THE SCHOOL DISTRICT OF PHILADELPHIA
BOARD OF EDUCATION
Office of Capital Programs
440 North Broad Street, 3rd Floor – Suite 371
Philadelphia, PA 19130

TELEPHONE: (215) 400-4730

Addendum No. 002

Subject: **Building Automation System (BAS) Replacement**
SDP CONTRACT NO. B-015c and B-016c of 2018/2019

Location: **High School For Creative & Performing Arts (CAPA)**
901 S Broad St.
Philadelphia, PA 19147

This Addendum, dated November 19, 2020, shall modify and become part of the Contract Documents for the work of this project. Any items not mentioned herein, or affected by, shall be performed strictly in accordance with the original documents.

Revise as indicated below or by attachment

1 Specifications

1.1 DELETE Article 3.07 D, Article 3.07 H, and Article 3.07 I of Specification Section 23 0923 Direct Digital Control System. All wiring shall be in raceway.

1.2 ADD the following article to 23 0923 Direct Digital Control System: 3.03.D.4 Smoke Control is currently and will remain a feature of the existing Fire Alarm System. Coordinate requirements of existing air handling unit and exhaust fan operation by the fire alarm to maintain this functionality with the new BAS.

2 Drawings

2.1 N/A

3 Contractor questions:

3.1 Drawings M105 & E103: Do smoke detectors connect and get programed to the Fire Alarm Control Panel (not shown on drawings) of the Fireman's Panel shown on Drawing M105?

RESPONSE: Per Keyed New Work Note #1 on Drawings E102, E103, and E104, the duct smoke detectors indicated on the Electrical drawings shall be connected and programmed to the existing fire alarm system by the Electrical Contractor. See the attached 2017 Honeywell drawings for information on the existing system. In addition, the duct detector / housing shall contain an auxiliary contact, which shall be interconnected to the BAS by the Mechanical Contractor as noted. All existing fire alarm devices will remain. Coordinate requirements of existing air handling unit and exhaust fan operation by the fire alarm to maintain this functionality with the new BAS. See USB-013055-FA6.1.

3.2 Can you provide a manufacturer and model number of the existing fire alarm system if we are connecting new duct detectors to the existing fire alarm system?

RESPONSE: The existing fire alarm control panel is a Honeywell XLS3000 system controller. See attached fire alarm drawings from the 2017 upgrade for additional information.

3.3 Specification Section 28 3100, 1.13 (4): Can you provide fire alarm drawings for the entire building showing all devices for the three year certification required by the Specification?

RESPONSE: See attached fire alarm drawings from the 2017 upgrade.

3.4 Who is the vendor for the existing fire alarm system in room 2045? Mechanical drawings note that it is a Honeywell system, but that is just a product manufacturer. Please provide the name of the proprietary vendor who maintenances the system and has the passcode/existing program to make changes.

RESPONSE:
Honeywell Building Solutions
512 Virginia Drive
Fort Washington, PA 19034
Michael Briggs, Project Manager
Office: 215-641-3045
Fax: 215-641-4310
Mobile: 215-407-1371

3.5 Spec section 283100-2.18 lists extra fire alarm devices to furnish. The only fire alarm scope in the electrical drawings are duct smoke detectors. The spec lists requirements to furnish extra smoke detectors (2.18.C), but not specifically duct smoke detectors. Please clarify if we should furnish extra duct smoke detectors. Please note duct smoke detectors are expensive.

RESPONSE: Furnish one (1) spare duct smoke detector, with housing, for Owner's stock. No other spare fire alarm devices are required.

3.6 Spec section 283100-3.01.B.1 lists EMT as applicable for fire alarm conduit. However, spec section 260533-3.01.A only lists rigid conduit as acceptable (in all locations), not EMT. Please clarify if fire alarm wiring should be installed in EMT or rigid conduit.

RESPONSE: All fire alarm system wiring shall be installed in metallic conduit. Utilize rigid galvanized steel (RGS) conduit in ALL Mechanical / Electrical spaces and in damp or wet locations. Electrical metallic tubing (EMT) may be utilized in all other areas where not subject to damage. Compression fittings shall be utilized for EMT conduit.

3.7 No room names are provided in any of the contract documents, so it is not clear which rooms are classified as damp/wet locations. Per electrical specs 265033-3.01.A.4.a and 260519-2.01.B.1.a, boxes and wiring specs change for damp or wet rated locations vs. dry locations. Please clarify which areas are damp/wet locations, if any.

RESPONSE: The following areas inside the building are to be considered as damp/wet locations:
All areas of the Basement, Kitchen 1026, Receiving 1126, Industrial Arts 2139, Dust Room 2162, Greenhouse 4130, all areas of the Attic, and the Penthouse(s). All installations within (or passing through) these locations shall comply with the requirements of 260533-3.01.A.4.a.

Also note: Dual rated type THHN/THWN wire may be utilized in all locations EXCEPT outdoors or underground; utilize type XHHW-2 for these applications. And, cast metal back boxes shall be utilized for ALL exposed installations, whether wet or dry location.

3.8 On drawing E101/detail 2 for equipment AC-2, keynote 6 calls for a 15A-3p circuit breaker in panel ELP1B with 4#12 wiring in ¾" conduit. However, in panel schedule for ELP1B on drawing E104, equipment AC-2 is shown as requiring a 40A-3p breaker with 3#10 + 1#8G wiring in ¾" conduit. Please clarify breaker and wiring/conduit size.

RESPONSE: Provide circuit breaker and wire and conduit for AC-2 as per Panel Schedule ELP1B on drawing E104.

3.9 On drawing E101/detail 2 for equipment RF-48, keynote 6 calls for a 15A-3p circuit breaker in panel ELP1B. However, in panel schedule for ELP1B on drawing E104, equipment RF-48 is shown as requiring a 20A-3p breaker. Please clarify breaker size.

RESPONSE: Provide circuit breaker and wire and conduit for RF-48 as per Keynote #6 on drawing E101.

3.10 Section 23 0923, Page 4, 1.04 Approved Control System Manufacturers – Would the Honeywell Niagara 4 product line be acceptable, particularly the "CIPer" IP-based products?

RESPONSE: Per 00 0100 Instructions to Bidder, Substitution requests by prospective bidders are not considered during the bidding period.
Proposed substitutions of specified equipment or material are addressed at the time of required submittals by the contractor awarded the contract in question. See General Conditions GC-4.23 SUBSTITUTIONS (OR EQUAL) for procedures and requirements. If a bid is based on providing equipment or material other than the basis of design, whether from a named manufacturer or not, it is a substitution; and bidder/contractor assumes the risk that its proposed substitution will be approved; if not approved the basis of design equipment or material must be provided.

3.11 Section 23 0923, Page 13, 2.04 Controllers – Item J seems to indicate that a LON network is acceptable. Is this in addition-to or alternate-to the BACnet I/P network specified elsewhere throughout this section?

RESPONSE: LONWORKS, LONTALK, or any LON is **not** acceptable.

3.12 Section 23 0923, Pages 26 & 27, 3.07 Wiring – Items D and E are in conflict with Item Z which specifies that all control wiring "…must be in conduit." Please confirm that UL-listed plenum cable may be used without raceway in plenum ceilings and above the 10' level in mechanical rooms.

RESPONSE: Items D and E are to be deleted from the Specification. Per 3.07.Z: All controls wiring located above plenum ceilings, behind walls, and in mechanical rooms must be in conduit. Existing conduits shall be reused where applicable

3.13 Section 23 0923, Page 27, 3.08 Communication Wiring – Item J indicates that BACnet MS/TP is allowable. This sort of conflicts with Section 2.04.A and others that seem to relay a preference for BACnet I/P. Is BACnet MS/TP acceptable for the VAV Controller network?

RESPONSE: Provide all controllers per 23 0923, 2.04.A.

3.14 Section 23 0923, Page 31, 3.16 Training – What is the expectation for number of days (or hours) of training to include in the quoted price? If no guidance for days or hours, then what is the measurement to be employed to say when training is complete?

RESPONSE: Training shall consist of review two eight hour sessions at project completion, and two additional eight hour training sessions at 6 months after completion. Training shall include review of operation and maintenance manuals and as-built plans, access levels for program modification, navigation through the BAS to view specific equipment, time schedule and temperature setpoint adjustment, data logging and setting and acknowledging alarms.

3.15 Please confirm whether or not automation technicians are to be paid prevailing wages.

RESPONSE: All hourly employees working on site must be paid prevailing wages per the rate structure attached to the bid documents.

3.16 Are automation technicians to be paid prevailing wages to match Electricians' rate or Electrician-Telecommunication rate?

RESPONSE: Automation technicians can be paid under the prevailing wage applicable to their trade as determined by the contractor/union requirements.

3.17 Can the existing Honeywell system drawings be provided to the bidders to provide further information regarding the existing system and what devices will be available for reuse?

RESPONSE: The Honeywell Control Drawings are not available for distribution.

3.18 Specification 230923 page 7, paragraph 1.09 – 'Ownership of Proprietary Information', in addition to items listed, please confirm all software licenses, database, graphic and programming tools are to be provided to the owner prior to the start of warranty period and prior to payment of retainage.

RESPONSE: Yes. All software licenses, database, graphic and programming tools are to be provided to the owner.

3.19 Specification 230923 page 23, paragraph 2.08 'Wiring and Raceways 'item A., states "Provide copper wiring, plenum cable, and raceways as specified in applicable sections of Division 26. Division 26 states the use of galvanized rigid conduit in indoor exposed locations. See Specification26 0533 page 3, paragraph 3.01. Please confirm if wiring associated with the Building Automation System is to be provided in galvanized rigid conduit in indoor exposed locations.

RESPONSE: Per M101-M111 general note 11: Provide raceways for all new BAS wiring exposed in unoccupied mechanical/electrical rooms and above ceilings. Provide wiremold for all BAS wiring exposed in occupied spaces.

Per 23 0923 3.07.Z: All controls wiring located above plenum ceilings, behind walls, and in mechanical rooms must be in conduit. Existing conduits shall be reused where applicable.

Utilize rigid galvanized steel (RGS) conduit in ALL Mechanical / Electrical spaces and in damp or wet locations. Electrical metallic tubing (EMT) may be utilized in all other areas where not subject to damage. Compression fittings shall be utilized for EMT conduit.

3.20 Specification 230923 page 23, paragraph 2.08 – 'Wiring and Raceways', Division 26 Specification does not address the use of plenum cable. Is plenum rated cable acceptable in concealed areas, inside walls, or above ceilings?

RESPONSE: See response to question 3.19.

3.21 Please confirm new network communication cable required to be installed to maintain the use of the existing system while the new BAS is installed, as noted in Section 01 1000 – Summary of Work.

