LONGWOOD
UNIVERSITY

Lenel On-Guard: Security System Installation and Wiring Standards

GENERAL TERMS

The Contractor shall add all access control System LENEL controllers LNL 2220, LNL 1320, LNL 1100 Multi Technology readers, and associated equipment to interface with the existing LENEL 0n-Guard access control system, as shown in product in use at Longwood on Pg 11, also note (DOOR DETAIL) for Access Control used at Longwood. The system shall be installed in accordance with the instructions provided and all precautions and special conditions are to be observed. The Contractor shall inspect and take responsibility for the full function of the work, including the work of others, as a single integrated system. Upon completion, testing of the system will commence until it meets the standards of the University. The company installing the system will also serve as the serving company during the warranty period. The installing company will honor and service the warranty on the parts as prescribed by the manufacturer. The installing and servicing company will be an authorized Lenel Value Added Reseller (VAR0). The installing and servicing company will utilize only Lenel certified technicians for the purpose of installing access control hardware to include locks, software and wiring.

COMPLIANCE REQUIREMTS

1. The work shall meet or exceed the latest codes, regulations. And requirements of the local and state authorities having jurisdiction. It is the responsibility of the contractor to be thoroughly familiar with these requirements.

AIA	American Institute of Architects
ADA	Americans with Disabilities Act
NEC	National Electric Code
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Prevention Association
OSHA	Occupational Safety and Health Act
ULI	Underwriters Laboratories, as noted
NECA	Standards of Installation

2. The owner reserves the right to direct the removal of any item which does not comply with the contract drawings or those specifications, or does not present a neat, orderly and workmanlike appearance.

3. In light of special conditions in respect to (fire-Rated-Assemblies) (Fire-stop) (Wall-Penetrations) and so on. It is the responsibility of the contractor to contact Longwood’s Department of Capital Planning and Construction or view their web site:

www.longwood.edu/physicalplant/PhysicalPlantSite/CPCDesignConstStandards.pdf

WIRING STANDARDS

A. All cable/wiring shall be (Plenum Rated) unless otherwise stated. All wiring must be protected against tampering. Wiring may be concealed in walls or above ceiling panels and where concealment within the building structure is not available, conduit must be employed. Whenever conduit must be used to meet the requirements of the specification, the University must approve its location.

B. The Contractor shall provide wiring installed in a neat and workmanlike manner and installed parallel with or at right angles to the sides and back of any box, enclosure or cabinet. All conductors terminated, spliced, or otherwise interrupted in any enclosure, cabinet, mounting or junction box shall be connected to terminal blocks. (Note: All new cabling must be continuous from component to component. Intermittent splices will not be permitted in any case.) Mark each terminal in accordance with the wiring diagrams of the system. Make all connections with approved pressure type terminal blocks, which are securely mounted. The use of wire nuts or similar devices shall be prohibited.

C. Wire size shall be sufficient to prevent voltage drop problems. Circuits shall not have a voltage drop exceeding 5% of nominal voltage. Power wiring, operating at 120 VAC minimum, shall be No. 12 AWG solid copper having similar insulation. Cabling shall be installed in a concealed manner unless otherwise approved by the University’s representative. In areas where the existing building structure is such that the cabling cannot be concealed, the cabling must be run in conduit, unless otherwise approved by the University’s representative.

D. All conductors installed in rigid metal conduit or electrical-metallic tubing shall have a minimum diameter of ¾ inch, unless otherwise approved. The use of flexible conduit not exceeding a six-foot length shall be permitted in device circuits. Shielded wiring shall be utilized where recommended by the manufacturer and grounded to an approved ground at only one point, as recommended by the associated equipment manufacturer.

E. No specific color-coding is required for any circuit; however, labeling of any circuit at terminal blocks in junction boxes, enclosures and cabinets shall be provided at each conductor connection. Each conductor or cable shall have a shrink-wrap or similar label to provide a unique and specific designation. Each terminal location shall contain a laminated drawing which indicates each conductor, its label, circuit, and terminal. The laminated drawing shall be neat, using 12 point lettering minimum size, and mounted within each cabinet, panel, or unit so that it does not interfere with the wiring or terminals.

F. The control termination boxes, enclosures, and cabinets shall be installed at locations suitable for efficient future service and as approved by the University’s representative. The termination enclosure shall be surface mounted with the top no more than 6 feet

above the finished floor. Service boxes required to be installed in unsecured areas (hallways, at security door, etc.) shall be installed in a concealed area, whenever possible, such as above the drop ceiling or in an adjoining closet, or at a height which reduces the possibility for tampering. Locations must be approved by the University.

G. All preparatory work, including conduit, cabling between system components and terminations shall be shown on as-built drawings to be submitted to the University by this Contractor.

