE VERIFIED IN FIELD BY CONTRACTOR.

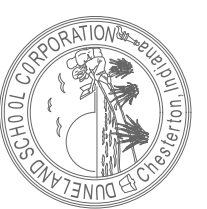
SHEET NOTES

1. ROUTE 4 #2 & 1 #2 GRD. -3/4"C. CONCEALED ABOVE ACCESSIBLE CEILING TO TWO (2) NEW 200A/1P LOCK-ON TYPE CIRCUIT BREAKERS IN AVAILABLE SPACE OF EXISTING WESTINGHOUSE 120/208V PANEL LOCATED IN STORAGE ROOM 103. VERIFY POWER REQUIREMENTS WITH MANUFACTURER AND EXISTING CONDITIONS AND REQUIREMENTS IN FIELD PRIOR TO ROUGH-IN. COMPLETE AS REQUIRED.

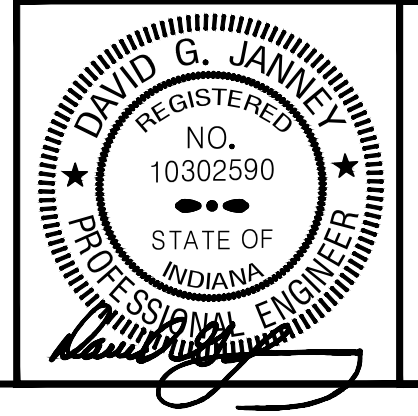


MEP ENGINEER
PROJECT NO. 1400
DATE: 07/23/2024
Miles Engineering Group
5711 W. MARKET ST. #A
MUNSTER, INDIANA 46340

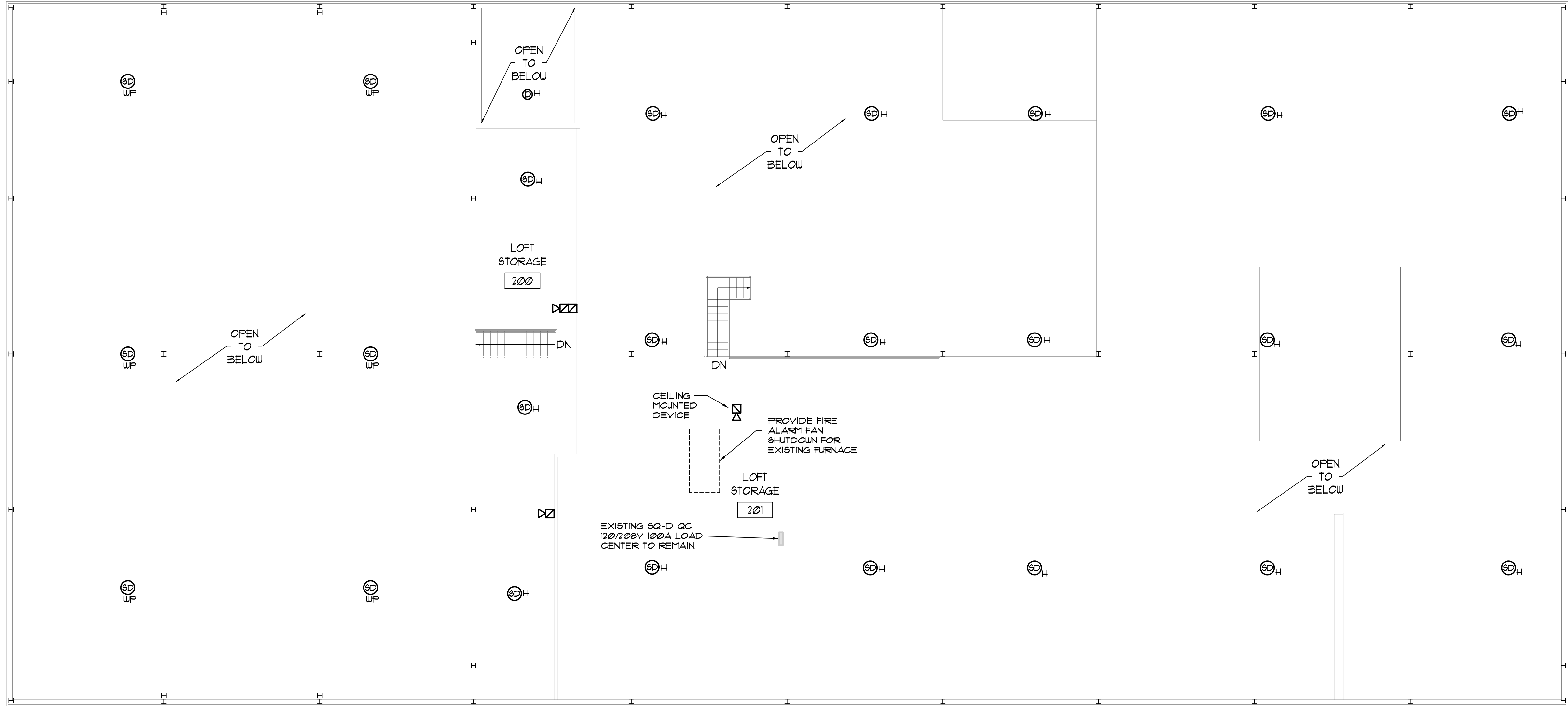
DUNELAND SCHOOL CORPORATION
BUS BARN FIRE ALARM RENOVATION / BUS BARN
ADMINISTRATION / MAINTENANCE BUILDING
1012 N. OLD STATE RD. 49
CHESTERTON, INDIANA 46304



PROJECT NUMBER: 14-006	REVISIONS:
PROJECT MANAGER: FF	1
DRAWN BY: FF	2
ISSUED FOR PROPOSAL: 06/02/2024	3
ADMINISTRATION / MAINTENANCE BUILDING	
FIRST FLOOR PLAN - POWER	



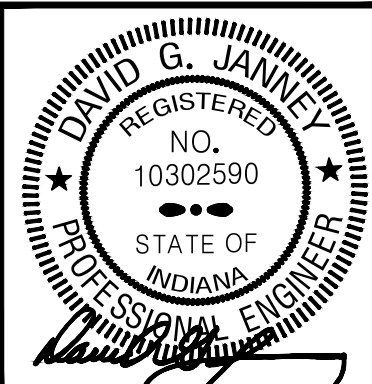
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1 ADMINISTRATION/MAINTENANCE BUILDING - LOFT FLOOR PLAN - POWER
1/8" = 1'-0"

GENERAL NOTES

1. ALL DEVICES IN UNFINISHED STORAGE AND GARAGE SPACES SHALL BE MOUNTED TO STEEL FRAMING ONLY. HOLES SHALL NOT BE CUT INTO THE METAL BUILDING.
2. SURFACE MOUNTED RACEWAYS SHALL BE PROVIDED AT ALL OCCUPIED SPACES - COLOR TO BE SELECTED BY ARCHITECT.
3. SURFACE MOUNTED CONDUIT AND KNOCK BOXES ARE TO BE PROVIDED AT ALL STORAGE AND GARAGE SPACES.
4. PANEL LOCATIONS SHALL BE VERIFIED IN FIELD BY CONTRACTOR.

