

**ASBESTOS, LEAD BASED PAINT, FUNGAL REMOVAL AND HAZARDOUS  
MATERIAL REMOVAL WORK PLAN**

For The

**PROPOSED CLINIC AREA  
ELEANOR MCMAIN SECONDARY SCHOOL  
5712 S. CLAIBORNE AVENUE  
NEW ORLEANS, ORLEANS PARISH, LOUISIANA**

Prepared for

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**PSI Project No. 0255487**

**January 13, 2012**

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## SECTION 1.0 - SUMMARY OF WORK

### 1.1. GENERAL

This Asbestos, Lead-based Paint, Fungal Removal, and Hazardous Materials Removal Work Plan gives the proper removal, transportation and disposal procedures to be used by Jahncke & Burns Architects, LLC's selected Abatement Contractor for the safe removal of the following materials with asbestos fibers, lead-based paint, mold impacted building materials, and hazardous materials as identified in this specification or as directed by the Owner's contract documents.

This area to be addressed in this document includes the area known as the Proposed Clinic Area within the Eleanor McMain Secondary School (McMain). This area is located within the first floor cafeteria of the Main School Building (see Figure 1).

#### 1.1.1 Asbestos

Asbestos-containing building materials (ACBM), defined as a building material with greater than one percent (>1%) asbestos as determined by laboratory analysis, was not identified in the Proposed Clinic Area. However, asbestos fibers were identified in the following material.

SUMMARY OF MATERIALS WITH ASBESTOS FIBERS	
ACBM Description	Quantity and Location
Gray Window Caulking	Approximately 2,000 Linear Feet associated with the Wood Window Frames Located Along the Exterior Facing Wall

Twelve (12) large wood window frames were located along the exterior facing wall of the Proposed Clinic Area. The window caulking was in poor condition and was not present throughout all areas of the windows.

Although the window caulking is not classified as ACBM under NESHAP regulation, OSHA regulations have indicated that there is no safe level of asbestos fibers. Therefore, the caulking identified as containing <1% asbestos fibers is included in this Work Plan in order to meet worker safety requirements.

In addition to the general project requirements outlined throughout this document, specific removal requirements are included in the following sections:

5.4 – Window Caulking - (page 13, 14)

#### 1.1.2 Lead-based Paint

Lead-based paint (LBP) has been identified on the Proposed Clinic Area. The location of the LBP is as follows.

SUMMARY OF MATERIALS WITH LEAD-BASED PAINT	
LBP Description	Location
White Paint	Twelve Wood Window Frames Located Along the Exterior Facing Wall

The white lead-based paint is present on the twelve (12) wood framed windows and not present on the window jambs and sills. The paint was in very poor condition. Note that caulking with <1% asbestos (indicated above) is also present on these windows.

In addition to the general project requirements outlined throughout this document, specific LBP requirements are located in Section 7.0 (page 17).

**1.1.3 Hazardous Materials**

Hazardous materials may include polychlorinated biphenyls (PCBs) associated with light ballasts, mercury-containing thermostats, petroleum products, and materials labeled "hazardous", or materials that should be identified for removal prior to renovation.

The following materials were identified during a survey of the cafeteria area within the Main School Building:

SUMMARY OF HAZARDOUS MATERIALS	
Material Description	Quantity and Location
Fluorescent Light Tubes	Approximately 20 Light Fixtures in the Cafeteria Area, with Two Tubes Per Fixture
Ballasts Associated with Fluorescent Light Fixtures	Approximately 20 Light Fixtures in the Cafeteria Area, with One Ballast Per Fixture

In addition to the general project requirements outlined throughout this document, specific requirements for the removal and disposal of hazardous materials are located in Section 8.0 (page 18).

**1.1.4 Mold Impacted Building Materials – Proposed Clinic Area**

Staining associated with fungal growth was observed on plaster ceilings of the Proposed Clinic Area. Approximately 20% of the ceiling area was affected by fungal growth.

SUMMARY OF FUNGAL IMPACTED AREAS	
Description	Location
Fungal Growth on Plaster Ceiling	Approximately 20% of the Ceiling in the Proposed Clinic Area, or 2,000 Square Feet

In addition to the general project requirements outlined throughout this document, specific requirements for the treatment of mold impacted building materials are located in Section 9.0 (page 19).

**1.2. PROJECT DESCRIPTION**

1.2.1. The Eleanor McMinn Secondary High School facility (subject property) includes a clinic facility that is currently located in a separate portable building located in the

school yard on the south side of the subject property. It is proposed that this clinic will be relocated within the cafeteria area located first floor on the Joseph Street side of the main school building. This proposed relocation will require renovation of interior and exterior portions of the cafeteria area that will disturb building materials present in that area. In addition, it is proposed that the exterior of the Main School Building will be renovated, which will include a modification to the exterior facing window systems in the Proposed Clinic Area.

- 1.2.2. A modified layout of the cafeteria area provided by Jahncke & Burns Architects, LLC and modified by PSI are included with this document as Figure 1. The drawing includes the locations of windows with LBP and asbestos-containing fibers in the caulking.

### 1.3. GENERAL REQUIREMENTS

The Contractor shall get familiarized with the conditions for the project and is responsible for estimating the quantities and verifying the locations of all work to be performed as outlined in this specification. Failure to do so shall not relieve the Contractor of his obligation to furnish all materials and labor necessary to carry out the provisions of the Contract. **The locations and quantities of the materials identified as containing asbestos fibers, LBP, hazardous materials and mold-impacted building materials must be field verified by the Contractor prior to bidding.**

- 1.3.1 On-site ambient air monitoring and final clearance will be conducted by a third party environmental consultant. Final clearance air samples in asbestos work areas will be collected and analyzed by Phase Contrast Microscopy (PCM).
- 1.3.2 Remove and dispose of all waste that may contain LBP and/or asbestos fibers in accordance with applicable regulations and these specifications.

### 1.4. CODES AND REGULATIONS

- 1.4.1. General Applicability of Codes, Regulations and Standards: Except to the extent that more explicit or more stringent requirements are written directly into the contract documents, all applicable codes, regulations, and standards have the same force and effect (and are made a part of the contract documents by reference) as if copied directly into the contract documents, or as if published copies are bound herewith.
- 1.4.2. Federal Regulations: Those which govern asbestos abatement work or hauling and disposal of asbestos waste materials including but not limited to the following:

U.S. Department of Labor, Occupational Safety and Health Administration, (OSHA), including but not limited to:

General Industry

Title 29, Part 1910, Section 1001 of the Code of Federal Regulations

Respiratory Protection

Title 29, Part 1910, Section 134 of the Code of Federal Regulations

Construction Industry

Title 29, Part 1926.1101, and 1926.62 of the Code of Federal Regulations

Access to Employee Exposure & Medical Records

Title 29, Part 1910, Section 20 of the Code of Federal Regulations

Hazard Communication

Title 29, Part 1910, Section 1200 of the Code of Federal Regulations

Specifications for Accident Prevention Signs and Tags

Title 29, Part 1910, Section 145 of the Code of Federal Regulations

U.S. Environmental Protection Agency (EPA) including but not limited to:

Worker Protection Rule

40 CFR Part 763, Subpart G  
CPTS 62044, FKR 2843-9  
Federal Register, Vol. 50, No. 134, 7/12/85  
P28530-28540

Regulation for Asbestos

Title 40, Part 61, Subpart A of the  
Code of Federal Regulations

National Emission Standard for Asbestos

Title 40, Part 61, Subpart M of the Code of  
Federal Regulations including Asbestos NESHAP  
Revision; Final Rule, Federal Register;  
Tuesday, November 20, 1990

Asbestos Hazard Emergency Response Act (AHERA)

Regulations 40 CFR 763 Subpart E

U.S. Department of Transportation (DOT) including but not limited to:

Hazardous Substances: Final Rule

Regulation 49 CFR, Parts 171 and 172

- 1.4.3. State and Local Regulations: Abide by all state and local regulations which govern asbestos and lead abatement work or hauling and disposal of waste materials, including but not limited to the Louisiana Department of Environmental Quality (LDEQ) code in title 33 Chapter 27. Prior to initiating work, proper written notification shall be submitted to the LDEQ per the requirements.

## 1.5. SCOPE

- 1.5.1. This project includes isolated removal of materials containing asbestos fibers as identified in this specification or as directed by the Owner's contract documents. These operations shall comply with OSHA Class II asbestos work requirements and EPA AHERA requirements. The scope of work is as follows:
- 1.5.2. Contractor shall submit pre-work submittals (1 copy) for review, prior to work. The submittals shall contain, but not be limited to, all licenses; personnel information; performance, labor, and payment bonds (if required); and LDEQ/EPA Notification. Contractor is directed to fill out and submit the LDEQ Notification for the Owner based on the timetable as set forth by the Owner's schedule.
- 1.5.3. Contractor shall supply all the necessary tools, equipment, labor, construction/abatement activity materials, waste transporter/can (enclosed disposal unit) and delivery of the waste to an appropriate waste disposal facility to complete the work as specified by this document and/or by the contract agreement.
- 1.5.4. Contractor shall supply electrical power continuously until all work areas have passed clearance inspection and testing for the project. Electrical power has been disconnected from the property.
- 1.5.5. Contractor, as a minimum, shall isolate the work areas in accordance with appropriate sections of CFR 1926.1101(g) as well as this work plan. A temporary airtight barrier, as required, shall be constructed to separate the work areas from the occupied areas in order to maintain service to these areas of the building. This barrier shall be constructed of polyethylene sheeting and wood framing or equivalent. Penetrations through the barrier shall be sealed with appropriate sealant.
- 1.5.6. Contractor shall remove and dispose of materials containing asbestos as indicated on the reference drawings and in this specification. Quantities and locations of the ACMs at the facility are identified in the Tables in Section 1.1 of the specification and the Figure 1 included as attachments.
- 1.5.7. The quantities are provided for the sole purpose of providing general guidance to the Contractor as to the scope of the project. The scope of the project shall include removal of all observable and identified hazardous materials regardless of quantity. Only materials that are concealed and could not have been reasonably identified at the time of the bidding shall be considered for additional payment in accordance with the Unit Costs.
- 1.5.8. Contractor shall construct a three-chamber wet decontamination unit for each work area. The decontamination chamber shall be equipped with a shower capable of delivering hot and cold water and filtering media from the shower drain to (5) microns. An adequate supply of soap, shampoo and disposable towels shall be maintained for workers at egress.

- 1.5.9. If necessary, all small movable objects shall be removed from the work areas. Large moveable objects left inside each work areas shall be covered by a minimum of one layer of 4-mil polyethylene sheeting.
- 1.5.10. Replacement (if necessary) will be conducted by others or as directed by the Owner's contract agreement.
- 1.5.11. Contractor is to begin work from the start date as noted on the LDEQ Notification or as amended by the Owner's contract. Work schedule is estimated to be a normal 8 hour day. The Contractor may opt to work a 10-12 hour day; however, the Contractor must inform the Consultant 24 hours in advance prior to change in work schedule. The Consultant and the Owner must approve any changes in the work schedule.
- 1.5.12. Contractor personnel shall not consume food, alcoholic beverages or smoke on project site premises during any activity. Personnel shall restrict themselves to work hours and park only in designated areas. No admittance to the premises is permitted unless escorted by an Owner's Representative or approved Asbestos Contractor/Supervisor.
- 1.5.13. Contractor shall coordinate all work times with the Owner's Asbestos Individual Consultant (AIC) or Project Manager and is directed to submit, adjust and amend the LDEQ Notification for the Owner based on his accessibility.
- 1.5.14. Contractor is to submit close out documents within 15 days of completion, to include, but not limited to, waste manifest(s), personal testing (PEL/STEL), licenses and project logs.

END OF SECTION 1.0

## SECTION 2.0 - PROTECTIVE CLOTHING AND EQUIPMENT

### 2.1. PROTECTIVE CLOTHING

#### 2.1.1 Coveralls:

Provide disposable full-body coveralls and disposable head covers, and require that they be worn by all workers in the Work Area. Provide a sufficient number for all required changes, for all workers in the Work Area.

#### 2.1.2 Cold Weather Gear:

Provide each worker, as needed, with an insulated jacket, pants, gloves and hat. Require that cold weather gear be removed in the Equipment Room of the asbestos abatement decontamination unit. Dispose of cold weather gear as asbestos waste at the completion of all work.

#### 2.1.3 Boots:

Provide work boots with non-skid soles, and where required by OSHA, foot protection, for all workers. Provide boots at no cost to workers. Do not allow boots to be removed from the Work Area for any reason, after being contaminated with asbestos-containing material. Dispose of boots which have not been decontaminated as asbestos-contaminated waste at the end of the work.

#### 2.1.4 Hard Hats:

Provide head protection (hard hats) as required by OSHA for all workers, and provide four (4) spares for use by Owner's Representative, Project Administrator, and Owner. Require hard hats to be worn at all times that work is in progress that may potentially cause head injury. Provide hard hats of type with plastic strap type suspension. Require hats to remain in the Work Area throughout the work. Thoroughly clean, decontaminate and bag hats before removing them from Work Area at the end of the work.

#### 2.1.5 Goggles:

Provide eye protection (goggles) as required by OSHA for all workers involved in scraping, spraying, or any other activity which may potentially cause eye injury. Thoroughly clean, decontaminate and bag goggles before removing them from Work Area at the end of the work.

#### 2.1.6 Gloves:

Provide work gloves to all workers and require that they be worn at all times in the Work Area. Do not remove gloves from Work Area and dispose of as asbestos-contaminated waste at the end of the work.

## 2.2. RESPIRATORS

- 2.2.1 Contractor shall comply with *29 CFR 1926.1101(h) and the OSHA General Industry Respirator Protection Standard in CFR 1910.134* and initiate appropriate respirator program. A minimum of half-mask air purifying respirators with dual HEPA (High Efficiency Particulate Air) filters shall be used during work area preparation and removal of non-friable materials. Approved organic canisters shall be utilized in conjunction with the asbestos filters during mastic removal. A minimum of full-face powered air purifying respirators (PAPR) with HEPA filtration shall be utilized during the removal of friable materials.
- 2.2.2 All respirators shall be approved by the National Institute of Occupational Safety and Health (NIOSH) for use in asbestos-containing atmospheres.
- 2.2.3 Each worker must perform positive and negative air pressure fit tests each time a respirator is put on or as respirator designs permit. Supplied air respirators shall be tested for adequate flow as specified by the manufacturer.
- 2.2.4 No one wearing a beard or other facial hair which will prevent a proper respirator seal shall be allowed to wear a respirator or enter the regulated area.

END OF SECTION 2.0

## **SECTION 3.0 - EMERGENCY PLANNING**

### **3.1 PROCEDURES**

- 3.1.1 The contractor shall develop emergency planning procedures prior to abatement initiation. This plan shall consist of, but not be limited to, emergency exit plans, notification procedures, and fire extinguisher locations. Both the contractor and the Owner shall agree on these procedures.
- 3.1.2 Telephone numbers of all emergency response personnel shall be clearly posted in the Clean room and Equipment room.

END OF SECTION 3.0

## SECTION 4.0 - SITE PREPARATION FOR ASBESTOS REMOVAL

### 4.1 WORKSITE PREPARATION

- 4.1.1 All movable objects shall be removed from the containment area. Cleaning of contaminated items shall be performed if the items are to be salvaged or reused. Otherwise, they shall be properly disposed of as asbestos waste. All non-movable objects that remain in the containment area shall be covered with a minimum of 4-mil plastic sheeting, secured in place.

### 4.2 WORKSITE ENCLOSURES AND CRITICAL BARRIERS

- 4.2.1 The contractor shall isolate the regulated area per *EPA regulation 40 CFR 61.145 (c) (3) (B)*, *OSHA Standard 29 CFR 1926.1101(e)* and *LDEQ regulations*. The regulated areas shall be roped off and marked with clearly written warning labels in order to keep unauthorized personnel out of the regulated area. The regulated area shall encompass the whole area expected to have an airborne fiber concentration greater than 0.01 fibers per cubic centimeter (f/cc) as a result of the removal activities and not the other non-related activities conducted in the building.
- 4.2.2 Regulated areas within which asbestos abatement is to be conducted shall be separated from adjacent areas by impermeable barriers such as plastic sheeting attached securely in place. All openings between containment areas and adjacent area, including but not limited to windows, doorways, elevator openings, corridor entrances, ventilation openings, drains, ducts, grills, grates, diffusers, and skylights shall be sealed. All penetrations that could permit air infiltration or air leaks through the barrier shall be sealed, with the exception of the make-up air provisions and the means of entry and exit.
- 4.2.3 Floor sheeting shall completely cover all floor surfaces and consist of a minimum of two layers of sheeting with at least a dart impact of 270 grams and tear resistance of machine direction (M.D.) 512 grams and traverse direction (T.D.) of 2067 grams, or at least 6-mil true thickness. Floor sheet shall extend up sidewalls at least 12 inches and shall be sized to minimize the number of seams. No seams shall be located at wall-to-floor joints. Sealing of all floor penetrations against water leakage is mandatory. Wall sheeting shall completely cover all wall surfaces and consist of a minimum of two layers of 4-mil sheeting. Wall sheeting shall be installed so as to minimize joints and shall extend beyond wall/floor joints at least 12 inches. No seams shall be located at wall-to-wall joints. Where a fire hazard exists, all plastic sheeting will be certified by the Underwriters Laboratory (UL) as being fire retardant. Where feasible, when containment walls exceed 260 linear feet must be constructed, a viewing window will be included in the wall for each 260 linear feet or fraction of that distance which will permit the viewing of at least 51% of the abatement work area. The window shall be constructed of plexiglass which measures approximately 18 inches by 18 inches. The bottom of the window will be at a reasonable viewing height from the outside floor.

- 4.2.4 Contractor shall provide enough negative air units to ensure four air exchanges inside the regulated area per/hr. at all times. Contractor shall supply a sufficient quantity of negative pressure units equipped with ANSI 29.2-79 Local Exhaust Ventilation Requirement and EPA guidance document EPA 560/5-83-002 Guidance for Controlling Friable Asbestos-Containing Materials in Buildings.
- 4.2.5 For exterior caulking, individually seal all critical openings which open onto the work site or are connected to and on the same level as the work site (e.g. building windows or doors opening onto a roof at the same level as the roof removal work site), including ventilation openings (supply and exhaust), doorways, windows, access hatches, skylights and other openings within 50 feet of each work site with duct tape alone or with polyethylene sheeting taped securely in place with duct tape.
- 4.2.6 In the case of window caulking, individually seal each window frame on the inside of building using minimum 6-mil polyethylene sheeting in a manner which will prevent asbestos fibers from entering the building during abatement or window removal. Maintain all seals until all work, including project clearance, is completed.

