SECTION 28 00 00 – Access Control, Electronic Surveillance, and Intrusion Alarm Systems

Document revision history: 06/2024 – Original Publication

Date	Section	Description of Change

PART 1 – GENERAL

1.1 Summary - Maintenance; Common Work Results; Schedules

a. See also Section 08 30 00 – Specialty Doors & Frames.
b. See also Section 09 50 00 – Ceilings.
c. See also Division 14 for Elevator requirements.
d. See also Division 23 for Instrumentation & Control for HVAC (DDC) and VFD for HVAC Standards.
e. See also Division 26 for Electrical.
f. See also Division 27 for Communications.
g. See also Laboratory Appendix for environmental controls, alarming, notification, signage, etc.
h. See also appendices for various space type requirements.
i. NEC and IEEE working clearance is required and to be maintained.
j. NEC and IEEE definitions will apply to all standards that follow.
k. UO goals of sustainability, life-cycle costs, maintainability, serviceability, high performance, quality equipment, and efficient campus inventory must be maintained. First costs may be impacted slightly as a result, but a better product will follow.
l. Access control, security cameras, and alarm monitoring system information shall be considered sensitive information. As such, the release of detailed information about the systems and how such systems are monitored shall be limited to those with a 'need to know.
m. Exterior placement of any and all equipment requires CPFM approval to ensure compliance with the UO Campus Plan. If approved, all University policies shall be followed.
n. Building system zoning requires CPFM review and approval.
o. NO demolition of one item shall occur in order to repair and/or replace another item.
p. ALL deleted items must be removed and not just abandoned. All abandoned or deleted conductors shall be physically removed. Conduits, pull boxes, and outlet boxes shall remain.
q. Systems and system components in new construction, remodels, and retrofits are to be compatible with existing systems and system components to the extent possible.

PART 2 – PRODUCTS

2.1 See subsequent sections

PART 3 – EXECUTION

3.1 Installation

a. Systems shall be fully commissioned prior to acceptance.
b. Supervising Installer shall have a minimum of 5 years of full-time experience in the installation and maintenance of systems with factory training and certification; documentation required.
c. Boxes, panels, equipment gutters, etc. are to be cleaned inside and out upon completion and prior to acceptance of work.
d. Warranty repair response time: 4 hours maximum

3.2 Interface with other products

a. Not applicable.

3.3 Testing

a. Not applicable.

3.4 Training

a. Training provided to UO designated employee shall be a minimum of 4 hours, and MUST be to a maintenance/technician level for ALL systems. Training shall be conducted only by factory-certified, factory-trained personnel who can demonstrate a minimum of 2-years of experience in the installation and operation of the access control system installed.
b. All accounts, logins, credentials to access training materials, and system administration associated with Access Control, Electronic Surveillance, Security Sensors, and Intrusion Alarm systems shall be provided prior to final approval.
c. ALL/ANY item that requires special tools and/or test equipment must be brought to the attention of the pertinent FS personnel prior to specification and/or installation.
d. Accessibility of Equipment:
    - Refer to and abide by all OSHA requirements, as appropriate.

SECTION 28 13 00 – Access Controls

Document revision history: 06/2024 – Original Publication

Date	Section	Description of Change
5/2/25	2.1 Required Components	Addition of Signo Reader part #s
5/2/25	3.1.g Installation	Updated door reader info
5/2/25	3.3 Commissioning	Revised process for coordinating equipment programming
7/11/25	2.1 Required Components	Updated model numbers for Wiegand Communication proximity readers

PART 1 – GENERAL

1.1 Summary

a. The ACS installed under this scope of work shall provide controlled access to the building interior and real-time monitoring of doors at multiple locations simultaneously.
b. ACS system hardware installed under this scope must be compatible with the current version and allow future upgrades.
c. The ACS building controllers shall be LAN addressable and shall be connected to UO campus-provided Ethernet receptacles.
d. At reader doors where power assist devices are located, the ACS system shall shunt the exterior power assist operator button while the door is locked so that it may only be used with a valid card presentation to protect the power assist drive assembly.
e. The ACS system shall control primary access points to be determined with each project and requires CPFM Lock & Door Shop, UOPD Security, and Auxiliary department review and approval.
f. All doors controlled by ACS shall be equipped with request-to-exit (REX) devices and door contacts.
g. Required Submittals:
    i. Manufacturer's specifications and technical data for all components.
    ii. List of programming decisions that need to be made for proper operation of the system.
    iii. Panel and power supply drawings layouts on the backboard allocated for ACS in the telecommunications closet. Indicate the desired location of 120 VAC power receptacles on this drawing for coordination.
    iv. One-line diagram showing all devices, controllers, and cable types between devices.
h. Access Control Products: The appropriate product models are to be approved by the designated FS Lock & Door Shop, UOPD, and Auxiliary department during project design and specification.

