SECTION 16730 - MULTIPLEXED INTELLIGENT FIRE DETECTION AND ALARM SYSTEM

1.0 GENERAL

1.1 THE CONTRACTOR SHALL PROVIDE A COMPLETE AND OPERATIONAL FIRE ALARM SYSTEM INCLUDING BUT NOT LIMITED TO CONTROL PANEL(S), NAC EXTENDERS, POWER SUPPLIES, INITIATING DEVICES, NOTIFICATION APPLIANCES, MONITORING MODULES, CONDUIT, JUNCTION BOXES, WIRING, ETC AS INDICATED ON THE DRAWINGS AND IN THIS SPECIFICATION FOR THE FIRE ALARM SYSTEM AND SHALL INCLUDE ALL ASSOCIATED COSTS FOR THE FIRE ALARM SYSTEM IN THE BASE BID.

DRAWINGS AND GENERAL PROVISIONS OF CONTRACT, INCLUDING GENERAL AND SUPPLEMENTARY CONDITIONS AND DIVISION-1 SPECIFICATION SECTIONS, APPLY TO WORK OF THIS SECTION.

1.2 DIVISION-16 BASIC ELECTRICAL MATERIALS AND METHODS SECTIONS APPLY TO WORK OF THIS SECTION.

1.2.1 THE FIRE ALARM SYSTEM SHALL BE INSTALLED BY A STATE CERTIFIED FIRE ALARM SYSTEM INSTALLATION CONTRACTOR. THE FIRE ALARM SYSTEM INSTALLATION CONTRACTOR SHALL HAVE AN UNLIMITED ELECTRICAL LICENSE (TYPE EC) OR A FIRE ALARM SPECIALTY LICENSE (TYPE EF).

1.2.2 THE EXISTING FIRE ALARM SYSTEM AT WEST NAVARRE INTERMEDIATE SCHOOL IS A CEREBUS PYROTRONICS MXL FIRE ALARM CONTROL PANEL. IT IS THE INTENT OF THIS SPECIFICATION TO EXPAND THE EXISTING CEREBUS PYROTRONICS FIRE ALARM SYSTEM AS REQUIRED TO PROVIDE NEW FIRE ALARM DEVICES IN THE NEW CLASSROOM ADDITION AND TO MAINTAIN THE EXISTING SYSTEMS CAMPUS WIDE AS A COMPLETE AND OPERATIONAL LOW VOLTAGE, TIME-DIVISION MULTIPLEXED, ADDRESSABLE INTELLIGENT FIRE ALARM SYSTEMS AS DESCRIBED HEREIN. THE SYSTEM SHALL INCLUDE, BUT NOT BE LIMITED TO: ADDITIONAL CONTROL PANEL(S) AND POWER SUPPLY, FIBER OPTIC NETWORKING, STANDBY POWER SUPPLY AND BATTERY, ALARM INITIATING AND INDICATING APPLIANCES AND DEVICES, MONITOR AND SUPERVISION DEVICES, SYSTEM WIRING, AND ACCESSORIES REQUIRED TO PROVIDE AND INSTALL A COMPLETE AND SOFTWARE OPERATIONAL SYSTEM. ALL EQUIPMENT AND INSTALLATION SHALL COMPLY WITH THE REQUIREMENTS OF THESE SPECIFICATIONS AND THE RELATED DRAWINGS. ITEMS SPECIFIED BY EITHER SHALL BE AS IF SPECIFIED BY BOTH.

1.2.3 THE SYSTEM SHALL COMPLY WITH ALL APPLICABLE PROVISIONS OF CURRENT NATIONAL FIRE PROTECTION ASSOCIATION STANDARDS ADOPTED BY ANY AUTHORITIES HAVING JURISDICTION. LOCAL SYSTEMS SHALL COMPLY WITH NFPA 72A. AUXILIARY SYSTEMS SHALL COMPLY WITH NFPA 72B. REMOTE STATIONS SYSTEMS SHALL COMPLY WITH NFPA 72C. PROPRIETARY SYSTEMS SHALL COMPLY WITH NFPA 72D. ALL SYSTEMS SHALL COMPLY WITH THE REQUIREMENTS OF NFPA 72E, NFPA 72G, NFPA 72H; AND THE FLORIDA BUILDING CODE, THE LIFE SAFETY CODE (NFPA 101), THE NATIONAL FIRE ALARM CODE (NFPA 72) AND THE NATIONAL ELECTRICAL CODE (NFPA 70). IN THE CASE OF ANY DISCREPANCY BETWEEN THESE SPECIFICATIONS, THE PROJECT DRAWINGS, OR ANY APPLICABLE CODES, THE SYSTEM SHALL COMPLY WITH THE MOST STRINGENT REQUIREMENT.

1.2.4 THE SYSTEM AND ALL COMPONENTS SHALL BE LISTED BY UNDERWRITER'S LABORATORIES FOR SPECIFIC APPLICATION AS FIRE ALARM EQUIPMENT. THE UL LABEL SHALL BE PRIMA FACIE EVIDENCE OF COMPLIANCE WITH THIS REQUIREMENT.

ANY EQUIPMENT NOT BEARING A UL LABEL WILL BE UNACCEPTABLE AND WILL BE REMOVED AND REPLACED WITH LABELED EQUIPMENT AT THE CONTRACTOR'S EXPENSE.

1.3 SUBMITTALS:

1.3.1 IN ADDITION TO THE ABOVE, DETAILED FIRE ALARM SHOP DRAWINGS, EQUIPMENT SPECIFICATIONS, VOLTAGE DROP AND BATTERY CALCULATIONS, WIRING DIAGRAMS, ETC IN ACCORDANCE WITH ALL REQUIREMENTS OF NFPA 72 ARE TO BE SUBMITTED TO SANTA ROSA COUNTY FIRE PREVENTION DEPARTMENT. FOR REVIEW AND PERMITTING PRIOR TO COMMENCEMENT OF WORK.

A. IT SHOULD BE ASSUMED THAT THE SCHOOL SYSTEM WILL ISSUE THE PERMIT AT NO COST TO THE CONTRACTOR. THE BUILDING DEPARTMENT IS PERFORMING ALL PLAN REVIEW UNDER AN AGREEMENT WITH THE SCHOOL SYSTEM. IN THE EVENT THAT THE BUILDING DEPARTMENT DOES REQUIRE A PERMIT FEE, THIS WILL BE PAID DIRECTLY TO THE BUILDING DEPARTMENT BY THE SCHOOL SYSTEM. THE CONTRACTOR SHALL COORDINATE THE PAYMENT OF THESE FEES THROUGH THE ARCHITECT.

B. IT SHOULD BE ASSUMED BY THE CONTRACTOR THAT THE BUILDING DEPARTMENT MAY EXERCISE INSPECTION REQUIREMENTS OF THE WORK. IF THIS IS THE CASE, THE CONTRACTOR SHALL COORDINATE AND COOPERATE WITH THE BUILDING DEPARTMENT IN ORDER TO FULFILL THIS REQUIREMENT.

1.3.2 SUBMIT TO THE ARCHITECT/ENGINEER THE PRODUCER'S STANDARD DESCRIPTIVE DATA SHEETS FOR EACH TYPE OF PRODUCT BEING PROVIDED. MARK THE DATA SHEET FOR THE PRODUCT BEING PROVIDED WITH AN IDENTIFYING MARK OR ARROW. THE FOLLOWING DATA SHEETS SHALL BE SUPPLIED:

A. ANY NEW SYSTEM CONTROL PANEL(S)
B. SYSTEM POWER SUPPLY.
C. STANDBY POWER SUPPLY.
D. EACH TYPE OF AUTOMATIC SMOKE DETECTOR.
E. EACH TYPE OF HEAT DETECTOR.
F. MANUAL ALARM INITIATING STATIONS.
G. DOOR HOLDERS.
I. CONTROL MODULES.
J. MONITOR MODULES.
K. REMOTE SYSTEM ANNUNCIATOR.
L. SYSTEM PRINTER.
M. ANY OTHER ITEM REQUIRED BY THE PROJECT DRAWINGS.