RESPONSE: The building to be occupied during construction. All contractors are responsible for maintaining existing systems and scheduling construction to support occupancy until new equipment and instruments are ready for use.

3.22 Is it acceptable to install new network cable properly supported via bridal rings above accessible ceilings?

RESPONSE: See response to question 3.19.

3.23 Specification 230923 page 25, paragraph 3.06 – 'Existing Equipment', states the requirement to install new wiring for existing devices. Specification 230923 states acceptable reuse of end devices, please confirm is it not acceptable to reuse the existing wire.

RESPONSE: Per M101-M111 general note 12: Remove all existing control wiring and provide new wiring; reuse conduits and raceways. Provide new conduit and raceways as needed.

3.24 Specification 230923 page 24, paragraph 3.03D – 'Coordination' Regarding fire and smoke damper control, please confirm the DDC system is not required to be UL864 system rated for smoke control.

RESPONSE: The new BAS system is not a smoke control system. Smoke Control is currently and will remain a feature of the existing Fire Alarm System. Coordinate requirements of existing air handling unit and exhaust fan operation by the fire alarm to maintain this functionality with the new BAS.

3.25 Specification 230923 page 26, paragraph 3.07 E – 'Wiring', contradicts Division 26 methods. Please clarify installation methods in mechanical and electrical rooms associated with the Building Automation System

RESPONSE: See response to question 3.19.

3.26 Specification 230923 page 27, paragraph 3.07 Z – 'Wiring', contradicts Paragraphs 3.07 H. Please clarify installation methods associated with the Building Automation System in concealed areas, inside walls and above ceilings.

RESPONSE: See response to question 3.19.

3.27 Shall the DDC shall be able to produce trend logs retrievable as spreadsheets and database programs. Industry standard is to trend all input, outputs and setpoints at 5 minute intervals, please confirm this is the intention.

RESPONSE: Yes. Provide a DDC system with 5-minute interval trend logs retrievable as spreadsheets and database programs for all inputs, outputs, and setpoints.

3.28 Should the DDC system include the ability to store trend data for a minimum of 3 years?

RESPONSE: Provide a DDC system with trend data storage for a minimum of 1 year.

3.29 Regarding Drawings M601 through M610, please confirm which points are existing to be reused and which are expected to be provided new. For example, Drawing M601 flow stations (Qty 4) could be assumed as existing and reused per Specification 230923 page 15, Paragraph O.

RESPONSE: Per M101-M111 General Note #1, the general scope of work includes – but is not limited to – replacement of the existing HVAC control system with a new HVAC control system from the head end BAS to the mechanical device.

Review of the complete set of bidding documents is required for understanding of project scope.

3.30 Drawing M601 is the refrigeration leak detection system existing to be reused?

RESPONSE: Reuse existing refrigerant leak detection system.

3.31 Other than airflow stations listed on M701 as new (Qty 7), please confirm all other airflow stations shown on drawings are existing to be reused.

RESPONSE: Yes.

3.32 Drawing M110 note 37. Detailing the chilled water system scope does not address water flow meters.

RESPONSE: Remove and reinstall any existing flow meters as needed.

3.33 The specifications identify “Approved Control System Manufacturers” including Delaware Valley Automation; Kindly advise who this company is.

Answer:

Delaware Valley Automation
1220 Ward Ave., Suite 200 West Chester, PA 19380
Main Phone # 484-882-1700
Joel Nace jnace@dvautomate.com
610-806-0126

3.34 Added as “Acceptable Control System Manufacturer”:

Carrier Corporation
4110 Butler Pike
Plymouth Meeting, PA 19462

END OF ADDENDUM #002

Philadelphia High School

CAPA

XLS3000 Fire Alarm System Upgrade

901 South Broad Street
Philadelphia, PA, US 19147
USB-013055

HONEYWELL DRAWING INDEX

DRAWING NO.	DRAWING TITLE	REVISION	DATE
USB-013055-FA0.1	Title and Index	A	JAN 20, 2017
USB-013055-FA0.2	General Notes	A	JAN 20, 2017
USB-013055-FA0.3	Device Legend & Cable Guide	A	JAN 20, 2017
USB-013055-FA0.4	Bill of Materials	A	JAN 20, 2017
USB-013055-FA1.1	Typical Field Device Installation Guide	A	JAN 20, 2017
USB-013055-FA2.1	Field Device Wiring	A	JAN 20, 2017
USB-013055-FA3.1	Panel Elevation	A	JAN 20, 2017
USB-013055-FA3.2	Panel Assembly (1 of 2)	A	JAN 20, 2017
USB-013055-FA3.3	Panel Assembly (2 of 2)	A	JAN 20, 2017
USB-013055-FA4.1	Fire Alarm Panel Wiring Diagram	A	JAN 20, 2017
USB-013055-FA4.2	Audio Cabinet and Annunciator Wiring Diagram	A	JAN 20, 2017
USB-013055-FA5.1	Battery Calculations	A	JAN 20, 2017
USB-013055-FA6.1	Sequence of Operations	A	JAN 20, 2017

Honeywell
BUILDING SOLUTIONS

HONEYWELL OFFICE
Honeywell International Inc.
512 Virginia Dr., Fort Washington, PA, US 19034-3264

TEL: (215)-407-1371 FAX: -

CONTRACT NUMBER: USB-013055
SALES: Kevin Wong
PROJECT MANAGEMENT: Michael Briggs
COMMISSIONING: Timothy Zaks
DESIGN: Cesar Bonilla
DRAFTING: Cesar Bonilla

SYSTEMS PROVIDED
FS90 to XLS3000 Fire Alarm System Upgrade

PROJECT DESIGN
-

TEL: FAX:

DESIGN CONSULTANT
-

TEL: FAX:

CONTRACTOR
-

TEL: FAX:

REV F		BY	QC	Title and Index
REV E		BY	QC	
REV D		BY	QC	Honeywell ExpertISE ©
REV C		BY	QC	512 Virginia Dr., Fort Washington, PA, US 19034-3264
REV B		BY	QC	Philadelphia High School CAPA XLS3000 Fire Alarm System Upgrade 901 South Broad Street Philadelphia, PA, US 19147
REV A Jan 20, 17	Issued for Review	BY CB	QC SM	DRAWING NUMBER USB-013055-FA0.1 REV A

GENERAL NOTES

1. ALL WIRING AND INSTALLATION MUST CONFORM WITH PROJECT SPECIFICATIONS, APPLICABLE CODE SUMMARIES AND REQUIREMENTS ADOPTED BY THE CITY.
2. SMOKE DETECTORS SHOULD NOT BE LOCATED IN DIRECT AIRFLOW, NOR CLOSER THAN 3 FEET (1 m) FROM AN AIR SUPPLY DIFFUSER OR RETURN AIR OPENING PER NFPA 72 (CHAPTER A.5.7.4.1) 2007 EDITION.
3. ALL SMOKE DETECTORS AND INITIATING DEVICES SHALL BE INSTALLED MINIMUM 3 FEET AWAY FROM ELECTRONIC BALLASTS (LIGHTING FIXTURES).
4. WHEN INSTALLING FIRE ALARM DEVICES, TERMINAL POLARITY MUST BE OBSERVED.
5. ALL NOTIFICATION CIRCUIT WIRES MUST BE SUPERVISED. HENCE, NO PARALLEL BRANCHING OF WIRES IS PERMISSIBLE (T-TAPPING). ALL AUDIBLE SIGNALING DEVICES SHALL PRODUCE A DISTINCTIVE THREE-PULSE TEMPORAL PATTERN.
6. DO NOT INSTALL ADDRESSABLE DEVICES PRIOR TO COORDINATION WITH A HONEYWELL INSTALLATION REPRESENTATIVE.
7. ALL 24 VDC WIRE TO BE INSTALLED IN DEDICATED WIRE RUNS SEPARATE FROM 120 VAC WIRING, IN ACCORDANCE WITH THE CURRENT NATIONAL AND STATE ELECTRICAL CODES.
8. CONDUIT (WHERE REQUIRED) SIZING TO BE DETERMINED BY THE ELECTRICAL CONTRACTOR AND SHALL CONFORM TO CONDUIT FILL CAPACITIES AS PER REQUIREMENTS OF CURRENT EDITIONS OF NATIONAL ELECTRICAL CODES.
9. DO NOT APPLY 120 VAC POWER TO CONTROL PANEL UNTIL A HONEYWELL SERVICE TECHNICIAN HAS INSPECTED ALL SYSTEM WIRING CONNECTIONS AND HAS APPROVED THE SYSTEM TO BE TURNED ON.
10. PLUG-IN TYPE DETECTORS REQUIRE A 4" SQUARE X 1-1/2" DEEP ELECTRICAL BOX OR A 3" OR 4" OCTAGONAL X 1-1/2" DEEP ELECTRICAL BOX. REFER TO DETAIL DRAWINGS FOR DEVICE WIRING & MOUNTING CONDITIONS.
11. 120 VAC INPUT CONNECTIONS TO THE FIRE ALARM CONTROL PANEL SHALL BE ON DEDICATED BRANCH CIRCUIT(S). THE CIRCUIT(S) AND CONNECTIONS SHALL BE MECHANICALLY PROTECTED. CIRCUIT DISCONNECTION SHALL HAVE A RED MARKING & SHALL BE ACCESSIBLE ONLY TO AUTHORIZED PERSONNEL AND SHALL BE IDENTIFIED AS FIRE ALARM CIRCUIT CONTROL. LOCATION OF THE CIRCUIT DISCONNECTION BREAKER SHALL BE PERMANENTLY IDENTIFIED AT THE FIRE ALARM CONTROL UNIT.
12. INSTALLATION MATERIALS SUCH AS CONDUIT, FITTINGS, JUNCTION BOXES, TERMINAL CABINETS, PULL BOXES, HANGERS, ETC. TO BE SUPPLIED AND INSTALLED BY THE ELECTRICAL CONTRACTOR. ALL WIRING IS TO BE FROM DEVICE TERMINAL TO DEVICE TERMINAL. SPLICES AND WIRE NUTS ARE NOT ACCEPTABLE.
13. ANY DEVIATION FROM THE DESIGN AND LOCATION OF EQUIPMENT SHOWN MUST FIRST HAVE A WRITTEN APPROVAL FROM HONEYWELL.
    ANY DEVIATION FROM DESIGN MUST ALSO BE INDICATED ON THE HONEYWELL SHOP DRAWINGS AND RETURNED TO HONEYWELL AT TIME OF JOB COMPLETION.
14. ALL SMOKE DETECTORS SHALL BE PROTECTED FROM DUST AND DEBRIS DURING CONSTRUCTION. SMOKE SENSING DETECTORS SHALL NOT BE INSTALLED UNTIL AFTER THE CONSTRUCTION CLEANUP OF ALL TRADES IS COMPLETE PER NFPA 72 (CHAPTER 5.7.1.11) 2007 EDITION.
    EXCEPTION: WHERE REQUIRED BY THE AUTHORITY HAVING JURISDICTION FOR PROTECTION DURING CONSTRUCTION. DETECTORS THAT HAVE BEEN INSTALLED DURING CONSTRUCTION AND FOUND TO HAVE A SENSITIVITY OUTSIDE THE LISTED AND MARKED SENSITIVITY RANGE SHALL BE CLEANED OR REPLACED AT AN ADDITIONAL COST TO THE CONTRACTOR.
15. ALL FIRE ALARM WIRING SHOULD BE RUN IN CONDUIT.

