2022 HOUSING-RELATED HAZARDS CAPITAL FUND - FR-6600-N-68

FIRE ALARM ALARM UPGRADE

WATERFALL HIGH RISE

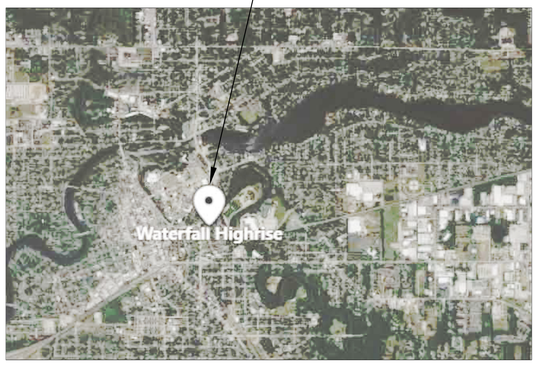
IN0263-22-7

THE HOUSING AUTHORITY OF THE CITY OF ELKHART INDIANA

1396 Benham Avenue Elkhart, Indiana 46516

VICINITY MAP

WATERFALL HIGH RISE
303 WATERFALL DRIVE



SHEET INDEX

ABBREVIATIONS

A/C	AIR CONDITIONING
AC	ACOUSTIC
ADJ	ADJUSTABLE
AFF	ABOVE FINISHED FLOOR
AL	ALUMINUM
AP	ACCESS PANEL
∠	ANGLE
APPX	APPROXIMATE
ARCH	ARCHITECTURAL
ASPH	ASPHALT
B MK	BENCH MARK
BD	BOARD
BIT	BITUMINOUS
BLDG	BUILDING
BLK	BLOCK
BLKG	BLOCKING
BM	BEAM
BRG	BEARING
BTM	BOTTOM
CAB	CABINET
CB	CONCRETE BLOCK
CC	CENTER TO CENTER
CF	CUBIC FEET
CFM	CUBIC FEET PER MINUTE
CHB	CHALK BOARD
CI	CAST IRON
CJ	CONTROL JOINT
℄	CENTER LINE
CLG	CEILING
CM	CONSTRUCTION MANAGER
CMU	CONCRETE MASONRY UNIT
CO	CLEAN OUT
COL	COLUMN
CONC	CONCRETE
CONT	CONTINUOUS
CONTR	CONTRACTOR
CPT	CARPET
CT	CERAMIC TILE
CTR	CENTER
CW	COLD WATER
CY	CUBIC YARD
DBL	DOUBLE
DF	DRINKING FOUNTAIN
DIA	DIAMETER
DIM	DIMENSION
DN	DOWN
DR	DOOR
DS	DOWN SPOUT
DTL	DETAIL
DW	DRYWALL
DWG	DRAWING
EA	EACH
EC	ELECTRICAL CONTRACTOR
EL	ELEVATION
ELEC	ELECTRIC (ELECTRICAL)
EP	EPOXY PAINT
EPNL	ELECTRICAL PANEL
ER	EMERGENCY
EWC	ELECTRIC WATER COOLER
EXST	EXISTING
EXT	EXTERIOR
FD	FLOOR DRAIN
FE	FIRE EXTINGUISHER
FEC	FIRE EXTINGUISHER CABINET
FHC	FIRE HOSE CABINET
FIN	FINISH
FL	FLASHING
FLR	FLOOR
FLUOR	FLUORESCENT
FNDN	FOUNDATION
FRP	FIBERGLASS REINF. PANEL
FT	FOOT (FEET)
FTG	FOOTING
GA	GAUGE
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GL	GLASS
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GYP BD	GYPSUM BOARD
HB	HOSE BIBB
HC	HOLLOW CORE
HDCP	HANDICAP
HDWR	HARDWARE
HM	HOLLOW METAL
HORZ	HORIZONTAL
HR	HOUR
HT	HEIGHT
HTR	HEATER
HW	HOT WATER
ID	INSIDE DIAMETER
INSUL	INSULATION (INSULATED)
INT	INTERIOR
ISO JT	ISOLATION JOINT
JT	JOINT
LAV	LAVATORY
MATL	MATERIAL
MAX	MAXIMUM
MC	MECHANICAL CONTRACTOR
MECH	MECHANICAL
MFR	MANUFACTURER
MIN	MINIMUM
MISC	MISCELLANEOUS
MNTG HT	MOUNTING HEIGHT
MO	MASONRY OPENING
MSRY	MASONRY
MT	MOSAIC TILE
MTD	MOUNTED
MTL	METAL
NIC	NOT IN CONTRACT
NO	NUMBER
OAI	OUTSIDE AIR INTAKE
OC	ON CENTER
OD	OUTSIDE DIAMETER
OPNG	OPENING
PC	PLUMBING CONTRACTOR
PERF	PERFORATED
PL	PLATE
PLAS	PLASTIC
PLBG	PLUMBING
PREFAB	PREFABRICATED
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PT	PAINT
QT	QUARRY TILE
RA	RETURN AIR
RD	ROOF DRAIN
RE	REFER TO
REINF	REINFORCING (REINFORCED)
Φ	ROUND
S TO S	STUD TO STUD
SAT	SUSPENDED ACOUSTICAL TILE
SC	STAINED CONCRETE
SCHED	SCHEDULE
SCW	SOLID CORE WOOD
SECT	SECTION
SF	SQUARE FOOT
SGL	SINGLE
SGT	STRUCTURAL GLAZED TILE
SHT	SHEET
SI	SQUARE INCH
SIM	SIMILAR
SJ	STEEL JOIST
SPEC	SPECIFICATIONS
SS	STAINLESS STEEL
STL	STEEL
STOR	STORAGE
SUSP	SUSPENDED
SV	STAINED AND VARNISHED
T	TREAD
T&G	TONGUE & GROOVE
TB	TACK BOARD
TEL	TELEPHONE
TERR	TERRAZZO
THK	THICK
TLT	TOILET
TOB	TOP OF BEARING
TYP	TYPICAL
V	VINYL
VAN	VANITY
VCT	VINYL COMPOSITION TILE
VERT	VERTICAL
VEST	VESTIBULE
VF	VINYL FABRIC
VT	VINYL TILE
VTR	VENT THRU ROOF
VWC	VINYL WALL COVERING
WC	WATER CLOSET
WD	WOOD
WDW	WINDOW
WH	WATER HEATER
WP	WEATHER PROOF

BOARD OF COMMISSIONERS

GOVERNING CODES

INDIANA BUILDING CODE 2014	2012 IBC
INDIANA PLUMBING CODE 2012	2006 IPC
INDIANA MECHANICAL CODE 2014	2012 IMC
INDIANA ELECTRICAL CODE 2009	2008 NFPA 70
INDIANA FIRE CODE 2014 INDIANA ENERGY	2012 IFC
CONSERVATION CODE 2010	ASHRAE 90.1 2007

WITH ALL LOCAL AND STATE AMENDMENTS

ISSUED FOR: CONSTRUCTION DOCUMENTS
DATE: MARCH 29, 2024

FORUM ARCHITECTS, LLC
415 Lincolnway East Mishawaka, Indiana
Phone: 574-233-2119
email: Info@forumarchitectsllc.com

FORUM ARCHITECTS

SET NUMBER

WILLIAM FRANCIS HERTZSCHED REGISTERED No.AR10200009 STATE OF INDIANA ARCHITECT

SEAL / SIGN

ELECTRICAL LEGEND

ACC	ADA ACCESSIBLE UNIT
A.F.F.	ABOVE FINISHED FLOOR
B.F.C.	BELOW FINISHED CEILING
C	CONDUIT
E.C.	ELECTRICAL CONTRACTOR/TRADE
EXT'G	EXISTING ITEM
EX LOC	EXISTING LOCATION
F.A.C.P.	FIRE ALARM CONTROL PANEL
L.I.G.	LAY IN GRID
LTG.	LIGHTING
MFG'R.	MANUFACTURER
M.C.	MECHANICAL CONTRACTOR/TRADE
W.P.	WEATHERPROOF
(S)	SYSTEM SMOKE DETECTOR
(S) CO	SYSTEM COMBINATION SMOKE/CARBON MONOXIDE DETECTOR
(S) R	SMOKE DETECTOR WITH RELAY BASE
(S)—	DUCT SMOKE DETECTOR WITH TEST/ANNUNCIATOR PANEL INSTALLED ADJACENT TO THE UNIT WITH CONNECTIONS TO MOTOR STARTER AND FACP AS REQUIRED.
(H)	HEAT DETECTOR
A	FIRE ALARM SPEAKER/VISUAL ALARM UNIT
A LD	FIRE ALARM SPEAKER/VISUAL ALARM UNIT LOW DECIBEL OUTPUT
F	FIRE ALARM PULL STATION – DUAL ACTION
	FIRE ALARM VISUAL UNIT
(V)	FIRE ALARM SPEAKER
FAAP	FIRE ALARM ANNUNCIATOR PANEL
FACP	FIRE ALARM CONTROL PANEL
C FS	FUTURE FLOW SWITCH
C TS	FUTURE TAMPER SWITCH

GENERAL ELECTRICAL NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH NATIONAL, STATE, AND LOCAL CODES IN FORCE AT THE TIME OF BIDDING, INCLUDING, BUT NOT LIMITED TO, THE INDIANA CONSTRUCTION RULES AND NATIONAL ELECTRICAL CODE.
2. DRAWINGS ARE DIAGRAMMATIC AND GENERALLY INDICATIVE OF WORK REQUIRED. THIS CONTRACTOR SHALL VERIFY IN FIELD ACTUAL LOCATIONS AND COORDINATE ELECTRICAL EQUIPMENT LOCATIONS WITH ACTUAL CONDITIONS PRIOR TO INSTALLATION OF ROUGH–INS. WHERE REQUIRED, ELECTRICAL ITEM LOCATIONS, MOUNTING HEIGHTS, ETC. SHALL BE REVISED AS REQUIRED TO CONDITIONS AT NO ADDITIONAL COST TO THE OWNER.
3. ALL CONDUITS SHALL BE CONCEALED WITHIN WALLS, CEILINGS OR FLOORS UNLESS SPECIFICALLY INDICATED ON THE DRAWINGS OR PRE–APPROVED BY THE ARCHITECT/ENGINEER.
4. INSTALL A SEPARATE GROUNDING CONDUCTOR, INSULATED GREEN, IN ALL POWER CONDUITS. WHERE WIRING COUNTS ARE INDICATED ON DRAWINGS, THESE WIRING COUNTS EXCLUDE THE GROUNDING CONDUCTOR, HOWEVER, GROUNDING CONDUCTOR IS REQUIRED.
5. MAINTAIN ACCURATE RECORDS OF ALL CHANGES MADE DURING CONSTRUCTION. PROVIDE A NEATLY MARKED SET OF BLUEPRINTS TO THE ENGINEER/ARCHITECT AT COMPLETION OF THE PROJECT, INDICATING ALL FIELD CHANGES.
6. UNLESS OTHERWISE NOTED, ALL DEVICE ELEVATIONS REFER TO CENTER OF OUTLET BOX. (SEE SPECIFICATIONS.) THE ELECTRICAL CONTRACTOR SHALL VERIFY ALL OUTLET LOCATIONS WITH OTHER TRADES.
7. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ANY CUTTING AND PATCHING REQUIRED FOR THE PROPER INSTALLATION, SUPPORT, OR ANCHORAGE OF ELECTRICAL EQUIPMENT. THE E.C. SHALL LAYOUT CAREFULLY IN ADVANCE WHERE CUTTING, CHANNELING OR DRILLING IS NECESSARY FOR THE PROPER COMPLETION OF ELECTRICAL WORK. COORDINATE WITH OTHER TRADES AS REQUIRED.

GENERAL DEMOLITION NOTES

1. THE CONTRACTOR SHALL VISIT SITE PRIOR TO SUBMITTING A BID AND DETERMINE THE EXACT SCOPE OF DEMOLITION WORK.
2. WHERE WALLS TO REMAIN ARE DAMAGED BY THE REMOVAL OF ANY ELECTRICAL EQUIPMENT, THIS CONTRACTOR SHALL PATCH AS REQUIRED TO MATCH ADJACENT SURFACES.
3. THE OWNER RETAINS FIRST SALVAGE RIGHTS TO ALL EQUIPMENT. ITEMS THAT THE OWNER WISHES TO RETAIN SHALL BE DELIVERED TO THE OWNERS STORAGE AREA. ALL OTHER MATERIALS SHALL BE REMOVED FROM THE SITE IMMEDIATELY.
4. COORDINATE SCHEDULE OF DEMOLITION WORK WITH THE OWNER. COORDINATE SHUTDOWN OF MAIN SERVICES WITH OWNER (I.E. POWER, FIRE ALARM, ETC.) AT LEAST 48 HOURS IN ADVANCE OF SHUTDOWN.
5. IF EXISTING EQUIPMENT OR CEILING TO REMAIN ARE DISRUPTED DURING DEMOLITION OR CONSTRUCTION, REPAIR AS REQUIRED.

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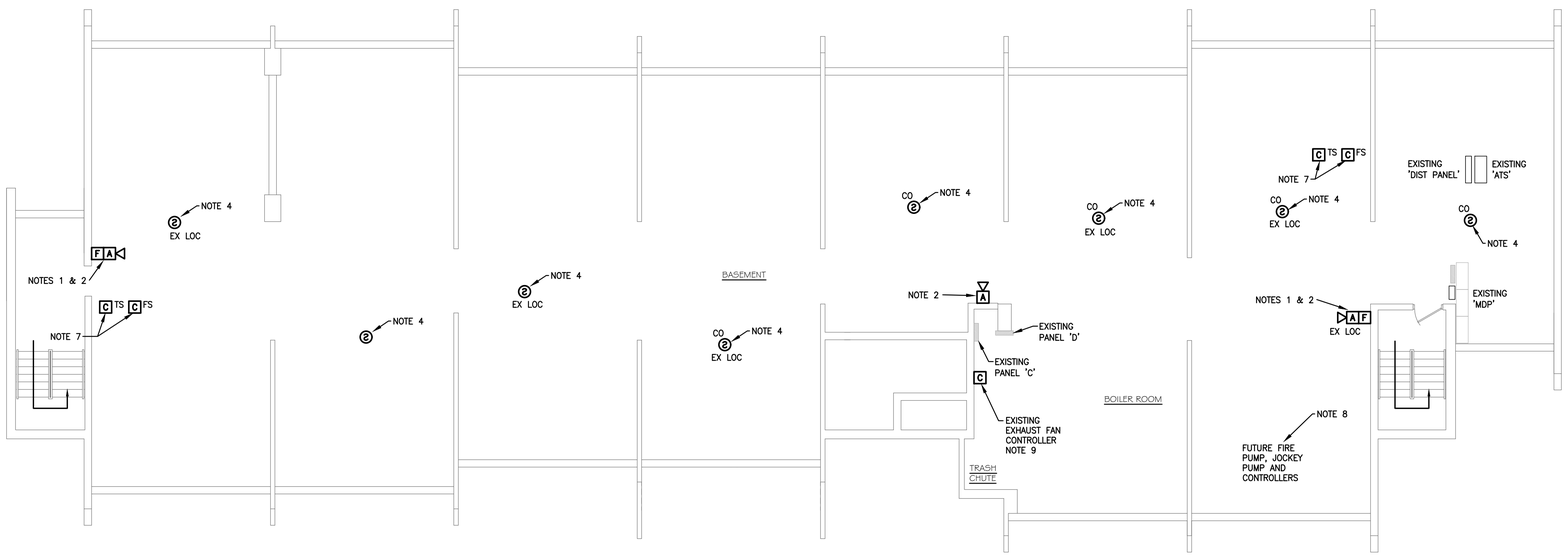
REVISIONS:	

THOMAS R. COOK
REGISTERED No. PE60021396
STATE OF INDIANA
PROFESSIONAL ENGINEER



PLAN NOTES:

1. PROVIDE AND INSTALL NEW DUAL ACTION PULL STATION AT EXISTING LOCATION. IF EXISTING LOCATION DOES NOT MEET ADA REQUIREMENTS PULL STATION TO BE INSTALLED AT HEIGHT AS REQUIRED BY ADA. EXTEND WIRING TO THE NEW LOCATION WITH SURFACE MOUNTED RACEWAY.
2. PROVIDE AND INSTALL NEW AUDIO/VISUAL NOTIFICATION DEVICE. NEW DEVICE TO BE MOUNTED TO MEET ADA REQUIREMENTS. EXTEND WIRING AS REQUIRED IN SURFACE MOUNTED RACEWAY OR CONDUIT TO NEW LOCATION.
3. PROVIDE AND INSTALL NEW VISUAL NOTIFICATION DEVICE. NEW DEVICE TO BE MOUNTED TO MEET ADA REQUIREMENTS. EXTEND WIRING AS REQUIRED IN SURFACE MOUNTED RACEWAY OR CONDUIT TO NEW LOCATION.
4. PROVIDE AND INSTALL NEW SMOKE DETECTOR. WHERE INDICATED PROVIDE COMBINATION SMOKE DETECTOR/CARBON MONOXIDE DETECTOR. COORDINATE EXACT LOCATION WITH EXISTING CONDITIONS IN THE FIELD.
5. PROVIDE AND INSTALL NEW HEAT DETECTOR. COORDINATE EXACT LOCATION WITH EXISTING CONDITIONS IN THE FIELD.
6. NEW FACP. COORDINATE EXACT LOCATION WITH EXISTING CONDITIONS. CONNECT TO EXISTING CIRCUIT.
7. PROVIDE WIRING TO CONNECT FUTURE FLOW AND TAMPER SWITCHES TO NEW FIRE ALARM SYSTEM. PROVIDE PROVISIONS IN FACP FOR FUTURE CONNECTION OF FLOW AND TAMPER SWITCHES.
8. PROVIDE PROVISIONS IN FACP FOR FUTURE FIRE PUMP, JOCKEY PUMP AND PUMP CONTROLLERS.
9. CONNECT EXISTING EXHAUST FAN CONTROLLER TO FIRE ALARM CONTROL PANEL FOR CONTROL OF EXHAUST FAN.