1.3.3 SUBMIT A "POINT-TO-POINT" WIRING DIAGRAM SHOWING THE CONNECTIONS TO THE EQUIPMENT AND TERMINAL CABINETS. INDICATE THE EQUIPMENT NUMBERS, TERMINAL NUMBERS, WIRE NUMBERS, ZONE NUMBERS AND WIRE COLORS. INCLUDE THE CONNECTIONS FOR THE MECHANICAL SYSTEMS AND THE FIRE DETECTION AND ALARM SYSTEM. THE SUBMITTAL SHALL BE MADE FOR APPROVAL PRIOR TO THE INSTALLATION OF THE WIRING IN THE RACEWAYS. MAKE A CLEAR STATEMENT THAT ALL CIRCUITS SHALL BE TERMINATED ON TERMINAL STRIPS AND THAT WIRE NUTS WILL NOT BE ALLOWED.

1.3.4 SUBMIT VOLTAGE DROP CALCULATIONS FOR ALL ALARM CIRCUITS.

1.3.5 SUBMIT BATTERY CALCULATIONS FOR THE FIRE ALARM PANEL WITH ALL DEVICES UNDER SUPERVISORY AND ALARM CONDITIONS. BATTERIES SHALL BE RATED TO

ACCOUNT FOR SUPERVISORY AND ALARM REQUIREMENTS WITH A 25% DERATING FACTOR.

1.3.6 SUBMIT VOLTAGE DROP CALCULATIONS FOR ALL APPLIANCE CIRCUITS EXCEEDING 300 FEET TO ENSURE PROPER VOLTAGE LEVELS.

1.3.7 SUBMIT QUALIFICATIONS SPECIFIED IN SECTION 1.4 "QUALITY ASSURANCE".

1.3.8 SUBMIT WRITTEN CERTIFICATION BY THE FIRE ALARM CONTRACTOR THAT NO POWER SUPPLY OR CIRCUIT ON THE SYSTEM HAS AN ELECTRICAL LOAD GREATER THAN 80% OF IT'S RATED CAPACITY.

1.3.9 SUBMIT A CUSTOM WIRING DIAGRAM FOR EACH BUILDING SHOWING WIRING TO EACH INDIVIDUAL APPLIANCE AND DEVICE.

1.3.10 SUBMIT A PER-WORK REPORT OF EXISTING SYSTEM

1.4 QUALITY ASSURANCE:

1.4.1 EACH AND ALL ITEMS OF THE FIRE ALARM SYSTEM SHALL BE LISTED AS A PRODUCT OF A SINGLE FIRE ALARM MANUFACTURER UNDER THE APPROPRIATE CATEGORY BY UNDERWRITERS' LABORATORIES, INC. (UL), AND SHALL BEAR THE "UL" LABEL. ALL CONTROL EQUIPMENT SHALL BE LISTED UNDER UL CATEGORY UOJZ AS A SINGLE CONTROL UNIT. PARTIAL LISTING WILL NOT BE ACCEPTABLE.

1.4.2 ALL CONTROL EQUIPMENT SHALL HAVE TRANSIENT PROTECTION DEVICES TO COMPLY WITH UL 864 REQUIREMENTS.

1.4.3 MANUFACTURER'S QUALIFICATIONS: FIRMS REGULARLY ENGAGED IN THE MANUFACTURER OF FIRE ALARM SYSTEMS OF TYPES, SIZES AND ELECTRICAL CHARACTERISTICS REQUIRED, AND WHOSE PRODUCTS HAVE BEEN IN SATISFACTORY USE IN SIMILAR SERVICE FOR NOT LESS THAN 5 YEARS.

1.4.4 INSTALLER'S QUALIFICATIONS: FIRM WITH AT LEAST 5 YEARS OF SUCCESSFUL INSTALLATION EXPERIENCE ON PROJECTS WITH FIRE ALARM SYSTEMS WORK SIMILAR TO THAT REQUIRED FOR THIS PROJECT AND CERTIFIED BY THE STATE OF FLORIDA TO INSTALL FIRE ALARM SYSTEMS.

1.4.5 FIRMS SHALL HAVE BE FACTORY AUTHORIZED SERVICE ORGANIZATION AND STOCK SPARE PARTS.

1.4.6 TECHNICAL SERVICES: MANUFACTURER SHALL MAKE AVAILABLE FACTORY TRAINING OF OWNER'S MAINTENANCE PERSONNEL SO THAT THEY WILL BE QUALIFIED TO PERFORM DIAGNOSTIC AND REPAIR FOR ALL COMPONENTS OF THE INSTALLED SYSTEM. MANUFACTURER SHALL ALSO MAKE AVAILABLE TO THE OWNER A MAINTENANCE CONTRACT.

1.5 SYSTEM DESCRIPTION AND OPERATION:

1.5.1 THE FIRE DETECTION AND ALARM SYSTEM SHALL BE A DIRECT WIRED, MULTIPLEXED, ADDRESSABLE FIRE ALARM SYSTEM IN STRICT COMPLIANCE WITH THESE SPECIFICATIONS AND ANY OTHER CODES ADOPTED BY ANY AUTHORITIES HAVING JURISDICTION. THE SYSTEM SHALL UTILIZE INDEPENDENTLY ADDRESSABLE "INTELLIGENT", ANALOG OUTPUT SMOKE DETECTORS AND OTHER ADDRESSABLE APPLIANCES DESCRIBED BY THESE SPECIFICATIONS. THE FIRE ALARM EQUIPMENT

SHALL BE INSTALLED IN THE LOCATIONS SHOWN ON THE PROJECT DRAWINGS. THE SEPARATE ITEMS OF THE FIRE ALARM EQUIPMENT SHALL BE ARRANGED AND INTERCONNECTED TO PROVIDE AN INTEGRATED SYSTEM FOR: THE EARLY DETECTION OF FIRE; THE NOTIFICATION OF BUILDING OCCUPANTS AND THE SUMMONING OF THE SERVING SCHOOL DISTRICT; THE OVERRIDE OF NORMAL HVAC SYSTEM OPERATION; AND THE ACTIVATION OF OTHER AUXILIARY SYSTEMS TO INHIBIT THE SPREAD OF SMOKE AND FIRE AND TO FACILITATE THE SAFE EVACUATION OF BUILDING OCCUPANTS.

1.5.2 THE SYSTEM SHALL BE FULLY SUPERVISED FOR THE DETECTION AND REPORTING OF THE DERANGEMENT OF ANY COMPONENT OR CIRCUIT ON THE SYSTEM. INITIATING DEVICE CIRCUITS SHALL PROVIDE THE LEVEL OF PERFORMANCE DESIGNATED AS STYLE 4 BY U.L. AND THE N.F.P.A. INDICATING CIRCUITS SHALL PROVIDE THE LEVEL OF PERFORMANCE DESIGNATED AS STYLE Y BY U.L. AND N.F.P.A.

1.5.3 THE FIRE ALARM SYSTEM SHALL BE MICROPROCESSOR DRIVEN WITH STORED PROGRAM CONTROL. THE SYSTEM SHALL USE A MULTIPLE MICROPROCESSOR DESIGN SO THAT THE FAILURE OF A SINGLE MICROPROCESSOR WILL NOT RESULT IN A TOTAL SYSTEM FAILURE. FIRE ALARM SYSTEMS WHICH UTILIZE ONLY ONE MICROPROCESSOR FOR SYSTEM CONTROL WILL NOT BE ACCEPTED.

1.5.4 THE FIRE ALARM SYSTEM SHALL OPERATE FROM DIRECT-CURRENT HAVING A NOMINAL POTENTIAL OF 24 VOLTS. THE DIRECT-CURRENT SHALL BE PROVIDED BY A SOLID-STATE POWER SUPPLY CONNECTED TO THE BUILDING ELECTRICAL SYSTEM BY A DEDICATED BRANCH CIRCUIT IN STRICT COMPLIANCE WITH NEC ARTICLE 725 AND 760.

