ELECTRONIC SAFETY AND SECURITY

DIVISION 28

28 05 00	General Electronic Safety and Security System Requirements
28 13 27	Building Access Control System
28 31 24	Premises Intruder Alarm System

SECTION 28 05 00

GENERAL ELECTRONIC SAFETY AND SECURITY SYSTEM REQUIREMENTS

PART 1 – GENERAL

1.1 WORK INCLUDES

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1, apply to this Section.

B. Electronic Safety and Security Systems complete including demolition of existing systems to be replaced. Completely remove equipment, cabling, backboxes, conduit, supports and all other required devices and equipment.

C. Installation of system equipment per specifications.

D. Supply in a timely manner to the electrical contractor special backboxes for installation as required.

E. Coordinate wireway, raceway, power, and outlet requirements with the builder and the electrical contractor.

F. Electronic Safety and Security Systems Contractors shall provide and install prior to cable installation plastic snap in bushings at each box opening, passage through a metal stud, and at the end of all open conduit stubs or sleeves to protect the cabling from damage.

G. Furnishing of all required materials, equipment, tools, scaffolding, labor, and transportation necessary for the complete installation of the Electronic Safety and Security systems as shown on the drawings and as specified herein.

H. Cable pathways, conduit, and cable support systems shall be complete with bushings, de-burred, cleaned, and secure prior to installation of cable.

I. Installation of each system may be required to be installed in phases as renovations to the building are completed.

J. It is the intent of these specifications to provide complete installations although every item necessary may not be specifically mentioned or shown.

1.2 WORK TO BE INCLUDED BY THE ELECTRICAL CONTRACTOR IN BASE CONTRACT PROPOSAL

A. Provide utility services conduit as outlined on drawings as required.

B. All required conduit for accessibility to attic space.

C. Furnishing and installation of all required standard back boxes and conduit.

D. Installation of special back boxes supplied by Division 28 contractor(s).

E. Furnishing and installation of all floor boxes, surface raceways, and other wireways which are detailed or specified under Division 26.

F. Provide equipment-mounting boards as outlined on drawings.

G. Provide equipment grounding system, conductors, and bus bars and as outlined in Division 26.

H. Provide 120-volt power and connection to equipment provided in Division 28.

I. Coordination of requirements of Division 28 with the Builder.

1.3 WORK NOT INCLUDED

A. Contractors shall make no agreement that obligates the Owner to pay any company providing communications, monitoring, or other services. Contractors shall not make selection, purchase, or installation of interconnect instruments/equipment to be used on this project.

1.4 RELATED SECTIONS

A. The conditions of the Division 0, Division 1, Division 26 requirements, and the contract requirements that include the General Conditions and the Supplementary Conditions apply to work of this division.

B. Section 26 05 34 - Provisions For Communication, Security & Safety Systems.

1.5 CODES, STANDARDS, AND THEIR ABBREVIATIONS

A. General:
   1. Perform all work in strict accordance with the requirements and recommendations stated in the codes and standards except when requirements are exceeded by the contract documents.
   2. In addition to the requirements outlined in other sections of the specifications the following standards are imposed as applicable to the work in each instance:
      a. OSHA Safety and Health Regulations for Construction.
      b. NFPA No. 70 National Electrical Code.
      c. NESC National Electrical Safety Code, ANSI Standard C2.
      d. NEiS National Electrical Installation Standards.
      e. Local Codes and Ordinances.

B. Where local codes or practices exceed or conflict with the NEC, it shall be the Contractor's responsibility to perform the work in accordance with the local code prevailing and local interpretations thereof. Any such additional work shall be performed at no additional cost to the Owner.

C. Materials and components shall be UL listed and labeled by Underwriters Laboratories, Inc. for the intended use under the latest appropriate testing standard.

D. The Contractor shall obtain all permits required to commence work. Upon completion of the Work, the Contractor shall obtain and deliver to the Owner's Representative a Certificate of Inspection and Approval from the State Board of Fire Underwriters, the City of River Oaks, Texas, and other authorities having jurisdiction. The Contractor shall pay required permit fees.

1.6 LIST OF ASSOCIATIONS AND STANDARDS:

ADA:	Americans with Disabilities Act.
ANSI:	American National Standards Institute, 1430 Broadway; New York, NY 10018.
ASTM:	American Society for Testing and Materials, 1916 Race Street; Philadelphia, PA 19103.
BICSI:	(RCDD5 Standards), 8610 Hidden River Parkway, Tampa, FL 33637
CBM:	Certified Ballast Manufacturers Association, 2116 Keith Building; Cleveland, Ohio 44115.
IEEE:	Institute of Electrical and Electronics Engineers, 345 East 47th Street; New York, NY 10017.
ICEA:	Insulated Cable Engineers Association, P.O. Box P, South Yarmouth, MA 02664.
NEC:	National Electrical Code; NFPA No. 70.
NECA:	National Electrical Contractors Association, Inc., 7315 Wisconsin Ave.; Washington, DC 20014.
NEMA:	National Electrical Manufacturers Association, 155 East 44th Street; New York, NY 10017.
NESC:	National Electrical Safety Code, ANSI Standard C2.
NFPA:	National Fire Protection Association, 60 Batterymarch Street; Boston, MA 02110.
OSHA:	Occupational Safety and Health Administration, US Department of Labor; Washington, DC 20402.
TAS:	Texas Accessibility Standards (TAS) Article 9102.
UL:	Underwriters Laboratories, Inc., 333 Pfigsten Road; Northbrook, IL 60062.

A. Nothing in the Contract Documents shall be construed to permit work not conforming to these codes.

B. When two or more codes or standards are applicable to the same work, then the stricter code or standard shall govern.

C. The date of the code or standard is that in effect on the date of issue stated on the contract documents, except when a particular publication date is specified.

D. The Contractor shall comply with all State, Federal, NFPA, local codes and ordinances that may alter any part of the plans or specifications. The Contractor shall bear all costs for correcting any deficiencies due to non-compliance.

E. Where local codes and ordinances are not in writing or on record but local precedence have been set, the Owner shall pay for any additional resulting cost.

1.7 DEFINITIONS

A. Approval: It is understood that approval must be obtained from the Owner/Architect in writing before proceeding with the proposed work. Approval by the Owner/Architect of any changes, submitted by the Contractor, will be considered as general only to aid the Contractor in expediting their work.

B. The Builder: The primary contractor engaged to oversee the construction project. They may be technically described as a Construction Manager, General Contractor, Managing Construction Contractor, et cetera.

C. The Contractor: The Contractor engaged to execute the work included a particular section only, although he may be technically described as a Subcontractor to the Builder. If the Contractor, engaged to execute said work, employs Sub-Contractors to perform various portions of the work included under a particular Section, they shall be held responsible for the execution of this work, in full conformity with Contract Document requirements. The Contractor shall cooperate at all times and shall be responsible for the satisfactory cooperation of their Subcontractors with the other Contractors on the job so that all of the various sections and phases of work may be properly coordinated without unnecessary delays or damage.

D. The Electrical Contractor: The Electrical Contractor shall be engaged to execute the work included Division 26 only.

E. PDF file or .pdf: The filename extension associated with “Portable Document Format” files, which are multi-platform computer files in the ISO 32000-1:2008 open standard format developed and licensed by Adobe Systems. These files are a digital electronic representation of text, documents, images, and technical drawings in a font and color-accurate fixed-layout format that is platform and display resolution independent. PDF files can be electronically transmitted, viewed, or printed with various free PDF reader application programs, and may allow markups/comments with various PDF editing application programs.

F. Provide: Defined as requiring both the furnishing and installation of the item or facility indicated, complete in all respects and ready for operation unless otherwise specifically noted.

1.8 SCHEDULE OF VALUES, APPLICATION FOR PAYMENT

A. The Contractor shall in accordance with the General Provisions of the Contract, including General and Supplementary Conditions, and Division 1, complete a Schedule of Values and Applications for Payment. When a portion of this work separately funded, including donations or E-Rate, the contractor shall accommodate this in the Schedule of Values and Applications for Payment. For E-Rate eligible portions of this work, the contractor will be required to participate in the E-Rate program, comply with all E-Rate regulations, and provide billing as needed. The contractor shall coordinate with the Owner to file Form 471 or latter edition and/or other forms as may be required.

1.9 WARRANTY

A. The Contractor shall warranty their work against defective materials and workmanship for a period of one year from date of acceptance of the job.

B. Neither the final payment nor any provisions in Contract Documents shall relieve the Contractor of the responsibility for faulty materials or workmanship.

C. He shall remedy any defects due thereto and pay for any damage to other work resulting there from, which shall appear within a period of one year from date of substantial completion.

D. The Owner shall give notice of observed defects with reasonable promptness.

E. This Warranty shall not be construed to include the normal maintenance of the various components of the system covered by these specifications.

1.10 SITE VISIT

A. Before submitting a proposal, each proposed contractor shall examine all plans and specifications relating to the work, shall visit the site of the project, and become fully informed of the extent and character of the work required, including all required utilities.

B. No consideration will be granted for any alleged misunderstanding of the materials to be furnished or the amount of work to be done, it being fully understood that the tender of a proposal carries with it the agreement to all items and conditions referred to herein, or indicated on the accompanying plans or required by nature of the site of which may be fairly implied as essential to the execution and completion of any and all parts of the work.

1.11 SUBMITTALS

A. Submittal procedures shall be per Division 1 - General Requirements.

B. Provide a complete submittal for each section as specified.

C. Submit complete submittal package within 30 calendar days after award of this work for approval. Equipment is not to be ordered without approval. Partial submittals are not acceptable for review. Each submittal shall include a dated transmittal.

D. A submittal may be electronically transmitted in PDF file format (preferred) or paper copies may be provided in quantities indicated in Division 1. Paper copies shall be organized including index tabs in a 3-ring black binder of sufficient size.

E. Each Product data submittal shall include:
   1. A cover sheet with the name and location of the project, the name, address, and telephone number of the Contractor, and the name, address, and telephone number of the submitting sub-contractor. Include on or after the cover sheet sufficient space for review stamps.
   2. An indication of any deviations from Contract Document requirements, including variations and limitations. Show any revisions to equipment layout required by use of selected equipment.
   3. A product data index and complete equipment list including for each product submitted for approval the manufactures name and part number, including options and selections.
   4. Cut-sheets or catalog data illustrating the physical appearance, size, function, compatibility, standards compliance, and other relevant characteristics of each product on the equipment list. Indicate by prominent notation (an arrow, circle, or other means) on each sheet the exact product and options being submitted.
   5. Submit design data, when the scope of work requires, including calculations, schematics, risers, sequences, or other data.
   6. When the contract requires extended product warranties, submit a sample of warranty language.
   7. Any resubmittal shall include a complete revised equipment list and any product data that is revised.

F. Submit shop or coordination drawings, when specified or the required for the scope of work, which include information that will allow to the Contractor to coordinate interdisciplinary work and when necessary guide the manufacturer or fabricator in producing the product. Shop or coordination drawings shall be specifically prepared to illustrate the submitted portion of work, this may require diagrams, schedules, details, and accurate to scale equipment and device layouts prepared using a CAD or BIM engineering drawing program.

G. The Engineer's review of submittals is only for confirmation of adherence to design of project and does not relieve the Contractor of final responsibility for furnishing all materials required for a complete working system and in complying with the Contract Documents in all respects.

1.12 PROJECT RECORD DOCUMENTS

A. The Contractor shall keep a set of plans on the job, noting daily all changes made in connection with the final installation including exact dimensioned locations of all new and uncovered existing utility piping outside the building.

B. Upon submitting their request for final payment, he shall turn over to the Owner/Engineer, for subsequent transmittal to the Owner revised plans showing "as installed" work.

C. In addition to the above, the Contractor shall accumulate during the jobs progress the following data in PDF file format (preferred) or paper copies to be turned over to the Owner/Engineer for checking and subsequent delivery to the Owner:
   1. All warranties, guarantees, and manufacturer's directions on equipment and material covered by the Contract.
   2. PDF file or paper copies of all Shop Drawing prints and CAD or BIM engineering drawing program files.
   3. Any software programs, data/programming files, passwords, special interface cables, or keys that may be needed to maintain or access equipment.
   4. Set of operating instructions. Operating instructions shall also include recommended maintenance and seasonal changeover procedures.
   5. Any and all other data and/or plans required during construction.
   6. Repair parts lists of all major items and equipment including name, address, and telephone number of local supplier or agent.
   7. The first page, or pages, shall have the names, addresses, and telephone numbers of the following:
      a. Builder and all Contractors.
      b. Major Equipment Suppliers
      c. Submit communication systems warranties.

1.13 TRAINING

A. Upon completion of the work and at a time designated by the Architect, provide formal training sessions for the Owner's operating personnel to include location, operation, and maintenance of all Electronic Safety and Security systems equipment and systems.

B. See other sections for time requirements.

1.14 PLANS AND SPECIFICATIONS

A. The intent of the project drawings is to establish the types of systems and functions, but not to set forth each item essential to the functioning of the system.

B. Electrical drawings are generally diagrammatic and show approximate location and extent of work.

C. Install the work complete including minor details necessary to perform the function indicated. Provide Electronic Safety and Security systems (including all hook-ups) complete in every respect and ready to operate.

D. If clarification is needed, consult the Owner/Architect/Engineer.

E. Review pertinent drawings and adjust the work to conditions shown. Where discrepancies occur between drawings, specifications, and actual field conditions, immediately notify the Owner/Architect/Engineer for their interpretation.

F. The Owner/Architect/Engineer reserves the right to make any reasonable change in the location of any part of this work without additional cost to the Owner.

1.15 PRODUCT SUBSTITUTIONS:

A. Descriptions and details, acceptable manufacturers' names listed, and specific manufacturer and model number items indicated in the plans and specifications shall establish a standard of quality, function, and design. Manufacturers and model numbers listed "no exceptions" shall not be substituted without specific notice in an addendum. Otherwise, where a specific manufacturer's product is indicated, products of other manufacturers listed as acceptable may be submitted for approval based on the substitute product being, in the opinion of the Engineer, of equivalent or better quality than that of the product specified.

B. Proposed contractors wishing to propose systems which differ in manufacturer, features, functions, or operating characteristics from those outlined in these specifications must do so in writing to the specifying authority at least ten (10) days prior to the proposal opening.

C. For manufacturers equipment or models other than that specified, the proposed contractor shall supply proof that such substitute equipment equals or exceeds the features, functions, performance, and quality of the specified equipment. Proposals must include detailed information showing all deviations from the system as specified and include relevant technical and cost data. This shall include a complete description of the proposed substitution, drawings, catalog cuts, performance data, test data, or any other data or information necessary for evaluation.

D. The Engineer will consider all such submittals and the Owner will issue an addendum listing items that the Engineer considers acceptable. Only such items as specified or approved as acceptable will be installed on this project.

E. Substitute products for which the proposed contractor does not obtain prior approval will not be considered acceptable for this project. Final approval of the alternate system shall be based on the decision of the Owner and Architect. Prior approval to make a proposal for this project does not automatically ensure the system will be an acceptable equivalent.

F. The Contractors' proposal represents that the contract proposal price is based solely upon the materials, equipment, and labor described in the Contract Proposal Documents (including addenda, if any) and that he contemplates no substitutions or extras.

G. The manufacturer of the proposed substitute unit shall provide samples for evaluation, when required, at no charge and non-returnable.

H. Requests for substitution are understood to mean that the Contractor:
   1. Has personally investigated the proposed substitution and determined that it is equivalent or superior in all respects to that specified.
   2. Will provide the same guarantee for the substitution that he would for that specified.
   3. Will, at no cost to the Owner, replace the substitute item with the specified product if the substitute item fails to perform satisfactorily.
   4. After Award of the Contract, substitutions will be considered only under one or more of the following circumstances:
      a. The substitution is required for compliance with subsequent interpretations of code or insurance requirements.
      b. The specified product is unavailable through no fault of the Contractor.
      c. The manufacturer refuses to warranty the specified products as required.
      d. Subsequent information indicates that the specified product is unable to perform properly or to fit in the designated space.
      e. In the Engineer's sole judgment, the substitution would be in the Owner's best interest.
      f. Revisions to the electrical system caused by substitutions shall be under the supervision of the Engineer, at a standard hourly rate charged by the Engineer. Charges from the Engineer, Architect, and Electrical Contractor shall be paid by the Contractor originating the changes.

1.16 FUTURE USE CABLING

A. When cabling is installed for future use, it shall be identified with a tag of sufficient durability to withstand the environment involved.

B. Locations and Existing Conditions:
   1. Location and condition of any existing equipment or services, when shown, have been obtained from substantially reliable sources, are shown as a general guide only, without guarantees as to accuracy.
   2. The Contractor will examine the site, verify all requirements, service points, and availability of all services required to complete this project. No consideration will be granted for any alleged misunderstanding of the materials and labor to be provided as necessitated by nature of the site including those items that may be fairly implied as essential to the execution and completion of any and all parts of this project.

C. Existing Electronic Safety and Security Systems Complete Demolition for Additions and Renovation

D. As indicated by the plans and specifications the electronic safety and security contractor shall be responsible for complete demolition of the existing electronic safety and security systems, including demolition of any devices and cabling previously abandoned. Demolition shall include:
   1. Disconnection and removal of all electronic safety and security devices not to remain in service in walls, floors, and ceilings.
   2. Identification and verification of abandoned wiring and equipment. All disconnected or abandoned devices that are visible shall be removed, i.e. non-functional fire pulls, bells, speakers, signals, et cetera. Remove abandoned wiring to the source of the supply everywhere possible, the accessible portions of all inaccessible abandoned cabling shall be removed.
   3. Removal of exposed abandoned conduit and supports including brackets, stems, hangers, and other accessories located on walls and above accessible finished ceilings. Cut abandoned conduit flush with walls, floors, etc., and patch surfaces.
   4. Provide a blank cover for abandoned device backboxes that are impractical to remove from masonry construction without unnecessary damage.
   5. Confirm with Owner/Architect regarding the handling and disposal/reuse of removed material, equipment, devices, et cetera.
   6. Off-site disposal in a legal manner of all materials not requested to be turned over to the Owner. Comply with government regulations pertaining to environmental protection, and disposal of materials and equipment. Do not burn any materials on the site.
   7. Repair of any finishes or adjacent construction damaged during modification, extension, and demolition work.

1.1 EXAMINATION

A. Verify field conditions including existing systems, equipment models, configurations, circuiting arrangements, cabling, and devices. Adjust all circuiting, cabling, and materials to be provided as required by job conditions.

B. Project drawings are based on casual field observation and existing record documents when available, report any significant discrepancies to the Engineer before disturbing existing systems.

C. The Contractor accepts the existing conditions when beginning demolition.

1.2 IMPLEMENTATION

A. Verify phasing in regard to systems and coordinate before energizing any system.

B. When required during phases of construction to maintain existing systems in service in particular areas, provide temporary wiring and connections as necessary to accommodate construction.

1.3 OPERATION OF NEW EQUIPMENT PRIOR TO PROJECT COMPLETION

A. When the phasing of a project requires that electronic safety and security systems are operable in certain areas and the Owner needs to operate the equipment the contractor shall make such provisions. The warranty period shall commence on new equipment when it is operated for the beneficial use of the Owner. Regardless of whether or not the equipment has or has not been operated, the Contractor shall properly clean the equipment, properly adjust, and complete all punch list items before final acceptance by the Owner. In these cases, the date of acceptance and the start of the warranty may be different dates.

1.4 PROTECTION OF EQUIPMENT AND MATERIALS

A. The Contractor shall take such precautions as may be necessary to protect his equipment from damage.

B. This shall include the creation of all required temporary shelters to protect any equipment above the floor of the construction and the covering of equipment in the completed building with tarpaulins or other protective covering.

C. Failure to comply with the above to the satisfaction of the Owner's inspector will be sufficient cause for the rejection of the equipment in question and its complete replacement by the Contractor.

1.5 FINAL OBSERVATION

A. It shall be the duty of the Contractor to make a careful observation trip of the entire project, assuring themselves that the work on the project is ready for final acceptance before calling upon the Owner/Architect/Engineer to make a final observation.

B. To avoid delay of final acceptance of the work, the Contractor shall have all necessary bonds, warranties, receipts, affidavits, et cetera, called for in the various articles of these specifications, prepared and signed in advance, together with a letter of transmittal, listing each paper included, and shall deliver the same to the Owner/Architect/Engineer at or before the time of said final observation. The Contractor is cautioned to check over each bond, receipt, et cetera, before preparing for submission to verify that the terms check with the requirements of the specifications.

C. The following and other provision of Division 1 General Conditions will be required at time of final completion:
1. Final clean up completed.
2. All systems are fully operational, all material and devices installed.
3. As built (as installed) drawings and operations manuals.

1.6 PROHIBITED MATERIALS

A. No new asbestos, lead, or materials containing these substances shall be permitted in this project. The Contractor shall consult the Architect concerning these materials if their presence is suspected. All work in or around existing asbestos or lead materials is at the sole risk of the Contractor and their personnel.

1.7 CUTTING AND PATCHING

A. Notify the Builder sufficiently ahead of construction of any floors, walls, ceiling, roof, et cetera, of any openings that will be required for their work.

B. The Contractor shall see that all sleeves required for their work are set at proper times to avoid delay of the job.

C. All necessary cutting of walls, floors, partitions, ceilings, et cetera, as required for the proper installation of the work under this Contract shall be done at the Subcontractor or at the Subcontractor's expense in a neat and workmanlike manner, and as approved by the Owner/Architect/Engineer.

D. Patching of openings and/or alterations shall be provided by the Electronic Safety and Security Subcontractor or at the Subcontractor's expense in an approved manner.

E. No joists, beams, girders, or columns shall be cut by any Contractor without first obtaining written permission of the Owner/Architect/Engineer.

