

KANSAS CITY FIRE & SECURITY
FIRE ALARM SYSTEM

FIRE ALARM PLAN NOTES

- 1
- 120VAC (BY OTHERS)

2

DRAWING INDEX

- FA.0.01
- COVER SHEET

FA.1.01

FA.6.01

APPLICABLE CODES

- NFPA 70 – NATIONAL ELECTRIC CODE (2017)
- NFPA 72 – NATIONAL FIRE ALARM & SIGNALING CODE (2016)
- NFPA 101 – LIFE SAFETY CODE (2018)
- INTERNATIONAL FIRE CODE – 2018
- INTERNATIONAL BUILDING CODE – 2018

SCOPE OF WORK:

KCFS TO INSTALL SMOKE DETECTOR ABOVE FACU, INSTALL NEW NOTIFICATION IN CONSTRUCTION SPACE. REMAINDER OF SYSTEM IS EXISTING TO REMAIN.

SYSTEM MONITORED BY A REMOTE SUPERVISING STATION
PER NFPA 72 26.5 (2016) – LANDLORDS RESPONSIBILITY

ABBREVIATIONS:

WP = WEATHER RESISTANT. ETR = EXISTING TO REMAIN.
ROR = RATE OF RISE. RCP = REFLECTED CEILING PLAN.
HAZ RATED = SPECIAL HAZARDOUS ENVIRONMENT RATED DEVICES.
NIC = NOT IN CONSTRUCTION. TI = TENANT IMPROVEMENT.