BASEMENT FIRE ALARM PLAN

SCALE: 1/8" = 1'–0"

NOTE:
THE EXISTING FIRE ALARM SYSTEM MUST REMAIN IN SERVICE AND ITS OPERATIONAL INTEGRITY MAINTAINED DURING THE UPGRADING AND INSTALLATION OF THE NEW ADDRESSABLE SYSTEM. AS THE NEW SYSTEM INSTALLATION PROGRESSES, BOTH SYSTEMS WILL BE CROSS TIED AND MAINTAINED UNTIL THE NEW SYSTEM IS FULLY OPERATIONAL, THEN THE OLD FIRE ALARM SYSTEM IS TO BE COMPLETELY REMOVED BY THE CONTRACTOR. IF THE SYSTEMS ARE NOT OPERATIONAL FOR ANY PERIOD OF TIME OVER 6 HOURS, THE CONTRACTOR SHALL MAINTAIN A FIRE WATCH OF THE BUILDING. FIRE WATCH REQUIREMENTS SHALL BE COORDINATED WITH FIRE MARSHALL AND OWNER PRIOR TO BEGINNING WORK ON THE PROJECT.

NOTE:
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NOTE:
REUSE EXISTING RACEWAY WHEN PRACTICAL WITHOUT DISRUPTING EXISTING SYSTEM FOR EXTENDED PERIODS. ALL EMT CONDUIT SHOULD BE AVAILABLE FOR REUSE. IN SOME CASES SURFACE RACEWAY MAY NEED TO BE REPLACED. DUE TO DIFFICULTY IN ACCESSING AND REINSTALLING COVERS. INCLUDE IN BID REPLACEMENT OF UP TO 150 FEET OF SURFACE RACEWAY (WIREMOLD TYPE OR SIMILAR). WITH FINISH TO MATCH EXISTING.

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FIRE ALARM ALARM UPGRADE
ELKHART HOUSING AUTHORITY
WATERFALL HIGH RISE
303 WATERFALL DRIVE ELKHART, INDIANA

BASEMENT
FIRE ALARM PLAN

FA-0

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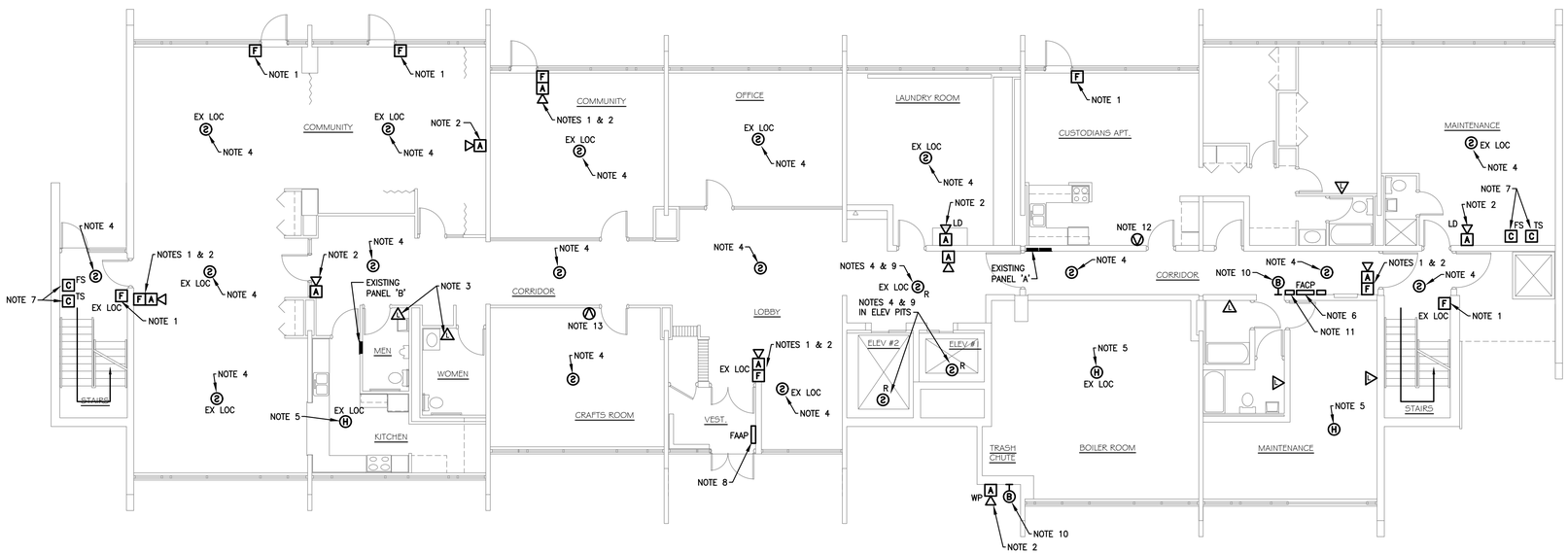

PLAN NOTES:

1. PROVIDE AND INSTALL NEW DUAL ACTION PULL STATION TO REPLACE EXISTING PULL STATION AT EXISTING LOCATION. IF EXISTING LOCATION DOES NOT MEET ADA REQUIREMENTS PULL STATION TO BE INSTALLED AT HEIGHT AS REQUIRED BY ADA. EXTEND WIRING TO THE NEW LOCATION WITH SURFACE MOUNTED RACEWAY.
2. PROVIDE AND INSTALL NEW HORN/VISUAL NOTIFICATION DEVICE. NEW DEVICE TO BE MOUNTED TO MEET ADA REQUIREMENTS. EXTEND WIRING AS REQUIRED IN SURFACE MOUNTED RACEWAY OR CONDUIT TO NEW LOCATION.
3. PROVIDE AND INSTALL NEW VISUAL NOTIFICATION DEVICE. NEW DEVICE TO BE MOUNTED TO MEET ADA REQUIREMENTS. EXTEND WIRING AS REQUIRED IN SURFACE MOUNTED RACEWAY OR CONDUIT TO NEW LOCATION.
4. PROVIDE AND INSTALL NEW SMOKE DETECTOR. COORDINATE EXACT LOCATION WITH EXISTING CONDITIONS IN THE FIELD.
5. PROVIDE AND INSTALL NEW HEAT DETECTOR. COORDINATE EXACT LOCATION WITH EXISTING CONDITIONS IN THE FIELD.
6. NEW FACP. COORDINATE EXACT LOCATION WITH EXISTING CONDITIONS. CONNECT TO EXISTING CIRCUIT.
7. PROVIDE WIRING TO CONNECT FUTURE FLOW AND TAMPER SWITCHES TO NEW FIRE ALARM SYSTEM. PROVIDE PROVISIONS IN FACP FOR FUTURE CONNECTION OF FLOW AND TAMPER SWITCHES.
8. NEW FAAP COMPLETE WITH VOICE CONTROLS. COORDINATE EXACT LOCATION WITH EXISTING CONDITIONS. CONNECT TO EXISTING CIRCUIT. COORDINATE EXACT LOCATION WITH OWNER AND FIRE MARSHALL PRIOR TO ROUGH-IN.
9. PROVIDE CONDUIT FROM SMOKE DETECTOR TO ELEVATOR CONTROLLER FOR CONNECTION TO ELEVATOR CONTROLLER. COORDINATE ALL REQUIREMENTS WITH ELEVATOR PROVIDER.
10. PROVIDE AND CONNECT NEW FIRE SPRINKLER BELL. COORDINATE LOCATIONS WITH OWNER PRIOR TO INSTALLATION.
11. CONNECT EXISTING ELEVATOR INTERFACE DEVICES TO ELEVATOR CONTROLLER AND FIRE ALARM.
12. PROVIDE AND INSTALL SPEAKER CONNECTED TO FIRE ALARM CONTROL PANEL. ALL WIRING TO BE IN CONDUIT. CONDUIT CAN BE SURFACE MOUNTED. SEAL ALL PENETRATIONS INTO APARTMENTS.

FIRST FLOOR FIRE ALARM PLAN

SCALE: 1/8" = 1'-0"

NOTE:
THE EXISTING FIRE ALARM SYSTEM MUST REMAIN IN SERVICE AND ITS OPERATIONAL INTEGRITY MAINTAINED DURING THE UPGRADING AND INSTALLATION OF THE NEW ADDRESSABLE SYSTEM. AS THE NEW SYSTEM INSTALLATION PROGRESSES, BOTH SYSTEMS WILL BE CROSS TIED AND MAINTAINED UNTIL THE NEW SYSTEM IS FULLY OPERATIONAL, THEN THE OLD FIRE ALARM SYSTEM IS TO BE COMPLETELY REMOVED BY THE CONTRACTOR. IF THE SYSTEMS ARE NOT OPERATIONAL FOR ANY PERIOD OF TIME OVER 6 HOURS, THE CONTRACTOR SHALL MAINTAIN A FIRE WATCH OF THE BUILDING. FIRE WATCH REQUIREMENTS SHALL BE COORDINATED WITH FIRE MARSHALL AND OWNER PRIOR TO BEGINNING WORK ON THE PROJECT.

NOTE:
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NOTE:
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FIRE ALARM ALARM UPGRADE
ELKHART HOUSING AUTHORITY
WATERFALL HIGH RISE
303 WATERFALL DRIVE ELKHART, INDIANA

FIRST FLOOR
FIRE ALARM PLAN

FA-1

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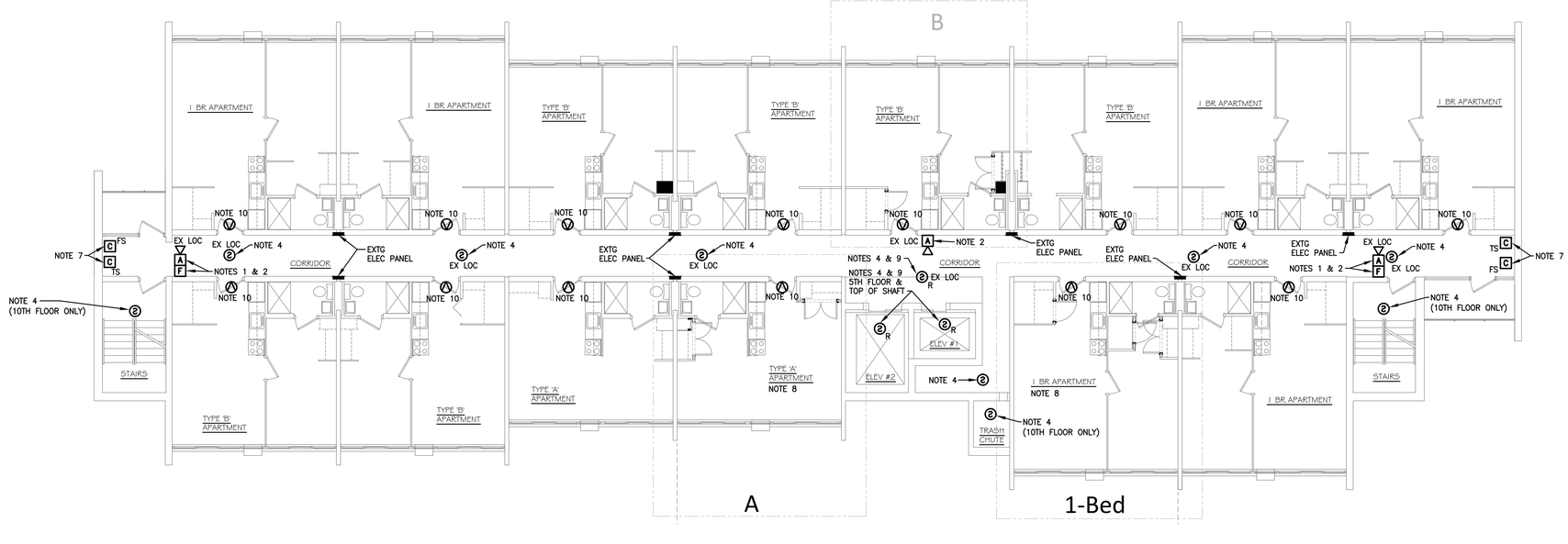
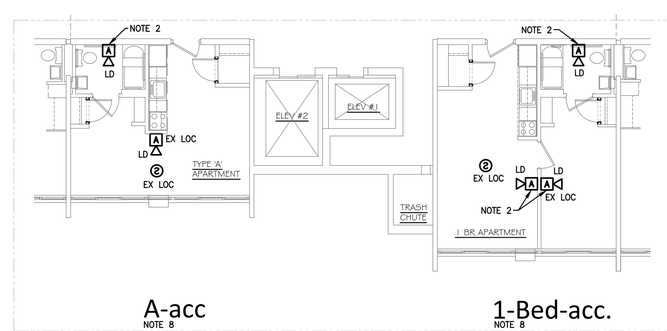


2ND–10TH FLOOR FIRE ALARM PLAN

SCALE: 1/8" = 1'–0"

SHEET NOTES:

1. PROVIDE AND INSTALL NEW DUAL ACTION PULL STATION TO REPLACE EXISTING PULL STATION AT EXISTING LOCATION. IF EXISTING LOCATION DOES NOT MEET ADA REQUIREMENTS PULL STATION TO BE INSTALLED AT HEIGHT AS REQUIRED BY ADA. EXTEND WIRING TO THE NEW LOCATION WITH SURFACE MOUNTED RACEWAY.
2. PROVIDE AND INSTALL NEW AUDIO/VISUAL NOTIFICATION DEVICE. NEW DEVICE TO BE MOUNTED TO MEET ADA REQUIREMENTS. EXTEND WIRING AS REQUIRED IN SURFACE MOUNTED RACEWAY OR CONDUIT TO NEW LOCATION.
3. PROVIDE AND INSTALL NEW VISUAL NOTIFICATION DEVICE. NEW DEVICE TO BE MOUNTED TO MEET ADA REQUIREMENTS. EXTEND WIRING AS REQUIRED IN SURFACE MOUNTED RACEWAY TO NEW LOCATION.
4. PROVIDE AND INSTALL NEW SMOKE DETECTOR. COORDINATE EXACT LOCATION WITH EXISTING CONDITIONS IN THE FIELD.
5. PROVIDE AND INSTALL NEW HEAT DETECTOR. COORDINATE EXACT LOCATION WITH EXISTING CONDITIONS IN THE FIELD.
6. NEW FACP. COORDINATE EXACT LOCATION WITH EXISTING CONDITIONS. CONNECT TO EXISTING CIRCUIT.
7. PROVIDE WIRING TO CONNECT FUTURE FLOW AND TAMPER SWITCHES TO NEW FIRE ALARM SYSTEM. PROVIDE PROVISIONS IN FACP FOR FUTURE CONNECTION OF FLOW AND TAMPER SWITCHES.
8. SEE 2ND–4TH FLOOR HANDICAP UNITS FIRE ALARM PLANS THIS SHEET AND INCLUDE WORK INDICATED. TYPICAL (6) UNITS.
9. PROVIDE CONDUIT FROM SMOKE DETECTOR TO ELEVATOR CONTROLLER FOR CONNECTION TO ELEVATOR CONTROLLER. COORDINATE ALL REQUIREMENTS WITH ELEVATOR PROVIDER.
10. PROVIDE AND INSTALL SPEAKER CONNECTED TO FIRE ALARM CONTROL PANEL. ALL WIRING TO BE IN CONDUIT. CONDUIT CAN BE SURFACE MOUNTED. SEAL ALL PENETRATIONS INTO APARTMENTS.



