# McCUTCHEN FIRE ALARM UPGRADE

SC STATE PROJECT #H27-I851

# UNIVERSITY OF SOUTH CAROLINA

Columbia, South Carolina

### **DESIGN TEAM**

**OWNER** 

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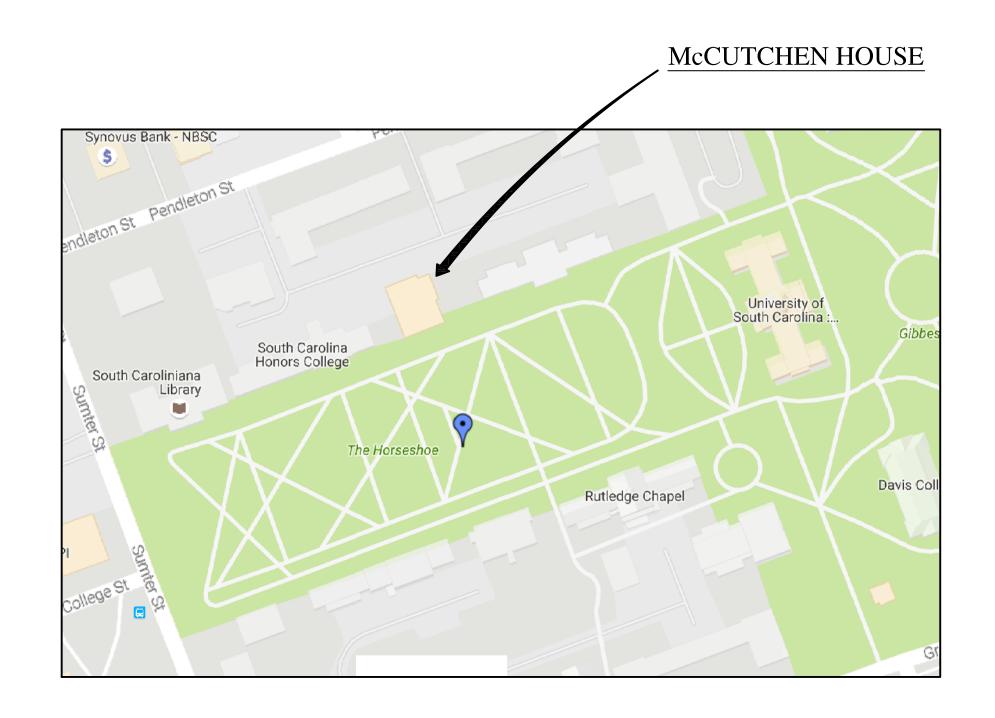
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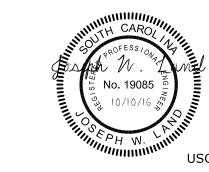
VICINITY MAP

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#### GENERAL CONSTRUCTION NOTES

1. PROVIDE ALL WORK IN ACCORDANCE WITH THE FOLLOWING CODES AND STANDARDS:

INTERNATIONAL EXISTING BUILDING CODE 2015 EDITION INTERNATIONAL FIRE CODE 2015 EDITION NFPA 70 - NATIONAL ELECTRICAL CODE 2014 EDITION NFPA 72 - NATIONAL FIRE ALARM CODE 2013 EDITION ANSI A117.1 - ACCESSIBLE AND USABLE LATEST EDITION

BUILDINGS AND FACILITIES

- 2. PROVIDE RACEWAY AND WIRING TO ALL EQUIPMENT, DEVICES AND APPLIANCES INDICATED ON THE CONTRACT DRAWINGS. THE DRAWINGS INDICATE PARTIAL RACEWAY AND WIRING REQUIREMENTS TO HELP CLARIFY DESIGN INTENT. WHERE RACEWAY AND/OR WIRING IS NOT INDICATED FOR EQUIPMENT, DEVICES OR APPLIANCES THE ARRANGEMENT, GROUPING, AND ROUTING SHALL BE PROVIDED IN ACCORDANCE WITH THE 2014 EDITION OF THE NATIONAL ELECTRICAL CODE AND THE 2013 EDITION OF THE NATIONAL FIRE ALARM CODE.
- ALL CONDUIT PENETRATIONS THROUGH WALLS AND CEILINGS SHALL BE 2-HOUR FIRESTOPPED IN ACCORDANCE WITH THE FIRESTOP DETAILS SHOWN ON DRAWING E-2.
- 4. RACEWAYS SHALL BE EMT, RED IN COLOR, AND WITH COMPRESSION TYPE FITTINGS UNLESS NOTED, DETAILED, OR SCHEDULED OTHERWISE. SIZE RACEWAYS FOR MAXIMUM OF 40% FILL PER THE NATIONAL ELECTRICAL CODE. CONCEAL RACEWAYS IN WALLS AND ABOVE DROP CEILINGS WHERE APPLICABLE. RACEWAYS MAY BE MOUNTED EXPOSED ON WALLS AND CEILINGS WHERE IN EQUIPMENT ROOMS AND WHERE CONCRETE IS ENCOUNTERED.
- CUT-IN BACKBOXES OF DETECTION DEVICES AND NOTIFICATION APPLIANCES INTO EXISTING WALLS, CEILINGS, AND MOLDINGS IN ORDER TO ACHIEVE A SEMI-FLUSH INSTALLATION. PROVIDE THE DEVICE MANUFACTURER'S CUSTOM SURFACE BACKBOX FOR NOTIFICATION DEVICES (AUDIBLE-ONLY, VISIBLE-ONLY AND COMBINATION SPEAKER/STROBES), FOR DETECTORS, AND FOR PULL STATIONS WHERE THEY CANNOT BE SEMI-FLUSH MOUNTED IN WALLS OR CEILINGS (WHERE CONCRETE IS ENCOUNTERED). PROVIDE WIREMOLD #700 RACEWAY AND #700 ENTRANCE END FITTINGS TO ADAPT THE BACKBOX'S RACEWAY NOCK-OUTS TO THE #700 SURFACE RACEWAY WHERE WIREMOLD IS INDICATED TO BE PROVIDED ON PLAN.
- . PROVIDE FIRE ALARM SYSTEM CABLES/WIRING AS RECOMMENDED BY THE FIRE ALARM SYSTEM MANUFACTURER. CABLES/WIRES SHALL BE SIZED TO ACCOMMODATE VOLTAGE DROP.
- SPLICING: CONNECT CONDUCTORS ASSOCIATED WITH THE FIRE ALARM SYSTEM THAT ARE TERMINATED, SPLICED, OR INTERRUPTED TO TERMINAL BLOCKS. MARK EACH TERMINAL IN ACCORDANCE WITH THE WIRING DIAGRAMS OF THE SYSTEM. MAKE ALL CONNECTIONS WITH APPROVED CRIMP-ON TERMINAL SPADE LUGS, PRESSURE-TYPE TERMINAL BLOCKS, OR PLUG CONNECTORS. SOLDER AND/OR WIRE NUTS SHALL NOT BE USED. PROVIDE GREENLITE CABLE ACCESSORY CORPORATION GTB-SERIES, BREAKOFF TYPE TERMINAL BLOCKS OR PRIOR APPROVED EQUAL (PHONE: 626-575-6263).
- 8. INSTALL SMOKE AND HEAT DETECTORS IN ACCORDANCE WITH THEIR U.L. LISTED SPACINGS AND IN ACCORDANCE WITH NFPA 72.
- 9. COORDINATE AND PERFORM TESTING OF FIRE ALARM AND FIRE REPORTING SYSTEMS WITH USC'S SUPERVISING MONITORING STATION AS REQUIRED BY THE UNIVERSITY.
- 10. COORDINATE ALL REQUIRED OUTAGES TO EXISTING ELECTRICAL SERVICES AND THE EXISTING FIRE ALARM SYSTEM WITH DENNIS GALLAGHER OF USC MAINTENANCE (PHONE NUMBER 917-0340) AND TODD GRIFFIN OF USC HEALTH & SAFETY (PHONE NUMBER 212-8775).
- 11. INSTALL ELECTRICAL SYSTEMS WITHOUT INTERFERING WITH EXISTING DUCTS, PIPES, FIXTURES, STRUCTURAL MEMBERS, OR OTHER EXISTING BUILDING COMPONENTS. RACEWAY, EQUIPMENT, DEVICE AND APPLIANCE LOCATIONS INDICATED ON PLAN ARE APPROXIMATE. THE CONTRACTOR SHALL LOCATE EQUIPMENT, DEVICES AND APPLIANCES SO AS NOT TO CONFLICT WITH EXISTING CEILING AND WALL MOUNTED EQUIPMENT, FIXTURES, AND DEVICES. MAINTAIN U.L. LISTED SPACINGS FOR FIRE ALARM SYSTEM DETECTION DEVICES AND NOTIFICATION APPLIANCES WHEN DETERMINING THEIR EXACT MOUNTING LOCATION. RACEWAY ROUTINGS SHOWN ON PLANS ARE TO BE USED TO DEVELOP SHOP DRAWINGS FOR FIRE ALARM SYSTEM CABLING REQUIREMENTS. RECORD DRAWINGS SHALL INDICATE ACTUAL RACEWAY ROUTINGS, INCLUDING RISER CONDUIT ROUTINGS.
- 12. CUTTING, DRILLING, AND PATCHING: PROVIDE CHASES, SLOTS, AND OPENINGS IN EXISTING BUILDING COMPONENTS TO ALLOW FOR ELECTRICAL INSTALLATIONS. PERFORM CUTTING, DRILLING, FITTING, AND PATCHING REQUIRED TO:
- A) INSTALL EQUIPMENT, DETECTION DEVICES, NOTIFICATION APPLIANCES, MATERIALS, AND RACEWAYS IN EXISTING STRUCTURES.
- B) REMOVE AND REPLACE DEFECTIVE WORK THAT DOES NOT CONFORM TO REQUIREMENTS OF THE CONTRACT DOCUMENTS.

CONCEALED WORK.

