

**FIRE ALARM SITE PLAN**  
SCALE: None FOR REFERENCE ONLY  
NORTH

**LEGEND**

- (Quantities for entire building)
- FACP** (1) Fire Lite MS-9600DLS Fire Alarm Control Panel
  - FAPS** (8) Silent Knight 5495 6 Amp Power Supply
  - PWR** (2) 24 VDC 1 Amp. output Power Supply, 120 VAC input (No backup batteries required)
  - FAAP** (1) LCD-80F Fire Lite Annunciator Panel
  - S** (135) Fire Lite SD355 Addressable Smoke Detector
  - F** (1) Fire Lite BG-12LX Manual Pull Station (MPS)
  - MM** (45) Fire Lite MMF-300 Std Size Monitor Module (MM)
  - RM** (41) Fire Lite CRF-300 Relay Module (RM)
  - H** (4) Fire Lite H355 Addressable 135° Heat Detector (HD)
  - CM** (6) Fire Lite CMF-300 Control Module (CM)
  - LP<sub>vc</sub>** (9) Ditek DKT-120HW 120VAC Lightning Protection Device
  - FS** (10) Sprinkler Flow Switch (By Others)
  - TS** (26) Sprinkler Tamper Switch (By Others)
  - PS** (1) Sprinkler Tamper Switch (By Others)
  - xx** (189) System Sensor P2W Horn Strobe (15cd 79mA; 30cd 107mA; 75cd 176mA @ 16-33 VDC)
  - xx** (29) System Sensor SW Horn Strobe (15cd 66mA; 30cd 94mA; 75cd 158mA @ 16-33 VDC)
  - 177** (11) System Sensor SCWH Strobe (177cd 281mA@16-33)
  - xx** (23) System Sensor SCW Strobe (15cd 66mA; 30cd 94mA; 75cd 158mA @ 16-33 VDC)
  - xx** (2) System Sensor SCW Strobe (30cd 94mA; 75cd 158mA @ 16-33 VDC)
  - 801** (801) System Sensor MHW Mini-Horn (69 mA @16-33 VDC)
  - 86** (86) System Sensor HW Horn (69 mA @16-33 VDC)
  - R** (2) Fire Lite MR-101/CR Control Relay
  - HD** (86) GE Interlogix ESL DHX-24120 Door Holder (15 mA)
  - FSD** (31) Fire Smoke Dampers (By Others)

**ABBREVIATIONS**

- EL - Elevator Lobby
- EMR - Elevator Machine Room
- PFR - Primary Floor Recall
- AFR - Alternate Floor Recall
- CAB - Alarm Signal in Elevator Cab
- STP - Shunt Trip Power
- ES - Elevator Shutdown
- SD - Smoke Detector
- HD - Heat Detector
- AV - Audiovisual
- MA - Milliampere
- HC - Handicapped
- HI - Hearing Impaired
- EOL - End-of-line Resistor
- c - circuit
- g & ga - wire gauge
- FACP - Fire Alarm Control Panel
- FAPS - Fire Alarm Power Supply
- NAC - Notification Appliance Circuit
- WP - Weatherproof
- DN - Down
- MPS - Manual Pull Station
- FCA - Floor Control Assembly
- DSD - Duct Smoke Detector
- FD - Fire Door
- SIV - Standpipe Isolation Valve
- CSAR - Corridor Supply Air Riser
- STG - Storage

**FIRE ALARM NOTES**

1. The scope of work is to install a fire alarm system in new 4-story, R-2 apartment buildings (2). Each building contains a NFPA 13R automatic sprinkler system. The protected building have an occupancy classification of R-2 multifamily with an A-3 Clubhouse & Leasing Office. Buildings are divided into separate areas with 2-hour fire walls and fire doors assemblies in corridors. An S-2 Parking garage is located adjacent to the property. No fire alarm system is required in an S-2 occupancy per IFC (2009) 907.
  2. The fire alarm system is designed to meet the requirements of NFPA 72 (2007) and IFC (2009) 907.2.9 Group R-2 occupancy. The system monitors the sprinkler flow and tamper switches, smoke detectors in the elevator lobbies and at the fire doors and the system manual pull station. Upon a signal from any of these, audible alarm notification is provided to apartment building occupants per IFC (2009) 907.6.2. Visual notification is provided inside building corridors, elevator lobbies and other common/occupiable areas. The fire pump is monitored for pump running, phase reversal and electrical power.
  3. The fire alarm control panel (FACP) is located in the Leasing Office Work Room. An Annunciator is located in the Leasing Office lobby.
  4. Fire door closure (release) service is provided by ceiling mounted smoke detectors installed in accordance with NFPA 72 (2007) 5.16.6.1 (1) On centerline of the doorway (2) No more than 5' measured along the ceiling and perpendicular to the doorway (3) no closer than 12" to the doorway. Two 24 VDC power supplies shall be used to provide power for the electromagnetic door holders. The primary power to the 24 VDC power supplies is the building's 120 VAC supply. No secondary power (battery backup) is required. The fire doors will release with loss of AC power.
  5. Spot smoke detectors are provided to actuate the FSD units in the corridors. Ceiling mounted smoke detector are installed within 5 feet, horizontally, of the FSD units in accordance with IBC (2009) Section 716.3.3.2 method 3.
  6. Monitor modules shall be installed in the fourth floor corridor ceiling to monitor the duct mounted smoke detectors installed in the air handler units on the roof.
  7. Single station (120VAC) smoke detectors are provided in all apartment units per IFC (2009) 907.2.11.2 but are NOT part of this system and are furnished, installed and tested by others. See the project electrical plans for exact locations.
  8. A single Manual Pull Station is provided in accordance with NFPA 72 (2007) 6.8.5.1.2. This design locates the manual pull station adjacent to the FACP in the fire pump room.
  9. The FACP reports all alarms, trouble and supervisory signals to a 24 hour monitoring Central Station Via DACT.
  10. All devices shall be installed where shown on the plans and in accordance with manufacturer's requirements:
- Manual Pull Station shall be installed with the operating handle at 48" AFF
- Wall mounted A/V's and strobes shall be mounted with the entire lens between 80" and 96" AFF. Exterior units shall be listed for outdoor service.
- Audible alarms (mini-horns) inside the units shall be ceiling mounted except in furdowns where they shall be wall mounted with their top at 90" AFF or 6" below finished ceilings, whichever is lower. Exterior units shall be listed for outdoor service.
- Smoke detectors shall be ceiling mounted in accordance with NFPA 72 and manufacturers requirements.
11. All wiring shall be in accordance with NFPA 70, Article 760 & 800. All exposed wire shall be installed inside 1/2" metallic conduit (refer to project specs and NEC). Concealed wires in walls, floor-ceiling spaces and attics may be installed without conduit.
  12. Signal Line Circuit (SLC) shall be Class 'B', Style 4 (T-taps allowed) with 16g, FPLR cable. refer to manufacturer's data sheets for backbox sizes and terminations requirements. SLC cable shall be separated from AC power, telephone or intercom wiring by 6 inches.
  13. A dedicated 120 VAC branch circuit (20 amps) shall be provided as the primary power for each FACP. Location of the dedicated branch circuit disconnecting means shall be permanently identified at the control unit. Additionally, the circuit disconnecting means shall be identified as "FIRE ALARM CIRCUIT", have a red marking and shall only be accessible to authorized personnel.
  14. Initiating Device Circuit (IDC) shall be wired Class B with 16g, FPLR cable.
  15. Notification Appliance Circuits (NAC) shall be wired Class B with 14g, FPLR cable.
  16. All fire rated penetrations shall be sealed with one-hour or two-hour UL listed firestop systems as required by the rating of the assembly.
  17. Following completion of the installation, system shall be tested in accordance with NFPA 72, Chapter 10.
  18. Ceiling height: 8'-0" unless otherwise noted. Construction: gypsum board with textured finish.
  19. All fire alarm wiring in the stairways, garage, fire pump room & trash compactor room shall be installed in conduit. See electrical specifications for conduit requirements.
  20. Refer to Fire Lite MS-9600 installation manual for system wiring and backbox requirements. Installer shall follow all manufacturer's recommendations.
  21. Point identification of initiating devices is shown adjacent to each device. The first number is the SLC (1 or 2) and the second number is the device ID number.

**SEQUENCE OF OPERATION:**

In the event of a signal from a manual pull station, smoke/heat detector, or sprinkler flow switch a general building alarm to all occupants shall initiate and a fire alarm signal transmitted to the Central Station via DACT. Door holder power is turned off and fire doors close. Power to corridor FSD's will be turned off and FDS's will close.

Elevator recall shall be initiated per ANSI A17.1 (see elevator recall sequence).

The occupant notification signal shall be audible and visual alarms. Strobes shall be synchronized and audible shall be a three-pulse temporal pattern and synchronized. Strobes in all Hearing Impaired Designated Rooms shall flash.

In the event of a trouble signal (power outage, broken wire, zone trouble, etc.) the fire alarm control panel shall emit a local tone and transmit a trouble signal to the central station via DACT.

In the event of a tamper switch, loss of shunt trip power, duct smoke detector or a low or high air pressure alarm from the sprinkler dry system, the fire alarm control panel shall emit a local tone and transmit a supervisory signal to the central station via DACT.

In Hearing Impaired Rooms, operation of a single station smoke detector will cause the visual signals (strobes) within that unit to flash.

**AUDIBILITY REQUIREMENT**

Audibility throughout each unit shall be as follows:  
Minimum 75 dBA at the pillow level in each sleeping room  
Minimum 75 dBA in all other areas of the unit and building or 15dBA above ambient sound levels or 5dBA above maximum sound levels that exceed 60 seconds, whichever is greater. Installer shall field verify actual sound level after installation in accordance with NFPA 72 Chapter 10 (See Note 17).

**HEARING IMPAIRED UNITS**

All units are capable of supporting visual alarms in accordance with IFC 2009 907.6.2.3.4. At this time, eight (8) units have been designated for Hearing Impaired Occupants. These units have been equipped of visual alarms (strobes) which shall be activated by both the in-room single station smoke detector and the building fire alarm system. One in-room single station smoke detector must have an internal auxiliary relay. This relay shall be monitored by the FACP via an addressable module (MM). Upon smoke detector actuation, an addressable control module (CM) shall operate the strobes in this unit only. Upon actuation of the general alarm, the CM's in the hearing impaired units shall operate all the strobes in each unit. The single station smoke detector with internal auxiliary relay is furnished by the electrical contractor. Refer the project electrical plans for locations.

**ELEVATOR & MACHINE ROOM**

1. Install addressable relays and monitor modules as shown to initiate elevator recall and elevator shutdown in accordance with ANSI A17.1.
2. A sprinkler is installed at the bottom and the top of the elevator shaft. A 135 Deg. F. heat detector shall be installed at the top of the hoistway to shutoff power to the elevator prior to water being discharged. A smoke detector shall be installed at the top of the elevator shaft to provide elevator recall.
3. Provide supervision of shunt trip power. See detail on FA 6.

