KAESTLE BOOS
associates, inc

A D D E N D U M N O . 1

ADDITIONS AND RENOVATIONS
WINDSOR FIRE DEPARTMENT & EMS
Windsor, CT
KBA #18009.02

Date: May 26, 2020

The following changes to the Project Manual shall become a part of the Drawings, Specifications, Bidding Requirements and Contract Documents; superseding previously issued Drawings, Specifications, Bidding Requirements, Contract Documents and Addenda, to the extent modified by this Addendum.

CLARIFICATIONS

BID OPENING HAS BEEN EXTENDED TO **JUNE 15, 2020**- TIME REMAINS THE SAME

NOTE: IMPORTANT! CHANGES TO "BIDDING PROCEDURES" LISTED BELOW UNDER CHANGES TO SPECIFICATIONS

Pre-Bid Walk-Through Lists of General Contractor Attendees for the – 9:00 a.m. & 10:30 a.m. sessions, dated May 22, 2020, attached at the end of this Addendum.

CHANGES TO SPECIFICATIONS

BIDDING AND CONTRACT REQUIREMENTS
INVITATION TO BID
Page 1
Sealed bids for the Additions and Renovations, Windsor Fire Department & EMS, 340 Bloomfield Avenue, Windsor, CT addressed to James Bourke, Finance Director will be received at the front door of the Windsor Town Hall, 275 Broad Street, Windsor, CT 06095 by Whit Przech, Building and Facilities Manager on MONDAY, June 15, 2020 BETWEEN 1:00 PM and 2:00 PM. Late bids will be rejected.

Due To Covid-19, the Bid Opening for the Windsor Fire and EMS complex on June 15, 2020 at 2:00 PM will be closed to public, but will be live streamed. To view the live Bid Opening click on the following link: https://townofwindsorct.com-videos/?page=nonmeeting

then click on the link for "Windsor Fire and EMS Complex Bid Opening-In Progress

The link to the live stream will be appear on the Town website 15 minutes before the actual Bid Opening at 2:00 PM.

Page 2
"All Requests for Information (RFI) are to be emailed to the attention of Nicholas Semyanko at nsemyanko@kba-architects.com. RFIs must be received by the Architect by **June 9, 2020, BY END OF DAY**– **Last day to receive RFIs."**

INSTRUCTIONS TO BIDDERS, AIA DOCUMENT A701
Article 3 Bidding Documents
Paragraph 3.3.2
Requests for clarification or interpretation of the Bidding Documents shall be submitted by the Bidder in writing and shall be received by the Architect by **NOON** on **June 9, 2020**—last day to receive Request for Information (RFI's).

Article 5 Consideration of Bids
Paragraph 5.3.1
Add the following paragraph:
The Public Building Commission may at their discretion consider three (3) apparent lowest qualified bids, including the major subcontractor (5.3.1.1.) provided by the bidder and make recommendations to award the contract which is in the best interest of the Town. The Commission will invite each of the three (3) bidders for the meeting to make a decision.
Paragraph 5.3.1.1.b.

A D D E N D U M N O . 1

ADDITIONS AND RENOVATIONS
WINDSOR FIRE DEPARTMENT & EMS
Windsor, CT
KBA #18009.02

Date: May 26, 2020

Add the following at the end of item b.
"b. List of all major subcontractors for (Site, Roofing, Plumbing, HVAC, Electrical, Security, **Struc. Steel, Masonry**).

DIVISION 01 – GENERAL REQUIREMENTS
Section 01 31 00 "Project Management and Coordination"
Paragraph 1.6C.1, change Revit 2017 to Revit **2019.**

Section 01 50 00 "Temporary Facilities and Controls"
Paragraph 1.3
Add subparagraph D.
D. Contractor can use existing boilers to temporarily heat the place during construction. Use of gas will be at no charge to the contractor. However, for New Apparatus Bay, until the building is completely enclosed, all cost for temporary heat including fuel will be contractor's responsibility.

The existing condition photos for contractors review see attached link:
https://kaestleboos-my.sharepoint.com/:f:/g/personal/lgreen_kba-architects_com/EjFjR3e-hLZHsNljku3z4TABT4xRJwPBXNFanH7gYC8mLQ?e=wW5Ra3

DIVISION 06 - WOOD, PLASTICS AND COMPOSITES
Section 06 40 23 "Interior Architectural Woodwork"
Revise Paragraph 2.2D to read as follows:

D. Decorative Pulls: Back mounted, 5-1/16" c/c, with 1-3/16-inch projection, 3/8-inch by 3/8 inch square, in satin nickel finish.

1. Basis of Design Product: Subject to compliance with requirements, provide **Amerock; Monument BP36571G10**, or comparable product by the following, or equal:

DIVISION 07 – THERMAL AND MOISTURE PROTECTION
Section 07 42 13.63 "Linear Metal Soffits"
Paragraph 2.2A.1.
1. Basis-of-Design Product **add (C-5)**: Subject to compliance..
Paragraph 2.2E; change 4-inches to **6-inches**.

Section 07 54 00 "Thermoplastic Membrane Roofing"
Add the following new Paragraph 2.2H:

H. Extruded Bellows Roof Expansion Joint: Manufacturer's standard, continuous, waterproof, joint cover assembly; consisting of primary and secondary, single-layered, elastomeric seals; secured along each edge with extruded-aluminum retainers for fastening to substrate.

1. Joint Movement Capability: Plus and minus 25 percent of joint size.
2. Primary Seal: Silicone extrusion; color to match membrane roofing.
3. Secondary Seal: EPDM, or manufacturer's standard elastomeric seal.
4. Drain-Tube Assemblies: Equip secondary seal with drain tubes and seals to direct collected moisture to drain.
5. Corner, Intersection, and Transition Units: Provide factory-fabricated units for corner and joint intersections and horizontal and vertical transitions including those to other building expansion joints.

A D D E N D U M N O . 1

ADDITIONS AND RENOVATIONS
WINDSOR FIRE DEPARTMENT & EMS
Windsor, CT
KBA #18009.02

Date: May 26, 2020

Insert new Paragraph 3.9; renumber subsequent paragraphs accordingly:
3.9 INSTALLATION OF EXPANSION JOINTS

A. Comply with manufacturer's written instructions for handling and installing roof expansion joints.

1. Anchor roof expansion joints securely in place, with provisions for required movement. Use fasteners, protective coatings, sealants, and miscellaneous items as required to complete roof expansion joints.
2. Install roof expansion joints true to line and elevation; and without warping, jogs in alignment, buckling, or tool marks.
3. Provide for linear thermal expansion of roof-expansion-joint materials.
4. Provide uniform profile of roof expansion joint throughout its length; do not stretch or squeeze membranes.
5. Provide uniform, neat seams.
6. Install roof expansion joints to fit substrates and to result in watertight performance.

B. Directional Changes: Install factory-fabricated units at directional changes to provide continuous, uninterrupted, and watertight joints.

C. Transitions to Wall Expansion-Control Joint Assemblies: Coordinate installation of roof expansion joints with other exterior expansion-control joint assemblies specified in Division 07 Section "Expansion Control" to result in watertight performance. Install factory-fabricated units at transitions between roof expansion joints and exterior expansion-control joint systems.

D. Splices: Splice roof expansion joints to provide continuous, uninterrupted, and waterproof joints.

1. Install waterproof splices and prefabricated end dams to prevent leakage of secondary-seal membrane.

E. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.

DIVISION 08 – OPENINGS
Section 08 33 23 “Overhead Coiling Doors”
Revise Paragraph 2.8D.1.b to read “120 V”

Section 08 36 13 “Sectional Doors”
Delete Section and replace with new Section attached to this Addendum.

Section 08 71 00 “Door Hardware”
At openings A114 and A115, (Hardware Sets 105 and 106), delete Wall Stop and add magnetic hold open 998 - TRI-VOLTAGE - 689 (Wall Mounted Magnet)

DIVISION 09 – FINISHES
Section 09 06 00 “Schedules for Finishes”
Finish Schedule
Delete in its entirety and **replace** with new “Finish Schedule”- May 26, 2020 – Addendum No. 1, attached at the end of this Addendum.

A D D E N D U M N O . 1

ADDITIONS AND RENOVATIONS
WINDSOR FIRE DEPARTMENT & EMS
Windsor, CT
KBA #18009.02

Date: May 26, 2020

Finish Legend
Delete in its entirety and **replace** with new "Finish Legend"- May 26, 2020 – Addendum No. 1, attached at the end of this Addendum.
General Notes
Delete in its entirety and **replace** with new "General Notes"- May 26, 2020 – Addendum No. 1, attached at the end of this Addendum.

Section 09 54 23 "Linear Metal Ceiling"
Paragraph 2.1

A. Steel Pans and Suspension System:
   1. Basis-of-Design Product *(C-8)* **change to (C-4):** Subject to compliance..

DIVISION 10 - SPECIALTIES
Section 10 14 00 "Signage"
Sign Schedule
Delete in its entirety and **replace** with new "Sign Schedule"- May 26, 2020 – Addendum No. 1, attached at the end of this Addendum.

Section 10 51 13.13 "Specialty Lockers"
Revise Paragraph 1.8A.3 to read as follows:

3. Warranty Period: Five years from date of Substantial Completion.

Revise Paragraphs 2.2B and C to read as follows:

B. Locker Construction: All welded construction, fabricated from 18 gauge cold-rolled steel sheet, with sliding drawer unit base.

1. Size: 30"W x 24"D x 72"H locker on 18 inch drawer unit.
2. Doors: Reinforced double doors, louvered.
3. Hinges: Full surface, 14 gauge stainless steel, continuous hinge.
4. Shelves: Fabricated from 16 gauge cold-rolled steel sheet.
5. Sloped top, with punch-out for electrical conduit. ~~and exhaust air, as indicated~~.
6. Provide sloped tops. ~~to act as ventilation plenum. Provide matching metal enclosure for ductwork to transfer from ceiling to lockers~~.

   a. Provide filler panels where lockers abut walls.
   b. Provide finished end panels for lockers and drawer bases not abutting walls.
   c. Provide separate finished end panel at open ends of drawer bases.
   d. Provide manufacturer's standard top closure trim for transition to gypsum board soffit.

C. Locker Configuration:

7. Three storage compartments, each 7"W x 13.9"D x 8"H.
8. One lockable security cabinet.
9. Clothes hanger bar.
10. Hat shelf, full width of locker x 13.9"D x 4.9"H.
11. Briefcase shelf, full width of locker x 13.9"D x 7.6"H.

12. Mirror; 8-1/2 x 11", magnetic and adjustable.
13. Hang panel; peg board style.
14. Door pocket; large enough for 1-inch clipboard.
15. ~~Body armor compartment for storing and drying.~~
16. Boot tray; perforated and removable.
17. Provide built-in combination lock on each unit.
18. Drawer unit: Lockable, 24" deep drawer constructed with heavy-duty 200 lb. drawer slides. ~~and a 9.5" deep butcher block hardwood bench~~.

DIVISION 11 - EQUIPMENT
Section 11 90 00 "Miscellaneous Equipment"
Delete Paragraph 1.2A.1 in its entirety

Add the following new Paragraph 1.2B.4:
4. Gear lockers.

Delete Paragraph 2.1 in its entirety.

DIVISION 12 – FURNISHINGS
Section 12 21 13 "Horizontal Louver Blinds"
Horizontal Blind Location Schedule
Delete in its entirety and **replace** with new "Horizontal Blind Location Schedule"- May 26, 2020 – Addendum No. 1, attached at the end of this Addendum.

Section 12 24 13 "Roller Window Shades"
Roller Shade Location Schedule
Delete in its entirety and **replace** with new "Roller Shade Location Schedule"- May 26, 2020 – Addendum No. 1, attached at the end of this Addendum.

DIVISION 28 – ELECTRONIC SAFETY AND SECURITY
Section 28 23 13 "Indoor IP Cameras
Delete in its entirety and **replace** with new Section 28 23 13 "Indoor IP Cameras"- May 26, 2020 – Addendum No. 1, attached at the end of this Addendum.

Section 28 23 23 "Outdoor IP Cameras"
Delete in its entirety and **replace** with new Section 28 23 23 "Outdoor IP Cameras"- May 26, 2020 – Addendum No. 1, attached at the end of this Addendum.

Section 28 23 33 "Multisensor Cameras"
Delete in its entirety and **replace** with new Section 28 23 33 "Multisensor Cameras"- May 26, 2020 – Addendum No. 1, attached at the end of this Addendum.

CHANGES TO DRAWINGS

NOTE:
Plumbing Contractor shall provide condensate drain piping for all heat pumps and heat pump Air Handling Units. Refer to Mechanical Drawings M1.03, M1.04 and M2.01 for heat pump and air handling unit locations and configurations. In Main Mechanical Rooms, provide a 1-1/4" vertical condensate header at each "stack" of AHU's and connect ¾" condensate drain

A D D E N D U M N O . 1

ADDITIONS AND RENOVATIONS
WINDSOR FIRE DEPARTMENT & EMS
Windsor, CT
KBA #18009.02

from each AHU to the vertical drain riser. Run all drains to floor drain. Run drain from HP-2 into the mechanical room riser. Run pumped drain from HP-1 to sink in Fire Work Room B112. Condensate piping shall be Schedule 40 PVC.

M1.05 ROOF MECHANICAL PLAN
Add the following relative to Condensing Units CU-1A, CU-1B, CU-2A & CU-2B: Mechanical Contractor shall provide supplemental steel (galvanized W6x15) on top of existing condensing unit steel dunnage to adapt the existing dunnage to the new condensing units' dimensional configuration. Steel beams shall run full length of the condensing units on each side. Provide connecting beams or channels between beams.

E2.02 MAIN LEVEL POWER PLAN – AREA B
At room Firematic Storage B114 - Change garage door power requirement to 1/2hp @120 v. Provide 2 #8 AWG, 1 #8 AWG GND in 3/4" conduit. Connect to panel NF3C #43. Change schedule for position #45 and 47 to spare.

E4.01 ELECTRICAL LOW VOLTAGE PLAN - AREA A:
Doorway between corridor A111 and A 109, Remove magnetic door hold open device and the both smoke detectors next to this door.

ATTACHMENTS

Pre-Bid Walk-Through Lists of General Contractor Attendees for the – 9:00 a.m. & 10:30 a.m. sessions, dated May 22, 2020.

Bid Questions and Responses:
RFI 001
RFI 002
RFI 003
RFI 004
RFI 005
RFI 006
RFI 007
RFI 008
RFI 009
RFI 010

Sketches:
SKSE-000
SKSE-001

Drawings:
E6.01 ELECTRICAL SCHEDULES
ESU2.01 ELECTRICAL SITE UTILITIES DETAILS

Specifications:
Section 08 36 13 "Sectional Doors", 12 pages, dated May 26, 2020- Addendum No. 1
Section 09 06 00 "Schedules for Finishes":

- Finish Schedule, four (4) pages, May 26, 2020-Addendum No. 1
- Finish Legend, four (4) page, May 26, 2020 – Addendum No. 1
- General Notes, one (1) page, May 26, 2020 – Addendum No. 1

A D D E N D U M N O . 1

ADDITIONS AND RENOVATIONS
WINDSOR FIRE DEPARTMENT & EMS
Windsor, CT
KBA #18009.02

Date: May 26, 2020

Section 10 14 00 “Signage”
- Sign Schedule, four (4) pages, May 26, 2020 – Addendum No. 1

Section 12 21 13 “Horizontal Louver Blinds”
- Horizontal Blind Location Schedule, one (1) page, May 26, 2020 – Addendum No. 1

Section 12 24 13 “Roller Window Shades”
- Roller Shade Location Schedule, one (1) page, May 26, 2020 – Addendum No. 1

Section 28 23 13 “Indoor IP Cameras”, twenty (20) pages, May 26, 2020 – Addendum No. 1
Section 28 23 23 “Outdoor IP Cameras”, twenty-two (22) pages, May 26, 2020 – Addendum No. 1
Section 28 23 33 “Multisensor IP Cameras”, twenty-two (22) pages, May 26, 2020 -Addendum No. 1

WALK THROUGH SIGN-IN SHEET
WINDSOR FIRE DEPARTMENT AND EMS ADDITIONS AND RENOVATIONS
GENERAL CONTRACTORS
MAY 22, 2020 at 9:00 a.m.

Name	Company Name & Address	Phone/Email
Adam Annulli	Orlando Annulli & Sons 147 Hale Road Manchester, CT 06042	Phone: 860-644-2427
		Email: adam@annulli.com
Gary Broderick	A. Secondino & Son, Inc. 21 Acorn Road Branford, CT 06405	Phone: 203-592-4651
		Email: gbroderick@asecondinoandson.com
Peter Gavin	Lawrence Brunoli, Inc. 11 Eastview Drive Farmington, CT 06032	Phone: 860-676-9900
		Email: pgavin@lbrunoli.com
Nicholas Barone	Montagno Construction , Inc.	Phone: 203-597-9014
		Email: nbarone@montagno.com
Michael Garneau	WJ Mountford Co. 70 Commerce Way South Windsor, CT 06074	Phone: 860-291-9448
		Email: mgarneau@wjmountford.com
Michael Daigle	Diversity Construction Group 531 Cortland Circle Cheshire, CT 06410	Phone: 203-699-8387
		Email: estimating@diversitycg.com
Martin Nosal	NDC Corp	Phone: 860-919-9958
		Email: martin.nosal@ndccorp.com
		Phone:
		Email:
		Phone:
		Email:
		Phone:
		Email:

WALK THROUGH SIGN-IN SHEET
WINDSOR FIRE DEPARTMENT AND EMS ADDITIONS AND RENOVATIONS
GENERAL CONTRACTORS
MAY 22, 2020 at 10:30 a.m.

Name	Company Name & Address	Phone/Email
Anthony Portonova	PDS Engineering Construction, Inc. 107 Old Windsor Road Bloomfield, CT 06002	Phone: 860-242-8587
		Email: a.portonova@pdsec.com
Vincent Parete	LaRosa Building Group, Inc. 163 Research Parkway Meriden, CT 06450	Phone: 203-235-1770
		Email: Vparete@LaRosaBG.com
Paul Campanelli	PAC Group LLC 126 South Main St. Suite 200 Torrington, CT 06790	Phone: 860-485-9363
		Email: pcampanelli@pacgroupllc.com
	Banton Construction	Phone: 203-234-2353
		Email: cpond@bantonconstruction.com
Richard Shultz	Enco Environmental Contracting 70 West Liberty Street Waterbury, CT 06706	Phone: 203-754-5959
		Email: richardshultz@sbcglobal.net
Sean Ditto	Consigli 100 Allyn Street Hartford, CT 06103	Phone: 860-239-0233
		Email: sditto@consigli.com
Joanne Cotoia	Newfield Construction 225 Newfield Avenue Hartford, CT 06106	Phone: 860-509-3032
		Email:joannecotoia@newfieldconstruction.com
Roel Legaspi	Nosal Builders 85 Fieldstone Court, Unit 1 Cheshire, CT 06410	Phone: 203-439-9320
		Email: roel@nosalbuilders.com
Justin Gamache	Wohlsen Construction	Phone: 203-826-2192
		Email: jgamache@wohlsen.com
		Phone:
		Email:
		Phone:
		Email:
		Phone:
		Email:

Orlando Annulli
and Sons, Inc.

REQUEST FOR INFORMATION #1: OVERHEAD DOOR CLARIFICATIONS

To: Nicholas Semyanko: nsemyanko@kba-architects.com

FROM: Jonathan Adams, Chief Estimator

DATE: May 18, 2020

PROJECT: WINDSOR FIRE DEPT. & EMS FACILITY

Question:

Specification Section(s): 083323; 083613 **Drawing(s): A6.02; A6.07; A8.02**

---

1. Electrical requirements of Overhead Doors needed:
   - Coiling Doors specified to be 115v/1p (083323/2.8/D/1/a + b)
   - Sectional Doors specified to be 208v/3p (083613/2.8/D/1/a)
   - What are the power requirements of the electric operators needed?

2. Sectional Door track configuration required:
   - Spec (083613/2.3/F) call for “high lift track”
   - Detail (4/A6.07) shows standard lift track
   - Details (H3 + H4/A8.02) show low headroom track
   - Which type of track will be needed here, this will also effect the mounting style of electrical operators needed?

3. Sectional Door Panels Appearance Clarification (Flush vs. Ribbed)
   - Spec (083613/2.3/E) calls for “Flush” panels
   - Detail (3/A6.02, and other views) show a ribbed panel appearance
   - Overhead Door Model 596 doors come with a flush panel design
   - Should these doors be OHD model 596 with a flush panel, or something else with a ribbed design?

4. Finish Color of Sectional Doors requested:
   - Spec (083613/2.3/K/1 + 2) calls for factory standard “Taupe” finish on inside and outside of door
   - Overhead Door model 596 comes standard in White, Industrial Brown, Gray, or Tan on the exterior
   - Overhead Door model 596 comes standard in White only on the interior
   - OHD/596 aluminum full view sections come standard White on inside and out
   - Which finish is needed here, a standard selection or a custom finish?

5. Finish Color of Coiling Doors requested:
   - Spec (083323/2.3/K) calls for Coiling Doors to be powder coat finished
   - Will this door need to be powder coated, or can a standard finish be used?
   - Does this door need to match the chosen finish of the Sectional Doors?

Response:

1. Coiling door for Firematic Storage B114 shall be 120V-1 Phase power, 1/2HP. Change branch circuit from 20A-3 pole to 20A-1 pole circuit to panel NF-3C. Run #8 wiring. **Sectional door are 208v 3 phase ½ hp with 24v control.**

2. Provide high lift track as specified.

3. Provide CLOPAY BUILDING PRODUCT COMPANY: MODEL 3722 as specified in this Addenda, Flush Panel

4. Manufacturer's color as to be RED.

5. Provide powder coat finish for coiling doors as specified, color to be RED.

By: Chris Mozian (RZ), Nicholas Semyanko (KBA) Date: May 19, 2020

ELECTRICAL CONTRACTORS, INC.

A TEGG Service Provider,

3510 MAIN STREET
HARTFORD, CONNECTICUT 06120
TEL: (860)549-2822 FAX: (860)549-8570
LIC. # 102800
E.O.E. - M/F

REQUEST FOR INFORMATION

SENT VIA: ____FAX ___E-MAIL __X__OTHER

Project Name: Windsor Fire Dept & EMS	**Date:05/19/20**
To: Nicholas Semyanko	**From: Steve Christmas**
Phone:	**Phone: (860) 549-2822**
Fax:	**Fax: (860) 549-8570**
Email:	**Email: @ecincorporated.com**
Subject: Request for Information #1	

Please Clarify:

RFI
Can I get clarification on the security cameras and low voltage cabling, excluding fire alarm? The spec states all cabling and equipment for communication, security, A/V and IT Electrical Contractor conduits and strings. (27 00 01 2.1). installed by owner or owners vendor. (27 00 01 Part 2 2.2). The security drawing SE-000 , notes 22 and 24 states that the Electrical Contractor is installing all of it?
Who owns all the pole associated material and gear? There's no detail on the pole or pole base size? Is the Nema 4x box with equipment inside mounted to the pole being provided? Installed by?

Thank you

RZDA Response: The entire Security System including all equipment, roughing, cabling, terminations, testing and programming are Part of the Electrical Contract Scope of Work. Refer to the "Responsibility Matrices" on Drawing E0.01, which overrides any language in the Specifications. Note: There are no light pole mounted cameras on this project, thus no requirement for camera power or fiber conduits to be run to the site light poles.

See Sketch SKSE 000 attached below.

JP 05/27/2020

RFI 003

REQUEST FOR INFORMATION #1:

To: Nick Semyanko

FROM: Banton Construction Company

DATE: May 19th, 2020

PROJECT: WINDSOR FIRE DEPARTMENT & EMS

Question:

Specification Section(s): *Section 00 31 26 Existing Hazardous Materials Information, Specification Section 02 82 13 Asbestos abatement*

Drawing(s): *Drawing HM-01 Main Level Abatement Plan*

We Refer to Specification Section 00 31 26 Existing Hazardous Materials Information, Specification Section 02 82 13 Asbestos abatement, and to Drawing HM-01 Main Level Abatement Plan. We also refer to the unit prices in the bid form, which are intended to be used for cost adjustment post contract.

Section 00 31 26- The information provided includes a report prepared by Cardno ATC (dated December 30, 2014), and a supplemental report by Fuss and & O'Neill Inc. dated 12/9/2019. This Fuss and O' Neil report includes Table 2, Summary of Asbestos-Containing Materials Inventory, with some items and Approximate Quantities. Another Table is included in Section 02 82 13, with some different items and some different quantities. This table has eight items.

Note 1 on Drawing HM-01 states "Quantities shall be verified by the contractor during the time of the walk-through. Discrepancies of amounts and/or locations of asbestos-containing materials shall be addressed prior to bidding the work to the owner or to the consultant." This is also stated in the Notes section under the Table in Section 02 82 13.

How does the contractor verify the quantities at the time of the walk-through? The quantities in the two previously referenced reports are different, and the areas indicated on the drawing are either different from quantities in tables, or are not verifiable without demolition and investigation.

The unit price schedule in the bid form includes seventeen items related to asbestos abatement, but these items do not fully align with Drawing HM-01 or either of the tables previously referenced, the latest of which included eight item. How do we provide unit prices for items that do not match the items in the documents?

Response:

By: Banton Construction Company – Frank Murphy, Senior Estimator
Date: May 19th, 2020

RFI 003

REQUEST FOR INFORMATION #1:

To: Nick Semyanko

FROM: Banton Construction Company

DATE: May 19th, 2020

PROJECT: WINDSOR FIRE DEPARTMENT & EMS

Response:

The Contractor shall reference Asbestos Abatement Specification Section 02 82 13 and HM-01 regarding quantities and locations of asbestos.

Please provide unit price items that “do not match the items in the documents” and indicate why they do not match and your limitations to why you cannot provide a unit price for review and comment. Your question does not include the “unit price items” you are referencing.

Kathleen Pane May 20, 2020

REQUEST FOR INFORMATION #1:

To: nsemyanko@kba-architects.com

FROM: PAC Group LLC

DATE: 05-20-20

PROJECT: Windsor Fire Dept/EMS

Question:

Specification Section(s): **Drawing(s): L5.01**

---

1. Site Plan L5.01 indicates some quantities of plants at various locations however some areas are missing quantities. Can an overall Quantity be provided by each plant type?

Response:

Contractors shall do their own overall plant quantity takeoffs based on plant tags on the plan. Note that plant tags with quantities indicated may also be accounting for plants in adjacent beds.

By: **Date:**

REQUEST FOR INFORMATION #2:

To: nsemyanko@kba-architects.com

FROM: PAC Group LLC

DATE: 05-20-20

PROJECT: Windsor Fire Dept/EMS

Question:

Specification Section(s): 08 33 23 **Drawing(s):**

---

2. Electrical requirements of Overhead Doors needed:
- Coiling Doors specified to be 115v/1p (083323/2.8/D/1/a + b)
- Sectional Doors specified to be 208v/3p (083613/2.8/D/1/a)
- What are the power requirements of the electric operators needed?

Response:

2. Coiling door for Firematic Storage B114 shall be 120V-1 Phase power, 1/2HP. Change branch circuit from 20A-3 pole to 20A-1 pole circuit to panel NF-3C. Run #8 wiring..
Sectional door are 208v 3 phase ½ hp with 24v control.

By: Chris Mozian (RZ), Nicholas Semyanko (KBA) **Date: May 20, 2020**

REQUEST FOR INFORMATION #3:

To: nsemyanko@kba-architects.com

RFI 004

FROM: PAC Group LLC

DATE: 05-20-20

PROJECT: Windsor Fire Dept/EMS

Question:

Specification Section(s): 08 33 23 **Drawing(s): A8.02**

---

3. Sectional Door track configuration required:

- Spec (083613/2.3/F) call for “high lift track”
- Detail (4/A6.07) shows standard lift track
- Details (H3 + H4/A8.02) show low headroom track
- Which type of track will be needed here, this will also affect the mounting style of electrical operators needed?

Response:

3. Provide high lift track as specified.

By: Nicholas Semyanko (KBA) **Date: May 20, 2020**

REQUEST FOR INFORMATION #4:

To: nsemyanko@kba-architects.com

FROM: PAC Group LLC

DATE: 05-20-20

PROJECT: Windsor Fire Dept/EMS

Question:

Specification Section(s): 08 33 23 **Drawing(s): A6.02**

---

4. Sectional Door Panels Appearance (Flush vs. Ribbed)

- Spec (083613/2.3/E) calls for “Flush” panels
- Detail (3/A6.02, and other views) show a ribbed panel appearance
- Overhead Door Model 596 doors come with a flush panel design
- Should these doors be OHD model 596 with a flush panel, or something else with a ribbed design?

Response:

4. Provide CLOPAY BUILDING PRODUCT COMPANY: MODEL 3722 as specified in this Addenda. Provide Flush Panel doors.

By: Nicholas Semyanko (KBA) **Date: May 20, 2020**

REQUEST FOR INFORMATION #5:

To: nsemyanko@kba-architects.com

FROM: PAC Group LLC

DATE: 05-20-20

PROJECT: Windsor Fire Dept/EMS

Question:

Specification Section(s): 08 33 23 **Drawing(s):**

---

5. Finish Color of Coiling Doors

- Spec (083323/2.3/K) calls for Coiling Doors to be powder coat finished
- Will this door need to be powder coated, or can a standard finish be used?
- Does this door need to match the chosen finish of the Sectional Doors?

Response:

5. Provide powder coat finish for coiling doors as specified, color to be RED.

.

By: Nicholas Semyanko (KBA) **Date: May 20, 2020**

REQUEST FOR INFORMATION #6:

To: nsemyanko@kba-architects.com

FROM: PAC Group LLC

DATE: 05-20-20

PROJECT: Windsor Fire Dept/EMS

Question:

Specification Section(s): 10 51 13.13 **Drawing(s): A10.04**

---

6. Lockers Spec 10 51 13.13

- lifetime warranty called for on frame. Manufacturer only offers a 5-year warranty. Please clarify? **5-Year warrant is acceptable.**
- The Infinity Locker is constructed with 18 Gauge Welded metal, the spec stats 14 gauge welded. Please clarify? **Provide 18 gauge construction.**
- Please confirm the end user wants all listed components within the spec? **Provide components as specified.**
- Spec calls for bench drawers but the drawings show possibly flush drawers on the drawing. I do not believe bench drawers will fit in the alcoves. Please clarify? **Do not provide bench drawer units.**
- Standard minimum size trim is 2", if the lockers are pushed to one size it would make the trim situation easier if the lockers are to be centered, the trim will need to be custom, flange out to connect to the wall or simply no trim at all. If gap is less than 1" no trim can be provided based on the small gap. What is the projected gap size between the wall and lockers? **Projected gap size is too small for trim. Do not provide trim for this unit.**
- The specs call for both slope tops and plenum trim to connect to a gypsum soffit. Which one is correct? If the slope tops are correct, does each locker run of 2 need a chimney cover? **Provide slope tops. No plenum trim required.**

Response:

6. See responses above.

By: Nicholas Semyanko (KBA) **Date: May 20, 2020**

REQUEST FOR INFORMATION #7:

To: nsemyanko@kba-architects.com

FROM: PAC Group LLC

DATE: 05-20-20

PROJECT: Windsor Fire Dept/EMS

Question:

Specification Section(s): 09 54 23 **Drawing(s): A2.01, A2.02**

---

7. Spec section 095423 calls for C-8. C-8 on the RCP legend is gyp. C-4 and C-5 are listed as linear metal in the legend. Are both types based on the item listed in the spec section?