2ND–4TH FLOOR HANDICAP UNITS FIRE ALARM PLANS

SCALE: 1/8" = 1'–0"

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2ND-10TH FLOOR
FIRE ALARM PLANS

FA-2

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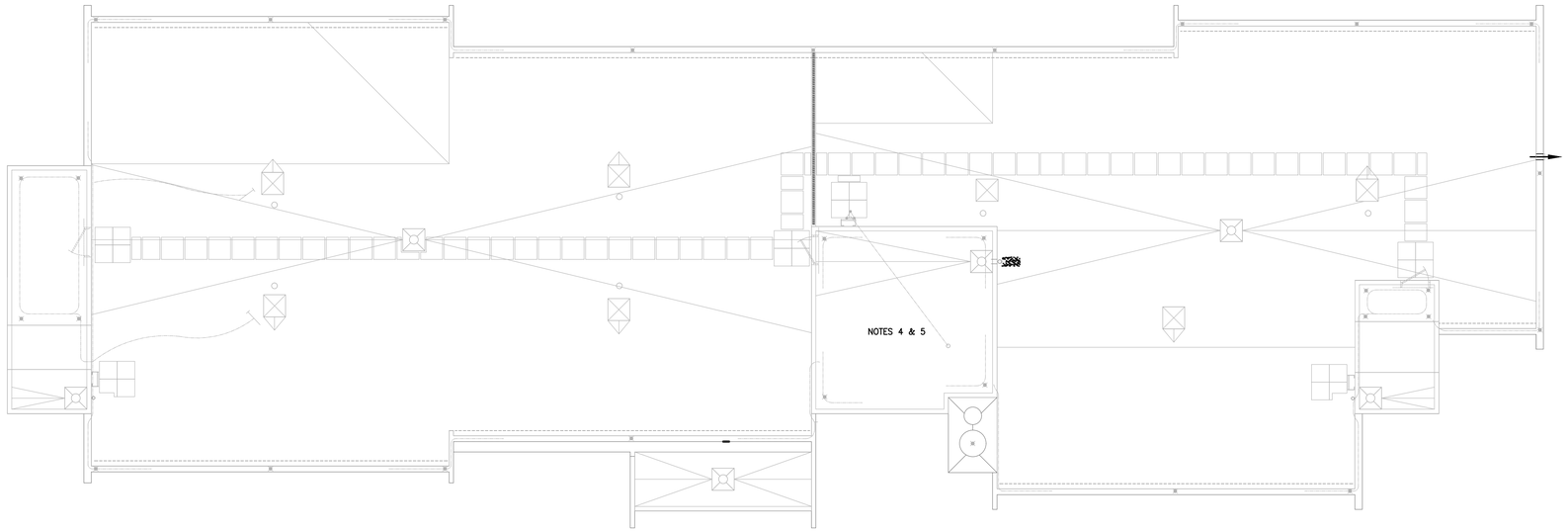
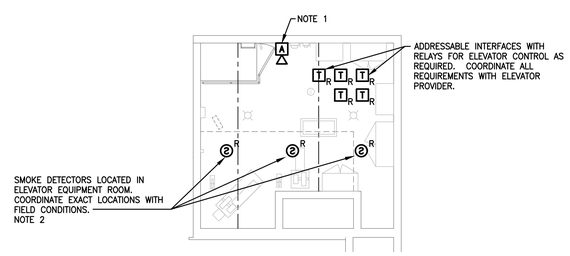
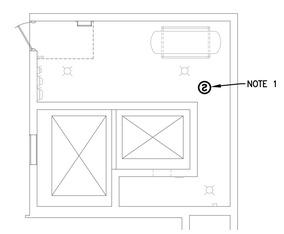


ROOF FIRE ALARM PLAN
SCALE: 1/8" = 1'-0"

SHEET NOTES:
1. PROVIDE AND INSTALL NEW AUDIO/VISUAL NOTIFICATION DEVICE. NEW DEVICE TO BE MOUNTED TO MEET ADA REQUIREMENTS. EXTEND WIRING AS REQUIRED IN SURFACE MOUNTED RACEWAY TO NEW LOCATION.
2. PROVIDE AND INSTALL NEW SMOKE DETECTOR. COORDINATE EXACT LOCATION WITH EXISTING CONDITIONS IN THE FIELD.
3. PROVIDE CONDUIT FROM SMOKE DETECTOR TO ELEVATOR CONTROLLER FOR CONNECTION TO ELEVATOR CONTROLLER. COORDINATE ALL REQUIREMENTS WITH ELEVATOR PROVIDER.
4. SEE ELEVATOR MACHINE ROOM FIRE ALARM PLAN THIS SHEET. LOCATED ABOVE PENTHOUSE.
5. SEE PENTHOUSE FIRE ALARM PLAN THIS SHEET.



ELEVATOR MACHINE ROOM (ON ROOF) FIRE ALARM PLAN
SCALE: 1/8" = 1'-0"



PENTHOUSE FIRE ALARM PLAN
SCALE: 1/8" = 1'-0"

NOTE:
THE EXISTING FIRE ALARM SYSTEM MUST REMAIN IN SERVICE AND ITS OPERATIONAL INTEGRITY MAINTAINED DURING THE UPGRADING AND INSTALLATION OF THE NEW ADDRESSABLE SYSTEM. AS THE NEW SYSTEM INSTALLATION PROGRESSES, BOTH SYSTEMS WILL BE CROSS TIED AND MAINTAINED UNTIL THE NEW SYSTEM IS FULLY OPERATIONAL, THEN THE OLD FIRE ALARM SYSTEM IS TO BE COMPLETELY REMOVED BY THE CONTRACTOR. IF THE SYSTEMS ARE NOT OPERATIONAL FOR ANY PERIOD OF TIME OVER 6 HOURS, THE CONTRACTOR SHALL MAINTAIN A FIRE WATCH OF THE BUILDING. FIRE WATCH REQUIREMENTS SHALL BE COORDINATED WITH FIRE MARSHALL AND OWNER PRIOR TO BEGINNING WORK ON THE PROJECT.

NOTE:
THESE DRAWINGS ARE PROVIDED TO CONVEY OWNERS INTENT, AND POSSIBLE LAYOUT OPTIONS. FINAL DESIGN, INCLUDING LAYOUT, AND CALCULATIONS REMAIN WITH THE CONTRACTOR. FINAL LAYOUT SHOULD MINIMIZE BUILDING, DISRUPTION AND REMOVAL AND REPLACEMENT OF CEILINGS WHERE APPLICABLE.

NOTE:
REUSE EXISTING RACEWAY WHEN PRACTICAL WITHOUT DISRUPTING EXISTING SYSTEM FOR EXTENDED PERIODS. ALL EMT CONDUIT SHOULD BE AVAILABLE FOR REUSE. IN SOME CASES SURFACE RACEWAY MAY NEED TO BE REPLACED. DUE TO DIFFICULTY IN ACCESSING AND REINSTALLING COVERS. INCLUDE IN BID REPLACEMENT OF UP TO 150 FEET OF SURFACE RACEWAY (WIREMOLD TYPE OR SIMILAR). WITH FINISH TO MATCH EXISTING.

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FIRE ALARM ALARM UPGRADE
ELKHART HOUSING AUTHORITY
WATERFALL HIGH RISE
303 WATERFALL DRIVE ELKHART, INDIANA

PENTHOUSE & MACHINE RM
FIRE ALARM PLANS

FA-3

FORUM
ARCHITECTS

SECTION 260000
ELECTRICAL

PART 1: GENERAL

1.1 GENERAL

A. THE WORK INDICATED IN THIS DIVISION AND ON THE ELECTRICAL DRAWINGS IS SUBJECT TO THE REQUIREMENTS OF THE INSTRUCTIONS TO BIDDERS (DIVISION 0) AND GENERAL CONDITIONS (DIVISION 1). THESE ARE HEREBY INCLUDED BY REFERENCE. THE CONTRACTOR IS DIRECTED TO EXAMINE ALL PORTIONS OF THE BID DOCUMENTS AS THEY PERTAIN TO THE WORK COVERED BY THIS DIVISION OF THE SPECIFICATIONS AND TO INCLUDE ALL COSTS IN BID FOR ALL ELECTRICAL WORK AS CALLED FOR BY THE COMPLETE BID DOCUMENTS.

B. PROVIDE ALL REQUIRED LABOR, MATERIALS, EQUIPMENT AND CONTRACTOR SERVICES NECESSARY FOR THE COMPLETE INSTALLATION OF EQUIPMENT INDICATED HEREIN AND ON THE DRAWINGS, COMPLETE WITH ALL RELATED SERVICES. REVIEW ALL EXISTING BUILDING CONDITIONS AS THEY RELATE TO ELECTRICAL WORK AND INCLUDE COSTS IN BID. COORDINATE REQUIREMENTS WITH OTHER TRADES AS REQUIRED.

C. ALL WORK SHALL BE PERFORMED BY EXPERIENCED PERSONNEL QUALIFIED TO CARRY OUT THE WORK IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, LOCAL CODES AND AS SPECIFIED HEREIN. THE CONTRACTOR SHALL PROVIDE APPROPRIATE QUALIFICATIONS AND RECORDS OF PAST EXPERIENCE FOR PERSONNEL AND SUBCONTRACTORS WHEN REQUESTED BY THE ENGINEER/ARCHITECT FOR REVIEW AND APPROVAL.

D. THE ELECTRICAL CONTRACTOR/TRADE SHALL BE RESPONSIBLE FOR COORDINATION AND DISTRIBUTION OF WORK TO HIS SUBCONTRACTORS AND SHALL VERIFY COMPLETENESS OF SUBMITTALS AND WORK.

E. CONTRACTOR SHALL NOT CUT ANY BEAM OR COLUMNS OR ANY PORTION OF STRUCTURAL SYSTEM WITHOUT SPECIFIC PERMISSION. CONTRACTOR SHALL COORDINATE WITH OWNER/ARCHITECT/ENGINEER.

F. DIVISION OF RESPONSIBILITY FOR VARIOUS ASPECTS OF THE WORK SHALL BE AS OUTLINED IN DIVISIONS 0 AND 1 OF THE SPECIFICATIONS. RESPONSIBILITY FOR COORDINATION WITH OTHER TRADES IS THE RESPONSIBILITY OF ALL TRADES.

1.2 CONTRACT DOCUMENTS

A. THE ELECTRICAL DRAWINGS LISTED IN THE DRAWING INDEX, TOGETHER WITH THESE SPECIFICATIONS, ARE AN INTEGRAL PART OF THE ELECTRICAL CONTRACT. WHAT IS CALLED FOR IN ONE IS AS BINDING AS IF CALLED FOR IN BOTH. IN CASE OF CONFLICT, THE GREATER QUANTITY OR BETTER QUALITY IS TO PREVAIL, SUBJECT TO THE APPROVAL OF THE ENGINEER/ARCHITECT.

B. THE ELECTRICAL DRAWINGS ARE DIAGRAMMATIC ONLY, BUT ARE TO BE FOLLOWED AS CLOSELY AS ACTUAL CONSTRUCTION OF THE PROJECT AND WORK OF OTHER TRADES WILL PERMIT. MINOR CHANGES FROM THESE DRAWINGS, NECESSARY TO COORDINATE WITH THE WORK OF OTHER TRADES AND TO MAKE THE WORK OF THIS CONTRACTOR CONFORM TO THE PROJECT AS CONSTRUCTED, ARE TO BE MADE AT NO ADDITIONAL COST TO THE OWNER.

C. ELECTRICAL DRAWINGS ARE NOT TO BE SCALED FOR THE PURPOSE OF EQUIPMENT INSTALLATION. ALL MEASUREMENTS TO BE DERIVED FROM ARCHITECTURAL AND SHOP DRAWINGS AND COORDINATED WITH FIELD CONDITIONS. ALL MEASUREMENTS MUST BE VERIFIED. THE CONTRACTOR IS RESPONSIBLE FOR ALL WORK FITTING INTO PLACE IN A SATISFACTORY AND WORKMANLIKE MANNER

D. INCREASED COST OF WIRING RESULTING FROM INCREASED ELECTRICAL RATINGS OVER THAT SHOWN ON THE ELECTRICAL DRAWINGS IS TO BE BORNE BY THE CONTRACTOR FURNISHING THE EQUIPMENT.

E. ARRANGE WORK FOR MAXIMUM CLEARANCE AND ACCESSIBILITY TO ALL WORK OF THIS TRADE AS WELL AS OTHER TRADES. COORDINATE WITH EXISTING CONDITIONS.

1.3 ALLOWANCES

A. SEE DIVISION 1 AND BIDDING/PROPOSAL REQUEST REQUIREMENTS OF THE SPECIFICATIONS.

1.4 CODES, STANDARDS AND PERMITS

A. ALL WORK SHALL BE IN ACCORDANCE WITH NATIONAL, STATE AND LOCAL CODES IN FORCE AT TIME OF BIDDING, INCLUDING BUT NOT LIMITED TO THE NATIONAL ELECTRICAL CODE AND INDIANA AMENDMENTS. IN ADDITION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND INSPECTION APPROVALS AS THE WORK PROGRESSES. ANY WORK WHICH IS COMPLETED WITHOUT THESE APPROVALS AND FOUND TO BE UNACCEPTABLE SHALL BE CORRECTED BY THE CONTRACTOR AT NO ADDITIONAL COST.

B. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PAYMENT OF ALL FEES ASSOCIATED WITH INSPECTIONS, PERMITS AND UTILITY CONNECTIONS UNLESS OTHERWISE INDICATED.

C. ALL STANDARDS REFERENCED IN THIS DIVISION OR ON THE DRAWINGS SHALL COMPLY WITH THE LATEST EDITION IN FORCE. MATERIAL AND EQUIPMENT FURNISHED AND INSTALLED UNDER THESE SPECIFICATIONS WHICH, IN THE OPINION OF THE ENGINEER/ARCHITECT, DO NOT COMPLY WITH THE STANDARDS OF THE ORGANIZATIONS LISTED, ARE TO BE REPLACED WITHOUT ADDITIONAL COST TO THE OWNER. STANDARDS SHALL INCLUDE BUT NOT BE LIMITED TO THE FOLLOWING:

NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
UL	UNDERWRITERS' LABORATORIES
NEMA	NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION
IEEE	INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS
ICEA	INSULATED CABLE ENGINEERS ASSOCIATIONS
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS

1.5 DEFINITIONS

A. CONCEALED: EMBEDDED IN WALLS, CEILINGS, FLOORS OR OTHER SPACES. NOT EXPOSED TO VIEW.

B. EXPOSED: NOT CONCEALED OR INSTALLED UNDERGROUND.

C. FURNISH, PROVIDE: TO SUPPLY, INSTALL, CONNECT AND PUT INTO OPERATION.

D. WORK: WIRING, EQUIPMENT, RACEWAYS, COORDINATION, ETC. AS REQUIRED BY THE CONTRACT DOCUMENTS FOR A COMPLETE AND OPERATING SYSTEM.