**ELEVATOR EMERGENCY RECALL**

Operation of any smoke detector in an elevator lobby or the machine room shall initiate fireman recall.

**ELEVATOR #1 & #2:**

1. In the event of level 1 elevator lobby smoke detector operation, elevator shall recall to level 2.
2. In the event of level 2, 3 or 4 elevator lobby smoke detector operation, elevator shall recall to level 1.
3. In the event of elevator machine room smoke detector operation, elevator shall recall to level 2. Warning lights inside cab shall also operate.

Operation of a smoke detector in the EMR or at the top of the elevator shaft shall initiate recall. Operation of a heat detector in the EMR or at the top of the elevator shaft shall initiate power shutdown via the shunt trip breaker. Power to the shunt breaker shall be supervised via the FACP.

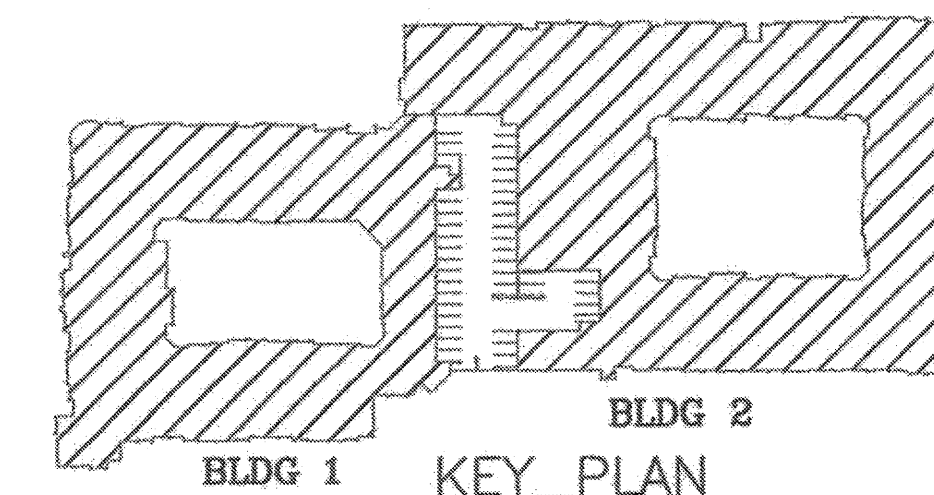
**TELEPHONE PROVIDER NOTE:**

Owner shall furnish two (2) publicly switched telephone lines. service shall be from a reliable source approved by its provider for fire alarm signal transmission. VOIP lines are not acceptable. Telephone service must be capable of operation during a power outage at the protected premise.

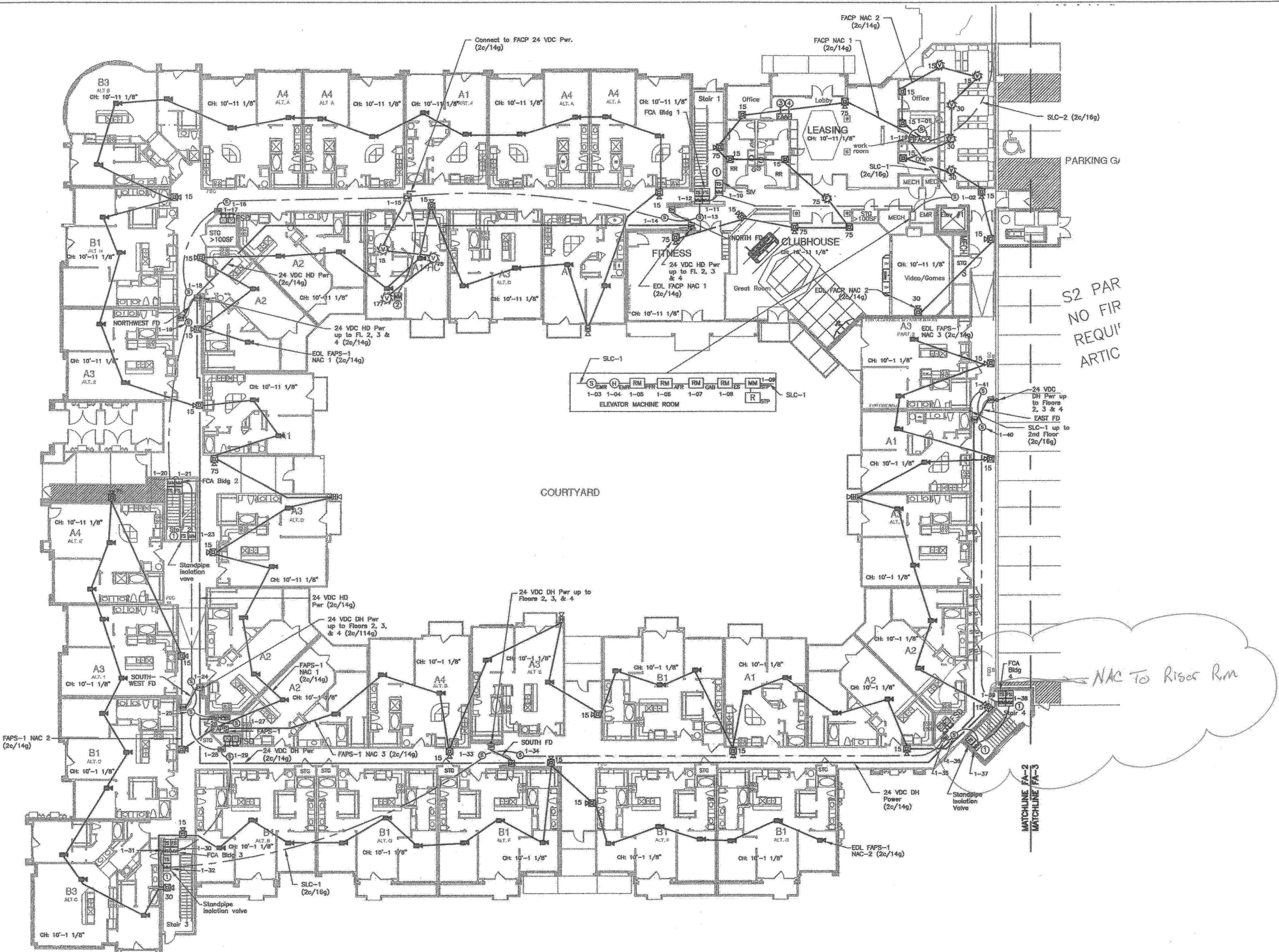
**RISER DIAGRAM**

Riser Diagram shown on drawings FA 10 and FA 11.

ISSUED FOR APPROVAL  
Philip R. Haught, P.E. #21366  
Fire Protection Engineering, LLC  
Registration No. F-2535  
Date: 7/13/2012



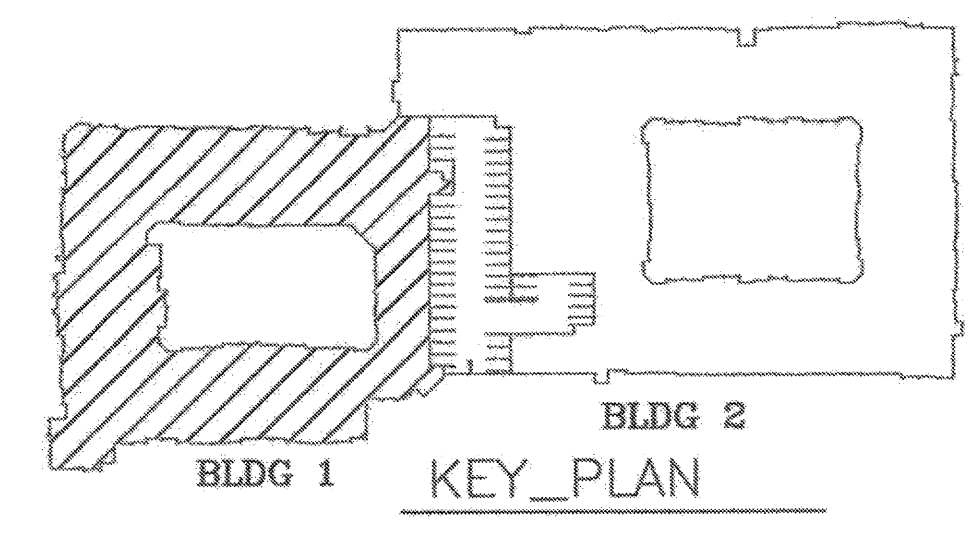
DRAWN BY: PRH  
APPROVED BY: FDH  
ENGINEER: Fire Protection Engineering, L.L.C. P.O. Box 180836 Austin, TX 78716 512/328-1717 TBPE Firm F-2535  
Professional Engineer Seal: PHILIP R. HAUGHT, 21366, LICENSED PROFESSIONAL ENGINEER, 7/13/12  
Project: Keller Springs Lofts, 4800 Keller Springs Road, Addison, Texas 75001  
Installer: Christian Cable Group, Inc., 1150 Blue Mound Road W. ste 301, Haslet, TX 76052, 817-439-5107, ACR-3219  
Revisions: 7/13/2012 Revised project address.  
SCALE: Noted  
DATE: 6/29/2012  
DRAWING NO.: FA 1  
SHEET NO. 1 OF 11