END OF SECTION 4.0

## SECTION 5.0 - ASBESTOS REMOVAL AND DISPOSAL PROCEDURES

### 5.1 GENERAL

- 5.1.1 Demarcate the work area with signs and barrier tape.
- 5.1.2 Access to regulated areas shall be limited to authorized personnel only.
- 5.1.3 A Competent Person shall supervise all asbestos work.
- 5.1.4 All persons entering a regulated area are required to wear respirators. The minimum respiratory protection for this scope of work is ½ mask air purifying respirator with HEPA filters unless fiber concentrations require greater protection. The Contractor is responsible for appropriate respirator selection.

### 5.2 DEFINITIONS

#### 5.2.1 Class I Work

Class I Work means activities involving the removal of TSI, flex duct, spray-on fireproofing, fire doors, surfacing ACM and presumed asbestos-containing material (PACM).

ACBM requiring Class I work was not identified in association with the renovation of the cafeteria area at the Eleanor McMinn Secondary School.

#### 5.2.2 Class II Work

Class II Work means activities involving the removal of ACM that is not TSI or surfacing material. This includes, but is not limited to, the removal of asbestos-containing floor tile and vinyl floor sheeting, transite, roofing, construction mastics, and **window caulking**.

#### 5.2.3 Wetting Materials:

A wetting material shall be used to minimize the amount of airborne asbestos fibers released during removal of asbestos from a structural unit and to encapsulate the removed asbestos. For wetting prior to disturbance of ACM, use either amended water or a removal encapsulant:

**5.2.3.1 Amended Water:** Provide water to which a surfactant has been added. Use a mixture of surfactant and water which results in wetting of the Asbestos-Containing Material and retardation of fiber release during disturbance of the material equal to or greater than that provided by the use of one ounce of a surfactant consisting of 50% polyoxyethylene ester and 50% polyoxyethylene ether mixed with five gallons of water.

**5.1.3.2 Removal Encapsulant:** Provide a penetrating type encapsulant designed specifically for removal of ACM. Use a material which results in wetting of the Asbestos-Containing Material and retardation of fiber release during disturbance of the material equal to or greater than that provided by water amended with a surfactant consisting of one ounce of a mixture of 50% polyoxyethylene ester and 50% polyoxyethylene ether in five gallons of water.

## 5.3 CLASS II WORK EXECUTION

### 5.3.1 ALL CLASS II WORK

- 5.3.1.1 Competent Person: All Class II work shall be supervised by a competent person as defined by the regulation.
- 5.3.1.2 Critical Barriers: Critical barriers shall be placed over all openings to the regulated area or utilize an alternate barrier or isolation method which prevents migration of airborne asbestos from the regulated area and meets the requirements of the regulation.
- 5.3.1.3 Impermeable Dropcloths: Impermeable dropcloths shall be placed on surfaces beneath all removal activity. Dropcloths shall extend horizontally in all directions one foot for every vertical foot the work surface is above the floor.
- 5.3.1.4 Controls: Comply with the work practices specified for each type of Class II asbestos work being performed as outlined in the following sections.
- 5.3.1.5 HEPA Filtration: Vacuums, powered saws and other equipment which may generate asbestos fibers shall be equipped with HEPA-filtered exhausts.
- 5.3.1.6 Wet Methods: Wet methods or wetting agents to control employee exposures shall be employed.
- 5.3.1.7 OSHA requires the prompt cleanup of wastes and debris and placement in leak-tight containers and labeled with the following information:

**DANGER  
CONTAINS ASBESTOS FIBERS  
AVOID CREATING DUST  
CANCER AND LUNG DISEASE HAZARD**

- 5.3.1.8 Establish a decontamination area that is adjacent to the regulated area for decontamination of employees and their equipment. At a minimum the decontamination shall consist of an area covered by an impermeable drop cloth on the floor or horizontal working surface of sufficient size to accommodate cleaning of equipment and removing personal protective equipment without spreading contamination. Work clothes must be cleaned with a HEPA vacuum before they are removed. All equipment and surfaces of containers filled with ACM must be cleaned prior to removing them from the equipment room or area. Entry to and exit from the regulated area shall be through the decontamination area.

## 5.4 WINDOW CAULKING

- 5.4.1 The asbestos-containing caulking shall be performed in accordance with NESHAP regulations.
- 5.4.2 Since it is proposed that the wood window systems with asbestos-containing caulking are to be removed and replaced, the caulking may be duct taped on both

sides of the window pane, and then the window system can be removed to the outside.

- 5.4.3 All removal activities shall be performed using wet methods.
- 5.4.4 The windows with the asbestos-containing caulking shall be packaged in leak-tight containers.

## 5.5 WASTE DISPOSAL

- 5.5.1 Disposal bags shall be 6-mil polyethylene bags, or Louisiana DSHS approved equivalent, that are preprinted with labels as required by the applicable *Occupational Safety and Health Administration (OSHA) regulation* and *EPA NESHAPS Standard 40 CFR Part 61, Subpart M*. All asbestos waste shall be double-bagged and goose necked at the top to prevent fiber release.
- 5.5.2 The contractor shall take care to prevent asbestos material from clinging to the outside of the filled bags or containers. The bags shall be HEPA vacuumed and/or wet-wiped prior to leaving the work area.
- 5.5.3 The waste transporter shall have a Louisiana Department of State Health Services (DSHS) asbestos transporter license.
- 5.5.4 Authorized persons shall be protected by disposable clothing and a minimum of half-face respirator while loading waste with asbestos fibers.
- 5.5.5 The enclosed cargo area of the truck or dumpster shall be lined with 6-mil polyethylene sheeting to prevent contamination from leaking containers. Trucks and dumpsters shall have lockable enclosed cargo areas.
- 5.5.6 Waste containers shall not be thrown into or out of the truck cargo area or dumpster.
- 5.5.7 Asbestos waste shall be disposed of in an approved landfill according to current state requirements.
- 5.5.8 A proper manifest shall be required of all off-site asbestos shipments per *LDEQ regulations* and *EPA NESHAPS Standard 40 CFR Part 61, Subpart M*. The Owner shall be responsible for signing the waste manifest. PSI shall review the manifest prior to removal of waste from the site. PSI will not be responsible for signing the waste manifests.
- 5.5.9 A copy of the waste manifest shall be sent to the Owner upon completion of the project.

END OF SECTION 5.0

## SECTION 6.0 - AIR MONITORING PLAN - ASBESTOS

### 6.1 GENERAL PROCEDURES

Monitoring of airborne concentrations of asbestos fibers shall be in general accordance with *OSHA regulation 29 CFR 1926.1101(f) and Appendices A and B, and EPA-AHERA regulation 40 CFR 763.90 Subpart E* and as specified in this plan. The Contractor shall employ his own Consultant for personal air monitoring and submit the results to the Owner's Representative.

### 6.2 MONITORING PRIOR TO ABATEMENT

Area monitoring shall be conducted in the work area prior to abatement operations in order to establish the airborne asbestos fiber concentrations in the work area prior to the commencement of removal operations. This result will establish an airborne fiber concentration in the work area during normal environmental conditions.

### 6.3 MONITORING DURING ABATEMENT

Area and personal monitoring shall be conducted to determine airborne fiber concentrations in and around the working environment. All air samples shall be referenced in the daily log.

#### 6.3.1 Area Sampling

Monitoring of the areas inside and surrounding the abatement site shall be performed on a daily basis. A minimum of two (2) general area samples shall be collected inside the regulated area and three (3) outside the regulated area. The outside samples shall be located at the negative air exhaust, in the adjacent space, and at the decontamination unit. The amount of air sampled shall be approximately 1,250 liters per sample. Reduction in air sample volumes may be necessary based on work activities and time constraints. If air monitoring outside of the regulated area shows air concentrations greater than the permissible exposure limit, (PEL-0.1 fibers/cc Time Weighted Avg.) the contractor's supervisor will be immediately notified.

#### 6.3.2 Personal Sampling

Monitoring of workers shall be conducted as required by the *OSHA regulation 29 CFR 1926.1101 (f)*. Personal sampling is the responsibility of the Contractor.

### 6.4 FINAL CLEARANCE

All project activity, except operations and maintenance (O&M), shall be cleared by using aggressive air sampling. Aggressive air sampling is the use of an air blower, such as a leaf blower with the force of air unaltered and operating as it comes from the factory, directed at all surfaces in order to cause loose asbestos fibers to become airborne.

Final clearance phase contrast microscopy (PCM) sampling shall be conducted after a final inspection by the on-site project manager. A minimum of 1,250 liters to a maximum of 3,850 liters of air shall be collected from each containment area greater than 160 square feet. Areas less than 160 square feet shall have at least three samples collected per

containment area and analyzed via phase contrast microscopy (PCM). The results of the PCM analysis for each sample shall be below, 0.01 f/cc.

#### 6.5 AIR SAMPLE ANALYSIS

PCM air samples shall be analyzed in accordance with the LDEQ-required "NIOSH 7400 Analytical Method "A" rules for Asbestos and Other Fibers by PCM" by a Proficiency Analytical Testing/Asbestos Analytical Registry (PAT/AAR) certified and LDEQ licensed laboratory. Collecting and analyzing samples, as well as inspecting the site, will be the responsibility of Professional Service Industries, Inc. (PSI), 22717 MCH Road, Mandeville, Louisiana. The laboratory results will be available within 24 hours after completion of the sampling.

END OF SECTION 6.0

## **SECTION 7.0 – LEAD-BASED PAINT HANDLING PROCEDURES**

### **7.1 GENERAL**

- 7.1.1 Lead-based paint (LBP) has been identified on the property. Renovation activities may involve the disturbance of lead-based paint and the possibility of creating lead dust exists. Therefore, employers whose workers are involved in the disturbance of lead-based paint must comply with OSHA regulations for lead exposure. The location of the LBP is as follows:
- White paint on the twelve wood window frame surfaces (not sills or jambs) located along the exterior facing wall.
- 7.1.2 Precautions should be taken to minimize lead dust generation and exposure and to avoid the accumulation of large quantities of LBP abatement wastes.
- 7.1.3 Operations that generate lead dust and fume include the following; flame-torch cutting, welding, the use of heat guns, sanding, scraping and grinding of LBP-coated surfaces.
- 7.1.4 Since it is proposed that the wood window systems with LBP are to be removed and replaced, all wood surfaces may be duct taped and the window systems can be removed intact. See Section 5.5 for a discussion of the asbestos-containing window caulking associated with these window systems.
- 7.1.5 The Contractor is responsible for the development and implementation of a worker protection program in accordance with 29 CFR 1926.20 and 29 CFR 1926.62(e). This program is essential in minimizing worker risk of lead exposure.

### **7.2 WASTE DISPOSAL**

- 7.2.1 The contractor shall be responsible for conducting an appropriate hazardous waste determination for the demolition wastes prior to disposal. The contractor shall contact the permitted landfill to determine if testing of the waste stream is required prior to disposal. Testing of the waste stream shall include analysis of a composite sample of the waste for lead using the Toxicity Characteristic Leaching Procedure (TCLP) as well as any other testing required by the EPA or LDEQ. The contractor shall ensure that all wastes are properly disposed of at an EPA or state permitted facility in accordance with the results of the hazardous waste determination.

END SECTION 7.0

## **SECTION 8.0 – HAZARDOUS MATERIALS REMOVAL AND DISPOSAL PROCEDURES**

### **8.1 GENERAL**

Hazardous materials” may include polychlorinated biphenyls (PCBs) associated with light ballasts, petroleum products, and materials labeled “hazardous”, or materials that should be identified for removal prior to renovation. The locations of the hazardous materials are as follows:

- Approximately 20 fluorescent light fixtures were present near the ceiling in the cafeteria area. The fixtures each contained two tubes and one ballast.

### **8.2 REMOVAL**

Safe working practices should be observed by the Contractor. Safety classes and gloves should be worn. Special training and site preparation are not required.

Fluorescent lights and ballasts shall be removed my mechanically dis-assembling the light fixtures to expose the light tubes and ballasts. Precautions should be taken to remove the tubes intact.

Ballasts shall be inspected to determine PCB content labeling. If a ballast is not labeled “No PCBs” or equivalent, then it shall be assumed to contain PCBs.

### **8.3 DISPOSAL**

The Contractor must insure that the fluorescent waste tubes are destined for a recycling facility.

Federal law requires disposal of PCB-containing ballasts and any PCB-contaminated materials at an EPA-approved facility.

The Contractor must keep some form of documentation to demonstrate that the tubes and ballasts were managed and disposed of properly.

**END SECTION 8.0**

## **SECTION 9.0 – MOLD REMEDIATION PROCEDURES**

### **9.1 GENERAL**

Mold was observed on approximately 20% of the ceiling area within the Proposed Clinic Area, or approximately 2,000 square feet of the plaster ceiling. The remediation of materials containing asbestos fibers shall be performed prior to mold abatement activities.

### **9.2 MOLD REMEDIATION**

- 9.1.1 Protect fixed contents within the Work Areas using a one layer of at least 4millimeter thick polyethylene sheeting. Mobile contents may be removed and placed in a secure area designated by the Owner.
- 9.1.2 HEPA vacuum all surfaces within the Work Area prior to protecting with polyethylene sheeting and proceeding with remedial activities.
- 9.1.3 Wet wipe the fungal impacted gypsum board surface with an EPA approved fungicide such as Fosters Product 40-80.
- 9.1.4. After drying, treat the cleaned area with an EPA approved fungal encapsulant, such as Fosters Product 40-20. Dehumidifiers and air scrubbers may be utilized to facilitate the drying process
- 9.1.5 HEPA vacuum all surfaces within the Work Area and perform a final cleaning before performing a final visual inspection.

END SECTION 9.0

## **SECTION 10.0 – FINAL CLEANUP PROCEDURES**

### **10.1 WORK AREA CLEAN-UP**

The work area and the decontamination area shall be thoroughly cleaned after all work is finished.

### **10.2 METHOD OF CLEAN-UP**

The area shall be cleaned with a HEPA vacuum and/or wet-wiped.

### **10.3 CLEAN-UP OF POLYETHYLENE SHEETING**

After vacuuming and/or wet-wiping, all of plastic sheeting shall be sprayed with an encapsulant and then disposed of as asbestos waste.

### **10.4 POST-CLEARANCE CLEAN-UP**

Contractor shall remove all waste materials and equipment from job site within 24 hours of completion of the project (Final Clearance Notification verbally or written from the Consultant).

**END SECTION 10.0**

## SECTION 11.0 - SUBMITTALS

### 11.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

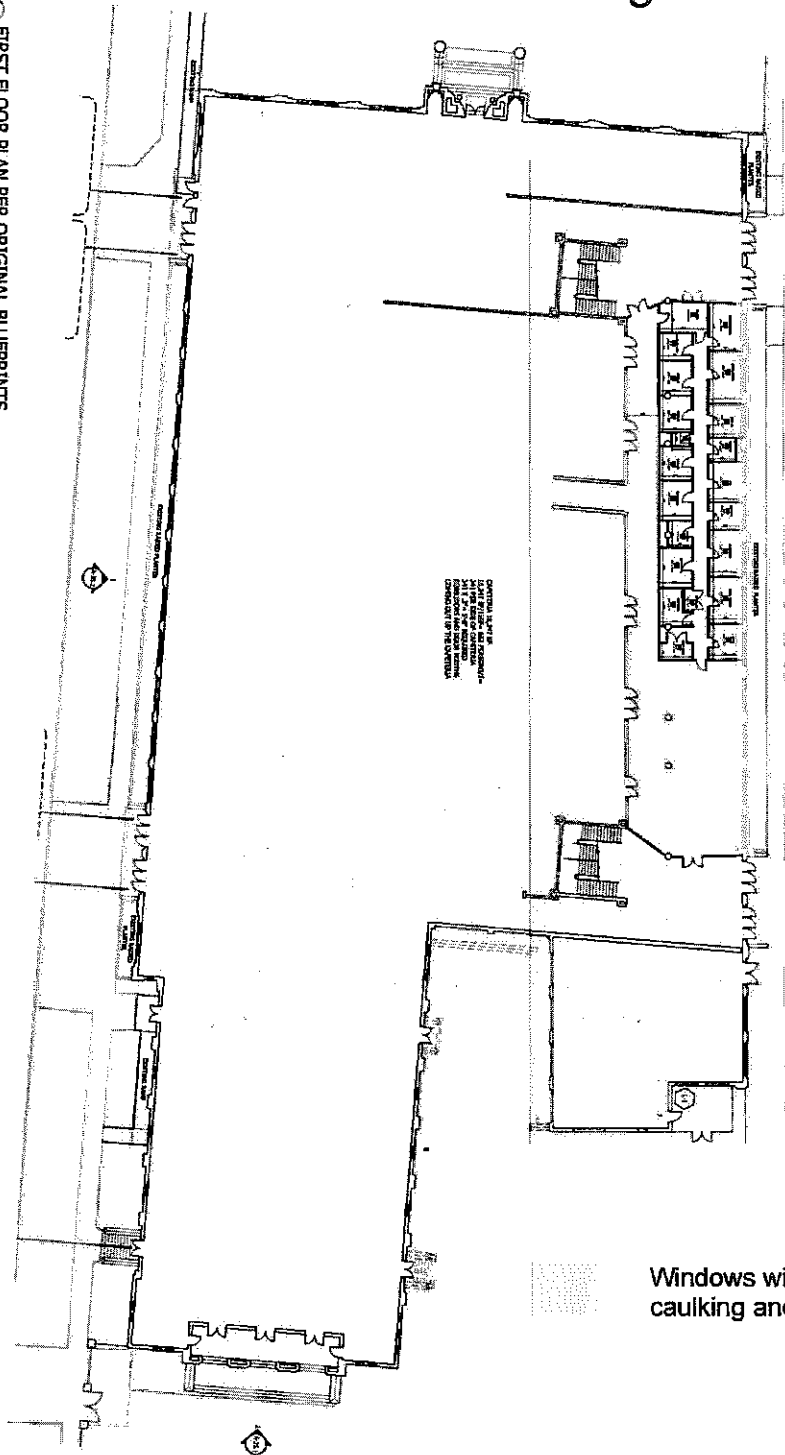
- 11.1.1 Before the start of work, the contractor shall provide a proposed detailed schedule including work dates, work shift time, number of employees, date of start and completion including dates of preparation work, removal and final inspection dates.
- 11.1.2 Submit the following to the Owner's representative for review of project coordination.
  - 11.1.2.1 Contingency Plans for emergency action.
  - 11.1.2.2 Telephone Numbers and location of emergency services.
  - 11.1.3.3 Notifications sent to emergency service agencies.
  - 11.1.2.4 Resume of Supervisor.
  - 11.1.2.5 Accreditation Training certificate for Asbestos Abatement Supervisor.
  - 11.1.2.6 Copy of medical examination for Asbestos Abatement Supervisor.
  - 11.1.2.7 LDEQ License for Asbestos Abatement Supervisor.
- 11.1.3 Submittals related to Regulatory Requirements:
  - 11.1.3.1 Notices: Submit notices required by federal, state and local regulations together with proof of timely transmittal to agency requiring the notice.
  - 11.1.3.2 Permits: Submit copies of current valid permits required by state and local regulations.
  - 11.1.3.3 Licenses: Submit copies of all state and local licenses and permits necessary to carry out the work of this contract.
- 11.1.4 Before the start of work, submit the following to the Owner's representative for review:
  - 11.1.4.1 Copies of certification from an EPA approved AHERA abatement workers course, LDEQ Asbestos Worker's registration and a current copy of medical examination for each worker.
- 11.1.5 At the completion of the project, submit two (2) copies of all the above referenced items to the Owner's representative as the project close-out documents.