PART 2 – PRODUCTS

2.1 Required Components

Access Control Product:	Manufacturer:	Model/Part#:	Note(s):

Building ACS Controllers	AMAG Lenel (Residential Buildings - Interior Only)	AMAG - 2150 Lenel - X3300	Required to integrate into the existing campus access control system, and for systems at Housing that need to incorporate with Lenel.
Proximity Readers	HID Schlage	If Wiegand Communication will be Default: 20NKS-03-01BURV Mullion, Pigtail 20KNKS-03-01BURV Mullion, Pigtail, with Keypad 20TKS-03-01BURV Mullion, Terminal Strip 20KTKS-03-01BURV Mullion, Terminal Strip, with Keypad 40NKS-03-01BURV Wallswitch, Pigtail 40KNKS-03-01BURV Wallswitch, Pigtail, with Keypad 40TKS-03-01BURV Wallswitch, Terminal Strip 40KTKS-03-01BURV Wallswitch, Terminal Strip, with Keypad If OSDP Communication will be Default (New Construction): 20NKS-03-0173YL Mullion, Pigtail 20KNKS-03-0173YL Mullion, Pigtail, with Keypad 20TKS-03-0173YL Mullion, Terminal Strip 20KTKS-03-0173YL Mullion, Terminal Strip, with Keypad 40NKS-03-0173YL Wallswitch, Pigtail 40KNKS-03-0173YL Wallswitch, Pigtail, with Keypad 40TKS-03-0173YL Wallswitch, Terminal Strip 40KTKS-03-0173YL Wallswitch, Terminal Strip, with Keypad	Readers shall be smart card capable (using U of O HID custom profile, incorporating Allegion custom DesFire credential) Keypad on the reader optional. New Projects shall be OSDP-certified
		Locknetics	Standalone doors requiring non-brass key access

Standalone ACS	Locknetics Schlage	Schlage NDEB with UO custom credential from Allegion	
ACS Rex Device	Bosch	To be approved	
ACS Door Contact	Sentrol, or approved	To be approved	Consult door hardware schedule.
ACS Door Prop Alarm	Design Security, Inc.	To be approved	With key switch.
Electrified Locking Device	Von Duprin	6000 series; 24VDC strike plates	- FS Lock and Door Shop, and/or Auxiliary department approval necessary
	HES	9600 series; 24VDC surface mounted rim device	- FS Lock and Door Shop, and/or Auxiliary department approval necessary
Magnetic Door Lock Device	-	-	Allowed ONLY with prior FS Lock & Door Shop review and approval.
Wire & Cable	-	OSDP-certified cabling for card readers. 22/4 security cable for door contacts, 16/2 security cable for electrified locking device	UL listed for use in plenum spaces. Installed per manufacturer's instructions. Cable profile shall be selected as per use in the intended space/application.
Outdoor Wire & Cable	-	OSDP-certified cabling for card readers. 22/4 security cable for door contacts, 16/2 security cable for electrified locking device	UL listed for outdoor use; wet environments; recommended for such use by manufacturer. Installed per manufacturer's instructions. Cable profile shall be selected as per use in the intended space/application.
Door Release Button & Intercom Systems	-	-	Momentary switch as approved by FS Lock & Door Shop, UOPD and/or Auxiliary department. Located at monitor station.
Post Base for Card Reader	-	-	Reviewed on a per-project basis

PART 3 – EXECUTION

3.1 Installation

a. All cabling shall be installed according to the chart above, and all cabling shall be labeled on the cable using industry best practices. All terminations on, inside, and around panel/head end locations shall have clearly printed labels regarding what cabling and devices are connected to each other.

d. Mount devices level and in a uniform fashion.

e. Coordinate post base locations and electrical/low voltage services prior to concrete pour.

f. Contractor shall **not** pull any ACS cables in conduits containing or intended to contain voice and data wiring unless approved by UO Network Services.
g. **Doors/Readers** shall be named according to the following scheme:
    i. 3-6-character identifier according to building/site. (Bean, 1715, KCASI, Huestis, etc.)
    ii. "Elev" + Name [N/S/E/W/1/2/3/A/B, etc] (for elevator designations, if applicable)
    iii. Direction (NW, SW, etc.)
    iv. Interior or Exterior [Int/Ext]
    v. Floor number (if not already part of the room number)
    vi. Room number given access from door (Main Entry, 156, etc.)
    vii. Human Recognizable description of door (Main Entry, Bike Cage, etc.)
    viii. Add DNU for doors that should never be unlocked or scheduled
        - Example: 1715 SE Ext 156 Main Entry DNU
    ix. Housing related doors need to include "HOU" prefix.
        - Housing example: HOU - 1715 SE Ext. 156 Main ENTRY DNU
    x. Full example: 1715 E Ext H175 Main Entry DNU

h. Nodes and Chains shall be named according to the following scheme:

Nodes (panels)
    i. Building Abbreviation (3-6 chars)
    ii. "Chain " + Chain Number
    iii. "Node " + Node Number on chain
    iv. "Room " + Room it's installed in
    v. Example: 1715 Chain 1 Node 1 Room 206

Chains
    i. Building Abbreviation (3-6 chars)
    ii. "Chain " + Chain Number
    iii. "Room " + Room it's installed in
    iv. Example: 1715 Chain 1 Room 206

3.2 Interface with other products

a. Not applicable.

3.3 Commissioning

a. UO Electrical Shop, UOPD, FASSIT, and/or Auxiliary department for setup of Ethernet network and IP address assignment; Contractor shall set up programming for ACS building controllers; reader definitions; door alarm points, inputs/output definitions, and assignments. FASSIT will add the pre-programmed devices into the ACS and verify connectivity.
b. When the installation of all system components and cabling is complete, initial testing shall consist of a local walk-through and working demonstration of all features with UO designee.
c. The contractor shall coordinate with Owner's Representative to get IP/Subnet/Gateway information, as well as to coordinate other pertinent information regarding the installation. The Owner's Representative will share a collaborative spreadsheet to collect equipment programming information outlined by equipment type in **Attachment 1**.
d. All passwords or access codes for the system shall remain at factory default unless the factory default poses a security risk, in which case all passwords shall be communicated in writing and

give written FASSIT, UOPD, or Auxiliary department approval of such change. Any costs associated with password recovery shall be borne by the Contractor.

e. Submittals shall include certification identifying that training personnel have a minimum of 4 hrs training of factory-certified training demonstrating a minimum of 2-years of experience in the installation and operation of the access control system installed, after all startup and testing procedures have been completed and as-built documentation delivered.
    i. Consultant shall confirm with Owner the minimum hours of required training necessary if system's size and complexity exceeds minimum training identified above, prior to completion of construction documents.
    ii. Training will include both an overview for responsible building parties and an in-depth session for CPFM, UOPD, FASSIT, and/or Auxiliary department maintenance to a service level.

