

GUIDE SPECIFICATIONS
FOR DETENTION
ELECTRONIC
REQUIREMENTS



Detention Equipment Manufacturers Association

A Division of



NATIONAL ASSOCIATION OF
ARCHITECTURAL METAL MANUFACTURERS

This standard was developed by representative members of the Detention Equipment Manufacturers Association (DEMA) a Division of the National Association of Architectural Metal Manufacturers (NAAMM) to provide their opinion and guidance on the specification and use of detention equipment. This standard contains advisory information only and is published as a public service by NAAMM and its DEMA Division.

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FORWARD

These specifications have been prepared in accordance with the CSI Section Format: Part 1 - General, Part 2 - Product and Part 3 – Execution. Guide specifications are intended to be used as the basis for developing job specifications and must be edited to fit specific job requirements. Inapplicable provisions shall be deleted, appropriate selections shall be made where there are choices, and provisions applicable to the job shall be added where necessary. Optional items or requirements are shown in brackets. **Notes and instructions to specifiers are given in italics directly following the paragraphs to which they apply. Notes that contain permissive language are not considered part of the standard.** Dates given with ASTM and other standards were current at the time this specification was published, and define the specific standards referenced herein. When a more recent standard is available, the specifier should verify its applicability to this guide prior to its inclusion. *While the CSI Section Format locates Delivery, Storage and Handling in Part 1, NAAMM Standard include them under Part 3 – Execution.*

SECTION 111990
DETENTION ELECTRONIC REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY:

- A. This section includes General Requirements that shall be applicable to all work described under this section, all related sections and contract documents.
1. Provide all equipment, labor, materials, tools, equipment and services required for the complete design, installation, checkout, startup, and testing of all systems shown and described in this section, all related sections and contract documents. Division 16 will provide all conduit raceways in accordance with Division 16 specifications for electrical material and installation requirements where not covered by Division 11.
 2. Provide all coordination as necessary between trades including but not limited to the following:
 - a. Division 4:
 - 1) Coordinate the installation of all backboxes and devices with masonry and steel blocks as required.
 - b. Division 8 and 11:
 - 1) Coordinate door frame locations, conduit penetrations, conduit routings, conduit and back-box installations with all trades whose equipment is to be integrated with the electronic systems provided by this section.
 - 2) Coordinate door control and monitoring power requirements, terminations and cable types.
 - 3) Coordinate with door hardware contractor for proper wiring of locks as required by code.
 - 4) Coordinate installation of pneumatic tubes on projects with pneumatic locks. The SEC shall install pneumatic tubes (provided by DEC) from manifolds in electronics equipment rooms to the locks. The DEC shall terminate all tubes and provide all other equipment, including necessary tubes between equipment locations.
 - c. Division 14:
 - 1) Coordinate elevator cab mounted equipment.
 - 2) Interface and coordinate with elevator system contractor for remote control and monitoring of elevator doors including cab dispatch, cab position indication, cab direction indication and status of door at each landing.
 - 3) Division 14 contractor shall provide interface terminals for each elevator in each elevator equipment room. Division 11 contractor shall provide all wiring from electronic security system equipment to elevator machine room including termination on interface terminals. Division 14 contractor to provide all wiring from elevator equipment room to elevator cab and install back-boxes in elevator cab for mounting of security devices by Division 11 contractor.
 - d. Division 15:
 - 1) Coordinate domestic water solenoid valve control with the Division 15 contractor.
 - e. Division 16:

- 1) Coordinate the installation of conduit and power conductors including the entrances and connection details to all boxes provided by Division 11 and Division 16 contractors.
 - 2) Coordinate the power requirements of all equipment, such that all adequate circuits and power distribution for all electronic equipment is available at the locations required.
 - 3) Coordinate with the Owners IT staff and the telephone system contractors for inmate telephone control.
- f. Coordinate roof and fire wall and smoke partition penetrations with other trades.
3. Wherever materials, methods or placements of materials and equipment for the electronic security systems Work is provided by other Contractors, it shall be the responsibility of the Security Electronics Contractor (SEC) to coordinate the Work and assure that it is provided in such a manner as to enhance the final system operation.
 4. This specification contains a combination of prescriptive and performance requirements. The Contractor is responsible for fully implementing the functions described in the Specifications and shown in the contract drawings. This will require the SEC to perform substantial work selecting system components, integrating system functions, and integrating various electronic security systems with each other and with equipment provided and installed by other Sections.

SPECIFIER: EDIT RELATED SECTIONS AS NECESSARY

1.2 RELATED SECTIONS:

- A. Drawings and all provisions of the Contract including General, Supplementary Conditions and Division 1 Specification sections, apply to the work of this section and its related sections.
- B. Division 1, Alternates
- C. Division 16 for required electrical work not covered by Division 11
- D. Section 111991 – Intercom and Paging Systems
- E. Section 111992 – Access Control System
- F. Section 111993 – CCTV System
- G. Section 111995 – Control Electronics
- H. Section 111995.1 – Equipment Racks, Cabinets and Enclosures
- I. Section 111995.2 – Touch Screen System
- J. Section 111995.3 – Video Visitation System
- K. Section 111995.4 – UPS System

