NOTE: This Addendum forms a part of the Contract Documents. Insert it in the Project Manual. Acknowledge receipt of this Addendum in the space provided on the Bid Form.

BIDDING REQUIREMENTS

1. DOCUMENT 003113 PRELIMINARY PROJECT SCHEDULE: Discard the section bound in Project Manual and use the substitute the accompanying section noted "Revised 9/25/17".

SPECIFICATION GROUP

CONSTRUCTION WORK

2. SECTION 066000 SOLID PLASTIC FABRICATIONS: Discard the section bound in the Project Manual and substitute the accompanying section (Pages 066000-1 through 066000-3), noted "Revised 9/25/17".

3. SECTION 114102 PREFABRICATED WALK-IN REFRIGERATED BOXES: Discard the section bound in the Project Manual and substitute the accompanying section (Pages 064000-1 through 064000-5), noted "Revised 9/25/17".

ELECTRICAL WORK

4. DOCUMENT 099102 ELECTRICAL PAINTING: Add the accompanying section (pages 099102 – 1 thru 099102 – 9) to the Project Manual.

5. SECTION 260505 WIRING FOR GATE SYSTEMS: Discard the section bound in the Project Manual and substitute the accompanying section (Pages 260505-1 through 260505-7), noted "Revised 9/25/17".

6. SECTION 265100 INTERIOR LIGHTING FIXTURES: Discard the section bound in the Project Manual and substitute the accompanying section (Pages 265100-1 through 265100-4), noted "Revised 9/25/17".
7. SECTION 275112 INTERCOM AND ZONE PAGING SYSTEM: Discard the section bound in the Project Manual and substitute the accompanying section (Pages 275112-1 through 275112-14), noted "Revised 9/25/17".

8. SECTION 281354 METAL DETECTOR: Discard the section bound in the Project Manual and substitute the accompanying section (Pages 281354-1), noted "Revised 9/25/17".

9. SECTION 281604 MICROWAVE DETECTION SYSTEM: Discard the section bound in the Project Manual and substitute the accompanying section (Pages 281604-1 through 281604-14), noted "Revised 9/25/17".

10. SECTION 281605 PERIMETER ALARM SYSTEM: Discard the section bound in the Project Manual and substitute the accompanying section (Pages 281605-1 through 281605-22), noted "Revised 9/25/17".

11. SECTION 282304 VIDEO SURVEILLANCE SYSTEM: Discard the section bound in the Project Manual and substitute the accompanying section (Pages 282304-1 through 282304-28), noted "Revised 9/25/17".

12. SECTION 283105 MODIFICATIONS TO FIRE ALARM SYSTEM: Discard the section bound in the Project Manual and substitute the accompanying section (Pages 283105-1 through 283105-22), noted "Revised 9/25/17".

13. SECTION 284601 ELECTRONIC DOOR LOCKING AND MONITORING SYSTEM: Discard the section bound in the Project Manual and substitute the accompanying section (Pages 284601-1 through 284601-42), noted "Revised 9/25/17".

**DRAWINGS**

**CONSTRUCTION WORK DRAWINGS**

14. Addendum Drawing:
   a. Drawing No. A-1002, noted "ADDENDUM DRAWING 09/25/17" accompanies this Addendum and forms part of the Contract Documents.

15. Revised Drawings:
   a. Drawings listed below, noted "ADDENDUM 1 09/25/17" accompany this Addendum and supersede the same numbered originally issued.

   **Architectural Drawings**
   
   A-1001 A-1202 A-1404 A-2201  
   A-1003 A-1203 A-1501 A-2202  
   A-1004 A-1301 A-1502 A-2401  
   A-1102 A-1302 A-1601 A-2601  
   A-1104 A-1303 A-1602 A-2602  
   A-1105 A-1305 A-1603 A-2603  
   A-1106 A-1401 A-1604 A-3101  
   A-1107 A-1402 A-1605 A-3102  

**HVAC WORK DRAWINGS**
16. Revised Drawings:
   a. Drawings listed below, noted "ADDENDUM 1 09/25/17" accompany this Addendum and superseded the same numbered originally issued.

   M-1104  M-1106  M-2104  M-7502
   M-1105  M-2103  M-7501

**PLUMBING WORK DRAWINGS**

17. Revised Drawings:
   a. Drawings listed below, noted "ADDENDUM 1 09/25/17" accompany this Addendum and superseded the same numbered originally issued.

   **Fire Protection Drawings**
   F-1102

   **Plumbing Drawings**
   P-1402  P-1404  P-7501
   P-1403  P-2102  P-7503

**ELECTRICAL WORK DRAWINGS**

18. Revised Drawings:
   a. Drawings listed below, noted "ADDENDUM 1 09/25/17" accompany this Addendum and superseded the same numbered originally issued.

   **Electrical Drawings**
   E-1001  E-1104  E-1700  E-3101
   E-1002  E-1105  E-2101  E-7600
   E-1003  E-1106  E-2102  E-7601
   E-1101  E-1108  E-2103  E-7602
   E-1102  E-1400  E-2104  E-7605
   E-1103  E-1500  E-2400  E-2700

   **Security Drawings**
   EY-1101  EY-1202  EY-2101  EY-7601
   EY-1102  EY-1502  EY-2502  EY-7614

**END OF ADDENDUM**

Margaret F. Larkin
Executive Director
Design and Construction
A Preliminary Project Schedule has been prepared for this project in CPM network format utilizing the Precedence Diagram Method. Bid Milestones are presented on the following pages which encompass the anticipated durations of Work related to the Project. The detailed Preliminary Project Schedule will be made available for review by the Contractors after award of the Contract to further assist in final CPM Baseline Project Schedule preparation in accordance with Sections 013200 and 013119.

After execution of the CMU-01 Agreement (blank included on last page of document 013200), the Project Schedule will become the basis for coordinating the work activities, measuring progress, and approving progress payments.

NOTE: The Bid Milestones summarizing the Preliminary Project Schedule included in this Document are to be used as reference in preparing a bid response. It is not intended that these examples limit the Contractor in anyway in preparation of a bid response.
# Project Milestones

## Activity ID | Phase/Area | Activity Name | Start
--- | --- | --- | ---
B01-1040 | BLDG 1 | Temp: Building Temp Enclosed | 29-Nov-17
B01-1050 | BLDG 1 | Temp: Building Temp Heat In Place | 06-Dec-17
B01-1060 | BLDG 1 | Removals: Ceiling Removals Complete | 27-Dec-17
B01-1280 | BLDG 1 | Bathrooms Ready for Ceilings | 03-Apr-18
B01-1290 | BLDG 1 | Above-Ceiling Ready for Ceiling Construction | 11-Apr-18
B01-1320 | BLDG 1 | Control/Security: Ready for Ceilings | 16-May-18
B01-1350 | BLDG 1 | Vestibule: Ready for Steel | 21-May-18
B01-1430 | BLDG 1 | Demo: Remove Existing Boiler | 01-Jun-18*
B01-1540 | BLDG 1 | Completion: Life Safety Complete | 18-Jul-18
B01-1550 | BLDG 1 | SWS: FACP Live & Ready for Testing | 18-Jul-18
B01-1560 | BLDG 1 | SWS: Cameras Set | 25-Jul-18
B01-1570 | BLDG 1 | Control/Security: Control Room Complete | 01-Aug-18
B01-1690 | BLDG 1 | Finishes: Kitchen Complete and Ready for Inspection | 08-Aug-18
B01-1700 | BLDG 1 | Completion: DOH Kitchen Inspection | 08-Aug-18
B01-1720 | BLDG 1 | Occupy: Deliver Furnishings and Equipment | 08-Aug-18
B01-1630 | BLDG 1 | SWS: Cameras Verified @ Main Control | 08-Aug-18
B01-1680 | BLDG 1 | Vestibule: Complete | 13-Aug-18
B01-1730 | BLDG 1 | Completion: C of O | 15-Aug-18
B01-1750 | BLDG 1 | Completion: DJJOY Acceptance for Occupancy | 22-Aug-18
B01-1660 | BLDG 1 | SWS: Camera Aiming Verified | 29-Aug-18
B01-1670 | BLDG 1 | SWS: Door Control & Intercom Verified @ Main Control | 29-Aug-18
B01-1760 | BLDG 1 | Occupy: Security Facility – 100% Lockdown | 19-Sep-18
B02-1020 | BLDG 2 | Removals: Ceiling Removals Complete | 27-Nov-17
B02-1060 | BLDG 2 | Temp: Building Temp Enclosed | 29-Nov-17
B02-1070 | BLDG 2 | Temp: Building Temp Heat In Place | 06-Dec-17
B02-1150 | BLDG 2 | New: Ready for Finishes | 15-Feb-18
B02-1280 | BLDG 2 | SWS: FACP Live & Ready for Testing | 29-Mar-18
B02-1310 | BLDG 2 | SWS: Cameras Set | 12-Apr-18
B02-1320 | BLDG 2 | Completion: Life Safety Complete | 12-Apr-18
B02-1330 | BLDG 2 | Completion: C of O | 12-Apr-18
B02-1380 | BLDG 2 | Occupy: Deliver Furnishings and Equipment | 26-Apr-18
B02-1390 | BLDG 2 | Demo: Remove Existing Boiler | 01-Jun-18*
B02-1400 | BLDG 2 | SWS: Cameras Verified @ Main Control | 01-Aug-18
B02-1410 | BLDG 2 | SWS: Camera Aiming Verified | 18-Aug-18
B02-1420 | BLDG 2 | SWS: Door Control & Intercom Verified @ Main Control | 29-Aug-18
B02-1430 | BLDG 2 | Completion: DJJOY Acceptance for Occupancy | 05-Sep-18
B02-1450 | BLDG 2 | Occupy: Security Facility – 100% Lockdown | 19-Sep-18
S-1070 | SITE | Utilities: Site Water Off | 15-Nov-17
S-1100 | SITE | Utilities: New Storm Structures CB #1 and CB #2 On the Job | 22-Nov-17
S-1150 | SITE | Site: Grade Swales & Install Underground | 13-Dec-17
S-1160 | SITE | Site: Re-Graded & Stabilized | 23-Dec-17
S-1180 | SITE | Utilities: New Storm Drainage System Complete | 27-Dec-17
S-1190 | SITE | Utilities: New 10-Inch Water Line Accepted and Back In Service | 03-Jan-18
S-1200 | SITE | Utilities: Site Water Back On | 03-Jan-18
S-1410 | SITE | Site Road: Perimeter Road Installed to Top of Base Course | 24-May-18
S-1420 | SITE | Site Paving: Start New Paving Work | 24-May-18
S-1450 | SITE | Utilities: New Generator Accepted and On-Line | 04-Jun-18
S-1460 | SITE | Utilities: New Site Water SYSTEMS Accepted by DOH | 14-Jun-18
S-1500 | SITE | Utilities: New Site Water and Fire Protection In Service | 14-Jun-18
S-1520 | SITE | Site Paving: Site Paving Complete | 18-Jun-18
### 45678 - Harriet Tubman Secure Center

#### Project Milestones

<table>
<thead>
<tr>
<th>Activity ID</th>
<th>Phase/Area</th>
<th>Activity Name</th>
<th>Start</th>
</tr>
</thead>
<tbody>
<tr>
<td>S-1540</td>
<td>SITE</td>
<td>Utilities: New Sanitary System Accepted by DOH</td>
<td>02-Jul-18</td>
</tr>
<tr>
<td>S-1550</td>
<td>SITE</td>
<td>Utilities: New Sanitary System In Service</td>
<td>02-Jul-18</td>
</tr>
<tr>
<td>S-1560</td>
<td>SITE</td>
<td>Site Fence: Perimeter Fence Complete: Senstar, Lighting, Razor Ribbon</td>
<td>02-Jul-18</td>
</tr>
<tr>
<td>S-1570</td>
<td>SITE</td>
<td>Site Paving: Site Concrete Sidewalks Complete</td>
<td>02-Jul-18</td>
</tr>
<tr>
<td>S-1590</td>
<td>SITE</td>
<td>Site Fence: New Site Gates Operational</td>
<td>16-Jul-18</td>
</tr>
</tbody>
</table>

- **SITE Utilities:** New Sanitary System Accepted by DOH
- **SITE Utilities:** New Sanitary System In Service
- **SITE Site Fence:** Perimeter Fence Complete: Senstar, Lighting, Razor Ribbon
- **SITE Site Paving:** Site Concrete Sidewalks Complete
- **SITE Site Fence:** New Site Gates Operational
GENERAL NOTES

1. GENERAL NOTES APPLY TO SPECIFIC ITEMS AS NOTED ON THE SHEET.

2. GENERAL NOTES APPLY TO SPECIFIC ITEMS AS NOTED ON THE SHEET.

3. GENERAL NOTES APPLY TO SPECIFIC ITEMS AS NOTED ON THE SHEET.

4. GENERAL NOTES APPLY TO SPECIFIC ITEMS AS NOTED ON THE SHEET.

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15. GENERAL NOTES APPLY TO SPECIFIC ITEMS AS NOTED ON THE SHEET.

16. GENERAL NOTES APPLY TO SPECIFIC ITEMS AS NOTED ON THE SHEET.

17. GENERAL NOTES APPLY TO SPECIFIC ITEMS AS NOTED ON THE SHEET.

18. GENERAL NOTES APPLY TO SPECIFIC ITEMS AS NOTED ON THE SHEET.

19. GENERAL NOTES APPLY TO SPECIFIC ITEMS AS NOTED ON THE SHEET.

20. GENERAL NOTES APPLY TO SPECIFIC ITEMS AS NOTED ON THE SHEET.

21. GENERAL NOTES APPLY TO SPECIFIC ITEMS AS NOTED ON THE SHEET.

22. GENERAL NOTES APPLY TO SPECIFIC ITEMS AS NOTED ON THE SHEET.

23. GENERAL NOTES APPLY TO SPECIFIC ITEMS AS NOTED ON THE SHEET.

ARCHITECTURAL ABBREVIATIONS

AC: ACCESS DOOR
AD: ANODIZED
AE: AREA
AF: ANGLE FRAME
AG: AGREEMENT
AK: ACCESS KITCHEN
AL: AN ANODIZED
AM: AMENDMENT
AN: ANTHRACITE
AO: ACCESS OVEN
AP: APPLIANCE
AQ: ABSOLUTELY QUARTZITE
AR: AIR RETURN
AS: ACCESS SPACE
AT: ACCESS TOILET
AU: AGREEMENT
AV: ACCESS VENT
AW: ACCESS WINTER
AX: ACCESS X-RAY
AY: ACCESS YARD
AZ: ACCESS ZONE
BA: BASE
BB: BACK-TO-BACK
BC: BACKPAINTER
BD: BASEMENT
BE: BACKFLOW
BF: BACKFLOW PREVENTER
BG: BACKGROUNDBUED
BH: BACKHANGING
BI: BACKING
BJ: BACKJOINT
BK: BASEMENT
BL: BASEMENT
BM: BASEMENT
BN: BASEMENT
BO: BASEMENT
BP: BASEMENT
BQ: BASEMENT
BR: BASEMENT
BS: BASEMENT
BT: BASEMENT
BU: BASEMENT
BV: BASEMENT
BW: BASEMENT
BX: BASEMENT
BY: BASEMENT
BZ: BASEMENT
CA: CABINET
CB: CABINET
CC: CABINET
CD: CABINET
CE: CABINET
CF: CABINET
CG: CABINET
CH: CABINET
CI: CABINET
CJ: CABINET
CK: CABINET
CL: CABINET
CM: CABINET
CN: CABINET
CO: CABINET
CP: CABINET
CQ: CABINET
CR: CABINET
CS: CABINET
CT: CABINET
CU: CABINET
CV: CABINET
CW: CABINET
CX: CABINET
CY: CABINET
CZ: CABINET
DA: DATA CENTER
DB: DATA CENTER
DC: DATA CENTER
DD: DATA CENTER
DE: DATA CENTER
DF: DATA CENTER
DG: DATA CENTER
DH: DATA CENTER
DI: DATA CENTER
DJ: DATA CENTER
DK: DATA CENTER
DL: DATA CENTER
DM: DATA CENTER
DN: DATA CENTER
DO: DATA CENTER
DP: DATA CENTER
DQ: DATA CENTER
DR: DATA CENTER
DS: DATA CENTER
DT: DATA CENTER
DU: DATA CENTER
DV: DATA CENTER
DW: DATA CENTER
DX: DATA CENTER
DY: DATA CENTER
DZ: DATA CENTER
EA: ELECTRICAL ACCESS
EB: ELECTRICAL BOX
EC: ELECTRICAL CENTER
ED: ELECTRICAL DISTRIBUTION
EE: ELECTRICAL EQUIPMENT
EF: ELECTRICAL FRAME
EG: ELECTRICAL GROUND
EH: ELECTRICAL HEAT}

END OF SHEET
APPLICABLE CODES

- 2013 NFPA 72 INSTALLATION OF FIRE ALARM SYSTEMS
- 2014 NFPA 70 NATIONAL ELECTRIC CODE
- 2013 NFPA 13 INSTALLATION OF FIRE SPRINKLERS
- 2010 ASCE 7 MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES WITH SUPPLEMENT NO.1
- 2009 ICC/ANSI A117.1 ACCESSIBLE AND USABLE BUILDINGS AND FACILITIES
- NEW YORK STATE LABOR DEPARTMENT INDUSTRIAL CODE FOR ITEMS RELATING TO PEOPLE WHO WORK IN THE BUILDING SUCH AS SAFETY GLASS,
- 2015 INTERNATIONAL FIRE CODE (3rd Printing) WITH NY 2016 UNIFORM CODE SUPPLEMENT
- 2015 INTERNATIONAL PROPERTY MAINTENANCE CODE (4th Printing) WITH NY 2016 UNIFORM CODE SUPPLEMENT
- 2015 INTERNATIONAL FUEL GAS CODE (3rd Printing) WITH NY 2016 UNIFORM CODE SUPPLEMENT
- 2015 INTERNATIONAL PLUMBING CODE (3rd Printing) WITH NY 2016 UNIFORM CODE SUPPLEMENT
- 2015 INTERNATIONAL BUILDING CODE (3rd Printing) WITH NY 2016 UNIFORM CODE SUPPLEMENT
- FIRE CODE 33 WELDING AND OTHER HOT WORKS
- FIRE CODE 33 FIRE SAFETY DURING CONSTRUCTION AND REMOVALS
- BUILDING CODE 33 SAFEGUARDS DURING CONSTRUCTION
- EXISTING BUILDING CODE 15 CONSTRUCTION SAFEGUARDS

CODE COMPLIANCE PLAN - LEVEL 0

<table>
<thead>
<tr>
<th>NAME AREA</th>
<th>OCCUPANCY</th>
<th>FUNCTION</th>
<th>CLASSIFICATION</th>
<th>OLF</th>
<th>GROSS/NET</th>
<th># OCCUPANTS</th>
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<tbody>
<tr>
<td>CIRCULATION</td>
<td>I-3</td>
<td>Institutional - Inpatient Treatment Areas</td>
<td></td>
<td>0.15</td>
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<tr>
<td>STORAGE</td>
<td>I-3</td>
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<td>1-C6</td>
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<td>CIRCULATION</td>
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<td>Institutional - Inpatient Treatment Areas</td>
<td></td>
<td>1-C3</td>
<td>113 SF</td>
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NOTE:
- BUILDING IS ALTERATION LEVEL 2 RECONFIGURATION RATED, EXCEPT AS NOTED ON THE PLAN.
- ALT 2 RATING IS LESS THAN 50% OF FLOOR AREA, EXCEPT AS NOTED ON THE PLAN.
- ALT 2 RATING IS LESS THAN 50% OF TOTAL BUILDING AREA.
- ALT 2 RATING IS LESS THAN 50% OF TOTAL BUILDING AREA.

CODE COMPLIANCE SCHEDULE - LEVEL 0

<table>
<thead>
<tr>
<th>NAME AREA</th>
<th>OCCUPANCY</th>
<th>FUNCTION</th>
<th>CLASSIFICATION</th>
<th>OLF</th>
<th>GROSS/NET</th>
<th># OCCUPANTS</th>
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<tbody>
<tr>
<td>CIRCULATION</td>
<td>I-3</td>
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<td>1-C5C</td>
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<td>STORAGE</td>
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<td>358 SF</td>
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</tbody>
</table>

FUNCTION CLASSIFICATION LEGEND

- Institutional - Inpatient Treatment Areas
- Accessory storage areas, mechanical equipment rooms

NOTE:
- SEE IEBC SUMMARY FOR CHAPTER 11 ON SHEET A-1005
- PER IBC 2015 ADDITION PERMITTED WHEN NEW AREA < THAN 50% OF FLOOR AREA, EXCEPT AS NOTED ON THE PLAN.
- THERE IS A CHANGE OF OCCUPANCY, BASED ON A CHANGE OF USE (BUT NOT A CHANGE OF USE GROUP). EXISTING OCCUPANCY IS I-3 CONDITION 1 (FREE MOVEMENT). NEW OCCUPANCY IS I-3 CONDITION 5 (RESTRICTED MOVEMENT). EXISTING 2-HOUR FIRE BARRIER TO REMAIN RATED WALLS (STAIRS AND SHAFTS REQUIREMENT). EXISTING 1-HOUR FIRE BARRIER TO REMAIN RATED WALLS (STAIRS AND SHAFTS REQUIREMENT). EXISTING FIRE PLATE MATERIAL OF CONSTRUCTION SPRINKLERED. REQUIRED EXIT CAPACITY TO ALERTNESS REQUIRED. EXIT CAPACITY TO ALERTNESS REQUIRED. EXIT CAPACITY TO ALERTNESS REQUIRED. EXIT CAPACITY TO ALERTNESS REQUIRED.
NOTE (ADDENDUM 1):
REMOVAL KEYNOTES R-12, R-15, R-55, & R-56 DELETED FROM DRAWING.

**REMOVALS SYMBOLS LEGEND**

- **R03**: Remove existing exterior masonry wall system in its entirety to the extent shown.
- **R14**: Remove existing VCT and mastic. Grind and prepare existing concrete slab throughout the entire room for finish as scheduled.
- **R15**: Remove window and all associated hardware in their entirety.
- **R17**: Remove portion of interior CMU wall to the extent shown. Grind and grout exposed CMU edges flush.
- **R18**: Remove existing door and frame and all associated hardware in its entirety.
- **R22**: Remove existing casework and/or countertop in its entirety. Existing rolling door to remain.
- **R24**: Remove masonry wall as required for door & linteled frame.
- **R25**: Remove existing steel window system.
- **R29**: Remove existing interior walls, ceiling, wall & floor finishes in their entirety back to existing substrate.
- **R42**: Remove existing glazing from window frame. Frame to remain.
- **R51**: Remove existing steel door panel and all associated hardware.
- **R53**: Remove existing masonry pier down to existing to the foundation.
- **R54**: Existing building signage, salvage & protect for re-use/re-installation.
- **R57**: Remove existing threshold at all bathrooms & laundry rooms.
- **R58**: Remove existing wood wall system in its entirety.
- **R74**: Remove existing folding partition in its entirety. Remove track system in its entirety.

**LEVEL 1 REMOVALS**

- **PLAN**: Level 1 Removals Plan
- **DATE**: 08/14/2017
- **EYP/CONSTRUCTION**: Final Submission

**WARNING**

Any alteration of this material in any way, unless done under the direction of a comparable professional, i.e. architect for an architect, engineer for an engineer or landscape architect for a landscape architect, is a violation of the New York State Education Law and/or regulations and is a class 'A' misdemeanor.
NOTE:
1. ALL CEILING TO BE 9'-0" AFF UNLESS NOTED OTHERWISE
2. CONTRACTOR OPTION: GWB-1 CAN BE REPLACED WITH “SUSPENDED METAL PANEL CEILING SYSTEM”
3. ALL GWB CEILINGS TO BE PAINTED AL-2
4. ALL GWB CEILINGS TO BE PAINTED AL-2
5. FRPB CEILING AT ALL BEDROOMS. PROVIDE JOINT BETWEEN PANELS AS SHOWN ON DRAWING.

LIGHT FIXTURES:
- 1' X 4'
- 2' X 2'
- WALL MOUNTED STRIP
- CEILING MOUNTED DOWNLIGHT
- WALL PACK
- EMERGENCY WALL PACK

ACCESS PANELS:
- 2' x 2' TYPICAL UNLESS NOTED OTHERWISE
- PANEL JOINTS
GENERAL NOTES:
1. REPAIR ALL CRACKS IN MASONRY, ASSUME 50 LF.
2. REPAIR ALL CRACKS IN STUCCO, ASSUME 20 LF.
3. REPAIR AND CLEAN ALL EXTERIOR MASONRY AND STUCCO. FINAL COLOR PER DIRECTORS REPRESENTATIVE.
4. THOROUGHLY CLEAN ALL SURFACES (NOT OTHERWISE NOTED) WITH FUNGICIDE.
5. REPLACE ALL WINDOW SEALANT.
6. CLEAN ALL OPENINGS AFTER REMOVALS OF SEALANT OR RESIDUE IN PREPARATION OF THE WORK.
7. CLEAN ALL LOUVERS INTERIOR AND EXTERIOR.
8. REPAIR ALL EXISTING BENT METAL FASCIA AND STANDING SEAM ROOF.

CONCRETE SPLASH BLOCK LOCATION TO BE COORDINATED WITH CONDENSATE DRAIN. SEE P-CONTRACT.

PROVIDE CAMPUS WIDE UPGRADES

HARRIET TUBMAN RESIDENTIAL CENTER
6706 PINE RIDGE ROAD
AUBURN, NY 13021

EYP/CONSTRUCTION

Final Submittal
08/14/2017

BUILDING 01
ROOF PLAN

A-1107
45678 - C
A01 - LEVEL 1

0' - 0"

R18
C65
R60
R61
R62

GENERAL NOTES

1. REPAIR ALL CRACKS IN MASONRY, ASSUME 50 LF
2. REPAIR ALL CRACKS IN STUCCO, ASSUME 20 LF
3. REPAIR AND CLEAN ALL EXTERIOR MASONRY AND STUCCO. FINAL COLOR PER DIRECTOR'S REPRESENTATIVE
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5. REPLACE ALL WINDOW SEALANT
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7. CLEAN ALL LOUVERS INTERIOR AND EXTERIOR.
8. REPAIR ALL EXISTING BENT METAL FASCIA AND STANDING SEAM ROOF

CONSTRUCTION & DESIGN

NEW YORK STATE OFFICE OF CHILDREN AND FAMILY SERVICES

CONSULTANT

CLIENT:

CONTRACT:

TITLE:

LOCATION:

SHEET TITLE:

DESIGNED BY:

PROJECT NUMBER:

DRAWN BY:

DRAWING NUMBER:

FIELD CHECK:

APPROVED:

WARNING

PROVIDE CAMPUS WIDE UPGRADES

HARRIET TUBMAN RESIDENTIAL CENTER
6706 PINE RIDGE ROAD
AUBURN, NY 13021

EYP/CONSTRUCTION

FINAL SUBMISSION 08/14/2017

NOTE:

FINAL GRADE TO BE BELOW FINISHED FLOOR. REFER TO CIVIL DRAWINGS FOR FINAL GRADE ELEVATIONS.

REMOVALS

- NORTH

- SOUTH

- WEST

- EAST

KEYNOTE LEGEND

DATA VALUE

PREVIOUS TEXT

C65 PATCH / REPAIR EXISTING STUCCO STAIN & OR DAMAGE AT FASCIA INTERSECTION. PROVIDE KICK-OUT FLASHING AT ALL ROOF/WALL INTERSECTIONS AS WATER DIVERTER, REFER TO DETAILS 7,8,& 9 / A-1305

R05 REMOVE EXISTING EXTERIOR STEEL DOOR AND ALL ASSOCIATED HARDWARE

R18 REMOVE EXISTING DOOR AND FRAME AND ALL ASSOCIATED HARDWARE IN ITS ENTIRETY.

R25 REMOVE EXISTING STEEL WINDOW SYSTEM.

R59 REMOVE EXISTING ROOF SYSTEM TO METAL DECK IN AREAS INDICATED

R60 REPAIR FASCIA TO MATCH EXISTING

R61 PATCH / REPAIR EXISTING STUCCO STAIN & OR DAMAGE AT FASCIA INTERSECTION

R62 SALVAGE AND PROTECT EXISTING BUILDING SIGNAGE FOR REUSE
NOTE: GRADE LINE TO REFLECT

GENERAL NOTES
1. REPAIR ALL CRACKS IN MASONRY, ASSUME 50 LF
2. REPAIR ALL CRACKS IN STUCCO, ASSUME 20 LF
3. REPAIR AND CLEAN ALL EXTERIOR MASONRY AND STUCCO. FINAL COLOR PER DIRECTORS REPRESENTATIVE.
4. THOROUGHLY CLEAN ALL SURFACES (NOT OTHERWISE NOTED) WITH FUNGICIDE
5. REPLACE ALL WINDOW SEALANT
6. CLEAN ALL OPENINGS AFTER REMOVALS OF SEALANT OR RESIDUE IN PREPARATION OF THE WORK.
7. CLEAN ALL LOUVERS INTERIOR AND EXTERIOR.
8. REPAIR ALL EXISTING BENT METAL FASCIA AND STANDING SEAM ROOF
2'-0" O.C., TYPICAL AT EXPANSION ANCHOR @

EXPANSION ANCHOR, TYPICAL

EXPANSION BOLT, OR BOLT WITH NUTS AND WASHERS.

FURNITURE NOTES - RTA

1. PROVIDE CAMPUS WIDE UPGRADES

2. WARNING

A LANDSCAPE ARCHITECT, IS A VIOLATION OF THE ENGINEER FOR AN ENGINEER OR LANDSCAPE ARCHITECT PROFESSIONAL, I.E. ARCHITECT FOR AN ARCHITECT, DONE UNDER THE DIRECTION OF A COMPARABLE

3. CONSULTANT

4. TITLE:

5. CONTRACT:

6. DRAWING NUMBER:

7. SHEET TITLE:

8. APPROVED:

9. FIELD CHECK:

10. DRAWN BY:

11. NUMBER:

12. PROJECT

13. MARK DATE

14. DESCRIPTION

HARRIET TUBMAN RESIDENTIAL CENTER

NEW YORK STATE OFFICE OF EDUCATION LOYAL ROAD, RONDA WYOMING NY 12345

NEW YORK STATE OFFICE OF EDUCATION LOYAL ROAD, RONDA WYOMING NY 12345

INTERIOR ELEVATIONS

FINAL SUBMISSION08/14/2017

45678 - C

BUILDING 01

INTERIOR ELEVATIONS

A-1405

SHEET 6

OF 132
MID-SPAN BRACE, 1-1/2"W x 18"GAGE STEEL STRAP SCREWED TO T/FLANGE OF CEILING JOIST USING #12 x 3/4" HEX DRILL POINT SCREWS

PROVIDE ADDITIONAL 600 S162 - 54 FRAMING AT GRILLE & FIXTURE LOCATIONS, VERIFY LOCATIONS IN FIELD.

(800 T150) @ PERIMETER, TYP.
(1000 T150) @ 10" PERIMETER, TYP.

TYPICAL 1' - 4" 4/A-1404

HILTI 1/2" DIAMETER HIT-Z ANCHOR W/ HY-200 Adhesive EMBEDDED 4-1/2" (TYP.)

CFMF JOIST, REFER TO SPAN TABLE

CL362 / 400 - 68 STIFF CLIP W/ (4) - #12 SCREWS

EXISTING OR PROVIDED MASONRY PARTITION. REFER TO FLOOR PLAN FOR TYPE CEILING SYSTEM. REFER TO RCP FOR TYPE 6 SEALANT, TYPICAL

HILTI 1/2" DIAMETER HIT-Z ANCHOR W/ HY-200 Adhesive EMBEDDED 4-1/2" (TYP.)

NOTE:
WHERE NO JOISTS ATTACH TO TRACK AROUND THE PERIMETER USE 1/2" DIAMETER HILTI HIT-Z ANCHORS W/ HY-200 Adhesive EMBEDDED 4-1/2" SPPED @ 16" O.C.

CFMF JOIST SPAN TABLE

<table>
<thead>
<tr>
<th>SPAN</th>
<th>JOIST</th>
<th>BRIDGING</th>
</tr>
</thead>
<tbody>
<tr>
<td>6' - 12'</td>
<td>600 S162 - 54</td>
<td>600 S162 - 54</td>
</tr>
<tr>
<td>12' - 16'</td>
<td>800 S200 - 68</td>
<td>800 S200 - 97</td>
</tr>
<tr>
<td>16' - 21'</td>
<td>1000 S200 - 97</td>
<td>1000 S200 - 97</td>
</tr>
</tbody>
</table>

LOAD TABLE BASED ON 60# / SF LOAD

FRPB BOARD SYSTEM
- 1/2" PARTICLE BOARD
- FRPB FINISH

FRPB
- 1/2" PARTICLE BOARD
- POLYCARBONATE SECURITY REINFORCING
- 5/8" GWB, PAINTED

GWB-1
- 1/4" CEMENT BOARD

GWB-2
- 5/8" GWB, PAINTED

ACCESS DOOR WITH INTEGRAL CASING BEAD (TYP. 4 SIDES) AND CYLINDER LOCK

CEILING SYSTEM - REFER TO RCP FOR TYPE

24" X 24", REFER TO CEILING PLANS FOR LOCATIONS 20 GAUGE METAL STUD FRAMING.

SEE FRPB FRAMING PLAN

DAYROOM
FRPB CEILING
FRPB PANEL JOINT
WALL MOUNTED LIGHT FIXTURE.
REFER TO E-CONTRACT

INSTITUTIONAL SPRINKLER HEAD, CENTERED
1-1/2" x 1-3/4" x 1/8" BENT STEEL CLOSURE PIECE W/ FASTENER, PAINT, TYP CMU WALL, REFER TO PLAN FOR TYPE 6 SEALANT, TYP.

EXISTING CMU BELOW

MASONRY ANCHOR

9/16" METAL FACED PANEL INFILL

REMOVE EXISTING STOP TO INSTALL NEW METAL PANEL

1 1/4" 16 GAUGE STRAP ANCHORS EACH COURSE WELD STRAP TO TUBE CMU WALL, REFER TO PLAN FOR TYPE 6 SEALANT, TYP.

2" x 6" x 3/8" STEEL TUBE EXISTING CMU BELOW

1 1/2" x 1 1/2" x 1/4" STEEL ANGLE STOPS TYPE 6 SEALANT, TYP.

S-4 GLAZING, UNO.

BULLNOSE CMU

ANGLE GLAZING STOP ATTACHMENT NOTES:

CSU SIDE: WELD ANGLE TO STEEL TUBE W 1 1/4" WELDS @ 6" OC MAX EACH SIDE, STAGGERED. 1" MAX FROM ENDS, TYPICAL ALL AROUND.

CORRIDOR OR SALLYPORT SIDE: SECURE ANGLE TO TUBE WITH 5/16" CADMIUM PLATED HIGH STRENGTH TAMPER RESISTANT (TORX-CENTERPIN REJECTION) MACHINE SCREWS @ 4" OC 2" MAX FROM ENDS.

CMU WALL, REFER TO PLAN FOR TYPE 6 SEALANT, TYP.

SHIM EXISTING MASONRY BELOW

EXISTING MASONRY BELOW

9/16" METAL FACED PANEL INFILL

CMU WALL, REFER TOPLAN FOR TYPE

16 GAGE STRAP ANCHORS EACH COURSE WELD STRAP TO TUBE CMU WALL, REFER TO PLAN FOR TYPE 6 SEALANT, TYP.

BULLNOSE CMU BELOW

TYPE 6 SEALANT, TYP.

1-1/4" 16 GAUGE STRAP ANCHORS EACH COURSE WELD STRAP TO TUBE CMU WALL, REFER TO PLAN FOR TYPE 6 SEALANT, TYP.

2" x 6" x 3/8" STEEL TUBE SHIM, TYPICAL

S-4 GLAZING, UNO.

NOTE: ON SCREENING/CONTROL ROOM WALL PARTITION, WINDOWS AND TUBE STEEL TO BE WELDED. WELD WINDOWS AND TUBE STEEL FRAME WITH 1-1/4" WELDS AT 6" O.C. MAX, EACH SIDE STAGGERED. 1" MAX FROM ENDS. TYPICAL ALL AROUND

COUNTERTOP

1 1/2" x 1 1/2" x 1/4" STEEL ANGLE STOPS

S-4 GLAZING, UNO.

TYPE 6 SEALANT, TYP.

2" x 6" x 3/8" STEEL TUBE

NOTE: ON SCREENING/CONTROL ROOM WALL PARTITION, WINDOWS AND TUBE STEEL TO BE WELDED. WELD WINDOWS AND TUBE STEEL FRAME WITH 1-1/4" WELDS AT 6" O.C. MAX, EACH SIDE STAGGERED. 1" MAX FROM ENDS. TYPICAL ALL AROUND

COUNTERTOP

1 1/2" x 1 1/2" x 1/4" STEEL ANGLE STOPS

S-4 GLAZING, UNO.

NOTE: ON SCREENING/CONTROL ROOM WALL PARTITION, WINDOWS AND TUBE STEEL TO BE WELDED. WELD WINDOWS AND TUBE STEEL FRAME WITH 1-1/4" WELDS AT 6" O.C. MAX, EACH SIDE STAGGERED. 1" MAX FROM ENDS. TYPICAL ALL AROUND
### Hollow Metal Frame Types

**Door Materials**

<table>
<thead>
<tr>
<th>Door Material</th>
<th>Glass Type</th>
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<tr>
<td>FRP</td>
<td>PG</td>
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<tr>
<td>AL</td>
<td>FG</td>
</tr>
<tr>
<td>STEEL</td>
<td>CMU</td>
</tr>
<tr>
<td>ALUMINUM</td>
<td></td>
</tr>
</tbody>
</table>

**Finish**

- **Right Hand** (RHR)
- **Left Hand Reverse** (LHR)
- **Left Hand** (LH)
- **Clear Fire Rated (No Wire)**
- **S-4**

**Frame Materials**

<table>
<thead>
<tr>
<th>Frame Material</th>
<th>Name Type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S-4</td>
</tr>
</tbody>
</table>

**Door Types**

- **1' - 9"**
- **2' - 0"**
- **3' - 8"**
- **7' - 0"**
- **7' - 8"**

**Anchor Types**

- **LHRA**
- **LHR**
- **LG**
- **GLASS TYPE**

**Hardware**

- **EQL-4**
- **EAL-4**
- **FLUSH**
- **FACTORY FINISH**

**Notes**

- **IMBED**
- **ANCHOR TYPES**
- **DRILL STEEL LINTEL TO CMU (CONTROLLED OR MONITORED BY SECURITY)**

---

**Door Schedule & Types**

<table>
<thead>
<tr>
<th>Door No.</th>
<th>Door Schedule &amp; Types</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-15</td>
<td>BATH X IAL-4 X IAL-4 S-4 1-15</td>
</tr>
<tr>
<td>1-7</td>
<td>OFFICE X IAL-4 X IAL-4 12 RH 1-7</td>
</tr>
<tr>
<td>1-4</td>
<td>STORAGE X IAL-4 X IAL-4 12 RH 1-4</td>
</tr>
<tr>
<td>1-34</td>
<td>STAIR X IAL-4 X IAL-4 12 RHR 1-34</td>
</tr>
<tr>
<td>1-29</td>
<td>DISH WASH X X 12 ROLL CLEAN ROLLING DOOR 1-29</td>
</tr>
<tr>
<td>1-28A</td>
<td>DINING X X 12 ROLL CLEAN ROLLING DOOR 1-28A</td>
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<tr>
<td>1-26</td>
<td>OFFICE X IAL-4 X IAL-4 12 LH 1-26</td>
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<td>1-25</td>
<td>CORRIDOR X IAL-4 X IAL-4 12 LH 1-25</td>
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<td>1-15</td>
<td>BATH X IAL-4 X IAL-4 12 RHR 1-15</td>
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<td>CLASSROOM X IAL-4 X IAL-4 12 LH 1-9</td>
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<tr>
<td>1-7</td>
<td>OFFICE X IAL-4 X IAL-4 12 RH 1-7</td>
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<tr>
<td>1-4</td>
<td>STORAGE X IAL-4 X IAL-4 12 RH 1-4</td>
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</tr>
<tr>
<td>1-15</td>
<td>BATH X IAL-4 X IAL-4 12 RHR 1-15</td>
</tr>
</tbody>
</table>
GENERAL REMOVAL NOTES

1. NOTIFY DIRECTOR'S REPRESENTATIVE IMMEDIATELY OF ANY DISCREPANCIES IN THE DRAWINGS REGARDING THE REMOVAL OF EXISTING MATERIAL, EQUIPMENT, AND SYSTEMS.

2. EXISTING MATERIAL, EQUIPMENT, AND SYSTEMS MUST BE REMOVED IN A MANNER THAT PREVENTS DAMAGE TO THE STRUCTURE AND THE SURROUNDING AREAS.

3. FIELD CONFIRMATION FOR ALL OPENINGS FOR INFILLS, WINDOWS, DOORS, AND LOUVERS

4. PROVIDE CONTINUOUS FULL DEPTH FIBERGLASS BATT INSULATION IN THE VOIDS BETWEEN WINDOWS AND DOORS.

5. MECHANICAL/PLUMBING CHASE DIMENSIONS AT CMU CONSTRUCTION ARE TO/FROM FACE OF CMU AND INDICATE CLEAR DIMENSIONS.

6. PROVIDE CONTINUOUS TYPES SECURITY BURGLAR ADVICE IMAGES OF DRAWING.

7. PROVIDE FIBERGLASS INSULATION SHEETING WITH INSULATION R-11, APPLIED IN ONE LAYER, AVOIDING CORNERS OR ZONES WITH LOW POINT.

8. PROVIDE CONTINUOUS TYPES SECURITY BURGLAR ADVISE IMAGES OF DRAWING.

9. AT ALL EXISTING WALLS AND CEILINGS THAT ARE TO RECEIVE FINISHES, PREP SUBSTRATE SO AS TO PROVIDE A SURFACE THAT IS FLUSH AND FREE OF SAWCUT MARKS.

10. REMOVE, PROTECT, STORE, AND RE-INSTALL ANY ITEMS AS NOTED ON THE DRAWINGS.

11. REMOVE, PROTECT, STORE, AND RE-INSTALL ANY ITEMS AS NOTED ON THE DRAWINGS.

12. PROVIDE CONTINUOUS TYPES SECURITY BURGLAR ADVISE IMAGES OF DRAWING.

13. PROVIDE CONTINUOUS TYPES SECURITY BURGLAR ADVISE IMAGES OF DRAWING.

14. PROVIDE CONTINUOUS TYPES SECURITY BURGLAR ADVISE IMAGES OF DRAWING.

15. PROVIDE CONTINUOUS TYPES SECURITY BURGLAR ADVISE IMAGES OF DRAWING.

16. AT ALL CEILING REMOVALS, REMOVE ALL LAYERS OF EXISTING CEILINGS AND HARDWARE AND ACCESSORIES. EXISTING CEILING FINISHES MUST BE REMOVED TO THE SUBSTRATE.

17. PROVIDE CONTINUOUS TYPES SECURITY BURGLAR ADVISE IMAGES OF DRAWING.

18. PROVIDE CONTINUOUS TYPES SECURITY BURGLAR ADVISE IMAGES OF DRAWING.

19. PROVIDE CONTINUOUS TYPES SECURITY BURGLAR ADVISE IMAGES OF DRAWING.

20. PROVIDE CONTINUOUS TYPES SECURITY BURGLAR ADVISE IMAGES OF DRAWING.
EXISTING CMU WALL TO BE REMOVED U.N.O.
(REFER TO REMOVAL KEYNOTE 17)

EXISTING DOOR AND FRAME SYSTEM TO BE REMOVED U.N.O.
(REFER TO REMOVAL KEYNOTE 18)

EXISTING WINDOW SYSTEM TO BE REMOVED U.N.O.
(REFER TO REMOVAL KEYNOTE 25)

EXISTING CASEWORK AND/OR MILLWORK TO BE REMOVED

EXISTING WALL TO REMAIN
EXISTING DOOR TO REMAIN
EXISTING WINDOW TO REMAIN

ASSUME 4 WINDOWS NEED GLAZING REPLACEMENT. EACH WINDOW = 30" x 30" APPROX. SIZE, VERIFY IN FIELD.

GLAZING REPLACEMENT AT CLERESTORY
**Sheet Title:**

**Design & Construction**

**New York State Office of Children and Family Services**

**Provision Campus Wide Upgrades**

**Harrriet Tubman Residence Center**

**6706 Pine Ridge Road**

**Auburn, NY 13021**

**45678 - C**

**EYP/Construction**

**Final Submission:** 08/14/2017

**KEYNOTE LEGEND**

**C26**

- Replace exterior metal pilasters in kind.

- Color by Director's Representative.

**C27**

- Steel door and frame system.

- Refer to door schedule.

**C28**

- Steel door panel.

- Refer to door schedule.

**C29**

- FDC connection.

**C42**

- Gutter - full length of building.

**C43**

- Downspout - 3" x 4".

**NOTE:**

- Final grade to be below finished floor.

- Refer to civil drawings for final grade elevations.

**WARNING**

- The alteration of this material in any way, unless done under the direction of a comparable professional, i.e., architect for an architect, engineer for an engineer, or landscape architect for a landscape architect, is a violation of the New York State Education Law and/or regulations and is a Class 'A' misdemeanor.
NOTE:

TOILET 2-4 IS FOR STAFF USE
TOILET 2-5 IS FOR RESIDENT USE

WARNING

PROVIDE CAMPUS WIDE UPGRADES
HARRIET TUBMAN RESIDENTIAL CENTER
6706 PINE RIDGE ROAD
AUBURN, NY 13021

CLIENT:

CONTRACT:

TITLE:

LOCATION:

SECTION:

SHEET TITLE:

DESIGNED BY:

PROJECT NUMBER:

DRAWN BY:

FIELD CHECK:

APPROVED:

DRAWING NUMBER:

THE ALTERATION OF THIS MATERIAL IN ANY WAY, UNLESS DONE UNDER THE DIRECTION OF A COMPARABLE PROFESSIONAL, I.E. ARCHITECT FOR AN ARCHITECT, ENGINEER FOR AN ENGINEER OR LANDSCAPE ARCHITECT FOR A LANDSCAPE ARCHITECT, IS A VIOLATION OF THE NEW YORK STATE EDUCATION LAW AND/OR REGULATIONS AND IS A CLASS 'A' MISDEMEANOR.

WARNING

NOTE:

REFER TO TYPICAL MOUNTING HEIGHTS FOR ADDITIONAL INFORMATION
REFER TO FINISH SCHEDULE FOR WALL FINISHES

TOILET AND BATH ACCESSORIES

<table>
<thead>
<tr>
<th>TYPE MARK</th>
<th>TYPE</th>
<th>COMMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>GB-1</td>
<td>GRAB BARS 1-1/2&quot; OD GAUGE STAINLESS STEEL BARS WITH 11 GAUGE STAINLESS STEEL FLANGES, ANTI-LIGATURE DESIGN, SEE INTERIOR ELEVATIONS FOR DIMENSIONS</td>
<td></td>
</tr>
<tr>
<td>HD-1</td>
<td>SECURITY ELECTRIC HAND DRYER SENSOR OPERATED: AMERICAN SPECIALTIES MODEL #0134 OR APPROVED EQUAL</td>
<td></td>
</tr>
<tr>
<td>M-1</td>
<td>ANTI-LIGATURE MIRROR CUSTOM 18 GA MIRROR STAINLESS STEEL (20 X 36) WITH HEMMED EDGES</td>
<td></td>
</tr>
<tr>
<td>M-3</td>
<td>SAFETY MIRROR 18&quot; FULL DOME MIRRORS: MODEL DO-18 BY CAMPUS CRAFTS, INC.</td>
<td></td>
</tr>
<tr>
<td>TTD-1</td>
<td>SECURITY TOILET PAPER HOLDER ANTI-LIGATURE RECESSED 14 GAUGE SS TOILET PAPER HOLDER</td>
<td></td>
</tr>
</tbody>
</table>

NOTE:

1/4" = 1'-0"

Gymnasium - East Interior Elevation

Gymnasium - West Interior Elevation

Keynote Legend

KEYNOTE LEGEND

NOTE

1/4" = 1'-0" 1/2" = 1'-0" 9' - 6" 2' - 0" 2' - 6"
EXISTING EXTERIOR WALL ASSEMBLY

TYPE 6 SEALANT AND BACKER ROD/JOINT FILLER TYPICAL AT ALL EXTERIOR DOOR HEADS

REFER TO DOOR SCHEDULE FOR GLAZING TYPE

TUBE STEEL 2" x 8" x 3/16", TYPICAL AT ALL EXTERIOR DOORS UNLESS NOTED OTHERWISE

2" x 5/8" STEEL DOOR STOP. WELD TO FRAME

2" x 2" x 1/8" STEEL ANGLE WINDOW STOP, TYPICAL. WELD TO STEEL TUBE FRAME WITH 6" O.C. WELDS ALL AROUND.

MASONRY ANCHOR 16" O.C. VERT. TYP.

7'-8" M.O. UNLESS NOTED OTHERWISE

COORDINATE W/ DOOR SCHEDULE FOR M.O.

Type 1C Insulation

2" TYPE 1C INSULATION

EXISTING WALL TO REMAIN

EXISTING METAL PANEL TO REMAIN

THERMALLY BROKEN DOOR FRAME, REFER TO DOOR SCHEDULE

CONTINUOUS BACKER ROD & SEALANT

CLOSURE PIECE TO MATCH EXISTING METAL PANEL

FILL FRAME SOLID WITH SPRAY-FOAM INSULATION

CONTINUOUS BACKER ROD & SEALANT

SHIM & SEAL, TYPICAL AT ALL HEAD AND JAMBS

FILL FRAME SOLID WITH SPRAY-FOAM INSULATION

CONTINUOUS BACKER ROD & SEALANT

EXISTING METAL PANEL TO REMAIN

EXISTING WALL TO REMAIN

DESIGN & CONSTRUCTION NEW YORK STATE OFFICE OF CHILDREN AND FAMILY SERVICES

CLIENT: EYP/CONSTRUCTION

CONTRACT: PROPOSED CAMPUSS WIDE UPGRADES

TITLE: HARRIET TUBMAN RESIDENTIAL CENTER

LOCATION: 6706 PINE RIDGE ROAD AUBURN, NY 13021

PROJECT NUMBER: 45678 - C

DESIRED BY: EYP/CONSTRUCTION

Drawing Number: FINAL SUBMISSION 08/14/2017

A-2602 4

WARNING: THE ALTERATION OF THIS MATERIAL IN ANY WAY, UNLESS DONE UNDER THE DIRECTION OF A COMPARABLE PROFESSIONAL, I.E. ARCHITECT FOR AN ARCHITECT, ENGINEER FOR AN ENGINEER OR LANDSCAPE ARCHITECT FOR A LANDSCAPE ARCHITECT, IS A VIOLATION OF THE NEW YORK STATE EDUCATION LAW AND OR REGULATIONS AND IS A CLASS 'A' MISDEMEANOR.
APPLICABLE CODES

CONSTRUCTION STANDARDS: All building projects must meet or exceed the following:
- Existing Building Code 15 Construction Safeguards
- Building Code 33 Safeguards During Construction
- Fire Code 33 Fire Safety During Construction and Removals
- Fire Code 35 Welding and Other Hot Works
- Under the New York State Uniform Fire Prevention and Building Code, all building projects must meet or exceed the following codes and reference standards identified as applicable:
- 2015 International Mechanical Code (3rd Printing) with NY 2016 Uniform Code Supplement
- New York State Labor Department Industrial Code for Items Relating to People Who Work in the Building such as Safety Glass, provisions for window washing, cot space for female employees, asbestos abatement, boiler design, etc.