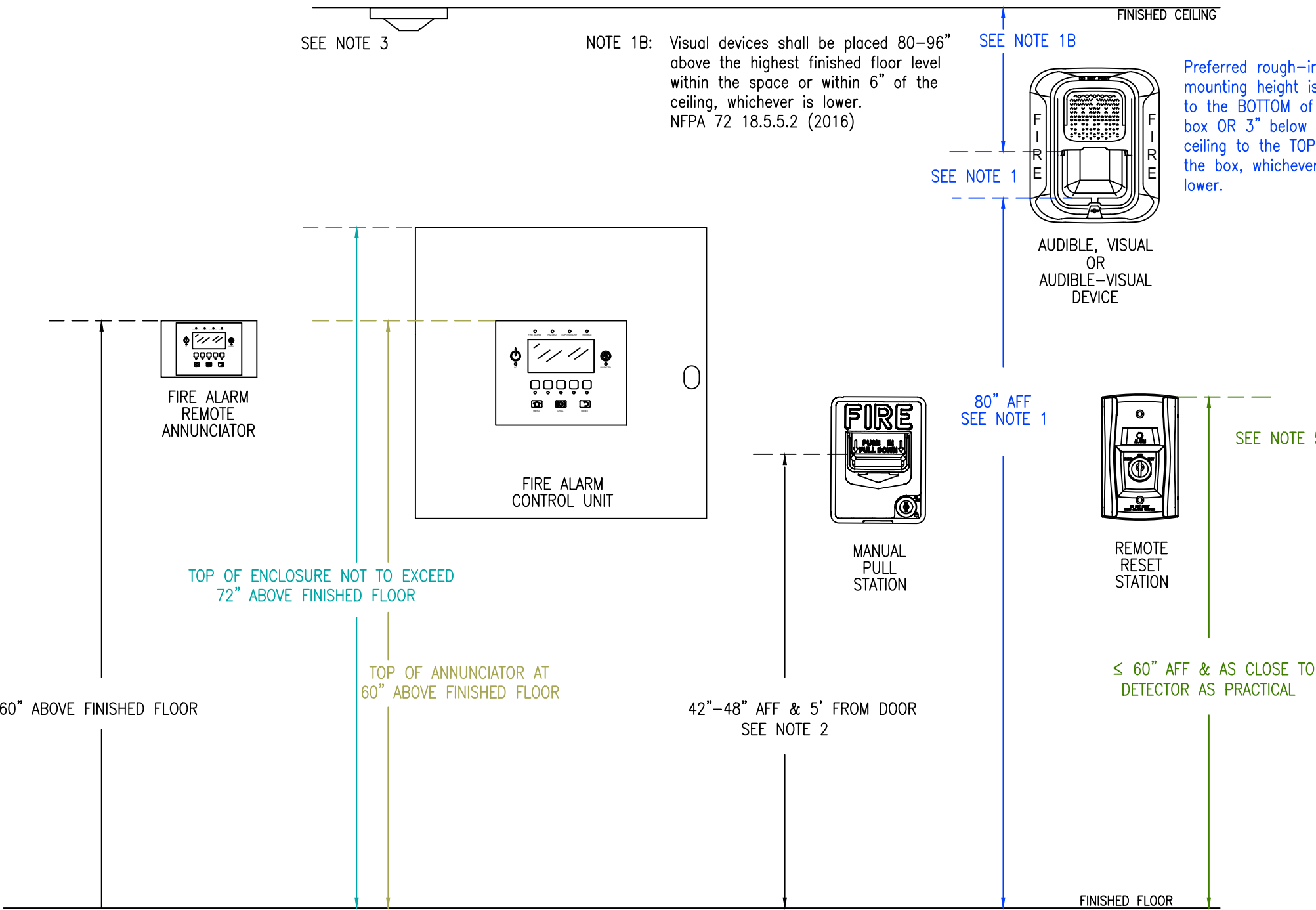
FIRE ALARM SYMBOLS		
ICON	DESCRIPTION	MOUNTING REQUIREMENTS
	FIRE LITE MS-5012 FIRE ALARM CONTROL PANEL	SURFACE MOUNTED ENCLOSURE PROVIDED, TOP 72" AFF; CONDUIT TO CEILING
	ANN-80 FIRE ALARM REMOTE ANNUNCIATOR	4" SQUARE, 1-1/2" STANDARD BOX, W/ SINGLE MUD RING; 60" AFF; CONDUIT TO CEILING
	ECC-50/100 50 WATT, 25V VOICE EVAC PANEL	SURFACE MOUNTED ENCLOSURE PROVIDED, TOP 72" AFF; CONDUIT TO CEILING
	AL600UL-ADA 6.5 AMP POWER SUPPLY PANEL	SURFACE MOUNTED ENCLOSURE PROVIDED, TOP 72" AFF; CONDUIT TO CEILING
	MS-7 PHOTO SMOKE DETECTOR	4" SQUARE, 1-1/2" STANDARD BOX W/ SINGLE MUD RING; NO HIGHER THAN 30" AFF
	650IP THERMAL DETECTOR	4" SQUARE, 1-1/2" STANDARD BOX W/ SINGLE MUD RING; NO HIGHER THAN 30" AFF
	D2, D4/D20 PHOTO SMOKE DUCT DETECTOR	INSTALL PER MANUFACTURER SPECIFICATIONS
	MS-7 MANUAL PULL STATION	4" SQUARE, 1-1/2" STANDARD BOX W/ SINGLE MUD RING; 48" AFF & 5" FROM DOOR; CONDUIT TO CEILING
	N/A SINGLE MONITOR MODULE	4" SQUARE, 2-1/8" DEEP BOX; CONDUIT TO CEILING
	N/A QUAD MONITOR MODULE	4" SQUARE, 2-1/8" DEEP BOX; CONDUIT TO CEILING
	N/A QUAD RELAY MODULE	4" SQUARE, 2-1/8" DEEP BOX; CONDUIT TO CEILING
	SR, SCR, SW, SCW ALARM STROBE, CANDELA SHOWN	WALL MOUNTED, 80"-96" AFF OR (C) = CEILING MOUNTED; 4" SQUARE, 1-1/2" STANDARD BOX W/ SINGLE MUD RING
	P2R, PC2R, P2W, PC2W HORN/STROBE, CANDELA SHOWN	WALL MOUNTED, 80"-96" AFF OR (C) = CEILING MOUNTED; 4" SQUARE, 1-1/2" STANDARD BOX W/ SINGLE MUD RING
	END OF LINE RESISTOR PROVIDED BY CONTROL/DEVICE	INSTALL AT THE LAST DEVICE OF THAT CIRCUIT
	SPRINKLER FLOW SWITCH	HANDY BOX INSTALLED ON SWITCH; THEN INSTALL 1/2" FLEX CONDUIT TO 4" SQUARE, 2-1/8" DEEP BOX ON WALL
	SPRINKLER TAMPER SWITCH	HANDY BOX INSTALLED ON SWITCH; THEN INSTALL 1/2" FLEX CONDUIT TO 4" SQUARE, 2-1/8" DEEP BOX ON WALL
	POST INDICATOR VALVE	1/2" WATER TIGHT FLEX CONDUIT FROM SWITCH TO WEATHERPROOF SINGLE GANG BOX ON U.G. CONDUIT
	KITCHEN HOOD SUPPRESSION SYSTEM	4" SQUARE, 2-1/8" DEEP BOX; CONDUIT TO CEILING
	M2M M203-LTE-FIRE CELLULAR COMMUNICATOR	BW-98RUL ENCLOSURE, CONDUIT TO FACU
	JUNCTION OF FIRE ALARM CABLES	4" SQUARE, 2-1/8" DEEP BOX, BLANK COVER; CONDUIT TO CEILING

