PART 1 - GENERAL

1.01 Fire detection, notification, and reporting ("Fire Alarm") system equipment for all new or renovated facilities.

1.02 All Fire alarm installations made with new parts and materials. Exceptions may be approved through negotiations with UAF, specifically addressing the supplier’s/contractor’s warranty obligation.

1.03 Network all fire alarm system control panels within a single building to provide a single, comprehensive and complete system with all programming, signal, supervisory, and control functions available throughout the system at each control panel. This is subject to variation as building or building-complex design and use, fire separation features, and fire fighting access will all influence the final design approval.

1.04 Initiation and indication coverage and features:

A. All residential facilities: Complete fire alarm system protection, consisting of detection in all spaces, smoke detection with notification in each sleeping room, and manual activation means for use by occupants (pull stations) at each floor-level exit.

B. Non residential facilities: Coverage consistent with intended occupancy and hazard, but include as a minimum, general area automatic detection (either smoke or heat, or monitoring of sprinkler systems), manual stations and notification.

C. In general, if the facility is equipped with general area automatic detection, duct detection will be waived by the University. The Authority Having Jurisdiction may require duct smoke detection installed in supply air streams or return air streams not required by applicable Codes. The intent is to install duct detection only for a specific risk and not for general detection purposes.

D. No duct detection in the exhaust air stream (i.e. fume hoods) unless specifically required by the Authority Having Jurisdiction.

E. Thermal Detection may be used in laboratories in lieu of smoke detection, especially when the laboratory will generate fumes, dust, etc. that may cause nuisance alarms.

F. Monitor sprinklers, including all zone flow and tamper alarms and the exterior water flow bell.
   
   1. Monitor all switches, alarm or supervisory, separately by zone modules or intelligent interface devices, not paralleled or daisy chained. Use individual monitoring modules to monitor each device.

   2. Two switches may be monitored on dual-input devices such as HTRI-2D.
G. Fan shutdown bypass logic will be available to firefighters to restart fans during an alarm.

H. DDC will have a connection to the Fire Alarm system only for purposes of restart and outside air damper control.

I. Fan shut down: TRI Interface Module wired to a set of contacts that will disconnect the power at a motor starter or VFD. Per Siemens, inductive current should not be an issue if shielded conductors are used.

J. Coordinate requirements for elevator recall, machine room and hoist initiation devices, and shunt trip control with Division 14 and Division 23 as well as applicable NFPA 13, NFPA 72, and ASME requirements.

K. LPG shut down: TRI Interface Module wired to a set of contacts that will close and automatic valve (by Div 23).

1.05 Function matrix: See sample below:

<table>
<thead>
<tr>
<th>MXL FCP</th>
<th>Power On (Green LED)</th>
<th>Alarm Silenced (Red LED)</th>
<th>Audible (Yellow LED)</th>
<th>Supervisory (Yellow LED)</th>
<th>Trouble (Yellow LED)</th>
<th>Security (Yellow LED)</th>
<th>Panel LCD Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal Standby</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Any One Heat / Smoke Detector Alarm</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any Two Heat/Smoke Detector Alarm - Same Unit</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any Heat/Smoke Detect Or Alarm in Any Two Separate Units</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manual Station alarm</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Silence Switch</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trouble Al (Grounded or Open Circuit, Power or System)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

1.06 Proprietary / protected premises systems monitoring:

A. All UAF fire alarm systems shall provide full Protected Premises notification to facility occupants, and shall be Proprietary Systems with automatic reporting to a supervising...
station (UAF Emergency Communications Center) unless specified otherwise.

B. Non-campus facility systems will report to a specified public safety agency.

C. Select system equipment to interface directly to monitoring agency receiver equipment without modification.

D. Include additional receiver equipment (hardware or software) required to expand the UAF Emergency Communications Center to monitor the new project facility as part of the project planning, and supplied with the project.

   1. Standard operating procedure on campus is to keep one open position available as a full time spare.

   2. Determine installation, whether by contractor or by UAF personnel, in the design stage of the project.

1.07 Locate remote control consoles near main entrances for each building. However fire-fighter access, weather protection, and informative display are all factors affecting UAF’s determination on the final locations. Environmental suitability of the installation area is essential, including temperature degradation during extended electrical power interruption.

1.08 Signaling:

A. No Voice Evac: Operate all on-campus fire alarm systems in the “General Evacuation” mode when signaling, unless otherwise required by code. This eliminates the need for “Zone Coded” or “Voice Evac” signaling systems.

   1. EXCEPTION: Domicile facilities may be specified for single room/apartment signal activation, with general notification only upon additional room or general area alarms.

   2. EXCEPTION: High Rise facilities, as defined by the building code, shall utilize a voice evacuation system when required by code.