1.5.5 A STANDBY POWER SUPPLY SHALL AUTOMATICALLY SUPPLY ELECTRICAL ENERGY TO THE SYSTEM WHENEVER THE PRIMARY POWER SUPPLY FAILS TO PROVIDE THE MINIMUM VOLTAGE REQUIRED FOR PROPER SYSTEM OPERATION. TRANSFER TIME FROM PRIMARY TO STANDBY POWER SHALL BE 30 SECONDS OR LESS IN ACCORD WITH N.F.P.A. STANDARDS. THE STANDBY POWER SUPPLY SHALL BE AN ELECTRICAL BATTERY WITH CAPACITY TO OPERATE THE SYSTEM UNDER MAXIMUM SUPERVISORY LOAD FOR 48 HOURS AND THEN BE CAPABLE OF OPERATING THE SYSTEM FOR 5 MINUTES IN THE ALARM MODE IN SYSTEMS WHICH ARE CLASSIFIED UNDER N.F.P.A. 71, 72A, AND 72D. IN SYSTEMS WHICH ARE CLASSIFIED UNDER N.F.P.A. 72B AND 72C, THE STANDBY BATTERY SHALL HAVE A CAPACITY TO OPERATE THE SYSTEM UNDER MAXIMUM SUPERVISORY LOAD FOR 60 HOURS AND THEN BE CAPABLE OF OPERATING THE SYSTEM FOR 10 MINUTES IN THE ALARM MODE. THE FIRE ALARM SYSTEM SHALL INCLUDE A CHARGING CIRCUIT TO AUTOMATICALLY MAINTAIN THE ELECTRICAL CHARGE OF THE BATTERY.

1.5.6 THE FIRE ALARM SYSTEM SHALL INCLUDE THE ALARM INITIATING AND INDICATING APPLIANCES AND DEVICES SHOWN ON THE PROJECT DRAWINGS.

1.5.7 SYSTEM SHALL HAVE REMOTE ALARM INDICATORS FOR SMOKE DETECTORS THAT ARE NOT IN VIEW, SUCH AS THOSE INSTALLED ABOVE CEILINGS OR IN AIR DUCT WORK.

1.5.8 PROVIDE AND INSTALL ALL REQUIRED EQUIPMENT AND ACCESSORIES NECESSARY FOR THE PROPER OPERATION OF THE SYSTEM.

1.6 SYSTEM FUNCTION OPERATION:

1.6.1 ALARM DETECTION: WHEN A FIRE ALARM CONDITION IS DETECTED BY ONE OF THE SYSTEM INITIATING DEVICES, THE FOLLOWING FUNCTIONS SHALL IMMEDIATELY OCCUR:

A. THE SYSTEM ALARM LED SHALL FLASH.
B. A LOCAL SOUNDING DEVICE IN THE PANEL SHALL BE ACTIVATED.
C. THE 80 CHARACTER LCD DISPLAY SHALL INDICATE ALL PERTINENT INFORMATION ASSOCIATED WITH THE ALARM AND IT'S LOCATION.
D. THE APPROPRIATE STATUS CHANGE MESSAGE SHALL BE SENT TO THE CRT AND PRINTER.
E. ALL AUTOMATIC PROGRAMS ASSIGNED TO THE ALARM POINT SHALL BE EXECUTED AND THE ASSOCIATED INDICATING DEVICES AND RELAYS ADDRESSED AND ACTIVATED.

1.6.2 SYSTEM TROUBLE DETECTION: WHEN A TROUBLE CONDITION IS DETECTED BY ONE OF THE SYSTEM INITIATING DEVICES, THE FOLLOWING FUNCTIONS SHALL IMMEDIATELY OCCUR:

A. THE SYSTEM TROUBLE LED SHALL FLASH.
B. A LOCAL SOUNDING DEVICE IN THE PANEL SHALL BE ACTIVATED.
C. THE 80 CHARACTER LCD DISPLAY SHALL INDICATE ALL PERTINENT INFORMATION ASSOCIATED WITH THE TROUBLE CONDITION AND IT'S LOCATION.
D. UNACKNOWLEDGED ALARM MESSAGES SHALL HAVE PRIORITY OVER TROUBLE MESSAGES, AND IF SUCH AS ALARM MUST ALSO BE DISPLAYED, THE TROUBLE MESSAGE SHALL NOT BE DISPLAYED ON THE LCD.
E. THE APPROPRIATE MESSAGE SHALL BE SENT TO CRT AND PRINTER.

1.6.3 CONTROL SWITCH OPERATION:

1.6.3.1 ACKNOWLEDGE SWITCH: ACTIVATION OF THE CONTROL PANEL ACKNOWLEDGE SWITCH IS RESPONSE TO A SINGLE NEW TROUBLE OR ALARM CONDITION SHALL SILENCE THE PANEL SOUNDING DEVICE AND CHANGE THE SYSTEM ALARM OR TROUBLE LED'S FROM FLASHING TO STEADY-ON. IF ADDITIONAL NEW ALARM OR TROUBLE CONDITIONS EXIST IN THE SYSTEM, ACTIVATION OF THIS SWITCH SHALL ADVANCE THE DISPLAY TO THE NEXT ALARM OR TROUBLE CONDITION THAT EXISTS, AND SHALL NOT SILENCE THE LOCAL AUDIBLE DEVICE OR CHANGE THE LEDS TO STEADY UNTIL ALL NEW CONDITIONS HAVE BEEN SO ACKNOWLEDGED. NEW ALARM CONDITIONS SHALL ALWAYS BE DISPLAYED BEFORE NEW TROUBLE CONDITIONS. ACTIVATION OF THE ACKNOWLEDGE SWITCH SHALL ALSO CAUSE A CORRESPONDING (TIME-STAMPED) MESSAGE TO BE DISPLAYED ON SYSTEM CRTS AND PRINTERS. OCCURRENCE OF A NEW ALARM OR TROUBLE CONDITION SHALL CAUSE THE PANEL TO RESOUND AND THE SEQUENCE DESCRIBED 1.6.1 AND 1.6.2 OF THESE SPECIFICATIONS SHALL REPEAT.

1.6.3.2 SIGNAL SILENCE SWITCH: ACTIVATION OF THE SIGNAL SILENCE SWITCH SHALL CAUSE ALL APPROPRIATE INDICATING APPLIANCES AND RELAYS TO RETURN TO THE NORMAL CONDITION AFTER AN ALARM CONDITION. THE SELECTION OF INDICATING CIRCUITS AND RELAYS SILENCED BY THIS SWITCH SHALL BE FULLY PROGRAMMABLE.

1.6.3.3 SYSTEM RESET SWITCH: ACTIVATION OF THE SYSTEM RESET SWITCH SHALL CAUSE ALL ELECTRONICALLY-LATCHED INITIATING DEVICES OR ZONES, AS WELL AS ALL ASSOCIATED OUTPUT DEVICES AND CIRCUITS, TO RETURN TO THE NORMAL CONDITION. IF ALARM CONDITIONS EXIST IN THE SYSTEM AFTER THE SYSTEM RESET SWITCH ACTIVATION, THE SYSTEM SHALL THEN RESOUND THE ALARM CONDITIONS AS INDICATED IN PARAGRAPH 1.6.1.

1.6.3.4 SYSTEM TEST: ACTIVATION OF THE SYSTEM TEST SHALL INITIATE AN AUTOMATIC TEST OF ALL INTELLIGENT DETECTORS IN THE SYSTEM. SUCH TEST SHALL ACTIVATE THE ELECTRONICS IN EACH INTELLIGENT DEVICE, SIMULATING AN ALARM CONDITION. A REPORT SUMMARIZING THE RESULTS OF THIS TEST SHALL BE DISPLAYED AUTOMATICALLY ON THE FRONT PANEL, AS WELL AS ON ANY CRTS OR PRINTERS IN THE SYSTEM.

1.6.3.5 LAMP TEST SWITCH: ACTIVATION OF THE LAMP TEST SWITCH SHALL TURN ON ALL LED INDICATORS, LCD DISPLAY AND LOCAL SOUNDER, AND THEN RETURN TO THE PREVIOUS CONDITION.