C) UPON WRITTEN INSTRUCTIONS FROM THE ARCHITECT/ENGINEER, UNCOVER AND RESTORE WORK TO PROVIDE FOR ARCHITECT/ENGINEER OBSERVATION OF

PROTECT EXISTING STRUCTURES, FURNISHINGS, FINISHES, MECHANICAL SYSTEMS, AND ELECTRICAL SYSTEMS WHILE PERFORMING CUTTING, DRILLING, FITTING, AND PATCHING.

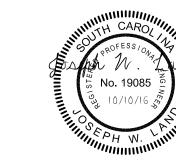
PATCH AND PAINT EXISTING SURFACES AND BUILDING COMPONENTS DAMAGED BY CUTTING AND DRILLING USING NEW MATERIALS THAT MATCH EXISTING MATERIALS. PATCHING AND PAINTING SHALL BE PERFORMED BY EXPERIENCED INSTALLERS. COORDINATE WITH THE OWNER TO VERIFY THE MANUFACTURER, TYPE, AND COLOR OF PAINT TO BE USED. APPLY TWO COATS OF PAINT TO EACH AREA THAT REQUIRES PATCHING/PAINTING.

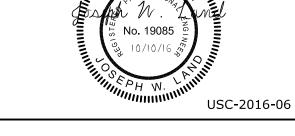
PATCH AND PAINT EXISTING SURFACES AND BUILDING COMPONENTS EXPOSED BY THE REMOVAL OF EXISTING EQUIPMENT, DEVICES, AND RACEWAYS USING NEW MATERIALS THAT MATCH EXISTING MATERIALS (NOTE THAT WHERE SURFACE MOUNTED RACEWAYS ARE REMOVED THAT THE EXISTING SURFACES BEHIND THE RACEWAYS SHALL BE PAINTED/REPAINTED. PATCHING AND PAINTING SHALL BE PERFORMED BY EXPERIENCED INSTALLERS. COORDINATE WITH THE OWNER TO VERIFY THE MANUFACTURER, TYPE, AND COLOR OF PAINT TO BE USED. APPLY TWO COATS OF PAINT TO EACH AREA THAT REQUIRES PATCHING AND/OR PAINTING.

ELECTRICAL LEGEND						
	SURFACE MOUNTED ELECTRICAL PANELBOARD (EXISTING). SURFACE MOUNTED CONTROL PANEL, TYPE AS NOTED ON PLAN.		H∆	AUDIBLE (SPEAKER) NOTIFICATION APPLIANCE, WALL MOUNTED. SEMI-FLUSH APPLIANCE IN WALL. SEE GENERAL CONSTRUCTION NOTE 5 ON THIS DRAWING.		
<b>■</b>	FLUSH MOUNTED CONTROL PANEL, TYPE AS NOTED ON PLAN.  RJ-31X COMMUNICATIONS PHONE JACK. MOUNT IN FIRE ALARM  CABINET.		V 15cd	VISIBLE (STROBE) NOTIFICATION APPLIANCE, CEILING MOUNTED. SEMI-FLUSH APPLIANCE IN CEILING. SEE GENERAL CONSTRUCTION NOTE 5 ON THIS DRAWING. PROVIDE APPLIANCE WITH STROBE CANDELA RATING NOTED ON PLAN.		
MIM	FIRE ALARM SYSTEM ADDRESSABLE MONITOR INTERFACE MODULE WITH CLASS "B" TYPE MONITOR WIRING IN ACCORDANCE WITH NFPA 72. MOUNT MODULE IN A STEEL NEMA-1 ENCLOSURE.		<sup>А</sup> / <sub>V</sub> ]15cd	COMBINATION AUDIBLE/VISIBLE (SPEAKER & STROBE) NOTIFICATION APPLIANCE, CEILING MOUNTED. SEMI-FLUSH MOUNT APPLIANCE IN CEILING. SEE GENERAL CONSTRUCTION NOTE 5 ON THIS DRAWING. PROVIDE APPLIANCE MANUFACTURER'S CUSTOM SURFACE BACKBOX IN		
RIM	FIRE ALARM SYSTEM ADDRESSABLE RELAY INTERFACE CONTROL MODULE. MOUNT MODULE IN A STEEL NEMA-1 ENCLOSURE.			UNFINISHED SPACES (EQUIPMENT/MECHANICAL/STORAGE ROOMS) AND WHERE WIREMOLD RACEWAY IS INDICATED TO BE USED. PROVIDE APPLIANCE WITH STROBE CANDELA RATING NOTED ON PLAN.		
F WP CV	CONVENTIONAL/HARD-WIRED FIRE ALARM MANUAL PULL STATION, WEATHERPROOF TYPE. SURFACE MOUNT STATION WITH TOP AT 48 INCHES ABOVE FINISHED FLOOR. SEE GENERAL CONSTRUCTION NOTE 5 ON THIS DRAWING. PROVIDE STATION MANUFACTURER'S CUSTOM SURFACE BACKBOX.		A <sub>/V</sub> WP	COMBINATION AUDIBLE/VISIBLE (SPEAKER & STROBE) NOTIFICATION APPLIANCE, SAME AS DESCRIBED ABOVE EXCEPT DEVICE SHALL BE WEATHERPROOF. PROVIDE A CUSTOM, GASKETED CAST-METAL BACKBOX TO SURFACE MOUNT APPLIANCE ON CEILING. PROVIDE APPLIANCE WITH STROBE CANDELA RATING NOTED ON PLAN.		
F wL	WIRELESS-TYPE FIRE ALARM MANUAL PULL STATION. SEMI-FLUSH MOUNT STATION IN WALL WITH TOP OF STATION AT 48 INCHES ABOVE FINISHED FLOOR. SEE GENERAL CONSTRUCTION NOTE 5 ON THIS DRAWING. IF A SEPARATE WIRELESS MODULE IS REQUIRED FOR THE STATION, SEMI-FLUSH MODULE IN WALL BELOW PULL STATION (CUT WALL SO BACKBOX WILL BE FLUSH IN WALL).		<b>F≰</b> 15cd	COMBINATION AUDIBLE/VISIBLE (SPEAKER & STROBE) NOTIFICATION APPLIANCE, WALL MOUNTED. SEMI-FLUSH MOUNT APPLIANCE IN WALL BETWEEN 80 AND 96 INCHES ABOVE FINISHED FLOOR. SEE GENERAL CONSTRUCTION NOTE 5 ON THIS DRAWING. PROVIDE APPLIANCE WITH STROBE CANDELA RATING NOTED ON PLAN.		
<b>⟨</b> S⟩ <sub>WL</sub>	WIRELESS-TYPE PHOTO-ELECTRIC SMOKE DETECTOR, CEILING MOUNTED.		HN F 15cd WP	COMBINATION AUDIBLE/VISIBLE (HORN & STROBE) NOTIFICATION APPLIANCE, WEATHERPROOF TYPE, WALL MOUNTED. PROVIDE A CUSTOM, GASKETED CAST-METAL BACKBOX TO SURFACE MOUNT		
<b>⊢</b> S) <sub>WL</sub>	WIRELESS-TYPE PHOTO-ELECTRIC SMOKE DETECTOR, WALL MOUNTED AT 8 INCHES BELOW CEILING (TO CENTER OF DETECTOR).			APPLIANCE ON WALL.  STEEL JUNCTION BOX WITH COVER, SIZED IN ACCORDANCE WITH THE		
$\bigoplus_{WL}$	WIRELESS-TYPE 135 DEGREE HEAT DETECTOR, FIXED TEMPERATURE ONLY, CEILING MOUNTED.		0	NATIONAL ELECTRICAL CODE. MOUNT ABOVE ACCESSIBLE CEILINGS WHERE APPLICABLE. FLUSH MOUNT IN NON-ACCESSIBLE CEILINGS WHERE APPLICABLE.		
H <sub>200</sub>	ADDRESSABLE 200 DEGREE HEAT DETECTOR, FIXED TEMPERATURE ONLY, CEILING MOUNTED. SEMI-FLUSH MOUNT DETECTOR IN ACOUSTICAL DROP CEILINGS. SURFACE MOUNT DETECTOR ON HARD CEILINGS USING DETECTOR MANUFACTURERS CUSTOM SURFACE BACKBOX. SEE GENERAL CONSTRUCTION NOTE 5 ON THIS DRAWING.		①wm <b>+</b> ①	STEEL WIREMOLD BOX WITH BLANK COVER, SURFACE MOUNTED ON CEILING. STEEL JUNCTION BOX WITH COVER, SIZED IN ACCORDANCE WITH THE		
H) <sub>200</sub>	CONVENTIONAL/HARD-WIRED 200 DEGREE HEAT DETECTOR, FIXED TEMPERATURE ONLY, CEILING MOUNTED. SURFACE MOUNT DETECTOR ON HARD CEILINGS USING DETECTOR MANUFACTURERS CUSTOM SURFACE BACKBOX. SEE GENERAL CONSTRUCTION NOTE 5 ON THIS		₩	NATIONAL ELECTRICAL CODE, WALL MOUNTED.  STEEL WIREMOLD BOX WITH BLANK COVER, SURFACE MOUNTED ON WALL.		
<b>©</b>	DRAWING.  ADDRESSABLE PHOTO-ELECTRIC DUCT-TYPE SMOKE DETECTOR WITH SAMPLING TUBE. DETECTOR SHALL BE PROPERLY RATED FOR AIR FLOW IN DUCT SYSTEM. MOUNT TO DUCTWORK AND PROVIDE CUSTOM CONTROL WIRING TO SHUTDOWN AIR HANDLING UNIT FAN. MODIFY EXISTING DUCT INSULATION AS REQUIRED TO INSTALL DETECTOR. A SUPERVISORY ALARM SHALL BE INDICATED AT THE FIRE ALARM CONTROL PANEL WHEN DETECTOR IS ACTIVATED.			EXPOSED EMT OR WIREMOLD RACEWAY, TYPE AS SCHEDULED OR NOTED ON PLAN. INSTALL HORIZONTAL RACEWAYS TIGHT TO DROP AND STRUCTURAL CEILINGS. PROVIDE CUSTOM FITTINGS REQUIRED FOR HORIZONTAL AND VERTICAL TRANSITIONS AND AS REQUIRED TO PROPERLY INTERFACE WITH FIRE ALARM SYSTEM BOXES.  CONCEALED EMT RACEWAY OR MC CABLE, TYPE AS SCHEDULED OR NOTED ON PLAN. PROVIDE CUSTOM FITTINGS REQUIRED FOR HORIZONTAL AND VERTICAL TRANSITIONS AND AS REQUIRED TO		
₩	REMOTE TEST AND INDICATING STATION FOR DUCT-TYPE SMOKE DETECTOR. WALL MOUNT STATION AT 60 INCHES ABOVE FINISHED FLOOR.			PROPERLY INTERFACE WITH FIRE ALARM SYSTEM BOXES.		