B. Exterior horns: Equip all facilities on campus with an exterior audible/visual notification appliance located on the “street” or “front” or “public entrance” side of the building to warn away potential building visitors:

   1. Have the appliance sealed onto its mounting box, with a thermal/vapor seal within the conduit to prevent condensation from the building’s conduit system, and a weep hole on the outside lowest point of the enclosure.

   2. Have the box mounted sufficiently off-plumb that any accumulating water will run to the weep hole.

C. Typically, in stairwells considered a component of the egress pathway, install audible
devices on every other landing, or at the top and bottom landings. Since stairwells are constructed of non-combustible material, sounds are not absorbed by the construction. Too many audible devices will create an uncomfortable environment with acute affects on the evacuee. Install visual signals on every landing. Place visual signals so as to not visually impair evacuees.

1.09 Water gongs: All on-campus facilities equipped with water-flow fire protection systems will be equipped with an120 volt alarm bell on the building exterior, located near the Fire Department Connection that sounds when water is flowing, stops sounding when water flow ceases, and is non-silenceable while sounding. If controlled by the same flow switch as the fire alarm water flow input, the exterior bell will use a separate set of switch contacts.

1.10 HVAC bypass programming: Fan shutdown bypassing: Toggle-type logic function, such that fans may be restarted (and subsequently re-stopped) even with the system still in alarm.

A. Bypasses are NOT automatically reset at midnight.

B. Troubles do NOT self restore.

C. Troubles are NOT resounded/reminded after 24 hours.

D. No in-panel history, or a circular history with log full trouble suppressed.

E. Maximum delay reporting AC fail/brownout.

F. Supervisory inputs (tampers, etc) are to be programmed Troubles.

G. Program all un-used inputs to TRIs/ICPs as Troubles, versus Alarms or Status Points.

PART 2 - PRODUCTS

2.01 Approved brands: Siemens Fire Alarm Control and Annunciator Systems, XLS model. No alternate brands, No substitutions allowed. Use only the most current revisions of hardware and software.

2.02 Graphic Annunciators shall not be used unless specifically requested by the UAF Fire Department and allowable within the project budget. UAF Fire Department prefers the use of Siemens Remote Control Consoles placed near the building entrance. If required, utilize a Kirkland or Siemens graphic annunciator: Submit display graphics and model number (size) for review and approval prior to ordering from Kirkland.

2.03 Acceptable manufacturers:

A. Audible/Visual: Wheelock Series NS, Siemens, alternate brand request required.
B. Manual Pull Stations: Wheelock, Siemens, alternate brand request required.

C. Lexan Covers: Safety Technology International, alternate brand request required.

D. Detection: Siemens, alternate brand request required.

2.04 Any design requiring interconnection not covered in the manufacturers instructions shall be shown in the planning drawings for review and approval and included in O&Ms.

A. Possible interconnections to the fire alarm system include the Division 25 Building Automation System, Fire/Smoke damper control/testing system, Division 28 Security Access.

2.05 O&M shall include a product data, programming data, complete program listing in hard copy for all systems relying on programming for proper operation. O&M Manuals for fire alarm systems with descriptive event readout/recording shall also include a Word file on non-volatile electronic media.

2.06 Fire Alarm Control Panels: Most existing systems are Siemens Pyrotronics MXL, SXL, or MXL-IQ and may remain so as long as Siemens continues to maintain them. All new construction and major renovations where fire alarm systems will be replaced shall use the Siemens XLS system. All major buildings will use a fully configurable system with descriptive event recording/readout configured for full interface with Siemens Network Command Center (NCC) in University Emergency Communications Center (UDC). Provide interconnection modules, including the XLS panel’s fiber transmitter interface, and the NCC fiber assembly (at both the XLS and the NCC).

A. The interface to University Emergency Communications Center will conform fully with all the features of NCC as defined in the Siemens NCC Installation and Operation documents:

1. Include all acknowledging, silencing, unsilencing, disarming, rearming, output activation, output deactivation, and resetting, and time synchronization.

2. Allow display of all signals generated by the facility’s Fire Alarm Control Panel. Include building graphics for upload to the NCC when utilizing the XLS system.

2.07 Optional small systems: alternative brands dialer compatibility.

A. Small-facility projects requiring simpler alarm systems may take advantage of emerging other technologies and sources, so long as they communicate adequately with the Silent Knight 9000 Receiver/9032 Line Card using BFSK 2/3 dialer format. Examples are the Silent Knight 5128 and 5104 Digital Communicator.

B. Small systems without XLS’s descriptive event readout will be broken out into zones that logically follow the facility’s construction, and provide meaningful location information for responders.
C. UAF prefers the use of a Siemens SXL panel for small applications with minimal detection, supervisory, and annunciation.