1.6 MATERIALS AND EQUIPMENT

A. WHERE "APPROVED EQUAL" CLAUSE IS INDICATED, IT MEANS MATERIAL, APPARATUS, EQUIPMENT AND SUPPLIES HAVING RECOGNIZED STANDARDS OF QUALITY AND PERFORMANCE WHICH, IN THE JUDGEMENT OF THE ENGINEER/ARCHITECT, WILL MEET THE DESIGN AND SPECIFICATION REQUIREMENTS. MATERIAL AND EQUIPMENT BY MANUFACTURERS OTHER THAN THOSE LISTED IN THE PLANS OR SPECIFICATIONS MUST BE SUBMITTED TO THE ENGINEER/ARCHITECT FOR APPROVAL NOT LATER THAN TEN (10) WORKING DAYS PRIOR TO THE DUE DATE FOR BIDS.

B. WHERE "OR EQUAL" CLAUSE IS INDICATED, IT MEANS MATERIAL AND EQUIPMENT OF EQUAL OR BETTER QUALITY AND PERFORMANCE THAN THAT LISTED IN THE PLANS AND SPECIFICATIONS, EXCEPT THAT NO APPROVAL PRIOR TO BIDDING IS REQUIRED.

1.7 SHOP DRAWINGS AND SUBMITTALS

A. PROVIDE ALL SUBMITTALS AS CALLED FOR IN DIVISION 1 OF THE SPECIFICATIONS, INCLUDING SHOP DRAWINGS, SAMPLES, MATERIAL LISTS, SCHEDULE OF VALUE, ETC. SHOP DRAWINGS SHALL BE COMPLETELY REVIEWED AND APPROVED BY THE CONTRACTOR AND TRADE FURNISHING THE EQUIPMENT (INDICATED BY THE CONTRACTOR'S APPROVAL STAMP) PRIOR TO SUBMITTING TO THE ENGINEER/ARCHITECT.

B. WHERE SHOP DRAWING SUBMITTALS ARE ASSEMBLED IN A FOLDER OR BOUND SETS, ALL FOLDERS OR SETS ARE TO BE IDENTICAL AND EACH SET MUST CONTAIN AN INDEX OF THE ITEMS ENCLOSED IN THE SET OR FOLDER. QUANTITY OF ORIGINAL COLOR SAMPLES REQUIRED SHALL BE COORDINATED WITH THE ARCHITECT.

C. REVIEW AND APPROVAL OF SHOP DRAWINGS BY THE ENGINEER/ARCHITECT IS FOR GENERAL CONFORMITY TO DESIGN INTENT ONLY. THIS REVIEW DOES NOT AUTHORIZE CHANGES TO THE CONTRACT SUM OR RELIEVE THE CONTRACTOR IN ANY WAY OF HIS CONTRACT OBLIGATIONS.

D. PROVIDE SUBMITTALS FOR THE FOLLOWING:

1. RACEWAYS
2. CONDUCTORS
3. FIRE ALARM SYSTEM AND COMPONENTS
4. FIRESTOPPING

1.8 ELECTRICAL

A. COORDINATE ALL WORK REQUIRING ELECTRICAL CONNECTION WITH THE CONTRACTOR PROVIDING THE EQUIPMENT. EXCEPT AS OTHERWISE INDICATED, ADDITIONAL INTERNAL WIRING, AUTOMATIC CONTROL WIRING, PROTECTIVE DEVICES, ETC. ASSOCIATED WITH WORK FURNISHED BY THE OTHER TRADES SHALL BE FURNISHED BY THE TRADE SUPPLYING THE EQUIPMENT.

B. VERIFY VOLTAGE AND PHASE CHARACTERISTICS OF THE ELECTRICAL SERVICE AND COORDINATE WITH MECHANICAL EQUIPMENT AS REQUIRED.

C. WHERE ELECTRICAL RATINGS OF EQUIPMENT INCREASE OVER THOSE INDICATED ON THE APPROVED CONSTRUCTION DOCUMENTS, THE CONTRACTOR PROVIDING THE EQUIPMENT SHALL PAY ADDITIONAL COSTS OF WIRING AND ELECTRICAL EQUIPMENT FOR PROPER ELECTRICAL SERVICE TO THE EQUIPMENT.

1.9 PAINTING AND FINISHING

A. UNLESS OTHERWISE INDICATED IN OTHER DIVISIONS OF THE SPECIFICATIONS, AT NO ADDITIONAL COST TO THE OWNER, REPAINT ALL PATCHED AREAS TO MATCH ORIGINAL FINISH WHERE HOLES OR CHASES HAVE BEEN CUT TO RECEIVE ELECTRICAL WORK. REPAINT PATCHED AREAS WITH TWO (2) COATS OF PAINT TO MATCH SURROUNDING AREAS; BLEND AS REQUIRED.

B. UNLESS OTHERWISE INDICATED IN OTHER DIVISIONS OF THE SPECIFICATIONS, AT NO ADDITIONAL COST TO THE OWNER, GIVE ALL FABRICATED STEEL SUPPORTS, HANGERS, BRACKETS AND PLATFORMS INSTALLED UNDER THIS CONTRACT TWO (2) COATS OF HIGH-GRADE ENAMEL.

C. TOUCH UP MARRED SURFACES OF EQUIPMENT HOUSING WITH ENAMEL OF A COLOR TO MATCH.

1.10 DEMOLITION

A. BEFORE STARTING DEMOLITION WORK, REVIEW ALL REQUIREMENTS FOR FINAL REMODELING WORK SO THAT USABLE EXISTING SYSTEM COMPONENTS, AS REQUIRED FOR COMPLETION OF THE NEW WORK, ARE NOT DESTROYED. COORDINATE ALL WORK WITH THE OTHER CONTRACTORS.

B. ALL ELECTRICAL EQUIPMENT AND CIRCUITS THAT ARE DAMAGED OR DESTROYED DURING DEMOLITION, AND ARE NOT CALLED OUT TO BE REMOVED ON THE DRAWINGS, MUST BE RESTORED TO ORIGINAL CONDITION.

C. PROVIDE ALL LABOR, MATERIALS AND NECESSARY COORDINATION FOR DEMOLITION WORK AS CALLED FOR BY THE CONTRACT DOCUMENTS. REMOVAL SHALL BE PARTIAL OR COMPLETE AS CALLED FOR AND SHALL BE COORDINATED WITH OTHER TRADES AND NEW CONSTRUCTION. WORK SHALL ALSO INCLUDE MISCELLANEOUS ITEMS RELATED TO WORK INDICATED WHERE NOT REUSED FOR NEW CONSTRUCTION.

D. THE CONDITION OF THE SITE, BUILDINGS AND SURROUNDINGS SHALL BE ACCEPTED AS FOUND. RESPONSIBILITY FOR CONDITIONS ARE SOLELY THE RESPONSIBILITY OF THE CONTRACTOR.

E. WORK PRACTICES AND JOB CONDITIONS SHALL MEET ALL STATE, FEDERAL AND LOCAL REQUIREMENTS TO PROTECT LIFE AND PROPERTY.

F. PROVIDE SHORING AND/OR BRACING AS REQUIRED TO PROTECT AGAINST COLLAPSE OR SETTLING.

G. VERIFY WORK TO BE PERFORMED BEFORE PROCEEDING. WORK TO REMAIN SHALL BE PROTECTED AND, IF DAMAGED, SHALL BE RESTORED TO LIKE NEW CONDITION.

H. PLUG, CAP OR DISCONNECT ACTIVE LINES AND SERVICES AS APPLICABLE. WORK SHALL BE PERFORMED BY QUALIFIED, LICENSED PERSONNEL.

I. IF ANY MATERIALS WHICH MIGHT BE CLASSIFIED AS HAZARDOUS WASTE ARE LOCATED, THE OWNER SHALL BE NOTIFIED. THE CONTRACTOR SHALL THEN WAIT UNTIL NOTIFIED THAT HAZARDOUS WASTE HAS BEEN REMOVED BEFORE CONTINUING WITH WORK.

J. TURN OVER ANY PERSONAL PROPERTY DISCOVERED DURING THE DEMOLITION PROCESS TO THE OWNER.

K. DEBRIS SHALL BE REMOVED FROM THE SITE ON A REGULAR BASIS. IF DEBRIS REMAINS AFTER COMPLETION OF DEMOLITION OR IS ALLOWED TO OBSTRUCT OTHER OPERATIONS, THE OWNER AND ENGINEER/ARCHITECT RESERVE THE RIGHT TO HAVE MATERIAL REMOVED. ALL COSTS OF SAID REMOVAL WILL BE BILLED TO THE CONTRACTOR OR CHARGED AGAINST CONTRACTOR PAY REQUESTS AT THE DISCRETION OF THE OWNER AND ENGINEER/ARCHITECT. LEAVE SITE IN A NEAT AND ORDERLY CONDITION.

L. PROTECT AREAS TO REMAIN FROM WEATHER. WEATHER DAMAGE SHALL BE REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.

1.11 RECORD DRAWING

A. PROVIDE ELECTRICAL RECORD DRAWINGS AS CALLED FOR IN DIVISION 1 AND INCLUDE ALL PERTINENT INFORMATION NOT SHOWN AND ALL CHANGES FROM THE ORIGINAL PLANS.

1.12 CHANGES, CONTRACT DOCUMENTS

A. THE CONTRACT DOCUMENT MAY BE SUPERSEDED BY LATER REVISED DRAWINGS OR SPECIFICATION ADDENDA PREPARED BY THE ENGINEER/ARCHITECT, AND ALL REASONABLE CHANGES (UP TO 3 FEET) IN LOCATION OF EQUIPMENT PRIOR TO ITS INSTALLATION, SHALL BE MADE WITHOUT ADDITIONAL COST TO THE OWNER.

1.13 OPERATING AND MAINTENANCE MANUALS AND INSTRUCTION

A. PROVIDE TWO (2) BOUND SETS OF COMPLETE INSTALLATION, OPERATING, AND MAINTENANCE INSTRUCTIONS OR AS OUTLINED IN DIVISION 1 OF THESE SPECIFICATIONS. MANUALS SHALL ALSO INCLUDE SUBMITTAL DATA STATING EQUIPMENT RATING AND SELECTED OPTIONS FOR EACH PIECE OF EQUIPMENT, COMPLETE PARTS LISTS, A COMPLETE NARRATIVE EXPLAINING HOW EACH SYSTEM IS INTENDED TO OPERATE, COPIES OF ORIGINAL SHOP DRAWINGS, ELECTRICAL CONTRACTOR'S NAME AND ADDRESS WITH SUBCONTRACTOR LISTS OF NAMES AND ADDRESSES, WARRANTIES, WARNINGS, ETC. GENERIC INSTRUCTIONS SHALL HIGHLIGHT APPLICABLE SECTIONS, WHEN NEEDED, TO DIFFERENTIATE FROM NON-RELEVANT EQUIPMENT.

B. UPON COMPLETION OF THE WORK, AND AT A DESIGNATED TIME, PROVIDE INSTRUCTIONS TO THE OWNER'S REPRESENTATIVE IN OPERATION AND MAINTENANCE OF ALL MECHANICAL EQUIPMENT. NOTIFY ENGINEER/ARCHITECT OF SCHEDULED TIME AND PLACE.

C. TURN OVER TO OWNER ALL TOOLS SUPPLIED WITH EQUIPMENT.

1.14 WORKMANSHIP

A. INSTALL ALL MATERIALS AND EQUIPMENT IN A NEAT AND WORKMANLIKE MANNER AND IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS, AS APPROVED BY THE ENGINEER/ARCHITECT TO CONFORM WITH THE CONTRACT DOCUMENTS.

B. PROVIDE TESTING AND START-UP FOR ALL EQUIPMENT AS RECOMMENDED BY MANUFACTURER UNLESS DIRECTED OTHERWISE.

1.15 SUPERVISION

A. HAVE A THOROUGHLY COMPETENT SUPERINTENDENT IN CHARGE OF THE WORK AT ALL TIMES, EXPERIENCED IN THE WORK TO BE DONE UNDER THIS CONTRACT. REPLACE ANYONE NOT DEEMED CAPABLE BY THE ENGINEER/ARCHITECT UPON REQUEST IMMEDIATELY, BY ONE WHO IS SATISFACTORY. A SATISFACTORY SUPERINTENDENT, ONCE ASSIGNED, IS NOT TO BE REMOVED WITHOUT THE CONSENT OF THE ENGINEER/ARCHITECT.

1.16 TESTS

A. AFTER THE INSTALLATION IS COMPLETED, AND AT SUCH TIME AS THE ENGINEER/ARCHITECT MAY DIRECT, THE CONTRACTOR IS TO CONDUCT AN OPERATING TEST FOR APPROVAL. DEMONSTRATE EQUIPMENT TO OPERATE IN ACCORDANCE WITH THE REQUIREMENTS OF THIS SPECIFICATION. PERFORM TESTS IN THE PRESENCE OF THE ENGINEER/ARCHITECT OR HIS AUTHORIZED REPRESENTATIVE. THE CONTRACTOR IS TO FURNISH ALL INSTRUMENTS AND PERSONNEL REQUIRED FOR THE TESTS.

1.17 GUARANTEES AND WARRANTIES

A. ALL LABOR, MATERIALS AND EQUIPMENT SHALL BE GUARANTEED BY THE CONTRACTOR AND WARRANTED BY THE MANUFACTURER FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE BY THE OWNER, UNLESS LONGER PERIOD IS SPECIFIED FOR SPECIFIC EQUIPMENT. LAMP GUARANTEE IS LIMITED TO REPLACING ALL DEFECTIVE OR NON-OPERATING LAMPS INSTALLED UNDER THIS CONTRACT AT TIME OF SUBSTANTIAL COMPLETION.

B. THE CONTRACTOR SHALL MAKE ALL NECESSARY REPAIRS AND ALTERATIONS DURING THE GUARANTEE PERIOD AS MAY BE REQUIRED BY THE OWNER OR ARCHITECT FOR CORRECT SYSTEM OPERATION AND TO COMPLY WITH THE DRAWINGS AND SPECIFICATIONS. THESE REPAIRS AND ALTERATIONS SHALL BE AT NO ADDITIONAL COST TO THE OWNER.

C. THE OWNER RESERVES THE RIGHT TO MAKE EMERGENCY SYSTEM REPAIRS WITHOUT VOIDING THE CONTRACTOR'S GUARANTEE.

1.19 UTILITY COORDINATION

A. THE TERM UTILITY SHALL APPLY TO ELECTRICAL, TELEPHONE, NATURAL GAS OR CABLE TELEVISION UTILITIES, AS REQUIRED BY WORK OF THIS CONTRACT.

B. COORDINATE ANY ELECTRIC UTILITY OUTAGE WITH THE OWNER. FURNISH TEMPORARY POWER CONNECTIONS AS REQUIRED TO MAINTAIN OWNER OPERATIONS FOR EXTENDED OUTAGES EXCEEDING 8 HOURS. CONTRACTOR SHALL INCLUDE IN BASE BID COST ALL EXPENSES TO PERFORM AFTER-HOURS PRE-ARRANGED OUTAGES.

PART 2: PRODUCTS

2.1 RACEWAYS

A. PROVIDE AND INSTALL RACEWAYS AS REQUIRED FOR THE NEW WORK. ALL CONDUITS WILL BE PROPERLY SUPPORTED FROM THE STRUCTURE OF THE BUILDING. RACEWAYS WILL BE RIGID METAL CONDUIT (RMC), INTERMEDIATE METALLIC CONDUIT (IMC), OR ELECTRICAL METALLIC TUBING (EMT) AS ALLOWED BY THE NEC. MINIMUM RACEWAY SIZE WILL BE THREE-QUARTER (3/4) INCH.