**FIRE ALARM PLAN FIRST FLOOR - BLDG 1**  
 SCALE: 1/16" = 1'-0"  
 NORTH

NAC WIRE SIZE - 14 GAUGE  
 SLC WIRE SIZE - 16 GAUGE

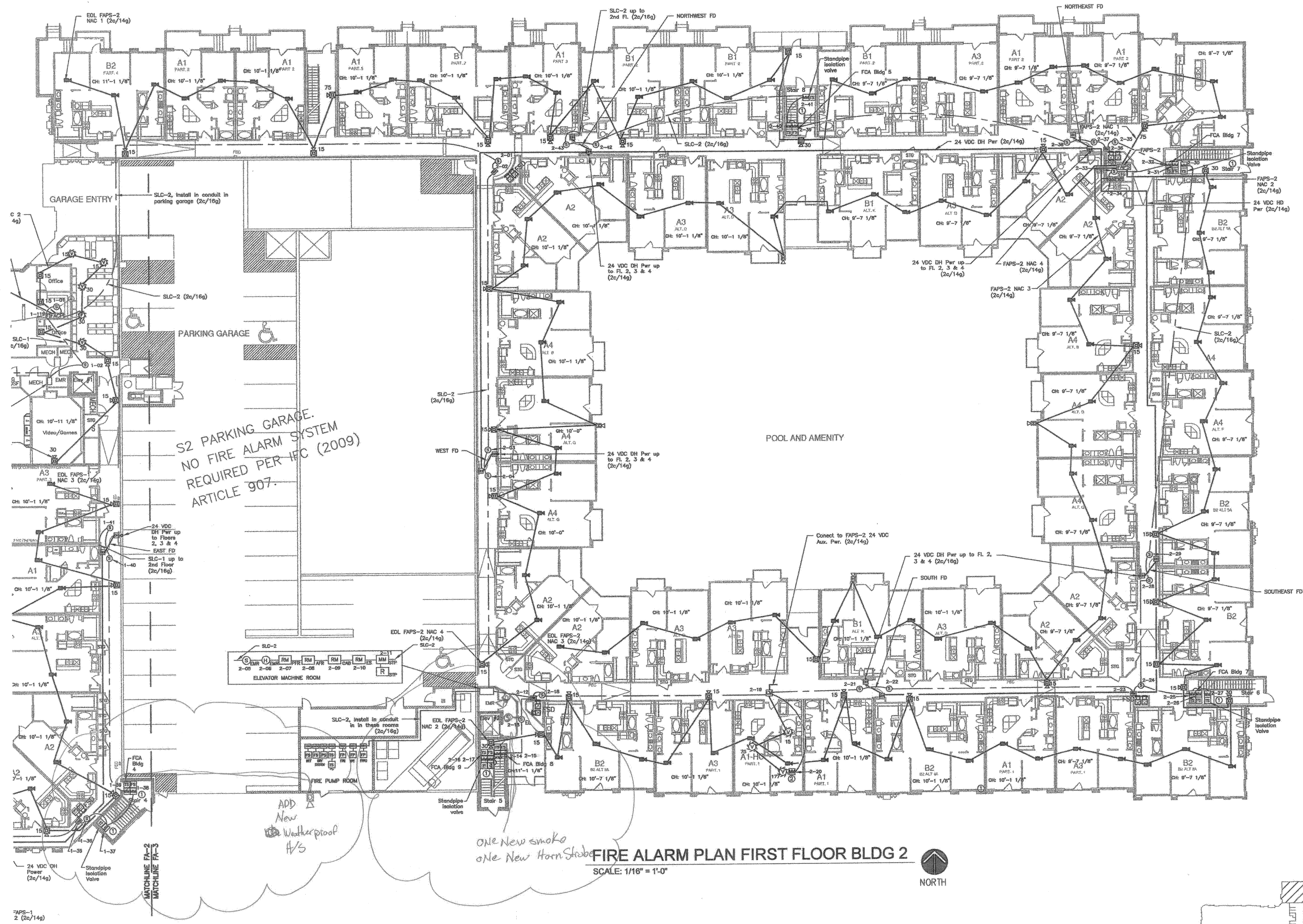
ISSUED FOR APPROVAL  
 Philip R. Haight, P.E. #21366  
 Fire Protection Engineering, LLC  
 Registration No. F-2535  
 Date: 7/13/2012



**KEYED NOTES:**

- 1 All wiring in stairways shall be installed in conduit. See Electrical specifications for conduit requirements.
- 2 Install on ceiling adjacent to in-room smoke detector (SD) & connect to Aux. relay in SD base.
- 3 Connect to EIA-485 in FACP (Two 16ga Twisted, Pair Shielded Cable)
- 4 Connect to 24 VDC Aux. Pwr. in FACP

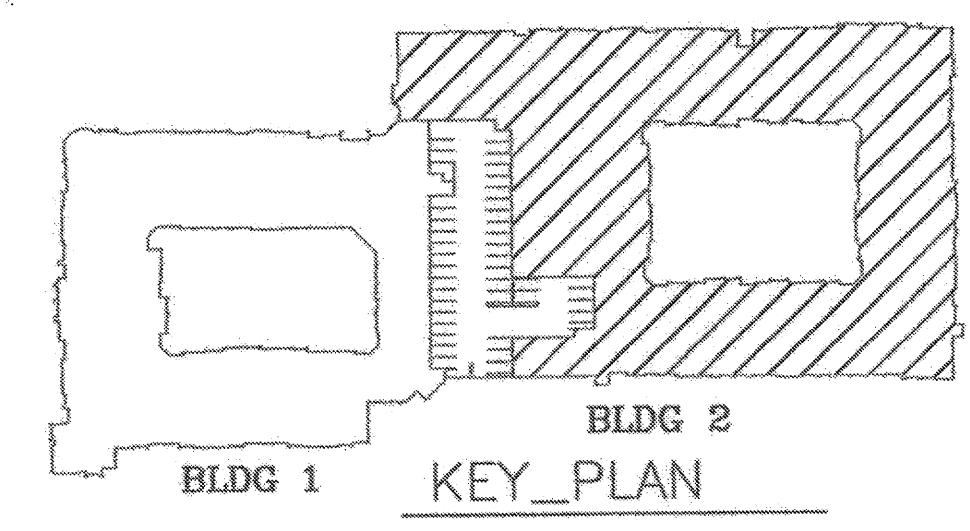
DRAWN BY: <b>PRH</b>
APPROVED BY: <b>FDH</b>
ENGINEER: Fire Protection Engineering, L.L.C. P.O. Box 160836 Austin, TX 78716 512/328-1717 TBPE Firm F-2535
<p style="text-align: center;">▲ Project:  <b>Keller Springs Lofts</b>        4800 Keller Springs Road        Addison, Texas 75001</p>
<p style="text-align: center;">Installer:  <b>Christian Cable Group, Inc.</b>        1150 Blue Mound Road W. ste 301        Haslet, TX 76062        817-439-5107</p>
<p style="text-align: right;">ACR-3219</p>
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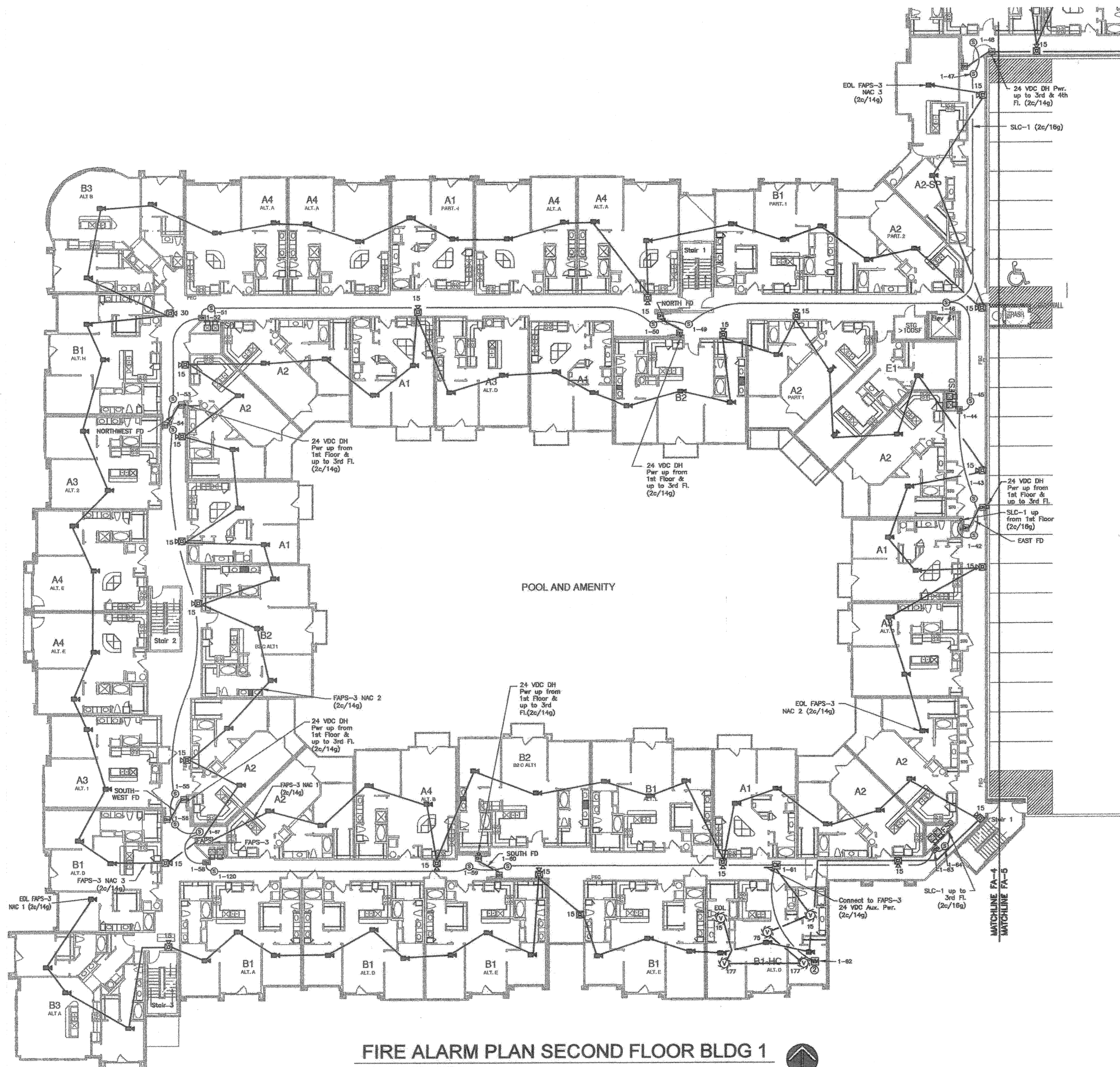
**FIRE ALARM PLAN FIRST FLOOR BLDG 2**  
 SCALE: 1/16" = 1'-0"  
 NORTH

NAC WIRE SIZE - 14 GAUGE  
 SLC WIRE SIZE - 16 GAUGE

ISSUED FOR APPROVAL  
 Philip R. Hought, P.E. #21366  
 Fire Protection Engineering, LLC  
 Registration No. F-2535  
 Date: 7/13/2012



DRAWN BY: PRH
APPROVED BY: FDH
ENGINEER: Fire Protection Engineering, L.L.C. P.O. Box 160836 Austin, TX 78716 512/328-1717 TBPE Firm F-2535
Project: Keller Springs Lofts 4800 Keller Springs Road Addison, Texas 75001
Installer: Christian Cable Group, Inc. 1150 Blue Mound Road W. Ste 301 Haslet, TX 76052 817-439-5107
Revisions: 7/13/2012 Revised project address.
SCALE: Noted
DATE: 6/29/2012
DRAWING NO. FA 3
SHEET NO. 3 OF 11



**FIRE ALARM PLAN SECOND FLOOR BLDG 1**  
 SCALE: 1/16" = 1'-0"  
 NORTH

NAC WIRE SIZE - 14 GAUGE  
 SLC WIRE SIZE - 16 GAUGE

**BATTERY CALCULATIONS**

**FIRE ALARM CONTROL PANEL**

DEVICE	STANDBY	ALARM
MS-9600UDLS	103 MA	253 MA
LCD-80F	25 MA	64 MA
BG-12LX (1)	0.3 MA	800 MA (Max.)
SD355 (135)	40 MA	Incl.
H355 (4)	1.2 MA	Incl.
DACT-UD2	17 MA	Incl.
MMF-301 (45)	16.9 MA	Incl.
CRF-300 (41)	11 MA	Incl.
CMF-300 (8)	3.1 MA	Incl.
ALARM CIRCUITS	0 MA	2205 MA
<b>TOTAL</b>	<b>214.5 MA</b>	<b>3351 MA</b>