#### GENERAL DEMOLITION NOTES

- 1. THE NEW FIRE ALARM SYSTEM SHALL BE FULLY INSTALLED AND TESTED PRIOR TO DEMOLITION OF THE EXISTING FIRE ALARM SYSTEM.
- 2. REMOVE ALL EXISTING FIRE ALARM SYSTEM EQUIPMENT, DEVICES, AND ALL ASSOCIATED RACEWAYS AND WIRING - CONTRACTOR SHALL TURN OVER EXISTING FIRE ALARM SYSTEM PANELS, DETECTION DEVICES, AND NOTIFICATION DEVICES TO THE USC FIRE MARSHAL (TODD GRIFFIN). INTENT OF THIS CONTRACT IS FOR THE CONTRACTOR TO DEMOLISH ALL EXISTING FIRE ALARM SYSTEM COMPONENTS AND ALL ASSOCIATED RACEWAYS AND WIRING SYSTEMS IN AND ON THE BUILDING, UNLESS SPECIFICALLY NOTED OTHERWISE.
- 3. THE CONTRACTOR SHALL VISIT THE SITE/BUILDING TO FIELD VERIFY EXISTING CONDITIONS PRIOR TO BID AND SHALL INCLUDE ALL WORK REQUIRED FOR COMPLETE DEMOLITION IN HIS BID.
- 4. ALL HOLES AND SURFACES EXPOSED BY THE REMOVAL OF EXISTING EQUIPMENT, DEVICES, APPLIANCES, AND RACEWAYS SHALL BE PATCHED AND PAINTED TO MATCH SURROUNDING FINISHES. SEE GENERAL CONSTRUCTION NOTE 12 ON THIS DRAWING.
- 5. SEE DEMOLITION LEGEND ON DRAWING E-7.







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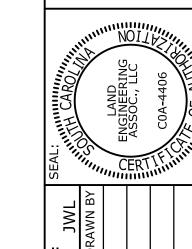
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UPGRADE

H27-1851

OFF TES



System No. F-A-1105

SECTION A-A

1. Floor Assembly — Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m³) concrete. As an

alternate, any min 2 hr fire rated D700, D800 or D900 Series Floor-Ceiling Design in the UL Fire Resistance Directory having a min 2-1/2 in. (64

mm) thickness of lightweight or normal weight (100-150 pcf or 1600-2400 kg/m³) concrete topping over the steel deck may be used. Max diam of

2. Through-Penetrant — One metallic pipe installed concentrically or eccentrically within opening. Annular space between penetrant and periphery

C. Conduit — Nom 4 in. (102 mm) diam (or smaller) steel electrical metallic tubing or nom 6 in. (152 mm) diam (or smaller) rigid steel conduit.

permanent form. When CP 604, CFS-S SIL GG or CFS-S SIL SL sealant is used (see Item 3B), min thickness of packing material is 4 in. (102

mm) and min thickness of floor is 4-1/2 in. (114 mm). Packing material to be recessed from top surface of floor to accommodate the required

B. Fill, Void or Cavity Materials\* - Sealant — Min 1/2 in. (13 mm) thickness of sealant applied within the annulus, flush with top surface of floor.

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE Sealant, FS-ONE MAX Intumescent Sealant or CP 604 Self-Leveling

C. Duct Wrap Material\* — Encapsulated duct wrap tightly wrapped around penetrant to extend 24 in. (610 mm) above the floor for penetrants of nom 4 in. (102 mm) diam or smaller, and 36 in. (914 mm) above floor for penetrants greater than a nom 4 in. (102 mm) diam. An additional

longitudinal seams of both layers of duct wrap and joints between layers of duct wrap are sealed with foil tape. One of the following types and

layer of encapsulated duct wrap tightly wrapped around the first layer of duct wrap to extend 12 in. (305 mm) (914 mm) above floor. All

\* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada),

FIRESTOP DETAIL - FLOOR/RISER

NOT TO SCALE

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Firestop Sealant, CFS-S SIL GG or CFS-S SIL SL Sealant

of opening shall be min of 0 in. (point contact) to max 2 in. (51 mm). Penetrant to be rigidly supported on both sides of floor assembly. The

A. Packing Material — Min 2 in. (51 mm) thickness of min 4 pcf (64 kg/m³) mineral wool batt insulation firmly packed into opening as a

CAN/ULC S115

L Rating At Ambient - Less Than 1

L Rating At 400 F - 4 CFM/sq ft

F Rating - 2 Hr

FT Rating - 2 Hr

FH Rating - 2 Hr

FTH Rating - 2 Hr

CFM/sq ft

ANSI/UL1479 (ASTM E814)

L Rating At Ambient - Less Than 1

L Rating At 400 F - 4 CFM/sq ft

W Rating - Class 1 (See Item 3B)

Underwriters Laboratories, Inc. | F Rating - 2 Hr

opening is 12-3/4 in. (324 mm).

thickness of fill material.

thicknesses of duct wrap may be used:

**Hilti Firestop Systems** 

C2. Nom 1-1/2 in. (38 mm) thick encapsulated duct wrap.

following types and sizes of penetrants may be used:

A. Steel Pipe — Nom 10 in. (254 mm) diam (or smaller) Schedule 40 (or heavier) steel pipe.

W Rating applies only when CP 604, CFS-S SIL GG or CFS-S SIL SL Sealant is used.

C1. Nom 1-1/2 in. (38 mm) or 2 in. (51 mm) thick encapsulated duct wrap. UNIFRAX I L L C — Fyrewrap Duct Insulation or FireWrap Duct 1.5 Insulation

THERMAL CERAMICS INC — FireMaster FastWrap XL Duct Insulation

B. Iron Pipe — Nom 10 in. (254 mm) diam (or smaller) cast or ductile iron pipe.

. Firestop System — The firestop system shall consist of the following:

T Rating - 2 Hr

CFM/sq ft

to UL 1479 and CAN/ULC-S115

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UPGRADE H27-1851

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ANSI/UL1479 (ASTM E814) CAN/ULC S115 Classified by Inderwriters Laboratories, In F Ratings — 1, 2, 3 and 4 Hr (See Item 3) F Ratings — 1, 2, 3 and 4 Hr (See Item 3) T Rating — 0 Hr FT Rating — 0 Hr L Rating At Ambient — Less Than 1 CFM/Sq Ft FH Ratings — 1, 2, 3 and 4 Hr (See Item 3) L Rating At 400 F — 4 CFM/Sq Ft FTH Rating — 0 Hr L Rating At Ambient — Less Than 1 CFM/Sq Ft L Rating At 400 F — 4 CFM/Sq Ft SECTION A-A I. Wall Assembly — Min 6 in. (152 mm) thick lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete. Wall may also be constructed of any UL Classified Concrete Blocks\*. Max diam of opening is 5-3/4 in. (146 mm). See Concrete Blocks (CAZT) category in the Fire Resistance Directory for names of manufacturers. 2. Through Penetrant — One metallic pipe, conduit or tube to be installed either concentrically or eccentrically within the firestop system. The annular space between the pipe, conduit or tube and periphery of opening shall be min 0 in. (point contact) to max 7/8 in. (22 mm). Pipe, conduit or tube to be rigidly supported on both sides of wall assembly. A. Steel Pipe — Nom 4 in. (102 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe. B. Iron Pipe — Nom 4 in. (102 mm) diam (or smaller) cast or ductile iron pipe. C. Conduit — Nom 4 in. (102 mm) diam (or smaller) rigid steel conduit. D. Conduit — Nom 4 in. (102 mm) diam (or smaller) steel electrical metallic conduit. E. Copper Tubing — Nom 4 in. (102 mm) diam (or smaller) Type L (or heavier) copper tubing. F. Copper Pipe — Nom 4 in. (102 mm) diam (or smaller) Regular (or heavier) copper pipe. 3. Fill, Void or Cavity Material — Sealant\* — Fill material applied within annulus, flush with both surfaces of wall. Type and thickness of sealant is dependent on F and FH Ratings as indicated in Table below. An additional 1/2 in. (13 mm) diameter bead of sealant applied at penetrant/gypsum board interface at point contact location on both surfaces of wall. HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE or CP 606 Sealant Sealant Thickness, In. (mm) F, FH Ratings hr Sealant Type FS-ONE or CP 606 5/8 (16) 1 (25) FS-ONE or CP 606 FS-ONE 1 (25) \*Bearing the UL Classification Mark

