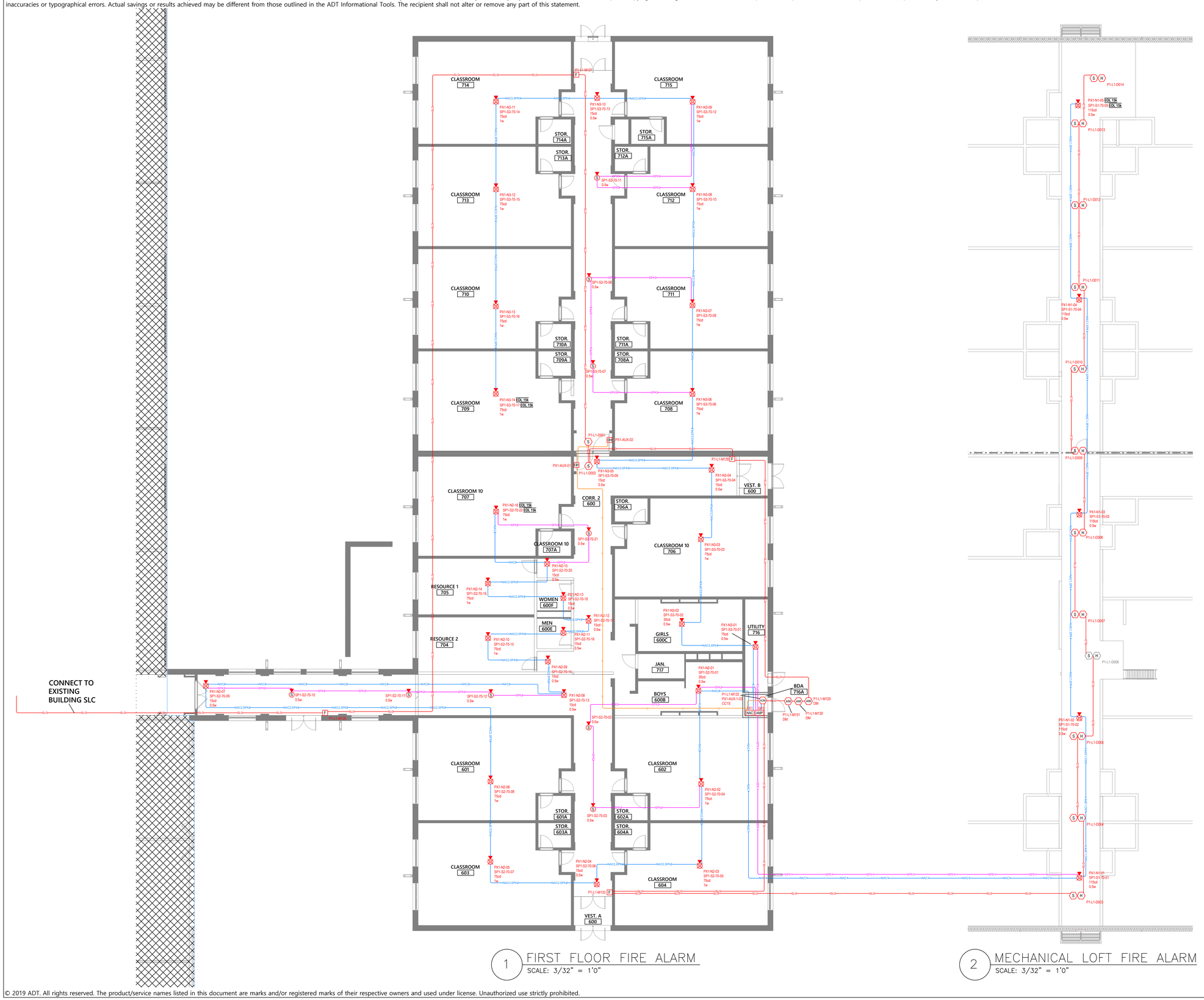


1 FIRST FLOOR FIRE ALARM
SCALE: 3/32" = 1'0"

2 MECHANICAL LOFT FIRE ALARM
SCALE: 3/32" = 1'0"

ADT Commercial
3821 Powhatan Road
Clayton, NC 27520
1-919-359-2239
adt.com/commercial
License # - SP.FA/LV.29655-02