1.6.4 SERVICE AIDS:

1.6.4.1 AUTOMATIC DETECTOR TEST: THE SYSTEM SHALL INCLUDE A SPECIAL AUTOMATIC DETECTOR TEST WHICH PERMITS A SERVICEMAN TO TEST ALL ADDRESSABLE ANALOG DETECTORS FROM THE SYSTEM CONTROL PANEL.

1.6.4.2 WATCH-DOG CIRCUITS: THE SYSTEM SHALL INCLUDE MULTIPLE, INDEPENDENT "WATCH-DOG" CIRCUITS TO DETECT AND REPORT FAILURE OF ANY MICROPROCESSOR CIRCUIT, MEMORY, OR SOFTWARE.

1.6.5 FIELD PROGRAMMING: THE SYSTEM SHALL BE FIELD PROGRAMMABLE, CONFIGURABLE AND EXPANDABLE IN THE FIELD WITHOUT THE NEED FOR SPECIAL TOOLS OR PROM PROGRAMMERS AND SHALL NOT REQUIRE REPLACEMENT OF MEMORY ICS. ALL PROGRAMS SHALL BE STORED IN NON-VOLATILE MEMORY. THE PROGRAMMING FUNCTION SHALL BE ENTERED WITH A SPECIAL PASSWORD THAT MAY BE SELECTED WHEN THE SYSTEM IS INSTALLED. THE PASSWORD MAY BE CHANGED IN THE FIELD TO A NEW VALUE AT ANY TIME BY ENTERING THE OLD PASSWORD AND REQUESTING A PASSWORD CHANGE.

1.7 SUBSTITUTIONS - PRIOR APPROVAL REQUIRED.

2.0 PRODUCTS

2.1 GENERAL: EQUIPMENT AND MATERIAL FURNISHED SHALL COMPLY WITH THE LATEST REVISIONS OF APPLICABLE CODES AND STANDARDS OF UNDERWRITERS LABORATORIES, INC., ANSI, NEMA AND NFPA AND SHALL BE LISTED, APPROVED AND LABELED FOR THE APPLICATIONS. EXCEPT AS NOTED, ALL SYSTEM COMPONENTS SHALL BE BUILT AND TESTED BY THE SAME MANUFACTURER, PROVIDING A SINGLE SOURCE OR RESPONSIBILITY.

2.2 ACCEPTABLE PRODUCERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE ALL NEW DEVICES AS REQUIRED TO EXPAND THE EXISTING EDWARDS EST3 FIRE ALARM SYSTEM ON CAMPUS TO PROVIDE COMPLETE AND OPERATIONAL FIRE ALARM SYSTEM FOR THE NEW CLASSROOM ADDITION AS WELL AS MAINTAIN THE EXISTING SYSTEM.

2.3 SYSTEM PERIPHERAL DEVICES:

2.3.1 ADDRESSABLE ANALOG PHOTOELECTRIC SMOKE DETECTORS: THE INTELLIGENT PHOTOELECTRIC SMOKE DETECTORS SHALL CONNECT WITH TWO WIRES TO ONE OF THE CONTROL PANEL LOOPS. THE DETECTORS SHALL USE THE PHOTOELECTRIC PRINCIPAL TO MEASURE SMOKE DENSITY AND SHALL, ON COMMAND FROM THE CONTROL PANEL, SEND DATA TO THE PANEL REPRESENTING THE ANALOG LEVEL OF

SMOKE DENSITY. THE DETECTORS SHALL BE CEILING-MOUNT AND SHALL INCLUDE A TWIST-LOCK BASE.

THE DETECTORS SHALL PROVIDE A TEST MEANS WHEREBY THEY WILL SIMULATE AN ALARM CONDITION AND REPORT THAT CONDITION TO THE CONTROL PANEL. SUCH A TEST MAY BE INITIATED AT THE DETECTOR ITSELF, BY ACTIVATING A MAGNETIC SWITCH, OR MAY BE ACTIVATED REMOTELY ON COMMAND FROM THE CONTROL PANEL.

THE DETECTORS SHALL PROVIDE ADDRESS-SETTING MEANS ON THE DETECTOR HEAD USING ROTARY DECIMAL SWITCHES. THE DETECTORS SHALL ALSO STORE AN INTERNAL IDENTIFYING CODE WHICH THE CONTROL PANEL SHALL USE TO IDENTIFY THE TYPE OF DETECTOR.

THE DETECTORS SHALL PROVIDE DUAL ALARM AND POWER LEDS. BOTH LEDS SHALL FLASH UNDER NORMAL CONDITIONS, INDICATING THAT THE DETECTOR IS OPERATIONAL AND IN REGULAR COMMUNICATION WITH THE CONTROL PANEL. BOTH LEDS MAY BE PLACED INTO STEADY ILLUMINATION BY THE CONTROL PANEL, INDICATING THAT AN ALARM CONDITION HAS BEEN DETECTED. AN OUTPUT CONNECTION SHALL ALSO BE PROVIDED IN THE BASE TO CONNECT AN EXTERNAL REMOTE ALARM LED. (EDWARDS 2551F WITH B501BF BASE)

2.3.2 DUCT SMOKE DETECTORS: EACH DUCT DETECTOR SHALL BE INSTALLED IN SUPPLY/RETURN AIR DUCTS AS INDICATED ON THE DRAWINGS. EACH DUCT DETECTOR SHALL HAVE PROPERLY SIZED AIR-DUCT SAMPLING TUBES. THE SMOKE DETECTOR SHALL BE AS DESCRIBED IN SECTION 2.4.1.

2.3.3 ADDRESSABLE MANUAL STATIONS: THE ADDRESSABLE MANUAL STATION SHALL CONNECT WITH TWO WIRES TO ONE OF THE SLC LOOPS. THE MANUAL STATION SHALL, ON COMMAND FROM THE CONTROL PANEL, SEND DATA TO THE PANEL REPRESENTING THE STATE OF THE MANUAL SWITCH.

THE MANUAL STATION SHALL PROVIDE ADDRESS-SETTING MEANS USING ROTARY DECIMAL SWITCHES AND SHALL ALSO STORE AN INTERNAL IDENTIFYING CODE WHICH THE CONTROL PANEL SHALL USE TO IDENTIFY THE TYPE OF DEVICE. AN LED SHALL BE PROVIDED WHICH SHALL FLASH UNDER NORMAL CONDITIONS, INDICATING THAT THE MANUAL STATION IS OPERATIONAL AND IN REGULAR COMMUNICATIONS WITH THE CONTROL PANEL. THE LED MAY BE PLACED INTO STEADY ILLUMINATION BY THE CONTROL PANEL, INDICATING THAT AN ALARM CONDITION HAS BEEN DETECTED.

2.3.4 MONITOR TRANSPONDER: THE MONITOR TRANSPONDER SHALL BE USED TO CONNECT A SUPERVISED ZONE OF CONVENTIONAL INITIATING DEVICES (ANY N.O. DRY CONTACT DEVICE, INCLUDING 4 WIRE SMOKE DETECTORS) TO ONE OF THE SLC LOOPS. THE MONITOR TRANSPONDER SHALL MOUNT IN A 4-INCH SQUARE 2-1/8" DEEP ELECTRICAL BOX. THE ZONE MAY BE WIRED FOR STYLE D OR STYLE B OPERATION.

THE MONITOR TRANSPONDER SHALL PROVIDE ADDRESS-SETTING MEANS USING ROTARY DECIMAL SWITCHES AND SHALL ALSO STORE AN INTERNAL IDENTIFYING CODE WHICH THE CONTROL PANEL SHALL USE TO IDENTIFY THE TYPE OF DEVICE. AN LED SHALL BE PROVIDED WHICH SHALL FLASH UNDER NORMAL CONDITIONS, INDICATING THAT THE MONITOR TRANSPONDER IS OPERATIONAL AND IN REGULAR COMMUNICATION WITH THE CONTROL PANEL.