FIRESTOP DETAIL - CONCRETE NOT TO SCALE

**Hilti Firestop Systems** 

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November 26, 2012

System No. W-J-1226

SECTION A-A
1. Wall Assembly — The 1, 2, 3 or 4 hr fire rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner described in the individual U400, V400 or W400 Series Wall or Partition Design in the UL Fire Resistance Directory and shall include the following construction features:
A. Studs — Wall framing shall consist of steel channel studs. Steel studs to be min 3-1/2 in. (89 mm) wide spaced max 24 in. (610 mm) OC.  B. Gypsum Board* — Min 5/8 in. (16 mm) thick with square or tapered edges. The gypsum board type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual Wall or Partition Design in the UL Fire Resistance Directory. Max diam of opening is 5-3/4 in. (146 mm).
The hourly F and FH Ratings of the firestop system are equal to the hourly fire rating of the wall assembly in which it is installed.  2. Through Penetrant — One metallic pipe, conduit or tube to be installed either concentrically or eccentrically within the firestop system. The
annular space between the pipe, conduit or tube and periphery of opening shall be min 0 in. (point contact) to max 7/8 in. (22 mm). Pipe, conduit or tube to be rigidly supported on both sides of wall assembly.
A. Steel Pipe — Nom 4 in. (102 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe.  B. Iron Pipe — Nom 4 in. (102 mm) diam (or smaller) cast or ductile iron pipe.
C. Conduit — Nom 4 in. (102 mm) diam (or smaller) rigid steel conduit.
D. Conduit — Nom 4 in. (102 mm) diam (or smaller) steel electrical metallic conduit.  E. Copper Tubing — Nom 4 in. (102 mm) diam (or smaller) Type L (or heavier) copper tubing.  F. Copper Pipe — Nom 4 in. (102 mm) diam (or smaller) Regular (or heavier) copper pipe.
3. Fill, Void or Cavity Material — Sealant* — Fill material applied within annulus, flush with both surfaces of wall. Type and thickness of sealant is dependent on F and FH Ratings as indicated in Table below. An additional 1/2 in. (13 mm) diameter bead of sealant applied at penetrant/gypsum board interface at point contact location on both surfaces of wall.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE or CP 606 Sealant

F, FH Ratings hr	Sealant Type	Sealant Thickness, In. (mm)	
1, 2	FS-ONE or CP 606	5/8 (16)	
3	FS-ONE or CP 606	1 (25)	
4	FS-ONE	1 (25)	

System No. W-L-1252

F Ratings — 1, 2, 3 and 4 Hr (See Items 1 and 3) | F Ratings — 1, 2, 3 and 4 Hr (See Items 1 and 3)

L Rating At Ambient — Less Than 1 CFM/Sq Ft FH Ratings — 1, 2, 3 and 4 Hr (See Items 1 and 3)

FTH Rating — 0 HR.

L Rating At Ambient — Less Than 1 CFM/Sq Ft

L Rating At 400 F — Less Than 1 CFM/Sq Ft

ANSI/UL1479 (ASTM E814)

Γ Rating — 1, 2, 3 and 4 Hr (See Items 1 and 3)

L Rating At 400 F — Less Than 1 CFM/Sq Ft

Classified by

Underwriters Laboratories, In

\*Bearing the UL Classification Mark



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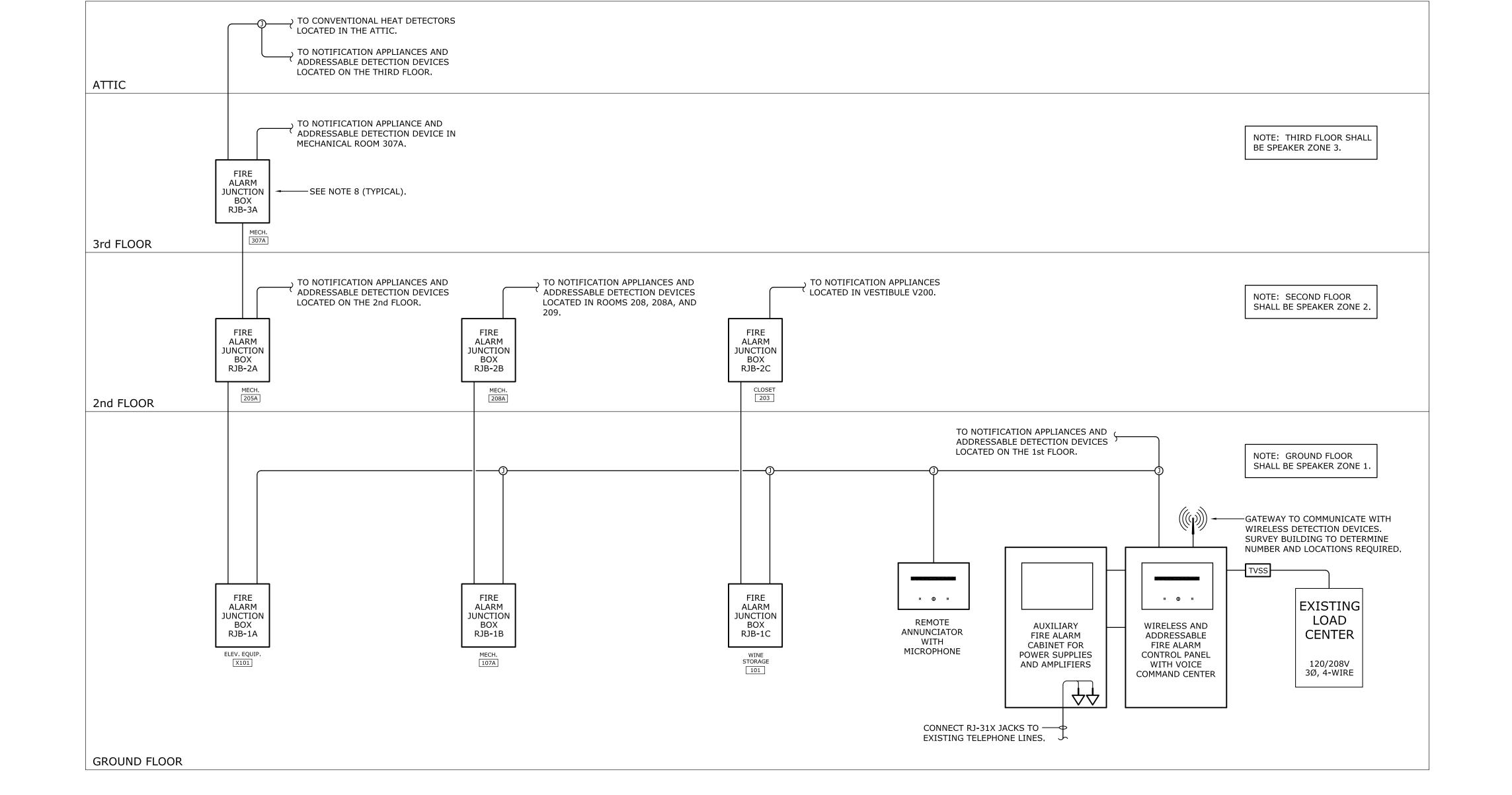
USC-2016-06

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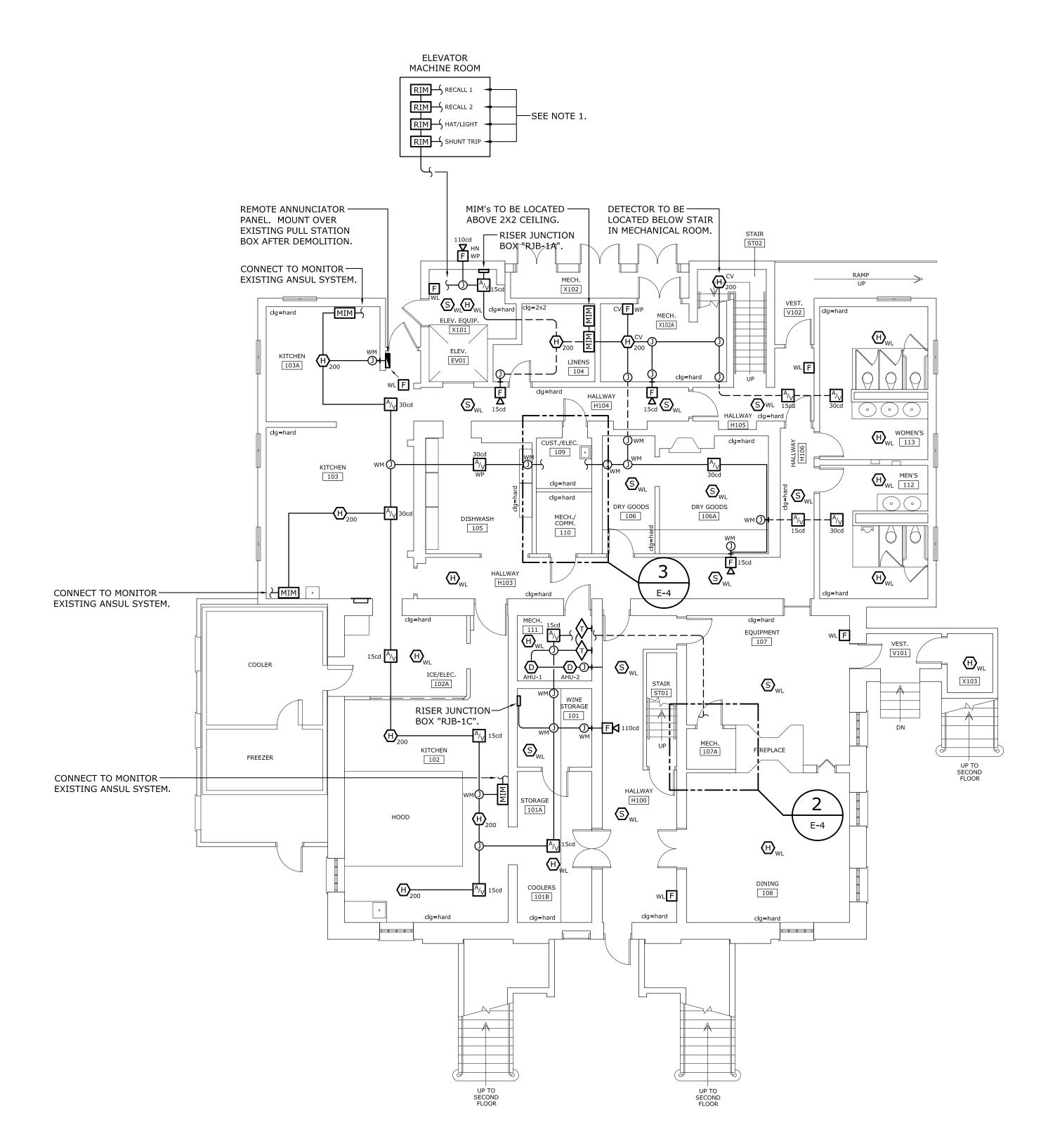