3.4 Training

a. Not applicable

3.5 Closeout, Warranty, and Support

a. With as-builts, record drawings, O&M manuals, etc. deliverables a complete list is required of all system devices, power packs, etc. noting their installed locations.
b. Guarantee all work against faulty and improper material and workmanship for a minimum of 1 year from the date of final written acceptance by FS Lock & Door Shop and/or FASSIT, except where guarantee or warranties for longer terms are clearly requested and specified.
c. During the entire warranty period the Contractor must provide all related software upgrades to the installed system(s).
d. Upon notification of a problem, the warranty provider shall furnish within 48 hours at no cost to the Owner such labor and materials as are needed to restore the system to proper operation.
e. During the entire warranty period the Contractor must guarantee a 4 hour response time for problem resolution.
f. Prior to the end of the warranty period, with FS Lock & Door Shop and FASSIT present, the Contractor is to conduct a 1 year inspection repairing any item(s) at Contractor's cost and provide a report of system equipment and system operational functions.

ATTACHMENT 1

Required by Contractor	Required by UO

CAMERAS

MAC Address	IP Address	Hostname	Network Zone	Camera name (naming conv in comment)	Building	Camera Location (interior/exterior, room #, facing, location notes)	Camera direction/FOV	Lat/Long (if available)	Model	DNS Server	NTP Server	Updated to latest firmware?	Firmware Version	Video motion and object analytics enabled on camera?
B8A434FA69E	*123.456.789.012*	*pdx-ne-llc-ext-1f-sw-entry-121A-ptz-cam01*	*dspspriv.uoregon.edu*	*PDX NE LLC ext 1F SW entry 121A PTZ cam01*	*Library & Learning Center (PLLC)*	*SW entry 121A, exterior*	*Viewing south room exit*	*44.04694358, -123.06794643*	*Axis P3301*	*dns.uoregon.edu*	*ntp.uoregon.edu*	*y*	*5.51.7.6 - PSS*	*y*

AMAG PANELS & DEVICES

MAC Address	IP Address	Panel name (Bldg, chain, node, room)	Panel location (bldg and room)	Model	DNS Server	# Doors/Readers on each panel	Total door count	Updated to latest firmware?	Firmware version	Verified integration with Bosch Intrusion?	Signoff of completion (UO Project lead)	Notes
B8A434FA69E	*123.456.789.012*	*1715 Chain 1 Node 1 Room 206*	*1715 Franklin 206*	*M2150*	*dns.uoregon.edu*	*8*	*14*	*y*	*12.455*	*y*	*John Smith*	*Example row - delete before filling this out*

SECURITY PANELS & DEVICES

MAC Address	IP Address	Panel name	Panel location (bldg and room)	Model	DNS Server	# of Attached Panic Buttons	# of Points	Points List	Manitou/Account Number	Receiver IP # & Comms Path Info	Updated to latest firmware?	Firmware version	Signoff of completion (UO Project lead)	Notes
B8A434FA69E	*123.456.789.012*	*Oregon Hall*	*Oregon Hall 1st Floor*	*B8512G*	*dns.uoregon.edu*	*0*	*3*	*Point 1: Front Entry Point 2: Back Door Point 3: Hallway Motion*	*UO1234*	*IP: 123.456.789.012 Phone: 555-123-4567*	*y*	*8.912*	*John Smith*	*Example row - delete before filling this out*

BAS PANELS & DEVICES

MAC Address	IP Address	Panel name	Panel location (bldg and room)	Model	DNS Server	System Type	Updated to latest firmware?	Firmware version	Signoff of completion (UO Project lead)	Notes
B8A434FA69E	*123.456.789.012*	*045-PXCM-09*	*Streisinger Room 190*	*PXCM*	*dns.uoregon.edu*	*HVAC Controls*	*y*	*PXME V2.8.10 APOGEE*	*John Smith*	*Example row - delete before filling this out*

UTILITY METERS

MAC Address	IP Address	Meter name	Meter location (bldg and room)	Notes
B8A434FA69E	*123.456.789.012*	*070S-LISB-ELE-MAIN_208*	*LISB B030*	*Example row - delete before filling this out*

SECTION 28 20 00 –Electronic Surveillance

Document revision history: 06/2024 – Original Publication

Date	Section	Description of Change
4/15/25	2.1 Security Camera System Components	
4/15/25	3.1.0 Installation	xii - Camera Power/Wattage Requirements

PART 1 – GENERAL

1.1 Summary - Security Camera Systems

a. Contractor is responsible for all labor, equipment, materials, documentation, and services necessary for a complete and operational Security Camera system and should coordinate closely with owner's rep or project manager who will bring in UO Electrical Shop, UOPD, FASS IT, and/or Auxiliary department as needed for each phase of construction. Work will include the installation of wiring, cabling, cameras, power supplies, displays, and other components necessary to provide a fully operational security camera system. UOPD is responsible for the overall oversight for new camera installations and should be consulted for every new project.
b. Owner Furnished Owner Installed (OFOI) and/or Owner Furnished Contractor Installed (OFCI) hardware will be planned in coordination with UOPD Security.
c. The system wiring, equipment, and installation shall comply with all listed requirements as well as any and all applicable national, state and local codes and standards.