2.3.5 CONTROL TRANSPONDER: THE CONTROL TRANSPONDER SHALL BE USED TO CONNECT A CONVENTIONAL INDICATING APPLIANCE CIRCUIT (IAC) OF 24VDC COMPATIBLE POLARIZED AUDIO/VISUAL INDICATING APPLIANCES TO ONE OF THE SLC LOOPS. THE CONTROL TRANSPONDER SHALL MOUNT IN A STANDARD 4-INCH SQUARE 2-1/8" DEEP ELECTRICAL BOX. THE IAC MAY BE WIRED FOR STYLE Z OR STYLE Y OPERATION. THE CONTROL TRANSPONDER MAY ALSO BE WIRED AS A DRY CONTACT (FORM C) RELAY. POWER FOR THE RELAY COIL SHALL BE PROVIDED BY THE SLC LOOP TO REDUCE WIRING CONNECTION REQUIREMENTS. AUDIO/VISUAL POWER SHALL BE PROVIDED BY A SEPARATE LOOP FROM THE MAIN CONTROL PANEL OR FROM SUPERVISED REMOTE POWER SUPPLIES.

THE CONTROL TRANSPONDER SHALL PROVIDE ADDRESS-SETTING MEANS USING ROTARY DECIMAL SWITCHES AND SHALL ALSO STORE AN INTERNAL IDENTIFYING CODE WHICH THE CONTROL PANEL SHALL USE TO IDENTIFY THE TYPE OF DEVICE. AN LED SHALL BE PROVIDED WHICH SHALL FLASH UNDER NORMAL CONDITIONS, INDICATING THAT THE CONTROL TRANSPONDER IS OPERATIONAL AND IN REGULAR COMMUNICATION WITH THE CONTROL PANEL.

2.3.6 FAULT ISOLATOR: THE FAULT ISOLATOR MAY BE USED TO ISOLATE WIRE-TO-WIRE SHORT CIRCUITS ON AN SLC LOOP IN ORDER TO LIMIT THE NUMBER OF OTHER TRANSPONDERS OR DETECTORS THAT ARE INCAPACITATED BY THE SHORT CIRCUIT FAULT. IF A WIRE-TO-WIRE SHORT OCCURS, THE ISOLATOR SHALL AUTOMATICALLY DISCONNECT THE SLC LOOP DOWNSTREAM FORM ITSELF. WHEN THE SHORT IS CORRECTED, THE ISOLATOR SHALL AUTOMATICALLY RECONNECT THE ISOLATED SECTION OF THE SLC LOOP.

THE FAULT ISOLATOR WILL MOUNT IN A STANDARD 4-INCH DEEP ELECTRICAL BOX. IT SHALL PROVIDE A SINGLE LED WHICH SHALL FLASH TO INDICATE THAT THE ISOLATOR IS OPERATIONAL AND SHALL ILLUMINATE STEADILY TO INDICATE THAT A SHORT HAS BEEN DETECTED AND ISOLATED.

2.3.7 ADDRESSABLE HEAT DETECTORS: THE ADDRESSABLE HEAT DETECTORS SHALL CONNECT WITH TWO WIRES TO ONE OF THE CONTROL PANEL LOOPS. THE DETECTORS SHALL HAVE A DUAL THERMISTOR SENSOR THAT WILL MONITOR THE AMBIENT TEMPERATURE FROM 0 DEGREES C TO 60 DEGREES C AND GIVE A FAST RESPONSE TO RAPID INCREASES IN TEMPERATURE. THE DETECTORS SHALL BE CEILING-MOUNT.

THE DETECTORS SHALL PROVIDE A TEST MEANS WHEREBY THEY WILL SIMULATE AN ALARM CONDITION AND REPORT THAT CONDITION TO THE CONTROL PANEL. SUCH A TEST MAY BE INITIATED AT THE DETECTOR ITSELF, BY ACTIVATING A MAGNETIC REED SWITCH, OR MAY BE ACTIVATED REMOTELY ON COMMAND FROM THE CONTROL PANEL.

THE DETECTORS SHALL PROVIDE ADDRESS-SETTING MEANS ON THE DETECTOR HEAD USING ROTARY DECIMAL SWITCHES. THE DETECTORS SHALL ALSO STORE AN INTERNAL IDENTIFYING CODE WHICH THE CONTROL PANEL SHALL USE TO IDENTIFY THE TYPE OF DETECTOR.

THE DETECTORS SHALL PROVIDE DUAL ALARM AND POWER LEDS. BOTH LEDS SHALL FLASH UNDER NORMAL CONDITIONS, INDICATING THAT THE DETECTOR IS OPERATIONAL AND IN REGULAR COMMUNICATION WITH THE CONTROL PANEL. BOTH LEDS MAY BE PLACED INTO STEADY ILLUMINATION BY THE CONTROL PANEL, INDICATING THAT AN ALARM CONDITION HAS BEEN DETECTED. AN OUTPUT CONNECTION SHALL ALSO BE PROVIDED IN THE BASE TO CONNECT AN EXTERNAL REMOTE ALARM LED.

2.3.8 ADDRESSABLE HEAT DETECTORS - EXPLOSION PROOF: SAME AS 2.4.7, EXCEPT IN EXPLOSION PROOF ENCLOSURE.

2.3.9 REMOTE SERIAL ANNUNCIATORS: SHALL BE PROVIDED WITH EACH CONTROL PANEL (TWO REQUIRED). THE ANNUNCIATOR SHALL PROVIDE ENGLISH DESCRIPTIONS OF ALARM AND TROUBLE CONDITIONS AS WELL AS THE SYSTEM STATUS.

2.4 CONVENTIONAL PERIPHERAL DEVICE REQUIREMENTS

2.4.1 REMOTE SMOKE DETECTOR INDICATORS: SHALL BE PROVIDED WHEN THE SMOKE DETECTOR IS NOT CLEARLY VISIBLE. THE INDICATOR SHALL HAVE A RED LED ON A SINGLE GANG PLATE WHICH INDICATES THE ALARM STATUS OF THE ASSOCIATED CEILING OR AIR-DUCT SMOKE DETECTOR.

2.4.2 AUDIBLE/VISUAL INDICATING DEVICES: SHALL BE SOLID-STATE ELECTRONIC FOR LOW CURRENT DRAW/HIGH OUTPUT. THE DEVICE SHALL PRODUCE A BROADBAND HORN SOUND OUTPUT OF 96 DBA (103 PEAK DBA) AT 10 FEET IN AN ANECHOIC CHAMBER. HORN CURRENT SHALL BE 17 MA AT 24VDC. STROBE CURRENT SHALL BE 88 MA AT 24 VDC FOR 117 CANDELA. MOUNTING SHALL BE FLUSH AND TERMINALS SHALL BE PROVIDED FOR IN-OUT FIELD WIRING OF UP TO #12 AWG WIRE. ALL DEVICES SHALL BE WIRED SO THAT THE AUDIBLE AND VISUAL DEVICES ARE ON SEPARATE CIRCUITS (4 WIRE). ALL MODELS SHALL BE UL LISTED FOR FIRE PROTECTION SERVICE. EXTERIOR HORNS SHALL BE RECESSED MOUNTED IN A RED METALLIC WEATHERPROOF CAST ALUMINUM BOX SO THAT MOISTURE CANNOT ENTER THE SYSTEM.

2.5 OTHER SYSTEM PERIPHERALS

2.5.1 MAGNETIC DOOR HOLDERS: SHALL HAVE AN APPROXIMATE HOLDING FORCE OF 25 LBS. AND BE SUITABLE FOR THE DOORS ON WHICH THEY ARE INSTALLED. THE DOOR PORTION SHALL HAVE A STAINLESS STEEL PIVOTAL MOUNTED ARMATURE WITH SHOCK ABSORBING NYLON BEARING. THE 120 VAC ELECTROMAGNET IS SEMI-FLUSH WALL MOUNTED PROJECTING 13/16" FROM THE WALL AND THE WIRING SHALL BE CONCEALED. THE DOOR CATCH PLATE SHALL EXTEND APPROXIMATELY 2-5/8" FROM THE DOOR. UTILIZE LARGER CATCH PLATES HOLDERS FOR DOORS REQUIRING CLEARANCES GREATER THAN 3". THE MAGNETIC DOOR HOLDER SHALL INTERFACE WITH THE FIRE ALARM CONTROL PANEL THROUGH A CONTROL MODULE AND AN EXTERNAL RELAY FOR SWITCHING THE 120 VAC LOAD. THE 120 VAC SHALL BE SEPARATED FROM THE FIRE ALARM SLC BY A METAL ENCLOSURE. UNDER NOT CONDITIONS SHALL VOLTAGES OF GREATER THAT 24 VDC BE INSTALLED IN THE FIRE ALARM RACEWAY.