#### SIINGLE-LINE DIAGRAM NOTES

- FURNISH SHOP DRAWINGS FROM THE FIRE ALARM MANUFACTURER INDICATING ALL WIRING FOR DETECTION AND NOTIFICATION CIRCUITS. INCLUDE EQUIPMENT TYPES AND LOCATIONS, RACEWAY SIZES, NUMBER AND TYPES OF WIRES/CABLES, DIAMETERS OF CABLES/WIRES AND COLOR CODING FOR EACH CIRCUIT TYPE. SHOP DRAWINGS SHALL BE PROVIDED ON 24" X 36" (D-SIZE) PRINTS.
- 2. ALL STROBES SHALL BE SYNCHRONIZED. ALL AUDIBLE NOTIFICATION DEVICES SHALL BE SHALL BE SYNCHRONIZED.
- 3. ALL POWER SUPPLIES AND AMPLIFIERS SHALL BE LOCATED IN THE MAIN FIRE CONTROL PANEL CABINETS. PROVIDE BATTERY CALCULATIONS TO VERIFY THE SECONDARY POWER SUPPLY HAS ADEQUATE CAPACITY IN ACCORDANCE WITH NFPA 72.
- 4. PROVIDE THREE SETS OF OPERATION AND MAINTENANCE MANUALS FOR THE FIRE ALARM SYSTEM. PROVIDE A 3-RING BINDER FOR EACH SET.
- 5. PROVIDE A COMPLETE FIRE ALARM TEST IN ACCORDANCE WITH NFPA 72. ALL SMOKE DETECTORS SHALL BE TESTED WITH AN APPROVED AERASOL SMOKE PRODUCT. PROVIDE A WRITTEN RECORD OF THE INSPECTIONS, TESTS, AND DETAILED TEST RESULTS IN THE FORM OF A TEST LOG. SUBMIT LOG UPON THE SATISFACTORY COMPLETION OF TESTS.
- 6. PROVIDE 8 HOURS OF TRAINING FOR TROUBLE-SHOOTING AND MAINTENANCE OF THE FIRE ALARM SYSTEM. SCHEDULE TRAINING WITH OWNER.
- PROVIDE FOR THREE SITE VISITS BY A FIRE ALARM SYSTEM TECHNICIAN AFTER PROJECT COMPLETION TO REPROGRAM THE FIRE ALARM SYSTEM AND/OR ADJUST SPEAKER TAP SETTINGS AS REQUESTED BY THE OWNER.
- 8. FIRE ALARM SYSTEM RISER JUNCTION BOXES SHALL BE 6"h x 6"w x 4"d (MINIMUM) STEEL
- BOXES SHALL INCLUDE A BACK-PLANE FOR MOUNTING TERMINAL BLOCKS.
- PROVIDE TERMINAL BLOCKS AS REQUIRED TO SPLICE ALL CABLES/WIRES REQUIRING SPLICE CONNECTIONS (CABLE SHIELDS SHALL ALSO BE SPLICED USING TERMINAL
- PAINT BOX COVERS RED AND PROVIDE A LABEL ON COVERS DEPICTING MARK NUMBER.

FIRE ALARM SYSTEM SINGLE-LINE DIAGRAM

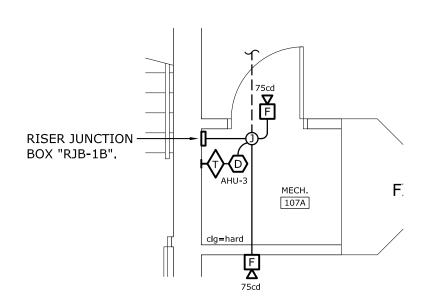
NOT TO SCALE



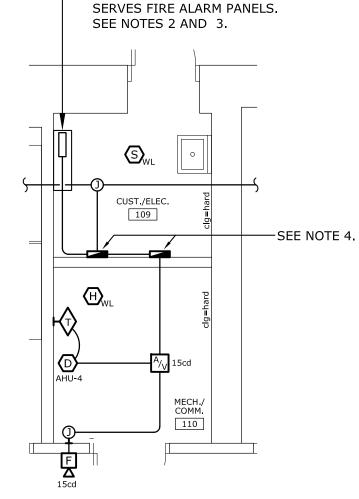


#### NOTES

- 1. ELEVATOR: EXISTING ELEVATOR AND ASSOCIATED CONTROLLER DO NOT CURRENTLY HAVE PROVISIONS FOR CONNECTION OF ELEVATOR RECALL, HAT/LIGHT INDICATOR IN ELEVATOR CAB, AND SHUNT-TRIP FOR POWER DISCONNECT. THESE FEATURES WILL BE ADDED UNDER A FUTURE PROJECT. PROVIDE PROGRAMMING FOR ELEVATOR RELAYS IN ACCORDANCE WITH ANSI 17.1 AND LLR REQUIREMENTS (EVEN THOUGH THE DEVICES WILL NOT BE EMPLOYED AT THIS TIME).
- 2. PROVIDE ONE ADDITIONAL 120 VOLT, 20-AMP RATED CIRCUIT FROM THE EXISTING SQUARE-D QO LOAD-CENTER TO NEW FIRE ALARM CONTROL PANELS. CIRCUIT SHALL BE TWO #12 AWG THHN COPPER CONDUCTORS WITH ONE GREEN INSULATED #12 AWG COPPER GROUND WIRE (CIRCUIT SHALL HAVE DEDICATED NEUTRAL AND GROUND CONDUCTOR). WIRING SHALL BE PROVIDED IN EMT RACEWAY WITH COMPRESSION FITTINGS; 3/4" MINIMUM SIZE. EXTEND EXISTING 120V FIRE ALARM CIRCUIT TO NEW PANELS ONCE THE EXISTING PANELS HAVE BEEN DEMOLISHED.
- 3. EXISTING PANELBOARD IS A SQUARE-D #QO-6-12, SERIES L5 LOAD-CENTER. PROVIDE ONE 20-AMP RATED, SINGLE-POLE CIRCUIT BREAKER IN BLANK SPACE OF LOAD CENTER TO SERVE AN ADDITIONAL 120V CIRCUIT FOR FIRE ALARM SYSTEM. UPDATE LOAD SCHEDULE TO REFLECT ADDED LOADS. PAINT CIRCUIT BREAKER HANDLES "RED".
- 4. CONTROL PANELS REFERENCED TO THIS NOTE ARE THE NEW FIRE ALARM CONTROL PANELS. TEMPORARILY MOUNT NEW FIRE ALARM PANELS LOW ON WALL UNTIL DEMOLITION OF EXISTING FIRE ALARM PANELS CAN BE PERFORMED. RELOCATE PANELS AFTER DEMOLITION SUCH THAT THEIR TOPS ARE 66" ABOVE FINISHED FLOOR.
- 5. ROOM RACEWAY SCHEDULE: WHERE RACEWAY IS INDICATED TO BE CONCEALED (YES) ON THE ROOM RACEWAY SCHEDULE, CUT EXISTING GYPSUM/PLASTER CEILINGS AS REQUIRED TO CONCEAL MC CABLES SERVING FIRE ALARM DEVICES. PATCH AND PAINT CEILINGS AFTER INSTALLATION OF CABLES. PAINT SHALL MATCH EXISTING CEILING COLOR - COORDINATE WITH OWNER TO VERIFY PAINT MANUFACTURER, TYPE, AND COLOR TO BE PROVIDED. APPLY TWO COATS OF PAINT TO EACH AREA WHERE CUTTING AND PATCHING IS REQUIRED.







EXISTING LOAD CENTER THAT

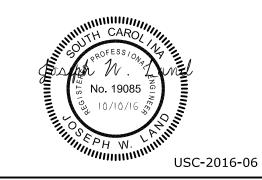
ENLARGED PLAN: ROOMS 109 AND 110 SCALE: 1/4" = 1'-0"

	ROOM RA	CEWAY S	SCHEDUL	.E	
ROOM NUMBER	ROOM NAME	RACEWAY TYPE	J-BOX TYPE	CONCEAL RACEWAY?	
101	WINE STORAGE	WIREMOLD	WIREMOLD	NO	
101A	STORAGE	WIREMOLD	WIREMOLD	NO	
101B	COOLERS	WIREMOLD	WIREMOLD	NO	
102	KITCHEN	WIREMOLD	WIREMOLD	NO	
102A	ICE/ELECTRICAL	WIREMOLD	WIREMOLD	NO	
103	KITCHEN	WIREMOLD	WIREMOLD	NO	
103A	KITCHEN	WIREMOLD	WIREMOLD	NO	
104	LINENS	EMT	STEEL	YES	
105	DISHWASH	WIREMOLD	WIREMOLD	NO	
106	DRY GOODS	WIREMOLD	WIREMOLD	NO	
106A	DRY GOODS	WIREMOLD	WIREMOLD	NO	
107	EQUIPMENT	MC CABLE	STEEL	YES <del>-</del>	SEE NOTE 5
108	DINING	MC CABLE	STEEL	YES -	SEE NOTE 5.
109	CUST./ELECT.	EMT	STEEL	NO	
110	MECH./COMM.	EMT	STEEL	NO	
111	MECHANICAL	EMT	STEEL	NO	
112	MEN'S	MC CABLE	STEEL	YES <del>-</del>	SEE NOTE 5
113	WOMEN'S	MC CABLE	STEEL	YES -	SEE NOTE 5
H100	HALLWAY	MC CABLE	STEEL	YES <del>-</del>	SEE NOTE 5
H101	HALLWAY	WIREMOLD	WIREMOLD	NO	
H102	HALLWAY	WIREMOLD	WIREMOLD	NO	
H103	HALLWAY	WIREMOLD	WIREMOLD	NO	
H104	HALLWAY	MC CABLE	STEEL	YES <del>-</del>	SEE NOTE 5
H105	HALLWAY	MC CABLE	STEEL	YES <del>-</del>	SEE NOTE 5
H106	HALLWAY	MC CABLE	STEEL	YES <del>-</del>	SEE NOTE 5
V101	VESTIBULE	EMT	STEEL	NO	
X101	ELEV. EQUIP.	EMT	STEEL	NO	
X102A	MECHANICAL	EMT	STEEL	NO	