END OF SECTION 11.0

## APPENDIX A: PROJECT DRAWING

Figure 1

① FIRST FLOOR PLAN PER ORIGINAL BLUEPRINTS  
SCALE: 1/8" = 1'-0"



Windows with <1% Asbestos  
caulking and lead-based paint

PROJECT NO.	1007
DATE	11/01/11
SCALE	AS SHOWN
DRAWN BY	H.W.
CHECKED BY	H.W.
DATE	11/01/11
PROJECT NO.	1007
SCALE	AS SHOWN
DRAWN BY	H.W.
CHECKED BY	H.W.
DATE	11/01/11

50%  
CONSTRUCTION  
DOCUMENTS  
NOT FOR  
CONSTRUCTION

A GYMNASIUM ADDITION AND EXTERIOR  
RENOVATIONS AT  
ELEANOR MCMAIN SECONDARY H.S.  
5712 SOUTH CLAIBORNE AVENUE  
NEW ORLEANS, LOUISIANA 70125

3516 MAGAZINE STREET  
NEW ORLEANS, LA 70115  
TEL: 504-899-6271  
FAX: 504-899-6200

**JAHNCKE & BURNS**  
ARCHITECTS, LLC

A-01

## APPENDIX B: CERTIFICATIONS

STATE OF LOUISIANA  
DEPARTMENT OF ENVIRONMENTAL QUALITY

certifies that

**Randal G Weber**

Has complied with all requirements of the Louisiana Department of Environmental Quality  
and is authorized to perform the duties of

**ASBESTOS PROJECT DESIGNER**

Accreditation No. 2D131332

AI No. 131332

Date of Issuance 10/4/2011

Expiration 10/26/2012

Failure to comply with all applicable provisions of La. R.S. 2025E. (1)(e) and La. R.S. 2025 F. (2)(a)  
may result in civil and/or criminal enforcement actions by the State.

*Christopher Maynard*  
Permit Support Services Division  
Office of Environmental Services

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## SECTION 28 16 00 - INTRUSION DETECTION

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes the following:
  - 1. Intrusion detection with multiplexed, modular, microprocessor-based controls, intrusion sensors and detection devices, and communication links to perform monitoring, alarm, and control functions.
- B. Related Sections include the following:
  - 1. Division 28 Section "Conductors and Cables for Electronic Safety and Security" for cabling between central-station control- units and field-mounted devices and controllers.

#### 1.2 DEFINITIONS

- A. Protected or Protection Zone: A space or area for which an intrusion must be detected and uniquely identified, the sensor or group of sensors assigned to perform the detection, and any interface equipment between sensors and communication link to central-station control unit.
- B. Standard-Intruder Movement: Any movement, such as walking, running, crawling, rolling, or jumping, of a "standard intruder" in a protected zone.

#### 1.3 SUBMITTALS

- A. Product Data: Components for sensing, detecting, and control, including dimensions and data on features, performance, electrical characteristics, ratings, and finishes.
- B. Shop Drawings: Detail assemblies of standard components that are custom assembled for specific application on this Project.
  - 1. Functional Block Diagram: Show single-line interconnections between components. Indicate control, signal, and data communication paths and identify control interface devices and media to be used. Describe characteristics of network and other data communication lines.
  - 2. Raceway Riser Diagrams: Detail raceway runs. Include designation of devices connected by raceway, raceway type, and size, and type and size of wire and cable fill for each raceway run.
  - 3. UPS: Sizing calculations.
  - 4. Site and Floor Plans: Indicate final outlet and device locations, routing of raceways, and cables inside and outside the building. Include room layout for central-station control-unit console, terminal cabinet, racks, and UPS.

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5. Device Address List: Coordinate with final system programming.
  6. System Wiring Diagrams: Include system diagrams unique to Project. Show connections for all devices, components, and auxiliary equipment. Include diagrams for equipment and for system with all terminals and interconnections identified.
  7. Details of surge-protection devices and their installation.
  8. Sensor detection patterns and adjustment ranges.
- C. Equipment and System Operation Description: Include method of operation and supervision of each component and each type of circuit. Show sequence of operations for manually and automatically initiated system or equipment inputs. Description must cover this specific Project; manufacturer's standard descriptions for generic systems are not acceptable.
- D. Samples for Initial Selection: For units with factory-applied color finishes.
- E. Qualification Data: For Installer:
1. Provide evidence demonstrating 5 years of experience in the security business.
  2. Provide references, which clearly state and show the effectiveness of proposed equipment and services.
  3. Provide evidence of currently maintaining a computerized monitoring station of established reputation for back-up capabilities.
  4. Provide evidence that personnel, on duty twenty-four hours per day, have successfully monitored intrusion detection systems from a local, in-house central station.
  5. Provide evidence of maintaining a fully equipped local service department capable of providing timely maintenance (four working hour response time) and factory-authorized service as required with on-going replacement parts.
- F. Field quality-control test reports.
- G. Operation and Maintenance Data:
1. Data for each type of product, including features and operating sequences, both automatic and manual.
  2. Central-station control-unit hardware and software data.
- H. Warranty: Special warranty specified in this Section.
- I. Other Information Submittals:
1. Test Plan and Schedule: Test plan defining all tests required to ensure that system meets technical, operational, and performance specifications within 60 days of date of Contract award.
  2. Examination reports documenting inspections of substrates, areas, and conditions.
  3. Anchor inspection reports documenting inspections of built-in and cast-in anchors.

#### 1.4 QUALITY ASSURANCE

- A. Installer Qualifications:

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1. An employer of workers, at least one of whom is a technician certified by the National Burglar & Fire Alarm Association.
2. Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.
3. Installation/Service - Shall have a minimum of one technician on permanent staff that has attended and has been certified by an approved training seminar by the manufacturer dealing with the UL installation procedures and service/maintenance of intrusion.
4. Central Station Operator - Shall have a minimum of one shift supervisor or key operator on permanent staff that has attended and been certified by an approved operator training seminar.
  - a. Each operator shall have completed a formal individual training program for new operators. This training shall consist of familiarization with the central station operation, review of the operator manual for the appropriate central station receiver, and a minimum of five (5) shifts of observation of the monitoring.
5. INSTALLER
  - A. The INSTALLER shall be a local installation and service organization, currently recognized as a factory authorized representative by the manufacturer of the specified system.
  - B. The INSTALLER shall provide a minimum of (3) references whose systems are of similar complexity and have been installed and maintained by the INSTALLER for the last (5) years.
  - C. At time of bid, the INSTALLER shall be licensed by the state or local jurisdiction to perform security work within the state. Contractors who have security licenses or permits pending shall not be considered acceptable for bidding on this project.
  - D. The INSTALLER shall assure that all personnel working on the project are registered with the state or local jurisdiction Systems Licensing Board as provided for by current state statutes.
    - 1) At the time of bid, the INSTALLER shall provide satisfactory evidence of liability insurance and Workmen's Compensation coverage for employed personnel as required by law.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- C. FMG Compliance: FMG-approved and -labeled intrusion detection devices and equipment.
- D. Comply with NFPA 70.
- E. All the work within the scope of this section shall be performed in accordance with the applicable state, parish and city laws and ordinances. Contractor shall be able to obtain all permits and licenses as required in addition to being a licensed contractor. All materials, supplies and equipment being furnished shall be installed in accordance with the latest version of the applicable standards of:
  - a. OSHA
  - b. National Electrical Code (NEC)

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- c. Underwriters' Laboratories, Inc (UL)
  - d. Electrical General Requirements
  - e. Basic Electrical Materials and Methods
  - f. Uniform Building Code
  - g. Americans with Disabilities Act (ADA)
- F. Testing Agency Qualifications: An independent testing agency, with the experience and capability to conduct the testing indicated, that is a member company of the National Burglar & Fire Alarm Association or is a nationally recognized testing laboratory (NRTL) as defined by OSHA in 29 CFR 1910.7.
1. Testing Agency's Field Supervisor: Person currently certified as an advanced alarm technician by the National Burglar & Fire Alarm Association to supervise on-site testing specified in Part 3.
- G. Product Options: Drawings indicate size, profiles, and dimensional requirements of detection devices and central-station control units and are based on the specific system indicated. Refer to Division 01 Section "Product Requirements."
- H. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- I. FMG Compliance: FMG-approved and -labeled intrusion detection devices and equipment.
- J. Comply with NFPA 70.

#### 1.5 PROJECT CONDITIONS

- A. Environmental Conditions: Capable of withstanding the following environmental conditions without mechanical or electrical damage or degradation of operating capability:
1. Altitude: Sea level to 4000 feet.
  2. Central-Station Control Unit: Rated for continuous operation in an ambient of 60 to 85 deg F and a relative humidity of 20 to 80 percent, noncondensing.
  3. Interior, Controlled Environment: System components, except central-station control unit, installed in air-conditioned interior environments shall be rated for continuous operation in ambients of 36 to 122 deg F dry bulb and 20 to 90 percent relative humidity, noncondensing.
  4. Exterior Environment: System components installed in locations exposed to weather shall be rated for continuous operation in ambients of minus 30 to plus 122 deg F dry bulb and 20 to 90 percent relative humidity, condensing. Comply with UL 294 and UL 639 for outdoor-use equipment. Rate for continuous operation when exposed to rain as specified in NEMA 250, winds up to 85 mph.
  5. Hazardous Environment: System components located in areas where fire or explosion hazards may exist because of flammable gases or vapors, flammable liquids, combustible

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dust, or ignitable fibers or flyings shall be rated, listed, and installed according to NFPA 70.

#### 1.6 WARRANTY

- A. Special Warranty: Manufacturer and INSTALLER agree to repair or replace components of intrusion detection devices and equipment that fail in materials or workmanship within specified warranty period.

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

#### 1.7 EXTRA MATERIALS

- A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Intrusion Detection Devices: Furnish quantity equal to five percent of the number of units of each type installed, but no fewer than one of each type.
2. Fuses: Three of each kind and size.
3. Tool Kit: Provide six sets of tools for use with security fasteners, each packaged in a compartmented kit configured for easy handling and storage.
4. Security Fasteners: Furnish no fewer than 1 box for every 50 boxes or fraction thereof, of each type and size of security fastener installed.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

#### 2.2 FUNCTIONAL DESCRIPTION OF SYSTEM

- A. Supervision: System components shall be continuously monitored for normal, alarm, supervisory, and trouble conditions. Indicate deviations from normal conditions at any location in system. Indication includes identification of device or circuit in which deviation has occurred and whether deviation is an alarm or malfunction. All device locations shall be defined with an easy to understand description such as "rear kitchen door" that will be displayed at the central-station control unit as well as the annunciator. All communications between the intrusion detection system and the Central-station control unit shall be IP-based.

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1. Alarm Signal: Display at central-station control unit and actuate audible alarm and display alarm status at the annunciator.
  2. Trouble Condition Signal: Distinct from other signals, indicating that system is not fully functional. Trouble signal shall indicate system problems such as battery failure, open or shorted transmission line conductors, or controller failure.
  3. Supervisory Condition Signal: Distinct from other signals, indicating an abnormal condition as specified for the particular device or controller.
- B. System Control: Central-station control unit shall directly monitor intrusion detection units and connecting wiring.
- C. System shall automatically reboot program without error or loss of status or alarm data after any system disturbance.
- D. Operator Commands:
1. Help with System Operation: Display all commands available to operator. Help command, followed by a specific command, shall produce a short explanation of the purpose, use, and system reaction to that command.
  2. Acknowledge Alarm: To indicate that alarm message has been observed by operator.
  3. Place Protected Zone in Access: Disable all intrusion-alarm circuits of a specific protected zone. Tamper circuits may not be disabled by operator.
  4. Place Protected Zone in Secure: Activate all intrusion-alarm circuits of a protected zone.
  5. Protected Zone Test: Initiate operational test of a specific protected zone.
  6. System Test: Initiate system-wide operational test.
  7. Print Reports.
- E. Timed Control at Central-Station Control Unit: Allow automatically timed "secure" and "access" functions of selected protected zones.
- F. Printed Record of Events: Print a record of alarm, supervisory, and trouble events on system printer. Sort and report by protected zone, device, and function. When central-station control unit receives a signal, print a report of alarm, supervisory, or trouble condition. Report type of signal (alarm, supervisory, or trouble), protected zone description, date, and time of occurrence. Differentiate alarm signals from other indications. When system is reset, report reset event with the same information concerning device, location, date, and time. Commands shall initiate the reporting of a list of current alarm, supervisory, and trouble conditions in system or a log of past events.
- G. Response Time: Two seconds between actuation of any alarm and its indication at central-station control unit.
- H. Circuit Supervision: Supervise all signal and data transmission lines, links with other systems, and sensors from central-station control unit. Indicate circuit and detection device faults with both protected zone and trouble signals, display at central-station control unit and actuate audible alarm and display alarm status at the annunciator. Maximum permissible elapsed time between occurrence of a trouble condition and indication at central-station control unit is 20 seconds. Initiate an alarm in response to opening, closing, shorting, or grounding of a signal or data transmission line.

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- I. Programmed Secure-Access Control: System shall be programmable to automatically change status of various combinations of protected zones between secure and access conditions at scheduled times. Status changes may be preset for repetitive, daily, and weekly; specially scheduled operations may be preset up to a year in advance. Manual secure-access control stations shall override programmed settings.
- J. Manual Secure-Access Control: Coded entries at manual stations shall change status of associated protected zone between secure and access conditions.

### 2.3 SYSTEM COMPONENT REQUIREMENTS

- A. Surge Protection: Protect components from voltage surges originating external to equipment housing and entering through power, communication, signal, control, or sensing leads. Include surge protection for external wiring of each conductor entry connection to components.
  - 1. Minimum Protection for Power Lines 120 V and More: Auxiliary panel suppressors complying with requirements in Division 26 Section "Surge Protective Devices for Low-Voltage Electrical Power Circuits."
  - 2. Minimum Protection for Communication, Signal, Control, and Low-Voltage Power Lines: Comply with requirements in Division 26 Section "Surge Protective Devices for Low-Voltage Electrical Power Circuits" as recommended by manufacturer for type of line being protected.
- B. Interference Protection: Components shall be unaffected by radiated RFI and electrical induction of 15 V/m over a frequency range of 10 to 10,000 MHz and conducted interference signals up to 0.25-V RMS injected into power supply lines at 10 to 10,000 MHz.
- C. Tamper Protection: Tamper switches on detection devices, controllers, annunciators, pull boxes, junction boxes, cabinets, and other system components shall initiate a tamper-alarm signal when unit is opened or partially disassembled and when entering conductors are cut or disconnected. Central-station control-unit alarm display shall identify tamper alarms and indicate locations.
- D. Self-Testing Devices: Automatically test themselves periodically, but not less than once per hour, to verify normal device functioning and alarm initiation capability. Devices transmit test failure to central-station control unit.
- E. Antimasking Devices: Automatically check operation continuously or at intervals of a minute or less, and use signal-processing logic to detect blocking, masking, jamming, tampering, or other operational dysfunction. Devices transmit detection of operational dysfunction to central-station control unit as an alarm signal.
- F. Addressable Devices: Transmitter and receivers shall communicate unique device identification and status reports to central-station control unit.
- G. Remote-Controlled Devices: Individually and remotely adjustable for sensitivity and individually monitored at central-station control unit for calibration, sensitivity, and alarm condition.

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## 2.4 ENCLOSURES

- A. Interior Sensors: Enclosures that protect against dust, falling dirt, and dripping noncorrosive liquids.
- B. Interior Electronics: NEMA 250, Type 12.
- C. Exterior Electronics: NEMA 250, Type 4X stainless steel.
- D. Corrosion Resistant: NEMA 250, Type 4X stainless steel.
- E. Screw Covers: Where enclosures are accessible, secure with security fasteners of type appropriate for enclosure.

## 2.5 SECURE AND ACCESS DEVICES

- A. Manufacturers:
  - 1. ADEMCO Group; Pittway Corporation.
  - 2. Continental Instruments.
  - 3. Corby Industries Inc.
  - 4. Crow Electronic Engineering, Inc.
  - 5. George Risk Industries.
  - 6. GE Security
  - 7. Hirsch Electronics
  - 8. Honeywell International Inc.
  - 9. International Electronics Inc.
  - 10. NAPCO Security Systems, Inc.
  - 11. Optex.
  - 12. Richardson Electronics, Ltd.
  - 13. Sonitrol
  - 14. Visonic Inc.
- B. Keypad and Display Module: Arranged for entering and executing commands for system-status changes and for displaying system-status and command-related data.