Response:

7. Spec Section 074213.63 refers to ceiling type C5.
Spec Section 095423 refers to ceiling type C4.

By: Nicholas Semyanko (KBA) **Date: May 20, 2020**

REQUEST FOR INFORMATION #8:

To: nsemyanko@kba-architects.com

FROM: PAC Group LLC

DATE: 05-20-20

PROJECT: Windsor Fire Dept/EMS

Question:

Specification Section(s): 09 67 23 Drawing(s):

---

8. Resinous flooring there is PRF-1, PRF-2 and PRF on the Finish Schedule. Spec 09 67 23 only provides PRF-1. Please clarify?

Response:

8. Provide PRF-1 at all locations indicated to receive poured resinous flooring.

By: Nicholas Semyanko (KBA) **Date: May 20, 2020**

REQUEST FOR INFORMATION #01:

To: Nicholas Semyanko

FROM: Mike Garneau, W.J. Mountford Co.

DATE: 5/20/2020

PROJECT: Windsor FD & EMS

Question: Below questions from Inner Space Systems regarding the Tiffin Lockers.

1. Tiffin Metal Product Infinity Locker is the spec'd locker, we offer a 5 year warranty, not a lifetime on the frame. **5-Year warrant is acceptable.**
2. The Infinity Locker is constructed with 18 Gauge Welded metal, the spec stats 14 gauge welded. **Provide 18 gauge construction.**
3. I would like verification that end user wants all listed components within the spec? **Provide components as modified in Addendum.**
4. Spec calls for bench drawers but the drawings show possibly flush drawers on the drawing. I do not believe bench drawers will fit in the alcoves. **Do not provide bench drawer units.**
5. Standard minimum size trim is 2", if the lockers are pushed to one size it would make the trim situation easier if the lockers are to be centered, the trim will need to be custom, flange out to connect to the wall or simply no trim at all. If gap is less than 1" no trim can be provided based on the small gap. What is the projected gap size between the wall and lockers? **Projected gap size is too small for trim. Do not provide trim for this unit.**
6. The specs call for both slope tops and plenum trim to connect to a gypsum soffit. Which one is correct? If the slope tops are correct, does each locker run of 2 need a chimney cover? **Provide slope tops. No plenum trim required.**

Specification Section(s): 105113.13 **Drawing(s): A4.02, A10.04**

Response:

See responses above.

By: Nicholas Semyanko (KBA) **Date: May 20, 2020**

Orlando Annulli
and Sons, Inc.

REQUEST FOR INFORMATION #2: HVAC CLARIFICATIONS

To: Nicholas Semyanko: nsemyanko@kba-architects.com

FROM: Jonathan Adams, Chief Estimator

DATE: May 21, 2020

PROJECT: WINDSOR FIRE DEPT. & EMS FACILITY

Question:

Specification Section(s): 230713; 233100 **Drawing(s): M Series**

---

1. Does the Dryer exhaust have to be of Aluminum construction?

2. Is there duct liner required for this project? If so what areas, material and thickness?

Response:

1. **Dryer Exhaust Ductwork shall be aluminum.**
2. **Duct liner is identified for the return air plenums on all air handling units as indicated on drawing M2.01. All other ducts are externally insulated**

By: JP **Date: 05/27/2020**

ELECTRICAL CONTRACTORS, INC.

A TEGG Service Provider,

3510 MAIN STREET
HARTFORD, CONNECTICUT 06120
TEL: (860)549-2822 FAX: (860)549-8570
LIC. # 102800
E.O.E. - M/F

REQUEST FOR INFORMATION

SENT VIA: ____FAX __ _ E-MAIL __X__OTHER

Project Name: Windsor Fire Dept & EMS	**Date:05/19/20**
To: Nicholas Semyanko	**From: Steve Christmas**
Phone:	**Phone: (860) 549-2822**
Fax:	**Fax: (860) 549-8570**
Email:	**Email: @ecincorporated.com**
Subject: Request for Information #1	

Please Clarify:

RFI
Can we use type mc cable to feed all the temp cir from the temp panels? Thx

Thank you

Response:
Type MC Cable, as well as Type SE or other approved cable types for Temporary Power are acceptable.

JP 05/27/2020

REQUEST FOR INFORMATION #9:

To: nsemyanko@kba-architects.com

FROM: PAC Group LLC

DATE: 05/22/20

PROJECT: Windsor Fire Dept/EMS

Question:

Specification Section(s): 07 54 00 **Drawing(s): A3.01**

---

9. Drawing A3.01 Roof Construction notes call out Mechanically Adhered PVC and specs call out mechanically attached PVC. Please clarify which is required?

Response:

Provide mechanically attached PVC roof.

By: Nicholas Semyanko **Date:** 05/26/2020

RFI 009

REQUEST FOR INFORMATION #1:

To: Nicholas Semyanko <nsemyanko@kba-architects.com>

FROM: PDS Engineering & Construction, Inc.

DATE: 5/26/20

PROJECT: Windsor FD & EMS

Question:

1. Is the sign schedule up-to-date? For all with dashes, will those be added later?
2. Could you please update the floor plan for area B? – The room #'s on the floor plan do not match room #'s on finished schedule.
3. Is there any line striping in the apparatus bays? I do not see any detail on any line striping. Finish schedule A125 references PRF 1,2 which tells me two colors.
4. Would you be able to upload any photos of the existing coating to be removed in the App Bay A125?
5. What is the value of the existing structure and are GC's required to provide property coverage on it during construction?
6. What limit is required for the OCP? It is not specified in 11.2
7. Electrical requirements of Overhead Doors needed:
   - Coiling Doors specified to be 115v/1p (083323/2.8/D/1/a + b)
   - Sectional Doors specified to be 208v/3p (083613/2.8/D/1/a)
   - What are the power requirements of the electric operators needed?
8. Sectional Door track configuration required:
   - Spec (083613/2.3/F) call for "high lift track"
   - Detail (4/A6.07) shows standard lift track
   - Details (H3 + H4/A8.02) show low headroom track
   - Which type of track will be needed here, this will also effect the mounting style of electrical operators needed?
9. Sectional Door Panels Appearance (Flush vs. Ribbed)
   - Spec (083613/2.3/E) calls for "Flush" panels
   - Detail (3/A6.02, and other views) show a ribbed panel appearance
   - Overhead Door Model 596 doors come with a flush panel design
   - Should these doors be OHD model 596 with a flush panel, or something else with a ribbed design?
10. Finish Color of Sectional Doors
    - Spec (083613/2.3/K/1 + 2) calls for factory standard "Taupe" finish on inside and outside of door
    - Overhead Door model 596 comes standard in White, Industrial Brown, Gray, or Tan on the exterior
    - Overhead Door model 596 comes standard in White only on the interior
    - OHD/596 aluminum full view sections come standard White on inside and out
    - Which finish is needed here, a standard selection or a custom finish?
11. Finish Color of Coiling Doors
    - Spec (083323/2.3/K) calls for Coiling Doors to be powder coat finished
    - Will this door need to be powder coated, or can a standard finish be used?
    - Does this door need to match the chosen finish of the Sectional Doors?

RFI 009

Specification Section(s): **Drawing(s):**

Response:

1. The Sign Schedule will be updated and reissued in this Addendum..
2. New Finish Schedule to be updated and reissued in this Addendum.
3. Striping is required. Layout will be provided in a later Addenda.
4. Existing photos may be added later.
5. Value of the existing structure is not available.
6. The limit of the OCP is One Million Dollars per incident, Two million Dollars aggregate.
7. Coiling door for Firematic Storage B114 shall be 120V-1 Phase power, 1/2HP. Change branch circuit from 20A-3 pole to 20A-1 pole circuit to panel NF-3C. Run #8 wiring.
Sectional door are 208v 3 phase ½ hp with 24v control.
8. Provide high lift track as specified.
9. Provide CLOPAY BUILDING PRODUCT COMPANY: MODEL 3722 as Flush Panel.
10. Manufacturer's color to be RED.
11. Provide powder coat finish for coiling doors as specified, color to be RED.

By: Nicholas Semyanko (KBA) **Date:** May 26, 2020

LaRosa Building Group, LLC

REQUEST FOR INFORMATION #2:

To: Nick Semyanko

FROM: Vincent Parete

DATE: 5-27-2020

PROJECT: Windsor EMS facility

- **Question:** There are electrical utility poles being removed and a few new electrical utility poles. There is also new overhead wire and underground primary wire that is being pulled as apart of temporary and permanent electrical services. Please confirm that the owner will pay the utility company fees associated with new and temporary electrical poles and primary wire.
- Please confirm that any sewer or water company fees associated with the new utility work will be paid for by the owner.

Specification Section(s): N/A **Drawing(s): N/A**

Response:

1. The Town of Windsor will carry all Utility Company Fees related to electrical pole removals/replacements/new poles and primary electrical “Customer Contributions.” Contractor is responsible for road crossing, cutting, excavations and conduit installations.
2. There will be no Sewer or Water utility charges.

By: JP **Date: 05/27/2020**

LaRosa Building Group, LLC

REQUEST FOR INFORMATION #4:

To: Nick Semyanko

FROM: Vincent Parete

DATE: 5-27-2020

PROJECT: Windsor EMS facility

- **Question:** Please reference S1.01. Are we cutting the face of CMU and installing rebar at all walls tagged as shear walls.

Specification Section(s): **Drawing(s): S1.01**

Response:

Yes – Designated shear walls are existing walls which will receive new grouted reinforcing steel. See drawing MT1/S3.03 for shear wall requirements.

By: Alan Chandler S/A **Date:** 5/27/2020

LaRosa Building Group, LLC

REQUEST FOR INFORMATION #5:

To: Nick Semyanko

FROM: Vincent Parete

DATE: 5-27-2020

PROJECT: Windsor EMS facility

- **Question:** Please confirm the entire roof line at column line X10 receives a new lineal metal soffit per detail 30 on A3.04. Additionally, detail 30 on A3.04 calls for the roof transition to receive new metal panels. However, the elevation drawings imply that all the existing fascia assemblies are existing to remain. Please advise.

Specification Section(s): **Drawing(s): A3.04 column line X10**

Response:

1. Entire roof line at column line x10 does not receive linear metal soffit. Detail 30/A3.04 only pertains to the new ladder construction at column line x10.
2. At column line x10 no new metal panels. At column line B2 new addition transition for apparatus bay it is receiving new metal panels. See detail 22/A3.04.
3. On existing building, the existing fascia is to remain.

By: Nicholas Semyanko **Date:** 5/27/2020

LaRosa Building Group, LLC

REQUEST FOR INFORMATION #6:

To: Nick Semyanko

FROM: Vincent Parete

DATE: 5-27-2020

PROJECT: Windsor EMS facility

- **Question:** Is the break metal cladding called for on 14 on A2.03 the same as the .063 Cladding at other locations around the roof?

Specification Section(s): **Drawing(s): A2.03**

Response:

Brake metal cladding called out on 14/A2.03 is the same .063 cladding detailed elsewhere.

By: Nicholas Semyanko **Date:** 5/27/2020

LaRosa Building Group, LLC

REQUEST FOR INFORMATION #7:

To: Nick Semyanko

FROM: Vincent Parete

DATE: 5-27-2020

PROJECT: Windsor EMS facility

- **Question:** Detail ALS4-A on A8.03 implies that we need to install salvaged blue stone behind all plate panels. However, only 1 bay between X8 and X7 (A5.01) call for us to install salvaged blue stone panels. Please advise.

Specification Section(s): **Drawing(s): A5.01 and A8.03**

Response:

Only one bay, between grids x8 and x7, receives salvaged bluestone panels.

By: Nicholas Semyanko **Date:** 5/27/2020

LaRosa Building Group, LLC

REQUEST FOR INFORMATION #8:

To: Nick Semyanko

FROM: Vincent Parete

DATE: 5-27-2020

PROJECT: Windsor EMS facility

- **Question:** It appears that behind each metal plate system there is a spray applied AVB as well as a rubberized asphalt fabric. Is this correct? Is this rubberized flashing continuous or only at connection points?

Specification Section(s): **Drawing(s):**

Response:

Spray foam insulation is continuous. Ruberized flashing is at all connection points.

By: Nicholas Semyanko **Date:** 5/27/2020

LaRosa Building Group, LLC

REQUEST FOR INFORMATION #9:

To: Nick Semyanko

FROM: Vincent Parete

DATE: 5-27-2020

PROJECT: Windsor EMS facility

- **Question:** Is barrier 1 being installed in all slabs on grade including the patching areas within the existing building?

Specification Section(s): 030510 **Drawing(s):**

Response:

Yes – Barrier 1 is to be provided in new slabs on grade including the patching areas within the existing building and in new concrete used in patching of floors.

By: Alan Chandler S/A **Date:** 5/27/2020

LaRosa Building Group, LLC

REQUEST FOR INFORMATION #10:

To: Nick Semyanko

FROM: Vincent Parete

DATE: 5-27-2020

PROJECT: Windsor EMS facility

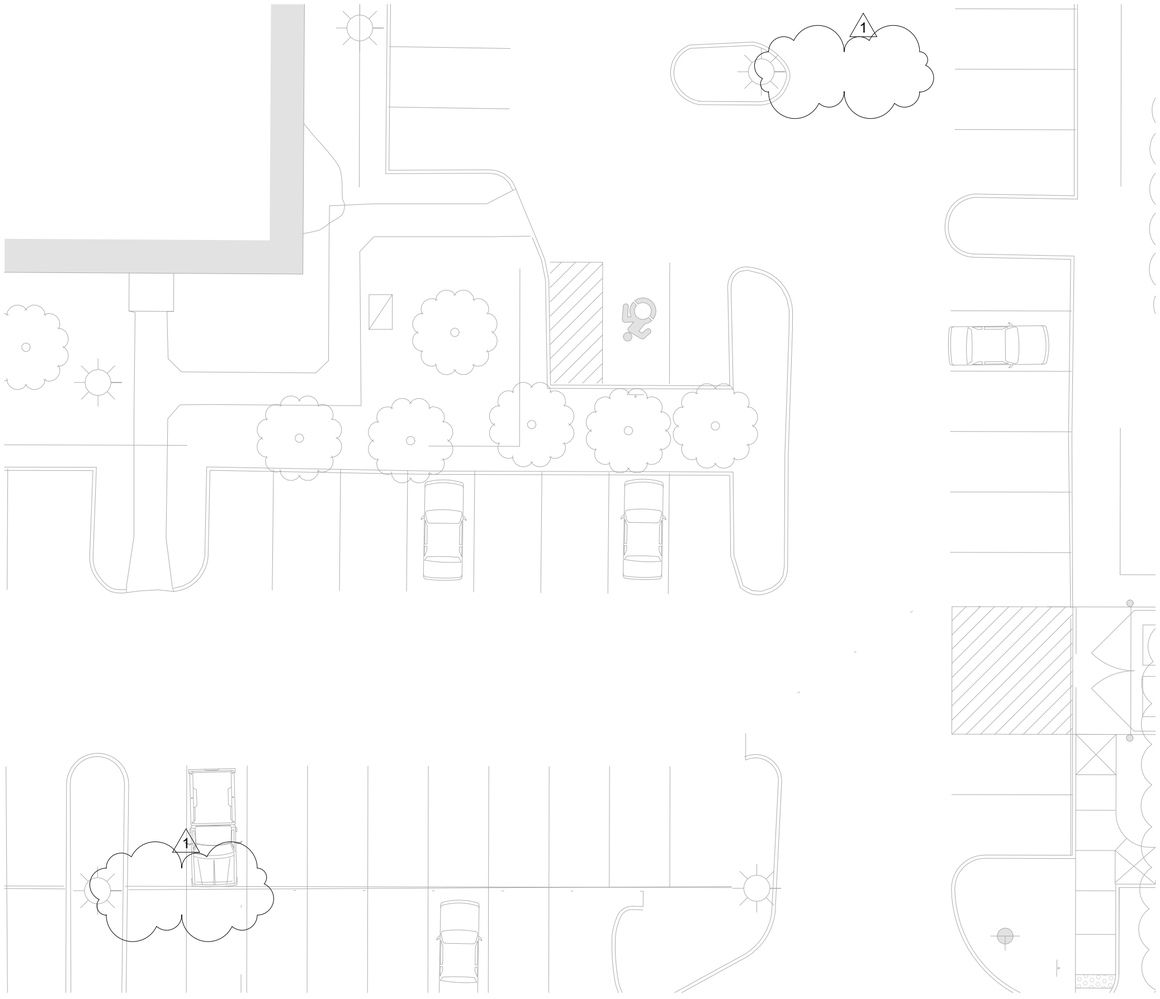
- Please confirm that all millwork in billing office 123, CEO 124, Office A190 and A191 are by the owner.

Specification Section(s): **Drawing(s):**

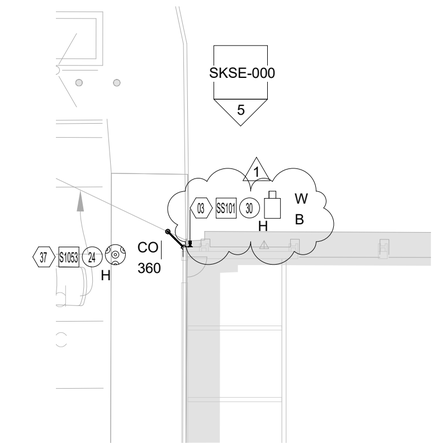
Response:

Millwork in Billing Office 123, CEO 124, Office A190 and A191 are by the Owner, confirmed.

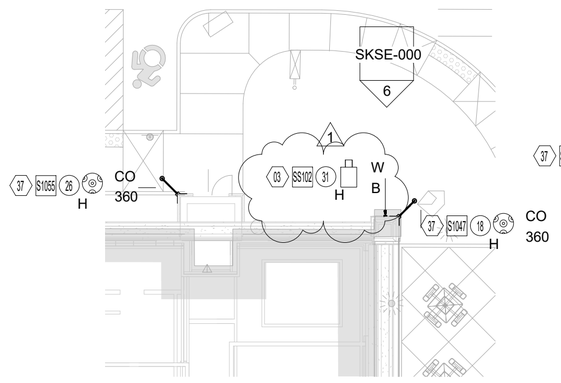
By: Nicholas Semyanko **Date:** 5/27/2020



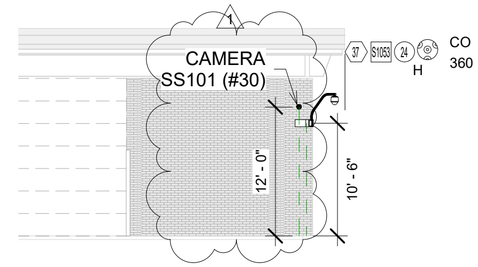
1 SITE - ADDENDUM 1 - 1
1/16" = 1'-0"



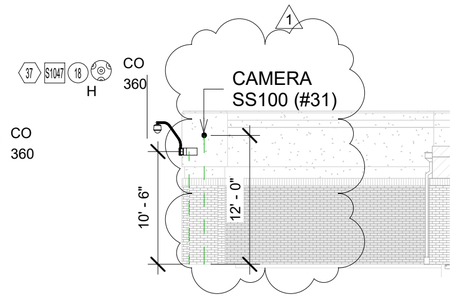
2 SITE - ADDENDUM 1 - 2
1/16" = 1'-0"



3 SITE - ADDENDUM 1 - 3
1/16" = 1'-0"



5 Elevation 1 - CAMERA SS101 (#30)
1" = 10'-0"



6 Elevation 1 - CAMERA SS102 (#31)
1" = 10'-0"

FIXED CAMERA

T: 1 B - BULLET
D - DOME
FE - FISHEYE

STATE OF CONNECTICUT
MATTHEW JOSEPH ALLAN
LICENSED ARCHITECT
1RI.0014390

KAESTLE BOOS associates, inc
416 Slater Road, P.O. Box 2590
New Britain, CT 06050-2590
Ph: 860-229-0361 F: 860-229-5303
16 Chestnut Street, Suite 301
Foxborough, MA 02035
Ph: 508-549-9906 F: 508-549-9907
313 Congress Street, Suite 150
Boston, MA 02210
Ph: 617-752-2212
20 Newman Avenue, Suite 2001-A
Rumford, RI 02916
Ph: 401-270-0365
Email: kba@kba-architects.com
Web: www.kba-architects.com

CONSULTANT:
GOOD HARBOR TECHMARK
SECURITY DESIGN & RISK MITIGATION STRATEGIES
17 ACCORD PARK DRIVE, SUITE 201
NORWELL, MA 02061
TEL: (781) 871-6555
FAX: (781) 871-5855
www.ghtechmark.com

PROJECT:
ADDITIONS & RENOVATIONS OF WINDSOR FIRE AND EMS COMPLEX
340 BLOOMFIELD AVENUE
WINDSOR, CT 06095

THIS SKETCH TO BE READ IN CONJUNCTION WITH THE CONTRACT DOCUMENTS

SKETCH GENERATED FOR:

ADDENDUM	R.R.F.I.	A.S.I.	P.R.	C.C.D.
1				

REFERENCE DETAIL/SHEET: SE-000, SE-100, SE-101, SE-201

TITLE: EXTERIOR CAMERAS

DATE:05/18/2020 DRAWN BY: TJP

SCALE:As indicated PROJECT NO.:18009.02

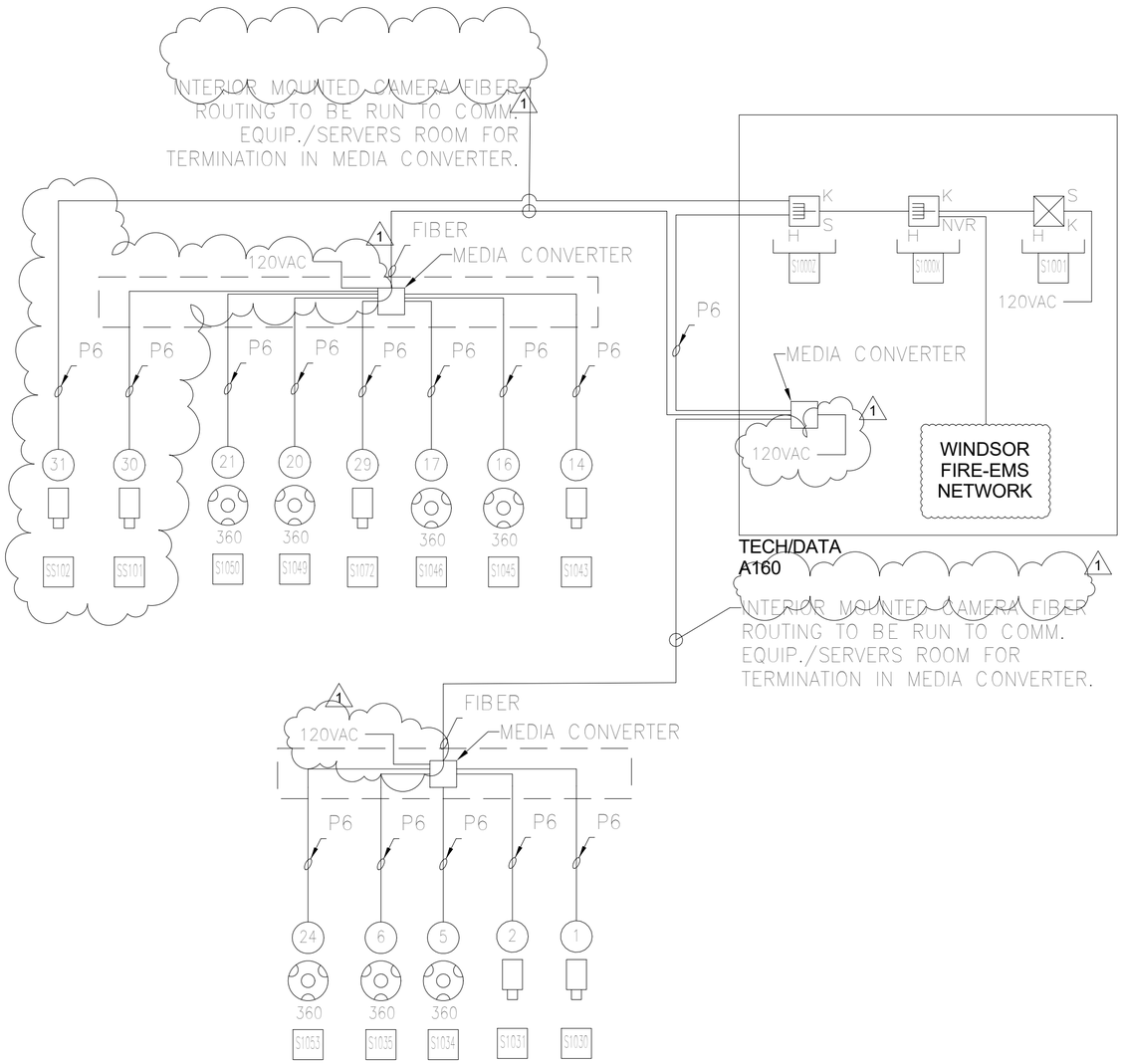
DRAWING NO.: SKSE-000

SECURITY DEVICE SCHEDULE - ADDENDUM 1

Global Device Number	Wire Label	Camera No.	Min. MP Lens	Drawing #	Section	Level	Room Name	Description	Mount	Technology	Connectivity	Typical #	Req. Cable	Termination Point	Power Req.	Comments
SS101	SS1011	30	8 MP	SE-100	AREA A	MAIN LEVEL	BUILDING EXTERIOR	BULLET CAMERA	W	B	H	03	1P-CAT6A, FIBER	S1000Z	N/A	SINGLE NETWORK JACK REQUIRED WITHIN 3 METERS
SS102	SS1021	31 (1)	8 MP	SE-100	AREA A	MAIN LEVEL	BUILDING EXTERIOR	BULLET CAMERA	W	B	H	03	1P-CAT6A	S1000Z	N/A (1)	SINGLE NETWORK JACK REQUIRED WITHIN 3 METERS

CAMERA MOUNT SCHEDULE ADDENDUM 1

Global Device Number	Wire Label	Camera No.	Min. MP Lens	Room Name	Room Number	Camera Model	Description	Mount	Technology	Connectivity	Mount 1	Mount 2	Mount 3	Mount 4	IR Module	Power
SS101	SS1011	30	8 MP	BUILDING EXTERIOR	-	8.0C-H5A-BO1-IR	BULLET CAMERA	W	B	H	H4-BO-JBOX1					
SS102	SS1021	31 (1)	8 MP	BUILDING EXTERIOR	-	8.0C-H5A-BO1-IR	BULLET CAMERA	W	B	H	H4-BO-JBOX1					



(1) ADDENDUM 1 CAMERA RISER
NTS

STATE OF CONNECTICUT
MATTHEW JOSEPH ALLAN
LICENSED ARCHITECT
ARI.0014390

KAESTLE BOOS associates, inc
416 Slater Road, P.O. Box 2590
New Britain, CT 06050-2590
Ph: 860-229-0361 F: 860-229-5303
16 Chestnut Street, Suite 301
Foxborough, MA 02035
Ph: 508-549-9906 F: 508-549-9907
313 Congress Street, Suite 150
Boston, MA 02210
Ph: 617-752-2212
20 Newman Avenue, Suite 2001-A
Rumford, RI 02916
Ph: 401-270-0365
Email: kba@kba-architects.com
Web: www.kba-architects.com

CONSULTANT:
GOOD HARBOR TECHMARK
SECURITY DESIGN & RISK MITIGATION STRATEGIES
17 ACCORD PARK DRIVE, SUITE 201
NORWELL, MA 02061
TEL: (781) 871-6555
FAX: (781) 871-5855
www.ghtechmark.com

PROJECT:
ADDITIONS & RENOVATIONS OF WINDSOR FIRE AND EMS COMPLEX
340 BLOOMFIELD AVENUE
WINDSOR, CT 06095

THIS SKETCH TO BE READ IN CONJUNCTION WITH THE CONTRACT DOCUMENTS

SKETCH GENERATED FOR:

ADDENDUM	R.R.F.I.	A.S.I.	P.R.	C.C.D.
1				

REFERENCE DETAIL/SHEET: SE-301, SE-400

TITLE: EXTERIOR CAMERAS

DATE: 05/18/2020
DRAWN BY: TJP
SCALE: NTS
PROJECT NO.: 18009.02
DRAWING NO.: SKSE-001

LIGHTING FIXTURE SCHEDULE

TYPE	MANUFACTURER	MODEL	LAMPS			VOLTAGE	REMARKS	ALTERNATE 1		ALTERNATE 2		ALTERNATE 3	
			LUMENS	WATTAGE	LUMENS/WATT			MANUFACTURER	MODEL	MANUFACTURER	MODEL	MANUFACTURER	MODEL
A	COLUMBIA	LCAT22-35MLG-EDU	3420 lm	29 W	118 lm/W	120 V	2x2 LED INDIRECT GRID MOUNTED	Cooper Lighting Solutions	22CZ2-32-UNV-L835-CD1-U	Lithonia Lighting	BLC 2X2 3300LM 80CRI 35K ADSM MVOLT	DAYBRITE	2FGG-30L-835-2D-UNV-DIM
AA	HUBBELL	LNC3-24L-4K-075-3-U-CS	5702 lm	60 W	95 lm/W	120 V	EXTERIOR WALL PACK	Cooper Lighting Solutions	AXCL6A	Lithonia Lighting	CSXW 30C 700 40K T3M MVOLT PE DDBXD	H.E. WILLIAMS	VWPH-L60-740-T3-DBZ-SDG L-DIM-UNV
AE	COLUMBIA	LCAT22-35MLG-EDU-ELL14	3420 lm	29 W	119 lm/W	120 V	2x2 LED INDIRECT GRID MOUNTED WITH BATTERY BACK-UP	Cooper Lighting Solutions	22CZ2-32-UNV-EL14W-L835-CD1-U	Lithonia Lighting	BLC 2X2 4000LM 80CRI 35K ADSM MVOLT EL14L	DAYBRITE	2FGG-30L-835-2D-UNV-DIM-EMLED
B	PRESCOLITE	LTR-4RD-H-SL15L-DM1 / LTR-4RD-T-SL35K8MD-SSWCWT	1500 lm	19 W	79 lm/W	120 V	4" ROUND RECESSED DOWN LIGHT 50 DEG CUT OFF SEMI - SPECULAR WHITE REFLECTOR AND TRIM 0-10V DIMMING WITH MEDIUM DISTRIBUTION	Cooper Lighting Solutions	HC4115D010HM412835 41WDHWF	Gotham	EVO4 35/15 AR WD LSS MVOLT GZ1 TRW	LIGHTOLIER	4RN/P4R-DL15-835-CC-Z10-U
BB	PRESCOLITE	LTR-6SQD-H-ML30L-DM1-LTR-6SQ-T-ML35K9XW-VS SPW	3000 lm	35 W	86 lm/W	120 V	6" SQUARE DIMMABLE LED DOWNLIGHT WITH WETLOCATION LISTED AND EXTRA WIDE DISTRIBUTION, WITH PEWTER REFLECTOR.	Cooper Lighting Solutions	PRS6FS12D010 SM6128FS 61SMDH	Gotham	EVO6SQ 35/35 AR WD LSS MVOLT EZ1 TRW	LIGHTOLIER	6SN/C6L-30-935-M-Z10U/C6S-DL-W-PW-P
BBE	PRESCOLITE	LTR-6SQD-H-ML30L-DM1-LTR-6SQ-T-ML35K9XWSS WCWT	3000 lm	35 W	86 lm/W	120 V	SAME AS TYPE BB EXCEPT WITH EMERGENCY BATTERY	Cooper Lighting Solutions	PRS6FS12D010REM14 SM6128FS 61SMDH	Gotham	EVO6SQ 35/30 AR WD LSS MVOLT EZ1 TRW	LIGHTOLIER	6SN/C6L-30-935-M-Z10U/C6S-DL-W-CC-P
D	COLUMBIA	CFP22-4035	4302 lm	41 W	105 lm/W	120 V	2x2 LED FLAT PANEL GRID MOUNTED	Cooper Lighting Solutions	22FP4235C	Lithonia Lighting	EPANL2X24000LMHE80CRI35K MIN10ZT MVOLT	DAYBRITE	2FXP-38L-835-2-DS-UNV-DIM
DE	COLUMBIA	CFP22-4035-PLD10M	4032 lm	41 W	98 lm/W	120 V	SAVE AS TYPE D WITH EMERGENCY BATTERY	Cooper Lighting Solutions	22FP4235C-EL14W	Lithonia Lighting	EPANL 2x2 4000LM 80CRI 35K MIN10 ZT MVOLT E10WCP	DAYBRITE	2FXP-38L-835-2-DS-UNV-DIM-EMLED
F	COLUMBIA	LCAT24-35MLG-EDU	3424 lm	30 W	114 lm/W	120 V	2x4 LED INDIRECT GRID MOUNTED	Cooper Lighting Solutions	24CZ2-35-UNV-L835-CD1-U	Lithonia Lighting	BLC 2x4 4000LM 80CRI 35K ADSM MVOLT	DAYBRITE	2FGG-38L-835-4D-UNV-DIM
FE	COLUMBIA	LCAT24-35MLG-EDU-ELL14	3424 lm	30 W	114 lm/W	120 V	SAME AS TYPE F EXCEPT WITH EMERGENCY BATTERY	Cooper Lighting Solutions	24CZ2-35-UNV-EL14WL835-CD1-U	Lithonia Lighting	BLC 2x4 4000LM 80CRI 35K ADSM MVOLT EL14L	DAYBRITE	2FGG-38-835-4D-UNV-DIM-EMLED
FL2	HUBBELL	LNC4-44L-4K-065-4-U-DB	1380 lm	111 W	12 lm/W	120 V	EXTERIOR LED WALL PACK, EXTRUDED ALUMINUM HOUSING, TYPE IV DISTRIBUTION, 44 LEDs, BRONZE FINISH, 4300K.	McGraw-Edison	GWC-AF-02-LED-E1-T3-GM-800	Lithonia Lighting	DSXW1 10C 350 40K T4M MVOLT DDBXD	GARDCO	121-32L-700-NWG4-4-UNV-BZ
G	COLUMBIA	CFP24-5535	5447 lm	49 W	111 lm/W	120 V	2x4 LED FLAT PANEL GRID MOUNTED	Cooper Lighting Solutions	24FP6435C	Lithonia Lighting	EPANL 2x4 6000LM 80CRI 35K MIN10 ZT MVOLT	DAYBRITE	2FXP-54L-835-4-DS-UNV-DIM
GE	COLUMBIA	CFP24-5535-PLD10M	5447 lm	49 W	111 lm/W	120 V	SAME AS TYPE G EXCEPT WITH EMERGENCY BATTERY	Cooper Lighting Solutions	24FP6435C-EL14W	Lithonia Lighting	EPANL 2x4 6000LM 80CRI 35K MIN10 ZT MVOLT E10WCP	DAYBRITE	2FXP-54L-835-4-DS-UNV-DIM-EMLED
GG			800 lm	60 W	13 lm/W	120 V	DECORATIVE EXTERIOR WALL BRACKET LANTERN WITH GREEN LED					HADCO	SELECTED DECORATIVE FIXTURE NO SUBSTITUTES 9962-BRZ-Q-L-LED-E-N-B WITH GREEN LED
H	PRESCOLITE	LTR-3RD-H-SL-15L-DM1 / LTR3RD-T-SL-35K-8-MD-VSS	1500 lm	19 W	79 lm/W	120 V	(3") DIAMETER DIMMABLE LED DOWNLIGHT.	Alphabet Lighting	NU3-RD-SW-20LM-35K-80-HE40-[VOLT]-DIM10-NC-WH-WH	Lithonia Lighting	LDN3 35/15 L03 AR LD MVOLT UGZ	LIGHTOLIER	3RN/P3R-DL-15-935-CDP-Z10U WITH GREEN LED LAMP
L6	AXIS	BBRLED-500-80-35-FL-6-W-UNV-DP-1-TB9	3000 lm	28 W	107 lm/W	120 V	FLUSH RECESSED 6' LINEAR LED, DIMMABLE DOWN LIGHT.	Nulite	RG4-05-L35-UNV-D-1C-STF-6'	Lumenwerx	VIA4R-HLO-FH-LED-80-300-35-6FT-UNV-D1-1-TG9-W	DAY-O-LITE	PRFL-44-D-35-LO-6-MG-W-DIM10
L8	AXIS	BBRLED-500-80-35-FL-8-W-UV-DP-1-1-TB9	4000 lm	37 W	108 lm/W	120 V	FLUSH RECESSED 8' LINEAR LED, DIMMABLE DOWN LIGHT.	Nulite	RG4-05-L35-UNV-D-1C-STF-8'	Lumenwerx	VIA4R-HLO-FH-LED-80-400-35-8FT-UNV-D1-1-TG9-W	DAY-O-LITE	PRFL-44-D-35-LO-8-MG-W-DIM10
L10	AXIS	BBRLED-500-80-35-FL-10-W-UNV-DP-1-TB9	5000 lm	46 W	109 lm/W	120 V	FLUSH RECESSED 10' LINEAR LED, DIMMABLE DOWN LIGHT.	Nulite	RG4-05-L35-UNV-D-1C-STF-10'	Lumenwerx	VIA4R-HLO-FH-LED-80-500-35-10FT-UNV-D1-1-TG9-W	DAY-O-LITE	PRFL-44-D-35-LO-10-MG-W-DIM10
M4	COLUMBIA	MPS4-35ML-FW-EDU	4625 lm	38 W	122 lm/W	120 V	4' LED DIRECT/INDIRECT PENDANT / SURFACE MOUNTED AS SHOWN ON PLANS FLAT FROSTED ACRLYIC LENS, WIDE DISTRIBUTION 0-10V DIMMABLE CUSTOM LENGTH STEM HANGERS. COORDINATE EXACT MOUNTING HEIGHT WITH ALL TRADES AND ARCHITECT.	Cooper Lighting Solutions	4SNLED-LD54-75L-LW-UNV-EL14W-L835-CD1-U	Lithonia Lighting	CLX L48 5000LM SEF FDL WD MVOLT GZ10 35K 80CRI WH	DAYBRITE	FSS-4-55L-835-DIM
M4E	COLUMBIA	MPS4-35ML4'-FW-EDU-ELL14	4625 lm	38 W	122 lm/W	120 V	SAME AS TYPE M4 WITH EMERGENCY BATTERY	Cooper Lighting Solutions	8TSNLED-LD5-95SL-LW-UNV-L835-CD1-U	Lithonia Lighting	CLX L48 5000LM SEF FDL WD MVOLT GZ10 35K 80CRI E10WLCP WH	DAYBRITE	FSS-4-55L-835-DIM-EMLED
M8	COLUMBIA	MPS8-35ML-FW-EDU	9250 lm	76 W	122 lm/W	120 V	SAME AS TYPE M4 EXCEPT 8' LONG	Cooper Lighting Solutions	8TSNLED-LD5-95SL-LW-UNV-L835-CD1-U	Lithonia Lighting	CLX L96 10000LM SEF FDL WD MVOLT GZ10 35K 80CRI WH	DAYBRITE	FSS-8-110L-835-DIM
M8E	COLUMBIA	MPS8-35ML-FW-EDU-ELL14	9250 lm	76 W	122 lm/W	120 V	SAME AS TYPE M8 WITH EMERGENCY BATTERY	Cooper Lighting Solutions	8TSNLED-LD5-95SL-LW-UNV-EL14W-L835-CD1-U	Lithonia Lighting	CLX L96 10000LM SEF FDL WD MVOLT GZ10 35K 80CRI E10WLCP WH	DAYBRITE	FSS-8-110L-835-DIM-EMLED
P	PRESCOLITE	LTR-6RD-H-SL15L-DM1 / LTR6RD-T-SL-35K-8-MD-VSS	1500 lm	19 W	79 lm/W	120 V	6" DIAMETER DIMMABLE LED DOWNLIGHT , 50° CUTOFF MEDIUM DISTRIBUTION.	HALO	HC6115D010-HM612835-61NDH	Gotham	EVO6 35/15 AR MD MVOLT GZ1	LIGHTOLIER	6RN-Z6RDL-15-835-W-0-CD-Z10U
RR			800 lm	60 W	13 lm/W	120 V	DECORATIVE EXTERIOR WALL BRACKET LANTERN WITH GREEN LED					HADCO	'SELECTED DECORATIVE FIXTURE NO SUBSTITUTES 9952-BRZ-Q-L-LED-E-N-B WITH RED LED
S7	IO LIGHTING LINE1.5	0-10-E-4KH0-45-100-2-20'-2-2	6140 lm	76 W	81 lm/W	120 V	BUILDING SIGN LIGHT 3.81W/FT 307LM/FT 4000K 80 CRI 50°LIGHT DISTRIBUTION	IO LIGHTING LINE1.5	0-10-E-4KH0-45-100-2-17'-2-2	Winona	WSL209W LLP XX MSL1 200ADJ 30DEG LLP5A 40K 24 200RAA NAA Remote Driver	COLOR KINETICS	350-000011-14
V	PRESCOLITE	LBSLEDA10L-35K-8-WH	1032 lm	16 W	63 lm/W	120 V	SURFACE MOUNTED ROUND LED SHOWER LIGHT WITH DIFFUSE IMPACT RESISTANT POLYCARBONATE LENS	Cooper Lighting Solutions	SMD6R12940WHE	WAC LIGHTING	FM-616G2-930-WT	LIGHTOLIER	S7R-835-10-Z10U
W8E	CORONET	U UP/DN-8'-35-LTG2-LTG2-UNV-DB-W-ACP-SD-EM120	5760 lm	80 W	72 lm/W	120 V	SAME AS W12E EXCEPT 8' LONG	Nulite	NP44-10UP/10DN-1C-U-D-W-[MOUNT]-8'-REMOTE EM	Fluxwerx	FD1 A D A 35 B 08FT G F2 M 03 B	MOJO	N1-PP-46-1000F-35K-010M1C-A4-W-GX-WH-08-EMLED
W12E	CORONET	U UP/DN-12'-35-LTG2-LTG2-UNV-DB-W--ACP-SD-EM120	8640 lm	120 W	72 lm/W	120 V	12'x4" U SHAPED LED DIRECT/INDIRECT PENDANT WITH WHITE FINISH, 35% DOWNLIGHT, 65% UPLIGHT WITH BATTERY BACK-UP	Nulite	NP44-10UP/10DN-1C-U-D-W-[MOUNT]-12'-REMOTE EM	Fluxwerx	FD1 A D A 35 B 12FT G F2 M 03 B G	MOJO	N1-PP-46-1000F-35K-010M1C-A4-W-GX-WH-12-EMLED
WP1	HUBBELL	LNC2-18L-4K-070-4-U-DB-2DR	4270 lm	43 W	99 lm/W	120 V	EXTERIOR LED WALL PACK 4000K,80CRI,TYPE 4 DISTRIBUTION WITH DUAL DRIVER	ACUITY BRANDS	DSXW1-LED-20C-530-40K-TFTM-MVOLT	ACUITY BRANDS	DSXW1-LED-20C-530-30K-TFTM-MVOLT	GARDCO	121-16L-1000-WW-G3-4-UNV-FINISH
WP2	HUBBELL	LNC2-18L-4K-070-S-U-DB-2DR	4014 lm	43 W	93 lm/W	120 V	EXTERIOR LED WALL PACK 4000K,80CRI,TYPE 3 DISTRIBUTION WITH DUAL DRIVER	ACUITY BRANDS	DSXW1-LED-20C-530-40K-T3-MVOLT	ACUITY BRANDS	DSXW1-LED-20C-530-30K-T3-MVOLT	GARDCO	121-16L-1000-WW-G3-3-UNV-FINISH
X	SIGNTEX	RPRBB1RBA-TW-DG		2 W		120 V	ULTRA SLIM DIECAST ALUMINUM LED EXIT LIGHT WITH BATTERY BACKUP, SINGLE FACE, RED LETTERS, BRUSHED ALUMINUM FINISH, UNIVERSAL MOUNT, BATTERY DIAGNOSTICS AND CHEVERONS AS INDICATED ON PLANS	ENVOY	EXLPDC-1-R-A	Isolite	TL2-EM-R-U-BA-MTEB	EVENLITE	RZR3-EM-R-1-BA-CN-SD
XC	SIGNTEX	RPRBB2RBA-TW-DG		6 W		120 V	ULTRA SLIM DIECAST ALUMINUM LED EXIT LIGHT WITH BATTERY BACKUP, DOUBLE FACE, RED LETTERS, BRUSHED ALUMINUM FINISH, UNIVERSAL MOUNT, BATTERY DIAGNOSTICS AND CHEVERONS AS INDICATED ON PLANS	ENVOY	EXLPDC-1-R-A	Isolite	TL2-EM-R-U-BA-MTEB	EVENLITE	RZR3-EM-R-2-BA-CN-SD
Z	LIGHTHEADED	D4B-F-S-T-5-P-120-BP/2-554-T-01-04-SL-BRO40-35-8018	1800 lm	17 W	106 lm/W	120 V	4"SQUARE DIMMABLE LED DOWN LIGHT WHITE FLANGE, BLACK REFLECTOR, DEEP REGRESSED SOFTENING LENS IN FIXED CHAMBER, 40 DEGREE BEAM	Alphabet Lighting	NU3-RD-SW-27LM-35K-80-HE40-[VOLT]-DIM10-NC-WH-WH	Tech Lighting	E4S-F-LO -835-40-D-N / E4S-F-B-L-W	LIGHTOLIER	4SN/P4S-DL-20-835-WH-WH-L-U

FLOOR/WALL BOX SCHEDULE

TYPE	LOCATION / SERVICE	CONTAINS	MODEL NUMBER	COVER PLATE	REMARKS
A	FLOOR, SLAB ON GRADE SEE DRAWING FOR EXACT LOCATIONS	1 DUPLEX RECEPTACLE, USB PORTS 2 DATA BOX	# 880MP 2 GANG	(1) #827TCAL-BK COMBO CARPET/TILE (1) # 828R-TCAL-BK RCPT (1) # 828GFITCAL-BK DATA	4 COMPARTMENT FLOOR BOX. NON METALLIC CONSTRUCTION. COVER HAS A CARPET COVER
B	BIG FLOOR, SLAB ON GRADE SEE DRAWING FOR EXACT LOCATIONS	2 DUPLEX RECEPTACLES, USB PORTS 2 DATA 1 TELEPHONE 1 HDMI	# RFB4-CI-1	# FPCTCXX BLACK	4 COMPARTMENT FLOOR BOX. CAST IRON CONSTRUCTION. COVER HAS A CARPET COVER
C	FLOOR, SLAB ON GRADE SEE DRAWING FOR EXACT LOCATIONS	1 DUPLEX	# MODULINK 880MP-1 GANG	NOT USED	NOT USED
D	BIG WALL BOX FOR MTG RMS, CONF RMS.SEE DRAWING FOR EXACT LOCATIONS	2 DUPLEX RECEPTACLES, USB PORTS 1 DATA 1HDMI 1 COAX	# EFSB4	NO COVER , FLUSH MOUNTED ON WALL BEHIND VIDEO MONITOR	4 COMPARTMENT WALL BOX. ALL ACCESSORIES INCLUDED WITH BOX WITH THE EXCEPTION OF DEVICE PLATES. THIS BOX ACCEPTS STANDARD DEVICE PLATES.
E	BASIC TV BOX WALL BOX SEE DRAWING FOR EXACT LOCATIONS	1 DUPLEX RECEPTACLES,USB PORTS 1 DATA	# TV2MW	NO COVER , FLUSH MOUNTED ON WALL BEHIND VIDEO MONITOR	

NOTE:
1. EC TO FURNISH ,INSTALL AND WIRE ALL RECEPTACLES IN FLOOR AND WALL BOXES. COMMUNICATION WIRING AND TERMINATIONS SHALL BE DONE BY OTHERS. COORDINATE EXACT NUMBER OF DEVICES WITH COMMUNICATION / TECHNOLOGY CONSULTANT AND OWNER.

2. ALL BOXES ARE BASED ON LEGRAND. CONTACT MIKE COLE @ 860-906-6288 OR MICHAEL.COLE@LEGRAND.US

SINGLE PHASE WIRE SCHEDULE

MOCP (1-POLE OR 2-POLE)	CONDUCTORS (1 PH, 2W) WITH GROUND	CONDUIT SIZE	CONDUCTORS (1 PH, 3W) WITH GROUND	CONDUIT SIZE
15A	2#12 & 1#12G	3/4"	3#12 & 1#12G	3/4"
20A	2#12 & 1#12G	3/4"	3#12 & 1#12G	3/4"
25A	2#10 & 1#10G	3/4"	3#10 & 1#10G	3/4"
30A	2#10 & 1#10G	3/4"	3#10 & 1#10G	3/4"
35A	2#8 & 1#10G	3/4"	3#8 & 1#10G	3/4"
40A	2#8 & 1#10G	3/4"	3#8 & 1#10G	3/4"
45A	2#6 & 1#10G	1"	3#6 & 1#10G	1"
50A	2#6 & 1#10G	1"	3#6 & 1#10G	1"
60A	2#4 & 1#10G	1"	3#4 & 1#8G	1-1/4"
70A	2#4 & 1#8G	1"	3#4 & 1#8G	1-1/4"
80A	2#3 & 1#8G	1-1/4"	3#3 & 1#8G	1-1/2"
90A	2#2 & 1#8G	1-1/4"	3#2 & 1#8G	1-1/2"
100A	2#1 & 1#8G	1-1/2"	3#1 & 1#8G	2"

THREE PHASE WIRE SCHEDULE

MOCP (3 POLE)	CONDUCTORS (3 PH, 3W) WITH GROUND	CONDUIT SIZE	CONDUCTORS (3 PH, 4W) WITH GROUND	CONDUIT SIZE
15A	3#12 & 1#12G	3/4"	4#12 & 1#12G	3/4"
20A	3#12 & 1#12G	3/4"	4#12 & 1#12G	3/4"
25A	3#10 & 1#10G	3/4"	4#10 & 1#10G	3/4"
30A	3#10 & 1#10G	3/4"	4#10 & 1#10G	3/4"
35A	3#8 & 1#10G	3/4"	4#8 & 1#10G	3/4"
40A	3#8 & 1#10G	3/4"	4#8 & 1#10G	3/4"
45A	3#6 & 1#10G	1"	4#6 & 1#10G	1"
50A	3#6 & 1#10G	1"	4#6 & 1#10G	1"
60A	3#4 & 1#10G	1-1/4"	4#4 & 1#10G	1-1/4"
70A	3#4 & 1#8G	1-1/4"	4#4 & 1#8G	1-1/4"
80A	3#3 & 1#8G	1-1/4"	4#3 & 1#8	1-1/4"
90A	3#2 & 1#8G	1-1/4"	4#2 & 1#8G	1-1/2"
100A	3#1 & 1#8G	1-1/2"	4#1 & 1#8G	2"
110A	3#1 & 1#6G	1-1/2"	4#1 & 1#6G	2"
125A	3#1/0 & 1#6G	1-1/2"	4#1/0 & 1#6G	2"
150A	3#1/0 & 1#6G	2"	4#1/0 & 1#6G	2"
175A	3#2/0 & 1#6G	2"	4#2/0 & 1#6G	2"
200A	3#3/0 & 1#6G	2"	4#3/0 & 1#6G	2-1/2"
225A	3#4/0 & 1#4G	2-1/2"	4#4/0 & 1#4G	2-1/2"
250A	3#250KCMIL & 1#4G	2-1/2"	4#250KCMIL & 1#4G	3"
300A	3#350KCMIL & 1#4G	3"	4#350KCMIL & 1#4G	3"
350A	3#500KCMIL & 1#3G	3"	4#500KCMIL & 1#3G	4"
400A	3#500KCMIL & 1#3G	3-1/2"	4#500KCMIL & 1#3G	4"
450A	(2)3#4/0 & 1#2G	(2) 3"	(2)4#4/0 & 1#2G	(2) 3"
500A	(2)3#250KCMIL & 1#2G	(2) 3"	(2)4#250KCMIL & 1#2G	(2) 3"
600A	(2)3#350KCMIL & 1#1G	(2) 3"	(2)4#350KCMIL & 1#1G	(2) 3"
700A	(2)3#500KCMIL & 1#1/0G	(2) 3-1/2"	(2)4#500KCMIL & 1#1/0G	(2) 4"
800A	(2)3#500KCMIL & 1#1/0G	(2) 3-1/2"	(2)4#500KCMIL & 1#1/0G	(2) 4"
900A	(3)3#350KCMIL & 1#2/0G	(3) 3"	(3)4#350KCMIL & 1#2/0G	(3) 3"
1000A	(3)3#500KCMIL & 1#2/0G	(3) 3-1/2"	(3)4#500KCMIL & 1#2/0G	(3) 3-1/2"
1200A	(4)3#350KCMIL & 1#3/0G	(4) 4"	(4)4#350KCMIL & 1#3/0G	(4) 4"
1600A	(4)3#600KCMIL & 1#4/0G	(4) 4"	(4)4#600KCMIL & 1#4/0G	(4) 4"
2000A	(6)3#400KCMIL & 1#250KCMIL G	(6) 3"	(6)4#400KCMIL & 1#250KCMIL G	(6) 3"
2500A	(8)3#400KCMIL & 1#250KCMIL G	(8) 3"	(8)4#400KCMIL & 1#250KCMIL G	(8) 3"

NOTES:

1. CONDUCTOR SIZES BASED UPON 75°C INSULATION.
2. UNLESS OTHERWISE INDICATED, CONDUCTOR SIZING SHALL MATCH THE SIZE INDICATED ABOVE FOR THE APPLICABLE OVERCURRENT DEVICE. PROVIDE LARGER CIRCUIT WHERE INDICATED.
3. MINIMUM SIZE CONDUIT IS 3/4" UNLESS OTHERWISE INDICATED IN THE SPECIFICATIONS OR ON THE DRAWINGS.
4. PROVIDE A 3-PHASE 4-WIRE CIRCUIT UNLESS DEVICE SERVED DOES NOT HAVE PROVISIONS FOR A NEUTRAL.
5. PROVIDE A 1-PHASE 3-WIRE CIRCUIT UNLESS DEVICE SERVED DOES NOT HAVE PROVISIONS FOR A NEUTRAL.
6. MINIMUM SIZE CONDUIT UNDERGROUND IS 4 INCH EXCEPT FOR SITE BRANCH CIRCUITS SUCH AS LIGHTING AND MISCELLANEOUS POWER AND SYSTEMS WHICH SHALL BE A MINIMUM OF 1 INCH.
7. PROVIDE TYPE OF RACEWAY OR CABLE AS INDICATED IN THE SPECIFICATIONS OR ON THE DRAWINGS.
8. CONDUIT AND WIRE SIZES SHOWN IN SCHEDULE ABOVE ARE BASED ON MAXIMUM CIRCUIT LENGTH OF 100'.
9. CONDUIT AND WIRE SIZES FOR CIRCUITS OVER 100' SHALL BE CALCULATED TO ACCOUNT FOR VOLTAGE DROP.

KAESTLE BOOS associates, inc

416 Slater Road, P.O. Box 2590, New Britain, CT 06050-2590
Phone: 860-229-0361 ▲ Fax: 860-229-5303
16 Chestnut Street, Suite 301, Foxborough, MA 02035
Phone: 508-549-9906 ▲ Fax: 508-549-9907
313 Congress Street, Suite 150, Boston, MA 02210
Phone: 617-752-2212 ▲
20 Newman Avenue, Suite 2001-A, Rumford, RI 02916
Phone: 401-270-0365 ▲

Email: kba@kba-architects.com ▲ Web: www.kba-architects.com

RZ Design Associates, Inc.
MECHANICAL, ELECTRICAL, AND STRUCTURAL ENGINEERING
750 OLD MAIN STREET
SUITE 202
ROCKY HILL, CT 06067
P: (860) 436-4336
F: (860) 436-4450
www.rzdesignassociates.com

ISSUE DATE

DATE	DESCRIPTION
AUGUST 30, 2019	DRAWINGS ISSUED FOR SCHEMATIC DESIGN
DECEMBER 13, 2019	DRAWINGS ISSUED FOR DESIGN DEVELOPMENT
FEBRUARY 28, 2020	DRAWINGS ISSUED FOR 90% CONSTRUCTION DOCUMENTS
MAY 1, 2020	DRAWINGS ISSUED FOR BIDDING AND CONSTRUCTION

REVISIONS

No.	DATE	DESCRIPTION
1	05/27/20	ADDENDUM #1

KEY PLAN

SCALE: AS NOTED

PROJECT TRUE

ADDITIONS & RENOVATIONS OF WINDSOR FIRE AND EMS COMPLEX

340 BLOOMFIELD AVENUE
WINDSOR, CT 06095

PROJECT NO.: 18009.01 DRAWN BY: CEM

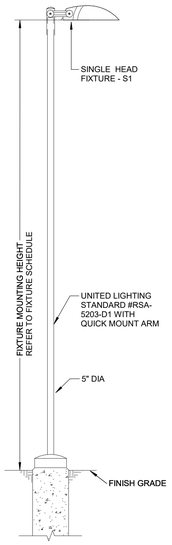
ELECTRICAL SCHEDULES

DRAWING NO.:

E6.01

LIGHTING FIXTURE SCHEDULE

TYPE	MANUFACTURER	MODEL	LAMPS			VOLTAGE	REMARKS
			LUMENS	WATTAGE	LUMENS/WATT		
CC	BEGA	33-058-K4-SLV	1000 lm	15 W	67 lm/W	120 V	DIECAST ALUMINUM LED RECESSED WALL LIGHT WITH ASYMMETRICAL DISTRIBUTION, 4K, SILVER FINISH
FL	KIM LIGHTING	LTV81FF/NF/36L4KUV-SR-RCA81	2985 lm	42 W	71 lm/W	120 V	INGROUND UP LIGHT FOR FLAG LIGHTING WITH SLIP RESISTANT LENS AND REBAR CAGE
S1	BEACON	VP-S/24L-55/3K7/2/A/DB/SCP-40F/BC WITH SSSB20-40A-1-B3-DBT POLE	6257 lm	55 W	114 lm/W	120 V	20FT LIGHTPOLE WITH (1) LED HEAD, 4000K,80CRI,TYPE 2 DISTRIBUTION AND PROGRAMMABLE MOTION AND DAYLIGHT SENSOR WITH BACK SIDE SHIELD
S2	BEACON	VP-S/24L-55/3K7/2/A/DB/SCP-40F/BC WITH SSSB20-40A-1-B3-DBT POLE	6257 lm	55 W	114 lm/W	120 V	20FT LIGHTPOLE WITH (1) LED HEAD, 4000K,80CRI,TYPE 2 DISTRIBUTION
S6	ARCLUCE	S-KL0204US-21S	1600 lm	20 W	80 lm/W	120 V	7 1/4"x 39" DIECAST ALUMINUM LIGHTEDLED BOLLARD WITH SILICONE GASKETS, SS SCREWS, AND NON-IRIDESCENT SPECULAR ALUMINUM REFLECTOR
SL1	HUBBELL	LTV83FF-WW-12L-4K-UV-SR-RCA83	1253 lm	14 W	90 lm/W	120 V	8"DIA INGROUND ADJUSTABLE WALL WASH LED WITH ANTI SLIP LENS REBAR CAGE ANCHOR. BLUE TOOTH CONNECTED FOR AIMING AND DIMMING.

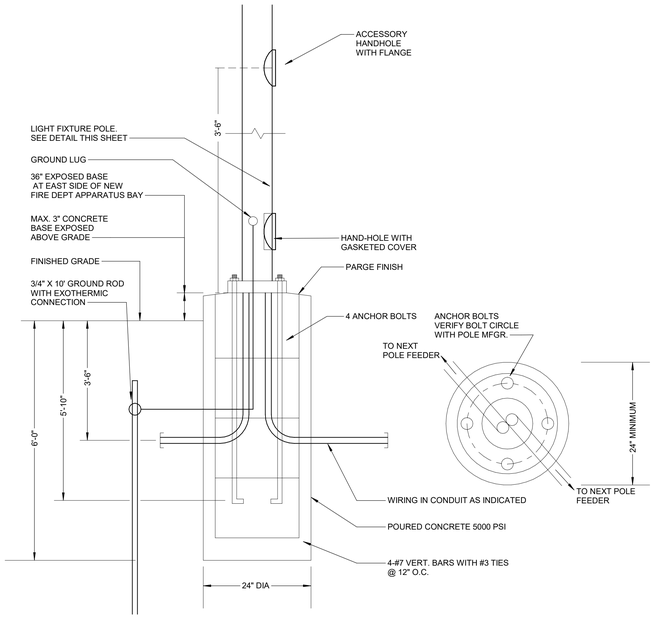


* MOUNTING HEIGHT (MH) SHALL BE THE DISTANCE FROM THE LIGHT CENTER OF THE LUMINAIRE TO THE GROUND.