1.3 REFERENCES:

- A. References to codes or standards identified in this document are for the convenience of the contractor and do not imply complete requirements whether or not referenced.
- B. Codes compliance: Comply with the current adopted editions of all applicable codes, including but not limited to:
 1. Federal, state and local codes, regulations and ordinances
 2. Uniform Building Code UBC
 3. National Electric Code NEC
 4. National Fire Code NFC
 5. Federal Communications Commission FCC

- 6. Occupational Safety and Health Act OSHA
- 7. All authorities having jurisdiction

C. Standards Compliance: Comply with the following standards as applicable:

- 1. Americans with Disabilities Act ADA
- 2. American National Standards Institute ANSI
- 3. American Society for Testing and Materials ASTM
- 4. Electronics Industry Association EIA
- 5. Electrical Testing Laboratories ETL
- 6. Factory Mutual FM
- 7. Institute of Electrical and Electronics Engineers IEEE
- 8. National Electrical Contractors Association NECA
- 9. National Electrical Manufacturers Association NEMA
- 10. National Fire Protection Association NFPA
- 11. Underwriter's Laboratories UL

1.4 SYSTEM DESIGN REQUIREMENTS

A. Combined Prescriptive And Performance Requirements

- 1. Division 11 includes a combination of prescriptive and performance specifications. Compliance with the performance specifications, as well as coordination and integration of the prescription requirements, is the responsibility of the SEC.
- 2. The performance requirements are intended to establish overall system performance requirements, satisfy the operational requirements, and establish the inter-coordination requirements for the Division 11 systems.
- 3. The prescriptive requirements establish the minimum quality, characteristics, and types of components, equipment, and materials to be used to achieve the stated system performance requirements.
- 4. The Contractor shall carefully consider all of the requirements for each of the Division 11 systems when preparing its bid. Any questions regarding the intent of these requirements, the scope of the systems, or their coordination requirements must be submitted in writing prior to bidding in accordance with the Instructions to Bidders. The Contractor shall have no claim for either extra compensation or extra time on the grounds that it did not understand the scope, the requirements of Division 11 or the coordination of trades.

B. Drawing Interpretation:

- 1. The Drawings are diagrammatic and indicate the general arrangement of systems and equipment unless indicated otherwise by dimensions or detail drawings. The Drawings utilize symbols, riser, block and single line diagrams to outline the Work to be provided. These drawings do not have any dimensional significance nor do they delineate every item required for the intended Work. No interpretation shall be made from the limitations of symbols and diagrams that all elements necessary for complete Work are included.
- 2. The Work shall be provided in accordance with the scope of work expressed on the Drawings and Specifications, and in conformance with the actual building architectural and structural conditions.

3. The use of words in the singular shall not be considered as singular where other indications denote that more than one item is referred to.
4. Details that appear on the Drawings that are specific with regard to the dimensioning and positioning of the Work are intended only for the purpose of establishing general feasibility. Field coordination shall be required for the Work.

1.5 DEFINITIONS:

- A. Concealed: Embedded in masonry or other construction installed behind wall furring with double partitions or hung ceilings, in crawl spaces, in shafts.
- B. Conveniently Accessible: Capable of being reached without climbing or crawling under or over obstacles, and with adequate working clearance both front and back.
- C. Custom: Created or modified for this unique application.
- D. Damage: Visible or invisible damage that negatively affects performance or appearance and creates defective materials or workmanship.
- E. Defective Materials or Workmanship: Operational failures, performance below required minimums, evidence that the system will not be reasonably maintainable, errors in documentation, abnormal operations, unsafe conditions, or similar unsatisfactory performance.
- F. Exposed: Not concealed.
- G. Engineer: The Engineer of Record assigned to the project.
- H. Failure: Any deviation from system operation and performance, as determined by the Contract Documents, subsequent submittals and the Engineer.
- I. Furnish: Purchase and deliver to the project site complete with every necessary appurtenance, support and accessory required for operation.
- J. Inmate Accessible Area: Areas or rooms that inmates are locked in, have regular or part time access to, regardless if they are supervised or escorted.
- K. Install: Unload at the delivery point at the site and perform every operation necessary to establish secure mounting and correct operation at the proper location in the Project.
- L. Nationally Recognized Testing Laboratory: A testing laboratory, which is approved, in accordance with OSHA regulations, by the Secretary of Labor.
- M. NIC: Not In Contract
- N. PBO: Provided By Others, provided by another Division of the Contract.
- O. Provide: Furnish and install, completely ready for use, including all accessories required for operation.
- P. Owner/ Owner Representative: Person(s) authorized by the owner to represent its interest.
- Q. UON: Unless Otherwise Noted
- R. Work: Includes all labor and materials required by the Contractor to implement the intent of the Contract Documents including, but not limited to the design, installation, startup, testing, maintenance and submittal requirements.

1.6 RENOVATION

- A. Work in renovated areas shall include removal of all abandoned systems including wiring.
- B. Where existing wiring is to be extended, install terminal box with terminal strips for this purpose. Label all terminals.

- C. Provide steel blank cover plates over existing boxes where devices are removed.
- D. Remove, store, turnover or re-install devices, equipment and materials specifically noted on the drawings. Remove devices in such a manner to maintain their integrity where possible.
- E. All unused devices shall be turned over to the Owner.
- F. Prior to starting renovation work, perform a complete operational test of the existing systems. Any portion of the system that is non-functional shall be reported along with recommended repairs prior to starting the renovation. Commencement of renovation work shall indicate acceptance of existing systems as fully operational.