## 2.6 DOOR AND WINDOW SWITCHES

- A. Manufacturers:
  - 1. ADEMCO Group; Pittway Corporation.
  - 2. Aleph International Corporation.
  - 3. Amseco; Division of Kobishi America, Inc.
  - 4. FBII; Pittway Corporation.
  - 5. GE Interlogix; General Electric Company.
  - 6. George Risk Industries.
  - 7. Hirsch Electronics

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8. Honeywell International Inc.
  9. Optex.
  10. Sonitrol
  11. Ultrak, Inc.; a division of Ademco Video Systems.
- B. Description: Balanced-magnetic switch, complying with UL 634, installed on frame with integral overcurrent device to limit current to 80 percent of switch capacity. Bias magnet and minimum of two encapsulated reed switches shall resist compromise from introduction of foreign magnetic fields.
- C. Flush-Mounted Switches: Unobtrusive and flush with surface of door and window frame.
- D. Overhead Door Switch: Balanced-magnetic type, listed for outdoor locations, and having door-mounting magnet and floor-mounting switch unit.
- E. Remote Test: Simulate movement of actuating magnet from central-station control unit.

## 2.7 PIR SENSORS

### A. Manufacturers:

1. ADEMCO Group; Pittway Corporation.
2. Aleph International Corporation.
3. Crow Electronic Engineering, Inc.
4. Digital Security Controls, Ltd.
5. FBI; Pittway Corporation.
6. GE Security
7. Hirsch Electronics
8. Honeywell International Inc.
9. NAPCO Security Systems, Inc.
10. Optex.
11. Richardson Electronics, Ltd.
12. Sonitrol
13. Visonic Inc.

### B. Description: Sensors detect intrusion by monitoring infrared wavelengths emitted from a human body within their protected zone and by being insensitive to general thermal variations.

1. Wall-Mounting Unit Maximum Detection Range: 125 percent of indicated distance for individual units and not less than 50 feet.
2. Ceiling-Mounting Unit Spot-Detection Pattern: Full 360-degree conical.
3. Ceiling-Mounting Unit Pattern Size: 84-inch diameter at floor level for units mounted 96 inches above floor; 18-foot diameter at floor level for units mounted 25 feet above floor.

### C. Device Performance:

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1. Sensitivity: Adjustable pattern coverage to detect a change in temperature of 2 deg F or less, and standard-intruder movement within sensor's detection patterns at any speed between 0.3 to 7.5 fps across 2 adjacent segments of detector's field of view.
2. Test Indicator: LED test indicator that is not visible during normal operation. When visible, indicator shall light when sensor detects an intruder. Locate test enabling switch under sensor housing cover.
3. Remote Test: When initiated by central-station control unit, start a test sequence for each detector element that simulates standard-intruder movement within sensor's detection patterns, causing an alarm.

## 2.8 ACOUSTIC-TYPE, GLASS-BREAK SENSORS

### A. Manufacturers:

1. ADEMCO Group; Pittway Corporation.
2. Crow Electronic Engineering, Inc.
3. Digital Security Controls, Ltd.
4. GE Interlogix; General Electric Company.
5. Hirsch Electronics
6. FBII; Pittway Corporation.
7. Honeywell International Inc.
8. International Electronics Inc.
9. NAPCO Security Systems, Inc.
10. Visonic Inc.

### B. Device Performance: Detect unique, airborne acoustic energy spectrum caused by breaking glass.

1. Sensor Element: Microprocessor-based, digital device to detect breakage of plate, laminate, tempered, and wired glass while rejecting common causes of false alarms. Detection pattern shall be at least a 20-foot range.
2. Hookup Cable: Factory installed, not less than 72 inches.
3. Activation Indicator: LED on sensor housing that lights when responding to vibrations, remaining on until manually reset at sensor controller or at central-station control unit.
4. Controller: Integral with sensor housing or in a separate assembly, locally adjustable by control under housing cover.
5. Glass-Break Simulator: A device to induce frequencies into protected glass pane that simulate breaking glass without causing damage to glass.

## 2.9 ANNUNCIATOR

### A. Manufacturers:

1. ADEMCO Group; Pittway Corporation.
2. Amseco; Division of Kobishi America, Inc.
3. DAQ Electronics, Inc.
4. Diebold, Incorporated.

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5. FBII; Pittway Corporation.
  6. GE Interlogix; General Electric Company.
  7. Hirsch Electronics
  8. Honeywell International Inc.
  9. Magal Security Systems Ltd.
  10. NAPCO Security Systems, Inc.
  11. Perimeter Products, Inc.
  12. Richardson Electronics, Ltd.
  13. Sonitrol
  14. Visonic Inc.
- B. Power and Signal Inputs: From central-station control unit.
- C. Visual Displays: Modular-lighted type with displays as indicated and engraved legend for each protected zone annunciated.
- D. Light Source: Duplicate LEDs for "alarm signals," visible at a distance of 30 feet.
- E. Signals Annunciated: "Secure," "access," and "alarm" shall be distinctly indicated for each protected zone by green, yellow, and red displays, respectively. Annunciate alarm condition by flashing light and steady alarm tone until silence-reset switch is operated.
- F. Audible Alarm: Unit mounted within annunciator cabinet; sounds for alarm conditions and is silenced by silence-reset switch on unit. Alarm shall sound again when condition is normalized until silence-reset switch is reset.
- G. Silence-Reset Switch: Resets annunciator to normal condition after alarm condition is restored.
- H. Test Switch: Tests annunciator LEDs.
- I. Cabinet: Two hinged doors, one behind the other. Metal outer door frame with minimum 1/4-inch-thick, clear acrylic vision lite. Steel inner door with mounting surface for annunciator modules. Both doors shall have flush tumbler locks and tamper switches. Comply with Division 26 Section "Raceway and Boxes for Electrical Systems."
1. Graphics: Integrate LED displays with graphic display panel to form a graphic annunciator.
- J. Electrical Power: Annunciator shall be powered by UPS of central-station control unit.
- 2.10 CENTRAL-STATION CONTROL UNIT
- A. Manufacturers:
1. ADEMCO Group; Pittway Corporation.
  2. Alarm Controls Corp.
  3. Diebold, Incorporated.
  4. GE Security

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5. Hirsch Electronics
6. Honeywell International Inc.
7. Magal Security Systems Ltd.
8. Silent Witness Enterprises, Ltd.
9. Sonitrol
10. Trentech; a division of Norment Security Group; a CompuDyne Company.
11. Visonic Inc.

B. Microprocessor System: Standard personal computer of modular design.

1. CENTRAL-STATION HARDWARE
2. Host Server and Operator Workstation: Provided by INSTALLER, to requirements specified below:
3. Host Server and Operator Workstation: Provided by INSTALLER, factory-configured with all software pre-loaded and tested.
4. Computer requirements may vary based on system size and customer specific application requirements. Increasing memory capacity, hard drive capacity, processor speed, as well as specifying single dual core or dual processors, and multi-monitor displays shall be considered and recommended when required above minimum specifications.
5. Application & Database Server Minimum Requirements:
  - a. 2.xGHz dual processor (Dual or Quad Core).
  - b. 4 GB RAM.
  - c. DVD-R/W.
  - d. 80GB HD, Raid-1 or Raid-10 Configuration.
  - e. 19-inch flat panel display, supporting 16bit high color at 1024x768 resolution.
  - f. 10/100/1000MB Ethernet Network Interface Card.
  - g. Standard 101-key keyboard and 2-button wheel mouse.
6. Operator Workstation Minimum Requirements:
  - a. 2.xGHz processor (Dual or Quad Core).
  - b. 2 GB RAM.
  - c. DVD-R/W.
  - d. 80GB HD.
  - e. 19-inch flat panel display, supporting 16bit high color at 1024x768 resolution.
  - f. 10/100/1000MB Ethernet Network Interface Card.
  - g. Standard 101-key keyboard and 2-button wheel mouse.
  - h. Integrated sound with speakers.
- i. Report Printer:
  - 1) Connected to the Central Station.
  - 2) Laser printer with minimum resolution of 600 dpi.
  - 3) RAM: 2 MB, minimum.
  - 4) Printing Speed: Minimum 12 pages per minute.
  - 5) Paper Handling: Automatic sheet feeder with 250-sheet paper cassette and with automatic feed.
- j. Interface: Bidirectional parallel and universal serial bus.
- k. LAN Adapter Card: 10/100 Mbps internal network interface card.
7. UPS: Self-contained; complying with requirements in Division 26 Section "Static Uninterruptible Power Supply."

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8. Size: Provide a minimum of 6 hours of operation of the central-station equipment, including 2 hours of alarm printer operation.
9. Batteries: Sealed, valve regulated, recombinant, lead calcium.
10. Accessories:
  - a. Transient voltage suppression.
  - b. Input-harmonics reduction.
  - c. Rectifier/charger.
  - d. Battery disconnect device.
  - e. Static bypass transfer switch.
  - f. Internal maintenance bypass/isolation switch.
  - g. External maintenance bypass/isolation switch.
  - h. Output isolation transformer.
  - i. Remote UPS monitoring.
  - j. Battery monitoring.
  - k. Remote battery monitoring.
11. Peripherals: Mouse for frequently used operator commands such as the following: Edit operator commands below to coordinate with "Functional Description of System" Article.
  - a. Help.
  - b. Acknowledge alarm.
  - c. Place protected zone in Access.
  - d. Place protected zone in Secure.
  - e. Protected zone Test.
  - f. System Test.
  - g. Print Reports.
  - h. Change Operator.
  - i. Display Graphics.

C. Electrical Power:

1. Normal System Power Supply: 120 V, 60 Hz, through a locked disconnect device and an isolation transformer in central-station control unit. Central-station control unit shall supply power to all components connected to it, unless otherwise indicated.
2. Power for Central-Station Control Unit: UPS sized for full load of unit.
3. Batteries: Rechargeable, valve-regulated, recombinant, sealed, lead-acid type with nominal 10-year life expectancy. Capacity adequate to operate the system, including audible trouble signal devices for up to six hours and audible and visual alarm devices under alarm conditions for an additional one hour.
4. Battery Charger: Solid-state, fully automatic, variable-charging-rate type. Charger shall recharge fully discharged battery within 24 hours.
5. Annunciation: Indicate a change in system condition and switching of system or component to backup power.

2.11 CENTRAL-STATION CONTROL-UNIT SOFTWARE

A. Support:

1. Multiuser operator with multiple tasks for each user.

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2. Support operation and management of all peripheral devices.
  3. File management functions for disk I/O.
  4. Printer spooling.
  5. Monitor status of UPS.
- B. Operator Commands:
1. Help.
  2. Acknowledge alarm.
  3. Place protected zone in Access.
  4. Place protected zone in Secure.
  5. Protected zone Test.
  6. System Test.
  7. Print Reports.
  8. Change Operator.
  9. Security Lighting Controls.
  10. Display Graphics.
  11. Command Input Errors: Supervise inputs to ensure that they are correct for proper execution. Provide automatic help when a command cannot be executed due to operator input error.
- C. System Access Control: Define system operator capability and functions through password-protected operations at three operator levels. Allow operator level change only by top-level operators and managers.
1. Activate tamper alarm after three successive attempts by an operator to execute functions beyond their defined level during a 24-hour period.
  2. Allow at least 32 passwords.
  3. Display operator's name or initials in console's first field.
  4. Report: Print operator's name or initials, action, date, and time on system printer at log-on and log-off. Do not display or print passwords.
  5. Define and assign passwords for the following:
    - a. System commands.
    - b. Access to system software.
    - c. Access to application software.
    - d. Individual protected zones to be accessed.
    - e. Access to database.
- D. Alarm-Monitoring Software: Monitor all sensors, central-station control units, UPS, and data transmission circuits and notify operator of an alarm condition. Print alarms in red on alarm printer and display on console's text and graphic maps.
1. Alarm Display:
    - a. Display higher-priority alarms first.
    - b. Oldest unacknowledged alarm has highest priority.
    - c. Operator acknowledgment of one alarm is not acknowledgment of any other alarm and may not inhibit reporting of subsequent alarms.

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- d. Type of alarm, location of alarm, and secondary alarm messages.
  - e. Date and time (to nearest second) of occurrence and operator response.
  - f. A unique message field with a width of at least 60 characters for each alarm. Allow operator to edit assignment of messages to a protected zone or sensor.
  - g. 25 secondary messages shall have a field of 4 lines of 60 characters each to allow further information to be entered by operator for each alarm.
  - h. Store most recent 1000 alarms and allow the data to be recalled, but not edited, by operator using the report generator.
- E. Monitor Display Software: Display text and graphic maps that integrate protected zone status. Use for various components and real-time data. Use uniform color codes on all displays as follows:
1. FLASHING RED to alert operator that a protected zone has gone into alarm or that primary power has failed.
  2. RED to alert operator that a protected zone is in alarm and that alarm has been acknowledged.
  3. YELLOW to advise operator that a protected zone is in access.
  4. GREEN to indicate that a protected zone is secure or that power is on.
- F. System Test Software: Enable operator to initiate a test of entire system or a particular portion of system. Store results of each test for future display, or print them out in report form.
- G. Report Generator Software: Commands to generate reports for displaying, printing, and storing on disk and tape. Store reports by type, date, and time and print each on report printer. Provide printer spooling. Generating reports shall not interrupt system operations. Allow operator to select report-generation mode, either periodic automatic or on request. Report headers shall automatically include time and date of printing and name of operator generating the report. Exact format of each report type shall be operator configurable. Allow operator to request, at any time, an immediate printout of any report.
1. Periodic Automatic Report Modes: Allow for specifying, modifying, or inhibiting the report to be generated, time the initial report is to be generated, time interval between reports, end of period, and output peripheral.
  2. Alarm Report: Include all alarms recorded by the system over an operator-selectable time. Include such information as type of alarm (intrusion, tamper, etc.), type of sensor, location, time, and action taken.
  3. System Test Report: This report documents the operational status of all system components following a system test.
  4. Access and Secure Report: This report documents all protected zones placed in access condition, time placed in access condition, and time placed in secure condition.
- H. All communications between the control units and the CENTRAL-STATION CONTROL-UNIT SOFTWARE shall be IP-based.

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## 2.12 SECURITY FASTENERS

- A. Operable only by tools produced for use on specific type of fastener by fastener manufacturer or other licensed fabricator. Drive system type, head style, material, and protective coating as required for assembly, installation, and strength.
- B. Manufacturers:
  - 1. Camcar Textron Inc.
  - 2. Holo-Krome; a Danaher Corporation.
  - 3. Safety Socket Screw Corporation.
  - 4. Tamper-Pruf Screws, Inc.
- C. Drive System Types: Pinned Torx-Plus.
- D. Socket Flat Countersunk Head Fasteners:
  - 1. Heat-treated alloy steel, ASTM F 835.
  - 2. Stainless steel, ASTM F 879, Group 1 CW.
- E. Socket Button Head Fasteners:
  - 1. Heat-treated alloy steel, ASTM F 835.
  - 2. Stainless steel, ASTM F 879, Group 1 CW.
- F. Socket Head Cap Fasteners:
  - 1. Heat-treated alloy steel, ASTM A 574.
  - 2. Stainless steel, ASTM F 837, Group 1 CW.
- G. Protective Coatings for Heat-Treated Alloy Steel:
  - 1. Zinc chromate, ASTM F 1135, Grade 3 or 4; for exterior applications and interior applications where indicated.
  - 2. Zinc phosphate with oil, ASTM F 1137, Grade I, or black oxide, unless otherwise indicated.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Comply with UL 681.
- B. Security Fasteners: Where accessible, install intrusion detection components using security fasteners with head style appropriate for fabrication requirements, strength, and finish of adjacent materials except that a maximum of two different sets of tools shall be required to operate security fasteners for Project.

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- C. Occupancy Adjustments: When requested within 12 months of Substantial Completion, provide on-site assistance in adjusting system to suit actual occupied conditions. Provide up to three visits to Project during other than normal occupancy hours for this purpose. Visits for this purpose shall be in addition to any required by warranty.
- 3.2 System Monitoring:
- A. 24/7 Intrusion Detection monitoring to be provided by a local, in-house central station operator.
  - B. Monitoring service is to be included for 3-years.
  - C. Central station operator shall contact up to 5 different contacts via OWNER assigned telephone numbers upon any condition requiring attention.
- 3.3 WIRING
- A. Wiring Method: Install wiring in metal raceways according to Division 26 Section "Raceway and Boxes for Electrical Systems." Conceal raceway except in unfinished spaces and as indicated. Minimum conduit size shall be 1/2 inch. Control and data transmission wiring shall not share conduit with other building wiring systems.
  - B. Wiring Method: Install wiring in raceways except in accessible indoor ceiling spaces and in interior hollow gypsum board partitions where cable may be used. Conceal raceways and wiring except in unfinished spaces and as indicated. Minimum conduit size shall be 1/2 inch. Control and data transmission wiring shall not share conduit with other building wiring systems.
  - C. Wiring Method: Cable, concealed in accessible ceilings, walls, and floors when possible.
  - D. Wiring within Enclosures: Bundle, lace, and train conductors to terminal points. Use lacing bars and distribution spools. Separate power-limited and non-power-limited conductors as recommended in writing by manufacturer. Install conductors parallel with or at right angles to sides and back of enclosure. Connect conductors that are terminated, spliced, or interrupted in any enclosure associated with intrusion system to terminal blocks. Mark each terminal according to system's wiring diagrams. Make all connections with approved crimp-on terminal spade lugs, pressure-type terminal blocks, or plug connectors.
  - E. Wires and Cables:
    - 1. Conductors: Size as recommended in writing by system manufacturer, unless otherwise indicated.
    - 2. 120-V Power Wiring: Install according to Division 26 Section "Low-Voltage Electrical Power Conductors and Cables," unless otherwise indicated.
    - 3. Control and Signal Transmission Conductors: Install unshielded, twisted-pair cable, unless otherwise indicated or if manufacturer recommends shielded cable, according to Division 28 Section "Conductors and Cables for Electronic Safety and Security."
    - 4. Computer and Data-Processing Cables: Install according to Division 28 Section "Conductors and Cables for Electronic Safety and Security."