XLS - F.A. SYSTEM WIRING GUIDELINES

1. ALL WIRING MUST COMPLY WITH LOCAL AND CURRENT EDITION OF THE ELECTRICAL CODE. ALL WIRING MUST BE DONE AS DESCRIBED NOTES 2 & 6 BELOW, TO OBTAIN SAFE AND PROPER SYSTEM OPERATION.
2. CONNECT EARTH GROUND TO THE ENCLOSURES PROPERLY; SEE LATEST EDITION OF NATIONAL ELECTRICAL CODES FOR APPROVED METHODS. CONDUIT GROUND IS NOT ADEQUATE.
3. SEPARATE ALL WIRING FOR INITIATING AND INDICATING DEVICES (SLC & NAC CIRCUITS) FROM ALL OTHER WIRING IN THE ENCLOSURES.
4. (WHERE USED) INSULATE ALL CABLE DRAIN WIRES FROM ANY CONDUIT OR OTHER EARTH GROUNDED ELECTRICAL BOX.
5. (WHERE USED) CONNECT SHIELD CABLE WIRE ONLY AT SPECIFIED LOCATION INSIDE OF ENCLOSURE (IF APPLICABLE).
6. EARTH GROUND ALL CONDUIT RUNS THROUGHOUT THE INSTALLATION.
7. ALL 110/120 VAC CIRCUITS TO BE INSTALLED IN DEDICATED CONDUIT.
8. ALL INITIATING CIRCUITS ARE RATED POWER LIMITED AND SHOULD BE WIRED IN ACCORDANCE WITH APPLICABLE CODES.
9. UNDERGROUND WIRING IS PERMISSIBLE ONLY IF ALL NEC WIRING REQUIREMENTS ARE MET.
10. OVERHEAD OR EXTERIOR WIRING IS NOT RECOMMENDED.

WIRING REQUIREMENTS

WIRING IS TO BE INSTALLED POINT-TO-POINT WITH NO SPLICING.

PLENUM CABLE VS. NON-PLENUM

THE NEC RECOGNIZES 3 TYPES OF POWER LIMITED FIRE ALARM CABLING:

FPL – THIS IS A GENERAL USE POWER LIMITED FIRE ALARM CABLE. IT CANNOT BE USED IN A PLENUM SPACE OR FOR RISERS (CABLING BETWEEN FLOORS). CABLE MUST BE IN CONDUIT.

FPLR – THIS IS A POWER LIMITED RISER RATED CABLE THAT CAN BE USED FOR GENERAL PURPOSES OR BETWEEN FLOORS. IT CANNOT BE USED IN A PLENUM SPACE, CABLE MUST BE IN CONDUIT.

FPLP – THIS IS A POWER LIMITED CABLE THAT CAN BE USED IN A PLENUM, RISER OR FOR GENERAL PURPOSE.

A PLENUM IS ANY AREA USED TO CONDUCT ENVIRONMENTAL AIR. PLENUM SPACES CAN BE DUCTWORK, THE SPACE ABOVE A DROP CEILING OR BELOW A RAISED FLOOR. BECAUSE THESE SPACES ARE BEING USED FOR THE AIR HANDLING SYSTEM, THERE ARE STRICT RULES THAT MUST BE FOLLOWED TO REDUCE THE RISK OF INTRODUCING TOXIC FUMES IN THE EVENT OF A FIRE. SINCE FIRE ALARM CABLING IS OFTEN INSTALLED EXPOSED, WITHOUT CONDUIT, ABOVE DROP CEILINGS, THE CABLING MUST BE RATED FOR USE IN A PLENUM SPACE.

REV F		BY	General Notes
REV E		BY	
REV D		BY	Honeywell ExpertISE ©
REV C		BY	512 Virginia Dr., Fort Washington, PA, US 19034-3264
REV B		BY	Philadelphia High School CAPA XLS3000 Fire Alarm System Upgrade 901 South Broad Street Philadelphia, PA, US 19147
REV A Jan 20, 17	Issued for Review	BY CB	DRAWING NUMBER USB-013055-FA0.2 REV A

PROJECT DESIGN: –	SYSTEM DESIGN: –	CONTRACTOR: –	HONEYWELL DESIGN: Cesar Bonilla	HONEYWELL INSTALLATION: Michael Briggs	DRAFTER: Cesar Bonilla

FIRE ALARM SYSTEM SYMBOL LEGEND

SYMBOL	DESCRIPTION	NOTES
FACP	FIRE ALARM CONTROL PANEL	–
FAAP	FIRE ALARM ANNUNCIATOR PANEL	–
BPSx	BOOSTER POWER SUPPLY	–
P	SMOKE DETECTOR, PHOTOELECTRIC	–
H	SMOKE DETECTOR FOR DUCT	–
P	MANUAL PULL STATION	–
MM	MONITOR MODULE	–
DMM	DUAL MONITOR MODULE	–
XP10	10 INPUT MONITOR MODULE	–
CR	RELAY CONTROL MODULE	–
CM	SUPERVISED CONTROL MODULE	–
cd	STROBE, CEILING MOUNTED	"cd" DENOTES CANDELA SETTING
cd	STROBE, WALL MOUNTED	"cd" DENOTES CANDELA SETTING
1/2W cd	SPEAKER/STROBE, CEILING MOUNTED	"cd" DENOTES CANDELA SETTING "W" DENOTES WATTAGE SETTING
1/2W cd	SPEAKER/STROBE, WALL MOUNTED	"cd" DENOTES CANDELA SETTING "W" DENOTES WATTAGE SETTING

NOTES

1) REFER TO THE BILL OF MATERIAL ON DRAWING FA0.4 FOR EXACT PART NUMBERS.
2) NOT ALL SYMBOLS MAY BE USED.

XLS SYSTEM WIRING SCHEDULE

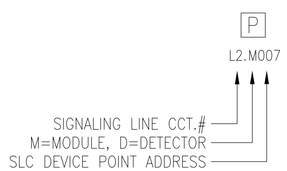
CABLE DESIGNATION	RECOMMENDED WIRE TYPE	TYPICAL CABLE USAGE
A	2–CONDUCTOR, #18 AWG SOLID TWISTED CABLE	FIRE ALARM ADDRESSABLE INITIATING DEVICES (SLC)
B	2–CONDUCTOR, #14 AWG SOLID THHN	NOTIFICATION APPLIANCE CIRCUITS (NAC): – H HORN ONLY – HS HORN / STROBE – SR STROBES
C	3–CONDUCTOR, #12 AWG SOLID THHN	120VAC POWER CIRCUIT
D	2–CONDUCTOR, #16 AWG SOLID THHN	24 VDC POWER – FIRE ALARM ANNUNCIATOR – DOOR HOLDERS (BY OTHERS) – FSD CONTROL RELAYS
H	2–CONDUCTOR, #16 AWG SOLID TWISTED SHIELDED	70VAC AUDIO NOTIFICATION APPLIANCE CIRCUIT
M	2–CONDUCTOR, #18 AWG SOLID TWISTED CABLE	XLS–NET NETWORK COMMUNICATIONS
N	2–CONDUCTOR, #18 AWG SOLID TWISTED CABLE	DAL NETWORK COMMUNICATIONS – DIGITAL AUDIO LOOP
R	2–CONDUCTOR, #18 AWG SOLID TWISTED CABLE	RS–485 DATA COMMUNICATIONS – FIRE ALARM ANNUNCIATOR

NOTES:

1. NOT ALL CABLE TYPES MAY APPLY TO THIS PROJECT.

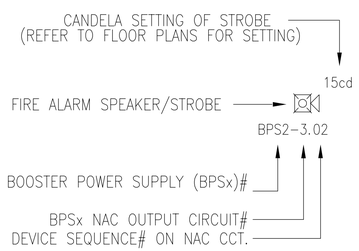
DEVICE ADDRESSING KEY

INTELLIGENT DEVICE ADDRESSING



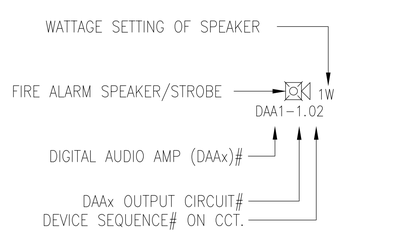
– DETECTOR ADDRESSES RANGE FROM D001–D159
– MODULE ADDRESSES RANGE FROM M001–M159
– SLC CIRCUITS SHALL BE WIRED AS "CLASS B"

NOTIFICATION DEVICE ADDRESSING (STROBE/HORN)



– STROBE CIRCUITS POWERED BY BPS
– STROBE CIRCUITS SHALL BE WIRED AS "CLASS B"

NOTIFICATION DEVICE ADDRESSING (SPEAKER)



– SPEAKER CIRCUITS POWERED BY DAA.
– SPEAKER CIRCUITS SHALL BE WIRED AS CLASS 'B'.