LIGHTING NOTES:

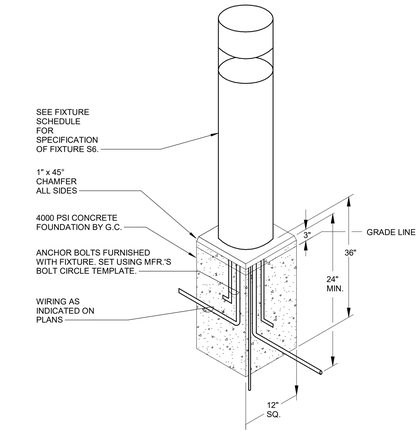
1. IF DISCREPENCIES EXIST BETWEEN THE LIGHTING SCHEDULE AND LIGHTING PLAN, THE PLAN SHALL DICTATE.
2. SEE LIGHT POLE BASE DETAIL THIS SHEET.

1 POLE SITE LIGHT DETAIL
NOT TO SCALE

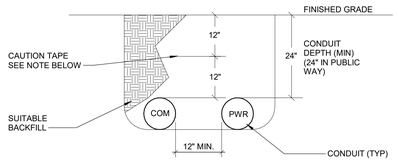


(COORDINATE WITH SECURITY CONTRACTOR FOR THE EXACT LIGHT POLE USED FOR SECURITY CAMERA)

2 LIGHT POLE AND BASE DETAIL
NOT TO SCALE



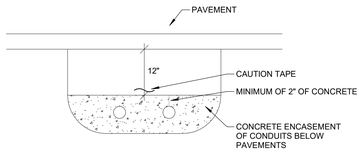
3 S6 BOLLARD BASE DETAIL
NOT TO SCALE



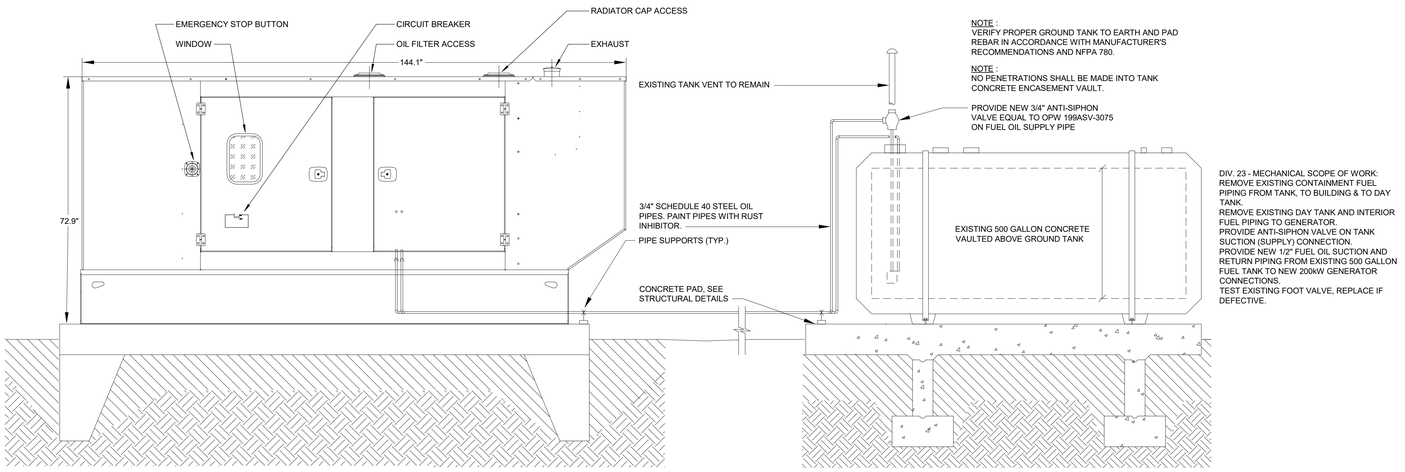
UNDERGROUND CAUTION TAPE: PERMANENT, BRIGHT -COLORED, CONTINUOUS PRINTED, VINYL TAPE FOR PERMANENT DIRECT- BURIAL SERVICE, AND WITH THE FOLLOWING FEATURES:

1. NOT LESS THAN 6 INCHES WIDE BY 4 MILS THICK.
2. EMBEDDED CONTINUOUS METALLIC STRIP OR CORE.
3. PRINTED LEGEND THAT INDICATES TYPE OF UNDERGROUND LINE.

4 TRENCH DETAIL
NOT TO SCALE



5 TRENCH DETAIL AT PAVED DETAILS
NOT TO SCALE



GENERATOR ENCLOSURE ELEVATION

TANK ELEVATION

6 TANK AND GENERATOR ENCLOSURE ELEVATION
12" = 1'-0"

KAESTLE BOOS associates, inc

416 Slater Road, P.O. Box 2590, New Britain, CT 06050-2590
Phone: 860-229-0361 ▲ Fax: 860-229-5303
16 Chestnut Street, Suite 301, Foxborough, MA 02035
Phone: 508-549-9906 ▲ Fax: 508-549-9907
313 Congress Street, Suite 150, Boston, MA 02210
Phone: 617-752-2212 ▲
20 Newman Avenue, Suite 2001-A, Rumford, RI 02916
Phone: 401-270-0365 ▲

Email: kba@kba-architects.com ▲ Web: www.kba-architects.com

RZ Design Associates, Inc.
MECHANICAL, ELECTRICAL, AND STRUCTURAL ENGINEERING
750 OLD MAIN STREET
SUITE 202
ROCKY HILL, CT 06067
P: (860) 436-4336
F: (860) 436-4450
www.rzdesignassociates.com

ISSUE DATE

DATE	DESCRIPTION
AUGUST 30, 2019	DRAWINGS ISSUED FOR SCHEMATIC DESIGN
DECEMBER 13, 2019	DRAWINGS ISSUED FOR DESIGN DEVELOPMENT
FEBRUARY 28, 2020	DRAWINGS ISSUED FOR 90% CONSTRUCTION DOCUMENTS
MAY 1, 2020	DRAWINGS ISSUED FOR BIDDING AND CONSTRUCTION

REVISIONS

No.	DATE	DESCRIPTION
1	05/27/20	ADDENDUM #1

KEY PLAN

SCALE: AS NOTED

PROJECT TRUE

ADDITIONS & RENOVATIONS OF WINDSOR FIRE AND EMS COMPLEX

340 BLOOMFIELD AVENUE
WINDSOR, CT 06095

PROJECT NO.: 18009.01 DRAWN BY: CEM

ELECTRICAL SITE UTILITIES DETAILS

DRAWING NO.:

ESU2.01

SECTION 08 36 13 - SECTIONAL DOORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The Contractor, Subcontractors, and/or suppliers providing goods and services referenced in or related to this Section shall also be bound by the Related Documents identified in Division 01 Section “Summary.”

1.2 SUMMARY

A. Section includes the following:

1. Electrically operated, insulated sectional doors with remote transmitters, and factory applied custom color.

B. Related Sections:

1. Division 05 Section "Metal Fabrications" for miscellaneous steel supports.
2. Division 26 Sections for electrical service and connections for powered operators and accessories.
3. Division 28 Sections for integration with security system.

1.3 ACTION SUBMITTALS

A. Product Data: For each type and size of sectional door and accessory. Include the following:

1. Construction details, material descriptions, dimensions of individual components, profile door sections, and finishes.
2. Rated capacities, operating characteristics, electrical characteristics, and furnished accessories.

B. Shop Drawings: For each installation and for special components not dimensioned or detailed in manufacturer's product data.

1. Include plans, elevations, sections, and mounting details.
2. Include details of equipment assemblies. Indicate dimensions, required clearances, method of field assembly, components, and location and size of each field connection.
3. Include points of attachment and their corresponding static and dynamic loads imposed on structure.
4. Include diagrams for power, signal, and control wiring.

C. Delegated-Design Submittal: For sectional doors indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1. Detail fabrication and assembly of doors.
2. Include design calculations.

D. Samples for Initial Selection: Manufacturer's finish charts showing full range of colors and textures available for units with factory-applied finishes.

1. Include similar Samples of accessories involving color selection.

E. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below:

1. Flat Door Sections: 6 inches square.

F. Delegated-Design Submittal: For sectional doors indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer licensed in the State of Connecticut responsible for their preparation.

1. Summary of forces and loads on walls and jambs.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Installer.

B. Warranties: Sample of special warranties.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For sectional doors to include in maintenance manuals.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for both installation and maintenance of units required for this Project.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. Standard for Sectional Doors: Fabricate sectional doors to comply with DASMA 102 unless otherwise indicated.

1.7 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of sectional doors that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures including, but not limited to, excessive deflection.
b. Faulty operation of hardware.
c. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use; rust through.
d. Delamination of exterior or interior facing materials.

2. Warranty Period (Delamination): 10 years from date of Substantial Completion.
3. Warranty Period for Hardware: Eight years from date of Substantial Completion.
4. Warranty Period for Springs: One year from date of Substantial Completion.

B. Special Finish Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS, GENERAL

A. Source Limitations: Obtain sectional doors including tracks, motors and accessories from single source from single manufacturer.

1. Provide secondary components for source acceptable to sectional door manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. General Performance: Sectional doors shall meet performance requirements specified without failure due to defective manufacture, fabrication, installation, or other defects in construction and without requiring temporary installation of reinforcing components.

B. Delegated Design: Design sectional doors, including comprehensive engineering analysis by a qualified professional engineer licensed in the State of Connecticut, using performance requirements and design criteria indicated.

C. Structural Performance: Exterior sectional doors shall withstand the effects of gravity loads, and the following loads and stresses within limits and under conditions indicated according to the Connecticut State Building Code.

1. Design Wind Loads: Determine loads based on Components and Cladding Wind Pressure Chart on Structural Drawings, and in accordance with the Connecticut State Building Code.
2. Testing: According to ASTM E 330.
3. Deflection Limits: Design sectional doors to withstand design wind loads without evidencing permanent deformation or disengagement of door components.

    a. Deflection of door sections in horizontal position (open) shall not exceed 1/120 of the door width.
    b. Deflection of horizontal track assembly shall not exceed 1/240 of the door height.

4. Operability under Wind Load: Design overhead coiling doors to remain operable under design wind load, acting inward and outward.

2.3 EXTERIOR DOOR ASSEMBLY

A. Steel Sectional Door: Sectional door formed with hinged sections.

1. Basis of Design Product: Subject to compliance with requirements, provide the following:

    a. Clopay Building Products Company; Model 3722.

B. Air Infiltration: Maximum rate not more than indicated when tested according to ASTM E 283.

1. Air Infiltration: Maximum rate of 0.08 cfm/sq. ft. at 15 and 25 mph.

C. Operation Cycles: Provide sectional door components and operators capable of operating for not less than number 50,000 cycles for each door. One operation cycle is complete when a door is opened from the closed position to the fully open position and returned to the closed position.

D. R-Value: 18.4 deg F x h x sq. ft./Btu, minimum.

E. Steel Sections: Zinc-coated (galvanized) steel sheet with G90 zinc coating.

1. Section Thickness: 2 inches.
2. Exterior-Face, Steel Sheet Thickness: 20 gauge minimum, nominal coated thickness.

    a. Surface: Flush (textured).

3. Insulation: Polyurethane.
4. Interior-Face, Steel Sheet Thickness: 28 gauge minimum, nominal coated thickness.

    a. Surface: Flush (textured).

F. Track Configuration: High lift track.

G. Weatherseals: Fitted to bottom and top and around entire perimeter of door. Provide combination bottom weatherseal and sensor edge.

H. Roller-Tire Material: Case-hardened steel.

I. Windows: Fully insulated vision (full view) as indicated on Drawings; in one or two rows at height indicated on Drawings; installed with glazing of the following type:

1. Clear Float Glass: 3 mm thick and complying with ASTM C 1036, Type I, Class 1, Quality Q3, fully tempered.
2. Insulating Glass: Manufacturer's standard, Low-E insulated glazing.
3. Frame Color: Black.

J. Electric Door Operator:

1. Usage Classification: Heavy duty, 60 to 90 cycles per hour.
2. Operator Type: Jackshaft, side mounted.
3. Motor Exposure: Interior, clean, and dry.
4. Emergency Manual Operation: Push-up type.
5. Obstruction-Detection Device: Automatic photoelectric sensor and monitored electric sensor edge on bottom bar.

    a. Provide two sets of photo cells for each door in locations determined by Owner. Coordinate mounting location with track guards.
    b. Sensor Edge Bulb Color: Black.

6. Remote-Control Station: Interior.
7. Provide individual receivers to operate each door.

    a. Provide thirty (30) two-channel, two button transmitters to operate Fire Department Apparatus Bay doors.

8. Other Equipment:

    a. Radio-control system.

K. Door Finish:

1. Exterior Facing Material: Manufacturer's optional Color Blast, factory applied polyurethane coating system, AAMA 2604, with solar reflective technology required for custom color selected by Architect (red).
2. Finish of Interior Facing Material: White.

2.4 STEEL DOOR SECTIONS

A. Exterior Section Faces and Frames: Fabricate from zinc-coated (galvanized), cold-rolled, commercial steel (CS) sheet, complying with ASTM A 653/A 653M, with indicated zinc coating and thickness.

1. Fabricate section faces from single sheets to provide sections not more than 24 inches high and of indicated thickness. Roll horizontal meeting edges to a continuous, interlocking, keyed, rabbeted, shiplap, or tongue-in-groove weathertight seal, with a reinforcing flange return.
2. For insulated doors, provide sections with continuous thermal-break construction, separating the exterior and interior faces of door.

B. Section Ends: Enclose open ends of sections with channel end stiles formed from galvanized-steel sheet not less than 14 gauge nominal coated thickness and welded to door section.

C. Reinforce bottom section with a continuous channel or angle conforming to bottom-section profile and allowing installation of astragal.

D. Reinforce sections with continuous horizontal and diagonal reinforcement, as required to stiffen door and for wind loading. Provide galvanized-steel bars, struts, trusses, or strip steel, formed to depth and bolted or welded in place. Ensure that reinforcement does not obstruct vision lites.

1. Provide horizontal struts on the inside face of each section to prevent potential thermal bowing from dark paint color on exterior face.

E. Provide reinforcement for hardware attachment.

F. Foamed-in-Place Thermal Insulation: Insulate interior of steel sections with door manufacturer's standard CFC-free polyurethane insulation, foamed in place to completely fill interior of section and pressure bonded to face sheets to prevent delamination under wind load, and with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, according to ASTM E 84. Enclose insulation completely within steel sections and the interior facing material, with no exposed insulation.

1. Interior Facing Material: Hot-dipped galvanized, cold-rolled, commercial steel (CS) sheet, complying with ASTM A 653/A 653M, with indicated thickness.

G. Fabricate sections so finished door assembly is rigid and aligned, with tight hairline joints and free of warp, twist, and deformation.

2.5 TRACKS, SUPPORTS, AND ACCESSORIES

A. Tracks: Manufacturer's standard, galvanized-steel track system of configuration indicated, sized for door size and weight, designed for lift type indicated and clearances indicated on Drawings, Provide complete system including brackets, bracing, and reinforcement to ensure rigid support of ball-bearing roller guides for required door type, size, weight, and loading.

1. Galvanized Steel: ASTM A 653/A 653M, minimum G60 zinc coating.
2. Slope tracks at an angle from vertical or design tracks to ensure tight closure at jambs when door unit is closed.
3. Track Reinforcement and Supports: Galvanized-steel members to support track without sag, sway, and vibration during opening and closing of doors.

a. Vertical Track Assembly: Track with continuous reinforcing angle attached to track and attached to wall with jamb brackets.
b. Horizontal Track Assembly: Track with continuous reinforcing angle attached to track and supported at points from curve in track to end of track by laterally braced attachments to overhead structural members.

B. Weatherseals: Replaceable, adjustable, continuous, compressible weather-stripping gaskets of flexible vinyl, rubber, or neoprene fitted to bottom and top of sectional door unless otherwise indicated.

1. Top section: Provide a continuous length EPDM rubber sealing strip.
2. Bottom section: Provide a continuous aluminum retainer and a U-shaped, 3-inch gray vinyl seal.

2.6 HARDWARE

A. General: Provide heavy-duty, corrosion-resistant hardware, with hot-dip galvanized, stainless-steel, or other corrosion-resistant fasteners, to suit door type.

B. Hinges: Heavy-duty, galvanized-steel hinges of not less than 11 gauge nominal un-coated thickness at each end stile and at each intermediate stile, according to manufacturer's written recommendations for door size. Attach hinges to door sections through stiles and rails with bolts and lock nuts or lock washers and nuts. Use rivets or self-tapping fasteners where access to nuts is not possible.

C. Rollers: Heavy-duty rollers with steel ball-bearings in case-hardened steel races, mounted with varying projections to suit slope of track. Extend roller shaft through both hinges where double hinges are required. Provide 3-inch- diameter roller tires for 3-inch- wide track, and (10) hardened steel ball bearings.

2.7 COUNTERBALANCE MECHANISM

A. Torsion Spring: Counterbalance mechanism consisting of adjustable-tension torsion springs fabricated from steel-spring wire complying with ASTM A 229/A 229M, mounted on torsion shaft made of steel tube or solid steel. Provide springs designed for number of operation cycles indicated.

B. Cable Drums and Shaft for Doors: Cast-aluminum or gray-iron casting cable drums mounted on torsion shaft and grooved to receive door-lifting cables as door is raised. Mount counterbalance mechanism with manufacturer's standard ball-bearing brackets at each end of torsion shaft. Provide one additional midpoint bracket for shafts up to 16 feet long and two additional brackets at one-third points to support shafts more than 16 feet long unless closer spacing is recommended by door manufacturer.

C. Cables: Galvanized-steel lifting cables with cable safety factor of at least 5 to 1.

D. Cable Safety Device: Include a spring-loaded steel or spring-loaded bronze cam mounted to bottom door roller assembly on each side and designed to automatically stop door if either lifting cable breaks.

E. Bracket: Provide anchor support bracket as required to connect stationary end of spring to the wall and to level the shaft and prevent sag.

F. Provide a spring bumper at each horizontal track to cushion door at end of opening operation.

2.8 ELECTRIC DOOR OPERATORS

A. General: Electric door operator assembly of size and capacity recommended and provided by door manufacturer for door and "operation cycles" requirement specified, with electric motor and factory-prewired motor controls, starter, gear-reduction unit, solenoid-operated brake, clutch, remote-control stations, control devices, integral gearing for locking door, and accessories required for proper operation.

1. Comply with NFPA 70.
2. Provide control equipment complying with NEMA ICS 1, NEMA ICS 2, and NEMA ICS 6; with NFPA 70, Class 2 control circuit, maximum 24-V ac or dc.

B. Usage Classification: Electric operator and components capable of operating for not less than number of cycles per hour indicated for each door.

C. Door-Operator Type: Unit consisting of electric motor, gears, pulleys, belts, sprockets, chains, and controls needed to operate door and meet required usage classification.

1. Jackshaft, Side Mounted: Jackshaft operator mounted on the inside front wall on right or left side of door and connected to torsion shaft with an adjustable coupling or drive chain.
2. Furnish V-belt drive from motor to full ball bearing power train with additional reduction by chain and sprockets. Power train shaft minimum ¾-inch diameter.
3. Roller Chain Drive: Door driven by roller chain drive at 6” to 12” per second.
4. Provide adjustable friction clutch to protect door and operator if door movement is obstructed.

D. Electric Motors: Comply with NEMA designation, temperature rating, service factor, enclosure type, and efficiency requirements.

1. Wiring Connections: Requirements for electrical characteristics.

    a. 208 volts, 60 Hz, three phase.

2. Motor Type and Controller: Reversible motor and controller (disconnect switch) for motor exposure indicated.
3. Motor Size: Minimum size as indicated (1/2 HP). If not indicated, large enough to start, accelerate, and operate door in either direction from any position, at a speed not less than 8 in./sec. and not more than 12 in./sec., without exceeding nameplate ratings or service factor.

4. Operating Controls, Controllers (Disconnect Switches), Wiring Devices, and Wiring: Manufacturer's standard unless otherwise indicated.
5. Coordinate wiring requirements and electrical characteristics of motors and other electrical devices with building electrical system and each location where installed.
6. Use adjustable motor-mounting bases for belt-driven operators.
7. Provide manual reset for overload protection.

E. Limit Switches: Equip each motorized door with adjustable switches interlocked with motor controls and set to automatically stop door at fully opened and fully closed positions.

F. Obstruction Detection Device: Equip motorized door with indicated external automatic safety sensor capable of protecting full width of door opening. Activation of device immediately stops and reverses downward door travel.

1. Photoelectric Sensor: Manufacturer's standard system designed to detect an obstruction in door opening without contact between door and obstruction.
2. Pressure-Sensor Edge: Provide each motorized door with an automatic safety sensor edge, located within astragal or weather stripping mounted to bottom bar. Contact with sensor immediately stops and reverses downward door travel. Connect to control circuit using manufacturer's standard take-up reel or self-coiling cable.

    a. Provide electrically actuated automatic bottom bar.

        1) Monitoring Type: Two-wire configured device.

G. Control Stations: Provide three-button control station with push-button controls labeled "Open," "Close," and "Stop" for each sectional door, in locations indicated.

1. Interior units, full-guarded, flush-mounted, heavy-duty type, with general-purpose NEMA ICS 6, Type 1 enclosure. Provide locking cover for all controls.
2. Provide long distance control wiring, 24 volt.
3. Coordinate wiring of control stations with security integration.
4. Provide push button control station wired to allow door to fully open and then close to within one foot of the floor for five minutes and then close completely. Provide an override to allow door to close completely.

    a. Provide mushroom type “open” button for quick activation and standard “close” and “stop” buttons.

5. Wire push buttons to start exhaust fans when doors are opened and then shut fans off when the doors are fully closed.
6. Provide contacts in all three button controls to turn off apparatus bay heating when doors open.

    a. Provide an override switch located in apparatus bay to turn on exhaust fans when doors open. Provide indicator light to show that heaters are on.

7. Provide a master control panel to operate all doors in Apparatus Bays from Fire Watch Room. Locate in casework as indicated.

8. Provide individual receivers to operate door.

H. Emergency Manual Operation: Equip each electrically powered door with capability for emergency manual operation with manual chain hoist.

1. Provide the following for all new sectional doors:

a. Chain-Hoist Operator: Consisting of endless steel hand chain, chain-pocket wheel and guard, and gear-reduction unit with a maximum 25-lbf force for door operation. Provide alloy-steel hand chain with chain holder secured to operator guide.
b. Provide wall hook and coil chain at door head height for security purposes.

I. Emergency Operation Disconnect Device: Equip operator with hand-operated disconnect mechanism for automatically engaging manual operator and releasing brake for emergency manual operation while disconnecting motor without affecting timing of limit switch. Mount mechanism so it is accessible from floor level. Include interlock device to automatically prevent motor from operating when emergency operator is engaged.

J. Motor Removal: Design operator so motor may be removed without disturbing limit-switch adjustment and without affecting emergency manual operation.

2.9 GENERAL FINISH REQUIREMENTS

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.10 STEEL AND GALVANIZED-STEEL FINISHES

A. Two-Part Polyurethane Finish (Exterior): Manufacturer's standard finish consisting of a two-part polyurethane based paint with solar reflective paint technology as required for selected color, complying with AAMA 2604. Comply with coating manufacturer's written instructions for cleaning, pretreatment, application, and minimum dry film thickness.

B. Baked-Enamel Finish (Interior): Manufacturer's standard baked-on finish consisting of prime coat and thermosetting topcoat. Comply with coating manufacturer's written instructions for cleaning, pretreatment, application, and minimum dry film thickness.

~~2.11 ALUMINUM FINISHES~~

~~A. Powder-Coat Finish: AAMA 2605. Comply with coating manufacturer's written instructions for cleaning, conversion coating, application, and baking.~~

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for substrate construction and other conditions affecting performance of the Work.

B. Examine locations of electrical connections.

C. Proceed with installation only after unsatisfactory conditions have been corrected. Commencement of work indicates acceptance of substrates.

3.2 INSTALLATION

A. Install sectional doors and operating equipment complete with necessary hardware, anchors, inserts, hangers, and equipment supports; according to manufacturer's written instructions and as specified.

1. Completely remove from all components, bar code and shipping labels. Clean all residues from tags and stickers.

B. Tracks:

1. Fasten vertical track assembly to opening jambs and framing, spaced not more than 24 inches apart.
2. Hang horizontal track assembly from structural overhead framing with angles or channel hangers attached to framing by welding or bolting, or both. Provide sway bracing, diagonal bracing, and reinforcement as required for rigid installation of track and door-operating equipment.
3. Repair galvanized coating on tracks according to ASTM A 780.

3.3 STARTUP SERVICES

A. Engage a factory-authorized service representative to perform startup service.

1. Complete installation and startup checks according to manufacturer's written instructions.
2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

3.4 ADJUSTING, CLEANING, AND PROTECTION

A. Adjust hardware and moving parts to function smoothly so that doors operate easily, free of warp, twist, or distortion.

B. Lubricate bearings and sliding parts as recommended by manufacturer.

C. Adjust doors and seals to provide weathertight fit around entire perimeter.

D. Align and adjust motors, pulleys, belts, sprockets, chains, and controls according to manufacturer's written instructions.

E. Protect sectional doors from damage during construction operations during remainder of construction period.

1. Replace door panels and accessories that may have been damaged during construction period.

F. Clean surfaces immediately after installation. Avoid damaging protective coatings and finishes. Remove excess sealants, dirt, and other substances.

G. Touch-up Painting: Immediately after welding galvanized materials, clean welds and abraded galvanized surfaces and repair galvanizing to comply with ASTM A 780.

3.5 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain sectional doors.

END OF SECTION 08 36 13

FINISH SCHEDULE

RM#	LOCATION	FLOOR	BASE	WALLS				DWGS.	REMARKS
				NORTH	SOUTH	EAST	WEST		
A101	VEST.	CT-1, EG	CTB-1	P-2	P-2	P-2	P-2		
A102	LOBBY	CT-1,2	CTB-1	P-2/WC-3	P-2/WC-3	P-2/WC-3	P-2/WC-3		SOFFIT TO BE PAINTED P-6
A103	CORRIDOR	LVT-1	RB-2	P-2, HIWC-1	P-2, HIWC-1	P-2, HIWC-1	P-2, HIWC-1		PROVIDE CG-1 AT ALL OUTSIDE CORNERS WHERE HIWC-1 OCCURS (TYP.)
A104	PASSAGE	LVT-1	RB-2	P-2, HIWC-1	P-2, HIWC-1	P-2, HIWC-1	P-2, HIWC-1		PROVIDE CG-1 AT ALL OUTSIDE CORNERS WHERE HIWC-1 OCCURS (TYP.)
A105	CORRIDOR	LVT-1	RB-2	P-2, HIWC-1	P-2, HIWC-1	P-2, HIWC-1	P-2, HIWC-1		PROVIDE CG-1 AT ALL OUTSIDE CORNERS WHERE HIWC-1 OCCURS (TYP.)
A106	VEST.	MAT	RB-2	P-2	P-2	P-2	P-2		
A107	CORRIDOR	LVT-1	RB-2	P-2, HIWC-1	P-2, HIWC-1	P-2, HIWC-1	P-2, HIWC-1		PROVIDE CG-1 AT ALL OUTSIDE CORNERS WHERE HIWC-1 OCCURS (TYP.)
A108	CORRIDOR	LVT-1	RB-2	P-2, HIWC-1	P-2, HIWC-1	P-2, HIWC-1	P-2, HIWC-1		PROVIDE CG-1 AT ALL OUTSIDE CORNERS WHERE HIWC-1 OCCURS (TYP.)
A109	CORRIDOR	LVT-1	RB-2	P-2, HIWC-1	P-2, HIWC-1	P-2, HIWC-1	P-2, HIWC-1		PROVIDE CG-1 AT ALL OUTSIDE CORNERS WHERE HIWC-1 OCCURS (TYP.)
A110	OMITTED	-	-	-	-	-	-		
A111	CORRIDOR	LVT-1	RB-2	P-2, HIWC-1	P-2, HIWC-1	P-2, HIWC-1	P-2, HIWC-1		PROVIDE CG-1 AT ALL OUTSIDE CORNERS WHERE HIWC-1 OCCURS (TYP.)
A112	FIRE LOBBY	CT-1,2, LVT-2	CTB-1, RB-1, WDB	P-2	P-2	P-2	P-2		SOFFIT TO BE P-6
A113	VEST.	EG	CTB-1	-	-	-	-	3/A6.06	SEE 3/A6.06 & 4/A6.06 FOR BRICK WALL CONSTRUCTION
A114	CORRIDOR	LVT-1	RB-2	P-2, HIWC-1	P-2, HIWC-1	P-2, HIWC-1	P-2, HIWC-1		PROVIDE CG-1 AT ALL OUTSIDE CORNERS WHERE HIWC-1 OCCURS (TYP.)
A115	CORRIDOR	LVT-1	RB-2	P-2, HIWC-1	P-2, HIWC-1,	P-2, HIWC-1	P-2, HIWC-1		PROVIDE CG-1 AT ALL OUTSIDE CORNERS WHERE HIWC-1 OCCURS (TYP.)
A116	CORRIDOR	LVT-1	RB-2	P-2, HIWC-1	P-2, HIWC-1	P-2, HIWC-1	P-2, HIWC-1		PROVIDE CG-1 AT ALL OUTSIDE CORNERS WHERE HIWC-1 OCCURS (TYP.)
A117	CORRIDOR	LVT-1	RB-2	P-2, HIWC-1	P-2, HIWC-1	P-2, HIWC-1	P-2, HIWC-1		PROVIDE CG-1 AT ALL OUTSIDE CORNERS WHERE HIWC-1 OCCURS (TYP.)
A118	CORRIDOR	LVT-1	RB-2	P-2, HIWC-1	P-2, HIWC-1	P-2, HIWC-1	P-2, HIWC-1		PROVIDE CG-1 AT ALL OUTSIDE CORNERS WHERE HIWC-1 OCCURS (TYP.)
A119	H.C.T.	CT-3	CTB-1	CWT-7,8,9, EP-1	CWT-7,8,9, EP-1	CWT-7,8,9, EP-1	CWT-7,8,9, EP-1		
A120	H.C.T.	CT-3	CT-1	CWT-7,8,9, EP-1	CWT-7,8,9, EP-1	CWT-7,8,9, EP-1	CWT-7,8,9, EP-1		
A121	CHIEF'S OFFICE	CPT-1	RB-3	P-1	WC-2	P-1	P-1		
A122	SHARED OFFICE	CPT-1	RB-3	P-1	WC-2	P-1	P-1		
A123	BILLING OFFICE	CPT-1	RB-3	P-1	WC-2	P-1	P-1		
A124	CEO OFFICE	CPT-1	RB-3	P-1	WC-2	P-1	P-1		
A125	APPARATUS BAY	PRF-1,2	PRFB-1	EP-2, 4	EP-2, 4	EP-2, 4	EP-2, 4		ALL OVERHEAD MECHANICAL & PLUMBING TO BE PAINTED P-4. ALL STRUCTURE, ROOF DECK AND RAILINGS TO BE PAINTED P-7.
A126	EMS DIRTY	PRF-1	PRFB-1	EP-2	EP-2	EP-2	EP-2		
A127	EMS CLEAN	PRF-1	PRFB-1	EP-2	EP-2	EP-2	EP-2		
A128	EMS OXYGEN	PRF-1	PRFB-1	EP-2	EP-2	EP-2	EP-2		
A129	HAZARDOUS WASTE	PRF-1	PRFB-1	EP-2	EP-2	EP-2	EP-2		
A130	CUST.	PRF-1	PRFB-1	EP-2	EP-2	EP-2	EP-2		
A131	EMS STORAGE	CC-S	-	P-2	P-2	P-2	P-2		
A132	WOMEN	CT-3	CTB-1	CWT-7,9,10, EP-1	CWT-7,9,10, EP-1	CWT-7,9,10, EP-1	CWT-7,9,10, EP-1		

