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REVISION HISTORY

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<tr>
<td>2</td>
<td>April 30, 2014</td>
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Dalhousie University Design Guidelines provide assistance to consultants during the planning, and design phases of the University’s expansion and renovations. The Guidelines do not relieve a consultant from any professional responsibility, duty or due diligence to design elegant, functional, efficient and low maintenance facilities.

Facility owners have preferred materials and requirements that make the task of maintaining facilities less costly. Dalhousie understands this is a balance between capital and operating cost. The Guidelines are not intended to be the only acceptable solution. Dalhousie expects consultants to bring modern and innovative ideas, materials and methods to the University. If these Guidelines do not allow these new ideas then the consultant is to make a request in writing to the Dalhousie Project Manager for an exception to the guidelines. Necessary reasoning and or calculations shall accompany the request. The exception request will be reviewed internally and either rejected or accepted. The consultant will document this rational and/or justification for each exception in the Basis of Design. The University Guidelines may be updated subsequently.

These documents provide design guidelines only, and are not intended for use, in whole or in part, as a specification. Do not copy the guidelines verbatim in specifications or in notes on drawings. Refer questions and comments regarding the content and use of these documents to the Dalhousie University Project Manager. The Guidelines are intended to be read in conjunction with the local codes and regulations, and in no way are to be considered as a code replacement. The codes and regulations represent the minimum acceptable standard. Where the technical design requirements differ from the building codes and other applicable codes and standards, the more stringent of the codes shall be applied.
OBJECTIVE:

This technical guideline provides guidance to all those participating in the conceptual / final design requirements.

REFERENCES:

- Canadian Electrical Code
- Nova Scotia Building Code
- Dalhousie Building Security Performance Guidelines

ABBREVIATIONS/DEFINITIONS:

**BFDO - Barrier Free Door Operator:** Power door operator supplied and installed by the door hardware contractor, wired by the electrical contractor.

**CX-33 Module:** Smart relay interface module used when barrier free door operators are used in conjunction with door access control.

**DC - Door Contact:** Magnetic door contact flush mounted in door frame at top of door. Provide a 1" diameter hole in door frame for installation of door contacts located 3" from edge of door, opposite the hinge. Door contacts supplied, installed, wired and terminated by the electrical contractor. Contacts shall be equal to GE Interlogix 1078W series normally open magnetic contacts.

**DH - Door Hold Open Device:** Upon activation of a command (fire alarm, time of day schedule) the door hold open device shall release, allowing the door to close. Door hold open devices may be integrated into door closer or wall mounted. Door hold opens shall be tied into the fire alarm system, wired and terminated by the electrical contractor. Where door hold open devices are required to be tied into the access control system, low voltage hold opens are preferred.

**EH - Electrified Transfer Hinge:** Electrified hinge allows for transfer of power and signals to door mounted devices. Supplied and installed by the door hardware contractor, wired and terminated by the electrical contractor.

**ES - Electric Strike:** Electric door strike shall be mounted on the door frame, supplied and installed by the door hardware contractor, wired and terminated by the electrical contractor with a required 12V version. In doors equipped with barrier free door operators, whereas the operator has the capability of providing power to an electric strike, the voltage of the strike needs to be determined from door operator product literature.
ELCK - Electrified Lock: Electrified lockset complete with integrated door contacts and request-to-exit, mounted on door, supplied and installed by door hardware contractor, wired and terminated by the electrical contractor. Electrified locks available in 12V or 24V. The 12V version shall be preferred as the Access Control system operates at 12V. When requiring 24V electrified locks, a separate 24V power supply must be installed.

ELR - Electric Latch Retraction: Electric latch retraction complete with request-to-exit, mounted on door, supplied and installed by door hardware contractor, wired and terminated by the electrical contractor. A separate power supply must be provided as per the manufacturers door hardware specifications and installed with the distance limitations as per specification.

Elevator control sequence - Floor Tracking: Limits access to specific floors and tracks personnel’s travel throughout facility.

Elevator control sequence - Restricted USER Access: Limits access to elevator for authorized personnel and does not prevent floor to floor access on any restricted floors. A simple system to ensure only authorized personnel use the elevator and have full access to the facility.

HID - HID Proximity Reader: Proximity card reader, HID cat. # 5455 BGN00 mounted on a single gang backbox flush wall mounted at 42" A.F.F., supplied, installed, wired and terminated by the electrical contractor. Where requiring mullion mount, proximity card reader shall be equal to HID 6005 BGB00. Typical device used for most interior doors.

HID/PIN - HID Proximity Reader with PIN pad: Combination proximity card reader complete with integrated PIN pad, HID cat. # 5355 AGK 00 (must be 4 bit output keypad type), mounted on a single gang backbox flush wall mounted at 42" A.F.F., supplied, installed, wired and terminated by the electrical contractor. The HID/PIN pad must be installed on all exterior card reader doors.