REFERENCE STANDARDS:
- 2009 ICC/ANSI A117.1 Accessible and Usable Buildings and Facilities
- 2010 ASCE 7 Minimum Design Loads for Buildings and Other Structures with Supplement No.1
- 2012 NFPA 13 Installation of Fire Sprinklers
- 2014 NFPA 70 National Electric Code
- 2013 NFPA 72 Installation of Fire Alarm Systems

CONSTRUCTION

Provide campus wide upgrades
Harriet Tubman Residential Center
6706 Pine Ridge Road
Auburn, NY 13021

Design & Construction

New York State Office of Children and Family Services

Consultant

EYP/Construction

Client:

Contract:

Title:

Location:

Sheet Title:

Drawn By:

Project Number:

Drawing Number:

Field Check:

Approved:

The alteration of this material in any way, unless done under the direction of a comparable professional, I.e. Architect for an Architect, Engineer for an Engineer or Landscape Architect for a Landscape Architect, is a violation of the New York State Education Law and/or Regulations and is a Class 'A' Misdemeanor.

WARNING

Notes:

1. Alteration Level 1 considered on this building, only repairs. Work classified as repairs per 2015 IEBC.
STAIR 1-34A
CHLORINATION 1-C2
RESIDENT STORAGE 1-C3
MECHANICAL 1-C6
ELEC. 1-C5
CORRIDOR 1-C1
STAIR 1-12A

BUILDING 1 BASEMENT ELECTRICAL REMOVALS

GRAPHIC SCALE SHEET:
<table>
<thead>
<tr>
<th>SHEET OF DRAWING NUMBER</th>
<th>DESCRIPTION</th>
<th>QUANTITY</th>
<th>UNIT</th>
<th>TOTAL</th>
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**NOTES**

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STAINLESS STEEL SHELL, ELASTOMER BELLows, STAINLESS STEEL ADAPTER AND MALE NUT.

CAST BRONZE COUNTERSUNK PLUG AND POLISHED STAINLESS STEEL ROUND ACCESS INTAKE.

14 GAGE STAINLESS, 8 GPH, CERTIFIED TO NSF/ANSI 61 AND 372, WALL MOUNTED,
SECTION 066000

SOLID PLASTIC FABRICATIONS

PART 1  GENERAL

1.01  SUBMITTALS

A. Waiver of Submittals: The “Waiver of Certain Submittal Requirements” in Section 013300 does not apply to this Section.

B. Shop Drawings: Show fabrication details and connection to adjacent Work.

C. Product Data: Catalog sheets, specifications and installation instructions.

D. Samples:
   1. Solid Plastic Panels: 12 inch square piece; each color, pattern, and finish.
      a. Color Samples: Manufacturer’s standard colors, patterns, and finishes.

E. Quality Control Submittals:
   1. Qualifications Certificates: Certified statement by technical representative of the panel manufacturer that the fabricator and installer are certified or approved.

F. Contract Closeout Submittals:
   1. Maintenance Data: Deliver 2 copies, covering the installed products, to the Director’s Representative.

1.02  QUALITY ASSURANCE

A. Qualifications: The fabrication and installation of the Work of this Section shall be performed by a fabricator and installer certified or approved by the solid plastic manufacturer.

1.03  PROJECT CONDITIONS

A. Do not install the Work of this Section until the walls and ceilings of the spaces to receive the Work have been finished.

PART 2  PRODUCTS

2.01  COMPANIES


2.02 MATERIALS

A. Solid Plastic Panels: Avonite Solid Surfacing by Aristech Acrylics, LLC; Corian by DuPont Surfaces; Formica Solid Surfacing by Formica Corp.; Swanstone Solid Surface by The Swan Corp.; or Gibraltar Solid Surfacing by Wilsonart International.

1. Color: As indicated, or if not indicated as selected from panel manufacturer’s standard colors.


2.03 FABRICATION

A. Shop fabricate components to greatest extent possible to sizes and shapes indicated, in accordance with approved shop drawings.

B. Form joints between components using joint adhesive, without conspicuous joints.

C. Provide shop cutouts for fittings and accessories as indicated on the Drawings.

D. Cut and finish component edges with clean, sharp returns. Rout radii and contours to template. Repair or replace defective and inaccurate materials.

E. Thermoforming: Comply with panel manufacturer’s printed instructions.

1. Form pieces prior to seaming and joining.

2. Prevent blistering, whitening, and cracking of pieces during forming.

F. Lavatory Tops with Integral Bowls: Molded countertop of solid polymer material, complete with integrally molded bowl of solid polymer material; edge details as indicated on Drawings. Provide with non-coved backsplash and endsplashes where shown on Drawings. ADA compliant 18” wide oval lav.

G. Fabrication Tolerances: Plus or minus 1/16 inch overall.
PART 3 EXECUTION

3.01 INSTALLATION

A. Install the Work of this Section in accordance with the manufacturer’s printed instructions, approved shop drawings, and as follows:
   1. Install components plumb and level, scribed to adjacent surfaces.
   2. Form field joints using adhesive, with joints inconspicuous in finished work.
   3. Provide back splashes and end splashes in locations indicated.
   4. Installation Tolerances: Plus or minus 1/8 inch overall.
   5. Keep components clean during installation.

3.02 CLEANING

A. After installation, clean exposed surfaces to remove dirt, adhesive, sealant, and other blemishes. Comply with panel manufacturer’s printed cleaning instructions.

3.03 PROTECTION

A. Apply heavy kraft paper or other heavy protective coating approved by the Director’s Representative, masked in place to prevent surface damage.

END OF SECTION
SECTION 099102

ELECTRICAL PAINTING

PART 1 GENERAL

1.01 DEFINITIONS

A. The word “paint” in this Section refers to substrate cleaners, fillers, sealers, primers, undercoats, enamels and other first, intermediate, last or finish coatings.

B. The word “primer” in this Section refers to substrate cleaners, fillers, sealers, undercoats, and other first or intermediate coats beneath the last or finish coating.

C. The words “finish paint” in this Section refers to the last or final coat and previous coats of the same material or product directly beneath the last or final coat.

D. Finish Paint Systems: Finish paint and primers applied over the same substrate shall be considered a paint system of products manufactured or recommended by the finish coat manufacturer.

1. Finish paint products shall meet or exceed specified minimum physical properties.

1.02 SUBMITTALS

A. Painting Schedule: Cross-referenced Painting Schedule listing all exterior and interior substrates to be painted and specified finish paint type designation; product name and manufacturer, recommended primers and product numbers, and finish paint color designation for each substrate to be painted.

1. Designate exterior substrates by building name and number, substrate to be painted and surface location.

2. Designate interior substrates by building name and number, floor, room name and number, and surface to be painted.

B. Product Data Sheets: Manufacturer’s published product data sheets describing the following for each finish paint product to be applied:

1. Percent solids by weight and volume, solvent, vehicle, weight per gallon, ASTM D 523 gloss/reflectance angle, recommended wet and dry film thickness, volatile organic compound (VOC) content in lbs/gallon, product use limitations and environmental restrictions, substrate surface preparation methods, directions and precautions for mixing and thinning, recommended application methods, square foot area coverage per gallon, storage instructions, and shelf-life expiration date.

2. Manufacturer’s recommended primer for each finish paint product and substrate to be painted.

3. Manufacturer’s complete range of available colors for each finish paint product to be applied.
C. Finish Paint Type Samples: Two finish paint samples applied over recommended primers for each substrate to be painted.
   1. Samples shall be in the designated color and specified ASTM D 523 reflectance.
   2. Label each sample with the following information:
      a. Project number and Painting Schedule designation describing substrates and locations represented by the sample.
      b. Finish paint and primer manufacturer, product names and numbers, finish paint color and reflectance.
   3. Leave a 1 inch wide exposed strip of unpainted substrate and each coat of primer and finish paint.
   4. Sample Sizes:
      a. Sheet Metals: 4 inch by 8 inch flat sheets.
      b. Bar and Tubular Metals: 8 inch long bars or tubular stock.

D. Quality Control Submittals:
   1. Test Reports: Furnish certified test results from an independent testing laboratory, showing that products submitted comply with the specifications, when requested by the Director’s Representative
   2. Certificates: Furnish certificates of compliance required under QUALITY ASSURANCE Article.

1.03 QUALITY ASSURANCE

A. Volatile Organic Compounds (VOCs) Regulatory Requirements: Chapter III of Title 6 of the official compilation of Codes, Rules and Regulations of the State of New York (Title 6 NYCRR), Part 205 Architectural Surface Coatings.
   1. Certificate of Compliance: List of each paint product to be delivered and installed. List shall include written certification stating that each paint product listed complies with the VOC regulatory requirements in effect at the time of job site delivery and installation.

B. Container Labels: Label each product container with paint manufacturer’s name, product name and number, color name and number, thinning and application instructions, date of manufacture, shelf-life expiration date, required surface preparations, recommended coverage per gallon, wet and dry film thickness, drying time, and clean up procedures.

C. Field Examples:
   1. Prior to on-site painting, at locations designated by the Director’s Representative, apply field examples of each paint type to be applied.
   2. Field examples to be applied on actual substrates to be painted and shall duplicate earlier approved paint samples.
      a. Field Example Minimum Wet and Dry Film Thickness: As indicated on approved product data sheet.
      b. Application: Apply each coat in a smooth uniform wet mil thickness without brush marks, laps, holidays, runs, stains, cloudiness, discolorations and other surface imperfections.
1) Leave a specified exposed width of each previous coat beneath each subsequent coat of finish paint and primer.

c. Use of Field Examples: Field examples shall serve as a quality control standard for acceptance or rejection of painting Work to be done under this Section.

3. Field Example Sizes:
   a. Electrical Equipment: As directed by Director’s Representative. Leave 1 inch minimum width exposed strips of each applied primer and finish coat.
   b. Linear Substrate Examples: 5 lineal feet with 12 inch long strips.

4. Do not begin applying paints represented by field examples until examples have been reviewed and approved by the Director’s Representative.
   a. Protect and maintain approved field examples until all painting work represented by the example has been completed and approved.

D. Compatibility of Paint Materials: Primers and intermediate paints shall be products manufactured or recommended by the finish paint manufacturer.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver materials to the Site in original, unopened containers and cartons bearing manufacturer’s printed labels. Do not deliver products which have exceeded their shelf life, are in open or damaged containers or cartons, or are not properly labeled as specified.

B. Storage and Handling: Store products in a dry, well ventilated area in accordance with manufacturer’s published product data sheets. Storage location shall have an ambient air temperature between 45 degrees F and 90 degrees F.

1.05 PROJECT CONDITIONS

A. Environmental Requirements:
   1. Ambient Air Temperature, Relative Humidity, Ventilation, and Surface Temperature: Comply with paint manufacturer’s published product data sheet or other printed product instructions.
   2. If paint manufacturer does not provide environmental requirements, use the following:
      a. Ambient Air Temperature: Between 45 degrees F and 75 degrees F.
      b. Relative Humidity: Below 75 percent.
      c. Ventilation: Maintain the painting environment free from fumes and odors throughout the Work of this Section.
      d. Surface Temperature: At least 5 degrees F above the surface dewpoint temperature.
   3. Maintain environmental requirements throughout the drying period.
B. The following items are not to be field painted unless otherwise specified, noted or directed:
   1. Stainless steel, chrome plated or monel surfaces.
   2. Piping or ductwork to be insulated.
   3. Insulation on concealed piping and concealed ductwork.
   4. Insulated items covered with aluminum, stainless steel, or PVC jacketing.
   5. Insulation on piping in walk-in and non walk-in tunnels.
   6. Uninsulated mechanical equipment with factory applied baked on enamel finish.
   7. Mechanical equipment with enameled steel insulated jacket.
   8. Prefabricated multi-wall chimneys.

1.06 EXTRA MATERIALS

A. Provide extra finish paint materials, from the same production run as paints to be applied, in the following quantities for each color installed:
   1. Paint Types EAL and IAL: Two gallons.
   2. Color Coded Paints: One gallon.
   3. Other Paint Types: One gallon.

PART 2 PRODUCTS

2.01 PAINT MANUFACTURERS

A. Where noted, the following finish paint manufacturers produce the paint types specified.
   1. Ameron Protective Coatings, 201 Berry St., Brea, CA 92621, (800) 926-3766.
   2. Armstrong World Industries, Inc., P.O. Box 3001, Lancaster, PA 17604, (800) 866-5639.
   4. ICI Dulux Paints, 4000 Dupont Cr., Louisville, KY 40207, (800) 984-5444.
   6. PPG Architectural Finishes, One PPG Plaza, Pittsburgh, PA 15272, (800) 441-9695.
2.02 MISCELLANEOUS PRODUCTS

A. Cleaning Solvents: Low toxicity with flash point in excess of 100 degrees F.

B. Color Pigments: Pure, nonfading, finely ground pigments with at least 99 percent passing a 325 mesh sieve.
   1. Use lime-proof color pigments on masonry, concrete and plaster.
   2. Use exterior pigments in exterior paints.

C. Galvanizing Compound, Cold: Single component compound with 93 percent pure zinc in the dried film and meeting the requirements of DOD-P-21035A (NAVY).

D. Masking Tape: Removable paper or fiber tape, self-adhesive and nonstaining.

E. Metal Filler: Polyester resin base autobody filler.

F. Mineral Spirits: Low odor type recommended by finish paint manufacturer.

G. Paint Stripper: As recommended by finish paint manufacturer.

H. Stain Blocker, Primer-Sealer: As recommended by finish paint manufacturer.


2.03 FINISH PAINT TYPES

A. Physical Properties:
   1. Specified percent solids by weight and volume, pigment by weight, wet and dry film thickness per coat, and weight per gallon are minimum physical properties of acceptable materials.
      a. Opaque Pigmented Paints: Physical properties specified are for white titanium dioxide base before color pigments are added.
      b. Specified minimum wet and dry film thickness per coat are for determining acceptable finish paint products. Minimum wet and dry film thickness per coat to be applied shall comply with approved finish paint manufacturer’s product data sheets.

B. Interior Finish Paint Types:
   1. Paint Type IAL-3: Interior Acrylic Latex, Semigloss Enamel.
      a. Solids by Weight: 49.0 percent.
      b. Solids by Volume: 35.0 percent.
      c. Solvent: Water.
      d. Vehicle: Vinyl acrylic resin.
      e. Weight Per Gallon: 10.0 lbs.
      f. Wet Film Thickness: 3.8 mils.
      g. Dry Film Thickness: 1.2 mils.
      h. Manufacturers: Benjamin Moore, ICI Dulux, Sherwin-Williams.
   2. Paint Type IAL-4: Interior Acrylic Latex, Gloss Enamel.
      a. Solids by Weight: 40.0 percent.
b. Solids by Volume: 32.0 percent.
c. Solvent: Water.
d. Vehicle: Vinyl acrylic resin.
e. Weight Per Gallon: 10.0 lbs.
f. Wet Film Thickness: 3.4 mils.
g. Dry Film Thickness: 1.2 mils.
h. Manufacturers: Benjamin Moore, PPG, Sherwin-Williams.

3. Paint Type ISP: Interior Steel Primer, Flat.
   a. Solids by Weight: 72.0 percent.
   b. Solids by Volume: 52.0 percent.
   d. Weight Per Gallon: 11.4 lbs.
   e. Wet Film Thickness: 3.0 mils.
   f. Dry Film Thickness: 1.5 mils.
   g. Manufacturers: PPG, Sherwin-Williams, Valspar.

C. Colors: Unless otherwise directed, provide paint colors shown on contract drawings. If directed, provide paint colors selected by the Director from finish paint manufacturers available color selections.
   1. Approved finish paint manufacturers to match designated colors of other manufacturers where colors are shown on contract documents.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine surfaces to be prepared, primed, or painted for compliance with contract documents, required environmental conditions, manufacturer’s product data sheets, product label instructions and other written requirements.
   1. Do not begin any phase of the work without first checking and verifying that surfaces and environmental conditions are acceptable for such work and that any earlier phase deficiencies and discrepancies have been properly corrected.
      a. The commencement of new work shall be interpreted to mean acceptance of surfaces to be affected.

3.02 PREPARATION

A. Protection: Cover and protect surfaces to be painted, adjacent surfaces not to be painted, and removed furnishings and equipment from existing paint removals, airborne sanding particles, cleaning fluids and paint spills using suitable drop cloths, barriers and other protective devices.
   1. Adjacent exterior surface protections include roofs, walls, landscaping, driveways and walkways. Interior protections include floors, walls, furniture, furnishings and electronic equipment.
   2. Remove and replace removable hardware, lighting fixtures, telephone equipment, other devices and cover plates over concealed openings in substrates to be painted.
a. Cover and neatly mask permanently installed hardware, lighting fixtures, cover plates and other devices which cannot be removed and are not scheduled for painting.

3. Schedule and coordinate surface preparations so as not to interfere with work of other trades or allow airborne sanding dust particle to fall on freshly painted surfaces.

4. Provide adequate natural or mechanical ventilation to allow surfaces to be prepared and painted in accordance with product manufacturer’s instructions and applicable regulations.

5. Provide and maintain “Wet Paint” signs, temporary barriers and other protective devices necessary to protect prepared and freshly painted surfaces from damages until Work has been accepted.

B. General: Clean and prepare surfaces to be painted in accordance with specifications, paint manufacturer’s approved product data sheets and printed label instructions. In the event of conflicting instructions or directions, the more stringent requirements shall apply.

1. Cleaners: Use only approved products manufactured or recommended by finish paint manufacturer. Unless otherwise recommended by cleaner manufacturer, thoroughly rinse with clean water to remove surface contaminants and cleaner residue.

C. Surfaces:

1. Existing Painted Substrates: Thoroughly clean to remove dirt, soot, grease, mildew, chalkiness and stains using finish paint manufacturer’s recommended cleaners.
   a. Remove loose, peeling, cracked and blistered paint by chipping, scraping, and sanding smooth with medium and fine sandpaper.
   b. Fill surface holes and depressions with finish paint manufacturer’s recommended filler and sand smooth to adjacent undisturbed edges.
   c. Touch-up bare spots on previously painted surfaces with finish paint manufacturer’s recommended primer.
   d. Sand existing semigloss and gloss paint surfaces to a uniform smooth dull finish before painting.
   e. Fill and sand smooth existing paint surface damages, depressions, ridges and other imperfections that will remain visible after new paints have been applied.

2. Galvanized Metal:
   a. Allow new galvanized surfaces to weather as long as possible before cleaning. Remove surface contaminants using clean rags and petroleum spirits.
   b. Remove “white rust” using appropriate solvent and, if necessary, wire brushing or sanding.
   c. Use appropriate Structural Steel Painting Council Standard SSPC-SP1 to SSPC-SP6 to prepare steel substrates where galvanized protection has been removed.

D. Painting Material Preparations:

1. Prepare painting materials in accordance with manufacturer’s approved product data sheets and printed label instructions.
a. Stir materials before and during application for a consistent mixture of density. Remove container surface paint films before stirring and mixing.
b. Slightly tint first opaque finish coat where primer and finish coats are the same color.
c. Do not thin paints unless allowed and directed to do so in writing within limits stated on approved product data sheets.

3.03 PAINTING SCHEDULE

A. Exterior Exposed Items: Unless otherwise specified, apply Type EAL-3 paint with manufacturer’s recommended primers on exterior substrates.

B. Interior Exposed Items: Unless otherwise specified, apply the following paint types with manufacturer’s recommended primers on the following interior substrates.
   1. Paint Type IAL-3: Exposed raceways, fittings, pull boxes, junction boxes, etc.
   2. Paint Type IAL-4, on shop or factory primed substrates.

3.04 APPLICATION

A. Environmental Conditions:
   1. Water-based Paints: Apply when surface temperatures will be 50 degrees Fahrenheit to 90 degrees Fahrenheit throughout the drying period.
   2. Other Paints: Apply when surface temperatures will be 45 degrees Fahrenheit to 95 degrees Fahrenheit throughout the drying period.
   3. Apply exterior paints during daylight hours free from rain, snow, fog and mist when ambient air conditions are more than 5 degrees above the surface dewpoint temperature and relative humidity less than 85 percent.
      a. When exterior painting is allowed or required during nondaylight hours, provide portable outdoor weather recording station with constant printout showing hourly to diurnal air temperature, humidity, and dewpoint temperature.
   4. Exterior Cold Weather Protection: Provide heated enclosures necessary to maintain specified temperature and relative humidity conditions during paint application and drying periods.

B. Application: Apply approved paints where specified, or shown on the drawings, and to match approved field examples.
   1. Applicators: Brushes, rollers or spray equipment recommended by the paint manufacturer and appropriate for the location and surface area to be painted.
      a. Approved minimum wet and dry film thicknesses for each coat shall be as recommended on approved product data sheets and the same for each application method and substrate.
C. Paint Type Coats To Be Applied: Unless otherwise specified, or recommended by finish paint manufacturer’s product data sheet and approved by submittal, the number of coats to be applied for each paint type are as follows:

1. Acrylic Latex Paint Type IAL:
   a. New Unpainted Surfaces: Apply 1 coat of primer and 2 coats of finish paint.
   b. Existing Painted Surfaces:
      1) Apply 2 coats of finish paint when existing paint has a lower gloss.
      2) Apply one coat of primer and 2 finish coats when existing paint has a higher gloss.
   c. Paint Type IAL: Provide mildewcide additive for bathrooms, kitchens, janitor closets, laundry rooms, restrooms and other wet or damp areas.

2. Paint Type ISP: Apply 1 coat.
   a. Allow paint to dry one week and test adhesion. Remove and replace defective primer where adhesion failures occur.

3. Other Paint Types: Apply in accordance with paint manufacturer’s product data sheets.

3.04 FIELD QUALITY CONTROL

A. Paint Samples: Assist the Director’s Representative in obtaining random one quart paint samples for testing at any time during the Work.
   1. Notify the Director’s Representative upon delivery of paints to the Site.
   2. Furnish new one quart metal paint containers with tight fitting lids and suitable labels for marking.
      a. Furnish labor to thoroughly mix paint before sampling and provide assistance with sampling when required.

3.05 ADJUSTING AND CLEANING

A. Reinstall removed items after painting has been completed.
   1. Restore damaged items to a condition equal to or better than when removed. Replace damaged items that cannot be restored.

B. Touch up and restore damaged finish paints. Touch up and restoration paint coats are in addition to the number of specified finish paint coats.

C. Remove spilled, splashed, or spattered paint without marring, staining or damaging the surface. Restore damaged surfaces to the satisfaction of the Director’s representative.

D. Remove temporary barriers, masking tape, and other protective coverings upon completion of painting, cleaning and restoration work.

END OF SECTION
SECTION 114102

PREFABRICATED WALK-IN REFRIGERATED BOXES

PART 1 GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE

A. Sealants: Section 079200.

1.02 SUBMITTALS

A. Waiver of Submittals: The “Waiver of Certain Submittal Requirements” in Section 013300 does not apply to this Section.

B. Shop Drawings:
   1. Panel layouts and elevations.
   2. Door panel details.
   3. Details of ceiling support assembly.

C. Product Data: Catalog sheets, performance charts, wiring diagrams, specifications, and installation instructions for each item specified.

D. Quality Control Submittals:
   1. Company Field Advisor Data:
      a. Name, business address and telephone number of Company Field Advisor secured for the required services.
      b. Certified statement from the Company listing the qualifications of the Company Field Advisor.
      c. Services and each product for which authorization is given by the Company, listed specifically for this project.

E. Contract Closeout Submittals:
   1. Operation and Maintenance Data: Deliver 2 copies, covering the installed products, to the Director’s Representative.
   2. Warranty: Copy of specified warranty.

1.03 QUALITY ASSURANCE

A. Regulatory Requirements:
   1. Prefabricated walk-in refrigerated boxes shall be approved by:
      a. National Sanitation Foundation (NSF).
   2. Refrigeration equipment shall have BTU/HR capacity ratings certified by the manufacturer.
4. Electric components, refrigeration system, and prefabricated panels shall be Underwriter’s Laboratory listed.
5. Panels shall be maximum UL 25 flame spread rated.

B. Company Field Advisor: Secure the services of a Company Field Advisor for a minimum of 16 working hours for the following:
1. Render advice regarding installation of the prefabricated walk-in refrigerated box.
2. Startup and verify operation of packaged refrigeration equipment.
3. Training of facility personnel on operation and service of alarms, monitoring equipment, and packaged refrigeration equipment.

1.04 WARRANTY

A. Manufacturer’s Warranty: Ten year warranty for prefabricated panels and standard duty doors.

1.05 MAINTENANCE

A. Special Tools: One tool for each type and size vandal resistant fastener.

PART 2 PRODUCT

2.01 PREFABRICATED WALK-IN REFRIGERATED BOXES

A. Acceptable Manufacturers:

B. Size and Capacity:
1. The walk-in shall be built to specified interior and exterior dimensions, as shown on the plans and drawings.
   a. Interior height 7’-6”.
2. Provide sufficient refrigeration to maintain +35° F temperature inside the cooler and -10° F temperature inside the freezer compartment when the ambient temperature is 100° F, the average number of door openings is 4 per hour, and there is no load from warm products entering unit.
3. Voltage: 208-230V/60HZ/3PH.
C. Prefabricated Walk-in Structure:
1. Construction: The walk-in structure shall be constructed with a fiberglass interior and exterior fiberglass (FRP) or metal shell forming a factory preassembled structure. The exterior shall be rust, dent and scratch resistant. The exterior shall be coated with an industrial enamel finish. The unit shall be designed for exterior mounting on a slab on-grade location.
3. Insulation: 4 inches rigid urethane, foamed-in-place, conforming to the energy code of US Department of Energy.
   a. Minimum R Values for Freezers:
      1) Walls, and Ceilings: R32.
      2) Floors: R28.
   b. Minimum R Values for Coolers:
      1) Walls, and Ceilings: R25.
   c. Maximum Distance Between Locking Devices: 46 inch centers.
4. Uniform Distributed Floor Loading (Standing Weight): Minimum 600 lbs per sq ft.
5. Door Opening Reinforcement: 4 inch x 4 inch pressure treated wood blocking foamed-in-place in the wall panels around the perimeter of heavy duty door opening, and with permanently foamed-in-place flexible PVC gaskets around perimeter on interior and exterior of panel edges.

D. Interior Surfaces:
1. Wall, Ceiling, and Corner Surfaces:
   a. 80 mil FRP composite or 22 gage stucco embossed galvanized steel.
2. Floor Panels:
   a. Woven fiberglass matting bonded to 3/4-inch-thick exterior grade plywood.
   b. Floor Finish: Skid resistant surface coating.

E. Exterior Surfaces:
1. Exposed Surfaces of Wall, Ceiling and Corner Panels, and Closure Trim:
   a. 100 mil FRP composite or 22 gage stucco embossed galvanized steel.

F. Roof / Ceiling: Slope minimum 4:12 or crown to prevent water accumulation; slope away from exterior door.

G. Wind / Hurricane Anchors: Factory provided anchors permanently attached to floor of walk-in and expansion anchor bolted to the concrete slab.

2.02 SPECIALTY DOORS

A. Heavy Duty Door:
1. Door Panel:
   a. Two surfaces bonded together with polyester plastic resin.
b. Each surface having an outer layer of polyester plastic with white pigment, and balance of pan consisting of glass fiber reinforced plastic.

c. Steel blocking for hardware attachment.

d. Door protected front and back with 4 foot high, 16 gage stainless steel kick plates. Secure kick plates with adhesive (penetration by fasteners is not acceptable).

   a. Minimum R Values for Freezer Doors: R32.

3. Gaskets:
   a. At Sides and Head of Door Lip: Grease resistant synthetic skin with resilient sponge core.
   b. Sill: Double sweep type of nylon reinforced neoprene.

4. Frame:
   a. Components similar to door construction except that:
      1) Jamb constructed of exterior grade plywood.
      2) Back of frame completely sealed with polyester plastic.
   b. Face of door flush with face of frame casing.
   c. Metal clad exposed surfaces of frame with 16 gage steel, minimum of 4 feet high. Metal clad remainder of frame with 26 gage stainless steel.
      1) Apply metal cladding in accordance with USDA regulations.

5. Door Hardware:
   a. Extra Heavy Duty Hinge: Polished 17 inch chrome plated brass self rising type with chrome plated ball bearing, stainless steel hinge pin with 3/16 inch stainless steel cross pin peened on each end, stainless steel vandal resistant fasteners, and provisions for padlocking; Model D38 by Dent Industries Inc., Bethlehem, PA.
      1) Minimum Number of Hinges Per Door: 3.
   b. Door Latch and Strike Assembly: Chrome plated die-cast zinc body and strike housing with chrome plated forged brass handle, and vandal resistant fasteners; Model K55 by Kason Industries Inc., Shenandoah, GA.
      1) Permits exit from within box when door is padlocked on exterior.
   d. Door Closer: Hydraulic arm type.

6. Strip Curtain: Constructed of PVC, with minimum 2 inch overlap with adjacent strips or door jambs.

7. Door Dimension In-Clear: 36 inches wide x 79 inches high.

8. Door Swings: As indicated on drawings.

B. Door Weather Hood: Provide factory mounted hood matching exterior wall finish to divert rain and ice from gasket area at exterior doors.
2.03 DOOR JAMB HEATER CABLE - BOXES BELOW 33 DEGREES F

A. Heater Cable:
   1. Type: Easily accessible anti-sweat electric heater cable.
   2. Function: Supplies sufficient heat to prevent condensation and frost formation at door jamb.
   3. Location: Place heater cables behind door jamb along the sides, head, and sill of door frame.

2.04 LIGHTING

A. Fluorescent Fixtures (Where the temperature is not expected to go below 0 degrees F.): Vandal resistant, two lamp, 4 foot ceiling mounted fixture (UL listed suitable for Wet Locations); All-Brite Light Co. Inc.’s Vaprotek Series, Columbia Lighting Inc.’s 4700 Series, or Keene Lighting Products’ Cleanlite:
   1. Ballast: -20 degrees F.
   2. Lamps: (F48T12/CW/HO).
   3. Minimum Efficacy Rating: 40 lumens per watt.

B. Fluorescent Fixtures (Where the temperatures are expected between 0 and -20 degrees F.): Vandal resistant, two lamp, 4 foot ceiling mounted fixture (UL listed suitable for Wet Locations); Metalux Lighting’s AVTL Series or Paramount Industries Inc.’s Lume.
   1. Ballast: -20 degrees F.
   2. Lamp: (F48T12/CW/VHO/LT).
   3. Minimum Efficacy Rating: 40 lumens per watt.

C. Toggle Switch/Neon-Pilot Light Combination: Flush mounted in exterior door panel and wired to light fixture.

2.05 AIR PRESSURE RELIEF VENTS - BOXES BELOW 33 DEGREES

A. Equip boxes with electric defrost or hot gas defrost type evaporators with electrically heated air pressure relief vents to allow air to either enter box or exhaust from box.

2.06 REFRIGERATION SYSTEM

A. Type: Self contained packaged system.
   1. Air cooled condensing unit with hermetic compressor, receiver, condenser, electric motors, and motor controllers.
   2. Low profile unit cooler with air defrost timer unless otherwise specified.
   3. Controls and wiring.
   4. Piping, thermal expansion valve, service valves, filter-drier, and moisture-liquid indicator.
   5. System factory charged with specified refrigerant.
   6. System factory pretested.
   7. Motors (Under 1 hp):
      a. Evaporator Motors: Electronically commutated type.
b. Condenser Motors: Permanent split capacitor type.

B. Refrigerants:
   1. Refrigerant 404a - Blend of CF3CHF2 (R-125, 44% by mass), CF3CH3 (R-143A, 52%) and CH2FCF3 (R-134A, 4%).

C. Electric Defrosting for Coils Operating less than 34 Degrees F (Entering Air Temperature):
   1. Valves, controls, timers, piping electric heater elements, wiring and drain connections to defrost evaporator coil and prevent refreezing of defrost water in evaporator drain pan or drain pipe.
   2. Wrap drain piping inside box with low wattage type strip heaters.

2.07 TEMPERATURE ALARM

A. Type: Combination digital alarm and thermometer.
   1. LED display.
   2. Remote low voltage sensor.
   3. Fully adjustable high and low set points.
   4. Switchable display for Fahrenheit, and Celsius.
   5. Alarm horn with mute switch.
   6. Safe and alarm lights.
   7. Battery backup with battery test switch.

2.08 FASTENERS FOR HEAVY DUTY DOORS

A. Vandal Resistant Fasteners: Torx head with center pin.

2.09 WIRE SHELVING

A. Type 304 stainless steel wire shelving and posts
   1. Adjustability: Shelves adjustable at 1 inch intervals along the entire length of the post.
   2. Shelf Ribs: Running front to back.

B. Dimensions, Number of Shelves and Layout: As indicted on Drawings

C. Product: Super Erecta Shelf, Intermetro Industries Corp.

PART 3 EXECUTION

3.01 PREPARATION

A. Prior to erection of preassembled walk-in refrigerated box examine concrete slab on which it is to rest. Do not install box until surface has been patched.

3.02 INSTALLATION - PREFABRICATED WALK-IN REFRIGERATED BOX
A. Install factory assembled box in accordance with the manufacturer’s printed installation instructions and approved shop drawings, unless otherwise shown or specified.

B. Factory install lighting, pressure relief vents, and temperature alarms on refrigerator and make provision for a single point connection by Electrical Work Contractor.

C. Secure unit to concrete slab base to resist wind uplift

3.03 PENETRATIONS THRU PREFABRICATED WALK-IN REFRIGERATED BOXES

A. Size field penetrations thru boxes for refrigerant piping and electric conduit 1/2 inch larger than the outside diameter of pipe (including insulation) or conduit, unless otherwise specified.

B. Carry insulation on refrigerant piping thru penetrations of boxes.

C. Pack spaces around refrigerant piping, hanger rods, conduit etc., with spray foam insulation and seal with Type 1D sealant. See Section 079200.

3.04 INSTALLATION - REFRIGERATION SYSTEM

A. Factory install refrigeration system in accordance with the manufacturer’s printed installation instructions.
   1. Allow ample room for servicing condensing unit, evaporator and controls.

B. Mount condensing unit on steel frame on exterior of box.

C. Mount evaporator coil on steel frame on interior of box, opposite the condensing unit. Hang evaporator coil with nonconductive hanger rods.

3.05 WIRE SHELVING INSTALLATION

A. Install metal storage shelving level, plumb, square, rigid, true, and with shelves flat and free of dents or distortion. Make connections to form a rigid structure, free of buckling and warping.
   1. Install exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible.
   2. Install braces, straps, plates, brackets, and other reinforcements as needed to support shelf loading and as required for stability.
   3. Adjust post-base bolt leveler to achieve level and plumb installation.
   4. Connect side-to-side and back-to-back shelving units together.
   5. Install shelves in each shelving unit at equal spacing.
B. Adjust metal storage shelving so that connectors and other components engage accurately and securely.

3.06 FIELD QUALITY CONTROL

A. Inspect complete installation prior to start-up.

B. Supervise initial start-up of refrigeration system. Make all necessary adjustments to system.

C. Operate system for a sufficient length of time in order to prove the system can achieve and maintain design temperature of box.

END OF SECTION
SECTION 260505
WIRING FOR GATE SYSTEMS

PART 1 GENERAL

1.0 SUBMITTALS

A. Waiver of Submittals: The “Waiver of Certain Submittal Requirements” in Section 013300 does not apply to this Section.

B. Submittals Package: Submit the product data and the shop drawings specified below all at the same time as a package.

C. Product Data: Catalog sheets, specifications, and installation instructions.

D. Shop Drawings: Show switches, controls, motors, and other electrical components. Include wiring diagrams of the complete system as proposed to be installed (standard diagrams will not be acceptable).

E. Contract Closeout Submittals:
   1. Operation and Maintenance Data: Deliver 2 copies, covering the installed products, to the Director’s Representative. Include:
      a. Operation and maintenance data for each product.
      b. Complete point to point wiring diagrams of entire system as installed. Number all conductors and show all terminations. (Numbers shall correspond to numbered tags installed on each conductor.)

PART 2 PRODUCTS

2.01 RACEWAYS, FITTINGS AND ACCESSORIES

A. Rigid Ferrous Metal Conduit: Steel, hot dipped galvanized on the outside and inside, UL categorized as Rigid Ferrous Metal Conduit (identified on UL Listing Mark as Rigid Metal Conduit - Steel or Rigid Steel Conduit), by Allied Tube & Conduit Corp., LTV Copperweld, or Wheatland Tube Co.

B. Flexible Metal Conduit: Galvanized steel strip shaped into interlocking convolutions, UL categorized as Flexible Metal Conduit (identified on UL Listing Mark as Flexible Steel Conduit or Flexible Steel Conduit Type RW), by AFC Cable Systems Inc., Anamet Electrical Inc., Electri-Flex Co., or International Metal Hose Co.

C. Liquid-tight Flexible Metal Conduit: UL categorized as liquid-tight flexible metal conduit (identified on UL Listing Mark as Liquid-Tight Flexible Metal Conduit, also specifically marked with temperature and environment application.
data), by AFC Cable Systems Inc., Anamet Electrical Inc., Electri-Flex Co., or Universal Metal Hose Co.

D. Insulated Bushings: Threaded, malleable iron/zinc electroplate with 105 degrees C (minimum) plastic insulated throat; Appleton Electric Co.’s BU50I Series, Cooper/Crouse-Hinds’ 1031 Series, OZ/Gedney Co.’s IBC-50 Series, Raco Inc.’s 1132 Series, Steel City/T & B Corp.’s BI-901 Series, or Thomas & Betts Corp.’s 1222 Series.

E. Plastic Bushings for 1/2 and 3/4 Inch Conduit: 105 degrees C minimum temperature rating; Appleton Electric Co.’s BBU50, BBU75, Blackburn (T & B Corp.’s) 50 BB, 75 BB, Cooper/Crouse-Hinds’ 931, 932, or OZ/Gedney Co.’s IB-50, IB-75, Raco Inc.’s 1402, 1403, Steel City/T & B Corp.’s BU-501, BU-502, or Thomas & Betts Corp.’s 222, 223.

F. Connectors and Couplings:
   1. Locknuts: UL, steel/zinc electroplate; Appleton Electric Co.’s BL-50 Series, Cooper/Crouse-Hinds’ 1 Series, OZ/Gedney Co.’s 1-50 Series, Raco Inc.’s 1002 Series, Steel City/T&B Corp.’s LN-101 Series, or Thomas & Betts Corp.’s 141 Series.
   2. Couplings (For Rigid Metal Conduit): Standard galvanized threaded couplings furnished by conduit manufacturer, or Allied Tube & Conduit Corp.’s Kwik-Couple.
   3. Flexible Metal Conduit Connectors: Arlington Industries Inc.’s Saddle-Grip, OZ/Gedney Co.’s C-8T, 24-34T, ACV-50T Series, or Thomas & Betts Corp.’s Nylon Insulated Tite-Bite Series.
   4. Liquid-tight Flexible Metal Conduit Connectors:
      a. Dry Locations: Steel, malleable iron, zinc electroplate, insulated throat; Appleton Electric Co.’s STB Series, Cooper/Crouse-Hinds’ LTB Series, OZ/Gedney Co.’s 4Q-50 Series, Raco Inc.’s 3512 Series, Steel City/T & B Corp.’s LT-701 Series, or Thomas & Betts Corp.’s 5332 Series.
      b. Wet Locations: OZ/Gedney Co.’s 4Q-TG Series (hot-dip/mechanically galvanized), or Thomas & Betts Corp.’s 3322 Series (PVC coated).

G. Conduit Bodies (Threaded): Malleable iron or cast iron alloy bodies and covers with hot dipped galvanized or other specified corrosion resistant finish; Cooper/Crouse-Hinds’ Condulets (Corro-free epoxy powder coat), or OZ/Gedney Co.’s Conduit Bodies (hot dipped galvanized). Stainless steel cover screws, covers gasketed to suit application.

H. Expansion Fittings: Cooper/Crouse-Hinds XJG (Corro-free epoxy powder coat), or OZ Gedney Co.’s AX, EXE (end type), hot dipped galvanized.

2.02 OUTLET, JUNCTION AND PULL BOXES

A. Galvanized Steel Boxes For Concealed Work: Standard type galvanized steel boxes and covers by Appleton Electric Co., Raco/Div. of Hubbell, or Steel City/T&B Corp.
B. Galvanized Steel Junction and Pull Boxes For Exposed Work: Code gage, galvanized steel screw cover boxes by Hoffman Enclosures Inc., Hubbell/Wiegmann, or Rittal/Electromate.

C. Threaded Type Boxes for Exposed Work:
   1. Outlet Boxes:
      a. For Dry, Damp Locations: Zinc electroplate malleable iron or cast iron alloy boxes by Appleton Electric Co., Cooper/Crouse-Hinds Co., or OZ/Gedney Co., with zinc electroplate steel covers to suit application.
      b. For Wet Locations: Malleable iron or cast iron alloy boxes with hot dipped galvanized or other specified corrosion resistant finish as produced by Cooper/Crouse-Hinds (hot dipped galvanized or Corro-free epoxy powder coat), or OZ/Gedney Co. (hot dipped galvanized), with stainless steel cover screws, and malleable iron covers gasketed to suit application.
   2. Junction And Pull Boxes:
      a. For Dry, Damp Locations: Zinc electroplate cast iron boxes by Appleton Electric Co., Cooper/Crouse-Hinds, or OZ/Gedney Co., with zinc electroplate steel or cast iron cover.
      b. For Wet Locations: Cast iron boxes by Cooper/Crouse-Hinds’ (hot dipped galvanized or Corro-free epoxy powder coat), or OZ/Gedney Co. (hot dipped galvanized), with stainless steel cover screws and cast iron cover gasketed to suit application.
   3. Conduit Bodies, Threaded (Provided with a Volume Marking):
      a. For Dry, Damp Location: Zinc electroplate malleable iron or cast iron alloy bodies with zinc electroplate steel covers; Appleton Electric Co.’s Unilets, Cooper/Crouse-Hinds’ Condulets, or OZ/Gedney Co.’s Conduit Bodies.
      b. For Wet Locations: Malleable iron or cast iron alloy bodies with hot dipped galvanized or other specified corrosion resistant finish; Cooper/Crouse-Hinds’ Condulets (hot dipped galvanized or Corro-free epoxy power coat), or OZ/Gedney Co.’s Conduit Bodies (hot dipped galvanized) with stainless steel cover screws and malleable iron covers gasketed to suit application.

D. Specific Purpose Outlet Boxes: As fabricated by equipment manufacturers for mounting their equipment thereon.

2.03 CONDUCTORS (600 VOLTS AND UNDER) AND ACCESSORIES

A. Date of Manufacture: No insulated conductor over one year old when delivered to the site will be acceptable.


C. Conductors: Annealed uncoated copper or annealed coated copper in conformance with the applicable standards for the type of insulation to be applied on the conductor.
D. Types:
1. Power Wiring:
   a. General: Rated 600V, NEC Type FEP, RHH, RHW, RHW-2, THHN, THW, THW-2, THWN, THWN-2, XHH, XHHW, XHHW-2.

2. Class 1 Wiring:
   a. No. 18 and No. 16 AWG: Insulated copper conductors suitable for 600 volts, N.E.C. types KF-2, KFF-2, PAFF, PF, PFF, PGF, PGFF, PTFF, RFH-2, RFHH-2, RFHH-3, SF-2, SFF-2, TF, TFF, TFN, TFFN, ZF, or ZFF.
   b. Larger than No. 16 AWG: Insulated copper conductors suitable for 600 volts, in compliance with N.E.C. Article 310.
   c. Conductor with other types and thickness of insulation may be used if listed for Class 1 circuit use.

3. Class 2 Wiring:
   b. Other types of cables may be used in accordance with N.E.C. Table 725-61 “Cable Uses and Permitted Substitutions”, as approved.

4. Class 3 Wiring:
   a. Single Conductors No. 18 and No. 16 AWG: Same as Class 1 No. 18 and No. 16 AWG conductors, except that:
      1) Conductors are also listed as CL3.
      2) Voltage rating not marked on cable except where cable has multiple listings and voltage marking is required for one or more of the listings.
   c. Other types of cables may be used in accordance with N.E.C. Table 725-61 “Cable Uses and Permitted Substitutions”, as approved.

E. Terminal Blocks and Connectors:
1. Terminal Blocks: Barrier type double screw terminals rated 300 V minimum, meeting UL94 requirements for materials Classed 94V-0.
2. Connectors: Plug and socket style, meeting UL94 requirements for materials classed 94V-0.


G. Insulation Tapes:
1. Plastic Tape: Electrical Products Div./3M’s Scotch 88, Plymouth Rubber Co.’s Plymouth/Bishop Premium 85CW.
2. Rubber Tape: Electrical Products Div./3M’s Scotch 23, or Plymouth Rubber Co.’s Plymouth/Bishop W963 Plysafe.

H. Cable Clamps and Clips, Cable Ties, Spiral Wraps, etc.: Wire management products by Catamount/T&B Corp., or Ideal Industries Inc.
2.04 SUPPORTING DEVICES

A. Channel Support System:
   1. Channel Material: 12 gage steel.
   2. Finish: Hot dipped galvanized.
   3. Fittings: Same material and finish as channel.
   4. UL Listed Systems:
      a. B-Line Systems Inc.’s B-22 (1-5/8 x 1-5/8 inches), B-12 (1-5/8 x 2-7/16 inches), B-11 (1-5/8 x 3-1/4 inches).
      b. Kindorf/T&B Corp.’s B-900 (1-1/2 x 1-1/2 inches), B-901 (1-1/2 x 1-7/8 inches), B-902 (1-1/2 x 3 inches).
      c. Unistrut Corp.’s P-3000 (1-3/8 x 1-5/8 inches), P-5500 (1-5/8 x 2-7/16 inches), P-5000 (1-5/8 x 3-1/4 inches).
      d. Versabar Corp.’s VA-1 (1-5/8 x 1-5/8 inches), VA-3 (1-5/8 x 2-1/2 inches).

B. Fastening Fittings for Existing Masonry: Kindorf/T&B Corp.’s E-243, E-244, E-245, or E-170, or Versabar Corp.’s VX-4310, VX-2308, VX-4308, or VX-4309.

C. Pipe Straps: Two-hole steel conduit straps; Kindorf/T&B Corp.’s, C-144 Series.

D. Pipe Clamps: One-hole malleable iron clamps; Kindorf/T&B Corp.’s HS-400 Series, or OZ/Gedney Co.’s 14-50 Series.

2.05 MARKERS

A. Markers:
   2. Flexible sleeve markers; Plastic Extruded Parts Inc.’s FS series.
   3. Snap-on markers; Plastic Extruded Parts Inc.’s RS series.

PART 3 EXECUTION

3.01 INSTALLATION, GENERAL

A. Provide power wiring and raceway system to the control consoles/cabinets.

B. Provide power and control wiring and raceway system from the control consoles/cabinets to the operating devices and appurtenances.

3.02 RACEWAYS INSTALLATION

A. Raceway Types and Locations:
   1. Conduit: Run conduit concealed or exposed as indicated on drawings:
      a. Install rigid ferrous metal conduit in all locations unless otherwise specified.
      b. Flexible Metal Conduit:
1) Use for short runs to equipment such as interlocks, limit switches or other items requiring adjustments (dry locations).

2) Use 1 to 2 feet of flexible metal conduit for final connection to equipment subject to vibration (dry locations).

c. Liquid-tight Flexible Metal Conduit:
   1) Use for short runs to equipment such as interlocks, limit switches or other items requiring adjustment (damp and wet locations).
   2) Use 1 to 2 foot of liquid-tight flexible metal conduit for final conduit connection to equipment subject to vibration (damp and wet locations).

2. Gate System Equipment Construction as Raceway: Track boxes, steel structural tubing, or steel plates may be utilized as raceways where designed expressly for the purpose by the gate system equipment manufacturer.

B. Conduit Ends:
   1. Use 2 locknuts and insulated bushing on end of each conduit entering console/cabinet or galvanized steel box (plastic bushing may be used on 1/2 inch & 3/4 inch conduit).
   2. Use insulated grounding bushings on the ends of conduits, which are not directly connected to the enclosure (such as stub-ups under equipment, etc.) and bond between bushings and enclosure with equipment grounding conductor.

C. Expansion Joints: Use expansion joint fittings where conduits cross expansion joints.

3.03 OUTLET, JUNCTION AND PULLBOX INSTALLATION

A. Boxes For Concealed Conduit System:
   1. Install boxes of depth to suit job conditions and also comply with Article 370 of the National Electrical Code.
   2. Use galvanized steel boxes with flush covers for junction and pull boxes.

B. Boxes For Exposed Conduit System:
   1. Use threaded type boxes for all Work with conduit sizes 1/2, 3/4 and 1 inch.
   2. Use threaded type boxes for all Work with conduit sizes over 1 inch in wet locations.
   3. Use galvanized steel junction and pull boxes for Work with conduit sizes over 1 inch in dry locations and damp locations.

C. Specific Purpose Outlet Boxes: Use specific purpose outlet boxes to mount equipment when available and suitable for job conditions.

3.04 CONDUCTOR INSTALLATION

A. Install wiring in raceways.
B. Wiring shall be continuous (no splices) except for plug-in connectors or terminal blocks for connections to motors, limit switches, and other electrical components to facilitate removal and replacement of these items.

C. Protect wiring in track boxes with wire trough or chase. Encase wiring in plastic sheathing or rubber grommets when passing through metal components and near moving parts.

3.05 SUPPORTING DEVICE INSTALLATION

A. Attachment of Conduit System:
   1. Masonry Construction: Attach conduit to masonry construction by means of pipe straps or pipe clamps and masonry anchorage devices.
   2. Channel Support System: Attach conduit to channel as indicated on drawings.

3.06 IDENTIFICATION, LABELING AND MARKING

A. Identify conductors with markers at terminal strips, cabinets, consoles and pullboxes (designations shall correspond with point to point wiring diagrams).

END OF SECTION
SECTION 265100
INTERIOR LIGHTING FIXTURES

PART 1 GENERAL

1.01 SUMMARY

A. Description of Work: Provide lighting fixtures and all accessories as indicated or required.

B. Procure any or multiple light fixtures specified in drawings from NYS Preferred Source Contractors/Suppliers should any or all specified fixtures be available through such sources including:
   1. Department of Correctional Services Industries Program (CORCRAFT)
   2. Disabled Persons’ organization such as Herkimer Industries.
   3. Veterans Workshop organizations operated by the US Department of Veterans Affairs.

1.02 LIGHTING FIXTURE TYPES

A. A lighting fixture type is indicated adjacent to each lighting fixture shown on the Drawings. (e.g., “L1,” “L2,” “H1,” etc.). Where all the fixtures in a room or area are identical, the type may be indicated only once. Refer to the Lighting Fixture Schedule. Request fixture type for any lighting fixture without a type indicated.

1.03 SUBMITTALS

A. Product Data: Manufacturer’s descriptive literature for each fixture type to be used on the project.
   1. Ballast manufacturer and model number or series to be indicated for each fluorescent fixture type.

PART 2 PRODUCTS

2.01 LIGHTING FIXTURES - GENERAL

A. Types: As described in the Lighting Fixture Schedule. Lighting fixture manufacturers’ series or catalog numbers listed indicate “Basis of Design” as well as general quality, type, and style, but may not cover all required design features and details. Provide lighting fixtures having all features details and accessories as noted in the fixture descriptions and in this specification section.

B. Design and Construction: Free of light leaks and so as to provide adequate ventilation for lamp(s) and ballast(s).
C. Lampholders: Shall make positive contact with lamp base or pins and shall securely hold lamps in place.