H. The University's representative shall be kept informed of all activity being conducted under this contract by written daily progress reports stating the accomplishments of the day, the number of Contractor personnel to be on-site the following day, a listing of any problems that are inhibiting the Contractor, any questions that need answered, and any recommendations. The University's representative prefers the report to be an e-mail message; however a fax would be acceptable.

I. The Contractor shall restore any surfaces where devices have been removed, replaced, or added to maintain the fire rating of the surface (walls, doors, etc.) and fire caulk all conduits and wall penetrations. Fire caulking must be coordinated with the project manager.

J. In replacing or adding system devices in existing condition areas, the Contractor shall be responsible for restoring any exposed area to match adjacent areas (patching, painting, etc.).

LOCATIONS

A. Drawings are generally indicative and diagrammatic of work to be installed. The Contractor shall determine the actual locations of all items related to the installation of the system that may have been installed by others including but not limited to cable and conduit raceways, electrical outlets, and associated system equipment.

B. The Contractor is responsible for the installed location of all devices. The Contractor shall apply for operational details and information regarding the required placement of all equipment, as the installed location may differ from that indicated on the drawings. Equipment or wiring improperly placed because of the Contractor's failure to obtain this information shall be relocated and reinstalled by the Contractor without additional expense to the University.

C. The system installation shall be subject to such revisions as may be necessary to overcome building obstructions. However, no change shall be made in location of equipment without written consent of the University.

OPERATION:

The Lenel On-Guard access control system shall be installed to operate as follows:

1. The system shall allow the reporting of an audible and/or visual alarm condition at the Lenel system monitoring stations for an open, closed, alarm and trouble condition as well as door forced and door held alarms. The alarm Monitoring sub-system shall be capable of monitoring normally-open and normally-closed contacts

and any cable short-to-ground or cable short-to-conductor condition. It must have a true request-for-exit function whereby an authorized egress shall cause the door position and latch monitor devices to be bypassed for a designated amount of time. The opening shall immediately restore to a fully “armed” condition once the door is closed and latched. In no case shall the door be programmed to operate with a delayed alarm function.

a. The Lenel On-guard security system shall have an audible horn at each door above or on the ceiling above door in residential buildings or as determined by Longwood University.

b. The system shall be interconnected to the University’s building fire alarm system. It is mandatory that designated electric door locking devices unlock during a fire alarm condition.

c. Contractor shall place all electronics, power supplies and associated electronic equipment in the designated and secure MDF room of the building

d. Each ACC shall be supplied with an integral backup battery capable of powering the ACC for a minimum of four (4) hours.

e. Each ACC shall communicate with the host computer using UDS 1100 Lantronics external device server with the integrated backup battery capable of powering the ACC for a minimum of four hours.

f. All ADA accessible doors specified with access control, these two systems must integrate as not to cause unnecessary alarms on exit of the area and upon entry reader must activate automatic opener button for cards with this access and just unlock door for those cards with that access.

g. The system shall be provided with multi-technology proximity card readers that are manufactured and fully imply an electromagnetic principal of operation.

h. The ACS shall provide REX (request-for-exit) devices to operate such that an authorized egress shall cause the door position and latch monitor devices to be bypassed and in no case cause the electric door hardware to unlatch. Electromagnetic locks are the only exception and must be approved prior to installation.

DOOR LOCK CONTROL SUB-SYSTEM OF THE ACS

1. The Door Lock Control sub-system shall be connected to electric Locks on doors listed on Exhibit A, the Security System Door Schedule. The access controlled door shall remain unlocked for a time Period of up to fifteen (15) seconds after presentation of an Authorized access control card or receiving a request-to-exit Signal, but shall immediately relock when the door is closed.

2. Interconnect latch bolt status monitor switches, as provided and installed under a separate contract and listed on Exhibit A the Security System Door Schedule and shown on the drawings, are to allow monitoring of the lock status. A sounder shall activate at the Security Monitoring station if the door is not latched after the designated time (15 seconds) following an opening.

3. Interconnect integral request-for-exit (REX) switches in designated hardware sets to the Access Control system. The REX switch shall

permit egress through the associated doors without creating a door forced or door held alarm or unlocking of door and requiring no special knowledge or action.

4. Interconnect provided door power assist devices such that exterior equipped ACS doors shall unlock upon the presentation of an authorized access control card as stated in part 1.7 D of this section, and cause the power assist device to engage. The automatic opening function shall be caused to engage no sooner than 300 milliseconds and no more than 500 milliseconds after the release of the door lock mechanism. This application should be unique to access control cards identified for persons requiring assistance as noted in the system database.

INTEGRATION

Integrate the Alarm Monitoring Reporting and Door Lock Control sub-systems of the ACS to operate as follows:

1. The system shall operate the electrified locking devices and/or monitor designated doors in response to an authorized access card being presented to a card reader or by an automatic programmed schedule, as described herein.