F. All openings in firewalls and floors shall be completely sealed after installation for a completely airtight installation. Sealing material shall be non-combustible and UL approved. The installed sealing assembly shall not cause the fire rating of the penetrated structure to be decreased.

G. All openings in exterior walls shall be sealed watertight.

H. Seal voids around conduits penetrating fire-rated assemblies and partitions using fire stopping materials and methods in accordance with NFPA and local codes.

1.8 MANUFACTURERS' INSTRUCTIONS

A. All equipment and devices shall be installed in accordance with the drawings and specifications, manufacturer's instructions, and applicable codes.

B. Where specifications call for installation of a product to be in accordance with manufacturer's instructions and/or where manufacturer's instructions are required for installation of a product, it shall be the contractor's responsibility to obtain the necessary applicable manufacturer's instructions and install the product in accordance with the manufacturer's instructions.

C. It shall be the Contractor's responsibility to install all equipment, materials, and devices shown on the plans and as called out in these specifications even if manufacturer's instructions are absolutely unattainable.

1.9 INSTALLATION

A. Cooperation with trades of adjacent, related or affected materials or operations, and or trades performing continuations of this work under subsequent contracts are considered a part of this work. In order to effect timely and accurate placing of work and to bring together, in the proper and correct sequence, the work of such trades, including work provided under a Division 1 allowance.

B. The Electronic Safety and Security Contractor shall coordinate installation of the Electronic Safety and Security systems with the Builder, Electrical, Mechanical, and Plumbing Contractors to ensure a complete working system for the Owner.

C. Where required for accessibility all conduit and boxes for all Electronic Safety and Security systems shall be provided by the Electrical contractor as specified, including systems in Division 28, any and all allowances shall be included. Normally low voltage wiring shall run open and supported in accessible attic space. All low voltage wiring in exposed areas such as gyms, stages, shops, and field houses shall be enclosed in conduit. Coordinate with and verify with Division 26 to provide required conduit and boxes at locations and heights as required.

D. Conduit, innerduct, track, or raceway shall conceal and protect wiring in exposed areas, within walls, through in- accessible areas, floors, chases, under slab, crawlspaces, or underground.

E. All conduit, duct, track, and raceway runs shall be spaced apart to allow for maintenance, such as the installation of couplings, without disturbing adjacent pathways.

F. All work must be performed by workers skilled in their trade. The installation must be complete whether the work is concealed or exposed.

G. Provide stainless screw/bolt hardware wherever stainless devices are used and in potentially wet areas.

H. Coordinate the actual locations of devices and outlets and equipment with building features and mechanical equipment as indicated on architectural, structural, and mechanical drawings. Review with the Owner/Architect any proposed changes in outlet or equipment location. Relocation of devices, before installation, of up to 3 feet from the position indicated, may be directed without additional cost. Remove and relocate outlets placed in an unsuitable location when so requested by the Architect.

PART 2 – PRODUCTS

A. Not Applicable

PART 3 – EXECUTION

A. Not Applicable

END OF SECTION

SECTION 28 13 27

BUILDING ACCESS CONTROL SYSTEM

PART 1 - GENERAL

1.1 SCOPE OF WORK

A. Provide an all new IP networked, credential card based, Building Access Control System that shall serve the doors as indicated on the project plans indicated for this campus and be readily expandable to serve the entire school district. Is shall be an Open Options/Mercury Access Technology, Addison, Texas - DNA Fusion enterprise class Building Access Control System software and utilizing various door controller model numbers, functions, and features described in this specification section and as indicated on plans, no exceptions.

B. Remove all existing access control system from the building.

C. Provide all required licenses and software to integrate the district's existing Video Insight Video Surveillance System.

D. Provide Premises Intruder Alarm System integration. See Section 28 16 24 - Premises Intruder Alarm System.

E. Install and test owner provided Surveillance CCTV IP Cameras as shown on plans.

F. NOTE: All electric door locks shall be configured for fail-safe un-delayed egress operation and fail-secure to prevent unauthorized entry on loss of power.

1.2 WORK INCLUDES

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1, apply to this Section.

B. Demolition of the existing access control system in its entirety including all controllers, power supplies, readers and cable.

C. Provide all equipment, materials, labor, software, licensing, supervision, and services necessary for or incidental to the installation of a card reader operated door access control system, as shown, or indicated on the drawings and as specified.

D. This access control system shall provide for controlled entry doors to be released when a valid credential card is presented to the credential card reader located adjacent to the door. This system shall monitor for unauthorized entry attempts, control access to the building, and log entry information. The system shall in no way impede free emergency exit from the building. Exit from the building shall not require special effort or knowledge.

E. In shall be the responsibility of this Contractor to obtain all required approvals and certifications from authorities having jurisdiction.

F. It shall be the responsibility of the Electrical Contractor to provide and install all conduit systems, standard electrical boxes, and operating power for the building access systems as outlined on the project drawings. This Contractor shall coordinate all system requirements with and provide special back boxes to the Electrical Contractor prior to installation of conduit.

G. The electrical contractor shall provide 120-volt power as required to the security system through separate dedicated branch circuits, maximum 20 amperes each. Each such circuit shall be labeled at the power distribution panel as ACCESS CONTROL. The location of all circuit breakers serving the system shall be posted in the control unit cabinets. Each cabinet shall be grounded securely to the building grounding system.

H. Provide all testing, documentation, training, and warranty service as outlined in these specifications.

1.3 RELATED SECTIONS

A. Section 26 05 34 - Provisions For Communication, Security & Safety Systems.

B. Section 27 10 30 - Data and Telephone Cable Plant.

C. Section 28 05 00 - General Electronic Safety and Security System Requirements.

D. Section 28 31 24 - Premises Intruder Alarm System

1.4 CODES AND REGULATIONS

A. Perform all work in strict accordance with the requirements and recommendations stated in the codes and standards except when requirements are exceeded by the contract documents.

B. The equipment, materials, and installation shall confirm to the latest version of all applicable codes, standards and regulations of authorities having jurisdiction including the following:
1. NFPA 70, National Electrical Code.
2. NFPA 72, National Fire Alarm and Signaling Code.
3. Americans with Disabilities Act.
4. Texas Accessibility Standards.
5. International Building Codes (IBC).
6. Local and State Building Codes.
7. All requirements of the local Authority Having Jurisdiction (AHJ).

1.5 SUBMITTALS

A. Submittal procedures: See Section 28 05 00.

B. Submit a complete submittal package within 30 calendar days after award of this work for approval. Equipment is not to be ordered without approval. Partial submittals are not acceptable for review. Each submittal shall include a dated transmittal.

C. Submittal may be electronically transmitted in PDF file format (preferred) or paper copies may be provided in quantities indicated in Division 1. Paper copies shall be organized including index tabs in a 3-ring black binder of sufficient size.

D. Quality Assurance Submittal:
1. Letter from manufacturer stating that this contractor is an Authorized Factory Distributor for the area where the project is located.
2. This contractor and Manufacturer shall supply sufficient information to indicate that the proposed system is based on the latest hardware, software technology available.
3. Current copy of this contractors Electronic Access Control Device Security Company license issued by the Texas Department of Public Safety Private Security Board.
4. Calculations for device circuit current drop and battery backup calculations.

E. Product Data Submittal including special boxes, cable, and other material as requested by the Owner/Architect including:
1. A cover sheet with the name and location of the project, the name, address, and telephone number of this contractor, and the name, address, and telephone number of the submitting sub-contractor. Include on or after the cover sheet sufficient space for review stamps.
2. An indication of any deviations from Contract Document requirements, including variations and limitations. Show any revisions to equipment layout required by use of selected equipment.
3. A product data index and complete equipment list including for each product submitted for approval the manufactures name and part number, including options and selections.
4. Cut-sheets or catalog data illustrating the physical appearance, size, function, compatibility, standards compliance, and other relevant characteristics of each product on the equipment list. Indicate by prominent notation (an arrow, circle, or other means) on each sheet the exact product and options being submitted.

5. Submit design data, when the scope of work requires, including calculations, schematics, risers, sequences, or other data.
6. Any resubmittal shall include a complete revised equipment list and any product data that is revised.

F. Submit shop drawings locating all components of the system, indicating circuit routing, cable type, and gauge. Shop or coordination drawings shall include information that will allow to this contractor to coordinate interdisciplinary work and when necessary guide the manufacturer or fabricator in producing the product. Shop or coordination drawings shall be specifically prepared to illustrate the submitted portion of work, this may require diagrams, schedules, details, and accurate to scale equipment and device layouts prepared using a CAD or BIM engineering drawing program.

1.6 QUALIFICATIONS OF A PROPOSED CONTRACTOR

A. Proposed contractors who do not currently possess the necessary qualifications, trained and experienced personnel, financial capacity, and meet the other requirements herein described will be disqualified.

B. this contractor shall be currently licensed under the Texas Department of Public Safety Private Security Board as an Electronic Access Control Service Installer Company to sell, install, and service private security systems.

C. The proposed contractor, as a business entity, shall be an authorized distributor and designated representative of the security panel manufacturer, with full warranty privileges, and shall have been actively engaged in the business of selling, installing, and servicing commercial building alarm systems for a period of at least 5 years.

D. Recently formed companies are acceptable only if specific pre-approval is requested, and granted by the Owner/Engineer, based on experience of key personnel, current and completed projects, and all licensing requirements are met 10 working days prior to the contract proposal date.

E. All employees working on the project must be registered alarm system installers. this contractor shall employ factory trained technicians capable of supporting the maintenance of the system. No contract employees are allowed unless they have been to the factory service school within the last 18 months. A certificate of this training shall be provided with this contractor’s submittal.

F. this contractor shall employ full time local technicians and installers. The manufacturer shall maintain a full-time factory employed service staff for product support and service.

G. The proposed Contractor shall have an office within 150-miles of the job site, staffed with trained technicians who are qualified and licensed to supervise the installation, to be responsible that the system is installed as submitted, to conduct system start up and perform a 100 percent operational audit of all installed devices, to instruct the Owners representatives in the proper operation of the system, and to provide service throughout the warranty period. this contractor shall be capable of dispatching technicians to repair a system within six hours of a service request.

H. The proposed contractor shall be fully experienced in the design and installation of the type of security system herein specified and shall furnish with the contract proposal an itemized list of the installations of the type specified herein. The list shall include the name of the project, date of completion, the amount of the contract, the name, and telephone number of a qualified person to contact for reference. This list must contain at least two (2) projects within a 150-mile radius of the school district to allow school administration officials to visit the job site for review of the system installation and service. Each reference project listed must utilize equipment by the same manufacturer as the proposed system.

I. This contractor shall employ factory-trained technicians capable of supporting the maintenance of the system. No contract employees are allowed unless they have been to the factory service school within the last 18 months. A certificate of this training shall be provided with this contractors’ submittal.

J. The Proposed Contractor shall not have any grievances or complaints of record regarding workmanship, code compliance, or service response. A Proposed Contractor that has any prior finding(s) of a code or license violation or has any litigation in process concerning the installation of a communication system is unacceptable.

K. The ability of a proposed Contractor to obtain plans and provide a performance bond shall not be regarded as the sole qualification of this contractors' competency and responsibility to meet the requirements and obligations of the contract.

L. The Builder shall be satisfied that a proposed Contractor meets all the requirements expressed herein before including this contractor's proposal in the project.

M. The Owner may investigate, as they deem necessary to determine the ability of the proposed Contractor to perform the work. The proposed Contractor shall furnish to the Owner with any information or data requested for this purpose.

N. The Owner reserves the right to reject any contract proposal if the evidence submitted, or their investigation, fails to indicate that this contractor is qualified to fulfill of any part of the contract or to complete the work contemplated therein.

O. The Owner reserves the right to reject the proposal of any Contractor who has previously failed to perform properly, or complete on time, contracts of a similar nature.

PART 2 – PRODUCTS

2.1 GENERAL

A. This contractor shall provide complete and satisfactorily operating Access Control System as described herein, using materials and equipment of types, sizes, ratings, and performances as indicated. Use materials and equipment that comply with referenced standards and manufacturers' standard design and construction, in accordance with published product information. Coordinate the features of all materials and equipment so they form a functional system, with components and interconnections matched for optimum performance of specified functions.

B. The system and all components shall be tested and found suitable for the specified purpose as part of a commercial building security system by a nationally recognized approvals agency acceptable to the AHJ.

C. The control units, power supplies, batteries, subassemblies, software, firmware, and all cable, devices control units, power supplies, batteries, subassemblies, software, firmware, cable, and all accessories provided shall be listed and labeled by Underwriters Laboratories, Inc. for commercial security system use under the latest appropriate testing standard.

D. All date keeping hardware, firmware, and software provided shall be fully compliant with the calendar year designated in four-digit date format. Any time equations must function normally, leap year, and daylight savings time must be supported.

E. Only equipment devices have been shown on the contract drawings. Specific wiring between equipment has not been shown.

F. The system shall include but not be limited to all control units, power supplies, batteries, subassemblies, card sensors, software, firmware, and all cable, door release equipment, and all accessories required to provide a complete operating system.

G. All equipment and components shall be installed in strict compliance with manufacturers' recommendations and the requirements of the components UL listing. Consult the manufacturer's installation manuals for all wiring diagrams, schematics, electrical requirements, cable types, and physical equipment sizes, etc., before beginning system installation. Refer to the manufacturers' riser / connection diagrams for all specific system installation/termination/wiring data.

H. All equipment and components shall be new, and the manufacturer's current model. All like devices shall be of the same manufacturer and model number.

I. All equipment shall be attached to walls and ceiling/floor assemblies and shall be held firmly in place (e.g., detectors shall not be supported solely by suspended ceilings). Fasteners and supports shall be adequate to support the required load.

2.2 ACCEPTABLE BUILDING ACCESS CONTROL SYSTEM MANUFACTURER

A. Descriptions and details, acceptable manufacturers' names listed, specific manufacturers' model numbers indicated in the project plans and specifications, and other pertinent information herein are intended to establish minimum standards of quality, compatibility, functions, features, and performance of the equipment to be furnished. Manufacturers and model numbers listed "no exceptions" shall not be substituted without specific notice in an addendum. Otherwise, where a specific manufacturer's product is indicated, products of other manufacturers listed as acceptable may be submitted for approval based on the substitute product being, in the opinion of the Engineer, of equivalent or better quality than that of the product specified.

B. Proposed contractors wishing to propose any product substitution must do so in writing to the specifying authority at least ten (10) days prior to the proposal opening.

C. For manufacturers equipment or models other than that specified, the proposed contractor shall supply proof that such substitute equipment equals or exceeds the features, functions, performance, and quality of the specified equipment. Proposals must include detailed information showing all deviations from the system as specified.

D. Substitute products for which the proposed contractor does not obtain prior approval will not be considered acceptable for this project. Final approval of alternate products shall be based on the decision of the Owner and Architect. Prior approval to make a proposal for this project does not automatically ensure products will be an acceptable equivalent.

E. It is the responsibility of this contractor to provide all features and functions as outlined in these specifications. The functions and features specified are vital to the operation of this stadium complex; therefore, inclusion in the list of acceptable manufacturers does not release this contractor from strict compliance with the requirements of this specification.

F. The system manufacturers model numbers, functions, and features described in this specification section are those of **Open Options/Mercury Access Technology**, Addison, Texas - DNA Fusion Enterprise software utilizing various door controller model numbers, functions, and features described in this specification section. This shall constitute the quality and performance of the equipment to be furnished, **no exceptions**; any other proposed manufactures devices or software must be pre-approved.

2.3 BUILDING ACCESS CONTROL SYSTEM INSTALLATION REQUIREMENTS

A. Contractors shall provide all material, labor, tools, and equipment required to perform the work described and make complete, safe, and functional systems.

B. Contractors shall pay for and acquire all permits and inspections required by controlling authority.

C. All work shall be installed in accordance with state, local, and national codes.

D. Contractors shall warrant their workmanship and materials for a period of one year from the date of acceptance upon completion of the project.

E. All work shall be done by mechanics skilled in the particular trade involved, under responsible supervision.

F. No surface mounted raceway or conduit will be accepted on any new construction job.

G. Seal all wall and floor penetrations with approved sealant.

H. Access control system cabling can share conduit with intrusion alarm system cabling.

I. All cabling must be suspended up off the ceiling grid.

J. Contractor must provide the Owner with all security equipment MAC addresses and network drop information.

K. The access control contractor shall provide and install all required parts and local cabling to get the system online and operational; this includes power supplies required to operate the electrified exit devices.

L. Where 110 Volt electrical receptacles as needed to accommodate system transformers, they shall be provided by the electrical contractor at exact locations coordinated with the access control contractor.

M. Where 110 Volt electrical receptacles as needed to accommodate door release hardware/ electrified exit devices, they shall be provided by the electrical contractor in an accessible location at 12” above the finished ceiling and within 20 feet of door location.

N. Data drops shall be provided by the cabling contractor for security equipment. See Section 27 10 30 - Data-Telephone Cable Plant.

O. Exterior card reader locations shall be prepared including a recessed single-gang weatherproof metal back box located approximately 44’’ centered from the ground and 12’’ off the opened door edge to the side, with a ½” secured rigid or flex conduit with pull string to an accessible interior location concealed above the finished ceiling.

P. Controlled door frames shall be prepared as detailed on the plans including a ½” secured rigid or flex conduit with pull string to an accessible interior location concealed above the finished ceiling.

Q. Continuous hinges with built in power transfers (concealed ribbon wire) are not acceptable.

R. Mag-locks are not acceptable.

2.4 RELATED WORK - NETWORK CONNECTIVITY

A. The system shall be utilizing the customer’s Ethernet system backbone for all security devices communications.

B. No Ethernet cabling, network RJ-45 jacks, or patch cords are included in the scope of this Specification Section.

C. The Owner will provide this Contractor with a terminated network drop at security devices, and the required TCP/IP configuration settings: static IP address, domain, gateway, and subnet mask.

D. This contractor will program and test all access control system devices for connection to the network.

E. This contractor will provide complete programming of all device parameters in accordance with the Owners requirements.

2.5 PREMISES INTRUDER ALARM SYSTEM INTEGRATION

A. When a valid credential is read requesting access into an ARMED zone of the Premises Intruder Alarm System, access shall be DENIED unless all of the following conditions are met:
   1. The controlled entry is located at a Premises Intruder Alarm System keypad.
   2. The credential holder is in an access group authorized for armed Premises Intruder Alarm System zone access.
   3. The time and day match the group schedule are for armed Premises Intruder Alarm System zone access.

B. When the Premises Intruder Alarm System zone is armed, the door contacts or motion sensors shall initiate an alarm condition, activate the local siren, log the event, and transmit the alarm to the security system monitoring service. The monitoring service will then alert security personnel or the police to evaluate the situation.

2.6 BUILDING ACCESS CONTROL SYSTEM SOFTWARE

A. The access management solution shall feature a browser (web) thin client, in addition to traditional “fat client” and Terminal Services-based thin client, for easy installation and updating on multiple workstations with multiple monitor support. It shall also include a Mobile Client that allows users to manage their access control system from any mobile device.

B. Cardholder entry and edit shall be accomplished via the Cardholder Entry Screen, which allows users and administrators to set up name, card and PIN numbers, card status (active, inactive, or date-based), and to select access levels for the employee or cardholder. User-defined fields can be used for supplemental information such as department, employee type (hourly, salaried, union, etc.), social security number, license plate number, and many others. Access to user fields shall be determined by the operator’s security clearance.

C. The system shall feature over 75 standard reports including card access events, cardholder and card listings, evacuation reports, and cardholder time and attendance.

D. The integrated graphical timezone display screen shall allow users to identify when a timezone is active (green in the graphical display), indicating that authorized cardholders have access to an area during the active period. It simplifies verification that timezones are set up properly for workdays, holidays, etc.

E. The Interactive Map feature shall give operators full functional control of the entire system through the use of dynamic device and alarm icons displayed on graphic map screens. Dynamic color graphics feature fully scalable alarm presentation with automatic zoom. Alarms can be acknowledged and cleared at the map level with the same functionality as at the device or alarm level. Maps have full drill-down capabilities to allow precise location of alarms, as well as full camera control.

2.7 BUILDING ACCESS CONTROL SYSTEM HOST COMMUNICATION/DATABASE SERVERS

A. The system shall be an Open Options/Mercury DNA Fusion enterprise suite software installation utilizing Distributed Network Architecture.

B. The software shall be installed on an Owner provided server that shall support the credential user database, door control, and management software via the district wide area network.

2.8 SMART CREDENTIAL CARDS

A. The District shall utilize their existing smart credential cards for the new card access system.

2.9 SMART CREDENTIAL CARD READERS

A. Controlled access door locations as indicated on plans shall be provided with an entry card reader to allow access to authorized individuals as scheduled. Readers shall a weatherproof design capable of operation in indoor or outdoor environments with a temperature range of 0 to 140° F and a relative humidity range of 10 to 100%.

B. Each Smart credential card reader shall mount on a standard single-gang electrical wall box, mullion, or on the surface of an interior or exterior wall and feature a read range of 6 to 9 inches. The electronics shall be potted with UL Listed potting compound to protect the reader from harsh environmental conditions.

C. Outdoor weatherproof back boxes shall be flush mounted and connected to a ½” threaded rigid pipe conduit and sealed. The reader casing shall be grounded to prevent electrostatic discharge from interfering with the operation of the reader.

D. Threaded conduit is required for outdoor applications and dielectric grease shall be used to coat field connections.

E. Provide low profile Smart credential card readers, gray in color, designed for narrow mullion mount or standard wall mount as required, match to existing mounting where applicable. Narrow mullion mount size 1.9" x 4.1" x 0.9". Standard size readers shall mount on a standard single-gang weatherproof electrical wall box or with a glass mount kit. Standard size 3.3" x 4.8" x 1.1".