STEEL

NO

X103 STORAGE



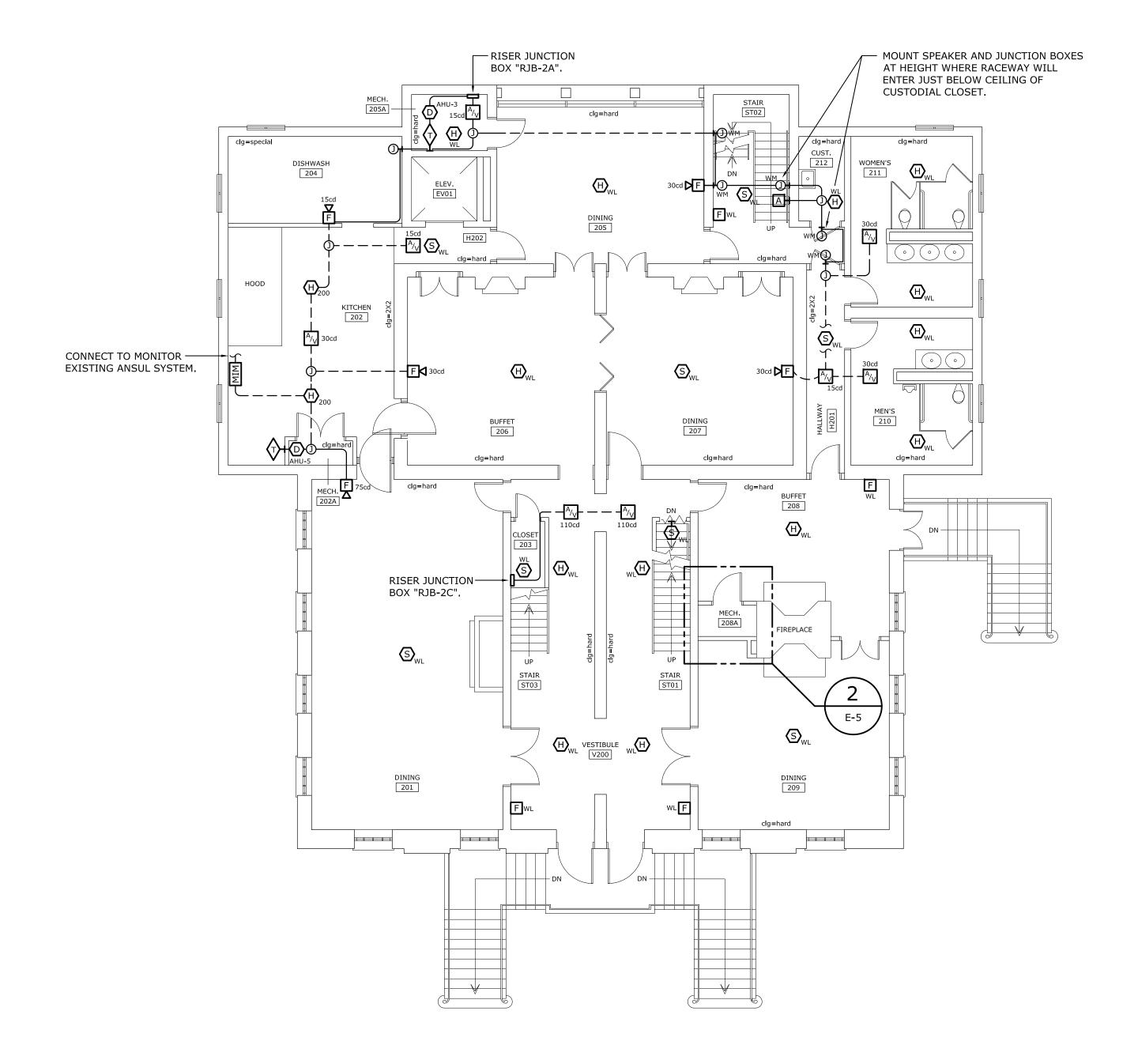


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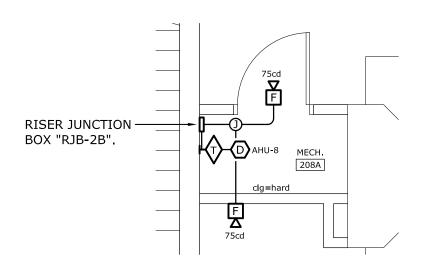
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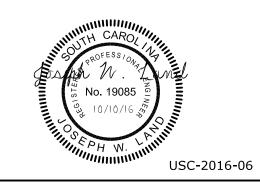
#### NOTES

. ROOM RACEWAY SCHEDULE: WHERE RACEWAY IS INDICATED TO BE CONCEALED (YES) ON THE ROOM RACEWAY SCHEDULE, CUT EXISTING GYPSUM/PLASTER CEILINGS CEILING COLOR - COORDINATE WITH OWNER TO VERIFY PAINT MANUFACTURER, TYPE, AND COLOR TO BE PROVIDED. APPLY TWO COATS OF PAINT TO EACH AREA WHERE CUTTING AND PATCHING IS REQUIRED.





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	ROOM RA	ACEWAY S	SCHEDUL	.E	
ROOM NUMBER	ROOM NAME	RACEWAY TYPE	J-BOX TYPE	CONCEAL RACEWAY	
201	DINING	EMT	STEEL	YES	
202	KITCHEN	EMT	STEEL	YES	
202A	MECHANICAL	EMT/FMC	STEEL	NO	
203	CLOSET	EMT	STEEL	NO	
204	DISHWASH	EMT	STEEL	NO	
205	DINING	MC CABLE	STEEL	YES -	SEE NOTE 1.
205A	MECHANICAL	EMT/FMC	STEEL	NO	
206	DINING	EMT/FMC	STEEL	YES	
207	DINING	EMT/FMC	STEEL	YES	
208	BUFFET	EMT/FMC	STEEL	YES	
208A	MECHANICAL	EMT/FMC	STEEL	NO	
209	DINING	EMT/FMC	STEEL	YES	
210	MEN'S	MC CABLE	STEEL	YES -	SEE NOTE 1.
211	WOMEN'S	MC CABLE	STEEL	YES -	SEE NOTE 1.
H201	HALLWAY	EMT/FMC	STEEL	YES	
H202	HALLWAY	MC CABLE	STEEL	YES -	SEE NOTE 1.
ST01	STAIR	N/A	N/A	N/A	
ST02	STAIR	WIREMOLD	WIREMOLD	NO	
ST03	STAIR	N/A	N/A	N/A	
V200	VESTIBULE	AC CABLE	STEEL	YES	