1.2 System Description

a. All UO security cameras shall be installed as part of the campus-wide system, administered by FASS IT/UOPD.
b. Camera descriptions should be named by UOPD or Project Lead type only, i.e. interior/exterior, fixed, PTZ, dual lens, 180/360-degree view, IR, etc.)
c. Specific equipment models will be specified by UOPD no sooner than 90-days prior to scheduled installation in coordination with the contractor.

PART 2 – PRODUCTS

2.1 Security Camera System Components

a. The appropriate product models are to be approved by designated UOPD Security and UO Network Services during project design and specification.

Surveillance Product:	Manufacturer:	Model:	Note(s):
Network Video Recorder	UOPD-approved or UO cloud provided	Virtual Server based or approved	System will be designed and specified based on site needs and as mentioned previously in this spec

IP Cameras	AXIS or approved	To be approved	IP cameras must be compatible with UOPD security camera software and selected by UOPD prior to installation. Work with UOPD for specific model numbers when putting a project together. Camera models should, at a minimum, have built-in analytics capabilities. Elevator cameras shall have special consideration and approval.
Camera Mounts, Adapters, and Accessories	To be approved	To be approved	ALL cameras to include necessary mounts and adapters recommended by manufacturer for the application. New camera placements on historic campus buildings should be run through campus planning committee.
Camera Cable	-	To be approved	Cat6 installed per manufacturer recommendation and best practices that suit the spaces they will be installed per NEC code. Follow NTS standard of (2) Cat6 cables per camera location
Storage	UOPD or FASS IT approved	UOPD or FASS IT approved	All camera footage stored virtually should retain at least 30 days of storage. Additional camera retention can be approved on a per camera or location basis.
Licenses	Milestone Camera License Boring Tool License	Coordinate with UOPD/FASS IT	Licenses are CFOI and shall be furnished prior to installation of the cameras Every camera requires this license requires a Boring Tool License
Milestone Information			Corporate Plus – 5-year support option

			Attach licenses to: M01-C01-223-01-6C4E6B

PART 3 – EXECUTION

3.1 Installation

a. For any security system related questions please contact FASS IT at fass@uoregon.edu.
b. Quality Assurance: All workers involved with this installation must have completed manufacturer training and have a minimum of 2-years installing specified equipment OR have a minimum of 5-years of installation experience with like equipment.
c. Install all equipment and cabling in a manner consistent with manufacturer recommendations and instructions.
d. Install all devices and components shown on drawings required for proper operation of the system.
e. Mount devices level and in a uniform fashion.
f. Wiring pathways to cameras shall be under the direction of UO Network services.
g. All camera cabling shall have clear, identifiable labeling attached at both ends of termination according to project drawings and with the direction of the project manager.
h. PoE Switches provided and coordinated by UO Network services.
i. If the project is not performed to UO standards as outlined in Division 28, the contractor shall remediate the problem before the project will be considered complete.
j. Contractor shall coordinate with UO Network Services to install all cabling associated with the operation of security camera systems.
k. Contractor shall **not** pull any security camera system cables in conduits containing or intended to contain voice and data wiring unless approved by UO Network Services.
l. All camera views shall not be considered final until signed off by the project manager for UO.
m. The contractor will pre-program every camera individually to ensure proper integration.
n. Every new capital project should provide (1) "spare" camera per model to be shelved and categorized, as replacement parts as needed, by UOPD.
o. The contractor shall submit a ticket to FASS IT by emailing fass@uoregon.edu to get IP/Subnet/Gateway information. The contractor shall pre-program the cameras (IP and other default settings), as per direction given by FASS IT, before the cameras are installed. Once the cameras are installed FASS IT will add the cameras into the Milestone platform. The contractor will provide an Excel spreadsheet "programming document" confirming the following programming and information:
    i. Camera name (building, UO room number, direction, etc.)
    ii. Camera location
    iii. Camera Mac Address
    iv. Camera Model
    v. Camera IP
    vi. DNS Server

vii. NTP
viii. Update Camera to latest Firmware
ix. Video motion and Analytic apps verified “enabled”.
x. Camera credentials
xi. Cameras direction/FOV (looking at trash, or viewing exterior doors)
xii. Camera Power/Wattage Requirements
xiii. Signoff of completion (from UO project lead)
xiv. Notes

3.2 Testing

a. When the installation of all system components, cabling, and programming is complete, initial testing shall consist of a local walk-through and a working demonstration of all features provided to the UO project lead.
b. All passwords or access codes for security camera systems shall remain at factory default unless the factory default poses a security risk, in which case all passwords shall be communicated in writing and give written UOPD Security approval of such change. This information is outlined above in the “programming document” section.
c. Prior to UO project leads’ final acceptance of the security camera system, all components must be tested in the presence of designated representative(s) from UOPD Security.

3.3 Closeout, Warranty, and Support

a. With as-builts, record drawings, O&M manuals, etc. deliverables a complete list is required of all system devices, power packs, etc. noting their installed locations. The template will be provided by FASS IT for necessary documentation. FASS can be contacted at fass@uoregon.edu. Paper copies of all documentation shall be kept in a clearly labeled cabinet in the MDF.
b. Guarantee all work against faulty and improper material and workmanship for a minimum of 1 year from the date of final written acceptance by UOPD Security, except where guarantee or warranties for longer terms are clearly requested and specified.
c. During the entire warranty period the Contractor must ensure all related software upgrades to the installed system(s) will be available.
d. Upon notification of a problem, the warranty provider shall furnish within 48 hours at no cost to the Owner such labor and materials as are needed to restore the system to proper operation.
e. During the entire warranty period the Contractor must guarantee a 4-hour response time for problem resolution.