IDH MAX - BEST IDH Max Lockset: Electrified lockset complete with integrated proximity card reader, door contact and request-to-exit, mounted on door, supplied and installed by door hardware contractor, wiring and termination by the electrical contractor. The IDH MAX comes complete with an reader module to be mounted in the door access control junction box.

Input Module: connects alarm inputs to the access control system, Genetec cat. # MR16IN, supplied, installed, wired and terminated by the electrical contractor. Each input module is capable of controlling up to 16 alarm inputs.

Intelligent Controller: Handles access control decisions and monitors activity, connects to and report real-time events over any IP network, Genetec cat. # EP2500, supplied, installed, wired and terminated by the electrical contractor. Each intelligent controller is capable of managing 32 downstream interfaces (eg. Reader modules, input modules, and output modules) over RS-485 communications cabling.

JB - Junction Box: Similar to a 10"x10"x6" Hoffman cat. # AA-10N106, mounted within 6" of the underside of the ceiling in accessible ceiling space on "secure" side of door. In areas without
ceilings, the junction box shall be installed 8'-0" to the bottom of the junction box. Maximum cable length between junction box and card reader shall be 15'-0". Provide and install a #6 AWG insulated copper bonding conductor from junction box to nearest bond bus.

**Network Controller:** Allows IP-based management of access control system, Genetec Synergis Cloud Link, supplied, installed, wired and terminated by the electrical contractor. Each network controller is capable of managing 256 card readers and electronic locks, as well as monitor events and alarms and provide reporting.

**Output Module:** connects output devices or relays controlled by contact closures to the access control system, Genetec cat. # MR16OUT, supplied, installed, wired and terminated by the electrical contractor. Each output module is capable of controlling outputs for up to 16 devices or relays.

**PB - Barrier Free Door Operator Push Button:** Barrier free door operator push button, supplied and installed by the door hardware contractor, wired and terminated by the electrical contractor at 36" A.F.F.

**P/S - Power Supply:** Power supply for electrified locks, electric latches, electric strikes, and door hold open devices. Supplied by the door hardware contractor, installed, wired and terminated by the electrical contractor. In facilities equipped with emergency power, all power supplies to be fed from an emergency source.

**P/S(ACS) - Access Control System Power Supply:** Power supply for access control system components, complete with battery backup. Supplied, installed, wired, and terminated by the electrical contractor. In facilities equipped with emergency power, all power supplies to be fed from an emergency source.

**Reader Module:** Handles access control decisions at the secured at door equipped with a card reader, Genetec cat. # MR50, supplied, installed, wired and terminated by the electrical contractor. Each reader module is capable of managing 1 card reader. A reader module that can manage 2 card readers is also available, but is less preferred.

**RTE(EX) - Request-to-Exit in Exit Device:** Request to exit device integral to the door hardware exit device or electrified lock. Wiring and termination by the electrical contractor.

**RTE(IR) - Infrared Request-to-Exit Device:** Infrared request-to-exit device equal to Kantech T.Rex Series, Cat. No. T.TREX-LT2 complete with T-REX-PLATE for mounting over a standard device box, supplied, installed, wired and terminated by the electrical contractor. Device to be mounted above the door frame opposite the latch side of the door as per the manufacturer’s recommendations. Coordinate the exact location with site conditions.

**SSV - Security system video:** The term used to identify the network of IP video devices and cameras throughout campus.
DOOR ACCESS CONTROL:

1. **Door Access Control:** For new construction, the door access control system shall be based on the "Genetec" electronic door control system consisting of the following components:

   1.1. **Network Controller:** Each network controller shall be capable of managing up to 256 readers and electronic locks, as well as monitoring of events and alarms. Typically, there would be one network controller installed for a building. The network controller shall be installed in the main communication room serving the building. At each network controller, provide the following:
      
      1.1.1. One FT4 rated Cat. 6 cable (blue) from the data patch panel to a surface mount data outlet installed within a 6" square junction box complete with a hinged cover, located within 12" of the network controller. If this cable passes through a return air plenum system, this cable shall be rated FT6 as per the NBCC.

   1.2. One FT4 rated Cat. 6 patch cord cable (white), 24" long, to connect network controller to above data outlet.

   1.3. **Intelligent Controller:** Each intelligent controller shall be capable of managing 32 downstream interfaces (eg. Reader modules, input modules, and output modules) over RS-485. Typically, there would be an intelligent controller installed on each level of the building. The intelligent controllers shall be installed in the communication rooms serving the respective floor. At each intelligent controller, provide the following:
      
      1.3.1. One FT4 rated Cat. 6 cable (blue) from the data patch panel to a surface mount data outlet installed within a 6" square junction box complete with a hinged cover, located within 12" of the network controller. If this cable passes through a return air plenum system, this cable shall be rated FT6 as per the NBCC.