2.2 FIRE ALARM SYSTEM

A. THIS SPECIFICATION DESCRIBES AN ADDRESSABLE FIRE DETECTION AND ALARM SIGNALING SYSTEM. BASIS OF DESIGN (BASE BID) IS THE SIEMENS CERBERUS® PRO MODULAR WITH DIGITAL VOICE EVACUATION – THE SYSTEM SHALL BE A COMPLETE, ELECTRICALLY SUPERVISED FIRE DETECTION AND EVACUATION SYSTEM USING ONE WAY COMMUNICATION AND FIREFIGHTERS' TELEPHONE AND SMOKE CONTROL SYSTEMS WITH A MICROPROCESSOR-BASED OPERATING SYSTEM. THE CONTROL PANEL SHALL BE INTELLIGENT DEVICE ADDRESSABLE, ANALOG DETECTING, LOW VOLTAGE AND MODULAR, WITH DIGITAL COMMUNICATION TECHNIQUES, IN FULL COMPLIANCE WITH ALL APPLICABLE CODES AND STANDARDS. THE FEATURES AND CAPACITIES DESCRIBED IN THIS SPECIFICATION ARE REQUIRED AS A MINIMUM FOR THIS PROJECT AND SHALL BE FURNISHED BY THE SUCCESSFUL CONTRACTOR. FIRE ALARM SYSTEMS BY POTTER AND NOTIFIER CAN BE BID AS ALTERNATES.

B. THE SYSTEM SHALL BE IN FULL COMPLIANCE WITH NATIONAL AND LOCAL CODES AND NFPA 72 REQUIREMENTS AS APPLICABLE. ALL EQUIPMENT SHALL BE UL LISTED.

C. THE SYSTEM SHALL INCLUDE ALL REQUIRED HARDWARE, RACEWAYS, INTERCONNECTING WIRING AND SOFTWARE TO ACCOMPLISH THE REQUIREMENTS OF THIS SPECIFICATION AND THE CONTRACT DRAWINGS, WHETHER OR NOT SPECIFICALLY ITEMIZED HEREIN.

D. ALL EQUIPMENT FURNISHED SHALL BE NEW AND THE LATEST STATE-OF-THE-ART PRODUCTS OF A SINGLE MANUFACTURER, ENGAGED IN THE MANUFACTURING AND SALE OF ANALOG FIRE DETECTION DEVICES FOR OVER 25 YEARS.

E. THE SYSTEM AS SPECIFIED SHALL BE SUPPLIED, INSTALLED, TESTED AND THEN APPROVED BY THE LOCAL AUTHORITY HAVING JURISDICTION, AND TURNED OVER TO THE OWNER IN AN OPERATIONAL CONDITION.

F. IN THE INTEREST OF JOB COORDINATION AND RESPONSIBILITIES, THE INSTALLING CONTRACTOR SHALL CONTRACT WITH A SINGLE SUPPLIER FOR FIRE ALARM EQUIPMENT, ENGINEERING, PROGRAMMING, INSPECTION AND TESTS.

G. ADDITIONAL SYSTEM OPERATION FOR FIRE ALARM CONDITION FOR VOICE:

a. SOUND A PRE-ANNOUNCE TONE FOLLOWED BY A FIELD PROGRAMMABLE DIGITIZED CUSTOM EVACUATION MESSAGE, ON THE FLOOR OF ALARM, THE FLOOR BELOW AND THE FLOOR ABOVE. THE VISUAL SIGNALS SHALL OPERATE IN A SIMILAR PATTERN.

b. A SIMULTANEOUS MESSAGE SHALL BE DELIVERED VIA ALL ALARM SPEAKERS INSTALLED ON THE REMAINING FLOORS INDICATING THE REQUIREMENT FOR OCCUPANTS OF THESE FLOORS TO REMAIN ALERT FOR FURTHER INSTRUCTIONS.

c. A SIMULTANEOUS MESSAGE SHALL BE DELIVERED VIA ALL ALARM SPEAKERS INSTALLED IN STAIRWAYS AND ELEVATORS INFORMING OCCUPANTS OF THE IMMINENT SHUTDOWN OF ELEVATOR CIRCUITS AND THE EXPECTED HIGH TRAFFIC LOAD IN THE STAIRWELLS.

d. AN AUTOMATIC ANNOUNCEMENT OR TONE EVACUATION SIGNAL SHALL BE CAPABLE OF INTERRUPTION BY THE OPERATION OF THE SYSTEM MICROPHONE TO GIVE VOICE EVACUATION INSTRUCTIONS OVERRIDING THE PRE-PROGRAMMED SEQUENCES.

e. STATUS LIGHTS NEXT TO SPEAKER SELECTION SWITCHES ON THE CONTROL PANEL SHALL INDICATE SPEAKER CIRCUIT SELECTION.

f. AUDIBLE SIGNALS SHALL BE SILENCED FROM THE FIRE ALARM CONTROL PANEL BY AN ALARM SILENCE SWITCH. VISUAL SIGNALS SHALL BE PROGRAMMED TO FLASH UNTIL SYSTEM RESET OR ALARM SILENCING, AS REQUIRED BY THE AHJ.

1.01 SUBMITTALS – FIRE ALARM

A. PRODUCT DATA: FOR EACH TYPE OF PRODUCT INDICATED. INCLUDE CONSTRUCTION DETAILS, MATERIAL DESCRIPTIONS, DIMENSIONS OF INDIVIDUAL COMPONENTS AND PROFILES, AND FINISHES. INCLUDE RATED CAPACITIES, OPERATING CHARACTERISTICS, ELECTRICAL CHARACTERISTICS, AND FURNISHED SPECIALTIES AND ACCESSORIES. COMPLETE MANUFACTURER'S CATALOG DATA INCLUDING SUPERVISORY POWER USAGE, ALARM POWER USAGE, PHYSICAL DIMENSIONS, AND FINISH AND MOUNTING REQUIREMENTS.

B. POWER CALCULATIONS. BATTERY CAPACITY CALCULATIONS. BATTERY SIZE SHALL BE A MINIMUM OF 125% OF THE CALCULATED REQUIREMENT. PROVIDE THE FOLLOWING SUPPORTING INFORMATION:

a. SUPERVISORY POWER REQUIREMENTS FOR ALL EQUIPMENT.
b. ALARM POWER REQUIREMENTS FOR ALL EQUIPMENT.
c. POWER SUPPLY RATING JUSTIFICATION SHOWING POWER REQUIREMENTS FOR EACH OF THE SYSTEM POWER SUPPLIES. POWER SUPPLIES SHALL BE SIZED TO FURNISH THE TOTAL CONNECTED LOAD IN A WORST-CASE CONDITION PLUS 25% SPARE CAPACITY.
d. VOLTAGE DROP CALCULATIONS FOR WIRING RUNS DEMONSTRATING WORST-CASE CONDITION.
e. NAC CIRCUIT DESIGN SHALL INCORPORATE A 20% SPARE CAPACITY FOR FUTURE EXPANSION.

C. SUBMIT MANUFACTURER'S REQUIREMENTS FOR TESTING DEVICE LOOP CARD CIRCUITS AND DEVICE ADDRESSES PRIOR TO CONNECTING TO CONTROL PANEL. AT A MINIMUM, THE FOLLOWING TESTS SHALL BE REQUIRED: DEVICE ADDRESS, THE USAGE (ALARM, SUPERVISORY ETC.), ENVIRONMENTAL COMPENSATION, TEMPERATURE RATINGS FOR THERMAL DETECTORS AND SMOKE DETECTOR SENSITIVITIES. THIS REQUIREMENT SHALL NEED APPROVAL BEFORE ANY WIRING IS CONNECTED TO THE CONTROL PANEL.

D. SHOP DRAWINGS: INCLUDE PLANS, ELEVATIONS, SECTIONS, DETAILS, AND ATTACHMENTS TO OTHER WORK.
a. DETAIL EQUIPMENT ASSEMBLIES AND INDICATE DIMENSIONS, WEIGHTS, LOADS, REQUIRED CLEARANCES, METHOD OF FIELD ASSEMBLY, COMPONENTS, AND LOCATION AND SIZE OF EACH FIELD CONNECTION.

b. WIRING DIAGRAMS: FOR POWER, SIGNAL, AND CONTROL WIRING.

c. COMPLETE DRAWINGS COVERING THE FOLLOWING SHALL BE SUBMITTED BY THE CONTRACTOR FOR THE PROPOSED SYSTEM:

1. FLOOR PLANS IN A CAD COMPATIBLE FORMAT AT A SCALE OF 1/8" = 1'-0" SHOWING ALL EQUIPMENT AND RACEWAYS, MARKED FOR SIZE, CONDUCTOR COUNT WITH TYPE AND SIZE, SHOWING THE PERCENTAGE OF ALLOWABLE NATIONAL ELECTRIC CODE FILL USED.

2. PROVIDE A FIRE ALARM SYSTEM FUNCTION MATRIX AS REFERENCED BY NFPA 72, FIGURE A-7-5.2.2 (9). MATRIX SHALL ILLUSTRATE ALARM INPUT/OUT EVENTS IN ASSOCIATION WITH INITIATION DEVICES. MATRIX SUMMARY SHALL INCLUDE SYSTEM SUPERVISORY AND TROUBLE OUTPUT FUNCTIONS. INCLUDE ANY AND ALL DEPARTURES, EXCEPTIONS, VARIANCES OR SUBSTITUTIONS FROM THESE SPECIFICATIONS AND/OR DRAWINGS AT TIME OF BID.

3. PLANS SHALL SHOW POWER CONNECTION, BATTERY CALCULATIONS, VOLTAGE DROP CALCULATIONS, CONDUCTOR TYPES AND SIZES.

4. PLANS SHALL INDICATE THE INTERFACE OF FIRE SAFETY CONTROL FUNCTIONS.

5. INSTALLATION DRAWINGS, SHOP DRAWINGS, AND AS-BUILT DRAWINGS SHALL BE PREPARED BY AN INDIVIDUAL EXPERIENCED WITH THE WORK SPECIFIED HEREIN.

E. INCOMPLETE SUBMITTALS SHALL BE RETURNED WITHOUT REVIEW, UNLESS WITH PRIOR APPROVAL OF THE ENGINEER.

E. CONTRACTOR SHALL SUBMIT FIRE ALARM DRAWINGS TO STATE FOR REVIEW PRIOR TO STARTING WORK.

F. QUALIFICATION DATA: FOR QUALIFIED INSTALLER, APPLICATOR, MANUFACTURER, FABRICATOR, PROFESSIONAL ENGINEER, TESTING AGENCY, AND FACTORY-AUTHORIZED SERVICE REPRESENTATIVE.

G. SOURCE QUALITY-CONTROL REPORTS.

H. FIELD QUALITY-CONTROL REPORTS.

I. OPERATION AND MAINTENANCE DATA: FOR ALL FIRE ALARM EQUIPMENT, TO INCLUDE IN OPERATION AND MAINTENANCE MANUALS.

J. SOFTWARE AND FIRMWARE OPERATIONAL DOCUMENTATION:

a. SOFTWARE OPERATING AND UPGRADE MANUALS.
b. PROGRAM SOFTWARE BACKUP: ON MAGNETIC MEDIA OR COMPACT DISK, COMPLETE WITH DATA FILES.
c. DEVICE ADDRESS LIST.
d. PRINTOUT OF SOFTWARE APPLICATION AND GRAPHIC SCREENS.

1.02 DELIVERY, STORAGE, AND HANDLING – FIRE ALARM

A. DELIVER PRODUCTS TO PROJECT SITE IN ORIGINAL, UNOPENED PACKAGES WITH INTACT AND LEGIBLE MANUFACTURERS' LABELS IDENTIFYING PRODUCT AND MANUFACTURER, DATE OF MANUFACTURE, AND SHELF LIFE IF APPLICABLE.

B. STORE MATERIALS INSIDE, UNDER COVER, ABOVE GROUND, AND KEPT DRY AND PROTECTED FROM PHYSICAL DAMAGE UNTIL READY FOR USE. REMOVE FROM SITE AND DISCARD WET OR DAMAGED MATERIALS.

1.03 PROJECT CONDITIONS – FIRRE ALARM

A. INSTALLED PRODUCTS OR MATERIALS SHALL BE FREE FROM ANY DAMAGE INCLUDING, BUT NOT LIMITED TO, PHYSICAL INSULT, DIRT AND DEBRIS, MOISTURE, AND MOLD DAMAGE.

1.04 WARRANTY – FIRE ALARM

A. SPECIAL WARRANTY: MANUFACTURER'S STANDARD FORM IN WHICH MANUFACTURER AGREES TO REPAIR OR REPLACE FIRE ALARM EQUIPMENT THAT FAIL(S) IN MATERIALS OR WORKMANSHIP WITHIN SPECIFIED WARRANTY PERIOD.

B. WARRANTY PERIOD: 2 YEAR FROM DATE OF SUBSTANTIAL COMPLETION.

1.05 SERVICE AGREEMENT – FIRE ALARM

A. TECHNICAL SUPPORT: BEGINNING WITH SUBSTANTIAL COMPLETION, PROVIDE SOFTWARE SUPPORT FOR 1 YEAR.

B. UPGRADE SERVICE: UPDATE SOFTWARE, FIRMWARE, TO LATEST VERSION AT PROJECT COMPLETION. INSTALL AND PROGRAM SOFTWARE UPGRADES THAT BECOME AVAILABLE WITHIN TWO YEARS FROM DATE OF SUBSTANTIAL COMPLETION. UPGRADING SOFTWARE, FIRMWARE SHALL INCLUDE OPERATING SYSTEM. UPGRADE SHALL INCLUDE NEW OR REVISED LICENSES FOR USE OF SOFTWARE.

C. PROVIDE 30 DAYS' NOTICE TO OWNER TO ALLOW SCHEDULING AND ACCESS TO SYSTEM AND TO ALLOW OWNER TO UPGRADE COMPUTER EQUIPMENT IF NECESSARY.

PART 2 – FIRE ALARM PRODUCTS

2.01 CONTROL PANEL – FIRE ALARM

A. THE FIRE ALARM CONTROL PANEL SHALL BE MICROPROCESSOR-BASED USING MULTIPLE MICROPROCESSORS THROUGHOUT THE SYSTEM, PROVIDING RAPID PROCESSING OF SMOKE DETECTOR AND OTHER INITIATION DEVICE INFORMATION TO CONTROL SYSTEM OUTPUT FUNCTIONS.

B. THERE SHALL BE A WATCHDOG CIRCUIT, WHICH SHALL VERIFY THE SYSTEM PROCESSORS AND THE SOFTWARE PROGRAM. PROBLEMS WITH EITHER THE PROCESSORS OR THE SYSTEM PROGRAM THE PANEL SHALL ACTIVATE A TROUBLE SIGNAL AND RESET THE PANEL.

C. THE SYSTEM MODULES SHALL COMMUNICATE WITH AN RS-485 NETWORK COMMUNICATIONS PROTOCOL. ALL MODULE WIRING SHALL BE TO TERMINAL BLOCKS, WHICH WILL PLUG INTO THE SYSTEM CARD CAGE. THE CONTROL PANEL SHALL BE CAPABLE OF EXPANSION VIA UP TO 100 SLC'S.

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FIRE ALARM ALARM UPGRADE
ELKHART HOUSING AUTHORITY
WATERFALL HIGH RISE
ELKHART, INDIANA
303 WATERFALL DRIVE

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MAXIMUM SYSTEM CAPACITY SHALL BE AT LEAST 2500 INTELLIGENT INITIATION DEVICES PER PANEL.