RM#	LOCATION	FLOOR	BASE	WALLS				DWGS.	REMARKS
				NORTH	SOUTH	EAST	WEST		
A133	MEN	CT-3	CTB-1	CWT-7,9,10, EP-1	CWT-7,9,10, EP-1	CWT-7,9,10, EP-1	CWT-7,9,10, EP-1		
A134	LOCKERS	LVT-1	RB-1	P-2	P-2	P-2	P-2		
A135	EMS BUNK	LVT-1	RB-1	P-2	P-2	P-2	P-2		
A136	LOCKERS	LVT-1	RB-1	P-2	P-2	P-2	P-2		
A137	EMS BUNK	LVT-1	RB-1	P-2	P-2	P-2	P-2		
A138	LOCKERS	LVT-1	RB-1	P-2	P-2	P-2	P-2		
A139	EMS BUNK	LVT-1	RB-1	P-2	P-2	P-2	P-2		
A140	LOCKERS	LVT-1	RB-1	P-2	P-2	P-2	P-2		
A141	EMS BUNK	LVT-1	RB-1	P-2	P-2	P-2	P-2		
A142	CLOSET	VT-1	RB-1	P-2	P-2	P-2	P-2		
A143	EMS KITCHEN	LVT-2	RB-5	P-1	P-1	P-1	P-1		
A144	EMS DAY ROOM	LVT-2	RB-5	P-1	P-1	P-1	P-1		
A145	EMS CONFERENCE	TCF-4,5	RB-4	P-1	P-1	P-1	P-1		
A146	GENERAL STORAGE	VT-1	RB-1	P-1	P-1	P-1	P-1		
A147	STORAGE	VT-1	RB-1	P-1	P-1	P-1	P-1		
A148	TABLE & CHAIR STORAGE	VT-1	RB-1	P-1	P-1	P-1	P-1		
A149	CUSTODIAN	VT-1	RB-1	P-1	P-1	P-1	P-1		
A150	STORAGE	VT-1	RB-1	P-1	P-1	P-1	P-1		
A151	SHARED ELECTRICAL	CC-S	-	P-1	P-1	P-1	P-1		
A152	MECHANICAL	CC-S	-	P-1	P-1	P-1	P-1		
A153	OMITTED	-	-	-	-	-	-		
A154	STORAGE	VT-1	RB-1	P-1	P-1	P-1	P-1		
A155	STORAGE	VT-1	RB-1	P-1	P-1	P-1	P-1		
A156	SHARED LAUNDRY	VT-1	RB-1	P-1	P-1	P-1	P-1		
A157	SHARED FITNESS	RAF	RB-5	P-1, HIWC-2	P-1, HIWC-2	P-1, HIWC-2	P-1, HIWC-2		
A158	OMITTED	-	-	-	-	-	-		
A159	TECH/DATA	VT-1	RB-1	P-1	P-1	P-1	P-1		
A160	EMS PROP STORAGE	CC-S	-	P-1	P-1	P-1	P-1		
A161	SHARED MEETING ROOM 2	TCF-1,3,5	RB-4	P-1	P-1	P-1	P-1, WD		
A162	SHARED MEETING ROOM 1	TCF-1,3,5	RB-4	P-1	P-1	P-1	P-1, WD		
A163	FIRE PROP STOR.	VT-1	RB-1	P-1	P-1	P-1	P-1		
A164	WOMEN'S TOILET	CT-3	CTB-1	CWT-7,8,9,10 EP	CWT-10, EP-1	CWT-10, EP-1	EP-1		

RM#	LOCATION	FLOOR	BASE	WALLS				DWGS.	REMARKS
				NORTH	SOUTH	EAST	WEST		
A165	MEN'S TOILET	CT-3	CTB-1	EP-1	CWT-10, EP-1	CWT-10, EP-1	CWT-7,8,9,10 EP		
A166	FIRE DAY ROOM	LVT-2	RB-5	P-1	P-1	P-1	P-1		
A167	FIRE KITCHEN	LVT-2	RB-5	P-1	P-1	P-1	P-1		
A168	LOCKER ALCOVE	LVT-1	RB-1	P-2	P-2	P-2	P-2		
A169	FIRE BUNK ROOM	LVT-1	RB-1	P-2	P-2	P-2	P-2		
A170	LOCKER ALCOVE	LVT-1	RB-1	P-2	P-2	P-2	P-2		
A171	FIRE BUNK ROOM	LVT-1	RB-1	P-2	P-2	P-2	P-2		
A172	LOCKER ALCOVE	LVT-1	RB-1	P-2	P-2	P-2	P-2		
A173	FIRE BUNK ROOM	LVT-1	RB-1	P-2	P-2	P-2	P-2		
A174	LOCKER ALCOVE	LVT-1	RB-1	P-2	P-2	P-2	P-2		
A175	FIRE BUNK ROOM	LVT-1	RB-1	P-2	P-2	P-2	P-2		
A176	LOCKER ALCOVE	LVT-1	RB-1	P-2	P-2	P-2	P-2		
A177	FIRE BUNK ROOM	LVT-1	RB-1	P-2	P-2	P-2	P-2		
A178	LOCKER ALCOVE	LVT-1	RB-1	P-2	P-2	P-2	P-2		
A179	FIRE BUNK ROOM	LVT-1	RB-1	P-2	P-2	P-2	P-2		
A180	LOCKER ALCOVE	LVT-1	RB-1	P-2	P-2	P-2	P-2		
A181	FIRE SHIFT BUNK	LVT-1	RB-1	P-2	P-2	P-2	P-2		
A182	FIRE BUNK TOILET	CT-3	CTB-1	EP-1	CWT-7,8,10 EP-1	CWT-10, EP-1	CWT-10, EP-1		
A183	FIRE BUNK TOILET	CT-3	CTB-1	EP-1	CWT-7,8,10 EP-1	CWT-10, EP-1	CWT-10, EP-1		
A184	FIRE BUNK TOILET	CT-3	CTB-1	CWT-7,8,10 EP-1	EP-1	CWT-10, EP-1	CWT-10, EP-1		
A185	FUTURE WORK ROOM	VT-1	RB-1	P-1	P-1	P-1	P-1		
A186	FILE STORAGE	VT-1	RB-1	P-1	P-1	P-1	P-1		
A187	CLOSET	VT-1	RB-1	P-1	P-1	P-1	P-1		
A188	FIRE CHIEF	CPT-1	RB-3	P-2	WC-2	P-2	P-2		
A189	SHARED OFFICE	CPT-1	RB-3	P-2	WC-2	P-2	P-2		
A190	OFFICE	CPT-1	RB-3	P-2	WC-2	P-2	P-2		
A191	OFFICE	CPT-1	RB-3	P-2	WC-2	P-2	P-2		
A192	FUTURE OFFICE	CPT-1	RB-3	P-2	WC-2	P-2	P-2		
A193	FUTURE OFFICE	CPT-1	RB-3	P-2	WC-2	P-2	P-2		
A194	FIRE CONFERENCE	TCF-2,3	RB-4	P-1	P-1	P-1	P-1		
B11	STAIR B1	PRF	PRFB	EP-2, 3	EP-2, 3	EP-2, 3	EP-2, 3	8/A4.01	
B101	CORRIDOR	RT	RB-5	P-2	P-2	P-2	P-2		

RM#	LOCATION	FLOOR	BASE	WALLS				DWGS.	REMARKS
				NORTH	SOUTH	EAST	WEST		
B102	PASSAGE	RT	RB-5	P-2	P-2	P-2	P-2		
B103	PASSAGE	RT	RB-5	P-2	P-2	P-2	P-2		
B104	PASSAGE	RT	RB-5	P-2	P-2	P-2	P-2		
B105	FIRE WATCH ROOM	RT	RB-5	P-2	P-2	P-2	P-2		
B106	STORAGE	VT-2	RB-5	P-2	P-2	P-2	P-2		
B107	STORAGE	VT-2	RB-5	P-2	P-2	P-2	P-2		
B108	H.C.T.	PRF	PRFB	EP-2	EP-2	EP-2	EP-2		
B109	CUSTODIAN	PRF	PRFB	EP-2	EP-2	EP-2	EP-2		
B110	FIRE LAUNDRY	PRF	PRFB	EP-2	EP-2	EP-2	EP-2		
B111	FIRE DECON	PRF	PRFB	EP-2	EP-2	EP-2	EP-2		
B112	FIRE WORK ROOM	PRF	PRFB	EP-2	EP-2	EP-2	EP-2		
B113	FIRE APPARATUS BAY	PRF	PRFB	EP-2, 3	EP-2, 3	EP-2, 3	EP-2, 3		ALL OVERHEAD MECHANICAL & PLUMBING TO BE PAINTED P-3. ALL STRUCTURE, ROOF DECK AND RAILINGS TO BE PAINTED P-7.
B114	FIREMATIC STORAGE	PRF	PRFB	EP-2	EP-2	EP-2	EP-2		
B115	STORAGE	PRF	PRFB	EP-2	EP-2	EP-2	EP-2		
B116	TURNOUT GEAR	PRF	PRFB	EP-2	EP-2	EP-2	EP-2		
B117	S.C.B.A / BOTTLE FILL STATION	PRF	PRFB	EP-2	EP-2	EP-2	EP-2		
B118	MEZZANINE	CC-S	-	EP-2	EP-2	EP-2	EP-2		
B119	COMPRESSOR	CC-S	-	EP-2	EP-2	EP-2	EP-2		

FINISH LEGEND

FLOORING

Key	Material	Manufacturer	Style	Color	Description
CC-S	SEALED CONCRETE	PER SPEC	CONCRETE SEALER	GREY	-
CPT-1	CARPET TILE	MILLIKEN	PLATO	MICA #PLN69	
EG	ENTRANCE GRILLE	MATS INC	DRI TRACK	NEW YORK DARK GREY	
LVT-1	LUXURY VINYL TILE	MANNINGTON	AMTICO WOOD COLLECTION 4-1/2" x 36" PLANK	WILD WALNUT #AROW7620	
LVT-2	LUXURY VINYL TILE	MANNINGTON	AMTICO ABSTRACT COLLECTION 18" x 18" TILE	UMBRA ECLIPSE #AROAUA33	
MAT	WALK-OFF MAT	MANNINGTON	RUFFIAN II 24" x 24" TILE	EBONY EARTH #1506	QUARTER TURN INSTALLATION
CT-1	CERAMIC TILE	CROSSVILLE	COLOR BLOX 12" x 24"	I SEE THE MOON #A1117	
CT-2	CERAMIC TILE	CROSSVILLE	COLOR BLOX 12" x 24"	SEA OTTER #A1108	
CT-3	CERAMIC TILE	CROSSVILLE	COLOR BLOX 2" MOSAIC	I SEE THE MOON #A1117	
TCF-1	TEXTILE COMPOSITE FLOORING	J & J FLOORING	KINETEX BOOM #1928 24" x 24" TILE	HIP HOP #1935	
TCF-2	TEXTILE COMPOSITE FLOORING	J & J FLOORING	KINETEX FLASH #1818 24" x 24" TILE	ROJO #1723	
TCF-3	TEXTILE COMPOSITE FLOORING	J & J FLOORING	KINETEX POP #1816 24" x 24" TILE	ROJO #1712	
TCF-4	TEXTILE COMPOSITE FLOORING	J & J FLOORING	KINETEX FLASH #1818 24" x 24" TILE	CIELO #1726	
TCF-5	TEXTILE COMPOSITE FLOORING	J & J FLOORING	KINETEX POP #1816 24" x 24" TILE	CIELO #1717	
RAF	RESILIENT ATHLETIC FLOORING	ROPPE	TUFLEX SPARTUS 27" x 27" TILE	FIESTA #031	
PRF	POURED RESIN FLOORING	DUR-A-FLEX	SHOP FLOOR SLIP RESISTANT FINISH	SLATE GREY	

RT-1	RUBBER TILE FLOORING	MANNINGTON	COLOR SPEC SMOOTH 18" x 18" TILE	NIMBUS #047	
HVT-1	HOMOGENOUS VINYL TILE	TOLI	STRATALINE 18" x 18" TILE	LOAM #7006	
HVT-2	HOMOGENOUS VINYL TILE	TOLI	STRATALINE 18" x 18" TILE	GRAVEL #5003	

BASE

Key	Material	Manufacturer	Style	Color	Description
CTB-1	CERAMIC TILE BASE	CROSSVILLE	COLOR BLOX 4"x24" BULLNOSE	I SEE THE MOON #A1117	4"H
PRFB	POURED RESIN FLOORING BASE	DUR-A-FLEX	SHOP FLOOR SLIP RESISTANT FINISH	SLATE GREY	4"H
RB-1	RUBBER BASE	ROPPE	CONTOURS SERENITY #PV4010	BROWN #110	4"H
RB-2	RUBBER BASE	ROPPE	PINNACLE STANDARD TOE BASE	BROWN #110	4"H
RB-3	RUBBER BASE	ROPPE	PINNACLE STANDARD TOE BASE	LIGHT GRAY #195	4"H
RB-4	RUBBER BASE	ROPPE	CONTOURS VERTICAL #PV4065	BLACK #100	4-5/8"H
RB-5	RUBBER BASE	ROPPE	PINNACLE STANDARD TOE BASE	CHARCOAL #123	4"H
WDB	FINISHED WOOD BASE	PER SPEC	-	TO MATCH PLAM-1	6"H

WALLS

Key	Material	Manufacturer	Style	Color	Description
CWT-1	CERAMIC WALL TILE	GARDEN STATE TILE	SLASH 3" x 12" TILE	WHITE	
CWT-2	CERAMIC WALL TILE	GARDEN STATE TILE	SLASH 3" x 12" TILE	WHITE DOT	
CWT-3	CERAMIC WALL TILE	GARDEN STATE TILE	SLASH 3" x 12" TILE	TURQUOISE	

CWT-4	CERAMIC WALL TILE	GARDEN STATE TILE	SLASH 3" x 12" TILE	TURQUOISE DOT	
CWT-5	CERAMIC WALL TILE	GARDEN STATE TILE	SLASH 3" x 12" TILE	RED	
CWT-6	CERAMIC WALL TILE	GARDEN STATE TILE	SLASH 3" x 12" TILE	RED DOT	
CWT-7	CERAMIC WALL TILE	DALTILE	COLOR WHEEL 4" x 8" TILE	MATTE ARTIC WHITE #0790	
CWT-8	CERAMIC WALL TILE	DALTILE	COLOR WHEEL 4" x 8" TILE	CURRANT #SH17	
CWT-9	CERAMIC WALL TILE	DALTILE	COLOR WHEEL 4" x 8" TILE	OCEAN BLUE #1049	
CWT-10	CERAMIC WALL TILE	DALTILE	COMPOSITION 12" x 24" TILE	GESSO MATTE #CO02	
EP-1	EPOXY PAINT	SHERWIN WILLIAMS	-	PASSIVE #SW 7064	
EP-2	EPOXY PAINT	SHERWIN WILLIAMS	-	WORDLY GRAY #SW 7043	
EP-3	EPOXY PAINT	SHERWIN WILLIAMS	-	RAVE RED #SW 6608	
EP-4	EPOXY PAINT	SHERWIN WILLIAMS	-	INTENSE TEAL #SW 6943	
EP-5	EPOXY PAINT	SHERWIN WILLIAMS	-	HIGH REFLECTIVE WHITE #SW 7757	
HIWC-1	HIGH IMPACT WALL COVERING	ACROVYN	RIGID PLASTIC WALL GUARD	DRIFTWOOD #262	
HIWC-2	HIGH IMPACT WALL COVERING	KOROGUARD	RIGID PLASTIC WALL GUARD	BRUSHED ALUMINUM	
P-1	PAINT	SHERWIN WILLIAMS	-	PASSIVE #SW 7064	
P-2	PAINT	SHERWIN WILLIAMS	-	WORDLY GRAY #SW 7043	SELECTED TO MATCH HIWC-1
P-3	PAINT	SHERWIN WILLIAMS	-	RAVE RED #SW 6608	
P-4	PAINT	SHERWIN WILLIAMS	-	INTENSE TEAL #SW 6943	

P-5	PAINT	SHERWIN WILLIAMS	-	HIGH REFLECTIVE WHITE #SW 7757	
P-6	PAINT	SHERWIN WILLIAMS	-	TIN LIZZIE #SW 9163	
P-7	PAINT	SHERWIN WILLIAMS	-	BLACK FOX #SW 7020	
P-8	PAINT	SHERWIN WILLIAMS	-	**TBD**	APPARATUS BAY OVERHEAD DOORS
WC-1	WALL COVERING	DL COUCH	CARGO LINEN TYPE II VINYL WALLCOVERING	HEIRLOOM L2-CO-15	
WC-2	WALL COVERING	DL COUCH	CARGO LINEN TYPE II VINYL WALLCOVERING	NAUTILUS L2-CO-12	
WC-3	WALL COVERING	DL COUCH	PANAMA LINEN VERSA GUARD	GREIGE #TYP3-121559	

WOODS & PLASTICS

Key	Material	Manufacturer	Style	Color	Description
SS-1	SOLID SURFACE	CORIAN	SOLID SURFACE	ASH CONCRETE	
PL-1	PLASTIC LAMINATE	WILSONART	STANDARD HDL	MANGALORE MANGO #7984-38	
WD	FINISHED WOOD	PER SPEC	-	TO MATCH PL-1	

SPECIALTIES/EQUIPMENT

Key	Material	Manufacturer	Style	Color	Description
CG-1	CORNER GUARDS	ACROVYN	VA-250N	DRIFTWOOD #262	
MT-1	METAL TRIM	SCHLUTER	RONDEC TBD	TBD	
MT-2	METAL TRIM	SCHLUTER	DILEX TBD	TBD	

GENERAL NOTES

A		Finish Plans are to be read in conjunction with Finish Schedules. Should there be a discrepancy between information given on the Finish/Color Schedule and any other Drawing or Specification, provide the higher quality finish.
B		Refer to Reflected Ceiling Plans for ceiling types and heights.
C		Refer to the Finish Legend, Interior Elevations and Finish Plans for definition, patterns, and extent of colors used.
D		All gypsum board soffits and ceilings shown on reflected ceiling plans to be painted to match adjacent wall color unless otherwise noted on Schedule or in drawings.
E		All exposed metal deck, exposed wood deck and plywood ceilings to be painted P-5 unless otherwise noted on Schedule or in drawings. Where adjacent walls are epoxy painted, exposed metal deck, exposed wood deck and plywood ceilings to be painted EP-5 unless otherwise noted on Schedule or in drawings.
F		All exposed steel columns and structure to be painted P-7 unless otherwise noted on Schedule or in drawings.
G		Paint all mechanical louvers, grilles, and registers to match adjacent wall color, unless otherwise noted on Schedule or in drawings.
H		All hollow metal doors, hollow metal door frames, and hollow metal borrowed light frames to be painted P-7 unless otherwise noted in Schedule or on drawings.
I		All solid surface window sills to be SS-1 unless otherwise noted on Schedule or in drawings.
J		All plastic laminate casework to be PL-1 unless otherwise noted in schedule. See schedule for countertop material and colors.
K		All exposed pipes and ductwork on walls to be painted to match adjacent wall unless otherwise noted on Schedule or in drawings.
L		All plywood shelves & cleats to be painted to match wall color unless otherwise noted on Schedule or in drawings.
M		All steel stair stringers and underside of steel stairs to be painted P-7. All steel ladders, steel guardrails & steel handrail brackets to be painted P-7.
M		All finished wood to be stained WD.
O		All wood trim around windows to be painted P-7 unless otherwise noted on Schedule or in drawings.

SIGN SCHEDULE

CON. RM. #	CONSTRUCTION RM. NAME	QTY	OWNER RM. #	SIGN TEXT	SIGN TYPE/ REF. DWG	REMARKS
A101	VEST.	-	-	-	-	
A102	LOBBY	-	-	-	-	
A103	CORRIDOR	-	-	-	-	
A104	PASSAGE	-	-	-	-	
A105	CORRIDOR	-	-	-	-	
A106	VEST.	-	-	-	-	
A107	CORRIDOR	-	-	-	-	
A108	CORRIDOR	-	-	-	-	
A109	CORRIDOR	-	-	-	-	
A111	CORRIDOR	-	-	-	-	
A112	FIRE LOBBY	-	-	-	-	
A113	VEST.	-	-	-	-	
A114	CORRIDOR	-	-	-	-	
A115	CORRIDOR	-	-	-	-	
A116	CORRIDOR	-	-	-	-	
A117	CORRIDOR	-	-	-	-	
A118	CORRIDOR	-	-	-	-	
A119	H.C.T.	1	###	RESTROOM	A	
A120	H.C.T.	1	###	RESTROOM	B	
A121	CHIEF'S OFFICE	1	###	CHIEF'S OFFICE	E	
A122	SHARED OFFICE	1	###	SHARED OFFICE	E	
A123	BILLING OFFICE	1	###	BILLING OFFICE	F	
A124	CEO OFFICE	1	###	CEO OFFICE	E	
A125	APPARATUS BAY	1	###	FIRE APPARATUS BAY	F	
A126	EMS DIRTY	1	###	EMS DIRTY	F	
A127	EMS CLEAN	1	###	EMS CLEAN	F	
A128	EMS OXYGEN	1	###	EMS OXYGEN	F	
A129	HAZARDOUS WASTE	1	###	HAZARDOUS WASTE	F	
A130	CUST.	1	###	CUST.	F	
A131	EMS STORAGE	1	###	EMS STORAGE	F	
A132	WOMEN	1	###	WOMEN	A	
A133	MEN	1	###	MEN	B	
A134	LOCKERS	1	-	BUNK NO. 1	15/A9.03	WOOD SIGN- SEE DETAIL
A134	LOCKERS	1	###	BUNK NO. 1	F	
A135	EMS BUNK	-	-	-	-	
A136	LOCKERS	1	-	BUNK NO. 2	15/A9.03	WOOD SIGN- SEE DETAIL
A136	LOCKERS	1	###	BUNK NO. 2	F	
A137	EMS BUNK	-	-	-	-	

SIGN SCHEDULE

CON. RM. #	CONSTRUCTION RM. NAME	QTY	OWNER RM. #	SIGN TEXT	SIGN TYPE/ REF. DWG	REMARKS
A138	LOCKERS	1	-	BUNK NO. 3	15/A9.03	WOOD SIGN- SEE DETAIL
A138	LOCKERS	1	###	BUNK NO. 3	F	
A139	EMS BUNK	-	-	-	-	
A140	LOCKERS	1	-	BUNK NO. 4	15/A9.03	WOOD SIGN- SEE DETAIL
A140	LOCKERS	1	###	BUNK NO. 4	F	
A141	EMS BUNK	-	-	-	-	
A142	CLOSET	1	-	-	-	
A143	EMS KITCHEN	2	###	EMS KITCHEN	F	
A144	EMS DAY ROOM	1	###	EMS DAY ROOM	F	
A145	EMS CONFERENCE	1	###	EMS CONFERENCE	F	
A146	GENERAL STORAGE	1	###	GENERAL STORAGE	F	
A147	STORAGE	1	###	STORAGE	F	
A148	TABLE & CHAIR STORAGE	1	###	TABLE & CHAIR STORAGE	F	
A149	CUSTODIAN	1	###	CUSTODIAN	F	
A150	STORAGE	1	###	STORAGE	F	
A151	SHARED ELECTRICAL	1	###	SHARED ELECTRICAL	F	
A152	MECHANICAL	1	###	MECHANICAL	F	
A153	OMITTED	-	-	-	-	
A154	STORAGE	1	###	STORAGE	F	
A155	STORAGE	1	###	STORAGE	F	
A156	SHARED LAUNDRY	1	###	LAUNDRY	F	
A157	SHARED FITNESS	1	###	FITNESS	F	
A158	OMITTED	-	-	-	-	
A159	TECH/DATA	1	###	TECH/DATA		
A160	EMS PROP STORAGE	1	###	EMS PROP STORAGE	F	
A161	SHARED MEETING ROOM	1	###	SHARED MEETING ROOM	F	
A162	SHARED MEETING ROOM	1	###	SHARED MEETING ROOM	F	
A163	FIRE PROP STOR.	2	###	FIRE PROP STOR.	F	
A164	WOMEN'S TOILET	1	###	WOMEN'S TOILET	F	
A165	MEN'S TOILET	1	###	MEN'S TOILET	F	
A166	FIRE DAY ROOM	2	###	FIRE DAY ROOM	F	
A167	FIRE KITCHEN	1	###	FIRE KITCHEN	F	
A168	LOCKER ALCOVE	1	-	BUNK NO. 1	15/A9.03	WOOD SIGN- SEE DETAIL
A168	LOCKER ALCOVE	1	###	BUNK NO. 1	F	
A169	FIRE BUNK ROOM	-	-	-	-	
A170	LOCKER ALCOVE	1	-	BUNK NO. 2	15/A9.03	WOOD SIGN- SEE DETAIL
A170	LOCKER ALCOVE	1	###	BUNK NO. 2	F	
A171	FIRE BUNK ROOM	-	-	-	-	

SIGN SCHEDULE

CON. RM. #	CONSTRUCTION RM. NAME	QTY	OWNER RM. #	SIGN TEXT	SIGN TYPE/ REF. DWG	REMARKS
A172	LOCKER ALCOVE	1	-	BUNK NO. 3	15/A9.03	WOOD SIGN- SEE DETAIL
A172	LOCKER ALCOVE	1	###	BUNK NO. 3	F	
A173	FIRE BUNK ROOM	-	-	-	-	
A174	LOCKER ALCOVE	1	-	BUNK NO.4	15/A9.03	WOOD SIGN- SEE DETAIL
A174	LOCKER ALCOVE	1	###	BUNK NO.4	F	
A175	FIRE BUNK ROOM	-	-	-	-	
A176	LOCKER ALCOVE	1	-	BUNK NO. 5	15/A9.03	WOOD SIGN- SEE DETAIL
A176	LOCKER ALCOVE	1	###	BUNK NO. 5	F	
A177	FIRE BUNK ROOM	-	-	-	-	
A178	LOCKER ALCOVE	1	-	BUNK NO. 6	15/A9.03	WOOD SIGN- SEE DETAIL
A178	LOCKER ALCOVE	1	###	BUNK NO. 6	F	
A179	FIRE BUNK ROOM	-	-	-	-	
A180	LOCKER ALCOVE	1	-	BUNK NO. 7	15/A9.03	WOOD SIGN- SEE DETAIL
A180	LOCKER ALCOVE	1	###	BUNK NO. 7	F	
A181	FIRE SHIFT BUNK	-	-	-	-	
A182	FIRE BUNK TOILET	1	###	FIRE BUNK TOILET	F	
A183	FIRE BUNK TOILET	1	###	FIRE BUNK TOILET	F	
A184	FIRE BUNK TOILET	1	###	FIRE BUNK TOILET	F	
A185	FUTURE WORK ROOM	1	###	FUTURE WORK ROOM	F	
A186	FILE STORAGE	2	###	FILE STORAGE	F	
A187	CLOSET	-	###	CLOSET	F	
A188	FIRE CHIEF	-	###	FIRE CHIEF	E	
A189	SHARED OFFICE	1	###	SHARED OFFICE	E	
A190	OFFICE	1	###	OFFICE	E	
A191	OFFICE	-	###	OFFICE	E	
A192	FUTURE OFFICE		###	FUTURE OFFICE	E	
A193	FUTURE OFFICE	1	###	FUTURE OFFICE	E	
A194	FIRE CONFERENCE	1	###	FIRE CONFERENCE	F	
B11	STAIR B1	-	-	-	-	
B101	CORRIDOR	-	-	-	-	
B102	PASSAGE	-	-	-	-	
B103	PASSAGE	-	-	-	-	
B104	PASSAGE	-	-	-	-	
B105	FIRE WATCH ROOM	1	###	FIRE WATCH ROOM	F	
B106	STORAGE	1	###	STORAGE	F	
B107	STORAGE	1	###	STORAGE	F	
B108	FIRE DECON LAUNDRY	1	###	FIRE DECON LAUNDRY	F	
B109	UNISEX TOILET	1	###	UNISEX TOILET	F	

SIGN SCHEDULE

CON. RM. #	CONSTRUCTION RM. NAME	QTY	OWNER RM. #	SIGN TEXT	SIGN TYPE/ REF. DWG	REMARKS
B110	FIRE WORK ROOM	1	###	FIRE WORK ROOM	F	
B111	CUSTODIAN	1	###	CUSTODIAN	F	
B112	FIRE APPARATUS BAY	1	###	FIRE APPARATUS BAY	F	
B113	FIREMATIC STORAGE	2	###	FIREMATIC STORAGE	F	
B114	STORAGE	1	###	STORAGE	F	
B115	TURNOUT GEAR	1	###	TURNOUT GEAR	F	
B116	S.C.B.A.	1	###	S.C.B.A.	F	
B117	BOTTLE FILL STATION	1	###	BOTTLE FILL STATION	F	
B118	MEZZANINE	-	-	-	-	
B119	COMPRESSOR	-	-	-	-	

HORIZONTAL BLIND LOCATION SCHEDULE

Room No.	Rm Name	Location	Qty.	Remarks
A145	EMS CONFERENCE	light in door A145	2	provide hold down clips at bottom
A194	FIRE CONFERENCE	light in door A194	1	provide hold down clips at bottom

ROLLER SHADE LOCATION SCHEDULE

Room No.	Rm Name	Window Elev.	Qty.	Fabric Type	Remarks
A121	CHIEF'S OFFICE		1	light-filtering	single roller
A122	SHARED OFFICE		2	light-filtering	single roller
A123	BILLING OFFICE		2	light-filtering	single roller
A124	CEO OFFICE		2	light-filtering	single roller
A135	EMS BUNK		1	light-blocking	single roller
A137	EMS BUNK		1	light-blocking	single roller
A135	EMS BUNK		1	light-blocking	single roller
A141	EMS BUNK		1	light-blocking	single roller
A166	FIRE DAY ROOM		2	light-filtering	single roller
A169	FIRE BUNK ROOM		1	light-blocking	single roller
A171	FIRE BUNK ROOM		1	light-blocking	single roller
A173	FIRE BUNK ROOM		1	light-blocking	single roller
A175	FIRE BUNK ROOM		1	light-blocking	single roller
A177	FIRE BUNK ROOM		1	light-blocking	single roller
A179	FIRE BUNK ROOM		1	light-blocking	single roller
A188	FIRE CHIEF		2	light-filtering	single roller
A189	SHARED OFFICE		2	light-filtering	single roller
A190	OFFICE		1	light-filtering	single roller
A191	OFFICE		1	light-filtering	single roller
A192	FUTURE OFFICE		1	light-filtering	single roller
A193	FUTURE OFFICE		1	light-filtering	single roller
B105	FIRE WATCH ROOM		3	light-filtering	single roller

SECTION 28 23 13 – INDOOR IP CAMERAS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The Contractor, Subcontractors, and/or suppliers providing goods and services referenced in or related to this Section shall also be bound by the Related Documents identified in Division 01 Section "Summary."