      1.3.2. One FT4 rated Cat. 6 patch cord cable (white), 24" long, to connect intelligent controller to above data outlet.

   1.4. **Reader Module:** controls 1 reader, 2 alarm inputs and 2 device outputs. Installed in the door access control junction box and powered from access control system power supply. Refer to standard wiring diagrams for specific details on wiring requirements.

   1.5. **Input Module:** controls up to 16 alarm inputs, Genetec cat. # MR16IN. Typically, there would be an input controller installed on each level of the building. The input module shall be installed in the communication rooms serving the respective floor.

   1.6. **Output Module:** controls up to 16 device or relay outputs, Genetec cat. # MR16OUT. Typically, there would be an input controller installed on each level of the building. The input module shall be installed in the communication rooms serving the respective floor.

   1.7. **Power Supplies:**
      
      1.7.1. **Network Controllers, Intelligent Controllers, Reader Modules and Input/Output Modules** require a separate power supply (P/S(ACS)). The access control system shall
use a central 12V power supply complete with battery backup. These power supplies shall be hardwired to a dedicated 120V circuit (emergency power when available) and located adjacent to the intelligent controllers in each communications room.

1.7.2. **DH - Door Hold Open Devices** require a standalone power supply located in proximity to the hold open device; supplied by the door hardware contractor, wired and installed by the electrical contractor.

1.7.3. **ES - Electric Strikes** require a separate power supply. A 12V DC version is preferred for all applications with the intent to utilize a central power supply. This central power supply is typically installed adjacent to the network controller power supply. In doors equipped with barrier free door operators, whereas the operator has the capability of providing power to an Electric strike, the voltage of the strike needs to be determined from Handicap operator product literature.

1.7.4. **ELCK - Electrified Locks** require a separate power supply. A 12V DC version is preferred for all applications with the intent to utilize a central power supply. This central power supply is typically installed adjacent to the multi door controller power supply. When 24V electrified locks are required, a separate 24V central power supply must be installed.

**NOTE:** Electric Strikes and Electrified Locks can be fed from the same central power supply unit, provided the overall amp-hour requirements are properly calculated and unit sized correctly.

1.7.5. **ELCH - Electric Latch Retraction** requires a separate power supply, provided as per the manufacturer’s door hardware specifications with assurance it is installed with the distance limitations as per specification.

1.8. **Junction Box complete with Reader Module:** At each door tied to the network controller, install a 10” x 10” x 6” junction above the door on the secure side with a minimum a Belden cat. # 9844 and cat. # 9952 cable runs. Refer to Appendix “A” for typical door control details for additional information on components, locations and cabling requirements.

1.9. **Wiring / Cabling:** Wiring and cabling for the door access control system shall be installed in a raceway system consisting of wire basket tray and/or J-hooks in accessible ceiling space and EMT conduit where run concealed in inaccessible ceiling areas such as drywall ceilings or bulkheads. Where the door access control cables are installed in a wire basket shared with communication cables, they shall be bundled together with Velcro cable straps and identified as door access control cables.

1.10. **Barrier Free Door Operators:** when installed on exterior doors, the operator shall be tied into the card access system controller to prevent damage to the motor. When the door has been locked, the outside barrier free operator button shall be disabled. Upon presentation of the proper credentials, the door access control system shall enable the outside door operator button for 5 seconds. Upon activation of the barrier free operator pushbutton, the door will open. After 5 seconds, the outside door operator button shall once again be disabled.
1.10.1. **Sequence:** Upon presentation of the proper credentials, the door access control system shall enable the outside door operator button for 5 seconds. Once the barrier free operator pushbutton is activated, the door will open. After 5 seconds, the outside door operator button is once again disabled.

1.11. **Card Access Control in an Elevator Cab:** The elevator controls must have the ability to accept external inputs from, and send a signal back to the Access Control System (ACS) via dry contacts.

1.11.1. **Option #1, Elevator control sequence - Floor Tracking (preferred):** The elevator floor selection buttons shall be interlocked with the ACS. When the occupant pushes a floor selection button, the elevator controller sends an output signal (dry contact) to the ACS via the Input Module indicating a request to travel to the specific selected floor. The ACS will then check the user credentials. If the user has permission to travel to the selected floor, the ACS will send a signal (dry contact) to the elevator controller via the Output Module device thus enabling the floor selection and allowing the user to travel to the selected floor. If the user does not have permission to travel to the selected floor, the floor selection times out and the elevator remains stationary.