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- F. Terminal strips in junction, pull, and outlet boxes; terminal cabinets; and equipment enclosures.
- G. Install power supplies and other auxiliary components for detection devices at controllers, unless otherwise indicated or required by manufacturer. Do not install such items near devices they serve.
- H. Identify components with engraved, laminated-plastic or metal nameplate for central-station control unit and each terminal cabinet, mounted with corrosion-resistant screws. Nameplates and label products are specified in Division 26 Section "Identification for Electrical Systems."

### 3.4 GROUNDING

- A. Ground system components and conductor and cable shields to eliminate shock hazard and to minimize ground loops, common-mode returns, noise pickup, cross talk, and other impairments.
- B. Signal Ground Terminal: Locate at main equipment rack or cabinet. Isolate from power system and equipment grounding. Provide 5-ohm ground. Measure, record, and report ground resistance.
- C. Install grounding electrodes of type, size, location, and quantity indicated. Comply with installation requirements in Division 26 Section "Grounding and Bonding for Electrical Systems."

### 3.5 FIELD QUALITY CONTROL

- A. Pretesting: After installation, align, adjust, and balance system and perform complete pretesting to determine compliance of system with requirements in the Contract Documents. Correct deficiencies observed in pretesting. Replace malfunctioning or damaged items with new ones and retest until satisfactory performance and conditions are achieved. Prepare forms for systematic recording of acceptance test results.
  - 1. Report of Pretesting: After pretesting is complete, provide a letter certifying that installation is complete and fully operable; include names and titles of witnesses to preliminary tests.
- B. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust field-assembled components and equipment installation, including connections, and to assist in field testing. Report results in writing.
- C. Testing Agency: Owner will engage a qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.
- D. Testing Agency: Engage a qualified testing and inspecting agency to perform the following field tests and inspections and prepare test reports:
- E. Perform the following field tests and inspections and prepare reports:

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1. Inspection: Verify that units and controls are properly labeled and interconnecting wires and terminals are identified.
2. Operational Tests: Schedule tests after pretesting has been successfully completed. Test all modes of system operation and intrusion detection at each detection device. Test for detection of intrusion and for false alarms in each protected zone. Test for false alarms by simulating activities outside indicated detection patterns.
3. Electrical Tests: Comply with NFPA 72, Section A-7. Minimum required tests are as follows:
  - a. Verify the absence of unwanted voltages between circuit conductors and ground.
  - b. Test all conductors for short circuits using an insulation-testing device.
  - c. With each circuit pair, short circuit at the far end of circuit and measure circuit resistance with an ohmmeter. Record circuit resistance of each circuit on Record Drawings.
  - d. Verify that each controller is in normal condition as detailed in manufacturer's operation and maintenance manual.
  - e. Test signal and data transmission circuits complying with requirements in Division 28 Section "Conductors and Cables for Electronic Safety and Security" for proper signal transmission under open-circuit conditions. One connection each should be opened at not less than 10 percent of initiating and indicating devices. Observe proper signal transmission according to class of wiring used.
  - f. Verify that transient surge-protection devices are installed according to manufacturer's written instructions.
  - g. Test each initiating and indicating device for alarm operation and proper response at central-station control unit.
  - h. Test both primary and secondary power. Verify, by test, that UPS is capable of operating the system for period and in manner specified.

F. Report of Tests and Inspections: Prepare a written record of tests, inspections, and detailed test results in the form of a test log.

G. Tag all equipment, stations, and other components for which tests have been satisfactorily completed.

### 3.6 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain intrusion detection. Refer to Division 01 Section "Demonstration and Training."

### 3.7 COMMISSIONING AND TRAINING

- A. The INSTALLER is required to place entire system into full and proper operation as designed and specified.
- B. Verify that all hardware components are properly installed, connected, communicating, and operating correctly.
- C. Verify that all system software is installed, configured, and complies with specified functional requirements.

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- D. The INSTALLER shall perform final acceptance testing in the presence of OWNER'S representative, executing a point by point inspection against a documented test plan that demonstrates compliance with system requirements as designed and specified:
- E. Submit documented test plan to OWNER at least (14) days in advance of acceptance test, inspection, and check-off.
- F. Conduct final acceptance tests in presence of OWNER'S representative, verifying that each device point and sequence is operating correctly and properly reporting back to control panel and control center.
- G. Acceptance by Owner is contingent on successful completion of check-off; if check-off is not completed due to additional work required, re-schedule and perform complete check-off until complete in one pass, unless portions of system can be verified as not adversely affected by additional work.
- H. The system shall not be considered accepted until all acceptance test items have been successfully checked-off. Beneficial use of part or all of the system shall not be considered as acceptance.
- I. The INSTALLER shall provide system operations, administration, and maintenance training by factory trained personnel qualified to instruct:
- J. OWNER will designate personnel to be trained.
- K. Provide printed training materials for each trainee including product manuals, course outline, workbook or student guides, and written examinations for certification.
- L. Provide hands-on training with operational equipment.
- M. Training shall be oriented to the specific system being installed under this contract as designed and specified.

END OF SECTION 28 16 00

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## SECTION 28 23 00 - VIDEO SURVEILLANCE

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section includes a video surveillance system consisting of cameras, digital video recorder, data transmission wiring, and a control station with its associated equipment.

#### 1.3 DEFINITIONS

- A. AGC: Automatic gain control.
- B. BNC: Bayonet Neill-Councilman - type of connector.
- C. B/W: Black and white.
- D. CCD: Charge-coupled device.
- E. FTP: File transfer protocol.
- F. IP: Internet protocol.
- G. LAN: Local area network.
- H. MPEG: Moving picture experts group.
- I. NTSC: National Television System Committee.
- J. PC: Personal computer.
- K. PTZ: Pan-tilt-zoom.
- L. RAID: Redundant array of independent disks.
- M. TCP: Transmission control protocol - connects hosts on the Internet.
- N. UPS: Uninterruptible power supply.
- O. UPS: Uninterruptible power supply.

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#### 1.4 SUBMITTALS

- A. Product Data: For each type of product indicated. Include dimensions and data on features, performance, electrical characteristics, ratings, and finishes.
- B. Shop Drawings: For video surveillance. Include plans, elevations, sections, details, and attachments to other work.
  - 1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
  - 2. Functional Block Diagram: Show single-line interconnections between components for signal transmission and control. Show cable types and sizes.
  - 3. Dimensioned plan and elevations of equipment racks, control panels, and consoles. Show access and workspace requirements.
  - 4. UPS: Sizing calculations.
  - 5. Wiring Diagrams: For power, signal, and control wiring.
- C. Equipment List: Include every piece of equipment by model number, manufacturer, serial number, location, and date of original installation. Add pretesting record of each piece of equipment, listing name of person testing, date of test, set points of adjustments, name and description of the view of preset positions, description of alarms, and description of unit output responses to an alarm.
- D. Field quality-control reports.
- E. Operation and Maintenance Data: For cameras, power supplies, infrared illuminators, monitors, videotape recorders, digital video recorders, video switches, and control-station components to include in emergency, operation, and maintenance manuals. In addition to items specified in Division 01 Section "Operation and Maintenance Data," include the following:
  - 1. Lists of spare parts and replacement components recommended to be stored at the site for ready access.
- F. Warranty: Sample of special warranty.

#### 1.5 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with NECA 1.
- C. Comply with NFPA 70.
- D. Electronic data exchange between video surveillance system with an access-control system shall comply with SIA TVAC.

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#### 1.6 PROJECT CONDITIONS

- A. Environmental Conditions: Capable of withstanding the following environmental conditions without mechanical or electrical damage or degradation of operating capability:
1. Control Station: Rated for continuous operation in ambient temperatures of 60 to 85 deg F and a relative humidity of 20 to 80 percent, noncondensing.
  2. Interior, Controlled Environment: System components, except central-station control unit, installed in air-conditioned interior environments shall be rated for continuous operation in ambient temperatures of 36 to 122 deg F] dry bulb and 20 to 90 percent relative humidity, noncondensing. Use NEMA 250, Type 1 enclosures.
  3. Interior, Uncontrolled Environment: System components installed in non-air-conditioned interior environments shall be rated for continuous operation in ambient temperatures of 0 to 122 deg F dry bulb and 20 to 90 percent relative humidity, noncondensing. Use NEMA 250, Type 3R enclosures.
  4. Exterior Environment: System components installed in locations exposed to weather shall be rated for continuous operation in ambient temperatures of minus 30 to plus 122 deg F dry bulb and 20 to 90 percent relative humidity, condensing. Rate for continuous operation when exposed to rain as specified in NEMA 250, winds up to 85 mph Use NEMA 250, Type 3R enclosures.
  5. Hazardous Environment: System components located in areas where fire or explosion hazards may exist because of flammable gases or vapors, flammable liquids, combustible dust, or ignitable fibers shall be rated, listed, and installed according to NFPA 70.
  6. Corrosive Environment: System components subject to corrosive fumes, vapors, and wind-driven salt spray in coastal zones. Use NEMA 250, Type 4X enclosures.
  7. Security Environment: Camera housing for use in high-risk areas where surveillance equipment may be subject to physical violence.

#### 1.7 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of cameras, equipment related to camera operation, and control-station equipment that fail in materials or workmanship within specified warranty period.
1. Warranty Period: Three years from date of Substantial Completion.

#### 1.8 REQUIREMENTS:

- A. Gymnasium Addition video surveillance system shall fully integrate with existing video surveillance system. Cameras shall connect via CAT-6A cables to POE-enabled rack-mounted switches located in the Equipment Rooms. Provide fiber and switches as required to fully integrate the video surveillance systems.
- B. Provide one file server for every 32 cameras.
- C. Provide minimum 24 TB of storage for each file server.

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- D. It is the responsibility of the Contractor to supply a properly operating system. All equipment, material and labor must be furnished, whether or not specifically mentioned in this project specification or shown on the System Drawing.
- E. The system shall record up to 64 IP video streams at 15 images per second at 4CIF for 30 days minimum.
- F. Resolution: .5 Megapixel.
- G. Disk Redudancy: RAID 5.
- H. Provide managed "Power Over Ethernet" 19" rack-mounted network switches as required. Provide HP ProCurve or approved equal.
- I. Provide Digital Video Management Software.
- J. Provide server computer with system compatible software for administration.
- K. Provide client computer with system compatible software, which shall be the user interface.
- L. Provide (1) full high definition 23" LCD Monitor.

## PART 2 - PRODUCTS

### 2.1 GENERAL

- A. All equipment and materials used shall be standard components that are manufactured and used in the manufacturer's system
- B. All systems and components shall have been thoroughly tested and proven in actual use.
- C. All systems and components shall be provided with the availability of a toll-free technical assistance program (TAP) from the manufacturer.—The TAP shall allow for immediate technical assistance for either the dealer/installer or the end user at no charge for as long as the product is installed.
- D. All systems and components shall be provided with a one-day turnaround repair express and 24-hour parts replacement. The repair and parts express shall be guaranteed by the manufacturer on warranty and nonwarranty items.
- E. The digital video software shall be installed by a manufacturer certified dealer/integrator. Certification for installation shall be conducted by the manufacturer and shall provide all necessary knowledge to fulfill the systemization and deployment across diverse networks and infrastructures, as well as provide commissioning abilities at the integrator level.
- F. Basis of design: Pelco.

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## 2.2 SYSTEM REQUIREMENTS

- A. Video-signal format shall comply with NTSC standard, composite interlaced video. Composite video-signal termination shall be 75 ohms.
- B. Surge Protection: Protect components from voltage surges originating external to equipment housing and entering through power, communication, signal, control, or sensing leads. Include surge protection for external wiring of each conductor's entry connection to components.
  - 1. Minimum Protection for Power Connections 120 V and More: Auxiliary panel suppressors complying with requirements in Division 26 Section "Transient-Voltage Suppression for Low-Voltage Electrical Power Circuits."
  - 2. Minimum Protection for Communication, Signal, Control, and Low-Voltage Power Connections: Comply with requirements in Division 26 Section "Transient-Voltage Suppression for Low-Voltage Electrical Power Circuits." as recommended by manufacturer for type of line being protected.
- C. Tamper Protection: Tamper switches on enclosures, control units, pull boxes, junction boxes, cabinets, and other system components shall initiate a tamper-alarm signal when unit is opened or partially disassembled. Control-station, control-unit alarm display shall identify tamper alarms and indicate locations.
- D. Provide two 4PR UTP CAT 6A and one RG-6 to each camera.
- E. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Bosch Security Systems, Inc.
  - 2. Panasonic Corporation of North America; Panasonic Security Systems.
  - 3. Pelco.
  - 4. Sony.
  - 5. Axis.

## 2.3 0.5 MEGAPIXEL STANDARD DEFINITION INTEGRATED NETWORK CAMERA

- A. The network camera shall offer dual video streams with up to SVGA resolution (800 x 600) in progressive scan format. The network camera shall be a compact size with a 3" class bubble, shall include a compact indoor enclosure, and come with an integrated varifocal 2.8~10 mm lens.
- B. The network camera shall be capable of firmware upgrades remotely, over the network. In addition, a built-in accessory jack shall provide hardware expansion capabilities for future accessories such as two way audio or hard drive.
- C. The network camera shall offer a service connector between NTSC and PAL analog video output, operated by a toggle button.

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- D. The network camera shall provide advanced low-light capabilities with sensitivity down to 0.12 lux in color.
- E. The network camera shall support two simultaneous, configurable video streams. H.264, MJPEG, and MPEG-4 compression formats shall be available for primary and secondary streams with selectable Unicast and Multicast protocols. The streams shall be configurable in a variety of frame rates and bit rates.
- F. The network camera shall support industry standard Power over Ethernet (PoE) IEEE 802.3af to supply power to the camera over the network.
- G. The network camera shall use a standard Web browser interface for remote administration and configuration of camera parameters. The browser interface shall support multiscreen remote monitoring for up to 16 cameras on the same virtual local area network (VLAN).
- H. The network camera shall support standard IT protocols outlined in section 2.04. In addition, the network camera shall support open architecture best practices with a published API available to third-party network video recording and management systems.
- I. The network camera shall meet or exceed the following design and performance specifications.

J. CAMERA SPECIFICATIONS

- 1. Imaging Device 1/3-inch, effective
- 2. Imager Type CMOS
- 3. Imager Readout Progressive scan
- 4. Maximum Resolution 800 x 600
- 5. Signal-to-Noise Ratio 50 dB
- 6. Auto Iris Lens Type DC drive
- 7. Electronic Shutter Range 1~1/100,000 sec
- 8. Wide Dynamic Range 60 dB
- 9. White Balance Range 2,000° to 10,000° K
- 10. Sensitivity f/1.2; 2,850K; SNR >24dB
- 11. Color (1x/33ms) 0.50 lux
- 12. Color SENS (15x/500 ms) 0.12 lux
- 13. Dome Attenuation
  - a. Clear Zero light loss
  - b. Smoke f/1.0 light loss
- 14. Construction
  - a. Back box Cast aluminum and polycarbonate plastic
  - b. Trim ring Polycarbonate plastic
  - c. Bubble Acrylic plastic
- 15. Finish White
- 16. Weight 0.77 lb (0.35 kg)

K. VIDEO SPECIFICATIONS

- 1. Compression H.264 in base profile, MPEG-4, and MJPEG
- 2. Video Streams Up to 2 simultaneous streams, the second stream variable based on the setup of the primary stream

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3. Up to 30, 25, 24, 15, 12.5, 12, 10, 8, 7.5, 6, 5, 4, 3, 2, and 1 (depending upon coding, resolution, and stream configuration)
4. Available Resolutions
  - a. 0.5 Megapixel 800 x 600; 4:3 aspect ratio; 30.0 ips max., 5.8 Mbps bit rate for MJPEG; 25.0 ips max., 1.6 Mbps bit rate for H.264; n/a for MPEG-4
  - b. 0.3 Megapixel 640 x 480; 4:3 aspect ratio; 30.0 ips max., 3.7 Mbps bit rate for MJPEG; 30.0 ips max., 1.6 Mbps bit rate for H.264; 30.0 ips max., 1.7 Mbps bit rate for MPEG-4
  - c. 0.1 Megapixel 320 x 240; 4:3 aspect ratio; 30.0 ips max., 0.9 Mbps bit rate for MJPEG; 30.0 ips max., 0.4 Mbps bit rate for H.264; 30.0 ips max., 0.4 Mbps bit rate for MPEG-4
  - d. Additional 640 x 512, 640 x 352, 480 x 368, 480 x 272, 320 x 256, 320 x 176, 4CIF (704 x 480 and □ 704 x 576) and CIF (352 x 240 and 352 x 288)
5. Supported Protocols TCP/IP, UDP/IP (Unicast, Multicast IGMP), UPnP, DNS, DHCP, RTP, RTSP, NTP, IPv4, SNMP, QoS, HTTP, HTTPS, LDAP (client), SSH, SSL, STMP, FTP, MDNS (Bonjour)
6. Users
  - a. Unicast Up to 20 simultaneous users
  - b. Multicast Unlimited H.264
7. Security Access Password protected
8. Software Interface Web browser view and setup, up to 16 cameras
9. Open IP Integration Pelco IP camera API
10. Minimum Web Browser Requirements
  - a. Operating System PC (Intel® Pentium® 4 microprocessor, 1.6(GHz) with Microsoft® Windows® XP, Windows Vista®, or Mac OS® X 10.4 or later
  - b. Web User Interface Requires QuickTime® 7.55 or later
  - c. RAM 512 MB
  - d. Ethernet Card 100 Mbps
  - e. Web Brower Internet Explorer® 7.0 or later, Mozilla® Firefox® 3.0 or later
  - f. Screen Resolution 1024 x 768 pixels or higher, 16- or 32-bit pixel color resolution

#### L. ELECTRICAL SPECIFICATIONS

1. Connectors RJ-45 for 100Base-TX, Auto MDI/MDI-X
2. Cable Cat5 cable or better for 100Base-TX
3. Input Voltage PoE (IEEE802.3af class 3)
4. Power Consumption <6 W
5. Current Consumption PoE, <200 mA maximum
6. Service Port External 3-connector, 2.5 mm provides NTSC/PAL video output
7. Accessory Port Connects Pelco accessories

#### M. ENVIRONMENTAL SPECIFICATIONS

1. Operating Temperature 32° to 122°F (0° to 50°C)
2. Operating Humidity 20% to 80%, noncondensing

#### N. MECHANICAL SPECIFICATIONS

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1. Pan/Tilt Adjustment
  - a. Pan 355°
  - b. Tilt 180°
  - c. Rotate 220°

O. CERTIFICATIONS

1. Camera shall be UL/cUL Listed\*

P. MODEL NUMBERS

1. IMS0C10-1 Sarix mini indoor fixed dome network camera, 0.5 megapixel, color, 2.8-10 mm varifocal megapixel lens, white trim ring, clear dome or approved equal.