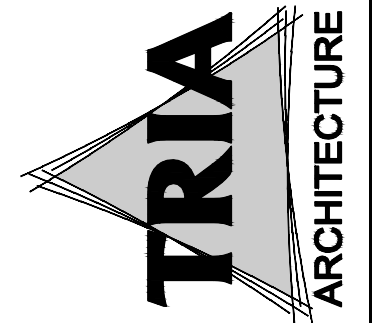


PROJECT NUMBER: E-011	REVISED:
PROJECT MANAGER: FF	
DRAWN BY: FF	
ISSUED FOR PROPOSAL: 06/02/06	
ADMINISTRATION / MAINTENANCE BUILDING LOFT FLOOR PLAN - POWER	



DUNELAND SCHOOL CORPORATION
BUS BARN FIRE ALARM RENOVATION
ADMINISTRATION / MAINTENANCE BUILDING / BUS BARN
1012 N. OLD STATE RD. 49
CHESTERTON, INDIANA 46304

Miles Engineering Group
MEP ENGINEER
P/125246400
E/125246400
INDIANA REG. NO. 125246400



E0.11

SPECIFICATIONS

PART 1 - GENERAL

- 1.1 FURNISH AND INSTALL LABOR AND MATERIALS NECESSARY TO PROVIDE A COMPLETE INSTALLATION OF ALL ELECTRICAL SERVICES AND SYSTEMS INDICATED AND AS MAY BE REQUIRED TO MAKE THE WORK COMPLETE FOR THE PURPOSES INTENDED. LAYOUTS SHOWN ARE DIAGNOSTIC - INSTALL FIXTURES, DEVICES, EQUIPMENT AND CONDUITS TO MEET ACTUAL FIELD CONDITIONS.
- 1.2 BIDDING REQUIREMENTS: VISIT SITE PRIOR TO BIDDING TO BE FULLY ACQUAINTED WITH FIELD CONDITIONS AND TO DETERMINE FULL EXTENT OF WORK REQUIRED FOR PROVIDING NEW INSTALLATIONS WITH EXISTING SYSTEMS. ITEMS NOT SPECIFICALLY INDICATED ON DRAWINGS THAT ARE IN CONFLICT WITH WORK SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT AND ENGINEER PRIOR TO BID FOR A DECISION. BIDDERS SHALL ACQUAINT THEMSELVES WITH THE WORKING CONDITIONS AND REQUIREMENTS OF THE ENTIRE PROJECT. WORK WILL BE BASED UPON FURNISHING ALL LABOR AND MATERIALS REQUIRED TO ENTIRELY COMPLETE WORK READY FOR USE.
- 1.3 CODES: WORK SHALL COMPLY WITH LOCAL, MUNICIPAL, STATE ELECTRICAL CODES. MATERIALS SHALL BE IN COMPLIANCE WITH NATIONAL FIRE PROTECTION ASSOCIATION (NFFA) STANDARDS.
- 1.4 OBTAIN AND PAY FOR LICENSES, PERMITS AND INSPECTIONS FOR WORK REQUIRED. CERTIFICATES OF INSPECTION SHALL BE DELIVERED TO THE OWNER.
- 1.5 SHOP DRAWINGS TO BE SUBMITTED (8X COPIES) FOR FIXTURES, EQUIPMENT, DEVICES AND MATERIALS WITHIN 14 DAYS OF CONTRACT AWARD FOR REVIEW. MINOR CHANGES IN LOCATION FROM THOSE SHOWN ON THE DRAWINGS SHALL BE MADE WITHOUT CHARGE IF SO DIRECTED BY THE ARCHITECT BEFORE INSTALLATION.
- 1.6 SCHEDULE WORK TO AVOID DOWNTIME AND INCONVENIENCE TO OWNER. OWNER'S OPERATING FACILITY SHALL REMAIN IN OPERATION AT ALL TIMES. REQUIRED SHUTDOWN OF EXISTING UTILITIES SHALL BE SCHEDULED WITH OWNER'S OPERATING PERSONNEL. NOTIFY OWNER'S REPRESENTATIVE 48 HOURS IN ADVANCE PRIOR TO ANY SHUTDOWN OF EXISTING SYSTEMS.
- 1.7 TEMPORARY SERVICES ARE TO BE PROVIDED TO MAINTAIN OPERATION OF FACILITY DURING THE PHASING OF WORK.
- 1.8 DO WORK NORMALLY DONE BY THE ELECTRICAL TRADES OR REQUIRED BY LOCAL JURISDICTIONAL RULINGS, WHETHER SPECIFICALLY INDICATED OR NOT.
- 1.9 CHANGES IN THE LOCATION OF THE EQUIPMENT, ETC., FROM THOSE SHOWN ON THE DRAWINGS SHALL BE MADE WITHOUT CHARGE IF SO DIRECTED BY THE ARCHITECT/OWNER BEFORE INSTALLATION.
- 1.10 OWNER TRAINING IN THE PROPER OPERATION, MAINTENANCE AND SERVICING OF SYSTEMS IS TO BE PROVIDED. (DIGITALLY RECORDED (AUDIO AND VIDEO) ALL TRAINING SESSIONS. PROVIDE IN A BOUND FORM TWO (2) SETS OF OPERATIONS, MAINTENANCE AND INSTRUCTION MANUALS, INCLUDING INFORMATION ON SPARE PARTS, LUBRICATION SCHEDULE, WIRING DIAGRAMS, ETC. FOR ALL MATERIALS AND EQUIPMENT. PROVIDE TWO (2) SETS OF ACCURATELY MARKED 'AS BUILT' PRINTS, ELECTRONIC FILE OF AS-BUILTS, AND TWO COPIES OF TRAINING SESSION VIDEO (DVD FORMAT).
- 1.11 WARRANTY DEFECTS TO EQUIPMENT, MATERIALS AND LABOR FOR A PERIOD OF ONE (1) YEAR AFTER FINAL ACCEPTANCE OF THE BUILDING BY THE ARCHITECT AND ENGINEER. DEFECTIVE FIXTURES, EQUIPMENT AND MATERIALS SHALL BE REPAIRED OR REPLACED AT NO COST TO THE OWNER. GUARANTEE THAT ALL WORKMANSHIP IS OF HIGH QUALITY AND THAT ALL EQUIPMENT FURNISHED UNDER THIS CONTRACT FULFILLS THE REQUIREMENTS OF THE SPECIFICATIONS. CONDUCT, AT NO COST TO THE OWNER, TESTS ON ANY EQUIPMENT FURNISHED WHEN SO REQUESTED BY THE ARCHITECT OR HIS REPRESENTATIVE WITHIN THE ONE YEAR PERIOD.

