1. This information provides guidelines for electronic safety systems including fire alarm and security systems. Automatic fire sprinkler systems are covered in the “DIVISION 21 Fire Suppression Systems” section. Access Control Standards are covered in “DIVISION 28 Access Control”.

2. The current campus wide Electronic Safety System is proprietary. Unless otherwise approved, the design shall utilize systems that are compatible with existing systems and infrastructure.

3. When working on or adjacent to existing buildings, require means and methods that protect occupants from exposure to noise, dust, traffic, and other hazards.

4. Fire alarm and security central monitoring system:
   a. The campus fire alarm and security system is manufactured by UTC Edwards System Technology (UTC/EST), and devices are monitored by FireWorks for all academic and residential buildings.
   b. The system is connected across campus via a fiber network. The following components are required at each building for connection to this system. Power supply shall be UL listed for the application and shall have backup battery power.
      i. Ethernet switch: To provide Ethernet transmission over multi-mode fiber between each building and FireWorks headend, provide 8 strand multi-mode fiber between Ethernet switch and fiber patch panel located in MDF. Cabling shall comply with telecommunications standards. Coordinate specific switch component with Facilities Development and Capital Budget (FDCB) Project representative who will coordinate with individuals as required. These components shall have a dedicated battery back-up power supply (APS-10A) and connection to the emergency power system. Shall be located inside 12" H x 12" W x 4" deep cabinet with hinge cover and keyed to match main panel (cat45). Battery back-up shall comply with requirements indicated below.
      ii. Two Ethernet device servers: To provide RS-232 to Ethernet conversion between the fire alarm panel and the Ethernet switch. Devices shall be DIN rail mounted, 24VDC powered, from the fire alarm panels, and have 1-10MB/s Ethernet port (RJ45) and 1- RS-232 port (RJ45). Manufacturer to be Lantronix XSDRSN-03, no substitutions.

5. Fire alarm equipment and wiring:
   a. Fire alarm panels in new buildings shall be UTC EST-3 series systems with a minimum of the following components:
      i. 3-CAB21B fire alarm cabinet
      ii. 3-CAB21DE door assembly
      iii. 3-CPU1 main central processing module
      iv. 3-RS232 communications card
      v. 3-LCD main cabinet display
      vi. 3-CHAS7 chassis rail assembly module
      vii. 3-MODCOM modem communicator card
      viii. 3-SSDC-1 single signature loop controller card
      ix. 3-SAC access control and key pad interface card (CONFIRM CLARIFICATION with WWU)
      x. 3-PPS/M main power supply
      xi. Modem programmed for a redundant dial out in case the Fireworks system is unable to function. Dial out will go to the receiver located at campus dispatcher via a dedicated phone line. Coordinate obtaining two dedicated phone lines via separate cables with FDCB project representative.
xii. System with audio shall have the following additional components:
   - 3-ASU
   - 3-CHAS4 chassis rail assembly
   - 3-ZA40A audio amplifier
   - MN-FVPN Fire alarm devices shall be as follows:
     - Smoke detectors: Photoelectric type, UTC Edwards SIGA-PD
     - Heat detectors: Rate of rise HRD
     - Pull station: SIGA 270
     - Speaker/strobe: Genesis High Fidelity Series
     - Beam detector: Bosch DS-240
     - Residence room smoke detectors: UTCEdwards SIGA-PD with sounder base AB4G-LF
     - Electromagnetic door holder: ESL (furnished by door hardware section)

b. Conductors:
   i. System vendor/contractor is responsible to size conductors to account for voltage drop.
   ii. Conductors #14 and larger shall be stranded; conductors smaller than #14 solid.
   iii. In each junction box or panel, label incoming wire pair with black tape within 2” of conduit.
   iv. Conductor minimum size and color shall be as follows, no exceptions:
      - Signature loop - #16, yellow positive, orange negative
      - Horn - #14, red positive, black negative
      - Strobe - #14, red positive, black negative
      - Speakers - #16, tan positive, purple negative
      - Power to detector (residences) - #14, pink positive, purple negative
      - Door holder - #14, blue negative, white positive

c. External power supplies:
   i. All power supplies shall be 24V BPS-10A.
   ii. Individually monitor each power supply with a CT1 monitor module.
   iii. Connect to the emergency generator. If emergency power system is an NFPA compliant generator, the battery back-up shall be for 4 hours; otherwise, size batteries as required by NFPA 72 for batteries as the sole secondary source of power.
   iv. Batteries shall be minimum of 2 each 7 Ah Enersys/Yuasa batteries as determined by load calculations – no substitutions.
   v. Conduit entrance in bottom of BPS cabinets prohibited. Reserve this zone for batteries in a normal upright position.
   vi. Strictly adhere to manufacturer’s recommendations for separation between line voltage and low voltage wiring.