HARNETT COUNTY SCHOOLS

HARNETT PRIMARY

NEW ADDITION
800 W HARNETT STREET
DUNN, NC 28334

FIRE ALARM SYSTEM

REVISIONS

NO.	DATE	REVISION
	BY:	
	BY:	
	BY:	
	BY:	
	BY:	
	BY:	
	BY:	
	BY:	

This fire alarm shop drawing was prepared for equipment application only. The information contained herein is intended to aid in the installation of this system. No design changes have been made to the engineer of record's contract documents.

Dated: 01-12-2023

Signed: James L. Carroll

James L. Carroll, CET
NICET #: 106506
NICET LEVEL IV
FIRE ALARM SYSTEMS

0-FT 5-FT 20-FT
1-FT 10-FT 30-FT
SCALE: 3/32" = 1'

PREPARED BY: J.Carroll
CHECKED BY:
PROJECT MANAGER: B.Heath
DATE: 01-12-2023
PROJECT NO: 314276

TITLE:
FIRE ALARM SHOP DRAWINGS

SHEET:
FA01

PX1 N1 POINT-TO-POINT REPORT

CIRCUIT SETTINGS		TOTALS	
Starting Calculation Voltage:	19.7	Max. Voltage Drop:	**0.19**
Min. Operational Voltage:	16	End Of Line Voltage:	**19.51**
Max. Circuit Current (A):	3	Voltage Drop Percent:	**0.99 %**
Wire Resistance (D/KFt):	3.07	Total Circuit Current (A):	**0.175**
Total Circuit Length (Ft):	294	Spare Current (A):	**2.825**
Total Circuit Resistance (Ω):	1.802977	Spare Current (A) Percent:	**94.17 %**

Circuit Wiring Properties: NAC1" 14/2 FPLP (NAC) 14 AWG, 2 Cond. Solid Copper FPLP/R Analog Unshielded

Distance measured using drawn segment lengths with 10.00 % additional length calculated

Device Label	Part No.	Description	Device Current (A)	Remaining Current (A)	Dist. From Previous (Ft)	Resistance From Previous (Ω)	Voltage Drop From Previous	Voltage At Device	Total Voltage Drop	Voltage Drop Percent
PX1-N1-01	GCSVWF	Speaker/Strobe, Ceiling, White, FIRE 115cd	0.035	**0.175**	75	**0.4605**	**0.08**	**19.62**	**0.08**	**0.41 %**
PX1-N1-02	GCSVWF	Speaker/Strobe, Ceiling, White, FIRE 115cd	0.035	**0.14**	45	**0.27608**	**0.04**	**19.58**	**0.12**	**0.61 %**
PX1-N1-03	GCSVWF	Speaker/Strobe, Ceiling, White, FIRE 115cd	0.035	**0.105**	58	**0.355911**	**0.04**	**19.54**	**0.16**	**0.79 %**
PX1-N1-04	GCSVWF	Speaker/Strobe, Ceiling, White, FIRE 115cd	0.035	**0.07**	61	**0.372327**	**0.03**	**19.52**	**0.18**	**0.93 %**
PX1-N1-05 EOL 15k	GCSVWF	Speaker/Strobe, Ceiling, White, FIRE 115cd	0.035	**0.035**	55	**0.338059**	**0.01**	**19.51**	**0.19**	**0.99 %**

Calculation Methods:
Resistance From Previous (Ω) = Wire Resistance (D/Ft) x 2 x Dist. From Previous (Ft)
Voltage Drop From Previous = Resistance From Previous (Ω) x Remaining Current (A)