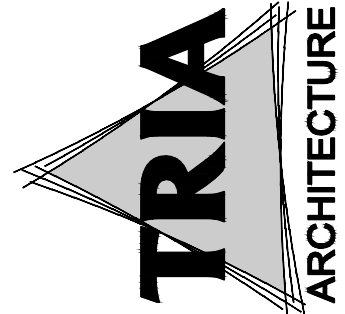
PART 2 - GENERAL COORDINATION - NOT USED

PART 3 - EXECUTION

- 3.1 COORDINATE EQUIPMENT ELECTRICAL REQUIREMENTS (VOLTAGES, PHASE, LOAD, ETC.) TO AVOID CONFLICTS.
- 3.2 REFER TO THE CONTRACT DOCUMENTS FOR ADDITIONAL ELECTRICAL WORK AND REQUIREMENTS. FURNISH, INSTALL AND LOCATE DISCONNECT SWITCHES AT EQUIPMENT/MOTOR LOCATION, AS REQUIRED, AND IN ACCORDANCE WITH CODE. IF THE WORK OF OTHER TRADES CAUSES A LOSS OF CONTINUITY OF THE EXISTING ELECTRICAL DISTRIBUTION, GROUNDING SYSTEM OR CIRCUITRY, IT SHALL BE RECONNECTED AND REPAIRED AT NO ADDITIONAL COST.
- 3.3 CONTRACTOR TO FIELD VERIFY IF EXISTING ASBESTOS WILL BE ENCOUNTERED PRIOR TO STARTING WORK. IF ASBESTOS IS PRESENT, THE OWNER WILL PROVIDE FOR THE REMOVAL OF ANY MATERIAL CONTAINING ASBESTOS.
- 3.4 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.
- 3.5 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 DEMOLITION WORK. INCLUDE ALL 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 INSTALLATIONS TO MEET FIELD CONDITIONS AS REQUIRED FOR A COMPLETE AND PROPER INSTALLATION. NO EXTRAS WILL BE ALLOWED AFTER BIDDING FOR REWORK OF EXISTING FIELD CONDITIONS TO RESOLVE ANY CONFLICTS FROM 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.
- 3.6 LAYOUT IS DIAGNOSTIC. PROVIDE DEVICES, CONDUIT AND EQUIPMENT TO MEET ACTUAL FIELD CONDITIONS.
- 3.7 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 AS TO WHETHER THE EQUIPMENT SHALL REMAIN AND BE RECONNECTED TO THE NEW SERVICES, BE RELOCATED, BE ABANDONED, ETC.
- 3.8 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 PERFORM WORK. THIS ALSO INCLUDES EXISTING CEILINGS OF PLASTER, DRYWALL, ETC. COORDINATE WORK IN ANY 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 ALL CEILING WORK NECESSARY FOR WORK ON THE PROJECT. WHEN WORK IS COMPLETED IN THE SPACE, REINSTALL OR PATCH EXISTING CEILINGS, REINSTALL DEVICES AND EQUIPMENT AND REPAIR DAMAGE AS REQUIRED TO COMPLETELY MATCH EXISTING CONDITIONS. REPAIR OR REPLACE ANY DAMAGE CAUSED TO EXISTING CEILING AREAS.