1.7 SUBMITTALS:

- A. Comply with Division 1.
- B. Product Data:
 1. Product data is required for all materials and equipment. Include complete bill of materials for each section with the product data submittal.
 2. Cross-reference submitted items to the Specifications using their related Section and paragraph number.
 3. Submit complete product data in a single, bound submittal of one or more volumes. Provide a table of contents and labeled divider tabs for each section. Partial submittals for individual Sections will be returned without review.
 4. Include descriptive literature, catalog cuts, illustrations, schematics, technical data sheets, and test data necessary for the Engineer to ascertain that proposed equipment and materials comply with specification requirements. Include manufacturer's name, model, catalog or part numbers. Catalog cuts shall be legible and shall clearly identify equipment being submitted.
 5. Include required calculations; I/O points lists, system zone schedules, and other tabular data as necessary to clarify system sizing and configuration. Do not, however, consider such submittals as a substitute for complete shop drawings.
 6. Specifically identify any deviations from the contract documents.
- C. Shop Drawings:
 1. Shop drawings are required for all systems and component assemblies.
 2. CAD files of a mutual agreed upon format of the site and floor plan drawings will be made available to the SEC at no cost upon request. These files may be used as a first step in the preparation of shop drawings. Do not consider the drawing plots from such files as a substitute for the Contract Drawings.
 3. Shop drawings will not be accepted or considered unless they are submitted as a complete package for each individual section. Partial submittals covering less than a whole system or with incomplete interfaces to other systems will be rejected.
 4. Standard manufacturer's drawings may not be used as shop drawings unless specifically modified for use on this project.
 5. Each drawing requires a unique drawing number and revision level.
 6. At a minimum, include the following shop drawings:
 - a. Floor Plans: Scaled drawings showing equipment and device locations in plan view. Include wire and cable types and quantities, raceway sizing and routing. Routing

information shall indicate where rated assemblies are penetrated. Separate into as many plan series as needed to prevent overlapping information. These drawings shall be fully coordinated with other trades prior to submittal. Show relationship to adjacent surrounding structure.

- b. Equipment and Control Room Plans and Elevations: Scaled, dimensioned drawings showing security equipment layouts in security equipment rooms, electrical/ security closets, and control rooms. Include electrical J-boxes and receptacles, power, conduit sizing and routing, metal gutters, wiring ducts, cable trays, and supports. Indicate all other non-security cabinets, enclosures, and equipment within the room.
 - c. Cabinet, Enclosure, and Rack Elevations: Drawings and cut sheets for each system equipment cabinet, enclosure, and racks.
 - d. System Block Diagrams: Single line block diagrams showing the general relationship between system components and the interconnection between systems. Use these drawings as a reference for the single line diagrams and point-to-point diagrams by cross-referencing the shop drawing number of those diagrams on these drawings.
 - e. Single Line Diagrams: Interconnection diagrams for the riser and trunk wiring between equipment cabinets, enclosures racks and major components. Use the same equipment designations as the floor plans and block diagrams.
 - f. Point-to-point diagrams: Drawing which show the wiring of each component or device of each individual system. Include details of power supply, grounding, shielding, shield grounding, surge protection, fusing, connector pin-outs, terminal assignments, and similar wiring and connection details. Use the same component and device designations as the floor plans and other shop drawings.
 - g. Schematic Diagrams: Drawings which show the functional component wiring of a system to include but not limited to resistors, diodes, transistors, relays, etc. Required for all custom systems and modified commercial products.
 - h. All other shop drawings necessary to install, fabricate, locate, identify, test, service, and repair the security electronic systems. Shop drawing approval by the Engineer is not a release from contract requirements as defined by the drawings, specifications, and governing codes and regulations.
- D. Samples:
- 1. Approval of any modified assemblies shall be required. Submit technical information with samples.
- E. Demonstration and Test Procedures:
- 1. Initial Performance Testing: Submit initial performance testing Forms.
 - 2. Performance Testing: Submit test procedures, forms and checklists for point-by-point testing. Include a listing for each individual system, each control station and control operator interface, each electronics room, each equipment closet, and each major system component. At a minimum, forms shall include columns for operational/non-operational status, remarks, workmanship and date corrected. Submit a sample format for approval a minimum of 15 days prior to demonstration.
- F. Test Results:
- 1. Initial Performance Testing: Submit completed test results of the Initial Performance Testing to the Project Inspector five (5) working days before scheduled Performance Testing.