D. Light Control: Reflectors, diffusers, lenses, louvers, baffles, etc., as indicated in the Lighting Fixture Schedule.

E. Accessories: As indicated and as required.

2.03 LED FIXTURES

A. General: LED fixtures are to meet requirements as set forth in the latest of the following standards:
   1. Reference Standards:
      a. LM-79-08, IESNA Approved Method for the Electrical and Photometric Measurements of Solid-State lighting Products.
      b. LM-80-08, IESNA Approved Method for Measuring Lumen Maintenance of LED Light Sources.
      c. IES TM-21-01: Projecting Long Term Lumen Maintenance of LED Light Sources
      d. UL 8750
      e. ANSI: C78.377A, C82.77-2002
      f. NEMA-SSL-1-2010, SSL-3-2010
      g. Color Binning: LED’s Shall utilize a maximum of three (2) MacAddam Ellipses

B. Independent testing Data, LED fixtures photometrics shall be produced by an independent testing company. LED fixture photometrics produced by Photopia is not acceptable.

2.04 CEILING MOUNTED FIXTURES

A. Fixtures, in general, have been specified for the particular type of ceiling where they are being installed. However, the Contractor shall verify all ceiling construction types prior to ordering light fixtures, and order lighting fixtures accordingly. Verify the exact ceiling system construction types and provide lighting fixtures, fittings, hangers, clamps, brackets, yokes, plaster flanges and miscellaneous devices as required for a complete installation to suit the ceiling construction.

2.05 PENDANT MOUNTED FIXTURES

A. Provide all necessary hardware, single-piece stems and miscellaneous components for a complete installation. When necessary for sloped ceilings, provide swivel type pendant hangers. For continuous row installations provide alignment hardware which spans adjacent fixtures.
2.06 CHAIN SUSPENDED FIXTURES

A. Install outlet box directly above fixture. Provide three conductor type SJO cord with NEMA L5-15 (120 volt) or NEMA L7-15 (277 volt) connecting plug and receptacle for each fixture.

2.07 DAMP AND WET LOCATION FIXTURES

A. UL Damp (or Wet) label, with corrosion resistant, weatherproof enamel or epoxy finish, and stainless steel or anodized aluminum fasteners.

2.08 LAMPS AND BALLASTS

A. Refer to Section Lamps and Ballasts and the Lighting Fixture Schedule.

PART 3 EXECUTION

3.01 GENERAL

A. Install lighting fixtures as described in the Lighting Fixture Schedule, complete with lamps and ballasts. Install all necessary accessory fittings, hangers, clamps, brackets, yokes, plaster flanges, outlet boxes, and miscellaneous devices required for a complete installation as recommended by the manufacturer.

3.02 FIXTURE MOUNTING AND SUPPORT

A. General: Securely support and/or suspend all lighting fixtures as indicated in specification section 260529 as well as the following: from structural members or the building. Lay-in, flanged, and recessed downlight fixtures may be supported by the framing members of the suspended ceiling system, where secured per NEC 410-16c. Secure troffers to ceiling tees at least twice along each long side of troffer.

B. Mounting Heights: Suspend pendant mounted lighting fixtures at heights indicated, measured from finished floor to bottom of fixture enclosure or reflector unless noted otherwise. Install wall mounted fixtures at heights indicated measured from finished floor to center of fixture outlet box unless noted otherwise.

C. Recessed Lighting Fixtures: Provide flexible connections to all recessed lighting fixtures as required by the code and in accordance with approved wiring methods.

3.03 LAMPS

A. Install specified lamps as recommended by the lamp and lighting fixture manufacturers. Follow lamp manufacturer’s recommendations for handling and installing lamps.
3.04 DRIVERS

A. Make all field connections necessary for factory-installed Drivers and install all special drivers as recommended by the manufacturer.

3.05 FINAL ACCEPTANCE

A. Coordinate with settings with Owner’s representative and make all aiming adjustments for applicable fixtures.

3.06 OPERATION

A. Verify all fixtures are operational per specifications and manufacturers recommendations.

END OF SECTION
SECTION 275112
INTERCOM AND ZONE PAGING SYSTEM

PART I   GENERAL

1.01 REFERENCES:
   A. NFPA and UL 50.

1.02 RELATED WORK SPECIFIED ELSEWHERE:
   A. Video Surveillance System: Section 282304.
   B. Door Control System: Section 284601.

1.03 SYSTEM DESCRIPTION:
   A. The dedicated intercom system equipment shall interface with the Touchscreen Control System, which provides the control functions for each system.
   B. Dedicated Intercom: The dedicated intercom system provides two-way communication between the master stations and the selected field intercom station.
   C. See Drawings for a schedule that identifies the intercom stations associated with each of the control stations.
   D. The Programmable Logic Controllers shall provide outputs to the video switcher via a data communications link to display the appropriate video camera on the control station's monitor while an intercom link is connected.
      1. Video Follow Event (VFE). There is a column titled “Camera” which indicates the CCTV camera(s) that is/are to be switched to the monitor(s) upon acknowledging a call-in request of the specified intercom station at the console.
   E. Intercom stations shall be transferred when control and monitoring is transferred via the Security Monitoring and Control System.

1.04 DEFINITIONS:
   A. The definition below supersedes the definition in Section 014216 for Technical Advisor and Field Advisor.
   B. Manufacturers’ Technical Advisor:
      1. An employee of the company producing the system (or a company which lists and markets the primary components of the system under their name) who is certified in writing by the company to be technically qualified in design, installation and servicing of the required products. Personnel
involved solely in sales do not qualify.

C. Integrator’s Field Advisor:
1. An individual employee by an organization (other than the company producing the system) certified in writing by the company producing the system, that the individual is technically qualified in design, installation and servicing of the required products and is capable to act as a field advisor in their behalf. Personnel involved solely in sales do not qualify.

D. Company Field Advisor: An employee of the Company which lists and markets the primary components of the system under their name who is certified in writing by the Company to be technically qualified in design, installation, and servicing of the required products or an employee of an organization certified by the foregoing Company to be technically qualified in design, installation and servicing of the required products. Personnel involved solely in sales to not qualify.

1.05 SUBMITTALS

A. Waiver of Submittals: The “Waiver of Certain Submittal Requirements” in Section 013300 does not apply to this Section.

B. Packaging of Submittals: Submittals required by this section are to be submitted (by contractor) in packages as follows: Submit (4) sets of shop drawings, product data and quality control submittals specified below as a complete package. SUBMITTALS NOT COMPLYING WITH ALL OF THE OUTLINED REQUIREMENTS WILL BE REJECTED.

1. Submittals Package 1: Submit seven (7) Shop drawings, Product Data and Quality Control Submittals specified below at the same time as a package.
   a. Submit Submittals Package 1 within 30 days of contract award.

2. Submittals Package 2: Submit Point to Point Wiring Diagrams and Training Submittals specified below at the same time as a package.
   a. Submit Submittals Package 2 within 30 days of receipt of approval of Submittals Package 1.

3. Submittals Package 3: Submit Contract Closeout Submittals specified below at the same time as a package.
   a. Submit Submittals Package 3 upon physical completion, when directed by the Director’s Representative.

C. Seismic Qualification Certificates: for security equipment racks from manufacturer.

1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions. Base certification on the maximum number of components capable of being mounted in each equipment rack along with rack type. Identify components on which certified is based.

3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

D. Shop Drawings (Submittals Package 1):

1. Composite wiring and/or schematic diagrams of the complete system as proposed to be installed (standard diagrams will not be accepted), including video signal integrity equipment, etc. required for a complete system.

2. Scale drawings showing mounting of video door station components.

3. Scaled elevation drawings showing location and mounting of components to be mounted in the security equipment racks in Security Equipment rooms.

E. Product Data (Submittals Package 1):

1. Catalog sheets, specifications and installation instructions.

2. Bill of materials showing proposed quantities of all equipment to be used on this project.

3. Detailed description of system operation (format similar to SYSTEM DESCRIPTION).

4. State number of video inputs and outputs used specifically for this project and number of video inputs and outputs available for future use if system is expanded to maximum capacity.

5. Name, address and telephone number of nearest fully equipped service organization.

6. Include calculations used to size UPS’s for a fifteen-minute back-up time.

F. Quality Control Submittals (Submittals Package 1):


   a. Also include copy of identification card issued by the Licensee for each person who will be performing the Work.

2. Installers' Qualifications Data: Include a completed INSTALLER'S QUALIFICATION DATA FORM for each person who will be performing the Work.

   a. Forms must be completely filled out.
b. Forms must include all information required, showing that the experience criteria have been met.

c. Each Form must be signed by the installer.

3. Company Field Advisor Data:
   a. Secure the services of a Company Field Advisor:
      1) Include the name, business address and telephone number of the Company Field Advisor.
   b. Certified statement from the Company listing the qualifications of the Company Field Advisor.
   c. Services and each product for which authorization is given by the Company, listed specifically for this project.

4. Letter from the Company Field Advisor stating that the Company Field Advisor has reviewed the Submittals Package for accuracy and completeness and approves all materials and installation methods included in the Submittals Package.

5. System Qualifications: Submit System Qualification information if proposing a system other than that specified.

6. Project Work Plan:
   a. Include a detailed work guideline listing the OCFS requirements as they apply to this specific site.
   b. Include a detailed project work scheduling plan.
   c. Include a set of detailed project installation drawings compiled specifically for this project.
   d. Include training schedules for this specific project.
   e. Include personnel contacts for this specific project.
   f. Include direction for proper handling and storage for all equipment.

G. Point to Point Wiring Diagrams (Submittals Package 2):
   1. Submit complete point to point wiring diagrams of the entire system as it is to be installed.
      a. Point to Point wiring diagrams shall show the following:
         1) All components in the system.
2) All cables and conductors between each component.

3) Identify all cables and conductors and show all terminations and splices (identification shall correspond to markers to be installed on each conductor).

b. Point to Point wiring diagrams shall have an accompanying letter from the Company Field Advisor(s) stating that the Company Field Advisor(s) has reviewed the Point to Point wiring diagrams for accuracy and completeness and approves the Point to Point wiring diagrams for use.

H. Contract Closeout Submittals (Submittals Package 3):

1. System acceptance test report.

2. Certificate: Affidavit, signed by the Company Field Advisor(s) and notarized, certifying that the system meets the contract requirements and is operating properly.

3. Operation and Maintenance Data:
   a. Deliver 2 copies, covering the installed products, obtain a signed receipt from the Director's Representative. Include:
      1) Operation and maintenance data for each product.
      2) Complete point to point wiring diagrams (As-Built Drawings) of entire system as installed. Identify all conductors and show all terminations and splices (identification shall correspond to markers installed on each conductor).
      3) Name, address, and telephone number of nearest fully equipped service organization.
      4) Show all “as installed” cable paths.
      5) Identify all conductors including cat6a cable and power cables.
      6) Show all terminations and splices. Identification shall correspond to marker installed on each conductor.

1.06 QUALITY ASSURANCE

A. Equipment Qualifications For Products Other Than Those Specified:
   1. At the time of submission provide written notice to the Director of the intent to propose an “or equal” for products other than those specified. Make the “or equal” submission in a timely manner to allow the Director sufficient time to review the proposed product, perform inspections and witness test demonstrations.
2. If products other than those specified are proposed for use furnish the name, address, and telephone numbers of at least 5 comparable installations that can prove the proposed products have performed satisfactorily for 3 years. Certify in writing that the owners of the 5 comparable installations will allow inspection of their installation by the Director's Representative and the Manufacturer Technical Advisor.
   a. Make arrangements with the owners of 2 installations (selected by the Director) for inspection of the installations by the Director's Representative. Also obtain the services of the Manufacturer Technical Advisor for the proposed products to be present. Notify the Director a minimum of 3 weeks prior to the availability of the installations for the inspection, and provide at least one alternative date for each inspection.
   b. Only references from the actual owner or owner’s representative (Security Supervisor, Maintenance Supervisor, etc.) will be accepted. References from dealers, system installers or others, who are not the actual owners of the proposed products, are not acceptable.
      1) Verify the accuracy of all references submitted prior to submission and certify in writing that the accuracy of the information has been confirmed.

2. The product manufacturer shall have test facilities available that can demonstrate that the proposed products meet the contract requirements.
   a. Make arrangements with the test facility for the Director's Representative to witness test demonstrations. Also obtain the services of the Manufacturer Technical for the proposed product to be present at the test facility. Notify the Director a minimum of 3 weeks prior to the availability of the test facility, and provide at least one alternative date for the testing.

4. Provide written certification from the manufacturer that the proposed products are compatible for use with all other equipment proposed for use for this system and meet all contract requirements.

B. Test Facility: The Company producing the system shall have test facilities available that can demonstrate that the proposed system meets contract requirements.

C. Manufacturer Technical Advisor: Secure the services of a Manufacturer Technical Advisor for a minimum of 24 working hours for the following:
   1. Render advice regarding installation and final adjustment of the system.
   2. Witness final system test and then certify with an affidavit that the system is installed in accordance with the contract documents and is operating properly.
   3. Train facility personnel on the operation and maintenance of the system (minimum of two 1 hour sessions).
   4. Explain available service programs to facility supervisory personnel for their consideration.
1.07 MAINTENANCE

A. Service Availability: A fully equipped service organization shall be available to service the completed Work.

B. Spare Parts:
   1. (2) Intercom Substations
   2. (1) Audio Relay Board
   3. (2) Speakers

1.08 WARRANTIES

A. Base equipment and installation warranty shall be 1 year from date of final system acceptance.

B. Special Warranty: The one year period required by paragraph 9.8 of the General Conditions is extended to (2) years for the Work of this Section when approved. Refer to supplementary Conditions.

C. Manufacturer's Warranty: Product and component specific manufacturer's standard warranty where greater than the 2 years required by the special warranty.

D. Equipment integrator and contractor shall respond to warranty service requests within 4 hours of initiation of call to the facility location.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Intercom Master Stations: Each dedicated intercom master station shall be equipped and wired as required to affect the functions as described in 284601 Door Control System. Each system shall include the following:
   1. Programmable Logic Controller (PLC) based audio switching system to perform the functions described herein.
   2. Equipment necessary to effect balanced audio switching.
   3. All software and programming necessary to perform the functions described herein.
   4. All power supplies and amplifiers required.
   5. Each Master Intercom Station shall consist of a remote intercom amplifier with separate microphone and speaker, volume up & down, and push-to-talk buttons.
   a. At graphic panel locations, the intercom master shall be integrated into the control panel.
      1) Intercom condenser microphone Manufacturer:
         i) Specified: Tech Works HM-1-SUB
         ii) Acceptable: Dukane, Rauland
      2) Gooseneck type, microphone with cardioid pattern, permanently mounted.
         i) Microphone manufacturer:
1. Specified: Astatic Conneaut Technologies, Inc. 827-13
2. Acceptable: Dukane, Rauland

b. At Touchscreen locations a separate intercom master station shall be provided.
   1) Construction shall be of 16-gauge stainless steel. Momentary pushbuttons shall be provided for volume up, volume down, and push-to-talk functions. The gooseneck microphone shall be removable, low impedance, electret condenser type. The speaker shall be 2 watt, 8 ohm. An internal circuit board shall be provided with all necessary terminals and relays. All terminals shall be "quick disconnect" type such that no tools are required to disconnect wiring for board replacement. Receptacles shall be provided on the exterior of the station for a foot operated push-to-talk switch and a headset with microphone. Upon inserting the headset plug into its receptacle all talk and listen functions shall transfer to the headset. The master station shall contain no active circuitry or control logic. All control functions shall be performed by a Programmable Logic Controller
      i. Manufacturer:
         1. Specified: Creative Technologies # ICM

c. Master intercom amplifiers
   1) Manufacturer:
      i. Specified: Tech Works ICA-202D
      ii. Acceptable: Rauland, Dukane
   2) All functions of the intercom amplifier shall be accessed through PLC outputs. (Push-to-talk, volume up & down, page mode relay, audio enable)

B. Intercom Substation:
   1. Each intercom substation shall be Surface mounted where shown on the drawings with push button call origination to the master station.
      a. Water and flame resistant
      b. Momentary call-in switch
      c. Surface mounted with tamper-resistant hardware
      d. 11-guage stainless steel;
      e. Exterior Substations to have 2-gang stainless steel back box with hood
      f. Interior Substations to have 2-gang stainless steel back box
      g. Manufacturer:
         1) Specified Dukane 4A1485A
         2) Acceptable: Rauland, Quam

C. General Paging:
   1. The paging system shall be configured into zones, refer to riser diagrams for additional information.
2. Power Amplifiers:
   a. Power output shall be as required to support the zones specified herein. Amplifiers shall be loaded to no more than 75 percent of their rated power output.
   b. Amplifier shall be 19” rack mount type.
   c. Amplifier shall be Dukane, Tech Works, or approved equal.

3. Speakers:
   a. Secure Specified:
      1) Back box - Atlas Soundolier 193-8-5
      2) Speaker - Atlas Soundolier C5T72
      3) Baffle - Atlas Soundolier VP161-R8

4. Horn/loud Speakers:
   a. Bosch SPT15A Series or approved equal.

D. Interface Boards. All intercom stations and Paging zones shall be connected to interface boards. Interface Boards shall utilize PLC manufacturers' style of input/output cables for connections to the PLC input & output modules. All field terminations inside the equipment enclosures shall be made to Interface Boards. Terminations shall not be made directly to PLC modules.
   1. Termination Boards shall be UL Listed or Recognized.
   2. Each control point on each interface board shall have an LED to indicate if the point is currently active.
   3. Interface boards shall be provided with a power LED for each power type supplied to the board that will indicate power is being supplied to the board.
   4. Interface boards' control power busses shall be fused.
   5. Interface Boards shall provide proper separation of Class 1 and Class 2 circuits as defined by Article 725 of the National Electric Code.
   6. Interface boards shall contain no active circuitry or control logic.
   7. All board terminations shall be pluggable to facilitate board replacement.
   8. Termination boards shall be warranted for 10 years from the date of shipment.

9. BOARD TYPES:
   a. Audio Relay Board
      1) 16 relays per board.
         i. Relays shall be rated at 2 amps each.
            1. Omron
      2) Manufacturer:
         i. Specified: Creative Technologies # ARB-16
         ii. Acceptable: Dukane, Rauland

E. Audio Level Monitoring Equipment: Circuit designed to detect audio levels higher than pre-set level and initiate a call-in to the Master Control panel. Circuit shall have day and night sensitivity settings with adjustable controls for each. Excessive audio shall be indicated through a set of dry contacts. Circuit shall be compatible with the dedicated intercom Master Station and associated equipment. One circuit shall be provided for each intercom station requiring audio level monitoring.
   1. Audio Level Monitoring Equipment inputs and outputs shall be wired to interface boards and not directly to the PLC modules.
2. Day and night sensitivity settings shall be controlled via the Touchscreen Control System.
3. Manufacturer:
   a. Specified: Creative Technologies
   b. Acceptable: Dukane

F. Lightning Protection: All cables entering or leaving a building shall be protected with Silicon Avalanche Diode protection devices. These devices shall be installed in the appropriate enclosure and grounded to the grounding system.

2.02 OPTICAL FIBER MEDIA CONVERTER (OFMC)

A. FM AUDIO TRANSMISSION
B. 20Hz - 20kHz
C. (2) single-mode fiber optic ports
D. Audio in and Audio out.
E. Operating Temp -40 degrees Celsius – 74 degrees Celsius
F. As manufactured by GE Security AR2025

2.03 WIRING

A. Conductors: Number of conductors, size and type as recommended by the Company producing the system.

2.04 SIGNS AND LABELS

A. Zone Locator: Card holder with aluminum or stainless steel frame, plexiglass front and sheet aluminum card backing plate. Minimum size card 3 x 5 inches. Type on card the zone numbers and description of area encompassed by each zone.

2.05 ACCEPTABLE MANUFACTURERS:

A. Manufacturer’s names, catalog numbers, and trade names are used to establish a level of quality and the operational characteristics for the products and systems specified. Specified materials, products, and services shall be provided unless otherwise approved by change to the bidding or contract documents. Materials, products, and services of manufacturers listed as “acceptable” may only be substituted for approval provided they meet or exceed the specified requirements and meet or exceed the level of quality and service established by the “specified” manufacturer. Listing of a manufacturer as specified or acceptable does not relieve the manufacturer of the responsibility to comply with the complete specification.

B. Equivalent products of other manufacturers will be considered based on product data, manuals, demonstration software, and other technical information as necessary to show compliance with the specification. Information must be submitted at least twenty one (14) days prior to bid due date and be approved by addendum.

C. Contact Rob Johnson at Secured State for product information based on products
listed in this specification: (618) 664-4292 x101.

PART 3  EXECUTION

3.01  GENERAL

A. Furnish all cables necessary to support the specified system.
B. Programmable Logic Controllers (PLC) shall be utilized to perform functions as specified. PLC’s shall be as specified in Section 284601 Door Control System.
C. All equipment shall be rack mounted in Type 1, Equipment Racks unless otherwise noted.
D. All components/equipment shall be fabricated into racks conforming to the UL 508A standard. (Enclosure and all internal equipment and wiring as a single entity)
E. Installation shall comply with the National Electric Code. Provide proper separation of all wiring and circuit types
F. Install all equipment in accordance with manufacturer’s recommendations.

3.02  COMPLETION

A. General: Upon completion of the work, remove excess debris, materials, equipment, apparatus, tools, and the like and leave premises clean, neat and orderly. Vacuum clean all equipment and enclosures to remove any dirt, dust, or foreign matter that may have accumulated during installation.
B. After complete installation, test system and correct all problems prior to acceptance testing. Once the Contractor is satisfied that the system is operating satisfactorily, operation of the entire system shall be demonstrated to the Owner.

3.03  INTERCOM SCHEDULE LEGEND (See Drawings).

3.04  CABLE AND CONDUCTOR INSTALLATION

A. Provide all signal cables and power conductors in raceways.
B. Signal cables and power conductors shall not be run in same raceway.
C. All signal cables and power conductors shall be continuous (no splices, except at terminal cabinet and video door station).

3.05  SYSTEM START UP

A. Power shall only be applied to the system after re-checking for proper grounding of the system and measuring all loops for lack of shorts, grounds, and open circuits.
3.06 IDENTIFICATION, LABELING AND MARKING

A. Identify conductors with markers at intercom master station, door video stations, and terminal cabinet (designations shall correspond with point to point wiring diagrams).

3.07 INSTALLATION

A. Install system in accordance with the Company’s printed instructions unless otherwise indicated.

B. Provide Surge Arresters on DC power line and signals going to the exterior door intercom substations.

C. Equipment shall be firmly secured, plumb, and level.

D. Wiring shall be uniform and in accordance with national electric codes and manufacturers’ instructions.

E. Coordinate all work with other effected trades and contractors.

F. Zone Locator: install adjacent to each master station.

3.08 FIELD QUALITY CONTROL

A. Preliminary System Test:
   1. Preparation: Have the Company Field Advisor adjust the completed systems and then operate them long enough to assure that they are performing properly.
   2. Run a preliminary test for the purpose of:
      a. Determining whether the systems are in a suitable condition to conduct an acceptance test.
      b. Checking and adjusting equipment.
      c. Training facility personnel.

B. System Acceptance Test:
   1. Preparation: Notify the Director’s Representative at least three working days prior to the test so arrangements can be made to have a Facility Representative witness the test.
   2. Make the following tests:
      a. Individually test each master station and each door video station. Verify proper volume levels and freedom from noise and distortion.
      b. Test each system function step by step as summarized under SYSTEM DESCRIPTION.
      c. Include schedule with all components installed and tested. Schedule shall include the following:
         1) Date of test
         2) Name of tester
         3) Verification of all camera call ups
4) Pass or fail of test
5) Corrective action required
d. Simulated utility power failure at full load to prove uninterruption of load power supply.
e. Simulated UPS failure at full load to prove transfer to utility power upon malfunction of UPS (disconnect batteries with temporary disconnect switch or other methods to temporarily disable unit).
f. Full load test for 15 minutes to prove capacity of system (utility power source disconnected). Record battery voltage and current at start and end of period. Record AC output voltage at start and end of period. Battery cell voltage under full load at the end of 15 minutes shall not be less than 1.75V.

3. Supply all equipment necessary for system adjustment and testing.
   a. Operational Test: Perform tests that include originating program and page messages at microphone outlets, preamplifier program inputs, and other inputs. Verify proper routing and volume levels and that system is free of noise and distortion.
   b. Signal-to-Noise Ratio Test: Measure signal-to-noise ratio of complete system at normal gain settings as follows:
      1) Disconnect microphone at connector or jack closest to it and replace it in the circuit with a signal generator using a 1000-Hz signal. Replace all other microphones at corresponding connectors with dummy loads, each equal in impedance to microphone it replaces. Measure signal-to-noise ratio.
      2) Repeat test for each separately controlled zone of loudspeakers.
      3) Minimum acceptance ratio is 50 dB.
   c. Distortion Test: Measure distortion at normal gain settings and rated power. Feed signals at frequencies of 50, 200, 400, 1000, 3000, 8000, and 12,000 Hz into each preamplifier outputs. Maximum acceptable distortion at any frequency is 3 percent total harmonics.
   d. Acoustic Coverage Test: Feed pink noise into system using octaves centered at 500 and 4000 Hz. Use sound-level meter with octave-band filters to measure level at five locations in each zone. For spaces with seated audiences, maximum permissible variation in level is plus or minus 2 dB. In addition, the levels between locations in same zone and between locations in adjacent zones must not vary more than plus or minus 3 dB.
   e. Power Output Test: Measure electrical power output of each power amplifier at normal gain settings of 50, 1000, and 12,000 Hz. Maximum variation in power output at these frequencies must not exceed plus or minus 1 dB.
   f. Signal Ground Test: Measure and report ground resistance at public address equipment signal ground. Comply with testing requirements specified in Division 26 Section “Grounding and Bonding for Electrical Systems.”
g. Inspection: Verify that units and controls are properly labeled and interconnecting wires and terminals are identified. Prepare a list of final tap settings of paging speaker-line matching transformers.

4. Submit written report of test results signed by Company Field Advisor and the Director's Representative. Include a record of final speaker-line matching transformer-tap settings, and signal ground-resistant measurement.

END OF SECTION
PART 1 GENERAL

1.01 SUBMITTALS

A. Product Data: Catalog sheets, specifications and installation instructions.

PART 2 PRODUCTS

2.01 METAL DETECTOR

A. CEIA Metal Detection System Model SMD600 Plus.
   1. 3 Levels of security
   2. Complies with the requirements of NIJ-0601.02
   3. 4 Multi0Zone Display Bars, each programmable as entry stop/go
      and/or local alarm indication
   4. Flexible Acoustic Alarm Signaling System
   5. 10 Acoustic Intensity Levels

2.02 HANDHELD METAL DETECTOR

A. CEIA Handheld Metal Detection System Model PD240
   1. Complies with the requirements of NIJ-0602.02
   2. Indoor and Outdoor Operations.
   3. High Immunity to floor rebars allows Lower-Body Screening
      without Sensitivity Reduction.
   5. Full Digital Design.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install metal detector in accordance with manufacturer’s printed
   instructions.

END OF SECTION
PART 1   GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE

A. Perimeter Alarm System: Section 281605.

B. Fence Accessory Stations For Perimeter Security Systems: Section 281602.

C. Division 26: Associated Electrical materials.

1.02 DEFINITIONS

Note: The definition below supercedes the definition in section 014216 for Technical Advisor and Field Advisor.

A. Manufacturers’ Technical Advisor
   1. An employee of the company producing the system (or a company which lists and markets the primary components of the system under their name) who is certified in writing by the company to be technically qualified in design, installation, and servicing of the required products. Personnel involved solely in sales do not qualify.

B. Integrator’s Field Advisor
   1. An individual employed by an organization (other than the company producing the system), certified in writing by the company producing the system, that the individual is technically qualified in design, installation and servicing of the required products and is capable to act as a field advisor in their behalf. Personnel involved solely in sales do not qualify.

1.03 SYSTEM DESCRIPTION

A. The microwave detection system shall operate as a zoned, outdoor perimeter protection system integrated with the perimeter alarm system (Section 281605) which detects movement and causes an alarm to be sounded at the perimeter alarm system’s Zone Monitor when an intrusion occurs in the microwave zone.
   1. The microwave transmitter and receiver combination (zone) can be remotely tested from the console by activating a "zone test" function via the perimeter alarm system.
   2. Tampering with the microwave transmitter unit, receiver unit, and associated control box causes a "tamper alarm" condition at the main security console (this condition is independent of a "perimeter zone alarm" condition.)
   3. Operation of the zone test feature at the Zone LCD Monitor of the
perimeter alarm system will initiate a zone test of the microwave zone.

1.04 SUBMITTALS

A. Waiver of Submittals: The "Waiver of Certain Submittal Requirements" in Section 013300 does not apply to this Section.

B. Submittal Requirements: Submittals required by this section are to be submitted in Submittal Packages as follows:

1. Submittals Package 1: Submit Product Data and Quality Control Submittals specified below at the same time as a package.
   a. Submit Submittals Package 1 within 30 days of contract award.

2. Submittals Package 2: Submit Contract Closeout Submittals specified below at the same time as a package.
   a. Submit Submittals Package 2 upon physical completion, when directed by the Director’s Representative.

3. It is the Contractor's responsibility to review and verify that all information required for each submittal package is included in the submittal package. Errors or omissions found by the Contractor are to be corrected prior to the Submittals Package submission for approval. Incomplete Submittal Packages submitted for review and approval will be returned.
   a. It is the Contractor's responsibility to verify that portions of the submittal packages provided by a Sub-Contractor are complete as well as portions of the submittal packages being provided directly by the Contractor.

C. Product Data (Submittals Package 1):

1. Submit catalog sheets, specifications, and installation instructions for each item being proposed.
   a. At the top of each catalog sheet, specification or installation instruction that is being submitted indicate the Specification Section, Article, Paragraph and Subparagraph of the item is being submitted.

2. Bill of Materials: Provide a Bill of Materials identifying each system device or component proposed to be used for this system as listed in PART 2 PRODUCTS of this section.
   a. The Bill of Materials shall provide the following information:
      1) Identify each item by name and model number.
      2) Indicate the page number(s) in the Submittal Package where information required for that item can be found.
      3) Identify the appropriate specification section, Article number, paragraph and subparagraph where that item is listed in the project manual.

3. Name, address and telephone number of nearest fully equipped service organization.

D. Quality Control Submittals (Submittals Package 1):

1. Work Schedule:
   a. Submit a work schedule of how the installation of the system
shall be performed. Schedule shall include:

1) A brief description of the work to be performed at each phase.
2) Estimated time durations required to perform each phase of the work.
3) Date that Pre-installation Training Meeting will be held.
   a) Pre-installation Training Meeting should not be held more than 2 weeks prior start of the installation of any system component listed PART 2 PRODUCTS for this system unless an earlier time is agreed upon by the Director’s Representative.
4) Delivery dates that materials being provided under this contract will be required to be at the contract site.
5) Delivery dates that materials being furnished by others will be required to be at the contract site.
6) Dates that services being furnished by others will be required to be performed.

b. Certification from the contractor stating that the contractor has verified with the manufacturers (and/or distributors) of the materials the Contractors proposes for this contract, that the manufacturers (and/or distributors) of the materials guarantees delivery of the materials no later than the date indicated in the Contractor’s work schedule.

2. Installers' Qualifications Data: Include a completed INSTALLER'S QUALIFICATION DATA FORM for each person who will be performing the Work.
   a. Forms must be completely filled out.
   b. Forms must include all information required, showing that the experience criteria have been met.
   c. Each Form must be signed by the installer.

3. Integrator’s Field Advisor Data, Include:
   a. Name, business address and telephone number of Integrator’s Field Advisor(s) secured for the required services.
   b. Certified statement (letter) from the Companies producing the system listing the qualifications of the Integrator’s Field Advisor. The certification statements from the Companies shall include the following:
      1) Information stating that the Integrator’s Field Advisor is experienced in the engineering, design and installation of the Equipment being used for this project.
      2) Each product for which the Company gives authorization for the Integrator’s Field Advisor to oversee installation of and each service the Integrator’s Field Advisor can perform in their behalf, listed specifically for this project.
   c. Listing of similar projects that the Integrator’s Field Advisor has worked on in the past 3 years.
   d. Listing of training that the Integrator’s Field Advisor has received on the equipment being proposed for this project.
E. Contract Closeout Submittals (Submittals Package 2):
   2. Certificate: Affidavit, signed by the Integrator’s Field Advisor and notarized, certifying that the system meets the contract requirements and is operating properly.
   3. Operation and Maintenance Data:
      a. Deliver 2 copies, covering the installed products, to the Director's Representative. Include:
         1) Operation and maintenance data for each product.
         2) Complete point to point wiring diagrams (As-Built Drawings) of entire system as installed. Identify all conductors and show all terminations and splices (identification shall correspond to markers installed on each conductor).
         3) Name, address, and telephone number of nearest fully equipped service organization.

1.05 QUALITY ASSURANCE

A. Installers' Qualifications: The persons installing the Work of this Section and their supervisor shall be personally experienced in security systems and shall have been engaged in the installation of security systems for a minimum of 3 years.
   1. Qualifying experience must be in the installation of security systems similar in operation and construction of the system being specified by this section.
   2. Furnish to the Director completed INSTALLER'S QUALIFICATION DATA FORM for each person who will be performing the Work. Each form shall include:
      a. Installer's name.
      b. Employer's Name and Address.
      c. Qualifying Experience: Project information of 5 similar projects, which the installer, had worked on during the past 3 years. Information shall include for each project:
         1) Name and Address of project.
         2) Dates installer worked on project.
         3) Name and telephone Number of installer's supervisor for the project.
         4) Types of security installation work installer performed on project.

B. Integrator’s Field Advisor: The Integrator’s Field Advisor will be responsible to perform the following:
   1. Provide the information required for the Submittals Packages as listed in this specification section.
      a. The Integrator’s Field Advisor shall compile one complete set of submittal information to the Contractor for copying by the Contractor and inclusion in the Contractor’s six copies of the submittal package.
   2. Conduct a pre-installation training meeting at the contract site with the installers (and their supervisor) who will be performing the work, the
Director's Representatives and facility supervisory and maintenance personnel. The meeting shall be a minimum of 2 hours in duration or longer as required to cover required topics. The topics covered shall include, but shall not be limited to the following:

a. Integrator’s Field Advisor shall present an overview of the system as it is to be installed.

b. Integrator’s Field Advisor shall lead a discussion of installation concerns and coordination issues on this system and related systems and related work being installed under this project.

c. Integrator’s Field Advisor shall provide training on procedures for installing system components and precautionary measures installers should be aware of while performing the work.

1) Integrator’s Field Advisor shall review wiring requirements for each component of the system with the installers and provide training on termination, bonding and grounding procedures required for proper installation of the system wiring.

a. Provide all materials necessary for training (samples of all equipment being installed, training aides, handouts, overhead projector, etc.).

3. Render advice and technical support regarding installation and integration with other systems.

a. Render advice and technical support regarding interconnections between this system, the Video Surveillance System (Section 282304).

4. Assist in coordination of the installation of this system as it relates to the installation other systems being provided under this contract and related contracts.

5. Provide technical advice and inspection of the installation at the contract site at all times during the installation of the system equipment and for the following:

a. Provide daily inspection the installation of the system.

b. Render advice and guidance regarding installation of the system.

c. Render advice and guidance on final adjustments of the system.

d. Render advice regarding installation of the system as it relates with the work with the other systems.

e. Perform preliminary tests of the system.

f. Perform the final systems test and certify with an affidavit that the system is installed in accordance with the contract documents and is operating properly.

g. Train facility security personnel, security supervisory personnel and maintenance personnel in operation and in routine (weekly and annual) testing of the system (minimum of four 2-hour sessions).

1.06 MAINTENANCE

A. Service Availability: A fully equipped service organization capable of guaranteeing response time within 4 hours to service calls shall be available 24 hours a day, 7 days a week to service the completed system.
B. **Spare Parts:**
   1. One of each type of surge protection units.
   2. Three of each size fuse.

**PART 2 PRODUCTS**

**2.01 MICROWAVE DETECTION SYSTEM**

A. **Microwave Transmitter and Receiver Units:** Senstar UltraWave Model E4FG0101 series Microwave Transmitter and Receiver Units, having:
   1. Zone lengths from 16 to 656 ft. Stackable for increased detection zone height.
   2. Suitable for operation on 48 volts DC.
   4. Optional network interface on receiver minimizes field wiring.
   5. For non-network applications, two user configurable relay outputs provided.
   6. Come with Mounting Brackets.

B. **Surge Protection:** Equip system with surge suppressors to protect equipment from voltage transients and lightning surges.
   1. Surge Protection Units for Data and Audio conductors: Ditek Corp.’s DTK-2MHLP-12 Surge Protection Units with Ditek Corp.’s MB10 mounting base.
   2. Surge Protection Units for DC power conductors: Ditek Corp.’s DTK-2MHLP-24 Surge Protection Units with Ditek Corp.’s MB10 mounting base.

C. **Interconnection Cable:**
   1. Multi-conductor cable with 3 individually shielded twisted pairs of insulated 18 AWG stranded copper wires enclosed in an overall shield in a jacket suitable for direct burial.

**2.02 MOUNTING POSTS**

A. **Mounting Post:** Galvanized steel pipe (Schedule 40), 4 inch (outside) diameter with length as indicated on drawings.
   1. Provide galvanized steel post cap.

B. **Concrete Bases as detailed on drawings and poured in place,** having:
   1. Type III Portland Cement, air-entrained concrete having minimum compressive strength of 5,000 psi at 28 days (and having minimum compressive strength of 2,000 psi at 1 day). Maximum water-cement ratio 0.40.

C. **Termination Box:** 6” x 6” x 4” (minimum size) NEMA 4X stainless steel
enclosure, Hoffman’s CHNFSS series enclosure. Secured to post with hot dipped galvanized or stainless steel fasteners.

D. Grounding:
1. Ground Electrodes:
   a. Rod Electrodes: Copper clad (min. .010 jacket) ground rods minimum 5/8 inches diameter by 8'-0" long.
2. Grounding Electrode Conductors and Bonding Conductors: # 6 AWG Copper conductors, bare or insulated with RHW, THW, XHHW, THWN or THHN insulation.

E. Microwave Reflector: Size and construction as indicated on drawings. Material of reflector plate-(Aluminum).

2.03 MARKERS

A. Markers:
1. Premarked self-adhesive; W.H. Brady Co.’s B940, Thomas and Betts Co.’s E-Z code WSL self-laminating, Ideal Industries' Mylar/Cloth wire markers, or Markwick Corp.’s permanent wire markers.
2. Flexible sleeve markers; Plastic Extruded Parts Inc.’s FS series.
3. Snap-on markers; Plastic Extruded Parts Inc.’s RS series.

2.04 ACCESSORIES

A. Contractor shall include all materials (conduits, enclosures, fasteners, etc) as required for installing the system equipment as indicated on the drawings.

2.05 ACCEPTABLE MANUFACTURERS:

A. Manufacturer’s names, catalog numbers, and trade names are used to establish a level of quality and the operational characteristics for the products and systems specified. Specified materials, products, and services shall be provided unless otherwise approved by change to the bidding or contract documents. Materials, products, and services of manufacturers listed as “acceptable” may only be substituted for approval provided they meet or exceed the specified requirements and meet or exceed the level of quality and service established by the “specified” manufacturer. Listing of a manufacturer as specified or acceptable does not relieve the manufacturer of the responsibility to comply with the complete specification.

B. Equivalent products of other manufacturers will be considered based on product data, manuals, demonstration software, and other technical information as necessary to show compliance with the specification. Information must be submitted at least fourteen (14) days prior to bid due date and be approved by addendum. Product substitution will not be accepted during the submittal process.

C. Contact Mark Clemons at Senstar for product information based on products
PART 3 EXECUTION

3.01 INSTALLATION

A. Pre-installation Training Meeting.
   1. Make arrangements through the Director’s Representative and the Integrator’s Field Advisor to have the Integrator’s Field Advisor conduct the Pre-installation Training Meeting for this system.
      a. Provide a minimum of one week notice to the Director’s Representative, so that a Pre-Installation Training Meeting schedule can be set up with facility personnel and arrangements can be made for a location to hold the meeting.
      b. The Integrator’s Field Advisor shall provide all materials necessary for training (samples of all equipment being installed, training aides, handouts, overhead projector, etc.).
      c. Training shall be schedule so to avoid conflict with any other training required by this contract.
      d. Contractor shall have all installers (and their immediate supervisor) who will be performing the work attend this training.
         1) Only persons who have attended this training meeting will be allowed to install or work with any of the products specified in PART 2 in this specification section.

B. Install microwave detection system in accordance with Company’s printed instructions and interconnect with Perimeter Alarm System (Section 281605) for a complete integrated system.
   1. No mounting, terminations and/or connections of devices specified in this section are to be made until the Pre-installation Training Meeting has been performed.

C. Exact location of microwave transmitter/receiver units post and base and the exact location of microwave reflector shall be as recommended by the Integrator’s Field Advisor.
   1. Locate units so that the microwave beam crosses perpendicular to the sides of the vehicle compound and perpendicular to reflector panel.
   2. Locate units far enough away from the sides of the vehicle compound so to assure the entire width of the vehicle compound is protected by the microwave zone and the “dead space” in front of the microwave units are outside the vehicle compound.
   3. Locate units to facilitate snow removal from detection zone.
   4. Have the Integrator’s Field Advisor mark exact location of posts at the site.

D. Install a ground rod electrode at each microwave receiver and transmitter location.

E. Make cable connections, terminations, and splices in fence accessory station, and microwave transmitter and receiver units. Splices will not be permitted at any
other locations.
1. Identify conductors with markers at terminal strips, pullboxes and security equipment racks (designations shall correspond with point to point wiring diagrams).
2. Install surge protection on each conductor entering and leaving fence accessory station.

F. Upon completion of the installation of the microwave receiver and transmitter units have the Integrator’s Field Advisor operate, adjust and test the microwave zone utilizing the Field Test Unit.
1. The Integrator’s Field Advisor shall confirm that the antenna being used is appropriate for site conditions and change the antenna as required for optimal performance of the microwave zone.
2. The Integrator’s Field Advisor shall select the channel the microwave zone is operating for optimal performance of the microwave zone.
3. The Integrator’s Field Advisor shall confirm that the signal bandwidth jumper is set for fast moving objects or slow moving objects as required by the Facility’s Security Supervisor.
   a. Provide testing as required to assist the facility in determining the correct setting.

3.02 SYSTEM TRAINING

A. After the system is substantially complete and operational, provide on-site training of facility security, security supervisory, and maintenance personnel.
1. Provide a minimum of 1 week notice to the Director’s Representative, so that a training schedule can be set up with facility personnel and arrangements can be made for a location to hold the training.
2. Provide all materials necessary for training (training aides, handouts, overhead projector, etc.).

B. System Operation Training: Training shall be set-up so that at the end of training, facility (security, security supervisory, and maintenance) personnel shall have a complete understanding of:
1. How the system operates.
   a. Training should include precautionary concerns that personnel should be aware of that could effect proper operation of the system.
2. Knowledge of all components in the system and their function.
3. How the system is interconnected with other security systems and how the system operates in conjunction with the other systems.
4. Weekly testing procedures for the system required to be performed by the Department.
   a. Each microwave zone shall be tested weekly as follows:
      1) Test the microwave zone by walking in a zigzag pattern through the entire zone. Detection should occur approximately 3 to 5 seconds after entering the zone. Detection should cause the perimeter alarm system to go into alarm and switch the appropriate CCTV camera to
the alarm monitor and cause the system video recorder to record the camera viewing the zone in alarm.
a) Check to see that, upon alarm pan/tilt/zoom cameras automatically move to view the zone in alarm.
   (1) Prior to performing a test on a perimeter zone monitored by pan/tilt/zoom camera stations, so to confirm proper functioning of the camera stations, perform the following:
      (a) Pan the camera stations 90 degrees away from the zone that is to be tested.
      (b) Tilt the camera stations to an angle other than what will be called up when the zone goes into alarm.
      (c) Adjust the lens’ field of view to a setting other than what will be called up when the zone goes into alarm.

2) Where the microwave zone intersects with adjacent zone (another microwave zones or a zone of another type of detection system) check to make sure that detection occurs in: either the zone you are testing, the adjacent zone, or both zones.

3) Check the entire zone for environmental conditions that could effect the operation of the zone. Specifically check for:
   a) Debris.
   b) Weeds.
   c) Snow (greater than 6 inches in depth).
   d) Erosion.

4) Record test of the zone on the appropriate Department forms, noting failures or any conditions that could effect operation of the zone.

C. System Maintenance Training: Training shall be set-up so that at the end of training, facility maintenance personnel shall have a complete understanding of:
   1. Routine (monthly, quarterly or annual) maintenance required to the system and how to perform that maintenance.
      a. Training should include precautionary concerns that personnel should be aware of that could effect proper operation of the system.
   2. Knowledge of all components in the system and adjustments to the components that they would be required to perform to maintain operation of the system.
   3. How to replace all items listed as spare parts for the system.
      a. Training should include precautionary concerns that personnel should be aware of that could effect proper operation of the system.
4. Annual testing procedures for the system required to be performed by the Department.
   a. Each microwave zone shall be tested annually as follows:
      1) Perform the weekly Test.
      2) Attach the microwave test unit to the microwave receiver unit.
      3) Remove covers from both the microwave transmitter and receiver unit.
         a) Verify that tamper alarms are reported at the perimeter alarm system's zone monitor upon removal of covers.
         b) Check that the channel selected at both units is the same.
         c) Check the sensitivity setting at the receiver is set between 40 to 50 percent of maximum.
      4) Verify alignment of the transmitter and receiver unit to the reflector with the microwave test unit.
         a) Adjust alignment of the transmitter and receiver units for optimum alignment if signal strength is not sufficient.
      5) Walk test the middle of the zone to determine the zone width.
         a) At the middle of the zone, stand approximately 12 to 15 feet (perpendicular) from the centerline of the beam, slowly walk toward the beam using 6 inch steps until the microwave test unit alarms. Stop walking this is the edge of the beam on that side of the zone.
         b) Cross the zone and again start outside the zone approximately 12 to 15 feet perpendicular from the centerline of the beam, slowly walk toward the beam using 6 inch steps until the microwave test unit alarms. Stop walking this is the edge of the beam on that side of the zone.
         c) The distance between the 2 alarmed points is the maximum width of the zone, which is greatest at the middle of the zone.
         d) Ensure that the zone does not detect the edge of the security (razor) coils. Adjust the sensitivity (to increase/decrease) the maximum width so it detects approximately 1 to 2 feet from the security coil.
      6) Crawl test with a slow belly crawl the ends of the zone adjacent to the microwave transmitter and receiver units and adjacent to the reflector.
         a) This test should be done inside the vehicle compound.
            (1) Where the microwave zone shoots
through a fence, the crawl test should be made at the base of both sides of the fence. Detection should occur on both sides of the fence.

b) Verify with the attendant at the perimeter alarm system's zone monitor that the alarm was received.
   (1) During the crawl test, monitor the microwave test unit to verify for proper sensitivity setting of the zone.
   (2) Adjust sensitivity setting of the zone, if signal strength is not sufficient. Adjustment to the height of the microwave heads may be required to detect a crawling target.

c) Repeat this test the test at the other end of the zone.

d) A Human shaped test dummy of approximately 5 to 6 feet in height may be used in lieu of an actual person performing the belly crawl test. Drag the dummy across the zone by rope.
   (1) Do not use an aluminum ball for the crawl test. The sensitivity setting to pick up the ball would make the sensitivity for the zone to high, and cause excessive nuisance alarms in the zone.

e) Use extra care to ensure sufficient detection in corner zones. Microwave unit at corner zones may be required to be located closer to the ground to ensure sufficient overlap with adjacent zones.

7) Record test of the zone on the appropriate Department forms, noting failures or any conditions that could effect operation of the zone.

3.03 FIELD QUALITY CONTROL

A. Preliminary System Test:
   1. Prerequisite: The CCTV Control System in Building No.1 must be operational and inter-connected with the Perimeter Alarm System and Perimeter Camera Stations prior to performing the Preliminary System Test.
   2. Preparation: Have the Integrator’s Field Advisor inspect and adjust the completed system and then operate it long enough to assure that it is performing properly.
      a. Contractor shall provide personnel to assist in the performance of the system tests and shall provide personnel and materials required to make adjustments as directed by the Integrator’s Field Advisor to prepare the system for the system acceptance tests.
   3. Run a preliminary test for the purpose of:
a. Determining whether the system is in suitable condition to conduct the acceptance test.

b. Checking and adjusting equipment.
   1) Check alignment between transmitter and receiver.
   2) Check that the sensitivity setting for each zone is set within 40 to 50 percent of maximum.
   3) Check that tamper switches within microwave transmitter and receiver unit operate and are monitored and annunciated at the perimeter alarm system's zone monitor.

c. Training facility personnel.

B. System Acceptance Test:
   1. Preparation: Submit the report of preliminary test to the Director's Representative certifying that the system is ready for the System Acceptance Test. The Director's Representative will schedule the test within the next 3 working days and make arrangements to have a Facility Representative witness the System Acceptance Test.
   2. The System Acceptance Test shall be witnessed by the Director's Representative and a Facility Representative and shall be performed under the direction of the Integrator's Field Advisor with the assistance of the Contractor's personnel.
   3. The System Acceptance Test shall include the following tests as an integral test required for Perimeter Alarm System (Section 281605):
      a. Perform simulated escape attempts listed below at 10 foot intervals within each zone unless otherwise directed (Director's Representative shall select exact location and type of escape attempt or combination of attempts). Each escape attempt shall produce an alarm. If it does not, wait 30 seconds and repeat at the same location. If misses are repeated in the same location, the entire zone must be corrected and retested. The simulated escape attempts shall be performed by a person weighing 120 lbs or less. Provide safety equipment and take proper precautions when performing tests. Terminate each attempt upon detection.
         1) Walk Test: Walk slowly across detection zone perpendicular to the beam.
         2) Run Test: Run quickly across detection zone perpendicular to the beam.
         3) Belly Crawl: Crawl on stomach across detection zone parallel to beam (2 inches per second). This test shall be conducted immediately adjacent to the transmitter and receiver units, microwave reflector and at other locations where directed.
            a) A Human shaped test dummy of approximately 5 to 6 feet in height may be used in lieu of an actual person performing the belly crawl test. Drag the dummy across the zone by rope.
      b. Test each function summarized in SYSTEM DESCRIPTION.
   3. Map out extent of microwave signal within each zone.
   4. Supply all equipment necessary for system adjustment and testing.
   5. Submit written report of test results signed by Company Field Advisor and
Director's Representative. Mount a copy of the final report in a plexiglass enclosed frame assembly adjacent to the security equipment racks. Include the following on the test form:

a. Sensitivity setting of each receiver (sensitivity setting should be 40 percent of maximum or less and in no case shall be greater than 50 percent of maximum).

b. Height of each receiver and transmitter.

c. Length of each zone.

d. Weather conditions during test.

C. System Testing and Adjusting During Guarantee Period:

1. After satisfactory completion of acceptance test, Facility personnel will investigate and record all system alarms. If the system does not meet the following criteria it shall be considered defective under the terms of paragraph 9.8 of the General Conditions:

a. False alarms that are internally generated within the system shall not exceed 1 per 100 hrs.

b. False alarms caused by the following weather conditions shall not exceed 1 per 48 hours:

1) Wind up to 30 mph.

2) Rain up to 3 inches per hour.

3) Snow up to 5 inches per hour.

2. Within one week of notification that any zone does not meet the above criteria, make arrangements to correct the zone and retest in accordance with 3.03 B. 3. a & b.