TOTAL STANDBY: 214.5 MA x 24 hrs = 5.1 AH  
 TOTAL ALARM: 3351 MA x 5 MINUTES = 0.3 AH  
 TOTAL CURRENT DRAW: 5.4 AH  
 DERATING FACTOR: 1.2  
 MINIMUM BATTERY CAPACITY: 6.5 AH  
 TOTAL CURRENT DRAW: 3.6 AMPS

**VOLTAGE DROP - FACP NA Circuits**  
 NAC 1: (1st Floor) current draw: 1.315 Amps  
 Maximum allowable voltage drop: 4.4 VDC (20.4-16VDC)  
 (Note: A/V's are rated 16-33 VDC)  
 Wire Resistance (14g): 3.0 Ohms/1000 ft  
 Design wire distance (scaled from plan): <190 ft.  
 Calculated Voltage Drop: 1.5 VDC\*

NAC 2: (1st Floor) current draw: 0.88 Amps  
 Maximum allowable voltage drop: 4.4 VDC (20.4-16VDC)  
 (Note: A/V's are rated 16-33 VDC)  
 Wire Resistance (14g): 3.0 Ohms/1000 ft  
 Design wire distance (scaled from plan): <160 ft.  
 Calculated Voltage Drop: 0.9 VDC\*

NAC 3: Control Circuit to activate Power Supplies  
 NAC 4: Not Used

**POWER SUPPLY CALCULATIONS**

**FAPS-1 Bldg 1**  
 Silent Knight 5495 (6 Amp)  
 24 Hours Standby, 5 Minutes Alarm  
 SK 5495 Standby 75mA Alarm 175mA  
 NAC 1 (10AV; 34MH) Standby 0mA Alarm 1445mA  
 NAC 2 (7AV; 25MH) Standby 0mA Alarm 1090mA  
 NAC 3 (7AV; 20MH) Standby 0mA Alarm 1031mA  
 NAC 4 Not Used  
 Total standby: 75 mA x 24hrs = 1.8 AH  
 Total alarm: 3741 mA x 5 minutes = .3 AH  
 Total current draw: 2.1 AH  
 Derating factor 1.2  
 Battery requirement: 2.5 AH  
 Battery supplied: (2) 7 AH-12 V in Series  
 Total Current Draw: 3.8 Amps

**FAPS-2 Bldg 2**  
 Silent Knight 5495 (6 Amp)  
 24 Hours Standby, 5 Minutes Alarm  
 SK 5495 Standby 75mA Alarm 175mA  
 NAC 1 (9AV; 31MH) Standby 0mA Alarm 1447mA  
 NAC 2 (12AV; 32MH) Standby 0mA Alarm 1563mA  
 NAC 3 (5AV; 23MH) Standby 0mA Alarm 753mA  
 NAC 4 (7AV; 23MH) Standby 0mA Alarm 924mA  
 AUX. PWR. (5Visual) Standby 0mA Alarm 505mA  
 Total standby: 75mA x 24hrs = 1.8 AH  
 Total alarm: 4862 mA x 5 minutes = .4 AH  
 Total current draw: 2.2 AH  
 Derating factor 1.2  
 Battery requirement: 2.6 AH  
 Battery supplied: (2) 7 AH-12 V in Series  
 Total Current Draw: 4.9 Amps

**FAPS-3 Bldg 1**  
 Silent Knight 5495 (6 Amp)  
 24 Hours Standby, 5 Minutes Alarm  
 SK 5495 Standby 75mA Alarm 175mA  
 NAC 1 (8AV; 31MH) Standby 0mA Alarm 1260mA  
 NAC 2 (10AV; 31MH) Standby 0mA Alarm 1317mA  
 NAC 3 (5AV; 32MH) Standby 0mA Alarm 939mA  
 NAC 4 Not Used  
 AUX. PWR. (5Visual) Standby 0mA Alarm 852mA  
 Total standby: 75mA x 24hrs = 1.8 AH  
 Total alarm: 4543 mA x 5 minutes = .4 AH  
 Total current draw: 2.2 AH  
 Derating factor 1.2  
 Battery requirement: 2.6 AH  
 Battery supplied: (2) 7 AH-12 V in Series  
 Total Current Draw: 4.6 Amps

**BATTERY CALCS. CONT'D**

**FAPS-4 Bldg 2**  
 Silent Knight 5495 (6 Amp)  
 24 Hours Standby, 5 Minutes Alarm  
 SK 5495 Standby 75mA Alarm 175mA  
 NAC 1 (7AV; 31MH) Standby 0mA Alarm 1205mA  
 NAC 2 (10AV; 32MH) Standby 0mA Alarm 1321mA  
 NAC 3 (2AV; 23MH) Standby 0mA Alarm 549mA  
 NAC 4 (5AV; 23MH) Standby 0mA Alarm 702mA  
 AUX. PWR. (5Visual) Standby 0mA Alarm 505mA  
 Total standby: 75mA x 24hrs = 1.8 AH  
 Total alarm: 4504 mA x 5 minutes = .4 AH  
 Total current draw: 2.2 AH  
 Derating factor 1.2  
 Battery requirement: 2.6 AH  
 Battery supplied: (2) 7 AH-12 V in Series  
 Total Current Draw: 4.9 Amps

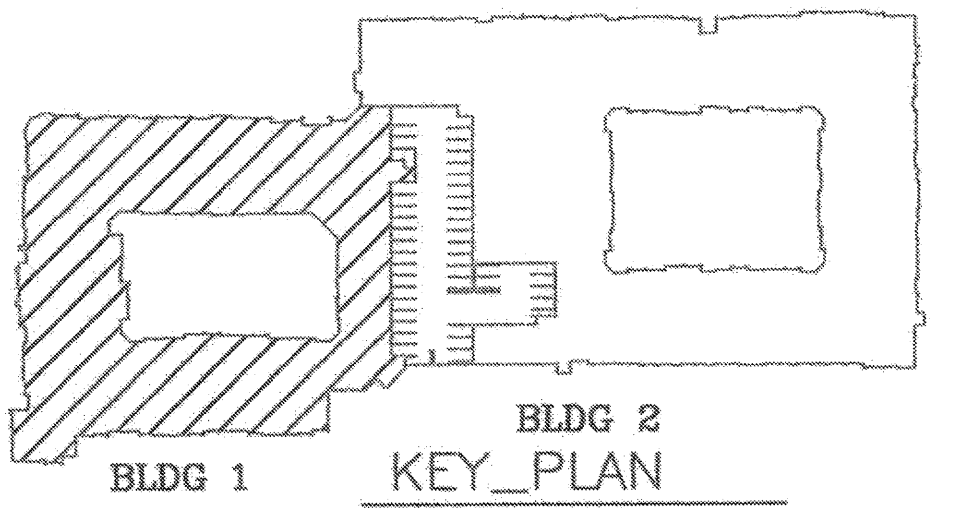
**FAPS-5 Bldg 1**  
 Silent Knight 5495 (6 Amp)  
 24 Hours Standby, 5 Minutes Alarm  
 SK 5495 Standby 75mA Alarm 175mA  
 NAC 1 (8AV; 31MH) Standby 0mA Alarm 1260mA  
 NAC 2 (10AV; 31MH) Standby 0mA Alarm 1317mA  
 NAC 3 (5AV; 32MH) Standby 0mA Alarm 939mA  
 NAC 4 Not Used  
 AUX. PWR. (5Visual) Standby 0mA Alarm 852mA  
 Total standby: 75mA x 24hrs = 1.8 AH  
 Total alarm: 4543 mA x 5 minutes = .4 AH  
 Total current draw: 2.2 AH  
 Derating factor 1.2  
 Battery requirement: 2.6 AH  
 Battery supplied: (2) 7 AH-12 V in Series  
 Total Current Draw: 4.6 Amps

**FAPS-6 Bldg 2**  
 Silent Knight 5495 (6 Amp)  
 24 Hours Standby, 5 Minutes Alarm  
 SK 5495 Standby 75mA Alarm 175mA  
 NAC 1 (7AV; 31MH) Standby 0mA Alarm 1205mA  
 NAC 2 (10AV; 32MH) Standby 0mA Alarm 1321mA  
 NAC 3 (2AV; 23MH) Standby 0mA Alarm 549mA  
 NAC 4 (5AV; 23MH) Standby 0mA Alarm 702mA  
 AUX. PWR. (5Visual) Standby 0mA Alarm 505mA  
 Total standby: 75mA x 24hrs = 1.8 AH  
 Total alarm: 4509 mA x 5 minutes = .4 AH  
 Total current draw: 2.2 AH  
 Derating factor 1.2  
 Battery requirement: 2.6 AH  
 Battery supplied: (2) 7 AH-12 V in Series  
 Total Current Draw: 4.9 Amps

**FAPS-7 Bldg 1**  
 Silent Knight 5495 (6 Amp)  
 24 Hours Standby, 5 Minutes Alarm  
 SK 5495 Standby 75mA Alarm 175mA  
 NAC 1 (8AV; 32MH) Standby 0mA Alarm 1260mA  
 NAC 2 (10AV; 31MH) Standby 0mA Alarm 1317mA  
 NAC 3 (5AV; 32MH) Standby 0mA Alarm 1031mA  
 NAC 4 Not Used  
 AUX. PWR. (5Visual) Standby 0mA Alarm 852mA  
 Total standby: 75mA x 24hrs = 1.8 AH  
 Total alarm: 4543 mA x 5 minutes = .4 AH  
 Total current draw: 2.2 AH  
 Derating factor 1.2  
 Battery requirement: 2.6 AH  
 Battery supplied: (2) 7 AH-12 V in Series  
 Total Current Draw: 4.6 Amps