2. Performance Testing: Submit completed test results of the Performance Testing.
- G. Record (As-Built) Documents:
1. Comply with Division 1.
 2. Provide an electronic media copy of all drawings on mutual agreed upon CAD format.
 3. Provide record drawings on DVD or other specified media.
 4. Software Records:
 - a. Submit final software programs on electronic media compatible with the installed system.
 - b. Standard and Custom Application Software:
 - 1) Prepare and submit the licenses to all software installed for the system. Compile a list with each program name, its installed version number, the number of copies installed, the serial number of each copy, the publisher's name and address, and the publisher's customer support telephone number.
 - 2) Provide the Project Inspector with all original installation disks or CD-ROMs and all software manuals for every software program installed for the system.
 - 3) Fully comply with all license agreements for the installed software. Install sufficient quantities of each software program so that the Owner fully meets the intent of the publisher's site license agreement. When in doubt, contact the publisher for an interpretation and comply with that interpretation.
 - 4) Transfer all software licenses to the Owner prior to completion of the project. Transfer shall include customer support rights.
 - c. User Data and User Programmable Software:
 - 1) Provide complete documentation of all user data and user programmable software, including but not limited to properties, preferences, settings, configurations, component modules, plug-in modules, user subroutines, databases, libraries, drivers, macros, templates, objects, slides, maps, images, sounds, icons, screen savers, and any other software files for each site.
 - 2) Provide narrative descriptions and diagrams that give basic descriptions of each software component and the interaction between software components. Provide a complete, annotated software component listing.
 - d. Provide the Project Inspector with a CD ROM of the final operating version of the user data and user programmable software.
 5. Operators Guide
 - a. Submit Operators Guide for approval 10 days prior to first phase of Operational Training.
 - b. Operators Guide shall outline the operation of each system. A guide is to be kept at each workstation for reference on the operation of the equipment.
 - c. Include written description in outline form how to operate the basics of the system. This shall include but not be limited to: access and control of individual devices, group control functions, emergency control functions, system acknowledgement and reset of alarms.
 - d. Include 8.5 x 11 inch graphics as needed to identify device locations and facilitate understanding of the written description.
 - e. Provide one copy for each work station and one master copy that may be reproduced by the Owner.

- f. Laminate each guide for each workstation, or other approved method.
- 6. Operational Manuals:
 - a. Submit the required quantity of identical manuals, which shall contain the Theory of Operation, start up, shut down, and emergency procedures and the manufacturer's operating instructions.
 - b. Subdivide the manual by section with tab dividers. Provide a table of contents, which identifies each section and the contents therein.
- 7. Maintenance Manuals:
 - a. Submit a complete set of maintenance documents as described in this Section. For documents of a size greater than 11 x 17 inches, prints, DVD or other specified media shall be furnished. Owner/Architect/Consultant to specify the preferred media.
 - b. Manuals shall include the following as a minimum requirement:
 - 1) Technical system description.
 - 2) System schematics.
 - 3) Detailed wiring diagrams to identify cabling, termination and routing.
 - 4) Panel assembly drawings to identify location of components, terminal strips and equipment as required correlating with system drawings.
 - 5) Preventive maintenance procedures and requirements.
 - 6) Descriptions and drawings as required to maintain equipment from the board to the component level.
 - 7) Description of software and user programmable functions. Procedures for user programmable functions shall be included.
 - c. For systems where the program resides on a disk or other similar storage medium, furnish a copy of the disk, or similar medium, to the Project Inspector.
 - d. Where multiple systems are combined into a single integrated system, documentation shall include a description of the integrated system and the details of the interfaces between systems.
- 8. Provide a list of current telephone numbers and addresses of all material vendors and equipment manufacturers who have supplied components in this Project. Include separate service telephone list and purchasing telephone list cross-referencing with each component.

1.8 QUALITY ASSURANCE:

A. Contractor Qualifications:

- 1. Contractors performing Section 111990 work must demonstrate competence in performing this type of work by providing similar past work experience history in writing if requested within fourteen days of the bid date. Approval of additional firm(s) will only be allowed as posted in writing by addendum. Work experience shall be demonstrated for the following systems for both design and installation:
 - a. Systems integration.
 - b. Software development and programming for the Control Electronics Touch Screen system.
 - c. Video Surveillance systems

B. Key Project Personnel:

1. Work experience with similar integrated security electronics systems shall be demonstrated for the key project personnel. Resumes of prospective key personnel shall be submitted after the contract award and no later than product data submittals.
2. The contractor shall be represented at all times as specified in the general conditions. The contractor's representative shall be responsible for technical and administrative work including but not limited to, the following:
 - a. Preparation and signature of all engineering and submittals.
 - b. Supervision of shop fabrication and field installation work.
 - c. Representation at all project meetings.
 - d. Progress schedule and progress reporting.
 - e. Conduct on-site performance and acceptance testing.
- C. Consider all qualification and experience materials submitted as binding. Obtain the Project Inspector's prior approval in writing for any deviations from the minimum requirements in organization, personnel, work plan, quality control plan, procurement plan or other declaration within the qualification submittal. Key project personnel substituted prior to or during the Work must meet the specification requirements and obtain the Project Inspector's approval.

1.9 DELIVERY, STORAGE AND HANDLING:

- A. Protect all materials and equipment from damage during storage at the site and throughout the construction period. Protect equipment and materials during shipment and storage against physical damage, dirt, dust, moisture, heat, cold, rain, and any foreign substances that may damage the equipment.
- B. All electronic equipment shall be stored inside or in weatherproof storage containers suitable for the purpose.
- C. Prevent damage from rain, dirt, sun and ground water by storing the equipment on elevated supports and covering them on all sides with securely fastened protective rigid or flexible waterproof coverings.