D. SYSTEM RESPONSE TIME FROM ALARM TO OUTPUT SHALL BE AN AVERAGE OF THREE (3) SECONDS.

E. DIGITAL VOICE COMMAND:

a. THE DIGITAL VOICE COMMAND CENTER, LOCATED WITH THE FACP, SHALL CONTAIN ALL EQUIPMENT REQUIRED FOR ALL GLOBAL AUDIO CONTROL, EMERGENCY TELEPHONE SYSTEM CONTROL, SIGNALING AND SUPERVISORY FUNCTIONS. THIS SHALL INCLUDE SPEAKER ZONE INDICATION AND CONTROL, TELEPHONE CIRCUIT INDICATION AND CONTROL, DIGITAL VOICE UNITS, MICROPHONE AND MAIN TELEPHONE HANDSET.
b. UP TO 5 DIGITAL VOICE COMMAND CENTERS SHALL BE SUPPORTED PER SYSTEM WITH THE ABILITY TO LIMIT CONTROL TO ONE DIGITAL VOICE COMMAND CENTER VIA A REQUEST/GRANT/DENY MECHANISM.
c. FUNCTION: THE VOICE COMMAND CENTER EQUIPMENT SHALL PERFORM THE FOLLOWING FUNCTIONS:

1. OPERATE AS A SUPERVISED MULTI-CHANNEL EMERGENCY VOICE COMMUNICATION SYSTEM.
2. AUDIBLY AND VISUALLY ANNUNCIATE THE ACTIVE OR TROUBLE CONDITION OF EVERY SPEAKER CIRCUIT AND EMERGENCY TELEPHONE CIRCUIT.
3. AUDIBLY AND VISUALLY ANNUNCIATE ANY TROUBLE CONDITION FOR DIGITAL TONE AND VOICE UNITS REQUIRED FOR NORMAL OPERATION OF THE SYSTEM.
4. PROVIDE ALL-CALL EMERGENCY PAGING ACTIVITIES THROUGH ACTIVATION OF A SINGLE CONTROL SWITCH.
5. AS REQUIRED, PROVIDE VECTORED PAGING CONTROL TO SPECIFIC AUDIO ZONES VIA DEDICATED CONTROL SWITCHES.
6. PROVIDE A FACTORY RECORDED "LIBRARY" OF VOICE MESSAGES AND TONES IN STANDARD WAV. FILE FORMAT, WHICH MAY BE EDITED AND SAVED ON A PC.
7. PROVIDE A SOFTWARE UTILITY CAPABLE OF OFF-LINE PROGRAMMING FOR THE VCC OPERATION AND THE AUDIO MESSAGE FILES. THIS UTILITY SHALL SUPPORT THE CREATION OF NEW PROGRAMS AS WELL AS EDITING AND SAVING EXISTING PROGRAM FILES. UPLOADING OR DOWNLOADING THE VCC SHALL NOT INHIBIT THE EMERGENCY OPERATION OF OTHER NODES ON THE FIRE ALARM NETWORK.
8. THE DIGITAL VOICE COMMAND SHALL BE MODULAR IN CONSTRUCTION, AND SHALL BE CAPABLE OF BEING FIELD PROGRAMMABLE WITHOUT REQUIRING THE RETURN OF ANY COMPONENTS TO THE MANUFACTURER AND WITHOUT REQUIRING USE OF ANY EXTERNAL COMPUTERS OR OTHER PROGRAMMING EQUIPMENT.
9. THE DIGITAL VOICE COMMAND AND ASSOCIATED EQUIPMENT SHALL BE PROTECTED AGAINST UNUSUALLY HIGH VOLTAGE SURGES OR LINE TRANSIENTS.

F. HISTORY: THE SYSTEM SHALL STORE 5000 EVENTS IN HISTORY WHILE IN STRAIGHT MODE AND 4500 IN CIRCULAR MODE. IN STRAIGHT MODE, TROUBLE WARNINGS WILL OCCUR AT 4000 AND 4500 EVENTS. IN CIRCULAR MODE, THE CONTROL PANELS SHALL MAINTAIN A 2000 EVENT ALARM HISTORY BUFFER, WHICH CONSISTS OF THE 2000 MOST RECENT ALARM EVENTS FROM THE 4500-EVENT HISTORY FILE.

G. THE SYSTEM SHALL HAVE THE ABILITY TO PROVIDE CONFIGURATION, STATUS, QUEUE AND HISTORY REPORTS.

2.02 POWER SUPPLY – FIRE ALARM

A. THE SYSTEM POWER SUPPLY/CHARGER (PSC) SHALL BE A 12-AMP SUPPLY WITH BATTERY CHARGER. THE POWER SUPPLY SHALL BE FILTERED AND REGULATED. THE POWER SUPPLY SHALL HAVE A MINIMUM OF 1 POWER LIMITED OUTPUT RATED AT 4 AMPS, AND A MINIMUM OF 1 OUTPUT RATED AT 12 AMPS. THE SYSTEM POWER SUPPLY CAN BE EXPANDED UP TO 48 AMPS. THE AUXILIARY POWER SUPPLY MODULE SHALL SHARE COMMON BATTERIES WITH THE PRIMARY POWER SUPPLY. THE SYSTEM POWER SUPPLY SHALL HAVE 4 RELAYS, 1 FOR COMMON ALARM, ONE FOR COMMON TROUBLE AND TWO PROGRAMMABLE RELAYS. THE POWER SUPPLY SHALL BE RATED FOR 120/240VAC 50/60HZ. THE MODULE SHALL BE MODEL NUMBER PSC-12 OR AN EXTENDER POWER SUPPLY (PSX-12) SHALL BE AVAILABLE FOR ADDITIONAL SYSTEM POWER REQUIREMENTS.

B. THE BATTERY CHARGER SHALL BE ABLE TO CHARGE THE SYSTEM BATTERIES UP TO 100AH BATTERIES. BATTERY CHARGING SHALL BE MICROPROCESSOR CONTROLLED AND PROGRAMMED WITH AN OPTIONAL THERMISTOR FOR MONITORING BATTERY TEMPERATURE TO CONTROL CHARGING RATE SHALL BE AVAILABLE.

C. THE POWER SUPPLY SHALL HAVE A PLUG FOR AN AC ADAPTER CABLE, WHICH ALLOWS A TECHNICIAN TO PLUG IN A LAPTOP COMPUTER FOR UP OR DOWNLOADING PROGRAM INFORMATION OR TEST EQUIPMENT.

D. TRANSFER FROM AC TO BATTERY POWER SHALL BE INSTANTANEOUS WHEN AC VOLTAGE DROPS LESS THAN 90% OR BROWN OUT CONDITIONS IT IS NOT SUFFICIENT FOR NORMAL OPERATION.

2.03 REMOTE POWER SUPPLY FOR NON-VOICE NOTIFICATION APPLIANCES – FIRE ALARM

A. THE PAD-5 POWER SUPPLY UNIT SHALL BE USED WITH A SIEMENS CERBERUS® PRO FIRE SAFETY MODULAR SYSTEM. IT SHALL AN ADDRESSABLE NAC DISTRIBUTED CONTROLLER TO PROVIDE POWER TO VISUAL STROBE CIRCUITS OR SUPPLY AUXILIARY POWER TO SUCH ITEMS AS DOOR HOLDER CIRCUITS. THE PAD-5 SHALL COMMUNICATE ON THE SLC LOOP TO THE SIEMENS CERBERUS® PRO FIRE SAFETY MODULAR CONTROL PANEL. IT SHALL PROVIDE STATUS MONITORING, DEVICE LEVEL FAULT INDICATIONS AND INDIVIDUAL NAC CONTROL USING A SINGLE ADDRESS ON THE SLC. THE PAD-5 UNIT SHALL PROVIDE A CONSTANT 24VDC NOMINAL OUTPUT VOLTAGE TO EACH NAC-INDEPENDENT OF VOLTAGE FLUCTUATIONS ON THE PRIMARY OR SECONDARY POWER SOURCE.

B. THE PAD-5 SHALL BE A SELF-CONTAINED UNIT WITH 24VDC POWER SUPPLY AND BATTERIES HOUSED IN ITS OWN LOCKED ENCLOSURE. ENCLOSURE SHALL BE MADE OF 16 GA COLD ROLLED STEEL, LOCKABLE AND HAVING THE SAME KEY AS THE OTHER CONTROL ENCLOSURES. SHALL HAVE 2 SIZES (1 UNIT AND A 2 UNIT) AND COLORS (RED AND BLACK).

2.04 SYSTEM ENCLOSURE – FIRE ALARM

A. ENCLOSURE NEEDED TO HOLD ALL THE CARDS AND MODULES AS SPECIFIED WITH AT LEAST SPARE CAPACITY FOR EXTRA CARDS. THE ENCLOSURE OUTER DOOR SHALL BE EITHER BLACK OR RED. PROVIDE THE COLOR AS TO THE LOCAL AHJ REQUIREMENTS. THE OUTER DOORS SHALL BE CAPABLE OF BEING A LEFT HAND OPEN OR A RIGHT HAND OPEN. THE INNER DOOR SHALL HAVE A LEFT-HAND OPENING. SYSTEM ENCLOSURE DOORS SHALL PROVIDE WHERE REQUIRED VENTILATION FOR THE MODULES OR CARDS IN THE ENCLOSURE.

B. PROVIDE SYSTEM ENCLOSURE FOR ALL AMPLIFIERS. WHERE REQUIRED BY THE MANUFACTURER, PROVIDE MEANS FOR VENTING HEAT FROM THE ENCLOSURE EITHER BY HAVING ENCLOSURE SIDES AND TOP VENTED OR THE DOORS VENTED.

2.05 INTELLIGENT INITIATING DEVICES – FIRE ALARM

A. GENERAL
a. ALL INITIATION DEVICES SHALL BE INSENSITIVE TO INITIATING LOOP POLARITY. SPECIFICALLY, THE DEVICES SHALL BE INSENSITIVE TO PLUS/MINUS VOLTAGE CONNECTIONS. EXCEPT WHEN BUILT IN ISOLATION ISOTECHNOLOGY™ IS USED POLARITY SENSITIVITY IS REQUIRED FOR THE DEVICES CONFIGURED IN ISOLATION MODE.

B. SMOKE DETECTORS – ADVANCED ADDRESSABLE OOH-SERIES
a. THE DETECTORS SHALL HAVE A TRI-COLOR LED TO STREAMLINE SYSTEM MAINTENANCE/INSPECTION BY PLAINLY INDICATING DETECTOR STATUS AS FOLLOWS: GREEN FOR NORMAL OPERATION, AMBER FOR MAINTENANCE REQUIRED, RED FOR ALARM.
b. DETECTORS SHALL UTILIZE STATE OF THE ART FORWARD/BACKWARD LIGHT SCATTERING TECHNOLOGY, WITH IMPROVED DETECTION FOR SMOLDERING AND FLAMING FIRE SIGNATURES. THE DETECTORS SHALL REPLACE THE NEED FOR IONIZATION DETECTORS DUE TO IMPROVED RESPONSE CHARACTERISTICS TO FLAMING FIRES.
c. WHEN REQUIRED, THE DETECTORS SHALL INCORPORATE AN ADDRESSABLE CARBON MONOXIDE (CO) SENSOR. THE CO SENSOR SHALL BE SELECTABLE AS AN INPUT TO THE MULTI-CRITERIA FIRE DETECTOR ALGORITHM AND AS AN INDEPENDENT LIFE-SAFETY CO GAS DETECTOR (IN COMPLIANCE WITH NFPA 720).
d. THE CO SENSOR OF THE MODEL OOHC941 HAS A 10-YEAR LIFETIME FROM THE DATE OF INSTALLATION.
e. DETECTORS SHALL PROVIDE PRE-ALARM SIGNAL AT 0.2% OBS/FT. AND A FULL ALARM AT 1.0% OBS/FT. TO MEET THE PERFORMANCE REQUIREMENTS OF NFPA 76 – NATIONAL FIRE PROTECTION ASSOCIATION STANDARD 76, FIRE PROTECTION OF TELECOMMUNICATIONS FACILITIES AS A VERY EARLY WARNING FIRE DETECTOR (VEWFD).

C. SMOKE DETECTORS – STANDARD ADDRESSABLE DETECTORS
a. THE SMOKE DETECTORS MUST PROVIDE AT LEAST 2 ENVIRONMENTAL PARAMETER SETS TO ASSIST IN DEVICE SENSITIVITY CONFIGURATION.
b. THE DETECTORS SHALL HAVE A TRI-COLOR LED TO STREAMLINE SYSTEM MAINTENANCE/INSPECTION BY PLAINLY INDICATING DETECTOR STATUS AS FOLLOWS: GREEN FOR NORMAL OPERATION, AMBER FOR MAINTENANCE REQUIRED, RED FOR ALARM.
c. THE DETECTOR SHALL BE ROHS-COMPLIANT: IT SHALL MEET STANDARDS FOR REDUCTION OF HAZARDOUS SUBSTANCES (ROHS) BY REDUCTION IN LEAD CONTENT AND OTHER RESTRICTED SUBSTANCES.
d. THE DETECTORS SHALL BE UL LISTED FOR OPERATION IN A 95% RELATIVE HUMIDITY (RH) ENVIRONMENT.
e. THE DETECTORS SHALL BE DESIGNED TO ELIMINATE CALIBRATION ERRORS ASSOCIATED WITH FIELD CLEANING OF THE CHAMBER.
f. THE DETECTORS SHALL SUPPORT THE USE OF A RELAY, OR LED REMOTE INDICATOR WITHOUT REQUIRING AN ADDITIONAL SOFTWARE ADDRESS. LOW PROFILE, WHITE CASE SHALL NOT EXCEED 2.5IN OF EXTENSION BELOW THE FINISH CEILING.
g. FOR THE DETECTORS WHERE REQUIRED, THERE SHALL BE AVAILABLE A LOCKING KIT AND DETECTOR GUARD TO PREVENT UNAUTHORIZED DETECTOR REMOVAL.

D. HEAT DETECTORS – ADDRESSABLE
a. THERMAL DETECTORS SHALL BE RATED AT 135°F (8.3°C) FIXED TEMPERATURE AND 15°F (8.3°C) DEGREES PER MINUTE RATE OF RISE. DETECTORS SHALL BE CONSTRUCTED TO COMPENSATE FOR THE THERMAL LAG INHERENT IN CONVENTIONAL TYPE DETECTORS DUE TO THE THERMAL MASS, AND ALARM AT THE SET POINT OF 135°F (8.3°C). THE CHOICE OF ALARM REPORTING AS A FIXED TEMPERATURE DETECTOR OR A COMBINATION OF FIXED AND RATE OF RISE SHALL BE MADE IN SYSTEM SOFTWARE AND BE CHANGEABLE AT ANY TIME WITHOUT THE NECESSITY OF HARDWARE REPLACEMENT.
b. THE DETECTORS FURNISHED SHALL HAVE A LISTED SPACING FOR COVERAGE UP TO 2,500 SQUARE FEET AND SHALL BE INSTALLED ACCORDING TO THE REQUIREMENTS OF NFPA 72 FOR OPEN AREA COVERAGE. THE THERMAL DETECTOR SHALL BE MODEL NUMBER HI921.

E. DUCT SMOKE DETECTORS – ADDRESSABLE
a. FOR DUCT DETECTOR APPLICATIONS, THE SMOKE DETECTOR SHALL BE AN INTELLIGENT DIGITAL PHOTOELECTRIC DETECTOR. DETECTORS SHALL BE LISTED FOR USE AS OPEN AREA PROTECTIVE COVERAGE, IN DUCT INSTALLATION AND SAMPLING ASSEMBLY INSTALLATION AND SHALL BE INSENSITIVE TO AIR VELOCITY CHANGES.
b. THE DETECTOR COMMUNICATIONS SHALL ALLOW THE DETECTOR TO PROVIDE ALARM INPUT TO THE SYSTEM AND ALARM OUTPUT FROM THE SYSTEM WITHIN FOUR (4) SECONDS. THE DETECTOR SHALL BE MOUNTED IN A DUCT DETECTOR HOUSING LISTED FOR THAT PURPOSE. THE DUCT DETECTOR SHALL SUPPORT THE USE OF A REMOTE TEST SWITCH, RELAY OR LED REMOTE INDICATOR. THE DUCT DETECTOR SHALL BE SUPPLIED WITH THE APPROPRIATE SAMPLING TUBES TO FIT THE INSTALLATION.
c. WHERE DUCT DETECTORS ARE EXPOSED TO THE WEATHER A WEATHERPROOF ENCLOSURE SHALL BE AVAILABLE. A NEMA-3R AND NEMA-4X OPTION SHALL BE AVAILABLE. THE DUCT HOUSING COVER SHALL INCLUDE A TEST PORT FOR FUNCTIONAL TESTING OF THE DETECTOR WITHOUT COVER REMOVAL. THE DUCT HOUSING SHALL INCLUDE A COVER REMOVAL SWITCH CAPABLE OF INDICATING COVER REMOVAL STATUS TO THE FIRE ALARM CONTROL PANEL.
d. THE INTELLIGENT DUCT DETECTOR SHALL HAVE A MODEL NUMBER FROM THE FDBZ-SERIES. WHERE REQUIRED THERE SHALL BE AVAILABLE A DUCT HOUSING WITH AN ON-BOARD RELAY. ALSO, WHERE REQUIRED, THERE SHALL BE A STANDALONE HOUSING AVAILABLE WITH ITS OWN POWER SUPPLY AND TEST/RESET SWITCH THAT DOES NOT REQUIRE CONNECTION TO A FIRE ALARM CONTROL PANEL. IT SHALL BE MODEL FBZ492-PR.