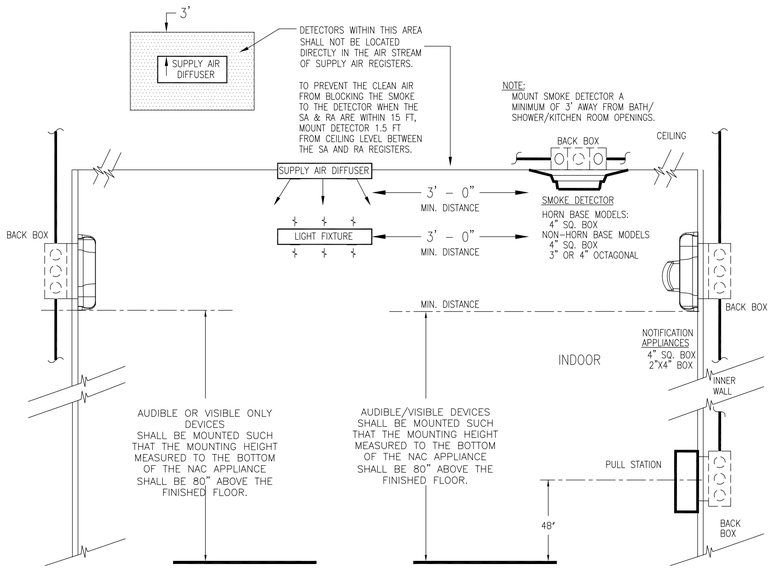
REV		BY	
REV F		BY	Device Legend & Cable Guide
REV E		BY	
REV D		BY	Honeywell *ExpertISE* ©
REV C		BY	512 Virginia Dr., Fort Washington, PA, US 19034–3264
REV B		BY	Philadelphia High School CAPA XLS3000 Fire Alarm System Upgrade 901 South Broad Street Philadelphia, PA, US 19147
REV A Jan 20, 17	Issued for Review	BY CB	DRAWING NUMBER USB–013055–FA0.3 REV A

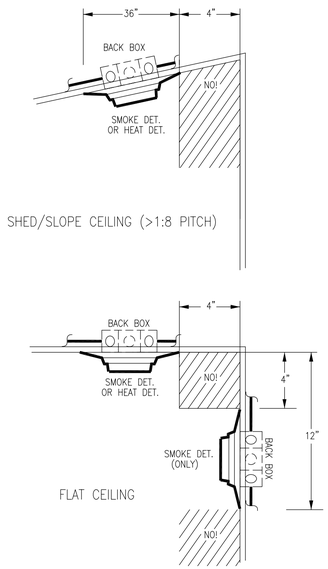
PROJECT DESIGN: –	SYSTEM DESIGN: –	CONTRACTOR: –	HONEYWELL DESIGN: Cesar Bonilla	HONEYWELL INSTALLATION: Michael Briggs	DRAFTER: Cesar Bonilla

	QUANTITY	PART NO.	PART DESCRIPTION	MANUFACTURER
Panel Devices				
	1	XLS3000-CPUD	XLS3000 with display	Honeywell
	2	LCM-320	Loop Control Module, CLIP/FlashScan Protocol	Honeywell
	2	LEM-320	Loop Expander Module, CLIP/FlashScan Protocol	Honeywell
	2	NCM-W	Network Control Module, Wire	Honeywell
	2	LCD-160	Remote Annunciator for XLS3000, 160 characters	Honeywell
	2	XLS-ABF-2B	LCD-160 enclosure	Honeywell
	1	ACM-48A	ACS Series Annunciators Control Module	Honeywell
	2	SCS-8	Smoke Control Master Module. 8 switches.	Honeywell
	1	SCE-8	Smoke Control Expander Module. 8 switches.	Honeywell
	1	XLS-DVC-EM	Digital Voice Command (DVC), Expanded Memory	Honeywell
	1	DVC-KD	Keypad for local annunciation and control	Honeywell
	1	CMIC-1	Microphone	Honeywell
	1	CHS-M3	Chassis for XLS3000 CPU	Honeywell
		CA-1	Chassis, DVC, One Row	Honeywell
	1	CHS-6	Chassis used with the XP6 and XP10 Multi-Modules	Honeywell
	1	XLS-LSPR	FS90 Retrofit Kit, Red	Honeywell
	2	BMP-1	Blank Module Dress Plate	Honeywell
	1	XP6-C	Six-Circuit Supervised Control Module	Honeywell
	1	AMPS-24	Main power supply and battery charger for the XLS3000	Honeywell
	2	PS-121000	12Volt-100AH Rechargeable Sealed Lead Acid Battery	Power Sonic
	1	BB-100	Battery Cabinet	Honeywell
Amplifiers				
	3	DAA2-5070	Digital Audio Amplifier, 50W 70VRMS	Honeywell
	1	EQDR-C4	EQ Cabinet Door. C Size.	Honeywell
	1	EQBB-C4	EQ Cabinet. C Size.	Honeywell
	1	XLS-LBBR	Battery Cabinet	Honeywell
	2	PS-12550	12Volt-55AH Rechargeable Sealed Lead Acid Battery	Power Sonic
Field Devices				
	27	S464G1007	Manual pull station, addressable (CLIP/FlashScan)	Honeywell
	100	TC806B1076	Intelligent Photoelectric Smoke Sensor (CLIP/FlashScan)	Honeywell
	3	TC808B1041	Intelligent Heat Detector (CLIP/FlashScan)	Honeywell
	34	TC810R1024	Relay module (CLIP/FlashScan)	Honeywell
	34	DNR	InnovairFlex intelligent duct detector housing, non-relay, does not include head	Honeywell
	34	TC806DNR	Intelligent Photoelectric Smoke Detector with remote test capability	Honeywell
	34	DST10	InnovairFlex sampling tube, steel, 10' with holes	Honeywell
	103	B210LP	Flanged low profile base	Honeywell
	27	STI1100	Manual pull station, STOPPER II,W/HORN,FLUSH	STI Stopper

REV F		BY	Bill of Materials
REV E		BY	
REV D		BY	Honeywell *ExpertISE* ©
REV C		BY	512 Virginia Dr., Fort Washington, PA, US 19034-3264
REV B		BY	Philadelphia High School CAPA XLS3000 Fire Alarm System Upgrade 901 South Broad Street Philadelphia, PA, US 19147
REV A Jan 20, 17	Issued for Review	BY CB	DRAWING NUMBER USB-013055-FA0.4 REV A

PROJECT DESIGN: -	SYSTEM DESIGN: -	CONTRACTOR: -	HONEYWELL DESIGN: Cesar Bonilla	HONEYWELL INSTALLATION: Michael Briggs	DRAFTER: Cesar Bonilla



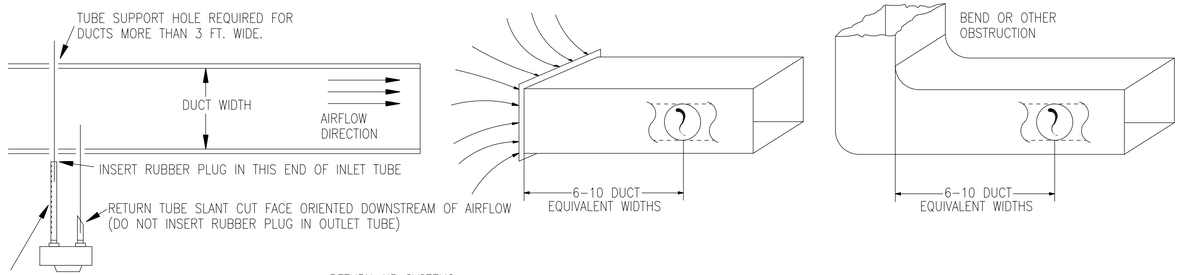


SMOKE & HEAT DETECTOR PLACEMENT

GENERAL NOTES:

A. DO NOT APPLY POWER TO ANY DEVICE UNTIL AUTHORIZED BY A HONEYWELL REPRESENTATIVE.
B. SEE FLOOR PLANS FOR ALL DEVICE LOCATIONS, DEVICE COUNTS, AND DEVICE ADDRESSES.
C. FOLLOW DEVICE INSTALLATION INSTRUCTIONS INCLUDED WITH DEVICES.
D. DETECTOR GUIDELINES:
NO SMOKE DETECTORS ALLOWED IN GARAGES.
NO SMOKE DETECTORS ALLOWED IN UNFINISHED ATTICS.
NO SMOKE DETECTORS ALLOWED IN AREAS WITH >100°F OR <40°F.
ION SMOKE DETECTORS MUST BE > 20' FROM COOKING APPLIANCES.
(PHOTO SMOKE DETECTORS ALLOWED <20' FROM COOKING APPLIANCE)
NO SMOKE DETECTORS WITHIN 3' FROM DOOR TO KITCHEN OR SHOWER/TUB ROOM
NO SMOKE DETECTORS WITHIN 3' HORIZONTAL FROM CEILING FAN BLADE TIP.
SMOKE DETECTORS ARE REQUIRED IN BASEMENTS ON CEILING ADJACENT TO STAIRWELLS.

1 FA1.1 FIELD DEVICE INSTALLATION GUIDELINES



RETURN AIR SYSTEMS:
SMOKE DETECTORS SHALL BE INSTALLED IN RETURN AIR SYSTEMS WITH A DESIGN CAPACITY GREATER THAN 2000 CFM (0.09 m/s) IN THE RETURN AIR DUCT OR PLENUM UPSTREAM OF ANY FILTERS, EXHAUST AIR CONNECTIONS, OUTDOOR AIR CONNECTIONS OR DECONTAMINATION EQUIPMENT AND APPLIANCES.

COMMON SUPPLY AND RETURN AIR SYSTEMS:
WHERE MULTIPLE AIR HANDLING SYSTEMS SHARE COMMON SUPPLY OR RETURN AIR DUCTS OR PLENUMS WITH A COMBINED DESIGN CAPACITY GREATER THAN 2000 CFM (0.9m3/s), THE RETURN AIR SYSTEM SHALL BE PROVIDED WITH SMOKE DETECTORS.

RETURN AIR RISERS:
WHERE RETURN AIR RISERS SERVE TWO OR MORE STOREYS AND SERVE ANY PORTION OF A RETURN AIR SYSTEM HAVING A DESIGN CAPACITY GREATER THAN 15000 CFM (7.1m3/s), SMOKE DETECTORS SHALL BE INSTALLED AT EACH STOREY. SUCH SMOKE DETECTORS SHALL BE LOCATED UPSTREAM OF THE CONNECTION BETWEEN THE RETURN AIR RISER AND ANY AIR DUCTS QR PLENUMS

SUPPLY AIR SMOKE DETECTORS:
IF INSTALLED, SUPPLY AIR SMOKE DETECTORS SHALL BE MOUNTED IN THE DUCT DOWNSTREAM OF BOTH THE FAN AND THE FILTERS. ADDITIONAL SMOKE DETECTORS IN THE SUPPLY AIR SYSTEM ARE NOT REQUIRED WHERE THE AIR PASSES THROUGH OTHER SMOKE COMPARTMENTS.

SMOKE DAMPERS THAT ARE PART OF A SMOKE BARRIER SHALL BE INSTALLED IN THE PLANE OF THE FIRE PARTITION AND NOT AFTER THE FIRST AIR DUCT INLET OR OUTLET, WHICHEVER IS CLOSER TO THE SMOKE BARRIER. IF THE SMOKE DAMPER IS CONTROLLED BY AIR SYSTEM SMOKE DETECTOR IT SHALL BE LOCATED UPSTREAM OF THE SMOKE DAMPER BUT AFTER ANY INLET OR OUTLET IN THAT DUCT.