1.11.2. **Option #2, Elevator control sequence - Restricted USER Access:** The elevator floor selection buttons shall be interlocked with the ACS. Certain facilities may be configured to restrict access to all or specific floors through the elevator. When the occupants provides credentials requesting to travel, the ACS checks the user credentials. If the user has permission to travel to the selected floor, the ACS will send a signal (dry contact) to the elevator controller via the Output Module thus enabling the floor selection and allowing the user to travel to the selected floor. This configuration does not prevent users from accessing other restricted floors.

1.12. **Card access control at the elevator call button** (hallway or elevator lobby): The elevator must have the ability to accept external inputs (i.e. dry contacts) from the Access Control System (ACS). The elevator call buttons will be disabled until proper credentials have been presented at the card reader mounted in each of the elevator lobbies.

1.12.1. **Sequence:** When a user presents credentials at the reader, the ACS checks the user credentials. If the user has permission to use the elevator from that floor, the ACS will send a signal to the elevator controller via the Output Module enabling the elevator call button and will call the elevator. The elevator call button shall light up to indicate to the user that the elevator has been called. If the user does not have permission to use the elevator, the floor selection remains disabled and the elevator remains stationary.

1.13. **Symbols and definitions:** For consistency, all definitions, acronyms and legends contained within this document must be utilized in all related door access control system documents or drawings supplied as part of any construction process.
SECURITY SYSTEM VIDEO SYSTEM:

2. Security System Video System:

2.1. The Security System Video System shall consist of the following components:

2.1.1. IP Based, Power Over Ethernet (POE), fixed and Pan-Tilt-Zoom (PTZ) type cameras compatible for use with Dalhousie’s Security System Video System. Coordinate with the project manager on a case by case basis.

2.1.2. Network Video Recorder (NVR)

2.1.3. Uninterruptible Power Supply (UPS)

2.1.4. Secure SSV rack to house the NVR and UPS.

2.2. Cameras: Ceiling mounted shall be the preferred location for interior cameras; however, wall mounted cameras will be acceptable in areas with obstructions or no ceilings. Cameras shall be IP Based with Power Over Ethernet (POE). The cameras shall use HTTP over port 80 or RSTP over port 80 but not over multiple ports. The video format shall be H.264. Cameras shall be compatible with Dalhousie Security System Video System. Coordinate compatible cameras during the project design basis with the Project Manager.

2.2.1. Fixed type interior cameras - ceiling mounted: Ceiling mounted, interior fixed type cameras shall be fixed dome cameras.

2.2.2. Fixed type interior cameras - wall mounted: Wall mounted, interior fixed type cameras shall be complete with wall mount bracket. Mount camera at 8'-0" A.F.F. to the bottom of the dome unless indicated otherwise.

2.2.3. PTZ type interior cameras - ceiling mounted: Ceiling mounted, interior PTZ type cameras shall be, Pan-Tilt-Zoom (PTZ) dome drive camera, complete with suspended ceiling installation kit.

2.2.4. PTZ type interior cameras - wall mounted: Wall mounted, interior PTZ type cameras shall be Pan-Tilt-Zoom (PTZ) dome drive camera, complete with wall mount and integral 120/24V transformer.

2.2.5. PTZ type exterior cameras - wall mounted: Wall mounted, exterior PTZ type cameras shall be Pan-Tilt-Zoom (PTZ) dome drive camera, stainless steel environmental pendant style complete with heater, fan and sun shield. Provide and install a heavy duty stainless steel mount. Camera shall be supplied complete with a 100VA, 120/24V remote power supply installed in a NEMA 1 enclosure for the dome drive. Mount camera at 12'-0" A.F.F. unless indicated otherwise.

2.3. SSV Rack: The SSV rack shall be equal to Middle Atlantic Cat No. EWR-8-22SD complete with Middle Atlantic FC-4-1C Fan Controller, two (2) Middle Atlantic Guards, two (2) Middle Atlantic Fan (4-1/4", 105 CFM). The rack will be supplied by the owner, received and installed by the contractor. Provide and install, within the rack enclosure, two duplex CSA5-20R receptacles fed from a dedicated 20A circuit, one data jack complete with Cat. 6 (Blue) cable back to the data patch panel for the UPS and one data jack complete with Cat. 6 (Blue) cable back to the data patch panel for each NVR system installed in the rack.
2.4. **Uninterruptible Power Supply (UPS):** The UPS shall be equal to Minuteman Cat No. E1000RM2RU complete with Minuteman SNMP-NET (NIC CARD), Part Number 90000716. The rack will be supplied by the owner, received and installed by the contractor. Connect the UPS into the receptacle in the SSV rack and provide and install a Cat. 6 patch cord to connect into the Dalhousie Network. The UPS shall be complete with rack mount adapters.