1.10 PROJECT CONDITIONS

- A. For work to be performed in an existing active facility:
 1. Survey all locations where work is to be performed and verify existing conditions and as-built records.
 2. Comply with the facility Security Procedures.
 3. Movement in and around the facility may be controlled or limited at any time.
 4. Living Units and related areas may be occupied during construction and retrofit. If occupied, inmates will be locked out of areas where the work is being performed.
 5. If the Contractor would like to use existing raceways or equipment not specifically identified in the plans or specifications submit a written request to the Project Inspector. Identify the location and status (i.e. empty, contains iso-duct, etc.) and the intended use. Use only after written approval from the Project Inspector has been obtained.
 6. Work in the existing building may be subject to hazardous material regulations and special handling requirements. Refer to Division 1 and the related drawings for asbestos and lead paint abatement requirements and procedures.

1.11 SEQUENCING AND SCHEDULING:

- A. Do not procure any equipment without accepted product data submittals and the acceptance of product samples, if required. Do not perform any field installation without approved shop drawings. Do not begin programming without approved operational narratives, the required users coordination meetings and requirements.
- B. Do not begin manufacturing of the custom control panels without the required Engineer's coordination, review and acceptance of the panel layouts and nomenclature, and the inclusion of all users' requirements.
- C. Complete programming prior to the Performance Testing.
- D. Develop and submit for approval a plan on how to make the transition from the existing security systems to the new security systems. Include the following:

1.12 COORDINATION:

- A. The facility will assign a contact person for the Project Inspector to coordinate access into secure areas. Coordinate all access requirements, system interruptions and scheduled down time with the Project Inspector.
- B. Coordinate with the Project Inspector for installation and testing of devices that are in occupied areas.
- C. Coordinate system changeover of security functions with Project Inspector in an existing facility.
- D. The Contractor is required to coordinate the layout of all pipes, ducts, conduits, cable trays, sprinkler lines, etc., with other trades and conditions.

1.13 WARRANTY:

- A. Provide a warranty of the system (including, but not limited to, software, hardware, and peripheral equipment) as a system, including interfaces to work by others for one year from the date of final acceptance. Divisions of Work among various suppliers, vendors, installers, subcontractors, and other parties will not be recognized or accepted.
- B. Guarantee to repair and replace defective materials or workmanship at no cost to the Owner during the warranty period including labor and materials.
- C. Respond within four (4) hours to an emergency maintenance request. Provide a twenty-four hour telephone contact number (24 hours per day, 365 days per year). Service response time is defined as the period between the placing of a service request and the arrival of a qualified technician on-site.
- D. Repair and make operational any defective materials or workmanship resulting from an emergency maintenance request within an 8-hour period from the time of the initial arrival of service personnel at the site. Correct non-emergency defective materials or workmanship within four (4) calendar days of receiving notice of the defect. An emergency maintenance request shall be defined as a system or portion of a system failure that affects annunciation of alarms. Failure of a single component i.e., camera or intercom station is not considered an emergency maintenance request.
- E. Where the equipment manufacturer's warranty covers a longer time period than that required by these specifications, the manufacturer's warranty shall be transferred to the Owner.

1.14 EXTRA MATERIALS:

- A. At substantial completion of the project, deliver to the Project Inspector all spare parts and extra materials required in each Section with a letter of transmittal. All spare parts and extra materials shall be brand new in their original shipping boxes or packages and shall have one year material warranty remaining at the time of delivery. Extra materials shall be available to the Contractor to use as

immediate replacements during the warranty period. The Contractor shall replace all extra materials used for the warranty requirements.

B. Special Tools:

1. Provide three of each type of security screw bits used.
2. Provide two of each type of specialty tools used.

C. Spare Parts:

1. Provide 25 of each type and size of security screw used.
2. Provide spare parts as required by each Section.

PART 2 - PRODUCTS

2.1 PRODUCT SUBSTITUTIONS:

- A. The products named in this section and the sections governed by this section establish minimum qualities that substitutions must meet to be considered acceptable. The specified products have also been used in preparing the drawings and specifications, and therefore establish the basis for equipment sizing, raceway design, wire and cable design, power consumption, and other design parameters.
- B. Any substitutions must meet all quality, operational, and functional requirements of the Specifications and Drawings. To be considered, all substitutions must be formally requested at least 14 days prior to scheduled bid date.
- C. Substitution requests will be considered only if submitted in strict accordance with the following:
 1. Cross-reference submitted items to the Specifications using their related Sections and paragraph numbers.
 2. Submit complete product data, descriptive literature, catalog cuts, illustrations, schematics, technical data sheets, and test data necessary for the Engineer to ascertain that proposed equipment and materials comply with specification requirements. Include manufacturer's name, model, catalog or part numbers. Catalog cuts shall be legible and shall clearly identify equipment being submitted.
 3. Specifically identify all deviations from the contract documents referencing the corresponding specification sections and paragraph/ article numbers.
 4. Technical Design Proposal:
 - a. Prepare and submit a complete integrated system block diagram indicating all proposed system equipment and components for the proposed substitution. Indicate all major equipment wiring.
 - b. Identify any non-compliance with the specification requirements.
 - c. If proposed systems require a substantial amount of design changes, submit a proposal to clearly address how the design modifications will be performed and how the required construction schedule will be met. Describe the entire process indicating all major activities and milestones.
- D. The Contractor shall take full responsibility for all design, coordination, cost, and schedule impact associated with substitutions including, but not limited to:

1. Its integration into the total system including physical mounting space, electrical interconnection, signal wiring, power, quality, electromagnetic interference, communication protocols, and similar design considerations.
 2. Any additional materials, equipment, components, accessories, items required for equivalent system operation and performance.
 3. Any necessary changes to branch power circuits, circuit protective devices, and the Work of other trades.
 4. Any modifications to wire, cable, and raceway design.
- E. Discontinued Products: When a specified product is discontinued or upgraded use the current replacement product.
- F. The Engineer reserves the right to completely reject any substitutions. If a substitution is rejected, Contractor will be responsible for all recovery time necessary to perform the work on schedule.