PX1 N2 POINT-TO-POINT REPORT

CIRCUIT SETTINGS		TOTALS	
Starting Calculation Voltage:	19.7	Max. Voltage Drop:	**0.94**
Min. Operational Voltage:	16	End Of Line Voltage:	**18.76**
Max. Circuit Current (A):	3	Voltage Drop Percent:	**4.76 %**
Wire Resistance (D/KFt):	3.07	Total Circuit Current (A):	**0.56**
Total Circuit Length (Ft):	480	Spare Current (A):	**2.44**
Total Circuit Resistance (Ω):	2.948131	Spare Current (A) Percent:	**81.33 %**

Circuit Wiring Properties: NAC2" 14/2 FPLP (NAC) 14 AWG, 2 Cond. Solid Copper FPLP/R Analog Unshielded

Distance measured using drawn segment lengths with 10.00 % additional length calculated

Device Label	Part No.	Description	Device Current (A)	Remaining Current (A)	Dist. From Previous (Ft)	Resistance From Previous (Ω)	Voltage Drop From Previous	Voltage At Device	Total Voltage Drop	Voltage Drop Percent
PX1-N2-01	GCSVWF	Speaker/Strobe, Ceiling, White, FIRE 30cd	0.035	**0.56**	18	**0.199009**	**0.06**	**19.64**	**0.06**	**0.31 %**
PX1-N2-02	GCSVWF	Speaker/Strobe, Ceiling, White, FIRE 75cd	0.035	**0.525**	23	**0.141091**	**0.07**	**19.56**	**0.14**	**0.69 %**
PX1-N2-03	GCSVWF	Speaker/Strobe, Ceiling, White, FIRE 75cd	0.035	**0.49**	21	**0.127737**	**0.06**	**19.5**	**0.2**	**1.00 %**
PX1-N2-04	GCSVWF	Speaker/Strobe, Ceiling, White, FIRE 15cd	0.035	**0.455**	31	**0.189247**	**0.09**	**19.42**	**0.28**	**1.44 %**
PX1-N2-05	GCSVWF	Speaker/Strobe, Ceiling, White, FIRE 75cd	0.035	**0.42**	33	**0.20176**	**0.08**	**19.33**	**0.37**	**1.87 %**
PX1-N2-06	GCSVWF	Speaker/Strobe, Ceiling, White, FIRE 75cd	0.035	**0.385**	19	**0.119006**	**0.05**	**19.29**	**0.41**	**2.10 %**
PX1-N2-07	GCSVWF	Speaker/Strobe, Ceiling, White, FIRE 15cd	0.035	**0.35**	100	**0.611934**	**0.21**	**19.07**	**0.63**	**3.19 %**
PX1-N2-08	GCSVWF	Speaker/Strobe, Ceiling, White, FIRE 15cd	0.035	**0.315**	97	**0.592043**	**0.19**	**18.88**	**0.82**	**4.15 %**
PX1-N2-09	GCSVWF	Speaker/Strobe, Ceiling, White, FIRE 15cd	0.035	**0.28**	11	**0.06951**	**0.02**	**18.86**	**0.84**	**4.25 %**
PX1-N2-10	GCSVWF	Speaker/Strobe, Ceiling, White, FIRE 75cd	0.035	**0.245**	21	**0.126383**	**0.03**	**18.83**	**0.87**	**4.40 %**
PX1-N2-11	GCSVWF	Speaker/Strobe, Ceiling, White, FIRE 15cd	0.035	**0.21**	19	**0.116296**	**0.02**	**18.81**	**0.89**	**4.53 %**
PX1-N2-12	GCSVWF	Speaker/Strobe, Ceiling, White, FIRE 15cd	0.035	**0.175**	8	**0.04926**	**0.01**	**18.8**	**0.9**	**4.57 %**
PX1-N2-13	GCSVWF	Speaker/Strobe, Ceiling, White, FIRE 15cd	0.035	**0.14**	11	**0.068199**	**0.01**	**18.79**	**0.91**	**4.62 %**
PX1-N2-14	GCSVWF	Speaker/Strobe, Ceiling, White, FIRE 75cd	0.035	**0.105**	22	**0.137562**	**0.01**	**18.78**	**0.92**	**4.69 %**
PX1-N2-15	GCSVWF	Speaker/Strobe, Ceiling, White, FIRE 15cd	0.035	**0.07**	19	**0.119132**	**0.01**	**18.77**	**0.93**	**4.74 %**
PX1-N2-16 EOL 15k	GCSVWF	Speaker/Strobe, Ceiling, White, FIRE 75cd	0.035	**0.035**	26	**0.161672**	**0.01**	**18.76**	**0.94**	**4.76 %**