F. Provide HID 13.56 MHz iCLASS multiCLASS SE models for support of the district issued HID iCLASS Seos 500X Smart Cards with dynamic support of multiple credential technologies including iCLASS Seos, iCLASS SE, standard iCLASS, MIFARE, MIFARE DESFire, Prox, and more for enrolment of allied agency card formats.

G. Provide mobile-ready readers come fully prepared to read Mobile IDs including customer/site-specific personalization, using Bluetooth and Seos.

H. For door control provide iCLASS multiCLASS SE RP15 Contactless Smartcard Reader (mullion mount) or iCLASS multiCLASS SE RP40 Contactless Smartcard Reader Wall Switch (standard single gang mount) Smart credential card readers with Wiegand format interface as required or equivalent.

2.10 DOOR CONTROLLER MODULES

A. The following Mercury Security Corporation open platform controllers shall be configured to automatically receive policy and schedule updates for all identities and hardware configurations as distributed by the Open Options software platform. The controllers shall ensure security is enforced at the controlled doors - even when upstream network communications are temporally interrupted.

B. All system programming shall be maintained in non-volatile memory such that program information is maintained even if all external AC and battery power is removed.

C. Provide as required Power-over-Ethernet and/or RS-485 serial interface controllers and door modules that include a door/reader interface module all in one unit and support standard reader technologies, including Wiegand, clock and data, magnetic stripe, keypads, LCD and biometrics.

D. Each module shall be housed in a wall enclosure and connected, internally or adjacently, to a 12 VDC battery backed up power supply.

E. Intelligent door controllers (Network Controllers) – EP series control modules shall include an Ethernet port for communication with the Physical Access Control System Enterprise Appliance (EPACS) server network and an RS-485 serial output interface for communication with a group of door reader interface sub-modules, wireless lock integration for ASSA ABLOY Aperio wireless hub, door, and cabinet devices, and also a group of model MR51E door reader interface sub-modules may communicate with an assigned EP control module directly through the Ethernet network, provide as follows:
   1. One Door PoE Capable Controller, expandable to host a total of Seventeen doors, with data network Ethernet communications port, requires 12 VDC input or may be PoE IEEE 802.3af powered - 150mA maximum. RS-485 serial output control port for MR series interface modules and includes two onboard reader ports (for a single opening), two tamper inputs, and two outputs. Shall be Open Options/Mercury Security model EP1501.
   2. Two Door Controller, expandable to host a total of Sixty-Four doors, with data network Ethernet communications port, requires 12 VDC input - 500mA maximum. RS-485 serial output control port for MR series interface modules and includes two onboard reader ports, eight tamper and power monitor inputs, and four outputs. Shall be Open Options/Mercury Security model EP1502.
   3. Controller to host up to Sixty-Four doors, with data network Ethernet communications port, requires 12 VDC input - 300mA maximum. RS-485 serial output control port for MR series interface modules, but does not include any onboard reader ports, inputs, or outputs. Shall be Open Options/Mercury Security model EP2500 intelligent controller.

F. Door reader interface sub-modules (Interface Modules) - MR series interface modules shall include card reader ports, input monitor points, and control relay outputs. The following door controllers shall be auto-addressable, directly managed by an assigned Mercury Security EP series intelligent host controller, and shall be capable of elaborate processes and procedures without host intervention, provide as follows:
   1. One Door Ethernet interface controller, requires 12 VDC input or may be PoE IEEE 802.3af capable - 300mA maximum, includes two onboard reader ports (for a single opening), four inputs, and two outputs. Shall be Open Options/ Mercury Security model MR51E.

2. One Door RS-485 serial interface controller, requires 12 VDC input - 150mA maximum, includes one onboard reader port, two inputs, and two outputs. Shall be Open Options/Mercury Security model MR50.
3. Two Door RS-485 serial interface controller, requires 12 VDC input - 450mA maximum, includes two onboard reader ports, eight inputs, and six outputs. Shall be Open Options/ Mercury Security model MR52.

G. Input Modules:
1. Open Options/Mercury Security model MR16IN EP series RS-485 serial interface multi-device panel providing the ability to monitor high concentrations of system auxiliary inputs. Each shall be capable of supporting 16 general purpose input circuits which can be individually set for normally-open or normally-closed operations and can be declared supervised and non-supervised. Individually configurable parameters can be set for sensitivity ranges, timing parameters, and end-of-line resistance values.

H. Output Modules:
1. Open Options/Mercury Security model MR16OUT EP series RS-485 serial interface multi-device panel providing the ability to control high concentrations of system auxiliary outputs. Each shall provide 16 general purpose outputs as Form C relay contacts, each with individually configurable parameters, which may be set for timing and for fail-safe vs. fail secure modes. Each relay output can be configured to control outboard devices and can be activated by the condition of selected system devices locally or regionally without host intervention.

2.11 MODULE ENCLOSURES AND POWER SUPPLY/BATTERY BACKUPS

A. Provide as required to house all modules, enclosures that shall be 19 gauge high grade steel with textured black finish enclosures for indoor use, suitable for surface wall mounting, and shall include battery backup power supplies where required. Each enclosure shall include a removable back plate for module mounting, a keyed lock, and tamper switch. Access power enclosures shall include a single AC power connection (for power supply), a pre-wired LSP power section. Each tamper switch shall be wired to a module input circuit for monitoring by the System.

B. Provide UL 294 listed power limited source, filtered and electronically regulated 12 VDC output power supplies with short circuit/thermal overload protection, and automatic switch over to stand-by battery backup when AC fails. Each power supply shall include a built-in charger and sealed type battery.

C. Power supply/chargers and batteries shall operating and emergency power to the system. Provide sufficient battery capacity for operation without AC power for all control modules, card readers, and electric unlocking/locking devices for a minimum of 4-hours (design calculations required). Include a 20% safety factor in battery calculations to ensure adequate performance for the service life of batteries.

D. Enclosures and power supplies shall be LifeSafety Power Inc., FlexPower, MCLASS Mercury series, or equivalent, models as follows:

E. E Series Access Module Enclosures:
1. E5, 2-board cabinet 8.5”x11”x3.0”
2. E1, 4-small board cabinet, not for larger EP2500 or EP150x modules 12”x14”x4.5”
3. E2, 4-board cabinet 16”x20”x4.5”
4. E4, 8-board cabinet 20”x24”x4.5”

F. EM Series Access Power Enclosures:
1. E5M, 2-board cabinet (1 board with a 75 watt power supply) 8.5”x11”x3.0”
2. E1M, 4-small board cabinet, not for larger EP2500 or EP150x modules (3 boards with a 75 watt power supply) 12”x14”x4.5”
3. E2M, 4-board cabinet (3 boards with a 75 watt power supply) 16”x20”x4.5”
4. E4M2, 8-board cabinet (2 large boards and 12 small boards with a 150 watt power supply) 20”x24”x4.5”
5. E4M, 8-board cabinet (7 boards with a 150 watt power supply) 20”x24”x4.5”
6. E4M1, Capacity of E4M plus mounting provisions for 6 boards on the inside of the door 20”x24”x4.5”
7. E8M, 9-board cabinet (6 boards with two 150 watt power supplies) 36”x30”x4.5”

G. Power Supply/Battery Chargers:
   1. FPO75, 75 watt with 2 main 12VDC outputs
   2. FPO75-D8PE, 75 watt with 8 Class II 12VDC outputs (expandable)
   3. FPO150-D8PE, 150 watt with 8 Class II 12VDC outputs (expandable)
   4. FPO150-2DD8PE, 150 watt with 16 Class II 12VDC outputs (expandable)

H. Power Supply Expansion Modules, multiple modules can be daisy chained from an expandable FPO series power supply to provide additional outputs:
   1. D8P, Simple distribution power module with 8 Class II (Power Limited) 12VDC outputs (2.5A each output).

I. Power Controller Modules (Lock Controller Modules), multiple modules can be daisy chained from an expandable FPO series power supply to provide additional outputs that are relay controlled by the System with fault detection and reporting to host power supply. Each input may be programmed to respond to: normally open dry contact transition, normally closed dry contact transition, application of voltage between 9 and 33VDC, or removal of voltage between 9 and 33VDC. Each output circuit output may be programmed for the following modes: voltage output from power supply one, voltage output from power supply two, fail-safe, fail-secure, normally open dry contact, normally closed dry contact, or fire alarm over ride for egress lock:
   1. C4P, Power Controller Module with 4 inputs/4 Class II (Power Limited) 12VDC controlled outputs (2.5A each output).
   2. C8P, Power Controller Module with 8 inputs/8 Class II (Power Limited) 12VDC controlled outputs (2.5A each output).

J. Batteries: Provide an up to 12Ah size sealed maintenance free battery per power supply/charger sized as required.

2.12 DOOR SWITCHES (ACCESS SYSTEM DOOR CONTACTS)

A. Provide door switches for each controlled door panel and as indicated on floor plans with conduit run to a nearby, accessible, junction box located concealed above finished ceiling:
   1. Assa Abloy DPS-M GY Concealed Door Position Switch for Metal doors.
   2. Assa Abloy DPS-W-GY Concealed Door Position Switch for Wood Doors.

B. Overhead doors, roof hatches, and controlled exterior pedestrian gates; provide industrial wide gap surface mount magnetic contacts, Interlogix 2507AD-L aluminum housing armored cable contact, wide gap, 1.5" gap size, DPDT or as required. Size: Switch and magnet halves are each 3” long x 1” high x 0.5” deep.

2.13 DOOR RELEASE HARDWARE INTERFACE

A. Install all wiring and control devices necessary to enable limited access to the indicated points of entry. Each controlled access door shall be fitted with a door switch (above), control relay, and an electric latch or strike. Each controlled door shall be setup to allow entry as permitted by the building access system, to prevent unauthorized entry, and to allow free exit from the building without special knowledge or effort. Magnetic force holding or ‘mag’ locks are prohibited by this specification.

B. NOTE: All electric door locks shall be configured for fail-safe un-delayed free egress operation and fail-secure to prevent unauthorized entry on loss of power.

C. Verify exact hardware requirements with Division 08 and Door Hardware Schedules including door and frame preparation details.

D. Only when the door hardware does not include integrated Request-to-Exit indication contacts, provide a request-to-exit sensor when required (see below).

2.14 REQUEST-TO-EXIT SWITCH OR SENSOR

A. The system shall not be programmed to unlock a door automatically from a request to exit signal, as this presents a security breach. The request to exit signal shall be used only to indicate a normal exit status, as opposed to a forced entry from the outside. Exit shall be made with the normal door hardware and shall not be impeded or assisted by the electronic system. Exit shall not be affected if the power is off and the battery backup exhausted.

B. When no request-to-exit switch is provided integrated into the door hardware (see above), provide at the exit side of each controlled door a request-to-exit passive infrared detector with x-y targeting and digital signal processing.

C. Request-to-Exit Switch Manufacturer / Model: Von Duprin RX option request-to-exit switch or equivalent.

D. Request-to-Exit Sensor Manufacturer / Model: Provide Assa Abloy XMS passive infrared (PIR) motion sensor request to exit detectors or equivalent.

2.15 VISITOR ENTRY DOOR CONTROL BUTTON DESKTOP CONSOLE

A. Provide where shown on the drawings a Visitor Entry Control Desktop Console with two buttons to control two single entry doors. One door is at the secondary set of entry doors at vestibule C100 into corridor C101 and one door is at the receptionist area C107 into interior corridor C101. The console shall to be located on the reception desk. The controlled doors shall be locked from the outside and a door release button shall control the door electric retractable strike, to allow visitors to be “buzzed-in” from the reception area.

B. The controlled entry door to be operated by the door release button shall in no way impede free emergency exit from the building. Exit from the building shall not require special effort or knowledge.

C. NOTE: All exit door electric locks shall be configured for fail-safe un-delayed egress operation and fail-secure to prevent unauthorized entry on loss of power.

D. Provide at the reception desk, one (1) SDC model DTMO-2 mini desktop console with two momentary switches with LED indicators.

E. The building access control system controls these doors in a parallel manner. Connect a pushbutton to an input on the door controller module and program the software to, upon pressing the pushbutton momentarily, unlock the door for a set period of time. This operation shall allow the opening of the doors from the secure side without a valid card read. All electric door release hardware shall be supplied by the door hardware supplier as specified under Division 08.

F. Console Cord: Provide Southwire V40168 or equivalent, control cable 4-conductor 18AWG unshielded, with ground, flexible copolymer jacket. Ground all equipment properly per the NEC.

2.16 SURVEILLANCE CCTV IP CAMERAS

A. Surveillance CCTV IP Cameras shall be owner provided and installed by the selected access control contractor at the locations shown on plans and as required. Contractor shall coordinate all locations with the owner prior to installation. Contractor shall aim and test the owner provided cameras.

2.17 CABLING

A. All wiring shall be NEC type CM low voltage cable.

B. All exterior cabling shall be in threaded rigid metallic conduit. All connectors must be fastened, tied, and crimped for maximum reliability.

C. Avoid if at all possible junctions or splicing - all junctions in cable shall be made by proper splicing techniques in a junction box.

D. All cabling is to be concealed where construction permits.

E. This contractor shall provide and install new and unused ASTM bare stranded copper conductor wire per ANSI/NEMA codes. Follow the manufacturer's instructions. All wire shall be as recommended by the manufacturer for the application.

F. All cable shall have a machine printed label located within 2” from every terminal block and within 6” from all other connections utilizing self-laminating flexible vinyl film labels.

G. Minimum wire gauge shall be selected based on cable length and current requirements.

H. Wire gauge shall be selected per circuit based on cable length and current requirements.

LOW VOLTAGE CABLE TYPES

Device	Conductors	Min. AWG	Description
RS-485 Serial Interface*	1-Pair Twisted	24	Overall Shield
Entry Intercom	4-Pair UTP	23	Category 6
Point Contact/Relay	1-Pair Twisted	22	Overall Shield
Two Point Contact/Relay	2-Pair Twisted	22	Overall Shield
Three Point Contact/Relay	3-Pair Twisted	22	Overall Shield
Four Point Contact/Relay	4-Pair Twisted	22	Overall Shield
Five Point Contact/Relay	5-Pair Twisted	22	Overall Shield
Six Point Contact/Relay	6-Pair Twisted	22	Overall Shield
Credential Reader (RS-485)	1-Pair Twisted	24	Overall Shield
Credential Reader (TTL)	6-Wire	18	Overall Shield
Composite	Multi-Conductor	22	Overall Shield
Low Voltage Power Combined	2-Pair Twisted	18	Unshielded
Low Voltage Power or Siren	1-Pair Twisted	18	Unshielded
Low Voltage Power	1-Pair Twisted	16	Unshielded
Low Voltage Power	1-Pair Twisted	14	Unshielded
Low Voltage Power	1-Pair Twisted	12	Unshielded

* Belden 9841 or equivalent up to 4,000’ per RS-485 serial circuit.

2.18 CABLE TIES

A. Nylon cable ties shall be furnished and installed to attach wire bundles to supports and for appropriate wire management as required.
1. Nylon wire tie, 3.9”, miniature - Panduit PLT1M-C or equivalent.
2. Nylon wire tie, 5.6”, miniature - Panduit PLT1.5M-C or equivalent.
3. Nylon wire tie, 11.4”, intermediate - Panduit PLT3I-C or equivalent.
4. Nylon wire tie, 14.6”, intermediate - Panduit PLT4I-C or equivalent.

2.19 SURGE AND AMPERAGE PROTECTION

A. Electrical surge protection shall be provided for all service entrance connections and on each copper pair that connects one building to another (i.e. any other portion of a building complex not under one continuous roof) at both exit points to prevent damage to equipment.

B. Security system circuit surge protectors shall be mounted in a standard grounded metallic electric box. Shall be Ditek, 12345-A Starky Road, Largo, Florida 34643 model numbers as follow, multiple pair units are available, or equivalent:
1. Part No. DTK-1LVLP-X 2-wire protector for 12 Volt circuits.
2. Part No. DTK-1LVLP-D 2 wire protector for 5 Volt circuits.
3. Part No. DTK-Z8LVLP-GP 8-pair protector for RS-485 circuits.

2.20 CABLE ROUTING, INSTALLATION, AND SUPPORT

A. System wiring and equipment installation shall be in accordance with good engineering practices as established by the NFPA. Wiring shall meet all state and local electrical code requirements.

B. Cable pathways, conduit, and cable support systems shall be complete with bushings, de-burred, cleaned, and secure prior to installation of cable.

C. Before energizing the system check all cables for correct connections and test for short circuits, ground faults, continuity, and insulation.

D. In all exposed areas such as gymnasiums, shops, field houses, janitors' closets, or mechanical / electrical rooms all access system cable shall be fully enclosed in conduit.

E. Access system cables shall be run in conduit stubs from wall boxes to accessible areas above finished ceilings. Conduit shall be required only within walls and concealed spaces to provide access. Provide bushings to protect the cable from damage for conduit ends, box openings, and passage through metal studs.

F. Access system cables shall be run in bundles above accessible ceilings and supported from building structure by j-hooks, conduit, or cable tray. Cabling shall be loosely bundled with cable ties randomly spaced at 30 to 48 inches on center, cable ties shall not be tight enough to deform cabling and shall not be used to support the cabling.

G. Do not attach any supports to joist bridging or other lightweight members. The support system shall provide a protective pathway to eliminate stress that could damage the cabling.

H. Mount all equipment firmly in place such that vibration or jarring will not interfere with system operation. Route cable in a professional, neat, and orderly installation.

I. The cable shall not be crushed, deformed, skinned, crimped, twisted, or formed into tight radius bends that could compromise the integrity of the cabling.

J. Access system cable must not be fastened to electrical conduits, mechanical ductwork / piping, sprinkler pipes, or routed to obstruct access to hatches, doors, utility access panels, or service work areas. Do not route cables through fire doors, ventilation shafts, grates, or parallel for more than four-feet with line voltage electrical conductors. Access system cables shall not be run loose on ceiling grid or ceiling tiles.

K. Support shall be provided by mounting appropriate fasteners that may be loaded with multiple cables. If the weight load is carried by the support rod or wire, the support assembly may attach to the ceiling grid for lateral stabilization. The required support wires for the ceiling grid or light fixtures shall not be utilized. Any fastener attached to the ceiling grid shall not interfere with inserting or removing ceiling tiles. The cable pathway of supports must be positioned at least 12 inches above the ceiling grid.

L. All cable shall have a label on both ends utilizing self-laminating, flexible vinyl film, non-smear, machine printed labels.

M. Each cable run shall include a three-foot service loop with wire tie located in the ceiling above the control unit panel. This is to allow for future re-termination or repair.

N. Provide for adequate ventilation to all equipment housings and take precautions to prevent electromagnetic or electrostatic hum.

O. All conduit, ducts, track, and raceways shall be supported from the structure at industry standard intervals for the size specified, utilizing proper anchoring devices. Cable fill may not exceed the manufacturers' instructions for each type of support.

P. All conduit, duct, track, and raceway runs shall be spaced apart to allow for maintenance, such as the installation of couplings, without disturbing adjacent pathways.

Q. Each cable run shall be free of splices. No terminations, splices, or equipment will be installed in or above ceilings.

R. All cabling will be placed with regard to the environment, EMI/RFI interference, and its effect on communication signal transmission.

S. Do not route any communication cable within two feet of any light fixture, HVAC unit, service access area, electric panel, or any device containing a motor or transformer.

T. Access system cable will not be installed in the same conduit, duct, or track with line voltage electrical cable.

U. Maximum cable pulling tension shall not exceed 25 pounds force (110 N) or the manufactures recommendation, whichever is less.

V. Any pulling compounds utilized must be approved by the cable manufacturer and shall not degrade the strength or electrical characteristics of the cable.

2.21 TERMINATION PRACTICES

A. Strip back only as much cable jacket as required to terminate.

B. Do not "loop" over wiring terminals, the cable could come loose and the condition not be detected as an open circuit or disconnected device.

C. Preserve wire twists as closely as possible to point of termination (0.5" maximum) to keep signal impairment to a minimum.

D. Avoid twisting cable jacket during installation.

2.22 BUSHINGS

A. Provide a plastic snap in bushing at each box opening, passage through a metal stud, and at the end of all open conduit stubs or sleeves prior to cable installation to protect the cabling from damage:
1. Box openings - Thomas & Betts Knockout Bushing Series 3210, or equivalent.
2. Metal stud passage - Thomas & Betts Twist It Bushing Catalog Number SB1216-SC, or equivalent.
3. Conduit ends - Thomas & Betts Anti-Short Bushing Series 390 or Tite-Bite Combination Coupling Series 442, or equivalent.

2.23 CEILING MOUNTED DEVICE BOX HANGERS

A. All ceiling mounted devices including: smoke detectors, heat detectors, remote power/status LEDs, ceiling mounted strobes and horn/strobes, et cetera, when mounted in a drop ceiling shall be supported by an electrical box hanger (Caddy #512 or #512A for deep boxes - 24" span), or equivalent. Box hangers shall be attached to the ceiling grid only for lateral stabilization, separate support wires shall be provided. The required support wires for the ceiling grid or light fixtures shall not be utilized. The backbox shall be flush and level with the bottom of the ceiling tile and the hole neatly cut for a finished appearance when the device is installed.

B. Device and box hanger assemblies shall not be supported solely by suspended ceilings. Fasteners and supports shall be adequate to support the required load.

2.24 J-HOOKS

A. Attachments for cabling support shall be spaced at approximately 48 to 60 inches on center. Each cable bundle shall be routed with enough slack to prevent damage to cables but not allowed to sag more than 12 inches mid-span between attachments. Attachments shall be sized as follows:
Single cables or bundles up to four cables may be supported directly by the building structure.