Q. OPTIONAL ACCESSORIES

1. Accessories, Supply Per Drawings as required for complete installation.
  - a. IM-PMWT White pendant mount
  - b. IM-WMWT White integrated wall mount

2.4 0.5 MP OUTDOOR STANDARD DEFINITION DOME NETWORK CAMERA

- A. The network camera shall offer dual video streams with up to SVGA resolution (800 x 600) in progressive scan format. Color and day/night models shall be available. An alarm input and relay output shall be built in for integration with hard wired external sensors. The network camera shall provide a removable, local storage medium (Micro SD) for scheduled and event-based recording of images.
- B. Color and day/night models shall be available for indoor and low-light environments.
- C. The network camera shall be capable of firmware upgrades remotely, over the network. In addition, a built-in accessory jack shall provide hardware expansion capabilities for future accessories such as two way audio, hard drive, and so forth.
- D. The network camera shall offer auto back focus (ABF) functionality through a push button on the camera. ABF parameters shall be configurable through a standard Web browser interface.
- E. The network camera shall offer a service connector between NTSC and PAL analog video output, operated by a toggle button.
- F. The network camera shall provide advanced low-light capabilities for color and day/night models with sensitivity down to 0.12 lux in color and 0.03 lux in black-white (B-W). Refer to section 2.03.1 for parameters.
- G. The network camera shall support two simultaneous, configurable video streams. H.264, MJPEG, and MPEG-4 compression formats shall be available for primary and secondary streams with selectable Unicast and Multicast protocols. The streams shall be configurable in a variety of frame rates and bit rates.

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- H. The network camera (day/night model) shall have movable IR cut filter mechanism for increased sensitivity in low-light installations. The presence or absence of the IR cut filter as well as the light level at which it is triggered shall be configurable through a Web browser.
- I. IEEE 802.3af to supply power to the camera over the network. The network camera shall also offer 24 VAC power input for use where PoE is not feasible or available. 24 VAC power required for heater operation.
- J. The network camera shall use a standard Web browser interface for remote administration and configuration of camera parameters including ABF. The browser interface shall support multiscreen remote monitoring for up to 16 cameras on the same virtual local area network (VLAN).
- K. The network camera shall support standard IT protocols outlined in section 2.03.2. In addition, the network camera shall support open architecture best practices with a published API available to third-party network video recording and management systems.
- L. The network camera shall meet or exceed the following design and performance specifications.

M. Camera Specifications

- |     |                          |                          |
|-----|--------------------------|--------------------------|
| 1.  | Imaging Device           | 1/3-inch, effective      |
| 2.  | Imager Type              | CMOS                     |
| 3.  | Imager Readout           | Progressive scan         |
| 4.  | Maximum Resolution       | 800x600                  |
| 5.  | Signal-to-Noise Ratio    | 50 dB                    |
| 6.  | Auto Iris Lens Type      | DC drive                 |
| 7.  | Electronic Shutter Range | 1~1/100,000 sec          |
| 8.  | Wide Dynamic Range       | 60 dB                    |
| 9.  | White Balance Range      | 2,000° to 10,000°K       |
| 10. | Sensitivity              | f/1.2; 2,850K; SNR >24dB |
| 11. | Color (1x/33ms)          | 0.50 lux                 |
| 12. | Color SENS (15x/500 ms)  | 0.12 lux                 |
| 13. | Mono (1x/33ms)           | 0.25 lux                 |
| 14. | Mono SENS (15x/500 ms)   | 0.03 lux                 |
| 15. | Dome Attenuation         |                          |
|     | a. Clear                 | Zero light loss          |
|     | b. Smoke                 | f/1.0 light loss         |
| 16. | Construction             |                          |
|     | a. Back box              | Cast aluminum            |
|     | b. Trim ring             | Cast aluminum            |
|     | c. Bubble                | Polycarbonate            |
|     | d. Finish                | Light gray powder coated |

N. Video Specifications

- 1. Compression H.264 in base profile, MPEG-4, and MJPEG
- 2. Video Streams - Up to 2 simultaneous streams, the second stream. Variable based on the setup of the primary stream

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3. Frame Rate - Up to 30, 25, 24, 15, 12.5, 12, 10, 8, 7.5, 6.5, 4, 3, 2, and 1 (depending upon coding, resolution, and stream configuration)
4. Available Resolutions
  - a. 0.5 Megapixel 800 x 600; 4:3 aspect ratio; 30.0 ips max., 5.8 Mbps bit rate for MJPEG; 25.0 ips max., 1.6 Mbps bit rate for H.264
  - b. 0.3 Megapixel 640 x 480; 4:3 aspect ratio; 30.0 ips max., 3.7 Mbps bit rate for MJPEG; 30.0 ips max., 1.6 Mbps bit rate for H.264
  - c. 0.1 Megapixel 320 x 240; 4:3 aspect ratio; 30.0 ips max., 0.9 Mbps bit rate for MJPEG; 30.0 ips max., 0.4 Mbps bit rate for H.264
  - d. Additional 640x512, 640x352, 480x368, 480x272, 320x256, 320 x 176
  - e. Supported Protocols TCP/IP, UDP/IP (Unicast, Multicast IGMP), UPnP, DNS, DHCP, RTP, RTSP, NTP, IPv4, SNMP, QoS, HTTP, HTTPS, LDAP (client), SSH, SSL, STMP, FTP, MDNS (Bonjour)
5. Users
  - a. Unicast Up to 20 simultaneous users
  - b. Multicast Unlimited H.264 or MPEG-4
6. Security Access Password protected
7. Software Interface Web browser view and setup, up to 16 cameras
8. Open IP Integration Pelco IP camera API
9. Minimum Web Browser Requirements
10. Operating System PC (Intel® Pentium® 4 microprocessor, 1.6 GHz) with Microsoft® Windows® XP, Windows Vista®, or Mac OS® X 10.4 or later
11. Web User Interface Requires QuickTime® 7.55 or later
12. RAM 12 MB
13. Ethernet Card 100 Mbps
14. Web Brower Internet Explorer® 7.0 or later, Mozilla® Firefox® 3.0 or later
15. Screen Resolution 1024 x 768 pixels or higher, 16- or 32-bit pixel color resolution

O. Electrical Specifications

1. Connectors RJ-45 for 100Base-TX, Auto MDI/MDI-X Cable Cat5 cable or better for 100Base-TX
2. Input Voltage 24 VAC or PoE (IEEE802.3af class 3)
  - a. Power Consumption <7 W, <40 W with heater operation
  - b. Current Consumption
    - 1) PoE <140 mA maximum
    - 2) 24 VAC <510 mA without heater operation 2.5 A Maximum with heater operation
3. Local Storage Micro SD
4. Alarm Input 10 VDC maximum, 5 mA maximum
5. Alarm Output 0 to 15 VDC maximum, 75 mA maximum
6. Service Connector External 3-connector, 2.5 mm provides NTSC/PAL video output
7. Accessory Port Connects Pelco accessories

P. Environmental Specifications

1. Operating Temperature -22° to 122°F (-30° to 50°C)

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2. Thermostat Operation Heater Thermostatically Controlled PoE operation 32° to 122°F (0° to 50°C) Heater operation for deicing below 32°F
3. Operating Humidity 20% to 80%, noncondensing

Q. Mechanical Specifications

1. Lens Mount CS mount, adjustable
2. Pan/Tilt Adjustment
  - a. Pan 368°
  - b. Tilt 160° (10° to 170°)
  - c. Rotate 355°

R. Certifications

1. Camera shall be UL/cUL Listed

S. Model Numbers

1. IES0DN12-1 Pelco Sarix outdoor fixed dome network camera, 0.5 megapixel, day/night, 2.8-12 mm varifocal megapixel lens, clear dome or approved equal.

T. Optional Modules

1. Accessories, Supply Per Drawings as required for complete installation.
  - a. ID-P Pendant mount
  - b. SWM-WT Wall mount for pendant
  - c. SWM-CAWT Corner adapter for wall mount
  - d. SWM-PAWT Pole adapter for wall mount

## 2.5 MONITORS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Bosch Security Systems, Inc.
2. Panasonic Corporation of North America; Panasonic Security Systems.
3. Pelco.
4. Sony.

## 2.6 FULL HIGH DEFINITION LCD MONITOR

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Bosch Security Systems, Inc.
2. Panasonic Corporation of North America; Panasonic Security Systems.
3. Pelco.
4. Sony.

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- B. Basis of Design: Pelco PMCL500 Series FHD LCD monitor
- C. The PMCL500 Series FHD LCD monitor (or approved equal) shall the following features: VGA and digital visual interface (DVI) inputs, picture-in-picture (PIP), looping BNC output, and full high definition resolution.
- D. The PMCL500 Series FHD LCD monitor shall provide a front panel that allows the user to adjust image quality, brightness, size, position, and geometry for optimal viewing.
- E. The PMCL500 Series FHD LCD monitor shall have improved airflow and thermal reduction allowing for longer component life, ensuring reliability in a 24/7 security installation environment.
- F. The PMCL500 Series FHD LCD monitor shall be constructed of a lightweight aluminum frame composition for desktop or wall-mount installations. Stationary and tilt wall mounts shall be available. The monitors shall provide built-in hand holds in the rear cover for easy installation and handling.
- G. The PMCL500 Series FHD LCD monitor shall be compatible with industry-leading megapixel technology, providing a minimum of 1366 x 768 native resolution that is used with the latest megapixel video security cameras.
- H. The PMCL500 Series FHD LCD monitor shall meet or exceed the following design and performance specifications.
- I. ELECTRICAL SPECIFICATIONS
  - 1. Input Voltage 100 to 240 VAC, 50/60 Hz
  - 2. Power Consumption
    - a. PMCL523A 210 W
  - 3. Video Input Interfaces 2 BNC, looping; 1 S-Video, looping; 1 RGB; 1 DVI; 1 component
  - 4. Audio Input Interfaces 2 audio L/R, RCA jack
  - 5. Horizontal Frequency: 31 to 69 kHz
  - 6. Vertical Frequency 56 to 85 Hz
  - 7. Sync Format NTSC/PAL
- J. ENVIRONMENTAL SPECIFICATIONS
  - 1. Operating Temperature 32° to 104°F (0° to 40°C)
  - 2. Operating Humidity 20% to 80%, noncondensing
- K. PHYSICAL SPECIFICATIONS
  - 1. Dimensions (without stand)
    - a. PMCL523A 4.0" D x 23.5" W x 14.8" H

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2. Unit Weight
  - a. PMCL523A 27.6 lb

L. MECHANICAL SPECIFICATIONS

1. Native Resolution 1366 x 768 WXGA
2. Panel Aspect Ratio 16:9
3. Viewing Area 508 x 286 mm
4. Pixel Pitch 0.372 x 0.372 mm
5. Video Formats 480p, 576p, 720p, 1080i, 1080p
6. Brightness 500 cd/m<sup>2</sup>
7. Contrast Ratio 700:1
8. Backlight Type CCFL
9. Panel Life 50,000 hours
10. Viewing Angle (H/V) 178°/178°
11. Displayable Colors 16.7 million
12. Response Time 8ms
13. PIP Selectable, sizeable, swappable, moveable
14. Speakers 2 internal (5 W, 4 ohms x 2)
15. Front Panel Controls Menu, source, up/ down, power, and volume +/-
16. Indicators LED (power on/off)

M. CERTIFICATIONS

1. CE, Class A
2. FCC, Class A
3. UL/cUL listed
4. C-Tick

N. PELCO MODEL NUMBERS

1. PMCL523A 23-inch (583 mm) LCD monitor or approved equal

2.7 NETWORK VIDEO RECORDERS (NVR)

- A. Description: Digital, time-lapse type, full-frame and motion recorder, with removable hard drive.

1. Recording Time: 400 hours minimum.
2. Resolution: 640 by 480 lines, minimum.
3. Programming shall include the following:
  - a. Motion analysis graph.
  - b. Password protection.
  - c. Alarm and timer controls.
  - d. Continuous recording option.
  - e. Time-lapse operating modes.
  - f. Search video by time, event, or motion.

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4. Programming: Software updating, image archiving, and image transfer to a PC.
5. Storage: 24 TB per file server, removable hard drive. Software shall permit hot-swapping drives.
6. Compression: MPEG-4, H.264.
7. Time and Date Generator: Records time (hr:min:sec) and date legend of each frame.
8. Audio Recording: 70 to 7000 Hz. Phono and microphone input; phono output.
9. Mounting: Standard 19-inch rack complying with CEA 310-E, or freestanding desktop.

## 2.8 IP VIDEO SYSTEMS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Bosch Security Systems, Inc.
2. Panasonic Corporation of North America; Panasonic Security Systems.
3. Pelco.
4. Sony.
5. Axis

B. Description:

1. System shall provide high-quality delivery and processing of IP-based video and control data using standard Ethernet-based networks.
2. System shall have seamless integration of all video surveillance and control functions.
3. Graphical user interface software shall manage all IP-based video matrix switching and camera control functions and recording and archive/retrieval management. IP system shall also be capable of integrating into larger system environments.
4. System design shall include all necessary compression software for high-performance, dual-stream, MPEG-4 video. Unit shall provide connections for all video cameras, discreet sensor inputs, and control system outputs.
5. All camera signals shall be compressed, encoded, and delivered onto the network for processing and control by the IP video-management software.
6. Camera system units shall be ruggedly built and designed for extreme adverse environments, complying with NEMA Type environmental standards.
7. Encoder/decoder combinations shall place video, and data network stream that can be managed from multiple workstations on the user's LAN or WAN.
8. All system interconnect cables, workstation PCs, and network intermediate devices shall be provided for full performance of specified system.

## 2.9 SIGNAL TRANSMISSION COMPONENTS

A. Cable: UTP CAT 6A. Comply with requirements in Division 28 Section "Conductors and Cables for Electronic Safety and Security."

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## 2.10 DIGITAL VIDEO MANAGEMENT SOFTWARE & HARDWARE

- A. The digital video management software, hereafter referred to as “the system” consists of Digital Sentry<sup>®</sup> NVs version 7 (or approved equal) operating on a manufacturer certified non-proprietary third party hardware platform. The NVs software shall consist of Base software with individual Licenses in the required quantity. Licenses shall not expire or have any reoccurring cost.
- B. The system shall record up to 64 IP video streams at 15 images per second at 4CIF resolution.
- C. The system shall also record a limited number of individual IP video streams at MegaPixel resolution with H.264 compression.
- D. System shall support automatic locating and configuring of cameras on the network.
- E. An unlimited number of systems shall be connectible over a network. Each system shall contain two network interface cards: one for IP camera/encoder data, and one to connect to a network for client computer access.
- F. The system shall be viewed, managed, and played back through a single user interface simultaneously with other Digital Sentry<sup>®</sup> digital video management systems (or approved equal) through supplied DS ControlPoint client software (or approved equal) and configured through supplied DS Admin (or approved equal).
- G. The software shall operate on certified non-proprietary third party hardware platform.
- H. The software shall run on the Windows<sup>®</sup> XP Professional operating system for 4 and 16 channel systems and Windows<sup>®</sup> Server 2003 for 32 and 64 channel systems.
- I. The system shall allow expansion of video channel capacity through a software upgrade without any hardware modification.
- J. The system shall support multiple models of IP cameras including Sarix (from Pelco) (or approved equal) and multiple third party manufacturers.
- K. The system shall support recording on internal server storage or optionally utilizing Pelco (or approved equal) or third party SCSI attached JBOD or RAID5.
- L. The system shall optionally support a distributed architecture in which up to five systems function as dedicated video acquisition units, a single database runs on separate database management server, and all video data is stored on an external RAID or JBOD device.
- M. The system shall be capable of continuous scheduled alarm/event and motion recording. Pre- and post-alarm recording shall also be available and shall be fully programmable on a per channel basis.
- N. The system shall allow archival of video data to computers or SAN storage devices over a network connection with the optional DS Archive Utility. The archival schedule shall be either automatic, at user-defined intervals or manual and shall be configurable per connected camera

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1. Software will be licensed based per archived recorder
2. Software will require a single archive server for search, playback, clip management and maintenance.
3. Each archive software shall support up to five recorders
4. Video shall only be copied for archive, existing video will remain on the source recorder until over-written.