A. If a monitored door is not closed and latched within a pre-determined time after it has been opened, a door held alarm condition shall be initiated, the associated horn device shall be activated, and a signal shall be transmitted to the Security Monitoring stations.

B. An audible alarm shall occur at the door and at the Security Control Stations, as indicated on the security system Door Schedule when the respective door has been opened or has been held ajar and/or not latched for a period of time greater than a predetermined period of delay (75 seconds).

C. The door ajar alarm condition shall reset automatically when the door is closed and the lock properly engaged.

AS-BUILT DOCUMENTS

A. During progress of the work, the Contractor shall keep an up-to-date record of all deviations from the contract documents and maintain an accurate record of the installation of the system, locating each cable and device precisely.

B. Upon completion of the installation, but prior to Acceptance Testing, the Contractor shall transfer all recorded data to new Reproducible prints of the original bid drawings. The Contractor shall deliver new reproducible as-built prints and three (3) copies of the drawings to the University with the Operating and manuals described herein.

C. The as-built prints shall include, but are not limited to, the following:

1. Device location floor plan drawing with installation details
2. Wire/Cable routing diagram with details of all wire junction locations
3. Equipment mounting details

4. Equipment interconnection diagrams
5. System monitoring and report layout
6. Complete parts list of all components installed including model numbers

MATERIALS AND FABRICATION

Produce hardware units of first quality metal and forming method using metal alloy, composition, temper, and hardness as required for each unit selected, but in no case of lesser (commercially recognized) quality than specified for applicable hardware units for finish designations indicated:

Fasteners

1. Provide hardware manufactured to conform to published templates, generally prepared for machine screw installation. Do not provide hardware that has been prepared for self-tapping sheet metal screws, except as specifically indicated.

2. Furnish screws for installation with each hardware item. Provide Phillips flat-head screws, except as otherwise indicated. Furnish exposed (exposed under ANY condition) screws to match hardware finish or, if exposed in surfaces of other work, to match finish of this other work as closely as possible including “prepared for paint” surfaces to receive painted finish.

3. Provide concealed fasteners for hardware units that are exposed when door is closed except to the extent no standard units of type specified are available with concealed fasteners. Do not use thru-bolts for installation where bolt head or nut on opposite face is exposed in other work unless their use in the only means of reinforcing the work adequately to fasten the hardware securely. Where thru-bolts are used as a means of reinforcing the work, provide sleeves for each thru-bolt or use sex screw fasteners.

ANCHORS AND SUPPORTS

The Contractor shall provide all required anchoring, supports, shelves and brackets for all equipment required by this system and not provided by others.

1. All fastenings, supports, hangers, clamps and anchors provided by the Contractor shall be of the type made for the specific purpose for which they are to be used. Toggle bolts or machine bolt fastenings for hollow tile, terra cotta or lath construction shall be provided. Machine screws for structural steel fastening, lead expansion shield and machine for solid masonry fastening, and lag screws or bolts for wood fastening shall be provided.

2. Fastenings and attachments such as screws, bolts, nuts, etc. shall be provided by the contractor as non-ferrous silicon bronze or shall be galvanized or cadmium plated steel. Where such devices are not commercially available in non-ferrous metals, or in steel with a protective coating, they shall be painted as specified elsewhere. All fastenings and attachments shall be made of such materials or so protected to offer maximum protection against deterioration from age, weather,

and dampness. All bolts and screws, where subject to weather or wet locations, shall be stainless steel.

3. Items provided by the Contractor shall not be supported by nylon ties, tape, or tie wire or perforated metal straps unless authorized by the Site Manager. Where items are to be fastened to masonry construction, use of wooden or fiber plugs will not be permitted. Screws or bolts in conjunction with approved lead-alloy expansion sleeves shall be used. (A-J, Hilti, or approved equal). Approved plastic anchors may be used for #10 and smaller screws, up to static loads of 20 lb per screw. Anchors must insert fully in solid masonry, in plaster, etc.

4. Approved toggle bolts provided by the Contractor shall be used on hollow masonry construction up to static loads of 40 lbs. per bolt.

5. Contractor shall use only rotary drill bits for holes to receive any type of anchor in masonry, tile, marble, hollow masonry or plaster for acceptance of anchors. In no case shall star-type drills be used.

6. The Contractor shall obtain shop drawing approval prior to installation for all fabricated or welded steel supports and structures.

7. All fastenings, anchors, hangers, and supports shall be from the building structure. No conduit, fire sprinkler piping, ductwork or ceiling system shall be used for such support.