2.2 MATERIALS AND EQUIPMENT:

- A. Provide products that are new, unused, and undamaged.
- B. Materials and equipment furnished shall be of current production by manufacturers regularly engaged in the manufacturing of such items, for which replacement parts are available.
- C. All material and equipment shall be listed, labeled, or certified by Underwriters' Laboratories, Inc., where such standards have been established. Equipment and material, which are not covered by UL Standard, will be accepted provided equipment and material is listed, labeled, certified or otherwise determined to meet safety requirements of a nationally recognized testing laboratory. Equipment of a class, which no nationally recognized testing laboratory accepts, certifies, lists, labels, or determines to be safe, will be considered, if inspected or tested in accordance with national industrial standards such as NEMA or ANSI.
- D. When more than one unit of the same class of equipment or material is required, such units shall be the products of a single manufacturer. Constituent parts, which are similar, shall be the product of a single manufacturer.
- E. All components of an assembled unit need not be products of the same manufacturer, however, all components must be acceptable to the Engineer. Components shall be compatible with each other and with the total assembly for the intended service.

2.3 EQUIPMENT MODIFICATIONS:

- A. When standard manufactured equipment is modified from its original condition or factory options have been exercised identify the changes as noted below.
1. Clearly identify the modifications on the shop drawings.
 2. Clearly identify each piece of modified equipment with a label, which states, "This unit has been modified..." and identify the modification or reference. Locate the label so that a service technician or factory service personal will be able to determine the equipment in use is non-standard and that modifications are required for service, testing and replacement.
 3. Identify and describe the modifications on the Record Documents.
- B. Equipment modification labels are not required for jumper or switch settings.

2.4 SECURITY SCREWS:

- A. Submit various types of security screws for approval.

- B. Screws shall be suitable for outdoor locations.

2.5 FABRICATION:

- A. Fabricate enclosures to easily accommodate interconnecting cables entering from above or below through the use of auxiliary gutters, cable trays, and conduits. Protect all metal cabinet edges where conductors cross and conduit ends with protective covering or bushing.
- B. Group wires and cables by types, boards and modules, and maintain National Electrical Code clearances throughout the installation, including Class 1, Class 2, communications, and branch circuit power separations. Maintain sufficient and proper separation between microphone-level audio, line-level audio, high-level audio, and video cables.
- C. Uniformly organize equipment and cable routing throughout all enclosures, racks, and cabinets. Provide wiring ducts, wireways, wire posts, D rings, wire saddles to route and secure factory and field wiring. Provide routing for all wiring from point of entry to point of termination to maintain required separation, access to all components, and general organization to the wiring. Neatly dress, route and secure wiring.
- D. Mechanically fasten cabinet raceways and cable clamps to enclosure rear panels, rack members, console members, or to other system components. The use of adhesive fasteners (without mechanical fastener) is not permitted. Furnish and install cable support posts where necessary to properly support cables.
- E. No splices are permitted in cabinet raceways. Exception: Splice to cable shield when within two inches of cable termination is permitted.
- F. Furnish and install metal grounding type outlet strips in each equipment cabinet, enclosure, and rack. Leave a minimum of two unused receptacles at each location for future expansion. Neatly shorten and dress power cords from individual equipment to the outlet strips. Exception: Fire Alarm Panels.
- G. Provide protection from accidental contact of all terminals or exposed conductors over 25 volts within enclosures that contain Class 2 wiring. Use non-conductive barriers, heat shrink or other acceptable methods. Tape of any kind is not permitted.

2.6 SOURCE QUALITY CONTROL:

- A. Shop Inspections:
 - 1. The Engineer may make quality assurance inspections of shop-fabricated assemblies, on or off site. The Engineer shall have the right at all times to inspect or otherwise evaluate all assemblies for conformance with codes and standards, quality of workmanship, and compliance with contract documents and shop drawings.
 - 2. The Engineer may inspect or re-inspect any item of the system and reserves the right to reject materials and workmanship found unacceptable during inspections.
- B. Shop Test
 - 1. After fabrication, assembly and programming of the security electronics systems, perform a Shop Test of the integrated security electronics system, including duress alarm, access control, intrusion detection, intercommunication, intercom, video surveillance, operator interface, and miscellaneous controls, with all functioning as a single, integrated system. Shop Testing shall be a major milestone that shall commence only after all shop assembly, system integration, and software development is complete. Owner's approval of the integrated Shop Test shall be obtained before the shipment of any system components to the site for installation.