Calculation Methods:
Resistance From Previous (Ω) = Wire Resistance (D/Ft) x 2 x Dist. From Previous (Ft)
Voltage Drop From Previous = Resistance From Previous (Ω) x Remaining Current (A)

PX1 N3 POINT-TO-POINT REPORT

CIRCUIT SETTINGS		TOTALS	
Starting Calculation Voltage:	19.7	Max. Voltage Drop:	**0.57**
Min. Operational Voltage:	16	End Of Line Voltage:	**19.13**
Max. Circuit Current (A):	3	Voltage Drop Percent:	**2.88 %**
Wire Resistance (D/KFt):	3.07	Total Circuit Current (A):	**0.49**
Total Circuit Length (Ft):	355	Spare Current (A):	**2.51**
Total Circuit Resistance (Ω):	2.139112	Spare Current (A) Percent:	**83.67 %**

Circuit Wiring Properties: NAC3" 14/2 FPLP (NAC) 14 AWG, 2 Cond. Solid Copper FPLP/R Analog Unshielded

Distance measured using drawn segment lengths with 10.00 % additional length calculated

Device Label	Part No.	Description	Device Current (A)	Remaining Current (A)	Dist. From Previous (Ft)	Resistance From Previous (Ω)	Voltage Drop From Previous	Voltage At Device	Total Voltage Drop	Voltage Drop Percent
PX1-N3-01	GCSVWF	Speaker/Strobe, Ceiling, White, FIRE 75cd	0.035	**0.49**	16	**0.160776**	**0.05**	**19.65**	**0.05**	**0.25 %**
PX1-N3-02	GCSVWF	Speaker/Strobe, Ceiling, White, FIRE 30cd	0.035	**0.455**	24	**0.148397**	**0.07**	**19.58**	**0.12**	**0.59 %**
PX1-N3-03	GCSVWF	Speaker/Strobe, Ceiling, White, FIRE 75cd	0.035	**0.42**	26	**0.159319**	**0.07**	**19.52**	**0.18**	**0.93 %**
PX1-N3-04	GCSVWF	Speaker/Strobe, Ceiling, White, FIRE 15cd	0.035	**0.385**	20	**0.121231**	**0.05**	**19.47**	**0.23**	**1.17 %**
PX1-N3-05	GCSVWF	Speaker/Strobe, Ceiling, White, FIRE 15cd	0.035	**0.35**	31	**0.191929**	**0.07**	**19.4**	**0.3**	**1.51 %**
PX1-N3-06	GCSVWF	Speaker/Strobe, Ceiling, White, FIRE 75cd	0.035	**0.315**	42	**0.258037**	**0.08**	**19.32**	**0.38**	**1.92 %**
PX1-N3-07	GCSVWF	Speaker/Strobe, Ceiling, White, FIRE 75cd	0.035	**0.28**	22	**0.132816**	**0.04**	**19.28**	**0.42**	**2.11 %**
PX1-N3-08	GCSVWF	Speaker/Strobe, Ceiling, White, FIRE 75cd	0.035	**0.245**	29	**0.179457**	**0.04**	**19.24**	**0.46**	**2.33 %**
PX1-N3-09	GCSVWF	Speaker/Strobe, Ceiling, White, FIRE 75cd	0.035	**0.21**	21	**0.131097**	**0.03**	**19.21**	**0.49**	**2.47 %**
PX1-N3-10	GCSVWF	Speaker/Strobe, Ceiling, White, FIRE 15cd	0.035	**0.175**	25	**0.152499**	**0.03**	**19.19**	**0.51**	**2.61 %**
PX1-N3-11	GCSVWF	Speaker/Strobe, Ceiling, White, FIRE 75cd	0.035	**0.14**	26	**0.161941**	**0.02**	**19.16**	**0.54**	**2.72 %**
PX1-N3-12	GCSVWF	Speaker/Strobe, Ceiling, White, FIRE 75cd	0.035	**0.105**	21	**0.131204**	**0.01**	**19.15**	**0.55**	**2.79 %**
PX1-N3-13	GCSVWF	Speaker/Strobe, Ceiling, White, FIRE 75cd	0.035	**0.07**	29	**0.179535**	**0.01**	**19.14**	**0.56**	**2.86 %**
PX1-N3-14 EOL 15k	GCSVWF	Speaker/Strobe, Ceiling, White, FIRE 75cd	0.035	**0.035**	21	**0.130874**	**0**	**19.13**	**0.57**	**2.88 %**