2.5.2 PRINTER: SHALL PROVIDE A HARD COPY PRINTOUT OF ALL CHANGES IN STATUS OF THE SYSTEM AND SHALL TIME-STAMP SUCH PRINTOUTS WITH THE CURRENT TIME-OF-DAY AND DATE. THE PRINTER SHALL BE WIDE CARRIAGE WITH 80-CHARACTERS PER LINE AND SHALL USE A STANDARD TRACTOR-FEED PAPER. THE PRINTER SHALL BE ENCLOSED IN A SEPARATE CABINET SUITABLE FOR PLACEMENT ON A DESKTOP OR TABLE. THE PRINTER SHALL COMMUNICATE WITH THE CONTROL PANEL USING AN INTERFACE COMPLYING WITH ELECTRICAL INDUSTRIES ASSOCIATION STANDARD RS-232C. POWER TO THE PRINTER SHALL BE 120 VAC 60 HZ. THE PRINTER SHALL BE SUPPLIED WITH ALL CABLES AND CONNECTIONS REQUIRED FOR FULL OPERATION.

3.0 EXECUTION

3.1 SYSTEM WIRING: SHALL BE IN METALLIC CONDUIT SOLELY FOR THE FIRE DETECTION AND ALARM SYSTEM AND SHALL COMPLY WITH CHAPTER 3 OF THE NATIONAL ELECTRICAL CODE. MINIMUM RACEWAY SIZE FOR THE FIRE ALARM SYSTEM SHALL BE 3/4". (NOTE: 3/8" FLEXIBLE METAL RACEWAY DOES NOT COMPLY WITH NEC 350-3 WHEN USED IN FIRE ALARM SYSTEMS AND THEREFORE WILL NOT BE PERMITTED.) FIRE ALARM SYSTEM WIRING AND CONDUIT SHALL NOT BE PLACED IN CABLE TRAYS.

3.1.1 THE COMPLETE RACEWAY SYSTEM SHALL BE GROUNDED AND BONDED IN ACCORD WITH THE REQUIREMENTS OF ARTICLE 250 OF THE NEC AND ANY FURTHER REQUIREMENTS IMPOSED BY CHAPTER 3 OF THE NEC RESULTING FROM THE PARTICULAR WIRING METHOD USED.

3.1.2 OUTLET BOXES FOR FIRE ALARM APPLIANCES AND DEVICES SHALL BE INSTALLED IN THE APPROXIMATE LOCATIONS INDICATED ON THE DRAWINGS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT THE FINAL LOCATIONS OF THE FIRE DETECTORS AND OTHER INITIATING AND INDICATING APPLIANCES AND DEVICES ARE IN COMPLIANCE WITH ALL APPLICABLE CODES.

3.1.3 ANY NON-METALLIC CONDUIT SHALL BE REPLACED WITH METALLIC CONDUIT WITH NO COST TO THE OWNER.

3.1.4 MOUNTING OF FIRE ALARM BOXES SHALL BE 48" ABOVE FINISHED FLOOR (HANDICAPPED CODE).

3.2 CONDUCTORS AND TERMINATIONS: CONDUCTORS FOR THE FIRE ALARM SYSTEM SHALL BE COPPER WITH TYPE THHN/THWN INSULATION. MINIMUM CONDUCTOR SIZE SHALL BE #14 AWG EXCEPT THAT SIGNALLING LINE CIRCUIT (SLC) LOOPS SHALL BE WIRED WITH UL LISTED TYPE FPL CABLE COMPRISED OF A JACKETED AND ELECTRICALLY UNSHIELDED PAIR OF CONDUCTORS #18 AWG OR LARGER. (WEST PENN WIRE D980) IF STRANDED CONDUCTORS ARE USED, THEY SHALL COMPLY WITH SECTION 760-16(C), 760-28(A), AND 760-30(A) OF THE NEC.

3.2.1 ALL CIRCUITS SHALL BE IDENTIFIED BY USING A UNIQUE CONDUCTOR INSULATION COLOR THROUGHOUT THE SYSTEM FOR EACH TYPE OF CIRCUIT. THE COLOR-CODE SHALL BE SUBMITTED ON THE DRAWINGS REQUIRED UNDER THE SUBMITTAL SECTION OF THIS SPECIFICATION. TRANSPOSING OR CHANGING CIRCUIT COLORS WILL NOT BE PERMITTED. ADDITIONALLY, ALL CIRCUIT SHALL BE NEATLY TAGGED WITH LEGIBLE LABELS AT EACH JUNCTION BOX AND AT THE SYSTEM CONTROL PANEL.

3.2.2 TERMINATION OF CONDUCTORS SHALL BE BY MEANS OF FACTORY WIRING TERMINALS OR FACTOR PIGTAILS. PIGTAILS FABRICATED IN THE SHOP OR FIELD SHALL NOT BE ALLOWED.

3.2.3 FIRE ALARM CONDUCTORS SHALL NOT BE PLACED IN ANY ENCLOSURE, RACEWAY, CABLE, COMPARTMENT, OUTLET BOX, JUNCTION BOX, OR SIMILAR FITTING CONTAINING CONDUCTORS OF ELECTRIC LIGHT OR POWER, OR ANY OTHER LOW VOLTAGE SYSTEM.

3.2.4 EACH SET OF ZONE CONDUCTORS SHALL BE TAGGED WITH THE ZONE NUMBER ON EACH CONDUCTOR AT TERMINATION (EACH END) AND IN EACH JUNCTION OR PULL BOX IN THE RACEWAY SYSTEM.

3.3 JUNCTION BOXES: WIRING SPLICES ARE TO BE AVOIDED TO THE EXTENT POSSIBLE. WHERE SPLICES ARE REQUIRED, THEY SHALL BE MADE IN JUNCTION BOXES AND TERMINATED ON TERMINAL STRIPS. THE JUNCTION BOX SHALL BE IDENTIFIED AS A

SPLICE POINT WITH PHENOLIC PLATES. THE JUNCTION BOX SHALL BE SIZED TO ACCOMMODATE THE TERMINATION AND TERMINAL STRIPS, EXTENSION RINGS ARE PROHIBITED.

3.3.1 THE CONTRACTOR SHALL PAINT ALL FIRE ALARM JUNCTION AND TERMINAL BOXES RED AND STENCIL WITH THE WORDS "FIRE ALARM CIRCUITS" IN COMPLIANCE WITH SECTION 760-4 OF THE NEC.

3.4 INSTALLATION OF INITIATING AND INDICATING APPLIANCES: INSTALLATION OF SYSTEM APPLIANCES AND DEVICES SHALL BE IN STRICT COMPLIANCE WITH THE EQUIPMENT MANUFACTURER'S WRITTEN INSTRUCTIONS. INSTALLATION OF APPLIANCES AND DEVICES SHALL NOT COMMENCE BEFORE ALL SPLICES ARE MADE AND ALL CIRCUITS HAVE BEEN TESTED FOR FAULTS AND SHORTS.

3.4.1 THE CIRCUIT SHALL AGAIN BE TESTED FOR FAULTS AND SHORTS AFTER ALL MANUAL STATIONS, AUDIBLE/VISUAL INDICATORS, HEAT DETECTORS, AND SMOKE DETECTOR BASES ARE INSTALLED AND BEFORE THE CIRCUITS ARE CONNECTED TO THE FIRE ALARM CONTROL PANEL.