Bundles up to 1/2" dia. (Ten 1/4" cables)	2" bridle ring, Caddy #4BRT32 or equivalent
Bundles up to 3/4" dia. (Sixteen 1/4" cables)	3/4" J-Hook, Caddy #CAT12 or equivalent
Bundles up to 1-5/16" dia. (Fifty 1/4" cables)	1-5/16" J-Hook, Caddy #CAT21 or equivalent
Bundles up to 2" dia. (Eighty 1/4" cables)	2" J-Hook, Caddy #CAT32 or equivalent

Split bundles greater than 2" dia. or provide cable tray.

B. Do not mix different signal strength cables on the same J-Hook (i.e. access system with telephone/data cable). Multiple J-Hooks can be placed on the same attachment point, up to the rated weight load of the attachment device.

2.25 COMMUNICATIONS CIRCUIT SURGE PROTECTION

A. Provide surge protection shall be provided for all exterior devices, communications service, or antenna entrance connections, and for each circuit that connects one building to another (i.e. any other portion of a building complex not under one continuous roof) at both entry/exit points to prevent damage to equipment.

B. Each surge protector shall be mounted in a standard grounded metallic electric box or equipment backboard with a separate ground wire ran directly to the ground bus bar or equipment panel ground stud, do not daisy chain ground wires.

C. Surge protectors for low voltage communications signal and control circuits with a data rate from 200kbps to 2Mbps, nominal voltage as listed below AC or DC. Each module shall protect up to two pairs using hybrid design multi-stage SAD technology, shall be Ditek 2MHLP series field replaceable modules with MB Series mounting bases for one to five modules, or equivalent, model numbers as follows:
   1. 70 to 75 Volt circuit, 4 wire protector with base DTK-2MHLP75BWB.
   2. 48 to 50 Volt circuit, 4 wire protector with base DTK-2MHLP48BWB.
   3. 36 Volt circuit, 4 wire protector with base DTK-2MHLP36BWB.
   4. 24 Volt circuit, 4 wire protector with base DTK-2MHLP24BWB.
   5. 12 Volt circuit, 4 wire protector with base DTK-2MHLP12BWB.
   6. 0 to 6 Volt circuits, 4 wire protector with base DTK-2MHLP5BWB.

D. Surge protectors for low voltage communications high data rate voice, data and signaling data and loop circuits, or serial communication, nominal voltage as listed below AC or DC. Each module shall provide Line-Ground (All) protection modes, maximum surge current: 2,000 Amps per pair (6V-50V) or 9,000 Amps per pair (75V-130V), and maximum continuous current: 5 Amps to 0.15 Amps, shall be Ditek LVLP series or equivalent, model numbers as follows:
   1. 115 to 130-Volt circuit, 2-pair protector, 10-12 AWG, DTK-2LVLAWGRUV.
   2. 95-Volt circuit, 2-pair protector, 10-12 AWG, DTK-2LVLAWGSGR.
   3. 75-Volt circuit, 2-pair protector, 10-12 AWG, DTK-2LVLAWGSPK.
   4. 48 to 50-Volt circuit, 2-pair protector, 16-22 AWG, DTK-2LVLPOPX.
   5. 24 to 30-Volt circuit, 2-pair protector, 16-22 AWG, DTK-2LVLPLV.
   6. 12 to 14-Volt circuit, 2-pair protector, 16-22 AWG, DTK-2LVLPX
   7. 0 to 6-Volt circuit, 2-pair protector, 16-22 AWG, DTK-2LVLPD.
   8. 0 to 6-Volt circuit, 8-pair protector (RS-485, RS-232), 16-22 AWG, DTK-8LVLPLVD.

E. Surge protectors for access control devices, types and nominal voltage as listed below. Each module shall provide Line-Ground (All) protection modes, maximum surge current: 2,000 Amps per pair power and 500 Amps per pair data, and maximum continuous current of 3 Amps, shall be Ditek model numbers as follows or equivalent:
   1. Wiegand credential reader surge protection 3-pair, 12 to 14-Volt terminal strip, Ditek DTK-3LVLPX.
   2. Credential reader surge protection, 4-pair reader, and 1-pair each: 12-Volt power, 24-Volt power, 5-Volt data, and 1-Volt signal, Ditek DTK-4LVLPCR.
   3. Entry intercom system with data circuit surge protection 1-pair 12/24-Volt power supply, 2-pair 130-Volt voice line, and 1-pair 0 to 6-Volt data circuit, Ditek DTK-4LVTEP.
   4. Entry intercom system with door release surge protection 1-pair 12/24-Volt power supply, 2-pair 130-Volt voice line, and 1-pair 24-Volt release solenoid circuit, Ditek DTK-4LVXR.

F. Surge protectors for Ethernet network runs rated up to Category 6A and operating at up to 10-Gigabit data rates. Each module shall protect up all four pairs using hybrid design multi-stage SAD technology which shall automatically reset to protect against multiple surges, Ethernet surge protectors shall be Ditek DTK-CAT6A series as follows:
   1. DTK-110RJC6APOE with 110 to RJ-45 connections with PoE.
   2. DTK-110C6APOE with 110 to 110 connections with PoE.
   3. DTK-110RJC6A with 110 to RJ-45 connections without PoE.
   4. DTK-110C6A with 110 to 110 connections without PoE.

G. Surge protectors for analog copper pair PSTN telephone service POTS/Trunk/C.O. line alarm Digital Communicator service lines shall be Ditek DTK-2MHTPWB, or equivalent, 2-pair/lines, maximum ring-up voltage 110V, includes base. In addition, At Telco service connection demarcation point locations servicing an alarm Digital Communicator, provide per line a Suttle Solutions Part # 635B-48, or equivalent, RJ31X surface mount jack with 8-conductor screw terminal board input and factory wired DATA and VOICE labeled, non-keyed RJ-45 output ports, with line seizure port shorting bar (1&4, 5&8) for alarm reporting device service.

H. Surge protectors for coaxial cable shall be suitable for analog and digital signals up to 2 Ghz, and shall feature 75 Ω nominal impedance, Center Pin - Shield, Shield - Ground protection modes, 20,000A surge current rating, a service voltage of 50VDC, and a clamping Voltage of 75VDC. Note: Insertion loss per surge protection module is 0.5dB, include signal attenuation from these devices in signal strength calculations. Surge protectors shall be Ditek VSP series, or equivalent, as follows:
1. Type 'F' connectors Ditek DTK-VSPA or Ditek DTK-VSPA2 (dual).
2. BNC connectors Ditek DTK-VSPBNCA or DTK-VSPBNCA2 (dual).
3. BNC connectors and 24-volt power connections Ditek DTK-PVP27B.
4. PTZ camera surge protection; BNC video, power, and data Ditek DTK-DP4P.
5. HD-SDI video Ditek DTK-iBNCHD.
6. Type 'N' antenna connector Ditek DTK-VSPN.

2.26 FIRE STOPPING, DRAFT/NOISE STOPPING, PENETRATIONS, AND CORING

A. UL Listed fire stopping methods that match the fire rating of the wall or floor being penetrated are to be used at all fire barrier penetrations. Seal the interior of the conduit sleeve around the cables and around the outside of the sleeve on each side of the penetration with fire-stop caulk or putty, install according to the manufacturers' instructions.

B. All penetrations through fire rated walls or floors shall feature a suitable length of metal conduit. Hole diameter shall not exceed ½" larger than the conduit or sleeve to be installed. The hole shall be neatly cut, not oversize or irregular. Do not share wall/floor penetrations with ductwork, piping, line voltage electrical conduits, etc.

C. All gypsum board or plaster penetrations shall tool cut using an appropriate hole saw / mandrel or manufactured assembly.

D. Draft/Noise Stopping - All penetrations through non-rated walls shall include draft/noise stopping to minimize the transfer of air and sound between enclosed areas. This shall include but not limited to:
1. Neatly cutting all non-rated wall penetrations with a 1" maximum clearance. All gypsum board or plaster penetrations shall be tool cut using an appropriate hole saw / mandrel or manufactured assembly. The hole shall be neatly cut and not oversize or irregular. Do not share wall penetrations with other types of ductwork, piping, line voltage electrical conduits, communications cabling, etc.
2. Provide and install non-combustible mineral wool, fiberglass, cellulose insulation, caulk, and/or sealant as required. Seal the interior of conduit sleeves around the cables and around the outside of the sleeve on each side of the penetration with caulk or putty, install materials according to the manufacturers' instructions.
3. This contractor shall make every effort to coordinate with the building Architect, Owner, Engineer, Builder, and Electrical Contractor to have sleeves placed in new construction so that later coring or drilling of building structural members will not be required. this contractor must consult with the building Owner, Architect, Engineer, and Builder prior to drilling, coring, or sawing of any wall, floor, etc. All penetrations shall be made at approved, appropriate, locations.

E. This contractor shall make every effort to coordinate with the building Architect, Owner, Engineer, Builder, and Electrical Contractor to have sleeves placed in new construction so that later coring or drilling of building structural members will not be required. this contractor must consult with the building Owner, Architect, Engineer, and Builder prior to drilling, coring, or sawing of any wall, floor, etc. All penetrations shall be made at approved, appropriate, locations.

F. Upon approval, this contractor shall be required to supply all labor, equipment, tools, and materials to create any additional penetrations, and shall provide the sleeve, temporary and final fire stopping. Exceptional care shall be taken not to stress, overheat, or penetrate any building support member. Coring shall be made with equipment appropriate for the dry penetration of concrete and block materials. Under no circumstances shall penetrations be made utilizing a chisel or percussion type equipment. Concrete, block, or plaster cores shall be made by dry saw methods only.

PART 3 – EXECUTION

3.1 DEMOLITION OF THE EXISTING ACCESS CONTROL SYSTEM FOR RENOVATION

A. The access control contractor shall be responsible for removal of the existing access control system. This shall also include demolition of any devices and cable previously abandoned. Demolition shall include disconnection and removal of all panels and devices and disposed of off-site, in a legal manner, of all materials not requested to be turned over to the Owner. Demolition also includes all cable, cable supports, and conduits. Comply with government regulations pertaining to environmental protection, and disposal of materials and equipment. Do not burn any materials on the site.

3.2 EXAMINATION

A. Verify existing field conditions, circuiting arrangements, cabling, and devices served in areas as shown on the Drawings. Adjust all circuiting, cabling, and materials to be provided as required by job conditions.

B. Identify and verify abandoned equipment, wiring, and devices. All disconnected or abandoned devices and cabling shall be removed.

C. Drawings are based on casual field observation and existing record documents. Report discrepancies to the Engineer before disturbing existing installation.

D. The Contractor accepts the existing conditions when beginning demolition.

3.3 PREPARATION

A. Disconnect access control devices in as shown or required.

B. Provide temporary wiring and connections as required to maintain the operation of existing systems during construction.

C. When work must be performed on energized equipment or circuits, use personnel experienced in such operations. Verify phasing on existing equipment and coordinate new phasing before energizing revised service.

D. Remove, relocate, and extend existing installations to accommodate new construction as required.

E. Remove abandoned wiring to the source of the supply.

F. Remove exposed abandoned conduit, including abandoned conduit, brackets, stems, hangers, and other accessories above accessible ceiling finishes. Cut conduit flush with walls, floors, and patch surfaces.

G. Disconnect and remove abandoned devices. Remove abandoned devices if conduit servicing them is abandoned and removed. Provide blank cover for abandoned devices that are removed in masonry construction.

H. Repair adjacent construction and finishes damaged during demolition and extension work.

I. Confirm with Owner/Architect regarding the handling and disposal/reuse of removed material, equipment, devices, et cetera.

3.4 OPERATION PRIOR TO COMPLETION

A. When the phasing of a project requires that access control systems are operable in certain areas and the Owner needs to operate the equipment, such provisions shall be made by the contractor. The warranty period shall commence when the equipment is operated for the beneficial use of the Owner. Regardless of whether or not the equipment has or has not been operated, the Contractor shall properly clean the equipment, properly adjust, and complete all punch list items before final acceptance by the Owner. The date of acceptance and the start of the warranty may not be the same date.

3.5 SEQUENCE OF OPERATION

A. Scheduled automatic door unlocking/locking of specific entry doors shall be programmed to require verification before being enacted. A credential card from a select group at the local facility (including the principal/vice principals, etc. as requested) must be presented at the facility within a two-hour period prior to the scheduled unlocking event. This is to prevent the entrance doors from be unlocked when no one is present to supervise the students, such as due to a snow day or other unscheduled occurrence. If a scheduled unlocking event is delayed, and a credential card from the select group is presented within two hours after the unlocking event was scheduled, the unlocking shall be enacted immediately.

B. This access control system shall provide for controlled access through entry doors and into restricted areas when a valid credential card is presented to the credential card reader located adjacent to the door, only if the users group access rights and time schedules allow for access. This system shall monitor for unauthorized entry attempts, control access to the building, and log entry information. The system shall in no way impede free emergency exit from the building. Exit from the building shall not require special effort or knowledge. Controlled door locks shall fail secure from outside entry on loss of power and backup power.

C. Door Forced and/or Door Held Open alarms shall have the capacity to be locally annunciated via Auxiliary Output relays on the individual controllers. This annunciation shall be controlled as follows. A direct one-to-one relationship shall be able to be programmed between the Door Forced and/or Door Held Open alarm and the auxiliary output. When either condition exists, the auxiliary output is energized. When either condition is cleared, the auxiliary output is de-energized.

D. The system shall provide the capability for individual controlled door locations as noted on plans. If the door remains held open for over three minutes, a system Door Held Open Alarm alert shall pop-up and generate an entry in the log file for later review, the alert shall be automatically silenced and cleared once the door is closed.

E. Controlled doors using a retractable latch strike shall, on a valid credential card read, activate the output to retract the door latch and immediately allow the exit door to be entered by standard pull lever operation; the door may then be opened without retracting the latch bolt. When the door closes, the latch bolt shall ride over the strike lip. The installation shall include dual switch monitoring, the strike shall have two SPDT contacts; one switch shall monitor the tripper, which is depressed when the latch bolt is inserted into the strike pocket. The second switch shall monitor the condition of the strike lip, indicating open or closed and locked conditions.

F. Controlled doors with frame or mullion retractable strike, on a valid credential card read, activate the output to retract the door strike and immediately allow the exit door to be entered by standard pull lever operation; the door may then be opened without retracting the latch bolt. When the door closes the beveled latch, bolt shall ride over the lip and fall into the electric strike pocket. The installation shall include dual switch monitoring, the strike shall have two SPDT contacts; one switch shall monitor the tripper, which is depressed when the latch bolt is inserted into the strike pocket. The second switch shall monitor the condition of the strike lip, indicating open or closed and locked conditions.

G. Controlled doors with a crash bar shall include electric latch retraction and a request-to-exit switch, the access control system shall, on a valid credential card read, activate the output to retract the latch bolt and immediately allow the door to be entered by standard pull handle operation.

H. Where required, the system shall interface with electric door openers utilized for ADA access. This interface shall interconnect to door control interface to mechanically open the door when a valid credential card is read, and the exterior door button is pressed. The exterior button shall also open the door when the door is scheduled to be unlocked without a credential card read. The interior door open button shall always be functional, allowing full egress, regardless of the status of the access control system; the interior button shall also be interfaced to the request to exit function.

I. The request-to-exit switch or sensor shall provide a means for the system to monitor the status of the controlled door and detect a forced entry condition. The request-to-exit signal shall be used only to indicate a normal exit status, as opposed to a forced entry. Exit shall be made with the normal door hardware and shall not be impeded or assisted by the electronic system. Exit shall not be affected if the power is off and the battery backup exhausted.

J. The access system door contact switch shall provide a means for the system to monitor the open/closed status of the controlled door and detect if the door is held open or left ajar after a valid credential card read.

K. The Visitor Entry Control Desktop Console system, when operated, shall operate the electric strike and allow the controlled door to be opened from the secured side without a credential card being read at the door's card reader. The opening of the door shall not cause an alarm condition.

3.6 PROJECT ORGANIZATION

A. INITIAL SITE/SCHEDULE SET-UP: The contractor to provide at the minimum the following set-up for each school:
1. Contractor to set-up all Graphical maps with doors linked and labeled to current district standards. Contractor to use correct room names and numbers as installed at site. Provide overall map showing all information with school labeled.
2. Contractor to incorporate owner's current database into new system. Contractor shall do initial employee entry set-up for each site.
3. Contractor to follow current district standards on initial school set-up. After the initial set-up is carried over following the existing school pattern, the owner will "fine tune" as necessary.
4. Provide District Access levels following the current district standard.
5. Program each door to follow the district holiday schedule.
6. Contractor to provide a minimum of five (5) hard copies of Graphical map for owner to distribute at each installed campus.
7. Contractor to verify with owner other initial set-up needs.
8. Contractor to coordinate with Owner/Engineer thirty (30) days prior to bringing system on line to verify labels and sequences. Training time and classes are to be set-up during this time also.

B. ALARM GRAPHICS TRAINING
1. The Contractor shall provide a one-day training class for the operators to develop the skills they need to use the alarm graphics editor, linker and monitor to identify the source and priority of alarm conditions on the Building Access System with the integrated alarm graphics option installed.
2. The class shall teach the operators to display alarm graphics maps at any level to identify the location of an active Building Access System alarm.
3. Design, draw, color, labels and saves facility maps, including named objects for map and alarm linking.
4. Create and manipulate shapes, lines, objects, and groups of objects.
5. Save and merge sub-views.
6. Link maps together by named objects and filenames.
7. Link a named map object to Building Access System alarm, customizing the object to identify the location, characteristic, and priority of the alarm.

3.7 TESTING, WARRANTY SERVICE

A. A factory trained representative of the manufacturer shall supervise the final connections and testing of the system and it shall be subject to the final acceptance of the Architect/Engineer and Owner.

B. This contractor will thoroughly test all components of the systems and devices proposed herein to assure equipment specifications are met. This contractor will start up, test, and debug systems to ensure that all aspects of the system are working, documented, and reporting properly.

C. This Contractor shall make a thorough inspection and test of the complete installed security system including all components and controls to ensure the following:
   1. Complete and functional system.
   2. Installed in accordance with manufacturer's instructions.
   3. Verify proper operation and processing of signals.

D. The installation will be verified through use of testing procedures designed to test all specific functions and requirements of your system under various operating conditions.

E. This Contractor shall provide a warranty of the installed system against defects in material or workmanship for a period of one (1) year from the date of substantial completion. Any equipment or wiring shown to be defective shall be replaced, repaired, or adjusted free of charge. All labor and materials shall be provided at no expense to the Owner. All equipment will carry a one-year warranty or manufacturer's warranty whichever is greater.

3.8 DRAWINGS, MANUALS, AND TRAINING

A. Upon completion of the installation, and prior to final inspection, the Building Access Control Contractor shall furnish four (4) hard copies and one (1) electronic CAD and PDF copy on CD-R of as-built drawings. In addition, the Building Access Control contractor shall furnish four (4) hard copies and one (1) electronic PDF copy on CD-R of a complete operating and maintenance manuals listing the manufacturer's name(s), including technical data sheets. Manuals shall include wiring diagrams to indicate internal wiring for each device and the interconnections between the items of equipment. Provide the Owner a copy of the panel control software including the licensed program, site specific data file, and passwords that the Owner may require to maintain the system. Provide a clear and concise description of operation that gives, in detail, the information required to properly operate the equipment and system. Provide a parts list with manufacturer and model number for commonly replaced parts. Include complete instructions for the inspection, testing, and maintenance of the system. Include copies of all programming sheets used to configure the system. As-built drawings and operating and maintenance manuals may be electronically transmitted in PDF file format (preferred) or paper copies may be provided in quantities indicated in Division 1. Paper copies shall be organized including index tabs in a 3-ring black binder of sufficient size.

B. Provide the Owner a copy of the panel control software including the licensed program, site specific data file, and passwords that the Owner may require to maintain the system.

C. Formal on-site training sessions shall be conducted by this Contractor. It shall be the responsibility of this Contractor to coordinate time and location of training sessions with the Owner. Provide documented general instruction as follows:
   1. Provide instruction to the maintenance personnel to include the location, inspection, maintenance, testing, and operation of all system components. Provide a minimum of four (4) hours—two 2-hour sessions separated by a minimum of two weeks.
   2. Provide instruction to designated personnel on the functions and operation of the building access system including capabilities, limitations, reporting, monitoring, and the meaning of status messages. State the proper procedure for testing, routine maintenance, and request for service. Provide detailed instruction on the operation of the system including group scheduling, adding users, deleting users, and changing passwords. Provide a minimum of four (4) hours—two 2-hour sessions separated by a minimum of two weeks.

END OF SECTION

SECTION 28 31 24

PREMISES INTRUDER ALARM SYSTEM

PART 1 – GENERAL

1.1 WORK INCLUDES

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1, apply to this Section.

B. Remove all existing premises intruder alarm system from the building.

C. Provide all equipment, materials, labor, supervision, and services necessary for or incidental to the installation of a complete Premises Intruder Alarm System (Burglar Alarm) as shown or indicated on the drawings and/or as specified.

D. In shall be the responsibility of the Intruder Alarm System Contractor to obtain all required installation permits, approvals, and certifications from authorities having jurisdiction. The Intruder Alarm System Contractor shall be responsible for identifying requirements for permits from the local police department for the installation of the alarm system specified herein and shall assist the Owner in obtaining the relevant alarm use permits.

E. It shall be the responsibility of the Electrical contractor to provide and install all conduit systems, standard electrical boxes, and operating power for the Intruder Alarm System as outlined on the project drawings. The Intruder Alarm System Contractor shall coordinate all system requirements with and provide special back boxes to the Electrical Contractor prior to installation of conduit.