SECTION 28 25 00 –Intrusion Alarm Systems

Document revision history: 06/2024 – Original Publication

Date	Section	Description of Change

PART 1 – GENERAL

1.1 Summary

a. All labor, equipment, materials, documentation, and services necessary for a complete and operational alarm monitoring system. Work will include the installation of wiring, cabling, power supplies, flat panel displays, and other components necessary to provide a fully operational alarm system.
b. Installed system shall be a turnkey package including design review, construction supervision, coordination, and commissioning services.
c. The system wiring, equipment, and installation shall comply with all listed requirements as well as any and all applicable national, state, and local codes and standards.
d. Basis of design: Bosch B8512G or (B9512G if over 100 points) Alarm panel

1.2 Applicable Standards

a. NEC Articles 250, 725, 800, and 830.
b. NFPA 70 - National Electrical Code (NEC).
c. NFPA 72 - National Fire Alarm and Signaling Code.
d. Manufacturer's installation guidelines and recommendations.

1.3 System Description

a. The Electronic Intrusion Alarm System shall provide security against unauthorized access to the facility.

PART 2 – PRODUCTS

2.1 Required Components

Component:	Manufacturer:	Model:	Note(s):
Alarm Panel	Bosch	B8512G Or B9515G if over 100 points	Programmable by Bosch RPS software, version 6.12 or later. 22/6 security cable Homerun from Keypad to Panel location. If life safety devices are attached to the system, a cellular backup dialer shall also be installed. The cellular dialer

			shall be added to the UO ADT account for ease of management.
Door Contact	Sentrol	To be approved	Spec'd for application. 22/4 security cable HR from DC to Panel location.
Motion Detector	Bosch	To be approved	Spec'd for application. 22/4 security cable HR from MD to Panel location.
Wireless Panic Buttons	Bosch	EN1235D	Cell Dialer must be installed with panic buttons as backup comms; Cell dialers furnished and installed by ADT primarily, unless approved by UOPD/FASSIT.
Keypad	Bosch	B942	To be approved

PART 3 – EXECUTION

3.1 Installation

a. Install the Intrusion Alarm System in strict accordance with the manufacturer's recommendations, applicable codes, and standards.

b. The contractor shall submit a ticket to FASSIT by emailing fass@uoregon.edu to get IP/Subnet/Gateway information. The contractor shall pre-program the Alarm panel (IP and other default settings), as per the direction given by FASSIT, before the system is installed. Once the Alarm panel is installed FASSIT will add the system into RPS as well as create and activate the necessary Manitou accounts for monitoring. The contractor will provide an Excel spreadsheet "programming document" confirming the following programming and information:
   i. Location name (building, UO room number, direction, etc.)
   ii. Panel Mac Address
   iii. Panel Model
   iv. Panel IP
   v. DNS Server
   vi. Update Panel to latest Firmware
   vii. RPS credentials
   viii. Points Numbers and Point Names
   ix. Signoff of completion (from UO project lead)
   x. Notes

c. Wiring
   xi. Use only UL-listed or equivalent cables and wires.
   xii. All wiring shall be installed in conduit where exposed and subject to physical damage.

xiii. Wiring shall be properly labeled, color-coded, and documented.
xiv. Maintain clear separation from power wiring to minimize interference.
xv. Ensure proper grounding of the system components.

d. Equipment
   xvi. Mount the control panel securely in a designated location, as approved by the project architect/engineer.
   xvii. Install motion detectors, door contacts, and other devices at locations specified in the design documents.
   xviii. Follow the manufacturer's guidelines for installing and configuring each component.
   xix. Perform a system test to ensure proper operation.

3.2 Testing and Commissioning

a. Prior to final acceptance, thoroughly test and commission the Electronic Intrusion Alarm System.
b. Conduct a complete functional test, including sensor activation, communication tests, and alarm response tests.
c. Document and test results with UOPD representative and provide a report to the owner.
d. Contractor to please send the following information to FASS IT at fass@uoregon.edu:
   i. Building Name
   ii. Building Address and nearest Cross street
   iii. Point numbers and Point names
   iv. Responding Parties list
e. FASSIT will provide an account number once the above information is received and inputted.

3.3 Training

a. Provide (2) hours of training to the facility's designated personnel on system operation and troubleshooting. Training shall be conducted only by factory-certified, factory-trained personnel who can demonstrate a minimum of 2-years of experience in the installation and operation of the access control system installed.
b. Ensure that key personnel understand how to arm and disarm the system, bypass zones, and respond to alarms.

3.4 Closeout, Warranty, and Support

a. With as-builts, record drawings, O&M manuals, etc. deliverables a complete list is required of all system devices, power packs, etc. noting their installed locations. Paper copies shall be left in the control panel.

b. Guarantee all work against faulty and improper material and workmanship for a minimum of 1 year from the date of final written acceptance by UOPD Security, except where guarantee or warranties for longer terms are clearly requested and specified.
c. During the entire warranty period the Contractor must ensure all related software upgrades to the installed system(s) will be available. Contractor will apply latest firmware update before system will be considered complete.
d. Upon notification of a problem, the warranty provider shall furnish within 48 hours at no cost to the Owner such labor and materials as are needed to restore the system to proper operation.
e. During the entire warranty period the Contractor must guarantee a 4-hour response time for problem resolution.