3.4.2 NO SMOKE DETECTOR HEADS SHALL BE INSTALLED UNTIL THE BUILDING(S) HAVE BEEN FINALLY CLEANED OF DUST AND DEBRIS. ADDITIONALLY, SMOKE DETECTOR HEADS SHALL NOT BE INSTALLED IN DUCT HOUSINGS UNTIL THE FINAL BUILDING CLEAN-UP HAS BEEN ACCOMPLISHED AND THE AIR HANDLING EQUIPMENT HAS BEEN OPERATED FOR A MINIMUM OF 48 ADDITIONAL HOURS.

3.4.3 ANY SMOKE DETECTOR HEADS INSTALLED PRIOR TO THE FINAL CLEAN-UP OF THE BUILDING SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE WITH NEW HEADS DELIVERED TO THE JOB SITE IN FACTORY SEALED CARTONS.

3.4.4 AIR DUCT SMOKE DETECTORS, INCLUDING HOUSING AND SAMPLING TUBES WHERE USED, SHALL BE LISTED OR APPROVED FOR THE RANGE OF AIR VELOCITIES WHICH MAY EXIST IN SERVICE.

3.4.5 AIR DUCT SMOKE DETECTORS SHALL BE SUITABLE FOR THE MAXIMUM TEMPERATURE WHICH MAY EXIST IN SERVICE.

3.5 INSTALLATION OF CONTROL PANEL AND RELATED EQUIPMENT: SHALL BE IN STRICT COMPLIANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS. THE CONTROL EQUIPMENT SHALL NOT BE INSTALLED UNTIL THE BUILDING IS SUBSTANTIALLY COMPLETE AND ALL WIRING AND SYSTEM APPLIANCES AND DEVICES HAVE BEEN INSTALLED AND ALL CIRCUITS CHECKED FOR FAULTS AND SHORTS AS REQUIRED HEREIN.

3.5.1 THE CONTRACTOR SHALL NEATLY LACE ALL CIRCUIT CONDUCTORS IN THE GUTTER SPACES OF THE CONTROL PANELS AND SECURE THE WIRING AWAY FROM THE CIRCUIT BOARDS AND COMPONENTS. ALL CIRCUITS SHALL BE NEATLY AND LEGIBLY LABELED IN THE CONTROL PANEL. NO WIRING EXCEPT HOMERUNS FROM THE FIRE ALARM SYSTEM CIRCUITS AND SYSTEM POWER SUPPLY CIRCUITS SHALL BE PERMITTED IN THE CONTROL PANEL ENCLOSURE(S). ADDITIONALLY, NO WIRING SPLICES WILL BE PERMITTED IN THE CONTROL PANEL ENCLOSURE.

3.5.2 AFTER THE SYSTEM HAS BEEN COMPLETELY TESTED TO THE SATISFACTION OF THE ARCHITECT, HIS CONSULTING ENGINEER, AND THE BUILDING OWNER; THE CONTRACTOR SHALL COMPLETE THE FIRE ALARM SYSTEM CERTIFICATION AND DESCRIPTION FORM PUBLISHED BY THE N.F.P.A. (ATTACHED AS ATTACHMENT #1). IN

COMPLIANCE WITH PUBLISHED N.F.P.A. STANDARDS, PARTS 1 AND 3 THROUGH 9 SHALL BE COMPLETED AFTER THE SYSTEM IS INSTALLED AND THE WIRING HAS BEEN CHECKED. PART 2 SHALL BE COMPLETED AFTER THE OPERATIONAL ACCEPTANCE TESTS HAVE BEEN COMPLETED. THE COMPLETED FORM SIGNED BY THE QUALIFYING AGENT (AS DEFINED BY THE STATE OF FLORIDA DEPARTMENT OF PROFESSIONAL REGULATION) OF THE ALARM SYSTEM CONTRACTOR SHALL BE DELIVERED TO THE ARCHITECT WITH THE OTHER SYSTEM DOCUMENTATION REQUIRED HEREIN.

3.5.3 PROVIDE A REMOTE LED ANNUNCIATOR LOCATED IN THE SCHOOL OFFICE. THE ANNUNCIATOR SHALL HAVE ALARM SILENCE AND RECALL FEATURES AND AN 80 CHARACTER DISPLAY.

3.5.4 RECALL SIGNAL SHALL BE SEPARATE AND DISTINCT FROM ANY OTHER SIGNAL. THE RECALL CONTROL, PUSH BUTTON OR OTHER TYPE SHALL BE LOCATED IN THE FIRE ALARM CONTROL PANEL UNDER LOCK AND KEY. IT SHALL BE LABELED "RECALL".

3.5.5 PROVIDE A CIRCUIT PROTECTOR ON EACH NEW ZONE AND SIGNAL CIRCUIT AT THE FIRE ALARM CONTROL PANEL.

3.6 INSTRUCTION TO THE OWNER: THE CONTRACTOR SHALL SCHEDULE, THROUGH THE ARCHITECT, A TIME TO INSTRUCT THE OWNER'S REPRESENTATIVE(S) IN THE PROPER OPERATION OF THE FIRE ALARM SYSTEM. THE INSTRUCTION SHALL ALSO COVER THE SCHEDULE OF MAINTENANCE REQUIRED BY N.F.P.A. 72H AND ANY ADDITIONAL MAINTENANCE RECOMMENDED BY THE SYSTEM MANUFACTURER. THIS INSTRUCTION SHALL ALSO BE SEPARATELY FURNISHED TO THE SERVING FIRE DEPARTMENT IF REQUESTED. THE INSTRUCTION SHALL BE PRESENTED IN AN ORGANIZED AND PROFESSIONAL MANNER BY A PERSON FACTORY TRAINED IN THE OPERATION AND MAINTENANCE OF THE EQUIPMENT AND WHO IS ALSO THOROUGHLY FAMILIAR WITH THE INSTALLATION. THE CONTRACTOR SHALL PROVIDE OPERATIONS MANUALS OR ANY OTHER CURRICULA THAT MAY ENHANCE THE INSTRUCTION OF THE OWNER'S REPRESENTATIVE(S) IN THE OPERATION AND MAINTENANCE OF THE SYSTEM.

3.7 DELIVERY OF SYSTEM DOCUMENTATION: THE CONTRACTOR SHALL DELIVER TO THE ARCHITECT THE FOLLOWING DOCUMENTS AFTER THE FIRE ALARM SYSTEM HAS BEEN COMPLETELY INSTALLED AND TESTED:

A. AN AS-BUILT COPY OF THE CUSTOM WIRING DIAGRAM FOR EACH BUILDING SHOWING WIRING TO EACH INDIVIDUAL FIRE ALARM APPLIANCE AND DEVICE.

B. AN AS-BUILT COPY OF THE SCALED PLAN OF EACH BUILDING SHOWING THE ACTUAL INSTALLED LOCATION OF EACH PIECE OF FIRE ALARM EQUIPMENT AS WELL AS THE INSTALLED RACEWAY SIZES ROUTING, CONDUCTOR SIZES AND QUANTITIES IN EACH RACEWAY, AND THE EXACT LOCATION OF EACH JUNCTION BOX.

C. A LETTER CERTIFYING THAT THE INSTALLATION IS IN STRICT COMPLIANCE WITH ALL APPLICABLE CODES AND IN STRICT COMPLIANCE WITH THE REQUIREMENTS OF THESE SPECIFICATIONS. THE LETTER SHALL ALSO CLEARLY EXPLAIN ANY DISCREPANCIES BETWEEN THE ORIGINALLY SUBMITTED SYSTEM DRAWINGS AND THE AS-BUILT SYSTEM DRAWINGS.

D. THE MANUFACTURE'S PUBLISHED MANUALS FOR THE OPERATION AND MAINTENANCE OF THE EQUIPMENT.

E. TWO ORIGINALS OF THE NFPA DOCUMENT TITLED FIRE ALARM SYSTEM CERTIFICATION AND DESCRIPTION COMPLETELY FILLED-IN AND SIGNED AS REQUIRED IN HEREIN.