6. Fire alarm system design:
   a. Partial coverage of smoke detection (as defined by NFPA 72) is required in all buildings with full fire sprinkler coverage, except when the quantity of duct detectors required by the mechanical design makes total coverage of smoke detectors a more cost effective solution. Consult FDCB project representative regarding this issue prior to completion of the design development phase.
   b. Total coverage of smoke detectors is required in all non-fire sprinklered buildings.
   c. Residential buildings shall be wired for maximum flexibility to allow conversion to hearing impaired units. See WWU typical wiring diagrams at the end of this section for common configurations. Coordinate with the FDCB project representative who will coordinate with individuals as required.
   d. Special care shall be taken by designer and installer of fire alarm system to avoid installing
spot type smoke detectors in areas where the air velocity exceeds 300 ft./min.

e. Smoke detectors shall not be installed within 18" of fluorescent lighting ballasts, and the drawings shall clearly indicate this on each floor plan of the fire alarm design and shop drawings.

f. Battery calculations shall be required from vendor at shop drawing submittal and at Substantial Completion.
   i. Battery capacity shall be sized at 120% of calculated battery load.
   ii. If loads are added during construction, battery capacity shall be increased to maintain 120% capacity at the completion of the project.
   iii. If emergency power system is an NFPA compliant generator, the battery back-up shall be for 4 hours; otherwise, size batteries as required by NFPA 72 for batteries as the sole secondary source of power.
   iv. Batteries shall be located in adequate sized cabinet with batteries upright.

g. Design consultants shall show all required devices on their drawings, including modules. FM Technical Maintenance will perform all programming and interface with campus head end systems. Designer shall coordinate sequence of operations and detailed scope of work with FDCB project representative prior to bidding. See matrix at end of this section as a starting point. Pre-design conference will be scheduled by FDCB project representative during Design Development phase to coordinate overall system configuration, and any existing capacity issues will be discussed for remodel projects.

h. All fire alarm conductors shall be run in an approved protected raceway. Provide seal-off in conduit where conduits enter the building from the exterior. In limited residential applications open cable systems may be allowed within enclosed chases; coordinate with FDCB project representative.

i. Shop drawings shall include a floor plan, riser diagram (showing all devices on each floor), number of conductors, required raceway sizes which include 25% design spare capacity based on 40% fill ratio, control panel wiring diagram, device wiring diagram, Acoustically Distinguishable Spaces (ADS), Speech Transmission Index (STI) with targeted levels of .6 STI if possible, and all other information recommended by NFPA 72 Annex A, current adopted edition. Shop drawings shall be submitted to FDCB project representative for review and acceptance prior to submittal to Authority Having Jurisdiction (AHJ).

j. Circuit capacity calculations:
   i. Each signature loop shall have a minimum of 25% design spare capacity.
   ii. Each visual circuit shall have a minimum 25% design spare capacity and at Substantial Completion of the project no circuit shall have a voltage less than 21 volts.
   iii. As part of shop drawing submittal, provide voltage drop calculations as proof individual loops are not overloaded.
   iv. All circuit wiring shall be installed per approved shop drawings. Unavoidable deviation from approved shop drawings shall be flagged in writing and reapproved by FDCB Project Representative in conjunction with FM Technical Maintenance.

k. Consultant shall specify that “T” taps are not allowed; all wiring shall be looped. Bid specifications shall require that all device terminations are field verified by a factory trained “Edwards Synergy Certified” technician. Contractor will be required to complete all system trouble shooting and fault correction prior to commissioning under observation of FM Technical Maintenance technicians.

l. O&M manuals shall contain all information recommended by NFPA 72 Annex A.

m. Design shall include capacity for meeting NFPA 72 recommended standards for Acoustically Distinguishable Spaces (ADS), Speech Transmission Index (STI), and STI-Public Address (STI-P).

n. For each building designed, require 5 of each of the following including 50’ of ¾” EMT, (2) 4” square boxes, and wire for the connection to each device:
i. Smoke detectors
ii. Pull stations
iii. Speaker/strobe