## 2.11 CLIENT

- A. A client computer with system compatible software shall 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.
- B. Client software shall be unlicensed and available to be installed on as many clients as required by the user.
- C. Client Software shall be compatible with multiple DVR and NVR platforms.
- D. Client Software shall be password controlled such that password functionality set at each connected system will be recognized at the client. Password shall limit the ability to access live or recorded video as well as the ability to export video.
- E. Client Software shall allow multiple monitor support for up to 4 displays per client workstation, providing virtual matrix functionality.
- F. Client Software shall allow the connection of a keyboard controller to the client workstation to control camera call-up.
- G. Client Software shall allow video streams to be selectable from a system tree on an individual camera, individual system, client defined local group or from predefined recorder based groups.
- H. Client software shall be a tab based work environment with the ability to undock the tabs creating a virtual workspace on single or multiple monitor clients.
- I. Client tabs shall include system management, live and search options. Tabs can be displayed simultaneously on the client.
  1. Systems Tab shall display and sort available systems, connection status, system names, system IP addresses, custom categories. This tab shall additionally allow
    - a. Manual connect and disconnect of systems to the client
    - b. Virtual systems naming
    - c. Auto Connecting
    - d. Adding, Deleting and Editing available systems
  2. Live video tab shall have the ability to be created up to 4 times on a single client workstation providing for video display combinations limited by the bandwidth of the

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- client workstation and video streams from as many different systems. Live video tab shall provide the following functionality
- a. Quick Review which shall display recorded video from the last 1, 5, 15, 30, 60 or 90 minutes, providing near instantaneous review of recent events
  - b. 1 week graphical display of recorded video
  - c. Borderless display option
  - d. Screen layout selection
  - e. On the fly on-screen display changes including time, date, camera name, frame rate, frame size, alarm display and border indicators
3. Search video tab shall allow for the search of 1 or multiple cameras from 1 or multiple systems simultaneously. Search tab shall provide the following functionality
- a. Time and date search
  - b. Advanced data search with interfaced software.
  - c. Video export to any system accessible media including locally to HDD, CD/DVD, SD, Flash USB device or to network storage
  - d. Video authentication of exported video via check sum verification
4. The Client shall incorporate virtual matrix functionality whereby camera sequences may be created on the monitoring workstation with the following functionalities:
- a. Each sequence shall have a maximum of 500 cameras.
  - b. Each camera in the sequence shall have its own individual dwell time, from 1 to 60 seconds.
  - c. The Client shall have the capability to display recorded video with full VCR controls. This feature shall display video from multiple cameras simultaneously. The user shall be able to play video as fast as possible (all images), in real time, or by skipping a selectable number of seconds.
  - d. The Client shall support simultaneous playback of up to sixteen cameras all synchronized with each other. Non-synchronous playback of multiple cameras shall not be acceptable.
  - e. The Client shall support tours of multi-camera displays

## 2.12 SYSTEM SPECIFICATIONS

- A. The system software shall meet or exceed the following design and performance specifications.
- B. Video Standards NTSC/PAL
- C. Video Decoding MPEG-4, MJPEG, H.264
- D. Video Resolutions
  1. CIF 352 x 240
  2. 2CIF 704 x 240
  3. 4CIF 704 x 480
  4. HD Up to 5 MegaPixel (NTSC and PAL)
- E. IP Camera Capacity 4, 16, 32, 64
- F. Recording Rate

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1. 64 Channels at 4CIF resolution 15ips
2. 64 Channels at CIF resolution 30 ips
3. 32 Channels at 4CIF resolution 15 ips
4. 32 Channels at CIF resolution 30 ips
5. 16 Channels at 4CIF resolution 30 ips
6. 16 Channels at CIF resolution 30 ips
7. 4 Channels at 4CIF resolution 30 ips
8. 4 Channels at CIF resolution 30 ips

#### 2.13 MINIMUM SERVER SPECIFICATIONS

- A. The system shall be supplied with a server meeting the following minimum specifications.
- B. Motherboard Industry-standard Intel® platform, server grade
- C. Processor Intel Dual Xeon® or better
- D. RAM: 4 GB
- E. Network Interface Card: Dual Gigabit
- F. Operating System: Windows Server® 2003 or better
- G. Hard Drive At least one 7200 rpm hard drive (SCSI or SATA)
- H. Drive Controller Card Required
- I. DVD-RW Required
- J. Operating System Partition Size
  1. Standalone NVs 20 GB
  2. Distributed NVs 160 GB
- K. Dedicated Server Required

#### 2.14 CERTIFIED SERVER PLATFORMS

- A. IBM IBM® E-server xSeries®
  1. (model #884031U) with SCSI drives and
  2. robust SCSI controller
- B. Dell Dell® PowerEdge® SC 1425 with SATA
  1. drives and standard drive controller on
  2. motherboard

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- C. Hewlett-Packard HP ProLiant Server (models DL380 or DL360)

#### 2.15 CLIENT COMPUTER MINIMUM REQUIREMENTS

- A. The system shall be supplied with one client computer meeting the following minimum specifications.
- B. Processor - Intel Dual Quad Core Intel Xeon Processors E5504 2.0GHz, 4M L3, 4.8GT/s 64 Bit processor shall be supplied
- C. Internal Memory: 4GB RAM, DDR3 Memory, 1066MHz, ECC (4 DIMMS)
- D. Video System: 512MB NVIDIA Quadro NVS 420 with DirectX 9.0

#### 2.16 MODEL NUMBERS

- A. DS-NVS-NC DS NVs Base Software or Approved Equal
- B. IP Camera Licenses
  - 1. *(Required for Each Connected IP Camera)*
  - 2. DS-SW-CAM-P IP camera license for Pelco cameras (or approved equal)

#### 2.17 Patch Panels

- 1. Use 24 Port Patch Panel, with horizontal wire management (Front and Back) for Cat 6 Augmented cabling terminations.
- 2. Use 24 Port-Power Over Ethernet (POE)- Patch Panel, with horizontal wire management (Front and Back) for Cat 6 Augmented cabling terminations for terminating all cameras where required.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine pathway elements intended for cables. Check raceways and other elements for compliance with space allocations, installation tolerance, hazards to camera installation, and other conditions affecting installation.
- B. Examine roughing-in for LAN, WAN, and IP network before device installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

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### 3.2 WIRING

- A. Comply with requirements in Division 26 Section "Raceway and Boxes for Electrical Systems."
- B. Wiring Method: Install cables in raceways unless otherwise indicated.
  - 1. Except raceways are not required in accessible indoor ceiling spaces and attics.
  - 2. Except raceways are not required in hollow gypsum board partitions.
  - 3. Conceal raceways and wiring except in unfinished spaces.
- C. Wiring within Enclosures: Bundle, lace, and train conductors to terminal points with no excess and without exceeding manufacturer's limitations on bending radii. Provide and use lacing bars and distribution spools.
- D. Splices, Taps, and Terminations: For power and control wiring, use numbered terminal strips in junction, pull, and outlet boxes; terminal cabinets; and equipment enclosures. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A-486B.
- E. For LAN connection and fiber-optic and copper communication wiring, comply with Division 27 Sections "Communications Backbone Cabling" and "Communications Horizontal Cabling."
- F. Grounding: Provide independent-signal circuit grounding recommended in writing by manufacturer.
- G. Fiber: Provide fiber connection connected from Existing Building Main Office Head End to Gymnasium Addition Equipment rooms. Provide connectors as required.

### 3.3 VIDEO SURVEILLANCE SYSTEM INSTALLATION

- A. Install cameras level and plumb.
- B. Install cameras with 84-inch- minimum clear space below cameras and their mountings. Change type of mounting to achieve required clearance.
- C. Set final camera position to obtain the field of view required for camera. Desired field of view for each camera shall be verified by the Engineer. Connect all controls and alarms, and adjust.
- D. Install tamper switches on components indicated to receive tamper switches, arranged to detect unauthorized entry into system-component enclosures and mounted in self-protected, inconspicuous positions.
- E. Identify system components, wiring, cabling, and terminals according to Division 26 Section "Identification for Electrical Systems."

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### 3.4 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- B. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections.
- C. Perform tests and inspections.
  - 1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.
- D. Tests and Inspections:
  - 1. Inspection: Verify that units and controls are properly installed, connected, and labeled, and that interconnecting wires and terminals are identified.
  - 2. Pretesting: Align and adjust system and pretest components, wiring, and functions to verify that they comply with specified requirements. Conduct tests at varying lighting levels, including day and night scenes as applicable. Prepare video-surveillance equipment for acceptance and operational testing as follows:
    - a. Prepare equipment list described in "Submittals" Article.
    - b. Verify operation of auto-iris lenses.
    - c. Set back-focus of fixed focal length lenses. At focus set to infinity, simulate nighttime lighting conditions by using a dark glass filter of a density that produces a clear image. Adjust until image is in focus with and without the filter.
    - d. Set back-focus of zoom lenses. At focus set to infinity, simulate nighttime lighting conditions by using a dark glass filter of a density that produces a clear image. Additionally, set zoom to full wide angle and aim camera at an object 50 to 75 feet away. Adjust until image is in focus from full wide angle to full telephoto, with the filter in place.
    - e. Set and name all preset positions; consult Owner's personnel.
    - f. Set sensitivity of motion detection.
    - g. Connect and verify responses to alarms.
    - h. Verify operation of control-station equipment.
  - 3. Test Schedule: Schedule tests after pretesting has been successfully completed and system has been in normal functional operation for at least 14 days. Provide a minimum of 10 days' notice of test schedule.
  - 4. Operational Tests: Perform operational system tests to verify that system complies with Specifications. Include all modes of system operation. Test equipment for proper operation in all functional modes.
- E. Video surveillance system will be considered defective if it does not pass tests and inspections.
- F. Prepare test and inspection reports.

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3.5 ADJUSTING

- A. Occupancy Adjustments: At no cost to the Owner: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting system to suit actual occupied conditions. Provide up to two visits to Project during other-than-normal occupancy hours for this purpose. Tasks shall include, but are not limited to, the following:
  - 1. Check cable connections.
  - 2. Check proper operation of cameras and lenses. Verify operation of auto-iris lenses and adjust back-focus as needed.
  - 3. Recommend changes to cameras, lenses, and associated equipment to improve Owner's use of video surveillance system.
- B. Provide a written report of adjustments and recommendations.

3.6 CLEANING

- A. Clean installed items using methods and materials recommended in writing by manufacturer.
- B. Clean video-surveillance-system components, including camera-housing windows, lenses, and monitor screens.

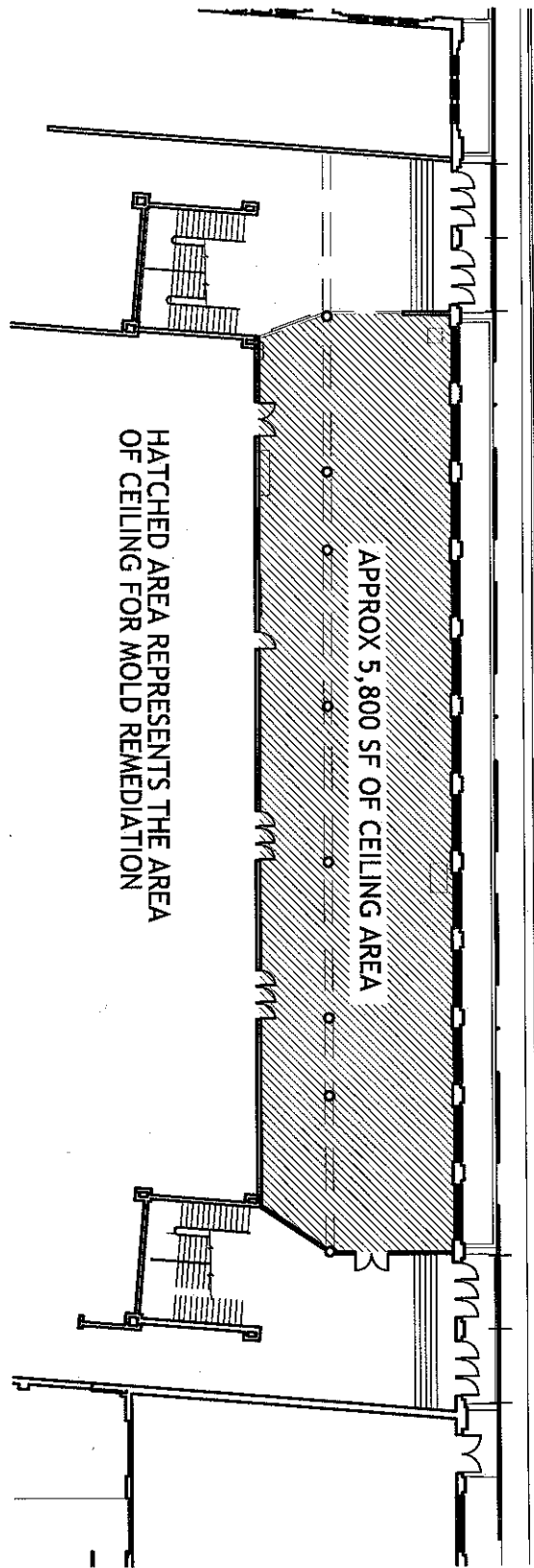
3.7 DEMONSTRATION

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

END OF SECTION 28 23 00



1  
 EXISTING FLOOR PLAN  
 SCALE: 1/32" = 1'-0"  
 RE: 1/A-1



JOSEPH STREET

APPROX 5,800 SF OF CEILING AREA

HATCHED AREA REPRESENTS THE AREA OF CEILING FOR MOLD REMEDIATION

McMAIN HEALTH CLINIC RENOVATION  
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**JAHNCKE & BURNS**  
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 jahnckeburns@bellsouth.net

Contractor must verify and check all job dimensions, details and specifications on site and report any error, omission, or discrepancy to the architect in writing before proceeding with work.

REVISION(S):  
 AD#1-06/20/12

DATE:

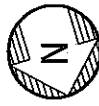
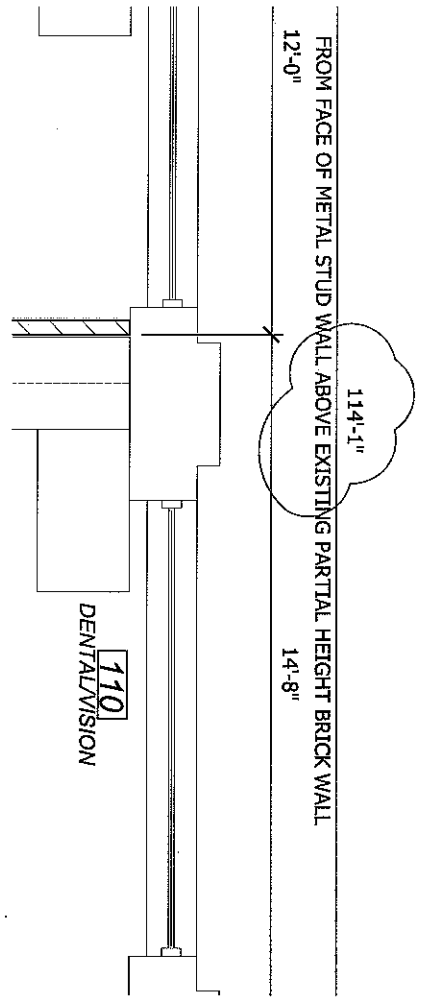
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PROJECT NO.

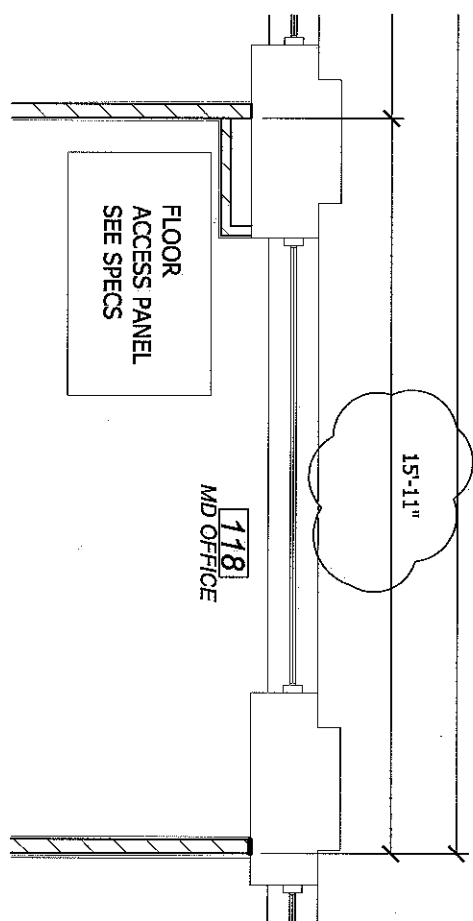
1007B

SHEET NO.:

AD1.1



**1**  
PARTIAL FLOOR PLAN  
SCALE: 1/4" = 1' - 0"  
RE: 1/A-1



**2**  
PARTIAL FLOOR PLAN  
SCALE: 1/4" = 1' - 0"  
RE: 1/A-1

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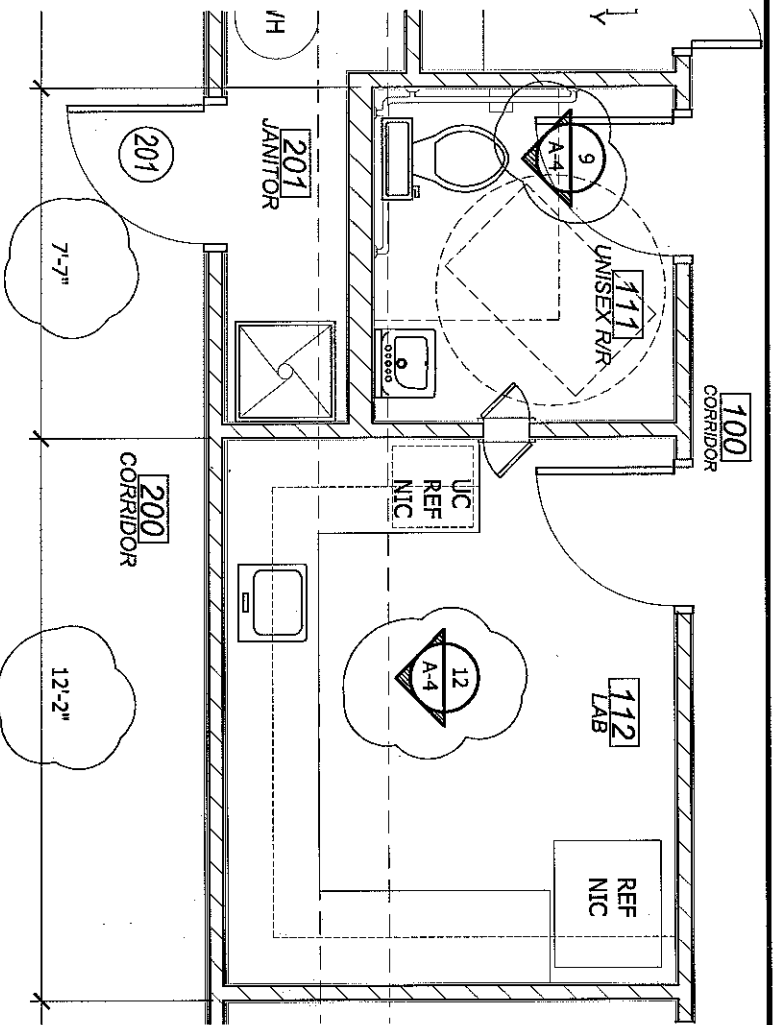
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AD#1-06/20/12

DATE:  
05/11/12

PROJECT NO.:  
1007B

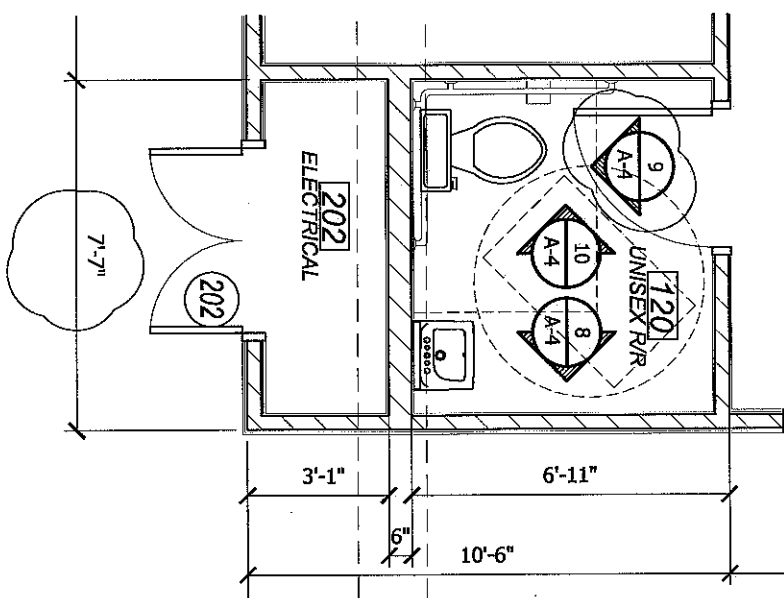
SHEET NO:

AD1.2



**1** PARTIAL FLOOR PLAN  
 SCALE:  $\frac{1}{4}$ " = 1' - 0"  
 RE: 1/A-1

NOTE: ALL DIMENSIONS ARE TO FACE OF STUD UNLESS OTHERWISE NOTED.