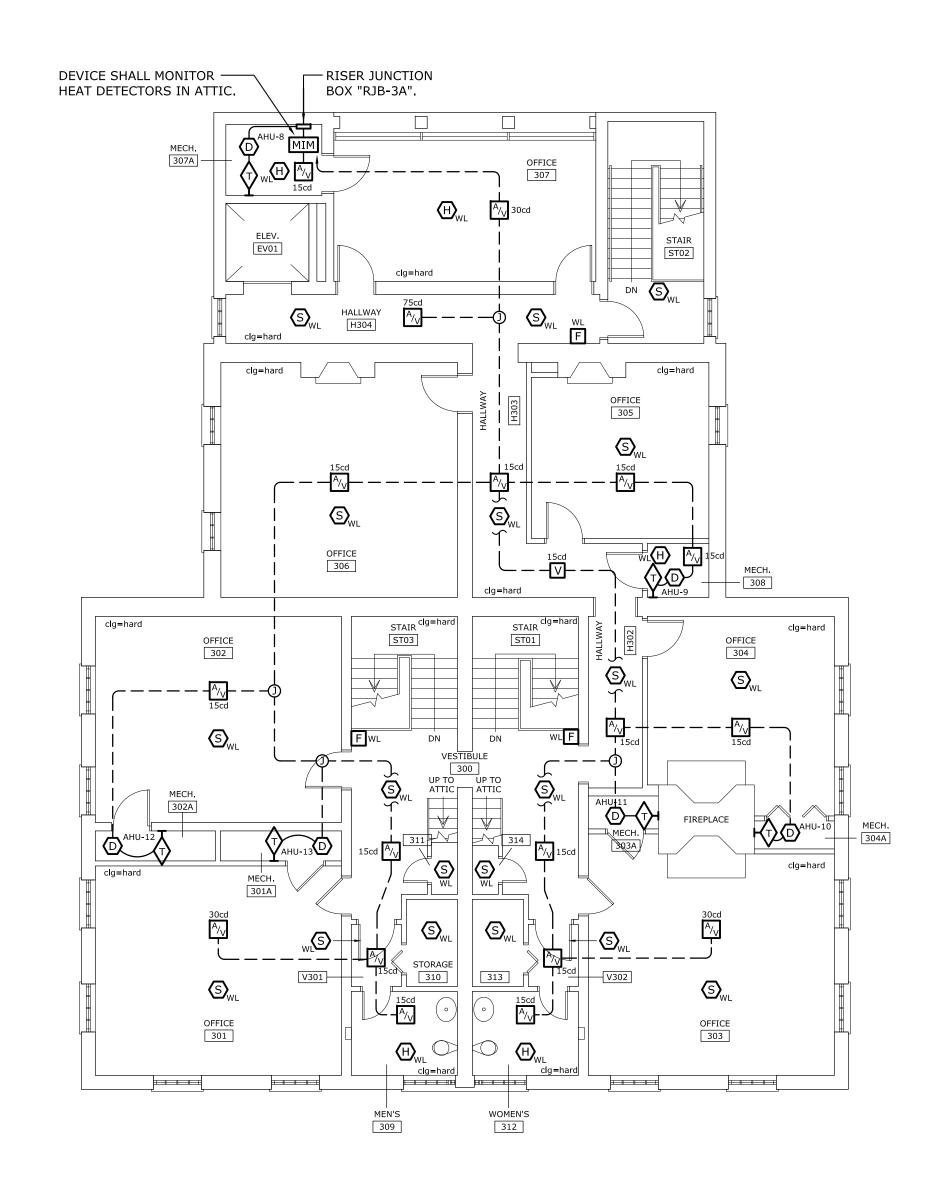


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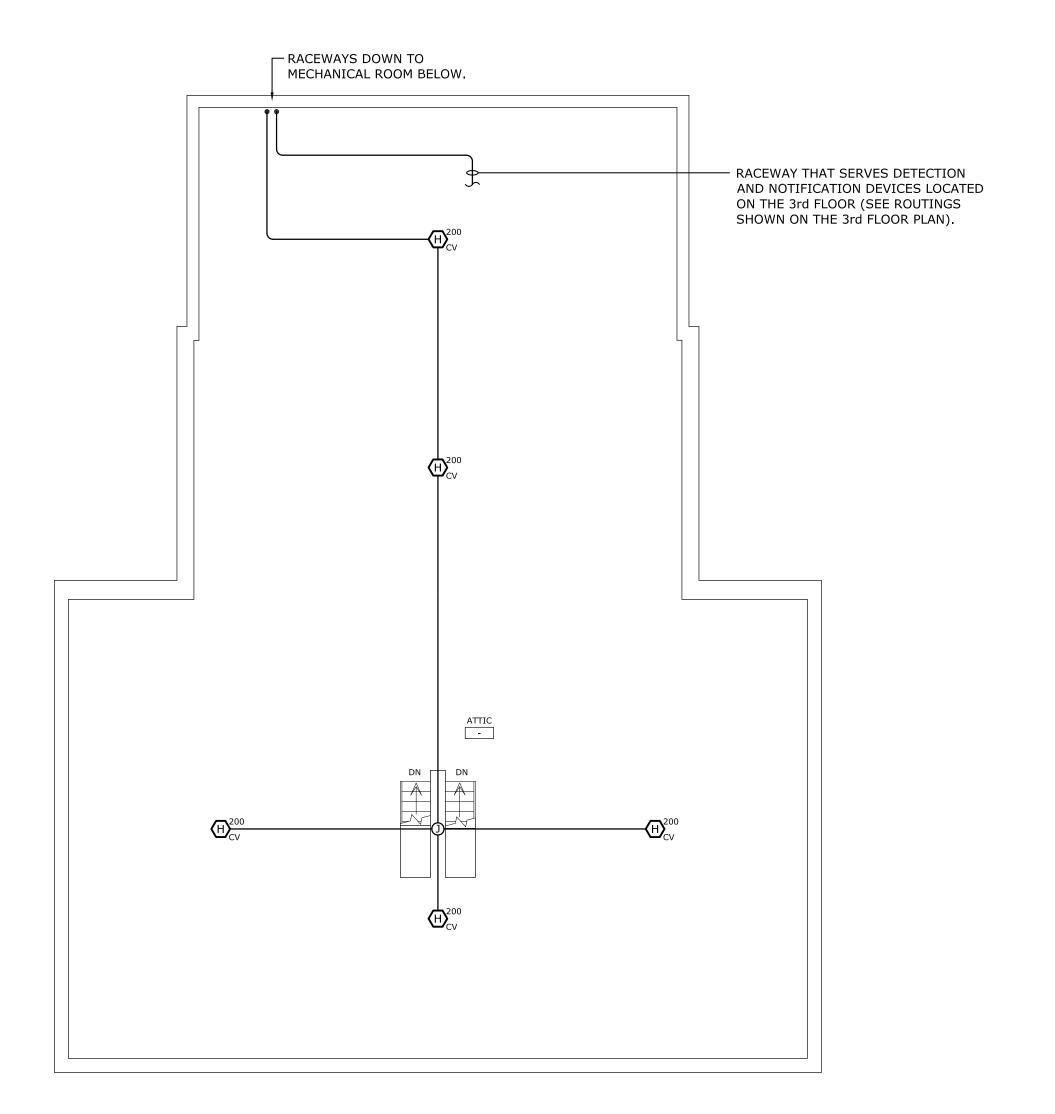
Carolina

NOTE: ALL RACEWAYS SERVING DETECTION AND NOTIFICATION DEVICES ON THE THIRD FLOOR SHALL BE ROUTED IN THE ATTIC SPACE OF THE BUILDING. THERE IS NO FLOOR AND THERE ARE NO CATWALKS IN THE ATTIC SPACE - THE CONTRACTOR SHALL PROVIDE TEMPORARY PLYWOOD FLOORING AS REQUIRED TO WORK IN THE ATTIC SPACE.

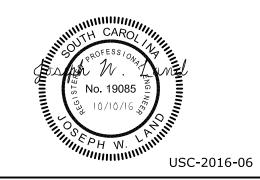




NOTE: ALL RACEWAYS SERVING DETECTION DEVICES IN THE ATTIC SHALL BE RUN EXPOSED - TIGHT TO JOISTS. SEE NOTE TO LEFT REGARDING FLOORING IN THE ATTIC SPACE.