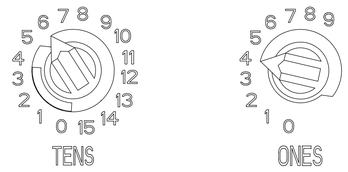
WHERE IN-DUCT SMOKE DETECTORS ARE INSTALLED IN CONCEALED LOCATIONS MORE THAN 10ft ABOVE THE FINISHED FLOOR, OR IN ARRANGEMENTS WHERE THE DETECTOR'S ALARM LIGHT IS NOT READILY VISIBLE TO RESPONDING PERSONNEL, THE DETECTOR SHALL BE PROVIDED WITH REMORE ALARM INDICATORS TO BE INSTALLED IN A READILY ACCESSIBLE LOCATION AND SHALL BE CLEARLY LABELED TO INDICATE BOTH THEIR FUNCTION AND THE AIR HANDLING UNIT(S) ASSOCIATED WITH EACH DETECTOR. (EXCEPTION: WHERE THE SPECIFIC DETECTOR IN ALARM IS INDICATED AT THE CONTROL UNIT)

2 FA1.1 DUCT SMOKE DETECTOR INSTALLATION GUIDELINES

REV F		BY	Typical Field Device Installation Guide
REV E		BY	
REV D		BY	Honeywell ExpertISE ©
REV C		BY	512 Virginia Dr., Fort Washington, PA, US 19034-3264
REV B		BY	Philadelphia High School CAPA XLS3000 Fire Alarm System Upgrade 901 South Broad Street Philadelphia, PA, US 19147
REV A Jan 20, 17	Issued for Review	BY CB	DRAWING NUMBER USB-013055-FA1.1 REV A

PROJECT DESIGN: -	SYSTEM DESIGN: -	CONTRACTOR: -	HONEYWELL DESIGN: Cesar Bonilla	HONEYWELL INSTALLATION: Michael Briggs	DRAFTER: Cesar Bonilla

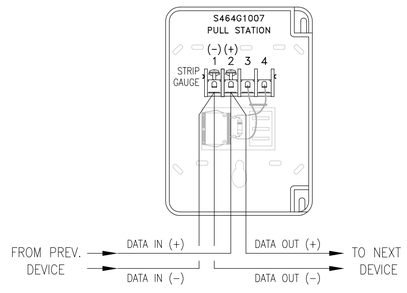
TO SET POINT NUMBER (ADDRESS)



NOTES:

1) DO NOT SET MORE THAN ONE MODULE OR ONE SENSOR WITH THE SAME ADDRESS ON THE SAME SLC.
2) A SENSOR AND A MODULE CAN HAVE THE SAME ADDRESS ON THE SAME SLC.
3) THE ABOVE EXAMPLE SHOWS THE DEVICE POINT ADDRESS (MODULE OR DETECTOR) AS 064.
4) MODULE POINT ADDRESSES RANGE FROM 001 THRU 159 (PREFIXED WITH 'M' ON DRAWINGS).
5) SENSOR POINT ADDRESSES RANGE FROM 001 THRU 159 (PREFIXED WITH 'D' ON DRAWINGS).
5) IF ANY EXISTING CLIP MODE DEVICES ARE ON THE SLC THEN THE ADDRESS CAPACITY IS REDUCE TO 99 DETECTORS AND 99 MODULES.

1 / FA2.1 SENSOR & MODULE ADDRESS DIAL SETTINGS

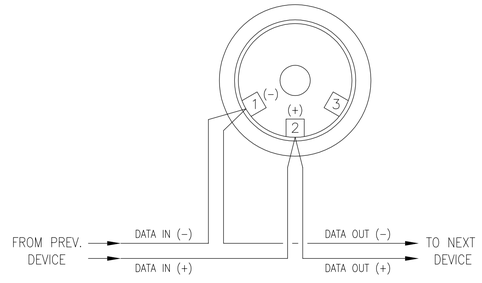


MOUNTING:

SINGLE GANG OR DOUBLE GANG 2-3/4" DEEP ELECTRICAL BOX
4" SQUARE OR 4-11/16" ELECTRICAL BOX WITH PLASTER RING
SB-10 OR SB-I/O ELECTRICAL BOX FOR SURFACE MOUNTING

2 / FA2.1 S464G1007 PULL STATION WIRING

ADDRESSABLE PULL STATION

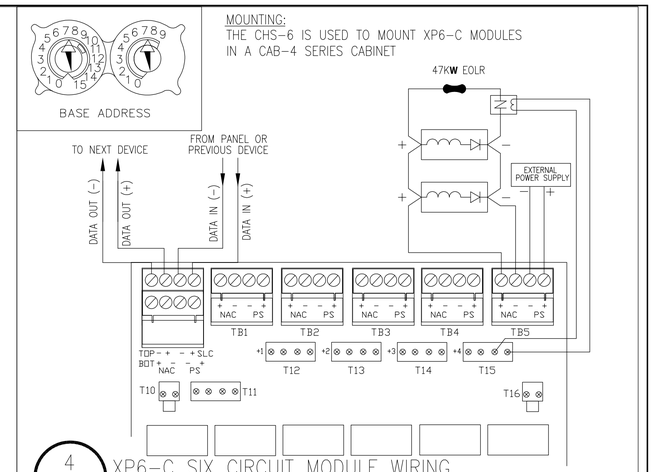


MOUNTING:

3-1/2" OR 4" OCTAGON x 1-1/2" DEEP ELECTRICAL BOX
4" SQUARE x 1-1/2" DEEP ELECTRICAL BOX W/ MUD RING
SINGLE GANG ELECTRICAL BOX WITH 1-1/2" MINIMUM DEPTH

3 / FA2.1 B210LP LOW PROFILE INTELLIGENT BASE

LOW PROFILE BASE FOR USE WITH INTELLIGENT SENSORS

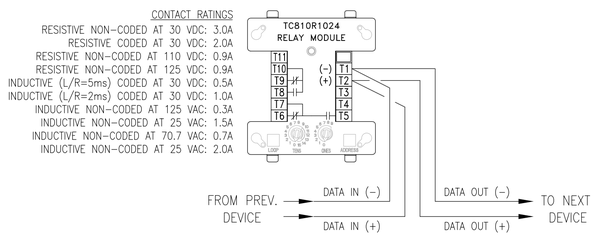


4 / FA2.1 XP6-C SIX CIRCUIT MODULE WIRING

SIX CIRCUIT SUPERVISED CONTROL MODULE

CONTACT RATINGS

RESISTIVE NON-CODED AT 30 VDC: 3.0A
RESISTIVE CODED AT 30 VDC: 2.0A
RESISTIVE NON-CODED AT 110 VDC: 0.9A
RESISTIVE NON-CODED AT 125 VDC: 0.9A
INDUCTIVE (L/R=5ms) CODED AT 30 VDC: 0.5A
INDUCTIVE (L/R=2ms) CODED AT 30 VDC: 1.0A
INDUCTIVE NON-CODED AT 125 VAC: 0.3A
INDUCTIVE NON-CODED AT 25 VAC: 1.5A
INDUCTIVE NON-CODED AT 70.7 VAC: 0.7A
INDUCTIVE NON-CODED AT 25 VAC: 2.0A

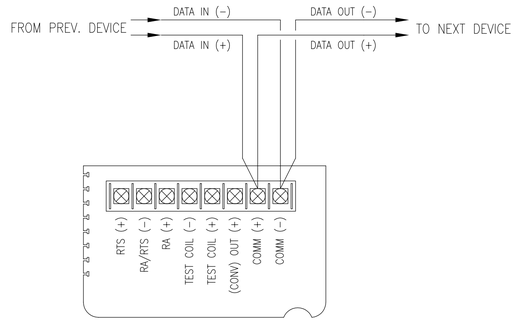


MOUNTING:

4" SQUARE x 2-1/8" DEEP ELECTRICAL BOX

5 / FA2.1 TC810R1024 RELAY MODULE WIRING

RELAY MODULE



MOUNTING:

SEE INSTALLATION INSTRUCTIONS INCLUDED WITH DEVICE.

6 / FA2.1 DNR DUCT DETECTOR BASE WIRING

NON-RELAY DUCT-DETECTOR HOUSING

REV		BY
REV F		BY
REV E		BY
REV D		BY
REV C		BY
REV B		BY
REV A Jan 20, 17	Issued for Review	BY CB