D. In a facility with general area smoke detection, arrange zones such that smoke detectors may be deactivated en-masse (by floor or other defined area) without compromising manual station and other automatic detection.

PART 3 - EXECUTION

3.01 Audible bases: Where sleeping rooms are equipped with audible bases under the smoke detectors, arrange the audibles power circuit so that only the affected detector’s base will sound in response to that detector’s alarm condition until the next alarm logic state is reached, (i.e. adjacent room or a general area alarm device); general area audibles or strobes shall not annunciate when only a single room smoke detector is in alarm.

3.02 Power sources:

A. Door Magnetic Door Holder power: Obtain operating power from, or interlock through, the primary power source for the FACP such that if the primary power is lost, the Magnetic Door Holder de-energize without requiring a functional operation by the fire alarm system.

B. Fire/smoke damper hold-open power: Obtain operating power from, or interlock through, the primary power source for the FACP. Initiation of a general alarm will cause the dampers to lose power and fail shut. Power loss to the dampers without an alarm to also shutdown the Central Supply Fans not allowed. A fire/smoke damper control system such as the Ruskin Inspector system may be specified.

3.03 Box and conduit fill, zone counts, power supply and loop loading not to exceed 80% of maximum to allow for growth.

3.04 Megger installed wiring prior to landing on devices or modules with device-location splice points temporarily made-up to test the entire loop. Provide megger report to UAF.

3.05 Testing may include acceptance testing for certification upon commissioning; acceptance testing by UAF; any partial tests deemed necessary by contractor/supplier or by UAF. The contractor/supplier shall perform a 100% test of the system in its completed form prior to, and separate from, acceptance testing by UAF.

3.06 Sample program list:

A. For those fire alarm systems made operable through programming by the contractor/supplier, submit a “first cut” or better (not planning notes) sample of the program listing, as complete as possible at the time of the submittal, for review and approval.
1. As a minimum, include samples from every data and comment field in the program and a thorough cross sectional cut of device custom messages to allow UAF to approve or customize wording in time to have it appear in the final program version.

2. When the program is not submitted for review prior to construction, any changes required by UAF will be accomplished at the contractor’s expense before the system is accepted by UAF. (See below for the Campus standard for Custom Messages).

B. Submitted custom message (Zeus Point) listings may be in the condensed two-line-per-device format, but O&M deliveries shall be in the older, 4- (or more) lines per device layout, to stay consistent with our other Campus systems. These listings will be posted in each FACP for use by responders of varying levels of training in their interpretation.

3.07 Wiring:

A. New Building Installations that will use the Siemens XLS Fire Finder Panel shall use the following wire types and wire sizes are as a minimum requirement:

1. Signaling Line Circuits – 16Gauge Twisted Pair, T-Tapping is allowed on Signaling Line Circuits in a Class B Wiring format.

2. Notification Appliance Circuits – 14gauge UL Approved Single Conductor or 14gauge Twisted Pair FPLR, T-Tapping is not allowed in any format

3. Network H-net, X-net, Can Bus – 16gauge Twisted Pair T-tapping is not allowed

B. For Retrofits of an existing Siemens MXL or for additions to an existing Siemens MXL Panel the following wire types and wire sizes are as a minimum requirement

1. Signaling Line Circuits – 16Gauge Twisted Shielded Pair, T-Tapping is allowed on Signaling Line Circuits in a Class B Wiring format.

2. Notification Appliance Circuits – 14gauge UL Approved Single Conductor or 14gauge Twisted Pair FPLR, T-Tapping is not allowed in any format

3. Network M-net – 16gauge Twisted Shielded Pair T-Tapping is not allowed

3.08 Wet areas: Protect installations within 6 feet of any sprinkler valve or fitting in liquid-tight conduit and NEMA 4 enclosures.

3.09 Wire colors:

A. For signal circuit pairs, the lighter of the two colors will be for the more POSITIVE polarity conductor, and the darker for the NEGATIVE (red is positive, black is negative).

B. In polarity reversal circuits, the color scheme will reflect the ALARM or ACTIVATED
state polarity, with the “normal supervision” or “standby” state opposite to the color code.

3.10 Class A and B wiring: Generally, UAF does not require Class A wiring for Initiating, Notification, or Signaling Line circuits. However, when Class A wiring is specified, pipe and run so that the path through the field is a loop, with the outbound and returning legs in separate conduit except for the short runs entering the FACP and field device enclosures on the enclosure’s mounting wall.

3.11 Program front panel function keys according to the following guidelines:

A. F1: Audibles bypass.

B. F2: Fan shutdown/damper bypass—on a toggle so responding fire fighters can start/stop fans as needed for smoke control, even during alarm.