Calculation Methods:
Resistance From Previous (Ω) = Wire Resistance (D/Ft) x 2 x Dist. From Previous (Ft)
Voltage Drop From Previous = Resistance From Previous (Ω) x Remaining Current (A)

1 VOLTAGE DROP CALCULATIONS – PX1

PANEL PX1 (BPS6A) BATTERY CALCULATION
(SECONDARY POWER SOURCE REQUIREMENTS)

PANEL COMPONENTS	QTY	PART NO.	DESCRIPTION	STANDBY CURRENT (AMPS) CURRENT DRAW (A)	STANDBY CURRENT (AMPS) TOTAL (A)	SECONDARY ALARM CURRENT (AMPS) CURRENT DRAW (A)	SECONDARY ALARM CURRENT (AMPS) TOTAL
	1	BPS6A Mainboard	Mainboard for BPS6A assembly	0.07	**0.07**	0.27	**0.27**
	1	DTK-120HW	Overvoltage Protector Circuit Protection-120V	0	**0**	0	**0**
CIRCUIT	SYMBOL	QTY	PART NO	DESCRIPTION	CURRENT DRAW (A)	TOTAL (A)	CURRENT DRAW (A)	TOTAL (A)
PX1-AUX	DH	2	1504-AQN5	Flush, Wall Mount, 24Vac/dc or 120Vac	0.015	**0.03**	0	**0**
	CC1S	1	SIGA-CC1S	Signature single input signal synchronization module	0	**0**	0	**0**
PX1-N1		5	GCSVWF	Speaker/Strobe, Ceiling, White, FIRE 115cd	0	**0**	0.035	**0.175**
PX1-N2		16	GCSVWF	Speaker/Strobe, Ceiling, White, FIRE 75cd	0	**0**	0.035	**0.56**
PX1-N3		14	GCSVWF	Speaker/Strobe, Ceiling, White, FIRE 30cd	0	**0**	0.035	**0.49**
				TOTAL STANDBY (A)	**0.1**	TOTAL ALARM (A)		**1.495**
				REQUIRED STANDBY TIME = 24 HOURS		REQUIRED ALARM TIME = 15 MINUTES		
SECONDARY STANDBY LOAD (A)		**0.1**		24		**2.4**		
SECONDARY ALARM LOAD (A)		**1.495**		0.25		**0.37**		
STANDBY AND ALARM SUBTOTAL (AMP HOURS)				**2.77**				
DERATING FACTOR				1.2				
SECONDARY LOAD REQUIREMENTS (AMP HOURS)				**3.33**				

PROVIDE (2) 12V 7AH BATTERIES
*BATTERY BOX SIZE CAPACITY NOT SPECIFIED. REFER TO MANUFACTURER DOCUMENTATION.