SECTION 28 31 00 – Fire Detection and Alarm

Document revision history: 06/2024 – Original Publication

Date	Section	Description of Change
4/21/25	Part 2.e ii & iii	Adds language for exceptions to audible alarms

PART 1 – GENERAL

1.1 Summary

a. This standard is established to aid the Design Professional of Record in development of the design and construction documents. Contents and requirements stated herein are to be incorporated into the final contract documents and the construction shop drawings.
   i. Fire alarm systems shall be designed by a National Institute for Certification in Engineering Technologies (NICET) Design Professional certified in Fire Alarm Systems. The fire alarm Design Professional will also have the necessary credentials as required by the State of Oregon and the local Authority Having Jurisdiction (AHJ).

b. Design Criteria
   i. The Fire Alarm System design shall comply with the latest adopted edition of the following codes and standards:
      - Oregon Structural Specialty Code (OSSC)
      - Oregon Fire Code (OFC)
      - National Fire Alarm and Signaling Code - NFPA 72
      - Oregon Electrical Specialty Code (OESC)
   ii. Related Divisions/Sections in UO Campus Design Standards
      - Section 08 70 00 - Hardware
      - Division 21 – Fire Suppression
      - Division 23 - Heating, Ventilation and Air Conditioning (HVAC)
      - Division 25 - Integrated Automation
      - Division 26 - Electrical
   ii. Where portions of a building remain occupied during a construction project, the fire alarm system will remain operational throughout the duration of the project. Construction phasing plans or planned fire watch periods will be included in the project design documents. The Contractor shall coordinate project phasing and shall provide temporary protection and system programming to accommodate the phased construction, alteration, and demolition activities.
   iii. Where an expansion/renovation project requires additional Fire Alarm Control Panel (FACP) capacity beyond that existing, a complete, new system is required. The use of multiple main control panels in a single building is not permissible.

iv. The main Fire Alarm Control Panel (FACP) shall be installed at the primary fire department entrance to the facility.
v. Any device, component, etc., with locking characteristics shall be keyed to a CAT 15 key.
vi. Evaluate feasibility of a smoke detection system design where area smoke detectors are provided for smoke damper and air handler control in lieu of duct mounted smoke detectors. If duct detectors are installed they are to be mounted to the exterior housing of the duct, equipped with air sampling tubes, and a remote test switch will be added to a "readily accessible" location. Alarm Verification shall be permitted for smoke detectors where the conditions or activities are anticipated to cause nuisance alarms.
vii. Only the detectors adjacent to fire shutters or elevator smoke doors will activate the door release function.
viii. Provide FACP software bypass switches for the following points:
- Notification Appliance Bypass
- Fire Sprinkler/Fire Pump Input Bypass
- HVAC Shutdown/FSD Closure/Door Holders Output Bypass
- Elevator Recall/Shunt Trip Input & Output Bypass

ix. A locking document storage cabinet will be provided at the main FACP location, or other location as determined by the UO Fire Marshal Office. The cabinet will be sized to contain the record drawings, the testing and completion documents, and will contain a permanently mounted electronic storage device for a copy of the FACP resident software, a copy of the programming software (current version), BIN files and any other panel related files, CAD files of as built, and a list of programmed points.
x. System shall be designed as class "B".
xi. Fire/smoke dampers are to have individual over current protection and disconnect. The fuse shall be sized for 125 percent for non-impedance protected motors and 200 percent for impedance protected motors. The combination over current /disconnect means shall be located within six (6) feet of the fire/smoke damper motor. The combination over current/disconnect means shall be either a little fuse #LSSY, for one (1) Edison-base fuse and one (1) single pole toggle switch. All fire/smoke damper overcurrent protection shall be accessible without disassembly of mechanical equipment or ceiling.

PART 2 – PRODUCTS

a. At the Eugene campus, the new fire alarm system will be manufactured by Notifier and be the 3030 Series equipment. 320 Series may be applied to smaller structures. Existing control equipment of a different manufacture will be allowed to remain for expansions of existing systems which do not warrant a complete fire alarm replacement. Equipment requirements at UO satellite campuses shall be evaluated and implemented case-by-case with written approval of the UO Fire Marshal Office (UOFMO).

b. All fire alarm initiating devices will be intelligent/addressable and will be programmed with an individual device address.
c. Smoke detectors shall be located within electric rooms, elevator lobbies, and control rooms, and at other locations required by Code. Smoke detectors shall be photoelectric type, except where ambient conditions dictate that another type of early warning detection should be used (such as heat detection).
d. Manual pull stations are to be single action locked, keyed CAT 15. No glass or ceramic retainer bars.
e. All fire alarm notification appliances will be intelligent/addressable.
    i. Visual strobe units shall be provided in all public use and common use areas and shall meet the public mode signaling requirements of ADA, UL, and NFPA 72.
    ii. Audible notification devices shall be arranged to provide a minimum of 15dbA above ambient sound levels in any space. Trumpet-type loud speakers may be required in mechanical spaces (or similar areas with high ambient noise) to ensure that this requirement is met.
        a. Exceptions may be requested of the AHJ for specialty spaces where sound is damaging. When audible notification is not provided, emergency signage is required adjacent to visual notification devices.