2.5. **Network Video Recorder (NVR):** The SSV NVR shall be supplied and installed by the owner. Exact requirements for the NVR shall be coordinated during the project design basis with Dalhousie University Facilities Management. The electrical contractor shall provide and install a Cat. 6 patch cord between each NVR and the corresponding data jack.

2.6. **Cabling Requirements:** At each camera location, provide and install a data jack complete with a blue Cat. 6 communication cable back to the respective floor data patch panel. In addition to the Cat. 6 cable, for PTZ type cameras provide and install 2#16LVT from the 24V power supply to the camera for the dome drive. Exterior cameras with dome heaters require an additional 120V power supply.

2.7. Refer to Appendix "B" for a typical SSV camera details.

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**INTRUSION ALARM SYSTEM:**

3. **Intrusion Alarm System:**

3.1. The Intrusion Alarm System shall be based on a DSC Maxsys system. The Intrusion Alarm System shall consist of a complete end to end system consisting of raceways, backboxes, cabling, devices, termination and testing all supplied and installed by the electrical contractor.

3.2. The intrusion alarm system shall consist of the following components:

3.2.1. DSC Maxsys Model #PC4020 control panels complete with TL250 T-Link alarm communicator, batteries, and alarm output to Dalhousie Security via Simplex MapNET interface.

3.2.2. Zone Expander: DSC Maxsys Model #PC4108A 8 hardwire zone expanders (16 zone expanders will not be acceptable)

3.2.3. Output Module: DSC Maxsys #PC4216 Low Current Output Modules complete with 16 programmable outputs.

3.2.4. Power Supply / Relay Output / Combus Repeater Module: Maxsys PC4204CX

3.2.5. Relay Board: DSC RL4-LC Low Current 4 Relay Board


3.2.7. Motion detectors: Equal to DSC #BV-601 motion detectors, ceiling or wall mount, complete with built-in tamper switch and wall or ceiling mount as required (based on site conditions).

3.2.8. Door contacts: Equal to Sentrol #SR-1078 series concealed 1” door contacts for man doors.

3.2.9. PC-TAB Security Sensor: Computer Security Products Inc. #PCT-SNSR.2 complete with connecting wires, RJ-11 adapter and EOL terminators to make a complete system. PC-Tab
bases shall be epoxied in place. Coordinate exact location on equipment with the
Dalhousie Project Manager.

3.2.10. Signal horns: DSC #SD15W Siren

3.2.11. Signal strobes: DSC #F34K Amber Warning Strobe

3.3. The main intrusion alarm panel shall be installed in the main communication room. If not
requiring an intrusion alarm in the building at the time of construction, the design shall
allow space in the main communication room for two 24"W x 30"H custom intrusion alarm
panels.

3.4. Provide 4" backboxes adjacent these panels for mounting low voltage power supplies. The
boxes may be powered from one dedicated circuit.

3.5. Provide two data jacks adjacent to the main intrusion alarm panels.

3.6. Zone expanders or additional intrusion alarm panels shall be mounted in the sub-
communication rooms. If there is no requirement for intrusion alarm in the building at the
time of construction, allow space for two 12" x 12" custom security panels.

3.7. Provide 4" backboxes adjacent to the panels in the sub-communication room for mounting
low voltage power supplies. The boxes may be powered from one dedicated circuit.

3.8. Device description and associated wiring:

3.8.1. Motion Sensors: Infrared motion sensors shall be mounted at 8'-0" A.F.F., preferably at
or near the corner of the room. Provide and install a single gang backbox complete with
grommeted stainless steel coverplate at 8'-0" A.F.F.. Motion sensors shall be fed with a
four conductor #22AWG unshielded cable. Motion sensors shall have a dedicated home
run to the intrusion alarm panel.

3.8.2. Door Contacts: Magnetic door contact shall be flush mounted in door frame at top of
door. Provide a 1" diameter hole in door frame for installation of door contacts. Where
monitoring the by the access control system, a second set of contacts or a two pole
version of the single 1" diameter contact shall be required. The owner’s prefer to have
only one door contact device installed at the top of the door. Coordinate with
Dalhousie Facilities Management. Standard intrusion alarm door contacts shall be fed
with a four conductor #22AWG unshielded cable. Each door shall have a dedicated
home run back to the intrusion alarm panel.

3.8.3. Strobe: Provide and install a single gang backbox, flush ceiling mounted outside of the
monitored space, generally at the door near the keypad. Alarm strobes shall be fed with
a two conductor #18AWG unshielded cable equal to Belden Cat. No. 8461.

3.8.4. Siren: Provide and install a single gang backbox, flush ceiling mounted inside of the
monitored space, generally above the keypad. Alarm sirens shall be fed with a two
conductor #18AWG unshielded cable equal to Belden Cat. No. 8461.