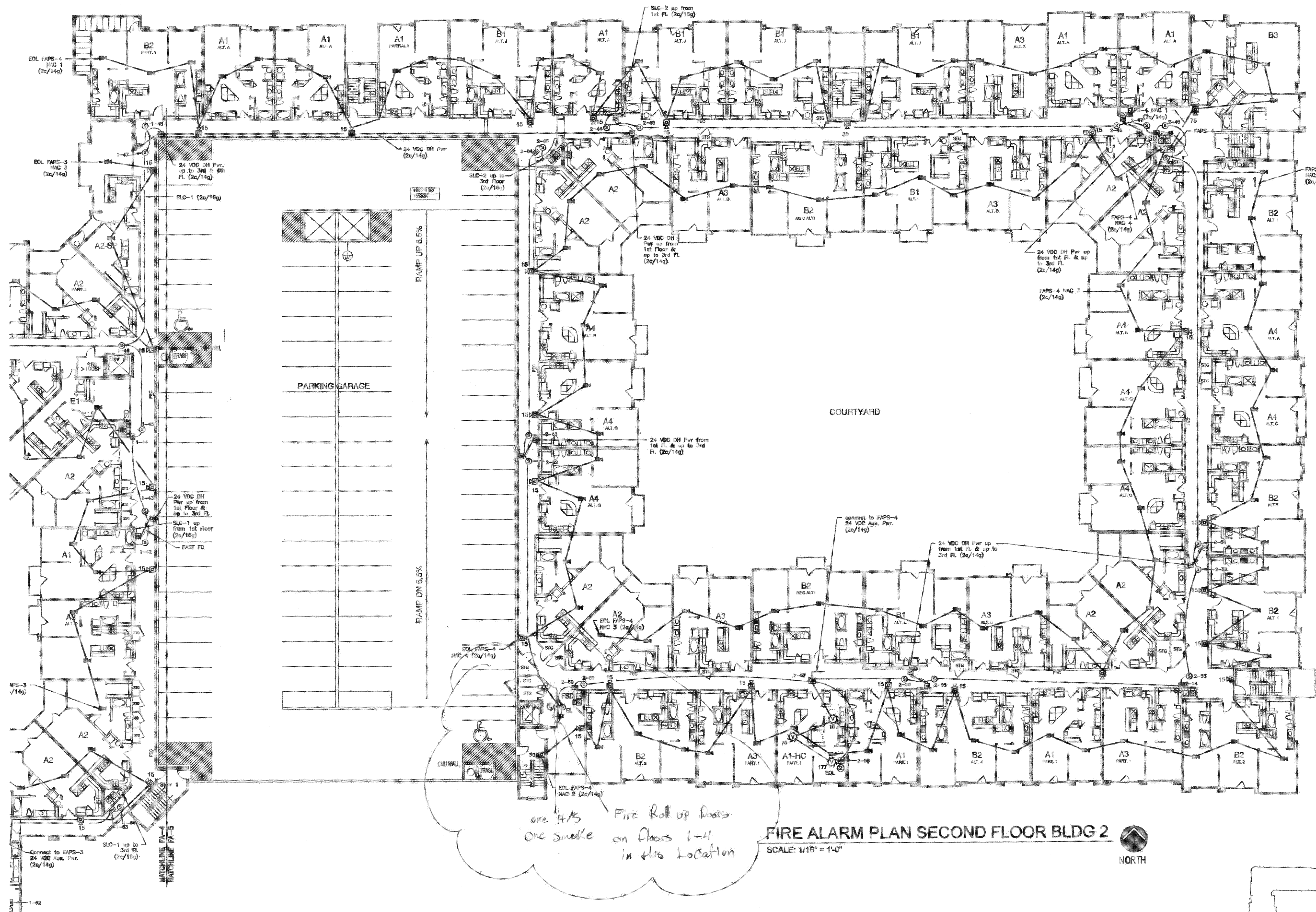
**FAPS-8 Bldg 2**  
 Silent Knight 5495 (6 Amp)  
 24 Hours Standby, 5 Minutes Alarm  
 SK 5495 Standby 75mA Alarm 175mA  
 NAC 1 (7AV; 31MH) Standby 0mA Alarm 1205mA  
 NAC 2 (10AV; 32MH) Standby 0mA Alarm 1321mA  
 NAC 3 (2AV; 23MH) Standby 0mA Alarm 549mA  
 NAC 4 (5AV; 23MH) Standby 0mA Alarm 702mA  
 AUX. PWR. (5Visual) Standby 0mA Alarm 505mA  
 Total standby: 75mA x 24hrs = 1.8 AH  
 Total alarm: 4504 mA x 5 minutes = .4 AH  
 Total current draw: 2.2 AH  
 Derating factor 1.2  
 Battery requirement: 2.6 AH  
 Battery supplied: (2) 7 AH-12 V in Series  
 Total Current Draw: 4.9 Amps

**DOOR HOLDER POWER SUPPLY**  
 Building 1 Door Holder Power Req'd.  
 20 FD x 2 DH/FD x 15 mA/DH = 600mA  
 Power Supply - 24VDC output 120VAV input  
 1,000 mA (1 Amp.) minimum  
 Building 2 Door Holder Power Req'd.  
 23 FD x 2 DH/FD x 15 mA/DH = 690mA  
 Power Supply - 24VDC output 120VAV input  
 1,000 mA (1 Amp.) minimum  
 NOTE: Secondary power (battery backup) is not required as doors will be released on loss of AC power.



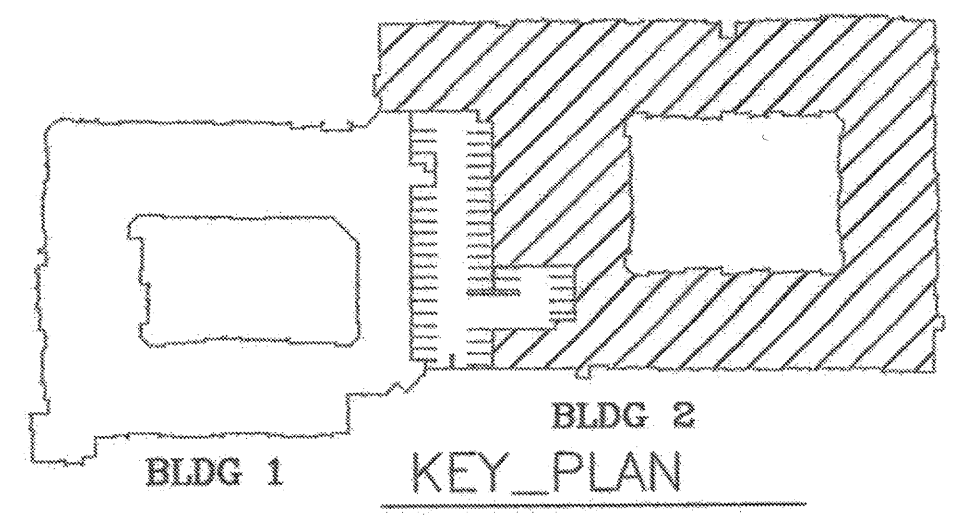
ISSUED FOR APPROVAL  
 Philip R. Hought, P.E. #21366  
 Fire Protection Engineering, LLC  
 Registration No. F-2535  
 Date: 7/15/2012

DRAWN BY: PRH  
 APPROVED BY: FDH  
 ENGINEER: Fire Protection Engineering, L.L.C.  
 P.O. Box 180836  
 Austin, TX 78716  
 512/328-1717  
 TBPE Firm F-2535  
  
 Project: Keller Springs Lofts  
 4800 Keller Springs Road  
 Addison, Texas 75001  
 Installer: Christian Cable Group, Inc.  
 1150 Blue Mound Road W. ste 301  
 Haslet, TX 76052  
 817-499-5107  
 ACR-3219  
 Revisions:  
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 SCALE: Noted  
 DATE: 6/29/2012  
 DRAWING NO. FA 4  
 SHEET NO. 4 OF 11



NAC WIRE SIZE - 14 GAUGE  
 SLC WIRE SIZE - 16 GAUGE

ISSUED FOR APPROVAL  
 Philip R. Hought, P.E. #21366  
 Fire Protection Engineering, LLC  
 Registration No. F-2535  
 Date: 7/13/2012



DRAWN BY:  
 PRH  
 APPROVED BY:  
 FDH  
 ENGINEER:  
 Fire Protection Engineering, L.L.C.  
 P.O. Box 160836  
 Austin, TX 78716  
 512/328-1717  
 TBPE Firm F-2535

Project:  
 Keller Springs Lofts  
 4800 Keller Springs Road  
 Addison, Texas 75001

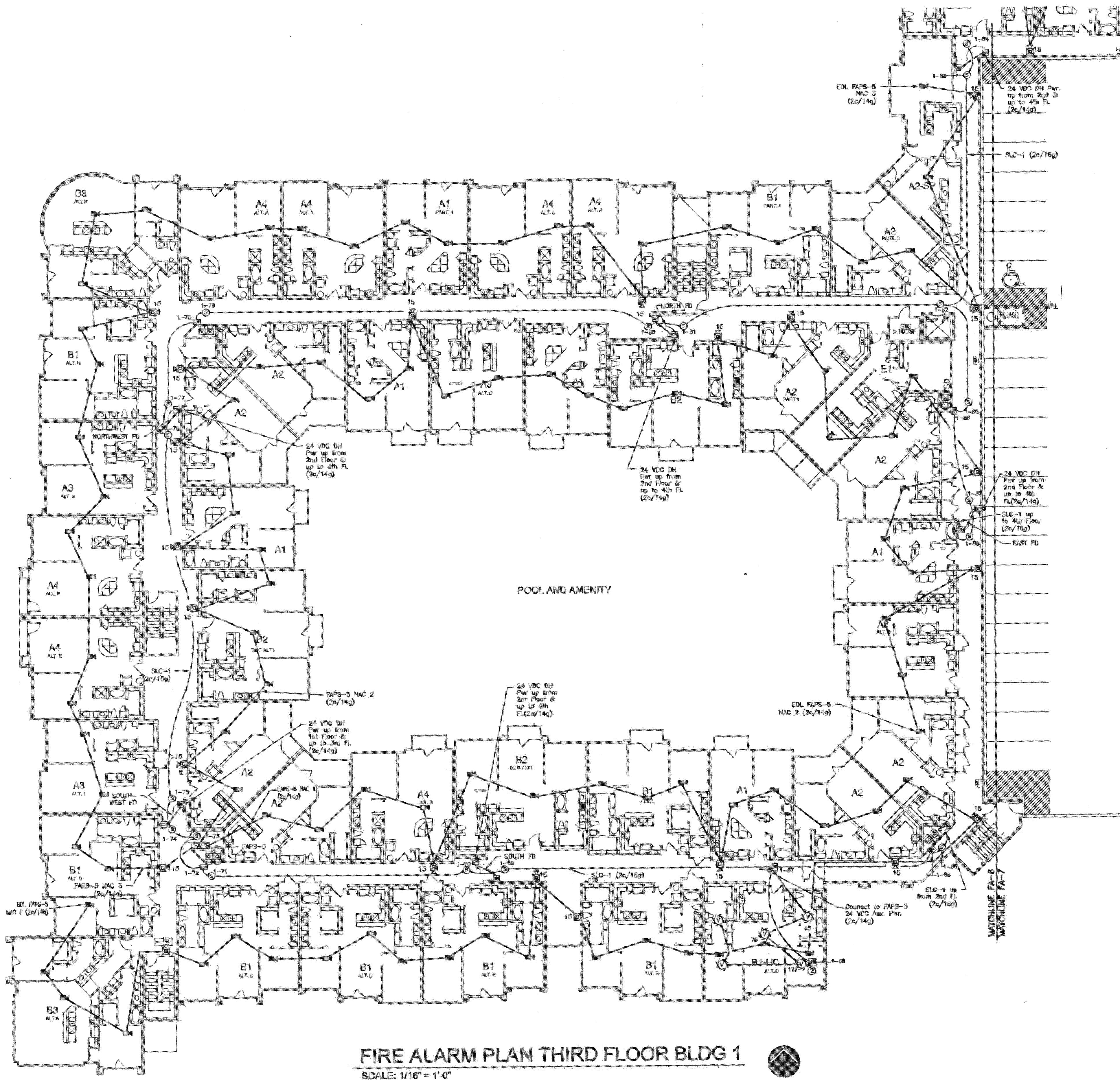
Installer:  
 Christian Cable Group, Inc.  
 1150 Blue Mound Road W. ste 301  
 Haslet, TX 78052  
 817-439-5107  
 ACR-3219

Revisions:  
 7/13/2012 Revised project address.