- 3.9 REMOVE EXISTING CONSTRUCTION AS REQUIRED AT EXISTING WALLS, FLOORS, PIPE CHASES, SURFACES, FINISHES, ETC. WHICH ARE AFFECTED BY THIS WORK. REPAIR EXISTING SURFACES AFFECTED, TO MATCH EXISTING SURFACE OF EXISTING OR BETTER QUALITY TO THE SATISFACTION OF THE OWNER'S REPRESENTATIVE.
- 3.10 EXISTING LIGHTING FIXTURES, ELECTRICAL DEVICES, CONDUIT, ETC., SHALL BE REMOVED AS NOTED ON DRAWINGS AND AS REQUIRED TO MEET NEW SCOPE OF WORK. EXISTING ELECTRICAL EQUIPMENT AND LIGHTING FIXTURES 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.
- 3.11 EXISTING ELECTRICAL DEVICES (RECEPTACLES, SWITCHES, OUTLET BOXES, CONDUIT, ETC.) WITHIN WALLS TO BE REMOVED SHALL BE DISCONNECTED COMPLETELY, REROUTE AND EXTEND EXISTING CIRCUITRY, ELECTRICAL FEEDERS AND GROUNDING SYSTEMS AS REQUIRED TO MAINTAIN CIRCUIT, FEEDER AND GROUNDING SYSTEM INTEGRITY FOR REMAINING DEVICES/EQUIPMENT. VERIFY EXACT CONDITIONS AND REQUIREMENTS IN FIELD.
- 3.12 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 ANY AND ALL 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.
- 3.13 CUTTING AND PATCHING WHICH MUST BE DONE TO ALLOW WORK TO BE PROPERLY INSTALLED. ALL DISTURBED CONSTRUCTION, SURFACES OR FINISHES MUST BE REPLACED OR REPAIRED TO THE ARCHITECT'S SATISFACTION. UNDER NO CONDITION SHALL STRUCTURAL WORK BE CUT EXCEPT UPON APPROVAL OF THE ARCHITECT.
- 3.14 EXISTING CIRCUITRY NOT INTERRUPTED BY THE WORK SHALL REMAIN AS IS UNLESS SPECIFICALLY NOTED OTHERWISE.
- 3.15 EXISTING CIRCUITRY (TO REMAIN) INTERRUPTED BY THE WORK SHALL BE PROPERLY RECONNECTED AS REQUIRED FOR A COMPLETE OPERATING SYSTEM.
- 3.16 EXISTING CONDUIT MAY BE REUSED WHEREVER POSSIBLE. REMOVE EXISTING BRANCH CIRCUIT WIRING AND INSTALL NEW AS SHOWN OR AS REQUIRED WHERE CIRCUITS ARE INTERRUPTED AND TO BE EXTENDED TO PANELS.
- 3.17 DEENERGIZE AFFECTED CIRCUITS AND REMOVE ELECTRICAL EQUIPMENT, DEVICES, FIXTURES, CONDUIT, WIRING, ETC. AND CAREFULLY REMOVE ITEMS.
- 3.18 SOME OR ALL CEILING SPACES ARE RETURN AIR PLENUMS. EXAMINE PLENUM BEFORE CEILING IS INSTALLED (OR REPLACED) AND SEAL OPENINGS AROUND CONDUIT, CABLE, ETC. PROVIDE PLENUM RATED CABLE (UNLESS IN CONDUIT), DEVICES AND EQUIPMENT PER CODE.
- 3.19 MINIMUM CONDUIT SIZE SHALL BE 1/2" EMT; MINIMUM IMC OR RIGID HUI CONDUIT SIZE TO BE 3/4". (VERIFY WITH LOCAL GOVERNING CODES PRIOR TO INSTALLATION.)
- 3.20 COUPLINGS AND CONNECTORS SHALL BE GLAND OR SET SCREW TYPE.
- 3.21 MINIMUM WIRE SIZE SHALL BE #12 THIN (OR THIN) SOLID COPPER; OVER 15' RUNS SHALL BE MINIMUM #10 THIN COPPER UNLESS NOTED OTHERWISE ON THE PLANS.
- 3.22 PROVIDE PROPER AND SUFFICIENT GROUND CONNECTION FOR ELECTRICAL DEVICES AND EQUIPMENT. CONDUIT CONNECTIONS SHALL BE DRAIN UP TIGHT AND SECURE.
- 3.23 WIRE SPLICES AND JOINTS SHALL BE MECHANICALLY AND ELECTRICALLY PERFECT. TWISTED SPLICES AND JOINTS SHALL BE DRAIN UP TIGHT AND FITTED WITH PROPER SIZED SCOTCHLOK OR IDEAL ELECTRICAL SPRING CONNECTORS.
- 3.24 SOLDERLESS CONNECTORS AND LUGS SHALL BE USED ON WIRES AND CABLES 1/2" AND LARGER. SPLICES AND JOINTS 1/2" AND LARGER SHALL BE TIGHTLY TAPED WITH BEST GRADE TAPE OF A HIGH GRADE VINYLITE PLASTIC TO AN INSULATION VALUE EQUIVALENT OR IN EXCESS OF THAT OF THE WIRE INSULATION.
- 3.25 SURFACE MOUNTED PULL BOXES, OUTLET BOXES, ETC., SHALL HAVE SUPPORTS INDEPENDENT OF CONDUIT SYSTEM AND SECURELY ANCHORED TO THE STRUCTURE. THE ENTIRE CONDUIT SYSTEM SHALL BE INDEPENDENTLY SUPPORTED FROM STRUCTURE. NO CONDUITS SHALL BE SUPPORTED FROM THE VENTILATING DUCTS, MECHANICAL PIPING OR THEIR HANGERS.
- 3.26 EXPOSED RACEWAYS SHALL BE ROUTED PARALLEL WITH OR AT RIGHT ANGLES TO WALL.
- 3.27 NO RACEWAYS SHALL BE INSTALLED WITHIN 6' OF HOT WATER PIPES OR SIMILAR HEAT PRODUCING APPLIANCES.
- 3.28 PROVIDE FULL WIRE IN EACH RACEWAY IN WHICH WIRING IS NOT INSTALLED.
- 3.29 COVERS OF JUNCTION OR PULL BOXES SHALL BE ACCESSIBLE AND IDENTIFIED PER SPECIFICATIONS. FIRE ALARM JUNCTION BOXES SHALL BE PAINTED RED. JUNCTION OR PULL BOXES AND THE LIKE SHALL BE INDEPENDENTLY SUPPORTED TO BUILDING STRUCTURE WITH NO WEIGHT BEARING ON RACEWAYS.
- 3.30 WIRE COLOR CODING SHALL BE COORDINATED THROUGHOUT THE ENTIRE PROJECT/BUILDING FOR NEW AND EXISTING SYSTEMS.
- 3.31 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.
- 3.32 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. COORDINATE WITH CONTRACTOR AS REQUIRED.
- 3.33 PROVIDE GROUND FAULT INTERRUPTER DEVICES AND CIRCUITS AS REQUIRED BY LOCAL CODE AUTHORITIES.