NOTE: NOT ALL SYMBOLS APPLY TO CURRENT PROJECT

SEQUENCE OF OPERATION MATRIX									
	ALARM AT FACU	TROUBLE AT FACU	SUPERVISORY AT FACU	NOTICE OF SOUNDING AUDIO/VISUAL DEVICES	HVAC / RTU SHUTDOWN	SIGNAL SENT TO OFF-SITE MONITORING	ELEVATOR RECALL	ELEVATOR EQUIPMENT SHUNT TRIP	
FIRE ALARM INPUTS									
1	MANUAL PULL STATION	X		X		X			
2	WATER FLOW	X		X	X	X			
3	SMOKE DETECTOR	X		X		X			
4	HEAT DETECTOR	X		X	X	X			
5	ELEVATOR LOBBY SMOKE(S)	X		X	X	X	X		
6	ELEVATOR EQUIPMENT ROOM SMOKE	X		X	X	X	X		
7	ELEVATOR EQUIPMENT ROOM HEAT	X		X	X	X	X	X	
8	ELEVATOR SHAFT HEAT	X		X	X	X	X	X	
9	ELEVATOR SHAFT SMOKE	X		X	X	X	X	X	
10	KITCHEN HOOD / ANSUL	X		X	X	X			
SUPERVISORY ALARM INPUTS									
1	DUCT DETECTOR		X		X	X			
2	TAMPER SWITCH		X			X			
3	CARBON MONOXIDE DETECTOR		X			X			
TROUBLE CONDITIONS									
1	OPEN CIRCUIT		X				X		
2	SHORT CIRCUIT		X				X		
3	GROUND FAULT		X				X		
4	BAD DEVICE, DIRTY DEVICE, NO ANSWER		X				X		
5	LOW BATTERY		X				X		
6	MAIN POWER FAIL		X				X		

NOTE: NOT ALL CONDITIONS APPLY TO CURRENT PROJECT.

FUNCTIONAL MATRIX



RECOMMENDED MOUNTING DETAIL
NOT TO SCALE

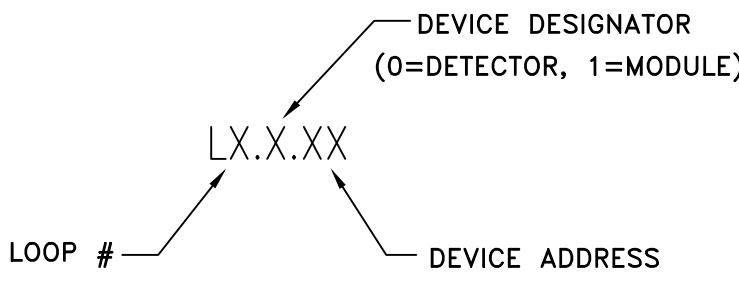
FIRE ALARM GENERAL NOTES

1. – WALL MOUNTED APPLIANCES SHALL BE MOUNTED SUCH THAT THE ENTIRE LENS IS NOT LESS 80" AND NOT GREATER THAN 96" ABOVE THE FINISHED FLOOR.
NFPA 72 18.5.5.1 (2016)
2. – MANUAL FIRE ALARM BOXES SHALL BE LOCATED WITHIN 5' OF EXIT DOORWAY.
NFPA 72 17.14.8.4 (2016)
–THE OPERABLE PART OF A MANUALLY ACTUATED ALARM INITIATING DEVICE SHALL BE NOT LESS THAN 42" AND NOT MORE THAN 48" FROM THE FINISHED FLOOR.
NFPA 72 17.14.5 (2016)
3. – IF THE INTENT IS TO INITIATE ACTION WHEN SMOKE/FIRE THREATENS A SPECIFIC OBJECT, THE DETECTOR SHALL BE PERMITTED TO BE INSTALLED IN CLOSE PROXIMITY TO THAT OBJECT.
NFPA 72 17.4.8 (2016)
A: IN HIGH-CEILING AREAS, DETECTION SHOULD BE PLACED ON THE WALL ABOVE AND WITHIN 60" OF THE PROTECTED ITEM.
NFPA 72 A17.4.8 (2016)
4. – ALL WIRING IN OPEN CEILING TO BE RUN PARALLEL AND PERPENDICULAR TO BUILDING STRUCTURE.
WIRING SHOULD BE CONCEALED FROM VIEW AS BEST POSSIBLE.
5. – WHERE DUCT SMOKE DETECTORS ARE NOT RESETTABLE FROM THE PROTECTED PREMISES FIRE ALARM SYSTEM, A LISTED ALARM/ SUPERVISORY INDICATOR WITH INTEGRAL RESET SWITCH SHALL BE PROVIDED IN AN ACCESSIBLE LOCATION.
NFPA 72 23.8.5.4.6.4 (2016)