SCALE:  
 Noted

DATE:  
 6/29/2012

DRAWING NO.  
**FA 5**  
 SHEET NO. 5 OF 11



**FIRE ALARM PLAN THIRD FLOOR BLDG 1**  
SCALE: 1/16" = 1'-0"



NAC WIRE SIZE - 14 GAUGE  
SLC WIRE SIZE - 16 GAUGE

**VOLTAGE DROP CALCULATIONS**

Voltage drop calculations for FACP notification appliance circuits (NAC) are shown on FA 4.  
Voltage drop calculations for FAPS NAC are point-to-point on separate 8 1/2 X 11 sheets included with the Manufacturer's data sheets.  
Voltage drop calculations for NAC's in Hearing Impaired units are powered from the auxiliary circuits in FAPS-2 through FAPS-8 and are shown below.

**FAPS-2 Bldg 2 HI VISUAL APPLIANCE CIRCUIT**  
Aux. Pwr. current draw: 0.505 Amps  
Maximum allowable voltage drop: 4.4 VDC (20.4-16VDC)  
(Note: A/V's & M/H's are rated 16-33 VDC)  
Wire Resistance (14g): 3.0 Ohms/1000 ft.  
Design wire distance (scaled from plan): <385 ft.  
Calculated Voltage Drop: 1.2 VDC\*

**FAPS-3 Bldg 1 HI VISUAL APPLIANCE CIRCUIT**  
Aux. Pwr. HI S256: current draw: 0.852 Amps  
Maximum allowable voltage drop: 4.4 VDC (20.4-16VDC)  
(Note: A/V's & M/H's are rated 16-33 VDC)  
Wire Resistance (14g): 3.0 Ohms/1000 ft.  
Design wire distance (scaled from plan): <275 ft.  
Calculated Voltage Drop: 1.4 VDC\*

**FAPS-4 Bldg 2 HI VISUAL APPLIANCE CIRCUIT**  
Aux. Pwr. current draw: 0.505 Amps  
Maximum allowable voltage drop: 4.4 VDC (20.4-16VDC)  
(Note: A/V's & M/H's are rated 16-33 VDC)  
Wire Resistance (14g): 3.0 Ohms/1000 ft.  
Design wire distance (scaled from plan): <385 ft.  
Calculated Voltage Drop: 1.2 VDC\*

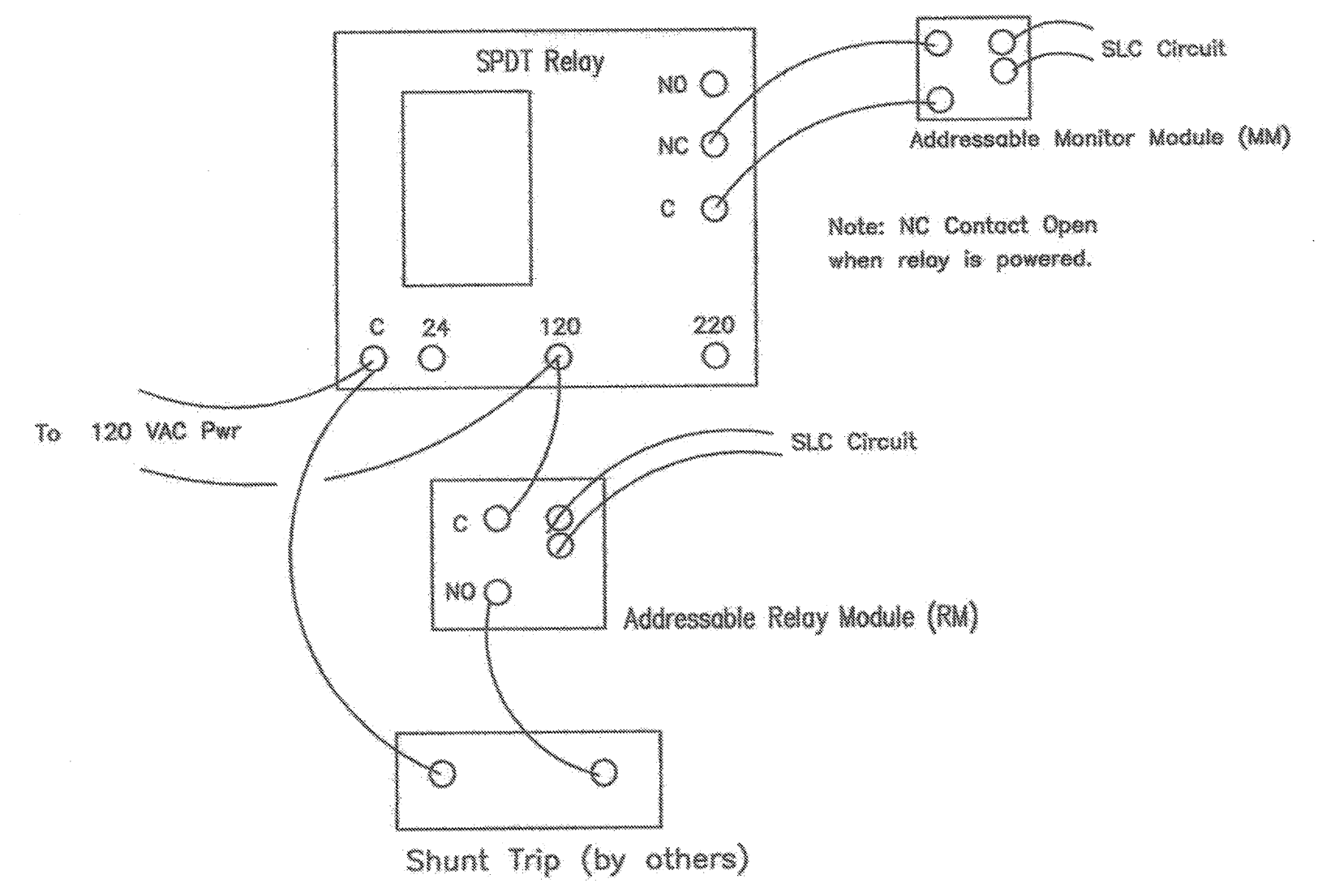
**FAPS-5 Bldg 1 HI VISUAL APPLIANCE CIRCUIT**  
Aux. Pwr. HI S256: current draw: 0.852 Amps  
Maximum allowable voltage drop: 4.4 VDC (20.4-16VDC)  
(Note: A/V's & M/H's are rated 16-33 VDC)  
Wire Resistance (14g): 3.0 Ohms/1000 ft.  
Design wire distance (scaled from plan): <275 ft.  
Calculated Voltage Drop: 1.4 VDC\*

**FAPS-6 Bldg 2 HI VISUAL APPLIANCE CIRCUIT**  
Aux. Pwr. current draw: 0.505 Amps  
Maximum allowable voltage drop: 4.4 VDC (20.4-16VDC)  
(Note: A/V's & M/H's are rated 16-33 VDC)  
Wire Resistance (14g): 3.0 Ohms/1000 ft.  
Design wire distance (scaled from plan): <385 ft.  
Calculated Voltage Drop: 1.2 VDC\*

**FAPS-7 Bldg 1 HI VISUAL APPLIANCE CIRCUIT**  
Aux. Pwr. HI S256: current draw: 0.852 Amps  
Maximum allowable voltage drop: 4.4 VDC (20.4-16VDC)  
(Note: A/V's & M/H's are rated 16-33 VDC)  
Wire Resistance (14g): 3.0 Ohms/1000 ft.  
Design wire distance (scaled from plan): <275 ft.  
Calculated Voltage Drop: 1.4 VDC\*

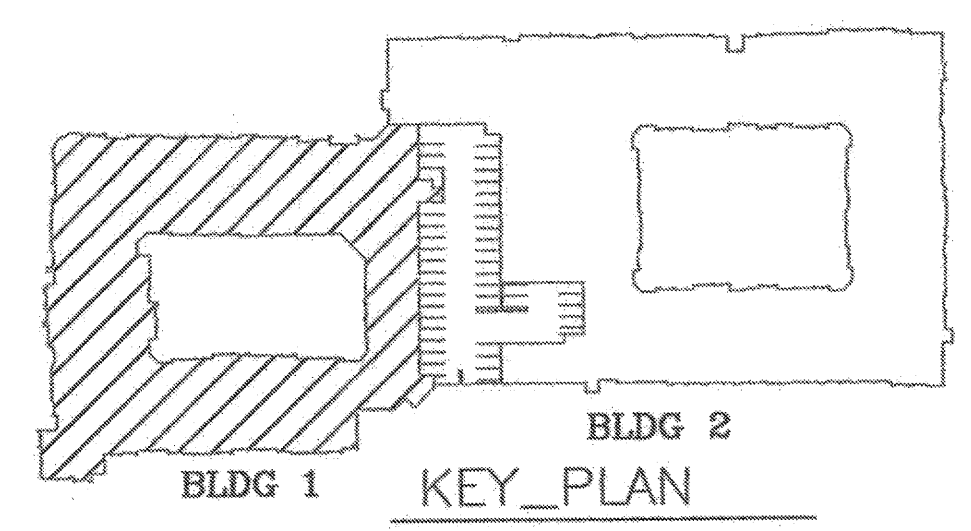
**FAPS-8 Bldg 2 HI VISUAL APPLIANCE CIRCUIT**  
Aux. Pwr. current draw: 0.505 Amps  
Maximum allowable voltage drop: 4.4 VDC (20.4-16VDC)  
(Note: A/V's & M/H's are rated 16-33 VDC)  
Wire Resistance (14g): 3.0 Ohms/1000 ft.  
Design wire distance (scaled from plan): <385 ft.  
Calculated Voltage Drop: 1.2 VDC\*

\* END-OF-LINE METHOD  
Voltage drop calculations are made assuming maximum current load to the last device of the circuit. Actually, current load decreases after each subsequent device. Therefore, the actual voltage drop will be less than the calculated voltage drop. This allows the installer some flexibility in circuit/wire routing without having to revise the calculations for each change made in the actual field installation.