F. The electrical contractor shall provide 120-volt power as required to the alarm system through separate dedicated branch circuits, maximum 20 amperes each. The alarm control panel and the auxiliary power supplies combine to form the alarm control unit. The panel and two or more auxiliary power supplies may be feed from one circuit as long the amperage drawn is within the limitations of a 20-ampere circuit. Each such circuit shall be labeled at the power distribution panel as INTRUDER ALARM. The location of all circuit breakers serving the alarm control unit shall be posted in the alarm control unit cabinets. Each cabinet shall be grounded securely to the building grounding system.

G. Provide all testing, documentation, training, and warranty service contract as outlined in these specifications.

1.2 RELATED SECTIONS

A. Section 26 05 34 - Provisions For Communication, Security & Safety Systems.

B. Section 28 05 00 - General Electronic Safety and Security System Requirements

C. Section 28 13 27 - Building Access Control System.

1.3 CODES AND REGULATIONS

A. Perform all work in strict accordance with the requirements and recommendations stated in the codes and standards except when requirements are exceeded by the contract documents.

B. The equipment, materials, and installation shall confirm to the latest version of all applicable codes, standards and regulations of authorities having jurisdiction including the following:
1. NFPA 70, National Electrical Code, Articles 250, 300, 725, 760, and 800.
2. NFPA 72, National Fire Alarm and Signaling Code.
3. Americans with Disabilities Act.
4. Texas Accessibility Standards.
5. International Building Codes (IBC).

6. Local and State Building Codes.
7. All requirements of the local Authority Having Jurisdiction (AHJ).

1.4 SUBMITTALS

A. Submittal procedures: See Section 28 05 00.

B. Submit a complete submittal package within 30 calendar days after award of this work for approval. Equipment is not to be ordered without approval. Partial submittals are not acceptable for review. Each submittal shall include a dated transmittal.

C. Submittal may be electronically transmitted in PDF file format (preferred) or paper copies may be provided in quantities indicated in Division 1. Paper copies shall be organized including index tabs in a 3-ring black binder of sufficient size.

D. Quality Assurance Submittal:
1. Letter from manufacturer stating that the Contractor is an Authorized Factory Distributor for the area where the project is located.
2. The Contractor and Manufacturer shall supply sufficient information to indicate that the proposed system is based on the latest hardware, software technology available.
3. Current copy of the Contractors Alarms Company license issued by the Texas Department of Public Safety Private Security Board.
4. Calculations for device circuit current drop and battery backup calculations.

E. Product Data Submittal including special boxes, cable, and other material as requested by the Owner including:
1. A cover sheet with the name and location of the project, the name, address, and telephone number of the Contractor, and the name, address, and telephone number of the submitting sub-contractor. Include on or after the cover sheet sufficient space for review stamps.
2. An indication of any deviations from Contract Document requirements, including variations and limitations. Show any revisions to equipment layout required by use of selected equipment.
3. A product data index and complete equipment list including for each product submitted for approval the manufactures name and part number, including options and selections.
4. Cut-sheets or catalog data illustrating the physical appearance, size, function, compatibility, standards compliance, and other relevant characteristics of each product on the equipment list. Indicate by prominent notation (an arrow, circle, or other means) on each sheet the exact product and options being submitted.
5. Submit design data, when the scope of work requires, including calculations, schematics, risers, sequences, or other data.
6. Any resubmittal shall include a complete revised equipment list and any product data that is revised.

F. Submit shop drawings locating all components of the system, indicating circuit routing, cable type, and gauge. Shop or coordination drawings shall include information that will allow to the Contractor to coordinate interdisciplinary work and when necessary guide the manufacturer or fabricator in producing the product. Shop or coordination drawings shall be specifically prepared to illustrate the submitted portion of work, this may require diagrams, schedules, details, and accurate to scale equipment and device layouts prepared using a CAD or BIM engineering drawing program.

1.5 QUALIFICATIONS OF A PROPOSED CONTRACTOR

A. Proposed contractors who do not currently possess the necessary qualifications, trained and experienced personnel, financial capacity, and meet the other requirements herein described will be disqualified.

B. The Contractor shall be currently licensed under the Texas Department of Public Safety Private Security Board as an Alarm Company to sell, install, and service private security systems.

C. The proposed contractor, as a business entity, shall be an authorized distributor and designated representative of the security panel manufacturer, with full warranty privileges, and shall have been actively engaged in the business of selling, installing, and servicing commercial building alarm systems for a period of at least 5 years.

D. Recently formed companies are acceptable only if specific pre-approval is requested, and granted by the Owner/Architect/Engineer, based on experience of key personnel, current and completed projects, and all licensing requirements are met 10 working days prior to the contract proposal date.

E. All employees working on the project must be registered alarm system installers. The Contractor shall employ factory trained technicians capable of supporting the maintenance of the system. No contract employees are allowed unless they have been to the factory service school within the last 18 months. A certificate of this training shall be provided with the Contractors submittal.

F. The contractor shall employ full time local technicians and installers. The manufacturer shall maintain a full time factory employed service staff for product support and service.

G. The proposed Contractor shall have an office within 150-miles of the job site, staffed with trained technicians who are qualified and licensed to supervise the installation, to be responsible that the system is installed as submitted, to conduct system start up and perform a 100 percent operational audit of all installed devices, to instruct the Owners representatives in the proper operation of the system, and to provide service throughout the warranty period. The contractor shall be capable of dispatching technicians to repair a system within six hours of a service request.

H. The proposed contractor shall be fully experienced in the design and installation of the type of Intruder Alarm System herein specified and shall furnish with the contract proposal an itemized list of the installations of the type specified herein. The list shall include the name of the project, date of completion, the amount of the contract, the name, and telephone number of a qualified person to contact for reference. This list must contain at least two (2) projects within a 150-mile radius of the school district to allow school administration officials to visit the job site for review of the system installation and service. Each reference project listed must utilize equipment by the same manufacturer as the proposed system.

I. The Contractor shall employ factory-trained technicians capable of supporting the maintenance of the system. No contract employees are allowed unless they have been to the factory service school within the last 18 months. A certificate of this training shall be provided with the contractors' submittal.

J. The Proposed Contractor shall not have any grievances or complaints of record regarding workmanship, code compliance, or service response. A Proposed Contractor that has any prior finding(s) of a code or license violation or has any litigation in process concerning the installation of a communication system is unacceptable.

K. The ability of a proposed Contractor to obtain plans and provide a performance bond shall not be regarded as the sole qualification of the Contractors' competency and responsibility to meet the requirements and obligations of the contract.

L. The Builder shall be satisfied that a proposed Contractor meets all the requirements expressed herein before including the Contractor's proposal in the project.

M. The Owner may investigate, as they deem necessary to determine the ability of the proposed Contractor to perform the work. The proposed Contractor shall furnish to the Owner with any information or data requested for this purpose.

N. The Owner reserves the right to reject any contract proposal if the evidence submitted, or their investigation, fails to indicate that the Contractor is qualified to fulfill of any part of the contract or to complete the work contemplated therein.

O. The Owner reserves the right to reject the proposal of any Contractor who has previously failed to perform properly, or complete on time, contracts of a similar nature.

PART 2 – PRODUCTS

2.1 GENERAL

A. Type: Complete 12 VDC, closed circuit, electrically supervised, microprocessor controlled Intruder Alarm System.

B. The system and all components shall be tested and found suitable for the specified purpose as part of a commercial Intruder Alarm System by a nationally recognized approval agency acceptable to the AHJ.

C. All date keeping hardware, firmware, and software provided shall be fully compliant with the calendar year designated in four-digit date format. Any time equations must function normally, leap year, and daylight savings time must be supported.

D. The control units, power supplies, batteries, subassemblies, software, firmware, and all cable, detection, and notification devices provided shall be listed and labeled by Underwriters Laboratories, Inc. for commercial intruder alarm system use under the latest appropriate testing standard including but not limited to the following:

UL 13	Power Limited Circuit Cables
UL 50	Enclosures for Electrical Equipment.
UL 294	Access Control System Units.
UL 365	Police Station Connected burglar Alarm Units and Systems.
UL 444	Communications Cables.
UL 464	Audible Signal Appliances.
UL 497B	Protectors for Data Communications and Fire Alarm Circuits.
UL 603	Power Supplies for Use with Burglar-Alarm Systems.
UL 609	Local burglar Alarm Units and Systems.
UL 611	Central-Station Burglar-Alarm Systems.
UL 634	Connectors and Switches for Use with Burglar-Alarm Systems.
UL 636	Holdup Alarm Systems and Units.
UL 639	Intruder Alarm Systems.
UL 681	Installation and Classification of Burglar and Holdup alarm Systems.
UL 864	Control Units for Fire Protective Signaling Systems.
UL 910	Test for Cable Flame-Propagation and Smoke-Density Values for Electrical and Optical-Fiber Cables Used in Spaces Transporting Environmental Air.
UL 983	Surveillance Camera Units
UL 1034	Burglary-Resistant Electric Locking Mechanisms.
UL 1037	Antitheft Alarms and Devices.
UL 1076	Proprietary Burglar Alarm Units and Systems.
UL 1479	Fire Tests of Through-Penetration Firestops.
UL 1481	Power Supplies for Fire Protective Signaling Systems.
UL 1581	Electrical Wires, Cables, and Flexible Cords.
UL 1610	Central-Station Burglar-Alarm Units.
UL 1635	Digital Alarm Communicator System Units.
ANSI/SIA	CP-01-2010 Control Panel Standard - Features for False Alarm Reduction.

E. Only equipment devices have been shown on the contract drawings. Specific wiring between equipment has not been shown.

F. The system shall include but not be limited to all control units, power supplies, batteries, subassemblies, keypads, software, firmware, and all cable, detection, notification, and all accessories required to provide a complete operating system.

G. All equipment and components shall be installed in strict compliance with manufacturers' recommendations and the requirements of the component's UL listing. Consult the manufacturer's installation manuals for all wiring diagrams, schematics, electrical requirements, cable types, and physical equipment sizes, etc., before beginning system installation. Refer to the manufacturers' riser / connection diagrams for all specific system installation / termination / wiring data. All equipment and components shall be new, and the manufacturer's current model. All like devices shall be of the same manufacturer and model number.

H. All equipment shall be attached to walls and ceiling/floor assemblies and shall be held firmly in place (e.g., detectors shall not be supported solely by suspended ceilings). Fasteners and supports shall be adequate to support the required load.

I. Installation subject to approval, inspection, and test of the Owner/Architect/Engineer.

2.2 RELATED WORK - NETWORK CONNECTIVITY

A. The system shall be utilizing the customer's existing Ethernet system backbone for all security devices communications.

B. No Ethernet cabling, network RJ-45 jacks, or patch cords are included in the scope of this Specification Section.

C. The Owner will provide this Contractor with a terminated network drop at security devices, and the required TCP/IP configuration settings: static IP address, domain, gateway, and subnet mask if required.

D. This contractor will program and test all Intruder Alarm System control devices for connection to the network.

E. This contractor will provide complete programming of all device parameters in accordance with the Owners requirements.

2.3 RELATED WORK – BUILDING ACCESS CONTROL SYSTEM INTEGRATION

A. For the main building the intrusion detection system shall disarm, by a valid Building Access Control System users card read (within one minute to disarm the system), on the card reader mounted right next to the zone keypads located inside the building entry.

2.4 ACCEPTABLE MANUFACTURES

A. Descriptions and details, acceptable manufacturers' names listed, and specific manufacturer and model number items indicated in the plans and specifications shall establish a standard of quality, function, and design. Manufacturers and model numbers listed "no exceptions" shall not be substituted without specific notice in an addendum. Otherwise, where a specific manufacturer's product is indicated, products of other manufacturers listed as acceptable may be submitted for approval based on the substitute product being, in the opinion of the Engineer, of equivalent or better quality than that of the product specified.

B. Proposed contractors wishing to propose any product substitution must do so in writing to the specifying authority at least ten (10) days prior to the proposal opening.

C. For manufacturers equipment or models other than that specified, the proposed contractor shall supply proof that such substitute equipment equals or exceeds the features, functions, performance, and quality of the specified equipment. Proposals must include detailed information showing all deviations from the system as specified.

D. Substitute products for which the proposed contractor does not obtain prior approval will not be considered acceptable for this project. Final approval of alternate products shall be based on the decision of the Owner and Architect. Prior approval to make a proposal for this project does not automatically ensure products will be an acceptable equivalent.

E. It is the responsibility of the Contractor to provide all features and functions as outlined in these specifications. The functions and features specified are vital to the operation of this facility; therefore, inclusion in the list of acceptable manufacturers does not release the contractor from strict compliance with the requirements of this specification.

F. The district standard and model numbers used in this specification are those of the **Bosch G Series** security system (9412GV4 Control Panel), this shall constitute the quality, compatibility, features, and performance of the equipment to be furnished, **no exceptions**.

2.5 GENERAL SYSTEM DESCRIPTION

A. The Premises Intruder Alarm System shall employ microcomputer technology to monitor various partitions for zoned sensor detection activity in order to determine system status, display appropriate information on the keypad(s) used with the system, and initiate appropriate programmed functions and alarm conditions. Each system must include at least one keypad per partition to provide control of system operation.

B. The system will shall include one on more partitions; each partition operates logically as a single physical alarm system protecting an independent area with a partition users group, each user assigned a distinct security code. Each partition will include alarm zones, each with various types of sensors as needed to provide perimeter and/or interior burglary protection.

C. The security system shall be managed, controlled, and reported by alarm zone. Each partition will contain one or more alarm zones, and each alarm zone assigned one or a logical group of sensors.

D. Each zone shall operate logically to monitor the status and condition of one or a related group of sensors. Zones are typical numbered, for example the zone entry/exit door may be Zone 01, perimeter door and widow sensing devices Zone 02, and interior occupant/intruder sensors Zone 03, and so on. The system is programmed to display the zone number/zone description on the keypad display when an alarm or trouble condition occurs.

E. When a device fault is detected, the assigned partition will not be ready to arm until the fault is corrected or the zone with the fault is bypassed. The system shall support a mode for alerting users, such as with an audible chime, indicating the opening of protected doors and windows while the system is disarmed.

F. A partitioned system may also include a "common zone" area, which is an area such as when a foyer or lobby is included in more than one partition. A common zone will sound and report alarms only when all related partitions are armed. When at least one of the partitions is not armed, the system will ignore sensors assigned to that common zone. Faults in a common zone are displayed on keypads in all partitions including the common zone and any of these partitions may clear and restore the common zone after an alarm.

G. Each partition shall have a current mode of operation, modes may include off/disarmed, occupied/stay, and un- occupied/away. In addition, selected zones may be bypassed in active modes, while leaving the rest of the system armed. A partition must be turned on or "armed" and the entry/exit delay expired for the entry/exit door before a system can sense burglary alarms.

H. When a burglary alarm occurs, both the keypad and any external sounders will sound, the keypad will display the zone(s) causing the alarm and an alarm message sent to the central monitoring station. The alarm event will be logged in the system memory including the zone number(s) involved and type of alarm, this information will remain displayed at the keypad until it is cleared by disarming the system, which also stops the alarm from sounding.

2.6 PROJECT SEQUENCE OF OPERATION

A. The premises intruder alarm system sequence of operation for this project shall be coordinated with the Owners requirements.

2.7 INTRUDER ALARM SYSTEM CONTROL PANEL RATINGS AND FUNCTIONS

A. UL listed and labeled for commercial burglar alarm systems.

B. A UL listed cabinet suitable for surface mounting. The cabinet and front shall be corrosion protected, given a rust resistant prime coat, and a painted standard finish. The back box and door shall be constructed of 0.060" minimum steel with provisions for electrical conduit connections into the sides and top. The cabinet shall provide storage for backup batteries. The door shall provide a key lock to access system components. The cabinet shall be attack resistant and fitted with front and back tamper switches. All components shall be securely mounted, all cable routed and tie wrapped in a neat, professional manner.

C. Power supply/charger and batteries shall supply power limited 12 VDC operating and emergency power to the system. Power supply shall be regulated with a minimum output of 4 amps at 12 VDC. Provide AC power failure and low battery reporting. Provide detection and notification of battery disconnection or system ground faults. All external connections of the control panel shall withstand 6 kilovolt transients to chassis ground. Upon AC power failure, the power supply shall automatically transfer the system to battery backup. The batteries are to be completely maintenance free. No liquids are to be required. Fluid level checks for refilling, spills, and leakage shall not be required. Provide sufficient battery capacity for operation without AC power for twenty-four hours of normal supervision without alarm and four hours with one alarm event. Include a 20% safety factor in battery calculations to ensure adequate performance for the service life of batteries.

D. An unsecured "plug-in" transformer in an exposed electrical receptacle is not acceptable. All power supply components shall be located in a suitable, locked, electrical enclosure with front and rear tampers switches.

E. All wiring in the alarm panel shall be terminated on IDC (insulation displacement connection) or screw type terminal blocks. No splice-cap or wire-nut terminations shall be permitted. No more than two wires are to be terminated on any one terminal. Provide sufficient terminal blocks for terminating 12 VDC power cable to devices as required. If the number of termination or other devices required exceeds the recommended capacity of the main panel enclosure, provide additional terminal cabinets as required meeting the requirements of the main panel enclosure, including front and rear tamper switches and a lock keyed alike with the panel.

F. Panel shall be UL approved for ANSI/SIA CP-01-2010 with design features to reduce the incidence of false alarms.

G. Remote access to system programming and functions shall be limited by high security password procedures and encrypted codes.

H. Microprocessor based design panel shall support up to 32 programmable areas/partitions, each supporting perimeter and interior points and supervision of up to 16 keypads.

I. The panel shall be expandable to support for up to 238 alarm individually identified points. Each detection device shall feature a home run cable to the control panel and be connected to an individual system zone at the panel.

J. Each alarm zone shall represent a single sensor with an independently wired communication link to the alarm panel, the zones within a defined space or area shall be grouped into logical partitions.

K. Provide a minimum of two (2) relay closures (dry contact) on the main board, capable of expansion with programmable relay modules.

L. Provide an integrated analog digital communicator and/or an interconnected Internet and a cellular communication module (see below), to support alarm reporting with the capability of transmitting all major digital formats for central station monitoring, coordinate requirements with Owner. The communicator shall automatically initiate and complete a verifiable test signal at least every 24 hours to ensure correct operation.

M. The alarm contractor shall provide all activation circuits and the digital communicator and communication modules shall ready for programming by the monitoring service selected by the Owner. The alarm contractor shall coordinate with and provide all necessary information to the representative of the service selected by the Owner.

N. The Owner shall select the monitoring service, remote supervising station, or central station and be responsible for hook-up and monthly monitoring costs.

O. Manufacturer / Model: Provide a Bosch D9412GV4 security panel, no exceptions, including as requited:
   1. B529 SDI2 Power Supply.
   2. B420 Ethernet Communication Module.
   3. B450 SDI2 Conettix Plug-in Communicator Interface.
   4. B440 or B411 Cellular Communication Module as required for owner selected monitoring service.

5. D8125 Zonex Popex Expansion.
6. POPIT expansion modules as required.

2.8 KEYPADS

A. Provide remote alphanumeric LCD keypads for arming and disarming the Intruder Alarm System. Locate as indicated on plans.

B. Each keypad shall feature a 2-line 32-character display to provide individual zone alarm display with English language zone descriptions and status messages.

C. Each keypad shall feature 10 number keys, 7 function keys, and 6 navigation keys including programmable panic switches. . When pressed, keys turn on keypad backlighting and emit the key-press tone (short beep).

D. Each keypad shall include a built-in audible signal speaker to produce several distinct audible warning tones.

E. Keypad to be a SDI2 bus compatible device, note that SDI bus keypads are not acceptable due to limited functionality under GV4 Version 2.03 and later firmware.

F. Manufacturer / Model: Bosch B920, LCD Keypad, no exceptions.

2.9 AUXILIARY POWER SUPPLY

A. Provide as required auxiliary power supply(s) with battery backup, UL listed and labeled for burglary alarm systems.

B. The filtered and electronically regulated power output supply/charger and batteries shall supply additional power limited 12 VDC operating and emergency power to the system when the load from detectors or local alarms exceeds the capability of the power supply built in the main panel. Power supply shall provide a minimum output of 4 amps at 12 VDC. Provide AC power failure and low battery reporting. Provide low battery disconnection. Standby battery operation time shall equal or exceed the standby operation time of the main panel, in any case provide a minimum of 12-amp hours battery backup.

C. Provide a UL listed cabinet suitable for surface mounting. The cabinet and front shall be corrosion protected, given a rust resistant prime coat, and a painted standard finish. The back box and door shall be constructed of 0.060" minimum steel with provisions for electrical conduit connections into the sides and top. The cabinet shall provide storage for backup batteries. The door shall provide a key lock to access system components, key alike with main panel. The cabinet shall be attack resistant and fitted with front and back tamper switches. All components shall be securely mounted, all cable routed, and tie wrapped in a neat, professional manner.

D. Electrical Contractor to provide power through a 120 VAC, 20 amp beaker.

E. Manufacturer / Model: Provide Altronix Model Number AL400ULX auxiliary power supplies or approved equivalent.

2.10 LOCAL AUDIBLE ALARM SIGNAL

A. Audible alarm shall be an electronic siren with tamper and weatherproof enclosure. Interior alarms shall be mounted concealed above the lay-in ceiling or as required.

B. Shall be a 900 mA at 12VDC operating voltage, 36 watt rated speaker-horn with built-in electronic dual tone siren driver. The siren tone produced shall be distinctly different from the building fire alarm or other local emergency signals.

C. Provide a heavy gauge steel enclosure with baked enamel textured finish suitable for outdoor mounting. Enclosure shall feature two built-in tamper switches and a silicon fiber screen foam inhibiting device.

D. Manufacturer / Model: Provide Revere Industries Model Number RVL-36C/SRN electronic siren or approved equivalent.

2.11 DOOR SWITCHES

A. Provide door switches as indicated on floor plans with conduit run to a nearby, accessible, junction box located concealed above finished ceiling. Shall be dual contact Double Pole-Double Throw (DPDT) switches with wire leads to provide support both access and security system connections.