END OF SECTION
SECTION 281605
PERIMETER ALARM SYSTEM

PART 1 GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE

A. Microwave Detection System: Section 281604.

B. Video Surveillance System: Section 282304.

C. Division 26: Associated Electrical materials.

1.02 AWARD REQUIREMENTS REGARDING THIS SYSTEM

A. As a condition of award the contractor will be required to provide proof that the contractor or the contractor’s designated sub-contractors are capable of meeting the contract requirements for this system. This proof shall include the following:

1. Proof that the companies (or persons) performing the work required for this system are experienced in the installation of this system or are experienced in the installation systems of similar operation and construction to the specified system and equipment.

2. Proof that the contractor and the contractor’s designated sub-contractors have resources (personnel, equipment, etc.) available to complete the contract requirements within the construction duration required by this contract.

3. Proof that the companies (or persons) performing the work required for this system are licensed in New York State to install security systems.

B. The Director may determine that a pre-award meeting will be held for this contract. At the meeting the contractor will be required to provide additional details to prove that the contractor or the contractor’s designated sub-contractors are capable of meeting the contract requirements for this system.

1.03 DEFINITIONS

A. Manufacturers’ Technical Advisor:

1. An employee of the company producing the system (or a company which lists and markets the primary components of the system under their name) who is certified in writing by the company to be technically qualified in design, installation, and servicing of the required products. Personnel involved solely in sales do not qualify.

B. Integrator’s Field Advisor:

1. An individual employed by an organization (other than the company producing the system), certified in writing by the company producing the
system, that the individual is technically qualified in design, installation and servicing of the required products and is capable to act as a field advisor in their behalf. Personnel involved solely in sales do not qualify.

1.04 SYSTEM DESCRIPTION

A. The perimeter alarm system operates as an automatic detection and alarm system to alert facility personnel of any change in status of all monitored perimeter alarm system zones.

B. The perimeter is divided into 9 sensor cable zones, and one microwave detection system zone.

C. The main components of the perimeter alarm system consist of the following:
   1. Zone monitor (multiplex control center).
   2. Armored Sensor Cables and Dual Zone Signal Processors.
   3. Dual Zone Signal Processors.
   4. Stand Alone Transponder.
   5. Universal Device Interface.

D. The Zone Monitor shall be located in the Control Room of Building No. 1 and shall perform the following:
   1. Indicates alarm, tamper, access or secure conditions for every zone in the system thru the use of various colored lamps on the zone monitor.
      a. The Zone Monitor shall also be connected to a Video Graphic Display, which will provide a graphic representation of the status of the perimeter security zones. The Video Graphic Display is being provided under separate contract and shall be interconnected to the Zone Monitor by the Integrator’s Field Advisor.
   2. Sounds an audible alarm for all alarm, tamper, and trouble conditions within the system.
   3. Provides audio monitoring for every sensor cable zone in the system, allowing facility personnel to distinguish various sounds of attempted breaching, tampering, or trouble conditions.
   4. Thru the Universal Device Interface, automatically initiates switching of the perimeter surveillance CCTV systems’ camera stations, covering any zone in alarm, to the designated monitors in the Control Room in Building No. 1.
   5. Change in the system’s status, indicating the date, time, system, and/or zone condition, zone number, and operator number are electronically stored to CCTV network system manager computer and can printed out by the System Alarm Printer when needed.
   6. The keypad on the zone monitor allows facility personnel to:
      a.Acknowledge changes in the system’s status (alarm, tamper and trouble conditions).
      b. Place any zone in the access mode.
      c. Program system functions.
      d. Perform a self-test of the complete system or individual zones.
E. Each sensor cable detection zone shall operate as an automatic, supervised, detection and alarm system, integrated with the Zone Monitor to alert security personnel of an attempted breach of the perimeter security fence. Each sensor cable zone's operation is summarized as follows:

1. Sensor cables located on the perimeter fences and dual zone processors (located in fence accessory stations) detect attempts to climb over or cut through the fence.
2. The cover of the dual zone processor is monitored by a tamper switch which is connected to the tamper circuit of one of the sensor cable zone's tamper circuit and connected in series with the FAS enclosures normally opened temper switch.
3. Transponders built into each Dual Zone Signal Processor transmit alarm conditions to the Zone Monitor.
4. Each zone’s status is continuously monitored by the perimeter alarm system.
5. Self-test features in the dual zone processors allow attendants at the Zone Monitor to conduct tests of sensor cable zones.

F. The microwave detection zone shall operate as an automatic, supervised, detection and alarm system, integrated with the Zone Monitor via a Stand Alone Transponder to alert security personnel of an attempted breach of the vehicle compound. The Stand Alone Transponder monitors and controls the microwave detection system zone as follows:

1. The microwave detection system's transmitter and receiver units (located adjacent to the vehicle compound) detect attempts to breach the vehicle compound (Section 281604).
2. The microwave detection system's transmitter and receiver units are connected to a Stand Alone Transponder which monitors the status of the microwave zones alarm and tamper contacts and transmits the status of the microwave zone to the Zone Monitor.
3. The microwave zone’s status is continuously monitored by the perimeter alarm system.
   a. All wiring between the microwave transmitter and receiver units and the Stand Alone Transponder are completely supervised.
4. Self-test features in the Zone Monitor allow attendants at the Zone Monitor to conduct tests of the microwave detection system zone.
   a. Operation of the zone test feature at the Zone Monitor will activate a relay output of the Stand Alone Transponder (which monitors the microwave zone) which will initiate a zone test of the microwave zone.

G. Stand Alone Transponders monitor tamper switches of fence accessory stations (FAS’s) to alert the system attendant of an opening of a FAS enclosure.

1. Tamper switches in the fence accessory stations are connected to the Stand Alone Transponders via TMP cables
2. Up to 3 adjacent fence accessory stations can be connected to the same tamper point of a Stand Alone Transponder as indicated on the schedule on the drawings.
3. All wiring between tamper switches of the fence accessory stations and the Stand Alone Transponders are completely supervised.

H. All wiring between Dual Zone Signal Processors, Stand Alone Transponders and the Zone Monitor is completely supervised.

1.05 SUBMITTALS

A. Waiver of Submittals: The "Waiver of Certain Submittal Requirements" in Section 013300 does not apply to this Section.

B. Submittal Requirements: Submittals required by this section are to be submitted (by contractor) in Submittal Packages as follows:

1. Submittals Package 1: Product Data and Quality Control Submittals specified below at the same time as a package.
   a. Submit Submittals Package 1 within 30 days of contract award.

2. Submittals Package 2: Submit Contract Closeout Submittals specified below at the same time as a package.
   a. Submit Submittals Package 2 upon physical completion, when directed by the Director’s Representative.

3. It is the Contractor's responsibility to review and verify that all information required for each submittal package is included in the submittal package. Errors or omissions found by the Contractor are to be corrected prior to the Submittals Package submission for approval. Incomplete Submittal Packages submitted for review and approval will be returned.
   a. It is the Contractor's responsibility to verify that portions of the submittal packages provided by a Sub-Contractor are complete as well as portions of the submittal packages being provided directly by the Contractor.

C. Product Data (Submittals Package 1):

1. Submit catalog sheets, specifications, and installation instructions for each item being proposed.
   a. At the top of each catalog sheet, specification or installation instruction that is being submitted indicate the Specification Section, Article, Paragraph and Subparagraph of the item is being submitted.

2. Bill of Materials: Provide a Bill of Materials identifying each system device or component proposed to be used for this system as listed in PRODUCTS of this section.
   a. The Bill of Materials shall provide the following information:
      1) Identify each item by name and model number.
      2) Indicate the page number(s) in the Submittal Package where information required for that item can be found.
      3) Identify the appropriate specification section, Article number, paragraph and subparagraph where that item is listed in the project manual.

3. Name, address and telephone number of nearest fully equipped service organization.
D. Quality Control Submittals (Submittals Package 1):

1. Work Schedule:
   a. Submit a work schedule of how the installation of the system shall be performed. Schedule shall include:
      1) A brief description of the work to be performed at each phase.
      2) Estimated time durations required to perform each phase of the work.
      3) Date that Pre-installation Training Meeting will be held.
         a) Pre-installation Training Meeting should not be held more than 2 weeks prior start of the installation of any system component listed PART 2 PRODUCTS for this system unless an earlier time is agreed upon by the Director’s Representative.
      4) Delivery dates that materials being provided under this contract will be required to be at the contract site.
      5) Delivery dates that materials will be required to be at the contract site.
      6) Dates that services will be required to be performed.
   b. Certification from the contractor stating that the contractor has verified with the manufacturers (and/or distributors) of the materials the Contractor proposes for this contract, that the manufacturers (and/or distributors) of the materials guarantees delivery of the materials no later than the date indicated in the Contractor’s work schedule.

2. Installers' Qualifications Data Forms: Include a completed INSTALLER’S QUALIFICATION DATA FORM for each person who will be performing the Work and their immediate supervisor.
   a. Forms must be completely filled out.
   b. Forms must include all information required, showing that the experience criteria have been met.
   c. Each Form must be signed by the installer.

3. Integrator’s Field Advisor Data, Include:
   a. Name, business address and telephone number of Integrator’s Field Advisor(s) secured for the required services.
   b. Certified statement (letter) from the Companies producing the system listing the qualifications of the Integrator’s Field Advisor. The certification statements from the Companies shall include the following:
      1) Information stating that the Integrator’s Field Advisor is experienced in the engineering, design and installation of the Equipment being used for this project.
      2) Each product for which the Company gives authorization for the Integrator’s Field Advisor to oversee installation of and each service the Integrator’s Field Advisor can perform in their behalf, listed specifically for this project.
   c. Listing of similar projects that the Integrator’s Field Advisor has worked on in the past 3 years.
d. Listing of training that the Integrator’s Field Advisor has received on the equipment being proposed for this project.

e. Confirmation of New York State Security/Fire Alarm Installers Licensure: Integrator’s Field Advisor must be covered by a New York State Security/Fire Alarm Installers license.

4. Manufacturer’s Technical Advisor Data: Include:
   a. Name, business address and telephone number of Manufacturer’s Technical Advisor secured for the required services.
   b. Certified statement from the Company listing the qualifications of the Manufacturer’s Technical Advisor.
   c. Services and each product for which authorization is given by the Company, listed specifically for this project.

E. Contract Closeout Submittals (Submittals Package 2):
   2. Certificate: Affidavit, signed by the Manufacturers’ Technical Advisor and Integrator’s Field Advisor and notarized, certifying that the system meets the contract requirements and is operating properly.
   3. Operation and Maintenance Data:
      a. Deliver 2 copies, covering the installed products, to the Director's Representative. Include:
         1) Operation and maintenance data for each product.
         2) Complete Point to Point Wiring Diagrams (As-Built Drawings) of entire system as installed. Identify all conductors and show all terminations and splices (identification shall correspond to markers installed on each conductor).
         3) Name, address, and telephone number of nearest fully equipped service organization.

1.06 QUALITY ASSURANCE

A. Installers' Qualifications: The persons installing the Work of this Section and their supervisor shall be personally experienced in security systems and shall have been engaged in the installation of security systems for a minimum of 3 years.
   1. Qualifying experience must be in the installation of security systems similar in operation and construction of the system being specified by this section.
   2. Furnish to the Director completed INSTALLER'S QUALIFICATION DATA FORM for each person who will be performing the Work and their immediate supervisor. Each form shall include:
      a. Installer's name.
      b. Employer's Name and Address.
      c. Qualifying Experience: Project information of 5 similar projects, which the installer, had worked on during the past 3 years. Information shall include for each project:
         1) Name and Address of project.
         2) Dates installer worked on project.
3) Name and telephone number of installer's supervisor for the project.
4) Types of security installation work installer performed on project.

B. Integrator’s Field Advisor: The Integrator’s Field Advisor will be responsible to perform the following:
   1. Provide the information required for the Submittals Packages in regards to the materials listed in this specification section.
      a. The Integrator’s Field Advisor shall compile one complete set of submittal information to the Contractor for copying by the Contractor and inclusion in the Contractor’s six copies of the submittal package.
   2. Assist the Manufacturers’ Technical Advisor in conducting the pre-installation training meeting at the contract site.
      a. Provide all materials necessary for training (samples of all equipment being installed, training aides, handouts, overhead projector, etc.).
   3. Render advice and technical support regarding installation and integration with other systems.
      a. Render advice and technical support regarding interconnections between this system, the microwave detection system (Section 281604).
      b. Render advice and technical support regarding interconnections between this system, the CCTV system (Section 282304).
   4. Assist the Contractor in coordination of the installation of this system as it relates to the installation other systems being provided under this contract and related contracts.
   5. Provide technical advice and inspection of the installation at the contract site at all times during the installation of the system equipment and for the following:
      a. Provide daily inspection the installation of the system.
      b. Render advice and guidance regarding installation of the system.
      c. Render advice and guidance on final adjustments of the system.
      d. Render advice regarding installation of the system as it relates with the work with the other systems.
      e. In Building No. 1, mount and perform terminations to the Zone Monitor and perform interconnections between the Zone Monitor and Universal Device interface unit of the CCTV control system and require programming of the Zone monitor and CCTV control system.
      f. Assist the Manufacturers’ Technical Advisor in the performance of the preliminary tests of the system.
      g. Perform the final systems test and certify with an affidavit that the system is installed in accordance with the contract documents and is operating properly.

C. Manufacturers’ Technical Advisor: The Manufacturers’ Technical Advisor will be responsible to perform the following:
1. Conduct a pre-installation training meeting at the contract site with the installers (and their supervisor) who will be performing the work, the Director's Representatives and facility supervisory and maintenance personnel. The meeting shall be a minimum of 8 hours in duration (held in four 2 hour increments). The topics covered shall include, but shall not be limited to the following:
   a. Manufacturers’ Technical Advisor shall present an overview of the system as it is to be installed.
   b. Manufacturers’ Technical Advisor shall lead a discussion of installation concerns and coordination issues on this system and related systems and related work being installed under this project.
   c. Manufacturers’ Technical Advisor shall provide training on procedures for installing system components and precautionary measures installers should be aware of while performing the work.
      1) Manufacturers’ Technical Advisor shall review wiring requirements for each component of the system with the installers and Integrator’s Field Advisor.
      2) Manufacturers’ Technical Advisor shall provide training on termination, bonding and grounding procedures required for proper installation of the system wiring.

2. Render advice and technical support regarding installation and integration with other systems.
   a. Render advice and technical support regarding interconnections between this system, the microwave detection system (Section 281604).
   b. Render advice and technical support regarding interconnections between this system, the CCTV system (Section 282304).

3. Provide services at the contract site for a minimum of 24 hours for the following:
   a. Inspect the installation of the system equipment and perform preliminary tests of the system.
   b. Perform final systems test and certify with an affidavit that the system is installed in accordance with the contract documents and is operating properly.
   c. Train facility security personnel, security supervisory personnel and maintenance personnel in operation and routine (weekly and annual) testing of the system (minimum of four 2-hour sessions).

1.07 MAINTENANCE

A. Service Availability: A fully equipped service organization capable of guaranteeing response time within 4 hours to service calls shall be available 24 hours a day, 7 days a week to service the completed system.

B. Spare Parts: are to be furnished at contract close-out to be stored at the contract site.
   1. One Stand Alone Transponder (SAFT-R).
   2. One Dual Zone Processor (FPS-5).
3. One 100 meter reel of Armored Sensor Cable (100MHS).
4. Two Termination/Splice kits (EOL CONDULET).
5. Two Splice Kits (TSK)
6. Four surge protectors (DTK-2MLP-12)
7. Two surge protectors (DTK-2MLP-24)
8. Two Hundred stainless steel cable ties for securing Armored Sensor Cable to fence fabric.

PART 2 PRODUCTS

2.01 ZONE MONITOR

A. Senstar (formerly Perimeter Products Inc.) Model No. MXF-7560 multiplex control center, having:
   1. 60 zone configuration (minimum).
   3. Alarm record keeping chip, Model No. ARKS.
   4. External power supply with battery back-up, and ampere-hour capacity to operate the Zone Monitor for a minimum of 8 hours.
   5. Mounting hardware required to mount the Zone Monitor in the console in the Control Room.
   6. All components necessary to perform the functions summarized under SYSTEM DESCRIPTION.

2.02 STAND ALONE TRANSPONDERS

A. Senstar (formerly Perimeter Products Inc.) Model No. SAFT-R Stand-Alone Transponder with relay outputs.

2.03 DUAL ZONE PROCESSORS

A. Dual Zone (Signal) Processor: Senstar (formerly Perimeter Products Inc.) Model No. FPS-5:
   1. Monitors a maximum of 2 zones per dual zone processor.
   2. Internal transponder.
   3. Weatherproof enclosure.
   4. EDAPT included

2.04 FIELD TEST UNIT

A. Sensor Cable Test Unit: Senstars (formerly Perimeter Products Inc.) Model No. MONITOR IV test unit for use with their sensor cable FPS-2-2M systems.

2.05 ARMORED SENSOR CABLE

A. Sensor Cable: Senstars (formerly Perimeter Products Inc.) Model No. 100MHS, (HELISENSOR) Armored sensor cable.
   1. Furnished in 100 meter or 200m lengths.
2.06 SPLICE/TERMINATION KITS

A. Senstars (formerly Perimeter Products Inc.) Model No. EOL -CONDULET, Termination/Splice kit for use with their HELISENSOR Armored Sensor Cable.
   1. Used for connecting two armored sensor cables together when required for longer detection zones and used to house the End-Of-Line resister at the end of the detection zone.

B. Senstars (formerly Perimeter Products Inc.) Model No. TSK splice kit for use in the splice box for splicing non-sensitive cable to armored sensor cable.

2.07 INTERCONNECTION CABLE

A. Non-sensitive coaxial cable: Senstars (formerly Perimeter Products Inc.) MNS series coaxial cable.

2.08 SURGE SUPPRESSORS

A. Equip system with surge protectors to protect equipment from voltage transients and lightning surges.
   1. Surge Protection Units for Data and Audio conductors: Ditek Corp.’s DTK-2MHLP-12 Surge Protection Units with Ditek Corp.’s MB10 mounting base.
   2. Surge Protection Units for DC power conductors: Ditek Corp.’s DTK-2MHLP-24 Surge Protection Units with Ditek Corp.’s MB10 mounting base.

2.09 SPLICE BOX

A. Splice Box: Hoffman’s CHNFSS series enclosure, for splicing non-sensitive cable to armored sensor cable. 6” x 6” x 4” (minimum size) NEMA 4X stainless steel enclosure. Secure to fence post with hot dipped galvanized or stainless steel fasteners (U-bolts, nuts, etc.).

2.10 STAINLESS STEEL CABLE TIES

A. Cable Ties: for securing the Armored Sensor Cable to the perimeter fence:
   1. Stainless Steel Cable Ties: As manufactured by Panduit, having:
      a. Width: 0.18 inches (3/16”).
      b. Length of cable ties as required for securely fastening sensor cable to chain link fence fabric at 12 intervals.

2.11 MARKERS

A. Markers:
   1. Premarked self-adhesive; W.H. Brady Co.’s B940, Thomas and Betts Co.’s E-Z code WSL self-laminating, Ideal Industries’ Mylar/Cloth wire markers, or Markwick Corp.’s permanent wire markers.
2. Flexible sleeve markers; Plastic Extruded Parts Inc.’s FS series.
3. Snap-on markers; Plastic Extruded Parts Inc.’s RS series.
4. Thermal transfer (non-smearing), Brady’s ID PAL hand held labeling tool, portable thermal transfer printer or equal.

2.12 ACCESSORIES

A. Provide all additional materials (conduits, enclosures, fasteners, etc) as required for installing the system equipment as indicated on the drawings.

2.13 ACCEPTABLE MANUFACTURERS:

A. Manufacturer’s names, catalog numbers, and trade names are used to establish a level of quality and the operational characteristics for the products and systems specified. Specified materials, products, and services shall be provided unless otherwise approved by change to the bidding or contract documents. Materials, products, and services of manufacturers listed as “acceptable” may only be substituted for approval provided they meet or exceed the specified requirements and meet or exceed the level of quality and service established by the “specified” manufacturer. Listing of a manufacturer as specified or acceptable does not relieve the manufacturer of the responsibility to comply with the complete specification.

B. Equivalent products of other manufacturers will be considered based on product data, manuals, demonstration software, and other technical information as necessary to show compliance with the specification. Information must be submitted at least fourteen (14) days prior to bid due date and be approved by addendum. Product substitution will not be accepted during the submittal process.

C. Contact Mark Clemons at Senstar for product information based on products listed in this specification: (703) 463-3084.

PART 3 EXECUTION

3.01 INSTALLATION

A. Pre-installation Training Meeting.
   1. Make arrangements through the Director’s Representative and the Integrator’s Field Advisor to have the Manufacturer’s Technical Advisor conduct the Pre-installation Training Meeting for this system.
      a. Provide a minimum of one week notice to the Director’s Representative, so that a Pre-Installation Training Meeting schedule can be set up with facility personnel and arrangements can be made for a location to hold the meeting.
      b. The Integrator’s Field Advisor shall provide all materials necessary for training (samples of all equipment being installed, training aides, handouts, overhead projector, etc.).
c. Training shall be schedule so to avoid conflict with any other training required by this contract.

d. Contractor shall have all installers (and their immediate supervisor) who will be performing the work attend this training.

1) Only persons who have attended this training meeting will be allowed to install or work with any of the products specified in PART 2 in this specification section.

B. Install the Work in accordance with the Company’s printed instructions. Interconnect with microwave detection system (Section 281604) and the Video Surveillance System (Section 282304) for a completely integrated system.

1. No mounting, terminations and/or connections of devices specified in this section are to be made until the Pre-installation Training Meeting has been performed.

2. No component of this system may be energized (powered up) until after the Integrator’s Field Advisor has inspected the component’s installation and approves it being energized.

C. Install sensor cable on fence as shown on drawings with stainless steel cable ties.

1. Sensor cable is to be fastened to fence fabric every 12 inches (maximum) on center.

2. Sensor cable shall be ran below mid rail and return back to the beginning of the zone on the upper mid-rail.

D. Surge Protection:

1. Install surge protection on each conductor entering and leaving fence accessory stations and running to adjacent fence accessory stations.

E. Make all cable connections, terminations and splices in fence accessory stations or security equipment racks.

1. Terminations and splices of the sensor cable (where indicated and required on the drawings) can be made on the fence utilizing the methods indicated on the drawing.

2. Use markers to identify conductors at terminal strips, fence accessory stations, and pull boxes (designations shall correspond with point to point wiring diagrams).

a. Markers for individual conductors of a multi-conductor cable is not required, if the following requirements are met:

   1) Each individual conductor in the cable is color coded differently from other conductors in the cable.

   2) The multi-conductor cable has a marker identifying it.

   3) The color coding of each conductor is identified on the point to point wiring diagram.

F. Upon completion of the installation of each sensor cable detection zone have the Integrator’s Field Advisor inspect the zone and then operate, adjust and test the zone utilizing the Field Test Unit to confirm that the zone is installed and operating properly.
G. In Building No. 1 all work regarding this system and related systems shall be performed in the presence and direct guidance of the Integrator’s Field Advisor.

1. The installation of all conduit and wire between the security equipment racks in the basement and the console in the Key Control Room on the first floor shall be performed under the direct guidance of the Integrator’s Field Advisor.

2. The mounting of the Zone Monitor in the console in the Key Control Room shall be performed by the Integrator’s Field Advisor with the assistance of the Contractor’s personnel.
   a. All termination (connections) to the Zone Monitor shall be performed by the Integrator’s Field Advisor.

3. The Integrator’s Field Advisor shall also perform all interconnections (connections, terminations, etc.) and programming required between Perimeter Alarm System and related systems so that this system will operate with the associated systems as described in the SYSTEM DESCRIPTION in this specification section.
   a. The Integrator’s Field Advisor shall perform all interconnections required between the zone monitor of this system and the universal device interface of the CCTV control system.
   b. The Integrator’s Field Advisor shall perform all interconnections and programming required between this system and the Video Graphic Display.

3.02 SYSTEM TRAINING

A. After the system is substantially complete and operational, provide on-site training of facility security, security supervisory, and maintenance personnel.

1. Provide a minimum of 1 week notice to the Director’s Representative, so that a training schedule can be set up with facility personnel and arrangements can be made for a location to hold the training.

2. Provide all materials necessary for training (training aides, handouts, overhead projector, etc.).

B. System Operation Training: Training shall be set-up so that at the end of training, facility (security, security supervisory, and maintenance) personnel shall have a complete understanding of:

1. How the system operates.
   a. Training should include precautionary concerns that personnel should be aware of that could effect proper operation of the system.

2. Knowledge of all components in the system and their function.

3. How the system is interconnected with other security systems and how the system operates in conjunction with the other systems.

4. Weekly testing procedures for the system required to be performed by the Department.

   a. It is required that each perimeter zone be tested weekly as follows:
      1) Perform the detections system’s weekly test as described below:
         a) Check to see that the activation of the detection system in that zone causes the following...
responses by the perimeter alarm system's zone monitor:
(1) An audible alarm is sounded by the zone monitor.
(2) The status of the display lights for that zone changes to red upon alarm and returns to green when the alarm is cleared.
(3) The appropriate visual indication is displayed (i.e. point number in alarm, alarm status, etc.) on the zone monitor’s LCD and on the Video Graphic Display.
(4) The system printer prints-out all actions by the perimeter alarm system during the test of the zone.
(5) Camera stations associated with the alarm points are automatically switched to the alarm monitor of the CCTV system and switched to the CCTV system’s Video Recorder. The Video Recorder should automatically start recording upon alarm.

(a) Prior to performing a test on a perimeter zone monitored by pan/tilt/zoom camera station, so to confirm proper functioning of the camera station, perform the following:
  (i) Pan the camera station 90 degrees away from the zone that is to be tested.
  (ii) Tilt the camera station to an angle other than what will be called up when the zone goes into alarm.
  (iii) Adjust the lens’ field of view to a setting other than what will be called up when the zone goes into alarm.

b. It is required that each sensor cable zone be tested weekly as follows:
1) Visually inspect the sensor cable zone by walking entire zone.
   a) Check to see that the sensor cable is securely fastened to the fence (or security coil) at approximately 12 inch intervals.
b) Look for loose items on the fence (such as loose signage, loose bracing, fence fabric, etc.) which could rattle in the wind causing nuisance alarms.

2) Climb Test: Perform a simulated climb test on the zone.
   a) Caution should be exercised due to the presence of security (razor) coil.
   b) Perform the following simulated climb test:
      1) Fence mounted sensor cable zones:
         Grasp the fence fabric with both hands (at approximately 5 feet high on the fence), shake the fence while lightly kicking the lower portion of the fence fabric. Kick the fence 4 times; this will simulate a climb of the fence. Detection should occur approximately 3 to 5 seconds after the last kick on the fence.

3) Cut Test: At the end of the zone (within 10 feet of the termination point of the zone), perform a simulated cut test on the zone.
   a) With a metal object (such as a screwdriver) strike the fence fabric (or security coil) 4 times, strike within 1 to 2 feet of the sensor cable (do not strike the sensor cable itself). Detection should occur approximately 3 to 5 seconds after the last strike on the fence (or coil).

4) Record test of the zone on the appropriate Department test forms, noting failures or any conditions that could effect operation of the zone.

c. It is required that each microwave detection system zone be tested weekly as described in Section 281604.

C. System Maintenance Training: Training shall be set-up so that at the end of training, facility maintenance personnel shall have a complete understanding of:
   1. Routine (monthly, quarterly or annual) maintenance required to the system and how to perform that maintenance.
      a. Training should include precautionary concerns that personnel should be aware of that could effect proper operation of the system.
   2. Knowledge of all components in the system and adjustments to the components that they would be required to perform to maintain operation of the system.
   3. How to replace all items listed as spare parts for the system.
      a. Training should include precautionary concerns that personnel should be aware of that could effect proper operation of the system working on the system.
   4. Annual testing procedures for the system required to be performed by the Department.
      a. The perimeter security alarm system shall be tested annually as follows:
         1) Test each point monitored by the perimeter alarm system.
a) Test each zone for alarm and tamper/trouble. Check to see that the activation of the detection system in that zone causes the following responses by the perimeter alarm system:

1) An audible alarm is sounded by the zone monitor.

2) The status of the display lights for that zone changes to red upon alarm and returns to green when the alarm is cleared.

3) The appropriate visual indication is displayed (i.e. point number in alarm, alarm status, etc.) on the zone monitor's LCD and on the Video Graphic Display.

4) The system printer prints-out all actions by the perimeter alarm system during the test of the zone.

5) Camera stations associated with the alarm points are automatically switched to the alarm monitors of the CCTV system. The Video Recording Equipment should automatically start recording in “real time” mode upon alarm.

(a) Prior to performing a test on a perimeter zone monitored by pan/tilt/zoom camera station, so to confirm proper functioning of the camera station, perform the following:

(i) Pan the camera station 90 degrees away from the zone that is to be tested.

(ii) Tilt the camera station to an angle other than what will be called up when the zone goes into alarm.

(iii) Adjust the lens’ field of view to a setting other than what will be called up when the zone goes into alarm.

2) Test each point controlled by the perimeter alarm system.

a) Test the self-test function for each perimeter zone. Check to make sure that all actions listed in 3.02, C, 4, a, 1, a), (1) through (5) above occur.

3) Test all lights on the zone monitor.

4) Load test batteries for the system and detection systems.

a) Disconnect all AC power feeds and operate systems for 30 minutes from batteries.
b) Monitor voltages of batteries from start to finish of 30 minute load test.
   (1) At the end of the tests, voltage should be above 12 VDC for 12 volt systems and above 24 VDC for 24 volt systems.
   (2) Replace batteries every 4 years regardless of load test results.

5) Check system’s time/date setting.
6) Check system printer’s operation.

b. Each sensor cable zone be tested annually as follows:
1) Visually inspect the sensor cable zone by walking entire zone.
   a) Check to see that the sensor cable is securely fastened to the fence at approximately 12 inch intervals. Replace cable ties as required.
   b) Look for loose items on the fence (such as loose signage, loose bracing, fence fabric, etc.) which could rattle in the wind causing nuisance alarms.

2) Open the zone processor unit.
   a) Verify that a tamper alarm is reported at the zone monitor upon opening the zone processor unit.
   b) Check that the cut and climb sensitivity setting is set for a 3 or 4 count.
      (1) Tighter fences should be set for 3, on looser the setting should be set at 4.
      (2) Setting should not be set above 4.
   c) Verify sensor cable supervision by disconnecting the sensor cable.

3) Climb Test: Perform a climb test on the zone. Test the zone at the beginning, middle and end (minimum number of locations required).
   a) Caution should be exercised due to the presence of security (razor) coil mounted on the fence.
   b) Test for climb sensitivity by climbing or shaking the fence. Detection should occur without excessive shaking.
   c) Detection should cause the perimeter alarm system to go into alarm and switch the appropriate CCTV camera to the alarm monitor and cause the system Video Recording Equipment to record the camera viewing the zone in alarm.
      (1) Check to see that, upon alarm pan/tilt/zoom cameras automatically move to view the zone in alarm.
   d) Attention should be paid at corners or where main fence posts are located. These areas are usually less sensitive. Perform slow, stealthy climbs at these locations.
e) Detection along the zone should be relatively consistent. Inconsistent areas may have loose fence fabric.

4) Cut Test: Perform a simulated cut test on the zone. Test the zone at the beginning, middle and end (minimum number of locations required). Test zone as indicated below:
   a) Fence mounted sensor cable (Test bottom and top of fence as indicated below):
      (1) With a metal object (such as a screwdriver) strike the fence fabric (strike the number of times that the cut setting is set at), strike within 1 to 2 feet of the bottom of the fence (do not strike the sensor cable itself). Detection should occur approximately 3 to 5 seconds after the last strike on the fence.
      (2) With a metal object strike the fence fabric (strike the number of times that the cut setting is set at), strike within 1 to 2 feet above the sensor cable (do not strike the sensor cable itself). Detection should occur approximately 3 to 5 seconds after the last strike on the fence.

5) Cut and climb testing can be monitored locally with the sensor cable system test unit.
   a) The test unit can be used also to check the zone’s audio signal. The audio signal should be relatively clear. Noisy audio is often an indication of wet sensor cable.

6) Record test of the zone on the appropriate Department forms, noting failures or any conditions that could effect operation of the zone.

c. It is required that each microwave detection system zone be tested annually as described in Section 13704.

3.03 FIELD QUALITY CONTROL

A. Sensor Cable Test: Perform a visual inspection of the fence mounted sensor cable to verify proper cable installation free of abrasions and breaks in the outside jacket. Also perform the following continuity/resistance tests with an ohmmeter capable of reading 1 megohm + 25 percent.
   1. Test continuity/resistance between conductors and shield of sensor cable and record readings. Normal reading shall be as recommended by the manufacturer of the sensor cable.
   2. Test continuity/resistance between shield of sensor cable and fence. Normal reading shall be infinite or maximum resistance of the meter.

B. Preliminary System Test:
1. **Prerequisite:** The CCTV Control System in Building No. 1 (being provided under separate contract) must be operational and inter-connected with the Perimeter Alarm System and Perimeter Camera Stations prior to performing the Preliminary System Test.

2. **Preparation:** Have the Manufacturers’ Technical Advisor and Integrator’s Field Advisor inspect and adjust the completed system and then operate it long enough to assure that it is performing properly.
   a. Contractor shall provide personnel to assist in the performance of the system tests and shall provide personnel and materials required to make adjustments as directed by the Manufacturers’ Technical Advisor (and/or the Integrator’s Field Advisor) to prepare the system for the system acceptance tests.

3. **Run a preliminary test for the purpose of:**
   a. Determining whether the system is in a suitable condition to conduct the acceptance test.
   b. Checking and adjusting equipment.
   c. Training facility personnel.

4. **Submit written report of preliminary test certifying that the system has been installed in accordance with the contract requirements and certifying that the system is ready for the System Acceptance Test.** Report shall be signed by the Manufacturers’ Technical Advisor, the Integrator’s Field Advisor, and the Contractor.

C. **System Acceptance Test:**

1. **Preparation:** Submit the report of preliminary test to the Director’s Representative certifying that the system is ready for the System Acceptance Test. The Director's Representative will schedule the test within the next 3 working days and make arrangements to have a Facility Representative witness the System Acceptance Test.

2. **The System Acceptance Test shall be witnessed by the Director’s Representative and a Facility Representative and shall be performed under the direction of the Integrator’s Field Advisor with the assistance of the Contractor’s personnel.**

3. **The System Acceptance Test shall include the following tests:**
   a. Test system functions step by step as summarized under SYSTEM DESCRIPTION, and as follows:
      1) Test each point monitored by the perimeter alarm system.
         a) Test each zone for alarm and tamper/trouble.
            Check to see that the activation of the detection system in that zone causes the following responses by the perimeter alarm system:
            (1) An audible alarm is sounded by the zone monitor.
            (2) The status of the display lights for that zone changes to red upon alarm and returns to green when the alarm is cleared.
            (3) The appropriate visual indication is displayed (i.e. point number in alarm,
alarm status, etc.) on the zone monitor’s LCD and on the Video Graphic Display.

(4) The system printer prints-out all actions by the perimeter alarm system during the test of the zone.

(5) Camera stations associated with the alarm points are automatically switched to the alarm monitors of the CCTV system. The Video Recording Equipment should automatically start recording in “real time” mode upon alarm.

(a) Prior to performing a test on a perimeter zone monitored by pan/tilt/zoom camera station, so to confirm proper functioning of the camera station, perform the following:

(i) Pan the camera station 90 degrees away from the zone that is to be tested.

(ii) Tilt the camera station to an angle other than what will be called up when the zone goes into alarm.

(iii) Adjust the lens’ field of view to a setting other than what will be called up when the zone goes into alarm.

b) Where multiple devices (i.e. 2 tamper switches, etc.) are connected to the same monitor point on the system, test each device separately to assure operation of all.

2) Make the following tests for each sensor cable zone:

a) Perform simulated escape attempts listed below at 10 foot intervals, unless otherwise directed (Director’s Representative shall select exact location and type of escape attempt or combination of attempts). Each penetration of the sensor system shall produce an alarm. If it does not, wait 30 seconds and repeat in the same location. If misses are repeated in the same location, the entire zone must be corrected and retested. The simulated escape attempts shall be performed by a person weighing 100 lbs or more. Provide safety equipment and take proper precautions when performing tests. Terminate
each test climb at detection or when the climb is complete, whichever comes first.

(1) Fast Climb Over: Approach and make contact with the fence and rapidly scale the fabric until the top is reached. At this point, either jump down or climb down the opposite side of the fence. Typical elapsed time for this intrusion against an 8 foot high, 3 strand barb wire topped chain link fence is 4-8 seconds.

(2) Slow/Stealthy Climb Over: Approach and make contact with the fence and slowly, deliberately, and stealthfully climb to the top of the fence, carefully negotiate the barb wire and climb down the opposite side of the fence. Typical elapsed time for this intrusion against an 8 foot high, 3 strand barb wire topped chain link fence is 10 to 20 seconds.

(3) Cut Through: At a minimum of one location in each zone, securely attach or tightly weave a 2 x 2 foot square sample of fence fabric to the lower portion of the fence. Sample fabric shall be identical to existing fence fabric. Cut sample fabric and note number of cuts and time to alarm (Do not damage fence). Typical elapsed time is 20 seconds. Remove sample fabric.

b) Perform the following tests to show that the system will not alarm from the following stimuli:

(1) A person weighting 100 to 200 lbs. walking at 3 mph within 10 feet of the protected fence.

3) Make system acceptance tests for the microwave detection system as described in Section 13704.

4) Test each point controlled by the perimeter alarm system.
   a) Test the self-test function for each perimeter zone. Check to make sure that all actions listed in 3.03, C, 3, a, 1), a), (1) through (5) above occur.

5) Test all lights on the zone monitor.

6) Load test batteries for the system and detection systems.
   a) Disconnect all AC power feeds and operate systems for 30 minutes from batteries.
   b) Monitor voltages of batteries from start to finish of 30 minute load test.
(1) At the end of the tests, voltage should be above 12 VDC for 12 volt systems and above 24 VDC for 24 volt systems.

7) Check system’s time/date setting.

8) Check system printer’s operation.

3. Supply all equipment necessary for system adjustment and testing.

4. Submit written report of test results signed by the Integrator’s Field Advisor, Contractor, Director’s Representative and the Facility’s Representative. Mount a copy of the final report in a plexiglass enclosed frame assembly adjacent to the security equipment rack.

D. System Testing and Adjusting During Guarantee Period:

1. After satisfactory completion of acceptance test, Facility personnel will investigate and record all system alarms. If the system does not meet the following criteria it shall be considered defective under the terms of paragraph 9.8 of the General Conditions:
   a. False alarms that are internally generated within the system shall not exceed 1 per 100 hrs.
   b. False alarms caused by the following weather conditions shall not exceed 1 per zone per 48 hours:
      1) Wind up to 30 mph.
      2) Rain up to 3 inches per hour.
      3) Snow up to 5 inches per hour.

2. Within one week of notification that any zone does not meet the above criteria, make arrangements to correct the zone and retest in accordance with 3.03, C.3.

END OF SECTION
SECTION 282304
VIDEO SURVEILLANCE SYSTEM

PART 1   GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE
A. Optical Fiber Cables: Section 271524
B. Electronic Door Locking and Monitoring System: Section 284601
C. Perimeter Alarm System: Section 281605
D. Cast In Place Concrete: Section 033001
E. Fence Accessory Stations for Perimeter Security systems: Section 281602

1.02 GENERAL REQUIREMENTS
A. The work to be done under this section of the Specifications shall include the furnishing of labor, material, equipment and tools required for the complete installation of the work indicated on the Drawings, as specified herein, or as noted in other sections of Division 28 – Electronic Safety and Security.
B. All materials a part of the electronic security infrastructure and necessary to its proper operation, but not specifically mentioned or shown on the Drawings, shall be furnished and installed without additional charge.
C. The Drawings and Specifications are complementary to each other and what is called for by one shall be as binding as if called for by both. If a discrepancy exists between the Drawings and Specifications, the higher level of functionality shall be included to meet the design intent.

1.03 REFERENCES
A. Underwriters Laboratories, Inc.
B. NEC

1.04 DEFINITIONS
Note: The definition below supersedes the definition in section 014216 for Technical Advisor and Field Advisor.
A. Approved: Acceptable to the Owner’s Representative and the Engineer.
B. Furnish: Supply and deliver to project site, ready for unloading, unpacking, assembly, installation, and similar operations.
C. Install: Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.

D. Integrator’s Field Advisor:
1. An individual employed by an organization (other than the company producing the system), certified in writing by the company producing the system, that the individual is technically qualified in design, installation and servicing of the required products and is capable to act as a field advisor in their behalf. Personnel involved solely in sales do not qualify.

E. Manufacturers’ Technical Advisor:
1. An employee of the company producing the system (or a company which lists and markets the primary components of the system under their name) who is certified in writing by the company to be technically qualified in design, installation, and servicing of the required products. Personnel involved solely in sales do not qualify.

F. Provide: Furnish and install, complete and ready for the intended use. Deliver to the project site all required equipment and accessories, install and interconnect all required equipment and accessories for a complete and operational CCTV system.

G. The term “Director’s Representative” means the employee or agent of the Design and Construction Group designated in writing by the Director as such. Under the general supervision of the Director, the Director’s Representative shall have complete charge of the Work and shall exercise full supervision and direction of the Work. Where the Contract Documents specifically designate a person to perform a function or duty, that person shall be the Director’s Representative but only for the performance of that function or duty. Where the work “directed” appears in the Contract Documents, the words “by the Director’s Representative” shall be deemed inserted thereafter in each case except where it is obviously inappropriate in context.

1.05 DESCRIPTION OF EXISTING SYSTEM

A. The indoor and outdoor perimeter surveillance CCTV system consists of recording equipment provisions for camera stations located throughout the interior of the building and camera stations located around the perimeter of the facility which are operated in conjunction with a Networked-based Video Security System (NVSS) consisting of encoders, decoders, network storage managers, system managers, PC work stations, keyboard control units, network switch, and monitors. The indoor and outdoor perimeter surveillance CCTV equipment is located in the main security console, along with a viewing station located in the control room in Building No. 90.
1. The existing indoor and outdoor perimeter surveillance CCTV equipment is manufactured by Pelco (DX9100).

B. An attendant at the control room operates the system with a workstation. The workstation allows viewing monitors to survey and evaluate the status of personnel in the areas within range of the camera stations.
C. Scenes are viewed by camera stations:
   1. Zoom-pan/tilt camera stations contain equipment required for completely adjustable viewing of scenes (remotely controlled from the keyboard control unit).
   2. Fixed camera stations contain equipment required for viewing a fixed scene (not remotely adjustable).

D. The video signal from each camera station is transmitted to a dedicated monitor for that camera station.
   1. Each dedicated monitor continuously displays the scene viewed by the camera station to which it is dedicated.
   2. Dedicated monitors are not controlled by the workstation and/or decoders.
   3. The scenes displayed by dedicated monitors are also displayed on selected monitors which are connected to the output of the workstation/decoders.

E. Camera stations transmit video signals to dedicated monitors. Each monitor continuously displays the scene viewed by the camera station to which it is dedicated. Dedicated monitors are not controlled by the NVSS.

F. A keyboard control unit, connected to the workstation, allows the attendant to control the following:
   1. Camera station functions including addressing, pan and tilt (joy stick control), zoom, and focus. (Iris is automatically controlled, not manually controlled through TVCPU).
   2. Alarm closure arm and clear.
   3. Camera station automatic sequencing run and hold.
      a. The programmed sequence may either be continuously repeated until the hold button is depressed or the sequence may be programmed to stop on a selected camera station until the run button is pushed.
   5. Call up of prepositioned scenes.
   6. Call up of any camera station to any monitor connected to the system.

1.06 MODIFICATIONS TO EXISTING SYSTEM

A. Remove all existing devices and apparatuses.

B. Provide a complete and new video surveillance system.

1.07 ALARM FROM PERIMETER SYSTEM DESCRIPTION

A. The IP video management system consists of VideoXpert™ Management software and components which includes power supplies, network storage managers, Power Over Ethernet Switches, PC work stations, keyboard control units, network switch, universal device interface, and monitors.
B. The IP video management system software updates shall be downloadable from a publicly available website.

C. The IP video management system is Microsoft® Windows®-based for easy setup and maintenance.

D. The IP video management system will support browser-based administration interface which provides management capabilities, locally and remote, without an installed Desktop.

E. The IP video management system will support the ability of modular plug-ins.

F. The network storage manager is to use RAID 6 parity across the storage drives to protect recorded data against a hard disk drive failure. The network storage manager will only use enterprise-level hard disk drives specifically rated for operation in RAID systems. Data will be stored for a minimum of 23 days.

G. Video monitoring of all cameras shall be possible from any workstation as set up per client’s request. Review capabilities for the digitally recorded video via the secure network specified without interruption to recording capabilities.

H. The IP video management system will be designed for reliability through fault-tolerant, distributed architecture, and multiple levels of redundancy.

I. The IP video management system will provide predictable scalability and modular design.

J. The IP video management system is to support up to 6 monitors per workstation, each driven by independent CPUs, displaying up to 16HD streams per monitor.

K. The IP video management system workstations must be capable to utilize a 3D mouse and programmable keyboard accessories, and keyboard shortcuts for common operations, to maximize operator control.

L. The IP video management system needs to provide an open interface that facilitates the creation and deployment of User Interface plug-ins including mapping, video information overlays (eConnect), Access control, and license plate recognition (PlateSmart – US only).

M. The IP video management system must support recording of MJPEG, MPEG-4 and H.264 IP streams.

N. The IP video management system shall support Pelco and third-party H.264 Megapixel video streams up to 28 Megapixel.

O. The IP video management system is to have a fully open architecture with support for both IP-specific camera as well as cameras with ONIVIF.

P. The IP video management system shall provide migration paths for Endura® (v2.4.3 or later) and Digital Sentry® (v7.9 or later).
Q. The IP video management system must be capable to Aggregate independent VMS deployments across networks and manage all video through a single system while preserving local operation (VideoExpert Ultimate distributions).

R. The IP video management system will be able to be viewed, managed, and played back through a single user interface simultaneously with Digital Sentry (v7.9 or later) and Endura (v 2.4.3 or later) digital video management systems through supplied VideoXpert Management software.

S. The IP video management system will run on standard commercial off-the-shelf processors and hardware with predictable performance characterized by benchmark information on manufacturer supplied specifications.

T. The IP video management system will support Pelco Sarix Analytics at no additional licensing cost.

U. The IP video management system shall indicate system performance and operation status utilizing a variety of reports including csv and pdf formats.

V. Client software shall create and assign tags, organizing system resources as administrators or operators decide.

W. Client software shall provide the capability of running a client application in addition to the video management system.

X. Client software, at minimum, to include advanced search capabilities for camera and recordings.

1. Client software will utilize an Investigation mode which enables operators to synchronize video playback and export investigative playlists covering scenes of interest in forward or reverse at speeds up to 128 times normal playback.

2. A client computer with system compatible software will be the user interface for viewing one or more systems. Live and recorded video and current event video shall be displayed on any client computer using a proper login and password. The client computer shall be able to connect to an unlimited number of recorders simultaneously to display live and recorded video.

3. Client Software will not require a license and be available to be installed on as many clients as required by the user.

4. Client Software must be compatible with existing Digital Sentry and Endura Network storage systems.

5. Client Software access will be User Account Controlled such that an operator must enter their credentials and will only have functionality prescribed to by the set of Roles assigned to their user account by their administrator. User Roles shall limit the ability to access live or recorded video as well as the ability to export video and other standard client operations.

6. Client Software to allow multiple monitor support for up to 6 displays per client workstation, providing virtual matrix functionality with the use of enhanced decoders.
7. Client Software must allow video streams to be selectable from a system tree on an individual camera, individual system, client defined local groups, or from pre-defined recorder based groups.

8. Client cells, at minimum, have the ability to include system management, live, and search options. Tabs can be displayed simultaneously on the client.

9. Systems cells will, at minimum, display connection status, system names, and custom categories. This tab at minimum will additionally allow:
   a. Mapping plug-ins
   b. Card Access plug-ins
   c. Web Browser plug-ins
   d. Live video
   e. Recorded video
   f. Mission control console
   g. eConnect plug-ins
   h. PlateSmart plug-ins (US only)
   i. Synchronized video live and recorded (investigations)
   j. Screen layout select 1, 4, 9, 16 etc.
   k. Digital Zoom
   l. User selectable in-video PTZ control
   m. Quick review from 30 sec, 1 min, 30 min and 1 hour (through keyboard hot buttons)
   n. Virtual matrix capabilities
   o. Display recorded video with full VCR controls with an active overlay, (play, fast forward and reverse, and frame by frame).
   p. Playback available on a time lime format for ease of use

10. Video export to any system-accessible media including locally to HDD, CD/DVD, Flash USB device or to network storage.

11. Video authentication of exported video via check sum verification.

12. Client, at minimum, will support simultaneous playback for up to (9) 1080P cameras all synchronized with each other. Also have the capability to playback non-synchronized cameras at one time in different cells.

13. Modular Window Based Client: the client shall be comprised of 1 main control panel, which can be hidden, working in unison with a series of windows, each providing a tab based experience.

14. Saveable Tabs: any layout of video can be saved as TAB to be later recalled by on operator.

15. Dockable Mission Control: the main control panel can be hidden, free floating or dynamically docked to any open VMS client Window.

16. Mission Control Sort: the device list in mission control can be sorted by device name or device ID.

17. Mission Control Filter: the device list in mission control can be filtered by the following terms:
   a. Simple text based filter (matching the device name or device ID)
   b. Tag based filtering (shows devices matching the intersection of all assigned tags)
   c. Status based Filtering: show devices with a particular status:
      1) Online
      2) Offline
3) Recording
4) Not recording
5) on screen
6) not on screen
18. Saved Investigations: operators are able to save a current investigation, preserving the associated device list and any created clips for later recall. Saved investigations can be shared with other operator’s similar tabs.
19. Remote Workspace Push: an operator with appropriate permissions can choose to have a saved workspace sent to one or more operators’ clients, causing their system to launch the saved workspace.
20. Remote Tab Push: an operator with appropriate permissions can choose to send a saved tab one or more operators’ clients, causing their system to launch the saved tab.
21. Thumbnail on timebar: when hovering over the timebar, an operator will see a thumbnail representing the contents of the video stream at that point in time.
22. Information popup: when hovering over a device, an operator will see a popup that shows the following:
   a. Device state
   b. Device name
   c. device ID
   d. thumbnail
   e. associated tags
   f. IP Address
23. Snapshot: an operator will be able to create a quick JPG image of the current frame of video in a cell.
24. Digital Zoom: the operator will able to digitally zoom in on a video stream on live or playback.
25. Optical Zoom and Pan Tilt Control: operators will be able to use the mouse, 3D mouse or KBD5000 joystick to send commands to cameras that support PTZ mechanism, thereby controlling where the camera is pointing.
26. Preset Trigger: operators will be able to trigger a preset action on cameras that are storing presets.
27. Drag to Swap: an operator will be able to select the video in one cell, drag that video over another cell and have the system swap the streams.
28. Dynamic call-up by ID: operators will be able to start typing a camera ID while having a cell selected to immediately see an input box. Hitting enter will load the associated camera to the cell.
29. Last Workspace Recall: the operator will be presented with the last workspace they had opened when they logged back into the system.

Y. System shall be able to associate any camera(s) with any microphone(s) when exporting video/sound.

1.08 SUBMITTALS

A. Waiver of Submittals: The “Waiver of Certain Submittal Requirements” in Section 013300 does not apply to this Section.
B. Packaging of Submittals: Submittals required by this section are to be submitted (by contractor) in packages as follows: Submit (4) sets of shop drawings, product data and quality control submittals specified below as a complete package. SUBMITTALS NOT COMPLYING WITH ALL OF THE OUTLINED REQUIREMENTS WILL BE REJECTED.