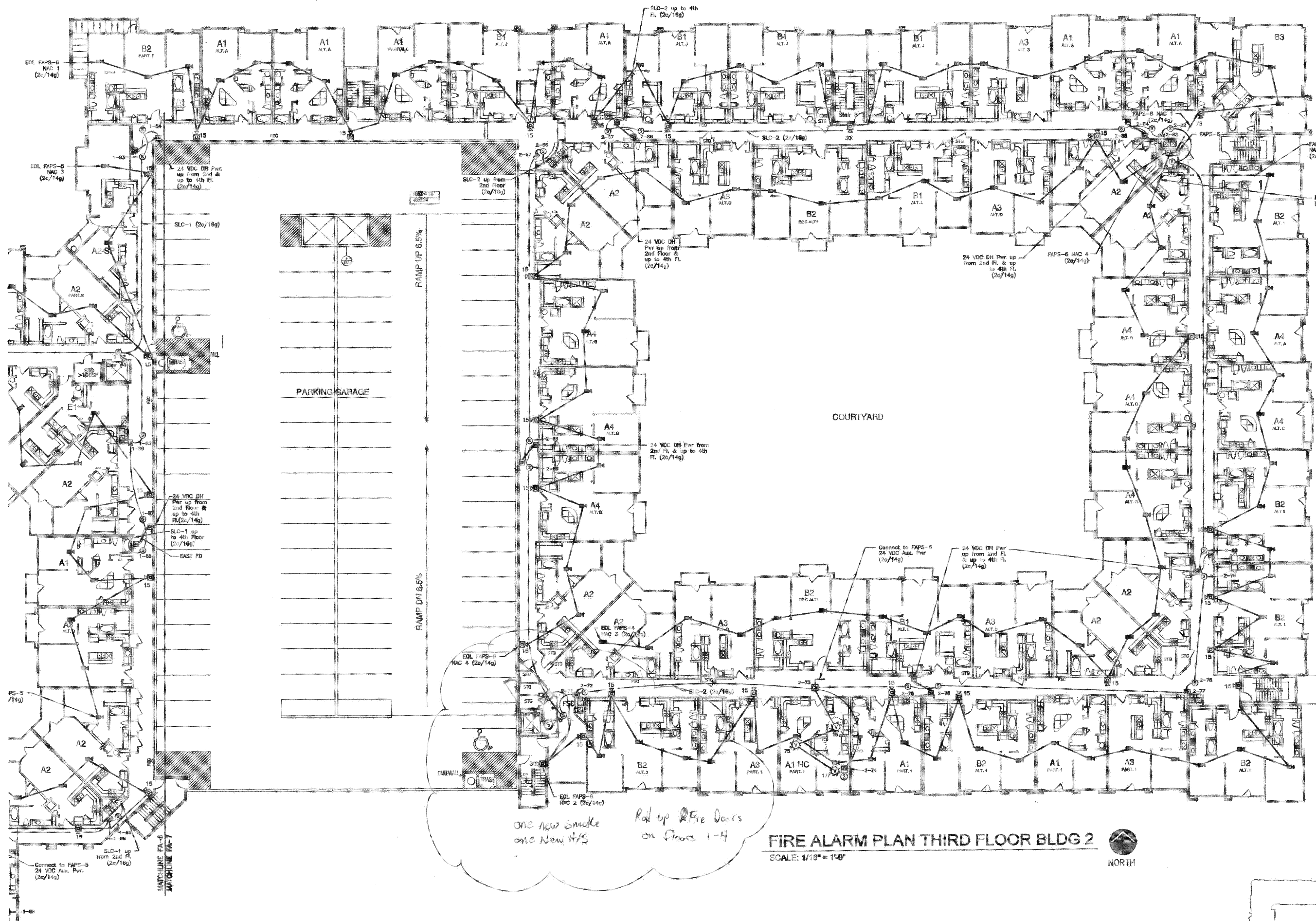
**ELEVATOR SHUTDOWN RISER DIAGRAM**

SCALE: NONE



ISSUED FOR APPROVAL  
Philip R. Hought, P.E. #21366  
Fire Protection Engineering, LLC  
Registration No. F-2535  
Date: 7/13/2012

DRAWN BY: PRH  
APPROVED BY: FDH  
ENGINEER: Fire Protection Engineering, L.L.C. P.O. Box 160836 Austin, TX 78716 512/328-1717 TBPE Firm F-2535  
Fire Protection Engineering, LLC Reg. No. F-2535  
21366  
LICENSED PROFESSIONAL ENGINEER  
Project: Keller Springs Lofts 4800 Keller Springs Road Addison, Texas 75001  
Installer: Christian Cable Group, Inc. 1150 Blue Mound Road W. ste 301 Haslet, TX 76052 817-439-5107  
ACR-3219  
Revisions: 7/13/2012 Revised project address.  
SCALE: Noted  
DATE: 2/29/2012  
DRAWING NO. FA 6  
SHEET NO. 6 OF 11



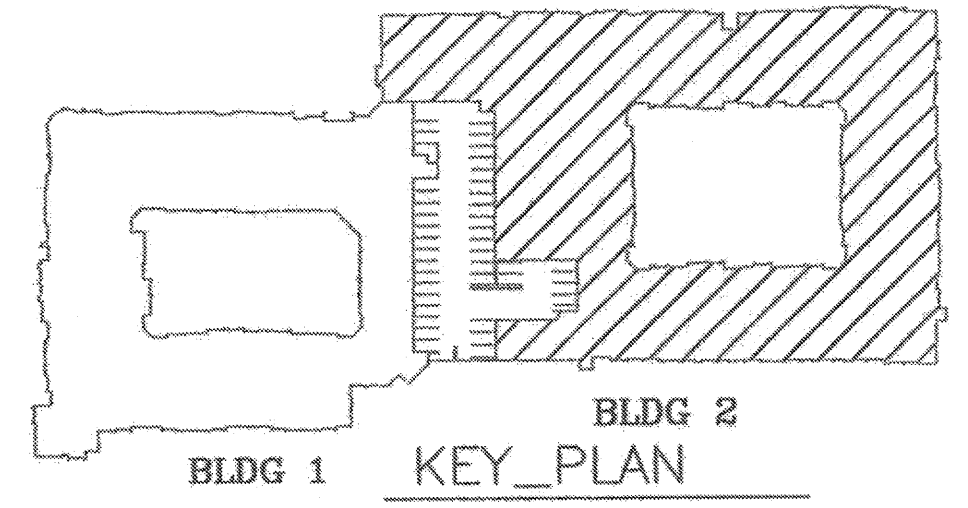
one new smoke  
one new H/S

Roll up Fire Doors  
on floors 1-4

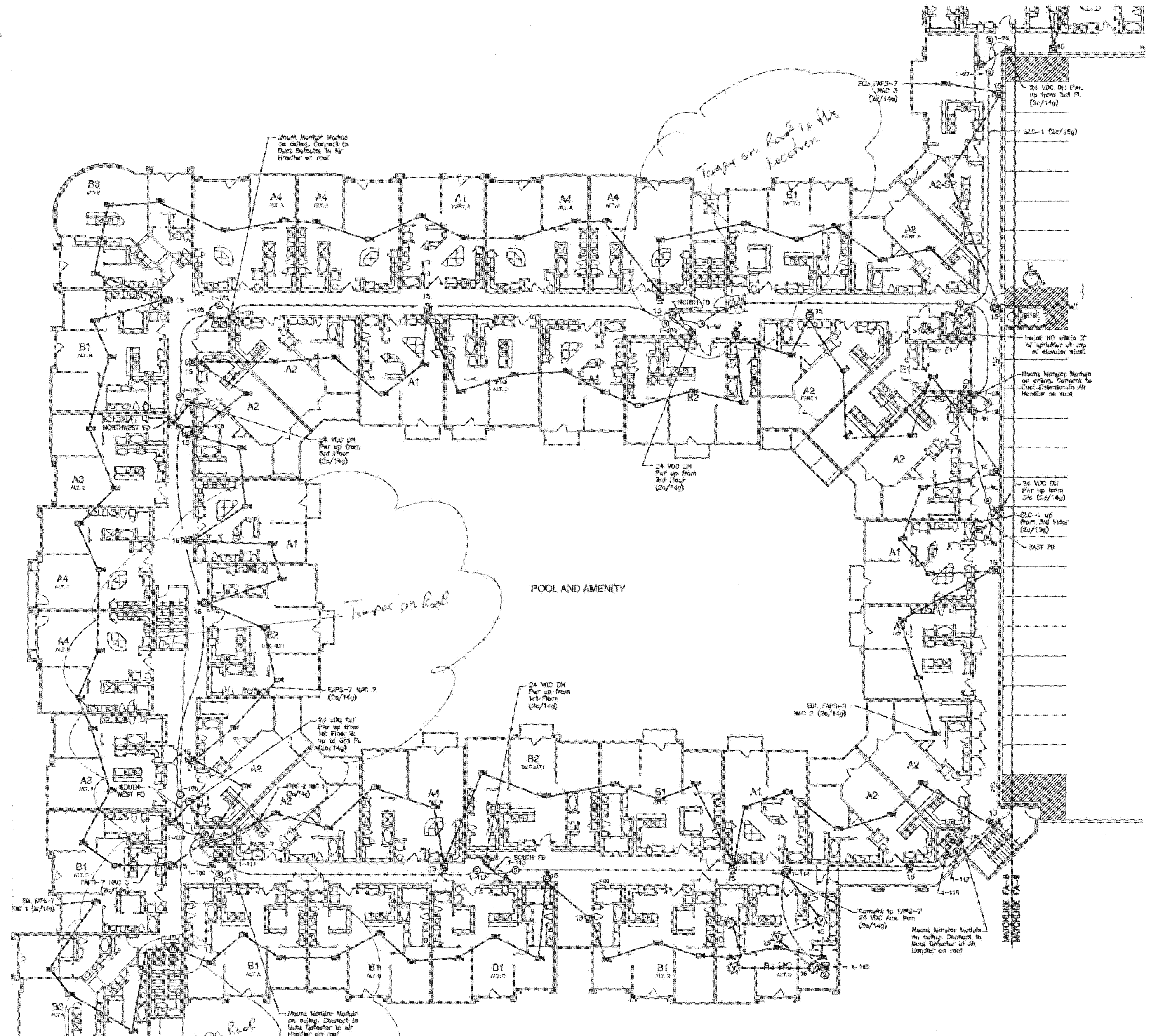
**FIRE ALARM PLAN THIRD FLOOR BLDG 2**  
SCALE: 1/16" = 1'-0"

NAC WIRE SIZE - 14 GAUGE  
SLC WIRE SIZE - 16 GAUGE

ISSUED FOR APPROVAL  
Philip R. Hought, P.E. #21366  
Fire Protection Engineering, LLC  
Registration No. F-2535  
Date: 7/13/2012