- 3.34 CONDUIT, LIGHTING, EQUIPMENT, ETC. SHALL NOT BE SUPPORTED FROM THE BOTTOM CHORD OF ENGINEERED JOISTS WITHOUT WRITTEN APPROVAL FROM THE STRUCTURAL ENGINEER. ALL CONDUITS, ROUTED THROUGH AREAS WITH NO CEILING, SHALL BE ROUTED WITHIN THE WEBBING OF THE JOISTS AND SHALL NOT BE ROUTED BELOW THE BOTTOM CHORD OF THE JOIST.
- 3.35 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.
- 3.36 WIRING DEVICES SHOWN BACK-TO-BACK IN WALLS SHALL BE SEPARATED BY 8" MINIMUM.
- 3.37 UNLESS OTHERWISE NOTED, DEVICE ELEVATIONS REFER TO CENTER LINE OF JUNCTION BOX. VERIFY JUNCTION BOX LOCATIONS IN FIELD AND WITH OWNER'S FINAL EQUIPMENT LAYOUT PRIOR TO ROUGHING IN SAME.
- 3.38 FURNISH AND INSTALL A GREEN GROUND WIRE IN ALL POWER CONDUITS, DEVICES, EQUIPMENT, FIXTURES AND THE LIKE, MUST BE GROUNDED. MECHANICAL/ELECTRICAL BONDS OF THE METALLIC RACEWAY SYSTEM SHALL BE MAINTAINED.
- 3.39 AT NEW FIRE OR SMOKE/FIRE DAMPER LOCATIONS, WIRE EACH SMOKE/FIRE DAMPER TO NEAREST EMERGENCY PANEL, TO LOCAL ACTIVATION SMOKE DETECTORS ON EITHER SIDE OF THE DAMPER (WITHIN 3'-0") AND ALSO WIRE THE SAME TO THE FIRE ALARM CONTROL PANEL AS REQUIRED FOR A COMPLETE AND OPERATING SYSTEM. REFER TO CONTRACT DOCUMENTS FOR LOCATIONS WHERE DUCTS PASS THROUGH SMOKE OR FIRE BARRIERS.
- 3.40 PROVIDE NEW 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 FOR A COMPLETE AND OPERATING INSTALLATION. THE COMPLETED FIRE ALARM SYSTEM SHALL BE FULLY TESTED BY THE CONTRACTOR IN THE PRESENCE OF THE OWNER'S REPRESENTATIVE, THE LOCAL AUTHORITY HAVING JURISDICTION AND THE MANUFACTURER'S NICET CERTIFIED TECHNICAL REPRESENTATIVE. UPON COMPLETION OF A SUCCESSFUL TEST, THE CONTRACTOR SHALL CERTIFY SUCH IN WRITING PER NFPA 72. ANY 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.
- 3.41 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.
- 3.42 THE FLASH RATES FOR ALL FIRE ALARM STROBES SHALL BE SYNCHRONIZED, COORDINATE ADDITIONAL REQUIREMENTS WITH NFPA 72.
- 3.43 ALL SINGLE POLE CIRCUITS SHALL HAVE SEPARATE INDEPENDENT NEUTRAL CONDUCTORS (NON-NETWORKED) WHICH (PER CODE) ARE CONSIDERED CURRENT CARRYING CONDUCTORS. THEREFORE, IF MORE THAN THREE (3) CURRENT CARRYING CONDUCTORS ARE RUN IN THE SAME RACEWAY, CONDUCTOR AMPACITY SHALL BE DERATED IN ACCORDANCE WITH NEC ARTICLE 310. AS SUCH, ALL MULTIPLE BRANCH CIRCUIT HOME RUNS SHALL, AT A MINIMUM, UTILIZE #10 AWG CONDUCTORS TO COMPLY WITH REQUIREMENTS HEREIN. COORDINATE REQUIREMENTS IN FIELD WITH SPECIFIC HOME RUN CONFIGURATION AND NEC 2008.
- 3.44 DATA AND TELEPHONE INFRASTRUCTURE - DATA AND TELEPHONE CABLING SHALL BE ROUTED THROUGH J-HOOKS, COORDINATE DEVICE AND CABLING COLOR WITH THE OWNER. PANDUIT, LEVITON/SUPERIOR ESSEX OR BERKTEK/ORTONICS ARE THE ACCEPTABLE MANUFACTURERS. CABLING SHALL BE CAT-6, PLENUM RATED AND TERMINATED IN THE IDF CABINET. PROVIDE CAT-6 PATCH PANELS AS REQUIRED TO ACCOMMODATE THE NEW CABLING. PROVIDE TWO (2) PATCH CABLES FOR EACH NEW JACK. EXTEND EACH TELEPHONE CABLE FROM THE IDF TO THE TELEPHONE SYSTEM AND CONNECT. LABEL ALL JACKS. TEST ALL NEW CONNECTIVITY UTILIZING MICROTEST OMNISCANNER. PROVIDE 25 YEAR WARRANTY FOR ALL CABLING PER THE MANUFACTURER.
- 3.45 MODIFY TELEPHONE TERMINAL BOARD CONNECTIVITY TO ACCOMMODATE NEW TELEPHONE AND COAXIAL CABLING. PROVIDE ALL PUNCH DOWN BLOCKS, SPLITTERS, AMPLIFIERS, CABLING, ETC. FOR A COMPLETE INSTALLATION.

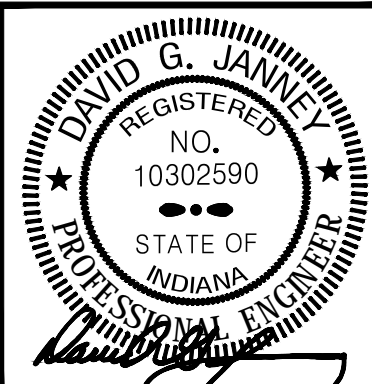


MEP ENGINEER
PROJECT NO. 14-040
PROJECT NAME: BUS BARN FIRE ALARM RENOVATION / MAINTENANCE BUILDING / BUS BARN ADMINISTRATION / MAINTENANCE BUILDING / BUS BARN ADMINISTRATION
DATE: 07/23/2016

DUNELAND SCHOOL CORPORATION
BUS BARN FIRE ALARM RENOVATION / MAINTENANCE BUILDING / BUS BARN ADMINISTRATION / MAINTENANCE BUILDING / BUS BARN ADMINISTRATION
1012 N. OLD STATE RD. 49
CHESTERTON, INDIANA 46304



REVISIONS
PROJECT NUMBER: 14-040
PROJECT NAME: FF
DRAWN BY: FF
DATE FOR PROPOSAL: 06/02/2016
ELECTRICAL SPECIFICATIONS



E0.13

FIRE ALARM SPECIFICATIONS

1. THE FIRE ALARM SYSTEM SHALL BE AN ADDRESSABLE FIRE ALARM SYSTEM, MULTIPLEXED FIRE ALARM SYSTEM, NOTIFIER NFS-320. THE SYSTEM SHALL BE OF ONE (1) MANUFACTURER AND UL LISTED AS A SYSTEM, AND SHALL BE PROVIDED WITH A ONE YEAR WARRANTY.

2. THE SYSTEM SHALL USE SUPERVISED MULTIPLEX DATA COMMUNICATIONS CIRCUITS, CLOSED LOOP INITIATION CIRCUITS, INDIVIDUAL ZONE SUPERVISION, AND INDIVIDUAL AUDIO AND VISUAL SIGNAL CIRCUIT SUPERVISION. THE SYSTEM SHALL INCLUDE ALL CONTROL CENTER PANELS, MANUAL DOUBLE ACTION PULL STATIONS, SMOKE DETECTORS, HEAT DETECTORS, HORNS, STROBE LIGHTS, ALL WIRING, OUTLET BOXES, AND ALL OTHER NECESSARY MATERIAL FOR A COMPLETE OPERATING SYSTEM.

3. THE SYSTEM SHALL BE POWERED FROM THE BUILDING'S 120VAC POWER SYSTEM. THE CONTROL PANEL, THE ANNUNCIATORS AND ALL SYSTEM COMMUNICATION DEVICES SHALL BE PROVIDED WITH A MINIMUM OF 60 HOURS BATTERY STANDBY WITH 10 MINUTES OF ALARM OPERATION AT THE END OF THIS PERIOD. ALL NORMAL OPERATING, SUPERVISORY, AND BATTERY POWER AND FAULT CONDITIONS SHALL BE SUPERVISED AND ANNUNCIATED.