PANEL SP1 (ANS50MD2) BATTERY CALCULATION
(SECONDARY POWER SOURCE REQUIREMENTS)

PANEL COMPONENTS	QTY	PART NO.	DESCRIPTION	STANDBY CURRENT (AMPS) CURRENT DRAW (A)	STANDBY CURRENT (AMPS) TOTAL (A)	SECONDARY ALARM CURRENT (AMPS) CURRENT DRAW (A)	SECONDARY ALARM CURRENT (AMPS) TOTAL
	1	ANS50MD2	50 Watt audio notification module with DMR and microphone	0.15	**0.15**	0.8	**0.8**
	1	ANSZM4B2A	Zone Module, 4 Class B or 2 Class A circuits.	0.015	**0.015**	0.035	**0.035**
	1	DTK-120HW	Overvoltage Protector Circuit Protection-120V	0	**0**	0	**0**
CIRCUIT	SYMBOL	QTY	PART NO	DESCRIPTION	CURRENT DRAW (A)	TOTAL (A)	CURRENT DRAW (A)	TOTAL (A)
SP1-S1-70		5	GCSVWF	Speaker/Strobe, Ceiling, White, FIRE 0.5w	0	**0**	0	**0**
SP1-S2-70		9	GCSVWF	Speaker/Strobe, Ceiling, White, FIRE 0.5w	0	**0**	0	**0**
		7	GCSVWF	Speaker/Strobe, Ceiling, White, FIRE 1w	0	**0**	0	**0**
		6	GCSWF	Speaker, Ceiling, White, FIRE 0.5w	0	**0**	0	**0**
SP1-S3-70		5	GCSVWF	Speaker/Strobe, Ceiling, White, FIRE 0.5w	0	**0**	0	**0**
		9	GCSVWF	Speaker/Strobe, Ceiling, White, FIRE 1w	0	**0**	0	**0**
		3	GCSWF	Speaker, Ceiling, White, FIRE 0.5w	0	**0**	0	**0**
				TOTAL STANDBY (A)	**0.165**	TOTAL ALARM (A)		**0.835**
				REQUIRED STANDBY TIME = 24 HOURS		REQUIRED ALARM TIME = 15 MINUTES		
SECONDARY STANDBY LOAD (A)		**0.165**		24		**3.96**		
SECONDARY ALARM LOAD (A)		**0.835**		0.25		**0.21**		
STANDBY AND ALARM SUBTOTAL (AMP HOURS)				**4.17**				
DERATING FACTOR				1.2				
SECONDARY LOAD REQUIREMENTS (AMP HOURS)				5				

PROVIDE (2) 12V 7AH BATTERIES
*BATTERY BOX SIZE CAPACITY NOT SPECIFIED. REFER TO MANUFACTURER DOCUMENTATION.

2 BATTERY CALCULATIONS – PX1/SP1

Project: Harnett Primary Addition FA Shop Dwgs Date: 1/12/2023
Speaker Schedule Summary
Source:
Voltage: 0v Watts: 0

PANEL/CIRCUIT	GCSVWF		WATTS	CIRCUIT LENGTH	START VOLTAGE	DECIBEL LOSS	AWG	OHMS/KFT	TOTAL RESISTANCE (OHMS)
RATING	0.5w	1w							
WATTS	0.5	1							
SP1-S1-70	5		2.5	294'	70.7v	-0.012484dB	16	4.89	1
SP1-S2-70	9	7	14.5	567'	70.7v	-0.140814dB	16	4.89	3
SP1-S3-70	5	9	13	470'	70.7v	-0.104541dB	16	4.89	2

NOTES: These calculations double the wire length indicated to account for the total wire resistance of the circuit.
DC resistance at 75° C/167° F per NFPA 70 ch. 9, table 8.