Field Device Wiring

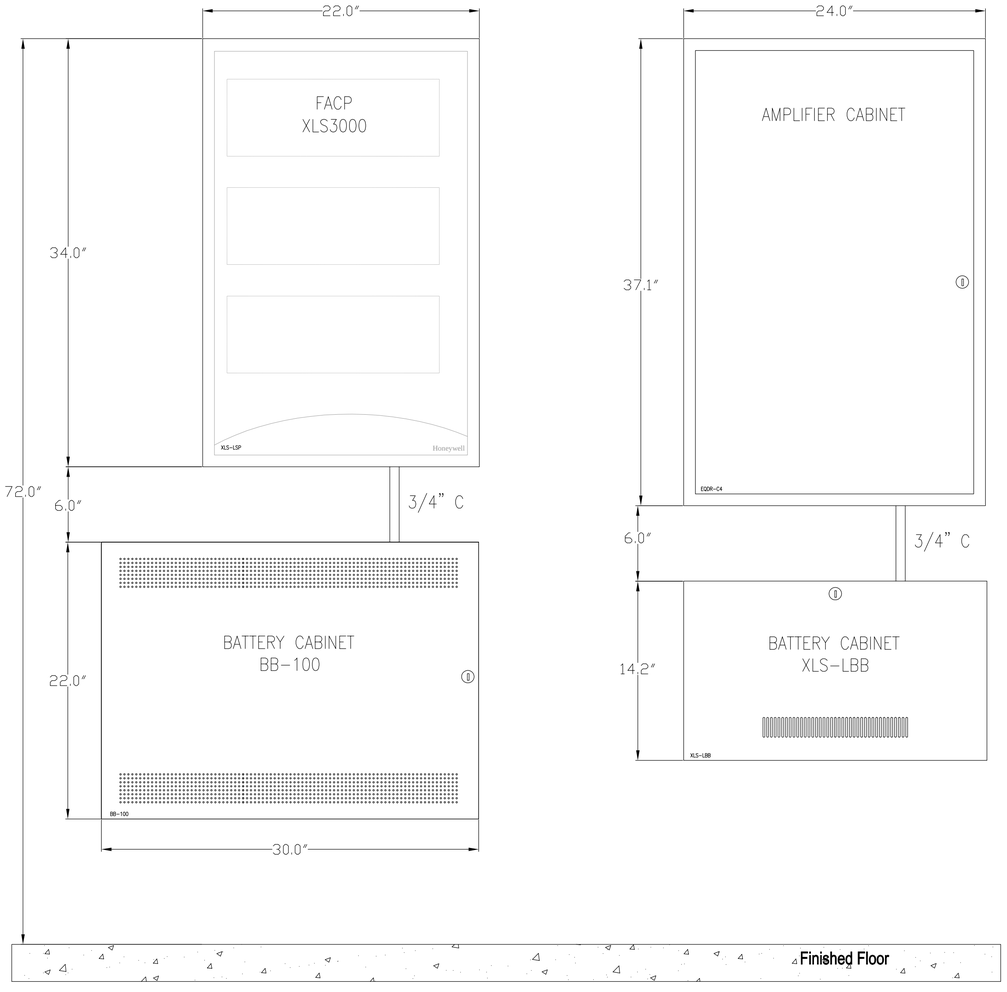
Honeywell *ExpertISE* ©

512 Virginia Dr., Fort Washington, PA, US 19034-3264

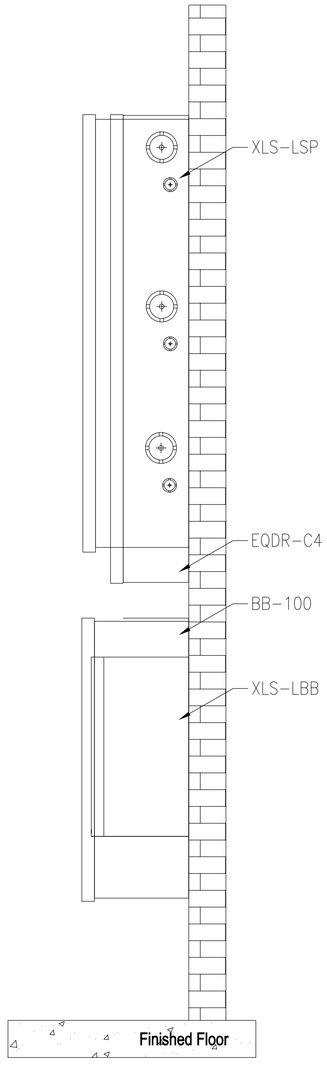
Philadelphia High School CAPA
XLS3000 Fire Alarm System Upgrade
901 South Broad Street
Philadelphia, PA, US 19147

DRAWING NUMBER USB-013055-FA2.1 REV A

PROJECT DESIGN: -	SYSTEM DESIGN: -	CONTRACTOR: -	HONEYWELL DESIGN: Cesar Bonilla	HONEYWELL INSTALLATION: Michael Briggs	DRAFTER: Cesar Bonilla

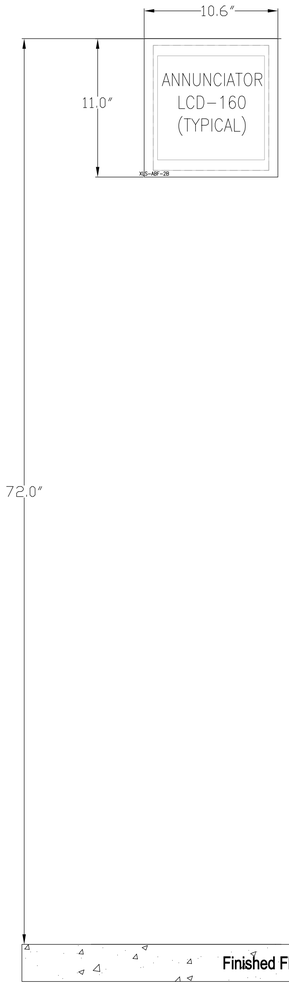


FRONT VIEW

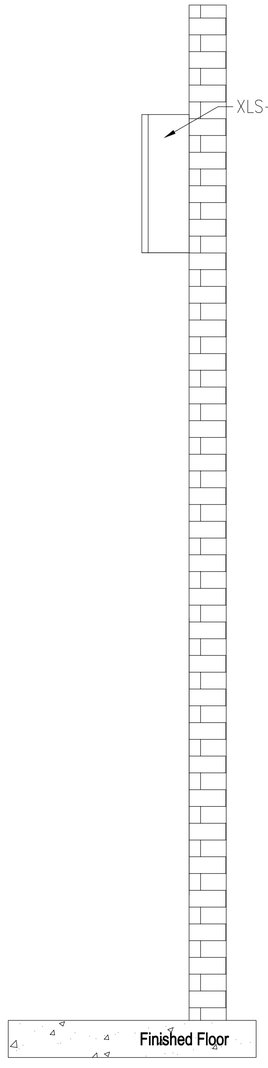


SIDE VIEW

1 FA3.1 FACP, AMPLIFIER & BATTERY CABINETS
LOCATION: 2ND FLOOR ROOM 2045



FRONT VIEW

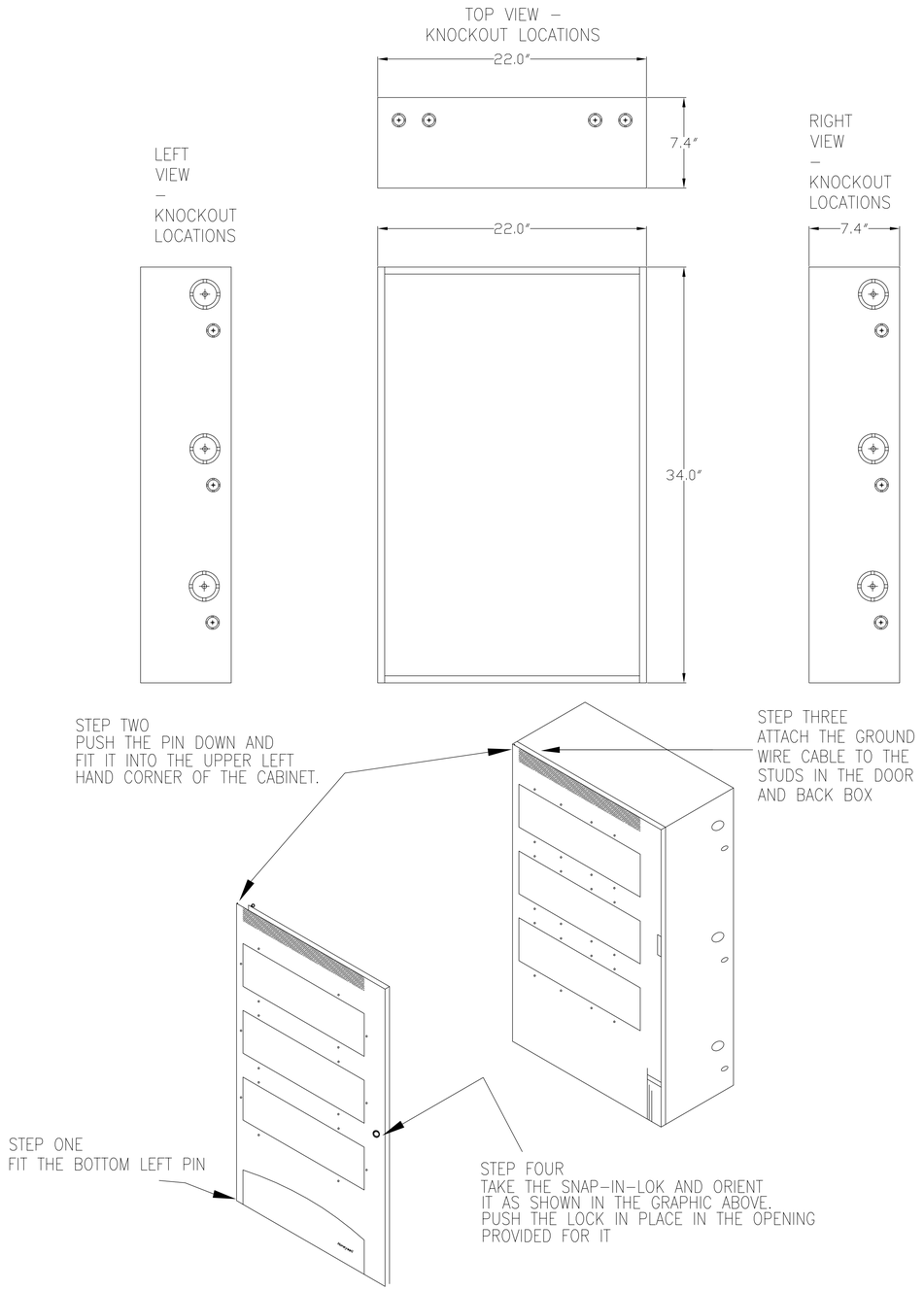


SIDE VIEW

2 FA3.1 REMOTE ANNUNCIATOR
LOCATION: TYPICAL

REV F		BY	Panel Elevation
REV E		BY	
REV D		BY	Honeywell *ExpertISE* ©
REV C		BY	512 Virginia Dr., Fort Washington, PA, US 19034-3264
REV B		BY	Philadelphia High School CAPA XLS3000 Fire Alarm System Upgrade 901 South Broad Street Philadelphia, PA, US 19147
REV A Jan 20, 17	Issued for Review	BY CB	DRAWING NUMBER USB-013055-FA3.1 REV A

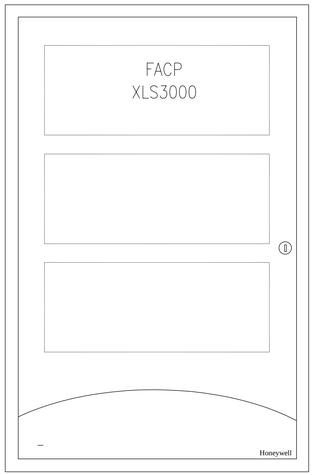
PROJECT DESIGN: –	SYSTEM DESIGN: –	CONTRACTOR: –	HONEYWELL DESIGN: Cesar Bonilla	HONEYWELL INSTALLATION: Michael Briggs	DRAFTER: Cesar Bonilla



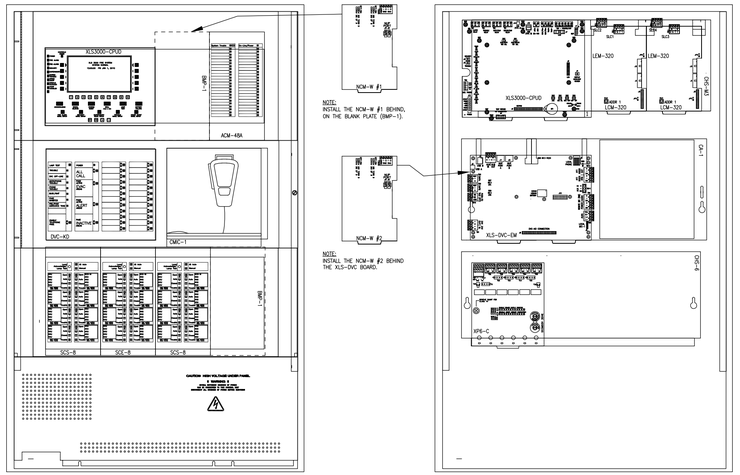
1 / FA3.2 XLS–LSP TYPICAL CABINET ASSEMBLY DETAILS
LOCATION: 2ND FLOOR ROOM 2045