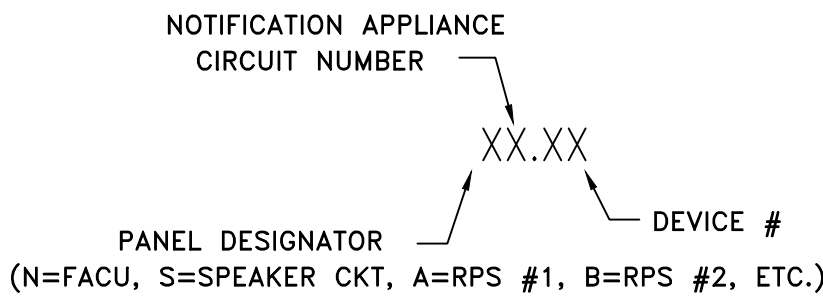
WIRING LEGEND

- 18/2 NON SHIELDED (PLENUM RATED) IDC
- 16/2 NON SHIELDED (PLENUM RATED) NAC/STROBE
- 16/2 NON SHIELDED (PLENUM RATED) 24VDC
- 18/4 NON SHIELDED (PLENUM RATED) ANNUNCIATOR/RTS

SIGNAL LINE CIRCUIT
DEVICE ADDRESS KEY



NOTIFICATION DEVICE ADDRESS KEY



AHJ SEAL	PROF SEAL
	NICET III #111458

Kansas City Fire & Security
901 E. Loula – Olathe, KS 66061
(913) 780-5237 FAX (913) 780-3473

"Protecting Kansas City"

Date:05/02/2022

Job:12225

Drawing:FA.0.01Sheet:1 OF 3

Scale:N/A

Desc: FIRE ALARM

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DESCRIPTION:
FL MS-5012
COVER PAGE

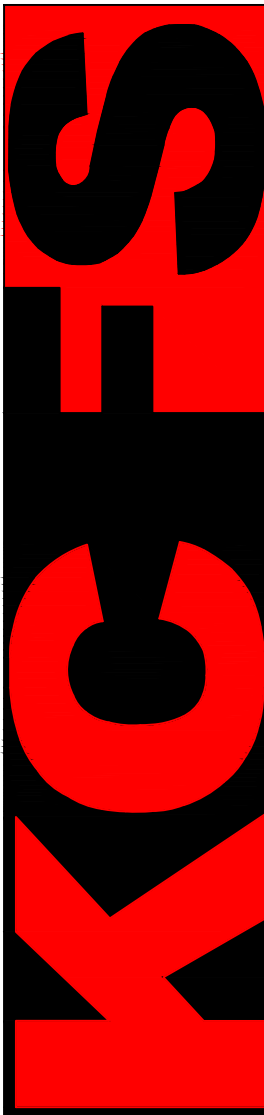
REVISION	DATE

NICET FIRE ALARM LEVEL III

Troy V. Koehn
901 EAST LOULA
OLATHE, KS 66061
913-780-5237

A.H.J.