1.2 SUMMARY

A. This section includes indoor, dome, covert and detention style network cameras for video surveillance.

B. Furnish labor, materials, inspections, supervision, etc., necessary for a turnkey installation and operation of the equipment specified herein. Work includes furnishing all items and accessories required or necessary for the correct operation of the equipment as shown on plans and/or specified herein exception of those items noted within this specification as being provided by others.

C. Related Sections

1. Section 08 71 00 Door Hardware
2. Section 21 00 00 Fire Suppression
3. Section 26 00 00 Electrical (including related sub-sections)
4. Section 28 00 00 Electronic Safety and Security
5. Section 28 05 13 Wire and Cable
6. Section 28 10 00 Electronic Access Control System
7. Section 28 20 00 Electronic Access Control and Intrusion Detection
8. Section 28 21 29 Data Communications Switches and Hubs
9. Section 28 23 00 Video Management System
10. Section 28 23 13 Indoor IP Cameras
11. Section 28 23 23 Outdoor IP Cameras
12. Section 28 23 33 Multisensor Cameras
13. Section 28 60 00 Security Rack, Console and Equipment

1.3 REFERENCES

A. Follow provisions of Section 28 00 00 Electronic Safety and Security.

1.4 ADMINISTRATIVE REQUIRMENTS

A. Coordination:

1. Coordinate with Owner or Owner's representative regarding camera network configuration and estimated bandwidth utilization prior to performing network connections.

2. Coordinate all work that must be performed in security head end spaces with the General Contractor, the Electrical Contractor, and the Telecommunications Contractor (if applicable).

3. Coordinate space allocation and network IP addresses with the IT department.

1.5 DESCRIPTION OF WORK

A. General Requirements

1. Furnish all labor, materials, tools, equipment, and services for a complete security system as indicated and in accordance with provisions of the contract documents.

2. Although such work is not specifically indicated, furnish and install all supplementary or miscellaneous items, and devices incidental to or necessary for a sound, secure and complete installation.

3. Comply with the provisions of Division 1 for General Requirements.

   a. In the event of a conflict between the provisions of this Section and Division 1, the more stringent provisions shall apply.

4. All system devices and components included shall be compatible.

5. Units of the same type of equipment shall be products of a single manufacturer. All material and equipment shall be new and currently in production. Each major component of equipment shall have the manufacturer's model and serial number in a conspicuous place.

6. Refer to drawings depicting ceiling types for accurate camera mounts. Drop and hard ceilings shall utilize in-ceiling mounts. Hard ceilings, which will not accept in-ceiling mounts shall utilize surface mount.

7. Cameras shall include all accessories, including dome covers, knockout plugs, adaptors, etc,. for a complete installation.

8. The Contractor is responsible for providing and coordinating external electrical power for each camera including, but not limited to, PoE, PoE+ and power injectors whether indicated on the contract documents or not.

1.6 INFORMATIONAL SUBMITTALS

A. Follow provisions of Section 28 00 00 Electronic Safety and Security.

B. Qualification Statements:

1. Manufacturer:

   a. Submit confirmation and details of manufacturer’s warranty, extended warranty, and replacement policies.

2. Contractor:

   a. Submit confirmation that Contractor is licensed to install video surveillance and security equipment as required by authority having jurisdiction.

b. Submit confirmation that installer or the entity installing or supervising the installation of this equipment has received manufacturer training and is certified by manufacturer on this equipment and that training the installer received is current.

C. Product Data: Manufacturer's product information and data sheets for each product specified in this section, including:

1. Substrate preparation instructions and recommendations.
2. Indicate component materials and dimensions and include construction and application details.
3. Installation means and methods.
4. Recommendations and requirements for proper storage and handling.

D. Video Quality test reports shall be provided for all cameras to confirm an optimum high definition video signal.

E. Shop Drawings:

1. Submit Manufacturer’s approved shop drawings detailing the section and elevation views of each product to be installed.
2. Battery calculations to show the expected loads and backup duration for camera power supplies and UPS devices for all active surveillance equipment.
3. Color samples.
4. Supply camera titles and descriptions prior to system programming.
5. Supply programming/database prior to performance testing.
6. Supply a cross reference between specified camera numbers and programmed camera numbers.
7. Supply final programming, camera images and system documentation on electronic media to Owner.

F. Warranty Information:

1. Submit confirmation and details of manufacturer’s warranty, extended warranty, and replacement policies.

G. System Support Resources:

1. Submit a list of available manufacturers providing fee based professional services available to the Contractor or Owner, including but not limited to the following:

a. Training.

b. Installation.

c. Commissioning.

d. Remote diagnostics and integration with 3rd party software and hardware systems.

1.7 CLOSEOUT SUBMITTALS

A. Supply licensing and registration information for all software, hardware, firmware, operational, and administrative licenses.

B. Supply network configuration backup files, restoration application and instructions.

1.8 QUALITY ASSURANCE

A. Follow provisions of Section 28 00 00 Electronic Safety and Security.

B. Qualifications - Manufacturers:

1. Manufacturer(s) suppling products noted in this section must have a minimum of 5 years in business.

C. Qualifications - Installers:

1. Installer must be licensed to install video surveillance and security equipment as required by authority having jurisdiction.

2. Installer must be capable of providing references that will attest to successful completion of projects of similar scope as the work noted in this section.

3. Installer must be certified by the manufacturer and be up to date with all training required to maintain good standing.

D. Mock-Ups: Provide a mock-up for evaluation of installer's workmanship.

1. Do not proceed with remaining Work until workmanship is approved by Architect.

2. Refinish mock-up area as required to produce acceptable work.

1.9 WARRANTY

A. Manufacturer Warranty: Provide manufacturer's warranty covering parts and labor costs to repair or replace part that fail to perform.

1. Warranty Period: Parts and labor warranty for 12 months from date of Substantial Completion.

2. Service During Warranty: Provide direct support to Owner via phone and email, including access to training and education in the form of documents, videos and other materials via the internet.

3. All equipment provided shall be backed by a minimum of three years manufacturer warranty.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis of Design Manufacturer: Avigilon.

1. Address: 555 Robson St., Vancouver, BC, V6B 1A6, Canada.
2. Phone: (888) 281-5182.
3. Website: www.avigilon.com.

B. No Substitutions Allowed

2.2 CAMERA LINE

A. H5A

2.3 DESIGN CRITERIA

A. General:

1. The CCTV System shall provide video surveillance, assessment, and visual alarm monitoring of selected interior access doors as well as other critical areas of the building as specified on the Contract Drawings.
2. Refer to Contract Documents for camera minimum resolution requirements.
3. The camera shall:

a. Be equipped with Day/Night functionality.
b. Be equipped with remote zoom and focus capabilities.
c. Be equipped with a slot for microSD/microSDHC/microSDXC memory card expansion.
d. Be manufactured with a vandal resistant body.
e. Be provided with wall and ceiling mounts as indicated on the Contract Drawings and Schedules.
f. Be recorded on the Network Video Recorder (NVR) and provide full video at all times.
g. Shall include camera licenses.
h. Shall be compatible with the VMS.
i. Shall provide multi-stream so that recording and viewing can be at different frame rate and compression.
j. Power supplies shall provide:

i. 120 VAC input and output voltage as required
ii. UL Listed
iii. Power fail contacts to monitor the status of the input power
iv. Key lockable wall mount metal enclosure with tamper switch

v. Independently fused outputs

B. System Design:

1. All cameras in this section must be designed in a modular fashion such that mounts, mounting components and hardware are universal and not integrated directly with the camera itself.

2. Video monitoring system must be tightly integrated using application programming interfaces and software development kits.

3. All systems must be capable of functioning autonomously during a failure of one or more of the related sections.

4. Cameras in this section must be capable of bi-directional communication.

5. Video monitoring system to be interfaced through digital communication protocols including but not limited to ASCII or Hexadecimal Data Transmissions. The Security Contractor shall furnish and install the surveillance system, consisting of camera assemblies, network switches, wiring & cabling, and low voltage camera power supplies.

   a. All active surveillance equipment and devices shall be on emergency/UPS/ battery backup power.

6. Camera assemblies include camera, lens, housing, and mount. Provide and install wiring and low voltage power from the security wall field/rack to the camera locations.

   a. Scope of work shall be complete from point of origin (camera) to point of termination (security rack).

7. The CCTV cameras shall be connected to the local area network with signals routed to a new network video recorder for recording, storage and video retrieval.

8. Camera lenses for fixed cameras shall be varifocal and sized to provide the owner approved field of view. The lens shall be IR corrected and have megapixel resolution.

9. Surveillance camera audio functions shall not be installed and/or disabled unless specifically requested by Owner.

10. Edge storage

    a. The camera shall support continuous and event controlled recording to:

       i. Local memory added to the cameras SD-card slot.

    b. The camera shall be able to detect and notify Edge storage disruptions.

    c. Secure digital cards providing 5 days of storage capacity.

       i. Follow video storage as defined in Section 28 23 00.

    d. Secure digital cards tested and approved from the manufacturer shall be

provided and installed at each camera.

C. System Certifications:

1. cULus certification mark for Canada/USA.

D. Safety Standards:

1. UL/CSA/IEC/EN 60950-1.
2. With IR: IEC 62471.

E. Electromagnetic Emissions Standards:

1. FCC Part 15 Subpart B Class B.
2. ICES-003 Class B.
3. EN 55032 Class B.
4. EN 61000-6-3.
5. EN 61000-3-2.
6. EN 61000-3-3.

F. Electromagnetic Emissions Standards:

1. EN 55024.
2. EN 61000-6-1.

2.4 PERFORMANCE REQUIREMENTS

A. Standards:

1. Video Standards: H.265 / H.264 / MJPEG / HDSM SmartCodec technology.
2. Image Standards: MPEG-4 - ISO/IEC 14496-10 AVC (H.264).
3. Networking Standards:
    a. IEEE 802.3af (Power over Ethernet).
    b. IEEE 802.1X (Authentication).
    c. IPv4 (RFC 791).
    d. IPv6.

B. Video Requirements:

1. Provide cameras capable of simultaneously delivering at least two individual video streams, for use when connecting to the Video Management Software for recording

and live viewing.

2. Provide cameras with a primary stream capable of supporting the video resolution and aspect ratio and capable of generating the image framerates noted in this section.

3. By generating a secondary stream at fractional resolutions of the primary stream, Video device must support HDSM-High Definition Stream Management and/or Dynamic Bandwidth Management.

C. Encoding Requirements:

1. Support compression and image quality settings from 1 to 20 to configure bandwidth utilized by the camera and desired image response. Provide user configuration of compression quality and image rate per camera.

2. Provide independently configured simultaneous H.265, H.264 and Motion JPEG streams (multi-stream).

3. Support Motion JPEG encoding in a selectable range from 1 up to 30 frames per second based on resolution configured.

4. Support H.264 encoding in a selectable range from 1 up to 30 frames per second based on resolution configured.

5. Support H.265 encoding in a selectable range from 1 up to 30 frames per second based on resolution configured.

6. Support Variable Bit Rate (VBR) in H.264 with a configurable maximum bit rate threshold.

7. Support Variable Bit Rate (VBR) in H.265 with a configurable maximum bit rate threshold.

8. Provide user configuration of compression format, compression quality, maximum bit rate, key frame interval, and image rate per camera.

9. Support motion compensation and motion vector during motion estimation in H.264, able to maintain frame rate, regardless of scene complexity, when bandwidth is capped at 12mbps at 30 FPS for 1-3MP and 20mbps at 30 FPS for 5-8MP.

10. Support G.711 PCM 8kHz audio compression.

D. Provide cameras that allow video and audio signals to be transported over:

1. HTTP (Unicast).

2. HTTPS (Unicast).

3. RTP (Unicast & Multicast).

4. RTP over RTSP (Unicast).

5. RTP over RTSP over HTTP (Unicast).

6. RTP over RTSP over HTTPS (Unicast).

E. Image Control Requirements:

1. User Configurations Supported:

a. Automatic and manual white balance control.

b. Automatic and manually defined exposure zones operating in the range 1/7 to 1/8196 sec second.

c. Flicker control (50 Hz, 60 Hz).

d. Automatic and manual iris control.

e. Color saturation and sharpening.

f. Motion detection sensitivity and threshold.

g. Digital rotation of the image when used with control center software.

h. Minimum Dynamic Range:

i. 83dB for 2-5MP and 85dB for 6-8MP. Dynamic Range shall not change based on configured encoding resolution.

F. Adaptive Video Analytics Specifications:

1. Configured Behaviors: Unlimited number of configured behaviors per video source supported.

2. Automatic Analytic set up and tuning of behavior identification:

a. Upon selection of analytic and Region of Interest (ROI), the device will automatically configure behavior identification.

b. The device will constantly monitor changes in the scene and perform a tuning of the behavior identification parameters as the scene environment changes.

3. Include detection of the following behaviors:

a. Object present in ROI.

b. Object enters ROI.

c. Object leaves ROI.

d. Object appeared.

e. Object disappeared.

f. Object crosses a line of interest or beam.

g. Object Movement Direction.

h. Object loitering.

i. Multiple objects in ROI over specified dwell time.

j. Dwell Time.

k. Number of objects exceeds limit in ROI.

l. Number of objects below limit in ROI.

m. Camera tampering.

G. Network Requirements: Provide video cameras that have the following network capabilities:

1. Supports both fixed (static) IP addresses and dynamically assigned IP addresses provided by a Dynamic Host Control Protocol (DHCP) server.

2. Supports user configuration of network parameters including:

a. Fixed (static) IP address.

b. Subnet mask.

c. Gateway.

d. Control port.

3. Are automatically detected when using a Video Management Application (VMA) or Network Video Recorder (NVR) supporting this feature.

4. Provides support for both IPv4 and IPv6 Networks.

H. Video Motion Detection Functionality Requirements: Provide video cameras capable of detecting motion based on:

1. Motion Detection Mask: Defined areas within the camera's field of view for the camera to detect motion.

2. Sensitivity: How much each pixel within the masked areas must change before it is considered in motion.

3. Threshold: Percentage of pixels that must detect change.

I. Event Functionality Requirements: Equip cameras with an integrated event functionality, which may be trigged by:

1. Alarm input terminal.

2. Video motion detection.

3. Camera temperature outside operative range.

J. Protocol Support Requirements: Provide video cameras that incorporate support for at least the following:

1. IPv4.

2. IPv6.
3. HTTP.
4. HTTPS.
5. SOAP.
6. DNS.
7. NTP.
8. RSTP.
9. RTCP.
10. RTP.
11. TCP.
12. UDP.
13. IGMP.
14. ICMP.
15. DHCP.
16. Zeroconf.
17. ARP.
18. SNMP v2c.
19. SNMP v3.

K. Streaming Support Requirements: Provide video cameras that incorporate support for at least the following:

1. RTP/UDP.
2. RTP/UDP multicast.
3. RTP/RTSP/TCP.
4. RTP/RTSP/HTTP/TCP.
5. RTP/RTSP/HTTPS/TCP.
6. HTTP.

L. Video Overlay Requirements: Provide video cameras with the following overlay requirements:

1. 64 individually configurable privacy zones to conceal defined areas in image as non-viewable. Masks required to be dynamically adjusted based on current zoom-factor, without capability of operator bypass.

2. Video masked by privacy zones must be obscured prior to streaming.

M. Security Requirements: Provide video cameras with the following security requirements:

1. Support the use of the following:

a. Password protection.

b. HTTPS Encryption.

c. Digest authentication.

d. WS authentication.

e. User access Log.

f. SSL encryption.

2. Restrict access to the built-in internet server by usernames and passwords at three different user group levels.

N. Electrical Power: Cameras capable of being powered by the following power sources:

1. PoE: IEEE 802.3af Class 3 PoE Compliant.

2. AC Power: 24 V +/- 10%, 15 VA min for bullet, 24 V +/- 10%, 13 VA min for dome, and 24 V +/- 10%, 9 VA min for box version.

3. DC Power: 12 V +/- 10%, 13 W min for bullet, 12 V +/- 10%, 12 W min for dome and 12 V +/- 10%, 7 W min for box version.

4. Battery Backup: 3V manganese lithium.

O. Installation and Maintenance Requirements: Provide video cameras with the following installation and maintenance requirements:

1. Allow firmware updates via network.

2. Store customer-specific settings in a non-volatile memory which cannot be lost during power cuts or soft reset.

3. Provide Microsoft Windows based management software, allowing camera configuration, upgrade of firmware, and backup of individual camera configurations.

P. Diagnostics:

1. Equipped with LEDs, indicating the camera's functional status, which may be user enabled or disabled.

2. Monitored by functionality which automatically reinitiates processes or restarts the unit if a malfunction is detected.

Q. Connectivity:

1. 100BASE-TX Fast Ethernet-port with RJ-45 socket, auto negotiation of network speed and transfer mode.

2. Terminal for receiving line level analog audio from an external microphone.

3. Terminal for providing line level analog audio for connection to an external speaker.

R. Operational Range:

1. Operating Temperature:

a. Box: -10 degrees C to +60 degrees C [14 F to 140 F].

b. Bullet (enclosed space): -40 degrees C to +60 degrees C [-40 F to 140 F].

c. Bullet (ambient convection): -40 degrees C to +65 degrees C [-40 F to 149 F].

d. Dome: -40 degrees C to +65 degrees C [-40 F to 140 F].

2. IR Illumination Operating Temperatures:

a. Indoor Dome: Up to +55 degrees C [131 F], 50% power from +44 degrees C to +55 degrees C [111 F to 131 F].

3. IR Illumination Hysteresis:

a. Indoor Dome: +2 degrees C [3.6 F].

4. Relative Humidity: 0–95 percent (non-condensing).

2.5 2.0 MEGAPIXEL INFRARED IP CAMERAS

A. 2.0 MP Infrared Indoor Dome-Type Camera with 3.3 - 9 mm lens.

1. Basis of Design Product: 2.0C-H5A-D1-IR, by Avigilon.

2. Performance:

a. Image Sensor: 1/2.8 inch progressive scan CMOS.

b. Maximum Resolution:

1) Aspect Ratio: 16:9: 1920 x 1080.

c. Imaging Rate: (50 Hz/60 Hz): 20 fps/30 fps.

d. Dynamic Range:

1) WDR Off: 83 dB.

2) WDR On: 126dB., dual exposure (30 fps).

3) WDR On: 132dB., triple exposure (20 fps or less).

e. Minimum Illumination:

1) Color: 0.027 lux.

2) Monochrome: 0.014 lux.

3) IR: 0.0 lux.

f. Field of View:

1) Horizontal angle: 16:9: 34 degrees to 99 degrees.

2) Vertical angle: 16:9: 18 degrees to 53 degrees.

B. 2.0 MP Infrared Indoor In-Ceiling Mount Camera with 3.3 - 9 mm lens.

1. Basis of Design Product: 2.0C-H5A-DC1-IR, by Avigilon.

2. Performance:

a. Image Sensor: 1/2.8 inch progressive scan CMOS.

b. Maximum Resolution:

1) Aspect Ratio: 16:9: 1920 x 1080.

c. Imaging Rate: (50 Hz/60 Hz): 20 fps/30 fps.

d. Dynamic Range:

1) WDR Off: 83 dB.

2) WDR On: 126dB., dual exposure (30 fps).

3) WDR On: 132dB., triple exposure (20 fps or less).

e. Minimum Illumination:

1) Color: 0.027 lux.

2) Monochrome: 0.014 lux.

3) IR: 0.0 lux.

f. Field of View:

1) Horizontal angle: 16:9: 34 degrees to 99 degrees.

2) Vertical angle: 16:9: 18 degrees to 53 degrees.

2.6 4.0 MEGAPIXEL INFRARED IP CAMERAS

A. 4.0 MP Infrared Indoor Dome-Type Camera with 3.3 - 9 mm lens.

1. Basis of Design Product: 4.0C-H5A-D1-IR, by Avigilon.
2. Performance:
    a. Image Sensor: 1/2.8 inch progressive scan CMOS.
    b. Maximum Resolution:
        1) Aspect Ratio: 16:9: 2560 x 1440.
        2) Aspect Ratio: 4:3: 2304x1728.
    c. Imaging Rate:
        1) WDR Off: (50 Hz/60 Hz): 25 fps/30 fps.
        2) WDR On: (50 Hz/60 Hz): 20 fps/20 fps.
    d. Dynamic Range:
        1) WDR Off: 83 dB.
        2) WDR On: 126dB.
    e. Minimum Illumination:
        1) Color: 0.030 lux.
        2) Monochrome: 0.015 lux.
        3) With IR: 0 lux.
    f. Field of View:
        1) Horizontal angle: 16:9: 34 degrees to 92 degrees.
        2) Horizontal angle: 4:3: 34 degrees to 92 degrees.
        3) Vertical angle: 16:9: 18 degrees to 50 degrees.
        4) Vertical angle: 4:3: 25 degrees to 68 degrees.

B. 4.0MP Infrared Indoor In-Ceiling Mount Camera with 3.3 - 9 mm lens.
1. Basis of Design Product: 4.0C-H5A-DC1-IR, by Avigilon.
2. Performance:
    a. Image Sensor: 1/2.8 inch progressive scan CMOS.
    b. Maximum Resolution:
        1) Aspect Ratio: 16:9: 2560 x 1440.
        2) Aspect Ratio: 4:3: 2304x1728.
    c. Imaging Rate:

1) WDR Off: (50 Hz/60 Hz): 25 fps/30 fps.

2) WDR On: (50 Hz/60 Hz): 20 fps/20 fps.

d. Dynamic Range:

1) WDR Off: 83 dB.

2) WDR On: 126dB.

e. Minimum Illumination:

1) Color: 0.030 lux.

2) Monochrome: 0.015 lux.

3) With IR: 0 lux.

f. Field of View:

1) Horizontal angle: 16:9: 34 degrees to 92 degrees.

2) Horizontal angle: 4:3: 34 degrees to 92 degrees.

3) Vertical angle: 16:9: 18 degrees to 50 degrees.

4) Vertical angle: 4:3: 25 degrees to 68 degrees.

2.7 6.0 MEGAPIXEL INFRARED IP CAMERAS

A. 6.0 MP Infrared Indoor Dome-Type Camera with 4.9 - 8 mm lens.

1. Basis of Design Product: 6.0C-H5A-D1-IR, by Avigilon.

2. Performance:

a. Image Sensor: 1/1.8 inch progressive scan CMOS.

b. Maximum Resolution:

1) Aspect Ratio: 16:9: 3200 x 1800.

2) Aspect Ratio: 3:2: 3072x2048.

c. Imaging Rate: (50 Hz/60 Hz): 25 fps/30 fps.

d. Dynamic Range:

1) WDR Off: 85 dB.

2) WDR On: 120dB.

e. Minimum Illumination:

1) Color: 0.055 lux.

2) Monochrome: 0.028 lux.

3) With IR: 0 lux.

f. Field of View:

1) Horizontal angle: 16:9: 52 degrees to 92 degrees.

2) Horizontal angle: 3:2: 41 degrees to 73 degrees.

3) Vertical angle: 16:9: 29 degrees to 51 degrees.

4) Vertical angle: 3:2: 27 degrees to 48 degrees.

B. 6.0 MP Infrared Indoor In-Ceiling Mount Camera with 4.9 - 8 mm lens.

1. Basis of Design Product: 6.0C-H5A-DC1-IR, by Avigilon.

2. Performance:

a. Image Sensor: 1/1.8 inch progressive scan CMOS.

b. Maximum Resolution:

1) Aspect Ratio: 16:9: 3200 x 1800.

2) Aspect Ratio: 3:2: 3072x2048.

c. Imaging Rate: (50 Hz/60 Hz): 25 fps/30 fps.

d. Dynamic Range:

1) WDR Off: 85 dB.

2) WDR On: 120dB.

e. Minimum Illumination:

1) Color: 0.055 lux.

2) Monochrome: 0.028 lux.

3) With IR: 0 lux.

f. Field of View:

1) Horizontal angle: 16:9: 52 degrees to 92 degrees.

2) Horizontal angle: 3:2: 41 degrees to 73 degrees.

3) Vertical angle: 16:9: 29 degrees to 51 degrees.

4) Vertical angle: 3:2: 27 degrees to 48 degrees.

2.8 8.0 MEGAPIXEL INFRARED IP CAMERAS

A. 8.0 MP Infrared Indoor Dome-Type Camera with 4.9 - 8 mm lens.

1. Basis of Design Product: 8.0C-H5A-D1-IR, by Avigilon.

2. Performance:

a. Image Sensor: 1/1.8 inch progressive scan CMOS.

b. Maximum Resolution:

1) Aspect Ratio: 16:9: 3840x2160.

c. Imaging Rate: (50 Hz/60 Hz): 25 fps/30 fps.

d. Dynamic Range:

1) WDR Off: 85 dB.

2) WDR On: 120dB.

e. Minimum Illumination:

1) Color: 0.055 lux.

2) Monochrome: 0.028 lux.

f. Field of View:

1) Horizontal angle: 16:9: 52 degrees to 92 degrees.

2) Vertical angle: 16:9: 29 degrees to 51 degrees.

B. 8.0 MP Infrared Indoor In-Ceiling Mount Camera with 4.9 - 8 mm lens.

1. Basis of Design Product: 8.0C-H5A-DC1-IR, by Avigilon.

2. Performance:

a. Image Sensor: 1/1.8 inch progressive scan CMOS.

b. Maximum Resolution:

1) Aspect Ratio: 16:9: 3840x2160.

c. Imaging Rate: (50 Hz/60 Hz): 25 fps/30 fps.

d. Dynamic Range:

1) WDR Off: 85 dB.

2) WDR On: 120dB.

e. Minimum Illumination:

1) Color: 0.055 lux.

2) Monochrome: 0.028 lux.

f. Field of View:

1) Horizontal angle: 16:9: 52 degrees to 92 degrees.

2) Vertical angle: 16:9: 29 degrees to 51 degrees.

2.9 ACCESSORIES:

A. Brackets and Mounts:

1. H4A-MT-NPTA1: Indoor/outdoor pendant NPT mount.
2. H4A-MT-WALL1: Indoor/outdoor pendant wall arm mount.

B. Camera Covers:

1. H4A-DC-SMOK1: In-ceiling dome camera cover with smoked bubble.
2. H4A-DD-SMOK1: Indoor dome camera cover with smoked bubble.

C. Other:

1. CM-AC-GROM1 : Pipe grommets.
2. H4A-AC-GROM1: Camera sealing grommets.
3. H4A-DD-SDWL1: Indoor dome camera sidewall knockout plugs.
4. H4-DC-CPNL1: Metal ceiling panel.

2.10 SECURE DIGITAL CARDS

1. SanDisk
2. Panasonic
3. Samsung
4. Or Approved Equal

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of Conditions: Do not begin installation until substrates have been properly prepared.

B. Evaluation and Assessment: If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Surface Preparation: Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

A. Install all products in this section following the product manufacturer’s published installation and application manuals and guidelines.

3.4 System Startup

A. Test equipment and configure system in accordance with instructions provided by the manufacturer prior to installation.

B. Review configurable features of the device with the Owner's Representative and establish a punch list for standard, device specific, location specific and VMA/NVR specific configuration of device(s).

1. Program and configure devices in accordance with this punch list so no additional programming is required for operation by the user.

C. Configure equipment requiring users to log on using a password with user/site-specific credentials. Default passwords are not acceptable and must be configured prior to project closeout.

D. Provide products with the latest and most up-to-date firmware by the manufacturer or provide firmware of a version specified by the provider of the Video Management Application (VMA) or Network Video Recorder (NVR).

3.5 Adjusting

A. Fine Tuning: Perform field software changes after initial programming session to "fine tune" operating parameters and sequence of operations based on any revisions to Owner's operating requirements.

3.6 Closeout

A. Demonstration:

1. Demonstrate administration and operation of devices described by this section.
2. Demonstrate how to authorize users and applications to operate and configure installed devices.
3. Demonstrate how an authorized user can gain access to and make changes to configuration.
4. Demonstrate how to operate functionality configured for this project as defined by configuration punch list.

B. License Assignment:

1. Register software, hardware, firmware, operational or administrative licenses necessary for to operate or administer devices to Owner.
2. Deliver to Owner's Representative proof of license registration from product manufacturer.

C. Device Configuration Backup:

1. Using manufacturer's backup software tool or VMA/NVR, perform a full system back-up at completion of initial programming.
2. Deliver configuration backup files, restoration application and instructions detailing for restoration of back-up configuration.

END OF SECTION 28 23 13

SECTION 28 23 23 – OUTDOOR IP CAMERAS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The Contractor, Subcontractors, and/or suppliers providing goods and services referenced in or related to this Section shall also be bound by the Related Documents identified in Division 01 Section "Summary."

1.2 SUMMARY

A. This section includes outdoor, dome-type network cameras for video surveillance.

B. Furnish labor, materials, inspections, supervision, etc., necessary for a turnkey installation and operation of the equipment specified herein. Work includes furnishing all items and accessories required or necessary for the correct operation of the equipment as shown on plans and/or specified herein exception of those items noted within this specification as being provided by others.

C. Related Sections

1. Section 08 71 00 Door Hardware
2. Section 21 00 00 Fire Suppression
3. Section 26 00 00 Electrical (including related sub-sections)
4. Section 28 00 00 Electronic Safety and Security
5. Section 28 05 13 Wire and Cable
6. Section 28 10 00 Electronic Access Control System
7. Section 28 20 00 Electronic Access Control and Intrusion Detection
8. Section 28 21 29 Data Communications Switches and Hubs
9. Section 28 23 00 Video Management System
10. Section 28 23 13 Indoor IP Cameras
11. Section 28 23 23 Outdoor IP Cameras
12. Section 28 23 33 Multisensor Cameras
13. Section 28 60 00 Security Rack, Console and Equipment

1.3 REFERENCES

A. Follow provisions of Section 28 00 00 Electronic Safety and Security.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Coordinate with Owner or Owner's representative regarding camera network configuration and estimated bandwidth utilization prior to performing network connections.

2. Coordinate all work that must be performed in security head end spaces with the General Contractor, the Electrical Contractor, and the Telecommunications Contractor (if applicable).

3. Coordinate space allocation and network IP addresses with the IT department.

1.5 DESCRIPTION OF WORK

A. General Requirements

1. Furnish all labor, materials, tools, equipment, and services for a complete security system as indicated and in accordance with provisions of the contract documents.