DEVICE & WIRE TOTALS	19	16	30						

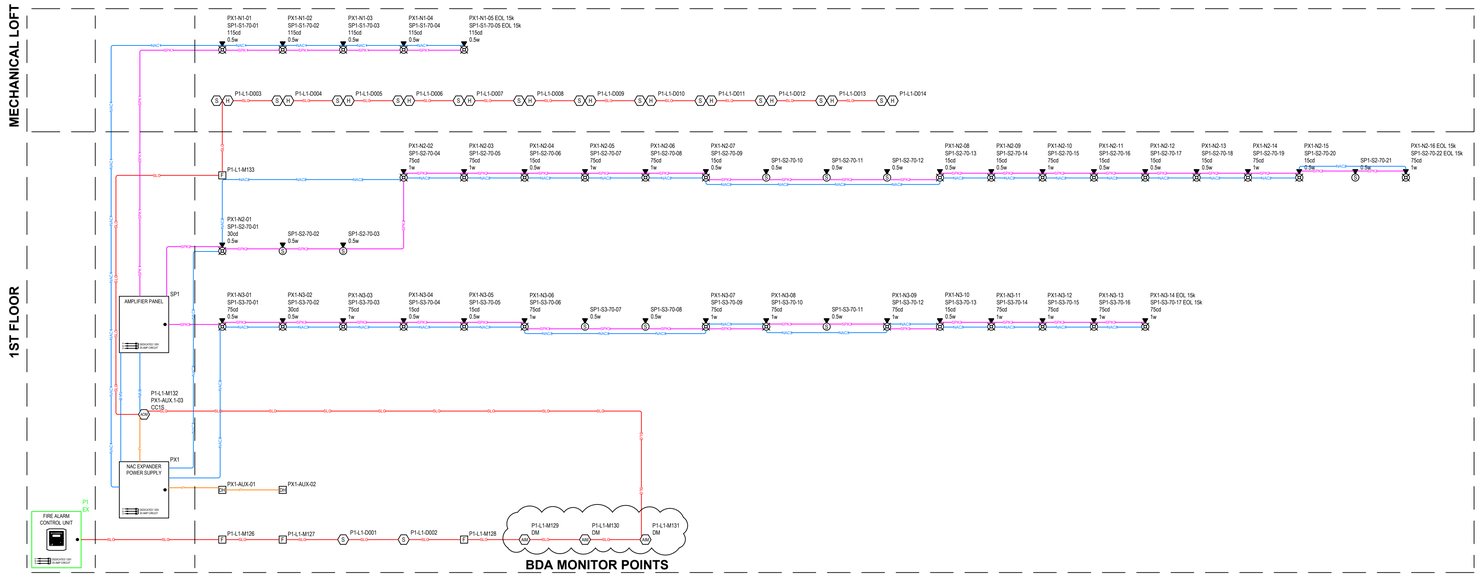
3 SPEAKER LOAD SUMMARY

DEVICE LEGEND

SYMBOL	QTY	EXISTING	MANUFACTURER	PART NO	DESCRIPTION
FACU	1	X	EDWARDS	EST3 MAIN FACP	FACP /W CPU, 4 LOOPS, 4 NACS, 4 3-ZA40B AMPS/FIBERS, MIC, 3-CAB21
	1	X	EDWARDS	3-SDDC2	SIGNATURE DUAL DRIVER CONTROLLER (LRM)
	1	X	EDWARDS	3-CPU3	CENTRAL PROCESSOR MODULE
	1	X	EDWARDS	3-LCD	LIQUID CRYSTAL DISPLAY MODULE
	1	X	EDWARDS	3-PPS/M	PRIMARY POWER SUPPLY 120V
NAC	1		EDWARDS	BPS6A	REMOTE BOOSTER POWER SUPPLY, 6.5A, 120VAC, RED
	1		EDWARDS	DITEK	OVERVOLTAGE PROTECTOR CIRCUIT PROTECTION-120V
	2		EDWARDS	12V6A5	7.2 AH BATTERY
AMP	1		EDWARDS	ANS50MDR2	50W AUDIO NOTIFICATION PANEL, RED
	2		EDWARDS	12V6A5	7.2 AH BATTERY
	1		EDWARDS	ANSZM4B2A	ZONE MODULE, 4 CLASS B OR 2 CLASS A CIRCUITS.
	1		EDWARDS	DITEK	OVERVOLTAGE PROTECTOR CIRCUIT PROTECTION-120V
F	4		EDWARDS	SIGA-278	DOUBLE ACTION FIRE ALARM STATION
CC1S	1		EDWARDS	SIGA-CC1S	SIGNATURE SINGLE INPUT SIGNAL SYNCHRONIZATION MODULE
DM	3		EDWARDS	SIGA-CT2	DUAL INPUT MODULE
S	2		EDWARDS	SIGA-OSD W/SIGA-SB4 BASE	INTELLIGENT OPTICAL SMOKE DETECTOR
	12		EDWARDS	SIGA-OSHD W/SIGA-SB4 BASE	MULTISENSOR SMOKE AND HEAT DETECTOR
	9		EDWARDS	GCSWF/GRSW	SPEAKER, CEILING, WHITE, FIRE
	35		EDWARDS	GCSVWF/GRSW	SPEAKER/STROBE, CEILING, WHITE, FIRE
DH	2		EDWARDS	1504-AQN5	FLUSH, WALL MOUNT, 24VAC/DC OR 120VAC