LEE'S SUMMIT



PRIME PHYSICAL THERAPY	FIRE ALARM – TI	1153 NE RICE ROAD	LEE'S SUMMIT, MO 64086	COVER PAGE
FA.0.01				



ADJACENT TENANT – NOT IN CONSTRUCTION

FA.1.01

FIRE ALARM BATTERY BACK-UP CALCULATION WORK SHEET FOR FIRE ALARM CONTROL UNIT									
FACU MODEL: MS-5012					DATE: 1-May-2022				
ITEM	DESCRIPTION	STANDBY CURRENT PER UNIT (AMPS)	QTY	TOTAL STANDBY CURRENT PER ITEM (AMPS)	ALARM CURRENT PER ITEM (AMPS)	QTY	TOTAL ALARM CURRENT PER ITEM (AMPS)		
FACU	FACU	0.0740 X	1 =	0.0740	0.1700 X	1 =	0.1700		
BG-1L	MANUAL PULL STATION	0.0000 X	2 =	0.0000	0.0000 X	2 =	0.0000		
PWB	SMOKE DETECTOR	0.0065 X	2 =	0.0130	0.0000 X	2 =	0.0000		
5691	HEAT DETECTOR	0.0000 X	0 =	0.0000	0.0000 X	0 =	0.0000		
DH-1D	DUCT DETECTOR	0.0210 X	0 =	0.0000	0.0650 X	0 =	0.0000		
RTR181	REMOTE TEST	0.0150 X	0 =	0.0000	0.0120 X	0 =	0.0000		
ANN	REMOTE ANNUNCIATOR	0.0150 X	0 =	0.0000	0.0400 X	0 =	0.0000		
CELL	CELL COMMUNICATOR	0.1000 X	0 =	0.0000	0.1000 X	0 =	0.0000		
		0.0000 X	0 =	0.0000	0.0000 X	0 =	0.0000		
		0.0000 X	0 =	0.0000	0.0000 X	0 =	0.0000		
ZONE	ZONE ALARM MAX	0.0000 X	5 =	0.0000	0.0240 X	5 =	0.1200		
NAC1	NOTIFICATION CKT HT	0.0000 X	1 =	0.0000	0.4600 X	0 =	0.4600		
		0.0000 X	0 =	0.0000	0.4830 X	0 =	0.0000		
		0.0000 X	0 =	0.0000	0.0000 X	0 =	0.0000		
		0.0000 X	0 =	0.0000	0.0000 X	0 =	0.0000		
TOTAL SYSTEM				STANDBY CURRENT (AMPS)	0.0750	TOTAL SYSTEM		ALARM CURRENT (AMPS)	0.7500
								MAY AMP	2.000
								PASS	
SITE: PRIME PHYSICAL THERAPY, 1135 NE RICE ROAD, LEE'S SUMMIT, MO 64088									
	REQUIRED STANDBY TIME (HRS)	TOTAL SYSTEM STANDBY CURRENT (AMPS)	REQUIRED STANDBY CAPACITY (AMP-HOURS)	REQUIRED ALARM TIME (HOURS)	TOTAL SYSTEM ALARM CURRENT (AMPS)	REQUIRED ALARM CAPACITY (AMP-HOURS)			
	24	X	0.0750 = 1.8000	5 MIN=0.084 15 MIN=0.252 0.004 X	X	0.7500 = 0.9300			
Prepared by: KCF's, 901 E LOULA CLATRE, KS 66081									
	REQUIRED STANDBY CAPACITY (AMP-HOURS)	REQUIRED DIALARM CAPACITY (AMP-HOURS)	TOTAL CAPACITY (AMP-HOURS)	TOTAL CAPACITY (AMP-HOURS)	SAFETY FACTOR	ADJUSTED BATTERY CAPACITY (AMP-HOURS)	BATTERY HOURS SUPPLIED		
	1.8000	X	0.0630 =	1.8630	1.8630 X	120% =	2.24 X		
BATTERY QTY: 1									

RPS MODEL NUMBER: AL600UL-ADA RPS# A DATE: 1-May-2022														
ITEM	DESCRIPTION	STANDBY CURRENT PER UNIT (AMPS)		QTY	TOTAL STANDBY CURRENT PER ITEM	ALARM CURRENT PER UNIT (AMPS)		QTY	TOTAL ALARM CURRENT PER ITEM					
RPS	MAIN BOARD	0.0750	X	1	=	0.0750		X	1	=	0.0750			
CKT #1	CIRCUIT #A1	0.0000	X	1	=	0.0000		1.0000	X	1	=	1.0000		
CKT #2	CIRCUIT #A2	0.0000	X	1	=	0.0000		0.9860	X	1	=	0.9860		
CKT #3	CIRCUIT #A3	0.0000	X	1	=	0.0000		0.6850	X	1	=	0.6850		
CKT #4	CIRCUIT #A4	0.0000	X	1	=	0.0000		0.5940	X	1	=	0.5940		
AUX	AUX POWER	0.0000	X	1	=	0.0000		0.0000	X	1	=	0.0000		
					TOTAL SYSTEM						TOTAL SYSTEM		MAX AMP	
					STANDBY CURRENT (AMPS)	0.0750						ALARM CURRENT (AMPS)	3.4400	7.85SS
SITE: PRIME PHYSICAL THERAPY, 1153 NE RICE ROAD, LEES SUMMIT, MO 64086														
		REQUIRED STANDBY TIME (HRS)			TOTAL SYSTEM STANDBY CURRENT (AMPS)	0.0750		REQUIRED ALARM TIME (HOURS) MIN=0.084 15 MINUS 2% 0.084		TOTAL SYSTEM ALARM CURRENT (AMPS)	3.4400		REQUIRED ALARM CAPACITY (AMP-HOURS)	
		24	X		0.0750 =	1.8000			X		5.4400 =	0.2890		
Prepared by: KCFs, 901 E LOULOU, OLATHE, KS 66061.														
		REQUIRED STANDBY CAPACITY (AMP-HOURS)			REQUIRED ALARM CAPACITY (AMP-HOURS)			TOTAL CAPACITY (AMP-HOURS)		TOTAL CAPACITY (AMP-HOURS)		SAFETY FACTOR	ADJUSTED BATTERY CAPACITY (AMP-HOURS)	BATTERY AMP-HOURS SUPPLIED
		1.44	*	0.2890	=			2.0890		2.0890	X	120%	2.51	7
BATTERY QTY: 2														