4. ALL CIRCUITS REQUIRING SYSTEM OPERATING POWER SHALL BE 24 VDC AND SHALL BE INDIVIDUALLY FUSED AT THE CONTROL PANEL. A MINIMUM OF FIVE (5) AMPS AUXILIARY FUSED POWER SHALL BE PROVIDED.

5. THE SYSTEM SHALL OPERATE UNDER NORMAL CONDITION DISPLAYING 'SYSTEM IS NORMAL'. WHEN AN ABNORMAL CONDITION IS DETECTED, THE APPROPRIATE LED (ALARM, SUPERVISORY OR TROUBLE) SHALL FLASH. THE PANEL AUDIBLE SIGNAL SHALL PULSE FOR ALARM CONDITIONS AND SOUND STEADILY FOR TROUBLE AND SUPERVISORY CONDITIONS, AND IDENTIFY VIA LCD DISPLAY, THE CUSTOM LOCATION LABEL, TYPE OF DEVICE, AND POINT STATUS (TROUBLE OR ALARM).

6. THE SYSTEM ALARM OPERATION RESULTING FROM THE ALARM ACTIVATION OF ANY MANUAL STATION, AUTOMATIC DETECTION DEVICE, OR OTHER INITIATION DEVICE SHALL BE AS FOLLOWS:

A. AUDIO/VISUAL ALARM INDICATING APPLIANCES SHALL BE ACTIVATED UNTIL SILENCED BY THE ALARM SILENCE SWITCH AT THE CONTROL PANEL.

B. 'DIGITAL ALARM COMMUNICATION TRANSMITTER (DACT): PROVIDE DACT IN FIRE ALARM CONTROL PANEL. DACT SHALL SEIZE THE CONNECTED/DEDICATED OR LEASED TELEPHONE LINE TO DIAL REPEATEDLY UNTIL REPORTED AUTOMATICALLY THE ALARM AND/OR TROUBLE CONDITIONS TO THE LOCAL/NEAREST OR DESIGNATED FIRE DEPARTMENT OR OTHER SUPERVISORY CENTRAL STATION, I.E. PRIVATE SECURITY COMPANY OR LOCAL POLICE STATION, ETC.'

C. THE MECHANICAL CONTROLS SHALL ACTIVATE/DE-ACTIVATE THE AIR HANDLING SYSTEMS PER CODE. UPON RESET OF CONTROL PANEL, AIR HANDLING UNITS SHALL SEQUENTIALLY START UP TO REDUCE ELECTRICAL DEMAND.

D. THE ALARM SHALL BE DISPLAYED ON THE LCD DISPLAY. THE SYSTEM ALARM RED LED SHALL FLASH ON THE CONTROL PANEL AND THE REMOTE ANNUNCIATOR AND AN ALARM TONE SHALL SOUND UNTIL ACKNOWLEDGED AT THE CONTROL PANEL OR THE REMOTE ANNUNCIATOR. SUBSEQUENT ALARMS RECEIVED FROM OTHER ZONES SHALL AGAIN FLASH THE SYSTEM ALARM LED ON THE CONTROL PANEL AND REMOTE ANNUNCIATOR. THE LCD DISPLAY SHALL SHOW THE NEW ALARM INFORMATION.

7. THE ACTIVATION OF ANY SYSTEM SMOKE DETECTOR SHALL INITIATE AN ALARM VERIFICATION OPERATION WHEREBY THE PANEL SHALL RESET THE ACTIVATED DETECTOR AND WAIT FOR A SECOND ALARM ACTIVATION. IF, WITHIN ONE (1) MINUTE AFTER RESETTING, A SECOND ALARM IS REPORTED FROM THE SAME OR ANY OTHER SMOKE DETECTOR, THE SYSTEM SHALL PROCESS THE ALARM AS DESCRIBED PREVIOUSLY. IF NO SECOND ALARM OCCURS WITHIN ONE MINUTE THE SYSTEM SHALL RESUME NORMAL OPERATION. THE ALARM VERIFICATION SHALL OPERATE ONLY ON SMOKE DETECTOR ALARMS. OTHER ACTIVATED INITIATING DEVICES SHALL BE PROCESSED IMMEDIATELY. THE CONTROL PANEL SHALL HAVE THE CAPABILITY TO DISPLAY THE NUMBER OF TIMES A ZONE HAS GONE INTO A VERIFICATION MODE.

8. THE SYSTEM SHALL ALLOW ACKNOWLEDGEMENT OF SYSTEM ACTIVITY, SILENCE, RESET, AND SUPERVISORY SERVICE AS FOLLOWS:

A. THE SYSTEM SHALL HAVE AN ALARM LIST KEY THAT WILL ALLOW THE OPERATOR TO DISPLAY ALL ALARMS, TROUBLES AND SUPERVISORY SERVICE CONDITIONS WITH THE TIME OF OCCURRENCE. THIS SHALL ALLOW FOR THE DETERMINATION OF NOT ONLY THE MOST RECENT ALARM BUT MAY ALSO ALLOW TRACING THE PATH OF THE FIRE.

B. PRESSING THE APPROPRIATE ACKNOWLEDGE BUTTON SHALL GLOBALLY ACKNOWLEDGE EVERY POINT IN ALARM.

C. AFTER ALL POINTS HAVE BEEN ACKNOWLEDGED, THE LEDS SHALL GLOW STEADY AND THE PANEL AUDIBLE SIGNAL SHALL BE SILENCED. THE TOTAL NUMBER OF ALARMS, SUPERVISORY AND TROUBLE CONDITIONS SHALL BE DISPLAYED ALONG WITH A PROMPT TO REVIEW EACH LIST CHRONOLOGICALLY. THE END OF THE LIST SHALL BE INDICATED.

D. PROVISION SHALL BE MADE FOR PASS CODE PROTECTION OF: ACKNOWLEDGE, ALARM SILENCE, SYSTEM RESET AND MANUAL CONTROL FUNCTIONS. FOUR (4) ACCESS LEVELS SHALL BE PROVIDED. PASS CODES SHALL CONSIST OF UP TO TEN (10) DIGITS. CHANGES TO PASS CODES SHALL ONLY BE MADE BY AUTHORIZED PERSONNEL.