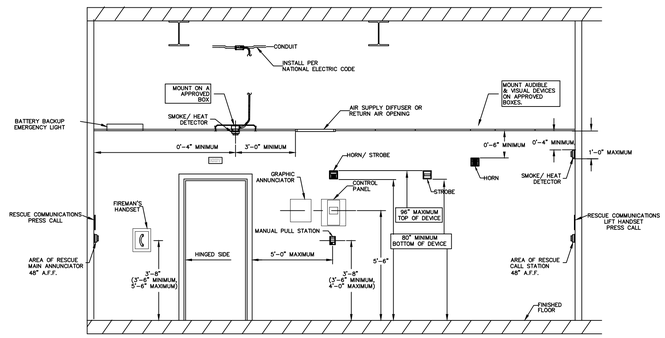
CABLE AND WIRE LEGEND

LABEL	PART NO	AWG	RESISTANCE (Ω/KFT)	DESCRIPTION	TOTAL LENGTH
NAC	14/2 FPLP (NAC)	14	3.07	2 COND. SOLID COPPER FPLP/R ANALOG UNSHIELDED	2'
NAC1	14/2 FPLP (NAC)	14	3.07	2 COND. SOLID COPPER FPLP/R ANALOG UNSHIELDED	294'
NAC2	14/2 FPLP (NAC)	14	3.07	2 COND. SOLID COPPER FPLP/R ANALOG UNSHIELDED	480'
NAC3	14/2 FPLP (NAC)	14	3.07	2 COND. SOLID COPPER FPLP/R ANALOG UNSHIELDED	355'
P	14/2 FPLP/R (AUX)	14	3.07	2 COND. SOLID COPPER FPLP/R UNSHIELDED	125'
SLC	16/2 FPLP SLC	16	4.89	2 COND. SOLID COPPER FPLP ADDRESSABLE UNSHIELDED	990'
SPK1	16/2 FPLP (SPEAKER)	16	4.89	2 COND. SOLID COPPER FPLP/R ANALOG SPEAKER	294'
SPK2	16/2 FPLP (SPEAKER)	16	4.89	2 COND. SOLID COPPER FPLP/R ANALOG SPEAKER	567'
SPK3	16/2 FPLP (SPEAKER)	16	4.89	2 COND. SOLID COPPER FPLP/R ANALOG SPEAKER	470'



4 SYSTEM RISER

DEVICE INSTALLATION REQUIREMENTS



ADT Commercial
3821 Powhatan Road
Clayton, NC 27520
1-919-359-2239
adt.com/commercial
License # - SP.FA/LV.29655-02

HARNETT COUNTY SCHOOLS

HARNETT PRIMARY

NEW ADDITION
800 W HARNETT STREET
DUNN, NC 28334

FIRE ALARM SYSTEM

REVISIONS

NO.	DATE	REVISION
	BY:	
	BY:	
	BY:	
	BY:	
	BY:	
	BY:	

This fire alarm shop drawing was prepared for equipment application only. The information contained herein is intended to aid in the installation of this system. No design changes have been made to the engineer of record's contract documents.

Dated: 01-12-2023

Signed: James L. Carroll

James L. Carroll, CET
NICET #: 106506
NICET LEVEL IV
FIRE ALARM SYSTEMS

NOT TO SCALE

PREPARED BY: J.Carroll
CHECKED BY:
PROJECT MANAGER: B.Heath
DATE: 01-12-2023
PROJECT NO: 314276

TITLE:
FIRE ALARM CALCULATIONS RISER

SHEET:
FA02