KFCES

NAC Voltage Drop Calculator for Audio / Visual devices

Point to Point Method										CIRCUIT MAX CURRENT				
CIRCUIT IS WITHIN LIMITS										CIRCUIT IS WITHIN LIMITS				
Project Name		PRIME PHYSICAL THERAPY												
Date		3-May-2022												
Circuit Number		At												
Area Covered		PRIME PT												
Nominal System Voltage		20.4												
Minimum Device Voltage		10												
Total Circuit Current		0.594												
		Wire Gauge												
		80 15 4.89												
		16 4.89												
Distance from source to 1st device										Standard Wire Resistance in Ohms per 1000 feet.				
Wire Gauge for balance of circuit										18=7.77 16=4.89 14=3.07 12=1.98 10=1.24				
Enter current in amps.										18-14 AWG = Solid Conductors 12-10 AWG = Stranded Conductors				
0.150 = 150 m														
Device Number	Device Current	Distance from previous device	At source	Voltage Drop from source	Notes:									
A4.01	0.080	80	19.94	0.465	2.26%	Wire resistance is doubled in the calculations for two wires (Positive and Negative). The voltage calculated to the last device must not be more than the manufactures listed operating voltage (IE: rated operating voltage 16-33VDC).								
A4.02	0.071	18	19.86	0.553	2.71%									
A4.03	0.041	13	19.79	0.609	2.98%									
A4.04	0.056	13	19.74	0.658	3.23%									
A4.05	0.017	10	19.68	0.763	3.85%									
A4.06	0.041	8	19.68	0.717	3.51%									
A4.07	0.041	6	19.67	0.733	3.59%									
A4.08	0.041	9	19.66	0.753	3.69%									
A4.09	0.187	30	19.59	0.808	3.96%									
END			19.59	0.808	3.96%									
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END														