3.8.5. PC Tab: For floor, desk or wall mounted equipment (monitors, computers, AV
equipment, etc.) provide and install a single gang backbox at 18" A.F.F.. For ceiling
mount applications (overhead projector), the single gang backbox shall be flush ceiling
mounted. PC Tabs shall be fed with a four conductor #22AWG unshielded cable. Each
PC Tab grouping (podium, ceiling projector, computer lab row of desks, etc.) shall have a
dedicated home run back to the intrusion alarm panel location. Each home run for PC Tabs shall have a maximum of 10 PC Tabs for the home run.

3.8.6. Alarm Keypad: Provide and install a single gang backbox, flush wall mounted at 48" A.F.F. in an accessible location within the monitored space. Feed with a four conductor #22AWG unshielded cable. A global keypad shall be installed at the building main entrance to assist security personnel with locating an alarm condition as they enter the building.

3.9. All zones shall be complete with double end-of-line terminations

3.10. The main panel for the building security system shall be connected to Dalhousie Security via a Simplex Mapnet interface. The monitoring shall be full 24 hour monitoring and shall include a complete indication of all alarms. Provide the necessary modules in the panel to interface with Dalhousie Security. Supply of Simplex Devices and final termination shall be by Dalhousie Facilities Management. Co-ordinate the installation of the same with Dalhousie Facilities Management.

3.11. The system shall include a complete programming package and all necessary software to implement the system features. Access to the programming shall be via restricted levels of security. Coordinate the programming of the system with Dalhousie Facilities Management.

3.12. Each partition has its own strobe by its associated main keypad and visible by security. Sirens shall be setup at each partition unless a siren can serve multiple partitions close together. Each partition has its own keypad or multiple keypads.

3.13. All MAXSYS panels shall be connected with a TLink board and a network connection to allow for updates and monitoring from DLS software.

3.14. RL4 relays shall be used to tie outputs into the input board from the 4216 which controls the siren and strobes.

3.15. Refer to Appendix "C" for a typical intrusion alarm riser
<table>
<thead>
<tr>
<th>LEGEND</th>
<th>CABLE DESCRIPTION</th>
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<tbody>
<tr>
<td>1</td>
<td>Belden #8461 (2/#18 AWG, Jacketed) or Equivalent.</td>
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<tr>
<td>2</td>
<td>Belden #9418 (4/#18 AWG, Shielded, Jacketed) or Equivalent.</td>
</tr>
<tr>
<td>3</td>
<td>Cat. 6 Cable, White Jacket</td>
</tr>
<tr>
<td>4</td>
<td>Belden #8446 (2/#18 AWG &amp; 4/#22 AWG) or Equivalent.</td>
</tr>
<tr>
<td>5</td>
<td>Belden #9952 (2/#16 AWG, Jacketed) or Equivalent.</td>
</tr>
<tr>
<td>6</td>
<td>Provo #5706 (6/#22 AWG, Shielded, Jacketed) or Equivalent.</td>
</tr>
<tr>
<td>7</td>
<td>Provo #Z422NR-WH (4/#22 AWG, Jacketed) or Equivalent.</td>
</tr>
<tr>
<td>8</td>
<td>Belden #9844 (Low Capacitance RS-485, 4/#24 AWG, Shielded, Jacketed) or Equivalent.</td>
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</tbody>
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**BFDO** | Barrier Free Door Operator  
**DC** | Door Contact  
**DH** | Door Hold Open Device  
**EH** | Electrified Hinge  
**ES** | Electric Strike  
**ELCK** | Electrified Lockset Lever  
**ELR** | Electric Latch Retraction  
**HID** | HID Proximity Reader (with Pin Pad Where Required)  
**IDH MAX** | Best IDH MAX Lockset  
**JB** | Junction Box  
**RTE(EX)** | Request to Exit In Door Hardware  
**RTE(IR)** | Infrared Request to Exit Motion Sensor  
**PB** | Barrier Free Door Operator Push Button  
**P/S** | Power Supply  
**P/S(AC)** | Access Control System Power Supply
NOTES:
1. SUPPLIED AS REQUIRED FOR PROJECT, IN CONSULTATION WITH PROJECT MANAGER. LOCATE IN RACK OF FACILITY'S MAIN COMMUNICATIONS ROOM. PROGRAMMING BY OWNER.
WIRING REQUIREMENT FOR
SUPERVISED DEVICES

NOTES:

PROJECT:
ACCCESS CONTROL AND SECURITY GUIDELINES

C.P. #
W.O. #

PROJECT MANAGER:

SCALE:

DRAWN BY:
DATE: 10/12/2018

NOT FOR CONSTRUCTION
BARRIER FREE DOUBLE DOOR CARD ACCESS
WITH ELR, RTE (EX) AND DC
TO INTELLIGENT CONTROLLER IN COMMUNICATION ROOM OR NEXT READER MODULE. ROUTE CABLES IN CONDUIT OR WIRE BASKET AND J-HOOKS IN ACCESSIBLE CEILING SPACE.