B. Steel or aluminum doors and frames flush mount: Provide recessed magnetic contact door switches, Interlogix 1076D-G recessed steel door contact with wire leads, 1" diameter, 0.50" gap size, DPDT, grey color or as required.

C. Overhead doors/roof hatches provide industrial wide gap surface mount magnetic contacts, Interlogix 2507AD-L aluminum housing armored cable contact, wide gap, 1.5" gap size, DPDT or as required. Size: Switch and magnet halves are each 3” long x 1” high x 0.5” deep.

2.12 MOTION DETECTORS

A. Provide dual technology, false alarm resistant - passive infrared and microwave sensors, surface, wall, or ceiling mount with brackets as required. All motion detectors shall combine heat and motion sensitive detection technologies, alarm activation only upon simultaneous activation of both fields of protection. The following model numbers are Bosch TriTech series, equivalent devices by other approved manufactures are acceptable. Where indicated on plans provide motion detectors as follows:

Range:	Bosch Model No.:
Broad 25' x 25'	Ds825 Wall/Ceiling Mount Standard Broad Range
Broad 40' x 40'	Ds840 Wall/Ceiling Mount Standard Broad Range
Broad 50' x 50'	Ds950 Wall/Ceiling Mount Standard Broad Range
Broad 60' x 60'	Ds960 Wall/Ceiling Mount Standard
Long 120' x 25'	Ds720i Wall/Ceiling Mount Optional Long Range
Broad 90' x 70”	Ds720i Wall/Ceiling Mount Standard Broad Range
Long 300' x 15'	Ds720i Wall/Ceiling Mount Standard Long Range
360° x 60' Radius	Ds9360 Panoramic Ceiling Mount (PIR and Microwave)
360° x 70' Radius	Ds9370 Panoramic Ceiling Mount (PIR and Microwave)
360° x 70' Radius	Ds9371 Panoramic Ceiling Mount (PIR and Microwave Black Housing)

2.13 CABINET/ENCLOSURE/PANEL TAMPER SWITCHES

A. Provide Interlogix model number NX-005 Tamper Switch and Bracket, GE Security model number 3025TM Self-Adjusting Tamper Terminal Contact, or equivalent as indicated to detect unauthorized opening of equipment enclosures.

2.14 CABLING (PLENUM RATED)

A. All cabling is to be concealed where construction permits.

B. This contractor shall provide and install new and unused ASTM bare stranded copper conductor wire per ANSI/NEMA codes. Follow the manufacturer's instructions. All wire shall the type recommended by the manufacturer for Intruder Alarm System applications.

C. All cable shall have labels on both ends utilizing self-laminating, flexible vinyl film and non-smear nylon marking pens. Utilize Tyton Corporation Part No. RO175 Rite-On labels and Part No. FTP1 nylon marking pens or equivalent.

D. All cable ran in underground conduit and overhead conduit in open areas shall be West Penn Wire Aquaseal, or equivalent outdoor/wet location rated.

E. All two-conductor wiring for sensor circuits shall be West Penn Wire No. 25221B, 22 AWG stranded, NEC type CMP, plenum cable (Outdoor West Penn Wire Aquaseal No. AQC291 or equivalent).

F. All four-conductor wiring for sensor circuits shall be West Penn Wire No. 25241B, 22 AWG stranded, NEC type CMP, plenum cable (Outdoor West Penn Wire Aquaseal No. AQC430 or equivalent).

G. All six-conductor wiring for sensor circuits shall be West Penn Wire No. 25270B, 22 AWG stranded, NEC type CMP, plenum cable (Outdoor West Penn Wire Aquaseal No. AQC439 or equivalent).

H. All eight-conductor wiring for sensor circuits shall be West Penn Wire No. 25271B, 22 AWG stranded, NEC type CMP, plenum cable (Outdoor West Penn Wire Aquaseal No. AQC439 or equivalent).

I. All wiring for signal circuits shall be West Penn Wire No. 25226B, 14 AWG stranded, NEC type CL2P, two-conductor plenum cable (Outdoor West Penn Wire Aquaseal No. AQC226 or equivalent).

J. All wiring for power/alarm circuits shall be West Penn Wire No. 25244B, 18 AWG stranded, NEC type CMP, two-conductor plenum cable (Outdoor West Penn Wire Aquaseal No. AQC224 or equivalent).

K. All wiring for keypad circuits shall be West Penn Wire No. 25357B, 22 AWG/four-conductor stranded, NEC type CMP plenum cable, one pair shielded, one pair unshielded, or as recommended by the keypad manufacturer.

L. Equivalent products by Belden or Carol.

2.15 CABLE TIES (PLENUM RATED)

A. HALAR Fluoropolymer plenum rated cable ties shall be furnished and installed to attach wire bundles to supports and for appropriate wire management as required.
1. HALAR wire tie, 4.0”, miniature - Panduit PLT1M-C702 or equivalent.
2. HALAR wire tie, 7.4”, standard - Panduit PLT2S-C702 or equivalent.
3. HALAR wire tie, 11.6”, standard - Panduit PLT3S-C702 or equivalent.

2.16 CABLE ROUTING, INSTALLATION, AND SUPPORT

A. System wiring and equipment installation shall be in accordance with good engineering practices as established by the NEC and the TIA/EIA. Wiring shall meet all state and local electrical code requirements.

B. All wiring shall test free from opens, grounds, or shorts. All communication cable shall be supported from the building structure and bundled. Do not attach any supports to joist bridging or other lightweight members.

C. Cable pathways, conduit, and cable support systems shall be complete with bushings, de-burred, cleaned, and secure prior to installation of cable.

D. The support system shall provide a protective pathway to eliminate stress that could damage the cabling. The cable shall not be crushed, deformed, skinned, crimped, twisted, or formed into tight radius bends that could compromise the integrity of the cabling.

E. In all exposed areas such as gymnasiums, shops, field houses, janitors’ closets, or mechanical / electrical rooms all communication cable shall be fully enclosed in conduit.

F. Communication cables shall be run in conduit stubs from wall boxes to accessible areas above finished ceilings. Conduit shall be required only within walls and concealed spaces to provide access.

G. Provide bushings to protect the cable from damage for conduit ends, box openings, and passage through metal studs.

H. Communication cables shall be run in bundles above accessible ceilings and supported from building structure. Cabling shall be loosely bundled with cable ties randomly spaced at 30 to 48 inches on center, cable ties shall not be tight enough to deform cabling and shall not be used to support the cabling.

I. Communication cable must not be fastened to electrical conduits, mechanical ductwork/piping, sprinkler pipes, or routed to obstruct access to hatches, doors, utility access panels, or service work areas. Do not route cables through fire doors, ventilation shafts, grates, or parallel for more than four-feet with line voltage electrical conductors. Communication cables shall not be run loose on ceiling grid or ceiling tiles.

J. Support shall be provided by mounting appropriate fasteners that may be loaded with multiple cables. Provided that the weight load is carried by the support rod or wire, the support assembly may attach to the ceiling grid for lateral stabilization. The required support wires for the ceiling grid or light fixtures shall not be utilized. Any fastener attached to the ceiling grid shall not interfere with inserting or removing ceiling tiles. The cable pathway of supports must be positioned at least 12 inches above the ceiling grid.

K. All cabling shall be placed with regard to the environment, EMI/RFI interference, and its effect on communication signal transmission.

L. Do not route any Intruder Alarm System cable within two feet of any light fixture, HVAC unit, service access area, electric panel, or any device containing a motor or transformer.

M. Communication cable will not be installed in the same conduit, raceway, tray, duct, or track with line voltage electrical cable without a metallic barrier meeting NEC requirements.

N. Maximum cable pulling tension should not exceed 25 pound-force (110 N) or the manufactures recommendation, whichever is less.

O. Any pulling compounds utilized must be approved by the cable manufacturer and shall not degrade the strength or electrical characteristics of the cable.

P. No terminations or splices shall be installed in or above ceilings.

Q. Cable bends shall not be tighter that the manufacturers' suggested bend radius.

R. Mount all equipment firmly in place such that vibration or jarring will not activate an alarm, supervisory, or trouble signal. Route cable in a professional, neat, and orderly installation.

S. All cable shall have a label on both ends utilizing self-laminating, flexible vinyl film and non-smear nylon marking pens. Utilize Tyton Corporation Part number RO175 Rite-On labels and Part number FTP1 nylon marking pens or equivalent.

T. Each cable run shall include a three-foot service loop with wire tie located in the ceiling above the control unit panel. This is to allow for future re-termination or repair.

U. Provide for adequate ventilation to all equipment racks and take precautions to prevent electromagnetic or electrostatic hum.

V. All conduit, ducts, track, and raceways shall be supported from the structure at industry standard intervals for the size specified, utilizing proper anchoring devices. Cable fill may not exceed the manufacturers' instructions for each type of support.

W. Devices mounted on a drop ceiling shall feature a back box fitted with a support hanger (Caddy #512 or #512A for deep boxes), or equivalent with independent drop wires to support the weight of the device.

2.17 TERMINATION PRACTICES

A. Strip back only as much cable jacket as required to terminate.

B. Preserve wire twists as closely as possible to point of termination (0.5" maximum) to keep signal impairment to a minimum.

C. Avoid twisting cable jacket during installation.

2.18 BUSHINGS

A. Provide a plastic snap in bushing at each box opening, passage through a metal stud, and at the end of all open conduit stubs or sleeves prior to cable installation to protect the cabling from damage:
   1. Box openings - Thomas & Betts Knockout Bushing Series 3210, or equivalent
   2. Metal stud passage - Thomas & Betts Twist It Bushing Catalog Number SB1216-SC, or equivalent
   3. Conduit ends - Thomas & Betts Anti-Short Bushing Series 390 or Tite-Bite Combination couplings Series 442, or equivalent

2.19 CEILING MOUNTED DEVICE BOX HANGERS

A. All ceiling mounted devices including when mounted in a drop ceiling shall be supported by an electrical box hanger (Caddy #512 or #512A for deep boxes - 24" span), or equivalent. Box hangers shall be attached to the ceiling grid only for lateral stabilization, separate support wires shall be provided. The required support wires for the ceiling grid or light fixtures shall not be utilized. The backbox shall be flush and level with the bottom of the ceiling tile and the hole neatly cut for a finished appearance when the device is installed.

B. Device and box hanger assemblies shall not be supported solely by suspended ceilings. Fasteners and supports shall be adequate to support the required load.

2.20 J-HOOKS

A. Attachments for cabling support shall be spaced at approximately 48 to 60 inches on center. The cable bundle shall not be allowed to sag more than 12 inches mid-span between attachments. Attachments shall be sized as follows:

   Single cables or bundles up to four cables may be supported directly by the building structure.

Bundles up to 1/2" dia. (Ten 1/4" cables)	2" bridle ring, Caddy #4BRT32, or equivalent
Bundles up to 3/4" dia. (Sixteen 1/4" cables)	3/4" J-Hook, Caddy #CAT12 or equivalent
Bundles up to 1-5/16" dia. (Fifty 1/4" cables)	1-5/16" J-Hook, Caddy #CAT21 or equivalent
Bundles up to 2" dia. (Eighty 1/4" cables)	2" J-Hook, Caddy #CAT32 or equivalent

   Split bundles greater than 2" dia. or provide cable tray.

B. Do not mix different signal strength cables on the same J-Hook (i.e. Intruder Alarm System with telephone/data cable). Multiple J-Hooks can be placed on the same attachment point, up to the rated weight load of the attachment device.

2.21 COMMUNICATIONS CIRCUIT SURGE PROTECTION

A. Provide surge protection shall be provided for all exterior devices, communications service or antenna entrance connections, and for each circuit that connects one building to another (i.e. any other portion of a building complex not under one continuous roof) at both entry/exit points to prevent damage to equipment.

B. Each surge protector shall be mounted in a standard grounded metallic electric box or equipment backboard with a separate ground wire ran directly to the ground bus bar or equipment panel ground stud, do not daisy chain ground wires.

C. Surge protectors for low voltage communications signal and control circuits with a data rate from 200kbps to 2Mbps, nominal voltage as listed below AC or DC. Each module shall protect up to two pairs using hybrid design multi-stage SAD technology, shall be Ditek 2MHLP series field replaceable modules with MB Series mounting bases for one to five modules, or equivalent, model numbers as follows:
   1. 70 to 75 Volt circuit, 4 wire protector with base DTK-2MHLP75BWB.
   2. 48 to 50 Volt circuit, 4 wire protector with base DTK-2MHLP48BWB.
   3. 36 Volt circuit, 4 wire protector with base DTK-2MHLP36BWB.

4. 24 Volt circuit, 4 wire protector with base DTK-2MHLP24BWB.
5. 12 Volt circuit, 4 wire protector with base DTK-2MHLP12BWB.
6. 0 to 6 Volt circuits, 4 wire protector with base DTK-2MHLP5BWB.

D. Surge protectors for low voltage communications high data rate voice, data and signaling data and loop circuits, or serial communication, nominal voltage as listed below AC or DC. Each module shall provide Line-Ground (All) protection modes, maximum surge current: 2,000 Amps per pair (6V-50V) or 9,000 Amps per pair (75V-130V), and maximum continuous current: 5 Amps to 0.15 Amps, shall be Ditek LVLP series or equivalent, model numbers as follows:
1. 115 to 130-Volt circuit, 2-pair protector, 10-12 AWG, DTK-2LVLAWGRUV.
2. 95-Volt circuit, 2-pair protector, 10-12 AWG, DTK-2LVLAWGSGR.
3. 75-Volt circuit, 2-pair protector, 10-12 AWG, DTK-2LVLAWGSPK.
4. 48 to 50-Volt circuit, 2-pair protector, 16-22 AWG, DTK-2LVLPOPX.
5. 24 to 30-Volt circuit, 2-pair protector, 16-22 AWG, DTK-2LVLPLV.
6. 12 to 14-Volt circuit, 2-pair protector, 16-22 AWG, DTK-2LVLPX
7. 0 to 6-Volt circuit, 2-pair protector, 16-22 AWG, DTK-2LVLPD.
8. 0 to 6-Volt circuit, 8-pair protector (RS-485, RS-232), 16-22 AWG, DTK-8LVLPLVD.

E. Surge protectors for Ethernet network runs rated up to Category 6A and operating at up to 10-Gigabit data rates. Each module shall protect up all four pairs using hybrid design multi-stage SAD technology which shall automatically reset to protect against multiple surges, Ethernet surge protectors shall be Ditek DTK-CAT6A series as follows:
1. DTK-110RJC6APOE with 110 to RJ-45 connections with PoE.
2. DTK-110C6APOE with 110 to 110 connections with PoE.
3. DTK-110RJC6A with 110 to RJ-45 connections without PoE.
4. DTK-110C6A with 110 to 110 connections without PoE.

F. Surge protectors for analog copper pair PSTN telephone service POTS/Trunk/C.O. line alarm Digital Communicator service lines shall be Ditek DTK-2MHTPWB, or equivalent, 2-pair/lines, maximum ring-up voltage 110V, includes base. In addition, At Telco service connection demarcation point locations servicing an alarm Digital Communicator, provide per line a Suttle Solutions Part # 635B-48, or equivalent, RJ31X surface mount jack with 8-conductor screw terminal board input and factory wired DATA and VOICE labeled, non-keyed RJ-45 output ports, with line seizure port shorting bar (1&4, 5&8) for alarm reporting device service.

2.22 FIRE STOPPING, DRAFT/NOISE STOPPING, PENETRATIONS, AND CORING

A. UL Listed fire stopping methods that match the fire rating of the wall or floor being penetrated are to be used at all fire barrier penetrations. Seal the interior of the conduit sleeve around the cables and around the outside of the sleeve on each side of the penetration with fire-stop caulk or putty, install according to the manufacturers' instructions.

B. All penetrations through fire rated walls or floors shall feature a suitable length of metal conduit. Hole diameter shall not exceed ½" larger than the conduit or sleeve to be installed. The hole shall be neatly cut and not oversize or irregular. Do not share wall/floor penetrations with ductwork, piping, line voltage electrical conduits, et cetera.

C. All gypsum board or plaster penetrations shall tool cut using an appropriate hole saw / mandrel or manufactured assembly.

D. Draft/Noise Stopping - All penetrations through non-rated walls shall include draft/noise stopping to minimize the transfer of air and sound between enclosed areas. This shall include but not limited to:
1. Neatly cutting all non-rated wall penetrations with a 1" maximum clearance. All gypsum board or plaster penetrations shall be tool cut using an appropriate hole saw / mandrel or manufactured assembly. The hole shall be neatly cut and not oversize or irregular. Do not share wall penetrations with other types of ductwork, piping, line voltage electrical conduits, communications cabling, etc.
2. Provide and install non-combustible mineral wool, fiberglass, cellulose insulation, caulk, and/or sealant as required. Seal the interior of conduit sleeves around the cables and around the outside of the sleeve on each side of the penetration with caulk or putty, install materials according to the manufacturers' instructions.

E. The Contractor shall make every effort to coordinate with the building Architect, Owner, Engineer, Builder, and Electrical Contractor to have sleeves placed in new construction so that later coring or drilling of building structural members will not be required. The Contractor must consult with the building Architect, Owner, Engineer, and Builder prior to drilling, coring, or sawing of any wall, floor, et cetera. All penetrations shall be made at approved, appropriate, locations.

F. Upon approval, the contractor shall be required to supply all labor, equipment, tools, and materials to create any additional penetrations, and shall provide the sleeve, temporary and final fire stopping. Special care shall be taken not to stress, overheat, or penetrate any building support member. Coring shall be made with equipment appropriate for the dry penetration of concrete and block materials. Under no circumstances shall penetrations be made utilizing a chisel or percussion type equipment. Concrete, block, or plaster cores shall be made by dry saw/core methods only.

PART 3 – EXECUTION

3.1 DEMOLITION OF THE EXISTING PREMISES INTRUDER ALARM SYSTEM FOR RENOVATION

A. The system contractor shall be responsible for removal of the existing system in its entirety. This shall also include demolition of any devices and cable previously abandoned. Demolition shall include disconnection and removal of all panels, devices, cable and disposed of off-site, in a legal manner, of all materials not requested to be turned over to the Owner. Demolition also includes all cable, cable supports, and conduits. Comply with government regulations pertaining to environmental protection, and disposal of materials and equipment. Do not burn any materials on the site.

3.2 EXAMINATION

A. Verify existing field conditions, circuiting arrangements, cabling, and devices served in areas as shown on the Drawings. Adjust all circuiting, cabling, and materials to be provided as required by job conditions.

B. Identify and verify abandoned equipment, wiring, and devices. All visible disconnected or abandoned devices and cabling shall be removed.

C. Drawings are based on casual field observation and existing record documents. Report discrepancies to the Engineer before disturbing existing installation.

D. The Contractor accepts the existing conditions when beginning demolition.

3.3 PREPARATION

A. Disconnect premises intruder alarm system devices in walls and ceilings as shown or required.

B. Provide temporary wiring and connections as required to maintain the operation of existing systems during construction.

C. When work must be performed on energized equipment or circuits, use personnel experienced in such operations. Verify phasing on existing equipment and coordinate new phasing before energizing revised service.

D. Remove, relocate, and extend existing installations to accommodate new construction as required.

E. Remove abandoned wiring to the source of the supply.

F. Remove exposed abandoned conduit, including abandoned conduit, brackets, stems, hangers, and other accessories above accessible ceiling finishes. Cut conduit flush with walls, floors, and patch surfaces.

G. Disconnect and remove abandoned devices. Remove abandoned devices if conduit servicing them is abandoned and removed. Provide blank cover for abandoned devices that are removed in masonry construction.

H. Repair adjacent construction and finishes damaged during demolition and extension work.

I. Confirm with Owner/Architect regarding the handling and disposal/reuse of removed material, equipment, devices, et cetera.

3.4 OPERATION PRIOR TO COMPLETION

A. When the phasing of a project requires that Intruder Alarm Systems are operable in certain areas and the Owner needs to operate the equipment, such provisions shall be made by the contractor. The warranty period shall commence when the equipment is operated for the beneficial use of the Owner. Regardless of whether or not the equipment has or has not been operated, the Contractor shall properly clean the equipment, properly adjust, and complete all punch list items before final acceptance by the Owner. The date of acceptance and the start of the warranty may not be the same date.

3.5 TESTING, WARRANTY, SERVICE

A. A factory trained representative of the manufacturer shall supervise the final connections and testing of the system and it shall be subject to the final acceptance of the Architect/Engineer and Owner.

B. The Intruder Alarm System Contractor shall make a thorough inspection and test of the complete installed Intruder Alarm System including all components such as motion detectors, and controls, to ensure the following:
1. Complete and functional system.
2. Installed in accordance with manufacturer's instructions.
3. Confirm at the panel, with an ohmmeter, that each zone has an end of line resister properly installed.
4. Each of the alarm conditions that the system is required to detect should be introduced on the system, including disconnection to the telephone line.
5. A walk test to confirm that each detector is located and properly aimed for the intended coverage area.
6. Verify that all tripped devices display the correct zone identification at the keypads.
7. Verify the proper processing of the signal at the panel and the correct activation of local alarms and the digital communicator.

C. The contractor shall provide a warranty of the installed system against defects in material or workmanship for a period of one (1) year from the date of substantial completion. Any equipment or wiring shown to be defective shall be replaced, repaired, or adjusted free of charge. All labor and materials shall be provided at no expense to the Owner. All equipment will carry a one-year warranty or manufacturer's warranty whichever is greater.

D. The contractor shall provide a warranty of all newly installed system devices and cabling against defects in material or workmanship for a period of one (1) year from the date of substantial completion. Any new equipment or cabling shown to be defective shall be replaced, repaired, or adjusted free of charge. All labor and materials shall be provided at no expense to the Owner. All new equipment will carry a one-year warranty or manufacturer's warranty whichever is greater.