F. DETECTOR BASES – ADDRESSABLE
a. DETECTOR BASES SHALL BE LOW PROFILE TWIST LOCK TYPE WITH SCREW CLAMP TERMINALS AND SELF-WIPING CONTACTS. BASES SHALL BE INSTALLED ON AN INDUSTRY STANDARD, 4IN SQUARE OR OCTAGONAL ELECTRICAL OUTLET BOX.

G. MANUAL PULL STATIONS – ADDRESSABLE
a. PROVIDE ADDRESSABLE MANUAL STATIONS WHERE SHOWN ON THE DRAWINGS, TO BE FLUSH OR SURFACE MOUNTED AS REQUIRED. MANUAL STATIONS SHALL CONTAIN THE INTELLIGENCE FOR REPORTING ADDRESS, IDENTITY, ALARM AND TROUBLE TO THE FIRE ALARM CONTROL PANEL. THE MANUAL STATION COMMUNICATIONS SHALL ALLOW THE STATION TO PROVIDE ALARM INPUT TO THE SYSTEM AND ALARM OUTPUT FROM THE SYSTEM WITHIN LESS THAN FOUR (4) SECONDS.
b. THE MANUAL STATION SHALL BE EQUIPPED WITH TERMINAL STRIP AND PRESSURE STYLE SCREW TERMINALS FOR THE CONNECTION OF FIELD WIRING. SURFACE MOUNTED STATIONS WHERE INDICATED ON THE DRAWINGS SHALL BE MOUNTED USING A MANUFACTURER'S PRESCRIBED MATCHING RED ENAMEL OUTLET BOX.

H. ADDRESSABLE INTERFACE DEVICES
a. ADDRESSABLE INTERFACE DEVICES SHALL BE PROVIDED TO MONITOR INPUTS (CONTACTS) AND CONTROL OUTPUTS (RELAYS) TO AND FROM THE FIRE ALARM SYSTEM AND ASSOCIATED DEVICES. THESE INTERFACE DEVICES SHALL BE ABLE TO MONITOR SINGLE OR DUAL CONTACTS. AN ADDRESS WILL BE PROVIDED FOR EACH CONTACT. WHERE REMOTE SUPERVISED RELAY IS REQUIRED THE INTERFACE SHALL BE EQUIPPED WITH A SPDT RELAY RATED FOR 4 AMPS RESISTIVE AND 3.5 AMPS INDUCTIVE. THE ADDRESSABLE INTERFACE MODULES SHALL BE MODEL FDCIO SERIES, XTRI SERIES, ILED-X SERIES, TSM-1X OR HCP SERIES. THESE DEVICES SHALL HAVE BUILT-IN ISOLATION FEATURE ISOTECHNOLOGY™.
b. MONITORING APPLICATIONS INCLUDE (BUT NOT LIMITED TO):
a. WATER-FLOW SWITCHES
b. TAMPER SWITCHES
c. PIV SWITCHES
d. DAMPER POSITION – ALL 3 STATES ON ONE INPUT
e. CONVENTIONAL DEVICES (E.G., SMOKE DETECTORS, BEAM DETECTORS, FLAME DETECTORS, ETC.)
f. DUCT DETECTORS

C. CONTROL APPLICATIONS INCLUDE (BUT NOT LIMITED TO):
a. NOTIFICATION APPLIANCE CIRCUITS (NAC)
b. TELEPHONE ZONES
c. SPEAKER ZONES.
d. DAMPER POSITION
e. SOLENOIDS FOR SPRINKLERS

D. WHERE APPLICABLE, ALL INTERFACE DEVICES SHALL MEET NFPA 72 CLASS X REQUIREMENTS FOR SURVIVABILITY.

2.06 DEVICE PROGRAMMING UNIT – FIRE ALARM

A. DEVICE PROGRAMMING UNIT: THE PROGRAMMING TOOL SHALL PROGRAM THE INTELLIGENT DEVICES WITH ADDRESSES. THE UNIT SHALL TEST THE DEVICE TO RESPOND TO ITS ADDRESS. DIPSWITCHES AND ROTARY SWITCHES SHALL NOT BE ACCEPTABLE. THE PROGRAMMER SHALL BE MODEL DPU WITH CARRYING CASE.

2.07 ADVANCED FIRE ALARM NOTIFICATION APPLIANCES (LED BASED)

A. SERIES SLSPW AND SLSPSW WALL MOUNT SPEAKERS AND SPEAKER/STROBES
a. THE SL-SERIES HIGH FIDELITY SPEAKER APPLIANCES SHALL BE SIEMENS SLSPW SPEAKER AND SLSPSW SPEAKER/STROBES FOR WALL-MOUNT APPLICATIONS
b. THE SPEAKERS SHALL BE UL LISTED UNDER UL 1480 FOR FIRE PROTECTIVE SERVICE
c. SPEAKERS EQUIPPED WITH STROBES SHALL BE LISTED UNDER UL 1971 FOR EMERGENCY DEVICES FOR THE HEARING-IMPAIRED.
d. IN ADDITION, THE SPEAKER/STROBES SHALL MEET THE REQUIREMENTS OF FCC PART 15 AND ICES-003.
e. ALL SPEAKERS SHALL BE DESIGNED FOR A FIELD SELECTABLE INPUT OF EITHER 25 OR 70V RMS, WITH SELECTABLE POWER TAPS FROM 1/8 WATT TO 2 WATTS.
f. ALL MODELS SHALL HAVE LISTED SOUND OUTPUT OF UP TO 87DB AT 10FT (3.05M) AND A LISTED FREQUENCY RESPONSE OF 300 TO 8000HZ.

B. SERIES SLSPC AND SLSPSC CEILING MOUNT SPEAKERS AND SPEAKER/STROBES
a. THE SL-SERIES HIGH FIDELITY SPEAKER APPLIANCES SHALL BE SIEMENS SLSPC SPEAKER AND SLSPSC SPEAKER/STROBES FOR CEILING-MOUNT APPLICATIONS
b. THE SPEAKERS SHALL BE UL LISTED UNDER UL 1480 FOR FIRE PROTECTIVE SERVICE
c. SPEAKERS EQUIPPED WITH STROBES SHALL BE LISTED UNDER UL 1971 FOR EMERGENCY DEVICES FOR THE HEARING-IMPAIRED.
d. IN ADDITION, THE SPEAKER/STROBES SHALL MEET THE REQUIREMENTS OF FCC PART 15 AND ICES-003.

PART 3 – EXECUTION – FIRE ALARM

3.01 EXAMINATION – FIRE ALARM

A. EXAMINE AREAS AND CONDITIONS FOR COMPLIANCE WITH REQUIREMENTS FOR INSTALLATION TOLERANCES AND OTHER CONDITIONS AFFECTING PERFORMANCE OF THE WORK.

B. PROCEED WITH INSTALLATION ONLY AFTER UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED.

3.02 INSTALLATION – FIRE ALARM

A. PERFORM WORK IN ACCORDANCE WITH THE REQUIREMENTS OF NFPA 70, NFPA 72, NFPA 13, NFPA 2001, AND NECA 1-2006, STANDARD OF GOOD WORKMANSHIP IN ELECTRICAL CONTRACTING.

B. FASTEN EQUIPMENT TO STRUCTURAL MEMBERS OF BUILDING OR METAL SUPPORTS ATTACHED TO STRUCTURE, OR TO CONCRETE SURFACES.

3.03 BOXES, ENCLOSURES AND WIRING DEVICES – FIRE ALARM

A. BOXES SHALL BE INSTALLED PLUMB AND FIRMLY IN POSITION.

B. EXTENSION RINGS WITH BLANK COVERS SHALL BE INSTALLED ON JUNCTION BOXES WHERE REQUIRED.

C. JUNCTION BOXES SERVED BY CONCEALED CONDUIT SHALL BE FLUSH MOUNTED.

D. UPON INITIAL INSTALLATION, ALL WIRING OUTLETS, JUNCTION, PULL AND OUTLET BOXES SHALL HAVE DUST COVERS INSTALLED. DUST COVERS SHALL NOT BE REMOVED UNTIL WIRING INSTALLATION WHEN PERMANENT DUST COVERS OR DEVICES ARE INSTALLED.

E. "FIRE ALARM SYSTEM" DECAL OR SILK-SCREENED LABEL SHALL BE APPLIED TO ALL JUNCTION BOX COVERS.

F. PANEL ENCLOSURES SHALL BE INSTALLED TO MEET CLEARANCE REQUIREMENTS PER NFPA 70 AND LOCAL CODES. MINIMUM REQUIREMENTS SHALL BE 3FT (1M) CLEARANCE IN FRONT OF THE ENCLOSURE

3.04 CONDUCTORS – FIRE ALARM

A. EACH CONDUCTOR SHALL BE IDENTIFIED AS SHOWN ON THE DRAWINGS AT EACH WITH WIRE MARKERS AT TERMINAL POINTS. ATTACH PERMANENT WIRE MARKERS WITHIN 2IN OF THE WIRE TERMINATION. MARKER LEGENDS SHALL BE VISIBLE.

B. ALL WIRING SHALL BE SUPPLIED AND INSTALLED IN COMPLIANCE WITH THE REQUIREMENTS OF THE NATIONAL ELECTRIC CODE, NFPA 70, ARTICLE 760, AND THAT OF THE MANUFACTURER.

C. WIRING FOR STROBE AND AUDIBLE CIRCUITS SHALL BE A MINIMUM 14 AWG, SIGNAL LINE CIRCUITS; 18 AWG TWISTED SHIELDED, SPEAKER CIRCUITS; 18 AWG TWISTED, TELEPHONE CIRCUIT; 18 AWG TWISTED SHIELDED.

D. ALL SPLICES SHALL BE MADE USING SOLDER-LESS CONNECTORS. ALL CONNECTORS SHALL BE INSTALLED IN CONFORMANCE WITH THE MANUFACTURER RECOMMENDATIONS.

E. CRIMP-ON TYPE SPADE LUGS SHALL BE USED FOR TERMINATIONS OF STRANDED CONDUCTORS TO BINDER SCREW OR STUD TYPE TERMINALS. SPADE LUGS SHALL HAVE UPSET LEGS AND INSULATION SLEEVES SIZED FOR THE CONDUCTORS.

F. THE INSTALLATION CONTRACTOR SHALL SUBMIT FOR APPROVAL PRIOR TO INSTALLATION OF WIRE, A PROPOSED COLOR CODE FOR SYSTEM CONDUCTORS TO ALLOW RAPID IDENTIFICATION OF CIRCUIT TYPES.

G. WIRING WITHIN SUB PANELS SHALL BE ARRANGED AND ROUTED TO ALLOW ACCESSIBILITY TO EQUIPMENT FOR ADJUSTMENT AND MAINTENANCE.

3.05 DEVICES – FIRE ALARM

A. RELAYS AND OTHER DEVICES TO BE MOUNTED IN AUXILIARY PANELS ARE TO BE SECURELY FASTENED TO AVOID FALSE INDICATIONS AND FAILURES DUE TO SHOCK OR VIBRATION.

B. WIRING WITHIN PANELS SHALL BE ARRANGED AND ROUTED TO ALLOW ACCESSIBILITY TO EQUIPMENT FOR ADJUSTMENT AND MAINTENANCE.

C. ALL DEVICES AND APPLIANCES SHALL BE MOUNTED TO OR IN AN APPROVED ELECTRICAL BOX.

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3.06 IDENTIFICATION – FIRE ALARM

A. IDENTIFY SYSTEM COMPONENTS, WIRING, CABLING, AND TERMINALS. COMPLY WITH REQUIREMENTS FOR IDENTIFICATION SPECIFIED IN DIVISION 26 SECTION "IDENTIFICATION FOR ELECTRICAL SYSTEMS."

B. PERMANENTLY LABEL OR MARK EACH CONDUCTOR AT BOTH ENDS WITH PERMANENT ALPHANUMERIC WIRE MARKERS.

C. A CONSISTENT COLOR CODE FOR FIRE ALARM SYSTEM CONDUCTORS THROUGHOUT THE INSTALLATION.

3.07 FIELD QUALITY CONTROL – FIRE ALARM

A. MANUFACTURER'S FIELD SERVICE: ENGAGE A FACTORY–AUTHORIZED SERVICE REPRESENTATIVE TO INSPECT COMPONENTS, ASSEMBLIES, AND EQUIPMENT INSTALLATIONS, INCLUDING CONNECTIONS, AND TO ASSIST IN TESTING.

B. TESTING GENERAL:

a. ALL ALARM INITIATING DEVICES SHALL BE OBSERVED AND LOGGED FOR CORRECT ZONE AND SENSITIVITY. THESE DEVICES AND THEIR BASES SHALL BE TAGGED WITH ADHESIVE TAGS LOCATED IN AN AREA NOT VISIBLE WHEN INSTALLED, SHOWING THE INITIALS OF THE INSTALLING TECHNICIAN AND DATE.

b. WIRING RUNS SHALL BE TESTED FOR CONTINUITY, SHORT CIRCUITS AND GROUNDS BEFORE SYSTEM IS ENERGIZED. RESISTANCE, CURRENT AND VOLTAGE READINGS SHALL BE MADE AS WORK PROGRESSES.

c. THE ACCEPTANCE INSPECTOR SHALL BE NOTIFIED BEFORE THE START OF THE REQUIRED TESTS. ALL ITEMS FOUND AT VARIANCE WITH THE DRAWINGS OR THIS SPECIFICATION DURING TESTING OR INSPECTION BY THE ACCEPTANCE INSPECTOR SHALL BE CORRECTED.

d. TEST REPORTS SHALL BE DELIVERED TO THE ACCEPTANCE INSPECTOR AS COMPLETED.

e. ALL TEST EQUIPMENT, INSTRUMENTS, TOOLS AND LABOR REQUIRED TO CONDUCT THE SYSTEM TESTS SHALL BE MADE AVAILABLE BY THE INSTALLING CONTRACTOR. THE FOLLOWING EQUIPMENT SHALL BE A MINIMUM FOR CONDUCTING THE TESTS:

1. LADDERS AND SCAFFOLDS AS REQUIRED TO ACCESS ALL INSTALLED EQUIPMENT.
2. MULTI–METER FOR READING VOLTAGE, CURRENT AND RESISTANCE.
3. TWO–WAY RADIOS AND FLASHLIGHTS.
4. A MANUFACTURER RECOMMENDED DEVICE FOR MEASURING AIR FLOW THROUGH AIR DUCT SMOKE DETECTOR SAMPLING ASSEMBLIES.
5. DECIBEL METER
6. INTELLIGIBILITY METER
7. IN ADDITION TO THE TESTING SPECIFIED TO BE PERFORMED BY THE INSTALLING CONTRACTOR, THE INSTALLATION SHALL BE SUBJECT TO TEST BY THE AUTHORITY HAVING JURISDICTION.

3.08 ACCEPTANCE TESTING – FIRE ALARM

A. A WRITTEN ACCEPTANCE TEST PROCEDURE (ATP) FOR TESTING THE FIRE ALARM SYSTEM COMPONENTS AND INSTALLATION WILL BE PREPARED BY THE ENGINEER IN ACCORDANCE WITH NFPA 72 AND THIS SPECIFICATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PERFORMANCE OF THE ATP, DEMONSTRATING THE FUNCTION OF THE SYSTEM AND VERIFYING THE CORRECT OPERATION OF ALL SYSTEM COMPONENTS, CIRCUITS, AND PROGRAMMING.