        <u>Example</u>

        

    iii. Notification devices should be red in color, unless permitted by the Project Manager, UOFMO, and AHJ. Where speakers are used for EV/ ACS signaling, the device shall not be labeled "FIRE" or have any other signifying marks to restrict its use for fire alarm only.
        a. Exceptions to the light color for notification devices in specialty spaces may be requested of the AHJ. When visual notification devices deviate from a white strobe. See example above.
    iv. In renovation activities, new strobe appliances within the work area shall be listed for use with existing devices. If new and existing devices are not compatible or if the provisions for strobe synchronization cannot be met, all devices within the affected area shall be replaced to comply with the applicable codes.

f. At Eugene campus facilities, provide a fire alarm transmitter capable of communicating over the UO campus loop analog and digital fiber pathway. Transmitters at off-campus Eugene facilities may use cellular dialers. Program transmitters to fully interface with the proprietary receiving station in the UO Police Department (UOPD) alarm monitoring center. At UO satellite campuses, provide a fire alarm transmitter capable of communicating to the central receiving station serving the satellite campus and to the UOPD alarm monitoring center. Provide point identification for all alarm, supervisory and trouble signals as well as all intelligent/addressable devices and appliances.
g. Wire installed must be approved by the manufacturer for Power Limited fire alarm use per NEC.
h. Provide the following spare parts:
    i. Fuses - (2) of each size used in the installed system.
    ii. Manual Pull Station - Minimum of one or 2% of total installation.
    iii. Spot Type Area Smoke Detector - Minimum of one or 6% of total installation.
    iv. Spot Type Heat Detector - Minimum of one or 6% of each type used in the total installation.
    v. Detector Base - Minimum of one or 2% of each type used in the total installation.
    vi. Interior Notification Appliance - Minimum of one or 4% of each type used in the total installation.
    vii. Exterior Notification Appliance - Minimum of one or 2% of each type used in the total installation.
    viii. Intelligent Modules - Minimum of one or 4% of each type used in the total installation.
i. Submittals
    i. Submittal requirements are per UO Division 1 General Requirements, the Contract Documents, the Construction Contract, and Minimum Required Documentation sections of NFPA 72.
    ii. The Contractor's fire alarm shop drawings and product data sheets shall be submitted to the UO Fire Marshal Office for review, including the Design Professional's review comments/submittal dispositions.

PART 3 – EXECUTION

3.1 Installation

a. Fire alarm system installation shall be supervised by a contractor NICET certified in Fire Alarm Systems.
b. Provide a complete metallic raceway for fire alarm systems. Provide a minimum 3/4 inch Electrical Metallic Tubing (EMT) for fire alarm wiring. A single cable run to a single device may be installed in 1/2 inch EMT. Provide a minimum 4 inch square box for junctions and terminations. Fire alarm wiring/ cabling to be marked as such every 50-ft or as reasonable for identification.

i. For EV/ACS systems employing relocation or partial evacuation, a Level 2 or Level 3 pathway survivability shall be required. Where notification zones are separated by not less than 2-hour fire- rated construction, a pathway survivability of Level 1, 2, or 3 shall be permitted.
ii. For EV/ACS systems that do not employ relocation or partial evacuation, Level 0, Level 1, Level 2, or Level 3 pathway survivability shall be permitted.
iii. Pathway survivability levels for in-building and/or wide-area MNS shall be determined by the risk analysis.
iv. In Area of Refuge wired emergency communications systems, a Level 2 or Level 3 pathway survivability shall be required. Where notification zones are separated by not less than 2-hour fire- rated construction, a pathway survivability of Level 1, 2, or 3 shall be permitted.
v. The main FACP and any additional Notification Appliance Circuit (NAC) panels will be connected to life safety branch circuits and provided with transient surge suppression.
    - Each control panel and NAC panel shall have a system smoke detector placed within 10-ft.
vi. All fire alarm notification appliances will operate from one pair of conductors. Exceptions are allowed for Emergency Voice Alarm Communications Systems (EVACS) and for certain weatherproof or hazardous location applications.
vii. Emergency control functions shall have bypass switches located at the FACP.
viii. Door holder circuits will be 24VDC from dedicated, battery backed power supplies. Powering of non-fire alarm loads from the FACP is prohibited.
ix. Duct mounted smoke detectors will report as supervisory alarms at the FACP.
x. Photoelectric Beam-Type smoke detectors will be provided with remote test capability. The test station will be installed in an accessible location.
xi. Provide isolation modules on Signaling Line Circuits (SLC) serving multiple floors or more than 50 devices on a single floor.
xii. Provide labeling of all devices and appliances with their respective system address. Label to be produced from an electronic labeling system visible from the floor without magnification. Hand-written labels are not acceptable.
xiii. Provide labeling of all conductors and cables at termination points in panels, cabinets, and junction boxes. Label to be produced from an electronic labeling system. Hand-written labels are not acceptable.
xiv. Roll-down fire doors shall be equipped with electric motor up/motor down controls interfaced with the FACP. Roll-down fire door and Fire Curtains shall be closed only by the nearest smoke detector in alarm on either side of the door. Roll-down fire doors and Fire Curtains shall automatically be restored to the open position upon fire alarm system reset to normal.