7. A-V equipment security and wiring:
   a. A PC-tab based security system is used in computer labs and areas with A-V mediation
equipment to protect against theft. Where security system is required by the project, the
following shall be provided and coordinated with FDCB Electrical Engineer and FM Technical
Maintenance.
   b. A security junction box (UTC Edwards RCC7) shall be located on each floor in MDF/IDF room.
      i. Designer shall request schematic diagram from FDCB project representative to be
         included in contract drawings. A representative cabinet diagram is included at the end of
         this section.
      ii. The schematic depicts what is provided by the University and what is contractor’s
         responsibility. See matrix at end of section as a typical scope breakdown.
      iii. Security junction box shall not be used as a raceway or junction box. Only wires that
         terminate in the security box shall enter it.
      iv. For purposes of signature loop device capacity calculations, each cabinet shall be
         considered full. The maximum capacity in a security cabinet for Siga Sec 2 modules and
         UCM modules are 16 and 32 respectively.
   c. Provide four (4) pair conductor cable (CAT # to match building data wiring) routed with
      telecommunications conductors between the MDF/IDF telecommunications 110 blocks and
      the standard data faceplate at the security point of termination. Follow all BICSI and
      associated standards for telecommunications wiring.
   d. UTC EST-3 Sec-2 modules shall be furnished by contractor to WWU in time for final
      installation.
      i. FM Technical Maintenance will perform programming, mounting, and termination of Sec-
         2 modules.
      ii. FDCB project representative will coordinate with all interested parties to determine what
         needs to be secured and quantity of each type. This inventory will be provided to the
         design team as the basis for determining security cabinet and module requirements.
      iii. Verify capacity of proposed loops with FM Technical Maintenance. Each loop is required
         to have 25% minimum spare capacity. If this standard cannot be achieved, additional
         loop(s) and/or a new service cabinet will be required.
      iv. PC Tab security loop criteria is as follows:
          • 12 to 14 standard devices per security loop
          • 1 A-V podium per loop
          • 1 Digital projector per loop
          • 1 Smart Board panel per loop
          • 1 UCM per loop
          • 2 maximum UCM’s per Siga Sec 2
8. CCTV:
   a. Coordinate CCTV system requirements with FDCB project manager in conjunction with University Police on a project by project basis. If CCTV system is required, the following features shall be considered.
   b. CCTV system shall be compatible with systems by Pelco.
   c. Computer labs (general and departmental) shall have two CCTV cameras mounted on opposite walls to assure full coverage of room. Where rooms have dividers, provide a pair of CCTV cameras for each section of room.
   d. CCTV cameras shall connect to an NVR capable of storing 30 days of continuous video. Coordinate frame rate and resolution for specific location and application with FM project representative. Provide a dedicated battery and generator backed up power supply. If NFPA 110 compliant generator is available, battery back-up shall be for 4 hours; otherwise, provide 24 hour battery back-up.
   e. Provide two (4) pair conductor cable (CAT6) link between NVR and Ethernet switch at Fire Alarm Control Panel (FACP).

9. Security system design:
   a. All security and access control provisions for a project shall be coordinated with FDCB Electrical Engineer and WWU Technical Maintenance in conjunction with the University Police Department’s (UPD) designated security representative. UPD will review and approve which areas of campus need enhanced security based on risk profile.
   b. Physical cable padlocked loops are part of the integrated security solution for A-V and computer equipment. These components are specified under other sections of these standards.
   c. Other security features determined on a project by project basis by the FDCB project manager and UPD.
   d. Duress buttons: Latching type with form “C” contact. Preferred vendor United Security Products HUB-2A.

10. Commissioning:
   a. Fire Alarm subcontractor shall complete City of Bellingham Confidence Report as part of Final Completion and occupancy permit process from Fire Marshall.
   b. Fire Alarm subcontractor shall provide service response within 24 hours, 7 days per week for all “Trouble” signals and false alarms for the period up to Fire Marshal acceptance of the system and a minimum one (1) month period following. If trouble frequency is significantly above campus average, period shall be extended as necessary.
   c. A copy of the completed O&M manual including Fire Alarm and Security system electronic record drawings shall be furnished to the Owner within the commissioning period. This copy is for the Owner’s operational use prior to receipt of design consultant reviewed and approved documentation. “Commissioning” period will be extended as needed until documentation is received.
   d. All parts replaced under warranty shall be new. Reconditioned parts are not acceptable.

11. Mass Notification Standards
   a. Mass Notification audio-visual devices are an integral part of the fire alarm system. Amber visual devices are to be placed in all locations where fire alarm strobes are located unless otherwise approved by WWU project manager. Amber strobes shall be identified with “ALERT” stenciled on them.
   b. Mass Notification amber strobe conductors are to be Yellow / Green #14
   c. Mass Notification minimum required equipment:
      i. Edwards APS 10A power Supply
ii. Edwards MN-BRKT3 mounting bracket  
iii. Edwards MN-FVPN  
iv. Edwards MN-PASM2
### ELECTRONIC SAFETY SYSTEMS SCOPE OF WORK COORDINATION MATRIX

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<th>ACTIVITY OR DEVICE</th>
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<tr>
<td>FIRE ALARM SYSTEM DEVICES</td>
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<td>RECONNECTION OF NEW WORK AT ISOLATION POINT</td>
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<td>PCTAB CONTACT MODULES (UCM)</td>
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</tr>
<tr>
<td>PCTAB TESTING</td>
<td>CONTRACTOR / OWNER</td>
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### NOTES:

1. Contractor shall coordinate with Owner to allow Owner access and opportunity to complete their work concurrently with the Contractor’s work on the system.
2. Items not specifically mentioned, but are required for a complete functional system shall be provided by the Contractor.
3. Owner within the table above is FM Technical Maintenance.
REPRESENTATIVE MEDIA SECURITY CABINET (EDWARDS RCC7)
TYPICAL RESIDENCE HALL ADA & NON-ADA WIRING DIAGRAM