E. PRESSING THE 'ALARM SILENCE' BUTTON SHALL CAUSE ALL ALARM SIGNALS TO CEASE OPERATION.

F. THE SYSTEM SHALL NOT PERMIT SIGNALS TO BE SILENCED DURING ALARM SILENCE INHIBIT MODE.

G. THE 'SYSTEM RESET' BUTTON SHALL BE USED TO RETURN THE SYSTEM TO ITS NORMAL STATE AFTER AN ALARM CONDITION HAS BEEN REMEDIED. THE LCD DISPLAY SHALL STEP THE USER THROUGH THE RESET PROCESS WITH SIMPLE ENGLISH LANGUAGE MESSAGES.

H. SHOULD AN ALARM CONDITION CONTINUE TO EXIST, THE SYSTEM SHALL REMAIN IN AN ABNORMAL STATE AND SYSTEM CONTROL RELAYS SHALL NOT RESET. THE DISPLAY SHALL INDICATE THE TOTAL NUMBER OF ALARMS AND TROUBLES PRESENT, ALONG WITH A PROMPT TO REVIEW THE POINTS.

I. WHEN THE 'ALARM SILENCE INHIBIT' FUNCTION IS ACTIVE, THE MESSAGE, 'SYSTEM RESET INHIBITED' SHALL BE DISPLAYED.

J. ACTIVATING THE SUPERVISORY SERVICE ACKNOWLEDGE SWITCH SHALL SILENCE THE SUPERVISORY AUDIBLE SIGNAL BUT CAUSE THE LED TO REMAIN ON.

9. THE SYSTEM SHALL PROVIDE INDEPENDENTLY SUPERVISED INITIATION CIRCUITS SO THAT A FAULT IN ANY ONE ZONE SHALL NOT AFFECT ANY OTHER ZONE. THE ALARM ACTIVATION OF ANY INITIATION CIRCUIT SHALL NOT PREVENT THE SUBSEQUENT ALARM OPERATION OF ANY OTHER INITIATION CIRCUIT.

10. THE SYSTEM SHALL PROVIDE INDEPENDENTLY SUPERVISED AND INDEPENDENTLY FUSED INDICATING APPLIANCE CIRCUITS FOR ALARM DEVICES. DISARRANGEMENT CONDITIONS OF ANY CIRCUIT SHALL NOT AFFECT THE OPERATION OF OTHER CIRCUITS.

11. THE SYSTEM SHALL BE CAPABLE OF OPERATING UP TO 121 ADDRESSABLE DEVICES PER SINGLE PAIR OF MAPNET WIRES.

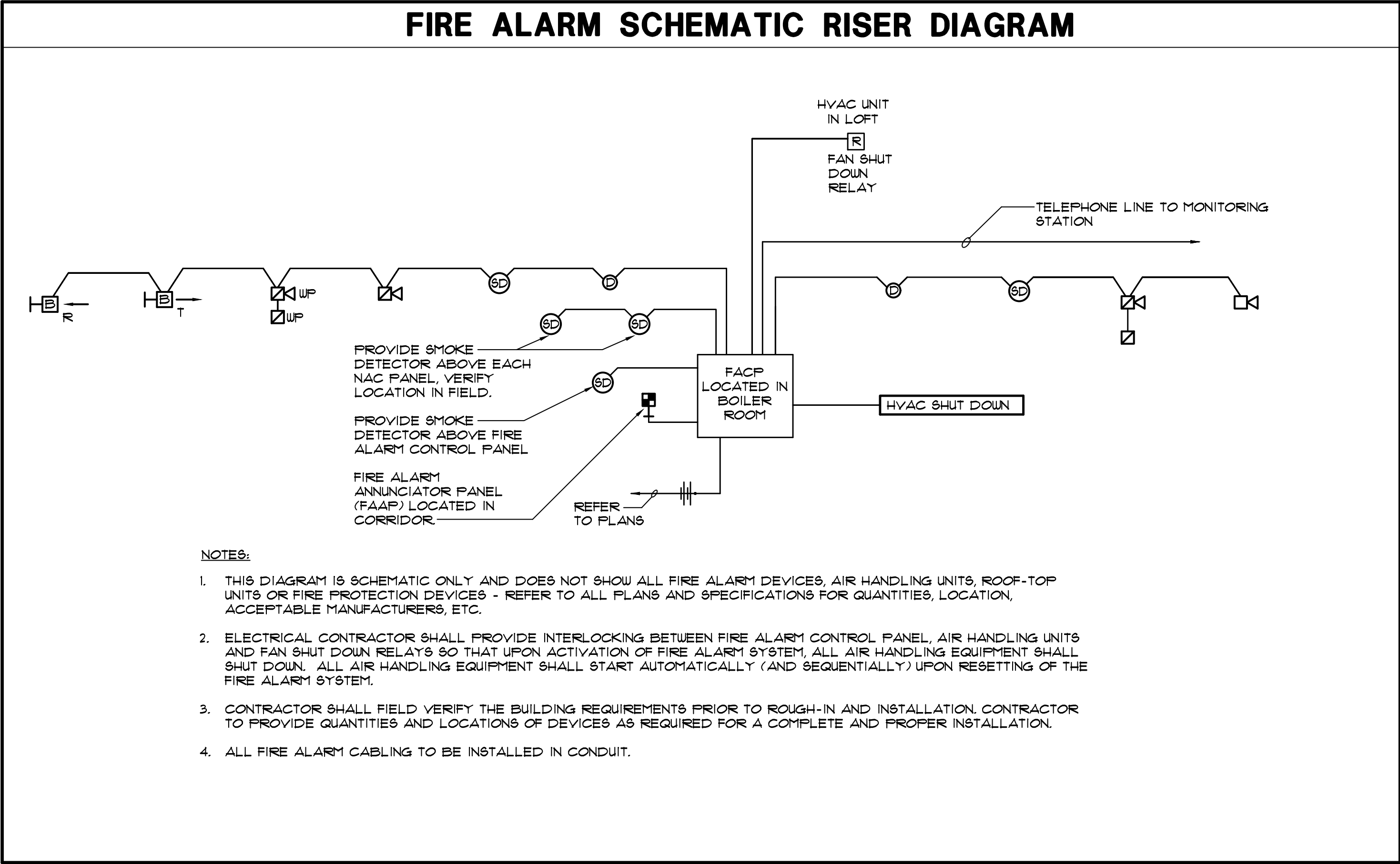
12. THE SYSTEM SHALL ALLOW UP TO 2,500 FEET WIRE LENGTH TO THE FURTHEST ADDRESSABLE DEVICE. T-TAPPING OF THE COMMUNICATIONS CHANNEL SHALL NOT BE ALLOWED.