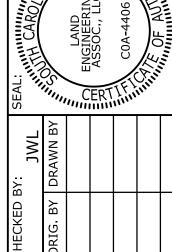


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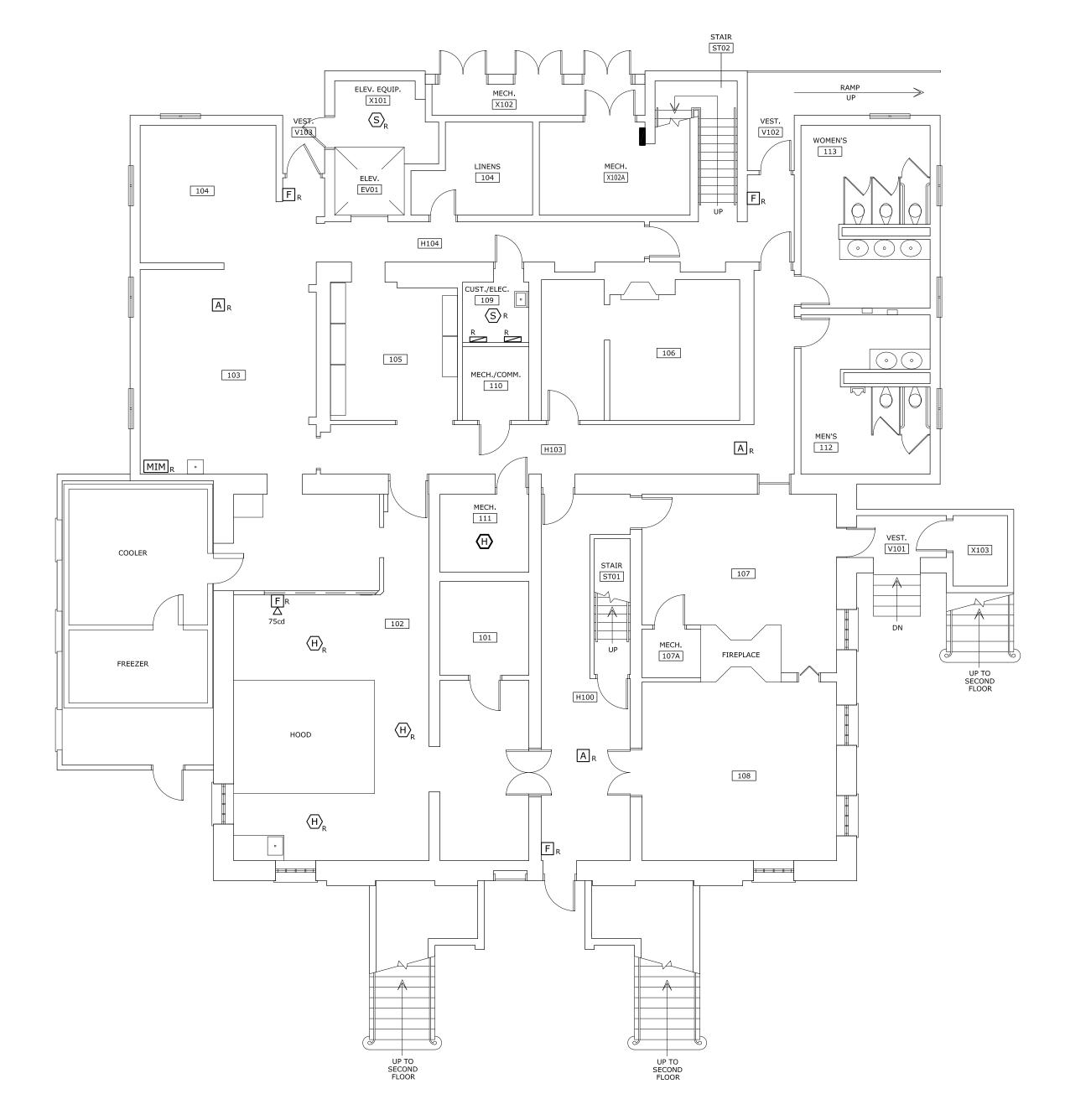
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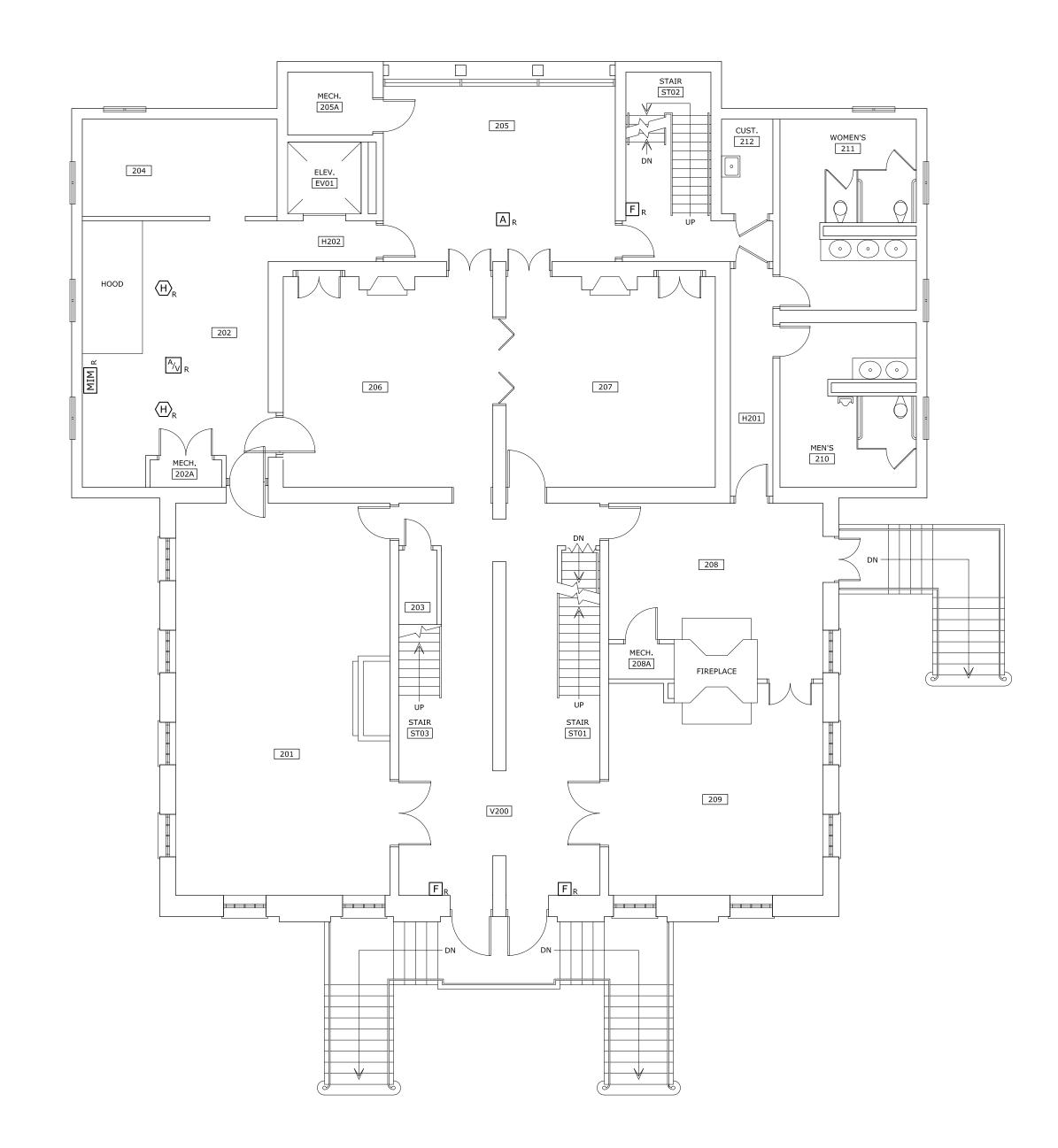
EXISTING FIRE ALARM MANUAL PULL STATION - REMOVE STATION AND ALL ASSOCIATED RACEWAY AND WIRING. PROVIDE A CUSTOM-SIZE BLANK, WHITE, PHENOLIC COVERPLATE TO FULLY COVER EXISTING OPENING IN WALL. MOUNTING SCREWS SHALL BE PAINTED MATCH COLOR OF COVERPLATE. EXISTING FIRE ALARM SMOKE DETECTOR - REMOVE DETECTOR AND ALL ASSOCIATED RACEWAY AND WIRING. PROVIDE A CUSTOM-SIZE BLANK, ROUND, WHITE, PHENOLIC COVERPLATE TO FULLY COVER EXISTING OPENING IN CEILING. MOUNTING SCREWS SHALL BE PAINTED MATCH COLOR OF COVERPLATE. EXISTING FIRE ALARM HEAT DETECTOR - REMOVE DETECTOR AND ALL ASSOCIATED RACEWAY AND WIRING. PROVIDE A CUSTOM-SIZE BLANK, ROUND, WHITE, PHENOLIC COVERPLATE TO FULLY COVER EXISTING OPENING IN CEILING. MOUNTING SCREWS SHALL BE PAINTED MATCH COLOR OF COVERPLATE. EXISTING CEILING MOUNTED FIRE ALARM HORN NOTIFICATION APPLIANCE - REMOVE APPLIANCE AND ALL ASSOCIATED RACEWAY AND WIRING. PROVIDE A CUSTOM-SIZE BLANK, WHITE, PHENOLIC COVERPLATE TO FULLY COVER EXISTING OPENING IN CEILING. MOUNTING SCREWS SHALL BE PAINTED MATCH COLOR OF COVERPLATE. EXISTING CEILING MOUNTED FIRE ALARM COMBINATION HORN/STROBE NOTIFICATION APPLIANCE - REMOVE APPLIANCE AND ALL ASSOCIATED RACEWAY AND WIRING. PROVIDE A CUSTOM-SIZE BLANK, WHITE, PHENOLIC COVERPLATE TO FULLY COVER EXISTING OPENING IN CEILING. MOUNTING SCREWS SHALL BE PAINTED MATCH COLOR OF COVERPLATE. EXISTING WALL MOUNTED FIRE ALARM HORN/STROBE NOTIFICATION APPLIANCE - REMOVE APPLIANCE AND ALL ASSOCIATED RACEWAY AND WIRING. PROVIDE A CUSTOM-SIZE BLANK, WHITE, PHENOLIC WALLPLATE TO FULLY COVER EXISTING OPENING IN WALL. MOUNTING SCREWS SHALL BE PAINTED MATCH COLOR OF WALLPLATE.

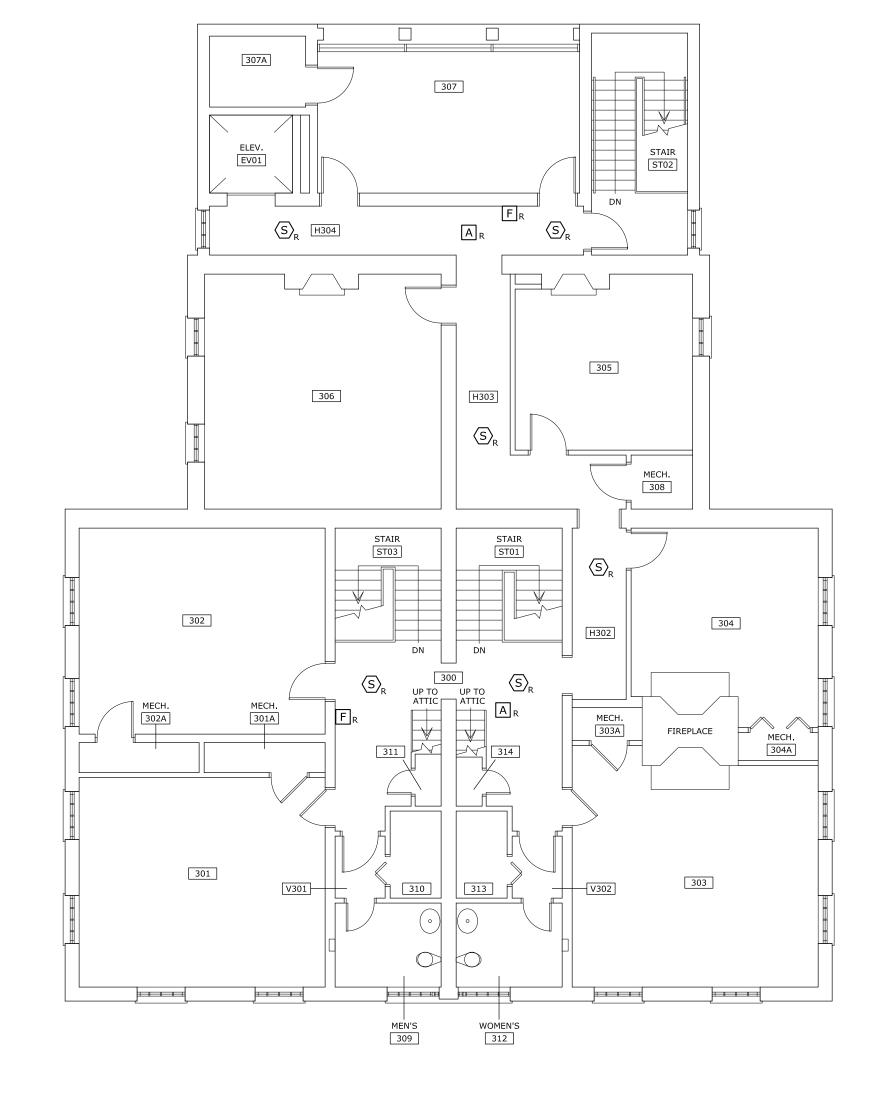
DEMOLITION LEGEND

ASSOCIATED RACEWAY AND WIRING.

EXISTING FIRE ALARM SYSTEM PANEL - REMOVE PANEL AND ALL

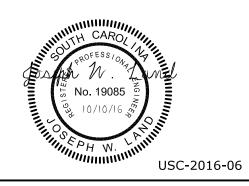
EXISTING FIRE ALARM SYSTEM ADDRESSABLE MONITOR INTERFACE MODULE - REMOVE MODULE ALL ASSOCIATED RACEWAY AND WIRING.













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IRE ALARM UPGRADE

University of South