DOUBLE DOOR CARD ACCESS WITH ELR, RTE (EX) AND DC

NOTES:

PROJECT:
ACCESS CONTROL AND SECURITY GUIDELINES

C.P. #

W.O. #

PROJECT MANAGER:

SCALE:

DRAWING:

DRAWN BY:

DATE: 10/12/2018

NOT FOR CONSTRUCTION
TO INTELLIGENT CONTROLLER IN COMMUNICATION ROOM OR NEXT READER MODULE. ROUTE CABLES IN CONDUIT OR WIRE BASKET AND J-HOOKS IN ACCESSIBLE CEILING SPACE.

TO FIRE ALARM RELAY

120V CIRCUIT

#6 BOND

P/S

READE MODULE IN JB

1/2" C's

120V CIRCUIT

BFDO

DC

DC

ELR

ELR

EH

RTE (EX)

RTE (EX)

EH

NOTES:

PROJECT:

ACCESS CONTROL AND SECURITY GUIDELINES

C.P. #

W.O. #

PROJECT MANAGER:

SCALE:

DRAWING:

DRAWN BY:

DATE:

10/12/2018

NOT FOR CONSTRUCTION

DAC-07

P:\10-18-114 DAL SAC GUIDELINES\DOOR ACCESS CONTROL DETAILS.DWG
DOUBLE DOOR CARD ACCESS WITH ELR, RTE (EX) AND DC

TO INTELLIGENT CONTROLLER IN COMMUNICATION ROOM OR NEXT READER MODULE. ROUTE CABLES IN CONDUIT OR WIRE BASKET AND J-HOOKS IN ACCESSIBLE CEILING SPACE.
BARİER FREE SINGLE DOOR CARD ACCESS WITH ES, RTE (EX) AND DC
TO INTELLIGENT CONTROLLER IN COMMUNICATION ROOM OR NEXT READER MODULE. ROUTE CABLES IN CONDUIT OR WIRE BASKET AND J-HOOKS IN ACCESSIBLE CEILING SPACE.

NOTE: HID, REQUEST TO EXIT AND DOOR CONTACT ARE INTEGRATED INTO LOCK. DOOR HARDWARE CONSULTANT SHALL ENSURE THAT DOOR IS PREPARED FOR ELECTRIFIED HINGE.

SINGLE DOOR CARD ACCESS WITH ELCK, RTE (EX) AND INTEGRATED DC AND HID
SINGLE DOOR CARD ACCESS WITH ELCK, RTE (EX) AND INTEGRATED DC
SINGLE DOOR CARD ACCESS WITH ES, RTE (IR) AND DC
SINGLE DOOR CARD ACCESS WITH ES, RTE (EX) AND DC
NOTES:
1. WIRING FROM INPUT AND OUTPUT MODULES TO ELEVATOR CONTROLLER BY ELECTRICAL CONTRACTOR. TERMINATIONS AT ELEVATOR CONTROLLER BY ELEVATOR MANUFACTURER. COORDINATE WITH ELEVATOR MANUFACTURER.
2. ALL WIRING AND TERMINATIONS BY ELECTRICAL CONTRACTOR UNLESS SPECIFICALLY NOTED OTHERWISE.

SEQUENCE OF OPERATION:
1. ELEVATOR CAB FLOOR BUTTON IS PRESSED.
2. ELEVATOR SIGNALS THE CARD SYSTEM WITH A MOMENTARY DRY CONTACT OUTPUT TO THE CORRESPONDING FLOOR INPUT.
3. USER PRESENTS THEIR CARD.
4. CARD CREDENTIALS FOR REQUESTED FLOOR ARE ASSESSED BY THE ACCESS CONTROL SYSTEM.
5. IF CARD FAILS, THEN NOTHING IS SENT TO THE ELEVATOR.
6. IF CARD PASSES THEN THE ACCESS CONTROL SYSTEM SIGNALS THE ELEVATOR WITH A DRY CONTACT MOMENTARY OUTPUT FROM THE CORRESPONDING FLOOR OUTPUT.
7. ELEVATOR CAB FLOOR BUTTON LIGHTS AND CAB TRAVELS TO THE ACCESS GRANTED FLOOR.