1. Submittals Package 1: Submit seven (7) Shop drawings, Product Data and Quality Control Submittals specified below at the same time as a package.
   a. Submit Submittals Package 1 within 30 days of contract award.

2. Submittals Package 2: Submit Point to Point Wiring Diagrams and Training Submittals specified below at the same time as a package.
   a. Submit Submittals Package 2 within 30 days of receipt of approval of Submittals Package 1.

3. Submittals Package 3: Submit Contract Closeout Submittals specified below at the same time as a package.
   a. Submit Submittals Package 3 upon physical completion, when directed by the Director’s Representative.

C. Seismic Qualification Certificates: for security equipment racks from manufacturer.

1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.

2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions. Base certification on the maximum number of components capable of being mounted in each equipment rack along with rack type. Identify components on which certified is based.

3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

D. Shop Drawings (Submittals Package 1):

1. Composite wiring and/or schematic diagrams of the complete system as proposed to be installed (standard diagrams will not be accepted), including video signal integrity equipment, etc. required for a complete system.

2. Scale drawings showing mounting of video door station components.

3. Scaled elevation drawings showing location and mounting of components to be mounted in the security equipment racks Security equipment rooms.

4. Details of camera station poles and bases.

E. Product Data (Submittals Package 1):

1. Catalog sheets, specifications and installation instructions.

2. Bill of materials showing proposed quantities of all equipment to be used on this project.

3. Detailed description of system operation (format similar to SYSTEM DESCRIPTION).

4. State number of POE ports used specifically for this project and number of POE ports available for future use if system is expanded to maximum capacity.
5. Name, address and telephone number of nearest fully equipped service organization.
6. Include calculations used to size UPS’s for a fifteen-minute back-up time.

F. Quality Control Submittals (Submittals Package 1):
      a. Also include copy of identification card issued by the Licensee for each person who will be performing the Work.
   2. Installers’ Qualifications Data: Include a completed INSTALLER’S QUALIFICATION DATA FORM for each person who will be performing the Work.
      a. Forms must be completely filled out.
      b. Forms must include all information required, showing that the experience criteria have been met.
      c. Each Form must be signed by the installer.
   3. Company Field Advisor Data:
      a. Secure the services of a Company Field Advisor:
         1) Include the name, business address and telephone number of the Company Field Advisor.
      b. Certified statement from the Company listing the qualifications of the Company Field Advisor.
      c. Services and each product for which authorization is given by the Company, listed specifically for this project.
   4. Letter from the Company Field Advisor stating that the Company Field Advisor has reviewed the Submittals Package for accuracy and completeness and approves all materials and installation methods included in the Submittals Package.
   5. System Qualifications: Submit System Qualification information if proposing a system other than that specified.
   6. Project Work Plan:
      a. Include a detailed work guideline listing the OCFS requirements as they apply to this specific site.
      b. Include a detailed project work scheduling plan.
      c. Include a set of detailed project installation drawings compiled specifically for this project.
      d. Include training schedules for this specific project.
      e. Include personnel contacts for this specific project.
   7. Include direction for proper handling and storage for all equipment.

G. Point to Point Wiring Diagrams (Submittals Package 2):
   1. Submit complete point to point wiring diagrams of the entire system as it is to be installed.
      a. Point to Point wiring diagrams shall show the following:
         1) All components in the system.
         2) All cables and conductors between each component.
         3) Identify all cables and conductors and show all terminations and splices (identification shall correspond to markers to be installed on each conductor).
b. Point to Point wiring diagrams shall have an accompanying letter from the Company Field Advisor(s) stating that the Company Field Advisor(s) has reviewed the Point to Point wiring diagrams for accuracy and completeness and approves the Point to Point wiring diagrams for use.

H. Contract Closeout Submittals (Submittals Package 3):
   1. System acceptance test report.
   2. Digital Video Test Recordings (Scenes) of all camera’s.
   3. Certificate: Affidavit, signed by the Company Field Advisor(s) and notarized, certifying that the system meets the contract requirements and is operating properly.
   4. Operation and Maintenance Data:
      a. Deliver 2 copies, covering the installed products, obtain a signed receipt from the Director's Representative. Include:
         1) Operation and maintenance data for each product.
         2) Complete point to point wiring diagrams (As-Built Drawings) of entire system as installed. Identify all conductors and show all terminations and splices (identification shall correspond to markers installed on each conductor).
         3) Name, address, and telephone number of nearest fully equipped service organization.
         4) Show all “as installed” cable paths.
         5) Identify all conductors including cat6 cable and power cables.
         6) Show all terminations and splices. Identification shall correspond to marker installed on each conductor.
         7) Written test report for all cables.

1.09 QUALITY ASSURANCE

A. Equipment Qualifications:
   1. Products other than those specified:
      a. If products other than those specified, are proposed for use, furnish the name, address, and telephone number of at least 5 comparable installations that can prove the proposed products have operated satisfactorily for 1 year.
         1) Reference information required above must be that of the End-User of the equipment, no other references will be accepted (i.e. Installers, Sales Reps, etc.).
         2) Pay travel expense for the Director's Representative to inspect two of these installations.
      b. The Company producing the product shall have test facilities available, which can demonstrate that the proposed product meets contract requirements.
         1) Pay all costs, including travel expenses to the test facility for the Director's Representative to witness test demonstration.
B. Installer's Qualifications: The persons installing the Work of this Section and their supervisor shall be personally experienced in closed circuit television systems and shall have been engaged in the installation of closed circuit television systems for a minimum of 3 years.

   1. Qualifying experience must be in the installation of CCTV systems similar in operation and construction of the system being specified by this section.

   2. Furnish to the Director completed INSTALLER'S QUALIFICATION DATA FORM for each person who will be performing the Work. Each form shall include:
      a. Installer's name.
      b. Employer's Name and Address.
      c. Qualifying Experience: Project information of 5 similar projects, which the installer, had worked on during the past 3 years. Information shall include for each project:
         1) Name and Address of project.
         2) Dates installer worked on project.
         3) Name and telephone Number of installer's supervisor for the project.
         4) Types of security installation work installer performed on project.

C. Manufacturers’ Technical Advisor: Secure the services of a Manufacturers’ Technical Advisor from the Company producing the NVSS for the following:

   1. Assist in the formation of the Submittals Packages, and review the Submittal Packages for accuracy and completeness.

   2. Engineering associated with interconnections between the Video Surveillance System (Section 282304) and the perimeter alarm system (Section 281605).

   3. Engineering associated with interconnections between the NVSS and the cameras.

   4. Render advice regarding installation and final adjustment of the system.

   5. Coordinate installation of the system and the related work with the other systems.

   6. Conduct a pre-installation meeting at the contract site with the installers (and their supervisor) who will be performing the work, the Director's Representatives and facility supervisory and maintenance personnel. The meeting shall be a minimum of 8 hours in duration (held in four 2 hour increments). The topics covered shall include, but shall not be limited to the following:
      a. Manufacturers’ Technical Advisor shall present an overview of the system as it is to be installed.
      b. Manufacturers’ Technical Advisor shall lead a discussion of installation concerns and coordination issues on this system and related systems and related work being installed under this project.
      c. Manufacturers’ Technical Advisor shall provide training on procedures for installing system components and precautionary measures installers should be aware of while performing the work.
1) Manufacturers’ Technical Advisor shall review point to point wiring diagrams with the installers and provide training on termination, bonding and grounding procedures required for proper installation of the system wiring and components.

7. Provide supervision of the installation at the contract site for a minimum of 60 hours and for the following:
   a. Supervise the installation of the NVSS.
   b. Render advice regarding installation and final adjustment of the system.
   c. Coordinate installation of the system and the related work with the other systems.
   d. Perform programming of the system.
   e. Perform preliminary tests of the system.
   f. Train facility security personnel, security supervisory personnel and maintenance personnel in operation and routine (weekly) testing of the system (minimum of four 3-hour sessions).
   g. Train facility maintenance personnel in adjustments, programming, routine maintenance and annual testing of the system (minimum of 8 hours of training – held in four 2 hour increments).
   h. Witness final system test and certify with an affidavit that the system is installed in accordance with the contract documents and is operating properly.
   i. Explain available service programs to facility supervisory personnel for their consideration.

D. Manufacturers’ Technical Advisor (Camera Stations): Secure the services of a Manufacturers’ Technical Advisor from the Company producing the camera stations for the following:

1. Assist in the formation of the Submittals Packages, and review the Submittal Packages for accuracy and completeness.
2. Engineering associated with interconnections between the NVSS and camera stations.
3. Assist the Manufacturers’ Technical Advisor of the NVSS with conducting the pre-installation meeting at the contract site. The Manufacturers’ Technical Advisor for the camera stations shall conduct a portion of the pre-installation meeting. This portion of the meeting shall be a minimum of 2 hours in duration and cover the following topics (but shall not be limited to the following):
   a. Manufacturers’ Technical Advisor for the camera stations shall present an overview of each type of camera station as they are to be installed.
   b. Manufacturers’ Technical Advisor for the camera stations shall lead a discussion of installation concerns and coordination issues on the installation of the cameras stations with the NVSS.
   c. Manufacturers’ Technical Advisor for the cameras shall provide training on procedures for installing the camera stations and precautionary measures installers should be aware of while performing the work.
1) Manufacturers’ Technical Advisor shall review point to point wiring diagrams with the installers and provide training on termination, bonding and grounding procedures required for proper installation of the system wiring and components.

4. Provide supervision of the installation at the contract site for a minimum of 8 hours and for the following:
   a. Supervise the installation of the camera stations.
   b. Render advice regarding installation of the cameras.
   c. Assist in initial and final adjustments to the cameras.
   d. Perform preliminary tests of the system.
   e. Train facility security personnel in operation, and routine (weekly) testing of the cameras (minimum of two 2-hour sessions).
   f. Train facility maintenance personnel in adjustments, routine maintenance and annual testing of the camera stations (minimum of 8 hours of training – held in four 2-hour increments).
   g. Assist in performing final system test and certify with an affidavit that the cameras are installed in accordance with the contract documents and are operating properly.
   h. Explain available service programs to facility supervisory personnel for their consideration.

1.10 MAINTENANCE

A. Service Availability: A fully equipped service organization capable of guaranteeing response time within 8 hours to service calls shall be available 24 hours a day, 7 days a week to service the completed system.

B. Spare Parts:
1. One complete outdoor PTZ camera station (camera, lens, receiver/driver, and housing).
2. Eight complete indoor camera station (Of each type) (camera, lens, housing).
3. 4% of total hard drive purchased.
4. VXS 80MM Mid Axial Fan (#VXS-FAN-MID)
5. One POE Switch
6. Three SFP
7. Two of each type of surge protector
8. Three of each size fuse for all electronic equipment.
9. VXS 80MM Exhaust Axial Fan Rear (#VXS-FAN-REAR)
10. VXS High Efficiency Power Supply (#VXS-PSU)
11. VXS Low Profile INT raid Adapter (#VXS-RAID)
12. VXS OS 200GB 2.5” SSD (#VXS-SSD-200GB)
PART 2  PRODUCTS

2.01  GENERAL

A. All equipment and materials used shall be standard components, manufactured and regularly utilized in CCTV Systems.

B. Furnish only CCTV System equipment that has been thoroughly tested before shipment to the project site.

C. Provide all equipment listed in the following Product Specification sub-sections but not limited to Section 2 of this Specification or Contract Drawings for a complete and operational CCTV System.

D. The system design is based on Pelco’s VideoXpert Platform; a Network Video Management System.

2.02  VIDEOXPERT™ SPACE MOUSE CONTROLLER (KCU)

A. The 3D Space Mouse must be compatible with all VideoXpert Series distributed, network video management components.

B. Patented six-degrees-of-freedom (6DoF) sensor – Intuitively and precisely navigate digital models or camera positions in 3D space.

C. Advanced ergonomic design – The full-size, soft-coated hand rest positions the hand comfortably, and 15 large, soft-touch, function keys allow quick access to frequently used commands.

D. QuickView Keys – Fingertip access to 12 views makes it easier to switch cameras.

E. Intelligent Function Keys – Easy access to 4 application commands for an optimized workflow.

F. On-Screen Display – Provides a visual reminder of function key assignments on your computer screen.

G. 3D Space Mouse Modifiers – Fingertip access to Ctrl, Shift, Alt and Esc keys saves time by reducing the need to move your hand between mouse and 3D Space Mouse.

H. Virtual NumPad – Allows direct numerical input into your application using your standard mouse rather than the 3D Space Mouse.

I. The 3D Space Mouse must be part of an integrated system and shall be configured so any number can be added to the system. When combined with user interfaces (UIs), network storage managers (NSM’s), encoders, IP cameras, and video consoles, the 3D Space Mouse forms an integral part of a complete network-based video control system.
J. The 3D Space Mouse will meet or exceed the following design and performance specifications.
   1. Power Supply Specifications
      a. Input Connector Type: Universal, interchangeable
   2. 3D Space Mouse Base Specifications
      a. 3D Space Mouse Interface: USB 2.0
      b. Cable: USB
   3. 3D Space Mouse Module Specifications
      a. Joystick: Fully proportional PTZ, variable speed; with zoom, iris, and focus controls
   4. Physical Specifications
      a. Dimensions: 204 x 142 x 58 cm (8.0” D x 5.6” W x 2.3” H)
      b. Unit Weight: 665 g (1.47 lbs)
   5. Environmental Specifications
      a. Ambient Temperature: 21° to 23°C (70° to 74°F)
      b. Operating Temperature: 0° to 40°C (32° to 104°F) air intake of unit
      c. Storage Temperature: –40° to 65°C (–40° to 149°F)
      d. Operating Humidity: 20%-80%

K. Pelco Model Number
   1. 3DX-600-3DMOUSE: VideoXpert enhanced 3D Mouse w/joy and Jog Stick

2.03 NETWORK BASED VIDEO SECURITY SYSTEM (NVSS)

A. CORE / CMG (SM)
   1. Ability to maintain database of cameras and recording devices, and provide a convenient Web interface.
   2. Ability to define administer level user accounts which will have the ability to set new roles and subset and permissions, determining the system functions and devices users can access.
   3. Ability to allow the ability to assign resources to recording pools through the Core’s Admin portal.
   4. Ability to store videos that operators elect to export from network storage devices for safe keeping.
   5. Ability to be deployed as an independent CORE server working with an independent Media Gateway to provide systems functions.
   6. Ability to be deployed in the same server as a Media Gateway, thereby creating a single server solution for system functionality.
   7. Ability to be deployed as a cluster, providing fault tolerance, scalability and load balancing.
   8. Ability to be deployed as a virtual machine.

B. OPS CENTER(WS)
   1. To be installed as VideoXpert client software.
   2. Client Software is deployable on Standard Windows based machines.
   3. Operator workspace can optionally be extended up to 6 monitors or beyond with use of Enhanced Decoders.
4. Allows the creation of Operator workspaces which shall define the layout of control panels, windows, and pre-populated camera channels and other content.

5. Allow users to configure and recall complete workspaces, enabling operators to quickly log in and get the information they need.

6. Client software can be controlled using a standard mouse and keyboard.

7. Client software operation can be enhanced utilizing the 3D mouse, KBD5000, or G710 Keyboard.

C. Recommended Client and Server Hardware Specifications:

1. Core/CMG, and Ops Center must meet or exceed the following design and performance specifications.

   a. System Specifications

   1) Processor: Intel® Xeon® E3-1275 v3
   2) Internal Memory: 32GB DDR3 RAM ECC (Core/CMG), 8GB DDR3 Non-ECC RAM (Media Gateway and Ops Center)
   3) Operating System: Microsoft® Windows® 2012 Server (Core/CMG and Media Gateway), Windows 7 Ultimate SP3 (Ops Center)
   4) User Interface: VideoXpert system software, web browser
   5) Internal Storage: SSD (480GB Core/CMG, 120GB Media Gateway and Ops Center)
   6) Storage: 1TB (Core/CMG)
   7) Drive Bays: 6 (5 unused)
   8) Optical Drive: DVD±RW
   9) USB Ports: 3 USB 2.0 ports (1 Front, 2 Rear) USB 3.0 Ports (rear)

   b. Video Specifications

   1) Video System: Intel HD Graphics P4700 (Core CMG), Intel HD Graphics P4700; supports optional upgrade
   2) Memory: Shared (Core/CMG), Shared; 1GB for OPS-WKS6 (Ops Center)
   3) Video Outputs: 2x DisplayPort, DVI-D, VGA (Core/CMG), 2x DisplayPort, DVI-D, VGA; supports up to 6 outputs for OPS WKS6 (Ops Center)
   4) Max Resolution: DisplayPort 3840x2160 at 60 Hz DVI-D and VGA 1920x1200 at 60 Hz
   5) Video Standards: NTSC 60 Hz, PAL 75 Hz

   c. Audio Specifications

   1) Audio Decoding: G.711 speech codec
   2) Audio Bit-rate: 64kbps
   3) Audio Levels:
      a) Input: Electret microphone
      b) Output: Up to 3 Vp-p, adjustable, minimum load of 8 ohms
   4) Audio Connectors
      a) Connector Tip: 3.5 mm stereo jacks (2x)
      b) Connector Ring: Signal left (input and output)
      c) Connector Sleeve: Common
d. Network Specifications
1) Interface: Gigabit Ethernet (1000Base-T) ports (2x)
e. Front Panel
1) Buttons: Power, configuration/reset:
   a) Unit Status: Green, amber, red
   b) Primary Network: Green, amber, red
2) Indicators
   a) Secondary Network: Green, amber, red
   b) Software Status: Green, amber, red (based on diagnostics)
   c) Hard Disk Status: Green, red, off (behind bezel)
f. Power Specifications
1) Power Input: 100 to 240 VAC, 50/60 Hz, autoranging
2) Power Supply: Internal
3) Cable Type: 1 USA (117 VAC); or 1 European (220 VAC); or 1 UK (250 VAC); or 1 Argentinean (250 VAC); or 1 Australian (250 VAC); All, 3 prongs, method connector
4) Power Consumption:
   a) 100 VAC / 60 Hz: 160.0 W, 1.60 A, 547 BTU/H
   b) 115 VAC / 60 Hz: 160.0 W, 1.39 A, 547 BTU/H
   c) 220 VAC / 60 Hz: 160.0 W, 1.39 A, 547 BTU/H
d) UPS: Compatible with APC Smart-UPS, managed through the VideoXpert product architecture
g. Environmental Specifications
1) Operational Temperature: 10° to 35°C (50° to 95°F) at unit intake
2) Storage Temperature: −40° to 65°C (−40° to 149°F)
3) Operating Humidity: 20% to 80%, non-condensing
4) Maximum Humidity: 10% per hour
5) Operating Altitude: −15 to 3,048 m (−50 to 10,000 ft)
6) Operating Vibration: 0.25 G at 3 Hz to 200 Hz at a sweep rate of 0.5 octave/minute
h. Physical Specifications:
1) Construction: Steel Cabinet
2) Finish:
   a) Front Panel: Grey metallic with black end caps
   b) Chassis: Black matte finish
   c) Dimensions: 58.8 x 43.4 x 8.9 cm (20.0” D x 17.1” W x 3.5” H)
3) Unit Weight
   a) Core/CMG: 14.2 kg (31.4 lbs)
   b) OPS Center: 14.2 kg (31.4 lbs)
   c) Media Gateway: 14.2 kg (31.4 lbs)
i. Certifications:
1) CE, Class A; meets EN50130-4 standard requirements
2) FCC, Class A
3) UL/cUL Listed
4) C-Tick
5) CCC
6) KCC
7) S-Mark

D. Warranty:
   1. 36 months, parts and labor

E. Supplied Accessories:
   1. USB Keyboard and Mouse
   2. Power cord (US)
   3. Bezel Key (2)
   4. Rack Mount Kit (Brackets, rails, and hardware for Mounting in a 2RU rack)

F. Pelco Model Numbers:
   1. CMG-SVR: VideoXpert Core and Media Gateway all-in-one hardware with software licenses
   2. COR-SVR: VideoXpert Core server hardware and software license
   3. OPS-WKS6: Ops Center workstation with upgraded graphics card, enabling use of up to 6 monitors using Enhanced Decoders (D09U-ENH-DEC)

2.04 VIDEOXPERT™ ENHANCED KEYBOARD

A. The keyboard must be compatible with all VideoXpert Series distributed network video management systems.

B. The mechanical keys deliver responsiveness and tactile feedback superior to rubber-domed keys. With an actuation force and distance of 45 g and 2 mm, respectively, the keys are optimized for rapid command entry. The keys have been tested for durability to a 50 million cycle life.

C. Whisper-quiet key. Quiet, non-clicking key switches, and a built-in dampening ring underneath each keycap significantly reduce the distracting noise coming from your key presses without sacrificing responsiveness.

D. Adjustable dual-zone backlighting, illuminated to locate keys—even in low light. The entire keyboard is backlit in white LED light and adjustable to one of four brightness levels, plus “Off”. For better visibility of the WASD and arrow keys, their brightness can be adjusted independently from the rest of the keyboard.

E. 26-key rollover Multi-key input on the VideoXpert means complex moves can be executed exactly every time. With 26-key rollover, press almost any number of keys plus modifier keys (Control, Alt, Shift) in any order and get exactly what you intended.

F. 110 anti-ghosting keys technology on contact. All 110 keys of the VideoXpert are calibrated to prevent anti-ghosting. During the heat of battle, you need to
simultaneously run, strafe, select a weapon and open a door. Press and hold multiple keys simultaneously without fear of missing or unexpected key presses.

G. USB pass-through to easily connect your mouse or other USB device via the keyboard Hi-Speed USB pass-through for your computer’s USB port.

H. Durable tilt legs stand up under keyboard. The durable tilt legs provide stability and comfort even in your most intense gaming sessions.

I. The keyboard shall meet or exceed the following design and performance specifications.
   1. Keyboard Base Specifications
      a. Keyboard Interface: USB 2.0
      b. Cable: USB
      c. Upstream Port: USB 2.0 (USB type B connector)
      d. Downstream Port: 2x USB 2.0 hi/full/low speed (USB type A connector)

   2. System Requirements: Windows 7, 2 USB ports 70 MB of available hard disk space

J. Pelco Model Number
   1. Y-U0018-G710KBD: VideoXpert Enhanced Keyboard

2.05 VIDEOXPERT™ ENHANCED VIDEO DECODER (ED)

A. The HD network video decoder is to be fully VideoXpert compatible.

B. The HD video decoder needs to support any digital video stream on the network and allow for the decoding of up to 16 simultaneous streams from any video encoder or recorder. It shall also allow for simultaneous and independent viewing of both live and recorded video.

C. The HD video decoder must decode H.264 in High, Main, or Base profiles, and MPEG-4 encoded video streams.

D. The HD video decoder capability to decode up to sixteen 4CIF resolution, 30 images per second (ips) MPEG-4 encoded video streams simultaneously, or up to twelve H.264 Baseline, 4CIF resolution, 30 ips video streams simultaneously, or up to four 1080p streams encoded in H.264 Baseline profile. Additional streams shall be decoded using EnduraView™. EnduraView shall minimize the network bandwidth consumption and CPU processing requirements by automatically subscribing to a lower resolution, lower bit-rate stream from a given camera depending on current load and screen configuration.

E. The HD video decoder will drive one high-resolution monitor through HDMI connections for displaying the video footage.

F. Diagnostics to be systemized with other system components. Any faults shall be reported to users that have subscribed to diagnostic alarms regardless of where the user is located. In addition, the HD video decoder shall also support SNMP messages and traps and be compatible with SNMP versions 1 and 2.
The HD video decoder to meet or exceed the following design and performance specifications.

1. Power Specifications
   a. Power Consumption
      1) 100VAC 121 W, 1.21 A, 413 BTU/H
      2) 120 VAC 119 W, 0.99 A. 406 BTU/H
      3) 240 VAC 122 W, 0.51 A. 416 BTU/H
   b. Power Supply External
   c. Power Input 100 to 240 VAC, 50/60 Hz, autoranging

2. Environmental Specifications
   a. Operating Temperature 10° to 35°C (50° to 95°F)
   b. Operating Humidity 20% to 80%, non-condensing
   c. Maximum Humidity 10% per hour
   d. Operating Altitude –16 to 3,048 m (~50 to 10,000 ft)
   e. Operating Vibration 0.25 G at 3 Hz to 200 Hz at a sweep rate of 0.5 octave/minute

3. Video Specifications
   a. System
      1) Maximum Resolution 2560 x 1600 resolution; 60 Hz (NTSC) 50 Hz capability for PAL
      2) Video Coding H.264 in High, Main, or Base profiles and MPEG-4
      3) Decoding Performance 16X real-time MPEG-4 streams at 704 x 480/576 (NTSC/PAL); 16X real-time H.264 Baseline streams at 704 x 480/576 (NTSC/PAL); 8X 720p H.264 Baseline streams; 4X 1080p H.264 Baseline streams
   b. Video Outputs/Connector
      1) Types, 2: HDMI outputs (2 HDMI-to-VGA adapters supplied)
      2) Screen Configuration: On each of monitor: 1 image (1 x 1), 4 images (2 x 2), 9 images (3 x 3), 16 images (4 x 4), 6 images (1 large + 5 small), 10 images (2 large + 8 small), 13 images (1 large + 8 small); Each high definition monitor (16:9 aspect ratio) can also display 6 images (3 x 2) and 12 images (4 x 3)

4. Network Specifications
   a. Interface Gigabit Ethernet (1000Base-T) ports (2x)
   b. Front Panel
      1) Buttons Power, configuration/reset
      2) Unit Status Green, amber, red
      3) Primary Network Green, amber, red
      4) Indicators
         a) Secondary Network Green, amber, red
         b) Software Status Green, amber, red (based on diagnostics)
         c) Hard Disk Status Green, red, off (behind bezel)

5. Certifications
   a. CE, Class A; meets EN50130-4 standard requirements
   b. FCC, Class A
   c. UL/cUL Listed
2.06 VIDEOXPERT™ STORAGE MANAGER (NSM)

A. The network storage manager is to record video and audio streams from IP cameras and video encoders on the network.

B. The network storage manager must incorporate the server functions and storage elements into a purpose-built chassis.

C. The network storage manager is to use RAID 6 parity across the storage drives to protect recorded data against a hard disk drive failure.

D. The network storage manager will only use enterprise-level hard disk drives specifically rated for operation in RAID systems.

E. The network storage manager chassis must be designed for video surveillance recording applications and encompass redundancy at all vital points:
   1. Redundant, hot swappable power supply modules
   2. Redundant, hot swappable system fans
   3. Hot swappable O/S drive
   4. Hot swappable CPU fans

F. The network storage manager chassis must be designed for online service and maintenance and cannot be removed from the rack when hard disk drives, fans, power supplies, or operating system drives must be replaced.

G. The network storage manager is to be built upon a reliable and robust Linux® operating system.

H. The network storage manager must support a guaranteed recording throughput of 250 Mbps per storage device with a minimum of 64 Mbps of read throughput. This throughput shall be guaranteed under normal and error (RAID rebuild) conditions.

I. The network storage manager will support any number of cameras so long as the maximum throughput required is less than 250 Mbps.

J. The network storage manager shall support the recording of H.264 in High, Main, or Base Profiles and MPEG-4 streams from standard resolution and megapixel cameras.
K. The network storage manager is to support continuous, scheduled, alarm/event (including analytics alarms), motion, and manual recording. Pre- and post-alarm periods shall be configurable up to the total capacity of the system.

L. The network storage manager must support bookmarking and locking/unlocking of video content on the drives.

M. The network storage manager is to support privacy tools that allow administrators to establish maximum retention times for normal, alarm, and locked video.

N. The network storage manager must support an intelligent video grooming protocol that can reduce the frame rate of recorded video as the video ages. Administrators shall have the flexibility to determine whether to groom alarm video or leave at its real-time level.

O. The network storage manager shall have the ability to report all diagnostic events, including software status diagnostics to a centralized user interface. In addition, Simple Network Management Protocol (SNMP) traps shall be available for monitoring through a third-party SNMP management console.

P. The network storage manager shall be fully managed from a remote workstation, including the ability to configure settings and update firmware and software.

Q. The network storage manager is to be capable of interfacing with the APC® Smart-UPS® using a USB connector. The network video recorder shall receive status and control signals from the uninterruptible power supply (UPS) when it is in backup mode. This function shall inform the operator about the amount of charge remaining and trigger a controlled shutdown when the charge becomes zero.

R. The network storage manager must meet or exceed the following design and performance specifications.

1. Power Specifications
   a. Power Input: 100 to 240 VAC, 50/60 Hz, autoranging
   b. Power Supply: Internal, dual-redundant, hot-swappable
   c. Cable Type: 2 USA (117 VAC)

2. Power Consumption
   a. 100 VAC: 262 W, 2.65 A, 895 BTU/H
   b. 115 VAC: 263 W, 2.31 A, 895 BTU/H
   c. 220 VAC: 254 W, 1.25 A, 868 BTU/H
   d. UPS: Compatible with APC Smart-UPS, managed through the Endura VideoXpert product architecture

3. Environmental Specifications
   a. Operating Temperature: 10° to 35°C (50° to 95°F) at unit intake
   b. Operating Humidity: 20% to 80%, non-condensing
   c. Maximum Humidity: 10% per hour
   d. Operating Altitude: –16 to 3,048 m (–50 to 10,000 ft)
   e. Operating Vibration: 0.25 G at 3 to 200 Hz at a sweep rate of 0.5 octave/minute
4. Physical Specifications
   a. Construction: Steel cabinet
   b. Finish:
      1) Front Panel: Gray metallic with black end caps
      2) Chassis: Black matte finish
   c. Dimensions:
      1) Without Rails: 68.1 x 43.2 x 13.2 cm (24.3" D x 17.0" W x 5.2" H)
      2) With Rails: 62.7 x 48.26 x 13.2 cm (24.7" D x 19.0" W x 5.2" H)
   d. Unit Weight:
      1) Empty: 21 kg (46 lbs)
      2) Fully Equipped: 30 kg (66 lbs)
   e. Mounting: Desktop (feet); Rack, 3 RU per unit (Rack rails and hardware provided)

5. System Specifications:
   a. System Drive: Linux CompactFlash system drive
   b. RAID Level: RAID 6 for storage drives
   c. Effective Capacity: Up to 27.2 TB
   d. Drive Interface: SAS/SATA II
   e. Network Interface: 2, 1 Gigabit Ethernet RJ-45 ports (1000Base-T)
   f. Security: 2 modes: secure mode (device authentication) and unsecured mode
   g. Auxiliary Interfaces:
      1) USB 2.0 2 USB 2.0 Ports on rear panel 1 USB 2.0 port on front panels

6. Front Panel Specifications
   a. Power: Blue Pelco badge
   b. Software Status: Green, amber, red (based on diagnostics)
   c. Network Port 1 Speed: Green, amber, red
   d. Network Port 2 Speed: Green, amber, red
   e. Hardware Status: Green, amber, red
   f. Hard Drive Status: Green, red
   g. Power Button: On, off (soft), off (hard)

7. Certifications:
   a. CE, Class A
   b. FCC, Class A
   c. UL/cUL Listed
   d. C-Tick
   e. S Mark
   f. CCC/CQC

S. Warranty:
   1. 36 months, parts and labor

T. Pelco Model Numbers:
   1. VSM5200-36: Network storage manager, 36 TB storage
   2. VSM5200-48: Network storage manager, 48 TB storage
SECURITY EQUIPMENT RACKS

A. Security Equipment Rack: fully welded steel frame, modular cabinet rack assembly; Middle Atlantic Products, MRK, having:
   1. Number of sections as required to house the system equipment.
      a. Each section 36 inches deep by 19 inches wide panel space, with height as indicated on drawings. Note: The number of sections indicated on the drawings are the minimum number to be provided. If additional sections are required due to the characteristics of the system equipment, provide additional sections as approved.
   2. Skeletal frame including top and bottom.
      a. Black e-coat finish and numbered rack spaces.
   3. Front, Back, and Side Panels:
      a. Fully vented locking front doors.
      b. Blank panels to cover front panel space where equipment is not installed.
      c. High CFM split rear door, 1320 CFM for 44 space with thermostat regulator.
      d. Set of 4 leveling feet.
      e. Solid top black e-coat finish.
         1) Size as required to enclose equipment indicated on the drawings.
      f. Black enamel finish.
   4. Chassis support angles and equipment shelves:
      a. Provide fixed shelves for support of equipment that is not rack mountable.
   5. Accessories as required for mounting and support of equipment.
   6. Surge Protection Multi-outlet strips mounted vertically within the enclosure with number of 15 amp, 120V ac receptacles (3 wire grounding type) as required for equipment. (Not less than 6 receptacles in each section.)
   7. One rack unit keyboard with 17” LCD monitor and 16 port KVM as manufactured by Middle Atlantic, model RM-KB-LCD17X16KVM
   8. LED light kit as manufactured by Middle Atlantic, model LT-GN-PNL.
   9. One rack unit cable management as manufactured by Middle Atlantic, model PHCM-1-2.

B. Wall Mounted Security Equipment Rack: Pivoting, sectional wall cabinet; Middle Atlantic Products, DWR, having:
   1. Tool-Free Quick-Mount system for easy, one-person mounting of the center section to the backpan on the jobsite.
   2. 16-guage steel construction with 1/8” thick laser-cut corner braces.
   3. Grounding/bonding stud in top and bottom of center section and backpan facilitates proper grounding and bonding of electronic equipment as per NEBS and NEC standards.
   4. Finished in a durable black textured powder coat.
   5. Reversible pad lockable center section is keyed differently from optional front door for security.
   6. Center section rear channel accommodates slim power to save space.
C. Security Equipment Racks:
   1. **Seismic Performance:** Equipment racks shall withstand the effects of earthquake motions determined according to ASCE/SEI 7. The term “withstand” means “the unit will remain in place without separation of any parts from the device when subjected to the seismic forces and the unit will be fully operational after the seismic event.

2.08 **UNINTERRUPTABLE POWER SUPPLY (UPS)**

A. Uninterruptable Power Supply (UPS): as manufactured by APC, model No. SMT750.
   1. Smart uninterrupted power supply, 750VA/500W tower.
   2. Output Connections: (6) NEMA 5-15R.
   3. Input Connections: NEMA L5-15P.
   4. Output Power Capacity: 500 Watts / 750 VA.
   5. Multi-function LCD status and Control Console.
   6. Audible Alarm: Alarm when on battery, distinctive low battery alarm and configurable delays.
   8. 3 years repair or replace (excluding battery) and 2 years for battery.

B. Uninterruptable Power Supply (UPS): as manufactured by APC, Model No. SRT5KXLT.
   1. Smart uninterrupted power supply, 5000VA/5.0Kva floor mounted.
   2. Output Connections: 3-wire hard wired utilizing APC Model No. SRT001 output hardwire kit.
   3. Input Connections: Nema L6-30P
   4. Output Power Capacity: 4.25Kwatts / 5.0 kVA.
   5. LED status indicators
   6. Audible Alarm: Alarm when on battery, distinctive low battery alarm and configurable delays.
   7. Battery type: Maintenance-free sealed Lead-Acid battery with suspended electrolyte, leak-proof.
   8. 3 years repair or replace (excluding battery) and 2 years for battery.

C. Uninterruptable Power Supply (UPS): as manufactured by APC, model No. SMX3000RMLV2U.
   1. Smart uninterrupted power supply, 3000VA/3.0Kva 2U rack mounted.
   2. Output Connections: (6) NEMA 5-15R and (2) NEMA 5-20R
   3. Input Connections: NEMA L5-30P.
   4. Output Power Capacity: 2700 Watts / 3000 VA.
   5. Control Panel: LED status display with On Line, On Battery, Replace Battery and Overload indicators, Multi-function LCD status and control console.
   6. Audible Alarm: Alarm when on battery, distinctive low battery alarm and configurable delays.
   8. Battery type: Maintenance-free sealed Lead-Acid battery with suspended electrolyte, leak-proof.
   9. 3 years repair or replace (excluding battery) and 2 years for battery.
10. (UPS-BAT) UPS Battery supply, as manufactured by APC, model number SMX120RMBP2U.

2.09 FLAT-PANEL HIGH DEFINITION LCD MONITOR

A. The PMCL600 Series FHD LED monitor shall the following features: VGA, BNC and HDMI inputs, picture-in-picture (PIP), looping BNC output, and full high definition resolution.

B. The High Definition LCD monitors shall be capable of providing a maximum of 1920 x 1080P Resolution with front panel controls.

C. The PMCL600 Series FHD LCD monitor shall meet or exceed the following design and performance specifications.
   1. Electrical Specifications
      a. Input Voltage
      b. Power Consumption
         a. PMCL624 35 W
         b. PMCL643 80 W
      c. Video Input Interfaces
         d. 1 BNC, looping; 1 HDMI (2 HDMI for wall mount); 1 VGA; 1 USB.
      e. Audio Input Interfaces
      f. Horizontal Frequency: 15 to 75 kHz
      g. Vertical Frequency 25 to 75 Hz
      h. Sync Format NTSC/PAL

D. Environmental Specifications
   1. Operating Temperature 32° to 104°F (0° to 40°C)
   2. Operating Humidity 10% to 85%, noncondensing

E. Physical Specifications
   1. Dimensions
      a. PMCL624 1.91” D x 21.8” W x 12.92” H
      b. PMCL643 2.5” D x 38.55” W x 22.89” H
   2. Unit Weight
      a. PMCL624 7.9 lb
      b. PMCL643 48.5 lb

F. Mechanical Specifications
   1. Native Resolution 1920 x 1080p
   2. Panel Aspect Ratio 16:9
   3. Viewing Area
      a. PMCL624 20.75 x 11.67 in
      b. PMCL643 37.52 x 21.378 in
   c. Pixel Pitch
      a. PMCL624 0.0106 x 0.0106 in
      b. PMCL643 0.0193 x 0.0193 in
   5. Video Formats 480p, 1080i, 1080p
6. Brightness
   a. PMCL624 250 cd/m²
   b. PMCL643 300 cd/m²

7. Contrast Ratio
   a. PMCL624 1000:1
   b. PMCL643 1200:1

8. LED Backlight Type

9. Panel Life 40,000 hours

10. Viewing Angle (H/V) 178°/178°

11. Displayable Colors 16.7 million

12. Response Time
   a. PMCL624 5 ms
   b. PMCL643 6.5 ms

13. Speakers 2 internal (8 ohms)

14. Front Panel Controls Power, left/right, up/down, menu, input.

15. Indicators LED (power on/off)

G. Warranty
   1. 2 year, parts and labor

H. Pelco Model Numbers
   1. PMCL624 24-inch
   2. PMCL643 43-inch

2.10 FLAT PANEL MOUNTS

A. The flat panel monitor shall be provided with a wall-mount suitable for the weight and size of the specified unit and provide swivel and/or tilt capabilities.

B. The flat panel monitor shall be provided with side-mounted speakers.

C. The wall mount shall be a Pelco PMCL-Series.

2.11 CAMERA STATIONS

A. General:
   1. The system’s back box shall have three conduit openings. The series is available with a clear lower dome.
   2. The camera system shall offer a large selection of camera and lens options.
   3. The camera system shall meet or exceed the following design and performance specifications.

B. Standard Indoor Camera
   1. General Specifications:
      a. Construction: Aluminum with steel camera mounting bracket and polycarbonate dome
      b. Finish: Light gray polyester power coat
      c. The indoor, vandal-resistant network dome camera shall provide options for clear and smoked lower dome.
d. The indoor, vandal-resistant network dome camera shall provide advanced low-light capabilities for day/night models with sensitivity down to 0.05 lux in color and 0.00 lux in monochrome with infrared.

2. Electrical Specifications:
   a. Network Port: RJ-45 for 100Base-TX, Auto MDI/MDI-X
   b. Input Power: PoE (IEEE802.3af, Class 3)
   c. Power Consumption: 330 mA maximum

3. Mechanical Specifications:
   a. Clear dome with zero light loss and smoked dome with f/1.0 light loss.
   b. Pan/Tilt Adjustment: Manual, 355° pan; 180° tilt

4. Video Specifications:
   a. Frame rates up to 30, 25, 15, 12.5, 10, 5, 1.
   b. Network interface of 100Mbps (or greater)
   c. Video Streams
      1) Multiple simultaneous streams with up to 2 different configurations plus service stream; the second stream is variable based on the setup of the primary stream
      2) Color: NTSC

5. Warranty
   a. 3 years, parts and labor.

6. Pelco
   a. IME Series, refer to camera matrix for exact quantity, mounts and type.

C. Standard Outdoor/Indoor PAN-TILT-ZOOM camera:

1. General Specifications:
   a. The indoor/outdoor network positioning camera shall be a discreet camera dome system consisting of a dome drive with a variable speed/high speed pan/tilt drive unit with continuous 360° rotation.
   b. The indoor/outdoor network positioning camera offer multiple simultaneous video streams with 2.1 megapixel (MPx) 1920 x 1080 resolution, auto iris with 30X optical, and 12X digital zoom.
   c. The indoor/outdoor network positioning camera shall support standard IT protocols.
   d. The indoor/outdoor network positioning camera shall be conformant to the ONVIF, Profile S and support open architecture best practices with a published API available to third-party network video recording and management systems.
   e. The indoor/outdoor network positioning camera shall provide image stabilization to compensate for vibration introduced into the camera.
   f. The indoor/outdoor network positioning camera shall provide user-selectable configurations for day/night auto mode.
   g. The environmental network dome camera shall be NEMA-4X, IP66 rated.
h. The environmental network dome camera shall provide a 3/4-inch NPT conduit attachment in the back box for in-ceiling applications.

2. Electrical Specifications:
   a. Network Port: RJ-45 for 100Base-TX, Auto MDI/MDI-X
   b. Input Power:
      1) 24 VAC nominal, 24VA nominal (without heater and blower), 81VA nominal (with heater and blower)
      2) 24 VDC nominal, 1 A nominal (without heater and blower), 3 A nominal (with heater and blower)
      3) PoE+, 18 W, Environmental Models (with heater on), 15 W, Non-Environmental Models (with heater off),
      4) HPoE, 60 W, Environmental Models (with heater on), 15 W, Non-Environmental Models (with heater off),

3. Mechanical Specifications:
   a. Pan Movement: 360° continuous pan rotation
   b. Pan Speed: Variable between 450° per second continuous pan to 0.1° per second.
   c. Presets: 256 positions
   d. Tours: 16 Tours
   e. Motor: Continuous duty and variable speed, operating at 18 to 32 VAC, 24 VAC nominal.

4. Video Specifications:
   a. Frame rates up to 60, 50, 30, 25, 15, 12.5 10, 8.333, 7.5, 6, 5, 3, 2.5, 2, 1.
   b. Network interface of 100Mbps (or greater)
   c. Video Streams
      1) Multiple simultaneous streams with up to 2 different configurations plus service stream; the second stream is variable based on the setup of the primary stream

5. Warranty
   a. 3 years, parts and labor.

6. Pelco
   a. The discreet camera dome system shall be the Spectra 1080P S6230-Series Network Dome Positioning System. Refer to camera matrix for exact quantity, mounts and type.

D. Outdoor Fixed Dome Camera: Pelco model IMP1110 Series Sarix Fixed Dome Camera, having:
   1. Camera:
      a. The environmental network dome camera shall offer multiple simultaneous video streams with 0.9 megapixel (MPx) 1280 x 720 resolution, auto iris and varifocal lens.
      b. The environmental network dome camera shall provide a manual 3-axis (pan/tilt/rotation) positioning to allow adjustment for optimum camera rotation and placement.
      c. The environmental network dome camera shall feature an unsupervised alarm input, relay output and line level/external microphone input connections.
      d. The environmental network dome camera shall provide a service video stream in addition to and independent of the video streams.
e. The environmental network dome camera shall provide advanced low-light capabilities for day/night models with sensitivity down to 0.01 lux in night mode and 0.000 lux in monochrome with infrared.

f. The environmental network dome camera shall support industry standard Power over Ethernet (PoE) IEEE 802.3af, Class 3 to supply power to the camera over the network.

g. The environmental network dome camera shall support industry standard Power over Ethernet (PoE) IEEE 802.3af, Class 3 to supply power to the camera over the network for indoor models and Power over Ethernet (PoE+) Class 4 or 24VAC to supply power to the camera over the network for environmental cameras.

2. Camera Specifications:
   a. Imaging Device: ¼-inch
   b. Focal length: 3 ~ 10mm
   c. Auto-iris.
   d. Electronic Wide Dynamic Range: up to 75 dB.
   e. Aperture F-stop rating: Better than or equal to f/1.4.

3. Camera Housing, having:
   a. Dome housing sized to house camera, lens and receiver/driver unit.
   b. Clear Housing lens.
   c. Minus 40 degrees F to 131 degrees F temperature operating range.
      1) Integral Heater and blower: Maintains internal temperature of housing within operating range of camera, lens, with an outside temperature of Minus 40 degrees F to 131 degrees F.

4. Power Requirements: 24 Volts AC/PoE+
   a. Provide 120V/24V transformer (as called out on drawings).

5. Mounting equipment: Provide all materials required to securely mount the Outdoor Fixed Camera/ Housing Assembly to the existing building wall or camera pole.

6. Accessories: Provide all materials and work, as required for the Outdoor Fixed Camera/ Housing Assembly to function as listed in items 1 thru 6 above and as indicated in the SYSTEM DESCRIPTION.

E. Camera Wall Mount:
   1. Mounting Method: Wall Mount is secured by a set screw to a mounting plate that is attached to the mounting surface with two fasteners (not supplied) no greater than 1/4-inch diameter.
   2. Cable Entry Via cable feedthrough hole in mount adapters.
   3. Maximum Load 10 lb (4.5 kg)
   4. Effective Projected Area (EPA): SWM-GY ~12 square inches
   5. Construction:
      a. Wall mount Cast aluminum
   6. Finish: Gray polyester powder coat

F. Corner Adapter:
1. Corner Adapter is attached to a vertical load-bearing surface with two 0.375-inch (M8) diameter stainless steel bolts of appropriate length (not supplied). Includes hardware to attach SWM mount.
2. Cable Entry Via cable feedthrough hole in mount adapters.
3. Maximum Load 10 lb (4.5 kg)
4. Construction:
   a. Adapters Aluminum
5. Finish: Gray polyester powder coat
6. Pelco:
   a. SWM-CA Corner mount

G. Parapet Mount:
1. Parapet, wall/rooftop mount mounts to inside or outside of Parapet wall with 0.375-inch (M8) diameter stainless steel bolts of appropriate length (not supplied). Includes indexing bolts to secure the arm in position.
2. Cable Entry Via cable feedthrough hole in bottom.
3. Maximum Load 45 lb (20.41 kg)
4. Construction:
   a. Aluminum
5. Finish: Gray polyester powder coat
6. Pelco:
   a. PP450 Parapet mount

2.12 SURGE PROTECTION

A. Equip system with surge suppressors to protect equipment from voltage transients and lightning surges. Provide surge suppressors to protect each cable (and conductor) entering and leaving fence accessory stations, and the security equipment rack for exterior devices.
1. Internal surge protection built-in to system devices is not acceptable protection, provide external surge suppressor units as manufactured by Ditek, Northern Technologies and Transtector.
2. The type of surge suppressor units to be provided shall be suitable for the circuit it is connected, as recommended by the surge suppressor manufacturer and approved for use by the Company Field Advisor(s) for the Indoor and outdoor CCTV System.

B. Surge Suppressors: Ditek’s Model DTK-1F.
1. AC hardwired transient voltage surge suppressor.
2. Single circuit.
3. UL, IEEE C62.41B listed.
5. <5 nsecond installed, <1 nsecond component level response time.
6. 120 VAC service voltage rated.
7. 22,500 amps surge current rated.
8. Operating temperature –40° C to +85°C.
9. 6,000,000 hours MTBF.

C. DITEK Surge Suppressor.
1. Provide surge protection on each exterior cameras CAT 6 cable and ACP cable entering and leaving security equipment racks. Provide 6” square box on interior side of building located next to camera for surge protection device. Ground to building steel.

2.13 WIRING

A. Cables:
   1. All electrical characteristics shall meet the requirements of the Company producing the system (attenuation, conductor to conductor capacitance, cross-talk, dc resistance, velocity of propagation, etc.).
   2. Exterior Cameras:
      a. For Connections between the Power Over Ethernet Switch (POE) and Camera Stations, provide CAT6 suitable for direct burial and plenum rated. Remove plenum rated below when installed within conduit.
   3. Interior Cameras Plenum Rated:
      a. For connection to Fixed Camera Stations located within the building, provide CAT 6 cable; Paige TIA/EIA certified category 6, unless otherwise recommended by camera manufacturers.
      b. For connection to PTZ Camera Stations located within the building, provide CAT 6 cable; Paige TIA/EIA certified category 6, unless otherwise recommended by camera manufacturers.
   4. Miscellaneous Cables; provide additional cables as required for System to function as summarized in SYSTEM DESCRIPTION and indicated on the drawings:
      a. Number, size, and type of conductors as recommended by the Company producing the equipment.
      b. Conductors shall be enclosed in a cable with a jacket suitable for the environment that they are to be installed.
      c. Conductors shall be enclosed in a cable with a jacket suitable for the environment that they are to be installed.

2.14 CONNECTORS

A. Connectors: As produced by Amphenol Corp. (Weatherproof type where installed in exterior locations.)

2.15 VIDEO SIGNAL INTEGRITY EQUIPMENT

A. Video amplifiers, differential amplifiers, ground loop eliminators, etc., as required for proper signal transmission to produce sharp, clear, distortion free pictures on monitors.

2.16 MARKERS AND NAMEPLATES

A. Station Locator: Flip type bound file, indexed with tabs and equipped with 8-1/2” x 11” (minimum) plans showing location of each camera station, guard station, and location of all major equipment associated with the system. Enclose each plan in clear plastic envelope so that plans can be removed and updated.
B. **Wiring Diagram:** One line diagram showing interconnection of all major components associated with the system. Encase with aluminum or stainless steel frame, and plexiglass front.

C. **Markers:**
   1. Premarked self-adhesive; W.H. Brady Co.’s B940, Thomas and Betts Co.’s E-Z code WSL self-laminating, Ideal Industries’ Mylar/Cloth wire markers, or Markwick Corp.’s permanent wire markers.
   2. Flexible sleeve markers; Plastic Extruded Parts Inc.’s FS series.
   3. Snap-on markers; Plastic Extruded Parts Inc.’s RS series.
   4. Thermal transfer (non-smearing), Brady’s ID PAL hand held labeling tool, portable thermal transfer printer or equal.

D. **Nameplates:** Precision engrave letters and numbers with uniform margins, character size minimum 3/16 inch high.
   1. Phenolic: Two color laminated engraver's stock, 1/16 inch minimum thickness, machine engraved to expose inner core color (white).
   2. Materials for Outdoor Applications: As recommended by nameplate manufacturer to suit environmental conditions.

### 2.17 ENVIRONMENTAL ALARM UNIT (EAU)

A. **Temperature sensor with water detection as manufactured by Network Technologies Incorporated.**
   1. Enviromux model Enviromux-5D.
      a. 5 external configurable sensors, 5 digital inputs, 2 output relays.
      b. Configure Smart Alerts for different event combinations.
      c. 100 to 240 VAC at 60 hz via AC adapter.
      d. Optional 1RU rackmount kit.
      e. Internal battery backup – alerts are sent when there is a power outage and when power returns.
      f. Dual redundant power for connection to two separate power sources.
      g. Supports NTI’s advanced sensors which can be extended up to 1,000 feet using Cat5/5e/6 cable.
      h. Integrates with various Open Source monitoring packages – Nagios and MRTG.
      i. Remote Temperature sensor (Enviromux-STSM-E7);
         Temperature accuracy ±1.26°F for -4 to 41°F and ±0.72°F for 41 to 140°F
      j. Industrial Temperature/Humidity Sensor (ENVIROMUX-STHS-N4085IND-10); Applications from -40 to 185°F (-40 to 85°C) and 20 to 80% relative humidity.