**2** PARTIAL FLOOR PLAN  
 SCALE:  $\frac{1}{4}$ " = 1' - 0"  
 RE: 1/A-1

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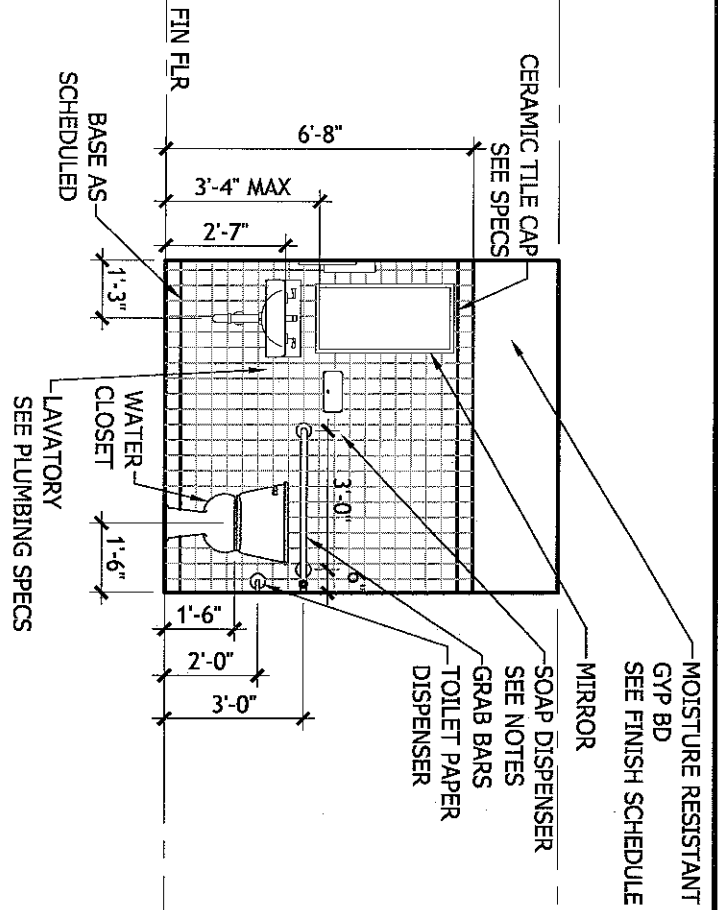
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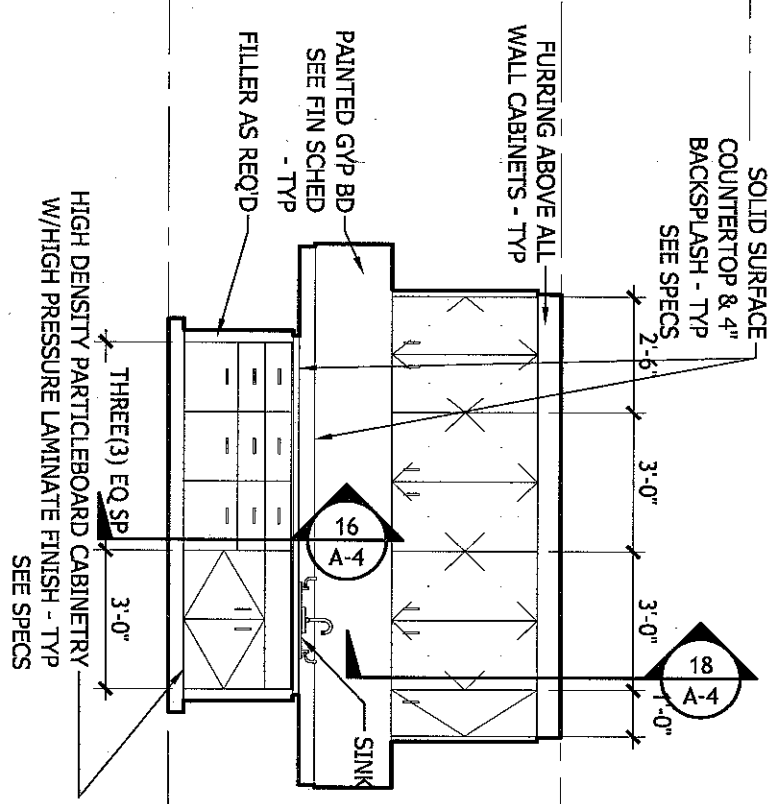
REVISION(S):  
 AD#1-06/20/12

DATE: 05/11/12  
 PROJECT NO. 1007B  
 SHEET NO:

**AD1.3**



**9** INT. ELEV. UNISEX R/R 111 & 120  
 SCALE: 1/4" = 1' - 0"  
 NO PASS-THRU @ UNISEX R/R 120  
 RE: 9/A-4



**12** INT. ELEV. LAB 112  
 SCALE: 1/4" = 1' - 0"  
 RE: 12/A-4

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DATE:	05/11/12
PROJECT NO.:	1007B
SHEET NO.:	AD1.4
REVISION(S):	AD#1-06/20/12

SPLIT SYSTEM AIR CONDITIONING UNIT SCHEDULE																		
MARK	SERVICE	FAN						COOLING				HEATING		UNIT	BASIS OF DESIGN			
		MIN CFM	CFM FA	EXT SP	FLA UNIT	MOTOR DATA	BTUH TOTAL	BTUH SENSIBLE	DB	ENT TEMP	MIN BTUH	No. OF ROW	GPM			MAX OVERCURRENT PROTECTION		
AC-1	EXTERIOR ZONE	2020	190	0.75	3.8	4.5	208/1	208/1	208/1	64,600	42,600	77.7	68.0	41,250	2	8.2	15	17min
AC-2	INTERIOR ZONE	1880	160	0.75	3.8	4.5	208/1	208/1	208/1	58,500	29,500	77.8	68.1	13,800	2	2.7	15	17min

1. UNITS SHALL BE INTERNALLY WIRED AND FLIBED TO ACCEPT ELECTRICAL SERVICE FROM ONLY ONE (1) DISCONNECTING MEANS.  
 2. FURNISH UNIT WITH SIBS FILTER RETURN KITS

CONDENSING UNIT SCHEDULE														
MARK	MATCH UNIT	OPERATING WYFLB	AMBIENT TEMP F	MIN. SEER	COMPRESSOR DATA			FAN DATA			MCA	UNIT	MOCP	BASIS OF DESIGN
					NO. FLA (EA)	VOLTRH	NO. FLA (EA)	VOLTRH	NO. FLA (EA)	VOLTRH				
CU-1	AC-1	280	85	13	1	18.6	208/1	1	1.3	208/1	12	20	TRANE	
CU-2	AC-2	280	85	13	1	27.8	208/1	1	1.3	208/1	38	80	TRANE	

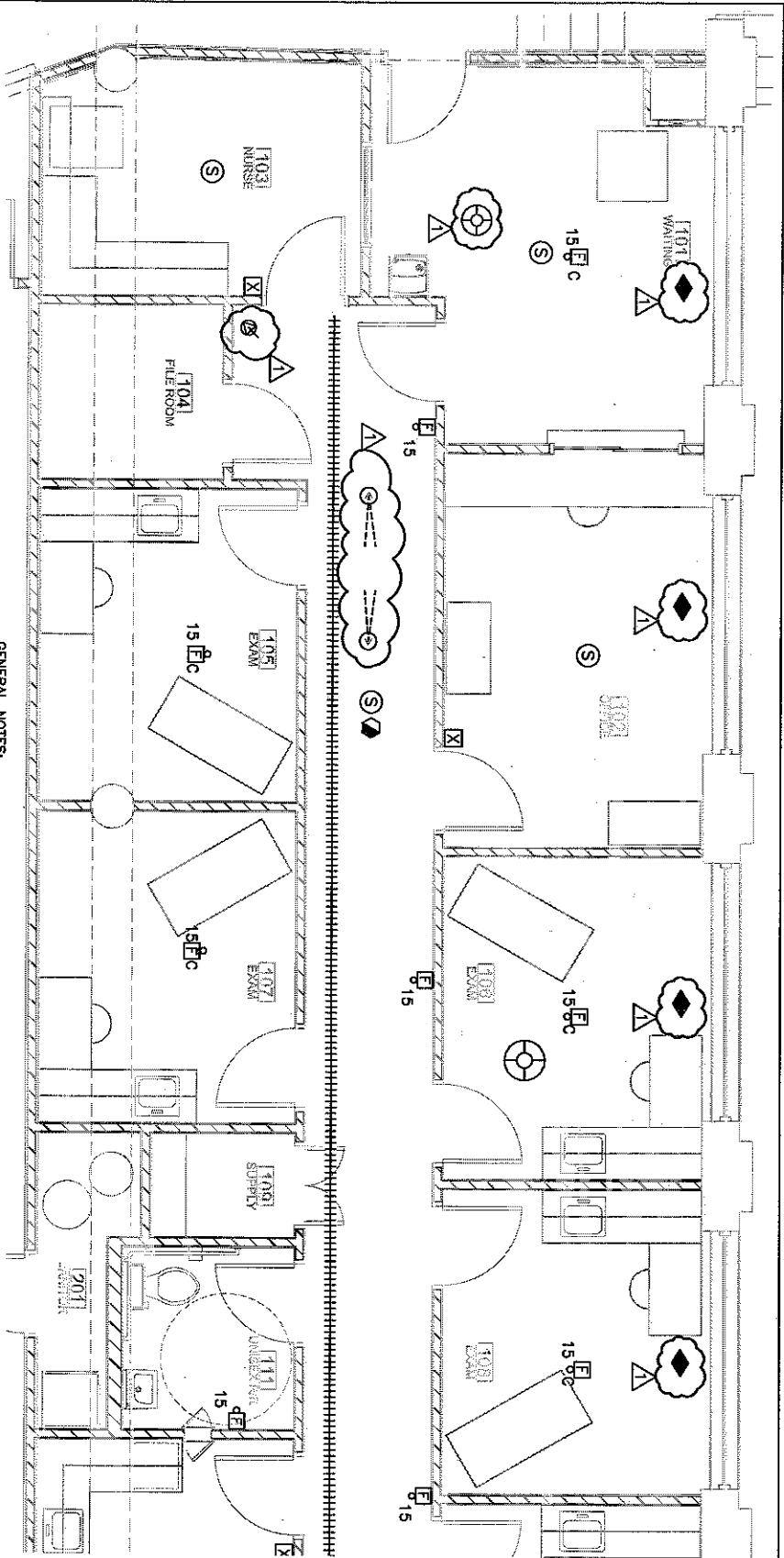
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REVISION(S):  
 Δ AD#1 6/20/12

DATE: 5/11/2012  
 PROJECT NO: 1007B  
 SHEET NO: ADM1.1

MCMAN HEALTH CLINIC RENOVATION  
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**PARTIAL FIRST FLOOR PLAN**

**SPECIAL SYSTEM**

1 SCALE: N.T.S.



**GENERAL NOTES:**

1. ALL FIRE ALARM DEVICES TO BE CONNECTED TO EXISTING BUILDING FIRE ALARM SYSTEM. MODIFICATIONS TO THE EXISTING FIRE ALARM SYSTEM SHALL BE IN ACCORDANCE WITH NFPA 101, NFPA 72, AND ADA-A6. MATCH EXISTING DEVICES IN SPACE. ALL DEVICES REQUIRED TO MODIFY SYSTEM SHALL BE LOCATED IN DATA 113.
2. INTERCOM SYSTEM SHALL FULLY INTEGRATE WITH EXISTING INTERCOM SYSTEM. EXISTING SYSTEM IS RAYLAND M07300 RAYLAND E4130.
3. CONTRACTOR TO COORDINATE NEW CABLE TRAY IN CEILING WITH ALL OTHER SYSTEMS IN CEILING, INCLUDING MECHANICAL SYSTEMS, FOR FUTURE ACCESS, SPECIFICALLY IN CORRIDOR AND DATA ROOM.

4. INTRUSION DETECTION SYSTEM SHALL FULLY INTEGRATE WITH EXISTING INTRUSION SYSTEM. EXISTING SYSTEM IS SONITROL.
5. VIDEO SURVEILLANCE SYSTEM SHALL FULLY INTEGRATE WITH EXISTING SURVEILLANCE SYSTEM. CAMERAS SHALL CONNECT VIA CAT-6A CABLES TO POE-ENABLED RACK-MOUNTED SWITCHES LOCATED IN DATA ROOM. PROVIDE FIBER AND SWITCHES AS REQUIRED TO FULLY INTEGRATE THE VIDEO SURVEILLANCE SYSTEM.

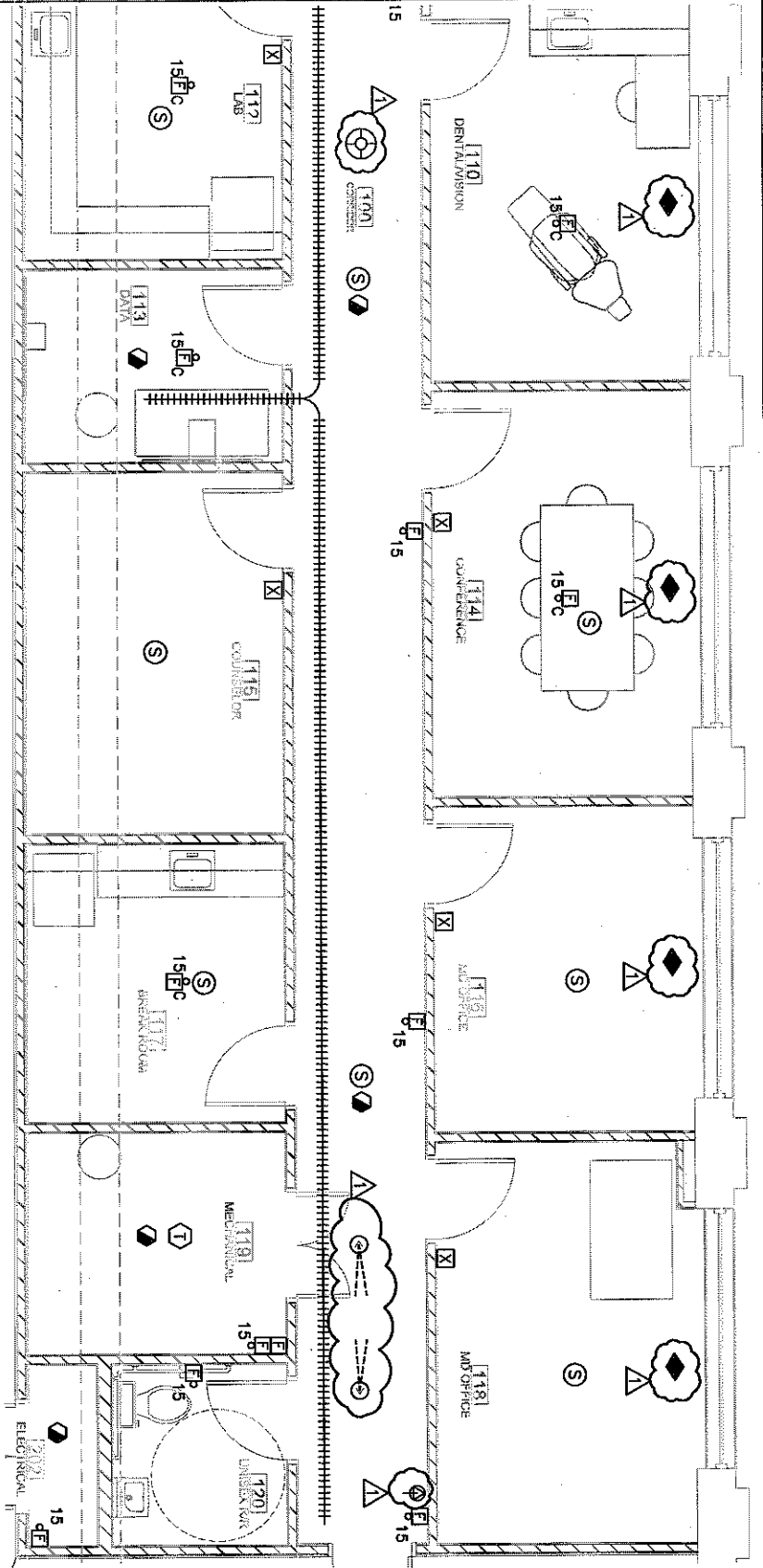
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REVISIONS:
AD#1 6/20/12
DATE: 5/11/2012
PROJECT NO. 1007B
SHEET NO. ADE1.1

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**1**  
SCALE: N.T.S.

**PARTIAL FIRST FLOOR PLAN  
SPECIAL SYSTEM**



**GENERAL NOTES:**

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2. INTERCOM SYSTEM SHALL FULLY INTEGRATE WITH EXISTING INTERCOM SYSTEM. EXISTING SYSTEM IS RAVLAND MC7300 RAVLAND TC4130.
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