3.6 DRAWINGS, MANUALS, AND TRAINING

A. Upon completion of the installation, and prior to final inspection, the Security Contractor shall furnish four (4) hard copies and one (1) electronic CAD and PDF copy on CD-R of as-built drawings. In addition, the Security contractor shall furnish four (4) hard copies and one (1) electronic PDF copy on CD-R of a complete operating and maintenance manuals listing the manufacturer's name(s), including technical data sheets. Manuals shall include wiring diagrams to indicate internal wiring for each device and the interconnections between the items of equipment. Provide the Owner a copy of the panel control software including the licensed program, site specific data file, and passwords that the Owner may require to maintain the system. Provide a clear and concise description of operation that gives, in detail, the information required to properly operate the equipment and system. Provide a parts list with manufacturer and model number for commonly replaced parts. Include complete instructions for the inspection, testing, and maintenance of the system. Include copies of all programming sheets used to configure the system.

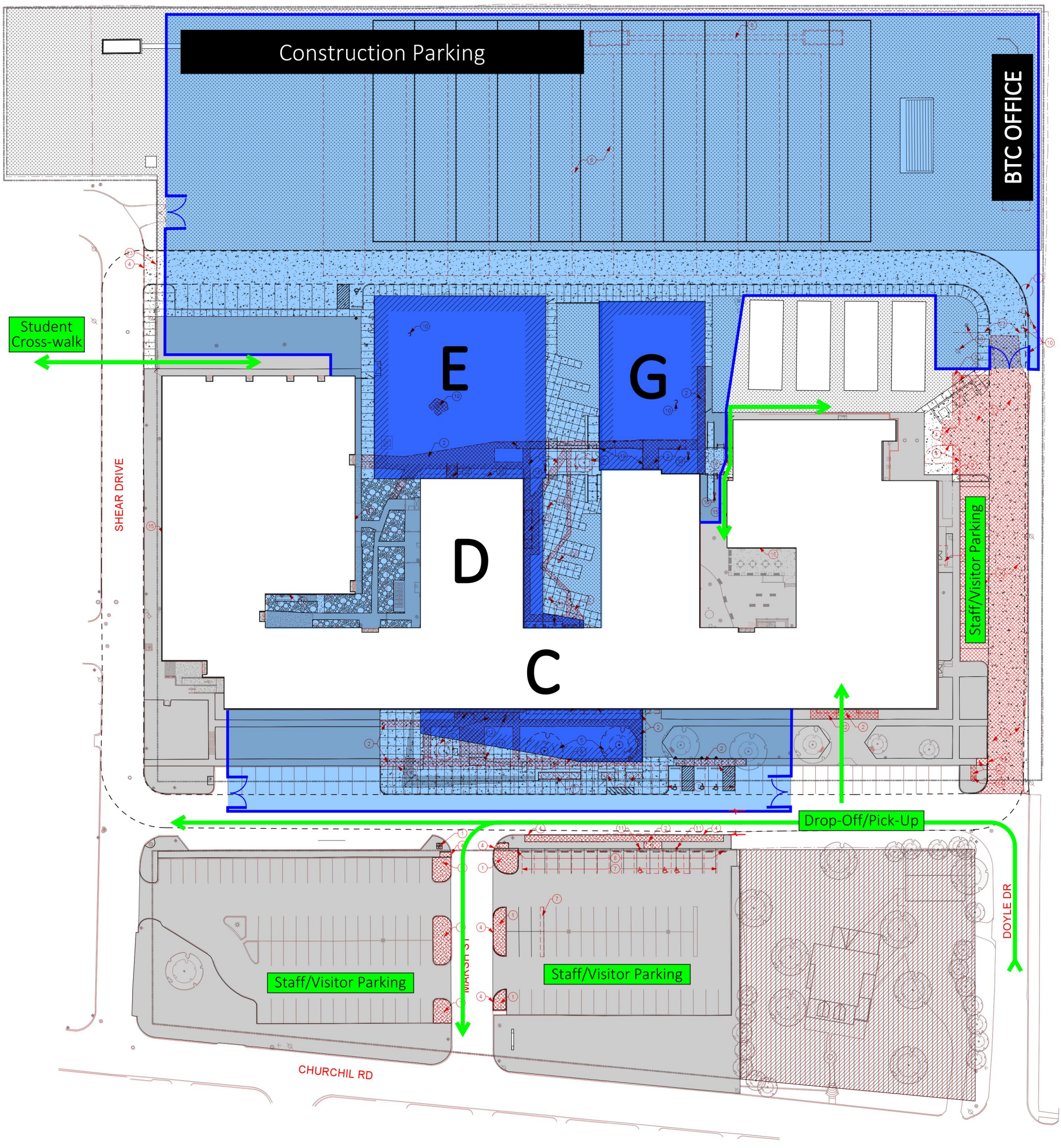
B. Provide the Owner a copy of the panel control software including the licensed program, site specific data file, and passwords that the Owner may require to maintain the system.

C. Formal on-site training sessions shall be conducted by the Intruder Alarm System contractor. It shall be the responsibility of the Contractor to coordinate time and location of training sessions with the Owner. Provide documented general instruction as follows:
   1. Provide instruction to the maintenance personnel to include the location, inspection, maintenance, testing, and operation of all system components. Provide a minimum of four (4) hours—two 2-hour sessions separated by a minimum of two weeks.
   2. Provide instruction to designated personnel on the functions and operation of the Intruder Alarm System including zoning, capabilities, limitations, monitoring, and the meaning of status messages. State the proper procedure for testing, routine maintenance, and request for service. Provide detailed instruction on the operation of the keypad including arming, disarming, adding users, deleting users, and changing passwords. Provide a minimum of four (4) hours—two 2-hour sessions separated by a minimum of two weeks.

END SECTION

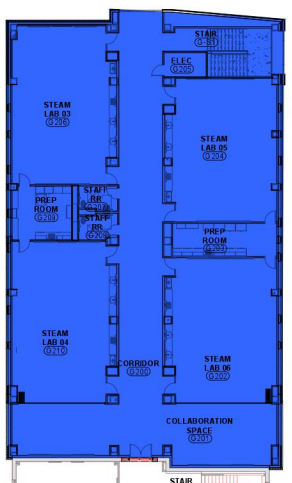
PHASE 1 (JAN - MAY 2019)

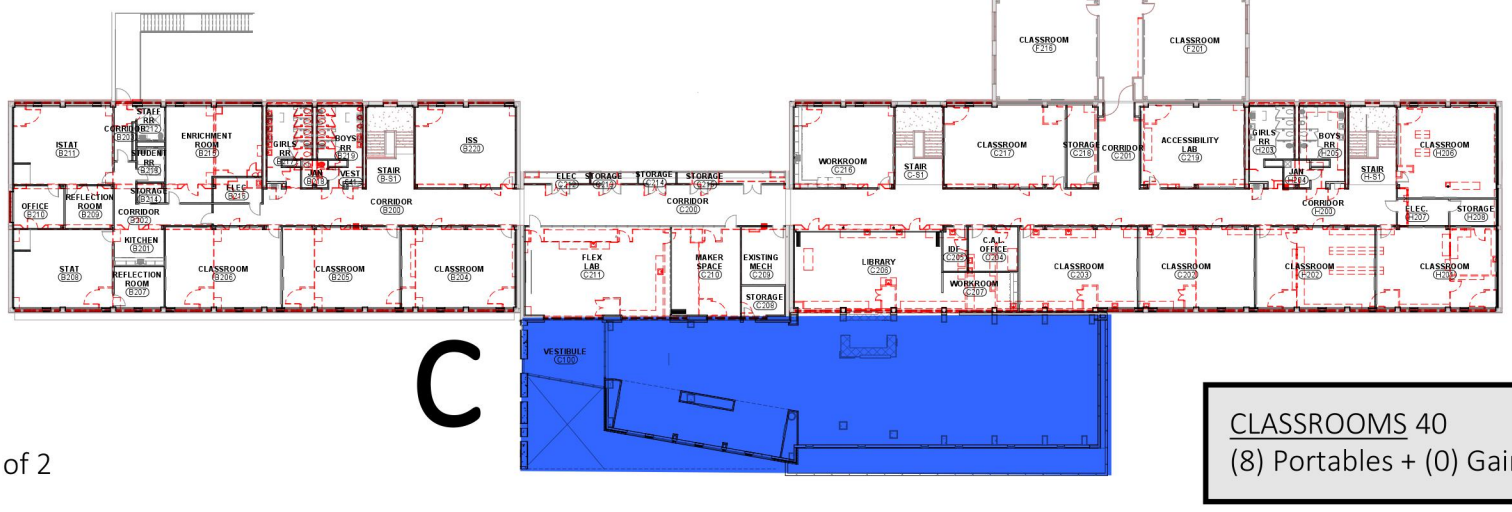
Areas Under Construction
Temporary Fencing
Staff/Student Pathways



PHASE 1 (JAN - MAY 2019)

New Construction (47k SF)
Renovations
Completed Areas
Staff/Student Pathways

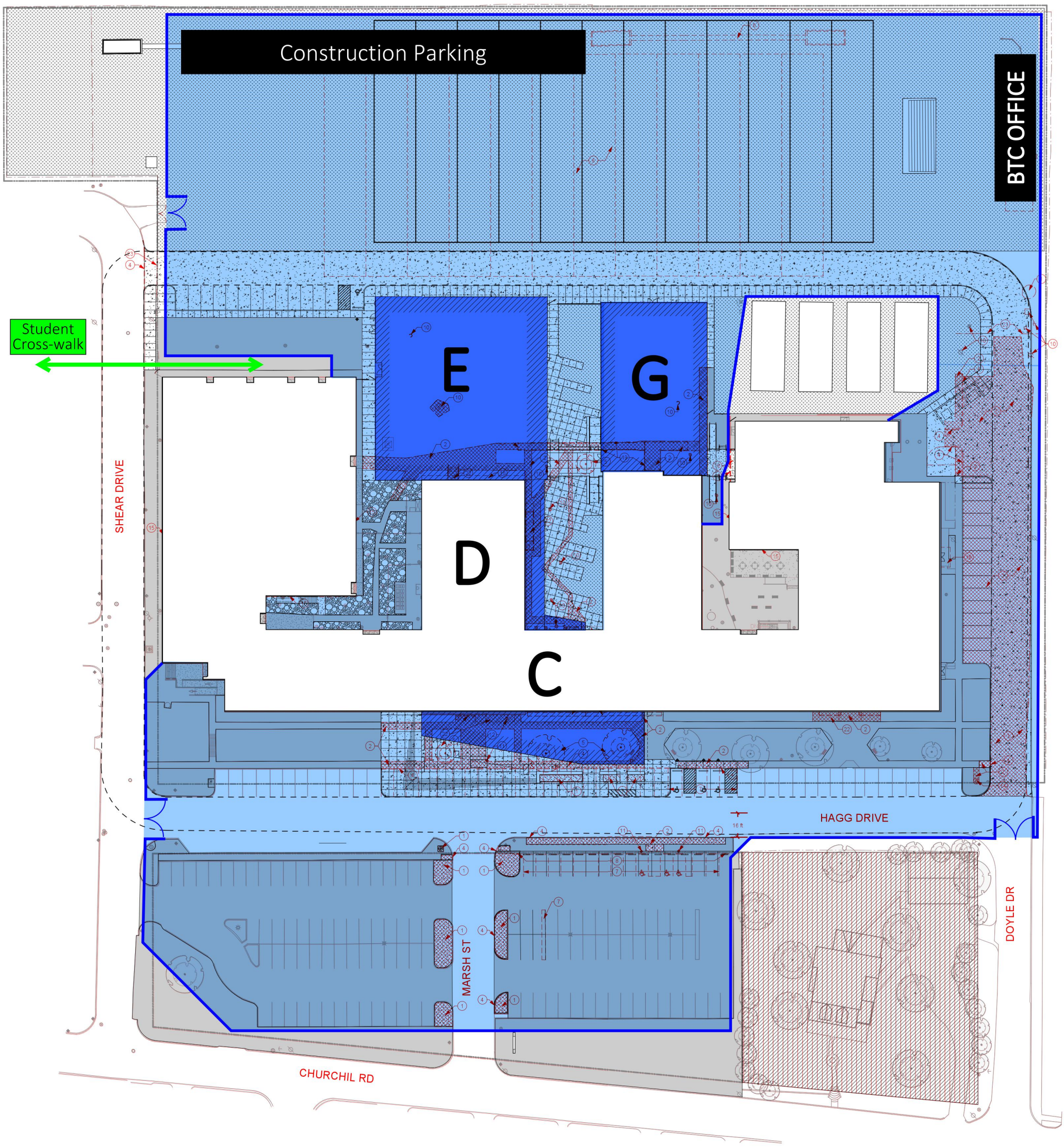




CLASSROOMS 40
(8) Portables + (0) Gained - (0) Lost = (48) Total

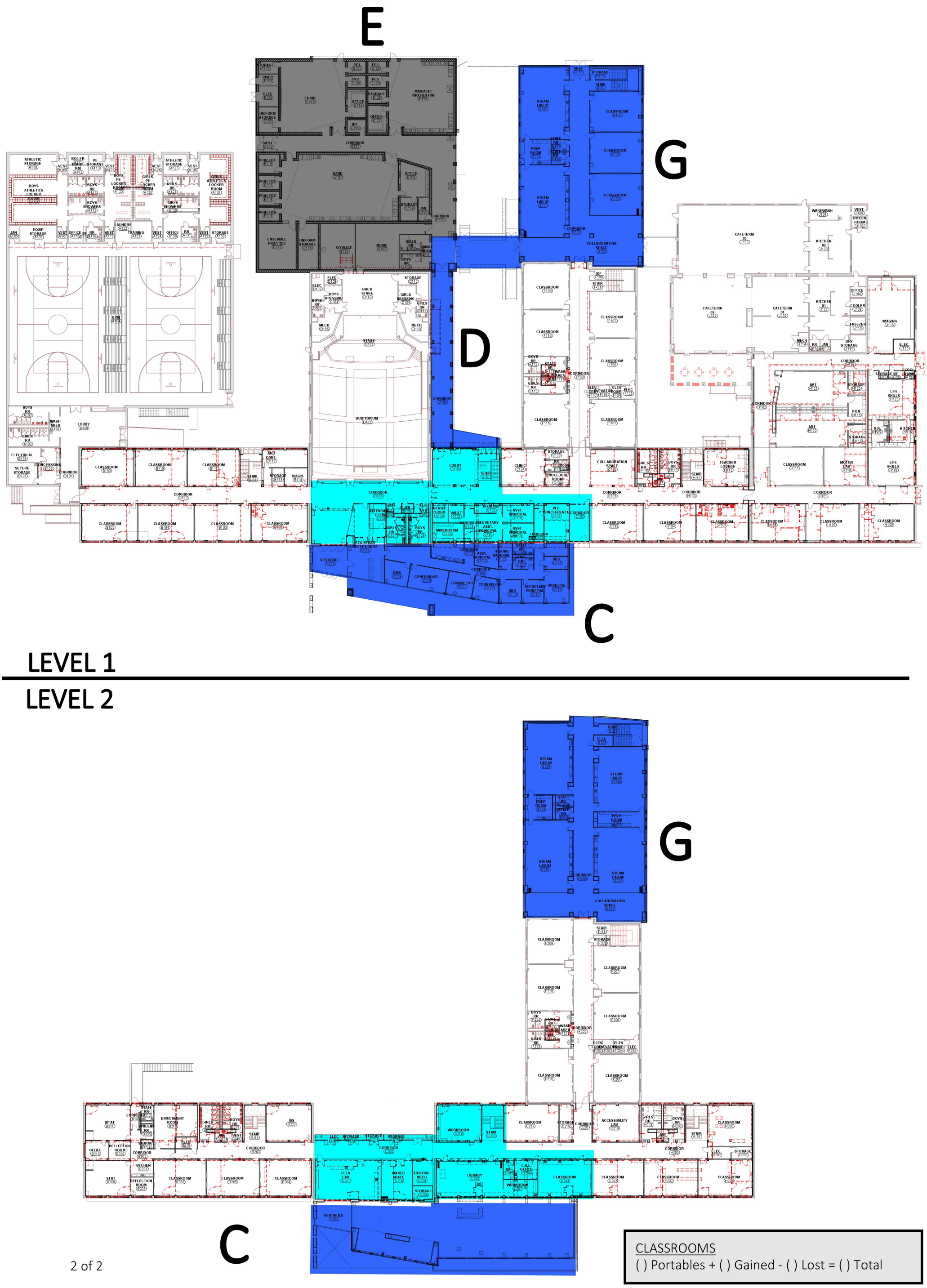
PHASE 2 (JUNE - AUG 2019)

Areas Under Construction
Temporary Fencing
Staff/Student Pathways



PHASE 2 (JUN - NOV 2019)

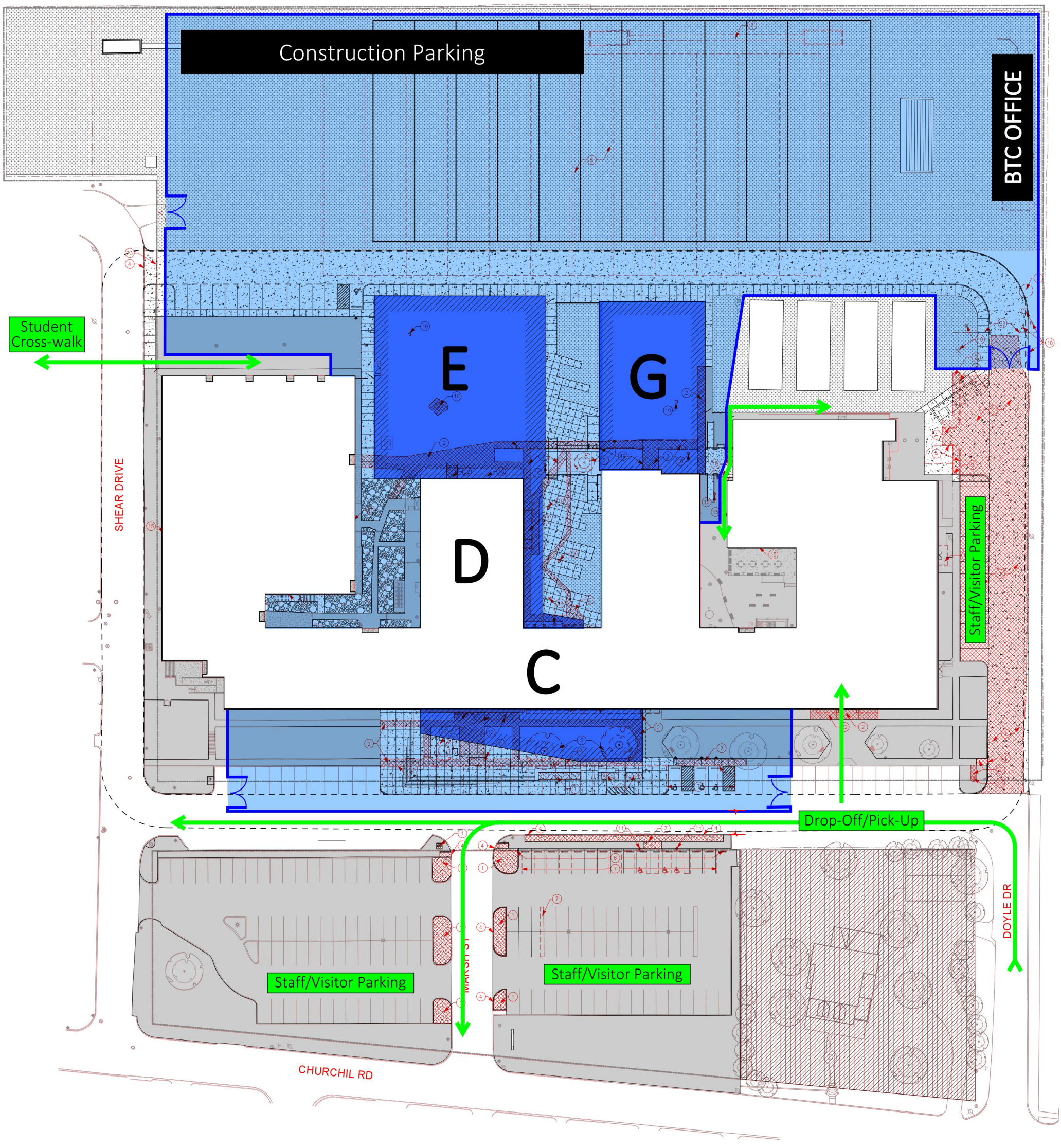
New Construction (47k SF)
Renovations (18k SF)
Completed Areas
Staff/Student Pathways



CLASSROOMS
( ) Portables + ( ) Gained - ( ) Lost = ( ) Total

PHASE 3 (SEPT - NOV 2019)

Areas Under Construction
Temporary Fencing
Staff/Student Pathways



PHASE 3 (DEC - MAR 2020)

New Construction (18k SF)
Renovations (12k SF)
Completed Areas
Staff/Student Pathways