### 2.18 CAMERA POWER INJECTOR

A. **Power Supply (outdoor PTZ cameras and Fence perimeter Fixed cameras), as manufactured by Pelco, POE75U. (Used in enclosures)**
   1. 75 Watts of High PoE power for exterior PTZ.
   2. 1 output
   3. 120VAC input
4. diagnostic LED
5. operating temperature -4 to 104 degrees Fahrenheit.

2.19 ACCESSORIES

A. Include accessories required to perform the functions summarized in SYSTEM DESCRIPTION and indicated on the drawings.

2.20 NETWORK SWITCHES

A. Ethernet Switch (CES/ES) as manufactured by Avaya, VSP 4450GSX.
   1. 12-Ports of 10/100/1000Base-T with PoE+ support
   2. 36 ports of 100/1000 Mbps SFP ports
   3. 2 ports of 1/10 gig SFP+
   4. System CPU operates at 1.2GHz
   5. Switch Configured with 2GB of 800 DDR3 DRAM
   6. RJ-45 Console port and a USB 2.0 port
   7. Ships with 1 set of 19” rack mount brackets
   8. Redundant Power Supplies.
   9. Dimensions: 1 rack unit
   10. Supply Required SFP modules.
   11. Electrical Specifications:
       a. Supplied with 1 x 1000W AC field replaceable power supply unit
       b. Supports addition of second field replaceable AC power supply for redundancy
       c. Power consumption without POE is 95W typical and 140W max with a thermal of 324BTU/hr typical and 477.70 BTU/hr max.

B. Power over Ethernet Switch (POE) as manufactured by Avaya, ERS 3524GT-PWR+.
   1. 24-Ports of 10/100/1000Base-T ports with support for IEEE 802.3af PoE or IEEE 802.3 at PoE+, with 4 shared SFP powers (combo with ports 21-24)
   2. 2 Rear SFP ports can be used as additional ports in Standalone Mode, or, as 2 rear HiStack ports delivering up to 10Gbps (FDX) of Stackable Chassis throughput per switch in Stacking Mode.
   3. System CPU speed: 400MHz
   4. System memory: 32MB Flash, 128MB DRAM
   5. RJ-45 Console port provides industry standard serial port connectivity
   6. Switch Capacity and forwarding rate (64-byte): 52Gbps / 38.7Mpps
   7. MTBF: 336,357 hrs
   8. Dimensions: 1 rack unit
  10. Electrical Specifications:
      a. Input Voltage: 100 to 240 VAC at 47 to 63 HZ
      b. Input Current (max): 5.0A @ 100VAC
      c. Power consumption: 500 Watts max
      d. Thermal output: 357 BTU/hr max

C. Power over Ethernet Switch (POE) as manufacturer by Avaya, VSP 4850GTS-PWR+.
   1. 48-Ports of 10/100/1000Base-T ports with support for both IEEE 802.3af PoE and IEEE 802.3at PoE+
   2. 2 Shared SFP Ports, Plus 2 x 1/10Gigabit SFP+ ports, Plus 2 x rear HiStack ports delivering up to 384Gbps of Stackable Chassis throughput.
   3. System CPU speed: 533MHz
   4. Switch is configured with 1 GB RAM
   5. RJ-45 Console port provides industry standard serial port connectivity.
   6. 146cm HiStack Cable.
   7. Dimensions: 1 rack unit
   8. Supply Required SFP modules.
   9. Electrical Specifications:
      a. Input Voltage: 100 to 240 VAC at 47 to 63 HZ
      b. Power consumption: 112 Watts (without PoE Load), 855 watts Max when operating on one power supply, 1855 watts max when operating on two power supplies.
      c. Thermal output: 383 BTU/hr max

2.21 COPPER PATCH PANEL (CPP)

A. UTP Coupler Patch Panel
   1. Exceeds channel requirements of ANSI/TIA-568-C.2 Category 6 and ISO 11801 Class E standards at swept frequencies 1 to 250 MHz.
   3. Industry Standard interface provides a quick and easy plug and play connection to RJ45 patch cords; backwards compatible.
   4. Factory installed 24-port patch panel mounts
   5. As manufactured by Panduit, model CP24688BL.

B. Cable Management System (CMS)
   1. 2RU
   2. Hinged cover
   3. 48 port
   4. As manufactured by Panduit

2.22 ALARM PANEL (AP)

A. Alarm panel, as manufactured by Honeywell, Vista-20P series.
   1. Aux. power 12VDC, 600mA maximum.
   2. Seven hour standby at 400mA aux. load with four amp hour battery.
   3. Supports up to four relay boards (up to 16 relays).
   4. Eight hardwired zones.
   5. Programmable swinger suppression.
   6. 20 selectable zone types plus four configurable zone types.
   7. 6160 keypad
2.23 THOMAS & BETTS WHILE-IN-USE COVER MODELS CKNM (SINGLE GANG) AND 2CKNM (DOUBLE GANG).

A. Specifications:
   1. High impact UV-resistant polycarbonate base construction.
   2. Weather proof transparent, high impact thermoplastic cover.
   3. Lockable cover design.
   4. UL Listed.

B. Provide the while-in-use covers at all emergency power 120vac receptacles.

2.24 WIRE-PULLING COMPOUNDS

A. To suit type of insulation; American Polywater Corp.’s Polywater Series, Electric Products Div./3M’s WL, WLX, or WLW, Greenlee Textron Inc.’s Y-ER-EAS, Cable Cream, Cable Gel, Winter Gel, Ideal Industries Inc.’s Yellow 77, Aqua-Gel II, Agua-Gel CW, or Thomas & Betts Corp.’s Series 15-230 Cable Pulling Lubricants, or Series 15-631 Wire Slick.

2.25 WIRE MANAGEMENT PRODUCTS

A. Cable Clamps and Clips, Cable Ties, Spiral Wraps, Velcro etc: as manufactured by Catamount/T&B Corp., or Ideal Industries Inc.

2.26 NETWORK TIME PROTOCOL (NTP)

A. 9389: NetClock/GPS NTP Time Server
B. 8225: GPS Outdoor Antenna
C. Cal7050: 50’ of Antenna cable (LMR 400)
D. GPS Surge Protector
E. 5-Year Spectracom Warranty
F. As manufactured by Spectracom

2.27 KEYBOARD/VIDEO/MOUSE EXTENDER (KVM-E)

A. Single Head:
   1. 1920 x 1080 @ 60 Hz
   2. 1”H x 2.9”W x 4.9”D
   3. Connectors
      a. Local unit:
         1) (1) USB Type B F; (1) DVI-D F
         2) Interconnect: (1) RJ-45; (1) 2.5-mm barrel connector; (2) 3.5-mm audio connectors
         3) Power: From the interface or via optional PS649-R3
      b. Remote unit:
         1) (2) USB Type A F; (1) DVI-I D F
2) Interconnect: (1) RJ-45;
3) Power: 90-240 VAC, 47-63 Hz, autosensing, external, with IEC 320 connector and cord

B. Dual Head:
1. 1920 x 1080 @ 60 Hz
2. 2"H x 3.1"W x 5"D
3. Connectors
   a. Local unit:
      1) (2) USB Type B F; (2) DVI-D F
      2) Interconnect: (2) RJ-45; (2) 2.5-mm barrel connector; (2) 3.5-mm audio connectors
      3) Power: From the interface or via optional PS649-R3
   b. Remote unit:
      1) (4) USB Type A F; (2) DVI-I D F
      2) Interconnect: (2) RJ-45;
      3) Power: 90-240 VAC, 47-63 Hz, autosensing, external, with IEC 320 connector and cord
4. As manufactured by blackbox, model ACU5502A-R3.

2.28 CAMERA STATION POLES

A. Tapered (continuous) galvanized steel poles, having:
1. 26 foot nominal height. (As indicated on drawings)
2. 15 inch minimum bolt circle.
3. 11 inch minimum shaft diameter at base OE – (3125 inches).
4. Bracket Arm: 6 feet long, 6 inch diameter, and 7 gage minimum galvanized steel with:
   a. Mounting plate at end for mounting camera station.
   b. 3 x 5 inch minimum handhole with reinforcing frame and cover located at outer end of arm.
5. 4 x 8 inch minimum handhole with reinforcing frame and cover near top of pole.
6. 4 x 8 inch minimum handhole near pole base with reinforcing frame and cover. Secure cover with vandal resistant screws.
7. Mounting plate on top of pole suitable for mounting camera station.
8. Four 1-1/2 inch diameter anchor bolts 60 inches long with 4 inch right angle leg. Threaded end hot dipped galvanized for minimum of 10 inches. Two galvanized nuts with each anchor bolt. Template for setting anchor bolts.
9. Pole construction suitable for a deflection rate of less than .26 inches per 100 lbs load at yield 18 inches from top of pole.

B. Acceptable Manufacturers: Union Metal Corporation, Canton Ohio 44711.

2.29 CONCRETE BASES

A. Bases may be precast or poured in place.
1. Use Concrete as specified in Cast-In-Place Concrete (Section 033001).
2. Construct concrete pole base as detailed on drawings.
3. Use reinforcing steel as detailed on drawings.
4. Install Four 1-1/2 inch diameter anchor bolts 60 inches long with 4 inch right angle leg. Threaded end hot dipped galvanized for minimum of 10 inches. Two galvanized nuts with each anchor bolt. Utilize pole manufactures template for setting anchor bolts.

2.30 **UNIVERSAL DEVICE INTERFACE (UDI)**

A. Universal device interface for third-party cameras or for ASCII systems.

B. Connections
   1. RS-232 DB-9 connector.
   2. 1 Gigabit Ethernet RJ-45 (10/100/1000Base-T)
   3. 2 USB 2.0 ports, 1 parallel port, 1 S-Video port, audio input/output

C. Power
   1. Power input: 12VDC
   2. Power Consumption: 60W, 5A, 205 BTU/H

D. Can accommodate IP camera streaming for as many as 16 standard resolution cameras and several megapixel cameras from most manufacturers.

E. Any combination and any mix of IP camera type and manufacturer is supported to reach a maximum bit rate, frame rate and resolution.

F. These cameras can be distributed throughout the network and then associated with a UDI5000 series to translate network communication packets into a standard that is compatible with the system.

G. Provides users with a powerful means by which to leverage investments in legacy analog systems and integrations, while paving the way to leverage the benefits afforded by today’s IP and megapixel camera technologies.

H. Pelco Model Numbers
   1. UDI5000-CAM.
   2. UDI5000-MTRX.

2.31 **OPTICAL FIBER BI-DIRECTIONAL RECEIVER/TRANSMITTER (OFBDR/OFBDT)**

A. POE Media Converter for fixed cameras as manufactured by Pelco, FMCI-PG1PoE.
   1. Electrical port supports auto negotiation for 10 Mbps, or 1000 Mbps, Full-Duplex or Half Duplex Data.
   2. IEEE802.3at Class1-4 Power over Ethernet (PoE) 30W at 48VDC
   3. LED Status Indicators for Monitoring All Critical and Normal Operating Parameters.
   4. Provide required FSFP modules.
   5. External Power supply.
   6. Operating temperature -40°f to 167°f
   7. Dimensions: 3.30”D x 2.50”W x 1.10”H
8. Electrical Specifications:
   a. Power Input: 48 VDC
   b. Power Consumption: 50W


B. Media Converter as manufactured by Pelco, FMCI-PG2.
   1. Supports Auto negotiation and Automatic medium dependent interface/medium dependent interface crossover (MDI/MDI-X)
   2. LED Status Indicators for Monitoring All Critical and Normal Operating Parameters.
   3. Stand-alone or rack mountable modular design.
   4. Compliant with IEEE 802.3 standards.
   5. Full-Duplex Transmission of 10/100/1000 Mbps Ethernet.
   6. Provide required FSFP modules.
   7. External Power supply.
   8. Operating temperature -40°F to 167°F
   9. Dimensions: 6.10"D x 5.30"W x 1.10"H
   10. Utilize USRACK chassis for rack mounting of device.
   11. Electrical Specifications:
       a. Power Input: standard size 8 to 15 VDC, mini AC/DC 22 to 27 VAC or 8 to 24 VDC
       b. Power Consumption: 2W

2.32 ACCEPTABLE MANUFACTURERS:

A. Manufacturer’s names, catalog numbers, and trade names are used to establish a level of quality and the operational characteristics for the products and systems specified. Specified materials, products, and services shall be provided unless otherwise approved by change to the bidding or contract documents. Materials, products, and services of manufacturers listed as “acceptable” may only be substituted for approval provided they meet or exceed the specified requirements and meet or exceed the level of quality and service established by the “specified” manufacturer. Listing of a manufacturer as specified or acceptable does not relieve the manufacturer of the responsibility to comply with the complete specification.

B. Equivalent products of other manufacturers will be considered based on product data, manuals, demonstration software, and other technical information as necessary to show compliance with the specification. Information must be submitted at least fourteen (14) days prior to bid due date and be approved by addendum. Product substitution will not be accepted during the submittal process.

C. Contact Mark Wilens at Wilens Professional Sales, Inc. for product information based on products listed in this specification: (845) 679-4300.
PART 3 EXECUTION

3.01 PRELIMINARY TEST RECORDINGS

A. After receipt of approval of submittal package No. 1, perform Preliminary Test Recordings (Video) to verify correct placement of the camera stations.

B. Prior to installation of the system, provide preliminary test recordings of 10% of total camera stations.
   1. Perform the following test recording for each camera station:
      a. Temporarily locate the camera stations at the locations indicated on the drawings.
         1) The camera station(s) shall have the cameras, lenses and housings as indicated on the drawings for the camera station(s).
         2) Provide temporary supports, cabling, etc. required for the camera station(s) for making the test recordings.
         3) Make a digital recording of each camera station test recording for a minimum of 30 seconds.
         4) Include written description and/or camera station layout to accompany digital recording to identify each recorded scene.
         5) Supply equipment necessary to make the video digital recordings.
         6) The temporary installation shall be performed under the supervision of the Company Field Advisor for the cameras.
         7) At the start of the recording for each camera station:
            a) A person is to hold a sign up to the camera with the camera station designation written on it that is be recorded in that scene. Sign must be visible in recording playback.
            b) The person is to then walk from end to end of the area to be covered by the camera station.

   2. All recordings shall be witnessed by the Director's Representative and the Company Field Advisor(s) for the cameras equipment.

   3. Provide a written report for the Director's Representative that includes any recommendations, if any, by the Company Field Advisor(s) for better video coverage.
      a. If during the course of making the preliminary test recordings the Company Field Advisor determines that an alternate location for a camera station might be more appropriate for an area, make an additional recording for that area with the equipment relocated to the location recommended by the Company Field Advisor.
         1) No changes to any equipment's permanent location is to be made without the written request.

3.02 INSTALLATION

A. Pre-installation Meeting:
1. After approval of Submittals Package 1, conduct Pre-Installation Meeting.
   a. Provide a minimum of 1 week notice to the Director’s Representative, so that a Pre-Installation meeting schedule can be set up with facility personnel and arrangements can be made for a location to hold the meeting.
   b. Provide all materials necessary for training (training aides, handouts, overhead projector, etc.).

B. Install closed circuit television system in accordance with the Company's printed instructions:
   1. Terminiations and connections to devices are not to be made until Point to Point Wiring Diagrams (required to be submitted in Submittals Package 2) have been submitted and approved.

C. Camera Station Poles:
   1. Install each camera station pole on a concrete base.
   2. Prepare a level surface on compacted earth, undisturbed earth or concrete footing. Set bases on the prepared surface. Have all bases checked and approved by the Director's Representative for level and elevation prior to making any conduit connections.
   3. Install camera station poles vertical:
      a. Use 2 nuts on each anchor bolt. Run first nut down on the thread to the top of the foundation.
      b. Install pole, run second nut down.
      c. Adjust pole if necessary, then tighten nuts in accordance with pole manufacturer's recommendations.
      d. Grout voids between metal base of camera station poles and concrete base. Create a drain through the grout by slipping a short length of conduit under the base in the wet grout, projecting it into the large drain hole in the base of the camera station poles. Rotate the conduit to finish the drain, then remove conduit.

D. Cables:
   1. Optical Fiber cables shall be continuous and un-spliced between the security equipment racks and the camera stations.
   2. Install conductors in raceways after the raceway system is completed. Exception: Conductor types specifically indicated on the drawings not to be installed in raceways.
   3. No grease, oil, or lubricant other than wire pulling compounds specified may be used to facilitate the installation of conductors.
   4. Connect system components requiring a primary power supply to dedicated emergency power branch circuits. 120 VAC Power by Electrical Contractor.
   5. Make connections and splices at system components, terminal strip cabinets, and console only. Connections or splices will not be allowed at any other location in the system.
   6. Use wire management products to bundle, route, and support wiring in junction boxes, pull boxes, wire ways, gutters, channels, and other locations where wiring is accessible.
7. The security vendor will be responsible for final calculations of power and signal runs to insure the wiring supplies a non-degraded signal and power requirements that meets manufactures specifications for equipment based on final device location and routing back to security headend equipment.

8. Bending and pulling tensions will not be exceeded per the cable manufacturer specifications. Contact manufacturer for specific requirements of the cable to be pulled.

E. Connections:
1. Make connections and splices at camera stations, fence accessory stations. Connections at the security equipment racks (Furnished by Others). Connections or splices will not be allowed at any other location in the system.

2. Use markers to identify conductors at terminal strips, fence accessory stations, and security equipment racks (designations shall correspond with point to point wiring diagrams).
   a. Markers for individual conductors of a multi-conductor cable is not required, if the following requirements are met:
      1) Each individual conductor in the cable is color coded differently from other conductors in the cable.
      2) The multi-conductor cable has a marker identifying it.
      3) The color coding of each conductor is identified on the point to point wiring diagram.

3. Use coaxial cable connectors for splicing and terminating coaxial cables. Use terminal strips for splicing and terminating other types of cable.

F. Surge Suppressers:
1. Provide surge protection on each CAT 6 cable and ACP cable entering and leaving security equipment racks.

2. At fence accessory stations: provide surge suppressers on each CAT 6 cable and ACP cable going to camera stations powered from that fence accessory station.

3. At fence accessory stations: provide surge suppressers on 24 VAC conductors going to camera stations powered from that fence accessory station.

G. Identification, Labeling, Marking:
1. Station Locators: Install adjacent to each workstation.

2. Wiring Diagram: Install adjacent to equipment in hub router security equipment rooms.

3. Nameplates:
   a. Install nameplate with monitor designation over each monitor.
   b. Install P-touch labels for camera station number on all interior cameras.
   c. Install phenolic nameplates for camera station number on all exterior cameras. Mount on wall or camera pole below camera 10’ AFG.
   d. Install phenolic nameplates for all equipment racks.
   e. Install phenolic nameplates for all equipment mounted in equipment racks.
4. Identification of Circuits: Identify wires and cables by system and function in cabinets with premarked, self-adhesive, wraparound type markers. Designations shall correspond with point to point wiring diagrams. Wiring must be identified at both ends of wiring and within 3 inches of termination point.

5. Battery Data: Insert a copy of the battery warranty in each battery compartment and mark on batteries the date placed in service.

H. Mounting Hardware:
   1. Mount all exposed equipment with security grade tamper proof center pin reject style torx type mounting screws.

I. Earth ground of equipment as required by equipment manufacturer.
   1. Do not use telephone ground connections as earth grounds.
   2. Do not use connections to building structural steel as earth grounds.
   3. Provide equipment-grounding conductors to ground bar

3.03 SYSTEM TRAINING

A. After the system is substantially complete and operational, provide on-site training of facility security, security supervisory, and maintenance personnel.
   1. Provide a minimum of 1 week notice to the Director’s Representative, so that a training schedule can be set up with facility personnel and arrangements can be made for a location to hold the training.
   2. Provide all materials necessary for training (training aides, handouts, overhead projector, etc.).

B. System Operation Training: Training shall be set-up so that at the end of training, facility (security, security supervisory, and maintenance) personnel shall have a complete understanding of:
   1. How the system operates.
      a. Training should include precautionary concerns that personnel should be aware of that could effect proper operation of the system.
   2. Knowledge of all components in the system and their function.
   3. How the system is interconnected with other security systems and how the system operates in conjunction with the other systems.
   4. Weekly testing procedures for the system required to be performed.
      Each perimeter zone shall be tested weekly as follows:
      a. Perform the detections system’s weekly test as described by below.
         1) Check to see that the activation of the detection system in that zone (thru the perimeter alarm system) causes the following responses by the perimeter surveillance CCTV system:
            a) Camera stations associated with the alarm points are automatically switched to the video quad and alarm monitor of the CCTV system and switched to the CCTV system’s video recorder. The video recorder should automatically start recording upon alarm.
Prior to performing a test on a perimeter zone monitored by pan/tilt/zoom camera station, so to confirm proper functioning of the camera station, perform the following:

(a) Pan the camera station 90 degrees away from the zone that is to be tested.
(b) Tilt the camera station to an angle other than what will be called up when the zone goes into alarm.
(c) Adjust the lens’ field of view to a setting other than what will be called up when the zone goes into alarm.

Verify pre-position (pre-shot) called-up upon alarm by each pan/tilt/zoom camera station is aimed and focused to completely view the zone in alarm.

Verify video recorder activation by reviewing recorded images after performing weekly testing of automatic camera call-up upon alarm.

(a) Recorded images should show actions of each camera station upon receipt of the alarms.
(b) Recorded images will provide record of test having been performed and will provide indication of the quality of the recording and ensure images being recorded are in satisfactory.

C. System Maintenance Training: Training shall be set-up so that at the end of training, facility maintenance personnel shall have a complete understanding of:

1. Routine (monthly, quarterly or annual) maintenance required to the system and how to perform that maintenance.
   a. Training should include precautionary concerns that personnel should be aware of that could effect proper operation of the system.

2. Knowledge of all components in the system and adjustments to the components that they would be required to perform to maintain operation of the system.

3. Programming of the system.
   a. Training should include, but is not limited to the following:
      1) How to program automatic call-up of camera stations as salvos (and set camera station pre-positions) when the zones they are associated with go into alarm.
2) How to set pre-positioned scenes for each zoom-pan/tilt camera station.

3) How to program automatic sequencing of camera stations in any order on monitors connected to the output of the enhanced decoder.
   a) How to set dwell time (2 to 60 seconds) that each camera station scene is displayed in sequence on the monitor.

4) How to set system time and date.

5) How to program on screen camera station identification displayed for each camera.
   a) How to set the identification positioning and brightness for each monitor connected to the output side of the enhanced decoder.

6) How to store and re-store system programming to and from CD’s, via the dedicated workstations.

7) Training should include instruction in all programming required to the system necessary for the system to operate as outlined in the SYSTEM DESCRIPTION.

8) Training should include precautionary concerns that personnel should be aware of that could effect proper operation of the system working on the system.

4. How to replace all items listed as spare parts for the system.
   a. Training should include precautionary concerns that personnel should be aware of that could effect proper operation of the system working on the system.

5. Annual testing procedures for the system required to be performed by the Department.
   a. The perimeter surveillance CCTV system be tested annually as follows:
      1) Perform weekly test upon the system.
      2) For pan/tilt/zoom camera stations: Verify all pre-positions settings for each camera station is aimed and focused as required.
      3) Check the condition of all of the system monitors to ensure that each displays a clear and sharp picture.
      4) Check system’s time/date setting.
      5) Check operation system from each system keyboards and monitors connected to the system.

3.04 FIELD QUALITY CONTROL

A. Cable Test: Electronically meter test and documents all cables, control wiring, and twisted cables prior to installing equipment and electronically test and document all cables under the supervision of Company Field Advisor. Test for open, grounds, and shorts.

B. Make corrections to wiring prior to proceeding. Advice the Director’s Representative of any cable that cannot be repaired.

C. Provide written test results for all cables and certify operation.
D. Test all cables after installation and prior to connecting new equipment.
   1. Cable Testing: The following tests will be performed to ensure that the cable is installed correctly:
      a. Wire map.
      b. Length.
      c. Insertion loss (attenuation).
      d. NEXT loss (Near-End Crosstalk)
      e. PSNEXT loss (Power Sum Near-End Crosstalk).
      f. ELFEXT loss.
      g. PSELFEXT loss (power Sum Equal Level Far-End Crosstalk)
      h. Return loss.
      i. ACR (Attenuation to Crosstalk Ratio)
      j. PSACR (Power Sum Version of ACR)
      k. Propagation Delay
      l. Delay Skey
      m. Model Number: Fluke Networks DTX-1800 Cable Analyzer.

E. UPS Testing:
   1. Perform the tests listed below according to manufacturer’s recommendations upon completion of installation of the system.
      a. Simulation of malfunctions to verify proper operation.
      b. Tests of duration of supply on emergency, demonstrations of low-battery voltage shutdown and transfer due to normal source failure. Utilize Load bank of equal load on UPS to test.
      c. Test for 15 minutes to prove capacity of system.
      d. Continue test beyond 15 minutes to automatic shutdown due to low battery voltage.
      e. Submit written report of test results signed by person performing test and the director’s representative.

F. Preliminary System Test:
   1. Preparation: Have the Company Field Advisor adjust the completed system and then operate it long enough to assure that it is performing properly:
      a. Adjust each camera's imaging device position ("Back Focus Adjustment") in relationship with its lens to maximize the camera performance. Make adjustments at night (or during the day using a filter). Iris shall be fully open while adjusting the position of the imaging device in the camera. Exact method for adjustments shall be in accordance with the camera and lens manufacturers' printed instructions.
      b. Make adjustments for clear, sharp, distortion free scenes and roll-free vertical interval switching to the satisfaction of the Director's Representative.
      c. Program system, including salvo call-up of camera stations upon alarm as indicated on the drawings and their pre-position programming of each camera station to view the zone in alarm.
         1) Pre-position Tour: Pre-position No. 99 for each camera station shall be set so that with all camera stations set at pre-position No. 99 a complete tour of the facility's
perimeter fences associated with the perimeter alarm system is made.

a) In pre-position No. 99, the entire perimeter shall be covered and automatic sequencing of cameras stations simulates a tour of the perimeter alarm system fence.

2. Run a preliminary test for the purpose of:
   a. Determining whether the system is in suitable condition to conduct the acceptance test.
   b. Checking and adjusting CCTV equipment.
   c. Training facility personnel.

G. Digital Test Recordings (Scenes):
   1. After completion of the preliminary system test and prior to system acceptance test, make digital recordings of the following scenes recorded from the cameras installed under this project:
      a. During daylight with the cameras positioned in pre-position No. 99, consecutively sequence all cameras (with the dwell time set for each camera at 30 seconds) for a minimum period of 15 minutes or until all cameras have been viewed twice.
      b. Same as item "a." above except recording shall be done at night.
      c. Activate a test of each perimeter alarm system zone and record the following:
         1) Record in quad view the salvo (4 camera stations) called up when the zone goes into alarm.
            a) After 30 seconds of recording, and while still recording, pan each camera station covering the zone a minimum 90 degrees away from the zone being tested, clear and re-test the zone and record for another 30 seconds in quad view.
            b) Without moving the camera stations record for a minimum of 15 seconds each of the camera stations at full screen covering the zone being tested.
   2. Include written description to accompany tape to identify each recorded scene.
   3. Digital recordings shall be suitable for playback on a standard digital MPEG video playback system.

H. System Acceptance Test:
   1. Prerequisite: Digital Test Recording of camera scenes must be approved prior to scheduling of the System Acceptance Test.
   2. Preparation: Notify the Director's Representative at least 3 working days prior to the test so arrangements can be made to have a Facility Representative witness the test.
   3. Make the following tests:
      a. Test each system function step by step as summarized in SYSTEM DESCRIPTION.
      b. Demonstrate that:
1) Each camera station provides sharp, clear, distortion free scenes on the associated monitors for the lighting conditions.

2) Each indoor camera station operates through full range of lighting conditions including: daylight (all fixtures off), general lighting on (at night), and night lights only (at night).

3) Each outdoor camera station operates through a full range of lighting conditions including low lighting levels. A portion of this test must be performed at night.

4) Each camera operates through the full range of zoom lens.

5) Each camera housing operates through the full range of its pan and tilt capabilities.

6) Outdoor camera station mountings are stable in wind conditions at the site.

4. Supply equipment necessary for system adjustment and testing.

5. Submit written report of test results signed by Company Field Advisor and Director's Representative. Mount a copy of the final report in a plexiglass enclosed frame assembly adjacent to the security equipment rack.

END OF SECTION
SECTION 283105
MODIFICATIONS TO FIRE ALARM SYSTEM

PART 1  GENERAL

1.01 ALLOWANCES

A. An allowance for the following portions of the Work of this Section is included in Section 012100:
   1. Services of the Company Field Advisor as described in QUALITY ASSURANCE.
   2. All items listed in SUBMITTALS.
   3. Engineering and reprogramming associated with the installation of the new equipment and updating existing information.
   4. All products listed in PART 2 of this Section except:
      a. Protective devices.
      b. Terminal strip cabinets.
      c. Conductors and cable.
      d. Signs, labels, markers, and nameplates.
      e. Labor for installation of the products is not included in the allowance and shall be included in the contract sum.
   5. Spare parts listed in Part 1 of this Section except protective devices.

1.02 REFERENCES

A. Underwriters Laboratories Inc.

B. National Fire Protection Association Standard 72 and 13” FOR SPRINKLER SYSTEM ALARM AND SUPERVISION.

1.03 DEFINITIONS

A. Initiating Device Circuit: A circuit to which automatic or manual initiating devices are connected where the signal received does not identify the individual device operated. Example:
   1. Circuits from PPSSs and ICUs to non-addressable signal initiating devices.

B. Notification Appliance Circuit: A circuit or path directly connected to a notification appliance. Example:
   1. Circuits from PPSSs and ICUs to notification appliances.

C. Signaling Line Circuit: A circuit or path between any combination of circuit interfaces, control units, or transmitters over which multiple system input signals or output signals, or both are carried. Examples:
   1. Circuits from PSS to building PPSSs and ICUs.
   2. Circuits from PPSSs and ICUs to addressable devices.
D. Operating Mode:
1. Private Mode:
   a. Audible and visible signaling only to those persons directly concerned with the implementation and direction of emergency action initiation and procedure in the area protected by the fire alarm system, and:
   b. Audible and visible signaling only to those persons within special designated areas where private mode operation is specified to be applicable.
2. Public Mode: Audible and visible signaling to occupants or inhabitants of the area protected by the fire alarm system.

1.04 DESCRIPTION OF EXISTING SYSTEM

A. The existing site fire alarm system is a FireworX FX-10RD Zoned System. This system monitors the following existing buildings: Building 1 (houses head end), building 2.

B. The existing fire alarm control panel in building 1, 10 zone, GE FX10RD FACP.

C. Existing System Description:
1. Smoke detectors and smoke sensors operate in conjunction with the systems’ alarm verification program.
   a. The alarm verification operation is selectable by zone for smoke detectors.
   b. The activation of any smoke detector within its zone initiates the alarm verification program.

2. Alarms are processed by the system at 3 levels of priority:
   a. Fire alarms have the highest priority.
   b. Other alarms that require interaction by the attendant have the second level of priority.
   c. Monitored points which do not require interaction by the attendant are the third level of priority.

4. Access to the system functions are controlled thru at least 3 levels of access security to prevent program modifications or use by unauthorized personnel.

5. Alarms, supervisory signals, and trouble signals are distinctively and descriptively annunciated.

6. Switches for silencing audible trouble and supervisory signals transfers the audible signal to a lamp or other visible indicator adjacent to the switches.

7. All system visual and audible trouble signals and visible indication of their restoration is indicated at the PSS.
   a. Each building’s visual and audible trouble signals and visible indication of their restoration is indicated at its PPSS.

8. Monitoring of ground fault conditions indicate a ground fault trouble condition at the PSS.

9. Summary reports are displayed and printed at the PSS upon appropriate keyboard or function command.
10. Life safety control-by-event functions are retained in a non-volatile programmable memory and are not alterable through normal operation of the system.
   a. The life safety control-by-event control points may be manually operated at any time by authorized personnel thru appropriate system commands.
   b. Dedicated switches in the remote annunciator/control centers (RA/CCs) allow personnel to manually operate specific pre-programmed life safety control-by-event control points.
   c. Life safety control-by-event functions are printed and displayed at the PSS.

11. User programmable control-by-event functions may be programmed thru appropriate system commands to automatically activate any user programmable control point upon a status change from any programmable monitor point.
   a. The user programmable control-by-event control points may be manually operated at any time by the authorized personnel thru appropriate system commands.
   b. Dedicated switches in the RA/CCs allows personnel to manually operate each pre-programmed user programmable control-by-event control point.
   c. Assigned messages, date and time are printed and displayed at the PSS for the control points activated by the user programmable control-by-event function.

12. User programmable parameters for automatic time-initiated functions (start/stop, on/off, secure/access, etc.) may be added, omitted and altered thru appropriate system commands.
   a. The time-initiated user programmable control points may be manually operated at any time by authorized personnel thru appropriate system commands.
   b. Dedicated switches in the RA/CCs allows personnel to manually operate each pre-programmed user programmable time-initiated control point.
   c. Assigned messages, date and time are printed and displayed at the PSS for the control points activated by the time-initiated control point.

D. The PSS activates immediately and performs its alarm functions upon receipt of system alarm condition thru actuation of automatic or manual initiating devices:
   1. The PSS sounds its audible alarm and illuminates its system alarm lamp or flashing display.
      a. The PSS displays the point and type of alarm condition.
      b. The PSS prints the assigned message with date and time on the printer for the point in alarm.
   2. The fire department is automatically called.
   3. An authorized person at the PSS presses the acknowledge button which silences its audible alarm and causes a print-out and CRT display of the assigned message for the point in alarm with date, time and an acknowledge prefix.
E. Life Safety Control-By-Event Functions: The PSS, PPSSs and ICUs immediately perform life safety control-by-event functions upon system alarm condition:

1. Audible alarm signal sounds:
   
a. Throughout the building in which the alarm is initiated. Alarm is transmitted to main FACP and annunciates on main FACP.

b. An authorized person may silence any alarm signal in progress through a silence command, but subsequent actuation of non-addressable initiating devices in other zones cause the system to resound and record the alarm. Subsequent actuation of another addressable initiating device also causes the system to resound and record the alarm.

c. An authorized person may activate the alarm notification appliances on selected floors, and all floors, each building, and all areas of the facility.
   
   1) Visual indicators in the RA/CC at the PSS indicate on/off status of the alarm notification appliances.

2. Visual alarm notification appliances illuminate and flash a fire warning signal.

3. Electromagnetic door hold-open devices de-energize, allowing the associated smoke doors to close.
   
   4. Selected HVAC equipment (fans, air handling units) shut down.

   5. Fire dampers and smoke dampers close.

6. Non-motorized rolling fire shutters and non-motorized rolling fire doors close when the associated smoke detecting devices are actuated.

7. Motorized rolling fire shutters and motorized fire doors close when the associated smoke detecting devices are actuated.

F. An authorized person manually resets system at conclusion of alarm condition. When an alarm condition is corrected, a print-out and display occurs at the PSS stating the assigned reset message for the point in alarm with the date, time and reset suffix.

G. Primary and Secondary Power Supplies:

1. Failure of primary power supplies automatically transfers the affected portions of the system to the secondary power supplies.

2. Utilizing the secondary battery power supplies, the system operates under maximum normal load conditions for 24 hours and then is capable of operating all alarm notification appliances used for evacuation for 5 minutes.

3. Upon restoration of primary power supply, the system reverts to normal operation without loss, attendant intervention, or manual re-start procedures.

H. Monitoring Integrity of Installation Conductors and Other Signaling Channels:

1. Performance of Signaling Line Circuits:
a. Circuits from PSS to PPMCU’s: NFPA 72, Class A, Style 7. A print-out and display occurs to identify trouble conditions.

b. Circuits from PPMCU’s and ICUs to Addressable Devices: NFPA 72, Class B, Style 4. A print-out and display occurs to identify trouble conditions.

2. Performance of Initiating Device Circuits (Buildings _1 & 2):
   a. Circuits from PPMCU’s and ICUs to Initiating Devices (Fire Alarm): NFPA 72, Class B, Style C. A print-out and display occurs to identify trouble conditions.

3. Performance of Notification Appliance Circuits (Buildings _1 & 2):
   a. Circuits from PPMCU’s and ICUs to Notification Appliances: NFPA 72, Class B, Style Y. A print-out and display occurs to identify trouble conditions.

4. Monitoring Integrity of Power Supplies:
   a. An audible and visual alarm, display and print-out indicates failure of the primary (main) power supplies, within the system, at the PSS.
   b. The system also monitors the secondary (battery) power supplies for battery trouble conditions (low voltage/no batteries, high current and charging current).

I. Interconnection of Fire Safety Control Functions:
   1. Monitoring of wiring to the protected premises fire safety function relays and appliances causes a print-out and display to occur at the PSS to identify trouble conditions.

J. Sprinkler System Alarm and Supervision:
   1. Flow of water through a waterflow fire alarm switch causes a system alarm.
   2. Supervision of sprinkler system signal attachments (sprinkler valve supervisory switches, pressure switches, etc.) indicates circuit trouble and supervisory signal conditions at the PSS.
   3. Control valves in the sprinkler system are supervised.

K. Supervision of All Fire Suppression Systems for Tampering:
   1. In addition to the specific supervision functions of each fire suppression system, each system indicates trouble condition at the PSS whenever components of the system are tampered with, opened or removed.

1.05 MODIFICATIONS TO EXISTING SYSTEM

A. Remove and Replace existing zoned fire alarm control panels in buildings 1 & 2 with fiber networked addressable fire alarm control panels.

B. Provide sprinkler valve supervisory and sprinkler alarm capability.

C. Provide additional addressable smoke detectors as indicated on contract drawings.

D. Provide additional addressable heat detectors as indicated on contract drawings.
E. Remove and replace existing alarm bells with combination horn/strobes.

F. Provide additional combination horn/strobes as indicated on contract drawings.

G. Provide ICU, signal initiating devices, notification appliances, etc.

H. Provide monitor modules to connect existing non-addressable zones to fire alarm control panel.

I. Provide 1-1/4" Conduit with (2) 6-strand Multimode fibers to create a fiber loop from FACP in building 1 to FACP in building 2.

1.06 DESCRIPTION OF COMPLETED SYSTEM

A. The completed system shall operate as outlined in DESCRIPTION OF EXISTING SYSTEM, with the following exceptions:

1. Actuation of multi-point aspirating smoke detector sends alarm signal to local FACP and initiates annunciation circuit in building and at main FACP.

2. Control valves in the sprinkler system are supervised to initiate 2 separate and distinct signals indicating movement of the valve from its normal position.
   a. The off-normal signal is initiated during the first 2 revolutions of a hand wheel or during 1/5 of the travel distance of the valve control apparatus from its normal position.
   b. The second signal indicates restoration of the valve to its normal position. (The off-normal signal remains until the valve is restored to its normal position).

1.07 SUBMITTALS

A. Waiver of Submittals: The “Waiver of Certain Submittal Requirements” in Section 013300 does not apply to this Section.

B. Preliminary Submittal: Existing system test report.

C. Submittals Package: Submit the shop drawings, product data, and quality control submittals specified below at the same time as a package.

1. Company Field Advisor Letter: With the submittals package include a letter from the Company Field Advisor stating that he/she has reviewed the Submittals Package for accuracy and completeness, and approves all materials and installation methods included in the Submittals Package.

D. Shop Drawings:

1. Composite wiring and/or schematic diagrams of the modifications as proposed to be installed (standard diagrams will not be acceptable).
   a. Indicate circuits which are power-limited if power-limited wiring is proposed for use.
   b. For 2-hour fire rated cable assemblies show proposed routes and installation details (include UL classification data, listing and system number).
c. Include transient surge and lightning protection grounding details for signaling line circuits, initiating device circuits, and ac power conductors entering and leaving each fire alarm control panel.

E. Product Data:
1. Catalog sheets, specifications and installation instructions.
2. Bill of materials.
3. Detailed description of completed system operation. Format similar to DESCRIPTION OF COMPLETED SYSTEM.
4. Include for each system component which utilizes batteries the battery ampere-hour capacity recommended for each component by the Company producing the system, for the specified duration.
5. Statement from the Company producing the system, for each size and type of single conductor and multiconductor cable proposed for use, indicating that the electrical characteristics meet the requirements of the Company.
6. Data from the Company furnishing the products, proving that detection devices that receive their power from the initiating device circuit or a signaling line circuit of a fire alarm control unit are UL listed for use with the control unit.
   a. Submit data proving that the software and firmware is listed for use with the control panel.
   b. Submit data proving that the initiating devices are listed for the intended application. Also for specific applications, such as:
      1) Smoke door release accomplished directly from the smoke detecting device, show listing for release service.
      2) Air duct smoke detecting devices, showing listing indicating complete range of air velocities, temperature and humidity expected at the device when the air handling system is operated.
      3) Smoke detecting devices installed in supply air duct downstream of the fan and filters, show detector listed for the air velocity present.
      4) For smoke detecting devices installed in return air system, show listing for the air velocity present where the air leaves each smoke compartment, or in the duct system before the air enters the return air system common to more than one smoke compartment.
   c. Submit data proving that relays and appliances connected to the fire alarm system which are used to initiate control of fire safety functions are listed for the purpose.
   d. Submit data proving that the method of monitoring the connection between the fire alarm system and controlled electrical and mechanical systems for integrity is listed for the purpose.
7. Detailed description of procedure proposed to test individual initiating devices.
a. Include product information pertaining to the test equipment that will be used to perform the tests.
b. Include certified statement that the proposed test method meets the test requirements of NFPA 72 and UL 268 (cite reference to the applicable NFPA and UL paragraphs).

F. Quality Control Submittals:
   a. Also include copy of identification card issued by the Licensee for each person who will be performing the Work.
2. Company Field Advisor Data: Include:
   a. Name, business address and telephone number of Company Field Advisor secured for the required services.
   b. Certified statement from the Company listing the qualifications of the Company Field Advisor.
   c. Copy of NICET Letter of Approval indicating Level III or higher Fire Alarm Systems certification.
   d. Services and each product for which authorization is given by the Company, listed specifically for this project.

G. Contract Closeout Submittals:
1. System acceptance test report.
2. Certificates:
   a. Affidavit, signed by the Company Field Advisor and notarized, certifying that the system meets the contract requirements and is operating properly.
   b. NFPA Record of Completion (NFPA 72 Figure 1-6.2.1) for the modifications.
3. Operation and Maintenance Data:
   a. Deliver 2 copies, covering the installed products, to the Director’s Representative. Include:
      1) Operation and maintenance data for each product.
      2) Complete point to point wiring diagrams of the modifications as installed. Identify all conductors and show all terminations and splices. (Identification shall correspond to markers installed on each conductor.)

1.08 QUALITY ASSURANCE

A. UL Listing: The system products for the modifications shall be listed in the UL Fire Protection Equipment Directory under product category “Control Units System (UOJZ)”.

B. Company Field Advisor: Company Field Advisor shall be National Institute for Certification in Engineering Technologies (NICET) certified as Level III or higher Fire Alarm Protection/Fire Alarm Systems Engineering Technician.
1. Secure the services of a Company Field Advisor from the Company of the existing system for a minimum of 24 working hours at the contract site for the following:
   a. Render advice and witness test of existing system.
   b. Render advice regarding modifications to the system.
   c. Assist in reprogramming the system.
   d. Witness final system test and then certify with an affidavit that the modifications were installed in accordance with the contract documents and are operating properly.

1.09 MAINTENANCE

A. Spare Parts:
   1. 10 percent spare of each type initiating device.
   2. 10 percent spare of each type notification appliance.
   3. 10 percent spare of each type protective device.

PART 2 PRODUCTS

2.01 PEER-TO-PEER NETWORK

A. Network: Equip the fire alarm control panels and other network devices with network interface modules able to function with the existing network communication bus signaling line circuit.

B. Fire Alarm Control Panels/Interconnected Control Units, Simplex’s 4100ES each with network boards suitable for 4 Multi mode fiber optic cable connections (2-Out / 2 Return):
   1. Base selection of each fire alarm control panel upon its capacity and capabilities to the specific requirements of the system at the panels’ location.
   2. Equip the approved fire alarm control panels to function as the PPMCUs’s and ICU’s.
   3. Permanently record the installed software and firmware version number within each fire alarm control panel.
   4. 14 gage metal cabinet. Size as recommended by the Company producing the system.
      a. Control switches, inaccessible behind hinged and locked door.
      b. Alarm display and lamps visible when door is closed.
   5. Annunciator (or display) which individually identifies addressable devices and identifies groups of non-addressable devices by zones.
   6. Do not load visual alarm appliance circuit outputs to more than 70 percent of the FACP’s power limited rating.
   7. Input circuits suitable for operation on 120 Vac primary (main) power supply and 24 Vdc secondary (battery) power supply.
   8. 24 Vdc Secondary (Battery) Power Supplies: Sealed, lead-acid gelled electrolyte or maintenance free lead-calcium batteries:
a. Ampere-hour capacity to operate for the same duration and conditions as the existing system.
b. Battery charger with charging characteristics as recommended by battery manufacturer.
d. Batteries and charger integrally mounted or separate cabinet mounted as recommended by the company producing the system.

9. Accessories as required for each FACP perform its required functions upon failure of network communications.

10. Transient surge and lightning protection for signaling line circuits, initiating device circuits, and ac power conductors entering and leaving each fire alarm control panel:
   a. Signaling Line Circuits and Initiating Device Circuits: UL listed to Standard 497B; Simplex’s 2081-9027, 2081-9028, 2081-9034, 2081-9043.
   b. AC Power Conductors: Simplex’s 2081-9033, 2081-9042.

C. Remote Auxiliary Power Supplies: Simplex’s 2080 Series:
   1. 14 gage surface mounted metal cabinet. Size as recommended by the Company producing the system.
   2. Control switches, inaccessible behind hinged and locked door.
   3. Input circuit suitable for operation on 120 Vac primary (main) power supply.
   4. Regulated and filtered 24 Vdc output.
   5. 24 Vdc Secondary (standby) Power Supply: Sealed, lead-acid gelled electrolyte or maintenance free lead-calcium batteries:
      a. Ampere-hour capacity to operate under load conditions specified in SYSTEM DESCRIPTION.
      b. Battery charger with charging characteristics as recommended by battery manufacturer.
      c. Meters for battery voltage and charging current.
      d. Batteries and charger integrally mounted or separate cabinet mounted as recommended by the Company producing the system.
   6. Activated by host FACP via signaling line circuit loop thru addressable modules:
      a. Addressable control monitor activates the power supply outputs.
      b. Addressable monitor module senses power supply trouble conditions.
   7. Supervised power supply, battery, and notification appliance circuits.

D. Remote Addressable Network Modules (RANM):
   1. Individual Addressable Module (IAM): Simplex’s 2190-9172, 2190-9173.
   3. Include 24V dc auxiliary circuit(s) as required by RANM type to suit relay operations for control, monitoring, or supervisory functions; or interconnection of fire safety control functions.
E. Remote Annunciator/Control Centers (RA/CCs): Simplex’s Network Node Unit, with:
1. Surface mounted enclosure.
2. Flush mounted enclosure.
4. LCD which is capable of displaying all system points.
5. Master enable/disable key switch for all control switches behind hinged and locked door having windows for visibility of system functions.
6. Annunciator modules for visual indication of specific life safety control-by-event functions:
7. Annunciator modules for visual indication of specific user programmable control-by-event functions specified in DESCRIPTION OF COMPLETED SYSTEM. Identify each visual indicator with appropriate message.
8. Annunciator modules for visual indication of speaker status.
9. Switch modules for manual operation of specific life safety control-by-event control points:
   a. Alarm notification appliances.
10. Switch modules for manual operation of each user programmable control-by-event control point which is utilized for this project.
11. Switch modules for manual operation of each user programmable automatic time-initiated control point which is utilized for this project.

2.02 INITIATING DEVICES

A. General:
1. Fire detection devices that receive their power from the initiating device circuit or a signaling line circuit of a fire alarm control unit shall be listed for use with the control unit.
2. Where individually identifiable (addressable) devices are required, but not available from the Company producing the system, either:
   a. Use non-addressable devices and individually wire each device to the FACP’s as separate monitor points, making each non-addressable device individually identifiable, or:
   b. Employ remote addressable network modules to make each non-addressable device individually addressable.

B. Ceiling Mounted Detectors (Intelligent, Addressable, Analog):
1. General:
   a. Heat detectors, and photoelectric smoke detectors shall have common mounting base which accommodates interchanging of the different type sensors.
2. Smoke detectors:
   a. Photoelectric Type: Simplex’s 4098-9714/9798.
      1) Photoelectric type smoke detector shall have initial sensitivity level of 3.2.

3. Heat Sensors:
   a. 135 degrees F (fixed temperature): Simplex’s 4098-9733/9789.

C. Air Duct Smoke Sensors (Intelligent, Addressable, Analog):
   1. Photoelectric Type: Simplex’s 4098-9752/3 with 4098-9714.
      a. Listed for the air velocity present at each air duct smoke sensor’s location.
      b. Sampling tube to suit installation.
      c. Local relay (for fire safety control functions from duct detector when applicable):
         1) Relay operation programmable from FACP.
         2) Form C contact(s) rated minimum 1A @ 28 Vdc power-limited, 1/2A @ 120V ac nonpower-limited.
         3) 24 Vdc auxiliary power circuit(s) as required to suit relay operation and function.

   2. Remote Alarm Indicator For Use With Air Duct Smoke Sensors: LED type indicator mounted on single gang stainless steel faceplate.

   3. Remote Alarm Indicator And Test Switch For Use With Air Duct Smoke Sensors: LED type indicator and key operated switch mounted on single gang stainless steel faceplate.

C. Manual Fire Alarm Boxes:
   1. Addressable:

2.03 NOTIFICATION APPLIANCES

A. General:
   1. Audible signal appliances shall be UL 464 listed:
      a. Classified “Public” or “Private Mode Only” to suit application.
      b. Marked “F.A. Service” or “F.A. Service - Private Mode Only” to suit application.

   2. Visual signal devices shall be UL listed:
      a. For private mode applications, UL 1638 “Fire Protective Visual Signaling Appliance”.
      b. For public mode applications, UL 1971 “Signaling Devices for the Hearing Impaired”.
      c. For wall mounting or ceiling mounting to suit application.

B. Audible/Visual Appliances:
   1. Type AVA: Simplex’s 4903/92_ _ Series, with:
      a. Adjustable output Xenon flashtube strobe:
         1) AVA-15/75: 15/75 candela.
         2) AVA-30/75: 30/75 candela.
         3) AVA-110: 110 candela.
      b. Clear lens having FIRE imprinted thereon in red letters.
         c. Audible alarm notification appliance:
1) Type as indicated on the drawings.

C. Horns: Simplex’s 4901 Series Modular Horns, with:
   1. Surface or flush mounted type as indicated on the drawings.
   2. Basic grille type except where projector type is indicated on the drawings.
   3. Weatherproof model where installed in damp or wet locations.

D. Visual Appliances:
   1. Type Simplex’s 4904 Series, with:
      a. Adjustable output Xenon flasher:
         1) VA-15/75: 15/75 candela.
         2) VA-30/75: 30/75 candela.
         3) VA-110: 110 candela.
      b. Clear lens having FIRE imprinted thereon in red letters,
      c. Surface or flush mounted enclosure as indicated on the drawings.

2.04 AUTOMATIC FIRE SUPPRESSION SYSTEM SIGNAL ATTACHMENTS

A. General:
   1. Use non-addressable devices and individually wire each device to the FACP’s as separate monitor points, making each non-addressable device individually identifiable, or:
   2. Employ remote addressable network modules to make each non-addressable device individually addressable.