B. A PROGRAM MATRIX SHALL BE PREPARED BY THE INSTALLING CONTRACTOR REFERENCING EACH ALARM INPUT TO EVERY OUTPUT FUNCTION AFFECTED AS A RESULT OF AN ALARM CONDITION ON THAT INPUT.

C. THE INSTALLING CONTRACTOR PRIOR TO THE ATP SHALL PREPARE A COMPLETE LISTING OF ALL DEVICE LABELS FOR ALPHANUMERIC ANNUNCIATOR DISPLAYS.

D. LOOP RESISTANCE TESTS: MEASURE AND RECORD THE RESISTANCE OF EACH CIRCUIT WITH EACH PAIR OF CONDUCTORS IN THE CIRCUIT SHORT–CIRCUITED AT THE FARTHEST POINT FROM THE CIRCUIT ORIGIN. THE TESTS SHALL BE WITNESSED BY THE OWNER AND TEST RESULTS RECORDED FOR USE AT THE FINAL ACCEPTANCE TEST.

E. PRELIMINARY TESTING: CONDUCT PRELIMINARY TESTS TO ENSURE THAT ALL DEVICES AND CIRCUITS ARE FUNCTIONING PROPERLY. AFTER PRELIMINARY TESTING IS COMPLETE, PROVIDE A LETTER CERTIFYING THAT THE INSTALLATION IS COMPLETE AND FULLY OPERABLE. THE LETTER SHALL STATE THAT EACH INITIATING AND INDICATING DEVICE WAS TESTED IN PLACE AND FUNCTIONED PROPERLY. THE LETTER SHALL ALSO STATE THAT ALL PANEL FUNCTIONS WERE TESTED AND OPERATED PROPERLY. THE CONTRACTOR AND AN AUTHORIZED REPRESENTATIVE FROM EACH SUPPLIER OF EQUIPMENT SHALL BE IN ATTENDANCE AT THE PRELIMINARY TESTING TO MAKE NECESSARY ADJUSTMENTS.

F. FINAL ACCEPTANCE TEST: NOTIFY THE OWNER IN WRITING WHEN THE SYSTEM IS READY FOR FINAL ACCEPTANCE TESTING. SUBMIT REQUEST FOR TEST AT LEAST 30 CALENDAR DAYS PRIOR TO THE TEST DATE. A FINAL ACCEPTANCE TEST WILL NOT BE SCHEDULED UNTIL THE LOOP RESISTANCE TEST RESULTS, AND THE SUBMITTALS REQUIRED IN PART 1 ARE PROVIDED TO THE OWNER. TEST THE SYSTEM IN ACCORDANCE WITH THE PROCEDURES OUTLINED IN NFPA 72.

a. VERIFY THAT THE CONTROL UNIT IS IN THE NORMAL CONDITION AS DETAILED IN THE MANUFACTURER'S OPERATING AND MAINTENANCE MANUAL.
b. TEST EACH INITIATING AND INDICATING DEVICE AND CIRCUIT FOR PROPER OPERATION AND RESPONSE. DISCONNECT THE CONFIRMATION FEATURE FOR SMOKE DETECTORS DURING TESTS TO MINIMIZE THE AMOUNT OF SMOKE OR TEST GAS NEEDED TO ACTIVATE THE DETECTOR.
c. TEST THE SYSTEM FOR ALL SPECIFIED FUNCTIONS IN ACCORDANCE WITH THE CONTRACT DRAWINGS AND SPECIFICATIONS AND THE MANUFACTURER'S OPERATING AND MAINTENANCE MANUAL.
d. VISUALLY INSPECT ALL WIRING
e. VERIFY WITH ALL PARTIES THE REQUIRED SURVIVABILITY OF WIRING, RACEWAYS, AND JUNCTION BOXES
f. VERIFY THAT ALL SOFTWARE CONTROL AND DATA FILES HAVE BEEN ENTERED OR PROGRAMMED INTO THE FACP.
g. VERIFY THAT SHOP DRAWINGS REFLECTING AS–BUILT CONDITIONS ARE ACCURATE. UPON FINAL APPROVAL BY ALL PARTIES, PROVIDE TWO SETS OF AS–BUILT DOCUMENTS IN A CABINET ADJACENT TO THE MAIN FACP OR DESIGNATED AREA WITHIN THE BUILDING. PER NFPA 72 7.7.2MEASURE THE CURRENT IN NOTIFICATION APPLIANCE CIRCUITS UNDER FULL LOAD TO ASSURE THAT THERE IS THE CALCULATED SPARE CAPACITY FOR EVERY CIRCUIT.
h. MEASURE VOLTAGE READINGS FOR CIRCUITS TO ASSURE THAT VOLTAGE DROP DOES NOT EXCEED SPECIFIED DESIGN REQUIREMENTS.
i. FIELD VERIFY AND MEASURE THE VOLTAGE DROP AT THE MOST REMOTE APPLIANCE ON EACH NOTIFICATION APPLIANCE CIRCUIT.

I. THE ACCEPTANCE INSPECTOR SHALL USE THE SYSTEM RECORD DRAWINGS IN COMBINATION WITH THE DOCUMENTS SPECIFIED IN THIS SPECIFICATION DURING THE TESTING PROCEDURE TO VERIFY OPERATION AS PROGRAMMED. IN CONDUCTING THE ATP, THE ACCEPTANCE INSPECTOR SHALL REQUEST DEMONSTRATION OF ANY OR ALL INPUT AND OUTPUT FUNCTIONS. THE ITEMS TESTED SHALL INCLUDE BUT NOT BE LIMITED TO THE FOLLOWING:

a. SYSTEM WIRING SHALL BE TESTED TO DEMONSTRATE CORRECT SYSTEM RESPONSE AND CORRECT SUBSEQUENT SYSTEM OPERATION IN THE EVENT OF:
a. OPEN, SHORTED AND GROUNDED SIGNAL LINE CIRCUITS.
b. OPEN, SHORTED AND GROUNDED NOTIFICATION, RELEASING CIRCUITS.
c. PRIMARY POWER OR BATTERY DISCONNECTED.

B. SYSTEM NOTIFICATION APPLIANCES SHALL BE DEMONSTRATED AS FOLLOWS:
a. ALL ALARM NOTIFICATION APPLIANCES ACTUATE AS PROGRAMMED
b. AUDIBILITY AND VISIBILITY AT REQUIRED LEVELS.
c. VOICE INTELLIGIBILITY MEASUREMENTS AT THE TIME OF COMMISSIONING AND WITH A FOLLOW UP INSPECTION SIX MONTHS AFTER SUBSTANTIAL COMPETITION TO VERIFY CONDITIONS

C. SYSTEM INDICATIONS SHALL BE DEMONSTRATED AS FOLLOWS:
a. CORRECT MESSAGE DISPLAY FOR EACH ALARM INPUT AT THE CONTROL DISPLAY.
b. CORRECT ANNUNCIATOR LIGHT FOR EACH ALARM INPUT AT EACH ANNUNCIATOR AND GRAPHIC DISPLAY AS SHOWN ON THE DRAWINGS.
c. CORRECT HISTORY LOGGING FOR ALL SYSTEM ACTIVITY.

D. SYSTEM OFF–SITE REPORTING FUNCTIONS SHALL BE DEMONSTRATED AS FOLLOWS:
a. CORRECT ZONE TRANSMITTED FOR EACH ALARM INPUT
b. TROUBLE SIGNALS RECEIVED FOR DISCONNECT

E. SECONDARY POWER CAPABILITIES SHALL BE DEMONSTRATED AS FOLLOWS:
a. SYSTEM PRIMARY POWER SHALL BE DISCONNECTED FOR A PERIOD OF TIME AS SPECIFIED HEREIN. AT THE END OF THAT PERIOD, AN ALARM CONDITION SHALL BE CREATED AND THE SYSTEM SHALL PERFORM AS SPECIFIED FOR A PERIOD AS SPECIFIED.
b. SYSTEM PRIMARY POWER SHALL BE RESTORED FOR FORTY–EIGHT HOURS AND SYSTEM–CHARGING CURRENT SHALL BE NORMAL TRICKLE CHARGE FOR A FULLY CHARGED BATTERY BANK.
c. SYSTEM BATTERY VOLTAGES AND CHARGING CURRENTS SHALL BE CHECKED AT THE FIRE ALARM CONTROL PANEL.

3.09 DOCUMENTATION – FIRE ALARM

A. SYSTEM DOCUMENTATION SHALL BE FURNISHED TO THE OWNER AND SHALL INCLUDE BUT NOT BE LIMITED TO THE FOLLOWING:
a. SYSTEM RECORD DRAWINGS AND WIRING DETAILS INCLUDING ONE SET OF REPRODUCIBLE DRAWINGS, AND A CD ROM WITH COPIES OF THE RECORD DRAWINGS IN DXF FORMAT FOR USE IN A CAD DRAFTING PROGRAM.
b. SYSTEM OPERATION, INSTALLATION AND MAINTENANCE MANUALS.
c. SYSTEM MATRIX SHOWING INTERACTION OF ALL INPUT SIGNALS WITH OUTPUT COMMANDS.
d. DOCUMENTATION OF SYSTEM VOLTAGE, CURRENT AND RESISTANCE READINGS TAKEN DURING THE INSTALLATION, TESTING AND ATP PHASES OF THE SYSTEM INSTALLATION.
e. SYSTEM PROGRAM SHOWING SYSTEM FUNCTIONS, CONTROLS AND LABELING OF EQUIPMENT AND DEVICES.
f. ALL APPLICABLE NFPA 72 COMMISSIONING REPORTS.

3.10 PROTECTION – FIRE ALARM

A. REMOVE AND REPLACE DEVICES AND PANEL COMPONENTS THAT ARE WET, MOISTURE DAMAGED, OR MOLD DAMAGED.

3.11 DEMONSTRATION – FIRE ALARM

A. INSTRUCTOR: INCLUDE IN THE PROJECT THE SERVICES OF AN INSTRUCTOR, WHO SHALL HAVE RECEIVED SPECIFIC TRAINING FROM THE MANUFACTURER FOR THE TRAINING OF OTHER PERSONS REGARDING THE INSPECTION, TESTING AND MAINTENANCE OF THE SYSTEM PROVIDED. THE INSTRUCTOR SHALL TRAIN THE EMPLOYEES DESIGNATED BY THE OWNER, IN THE CARE, ADJUSTMENT, MAINTENANCE, AND OPERATION OF THE FIRE ALARM SYSTEM.

B. TRAINING SESSIONS SHALL COVER ALL ASPECTS OF SYSTEM PERFORMANCE, INCLUDING SYSTEM ARCHITECTURE, SIGNALING LINE CIRCUIT CONFIGURATIONS, SENSOR AND OTHER INITIATING DEVICE TYPES, LOCATIONS, AND ADDRESSES, FIRE ALARM CONTROL PANEL FUNCTION KEY OPERATION, AND OTHER FUNCTIONS AS DESIGNATED BY THE OWNER.

C. REQUIRED INSTRUCTION TIME: PROVIDE 16 HOURS OF INSTRUCTION AFTER FINAL ACCEPTANCE OF THE SYSTEM. THE INSTRUCTION SHALL BE GIVEN DURING WORKING HOURS ON SUCH DATES AND TIMES AS ARE SELECTED BY THE OWNER. THE INSTRUCTION MAY BE DIVIDED INTO TWO OR MORE PERIODS AT THE DISCRETION OF THE OWNER. ONE TRAINING SESSION SHALL BE VIDEOTAPED BY THE CONTRACTOR. REQUIRED OWNER FORMAT SHALL BE DELIVERED TO THE OWNER.

D. PROVIDE A TYPESET PRINTED OR TYPEWRITTEN INSTRUCTION CARD MOUNTED BEHIND A LEXAN PLASTIC OR GLASS COVER IN A STAINLESS STEEL OR ALUMINUM FRAME. INSTALL THE FRAME IN A CONSPICUOUS LOCATION OBSERVABLE FROM THE FACP. THE CARD SHALL SHOW THOSE STEPS TO BE TAKEN BY AN OPERATOR WHEN A SIGNAL IS RECEIVED AS WELL AS THE FUNCTIONAL OPERATION OF THE SYSTEM UNDER ALL CONDITIONS, NORMAL, ALARM, SUPERVISORY AND TROUBLE. THE INSTRUCTIONS SHALL BE APPROVED BY THE OWNER.

E. COMPREHENSIVE SYSTEM TROUBLESHOOTING TRAINING SHALL BE PROVIDED FOR A SINGLE INDIVIDUAL DESIGNATED BY THE OWNER. THIS SESSION SHALL BE SEPARATE AND DISTINCT FROM THE ABOVE–DESCRIBED SESSIONS.

F. ALL TRAINING SESSIONS SHALL BE CONDUCTED FOLLOWING FINAL SYSTEM CERTIFICATION AND ACCEPTANCE. THREE ADDITIONAL TRAINING SESSIONS SHALL BE PROVIDED FOR ALL SECURITY PERSONNEL ON ALL SHIFTS SIX MONTHS AFTER FINAL SYSTEM CERTIFICATION.

G. ALL TRAINING SESSIONS SHALL BE CONDUCTED BY AN AUTHORIZED FIRE ALARM SYSTEM DISTRIBUTOR REPRESENTATIVE, WHO HAS RECEIVED SPECIFIC TRAINING FROM THE MANUFACTURER FOR THE TRAINING OF OTHER PERSONS REGARDING THE INSPECTION, TESTING, AND MAINTENANCE OF THE SYSTEM PROVIDED.

PART 4: EXECUTION – GENERAL

4.1 GENERAL

A. INSTALL ALL EQUIPMENT IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS, UL LISTING REQUIREMENTS AND ACCEPTED PRACTICES.

B. PROVIDE APPROPRIATE FIRESTOPPING MATERIAL AROUND ALL PENETRATIONS THROUGH FIRE–RATED WALLS.

4.2 COORDINATION

A. TO AVOID CONFLICTS, COORDINATE EXACT PLACEMENT OF ELECTRICAL ITEMS AND ELEVATION OF CONDUIT ROUTES WITH OTHER TRADES PRIOR TO INSTALLATION. ANY CONFLICTS THAT CANNOT BE RESOLVED BETWEEN TRADES MUST BE BROUGHT TO THE ATTENTION OF THE ENGINEER/ARCHITECT IN WRITING AND RESOLVED BEFORE PROCEEDING.

4.3 ACCESSIBILITY

A. MAINTAIN ACCESSIBILITY TO ALL EQUIPMENT FOR OPERATION, MAINTENANCE AND REPAIR.

4.4 CUTTING AND PATCHING

A. LAY OUT WORK CAREFULLY IN ADVANCE. WHERE CUTTING CHANNELING, CHASING OR DRILLING OF FLOORS, WALLS, PARTITIONS, CEILINGS OR OTHER SURFACES IS NECESSARY, THE WORK IS TO BE CAREFULLY DONE. ANY DAMAGE TO THE BUILDING, PIPING OR OTHER EQUIPMENT IS TO BE REPAIRED BY SKILLED MECHANICS OF THE TRADES INVOLVED AT NO ADDITIONAL COST TO THE OWNER. THIS CONTRACTOR/TRADE WILL BE RESPONSIBLE FOR ALL CUTTING AND PATCHING RELATED TO THE WORK OF THIS DIVISION OF THE SPECIFICATIONS.

B. UNLESS OTHERWISE INDICATED IN OTHER DIVISIONS OF THE SPECIFICATIONS, AT NO ADDITIONAL COST TO THE OWNER, REPAINT ALL PATCHED AREAS TO MATCH ORIGINAL FINISH WHERE HOLES OR CHASES HAVE BEEN CUT TO RECEIVE ELECTRICAL WORK. REPAINT PATCHED AREAS WITH TWO (2) COATS OF PAINT TO MATCH SURROUNDING AREAS; BLEND AS REQUIRED.

END OF SECTION

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ELECTRICAL SPECIFICATIONS

FA-6

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