TURN OVER (D & E)
in JANUARY 2020

E

Temporary Wall

Temporary Wall

Temporary Wall

H

H

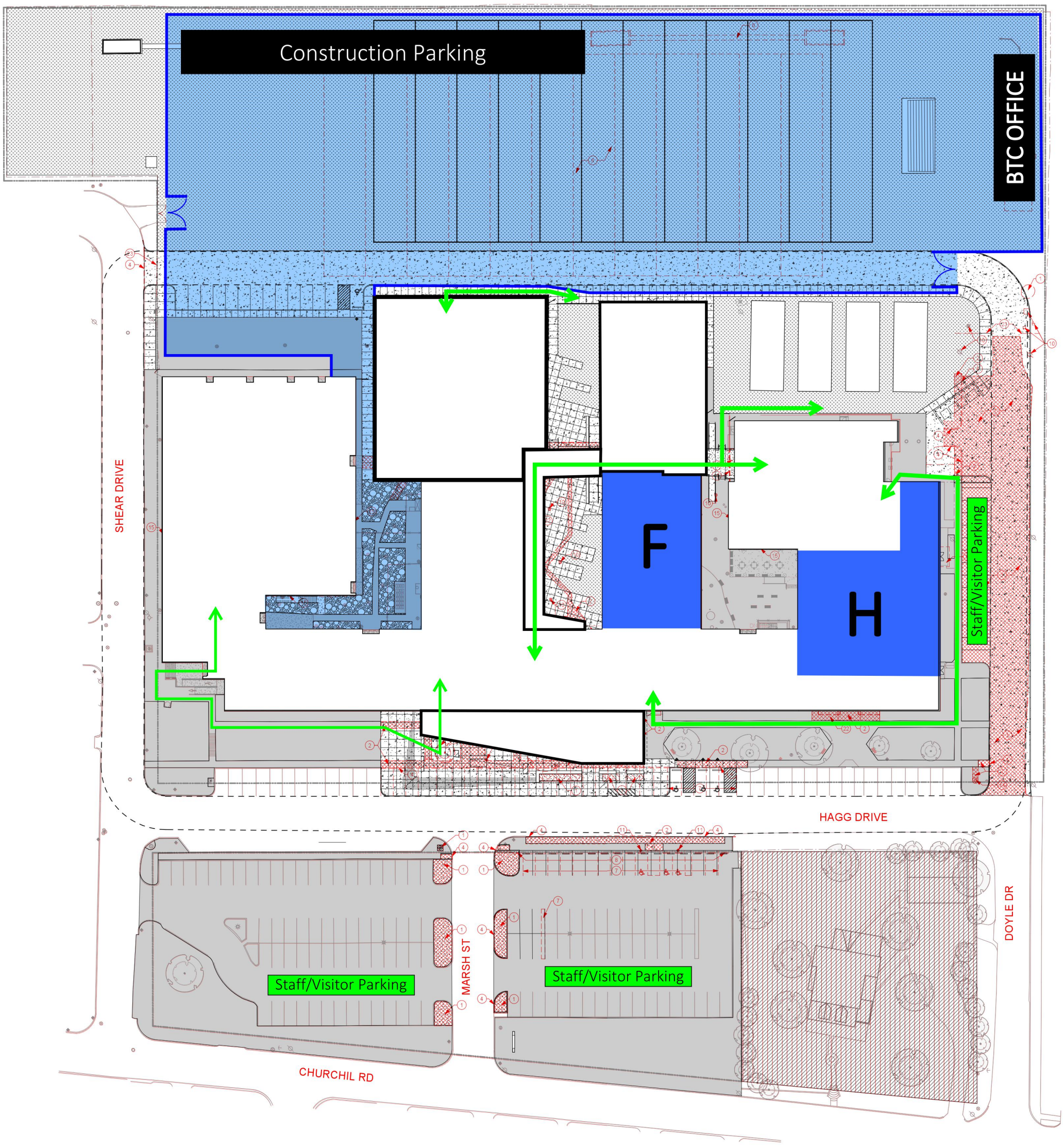
LEVEL 1

LEVEL 2

CLASSROOMS 40
(8) Portables + (11) Gained - (13) Lost = (46) Total

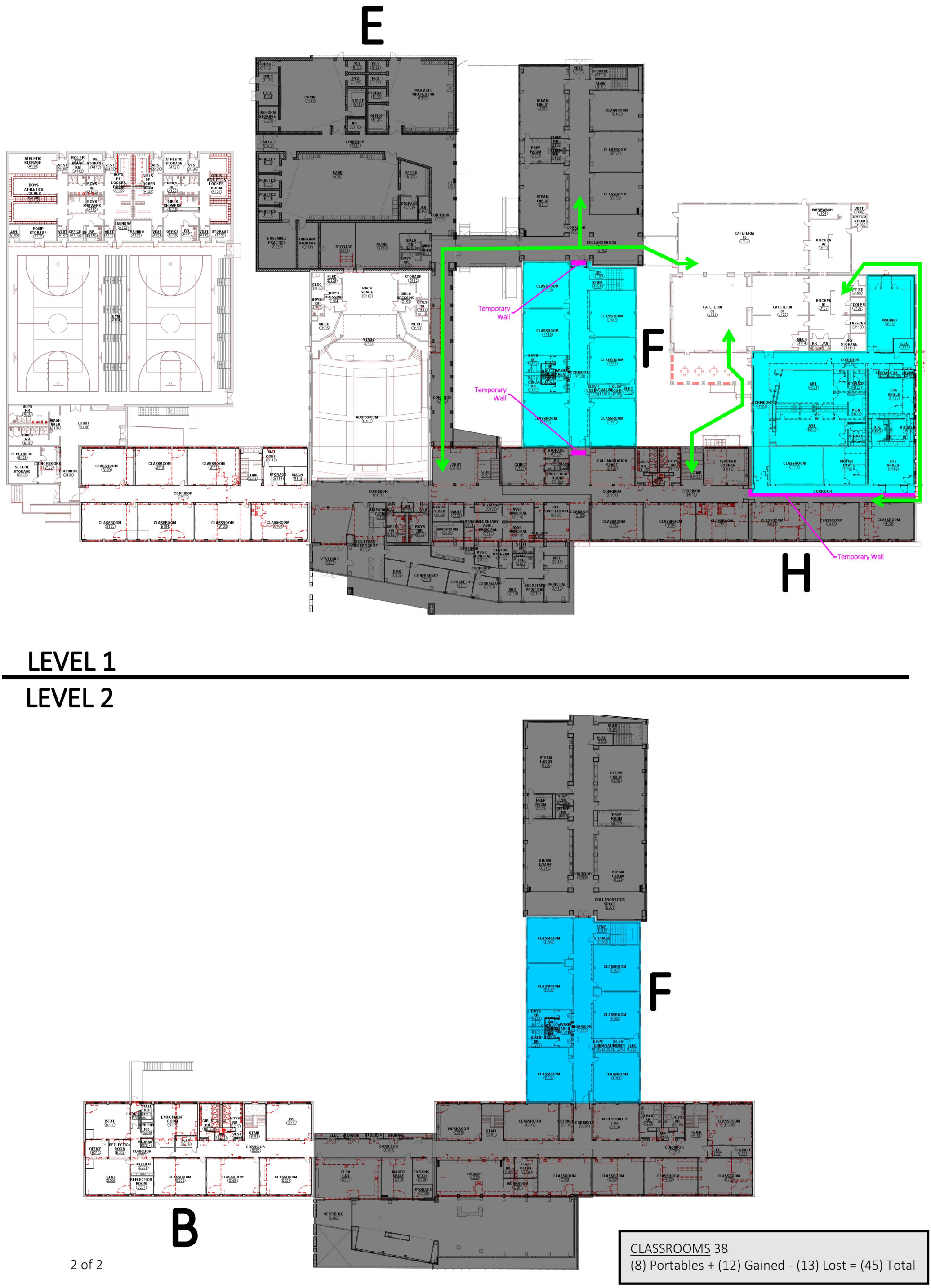
PHASE 4 (DEC - MAR 2020)

Areas Under Construction
Temporary Fencing
Staff/Student Pathways



PHASE 4 (MAR - JUN 2020)

New Construction
Renovations (25k SF)
Completed Areas
Staff/Student Pathways



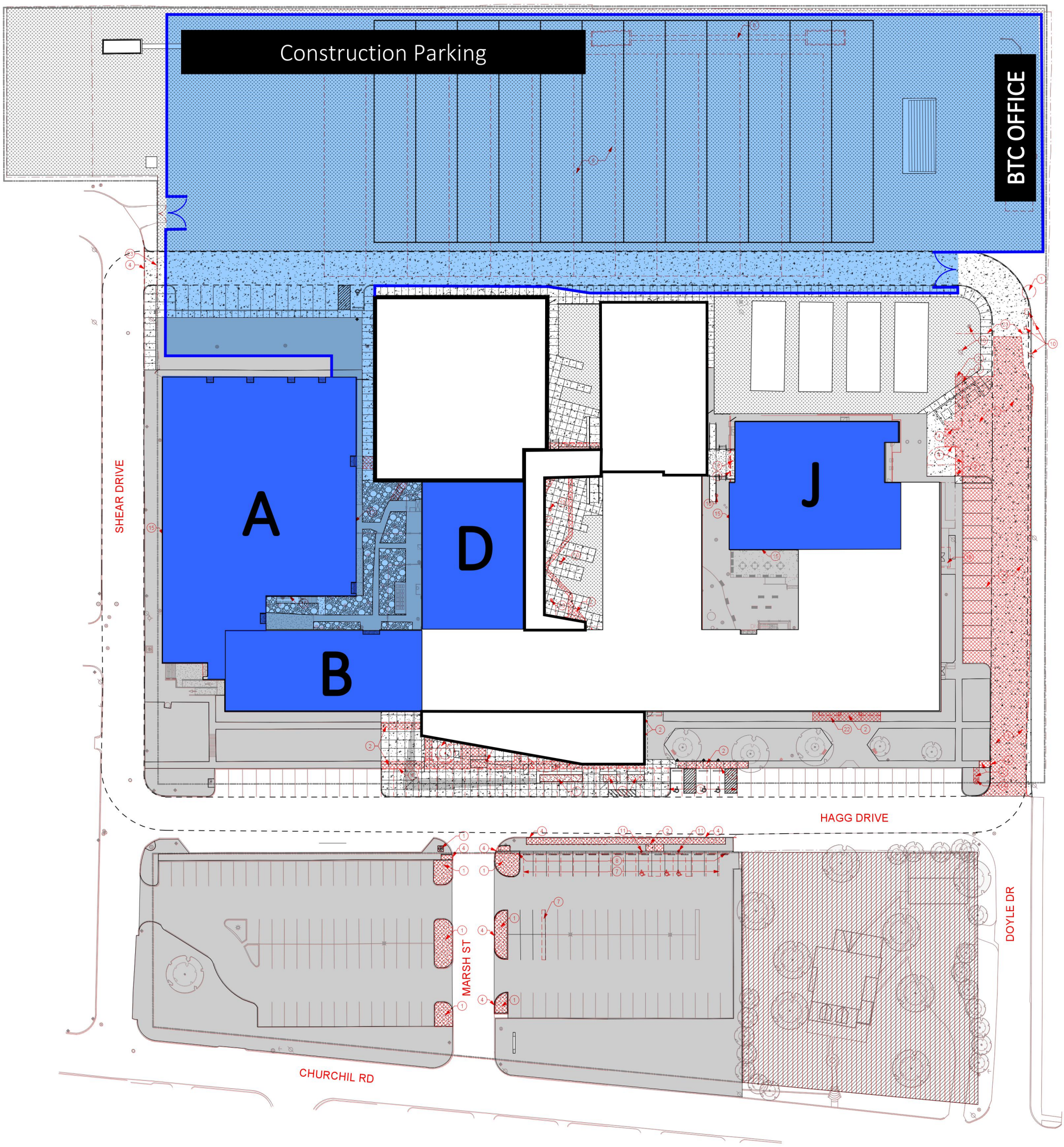
LEVEL 1

LEVEL 2

CLASSROOMS 38
(8) Portables + (12) Gained - (13) Lost = (45) Total

PHASE 5 (MAR - AUG 2020)

Areas Under Construction
Temporary Fencing
Staff/Student Pathways

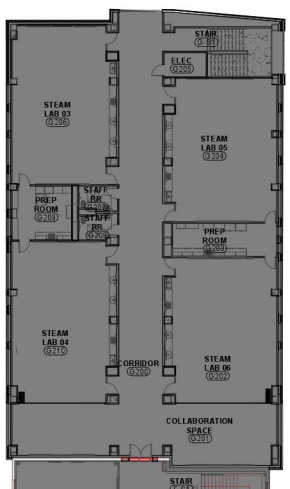


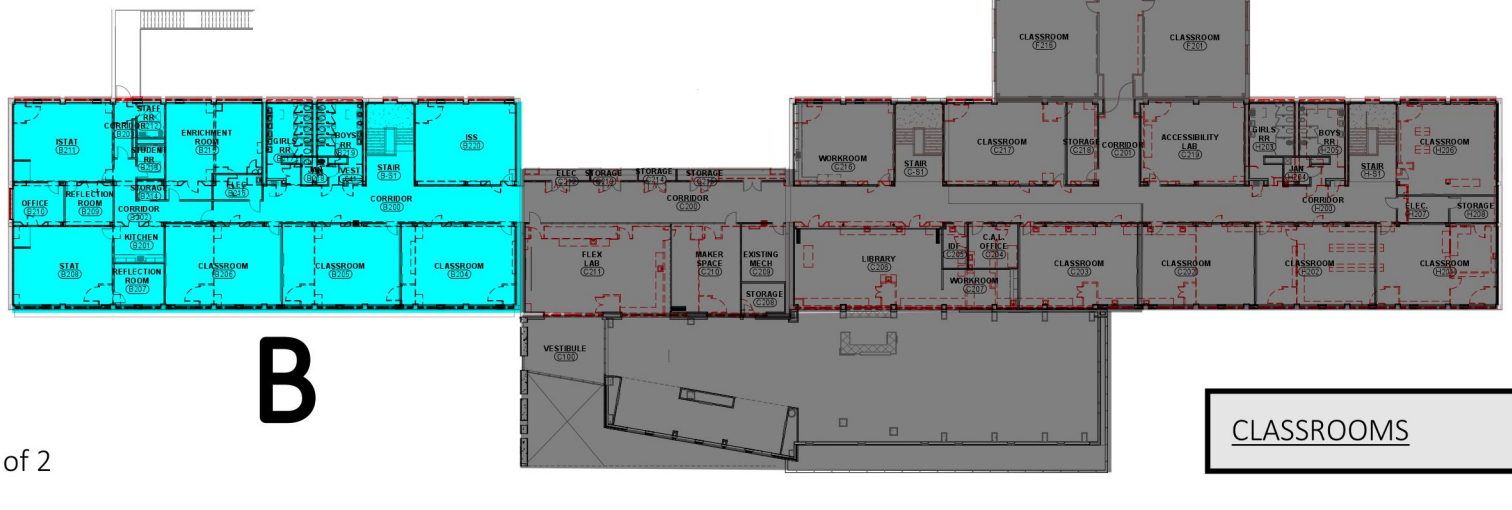
PHASE 5 (JUN - AUG 2020)

New Construction
Renovations (60k SF)
Completed Areas
Staff/Student Pathways

LEVEL 1

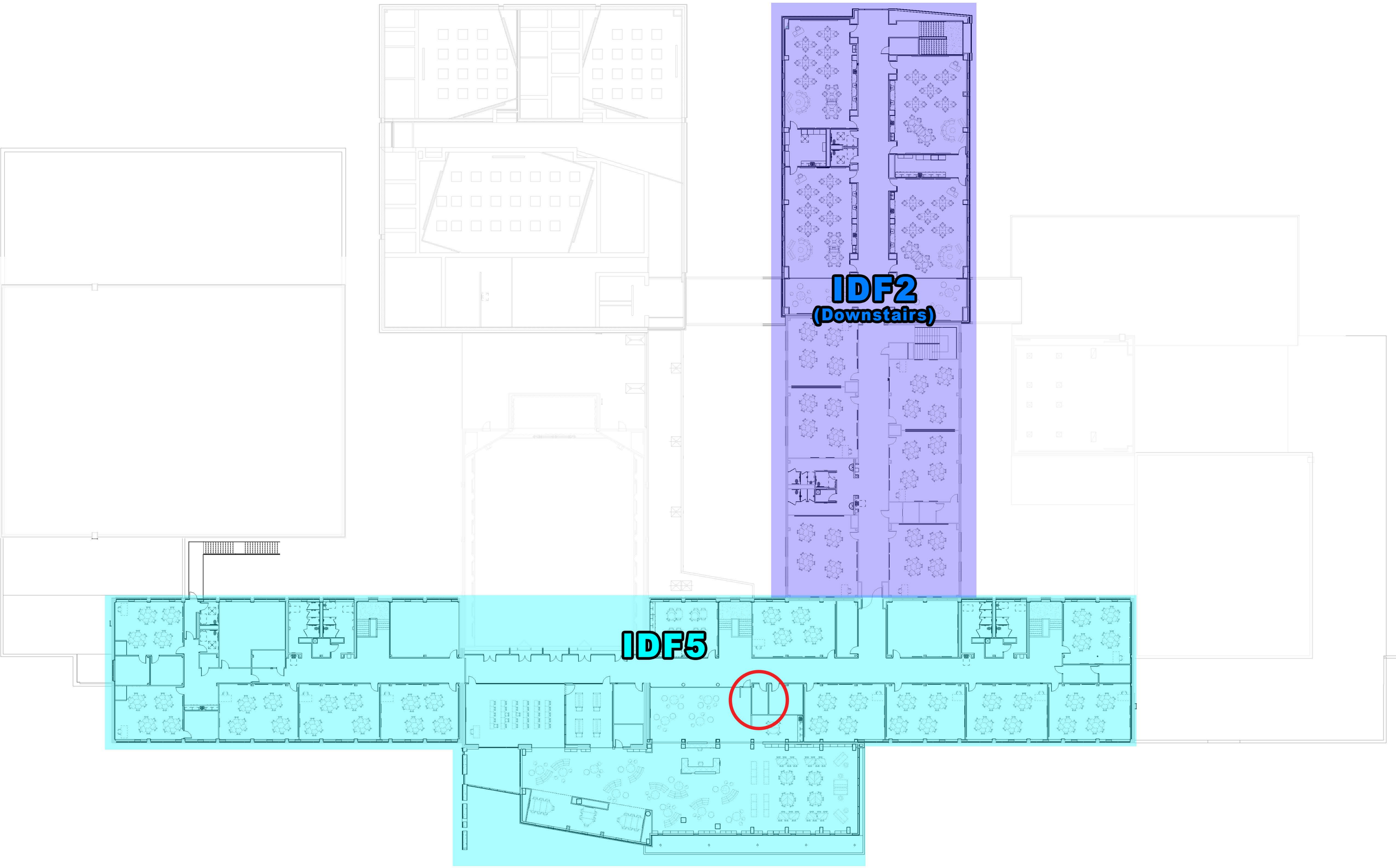
LEVEL 2





CLASSROOMS

IDF4
IDF3
IDF2
IDF1
MDF
CASTLEBERRY LIONS
CASTLEBERRY LIONS


IDF2
(Downstairs)
IDF5

TOTAL CLASSROOMS = 45

CLASSROOMS (38) STEAM LABS (7)

WHOLE BUILDING (TOTAL AREA = 166,635 SF)

EXISTING BUILING (TOTAL AREA = 89,815 SF (1ST) + 30,245 SF (2ND) = 120,060 SF
ADMINISTRATION ADDITION (TOTAL AREA = 4,635 SF (1ST) + 5,425 SF (2ND) = 10,060 SF)
CLASSROOM ADDITION (TOTAL AREA = 9,420 SF (1ST) + 9,365 SF (2ND) = 18,785 SF)
FINE ARTS ADDITION (TOTAL AREA = 17,730 SF)

Badge Reader Locations

Department Legend

- ADMIN.
- ATHLETICS
- CAFETERIA
- CIRCULATION
- CLASSROOM
- FINE ARTS
- RESTROOM
- SCIENCE
- SPECIAL PROGRAMS
- SUPPORT

TOTAL CLASSROOMS = 45

CLASSROOMS (38) STEAM LABS (7)

Department Legend

- ADMIN.
- CIRCULATION
- CLASSROOM
- LIBRARY
- RESTROOM
- SCIENCE
- SPECIAL PROGRAMS
- SUPPORT

TOTAL CLASSROOMS = 45
CLASSROOMS (38) STEAM LABS (7)
WHOLE BUILDING (TOTAL AREA = 166,635 SF)
EXISTING BUILING (TOTAL AREA = 89,815 SF (1ST) + 30,245 SF (2ND) = 120,060 SF
ADMINISTRATION ADDITION (TOTAL AREA = 4,635 SF (1ST) + 5,425 SF (2ND) = 10,060 SF)
CLASSROOM ADDITION (TOTAL AREA = 9,420 SF (1ST) + 9,365 SF (2ND) = 18,785 SF)
FINE ARTS ADDITION (TOTAL AREA = 17,730 SF)
Camera Locations
1st Floor
Department Legend
ADMIN.
ATHLETICS
CAFETERIA
CIRCULATION
CLASSROOM
FINE ARTS
RESTROOM
SCIENCE
SPECIAL PROGRAMS
SUPPORT
CHOIR
MARIACHI /ORCHESTRA
BAND
ENSEMBLE PRACTICE
STORAGE
MUSIC
BACK STAGE
STAGE
AUDITORIUM
GYM
LOBBY
STEAM LAB 01
STEAM LAB 02
CLASSROOM
COLLABORATION SPACE
CAFETERIA 01
CAFETERIA 02
KITCHEN 01
KITCHEN 02
ART
LIFE SKILLS
MOTOR LAB
CORRIDOR
EXTERIOR COVERED WALKWAY
VESTIBULE
REGISTRAR RECEPTIONIST
CONFERENCE
COUNSELOR
PRINCIPAL
VAULT
CLINIC
ELEVATOR
x2

TOTAL CLASSROOMS = 45

CLASSROOMS (38) STEAM LABS (7)

Camera Locations
2nd Floor

Department Legend

- ADMIN.
- CIRCULATION
- CLASSROOM
- LIBRARY
- RESTROOM
- SCIENCE
- SPECIAL PROGRAMS
- SUPPORT