DRAWN BY: PRH
APPROVED BY: FDH
ENGINEER: Fire Protection Engineering, L.L.C. P.O. Box 160896 Austin, TX 78716 512/328-1717 TBPE Firm F-2535
Project: Keller Springs Lofts 4800 Keller Springs Road Addison, Texas 75001
Installer: Christian Cable Group, Inc. 1150 Blue Mound Road W. ste 301 Haslet, TX 76052 817-439-5107
Revisions: 7/13/2012 Revised project address.
SCALE: Noted
DATE: 6/29/2012
DRAWING NO. FA 7
SHEET NO. 7 OF 11



**FIRE ALARM PLAN FOURTH FLOOR BLDG 1**

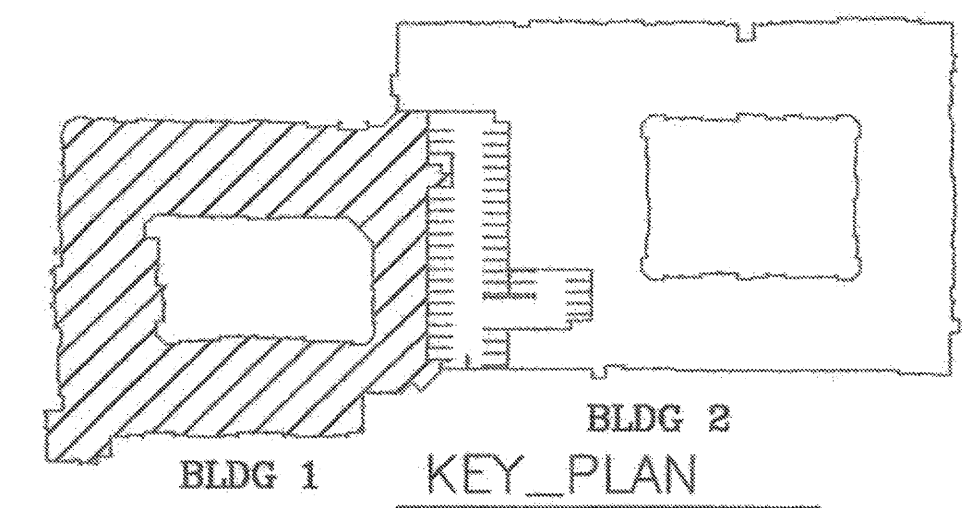
SCALE: 1/16" = 1'-0"



Modules on first floor stairwell Monitor Roof Tempers

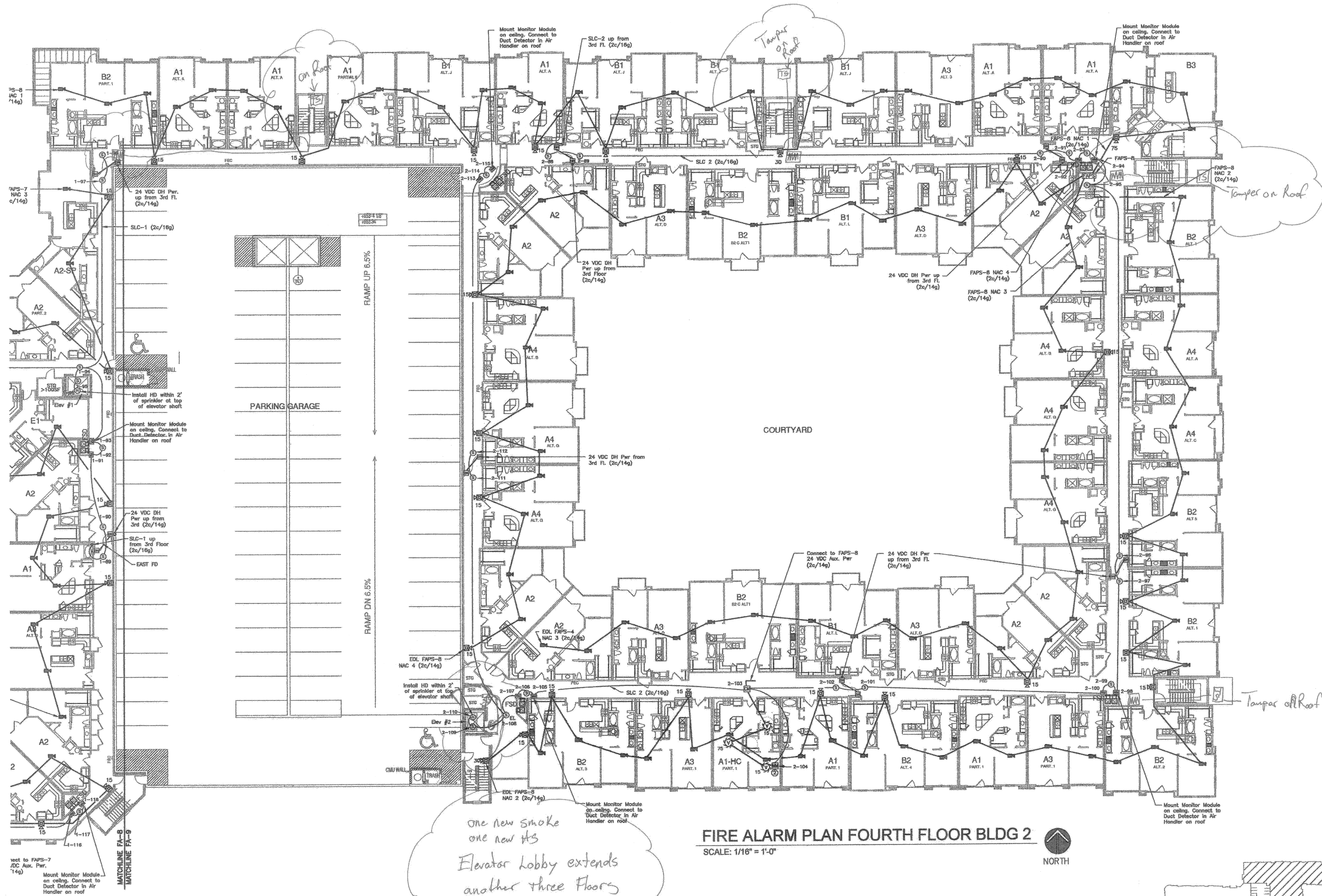
NAC WIRE SIZE - 14 GAUGE  
SLC WIRE SIZE - 16 GAUGE

ISSUED FOR APPROVAL  
Philip R. Hought, P.E. #21366  
Fire Protection Engineering, LLC  
Registration No. F-2535  
Date: 7/13/2012



DRAWN BY:	PRH
APPROVED BY:	FDH
ENGINEER:	Fire Protection Engineering, L.L.C. P.O. Box 180836 Austin, TX 78716 512/328-1717 TBPE Firm F-2535
Project:	Keller Springs Lofts 4800 Keller Springs Road Addison, Texas 75001
Installer:	Christian Cable Group, Inc. 1150 Blue Mound Road W. ste 301 Haslet, TX 76052 817-439-5107 ACR-3219
Revisions:	7/13/2012 Revised project address.
SCALE:	Noted
DATE:	6/29/2012
DRAWING NO.	FA 8
SHEET NO.	8 OF 11



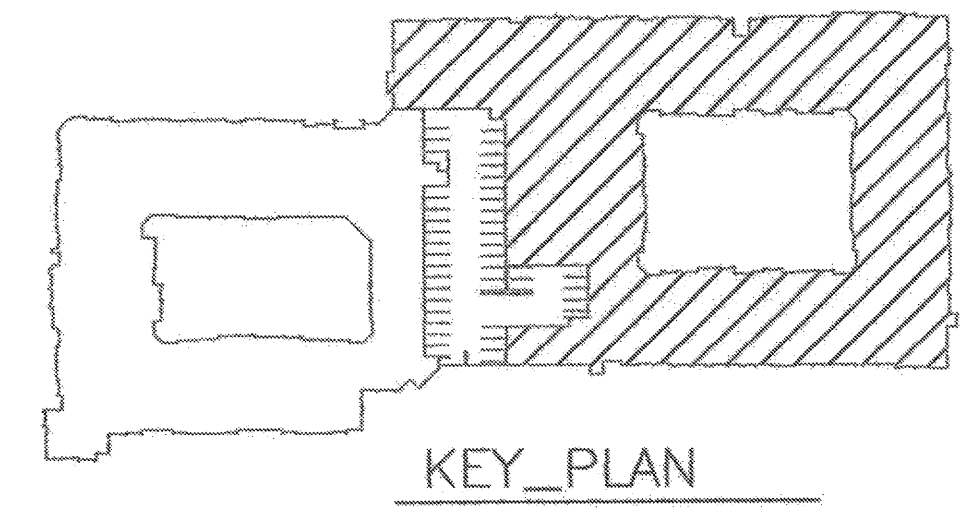


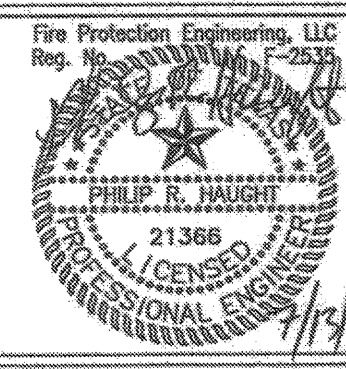
**FIRE ALARM PLAN FOURTH FLOOR BLDG 2**  
 SCALE: 1/16" = 1'-0" NORTH

one new smoke  
 one new H/S  
 Elevator Lobby extends  
 another three floors  
 3 more smokes  
 3 more H/S

NAC WIRE SIZE - 14 GAUGE  
 SLC WIRE SIZE - 16 GAUGE

ISSUED FOR APPROVAL  
 Philip R. Hought, P.E. #21366  
 Fire Protection Engineering, LLC  
 Registration No. F-2535  
 Date: 7/13/2012



<p>DRAWN BY: <b>PRH</b></p> <p>APPROVED BY: <b>FDH</b></p> <p>ENGINEER:  <b>Fire Protection Engineering, L.L.C.</b>        P.O. Box 160896        Austin, TX 78716        512/328-1717        TBPE Firm F-2535</p> <p style="text-align: right;">         7/13/12     </p>	<p>Project:  <b>Keller Springs Lofts</b>        4800 Keller Springs Road        Addison, Texas 75001</p>
<p>Installer:  <b>Christian Cable Group, Inc.</b>        1150 Blue Mound Road W. ste 301        Haslet, TX 76052        817-439-5107</p>	<p>ACR-3219</p>
<p>Revisions:        7/13/2012 Revised project address.</p>	
<p>SCALE: Noted</p>	
<p>DATE: 6/29/2012</p>	
<p>DRAWING NO. FA 9</p>	
<p>SHEET NO. 9 OF 11</p>	