2. Although such work is not specifically indicated, furnish and install all supplementary or miscellaneous items, and devices incidental to or necessary for a sound, secure and complete installation.

3. Comply with the provisions of Division 1 for General Requirements.

a. In the event of a conflict between the provisions of this Section and Division 1, the more stringent provisions shall apply.

4. All system devices and components included shall be compatible.

5. Units of the same type of equipment shall be products of a single manufacturer. All material and equipment shall be new and currently in production. Each major component of equipment shall have the manufacturer's model and serial number in a conspicuous place.

6. Cameras shall be protected from lightning if mounted on the exterior.

7. Cameras shall include all accessories, including dome covers, knockout plugs, adaptors, etc,. for a complete installation.

8. The Contractor is responsible for providing and coordinating external electrical power for each camera including, but not limited to, PoE, PoE+ and power injectors whether indicated on the contract documents or not.

1.6 INFORMATIONAL SUBMITTALS

A. Submit under provisions of Section 01 30 00.

B. Qualification Statements:

1. Manufacturer:

a. Submit confirmation and details of manufacturer’s warranty, extended warranty, and replacement policies.

2. Contractor:

a. Submit confirmation that Contractor is licensed to install video surveillance and security equipment as required by authority having jurisdiction.

b. Submit confirmation that installer or the entity installing or supervising the installation of this equipment has received manufacturer training and is certified by manufacturer on this equipment and that training the installer received is current.

C. Product Data: Manufacturer's product information and data sheets for each product specified in this section, including:

1. Substrate preparation instructions and recommendations.

2. Indicate component materials and dimensions and include construction and application details.

3. Installation means and methods.

4. Recommendations and requirements for proper storage and handling.

D. Video Quality test reports shall be provided for all cameras to confirm an optimum high definition video signal.

E. Shop Drawings:

1. Submit Manufacturer’s approved shop drawings detailing the section and elevation views of each product to be installed.

2. Battery calculations to show the expected loads and backup duration for camera power supplies and UPS devices for all active surveillance equipment.

3. Color samples.

4. Supply camera titles and descriptions prior to system programming.

5. Supply programming/database prior to performance testing.

6. Supply a cross reference between specified camera numbers and programmed camera numbers.

7. Supply final programming, camera images and system documentation on electronic media to Owner.

F. Warranty Information:

1. Submit confirmation and details of manufacturer’s warranty, extended warranty, and replacement policies.

G. System Support Resources:

1. Submit a list of available manufacturers providing fee based professional services available to the Contractor or Owner, including but not limited to the following:

a. Training.

b. Installation.

c. Commissioning.

d. Remote diagnostics and integration with 3rd party software and hardware systems.

1.7 CLOSEOUT SUBMITTALS

A. Supply licensing and registration information for all software, hardware, firmware, operational, and administrative licenses.

B. Supply network configuration backup files, restoration application and instructions.

1.8 QUALITY ASSURANCE

A. Follow provisions of Section 28 00 00 Electronic Safety and Security.

B. All equipment provided shall be backed by a minimum of three years manufacturer warranty.

C. Qualifications - Manufacturers:

1. Manufacturer(s) suppling products noted in this section must have a minimum of 5 years in business.

D. Qualifications - Installers:

1. Installer must be licensed to install video surveillance and security equipment as required by authority having jurisdiction.

2. Installer must be capable of providing references that will attest to successful completion of projects of similar scope as the work noted in this section.

3. Installer must be certified by the manufacturer and be up to date with all training required to maintain good standing.

E. Mock-Ups: Provide a mock-up for evaluation of installer's workmanship.

1. Do not proceed with remaining Work until workmanship is approved by Architect.

2. Refinish mock-up area as required to produce acceptable work.

1.9 WARRANTY

A. Manufacturer Warranty: Provide manufacturer's warranty covering parts and labor costs to repair or replace part that fail to perform.

1. Warranty Period: Parts and labor warranty for 12 months from date of Substantial Completion.

2. Service During Warranty: Provide direct support to Owner via phone and email, including access to training and education in the form of documents, videos and other materials via the internet.

3. All equipment provided shall be backed by a minimum of three years manufacturer warranty.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis of Design Manufacturer: Avigilon.

1. Address: 555 Robson St., Vancouver, BC, V6B 1A6, Canada.

2. Phone: (888) 281-5182.

3. Website: www.avigilon.com.

B. No Substitutions Allowed

2.2 CAMERA LINE

A. H5A

2.3 DESIGN CRITERIA

A. General:

1. The CCTV System shall provide video surveillance, assessment, and visual alarm monitoring of selected exterior access doors as well as other critical areas of the building as specified on the Contract Drawings.

2. Refer to Contract Documents for camera minimum resolution requirements.

3. The camera shall:

   a. Be equipped with Day/Night functionality.

   b. Be equipped with remote zoom and focus capabilities.

   c. Be equipped with infrared illumination.

   d. Be equipped with a slot for microSD/microSDHC/microSDXC memory card expansion.

   e. Be manufactured with a vandal resistant body.

   f. Be provided with wall, ceiling, building (corner/wall), pendant and pole mounts as indicated on the Contract Drawings and Schedules.

      i. Pole mounted cameras shall be mounted with the use of the wall mount and a pole mount adapter.

      ii. Where installed under building overhangs, exterior cameras shall be flush mounted or appropriately pendant mounted at the correct height to accommodate a finished overhang ceiling.

      iii. Wall mount exterior cameras shall be mounted with the use of the wall mount and a pendant mount adapter.

      iv. Corner mounted cameras shall be provided with corner mount brackets as well as a pendant mount adapter.

   g. Be recorded on the Network Video Recorder (NVR) and provide full video at all times.

   h. Provide surge protection for exterior cameras at the camera and at the camera and point of termination (security rack).

   i. Shall include camera licenses.

   j. Shall be compatible with the VMS.

   k. Shall provide multi-stream so that recording and viewing can be at different frame rate and compression.

   l. Power supplies shall provide:

      v. 120 VAC input and output voltage as required

      vi. UL Listed

      vii. Power fail contacts to monitor the status of the input power

viii. Key lockable wall mount metal enclosure with tamper switch

ix. Independently fused outputs

B. System Design:

1. All cameras in this section must be designed in a modular fashion such that mounts, mounting components and hardware are universal and not integrated directly with the camera itself.

2. Video monitoring system must be tightly integrated using application programming interfaces and software development kits.

3. All systems must be capable of functioning autonomously during a failure of one or more of the related sections.

4. Cameras in this section must be capable of bi-directional communication.

5. Video monitoring system to be interfaced through digital communication protocols including but not limited to ASCII or Hexadecimal Data Transmissions. The Security Contractor shall furnish and install the surveillance system, consisting of camera assemblies, network switches, wiring & cabling, and low voltage camera power supplies.

   a. All active surveillance equipment and devices shall be on emergency/UPS/ battery backup power.

6. Camera assemblies include camera, lens, housing, and mount. Provide and install wiring and low voltage power from the security wall field/rack to the camera locations.

   a. Scope of work shall be complete from point of origin (camera) to point of termination (security rack).

7. The CCTV cameras shall be connected to the local area network with signals routed to a new network video recorder for recording, storage and video retrieval.

8. Camera lenses for fixed cameras shall be varifocal and sized to provide the owner approved field of view. The lens shall be IR corrected and have megapixel resolution.

9. Pole mounted exterior mounted cameras will require independent 120VAC power and shall have video and data signals transmitted over multi-mode fiber. The fiber and conduit, including the termination of the fiber in a fiber receiver and transmitter, as well as, the media converter required to convert the transmission from fiber to category cable for connection at the camera and NVR, respectively is required in this scope of work.

10. Surveillance camera audio functions shall not be installed and/or disabled unless specifically requested by Owner.

    a. Provide audio and video storage capacity in the following rooms:

       i. Interview Rooms

       ii. Cells (including Padded and HC)

       iii. Booking

iv. Processing

11. Edge storage

a. The camera shall support continuous and event controlled recording to:

i. Local memory added to the cameras SD-card slot.

b. The camera shall be able to detect and notify Edge storage disruptions.

c. Secure digital cards providing 5 days of storage capacity.

i. Follow video storage as defined in Section 28 23 00.

d. Secure digital cards tested and approved from the manufacturer shall be provided and installed at each camera.

C. System Certifications:

1. cULus certification mark for Canada/USA.

D. Safety Standards:

1. UL/CSA/IEC/EN 60950-1.

E. Electromagnetic Emissions Standards:

1. FCC Part 15 Subpart B Class B.

2. ICES-003 Class B.

3. EN 55032 Class B.

4. EN 61000-6-3.

5. EN 61000-3-2.

6. EN 61000-3-3.

F. Electromagnetic Emissions Standards:

1. EN 55024.

2. EN 61000-6-1.

2.4 PERFORMANCE REQUIREMENTS

A. Standards:

1. Video Standards: H.265 / H.264 / MJPEG / HDSM SmartCodec technology.

2. Image Standards: MPEG-4 - ISO/IEC 14496-10 AVC (H.264).

3. Networking Standards:

a. IEEE 802.3af (Power over Ethernet).

b. IEEE 802.1X (Authentication).

c. IPv4 (RFC 791).

d. IPv6.

B. Video Requirements:

1. Provide cameras capable of simultaneously delivering at least three individual video streams, for use when connecting to the Video Management Software for recording and live viewing.
2. Provide cameras with a primary stream capable of supporting the video resolution and aspect ratio and capable of generating the image framerates noted in this section.
3. By generating a secondary stream at fractional resolutions of the primary stream, Video device must support HDSM-High Definition Stream Management and/or Dynamic Bandwidth Management.

C. Encoding Requirements:

1. Support compression and image quality settings from 1 to 20 to configure bandwidth utilized by the camera and desired image response. Provide user configuration of compression quality and image rate per camera.
2. Provide independently configured simultaneous H.265, H.264 and Motion JPEG streams (multi-stream).
3. Support Motion JPEG encoding in a selectable range from 1 up to 30 frames per second based on resolution configured.
4. Support H.264 encoding in a selectable range from 1 up to 30 frames per second based on resolution configured.
5. Support H.265 encoding in a selectable range from 1 up to 30 frames per second based on resolution configured.
6. Support Variable Bit Rate (VBR) in H.264 with a configurable maximum bit rate threshold.
7. Support Variable Bit Rate (VBR) in H.265 with a configurable maximum bit rate threshold.
8. Provide user configuration of compression format, compression quality, maximum bit rate, key frame interval, and image rate per camera.
9. Support motion compensation and motion vector during motion estimation in H.264, able to maintain frame rate, regardless of scene complexity, when bandwidth is capped at 12mbps at 30 FPS for 1-3MP and 20mbps at 30 FPS for 5-8MP.
10. Support G.711 PCM 8kHz audio compression.

D. Provide cameras that allow video and audio signals to be transported over:

1. HTTP (Unicast).
2. HTTPS (Unicast).
3. RTP (Unicast & Multicast).
4. RTP over RTSP (Unicast).
5. RTP over RTSP over HTTP (Unicast).

6. RTP over RTSP over HTTPS (Unicast).

E. Image Control Requirements:

1. User Configurations Supported:

a. Automatic and manual white balance control.

b. Automatic and manually defined exposure zones operating in the range 1/7 to 1/8196 sec second.

c. Flicker control (50 Hz, 60 Hz).

d. Automatic and manual iris control.

e. Color saturation and sharpening.

f. Motion detection sensitivity and threshold.

g. Digital rotation of the image when used with control center software.

h. Minimum Dynamic Range:

i. 83dB for 2-5MP and 85dB for 6-8MP. Dynamic Range shall not change based on configured encoding resolution.

F. Adaptive Video Analytics Specifications:

1. Configured Behaviors: Unlimited number of configured behaviors per video source supported.

2. Automatic Analytic set up and tuning of behavior identification:

a. Upon selection of analytic and Region of Interest (ROI), the device will automatically configure behavior identification.

b. The device will constantly monitor changes in the scene and perform a tuning of the behavior identification parameters as the scene environment changes.

3. Include detection of the following behaviors:

a. Object present in ROI.

b. Object enters ROI.

c. Object leaves ROI.

d. Object appeared.

e. Object disappeared.

f. Object crosses a line of interest or beam.

g. Object Movement Direction.

h. Object loitering.

i. Multiple objects in ROI over specified dwell time.

j. Dwell Time.

k. Number of objects exceeds limit in ROI.

l. Number of objects below limit in ROI.

m. Camera tampering.

G. Network Requirements: Provide video cameras that have the following network capabilities:

1. Supports both fixed (static) IP addresses and dynamically assigned IP addresses provided by a Dynamic Host Control Protocol (DHCP) server.

2. Supports user configuration of network parameters including:

a. Fixed (static) IP address.

b. Subnet mask.

c. Gateway.

d. Control port.

3. Are automatically detected when using a Video Management Application (VMA) or Network Video Recorder (NVR) supporting this feature.

4. Provides support for both IPv4 and IPv6 Networks.

H. Video Motion Detection Functionality Requirements: Provide video cameras capable of detecting motion based on:

1. Motion Detection Mask: Defined areas within the camera's field of view for the camera to detect motion.

2. Sensitivity: How much each pixel within the masked areas must change before it is considered in motion.

3. Threshold: Percentage of pixels that must detect change.

I. Event Functionality Requirements: Equip cameras with an integrated event functionality, which may be trigged by:

1. Alarm input terminal.

2. Video motion detection.

3. Camera temperature outside operative range.

J. Protocol Support Requirements: Provide video cameras that incorporate support for at least the following:

1. IPv4.

2. IPv6.

3. HTTP.

4. HTTPS.

5. SOAP.

6. DNS.

7. NTP.
8. RSTP.
9. RTCP.
10. RTP.
11. TCP.
12. UDP.
13. IGMP.
14. ICMP.
15. DHCP.
16. Zeroconf.
17. ARP.
18. SNMP v2c.
19. SNMP v3.

K. Streaming Support Requirements: Provide video cameras that incorporate support for at least the following:

1. RTP/UDP.
2. RTP/UDP multicast.
3. RTP/RTSP/TCP.
4. RTP/RTSP/HTTP/TCP.
5. RTP/RTSP/HTTPS/TCP.
6. HTTP.

L. Video Overlay Requirements: Provide video cameras with the following overlay requirements:

1. 64 individually configurable privacy zones to conceal defined areas in image as non-viewable. Masks required to be dynamically adjusted based on current zoom-factor, without capability of operator bypass.
2. Video masked by privacy zones must be obscured prior to streaming.

M. Security Requirements: Provide video cameras with the following security requirements:

1. Support the use of the following:
   a. Password protection.
   b. HTTPS Encryption.
   c. Digest authentication.
   d. WS authentication.

e. User access Log.

f. SSL encryption.

2. Restrict access to the built-in internet server by usernames and passwords at three different user group levels.

N. Electrical Power: Cameras capable of being powered by the following power sources:

1. PoE: IEEE 802.3af Class 3 PoE Compliant.

2. AC Power: 24 V +/- 10%, 15 VA min for bullet, 24 V +/- 10%, 13 VA min for dome, and 24 V +/- 10%, 9 VA min for box version.

3. DC Power: 12 V +/- 10%, 13 W min for bullet, 12 V +/- 10%, 12 W min for dome and 12 V +/- 10%, 7 W min for box version.

4. Battery Backup: 3V manganese lithium.

O. Installation and Maintenance Requirements: Provide video cameras with the following installation and maintenance requirements:

1. Allow firmware updates via network.

2. Store customer-specific settings in a non-volatile memory which cannot be lost during power cuts or soft reset.

3. Provide Microsoft Windows based management software, allowing camera configuration, upgrade of firmware, and backup of individual camera configurations.

P. Diagnostics:

1. Equipped with LEDs, indicating the camera's functional status, which may be user enabled or disabled.

2. Monitored by functionality which automatically reinitiates processes or restarts the unit if a malfunction is detected.

Q. Connectivity:

1. 100BASE-TX Fast Ethernet-port with RJ-45 socket, auto negotiation of network speed and transfer mode.

2. Terminal for receiving line level analog audio from an external microphone.

3. Terminal for providing line level analog audio for connection to an external speaker.

R. Operational Range:

1. Operating Temperature:

a. Dome: -40 degrees C to +65 degrees C [-40 F to 140 F].

2. IR Illumination Operating Temperatures:

a. Outdoor Dome: Up to +57 degrees C [135 F], 50% power from +49 degrees C to +57 degrees C [120 F to 135 F].

3. IR Illumination Hysteresis:

a. Outdoor Dome: +2 degrees C [3.6 F].

4. Relative Humidity: 0–95 percent (non-condensing).

2.5 2.0 MEGAPIXEL INFRARED IP CAMERAS

A. 2.0 MP Infrared Outdoor Dome-Type Camera with 3.3 - 9 mm lens.

1. Basis of Design Product: 2.0C-H5A-DO1-IR, by Avigilon.

2. Performance:

a. Image Sensor: 1/2.8 inch progressive scan CMOS.

b. Maximum Resolution:

i) Aspect Ratio: 16:9: 1920 x 1080.

c. Imaging Rate: (50 Hz/60 Hz): 25 fps/30 fps.

d. Dynamic Range:

i) WDR Off: 83 dB.

ii) WDR On: 126dB., dual exposure (30 fps).

iii) WDR On: 132dB., triple exposure (20 fps or less).

e. Minimum Illumination:

i) Color: 0.027 lux.

ii) Monochrome: 0.014 lux.

iii) IR: 0.0 lux.

f. Field of View:

i) Horizontal angle: 16:9: 34 degrees to 99 degrees.

ii) Vertical angle: 16:9: 18 degrees to 53 degrees.

B. 2.0 MP Infrared Outdoor Pendant-Mounted Dome-Type Camera with 3.3 - 9 mm lens.

1. Basis of Design Product: 2.0C-H5A-DP1-IR, by Avigilon.

2. Performance:

a. Image Sensor: 1/2.8 inch progressive scan CMOS.

b. Maximum Resolution:

i) Aspect Ratio: 16:9: 1920 x 1080.

c. Imaging Rate: (50 Hz/60 Hz): 25 fps/30 fps.

d. Dynamic Range:

i) WDR Off: 83 dB.

ii) WDR On: 126dB., dual exposure (30 fps).

iii) WDR On: 132dB., triple exposure (20 fps or less).

e. Minimum Illumination:

i) Color: 0.027 lux.

ii) Monochrome: 0.014 lux.

iii) IR: 0.0 lux.

f. Field of View:

i) Horizontal angle: 16:9: 34 degrees to 99 degrees.

ii) Vertical angle: 16:9: 18 degrees to 53 degrees.

2.6 4.0 MEGAPIXEL INFRARED IP CAMERAS

A. 4.0 MP Infrared Outdoor Dome-Type Camera with 3.3 - 9 mm lens.

1. Basis of Design Product: 4.0C-H5A-DO1-IR, by Avigilon.

2. Performance:

a. Image Sensor: 1/2.8 inch progressive scan CMOS.

b. Maximum Resolution:

i) Aspect Ratio: 16:9: 2560 x 1440.

ii) Aspect Ratio: 4:3: 2304x1728.

c. Imaging Rate:

i) WDR Off: (50 Hz/60 Hz): 25 fps/30 fps.

ii) WDR On: (50 Hz/60 Hz): 20 fps/20 fps.

d. Dynamic Range:

i) WDR Off: 83 dB.

ii) WDR On: 126dB.

e. Minimum Illumination:

i) Color: 0.030 lux.

ii) Monochrome: 0.015 lux.

iii) With IR: 0 lux.

f. Field of View:

i) Horizontal angle: 16:9: 34 degrees to 92 degrees.

ii) Horizontal angle: 4:3: 34 degrees to 92 degrees.

iii) Vertical angle: 16:9: 18 degrees to 50 degrees

iv) Vertical angle: 4:3: 25 degrees to 68 degrees

B. 4.0 MP Infrared Outdoor Pendant-Mounted Dome-Type Camera with 3.3 - 9 mm lens.

1. Basis of Design Product: 4.0C-H5A-DP1-IR, by Avigilon.

2. Performance:
    a. Image Sensor: 1/2.8 inch progressive scan CMOS.
    b. Maximum Resolution:
        i) Aspect Ratio: 16:9: 2560 x 1440.
        ii) Aspect Ratio: 4:3: 2304x1728.
    c. Imaging Rate:
        i) WDR Off: (50 Hz/60 Hz): 25 fps/30 fps.
        ii) WDR On: (50 Hz/60 Hz): 20 fps/20 fps.
    d. Dynamic Range:
        i) WDR Off: 83 dB.
        ii) WDR On: 126dB.
    e. Minimum Illumination:
        i) Color: 0.030 lux.
        ii) Monochrome: 0.015 lux.
        iii) With IR: 0 lux.
    f. Field of View:
        i) Horizontal angle: 16:9: 34 degrees to 92 degrees.
        ii) Horizontal angle: 4:3: 34 degrees to 92 degrees.
        iii) Vertical angle: 16:9: 18 degrees to 50 degrees.
        iv) Vertical angle: 4:3: 25 degrees to 68 degrees.

2.7 6.0 MEGAPIXEL INFRARED IP CAMERAS

A. 6.0 MP Infrared Outdoor Dome-Type Camera with 4.9 - 8 mm lens.
    1. Basis of Design Product: 6.0C-H5A-DO1-IR, by Avigilon.
    2. Performance:
        a. Image Sensor: 1/1.8 inch progressive scan CMOS.
        b. Maximum Resolution:
            i) Aspect Ratio: 16:9: 3200 x 1800.
            ii) Aspect Ratio: 3:2: 3072x2048.
        c. Imaging Rate: (50 Hz/60 Hz): 25 fps/30 fps.
        d. Dynamic Range:
            i) WDR Off: 85 dB.
            ii) WDR On: 120dB.

e. Minimum Illumination:

i) Color: 0.055 lux.

ii) Monochrome: 0.028 lux.

iii) With IR: 0 lux.

f. Field of View:

i) Horizontal angle: 16:9: 52 degrees to 92 degrees.

ii) Horizontal angle: 4:3: 41 degrees to 73 degrees.

iii) Vertical angle: 16:9: 29 degrees to 51 degrees.

iv) Vertical angle: 4:3: 27 degrees to 48 degrees.

B. 6.0 MP Infrared Outdoor Pendant-Mounted Dome-Type Camera with 4.9 - 8 mm lens.

1. Basis of Design Product: 6.0C-H5A-DP1-IR, by Avigilon.

2. Performance:

a. Image Sensor: 1/1.8 inch progressive scan CMOS.

b. Maximum Resolution:

i) Aspect Ratio: 16:9: 3200 x 1800.

ii) Aspect Ratio: 3:2: 3072x2048.

c. Imaging Rate: (50 Hz/60 Hz): 25 fps/30 fps.

d. Dynamic Range:

i) WDR Off: 85 dB.

ii) WDR On: 120dB.

e. Minimum Illumination:

i) Color: 0.055 lux.

ii) Monochrome: 0.028 lux.

iii) With IR: 0 lux.

f. Field of View:

i) Horizontal angle: 16:9: 52 degrees to 92 degrees.

ii) Horizontal angle: 3:2: 41 degrees to 73 degrees.

iii) Vertical angle: 16:9: 29 degrees to 51 degrees.

iv) Vertical angle: 3:2: 27 degrees to 48 degrees.

2.8 8.0 MEGAPIXEL INFRARED IP CAMERAS

A. 8.0 MP Infrared Outdoor Dome-Type Camera with 4.9 - 8 mm lens.

1. Basis of Design Product: 8.0C-H5A-DO1-IR, by Avigilon.

2. Performance:
    a. Image Sensor: 1/1.8 inch progressive scan CMOS.
    b. Maximum Resolution:
        i) Aspect Ratio: 16:9: 3840x2160.
    c. Imaging Rate: (50 Hz/60 Hz): 25 fps/30 fps.
    d. Dynamic Range:
        i) WDR Off: 85 dB.
        ii) WDR On: 120dB.
    e. Minimum Illumination:
        i) Color: 0.055 lux.
        ii) Monochrome: 0.028 lux.
    f. Field of View:
        i) Horizontal angle: 16:9: 52 degrees to 92 degrees.
        ii) Vertical angle: 16:9: 29 degrees to 51 degrees.

B. 8.0 MP Infrared Outdoor Pendant-Mounted Dome-Type Camera with 4.9 - 8 mm lens.
1. Basis of Design Product: 8.0C-H5A-DP1-IR, by Avigilon.
2. Performance:
    a. Image Sensor: 1/1.8 inch progressive scan CMOS.
    b. Maximum Resolution:
        i) Aspect Ratio: 16:9: 3840x2160.
    c. Imaging Rate: (50 Hz/60 Hz): 25 fps/30 fps.
    d. Dynamic Range:
        i) WDR Off: 85 dB.
        ii) WDR On: 120dB.
    e. Minimum Illumination:
        i) Color: 0.055 lux.
        ii) Monochrome: 0.028 lux.
    f. Field of View:
        i) Horizontal angle: 16:9: 52 degrees to 92 degrees.
        ii) Vertical angle: 16:9: 29 degrees to 51 degrees.

C. **8.0 MP Infrared Outdoor Bullet-Type Camera with 4.9 - 8 mm lens.**
1. **Basis of Design Product: 8.0C-H5A-BO1-IR, by Avigilon.**

2. **Performance:**
   - **a. Image Sensor: 1/1.8 inch progressive scan CMOS.**
   - **b. Maximum Resolution:**
     - **i) Aspect Ratio: 16:9: 3840x2160.**
   - **c. Imaging Rate: (50 Hz/60 Hz): 25 fps/30 fps.**
   - **d. Dynamic Range:**
     - **i) WDR Off: 85 dB.**
     - **ii) WDR On: 120dB.**
   - **e. Minimum Illumination:**
     - **i) Color: 0.055 lux.**
     - **ii) Monochrome: 0.028 lux.**
   - **f. Field of View:**
     - **i) Horizontal angle: 16:9: 52 degrees to 92 degrees.**
     - **ii) Vertical angle: 16:9: 29 degrees to 51 degrees.**

2.9 ACCESSORIES:

A. Brackets and Mounts:

1. H4AMH-AD-PEND1: Outdoor pendant mount.
2. H4A-MT-NPTA1: Indoor/outdoor pendant NPT mount.
3. H4A-MT-WALL1: Indoor/outdoor pendant wall arm mount.
4. H4-MT-CRNR1: Aluminum corner mounting bracket for pendant dome cameras.
5. H4-MT-POLE1: Aluminum pole mounting bracket for pendant dome cameras.
6. IRPTZ-MNT-WALL1: Pendant wall mount for dome cameras.
7. H4-MT-CRNR1: Corner mounting bracket

B. Camera Covers:

1. H4AMH-DO-COVR1: Dome cover with a clear bubble.
2. H4A-DO-SMOK1 : Outdoor dome camera cover with smoked bubble.
3. H4A-DP-SMOK1: Pendant dome camera cover with smoked bubble.

C. Other:

1. CM-AC-GROM1 : Pipe grommets.
2. H4A-AC-GROM1: Camera sealing grommets.
3. H4-DC-CPNL1: Metal ceiling panel.

2.10 SECURE DIGITAL CARDS

1. SanDisk
2. Panasonic
3. Samsung
4. Or Approved Equal

2.11 SURGE PROTECTION

1. Ditek
2. Nitek
3. Tripp Lite
4. Or Approved Equal

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of Conditions: Do not begin installation until substrates have been properly prepared.

B. Evaluation and Assessment: If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Surface Preparation: Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

A. Install all products in this section following the product manufacturer's published installation and application manuals and guidelines.

3.4 SYSTEM STARTUP

A. Test equipment and configure system in accordance with instructions provided by the manufacturer prior to installation.

B. Review configurable features of the device with the Owner's Representative and establish a punch list for standard, device specific, location specific and VMA/NVR specific configuration of device(s).

1. Program and configure devices in accordance with this punch list so no additional programming is required for operation by the user.

C. Configure equipment requiring users to log on using a password with user/site-specific credentials. Default passwords are not acceptable and must be configured prior to project closeout.

D. Provide products with the latest and most up-to-date firmware by the manufacturer or provide firmware of a version specified by the provider of the Video Management Application (VMA) or Network Video Recorder (NVR).

3.5 ADJUSTING

A. Fine Tuning: Perform field software changes after initial programming session to “fine tune” operating parameters and sequence of operations based on any revisions to Owner’s operating requirements.

3.6 CLOSEOUT

A. Demonstration:

1. Demonstrate administration and operation of devices described by this section.
2. Demonstrate how to authorize users and applications to operate and configure installed devices.
3. Demonstrate how an authorized user can gain access to and make changes to configuration.
4. Demonstrate how to operate functionality configured for this project as defined by configuration punch list.

B. License Assignment:

1. Register software, hardware, firmware, operational or administrative licenses necessary for to operate or administer devices to Owner.
2. Deliver to Owner’s Representative proof of license registration from product manufacturer.

C. Device Configuration Backup:

1. Using manufacturer’s backup software tool or VMA/NVR, perform a full system back-up at completion of initial programming.
2. Deliver configuration backup files, restoration application and instructions detailing for restoration of back-up configuration.

END OF SECTION 28 23 23

DO NOT REMOVE
THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 28 23 33 - MULTISENSOR IP CAMERAS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The Contractor, Subcontractors, and/or suppliers providing goods and services referenced in or related to this Section shall also be bound by the Related Documents identified in Division 01 Section “Summary.”

1.2 SUMMARY

A. This section includes multiple sensor, dome-type network cameras for video surveillance.

B. Furnish labor, materials, inspections, supervision, etc., necessary for a turnkey installation and operation of the equipment specified herein. Work includes furnishing all items and accessories required or necessary for the correct operation of the equipment as shown on plans and/or specified herein exception of those items noted within this specification as being provided by others.

C. Related Sections

1. Section 08 71 00 Door Hardware
2. Section 21 00 00 Fire Suppression
3. Section 26 00 00 Electrical (including related sub-sections)
4. Section 28 00 00 Electronic Safety and Security
5. Section 28 05 13 Wire and Cable
6. Section 28 10 00 Electronic Access Control System
7. Section 28 20 00 Electronic Access Control and Intrusion Detection
8. Section 28 21 29 Data Communications Switches and Hubs
9. Section 28 23 00 Video Management System
10. Section 28 23 13 Indoor IP Cameras
11. Section 28 23 23 Outdoor IP Cameras
12. Section 28 23 33 Multisensor Cameras
13. Section 28 60 00 Security Rack, Console and Equipment

1.3 REFERENCES

A. Follow provisions of Section 28 00 00 Electronic Safety and Security.

1.4 ADMINISTRATIVE REQUIRMENTS

A. Coordination:

1. Coordinate with Owner or Owner’s representative regarding camera network configuration and estimated bandwidth utilization prior to performing network connections.
2. Coordinate all work that must be performed in security head end spaces with the

General Contractor, the Electrical Contractor, and the Telecommunications Contractor (if applicable).