ELEVATOR CAB CARD ACCESS RISER

NOTES:

PROJECT:
ACCESS CONTROL AND SECURITY GUIDELINES

C.P. #
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DRAWN BY:
DATE: 10/12/2018
NOT FOR CONSTRUCTION

DAC-14
APPENDIX B SECURITY SYSTEM VIDEO SYSTEM DETAILS:
CAT 6 PATCH CABLE

CABLE TRAY OR J-HOOK

ADJUSTABLE BACKBOX SUPPORT (EQUAL TO B-LINE CAT NO. BA50A), SUPPLIED AND INSTALLED BY ELECTRICAL CONTRACTOR. WHERE WALL MOUNTED USE B-LINE SUPPORT BRACKET

4.11/16" SQUARE x 2.1/2" BACKBOX, WALL OR CEILING MOUNTED.

CCTV CAMERA

T-BAR CEILING SYSTEM

TYPICAL INTERIOR CEILING DOME CCTV CAMERA SUPPORT SYSTEM

SCALE : N.T.S.

NOTES:

PROJECT: CCTV GUIDELINES

DRAWING: CEILING MOUNTED DOME, FIXED

SCALE: NTS

DATE: NOV. 2012

DRAWN BY: TRP

REV: 1

FILE NAME: CCTV-1
TYPICAL INTERIOR CEILING DOME DRIVE (PTZ) CCTV CAMERA SUPPORT SYSTEM

SCALE: N.T.S.
CAT 6 CABLE TO DATA PATCH PANEL

4.11/16" SQUARE BACKBOX C/W SINGLE GANG TILE RING FLUSH WALL MOUNTED 8" ABOVE CAMERA MOUNT BRACKET. PROVIDE AND INSTALL A BLANK STAINLESS STEEL COVERPLATE.

CAT-6 MDVO MOUNTED ON CABLE.

CAT 6 CABLE, BLUE

WALL MOUNT BRACKET

FIXED DOME CAMERA

TYPICAL INTERIOR WALL MOUNT FIXED DOME CCTV CAMERA SUPPORT SYSTEM

SCALE: N.T.S.
TYPICAL INTERIOR WALL MOUNT DOME DRIVE (PTZ) CCTV CAMERA SUPPORT SYSTEM

SCALE : N.T.S.

NOTES:

PROJECT: CCTV GUIDELINES

SCALE: NTS

DATE: NOV, 2012

DRAWING: WALL MOUNTED DOME WITH PTZ

FILE NAME:
CAT.6 CABLE (BLUE) TO DATA PATCH PANEL.

4.11/16" SQUARE JUNCTION BOX IN ACCESSIBLE CEILING SPACE. MOUNT CAT.6 MVDO INSIDE JUNCTION BOX.

2#12+#12 BOND - 1/2"C TO 120V CCT.

2#12+12 BOND FOR DOME HEATER

HEAVY DUTY STAINLESS STEEL WALL MOUNT BRACKET

STAINLESS STEEL DOME C/W HEATER

CONDUIT SLEEVES

TYPICAL OUTDOOR WALL MOUNT DOME CCTV CAMERA SUPPORT SYSTEM

SCALE : N.T.S.
TYPICAL OUTDOOR WALL MOUNT DOME
CCTV CAMERA SUPPORT SYSTEM WITH PTZ

SCALE: N.T.S.

NOTES:

PROJECT: CCTV GUIDELINES
DRAWING: OUTDOOR WALL MOUNTED
DOME WITH PTZ

SCALE: NTS
DATE: MAY, 2012
DRAWN BY: TRP
REV. 1
FILE NAME: _
ELECTRICAL LEGEND

SECURITY KEYPAD FLUSH WALL MOUNTED AT 46" A.F.F.

CONCEALED DOOR CONTACT FOR INTRUSION ALARM SYSTEM

INTRUSION ALARM MOTION SENSOR FLUSH WALL MOUNTED AT 8'-0" A.F.F.

PC TAB SECURITY DEVICE, CEILING MOUNT OR FLUSH WALL MOUNTED 18" A.F.F.

INTRUSION ALARM HORN, WALL MOUNTED 7'-6" A.F.F.

INTRUSION ALARM STROBE, WALL MOUNTED 7'-6" A.F.F.

Belden #8461 (2 CONDUCTOR #18AWG, JACKETED) OR EQUIVALENT.

Belden #9418 (4 CONDUCTOR #18AWG, JACKETED) OR EQUIVALENT.

Provo #Z422NR-WH (4 CONDUCTOR #22AWG, JACKETED) OR EQUIVALENT.
TWO 4" SQUARE JUNCTION BOXES SUITABLE FOR MOUNTING LOW VOLTAGE POWER SUPPLIES ON THE SIDE KNOCKOUTS.

LEVEL 1
COMMUNICATION ROOM

PROVIDE AND INSTALL A 12"X12" BOX IN BASEMENT COMMUNICATION ROOM. COIL 6' SLACK CABLE IN BOX. CABLES SHALL CONTINUE UNBROKEN FROM THE INTRUSION ALARM PANEL TO THE MAPNET DEVICE LOCATION.