3.2 Impairments and Safeguards

a. Safeguarding of the building during demolition, alteration, and construction shall be a joint cooperative effort involving the entire project team, to include the fire protection

contractor, the fire alarm contractor, the Construction Manager/General Contractor (CMGC), Owner, UOFMO, and AHJ.

b. The Contractor shall ensure proper building protection and safeguarding at all times in accordance with all applicable codes, standards, and regulations, including but not limited to the OSSC, the OFC, and the current edition of NFPA 241 *Standard for Safeguarding Construction, Alteration, and Demolition Activities.*

c. During times when the existing, modified and/or new building fire protection systems are impaired, the Contractor shall provide appropriate safeguarding of the renovation work area, to include temporary heat detection or adequate alternate protection throughout the space as coordinated with, and approved by, the building manager, project manager or construction manager, UOFMO, and AHJ.

d. Safeguarding shall also apply to all related phasing, shut-downs, swing spaces, temporary facilities and relocations, etc. Detection shall be located and installed in accordance with the products' listing and manufacturer's instructions and shall be tested and maintained until such time that the permanent building protection is restored. Alternative safeguarding such as, but not limited to, fire watch personnel, or temporary fire protection systems, may be considered if acceptable to the project manager or construction manager, UOFMO, and AHJ. Refer to, and coordinate with, fire alarm systems documents, and safeguarding and impairments notes and specifications. Coordinate with fire alarm system contractor and all other trades.
    i. Temporary detection shall be provided while portions of the existing fire protection or alarm systems are impaired or out of service for an extended period (generally 8-hours or more) during construction, alteration, and demolition activities.
    ii. Temporary notification equipment shall include ADA compliant combination audible/visual notifications appliances where required by Code.
    iii. All temporary alarm devices shall be connected to the building fire alarm system and shall function as permanent until replaced with final systems components.
    iv. Bagging, or the temporary covering of smoke detectors, shall not be allowed during construction unless specifically permitted by the Project Manager, UOFMO, and AHJ.

e. The Contractor shall be required to submit a complete demolition, alteration, construction, phasing, and impairment plan to include the information above, a schedule of project milestones and related work, and an anticipated schedule for installation, impairments, programming and all phases of final testing and completion of the work. This plan shall be coordinated with all AHJ's, the project fire prevention program manager, construction manager, and shall include any and all information, drawings, and graphics to meet the approval of the AHJ's, the Project Manager, the UOFMO, or the relevant insurance underwriters (when applicable).

3.3 Testing

a. A written Acceptance Test Procedure (ATP) shall be provided for demonstration/training on the system and certification of proper system operation. In coordination with the Project Manager and the UOFMO, the ATP shall be prepared by the contractor and submitted to the UOFMO for approval at least four (4) weeks prior to the performance of the ATP.
b. Scheduling of final inspection and testing with the AHJ to include the Project Manager and UOFMO.
c. Fire alarm technician shall conduct testing. Contractor representative shall be present.
d. Testing performed according to NFPA 72 and AHJ requirements. Minimum requirements include:
    i. Bypass and control valve switches shall be operated to indicate proper supervision.
    ii. Valve and sprinkler flow supervision switches shall be operated to verify proper response.
    iii. Valve and sprinkler flow supervision switches shall have one wire removed to verify proper supervision.
    iv. Each alarm output, detection or supervision zone shall be tested for proper response to ground conditions.
    v. AC power shall be interrupted to test proper operation on batteries.
    vi. Critical fuses shall be removed to check for proper supervision.
    vii. Detectors shall be tested for proper alarm operation.
    viii. Alarm sounding devices shall be tested for proper operation.
    ix. HVAC control functions and circuits shall be tested for proper operation and supervision.
    x. Complete preliminary report per Chapter 1 of NFPA 72.

3.4 Training

a. Provide factory training for any untrained UO Fire Marshal Office and UOPD Alarm Shop personnel. Training to be provided for both Operator and Technician levels and training hours distributed accordingly. Operator training to include all control panel functions and creation of reports. Technician training to include hardware repair and maintenance by university personnel of all building panels, devices, and appliances, diagnostic procedures, system expansion and maintenance techniques. Factory training shall include tuition, travel and lodging.
b. For trained UOFMO and UOPD alarm shop personnel, vendor and installing contractor shall conduct training session(s) during which maintenance and operational aspects of the systems will be described and demonstrated. Trainer shall be thoroughly familiar with the characteristics of the installed system. Minimum hours of the shall reflect the system size and complexity and be coordinated with the UOFMO.
c. For control equipment other than that specified in the Division 28 Products section, provide factory sponsored certified technical training for the system installed. This training shall certify two University technicians to maintain, service, and program the installed system. Provide for tuition, transportation and lodging for university

technicians to attend this training. Include a subscription for direct manufacturer's technical support for the system.

3.5 Close Out, Warranty, and Support

a. Provide all required materials from the Completion Documentation and Minimum Required Documentation sections of NFPA 72.
b. Provide the NFPA 72 Inspection, Testing and Maintenance Documentation.
c. Provide permanently mounted zone map adjacent to each FACP and fire alarm annunciator. Maps sized to be clearly visible without magnification.
d. With as-builts, record drawings, O&M manuals, etc. deliverables, a complete list is required of all system components indicating their installed locations.
e. Reviewed and accepted record drawings will be available for verification purposes. Record drawings and performance testing are conditions for substantial completion.
f. Guarantee all work against faulty and improper material and workmanship for a minimum of 1 year from the date of final written acceptance by Project Manager and UOFMO, except where guarantee or warranties for longer terms are clearly requested and specified.
    i. During the entire 1-year warranty period the Contractor shall guarantee a 4-hour response time for problem resolution.
    ii. During the entire 1-year warranty period the Contractor shall provide all related software upgrades to the installed system(s).
    iii. At the end of the 1-year warranty period, with Project Manager and UOFMO present, the contractor shall conduct an inspection and provide a report of the system equipment and system operational functions.
g. In addition to the 1-year system warranty, any software changes and/or updates that impact critical performance and/or panel function shall be provided at no cost to the Owner for the additional period of 3 years.