3. Coordinate space allocation and network IP addresses with the IT department.

1.5 DESCRIPTION OF WORK

A. General Requirements

1. Furnish all labor, materials, tools, equipment, and services for a complete security system as indicated and in accordance with provisions of the contract documents.

2. Although such work is not specifically indicated, furnish and install all supplementary or miscellaneous items, and devices incidental to or necessary for a sound, secure and complete installation.

3. Comply with the provisions of Division 1 for General Requirements.

a. In the event of a conflict between the provisions of this Section and Division 1, the more stringent provisions shall apply.

4. All system devices and components included shall be compatible.

5. Units of the same type of equipment shall be products of a single manufacturer. All material and equipment shall be new and currently in production. Each major component of equipment shall have the manufacturer's model and serial number in a conspicuous place.

6. Cameras shall be protected from lightning if mounted on the exterior.

7. Cameras shall include all accessories, including dome covers, knockout plugs, adaptors, etc,. for a complete installation.

8. The Contractor is responsible for providing and coordinating external electrical power for each camera including, but not limited to, PoE, PoE+ and power injectors whether indicated on the contract documents or not.

1.6 INFORMATIONAL SUBMITTALS

A. Follow provisions of Section 28 00 00 Electronic Safety and Security.
B. Qualification Statements:

1. Manufacturer:

a. Submit confirmation and details of manufacturer’s warranty, extended warranty, and replacement policies.

2. Contractor:

a. Submit confirmation that Contractor is licensed to install video surveillance and security equipment as required by authority having jurisdiction.

b. Submit confirmation that installer or the entity installing or supervising the installation of this equipment has received manufacturer training and is certified by manufacturer on this equipment and that training the installer received is current.

C. Product Data: Manufacturer's product information and data sheets for each product specified in this section, including:

1. Substrate preparation instructions and recommendations.
2. Indicate component materials and dimensions and include construction and application details.
3. Installation means and methods.
4. Recommendations and requirements for proper storage and handling.

D. Video Quality test reports shall be provided for all cameras to confirm an optimum high definition video signal.

E. Shop Drawings:

1. Submit Manufacturer’s approved shop drawings detailing the section and elevation views of each product to be installed.
2. Battery calculations to show the expected loads and backup duration for camera power supplies and UPS devices for all active surveillance equipment.
3. Color samples.
4. Supply camera titles and descriptions prior to system programming.
5. Supply programming/database prior to performance testing.
6. Supply a cross reference between specified camera numbers and programmed camera numbers.
7. Supply final programming, camera images and system documentation on electronic media to Owner.

F. Warranty Information:

1. Submit confirmation and details of manufacturer’s warranty, extended warranty, and replacement policies.

G. System Support Resources:

1. Submit a list of available manufacturers providing fee based professional services available to the Contractor or Owner, including but not limited to the following:
    a. Training.
    b. Installation.
    c. Commissioning.
    d. Remote diagnostics and integration with 3rd party software and hardware systems.

1.7 CLOSEOUT SUBMITTALS

A. Supply licensing and registration information for all software, hardware, firmware, operational, and administrative licenses.

B. Supply network configuration backup files, restoration application and instructions. Provide system programming, camera titles, descriptions, camera images and database.

1.8 QUALITY ASSURANCE

A. Follow provisions of Section 28 00 00 Electronic Safety and Security.

B. All equipment provided shall be backed by a minimum of three years manufacturer warranty.

C. Qualifications - Manufacturers:

1. Manufacturer(s) suppling products noted in this section must have a minimum of 5 years in business.

D. Qualifications - Installers:

1. Installer must be licensed to install video surveillance and security equipment as required by authority having jurisdiction.

2. Installer must be capable of providing references that will attest to successful completion of projects of similar scope as the work noted in this section.

3. Installer must be certified by the manufacturer and be up to date with all training required to maintain good standing.

E. Mock-Ups: Provide a mock-up for evaluation of installer's workmanship.

1. Do not proceed with remaining Work until workmanship is approved by Architect.

2. Refinish mock-up area as required to produce acceptable work.

1.9 WARRANTY

A. Manufacturer Warranty: Provide manufacturer's warranty covering parts and labor costs to repair or replace part that fail to perform.

1. Warranty Period: Parts and labor warranty for 12 months from date of Substantial Completion.

2. Service During Warranty: Provide direct support to Owner via phone and email, including access to training and education in the form of documents, videos and other materials via the internet.

3. All equipment provided shall be backed by a minimum of three years manufacturer warranty.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis of Design Manufacturer: Avigilon.

1. Address: 555 Robson St., Vancouver, BC, V6B 1A6, Canada.

2. Phone: (888) 281-5182.

3. Website: www.avigilon.com.

B. No Substitutions Allowed

2.2 CAMERA LINE

A. H4 Multisensor Camera

2.3 DESIGN CRITERIA

A. General:

1. The CCTV System shall provide video surveillance, assessment, and visual alarm monitoring of selected exterior access doors as well as other critical areas of the building as specified on the Contract Drawings.
2. Refer to Contract Documents for camera minimum resolution requirements.
3. The camera shall:
    a. Be equipped with Day/Night functionality.
    b. Be equipped with remote zoom and focus capabilities.
    c. Be equipped with a slot for microSD/microSDHC/microSDXC memory card expansion.
    d. Be manufactured with a vandal resistant body.
    e. Be provided with wall, ceiling, building (corner/wall), pendant and pole mounts as indicated on the Contract Drawings and Schedules.
        1) Pole mounted cameras shall be mounted with the use of the wall mount and a pole mount adapter.
        2) Where installed under building overhangs, exterior cameras shall be flush mounted or appropriately pendant mounted at the correct height to accommodate a finished overhang ceiling.
        3) Wall mount exterior cameras shall be mounted with the use of the wall mount and a pendant mount adapter.
        4) Corner mounted cameras shall be provided with corner mount brackets as well as a pendant mount adapter.
    f. Be recorded on the Network Video Recorder (NVR) and provide full video at all times.
    g. Provide surge protection for exterior cameras at the camera and at the camera and point of termination (security rack).
    h. Shall include camera licenses.
    i. Shall be compatible with the VMS.
    j. Shall provide multi-stream so that recording and viewing can be at different frame rate and compression.
    k. Power supplies shall provide:
        1) 120 VAC input and output voltage as required
        2) UL Listed

3) Power fail contacts to monitor the status of the input power

4) Key lockable wall mount metal enclosure with tamper switch

5) Independently fused outputs

B. System Design:

1. All cameras in this section must be designed in a modular fashion such that mounts, mounting components and hardware are universal and not integrated directly with the camera itself.

2. Video monitoring system must be tightly integrated using application programming interfaces and software development kits.

3. All systems must be capable of functioning autonomously during a failure of one or more of the related sections.

4. Cameras in this section must be capable of bi-directional communication.

5. Cameras shall not be fisheye or panoramic cameras unless specifically specified. Cameras shall provide four individually-adjustable sensors.

6. Video monitoring system to be interfaced through digital communication protocols including but not limited to ASCII or Hexadecimal Data Transmissions. The Security Contractor shall furnish and install the surveillance system, consisting of camera assemblies, network switches, wiring & cabling, and low voltage camera power supplies.

   a. All active surveillance equipment and devices shall be on emergency/UPS/ battery backup power.

7. Camera assemblies include camera, lens, housing, and mount. Provide and install wiring and low voltage power from the security wall field/rack to the camera locations.

   a. Scope of work shall be complete from point of origin (camera) to point of termination (security rack).

8. The CCTV cameras shall be connected to the local area network with signals routed to a new network video recorder for recording, storage and video retrieval.

9. Camera lenses for fixed cameras shall be varifocal and sized to provide the owner approved field of view. The lens shall be IR corrected and have megapixel resolution.

10. Pole mounted exterior mounted cameras will require independent 120VAC power and shall have video and data signals transmitted over multi-mode fiber. The fiber and conduit, including the termination of the fiber in a fiber receiver and transmitter, as well as, the media converter required to convert the transmission from fiber to category cable for connection at the camera and NVR, respectively is required in this scope of work.

11. Provide the motion analytic at the Impound Lot pole camera:

    a. The analytic shall alert dispatch of motion inside of the Impound Lot enclosure.

12. Surveillance camera audio functions shall not be installed and/or disabled unless specifically requested by Owner.
    a. Provide audio and video storage capacity in the following rooms:
        1) Interview Rooms
        2) Cells (including Padded and HC)
        3) Booking
        4) Processing
13. Edge storage
    a. The camera shall support continuous and event controlled recording to:
        1) Local memory added to the cameras SD-card slot.
    b. The camera shall be able to detect and notify Edge storage disruptions.
    c. Secure digital cards providing 5 days of storage capacity.
        1) Follow video storage as defined in Section 28 23 00.
    d. Secure digital cards tested and approved from the manufacturer shall be provided and installed at each camera.

C. System Certifications:
1. ONVIF Profile S and Profile T.
2. cULus certification mark for Canada/USA.

D. Safety Standards:
1. UL/CSA/IEC/EN 60950-1.

E. Electromagnetic Emissions Standards:
1. FCC Part 15 Subpart B Class B.
2. ICES-003 Class B.
3. EN 55032 Class B.
4. EN 61000-6-3.
5. EN 61000-3-2.
6. EN 61000-3-3.

F. Electromagnetic Emissions Standards:
1. EN 55024.
2. EN 61000-6-1.

2.4 PERFORMANCE REQUIREMENTS

A. Standards:
1. Video Standards: H.264 / H.265 / MJPEG / HDSM SmartCodec technology.

2. Image Standards: MPEG-4 - ISO/IEC 14496-10 AVC (H.264).

3. Networking Standards:

   a. IEEE 802.3af (Power over Ethernet).

   b. IEEE 802.1X (Authentication).

   c. IPv4 (RFC 791).

   d. IPv6.

B. Video Requirements:

1. Provide cameras capable of simultaneously delivering at least two individual video streams, for use when connecting to the Video Management Software for recording and live viewing.

2. Provide cameras with a primary stream capable of supporting the video resolution and aspect ratio and capable of generating the image framerates noted in this section.

3. By generating a secondary and/or tertiary stream at fractional resolutions of the primary stream, Video device must support HDSM-High Definition Stream Management and/or Dynamic Bandwidth Management.

C. Encoding Requirements:

1. Support compression and image quality settings from 1 to 20 to configure bandwidth utilized by the camera and desired image response. Provide user configuration of compression quality and image rate per camera.

2. Provide independently configured simultaneous H.264, H.265 and Motion JPEG streams (multi-stream).

3. Support Motion JPEG encoding in a selectable range from 1 up to 12 frames per second based on resolution configured.

4. Support H.265 encoding in a selectable range from 1 up to 12 frames per second based on resolution configured.

5. Support Variable Bit Rate (VBR) in H.265 with a configurable maximum bit rate threshold.

6. Provide user configuration of compression format, compression quality, maximum bit rate, key frame interval, and image rate per camera.

7. Support motion compensation and motion vector during motion estimation in H.264 and H.265, able to maintain frame rate, regardless of scene complexity, when bandwidth is capped at 17.5mbps at 12 FPS.

8. Support G.711 PCM 8kHz audio compression.

D. Transmission Requirements:

1. Provide cameras that support the following when connecting to a VMS:

   a. Dynamic Bandwidth Management.

   b. High Definition Stream Management.

2. 3MP Cameras must Transmit two distinct video streams:
    a. Primary Stream: Supports up to full resolution and prescribed frame rate.
    b. Secondary Stream: Supports fractional resolution and mirrors the frame rate and aspect ratio of the primary stream at a maximum 0.3MP - 640x480 (4:3) / 768x432 (16:9).
3. 5MP or 8MP Cameras must Transmit three distinct video streams:
    a. Primary Stream: Supports up to full resolution and prescribed frame rate.
    b. Second Stream: Supports fractional resolution and mirrors the frame rate and aspect ratio of the primary stream at a maximum 1.3MP – 1280x960 (4:3) / 1536x864 (4:3).
    c. Third Stream: Supports fractional resolution and mirrors the frame rate and aspect ratio of the primary stream at a maximum 0.3MP - 640x480 (4:3) / 768x432 (16:9).

E. Provide cameras that allow video and audio signals to be transported over:
1. HTTP (Unicast).
2. HTTPS (Unicast).
3. RTP (Unicast & Multicast).
4. RTP over RTSP (Unicast).
5. RTP over RTSP over HTTP (Unicast).
6. RTP over RTSP over HTTPS (Unicast).

F. Image Control Requirements:
1. User Configurations Supported:
    a. Automatic and manual white balance control.
    b. Automatic and manually defined exposure zones operating in the range 1 and 1/8000 second.
    c. Flicker control (50 Hz, 60 Hz).
    d. Automatic and manual iris control.
    e. Color saturation and sharpening.
    f. Motion detection sensitivity and threshold.
    g. Digital rotation of the image.
    h. Minimum Dynamic Range:
        1) 100db.
        2) Dynamic Range shall not change based on configured encoding resolution.
2. Adaptive Video Analytics Specifications:

a. Configured Behaviors: Unlimited number of configured behaviors per video source supported.

b. Automatic Analytic set up and tuning of behavior identification:

1) Upon selection of analytic and Region of Interest (ROI), the device will automatically configure behavior identification.

2) The device will constantly monitor changes in the scene and perform a tuning of the behavior identification parameters as the scene environment changes.

3. Include detection of the following behaviors:

a. Object present in ROI.

b. Object enters ROI.

c. Object leaves ROI.

d. Object appeared.

e. Object disappeared.

f. Object crosses a line of interest or beam.

g. Object Movement Direction.

h. Object loitering.

i. Multiple objects in ROI over specified dwell time.

j. Dwell Time.

k. Number of objects exceeds limit in ROI.

l. Number of objects below limit in ROI.

m. Camera tampering.

G. Network Requirements: Provide video cameras that have the following network capabilities:

1. Supports both fixed (static) IP addresses and dynamically assigned IP addresses provided by a Dynamic Host Control Protocol (DHCP) server.

2. Supports user configuration of network parameters including:

a. Fixed (static) IP address.

b. Subnet mask.

c. Gateway.

d. Control port.

3. Are automatically detected when using a Video Management Application (VMA) or Network Video Recorder (NVR) supporting this feature.

4. Provides support for both IPv4 and IPv6 Networks.

H. Video Motion Detection Functionality Requirements: Provide video cameras capable of detecting motion based on:

1. Motion Detection Mask: Defined areas within the camera's field of view for the camera to detect motion.
2. Sensitivity: How much each pixel within the masked areas must change before it is considered in motion.
3. Threshold: Percentage of pixels that must detect change.

I. Event Functionality Requirements: Equip cameras with an integrated event functionality, which may be trigged by:

1. Alarm input terminal.
2. Video motion detection.
3. Camera temperature outside operative range.

J. Protocol Support Requirements: Provide video cameras that incorporate support for at least the following:

1. IPv4.
2. IPv6.
3. HTTP.
4. HTTPS.
5. SOAP.
6. DNS.
7. NTP.
8. RSTP.
9. RTCP.
10. RTP.
11. TCP.
12. UDP.
13. IGMP.
14. ICMP.
15. DHCP.
16. Zeroconf.
17. ARP.
18. SNMP v2c.
19. SNMP v3.

K. Streaming Support Requirements: Provide video cameras that incorporate support for at least the following:

1. RTP/UDP.
2. RTP/UDP multicast.
3. RTP/RTSP/TCP.
4. RTP/RTSP/HTTP/TCP.
5. RTP/RTSP/HTTPS/TCP.
6. HTTP.

L. Video Overlay Requirements: Provide video cameras with the following overlay requirements:

1. 64 individually configurable privacy zones to conceal defined areas in image as non-viewable. Masks required to be dynamically adjusted based on current zoom-factor, without capability of operator bypass.
2. Video masked by privacy zones must be obscured prior to streaming.

M. Security Requirements: Provide video cameras with the following security requirements:

1. Support the use of the following:
   a. Password protection.
   b. HTTPS Encryption.
   c. Digest authentication.
   d. WS authentication.
   e. User access Log.
   f. SSL encryption.
2. Restrict access to the built-in internet server by usernames and passwords at three different user group levels.

N. Electrical Power: Cameras capable of being powered by the following power sources:

1. PoE: up to IEEE 802.3af Class 3 PoE Compliant.
2. AC Power: 24 V +/- 10%, 10 VA min (13 VA min with -IR option).
3. DC Power: 12 V +/- 10%, 7 W min (9 W min with -IR option).
4. Battery Backup: 3V manganese lithium.

O. Functionality:

1. Alarm input and output terminals.
2. Line audio input (for external microphone) and audio output (for external speaker) connections.
3. Firmware reset button to reset cameras to factory default settings.

4. Enhanced Framerate Mode: Enhanced framerate mode allowing for higher framerates when analytics are disabled on all camera heads within the system.

P. Diagnostics:

1. Equipped with LEDs, indicating the camera's functional status, which may be user enabled or disabled.

2. Monitored by functionality which automatically reinitiates processes or restarts the unit if a malfunction is detected.

Q. Connectivity:

1. Gigabit Ethernet-port with RJ-45 socket, auto negotiation of network speed and transfer mode.

2. Terminal for receiving line level analog audio from an external microphone.

3. Terminal for providing line level analog audio for connection to an external speaker.

R. Installation and Maintenance Requirements: Provide video cameras with the following installation and maintenance requirements:

1. Allow firmware updates via network.

2. Store customer-specific settings in a non-volatile memory which cannot be lost during power cuts or soft reset.

3. Provide Microsoft Windows based management software, allowing camera configuration, upgrade of firmware, and backup of individual camera configurations.

S. Operational Range:

1. Temperature:

a. Ceiling Mount: -10 degrees C to +50 degrees C [14 F to +122 F].

b. Pendant and Surface Mount: -40 degrees C to +60 degrees C [-40 F to +140 F].

2. Relative Humidity: 0–95 percent (non-condensing).

2.5 MULTISENSOR IP CAMERAS

A. 9MP HD Multisensor Camera; three 3MP sensors, wide dynamic range (WDR) and a 2.8mm lens:

1. Basis of Design Product: 9C-H4A-3MH-270 – H4 Multisensor, by Avigilon.

2. Performance:

a. Image Sensors: 1/2.8 inch progressive scan CMOS.

b. Aspect Ratio: 4:3.

c. Active Pixels (H x V): 2048 x 1536 per sensor.

d. Imaging Area (H x V): 5.18 mm x 3.89mm (0.204 inches x 0.153 inches).

e. Imaging Rate: 24 fps at 60Hz and 25 fps at 50Hz.

f. IR Illumination:

1) Color Mode: 0.025 lux (F1.2).

2) Mono Mode 0.005 lux (F1.2).

3) With IR Illuminator Active: 0 lux.

g. Dynamic Range: 100 dB with WDR active.

h. Resolution Scaling: Down to 640 x 480.

i. Angle of View: 103 degrees.

1) Indoor Ceiling Mount.

2) Indoor / Outdoor Pendant Mount.

3) Indoor / Outdoor Surface Mount.

B. 9MP HD Multisensor Camera; three 3MP sensors, wide dynamic range (WDR) and a 4mm lens:

1. Basis of Design Product: 9C-H4A-3MH-180 – H4 Multisensor, by Avigilon.

2. Performance:

a. Image Sensors: 1/2.8 inch progressive scan CMOS.

b. Aspect Ratio: 4:3.

c. Active Pixels (H x V): 2048 x 1536 per sensor.

d. Imaging Area (H x V): 5.18 mm x 3.89mm (0.204 inches x 0.153 inches).

e. Imaging Rate: 24 fps at 60 Hz and 25 fps at 50Hz.

f. IR Illumination:

1) Color Mode: 0.05 lux (F1.6).

2) Mono Mode 0.01 lux (F1.6).

3) With IR Illuminator Active: 0 lux.

g. Dynamic Range: 100 dB with WDR active.

h. Resolution Scaling: Down to 640 x 480.

i. Angle of View: 72 degrees.

j. Mounting:

1) Indoor Ceiling Mount.

2) Indoor / Outdoor Pendant Mount.

3) Indoor / Outdoor Surface Mount.

C. 12MP HD Multisensor Camera; four 3MP sensors, wide dynamic range (WDR) and a 2.8mm lens:

1. Basis of Design Product: 12C-H4A-4MH-360 – H4 Multisensor, by Avigilon.
2. Performance:
    a. Image Sensors: 1/2.8 inch progressive scan CMOS.
    b. Aspect Ratio: 4:3.
    c. Active Pixels (H x V): 2048 x 1536 per sensor.
    d. Imaging Area (H x V): 5.18 mm x 3.89mm (0.204 inches x 0.153 inches).
    e. Imaging Rate: 20 fps at 60 Hz and 20 fps at 50Hz.
    f. IR Illumination:
        1) Color Mode: 0.025 lux (F1.2).
        2) Mono Mode 0.005 lux (F1.2).
        3) With IR Illuminator Active: 0 lux.
    g. Dynamic Range: 100 dB with WDR active.
    h. Resolution Scaling: Down to 640 x 480.
    i. Angle of View: 103 degrees.
    j. Mounting:
        1) Indoor Ceiling Mount.
        2) Indoor / Outdoor Pendant Mount.
        3) Indoor / Outdoor Surface Mount.

D. 15MP HD Multisensor Camera; three 5MP sensors, wide dynamic range (WDR) and a 2.8mm lens:
1. Basis of Design Product: 15C-H4A-3MH-270 – H4 Multisensor, by Avigilon.
2. Performance:
    a. Image Sensors: 1/2.8 inch progressive scan CMOS.
    b. Aspect Ratio: 4:3.
    c. Active Pixels (H x V): 2592 x 1944 per sensor.
    d. Imaging Area (H x V): 5.18 mm x 3.89mm (0.204 inches x 0.153 inches).
    e. Imaging Rate: 15 fps at 60 Hz and 17 fps at 50Hz.
    f. IR Illumination:
        1) Color Mode: 0.025 lux (F1.2).
        2) Mono Mode 0.005 lux (F1.2).
        3) With IR Illuminator Active: 0 lux.
    g. Dynamic Range: 100 dB with WDR active.

h. Resolution Scaling: Down to 640 x 480.

i. Angle of View: 103 degrees.

j. Mounting:

1) Indoor Ceiling Mount.

2) Indoor / Outdoor Pendant Mount.

3) Indoor / Outdoor Surface Mount.

E. 15MP HD Multisensor Camera; three 5MP sensors, wide dynamic range (WDR) and a 4mm lens:

1. Basis of Design Product: 15C-H4A-3MH-180 – H4 Multisensor, by Avigilon.

2. Performance:

a. Image Sensors: 1/2.8 inch progressive scan CMOS.

b. Aspect Ratio: 4:3.

c. Active Pixels (H x V): 2592 x 1944 per sensor.

d. Imaging Area (H x V): 5.18 mm x 3.89mm (0.204 inches x 0.153 inches).

e. Imaging Rate: 15 fps at 60 Hz and 17 fps at 50Hz.

f. IR Illumination:

1) Color Mode: 0.05 lux (F1.6).

2) Mono Mode 0.01 lux (F1.6).

3) With IR Illuminator Active: 0 lux.

g. Dynamic Range: 100 dB with WDR active.

h. Resolution Scaling: Down to 640 x 480.

i. Angle of View: 72 degrees.

j. Mounting:

1) Indoor Ceiling Mount.

2) Indoor / Outdoor Pendant Mount.

3) Indoor / Outdoor Surface Mount.

F. 20MP HD Multisensor Camera; four 5MP sensors, wide dynamic range (WDR) and a 2.8mm lens:

1. Basis of Design Product: 20C-H4A-4MH-360 – H4 Mutlisensor, by Avigilon.

2. Performance:

a. Image Sensors: 1/2.8 inch progressive scan CMOS.

b. Aspect Ratio: 4:3.

c. Active Pixels (H x V): 2592 x 1944 per sensor.

d. Imaging Area (H x V): 5.18 mm x 3.89mm (0.204 inches x 0.153 inches).

e. Imaging Rate: 13 fps at 60 Hz and 13 fps at 50Hz.

f. IR Illumination:

1) Color Mode: 0.025 lux (F1.2).

2) Mono Mode 0.005 lux (F1.2).

3) With IR illuminator Active: 0 lux.

g. Dynamic Range: 100 dB with WDR active.

h. Resolution Scaling: Down to 640 x 480.

i. Angle of View: 103 degrees.

j. Mounting:

1) Indoor Ceiling Mount.

2) Indoor / Outdoor Pendant Mount.

3) Indoor / Outdoor Surface Mount.

G. 24MP HD Multisensor Camera; with three 8MP sensors, wide dynamic range (WDR) and a 4mm lens:

1. Basis of Design Product: 24C-H4A-3MH-270 – H4 Multisensor, by Avigilon.

2. Performance:

a. Image Sensors: 1/2.5 inch progressive scan CMOS.

b. Aspect Ratio: 16:9.

c. Active Pixels (H x V): 3840 x 2160 per sensor.

d. Imaging Area (H x V): 6.22 mm x 3.50mm (0.245 inches x 0.138 inches).

e. Imaging Rate: 12 fps at 60 Hz and 13 fps at 50Hz.

f. IR Illumination:

1) Color Mode: 0.2 lux (F1.6).

2) Mono Mode 0.04 lux (F1.6).

3) With IR Illuminator: 0 lux.

g. Dynamic Range: 100 dB with WDR active.

h. Resolution Scaling: Down to 768 x 432.

i. Angle of View: 101 degrees.

j. Mounting:

1) Indoor Ceiling Mount.

2) Indoor / Outdoor Pendant Mount.

3) Indoor / Outdoor Surface Mount.

H. 24MP HD Multisensor Camera: with three 8MP sensors, wide dynamic range (WDR) and a 5.2mm lens:

1. Basis of Design Product: 24C-H4A-3MH-180 – H4 Multisensor, by Avigilon.

2. Performance:

a. Image Sensors: 1/2.5 inch progressive scan CMOS.

b. Aspect Ratio: 16:9.

c. Active Pixels (H x V): 3840 x 2160 per sensor.

d. Imaging Area (H x V): 6.22 mm x 3.50mm (0.245 inches x 0.138 inches).

e. Imaging Rate: 12 fps at 60 Hz and 13 fps at 50Hz.

f. IR Illumination:

1) Color Mode: 0.2 lux (F1.6).

2) Mono Mode 0.04 lux (F1.6).

3) With IR Illuminator: 0 lux.

g. Dynamic Range: 100 dB with WDR active.

h. Resolution Scaling: Down to 768 x 432.

i. Angle of View: 101 degrees.

j. Mounting:

1) [Specifier Notes] – Retain only those paragraphs applicable to the mounting requirements of products specified in this section.

2) Indoor Ceiling Mount.

3) Indoor / Outdoor Pendant Mount.

4) Indoor / Outdoor Surface Mount.

I. 32MP HD Multisensor Camera; four 8MP sensors, wide dynamic range (WDR) and 4mm lens:

1. Basis of Design Product: 32C-H4A-4MH-360 – H4 Multisensor, by Avigilon.

2. Performance:

a. Image Sensors: 1/2.5 inch progressive scan CMOS.

b. Aspect Ratio: 16:9.

c. Active Pixels (H x V): 3840 x 2160 per sensor.

d. Imaging Area (H x V): 6.22 mm x 3.50mm (0.245 inches x 0.138 inches).

e. Imaging Rate: 8 fps at 60 Hz and 8 fps at 50Hz.

f. IR Illumination:

1) Color Mode: 0.2 lux (F1.8).

2) Mono Mode 0.04 lux (F1.8).

3) With IR Illuminator: 0 lux.

g. Dynamic Range: 100 dB with WDR active.

h. Resolution Scaling: Down to 768 x 432.

i. Angle of View: 70 degrees.

j. Mounting:

1) Indoor Ceiling Mount.

2) Indoor / Outdoor Pendant Mount.

3) Indoor / Outdoor Surface Mount.

2.6 ACCESSORIES:

A. Brackets and Mounts:

1. H4AMH-AD-PEND1: Outdoor pendant mount.
2. H4A-MT-NPTA1: Indoor/outdoor pendant NPT mount.
3. H4A-MT-WALL1: Indoor/outdoor pendant wall arm mount.
4. IRPTZ-MNT-WALL1: Pendant wall mount for dome cameras.
5. H4-MT-POLE1: Pole mount bracket

B. Camera Covers:

1. H4AMH-DO-COVR1: Dome cover with a clear bubble.
2. H4A-DC-SMOK1: In-ceiling dome camera cover with smoked bubble.
3. H4A-DD-SMOK1: Indoor dome camera cover with smoked bubble.

C. Other:

1. CM-AC-GROM1 : Pipe grommets.
2. H4A-AC-GROM1: Camera sealing grommets.
3. H4A-DD-SDWL1: Indoor dome camera sidewall knockout plugs.
4. H4-DC-CPNL1: Metal ceiling panel.

2.7 SECURE DIGITAL CARDS

1. SanDisk
2. Panasonic
3. Samsung
4. Or Approved Equal

2.8 SURGE PROTECTION

1. Ditek
2. Nitek
3. Tripp Lite
4. Or Approved Equal

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of Conditions: Do not begin installation until substrates have been properly prepared.

B. Evaluation and Assessment: If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Surface Preparation: Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

A. Install all products in this section following the product manufacturer's published installation and application manuals and guidelines.

3.4 SYSTEM STARTUP

A. Test equipment and configure system in accordance with instructions provided by the manufacturer prior to installation.

B. Review configurable features of the device with the Owner's Representative and establish a punch list for standard, device specific, location specific and VMA/NVR specific configuration of device(s).

1. Program and configure devices in accordance with this punch list so no additional programming is required for operation by the user.

C. Configure equipment requiring users to log on using a password with user/site-specific credentials. Default passwords are not acceptable and must be configured prior to project closeout.

D. Provide products with the latest and most up-to-date firmware by the manufacturer or provide firmware of a version specified by the provider of the Video Management Application (VMA) or Network Video Recorder (NVR).

3.5 ADJUSTING

A. Fine Tuning: Perform field software changes after initial programming session to "fine tune" operating parameters and sequence of operations based on any revisions to Owner's operating requirements.

3.6 CLOSEOUT

A. Demonstration:

1. Demonstrate administration and operation of devices described by this section.
2. Demonstrate how to authorize users and applications to operate and configure installed devices.
3. Demonstrate how an authorized user can gain access to and make changes to configuration.
4. Demonstrate how to operate functionality configured for this project as defined by configuration punch list.

B. License Assignment:

1. Register software, hardware, firmware, operational or administrative licenses necessary for to operate or administer devices to Owner.
2. Deliver to Owner's Representative proof of license registration from product manufacturer.

C. Device Configuration Backup:

1. Using manufacturer's backup software tool or VMA/NVR, perform a full system back-up at completion of initial programming.
2. Deliver configuration backup files, restoration application and instructions detailing for restoration of back-up configuration.

END OF SECTION 28 23 33

DO NOT REMOVE
THIS PAGE INTENTIONALLY LEFT BLANK