2. Each input and output point, operational sequence, touch screen display, operation of touch screen and control panel will be tested. Provide sample field devices, approved mock up devices and jumpers to simulate actual field operating conditions. In addition, simulated system failures, response time, boot up time and other tests will be conducted as directed by the Owner.
3. Notify the Owner a minimum of 15 working days prior to Shop Testing so that the Owner may schedule personnel to witness testing.
4. Conduct tests in strict accordance with an Owner-approved test procedure. Demonstrate full compliance with the required operating modes and sequences of operation. Record test results on a report which shall include a list of all personnel witnessing the tests, test methods used, and a record of each specific test made.
5. If test results are not in compliance with requirements or testing reveals changes or modifications that are required by the Owner, make necessary changes, repairs, corrections, or adjustments and demonstrate functionality.
6. The initial Shop Test will include all equipment for Phase 1 and programming for the entire facility. Remaining tests will be configured for the equipment required by each Phase.

PART 3 – EXECUTION

3.1 EXAMINATION:

- A. Carefully inspect the installed Work by other trades and verify that all such Work is complete to the point where installation of the Work of this division may properly commence.
- B. In the event of discrepancy, immediately notify the Project Inspector. Do not proceed with installation in areas of discrepancy until such discrepancies have been fully resolved.

3.2 INSTALLATION:

- A. Install all equipment in accordance with all pertinent codes and regulations, the accepted design, and the referenced standards.
- B. Pre-assemble electronic panels, racks and cabinets off-site when possible.
- C. Equipment Identification:
 1. Install a nameplate on each individual equipment rack, enclosure, boxes, cabinet, and significant equipment item.
 2. Use identifiers and abbreviations defined in the Drawings whenever possible. Use plan designation for labeling, unless indicated otherwise.
 3. Nameplates shall be laminated black phenolic resin with a white core and engraved lettering, a minimum of 1/4” high. Use fasteners to install nameplates. Do not fasten with adhesives.
 4. Engrave using upper case letters of uniform height; centered on device, cover plate, or enclosure; with all characters made clearly and distinctly.
 5. All equipment shall have the manufacturer’s name, address, model number and rating on a nameplate securely affixed in a conspicuous place. All equipment shall bear labels attesting to Underwriters Laboratories approval where subject to Underwriters Laboratories label service.
 6. Identify all field terminals and relays with device identification. Lettering shall be 3/16” high or the maximum size allowed by the device.
- D. Equipment Installation:

1. Install all equipment in accordance with the manufacturer's recommendations, and accepted shop drawings.
 2. Install all equipment in compliance with CEC requirements, NECA's "Standard of Installation", and recognized industry practices.
 3. If applicable, submit structural and seismic mounting load calculations demonstrating adequate support and bracing for specified seismic zone.
 4. Do not attach electrical materials to roof decking, removable or knockout panels, or temporary walls and partitions unless indicated otherwise. Use hangers and other supports to support the equipment and materials, intended for this purpose.
 5. Locate equipment as close as practical to the locations shown on the Drawings.
 6. Maintain minimum 3-foot working clearances on each side of equipment or equipment racks where access is required to inspect, service, or adjust.
 7. Check equipment against available mounting space indicated on the drawings. Coordinate location of equipment with existing devices to minimize interference. Bring all conflicts or clearance problems to the attention of the Engineer during the preparation of shop drawings.
 8. Remove and protect existing equipment that is to be reinstalled. Make modifications and adjustments as required for re-mounting devices.
- E. Confined Spaces: Comply with OSHA regulations (Standards – 29 CFR) 1910.146 when working in confined spaces (e.g. maintenance hatches or manholes).
- F. Security Screws:
1. Provide security screws wherever screws are exposed in ward or public accessible areas (i.e. transmitters, repeaters, locators, intercom substations, speakers, camera housings, cover plates, etc.). Security screws are not required in communications equipment rooms or pipe chases.
- G. Special Security Requirements, exposed raceway:
1. Where not specifically shown on the drawings, specified or required by code, use the following guidelines for the selection of exposed raceway types:
 - a. RGS – Exterior locations above building overhang (roof).
 - b. IMC – Locations under fifteen feet in height from finished floor where exposed to inmate or public access.
 - c. EMT – Exposed locations not accessible to inmates or public access. Use compression fittings.
 - d. PVC – Concrete encased, below grade under concrete slab, buried below grade. Use metal risers.

3.3 FIELD QUALITY CONTROL:

A. Initial Performance Test:

1. Initial Performance Testing is to be conducted by the Contractor.
2. Point-by-point testing shall include the sequential operation of the Security Electronics Systems in each of its operating modes. Perform a thorough, device-by-device operational test including system integration to systems, in addition to completion of all required performance testing and measurement testing. Testing shall include devices not within the scope of work such as cell call

buttons, intercoms and door operations for complete operational testing of the systems provided under Division 11.