18/2 NON SHIELDED (PLENUM RATED) IDC SLC

16/2 NON SHIELDED (PLENUM RATED) NAC/STROBE NAC

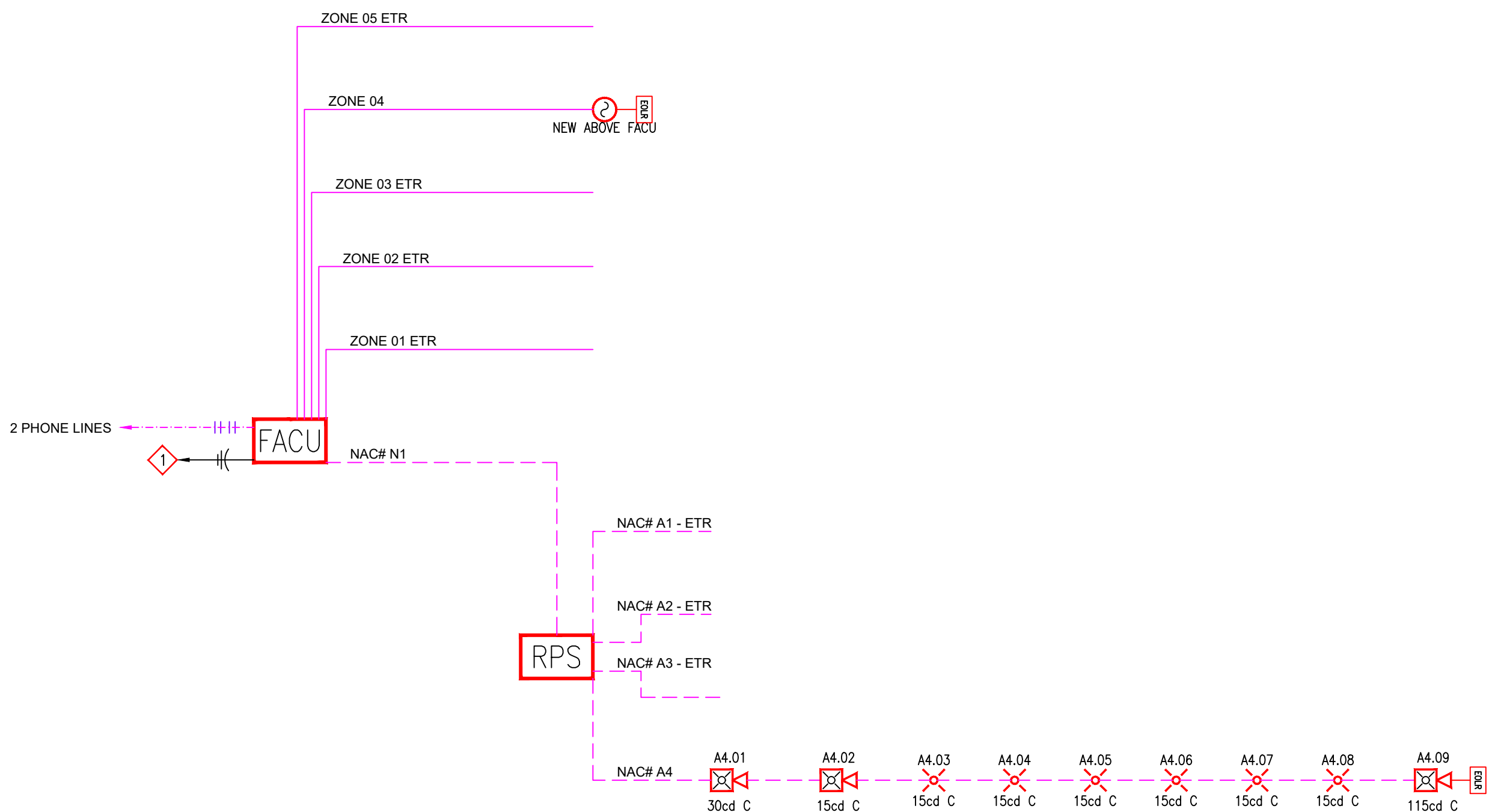
16/2 NON SHIELDED (PLENUM RATED) 24VDC 24V

18/4 NON SHIELDED (PLENUM RATED) ANNUNCIATOR/RTS

LOOP # → LX.X.XX → DEVICE DESIGNATOR (0=DETECTOR, 1=MODULE)
 → DEVICE ADDRESS
 NOTIFICATION APPLIANCE
 CIRCUIT NUMBER → XX.XX → DEVICE #
 PANEL DESIGNATOR
 (N=FACU, S=SPEAKER CKT, A=RPS #1, B=RPS #2, ETC.)

- 1 120VAC (BY OTHERS)
- 2 HOME RUN TO FACU OR RPS

WP = WEATHER RESISTANT. ETR = EXISTING TO REMAIN.
ROR = RATE OF RISE. RCP = REFLECTED CEILING PLAN.
HAZ RATED = SPECIAL HAZARDOUS ENVIRONMENT RATED DEVICES.
NIC = NOT IN CONSTRUCTION. TI = TENANT IMPROVEMENT.