B. Sprinkler Valve Supervisory Switches:
   1. For Outside Screw & Yoke Gate Valves: Grinnell’s Model F640, Potter Electric Signal Co.’s OSYSU Series, or Simplex’s 2097 Series.
   2. For Post Indicator Valves: Potter Electric Signal Co.’s PCVS Series, or Simplex’s 2097 Series.
   3. For Gate Valves (Non-Rising Stem) and Special Applications: Potter Electric Signal Co.’s PTS, or Simplex’s 2097 Series.

C. Tamper Switches: By Micro Switch or Square D Company to suit installation conditions.

D. Waterflow Switch, Vane Type: Autocall Div., Federal Signal Corp.’s 4160, Potter Electric Signal Co.’s VSR, Reliable’s Model A, or Simplex’s 2097 Series having:
   1. Corrosion-resistant vane.
   2. Splash/dust resistant enclosure with anti-tamper switch.
   3. Adjustable pneumatic retard.
   4. Screw type wiring terminals.
   5. Switch rated minimum 7.0 amps at 125 Vac and 0.25 amps at 125 Vdc.
2.05 PROTECTIVE DEVICES

A. Pull Station Protective Shield: Clear Lexan shield and red frame covering manual pull station. When shield is lifted a battery powered warning horn is activated. The horn is silenced by lowering and realigning the shield.
   1. Simplex’s 2099Series (STI) including:
      a. Batteries.
      b. Weatherproof shield for damp and wet locations.
      c. Mounting accessories.

C. Steel Web Guards.
   1. For Smoke and Heat Detecting Devices: Simplex’s 2098-Series.
   2. Steel Web Guards for General Application (Horns, Strobes, Speakers, etc.):  
      a. Construction:
         1) All welded 7 gage wire.
         2) Nickel plated finish with lacquer coating.
      b. Manufacturer: Chase Security Systems, Inc. 5947 North Milwaukee Avenue, Chicago, IL 60646, Telephone (773) 775-7148, FAX (773) 594-0078.

2.06 TERMINAL STRIP CABINETS

A. Lockable, vandal resistant, surface mounted cabinets constructed of 14 gage steel, size as recommended by the Company producing the system. Equip cabinets with barrier type double screw terminals rated 300 V minimum, meeting UL 94 requirements for materials classed 94 V-0. Use identification strips, tags or labels to identify each conductor. Paint cabinets fire department red and stencil on front in 1/2 inch high white letters, the purpose of each terminal strip cabinet.

2.07 POWER-LIMITED INSULATED CONDUCTORS

A. All electrical characteristics shall meet the requirements of the Company producing the system (conductor to conductor capacitance, dc resistance, velocity of propagation etc.).

B. Multiconductor Cables N.E.C. Type FPLP, FPLR, FPL:
   1. Insulated copper conductors.
   2. Conductors twisted, shielded and jacketed as recommended by the Company producing the system.
   3. Voltage rating of not less than 300 volts (Voltage rating not marked on cable except where cable has multiple listings and voltage marking is required for one or more of the listings).

C. Other types of cables may be used in accordance with N.E.C. Table 760-61 “Cable Uses and Permitted Substitutions”, as approved, if listed as being suitable for the purpose.
2.08 NONPOWER-LIMITED INSULATED CONDUCTORS

A. All electrical characteristics shall meet the requirements of the Company producing the system (conductor to conductor capacitance, dc resistance, velocity of propagation, etc.).

B. Conductors twisted, shielded and jacketed as recommended by the Company producing the system.

C. Single Conductors:
   1. No. 18 and No. 16 AWG: Insulated copper conductors suitable for 600 volts, N.E.C. types KF-2, KFF-2, PAFF, PTFF, PF, PFF, PGF, PGFF, RFH-2, RFHH-2, RFHH-3, SF-2, SFF-2, TF, TFF, TFN, TFFN, ZF, ZFF.
   2. Larger Than No. 16 AWG: Insulated copper conductors suitable for 600 volts, in compliance with N.E.C. Article 310.
   3. Conductors with other types and thickness of insulation may be used if listed for nonpower-limited fire alarm circuit use.

D. Multiconductor Cables N.E.C. Types NPLFP, NPLFR, NPLF:
   1. No. 18 and No. 16 AWG: Insulated copper conductors rated 600 volts, N.E.C. types KF-2, KFF-2, PAFF, PTFF, PF, PFF, PGF, PGFF, RFH-2, RFHH-2, RFHH-3, SF-2, SFF-2, TF, TFF, TFN, TFFN, ZF, ZFF.
   2. No. 14 AWG and Larger: Insulated copper conductors suitable for 600 volts, one of the types listed in N.E.C. Table 310-13 or one that is identified for nonpower-limited fire alarm circuit use.
   3. Marking: NPLFP, NPLFR, and NPLF marked to suit listings and marked with a maximum usage voltage rating of 150 volts.

2.09 MC CABLE

A. Metal-Clad Cable, N.E.C. Type MC:
   1. All electrical characteristics shall meet the requirements of the Company producing the system (conductor to conductor capacitance, dc resistance, velocity of propagation, etc.).
   2. Conductors twisted, shielded and jacketed as recommended by the Company producing the system.
   3. Interlocked flexible galvanized steel armor sheath conforming to UL requirements for type MC metal clad cable.
   4. Insulated copper conductors suitable for 600 volts.
      a. No. 18 and No. 16 AWG: A type listed in N.E.C. Table 402-3 with a maximum operating temperature not less than 90°C, or types KF-2, KFF-2, PAF, PAFF, PTFF, PF, PFF, PGF, PGFF, PTF, PTFF, SF-2, SFF-2, ZF, ZFF.
      b. No. 14 AWG and Larger: One of the types listed in N.E.C. Table 310-13 or of a type identified for use in Type MC cable.
   5. Acceptable Companies: AFC Cable Systems Inc., Coleman Cable Co.
2.10 SIGNS, LABELS, MARKERS, AND NAMEPLATES

A. Procedure Sign:
   1. Complete Unit: Card holder with aluminum or stainless steel frame, plexiglass front and sheet aluminum card backing plate. Minimum size card 8 x 10 inches. For each procedure sign, furnish 1 blank card in holder and 5 spare blank cards suitable for typing future procedures thereon.
   2. Revised Cards: Size as required to fit existing holder, suitable for typing revised procedures thereon.

B. Nameplates: Precision engrave letters and numbers with uniform margins, character size minimum 3/16 inch high.
   1. Phenolic: Two color laminated engraver’s stock, 1/16 inch minimum thickness, machine engraved to expose inner core color (white).
   2. Aluminum: Standard aluminum alloy plate stock, minimum .032 inches thick, engraved areas enamel filled or background enameled with natural aluminum engraved characters.
   3. Materials for Outdoor Applications: As recommended by nameplate manufacturer to suit environmental conditions.

C. Fire Alarm Signs: 9 x 12 inches, metal, with the words “FIRE ALARM” imprinted thereon in white letters upon a red background. Include a white arrow pointing down, left or right showing the route to, or actual location of the fire alarm stations. Frame the outside edges of the signs in red and white diagonal stripes.
   1. Sign Mounting Styles:
      a. Single face for mounting flat against the wall.
      b. Double faced for mounting extended from wall.

D. Manual Fire Alarm Box Signs: Precision engrave letters with uniform margins, character size minimum 1/8 inch high, stating “LOCAL ALARM ONLY - NOT CONNECTED TO FIRE DEPARTMENT-CALL FIRE DEPARTMENT BY TELEPHONE”.
   1. Phenolic: Two color (red surface, white core) laminated engraver’s stock, 1/16 inch minimum thickness, machine engraved to expose inner core color.

E. Markers:
   b. Other Styles: To suit application by W.H. Brady Co., Ideal Industries, Marwick Corp., Plastic Extruded Parts, Inc., or Thomas and Betts Co.

2.11 SYSTEM KEYING

A. All system locks, key switches, etc., shall match existing keying.
2.12 ACCESSORIES

A. Include accessories required to perform the functions summarized in DESCRIPTION OF COMPLETED SYSTEM and indicated on the drawings.

2.13 ACCEPTABLE MANUFACTURERS:

A. Manufacturer’s names, catalog numbers, and trade names are used to establish a level of quality and the operational characteristics for the products and systems specified. Specified materials, products, and services shall be provided unless otherwise approved by change to the bidding or contract documents. Materials, products, and services of manufacturers listed as “acceptable” may only be substituted for approval provided they meet or exceed the specified requirements and meet or exceed the level of quality and service established by the “specified” manufacturer. Listing of a manufacturer as specified or acceptable does not relieve the manufacturer of the responsibility to comply with the complete specification.

Equivalent products of other manufacturers will be considered based on product data, manuals, demonstration software, and other technical information as necessary to show compliance with the specification. Information must be submitted at least fourteen (14) days prior to bid due date and be approved by addendum. Product substitution will not be accepted during the submittal process.

C. Contact John Vozzy at Simplex for product information based on products listed in this specification: (518) 952-6042

PART 3 EXECUTION

3.01 VERIFICATION OF CONDITIONS

A. Testing Existing System:
   1. Prior to modifying the system, make the following tests to ascertain the operating condition of the existing system:
      a. Test spare zones that will be utilized for the work.
      b. Test active zones which will be modified. Test all existing devices that are remaining to confirm proper operation.
      c. Test PSS, PPSS and ICU functions associated with the modifications.
   2. Test shall be witnessed by the Company Field Advisor and the Director’s Representative.
   3. Conduct tests that are disruptive to facility personnel after normal working hours as directed.
4. Prepare a written report for the Director’s Representative indicating the repairs required, if any, to make the existing sub-systems function properly.

5. Repairs to the existing sub-systems are not included in the Work unless requested by Order on Contract.

### 3.02 INTERRUPTIONS TO EXISTING SUB-SYSTEMS

A. Maintain the existing system in its present condition to the extent possible while installing new Work.

B. Prior to making changes or removals relative to the existing system, notify the Director’s Representative and have procedures approved.

C. When changes or removals are required to the existing fire alarm system such that it’s ability to act as a fire alarm system is impaired, provide a temporary fire alarm system so that the building is protected at all times by a functioning fire alarm system. Notify Building Supervisor (thru Director’s Representative) of proposed temporary measures and scheduling. Both the proposed temporary measures and the scheduling must be approved by the Director’s Representative.

D. Provide signs, instructions and alternate methods for reporting a fire.

### 3.03 INSTALLATION

A. Install the Work in accordance with the Company’s printed instructions unless otherwise indicated.

B. Reprogram the system to include new monitor and control points and update existing system program to include changes and additions requested by facility.
   1. Obtain from the facility personnel through the Director’s Representative, a list of desired system program changes, additions, etc.

C. Do not install smoke detecting devices until the Work (including cleaning) of all trades in the area has been completed. Protect installed smoke detecting devices from airborne dust and debris.

D. Mount smoke detecting devices, and seal air holes in the back of the devices (including interior of raceways and holes associated with installation of boxes and raceways) so that air flow from inside of housing or from the periphery of the housing will not prevent entry of smoke during a fire or test condition. Seal air holes with gaskets, expanding silicone foam, or other sealants as approved.

E. Wiring For Survivability:
   1. Signals from manual fire alarm boxes and other fire alarm initiating devices within a building transmitted over the same signaling line circuit shall not interfere with the manual fire alarm box signals when both types of initiating devices are operated at the same time.
2. Failure of equipment or a fault on one or more installation wiring conductors of one notification appliance circuit shall not result in functional loss of any other notification appliance circuit.

3. Connect PPSSs, ICUs and other system components requiring a primary power supply to dedicated branch circuits.
   a. Do not connect PPSS’s and ICUs to a 2 pole device which can trip both poles at once, such as a 2 pole circuit breaker with handle tie (omit the tie).

4. Splices in wiring in vertical risers is prohibited, except when the length of conductors approximate 150 feet in vertical risers, terminal strip cabinet may be used. Exception: For 2-hour fire rated cable assembly, use UL listed methods to maintain 2-hour rating.

5. Avoid splices in horizontal runs. When splices are necessary, use junction boxes. Exception: For 2-hour fire rated cable assembly, use UL listed methods to maintain 2-hour rating.
   a. Make splices with mechanical or hydraulic type pressure connectors. The use of wire nuts is prohibited.
   b. Paint cover of terminal strip cabinets and junction boxes fire department red.

6. Protect notification appliance circuits and other circuits necessary for the operation of the notification appliance circuits from the point at which they exit the fire alarm panel until the point that they enter the notification zone that they serve using one or more of the following methods:
   a. Route all wiring in conduit..

7. Wiring Class A, Style 6, 7, D, E, or Z Signaling Line Circuits, Initiating Device Circuits and Notification Appliance Circuits: Do not install both legs of Class A, Style 6, 7, D, E, or Z circuits in same cable assembly, enclosure, or raceway back to PPSS’s or ICUs.
   a. Run return legs along another route to obtain maximum benefit of these alternate path circuits.

G. Existing RA/CC: Rearrange existing annunciator and switch modules to accommodate new annunciator and switch modules.
   1. Install new annunciator and switch modules in same function location as existing annunciator and switch modules. Arrange the new and existing modules in logical sequential order.

H. Identification, Labeling, Marking:
   1. Procedure Sign Adjacent to PSS: Install revised card in existing procedure sign to suit modifications made to procedures.
   2. Alarm Notification Appliance Locator:
      a. New RA/CCs: Install new zone locator adjacent to RA/CCs.
      b. Existing RA/CCs: Install revised card in existing zone locators to suit modifications made to the RA/CCs.
   3. Nameplates:
      a. Install on each manual fire alarm box a nameplate stating: Floor number, and location (1st Fl, east, etc.).
b. Install adjacent to each RA/CC annunciator module and switch module a nameplate indicating function of module.

c. Label the device used as the circuit disconnecting means for the dedicated branch circuits serving the system “FIRE ALARM CIRCUIT CONTROL” with white letters on a red background.
   1) Install on each system component requiring a primary power supply a label stating the location of its circuit disconnecting means.

d. Install nameplate on each remote alarm indicator stating the location of its smoke detecting device and the area protected by the smoke detecting device and its function (IN DUCT SMOKE DETECTOR ALARM FOR ________).

4. Power-Limited Circuits: Mark circuits at terminations, indicating that circuit is a power-limited fire protective signaling circuit.

5. Fire Alarm Signs: Where directed, install single face signs mounted flat against the wall at conspicuous locations, drawing attention to the manual fire alarm boxes. Fasten signs to walls with vandal resistant fasteners.


8. Identification of Circuits: Identify wires and cables by system and function in interconnection cabinets, and FACP’s to which they connect with premarked, self-adhesive, wraparound type markers. Designations shall correspond with point to point wiring diagrams.

9. Battery Data: Insert a copy of the battery warranty in each battery compartment and mark on batteries the date placed in service.

10. Alarm Verification Warning Marking: Affix to the inside of each FACP, a list indicating:
   a. Affected circuits.
   b. Delay (seconds).
   c. The smoke detector model numbers used.

I. Fire Suppression Systems Signal Attachments:
   1. Install tamper switches.
   2. Install sprinkler system signal attachments.

J. Protective Devices: Install where indicated on the drawings.
   1. Where devices are installed on wood or masonry surfaces, attach protective devices directly to the surface with vandal resistant fasteners.
   2. Where devices are installed on suspended ceiling provide additional supports in the ceiling, such as channel support system, angle iron or additional runner bars. Fasten the additional supports rigidly to the ceiling runner bar system. Attach frame or brackets of protective device to the supports with vandal resistant fasteners. Install metal spacers between the protective device frame and the supports so that the ceiling tiles will not be a part of the support system.
3. Use finishing collar between surface and protective device where protective device cannot be mounted tight against surface due to job conditions.

3.04 FIELD QUALITY CONTROL

A. Preliminary System Test:
1. Preparation: Have the Company Field Advisor adjust the portion of the system applicable to the Work, and then operate it long enough to assure that it is performing properly.
2. Run a preliminary test for the purpose of:
   a. Determining whether the system is in a suitable condition to conduct an acceptance test.
   b. Checking and adjusting equipment.
   c. Training facility personnel.

B. System Acceptance Test:
1. Preparation: Notify the Director’s Representative at least 3 working days prior to the test so arrangements can be made to have a Facility Representative witness the test.
2. Supply all equipment necessary for system adjustment and testing.
3. Make the following tests:
   a. Test the portion of the system applicable to the Work in accordance with NFPA 72, Chapter 7.
      1) Follow test methods stated in Table 7-2.2.
      2) Record results on NFPA 72 Figure 1-6.2.1 Record of Completion.
   b. Test system operation step by step as summarized in DESCRIPTION OF COMPLETED SYSTEM.
4. Submit written report of test results signed by Company Field Advisor and the Director’s Representative. Also complete an NFPA Record of Completion.
   a. Mount a copy of the written report of test results, and the NFPA 72 Record of Completion in plexiglass enclosed frame assemblies adjacent to the PSS (one framed assembly for each report).

C. Conduct tests that are disruptive to facility personnel after normal working hours as directed.

3.05 INSULATED CONDUCTOR SCHEDULE - TYPES AND USE

A. Signaling Line Circuits, Initiating Device Circuits and Notification Appliance Circuits:
1. Power-Limited Circuits: For interior wiring (in raceways) use power-limited insulated multiconductor cable types specified in PART 2 except where a 2-hour fire rated cable assembly is required.
   a. Number of conductors and conductor size as recommended by the Company producing the system, except that conductor size shall not be less than No. 18 AWG for signaling line circuits and
not less than No. 16 AWG for initiating device circuits and notification appliance circuits.

b. Using Non-power-Limited Wiring On Power-Limited Circuits: Wiring size and types specified for NONPOWER-limited circuits may be used for power-limited circuits if power-limited circuits are reclassified and the power-limited markings are eliminated. Refer to NEC Article 760-52(a) Exception No. 3.

2. Nonpower-Limited Circuits: For interior wiring (in raceways) use nonpower-limited insulated single conductors or multiconductor cable types specified in PART 2 except where a 2-hour fire rated cable assembly is required.
   a. Number of conductors and conductor size as recommended by the Company producing the system, except that conductor size shall not be less than No. 18 AWG for signaling line circuits, not less than No. 16 AWG for initiating device circuits, and not less than No. 14 AWG for notification appliance circuits.

3. Where wiring is specifically indicated on drawings not to be run in raceway, use metal-clad cable type MC (concealed, unless otherwise indicated), except where a 2-hour fire rated cable assembly is required.

B. Signaling Line Circuits Between PPMCU’s and Networked ICUs: Use Type LAN-O or type LAN-I optical fiber cables (Section 271525) in raceways for network communication bus circuits.

C. Control Circuits Associated with the Fire Alarm System: use Class 1, 2, and 3 wiring specified in Section 260519.

D. Primary Supply Circuits and Secondary Supply Wiring:
   1. Use electric light and power wiring specified in Section 260519.

END OF SECTION
SECTION 284601

ELECTRONIC DOOR LOCKING AND MONITORING SYSTEM

PART 1  GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE

A. Video Surveillance System (282304).
B. Intercom and Zone Paging System (275112).
C. Wiring – Division 26.
D. National Electric Code
E. Underwriters Laboratories UL508A

1.02 GENERAL CONDITIONS

A. The conditions of the Contract (General, Supplementary, and other Conditions) and the General Requirements (Sections of Division 1) are hereby made a part of this Section.

1.03 WORK INCLUDED

A. Included under this Section of the Work shall be the furnishing, installation, connection and testing of the complete electronic door locking and monitoring system. Electronic door locking and monitoring system shall be microprocessor based. The Programmable Logic Controller (PLC) shall be the device that accepts the various inputs from systems being interfaced with door control.

B. Coordination:
   1. The electronic door locking and monitoring system shall be installed by the Security Contractor-Installer (SCI)
   2. The electronic door locking and monitoring system shall be furnished by the Touchscreen Control System Vendor (TCSV).
   3. See Section 087100 for coordination and interface requirements with the Finish Hardware Subcontractor.

1.04 DEFINITIONS:

A. The definition below supersedes the definition in Section 014216 for Technical Advisor and Field Advisor.

B. Manufacturers’ Technical Advisor:
   1. An employee of the company producing the system (or a company which lists and markets the primary components of the system under their
name) who is certified in writing by the company to be technically qualified in design, installation and servicing of the required products. Personnel involved solely in sales do not qualify.

C. Integrator’s Field Advisor:
   1. An individual employee by an organization (other than the company producing the system) certified in writing by the company producing the system, that the individual is technically qualified in design, installation and servicing of the required products and is capable to act as a field advisor in their behalf. Personnel involved solely in sales do not qualify.

D. Company Field Advisor: An employee of the Company which lists and markets the primary components of the system under their name who is certified in writing by the Company to be technically qualified in design, installation, and servicing of the required products or an employee of an organization certified by the foregoing Company to be technically qualified in design, installation and servicing of the required products. Personnel involved solely in sales do not qualify.

1.05 SYSTEM DESCRIPTION

A. The Security Control and Monitoring System is an integrated monitoring and control system that includes touchscreen stations with control software (touchscreen system), control panels, and programmable logic controllers (PLCs).

B. The Security Control and Monitoring System interfaces directly with the following systems:
   1. Intercom and Zone Paging System (275112)

1.06 COOPERATION WITH OTHER TRADES

A. The Contractor shall coordinate the work of this Section with that of other Sections as required ensuring that the entire work of this Project will be carried out in an orderly, complete, and coordinated fashion.

B. Coordinate with specific hardware used by Division 8 Contractors for builder’s hardware and security hardware.

C. Division 28 responsibilities shall include the following:
   1. Division 28 shall be responsible for furnishing and installing all equipment, installation, terminations, and testing of systems defined in Division 28.
   2. Termination to locking hardware shall be via Molex connector pigtails. Division 11 and Division 8 shall provide pigtails.
   3. Provide all control hardware and systems to control and/or monitor a door in accordance with the requirements of Division 28 and the wiring diagrams provided by Division 11.
   4. After installation, verify proper control operation of all doors.
   5. Coordinate with specific hardware used by Division 8 for builder’s hardware and security hardware.
6. Division 28 shall be responsible for coordination of all interfaces with Division 26 for any lighting or power controls or Fire Alarm System interface that may be required from the Division 28 control systems. Unless stated otherwise, all interfaces shall be via dry contacts provided by Division 26.

7. Division 28 shall be responsible for coordinating with Division 26 the exact locations and requirements for electrical power provided to the security equipment.

8. Division 28 shall be responsible for ensuring that all security system equipment is powered from an emergency power panel and that all system processors and alarm devices are powered from an uninterruptible power system (UPS). Other systems to be powered from a UPS are specified herein.

D. Division 8 responsibilities shall include the following:
1. Furnish and install door locking hardware as required for the system to perform the functions as defined herein.
2. Provide a single point of connection for Division 28. For swing doors, the interface point shall be the lock pocket. For sliding doors, the interface point shall be a junction box in the frame and shall be shown on the shop drawings.
3. The wiring interface shall be via a Molex connector. The mating connector, to which the Division 28 conductors are connected, shall be furnished to the Division 28 contractor with a 6” long conductor pigtail.
4. Furnish, project specific, wiring drawings and other information as required for design and installation of the control drawings.
5. After installation, adjust all locks and switches for proper mechanical alignment.
6. Provide boxes or pockets as required to accommodate door position switches, locks, and/or push buttons.
7. Provide interconnecting conduit between the door position switch and the lock pocket.
8. Extend the lock pocket to accommodate jamb mounted push buttons or provide a means to install and maintain push buttons where installed.

E. Division 26 electrical responsibilities shall include the following:
1. Furnish and install all conduits and wiring required for the systems defined in Division 28.

1.07 SUBMITTALS

A. Waiver of Submittals: The “Waiver of Certain Submittal Requirements” in Section 013300 does not apply to this Section.

B. Submittals Package: Submit the shop drawings, product data, and quality control submittals specified below at the same time as a package.

C. Shop Drawings:
1. Bill of materials.
2. Composite wiring and/or schematic diagrams of the complete system as proposed to be installed (standard diagrams will not be accepted).
3. Total electrical load of the complete system in supervisory and alarm conditions.

4. Detailed description of system operation (format similar to SYSTEM DESCRIPTION).

D. Product Data:
1. Catalog sheets, specifications and installation instructions.
2. Name, address and telephone number of nearest fully equipped service organization.

E. Specific Requirements:
1. Submit coordination meeting minutes showing review of each door opening and operation.
2. Submit catalog cuts for all equipment and devices being furnished under this Section.
3. Submit floor plans showing locations of all control equipment.
4. Submit wiring diagrams for complete interconnection of the system
   a. Typical wiring diagrams for each device along with termination schedules listing all devices
   b. Wiring details for each piece of head end equipment.
   c. Pin-out drawings for all multi conductor cables

F. Quality Control Submittals:
   a. Include copy of identification card issued by the Licensee for each person who will be performing the work.
2. Manufacturer Technical Advisor Data shall include the following:
   a. Name, business address, and telephone number of Manufacturer Technical Advisor secured for the required services.
   b. Certified statement from the Company listing the qualifications of the Manufacturer Technical Advisor.
   c. Services and each product for which authorization is given by the Company, listed specifically for this project.

G. Contract Closeout Submittals:
2. Certificate: Affidavit, signed by the Manufacturer Technical Advisor and notarized, certifying that the system meets the contract requirements and is operating properly.
3. Operation and Maintenance Data:
   a. Deliver 2 copies, covering the installed products, to the Director’s Representative. Include:
      1) Operation and maintenance data for each product.
      2) Complete point-to-point wiring diagrams of entire system as installed. Number all conductors and show all terminations and splices. (Numbers shall correspond to numbered tags installed on each conductor.)
      3) Name, address, and telephone number of nearest fully equipped service organization.
H. Security Vendor to submit proof of state licensure for installation of security systems.

I. Security Vendor to submit proof of installer certification for all equipment to be installed on project.

J. Shop Drawings:
   1. Diagrams for cable management system.
   2. See Editing Instruction No. 5 in the Evaluations for discussion of graphic standards for Drawings.
   3. System labeling schedules.
   4. Detailed wiring diagrams, to include a detailed non-typical system one-line along with detailed device wiring.
   5. Cable administration drawings.
   6. Battery and charger calculations for central station, workstations, and controllers.
   7. Floor plan drawings indicating all field device locations including unique architectural numbers or labels.
   8. Door schedule.
   9. Project specific, typical, field device wiring diagrams.
   10. Termination schedules.
   11. Equipment room enclosures, equipment layout information.
   12. System load calculations.
   13. Touchscreen control system one-line drawing.
   14. PLC backplane drawings and Bill of Materials for each and every PLC backplane.
   15. Individual equipment wiring details.

K. Control Software Submittal
   1. Within 30 days of receiving the approved paper submittal, provide a self-installing system software submittal on CD-ROM. All graphic operations shall be functional. All building layouts, icon placements, supplementary windows, etc. shall be complete. The submittal shall essentially be a working version of the Control Software Module less PLC communications.
   2. Additionally, provide a complete written description of each and every icon function as described in Section 1.15 along with a complete accounting of each icon state to include the following:
      a. BITMAP
      b. ICON STATE NAME
      c. DESCRIPTION
      d. COLOR
      e. SOUND
      f. ALARMED
      g. FLASHING
      h. RECORD
      i. ICON VISIBLE
      j. LED VISIBLE

L. Factory Demonstration:
1. Approximately 90 days prior to the scheduled completion of the project, schedule a demonstration for one Owner's representative and one Architect/Engineer representative to witness a demonstration of the complete touchscreen control and monitoring system assembled in the TCSV’s factory. Both the SCI and TCSV shall be present during testing. The complete and entire touchscreen control system shall be assembled for the demonstration. All touchscreen stations, PLCs, Administration computer, data terminals, printers, equipment enclosures, etc., shall be 100 percent networked and tested complete. One of each function, general features, and system performance shall all be demonstrated. Additionally, the Administration and Documentation software modules shall be demonstrated. Following successful completion of the Factory Demonstration, the touchscreen control and monitoring system shall be deemed substantially complete.

1.08 DOCUMENTATION SOFTWARE

A. All Security System documentation shall be provided by means of the Documentation Software Module. The Documentation Software shall be fully functional as specified herein. Submission of paper documents, a series of electronic files, or an electronic manual (PDF document or similar) is not acceptable.

B. Documentation Software Module

1. The primary purpose of the Documentation Software is to provide a means by which the construction team (on the front-end) and maintenance personnel (on the back end), of a project can access information pertaining to the Security Control System as simply and efficiently as possible. This is accomplished by means of an intuitive, dynamic, graphical interface. Selecting field device symbols on a floor plan or site graphic provides access to the information pertaining to that device. The Documentation Software shall be provided on the Administration Computer.

2. Main Components of Documentation Software:
   a. MAIN VIEW - area of the screen where the "current" document is viewed.
   b. NAVIGATION PANEL - presents a "tree structure" of all documents and information contained in the Graphical Documentation Software.
   c. TOOL BAR - provides a means of navigating and printing the documentation.

3. Graphic Operation:
   a. Provide dynamic images, without breaks, from which the user can intuitively access system documentation. The images shall be accurately and proportionally scaled to the actual building or Site layout and of sufficient size as to accommodate all monitored and controlled devices in the form of symbols. The symbols shall be positioned proportional to the devices' actual position relative to the building graphic. Each unique device shall be represented by a unique symbol.
      1) Site Plan (1 image).
2) Each floor of each building (1 image per floor).

b. It shall be possible to zoom in, zoom out, and pan any given image. This functionality shall be accessible via the tool bar or by selecting the right mouse button.

4. System Functionality:

a. Selecting a “Field Set” symbol with the mouse shall make available all information pertinent to that specific device. That information shall be displayed directly or via a hyperlink and shall include at a minimum:

1) Device ID and label.
2) All “Field Set” information including name, number, power requirements, cable requirements, and bill of material.
3) All “Function” information including name and full functional description.
4) All PLC IO termination data including “Rack Set” (a piece of equipment mounted in a rack) name and location, equipment room and PLC names, IO type, memory address, termination point and description, and power requirements.
5) All "Group" information including all members of each group and their respective PLC addresses.
6) All device schedule information.
7) All pertinent "Documents" including rough-in drawings, physical drawings, wiring diagrams, manufacturers' installation, operation, and maintenance manuals. All documents shall be viewable directly from the Documentation Software program.

b. The Documentation Software shall also allow the user to view all information contained in the Electronic Documentation System via the FOLDER ITEMS. The following is a list of the minimum "Folders" required, their respective contents, and operation:

1) Floor Plans - Selecting the floor plans folder shall present a list of all floor plans available for viewing.

2) Equipment Rooms - Selecting the equipment rooms folder shall present a list of all equipment rooms. Selecting a specific equipment room shall present a floor plan of that equipment room and present a list of all equipment racks within the specific equipment room. Selecting a specific equipment rack shall present a scaled elevation graphic of that rack. The elevation graphic shall show all the relevant views (front, back, left, and/or right). Selecting and highlighting a subpanel on the elevation graphic shall present all corresponding Rack Set information previously described above.

3) PLCs - Selecting the PLCs folder shall present a list of all PLCs (programmable logic controllers) available for viewing. Selecting a specific PLC shall present an I/O (Input/Output) table for that PLC. I/O shall be presented such that an individual "cell" in the table represents each
bit. Rows shall represent channels or words. Columns shall represent bits 0 to 15. Cells shall be "color coded" based on I/O type. All "hard I/O" cells shall contain termination information including rack, rack set location, and terminal number. When a bit is associated with a group (example: Interlock group), that information shall also be provided. It shall be possible to filter the information contained in the I/O table cells. Selecting any cell within the table shall present all corresponding Rack Set information previously described in paragraph above.

4) Field Sets - Selecting the field sets folder shall present a list of all field set types available for viewing. Selecting a specific field set type shall present information common to the selected field set type and present a list of all available field devices (by architectural number) of that type. Selecting a specific field device shall present all corresponding Field Set information previously described in paragraph above.

5) Rack Sets (rack mounted equipment) - Selecting the rack sets folder shall present a list of all rack set types available for viewing. Selecting a specific rack set type shall present information common to the selected rack set type and present a list of all available rack sets (by rack location) of that type. Selecting a specific rack set shall present all corresponding termination information.

6) Functions - Selecting the functions folder shall present a list of all function types available for viewing. Selecting a specific function type shall present a list of available functions (by location) of that type. Selecting a specific function shall present all corresponding termination information.

7) Groups - Selecting the Groups folder shall present a list of all Group types available for viewing. Selecting a specific Group type shall present a list of available Groups (by location or name) of that type. Selecting a specific Group shall display all members of that group and their respective PLC addresses.

8) Schedules - Selecting the schedules folder shall present a list of all schedules available for viewing. Selecting a specific schedule shall present all data pertaining to that schedule. Selecting any "Field Set" device in a schedule by its architectural number shall present all Field Set information previously described in Paragraph 1.7.B.4. above.

9) Documents - Selecting the documents folder shall present a list of sub-folders for each document type:
   a) Maintenance and Troubleshooting
   b) Drawings Audio
   c) Drawings CCTV
   d) Drawings Computer
e) Drawings Door  
f) Drawings Floorplan  
g) Drawings PLC  
h) Drawings Power  
i) Drawings Rack  
j) Drawings System  
k) Functions  
l) Manuals  
m) Miscellaneous  
n) Product Data

10) Selecting a document’s sub-folder shall present a list of all documents contained in that subfolder. Selecting a specific document shall display that document.

11) Suppliers - Selecting the Suppliers folder shall present a list of all suppliers with contact information and a link to their web site (Internet connection required).

a) All schedules and tables included in the Documentation Software shall present "live" data, which can be filtered and sorted and shall contain hyperlinks as described above.

b) All information contained in the Documentation System must be printable. The user shall be able to print customized reports by filtering and sorting the presented data.

c) Whenever “Field Set” information is displayed, the “Field Set” device shall be zoomed and centered on the floor plan graphic automatically or by selecting the “Locate on Floor plan” hyperlink.

1.09 MAINTENANCE

A. Service Availability: A fully equipped service organization capable of guaranteeing response time within 8 hours to service calls shall be available 24 hours a day, 7 days a week to service the on-going installation and the completed system.

1.10 QUALITY ASSURANCE

A. Company Testing Facility: The Company producing the system shall have test facilities available which can demonstrate that the proposed system meets Contract requirements.

B. Equipment Qualifications For Products Other Than Those Specified:
   1. At the time of submission, provide written notice to the Director of the intent to propose an “or equal” for products other than those specified. Make the “or equal” submission in a timely manner to allow the Director sufficient time to review the proposed product, perform inspections and witness test demonstrations.
   2. If products other than those specified are proposed for use, furnish the name, address, and telephone numbers of at least 5 comparable
installations that can prove the proposed products have performed satisfactorily for 3 years. Certify in writing that the owners of the 5 comparable installations will allow inspection of their installation by the Director's Representative and the Manufacturer Technical Advisor.

a. Make arrangements with the owners of 2 installations (selected by the Director) for inspection of the installations by the Director's Representative. Also obtain the services of the Manufacturer Technical Advisor for the proposed products to be present. Notify the Director a minimum of 3 weeks prior to the availability of the installations for the inspection, and provide at least one alternative date for each inspection.

b. Only references from the actual owner or owner’s representative (Security Supervisor, Maintenance Supervisor, etc.) will be accepted. References from dealers, system installers, or others, who are not the actual owners of the proposed products, are not acceptable.

1) Verify the accuracy of all references submitted prior to submission and certify in writing that the accuracy of the information has been confirmed.

3. The product manufacturer shall have test facilities available that can demonstrate that the proposed products meet the Contract requirements.

a. Make arrangements with the test facility for the Director's Representative to witness test demonstrations. Also obtain the services of the Manufacturer Technical Advisor for the proposed product to be present at the test facility. Notify the Director a minimum of 3 weeks prior to the availability of the test facility, and provide at least one alternative date for the testing.

4. Provide written certification from the manufacturer that the proposed products are compatible for use with all other equipment proposed for use for this system and meet all contract requirements.

C. Manufacturer Technical Advisor: Secure the services of a Manufacturer Technical Advisor for a minimum of 40 working hours for the following:

1. Render advice regarding installation and final adjustment of the system.
2. Assist in initial programming of the system.
3. Witness final system test and then certify with an affidavit that the system is installed in accordance with the Contract Documents and is operating properly.
4. Train facility personnel on the operation and maintenance of the system (minimum of 3 one hour sessions).
5. Explain available service programs to facility supervisory personnel for their consideration.

D. Service Availability: A fully equipped service organization capable of guaranteeing response time within 24 hours to service calls shall be available to service the completed Work.

1.11 TOUCHSCREEN SYSTEM GENERAL FEATURES:

A. For systems with more than one PLC, failure or communication loss to one PLC shall not effect communication to the other PLCs or disrupt or delay control and
monitoring of any device unrelated to the failed PLC. Furthermore, when the failed PLC is restored, the control and monitoring of devices related to the restored PLC shall immediately continue without restarting the application.

B. Failure of any one touchscreen station, the administration station, or other networked computer shall not affect the operation of any other station. All touchscreen stations shall communicate directly with the PLCs for all control and monitoring functions. Systems that utilize a file or data server to facilitate communication are not acceptable. PLCs shall be located in each equipment room as indicated on the Drawings.

C. Each touchscreen station shall be configured with all the software and graphic files required for all locations. Each touchscreen shall automatically recognize its intended location upon startup and configure itself accordingly. If the intended location is not recognized (as in the case of a spare touchscreen), a window shall be displayed requiring selection of the current location. In the event that one touchscreen must be moved, its intended location identity shall be able to be changed allowing it to be operated in a new location without software changes or updates.

D. The system shall utilize voice instructions for alerting the operator to alarm conditions and critical control sequences such as interlock, interlock override, emergency release, and other functions. There shall also be a voice annunciation ON/OFF switch to enable and disable the voice instructions.

E. The Control Software Module shall be self-updating. All software updates shall be performed so that the operator needs only to exit and restart the Control Module for the updates to be recognized. File copies, program installs, etc., shall not be required. Furthermore, all software and data updates shall be made via dial-in communication over a facility provided phone line. Other than enabling the dial-in communication, all updates shall be done without requiring assistance from the facility.

F. All logged event data shall be initially stored on the local touchscreen station and then periodically transferred to the Administration computer at intervals adjustable by the facility. The default interval shall be every 60 minutes. The facility shall also have the means to immediately transfer all data at any time as necessary. Upon confirmation of transfer, the data shall be removed from the local touchscreen station so that its hard disk does not become full over time. All data shall be stored in an encrypted format to prevent alteration.

G. The computer mouse and touchscreen transducer shall operate interchangeably and simultaneously. The operator shall be able to hide the mouse pointer to minimize distraction.

1.12 TOUCHSCREEN SYSTEM - FUNCTIONS - GENERAL

A. Icon Functionality:
1. OVERVIEW: All system control shall be accomplished through graphical buttons known as ICONS. System monitoring shall be accomplished through changes in the icon's bitmap graphic and
associated virtual LED. System activity shall be instigated from a field input (such as an intercom station) or from the touchscreen (such as pushing the “open” icon for a sliding gate). How the system reacts to this activity shall be defined by its FUNCTION. Each icon shall have one specific function and one unique description. For example, a function would be “intercom control and monitoring.” A description would be the architectural number for a specific intercom station. Each icon function shall be comprised of multiple icon states as required for proper operation. For example, the “intercom control and monitoring function” could have three possible states: idle, calling, and active. It could only be in one of the three possible states at any given time.

2. ICON STATES: Each icon state shall have, at a minimum, the following properties:
   a. ICON BITMAP - The bitmap graphic that appears on the icon in the zoom view. The bitmap shall graphically depict the current state of the device.
   b. ICON STATE NAME - Each icon shall always be in one and only one of the available states. The states shall always be the same for a given function.
   c. DESCRIPTION - Describes the Icon state.
   d. COLORS - Indicates the main color of the Icon and associated virtual LED. Red shall typically indicate non-secure, emergency or alarm functions, activities, or conditions. Yellow shall typically indicate caution conditions such as intermediate steps in control sequences and "access" conditions. Green shall typically indicate a secure condition. Other colors shall be utilized as necessary in a consistent manner.
   e. SOUND - An associated sound file that plays in repeating intervals (usually in the alarmed state) Alarm sounds shall be distinctly discernible from each other and from intercom call-in sounds and touchscreen feedback sounds.
   f. ALARMED - Indicates whether or not the Icon is alarmed. If alarmed, it shall also indicate what priority has been assigned. All alarms shall be displayed in the event queue sorted first by priority and second by date/time.
   g. FLASHING - Specifies whether the icon bitmap and associated virtual LED flashes on and off or remains constantly on.
   h. RECORD - Indicates if the event is recorded to the Administration computer.
   i. ICON VISIBLE - Indicates if the Icon is visible or hidden. Hidden Icons shall be used for functions such as PLC alarms where the Icon only needs to be visible in an alarmed state. This minimizes clutter on the graphics.
   j. LED VISIBLE - Indicates if the status LED is visible or hidden.

1.13 TOUCHSCREEN SYSTEM - FUNCTIONS - SPECIFIC:

A. Specific Icon Control Functions: The following descriptions may not include all control and monitoring functions for all icons required for this project but provides a representative sample to indicate the type and level of control and monitoring expected.
B. Door Control and Monitoring

1. SWING DOORS
   a. CONTROLLED AND MONITORED. Selecting the Door Icon will display a control bar with several options, Unlock Door, Activate Hold Open, and Hide. Selecting the Unlock Door option will energize the lock relay for a preset time. The Door Icon shall be unsecured as long as the door is open or unlocked. When the door is closed and locked, the Door Icon shall return to the secured state. Open relay times shall be adjustable via the Administration computer.

   b. HOLD OPEN. Selecting the Door Icon will display a control bar with several options, Unlock Door, Activate Hold Open, and Hide. Selecting the Activate Hold Open option will energize the lock relay. The Door Icon shall change to the hold state and the door relay shall be maintained. The Door Icon shall be unsecured as long as the door is open or unlocked. Selecting the Door Icon a second time shall de-energize the door relay. When the door is closed and locked, the Door Icon shall return to the secured state.

2. SLIDING DOORS
   a. CONTROLLED/ MONITORED. Selecting the Door Status Icon will display a control bar with several options, Open, Stop, and Close. Selecting the ‘Open’ option will energize the Open Relay for a preset time. When the door is open, the Door Status Icon shall change to the unsecured state. To close the door, touch the ‘Close’ option. The Close Relay energizes for a preset time. To stop a moving door, touch the ‘Stop’ option. To start a door moving again, touch the ‘Open’ or ‘Close’ option. When the door is closed, the Door Status Icon shall change to the secured state. Open and Close relay times shall be adjustable via the Administration computer.

3. MONITORED DOORS. When a monitored swing door opens, the Door Icon shall change to the alarmed state. Selecting the Door Icon shall change the Door Icon to the acknowledged state. When the door is closed, the Door Icon shall change to the field reset state. Selecting the Door Icon shall change the door Icon to the secured state.

4. CONTROLLED/ MONITORED EXTERIOR SLIDING GATE. Selecting the Door Status Icon will display a control bar with several options, Open, Stop, and Close. Selecting the ‘Open’ option will energize the Open Relay for a preset time. When the door is open, the Door Status Icon shall change to the unsecured state. To close the door, touch the ‘Close’ option. The Close Relay energizes for a preset time. To stop a moving door, touch the ‘Stop’ option. To start a door moving again, touch the ‘Open’ or ‘Close’ option. When the door is closed, the Door Status Icon shall change to the secured state. Open, Close and Stop relay times shall be adjustable via the Administration computer.

5. INTERLOCKS and INTERLOCK OVERRIDE. Icons for all doors and gates that are members of one or more interlock groups will display a large “I” in the middle. When one door or gate of an interlock becomes unsecured, all other door or gate icons interlocked with that door change to the disabled state. To open a disabled door and override the interlock, select the Door Icon in the disabled state. Selecting the ‘Override Door’
option will cause a pop-up window with a flashing “Warning” to be displayed for 2.5 seconds. A second pop-up window is displayed indicating that compromising the interlock is a serious security risk. Select OK to continue. A third pop-up window is displayed confirming operator intentions. Select OK to unlock the door and override the interlock. When all doors and gates interlocked with another door are secure, Door Icon will return to the secured state.

6. **EMERGENCY RELEASE.** An Emergency Release button shall be provided to allow the emergency release of selected doors and door groups. Selecting the Emergency Release button from the Global Keypad area shall present an emergency release screen with all available emergency release icons. Selecting an emergency release icon shall highlight the effected background graphic area yellow and display a warning message with OK and Cancel options. If OK is selected a confirming message is displayed. If confirmed, the effected background graphic area shall highlight red and the door(s) shall unlock. The doors in the emergency release group shall remain unlocked and in the Active state until reset. The emergency release group shall also be added to the event queue. Selecting the Emergency Release Group icon a second time shall highlight the effected background graphic area yellow and display a warning message with OK and Cancel options. If OK is selected the release is canceled. The emergency release icon changes to the “Inactive” state. All doors in the emergency release group shall be locked at a staggered rate. The emergency release group shall be removed from the event queue.

7. **DOOR ALARM.** When a swing door opens without the open control signal from the Security Control system, an alarm is initiated.
   a. **DOOR DPS CHATTER.** A door position switch (DPS) can chatter when a swing door is closed thereby causing a nuisance alarm. To prevent this, each door has an adjustable time period for which an alarm condition is ignored following a door being closed. For more information on setting door chatter timers, see Section 1.12 TOUCHSCREEN SYSTEM ADMINISTRATION.
   b. **DOOR OPEN-TOO-LONG.** When a door is not a member of an active ‘hold open’ group, and remains open longer than a predefined time, the icon changes to the OTL alarm state. Selecting the icon will return it to its previous state and restart the Open-Too-Long timer. Open-Too-Long times shall be adjustable via the Administration computer.

C. **Audio Control**

1. **INTERCOM.** When a call is initiated from a field intercom station, the touchscreen station shall “zoom” to the proper area of the facility, center the icon of the calling station on the display monitor, and change the icon to the calling state. Selecting the calling icon shall acknowledge the call and create a talk path. If applicable, an associated CCTV camera image shall display on the control room CCTV monitor. Selecting the icon a second time shall close the talk path and return the icon to the default idle state. If applicable, the associated CCTV camera image shall return to a default view. If a call is interrupted by an alarm with a higher priority, acknowledging that higher priority alarm shall return the graphic
display to its previous view of the intercom icon. The system shall be configurable to allow the facility to handle incoming calls by selecting a “Locate” icon rather than going to the calling icon automatically.

2. PUSH-TO-TALK. Touching the push-to-talk button shall open a talk path to the current active intercom or paging zone. The push-to-talk button shall be disabled when there is no active intercom or paging zone.

3. INTERCOM DURESS. If a field intercom call pushbutton is held in longer then the pre-assigned time limit, a duress alarm is initiated. The icon shall change to the ‘duress’ state. TOUCHSCREEN SYSTEM ADMINISTRATION.

4. CELL INTERCOM CALL DISABLE. To prevent nuisance calls from an intercom, select the associated Door icon and the “Call Disable” option. The Intercom icon changes to a ‘disabled’ state and intercom calls from the cell intercom station are ignored. To return to normal operation, select the associated Door icon and the “Call Enable” option. The Intercom Icon changes to an ‘idle’ state and intercom calls are again annunciated.

5. SPEAKERS.
   a. INTERCOM. Selecting an idle IC Speaker Icon shall open a talk path to the intercom speaker and change the icon to the active state. Any other active intercom calls shall be canceled. Selecting the IC Speaker Icon a second time shall close the talk path and return the icon to the default idle state.

D. CCTV:
   1. CAMERA. Touching a camera icon shall switch on the associated camera for display on the control room CCTV monitor and changes the camera icon to the active state. Selecting a second camera icon shall change the previous icon to inactive and new icon to active. Selecting the same camera icon a second time shall switch the camera image back to a default view and change the icon to an inactive state.

E. Alarms:
   1. UPS ALARMS: An UPS alarm shall be initiated whenever battery backup is required. The associated icon shall change to the alarmed state. Selecting the UPS icon shall acknowledge the alarm. The alarm condition shall reset when battery backup is no longer required. The icon shall change to the field reset state. Selecting the UPS Icon in the field-reset state shall return the UPS Icon to the normal state. All UPS events shall be recorded on the Administration computer. Adjustable timers shall be provided to delay alarms. Timers shall be adjustable via the Administration computer.
   2. PLC ALARMS: A PLC alarm shall be initiated whenever a PLC loses battery backup, loses communication with another PLC, or has a general diagnostic alarm. The associated icon shall change to the alarmed state. The alarm condition shall reset when the alarm clears from the PLC.
   3. DURESS ALARMS: When a duress alarm occurs, the icon shall change to the alarmed state. When the alarm condition is reset in the field, the icon shall change to the field reset state. All Duress events shall be recorded on the Administration computer.

4. ALARM HANDLING
a. ALARM ACKNOWLEDGE/RESET. When an alarm is first received, it will be added to the event queue in order of priority and time. A continuous alarming tone will sound and the device icon changes to the alarmed state. Selecting the device icon in the alarmed state will acknowledge the alarm, silence the audible tone, and change the device icon to the acknowledged state. Once the device is reset in the field, the device icon changes to the field reset state. To reset an alarm, select the device icon in the field reset state and it will change to the normal state.

b. ADMINISTRATIVE ALARM SHUNT. From the Security Administration computer, alarms can be ignored or shunted during a specified period of time. In this instance, devices normally alarmed will instead change to the ‘shunted’ state. When the time period is over, normal alarming will resume.

c. CAMERA VIDEO-FOLLOW-EVENT (VFE). Every security system device shall be able to have a camera(s) assigned to be displayed on an available alarm monitor(s) based on system events.
   1) Assigned camera(s) shall display on the assigned alarm monitor(s) based on a “Video-On” flag.
   2) Assigned camera(s) shall revert to default camera(s) based on a “Video-Off” flag.
   3) When a device from the event queue is selected, the assigned camera(s) is displayed on the assigned alarm monitor(s) regardless of the device’s current state.
   4) When a door’s control-bar closes, the default camera(s) is displayed on the assigned alarm monitor(s). This feature allows cameras to be displayed temporarily upon selecting a door icon (usually in the secured state).
   5) VFE shall be user configurable from the Security Administration computer.

F. Miscellaneous Functions

1. LOGIN: Access to the system software shall be password protected and all operators shall log into the software module. A video keypad window shall be displayed that utilizes a "scramble" function so digits do not appear in the same location each time an operator logs onto the system. All log-in/log-out activities shall be recorded on the Administration computer.

2. CONTROL TRANSFER: Three methods of control/transfer shall be provided:
   a. Station Transfer: To transfer a touchscreen station (send control to another location); select the Transfer icon in the Global Keypad Area. All control and monitoring functions are transferred to the designated alternate control station. The transferred station shall display the login window only.
   b. Station Takeover: To takeover a touchscreen station (take control from another location), select the appropriate Takeover Icon at Master Control. All control and monitoring functions are transferred. The station that was taken over displays “Station Disabled” and the current operator of the transferred station is
logged out. Master Control receives a message indicating it now has control over the new designated control area.

c. Station Duress: To transfer a touchscreen station under duress, select the Duress icon in the Global Keypad Area. All control and monitoring functions are transferred to Master Control. An alarm is initiated and a message pops-up at Master Control indicating it has control of the duressed station’s designated control area. The station that is in duress displays “Station Disabled” and the current operator of the duressed station is logged out.

3. STATION CONTROL. Touching the "STATION CONTROL" icon shall display the "Station Control" window. This window allows the operator to see the status of all touchscreen stations, take control of stations, and restore control to stations.