3. Notify the Project Inspector ten days in advance that this activity will be occurring.

B. Performance Testing:

1. Performance Testing is to be conducted by the Contractor and witnessed by the Engineer.
2. Schedule point-by-point performance testing only after Initial Performance Testing has been satisfactorily completed and all necessary corrections have been made. Provide the Project Inspector with a minimum of 15 working days notice with a request to schedule Performance Testing. Submit Initial Performance Test records prior to the scheduled Performance Test. Failure to submit test results as specified shall be cause to re-schedule testing.
3. Point-by-point testing shall include the sequential operation of the Security Systems in each of its operating modes. Demonstrate device-by-device operational performance including device operation and integration to systems. Demonstrate on request any required performance and measurement testing.
4. Conduct point-by-point testing in the presence of Owner's representative. Record test results on the accepted test checklist that shall include a list of all personnel witnessing the tests. If test results are not in compliance with requirements, make necessary changes or adjustments at no additional cost, and arrange for another test. This process shall continue until the systems are acceptable to the Engineer.
5. Demonstrate acceptable system performance for all systems in accordance with the contract documents and all previous review comments. Demonstrate complete functionality of all controls, alarms and other functions.
6. Performance Testing will also include inspections for simultaneous system operation, contract document compliance, codes and standards compliance, and workmanship.
7. If failures during Performance Testing indicate that Initial Performance Testing was not properly completed, Performance Testing may be stopped and require rescheduling once the Contractor demonstrates completion of the Initial Performance Testing. Halting Performance Testing and re-testing of previously tested items will be at the sole discretion of the Project Inspector.

C. Continuous Operational Test:

1. After completion and approval of the Performance Testing, conduct a 12 calendar day operational test in order to demonstrate continuous system performance. The systems will not be accepted until they operate for the entire test period without a system failure. Restart the test period from the beginning after every confirmed system failure.
2. The Owner will provide staff to man and operate all control points during Continuous Operational Test. Owner's test personnel will simulate staff movement, generate alarms, and otherwise randomly operate as many functions as practical on a nearly continuous, 24-hour-per day basis. Provide jumpers and simulation programs to test alarms and other conditions that cannot be readily performed by test personnel. The test staff will record all suspected problems and provide these reports to the Project Inspector.
3. System failure is defined as any portion of the system that fails to operate as intended. Individual device failure such as a single camera will not be a cause for system failure.
4. Completion of the Continuous Operational Test is required for Substantial Completion or project Milestones.

3.4 CLEANING:

- A. Protect equipment during installation against entry of foreign matter on the inside. Vacuum clean all equipment both inside and outside before testing, operating and painting. Clean electrical connections with a suitable solvent prior to assembly.
- B. Remove from the premises and dispose of all packing material and debris on a daily basis.
- C. Upon completion of the Work, remove excess debris, materials, equipment, apparatus, tools and the like and leave the premises clean, neat and orderly.
- D. Thoroughly polish all bright metal or plated Work and remove any pasted labels, dirt or stains from the equipment.

3.5 TRAINING:

- A. Train the operational staff in the operation of the Security Electronics Systems prior to the end of the Phase 1 Continual Operational Test.
- B. All classroom training is to occur on site at a location provided by the Owner.
 - 1. Training shall include manuals, personal instruction, and hands on applications for three different levels of students, 'operator', 'maintenance' and 'programming' levels.
- C. Operational Training:
 - 1. Train both the technical and non-technical (security) staff on how to operate and control the security systems.
 - 2. Provide operational training for the Housing Units systems and Central Control Systems. Instruct staff on how to operate individual systems and integrated systems.
- D. Maintenance Training:
 - 1. Train the maintenance staff on both system and device maintenance procedures. Instruct on basic troubleshooting, replacing, servicing and preventive maintenance tools and procedures.
 - 2. Provide a combination of classroom sessions supported by audio/visual aids, and field sessions with personnel participating in hands-on preventative and corrective maintenance.
- E. Programming Training:
 - 1. Curriculum shall include, but not be limited to, password levels, programmable user features, adding/deleting of devices, revising/adding of graphics, and software troubleshooting.
- F. General Training shall include areas of the systems not specifically covered by other specification sections. Provide general training sessions for system operations, maintenance, and programming as follows:
 - 1. Operational Training8 hours
 - 2. Maintenance Training.....8 hours
 - 3. Program Training8 hours
- G. Submit proposed training schedules 15 days prior to training for Project Inspector's approval. Estimate classroom and hands-on hours required for both operational and maintenance training. Include a syllabus for each class session.
- H. All training required by this section is to be site specific and in addition to training that is required by other sections.

END OF SECTION 111990

RECOMMENDED GUIDE SPECIFICATIONS FOR DETENTION EQUIPMENT MANUFACTURES ASSOCIATION (DEMA)

NAAMM / DEMA 11 19 00 – Basic Detention Equipment Requirements

NAAMM / DEMA 11 19 10 (HMMA 863) - Detention Hollow Metal

NAAMM / DEMA 11 19 20 - Detention Hardware

NAAMM / DEMA 11 19 30 - Detention Glass and Glazing

NAAMM / DEMA 11 19 40 - Detention Furnishing and Accessories

NAAMM / DEMA 11 19 45 - Detention Bar Grating – Wire Mesh

NAAMM / DEMA 11 19 46 - Detention Bar Grating – Expanded Metal

NAAMM / DEMA 11 19 50 - Detention Fixed Exterior Windows

NAAMM / DEMA 11 19 60 - Detention Wall Systems

NAAMM / DEMA 11 19 70 - Detention Ceiling

NAAMM / DEMA 11 19 80 - Detention Cells

NAAMM / DEMA 11 19 90 - Detention Electronics