REV F		BY	Panel Assembly (1 of 2)
REV E		BY	
REV D		BY	Honeywell *ExpertISE* ©
REV C		BY	512 Virginia Dr., Fort Washington, PA, US 19034–3264
REV B		BY	Philadelphia High School CAPA XLS3000 Fire Alarm System Upgrade 901 South Broad Street Philadelphia, PA, US 19147
REV A Jan 20, 17	Issued for Review	BY CB	DRAWING NUMBER USB–013055–FA3.2 REV A

PROJECT DESIGN: –	SYSTEM DESIGN: –	CONTRACTOR: –	HONEYWELL DESIGN: Cesar Bonilla	HONEYWELL INSTALLATION: Michael Briggs	DRAFTER: Cesar Bonilla

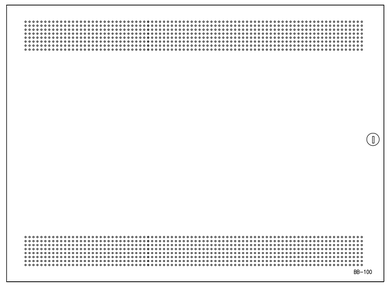


OUTER DOOR

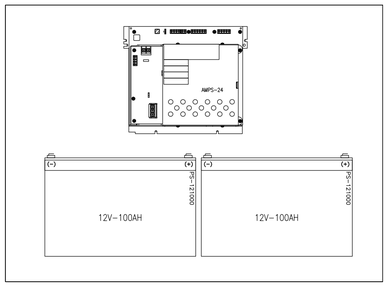


INNER DEAD FRONT

PANEL INTERIOR

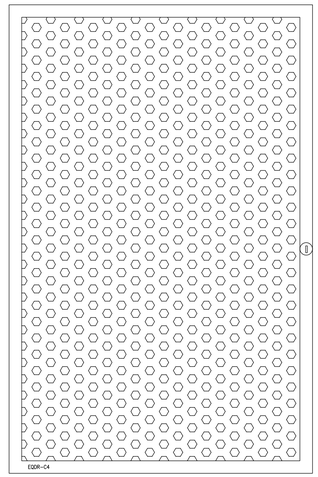


OUTER DOOR

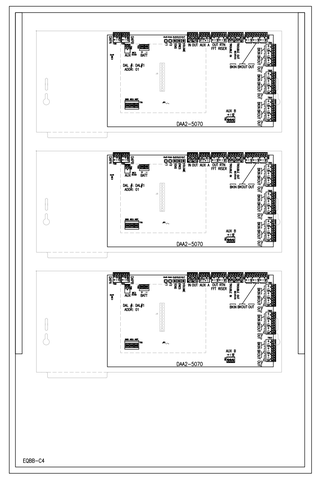


CABINET INTERIOR

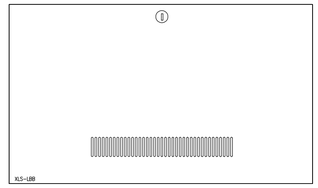
1 FA3.3 FACP & BATTERY CABINET
LOCATION: 2ND FLOOR ROOM 2045



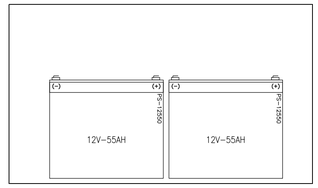
OUTER DOOR



PANEL INTERIOR



OUTER DOOR



CABINET INTERIOR

2 FA3.3 AMPLIFIER & BATTERY CABINET
LOCATION: 2ND FLOOR ROOM 2045

REV F		BY	Panel Assembly (2 of 2)
REV E		BY	
REV D		BY	Honeywell ExpertISE ©
REV C		BY	512 Virginia Dr., Fort Washington, PA, US 19034-3264
REV B		BY	Philadelphia High School CAPA XLS3000 Fire Alarm System Upgrade 901 South Broad Street Philadelphia, PA, US 19147
REV A Jan 20, 17	Issued for Review	BY CB	DRAWING NUMBER USB-013055-FA3.3 REV A

PROJECT DESIGN: –	SYSTEM DESIGN: –	CONTRACTOR: –	HONEYWELL DESIGN: Cesar Bonilla	HONEYWELL INSTALLATION: Michael Briggs	DRAFTER: Cesar Bonilla

TO SLC L2
FROM SLC L2
TO SLC L1
FROM SLC L1
SLC
SLC
LCM-320 #1
LEM-320 #1
SW1
ADDR 1

TO SLC L4
FROM SLC L4
TO SLC L3
FROM SLC L3
SLC
SLC
LCM-320 #2
LEM-320 #2
SW1
ADDR 3

ACM-48A
SW32 SW28
POWER
EIA-485
SW29
ON
ELR TERMINATE

DATA TO LCD-160 ANNUNCIATOR #1

XLS3000-CPUD
NCM-W #1
NUP PORT

SCE-8
SCS-8
EXPANSION CONNECTOR
EIA-485 IN-
EIA-485 OUT-
EIA-485 OUT+
EIA-485 IN+
NOT USED
NOT USED
24VDC IN-
24VDC OUT-
24VDC IN+
24VDC OUT+
EARTH GROUND

SCS-8
NOTE: ENABLE EOL RESISTOR

24VDC TO LCD-160 ANNUNCIATOR #1

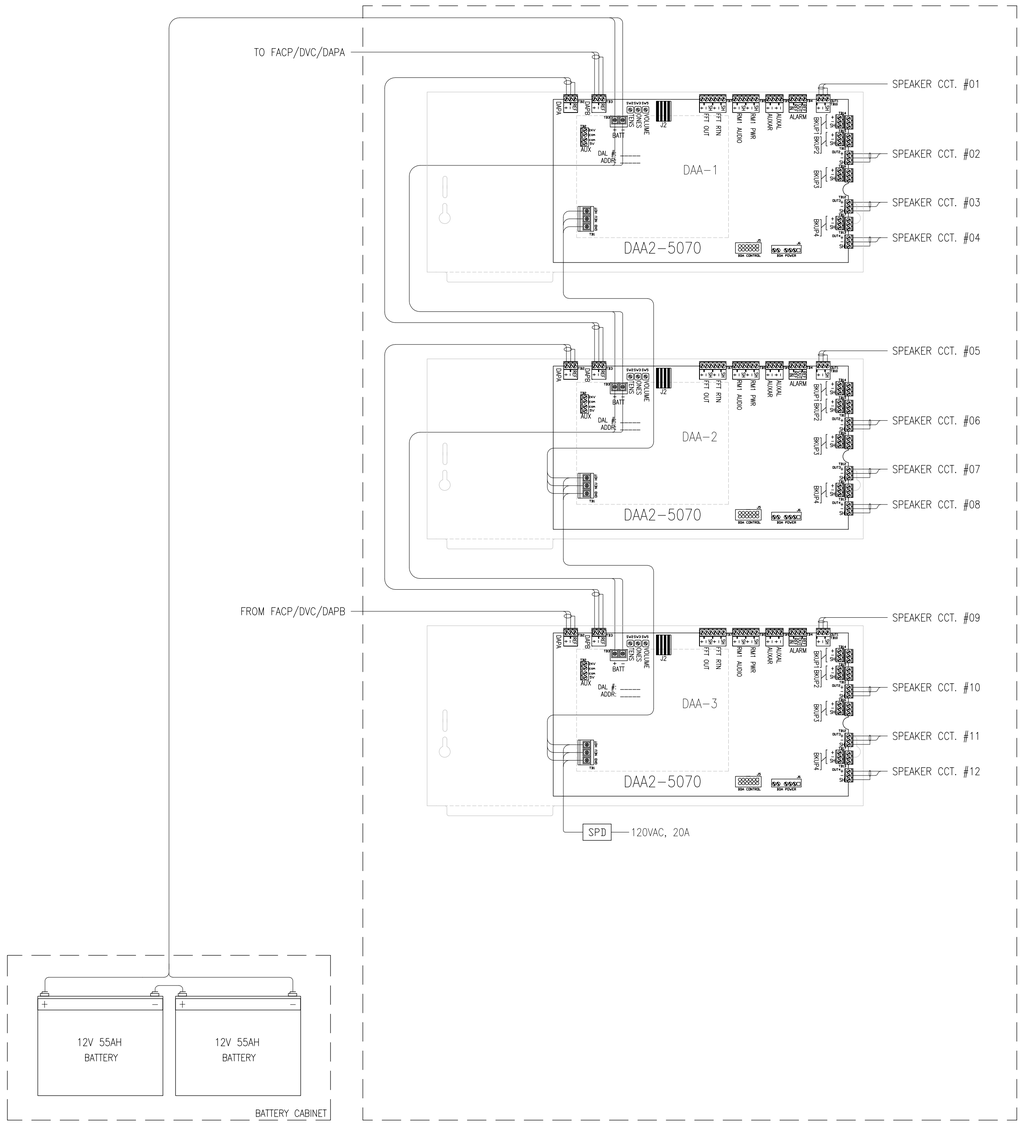
TO DAA-3/DAPA
FROM DAA-1/DAPB

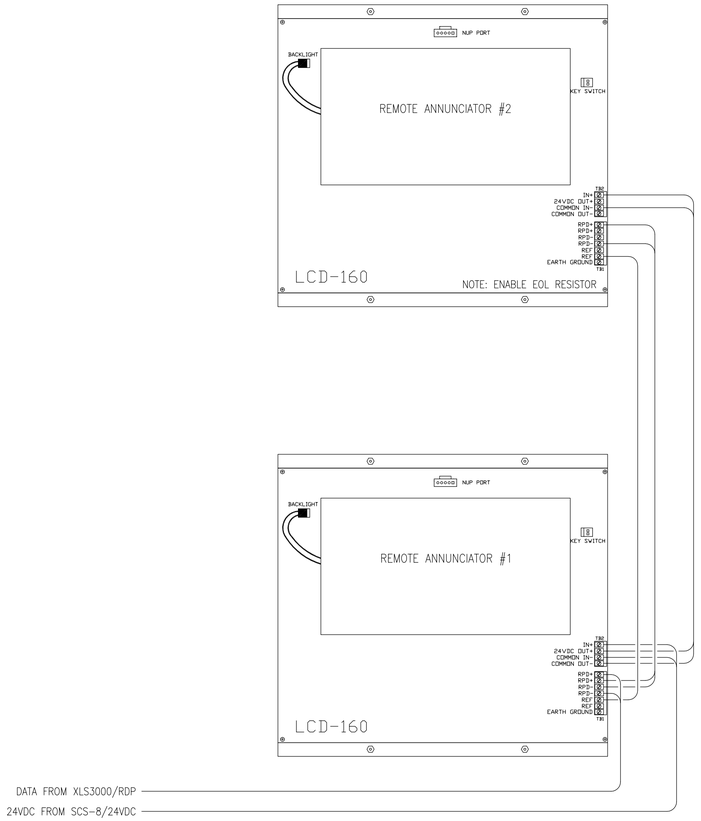
LS-DVC-EM
NCM-W #2
CMIC-4

AMPS-24
PS-121000
PS-121000
(-) (+)
(-) (+)