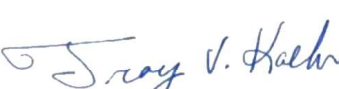


SYSTEM RISER DIAGRAM

SCALE: NONE

FIRE ALARM SYMBOLS		
ICON	DESCRIPTION	MOUNTING REQUIREMENTS
FAU	FIRE LITE MS-502 FIRE ALARM CONTROL PANEL	SURFACE MOUNTED ENCLOSURE PROVIDED, TOP 72" AFF; CONDUIT TO CEILING
ANN	ANN-80 FIRE ALARM REMOTE ANNUNCIATOR	4" SQUARE, 1-1/2" STANDARD BOX, W/ SINGLE MUD RING; CONDUIT TO CEILING
ENC	ESC-50/100 50 WATT, 25V VOLTS EVAC PANEL	4" SQUARE MOUNTED ENCLOSURE PROVIDED, TOP 72" AFF; CONDUIT TO CEILING
RPS	AL600U-4A POWER SUPPLY PANEL	SURFACE MOUNTED ENCLOSURE PROVIDED, TOP 72" AFF; CONDUIT TO CEILING
2WB	2WB PHOTO SMOKE DETECTOR	4" SQUARE, 1-1/2" STANDARD BOX W/ SINGLE MUD RING; NO HIGHER THAN 30" AFF
1WB	1WB THERMAL DETECTOR	4" SQUARE, 1-1/2" STANDARD BOX W/ SINGLE MUD RING; NO HIGHER THAN 30" AFF
D2, D4/D20	D2, D4/D20 PHOTO SMOKE DUAL DETECTOR	INSTALL PER MANUFACTURER SPECIFICATIONS
MS-7	MS-7 MANUAL PULL STATION	4" SQUARE, 1-1/2" STANDARD BOX W/ SINGLE MUD RING; 48" AFF & 8" FROM DOOR, CONDUIT TO CEILING
N/A	N/A SINGLE MONITOR MODULE	4" SQUARE, 2-1/8" DEEP BOX; CONDUIT TO CEILING
N/A	N/A QUAD MONITOR MODULE	4" SQUARE, 2-1/8" DEEP BOX; CONDUIT TO CEILING
N/A	N/A QUAD RELAY MODULE	4" SQUARE, 2-1/8" DEEP BOX; CONDUIT TO CEILING
SC, SCR, SW, SCW	SC, SCR, SW, SCW ALARM STROBE, CANDELA SHOWN	WALL MOUNTED, 80"-96" AFF OR (C) = CEILING MOUNTED; WALL MOUNTED, 80"-96" AFF OR (C) = CEILING MOUNTED;
P2R, P2R, P2M, P2W	P2R, P2R, P2M, P2W HORN/STROBE, CANDELA SHOWN	WALL MOUNTED, 80"-96" AFF OR (C) = CEILING MOUNTED; 4" SQUARE, 1-1/2" STANDARD BOX W/ SINGLE MUD RING
END OF LINE RESISTOR	END OF LINE RESISTOR PROVIDED BY CONTROL DEVICE	INSTALL AT THE LAST DEVICE OF THAT CIRCUIT
SPRINKLER FLOW SWITCH	SPRINKLER FLOW SWITCH	HANDY BOX INSTALLED ON SWITCH; THEN INSTALL 1/2" FLEX CONDUIT TO 4" SQUARE, 2-1/8" DEEP BOX ON WALL
SPRINKLER TAMPER SWITCH	SPRINKLER TAMPER SWITCH	HANDY BOX INSTALLED ON SWITCH; THEN INSTALL 1/2" FLEX CONDUIT TO 4" SQUARE, 2-1/8" DEEP BOX ON WALL
PIV	PIV STOP INDICATOR VALVE	1/2" WATER TIGHT FLEX CONDUIT FROM SWITCH TO WEATHERPROOF SINGLE GANG BOX ON U.G. CONDUIT
KITCHEN HOOD SUPPRESSION SYSTEM	KITCHEN HOOD SUPPRESSION SYSTEM	4" SQUARE, 2-1/8" DEEP BOX; CONDUIT TO CEILING
MJM M003-LT-FIRE CELLULAR COMMUNICATOR	MJM M003-LT-FIRE CELLULAR COMMUNICATOR	BW-98RUL ENCLOSURE, CONDUIT TO FACU.
N/A	N/A 2-1/2" MOUNTED FIRE ALARM CABLES	4" SQUARE, 2-1/8" DEEP BOX, BLANK COVER; CONDUIT TO CEILING

NOTE: NOT ALL SYMBOLS APPLY TO CURRENT PROJECT

AHJ SEAL	PROP SEAL
	 NICET III #111458

Kansas City Fire & Security
901 E. Loula - Olathe, KS 66061
(913) 780-5237 FAX (913) 780-3473
"Protecting Kansas City"

Job:	12225		
Drawing:	FA.6.01	Sheet:	3 OF 3
Scale:	NTS		
Descr:	FIRE ALARM		

DESCRIPTION:
FL MS-5012
CALCS & RISER

REVISION	DATE

NICET FIRE ALARM LEVEL III
Troy V. Koehn
901 EAST LOULA
OLATHE, KS 66061
913-780-5237

LEE'S SUMMIT

[illegible]

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Age Group	2006	2007	2008
18-29	~85	~85	~85
30-49	~75	~75	~75
50-69	~65	~65	~65
70+	~55	~55	~55



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10. *Journal of the American Medical Association*, 2000; 283: 2689-2693.