C. F3: Door release bypass—also on a toggle.

D. F4: Elevator recall bypass (shunt trips do not get bypassed).

E. ALT1 / F1. Waterflow switch bypass—on a toggle so it may be un-bypassed without resetting panel. (Tamper Switches do not get bypassed).

3.12 There will be not be a function key for unlocking magnetic held closed rear doors.

3.13 Device custom messages shall conform to the following general format, using a maximum of 32 character spaces. Messages shall be approved through the Submittal process prior to final programming:

A. For initiating devices:

1. Message format: (device type)(device #.)(room/area)(application)(bldg name). Building name may be dropped for XLS panels upon approved by the UAF Fire Department

2. Examples:

a. FPT01-18 149 LAB HEAT DUCK.

b. ILI02-07 100M1 MENS SMOKE DUCK.

c. TRI03-01 CHEM BUNK (XX) DUCK (XX=pull/heat-specify).

d. TRI03-02 CHEM BUNK (XX) DUCK (XX=pull/heat-specify).

e. FPT03-13 100E2 ELEVPITHEAT BRKS.
f. MSI03-16 100C13 NWHALLPULL BRKS.

g. FPI04-10 100U1DUCSMOKE(XXX)BRKS (xxx=RF-X(RETURN FAN-X),SF-X(SUPPLY FAN-X),OR AH-X(MIXED AIR HANDLER-X)AND SPECIFY THE NUMBER (-X)).

h. TRI04-11 100U1TESTDUCT04-10BRKS.

i. TRI05-19 GRG131TAMPR FLR-X BUNL (SPECIFY FLOOR (-X)).

j. TRI05-22 GRG131SPRNK FLR-X BUNL (SPECIFY FLOOR (-X)).

k. ILI06-07 243A LAB SMOKE BUNL.

l. ILI19-06 200U6DUCSMOKE(XXX)BUNL (xxx=RF-X(RETURN FAN-X),SF-X(SUPPLY FAN-X),OR AH-X(MIXED AIR HANDLER-X)AND SPECIFY THE NUMBER (-X)).

m. ILI19-10 200U6DUCSMOKEAHU-1BUNL.

n. TRI21-01 200V1PROPANESHUTOFFART.

o. TRI23-01 200U6AHU-3SHUTDOWNFART.

B. For notification appliances/other modules:


2. Examples:

   a. MMB253-4NACcktI lvl1So.sgnl LIB.

   b. CSM4 21-2NACcktDlvl4Ea.sgnl LIB.

   c. PSR-1 02 AudPwrTRBL relay WOODC.

   d. MKB-1 251 MXL KEYPAD ARCHLTH.

   e. MKB-1 250RCC-1No.EntrKPDARCHLTH.

   f. CMI-300 NCC LINK ARCHLTH.

   g. ALD-2I3&4 flrs1,2EASTZNSARCHLTH.

   h. MOI1-7 North Ent Annun BUNL.
3.14 Psuedo-messages shall be descriptive, and end in a building name abbreviation common to other messages in the CSGM.

3.15 Do not install smoke detectors while substantial carpentry/masonry or other dust-generating efforts are not yet completed. Detectors installed in a dusty environment without protection will be considered “used” and will be replaced by the contractor with new parts at no cost to Owner.

3.16 Splices:
   A. Any splicing or distribution joins in or at the FACP or at riser nodes will be made on terminal strips in an appropriate enclosure.
   B. In high-wall room applications, provide a distribution/isolation splice (wire-nuts in a pull-box) at a convenient height for any ceiling or near-ceiling mounted devices.

3.17 Boxes and covers:
   A. All boxes will be covered.
   B. Install TRIs into the box specified on Siemens’ installation sheet, and apply the specified cover.
   C. In Sprinkler Flow Switch enclosures, where 120VAC for the Water Gong is shared under the same switch cover as the TRI detection wiring use a separate entrance fitting and conduit (liquid-tight) for the high voltage.

3.18 Securely mount devices, appliances and module enclosures to the building or other substantial structure.
   A. Mounting to removable ceiling panels, wall finishes, sheetrock, or other insubstantial building components without code approved hardware, hangers, and braces is not allowed.
   B. Box extension rings used to adjust mounting height off the wall are limited to a single above-the-finish extension. If more clearance is required and a commercially provided support is not available, fabricate a welded, paint-finished steel bracket, and secure to building structure.
   C. Stacking boxes to mount devices not allowed except as stated elsewhere in this document.
   D. Mark end of lines: Inconspicuously mark ceilings and wall boxes on visible surface trim to indicate EOL presence, using clear adhesive, mylar or plastic type, minimum 3/16 inch size with black, or other color as appropriate, letters by a Kroy lettering type device.