4. EVENT QUEUE. The event queue is a list of outstanding events that either need to be addressed or monitored by the operator. The event type, location, and time of occurrence are displayed.

5. UTILITIES. Touching the "UTILITIES" icon shall display the "Utilities" window. Based on the operator’s security level, this window allows administrative functions to be performed.

a. CLEAN SCREEN. Touching the “Clean Screen” button shall disable all touch points on the touchscreen station for 20 seconds.

b. SCREEN CALIBRATION. Touching the “Calibrate” button shall display a touchscreen calibration window.

c. VOLUME UP. Touching the volume up button allows the operator to increase the volume of the console speaker.

d. VOLUME DOWN. Touching the volume down button allows the operator to decrease the volume of the console speaker.

e. SHOW/HIDE CURSOR. Allows the cursor visibility to be toggled on and off.

f. SHOW/HIDE EXCEPTION ICONS. Allows the display of icons that normally are hidden.

g. DISABLE/ENABLE SPEECH. Toggles whether or not voice messages are annunciated. If enabled, a voice message will be annunciated whenever an icon changes to a state that is configured for voice messaging.

h. ADJUST SPEECH. Controls the features of digitized voice messaging.

1) Select voice from available list.

2) Test – Allows the operator to hear adjustments made to the digitized voice.

3) Save – Allows the operator to save the changes made to the digitized voice.

4) Exit – Closes speech adjustment window.

i. UPDATE APPLICATION. Allows the station to receive immediate application updates from Administration Software Module.

j. END PROGRAM. Shall end the Control Software Module. Access to this button shall require administrative security rights.
1.14 TOUCHSCREEN SYSTEM ADMINISTRATION:

A. The Touchscreen Control System shall be provided with an Administration Software Module, which shall be password protected and reside on the system’s Administration computer. The Administration software shall also be capable of being operated on multiple stations simultaneously.

B. GRAPHIC DISPLAY. A means of selecting any graphic image that is viewable on any Touchscreen Station shall be provided. Views shall be displayed in one of two formats – ‘zoomed in’ or ‘zoomed out’. ‘From the ‘zoomed out’ format, all controlled and/or monitored areas shall be represented by colored squares (LEDs). From the ‘zoomed in’ format, all controlled and/or monitored areas shall be represented by selectable buttons (Icons).

1. THE ADMINISTRATIVE COMPUTER SHALL GRAPHICALLY MONITOR (BUT NOT CONTROL) SYSTEM ACTIVITY IN REAL TIME.

C. SYSTEM OPERATORS. It shall be possible to add, delete, and edit System Operators. Only operators with administrator privileges shall have access to this area. An administrator shall not be able to delete their record or remove their administrator privilege. Operator names and passwords shall not be duplicated. Passwords must contain at least 4 digits.

D. SECURITY LEVELS. It shall be possible to add, delete, and edit Security Levels. Each operator without administrator privileges must be assigned a security level. Only operators with administrator privileges shall be allowed access to this area. A security level in use cannot be deleted.

E. ICON STATES. Every field device in the Security System has an associated Icon Type. Multiple icons (example: Swing Door) can have the same icon type. Each icon type has multiple icon states. The following information shall be available and editable as indicated for each icon state as applicable: (Changes shall be made globally to all icons of same type)

1. Icon Type – Name given to the specific icon type to which the state applies. (Read only)
2. State No – A reference number for the icon state. (Read only)
3. Icon State – The icon state name. (Read only)
4. Annunciated Message – If voice annunciation is active for this state, then when this state becomes active, the following is annunciated: <Annunciated Message> <Icon Type> <Icon Label>. (Editable)
5. Graphic Image – The graphic image that shows on the icon when this state is active (Editable)
6. Graphic File – The name of the bitmap file for the graphic image. (Editable)
7. Sound File – The name of the sound file that is heard when this state is active. (Editable)
8. Led On – The flashing on led color when this state is active. This is also used for the event queue record background color if applicable. (Editable)
9. Led Off – The flashing off led color when this state is active. (Editable)
10. Event Priority – The order in which the icon state is displayed on the event queue when active (Editable)
11. Flash – Indicates whether or not the led and icon will flash when this state is active. (Editable)
12. Icon – Indicates whether or not an icon is visible when this state is active. Icons for monitored only devices in a safe state are normally not visible to reduce graphic clutter. (Editable)
13. Led – Indicates whether or not the led is visible when this state is active. LEDs for monitored only devices in a safe state are normally not visible to reduce graphic clutter. (Editable)
14. Record – Indicates whether or not a record is stored in the event database whenever this state becomes active. (Editable)
15. Print – Indicates whether or not a record is sent to the system printer whenever this state becomes active. (Editable)
16. Voice – Indicates whether or not a digitized voice message is annunciated whenever this state becomes active. (Editable)
17. Video On – Indicates whether or not assigned camera(s) is displayed on assigned alarm monitor(s) whenever this state becomes active. (Editable)
18. Video Off – Indicates whether or not default camera(s) is displayed whenever this state becomes active. (Editable)

F. ICON FUNCTIONS. Each and every icon used by the Control Software Module shall be listed. The following information shall be available and editable as indicated for each icon location as applicable: (Changes shall only effect the Individual icon location)
1. Icon Type – Name given to the specific icon type. (Read only)
2. Arch No – The architectural number assigned to the field set that the icon represents. (Read only)
3. Label – The caption shown with the icon. (Editable)
4. Record All – Indicates that a record is stored in the event database every time the icon changes state (Editable)
5. Print All – Indicates that a record is sent to the system printer every time the icon changes state. (Editable)
6. Shunted Time Zone – Allows the Administrator to select a time zone when alarm events for this icon are ignored. (Editable – see TIMING ZONES)
7. Unlocked Time Zone – Allows the Administrator to select a time zone when a door icon is held open. (Editable – see TIMING ZONES)
8. Note – description or reference information for the icon (Editable)

G. TIMING ZONES. It shall be possible to add, delete, edit, or rename Time zones. Time zones allow actions to be performed on a scheduled basis. Time zones only apply to shunting alarms and opening doors.

H. DEVICE MAINTENANCE. The system shall record device operations every time a door is unlocked, an intercom is activated, a UPS is alarmed, or etc. The system will also allow the operator to input a ‘Maintenance Interval’ which specifies the number of cycles required before maintenance for that device is necessary. When device cycles reach the Maintenance Interval set value, the record is highlighted until the “Count Since Last Maintenance” value is set back to zero.
I. DEVICE TIMING. The system shall allow for specific device timing adjustments to be performed.

1. Door
   a. Chatter Length – Time allowed for the door position switch to oscillate between secure and unsecure. Once the time has expired, an unauthorized door opening will generate an alarm.
   b. OTL Length – Time allowed for a door to be unsecured before an ‘open too long’ alarm is generated.
   c. Unlock Length – Amount of time the unlock relay is energized.
   d. Open Length – Amount of time the unlock relay is energized.
   e. Close Length – Amount of time the unlock relay is energized.

2. Intercom
   a. IC Panic Length – Required duration for a field intercom button to be held down before a panic alarm is generated.

3. UPS
   a. UPS Battery Alarm Delay – Period of time when system is operating on UPS before an alarm is generated.

J. CAMERAS / VIDEO. It shall be possible to assign any security device to a unique camera/monitor combination. Also known as video follow event (VFE), the assigned camera(s) are displayed on alarm monitor(s) accordingly.

1. It shall be possible to add new cameras and associated icons to the system.

2. It shall be possible to add new monitors to the system.
K. EVENT HISTORY. Event data shall be available for viewing. By default, only the current day’s events will be displayed. Previous day’s events shall be able to be combined and retrieved as necessary. Previous day’s events shall be able to be archived to, and retrieved from, removable data storage. The data shall be able to be sorted, filtered, grouped, and printed as necessary. The following is sample data:

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Station</th>
<th>Operator</th>
<th>Event</th>
<th>Description</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>2/14/99</td>
<td>8:23:16</td>
<td>PCF</td>
<td></td>
<td>Unsuccessful Login Attempt</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2/14/99</td>
<td>8:23:16</td>
<td>PCF</td>
<td>J. Briggs</td>
<td>Successful Login</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2/14/99</td>
<td>8:23:16</td>
<td>MC</td>
<td>J. Briggs</td>
<td>Control Transfer</td>
<td>Takeover</td>
<td>PCF</td>
</tr>
<tr>
<td>2/14/99</td>
<td>8:23:16</td>
<td>MC</td>
<td>J. Briggs</td>
<td>Alarmed</td>
<td>Door Position Switch</td>
<td>A1103</td>
</tr>
<tr>
<td>2/14/99</td>
<td>8:23:16</td>
<td>MC</td>
<td>J. Briggs</td>
<td>Acknowledged</td>
<td>UPS Alarm</td>
<td>A1103</td>
</tr>
<tr>
<td>2/14/99</td>
<td>8:23:16</td>
<td>MC</td>
<td>J. Briggs</td>
<td>Unlocked</td>
<td>Access Door</td>
<td>A1103</td>
</tr>
<tr>
<td>2/14/99</td>
<td>8:23:16</td>
<td>MC</td>
<td>J. Briggs</td>
<td>Interlock Override</td>
<td>Interlock Override Active</td>
<td>A1103</td>
</tr>
<tr>
<td>2/14/99</td>
<td>8:23:16</td>
<td>MC</td>
<td>J. Briggs</td>
<td>Interlock Override</td>
<td>Access Door</td>
<td>A1103</td>
</tr>
<tr>
<td>2/14/99</td>
<td>8:23:16</td>
<td>MC</td>
<td>J. Briggs</td>
<td>Deadlock Enable</td>
<td>Cell Door</td>
<td>A1103</td>
</tr>
<tr>
<td>2/14/99</td>
<td>8:23:16</td>
<td>MC</td>
<td>J. Briggs</td>
<td>Emergency Release Enabled</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2/14/99</td>
<td>8:23:16</td>
<td>MC</td>
<td>J. Briggs</td>
<td>Emergency Release</td>
<td>Active</td>
<td>A1103</td>
</tr>
</tbody>
</table>

L. ARCHIVING. The system shall provide a means for archiving or Historical Event Data and Software Updates/System Settings to a removable data storage media.

1.15 SYSTEM PERFORMANCE:

A. The systems shall be configured to affect the following system performance criteria:

1. CONTROL: Outputs to field devices such as door locks shall activate within 250 milliseconds of the touchscreen or discrete control switch activation.
2. SCREEN UPDATES: All graphic display and icon changes at the touchscreen station shall occur in real time with no perceivable delay.
3. ANNUNCIATION: Inputs from field devices such as alarms or intercom calls shall annunciate at the touchscreen station or control panel within 250 milliseconds or the device being activated.
4. INTERDEPENDENCE: Touchscreen stations shall not be interdependent. The failure of one station shall not affect the operation of other stations. Failure of the Administration computer shall not affect the operation of any touchscreen station.
5. SYSTEM FAULTS: System faults, crashes, reset or reboots shall not be capable of activating field outputs such as door locks.

1.16 FAILURE RECOVERY

A. PLC
1. Each PLC location shall be provided with a flash memory card containing all PLC programs and settings for that location. In the event of a PLC processor failure, it shall be possible to replace the processor and reinstall all programs and settings in less than 5 minutes.

B. Touchscreen Stations
1. Failure of any single touchscreen station, file server, data server, or other networked computer shall not affect the operation of any other station.
2. There shall be multiple courses of action available to the facility concerning a Touchscreen Station computer failure:
   a. All touchscreen computers shall be configured so that by changing the intended location identity (IP Address), any touchscreen computer can replace any other touchscreen computer without software changes or updates
   b. The control area affected by a failed touchscreen computer can be “taken over” by a higher level touchscreen station.
   c. The facility’s spare computer can replace any failed touchscreen station computer. The spare computer shall be configured with all the software and graphic files required for all locations. Upon startup, a window shall be displayed on the spare computer to identify its current control location. Also upon startup, any updates to the security system software or data files applied after the initial system installation shall be retrieved from the Administration computer and applied equally to the spare.

C. Administration Computer
1. In the event of failure, the Administration computer shall not be necessary for normal system operation. However, the facility would be unable to make changes to the system or archive historical data.
2. The Administration computer shall be configured with redundant hard disk drives in a mirrored RAID1 configuration such that the computer will continue to operate in the event of a single disk drive failure. Replacing the failed disk drive with the provided spare drive will automatically restore the computer to full redundant operation.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS:

A. Manufacturer’s names, catalog numbers, and trade names are used to establish a level of quality and the operational characteristics for the products and systems specified. Specified materials, products, and services shall be provided unless otherwise approved by change to the bidding or contract documents. Materials, products, and services of manufacturers listed as “acceptable” may only be
substituted for approval provided they meet or exceed the specified requirements and meet or exceed the level of quality and service established by the “specified” manufacturer. Listing of a manufacturer as specified or acceptable does not relieve the manufacturer of the responsibility to comply with the complete specification.

B. Equivalent products of other manufacturers will be considered based on product data, manuals, demonstration software, and other technical information as necessary to show compliance with the specification. Information must be submitted at least twenty one (21) days prior to bid due date and be approved by addendum.

1. Firms desiring to be considered as a Touchscreen Control System Vendor, shall provide self-installing Software demonstrations on CD or DVD. The disc shall include demonstrations for the Control, Administration, and Documentation Software Modules demonstrating compliance with 17XXX Touchscreen Control Systems specified herein. All graphic operations shall be functional. All building layouts, icon placements, supplementary windows, etc. shall be complete. The submittal shall essentially include working versions of all three (3) software modules less PLC communications. Demonstration shall be of software used previously on at least 2 completed projects. Provide the name and telephone number of an individual at each facility familiar with the performance, operation, and maintenance of the facility’s systems (preferably, the maintenance manager).

2. If self-installing demonstrations (Control, Administration, and Documentation) are not available on disc, provide an alternate demonstration method and project references as stated above. Acceptable alternate methods:
   a. Schedule and attend a meeting at the Security Consultant’s office at least twenty one (21) days prior to bid due date to demonstrate the proposed Software using TCSV’s computer hardware. Demonstration shall be of software used previously on at least 2 completed projects.
   b. Schedule and attend a demonstration at an operational facility at least twenty one (21) days prior to bid due date to demonstrate the proposed Software. Demonstration shall be of software used previously on at least 2 completed projects. (Note; an additional reference is still required.) All travel costs and expenses shall be borne by the proposing TCSV.

C. Contact Rob Johnson at Secured State for product information based on products listed in this specification: (618) 664-4292 x101.

2.02 TOUCHSCREEN SYSTEM

A. Control Software Module:

1. Purpose: The primary purpose of the Touchscreen System is to provide a means by which an operator can monitor and control specific aspects of a facility as simply and efficiently as possible. This is accomplished through an intuitive dynamic graphical operator interface. Events that occur without initiation by the operator (intercom calls, for example) shall be brought to the immediate attention of the operator so that they
may deal with the event without searching or delay. Events that are initiated by the operator (station transfers, for example) shall as much as possible be grouped together for intuitive access.

2. Main Components: The Touchscreen System Graphical User Interface is comprised of six main components:
   a. MAIN VIEW – Provides an overall status of the current geographical area being monitored. The area graphic is displayed along with virtual LED lights that indicate the status of each controlled and/or monitored device.
   b. ZOOM/CONTROL VIEW – Provides a larger view of the current geographical area.
   c. AERIAL GRAPHIC VIEW – Provides a geographical reference. The portion of the zoom/control view that is currently visible is always highlighted in the aerial view.
   d. GLOBAL KEYPAD – All security system operations other than graphic positioning and icon controls are handled in this area through multiple button controls. Examples would be Interlock Override, Emergency Release, Control Transfer, System Enable / Disable, Duress, etc. Specific functionality can be unique to a given project and is described hereafter. The global keypad shall always be available and shall not be hidden by other windows.
   e. EVENT QUEUE – A tabular listing of all pending events listed first by priority and second by date/time. The background of each table record shall be colored to match the current state of its related icon. Up and down arrow buttons shall be provided for scrolling from the touchscreen. A “Locate” button shall be provided to locate the associated icon of the current record and center it on the display. The Select button shall be disabled when the event queue is empty. The event queue shall always be available and shall not be hidden by other windows.
   f. STATUS AREA – Provides text information regarding current icon status, current system status and current date and time. The status area shall always be available and shall not be hidden by other windows.

3. Graphic Operation:
   a. Provide a single dynamic image, (zoom/control view) without breaks, from which the operator can intuitively maneuver the entire geographical area for each of the following:
      1) Site Plan (1 image)
      2) Each floor of each building (1 image per floor)
      3) For Pod Control locations, provide one image for each pod area
      4) The image(s) shall be accurate and proportionally scaled to the actual building layout and of sufficient size as to accommodate all monitored and controlled devices in the form of icons. The icons shall be positioned proportional to the devices actual position relative to building graphic (leader lines are not acceptable). The icons as shown on the touchscreen monitor shall be no smaller than ½ inch square. The icons shall be spaced far enough apart so that an operator will not be at risk of inadvertently
selecting the wrong icon. The image shall be oriented correctly from the perspective of the station operator for areas that are visible from the station location.

b. Traditional systems that divide a geographical area (such as one floor of a building) into multiple, sometimes overlapping, “tiles”, “pages”, or “screens” are not acceptable.

c. All graphic operations shall occur in real time without delay.

d. Touching anywhere on the main or aerial views will zoom and center the specific location touched.

e. Dragging the zoomed view will provide dynamic panning of that view.

f. Dragging on the highlighted portion of the aerial view will dynamically reposition the zoomed view.

g. All field initiated events, such as intercom calls, alarms, and etc., shall cause the proper view of the facility to be brought to the operator, zoomed in, with the associated icon centered on the touchscreen monitor.

h. Touching any graphical icon or button shall generate a short audible tone.

B. LCD Touchscreen monitor

1. The touchscreen monitor shall have, at a minimum, the following components and features:
   a. 19” Active matrix TFT LCD
   b. 1280 x 1024 resolution
   c. Two (2) built-in speakers, 2 watt minimum
   d. IntelliTouch™ surface acoustical wave touchscreen as manufactured by Elo TouchSystems, or approved equal.
   e. Warranty:
      1) Monitor: 3 years
      2) Touch Technology: 10 years.
      3) Backlight lamp life: 40,000 hours to half brightness
   f. Manufacturer:
      1) Specified: Elo TouchSystems 1928L

C. Computer Touchscreen Station:

1. The computer touchscreen station shall include, at a minimum, the following components, and features:
   a. Microsoft® Windows® 7 Professional operating system with the latest service packs.
   b. Intel Pentium processor, Core 2 Duo 2.0GHz or faster
   c. 1 GB of RAM minimum. Provide additional RAM as necessary to optimize system performance.
   d. 80GB SATA 3.0Gb/s and 8MB DataBurst Cache hard disk drive or faster
   e. 256MB graphics card with support for 1280 x 1024 resolution at 85 MHz.
   f. 10/100 Network Interface as required to communicate with PLC, touchscreen transducer controller, and LAN.
   g. 16X DVD-ROM SATA.
   h. 32 bit sound card and speakers.
i. USB Keyboard and 2 Button Optical Mouse with Scroll.

j. Manufacturer: Dell, Micron, Gateway, or IBM

2. The operation of the touchscreen software shall not depend on a keyboard. The keyboard shall be locked away in the security equipment closet and shall not be normally accessible from the console surface except as required for installation and maintenance purposes.

### 2.03 TOUCHSCREEN STATIONS

<table>
<thead>
<tr>
<th>SHEET NO.</th>
<th>DESIGNATION</th>
<th>DESCRIPTION</th>
<th>MONITOR SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>EY-1202</td>
<td>Control Room</td>
<td>Access Control Touch Screen</td>
<td>19”</td>
</tr>
</tbody>
</table>

A. Administration Computer:

1. The Administration computer shall include, at a minimum, the following components, and features:
   a. Microsoft® Windows® 7 Professional operating system with the latest service packs.
   b. Intel Pentium processor, Core 2 Duo
   c. 1 GB of RAM, minimum. Provide additional RAM as necessary to optimize system performance.
   d. 160GB RAID1 (2x160GB) SATA 3.0Gb/s and 8MB DataBurst Cache hard disk drives
   e. 256MB graphics card with support for 1280 x 1024 resolution at 85 MHz
   f. 10/100 Network Interface as required to communicate with PLC, touchscreen transducer controller, and LAN.
   g. 16X DVD+/-RW SATA
   h. Internal Audio Speaker
   i. USB Keyboard and 2 Button Optical Mouse with Scroll
   j. V.92, PCI, Data/Fax Modem.
   k. The Administration computer shall operate as the master clock for which all touchscreen stations shall be automatically synchronized once per hour.
   l. Manufacturer:
      1) Specified: Dell, Hewlett Packard, IBM
   m. System Printer:
      1) Hewlett Packard: P2055dn LaserJet Printer or approved equal.

B. Touchscreen Control System Vendor (TCSV):

2.04 PROGRAMMABLE LOGIC CONTROLLERS

A. General Specifications:

1. Environmental ratings for all components of the PLC system, except programming equipment, shall meet or exceed the following requirements:
   a. Ambient Temperature rating of 0 to 60 DegC (32 to 140 DegF) operational and -20 to 70 DegC (-4 to 158 DegF) storage.
   b. Humidity rating of 10 to 90 percent Relative Humidity (non-condensing).
   c. All system modules shall be designed so as to provide for free airflow convection cooling. No internal fans or other means of cooling except heat sinks shall be required.

2. The PLC shall meet the following standards: UL Listed, CSA Certified, and CE.

3. The PLC system shall have been designed and tested to operate in an industrial environment.

4. The PLC and I/O modules shall be of modular and rack mounted construction.

5. The system power supplies shall be protected against short circuits.

6. The PLC system shall be designed so that each control area operates totally independent of one another. Failure or loss of a controller shall not hamper the operation of any other controller.

7. Programmable controller manufacturer must guarantee the availability of replacement/spare parts for a minimum of ten (10) years.

8. All I/O modules and housings must be of a standard type and fully interchangeable with previous PLC series.

9. All controllers and I/O structures of a single manufacturer shall be capable of being mounted on the same size fixing centers to allow for larger capacity controllers to be installed in the future should the facility require an expansion beyond the limits specified in the original contract documents.

10. Controllers must be capable of driving local I/O racks, where local is defined as up to one hundred (100) feet from the control unit, without the need for further intelligent interface modules.

11. When required, the system must be capable of controlling remote I/O up to a distance of 500 meters (1,640 feet) from the controller, using high-speed links with a minimum data rate of one hundred and eighty seven (187) Kbaud. Communications over this link shall be accomplished using twisted-pair wires with an overall shield.

B. PLC Central Processing Unit:

1. The central processing unit (CPU) shall be microprocessor based, encased in a shielded enclosure to provide RFI protection, and shall provide the logic control functions and date transfer based upon the program stored in memory and the status of the inputs and outputs. The controller must be able to support up to 5,120 local I/O.

2. The minimum standard control functions of the CPU shall include:
   a. Relay Ladder Logic
   b. Latching relays
c. Timer clock pulses (.02s, 0.1s, 0.2s, 1s & 1m) and timers (.01 & 0.1 sec. Increments).
d. Counters (up/down)
e. Data comparison (=, <, >), data range comparison, and data table comparison.
f. Data transfers (single register, blocks of registers, data distribution and collection using pointer).
g. Synchronous shift registers forward and reverse (multiple channel length bit shifts).
h. One-shot output and input controls.
i. Master control relays (interlocks).
j. Bit reads and moves.
k. I/O forcing and setting
l. BCD to Binary or Hexadecimal conversion.
m. Binary or Hexadecimal to BCD conversion.
n. I/O Refresh on command, immediate I/O inputs, and scheduled interrupt on command.
o. On-line program editing.

3. The following minimum modes of operation of the CPU must be selectable via a key operated switch or programming software commands:
   a. PROGRAM - Processor is not scanning program in memory and all outputs are held OFF.
   b. MONITOR - Processor is executing program and changes in user memory and data memory are allowed.
   c. RUN - Processor is executing program in memory and outputs are controlling to the program. No editing of program or data registers is allowed.

4. The above settings shall require either a key, a programming console with a key, or programming software loaded on a computer to change the operating mode of the CPU.

5. The processor shall incorporate extensive self-diagnostic features, which will not halt the processor. In addition, separate visual indicators will annunciate at the following conditions:
   a. POWER - Logic power is applied to the CPU and I/O rack from the power supply.
   b. RUN - Processor is executing the program in memory and outputs are being controlled according to the program.
   c. OUTPUT INHIBIT - Processor is executing program in memory according to input status, but outputs are being held in the OFF-state.
   d. ALARM - A non-fatal error (such as a low memory battery condition) has occurred in the PLC hardware or program software, The PLC is still running and the outputs are being controlled according to the program.
   e. ERROR - A fatal error (such as a memory parity error) has occurred, the CPU is not scanning the program, and the outputs are held in the OFF-state.
   f. COMM - Indicating the CPU is communicating with the device connected to the peripheral port or RS-232C port.
6. In addition to visual self-diagnostic indicators (LED’s) the processor shall have a specifically designated block of a least 100 words of internal diagnostic words and bits. These shall provide more detailed system status and fault diagnostic information accessible by programming equipment or intelligent peripherals.

7. The processor must contain an error log area. This area must be able to log what error occurred and when the error happened, giving exact time and date. This area must be able to store a minimum of 1000 records.

8. At a minimum, the internal diagnostic registers shall provide the following information:
   a. Type of digital (input or output) or intelligent (analog, ASCII, etc.) I/O unit inserted in a particular slot (I/O table listing). This data should be accessible via programming console or programming software.
   b. If an I/O module is improperly mounted (wrong slot) or not in a slot (I/O verify or I/O bus error).
   c. Error codes for intelligent I/O module errors.
   d. PLC operation mode.
   e. Present and maximum scan time.
   f. Local Area Network operation status and error status.
   g. Local Area Network data Send and Receive verification and error status.
   h. Serial Host Computer interface operation and error status.
   i. Remote I/O rack operation and error status.
   j. Memory Error Area.
   k. Startup time. The start time should be updated every time the power is turned ON.
   l. Power Interruption Time.

9. A single RS232 or RS422 compatible or Fiber Optic differential communication port shall be used for software based ladder logic programming and communications to other compatible devices. The PLC system must support up to three of these ports simultaneously.

10. The data rate of the serial communications port shall be switch selectable. The following shall be the minimum available data rates: 300, 1200, 2400, 4800, 9600, and 19,200 baud.

C. PLC Processor Memory:
   1. The program storage medium shall be Battery Backed Random Access Memory (RAM). The memory shall be housed in the same enclosure as the processor.
   2. Whenever any words (contacts, coils, entire rungs, etc.) of program memory have been deleted, the remaining program shall automatically be repositioned in memory so as to fill the void left by the deleted words. The automatic use of NOP’s to replace deleted words of program memory is not acceptable.
   3. Program memory area shall not be used to store data values (numbers) or I/O image table. A unique memory register area which is separate from ladder logic (program) memory shall be used to store data values.
   4. In addition to the program memory area, the processor must contain a word addressable only area, used for internal data storage and manipulation. This area must be a minimum of 8K words in size.
5. Typical scan time for 1K words of ladder program memory shall not be greater than 0.15 ms.
6. Memory word size shall not be less than 16 bits.
7. In order to detect short pulse duration on selected inputs, it shall be possible to use immediate bit refresh update I/O units or program an immediate I/O refresh command in the ladder logic program.
8. To minimize word utilization for program storage in the CPU, no words must be required wire spaces or wire connects within the rungs and no word space must be required to mark the start of a new rung.
9. Each word of memory shall incorporate a parity bit for memory error checking accompanied by a visual indication of a CPU memory error.
10. The CPU shall maintain its RAM program memory indefinitely, regardless of battery status, as long as AC power is applied to the system.
11. If AC power is removed from the system, the RAM memory backup battery shall retain program and register memory for a minimum of 5 years from date of purchase or for at least 2 weeks after the first appearance of the “battery low” warning.
12. The PLC must have the ability to utilize two methods of memory filing. The ability to utilize FLASH memory cards up to 30MB. The ability to utilize the PLC’s extended data memory areas as file memory. File memory can be used to store the entire user program, I/O memory contents, and/or parameter area contents.
13. All PLCs must have the ability to utilize a real-time clock. For monitoring:
   a. The time that power interruptions,
   b. The time that the plc was turned on, and
   c. The total time the PLC has been ON.

D. PLC Relay Equivalents, Special Functions Outputs & Instructions:
1. The processor shall be equipped with no less than 71,204 dedicated internal relay bits, used to store and manipulate data internally.
2. The number of normally open (NO) and normally closed (NC) contacts of an internal relay bit shall be unlimited, dependent only upon program memory capacity.
3. It shall be possible to make any internal coil into a one scan one-shot with a single command.
4. It shall be possible to program any internal coil as a latching relay with both a latch and an unlatch rung segment.
5. It shall be possible to program multiple Master Control Relay (MCR’s). It shall be possible to use programming equipment, host computers, or the actual ladder logic program to operate special PLC instructions, which perform the following functions:
   a. Halt the operation of the CPU.
   b. Place the CPU in the output inhibit mode.
   c. Return the processor to the RUN mode by clearing ladder halt commands or by mode change from a host computer or programming console.

E. PLC General Purpose Storage Registers
1. Each register shall be 16 bits in length and capable of storing a four digit BCD (0000 to 9999) or Hexadecimal (0000 to FFFF) value.
2. Programming techniques shall allow all registers to be programmed as a totalizing counter, totalizing timer, part of a shift register, or for numerical or ASCII data storage.

3. It shall be possible to monitor and alter any register value via a programming console or host computer using programming software without halting the CPU.

4. It shall be possible to alter individual bits of any storage register using a programming console or host computer using programming software halting the CPU.

5. It shall be possible to set the value of any single storage register or any contiguous block of storage registers with the use of a single programming command.

6. It shall be possible to preset any value into any single storage register or any contiguous block of storage registers with the use of a single programming command.

7. Programming techniques shall allow the access and use of any single bit or of all individual bits of information from any zone of a shift register, regardless of size. The accessing of any individual bit shall be possible with a single rung of ladder programming.

8. The CPU shall be equipped with no less than 32,767 general-purpose data memory registers. In addition, any internal relay registers not used for real I/O or as individual contacts and coils may be used as general-purpose data memory registers.

9. Register data shall be retained in the event of AC power loss as long as the ladder program is retained.

F. PLC Counters and Timers

1. There shall be no less than 4,096 timers and 4,096 counters in the CPU. All counters and timers shall be capable of storing four digit decimal values from 0000 to 9999.

2. Programming techniques shall allow for cascading of timers and counters. It shall be possible to program memory retentive times that can be started and halted without being automatically reset.

3. It shall be possible to program a reset contact or data comparison so that a timer can be halted and its present value reset to zero.

4. Programming techniques shall allow for programming ON delay and OFF delay timers.

5. It shall be possible to program UP, DOWN, and bi-directional counters.

6. It shall be possible to program a reset bit or data comparison command that will halt and reset a counter.

7. Programming techniques shall provide for as many timer or counter comparison values as desired.

8. Programming techniques will allow for decoding an interval of a timer or a counter (between range or compare instruction). Up to 16 ranges or intervals of a timer or counter shall be able to be acted upon with a single ladder command.

G. PLC Data Functions, Shift Registers

1. It shall be possible to program the transfer of data between one data storage register and another, between an input or output channel and a
storage register, or to transfer a constant value to any data storage register using a single command.

2. It shall be possible to perform a block transfer of a contiguous block of data registers to any other non-overlapping contiguous block of data registers, regardless of block size with a single ladder command.

3. It shall be possible to transfer any one constant to any contiguous block of data registers, regardless of block size with a single ladder command.

4. It shall be possible to program data transfer, data comparison, data value increment, data value decrement or any other mathematical operation on a data register either once every scan as long as the controlling rung is true or to execute these functions for only one scan at the leading edge of the controlling rung going true.

5. It shall be possible to perform Binary to BCD or BCD to Binary conversion of data in any data register with a single instruction.

6. Shift registers must be capable of shifting individuals bits, digits, or entire words either once per scan or for only one scan when their controlling rung goes true. The bit and digit shift registers must be able to shift either up or down.

7. The only limit to shift register size shall be the amount of contiguous data words available in memory to be used by that shift register.

H. PLC Digital Inputs and Outputs
1. Each input or output module shall be a self-contained unit housed within an enclosure so that no part of its circuit board is exposed to contact by handling.

2. Input and output units shall be UL listed, CSA certified and CE.

3. Pressure type screw terminals will accept one No. 12 or two No. 14 stranded or solid wires.

4. Convenience marker strips shall be provided adjacent to the I/O field wiring terminals for user labeling of all I/O points.

5. It shall be possible to replace any I/O module without removing or disturbing user field wiring.

6. Input and output modules shall be available in 8, 16, 32, 64, and 96 points per unit. The 32, 64, and 96-point units shall not be multiplexed I/O and shall have a thumbscrew secured, high density connector capable of accepting individual soldered or crimped connector pins or ribbon cable via IDC type connector configuration.

7. All high-density DC input or output units shall be solid state in nature. The output units shall be transistor type for long life and high DC reliability. Reed relays are not acceptable.

I. PLC Remote Inputs and Outputs
1. The remote I/O system shall be compatible with all of the company’s modular mid-sized and large PLC’s and I/O units.

2. All power for the remote I/O on a rack will be supplied by that rack’s power supply unit.

3. The communication between the local PLC system and the remote I/O racks shall be continuous, full duplex, serial communications with a data rate of at least 1.5 Mbaud.

4. The remote I/O system shall support a total of at least 512 remote I/O points with one remote master.
5. The maximum number of remote I/O points at any single drop shall be determined by the number and density of the individual I/O units on the rack rather than any internal per-rack limitation.

6. The communications media for the remote I/O system shall be field terminable, 200-micron optical fiber with a maximum transmission distance of not less than 800 meters between drops without a repeating mechanism.

7. Remote I/O Network shall be available in fiber or wire options to allow greater flexibility.

8. The remote I/O system shall have a group of pre-assigned diagnostic registers which shall be used to report system faults to the main processor.

9. In the event of a failure of a particular drop on the remote I/O system, the CPU shall be capable of being configured to either issue an alarm and continue to run or to shutdown in an error condition as it would in the event of local I/O failure.

10. In the event of failure of a remote I/O drop, all output points on that drop shall be turned OFF.

11. In the event of a remote I/O drop failure, the remote I/O System must be capable of restarting automatically once the error is cleared.

12. Remote drops shall have the capability of supporting a programming/diagnostic port.

J. Network Options

1. Networking options must include Ethernet, Profibus DP, DeviceNet, and Omron’s SYSMAC bus remote I/O and ControllerLink network. Ethernet communications must support TCP, UDP, and FTP protocols. The PLC should have the ability to generate e-mail messages to be sent via WAN or LAN, to report errors, provide scheduled maintenance and status reports. In addition, FTP (file transfer protocol) can be used to transfer data files between a host computer and or FLASH memory card and the PLC’s memory.

K. PLC Programming Equipment

1. It shall be possible to program and monitor any PLC from a single Host Computer via the LAN.

2. Programming software must be compatible Windows 7.

3. The programming software must not require the use of any hardware protection key, any special internal circuit board on the computer, or any sort of floppy disk to operate.

4. Programming Laptop Computer
   a. Core 2 Duo, 2.00GHz
   b. 80GB Hard Drive 5400RPM
   c. Microsoft® Windows 7 Professional operating system with the latest service packs.
   d. 10/100 Base-T Network Adapter
   e. 8X DVD+//-RW
   f. 56K internal modem
g. Manufacturer:
   1) Specified: Dell
   2) Acceptable:
      a) Hewlett Packard
      b) IBM

L. PLC Programming

1. It shall be possible to program relay contacts in series using some form of “line wrap” software feature when the programmer runs out of horizontal space on a single line. The length of any rung, in parallel contacts, must be a maximum of at least 22 lines.

2. Any ladder or ladder element delete function must require at least two steps to prevent accidental deletion of any part of the ladder program.

3. If a programming console is used, it must provide display of I/O number, program address location, type of contact or element (coil or contact, series or parallel, bit or word, NO or NC, and etc.) status during monitoring and forcing indication.

4. It shall be possible to search the program for any contact number, coil number, storage register type and number, address location, or special function number that the CPU supports.

5. It shall be possible to delete all or part of anything without affecting the remainder of the program. In either case, the program must automatically recompile to accept the new addition or remove the gap left by any deletion.

6. It shall be possible to force any input, output, or internal bit ON or OFF using either the programming console or the computer-based programming software.

7. Programming of nested branches and rungs with multiple outputs must be possible.

8. It shall be possible to program any given I/O point or internal bit or register as often as desired.

9. Using the computer-based programming software, it shall be possible to simultaneously display the following information for any desired rung:
   a. The ON or OFF state of any contact or coil.
   b. The contents of any given storage register.
   c. Whether a coil is standard, normally closed, one-shot, or a latching relay.

10. The computer-based programming software must be capable of displaying non-adjacent rungs during program monitoring operation.

11. If a rung of logic is satisfied then the complete line should be highlighted not just the contacts/coils.

12. Monitoring or any bit/word across the network from any PLC should be supported to aid troubleshooting.

13. It should also be able to:
   a. Operate without using the mouse.
   b. Navigate using directory tree displays.
   c. Enter bit input/output instructions with function keys.
   d. Split the screen 2 or 4 ways.
   e. Convert from text inputs to ladder programs by either inputting mnemonics to ladder diagram displays or convert text input with text editors or word processors.
f. Program with names rather than specific addresses.
g. Have the ability to utilize name, addresses, I/O comments, and other data from Microsoft Excel.
h. Drag and drop DOS files between Memory Cards in the computer and in the PLC.
i. Display error histories from the CPU Unit with time stamping.
j. Protect programs from access using passwords.
k. Have the ability to run and monitor multiple programs all at one time.

M. Manufacturer:
1. Specified: OMRON CS1 Series
2. Acceptable:
   a. GE Fanuc
   b. Modicon
   c. Allen Bradley

2.05 REDUNDANT COMMUNICATION NETWORK

A. Communications between all Touchscreen Control System devices, including Touchscreens, Servers, Terminals and PLCs, shall be provided via redundant 10/100 Mbps Ethernet.
1. The communications network shall employ redundant Ethernet Switches (not hubs) using a redundant loop configuration for the system backbone wiring. Network Switches shall operate at near media-speed on all ports simultaneously, allowing data flow to different segments to occur simultaneously thereby lowering or eliminating traffic bottlenecks that might be present in a shared environment. Failure of any communication subsection on the redundant ring shall cause a diversion of data to alternate communication paths within 500ms. Switches shall support transmission rates of 10 or 100 Mbps. Each switch shall be provided with two (2) 100Base-FX, female, SC-type fiber optic connectors for fiber optic backbone connection. Additionally, a minimum of five (5) 10/100Base-T RJ45 female connectors for Touchscreen Control System devices shall be provided. Switches shall be suitable for industrial environments.
2. As a minimum, each equipment room shall be provided with an Ethernet Switch.
3. Manufacturer:
   a. Specified: Hirschmann
   b. Acceptable: Phoenix Contact
   c. Avaya
4. Wire and Cable:
   a. Backbone wiring from switch to switch shall be "loop" configured using 8.3 Fiber Optic cable. Wiring from individual switch to device shall be via Category 6 twisted pair cable.
   b. Category 6 wire and cable shall be furnished and installed in accordance with the manufacturer's recommendations for 100 Base-T Ethernet operations. If distances exceed manufacturer or industry recommended standards, then fiber optic cable and devices shall be utilized.
B. PLC to PLC Communications
   1. 10/100 Mbps Ethernet or Bi-directional, self-healing, token loop network with a deterministic transmission rate of 2Mbaud
   2. Provide as required to meet performance requirements specified in 1.2 SYSTEM PERFORMANCE. Network shall support 64 nodes maximum on 8.3 Single-mode fiber. Provide all PLC modules and hardware as necessary.

2.06 INTERFACE BOARDS

A. Interface boards shall be UL Listed or Recognized.

B. Interface Boards shall utilize standardized, multi-conductor cables for connections to the PLC input & output modules. All field terminations inside the equipment enclosures shall be made to Interface Boards. Terminations shall not be made directly to PLC modules.

C. Interface boards shall be constructed for mounting on standard 19" E.I.A. mounting rails and shall have 3/4" aluminum support angles at the top and bottom for maximum rigidity.

D. Interface boards shall be provided with a power LED that will indicate power is being supplied to the board.

E. Interface boards' control power busses shall be fused.

F. Interface Boards shall provide proper separation of Class 1 and Class 2 circuits as defined by Article 725 of the National Electric Code.

G. Interface boards shall contain no active circuitry or control logic.

H. All terminals shall be "quick disconnect" types such that no tools are required to disconnect wiring should a board replacement be necessary.

I. Interface Board labeling shall be consistent with the PLC so that no cross-reference is required to trace circuits.

J. All terminals shall be factory labeled using printed labels. Field installed or hand written labels are not acceptable. Labels shall be consistent with system documentation indicating project specific ID numbers.

K. Termination boards shall be warranted for 10 years from the date of shipment.

L. Board Types:
   1. Interposing Relay Board
      a. 16 relays per board.
      b. Relays shall be plug-in, electro-mechanical type, rated at 10 amps each minimum.
         1) Omron
         2) Potter & Brumfield
c. Each relay output shall be individually fused to protect field wiring to the device.
d. Each relay shall have an associated LED to indicate when its' individual coil is energized.
e. Manufacturer:
   1) Specified: Creative Technologies # RB-16

2. Input/Output Break-Out Board
   a. 16 Points
   b. 16 Inputs or Outputs per board. Boards shall be mounted in pairs for a total of 32 points in 19 inches of horizontal space (side-by-side)
c. Each input/output point shall have an LED to indicate if the point is currently active. Each input/output termination point shall have its corresponding “common wire” termination point located adjacently for ease of troubleshooting field devices. Terminating all “common wires” at a separate location is not acceptable.
d. Manufacturer:
   1) Specified: Creative Technologies # BOB-16

3. Control Panel Interface Board
   a. Field cable interfaces via standard 50 pin TELCO connector
   b. 48 Points per board
   c. Manufacturer:
      1) Specified: Creative Technologies # PIB-48

2.07 REQUIRED SPARE PARTS:

A. One PLC Processor
B. One PLC input module
C. One PLC output module
D. One PLC network communication module
E. One PLC power supply
F. One PLC backplane
G. One of each type of power supply used
H. One Network Ethernet Switch
I. One 19” touchscreen monitor
J. One 160GB RAID 1 hard drive, compatible with Administration computer
K. One computer configured identical to the other touchscreen computers, including all software and files to serve as a replacement for any other touchscreen computer.
PART 3 EXECUTION

3.01 GENERAL

A. All components/equipment (PLCs, termination boards, power supplies, network switches and etc.) shall be rack mounted in, Middle Atlantic Equipment Racks.

1. All components/equipment shall be fabricated into racks conforming to the UL 508A standard. (Enclosure and all internal equipment and wiring as a single entity)

B. Prior to the installation of Security Control equipment:

1. Verify that all construction activities within the Control & Equipment rooms are complete. Rooms should be temperature / humidity controlled, dust free, and secure. Do not install equipment until these conditions are met.

2. When conditions dictate storing equipment prior to installation, the temporary storage location should meet the requirements of item 1. (Above)

3. Verify that the permanent, surge protected, power source is available for connection to the equipment.

4. Verify that all circuits feeding system processors have UPS backup.

5. Verify phone lines are available for off-site access to system processors.
   a. Programmable Logic Controller Network
   b. Touchscreen Network

C. Contractor shall install all conductors and make final connections to the locking system hardware and controls as required to effect the locking and control functions defined in the Division 28 specifications.

D. All conductors from the security equipment enclosures to electrically operated door locks shall be minimum 14 Ga. Copper THWN. All conductors from the security equipment enclosures to door position switches and bolt position switches shall be minimum 16 Ga. Copper THWN. Install the number of conductors required to provide the control and monitoring functions specified.

E. Programmable Logic Controllers (PLC) shall be utilized to perform functions as specified. PLC’s shall be as specified.

F. The door locking PLCs and Touchscreen Stations shall be powered from a UPS.

G. Division 26 shall furnish and install all panel boards, breakers, wiring, and etc. to provide protected branch circuits to all security equipment.

H. In each equipment room, UPS shall have the same power source (Emergency Panel) as Door lock circuits. PLCs shall monitor UPS for loss of power. Upon loss of power, all locks in an active group release shall be de-energized until power is regained, at which time locks shall be re-energized sequentially.

I. Disconnect the primary AC power circuits to all of the electronic door locking and monitoring system equipment and test for survivability and proper operation and provide battery load calculations for 10 minute intervals up to 1 hour (min).
J. Interposing relays for door lock control shall be plug-in type with hold down clip and LED indicator. AC or DC types shall be selected as appropriate for the application. Each door lock/relay circuit shall be individually fuse-protected to isolate shorted circuits.

K. Installation shall comply with the National Electric Code. Provide proper separation of all wiring and circuit types.

3.02 INSTALLATION

A. Install system in accordance with the Company’s printed instructions unless otherwise indicated.
   1. Locate equipment as indicated on Drawings.

B. Wiring:
   1. Install conductors in raceways after the raceway system is completed by others. Exception: Conductor types specifically indicated on the drawings not to be installed in raceways.
      a. No grease, oil, or lubricant other than wire-pulling compounds specified may be used to facilitate the installation of conductors.
   2. Connect system components requiring a primary power supply to dedicated branch circuits.
   3. Make connections and splices at system components, Electronic door locking and monitoring system interconnection cabinets, terminal strip cabinets, and console only. Connections or splices will not be allowed at any other location in the system.
   4. Use wire management products to bundle, route, and support wiring in junction boxes, pullboxes, wireways, gutters, channels, and other locations where wiring is accessible.

C. Mounting Hardware:
   1. Mount all exposed equipment with security grade tamper proof center pin reject style Allen type mounting screws.

D. Surge Suppressors:
   1. Install surge suppressors on each conductor entering and leaving Electronic door locking and monitoring system from outdoor components.
   2. Ground the suppressors per NFPA 70 and manufacturer requirements.
   3. Install surge suppressors for 120Vac input circuits prior to connections to power supplies.
   4. Install suppressors within power supply cabinet or separate NEMA enclosure as recommended by manufacturer.

E. Earth ground of equipment as required by equipment manufacturer.
   1. Do not use telephone ground connections as earth grounds.
   2. Do not use connections to building structural steel as earth grounds.
   3. Provide equipment-grounding conductors supplied from an existing established earth ground source or from a grounding bus in an existing panelboard.
F. Identification, Labeling, Marking:
   1. Station Locators: Install adjacent to each workstation.
   2. Wiring Diagram: Install adjacent to equipment in each BDF room computer closet.
   3. Nameplates:
      a. Install lamacoid engraved nameplate with card reader designation over each card reader.
      b. Install nameplate with monitor designation over each monitor.
   4. Identification of Circuits: Identify wires and cables by system and function in cabinets with premarked, self-adhesive, wraparound type markers. Designations shall correspond with point to point wiring diagrams.
   5. Battery Data: Insert a copy of the battery warranty in each battery compartment and mark on batteries the date placed in service.

G. Provide training and enrollment software to the facility for enrollment of employees. Provide initial enrollment of 25 employees in the base contract.

3.03 SYSTEM TRAINING

A. After the system is substantially complete and operational, provide on-site training of facility security, security supervisory, and maintenance personnel. Provide training for 8 (4) hour sessions.
   1. Provide a minimum of 1 week notice to the Director’s Representative, so that a training schedule can be set up with facility personnel and arrangements can be made for a location to hold the training.
   2. Provide all materials necessary for training (training aides, handouts, overhead projector, etc.).

B. System Operation Training: Training shall be set-up so that at the end of training, facility (security, security supervisory, and maintenance) personnel shall have a complete understanding of:
   1. How the system operates.
      a. Training should include precautionary concerns that personnel should be aware of that could affect proper operation of the system.
   2. Knowledge of all components in the system and their function.
      a. How the system is interconnected with other security systems and how the system operates in conjunction with the other systems.
   3. Weekly testing procedures for the system required to be performed.

C. System Maintenance Training: Training shall be set-up so that at the end of training, facility maintenance personnel shall have a complete understanding of:
   1. Routine (monthly, quarterly or annual) maintenance required to the system and how to perform that maintenance.
      a. Training should include precautionary concerns that personnel should be aware of that could affect proper operation of the system.
2. Knowledge of all components in the system and adjustments to the components that they would be required to perform to maintain operation of the system.

3. Programming of the system:
   a. Training should include instruction in all programming required to the system necessary for the system to operate as outlined in the SYSTEM DESCRIPTION.
   b. Training should include precautionary concerns that personnel should be aware of that could affect proper operation of the system working on the system.

3.04 COMPLETION

A. General: Upon completion of the work, remove excess debris, materials, equipment, apparatus, tools, and the like and leave premises clean, neat and orderly. Vacuum clean all equipment and enclosures to remove any dirt, dust, or foreign matter that may have accumulated during installation.

B. Testing:
   1. Factory Testing:
      a. All components of the door control system shall be operationally tested together with the exception of the end devices. At this time, all components of the system, such as Touchscreen Stations, Administration Computer, Network Switches, Control Panels, Power Supplies, Interface Boards, and interconnecting wiring shall be complete and fitted with their connectors. Factory testing shall take place at the TCSV’s fabrication facility.
      b. Give notice at least 4 weeks prior to system testing as the Owner may wish to be present to verify substantial completion of system.
   2. Site Testing: After complete installation of the system in the field, all problems shall be corrected prior to final testing. Once the Contractor is satisfied that the system is operating satisfactorily, operation of the entire system shall be demonstrated to the Owner. If, during this final demonstration, it becomes evident that there are still problems with the system, the demonstration will be cancelled and rescheduled when all problems are corrected.

3.05 FIELD QUALITY CONTROL

A. Cable Test: Electronically meter test and documents all existing cables, control wiring, and twisted cables prior to installing new equipment and electronically test and document all new cables under the supervision of Company Field Advisor. Test for open, grounds, and shorts.

B. Make corrections to wiring prior to proceeding. Advise the Director’s Representative of any cable that cannot be repaired.

C. Provide written test results for all cables and certify operation.

D. Test all cables after installation and prior to connecting new equipment.
E. Preliminary System Test:
1. Preparation: Have the Manufacturer’s Technical Advisor adjust the completed system and then operate it long enough to assure that it is performing properly:
2. Run a preliminary test for the purpose of:
   a. Determining whether the system is in suitable condition to conduct the acceptance test.
   b. Checking and adjusting equipment.
   c. Training facility personnel.

F. System Acceptance Test:
1. Preparation: Notify the Director’s Representative at least 3 working days prior to the test so arrangements can be made to have a Facility Representative witness the test.
2. Supply all equipment necessary for system adjustment and testing.
3. Make the following tests:
   a. Test all software. Demonstrate that all features of the software are operable.
   b. Individually test each master station and sub-station.
   c. Test each system function step by step as summarized under TOUCHSCREEN SYSTEM – FUNCTION SPECIFIC.
   d. Individually test each door (card access and monitoring).
4. Submit written report of test results signed by Manufacturer’s Field Advisor and Director’s Representative. Mount a copy of the final report in a Plexiglas enclosed frame assembly adjacent to the central controller.

3.06 INSULATED CONDUCTOR SCHEDULE – TYPES AND USE

A. Communication Circuits:
1. For interior wiring (in raceways), use communication and power cable types specified in PART 2.
2. Where wiring is specifically indicated on the drawings not to be run in raceway use plenum rated cable (concealed unless otherwise indicated).

B. Remote-Control, Signaling, and Power-Limited Circuits: Per manufacturer’s requirements.

END OF SECTION