REV F		BY	Fire Alarm Panel Wiring Diagram
REV E		BY	Honeywell ExpertISE ©
REV D		BY	512 Virginia Dr., Fort Washington, PA, US 19034-3264
REV C		BY	Philadelphia High School CAPA
REV B		BY	XLS3000 Fire Alarm System Upgrade
REV A Jan 20, 17	Issued for Review	BY CB	901 South Broad Street Philadelphia, PA, US 19147
			DRAWING NUMBER USB-013055-FA4.1 REV A

PROJECT DESIGN: –	SYSTEM DESIGN: –	CONTRACTOR: –	HONEYWELL DESIGN: Cesar Bonilla	HONEYWELL INSTALLATION: Michael Briggs	DRAFTER: Cesar Bonilla





REV F		BY	Audio Cabinet and Annunciator Wiring Diagram
REV E		BY	
REV D		BY	Honeywell ExpertISE ©
REV C		BY	512 Virginia Dr., Fort Washington, PA, US 19034-3264
REV B		BY	Philadelphia High School CAPA XLS3000 Fire Alarm System Upgrade 901 South Broad Street Philadelphia, PA, US 19147
REV A Jan 20, 17	Issued for Review	BY CB	DRAWING NUMBER USB-013055-FA4.2 REV A

PROJECT DESIGN: –	SYSTEM DESIGN: –	CONTRACTOR: –	HONEYWELL DESIGN: Cesar Bonilla	HONEYWELL INSTALLATION: Michael Briggs	DRAFTER: Cesar Bonilla

BATTERY CALCULATIONS

Equipment: FACP
Location: 2nd Floor Room 2045

Battery Amp-Hours Calculation

Standby Alarm Time (tAlarm)	15	Minutes
Standby Supervisory Time (tSupv)	24	Hours
Derating Factor (DF)	1	(Multiplier)
Safety Factor (SF)	1.2	(Multiplier)

		Supply	Alarm	Supervisory	Total	Total	
Part No. (Setting)	Quantity	Current (mA)	Current (mA)	Current (mA)	Alarm (A)	Supv. (A)	Amp Hours
XLS3000-CPUD	1	0	340	340	0.340	0.340	8.25
AMPS-24	1	5000	130	130	0.130	0.130	3.15
LCM-320 (FULL LOAD)	2	0	330	130	0.660	0.260	6.41
LEM-320 (FULL LOAD)	2	0	300	100	0.600	0.200	4.95
XLS-DVC-EM	1	0	440	440	0.440	0.440	10.67
DVC-KD	1	0	60	60	0.060	0.060	1.46
LCD-160	2	0	325	300	0.650	0.600	14.56
ACM-48A	1	0	70	16	0.070	0.016	0.40
SCS-8	2	0	62	62	0.124	0.124	3.01
SCE-8	1	0	36	36	0.036	0.036	0.87
NCM-W	2	0	110	110	0.220	0.220	5.34
XP6-C(A)	1	0	35	2.25	0.035	0.002	0.06
Totals		5000			3.365	2.428	

Total Battery Load (AH)	59.12
Derating Factor (DF)	1
Safety Factor (SF)	1.2
Total Battery Required (AH)	70.94

Battery Amp-Hour Calculation Formula:
((tAlarm * iAlm) + (tSupv x iSupv)) x SF

Supplied Battery Capacity: 100 AH

Equipment: Audio Cabinet
Location: 2nd Floor Room 2045

Battery Amp-Hours Calculation

Standby Alarm Time (tAlarm)	15	Minutes
Standby Supervisory Time (tSupv)	24	Hours
Derating Factor (DF)	1	(Multiplier)
Safety Factor (SF)	1.2	(Multiplier)

		Supply	Alarm	Supervisory	Total	Total	
Part No. (Setting)	Quantity	Current (mA)	Current (mA)	Current (mA)	Alarm (A)	Supv. (A)	Amp Hours
DAA2-5070 (Max load)	3	0	3750	400	11.250	1.200	31.61
Totals		0			11.250	1.200	

Total Battery Load (AH)	31.61
Derating Factor (DF)	1
Safety Factor (SF)	1.2
Total Battery Required (AH)	37.94

Battery Amp-Hour Calculation Formula:
((tAlarm * iAlm) + (tSupv x iSupv)) x SF

Supplied Battery Capacity: 55 AH

REV F		BY	Battery Calculations
REV E		BY	
REV D		BY	Honeywell *ExpertISE* ©
REV C		BY	512 Virginia Dr., Fort Washington, PA, US 19034-3264
REV B		BY	Philadelphia High School CAPA XLS3000 Fire Alarm System Upgrade 901 South Broad Street Philadelphia, PA, US 19147
REV A Jan 20, 17	Issued for Review	BY CB	DRAWING NUMBER USB-013055-FA5.1 REV A

PROJECT DESIGN: -	SYSTEM DESIGN: -	CONTRACTOR: -	HONEYWELL DESIGN: Cesar Bonilla	HONEYWELL INSTALLATION: Michael Briggs	DRAFTER: Cesar Bonilla

SEQUENCE OF OPERATIONS

FIRE ALARM SYSTEM SEQUENCE OF OPERATION MATRIX

System Inputs	CONTROL UNIT ANNUNCIATION							NOTIFICATION									FIRE SAFETY CONTROL					
System Outputs	ACTIVATE COMMON ALARM SIGNAL INDICATOR	ACTIVATE AUDIBLE ALARM SIGNAL	ACTIVATE COMMON SUPERVISORY SIGNAL INDICATOR	ACTIVATE AUDIBLE SUPERVISORY SIGNAL	ACTIVATE COMMON TROUBLE SIGNAL INDICATOR	ACTIVATE AUDIBLE TROUBLE SIGNAL		ACTIVATE ALL BUILDING HORNS (SLOW WHOOP TONE)	ACTIVATE ALL BUILDING STROBES		TRANSMIT FIRE ALARM SIGNAL TO JFK CENTER	TRANSMIT SUPERVISORY SIGNAL TO JFK CENTER	TRANSMIT TROUBLE SIGNAL TO JFK CENTER		ACTIVATE CORRESPONDING SUGNAL ON ANNUNCIATORS	PRINT RECORD OF ALL SYSTEM EVENT ON THE SYSTEM PRINTER		RELEASE MAGNETIC DOOR HOLDERS AND DOOR EXIT DEVICES	RECALL ELEVATORS TO PRIMARY RECALL FLOOR	RECALL ELEVATORS TO ALTERNATE RECALL FLOOR	SHUTDOWN ASSOCIATED AHU AS PER SMOKE CONTROL SEQUENCE		
MANUAL STATION	X	X						X	X		X					X		X					
AREA SMOKE DETECTORS	X	X						X	X		X					X		X					
SMOKE DETECTORS – 1st FLOOR	X	X						X	X		X					X		X		X			
SMOKE DETECTORS – 2nd THRU TOP FLOOR	X	X						X	X		X					X		X	X				
DUCT SMOKE DETECTORS	X	X						X	X		X					X		X			X		
HEAT DETECTORS	X	X						X	X		X					X		X					
WATER FLOW/PRESSURE SWITCH	X	X						X	X		X					X		X					
SPRINKLER TAMPER VALVE			X	X								X				X							
DEVICE NO RESPONSE					X	X							X										
FIRE ALARM AC POWER FAILURE					X	X						X											
FIRE ALARM SYSTEM LOW BATTERY					X	X						X											
OPEN CIRCUIT					X	X							X										
GROUND FAULT					X	X							X										
PANEL NOTIFICATION APPLIANCE CIRCUIT SHORT					X	X							X										
BOOSTER POWER SUPPLY AC POWER FAILURE					X	X							X										
BOOSTER POWER SUPPLY LOW BATTERY					X	X							X										

SMOKE CONTROL SEQUENCE SHALL BE AS FOLLOWS:

AC–1, AC–2, AC–3, AC–4, AC–7, AC–9, AC–10, HV–1, HV–2, HV–3, HV–4.
THE ACTIVATION OF A DUCT MOUNTED SMOKE DETECTOR SHALL RENDER ITS ASSOCIATED AIR HANDLING UNIT INOPERATIVE AND SIGNAL THE FIRE ALARM SYSTEM.

AC–5
THE ACTIVATION OF A DUCT MOUNTED SMOKE DETECTOR SHALL RENDER ITS ASSOCIATED AIR HANDLING UNIT INOPERATIVE, START EXHAUST FANS 58 AND 59, AND SIGNAL THE FIRE ALARM SYSTEM.
THE ACTIVATION OF THE SPRINKLER WATERFLOW SWITCH SERVING THE GREAT HALL (ATIIC WEST) SHALL START EXHAUST FANS 58 AND 59.

AC–8, AC–11
THE ACTIVATION OF A DUCT MOUNTED SMOKE DETECTOR AND/OR OPERATION OF THE AUTOMATIC SPRINKLER SYSTEM SERVING THE THEATRE 12ND FLR EAST) WILL RELEASE THE SPRING LOADED OUTLET SMOKE HATCH AND START EF–60, FULLY OPEN THE OUTSIDE AIR DAMPERS, STOP RAF–8 AND RAF–11, FULLY OPEN THE RELIEF AIR DAMPERS, AND OPEN ALL COMBINATION FIRE/SMOKE DAMPERS.

REV F		BY
REV E		BY
REV D		BY
REV C		BY
REV B		BY
REV A Jan 20, 17	Issued for Review	BY CB

Sequence of Operations

Honeywell *ExpertISE* ©
512 Virginia Dr., Fort Washington, PA, US 19034–3264

Philadelphia High School CAPA
XLS3000 Fire Alarm System Upgrade
901 South Broad Street
Philadelphia, PA, US 19147

DRAWING NUMBER USB–013055–FA6.1 | REV A

PROJECT DESIGN: –	SYSTEM DESIGN: –	CONTRACTOR: –	HONEYWELL DESIGN: Cesar Bonilla	HONEYWELL INSTALLATION: Michael Briggs	DRAFTER: Cesar Bonilla