13. ALL MAPNET COMMUNICATIONS WIRING SHALL BE TWISTED AND SHIELDED CABLES. ALL WIRING SHALL BE IN A CONDUIT SYSTEM SEPARATE FROM OTHER BUILDING WIRING. ALL JUNCTION BOXES SHALL BE SPRAYED RED AND LABELED 'FIRE ALARM'. WIRING COLOR CODE SHALL BE MAINTAINED THROUGHOUT THE SCOPE OF THE WORK.'

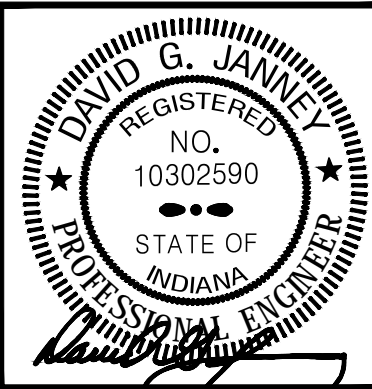
14. APPROVED EQUAL SYSTEMS MAY BE CONSIDERED FROM OTHER MANUFACTURERS, IF APPROVED BY BOTH THE OWNER AND THE ARCHITECT.

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PROJECT NUMBER: E-016	REVISIONS:
PROJECT MANAGER: FF	1
DRAWN BY: FF	2
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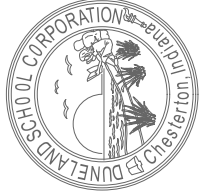


SYMBOL LIST	
* NOTE: FIRE ALARM DEVICES, MOUNTING HEIGHT, ETC. SHALL COMPLY WITH 'ADA' STANDARDS.	
	FIRE ALARM CONTROL PANEL
	FIRE ALARM ANNUNCIATOR PANEL
	FIRE ALARM SYSTEM HEAT DETECTOR WITH HIGH AMBIENT TEMPERATURE RATING - IN BOILER ROOM
	HARSH ENVIRONMENT WET LOCATION LISTED FIRE ALARM SYSTEM SMOKE DETECTOR WITH HIGH AMBIENT TEMPERATURE RATING - CEILING MOUNTED
	FIRE ALARM SYSTEM SMOKE DETECTOR - CEILING MOUNTED
	HIGH AMBIENT TEMPERATURE RATED FIRE ALARM SYSTEM SMOKE DETECTOR - CEILING MOUNTED
	FIRE ALARM CONTROL RELAY IN AIR HANDLING UNIT CONTROL PANEL WIRED TO SHUT DOWN FANS UPON FIRE ALARM SYSTEM ACTIVATION - NOTE: FANS TO AUTOMATICALLY RESTART UPON FIRE ALARM SYSTEM RESET. ALSO, RELAYS SHALL BE INTERFACED TO FIRE DOORS TO DISENGAGE UPON ACTIVATION OF THE FIRE ALARM SYSTEM.
	FIRE ALARM FULL STATION MTD 42' AFF.
	FIRE ALARM AUDIO/VISUAL DEVICE MTD. 80' AF. OF 6' BELOW FINISHED CEILING WHICHEVER IS LOWER.
	HARSH ENVIRONMENT COLD TEMPERATURE/ WET LOCATION LISTED FIRE ALARM FULL STATION MTD 42' AFF. PROVIDE WITH SURFACE MOUNTED NEMA BACK BOX AND GASKET KIT.
	HARSH ENVIRONMENT COLD TEMPERATURE/ WET LOCATION LISTED FIRE ALARM AUDIO/VISUAL DEVICE MTD. 80' AF. OF 6' BELOW FINISHED CEILING WHICHEVER IS LOWER. PROVIDE WITH SURFACE MOUNTED NEMA BACK BOX AND GASKET KIT.
	HARSH ENVIRONMENT COLD TEMPERATURE/ WET LOCATION LISTED FIRE ALARM AUDIO/VISUAL DEVICE WITH HIGH DECIBEL SETTING FOR AREAS WITH HIGH AMBIENT NOISE MTD. 80' AF. OF 6' BELOW FINISHED CEILING WHICHEVER IS LOWER. PROVIDE WITH SURFACE MOUNTED NEMA BACK BOX AND GASKET KIT.
	FIRE ALARM STROBE ONLY MTD 80' AFF. - 15 CANDELA
	FIRE ALARM STROBE ONLY MTD 80' AFF. - 15 CANDELA
	ALL DEVICES INDICATED WITH SHADED BOX BASE TO BE SURFACE MOUNTED TO THE EXISTING WALL ON WIREMOLD STEEL *20000 OR EQUAL IF SINGLE SERVICE. OR WIREMOLD *40000 IF DUAL SERVICES. SURFACE RACEWAY SHALL BE PAINTABLE FOR FUTURE OWNER PAINTING WORK.
	XTRALIS *081D SERIES FIRE ALARM SYSTEM BEAM TYPE SMOKE DETECTOR TRANSMITTER - PROVIDE COLD TEMPERATURE BEAM DETECTOR WITH MANUFACTURER PROVIDED LONG DISTANCE KIT, REFLECTOR, HEATER BLOWER KIT AND REMOTE TEST/KEY SWITCH
	XTRALIS *081D SERIES FIRE ALARM SYSTEM BEAM TYPE SMOKE DETECTOR RECEIVER - PROVIDE COLD TEMPERATURE BEAM DETECTOR WITH MANUFACTURER PROVIDED LONG DISTANCE KIT, REFLECTOR, HEATER BLOWER KIT AND REMOTE TEST/KEY SWITCH
	JUNCTION BOX - SIZE AND TYPE AS REQUIRED.
	ELLIPSE TAG REFERENCE TO SHEET NOTES
	ELECTRIC PANELBOARDS.
	KNOX BOX - PER THE LOCAL FIRE DISTRICT STANDARDS, AT THE LOCATION INDICATED. PROVIDE BOTH POWER AND SMOKE EVACUATION KEY CONTROLS AS REQUIRED BY AHJ. VERIFY ELEVATION OF DEVICE WITH THE LOCAL FIRE DISTRICT PRIOR TO INSTALLING SAME. WHERE REQUIRED, FURNISH AND INSTALL A FLASHING ANNUNCIATOR, TIED TO THE FIRE ALARM SYSTEM, TO IDENTIFY LOCATION OF THE KNOX BOX.



E0.15

REVISIONS:
PROJECT NO. E-016
PROJECT NAME: FF
DRAWN BY: FF
CHECKED BY: FF
DATE: 06/23/06
ELECTRICAL SYMBOL LIST AND
FIRE ALARM SCHEMATIC RISER DIAGRAM



DUNELAND SCHOOL CORPORATION
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