F. A PROPOSAL FORM THE SYSTEM CONTRACTOR THE OWNER OF THE BUILDING FOR A MAINTENANCE AGREEMENT AFTER THE WARRANTY PERIOD HAS EXPIRED. THE PROPOSAL SHALL COMPLY WITH THE REQUIREMENTS OF THESE SPECIFICATIONS.

3.7.1 THE CONTRACTOR SHALL DELIVER THE ABOVE DOCUMENTS TO THE ARCHITECT AT ONE TIME. FINAL PAYMENT OF THE CONTRACTOR WILL NOT BE AUTHORIZED UNTIL THE COMPLETE DOCUMENTATION SPECIFIED HEREIN IS DELIVERED TO THE ARCHITECT.

3.7.2 INSTALLATION OF EQUIPMENT AND DEVICES THAT PERTAIN TO OTHER WORK IN THE CONTRACT SHALL BE CLOSELY COORDINATED WITH THE OTHER APPROPRIATE SUB-CONTRACTORS.

3.8 SYSTEM WARRANTY: THE CONTRACTOR SHALL WARRANT THE INSTALLED FIRE ALARM SYSTEM TO FREE FROM ANY DEFECTS OF MATERIAL AND INSTALLATION FOR A PERIOD OF ONE YEAR FROM ACCEPTANCE BY THE ARCHITECT. ANY DEFICIENCIES SHALL BE IMMEDIATELY CORRECTED AT NO ADDITIONAL COST TO THE OWNER.

3.8.1 THE CONTRACTOR SHALL MAINTAIN A SERVICE ORGANIZATION WITH ADEQUATE SPARE PARTS STOCK WITHIN 150 MILES OF THE INSTALLATION.

3.8.2 DURING THE WARRANTY PERIOD THE CONTRACTOR SHALL SCHEDULE TWO FOLLOW-UP INSPECTIONS OF THE FIRE ALARM SYSTEM WITH THE BUILDING OWNER. THE INSPECTIONS SHALL BE SCHEDULED AT SEMI-ANNUAL INTERVALS AND SHALL BE CONDUCTED IN STRICT COMPLIANCE WITH TESTING PROCEDURES FOR SIGNALING SYSTEMS (ANSI/NFPA 72H). THE FIRE ALARM SYSTEM CONTRACTOR SHALL ALSO PERFORM ANY ROUTINE SEMIANNUAL MAINTENANCE REQUIRED BY NFPA 72H AT THE TIME OF THESE INSPECTIONS AT NO ADDITIONAL COST.

3.8.3 AT EACH OF THE FOLLOW-UP INSPECTIONS AND AFTER THE SYSTEM HAS BEEN COMPLETELY TESTED TO THE SATISFACTION OF THE BUILDING OWNER, THE CONTRACTOR SHALL COMPLETE THE FIRE ALARM SYSTEM CERTIFICATION AND DESCRIPTION FORM PUBLISHED BY THE NFPA. THE COMPLETED FORM SIGNED BY THE QUALIFYING AGENT (AS DEFINED BY THE FLORIDA DEPARTMENT OF PROFESSIONAL REGULATION) OF THE ALARM SYSTEM CONTRACTOR SHALL BE DELIVERED TO THE BUILDING OWNER.

3.8.4 THE WARRANTY PERIOD WILL NOT EXPIRE UNTIL THE SECOND SEMI-ANNUAL INSPECTION AND MAINTENANCE SERVICE TO THE SYSTEM HAS BEEN PERFORMED TO THE SATISFACTION OF THE ARCHITECT AND HIS CONSULTING ENGINEER, ANY DEFICIENCIES IN THE SYSTEM HAVE BEEN FULLY CORRECTED, AND THE REFERENCED DOCUMENTATION OF SUCH HAS BEEN DELIVERED TO THE OWNER.

3.9 MAINTENANCE CONTRACT: AS PART OF THE INSTALLATION OF THE FIRE ALARM SYSTEM AND AS REQUIRED HEREIN, THE CONTRACTOR SHALL DELIVER TO THE ARCHITECT, A PROPOSAL, ADDRESSED TO THE OWNER OF THE BUILDING, FOR MAINTENANCE OF THE FIRE ALARM SYSTEM AFTER THE WARRANTY PERIOD HAS EXPIRED. THE PROPOSAL SHALL NOT EXPIRED OR BE CAPABLE OF BEING WITHDRAWN UNTIL 30 DAYS AFTER THE EXPIRATION DATE OF THE SYSTEM WARRANTY. THE PROPOSAL SHALL BE FORMULATED SO AS TO OFFER THE OWNER COMPLETE MAINTENANCE OF THE SYSTEM IN COMPLIANCE WITH ALL APPLICABLE CODES AND

THE MANUFACTURER'S RECOMMENDATIONS. THE EXACT CONTRACTUAL ARRANGEMENTS FOR THIS SERVICE WILL BE LEFT TO THE DISCRETION OF THE TWO PARTIES.

3.15 TESTS: UPON COMPLETION OF THE INSTALLATION, THE CONTRACTOR AND THE MANUFACTURER'S AUTHORIZED REPRESENTATIVE TOGETHER SHALL TEST EVERY ALARM INITIATING DEVICE FOR PROPER RESPONSE AND ZONE INDICATION, EVERY ALARM SIGNALING DEVICE FOR EFFECTIVENESS, AND ALL AUXILIARY FUNCTIONS. REPEAT ALL TESTS WITH "NORMAL" POWER DISCONNECTED. THE OWNER AND DESIGNATED REPRESENTATIVE SHALL BE GIVEN THE OPPORTUNITY TO WITNESS THESE TESTS. AN ITEMIZED TEST REPORT SHALL BE SUBMITTED TO THE OWNER, DETAILING AND CERTIFYING ALL RESULTS.

3.16 WARRANTIES: THE CONTRACTOR SHALL WARRANT THE COMPLETE FIRE ALARM SYSTEM WIRING AND EQUIPMENT TO BE FREE FROM INHERENT MECHANICAL AND ELECTRICAL DEFECTS FOR A PERIOD OF 1 YEAR FROM THE DATE OF PLACING THE COMPLETED SYSTEM IN OPERATION. THE CONDUCTORS SHALL BE REPLACED ON ANY ZONE THAT EXHIBITS REPEATED GROUND FAULTS. IF THE GROUND FAULTS PERSIST, EACH DEVICE ON THAT ZONE SHALL BE REPLACED. THESE REPAIRS ARE TO BE CONSIDERED WARRANTY WORK AND SHALL BE PERFORMED AT NO ADDITIONAL COST TO THE OWNER.

3.17 THE EQUIPMENT MANUFACTURER SHALL MAKE AVAILABLE TO THE OWNER A MAINTENANCE CONTRACT PROPOSAL TO PROVIDE A MINIMUM OF 2 INSPECTIONS AND TESTS PER YEAR IN COMPLIANCE WITH NFPA-72H GUIDELINES.

3.18 THE MAINTENANCE CONTRACT SHALL INCLUDE AN AGREEMENT BY THE MANUFACTURER THAT IT WILL PROVIDE TO THE OWNER, VERIFIABLE EVIDENCE TO SUBSTANTIATE ITS CLAIM THAT DAMAGE TO ANY PART OF THE FIRE ALARM SYSTEM WAS CAUSED BY LIGHTNING. SUCH EVIDENCE SHALL INCLUDE, BUT NOT LIMITED TO, PROOF THAT THE SURGE ENTERED THE EQUIPMENT EITHER ON POWER CONDUCTORS, SYSTEM GROUND OR BY COMMUNICATION LINES. PROOF THAT THE SURGE WAS NOT RELATED TO SWITCHING, WELDING, MOTOR STARTING, COPY MACHINES OR EQUIPMENT WITH SILICON CONTROLLED RECTIFIERS SUCH AS BATTERY CHARGERS AND UN-INTERRUPTIBLE POWER SYSTEMS.

3.19 FURNISH 3 BOUND COPIES OF BROCHURE INCLUDING MAINTENANCE INSTRUCTION, SPARE PARTS LIST, WIRING DIAGRAM AND TROUBLE SHOOTING CHECK LIST.

END OF SECTION