PERFORMANCE OF EQUIPMENT

A. All materials and equipment of any kind shown on the drawings, or required for the completion of the work in accordance with the intent of these specifications, shall be completely satisfactory and acceptable in operations, performance and capacity. No approval, either written or verbal, of any drawings, descriptive date, or samples of such material, equipment, and/or accessories shall relieve the Contractor of his responsibility to turn over the same to the University in perfect working order a the completion of the work.

B. Any material or equipment, the operation capacity of, or performance of, which does not comply with the drawings and/or specification requirements, or which is damaged prior to acceptance by the University, will be held to be defective material and shall be removed, replaced, and re-installed by the Contractor with the proper and acceptable materials or equipment at no additional cost to the University.

C. The contractor shall deliver to the University, prior to System Acceptance, a statement certifying that the equipment has been inspected and found to be properly installed and functioning satisfactorily in accordance with manufacturer’s specifications.

D. The control termination boxes, enclosures, and cabinets shall be installed at locations suitable for efficient future service and as approved by the University’s representative. The termination enclosure shall be surface mounted with the top no more than 6 feet above the finished floor. Service boxes required to be installed in unsecured areas (hallways, at security doors, etc) shall be installed

in a concealed area, whenever possible, such as above the drop ceiling or in an adjoining closet, or at a height which reduces the possibility of tampering. Locations must be approved by the University.

INSTALLATION REQUIREMENTS – DOOR HARDWARE EXECUTION

1. The Contractor shall ensure that the installation and operation of the installed system(s) are complete in every aspect, including all necessary equipment and accessories listed and not listed.

2. The Contractor shall install the system in accordance with the plans and specifications, including special UL requirements, applicable building codes and the manufacturer's recommendations. All wiring shall be installed in strict compliance with all the provisions of the National Electrical Code, special UL requirements and local requirements.

3. It is the responsibility of the Contractor to provide the name and other required information about the technicians to the University, in order to obtain the appropriate security identification for access to the facility by Contractor personnel.

D. Contractor shall supply and install all system components unless otherwise stated, make final connections, fully program, test and make operational the complete system.

E. All devices shall be installed in accordance with the manufacturer's instructions and in a manner that will provide maximum protection against damage and tampering.

F. The Contractor shall provide on-site supervision of all aspects of the installation.

G. The Contractor shall be held responsible for the protection of and damage to his works prior to the final acceptance of same and shall repair or replace all damaged work at his expense.

H. The Contractor shall clean all dirt and debris from the inside and the outside of the equipment cabinets prior to Acceptance Testing.

I. The Contractor shall insure that all patching of the ceiling, painting, and repair of areas affected by the installation or incidental damages of the system is complete, and meets the requirements as specified and approved by the University.

J. The Contractor shall provide proper protection to existing construction, furniture, equipment, and fixtures and shall be responsible for any necessary repairs at no cost to the University.

CONTINUITY OF SECURITY

A. Contractor must maintain the level of security at each of the openings (door, gate, window, etc.) that is part of this work, as required by the University.

B. At the end of each workday, the Contractor shall insure that all openings covered by this contract are secured, monitored, and function to maintain the required security level, as required by the University.

TESTING

A. “Manufacturer recommended” testing shall be performed prior to installation and during Acceptance Testing. The Contractor shall submit three (3) copies of a report indicating the results of the recommended “manufacturer testing”.

B. The Contractor shall assemble, interconnect and thoroughly test all equipment, provided and not provided, necessary to a functional system prior to the University’s Acceptance Testing. The equipment shall be fully functional and programmed for operation. The University shall be given the opportunity to witness functional tests of the system.

C. After all site wiring has been installed and prior to making any connections to the system panels or devices, the Contractor shall test all wiring, including existing wiring incorporated into the new system, for insulation resistance, grounds, and/or shorts. The University’s representative shall be given the option to witness the tests and shall be given a copy of the test results with the installation submittals.

D. The Contractor shall conduct preliminary tests to ensure that all devices and circuits are functioning properly prior to startup. After preliminary testing, a letter certifying that the installation is complete and fully operable shall be provided prior to Acceptance Testing. The letter shall state that each system device and component and each system has been tested and is functioning in place and is operating properly. The letter shall include the names and titles of the witnesses to the preliminary tests.

RESPONSIBILITY

A. The Contractor shall insure that the installation and operation of the systems, as required, are complete in every aspect, including all necessary equipment listed and equipment not listed but required to perform as described.

B. The Contractor shall ensure full operation and functionality of the entire system, including all components provided by the Contractor and all others providing components or services.

C. The Contractor shall insure that all patching of the ceiling, painting and repair of areas affected by the installation or incidental damages of the system is complete and meets the requirements as specified and approved by the University.

D. The Contractor shall be responsible for all permits, inspections, plans, submissions, etc.

SUBSTITUTIONS

A. The word “approved” or the phrase “as approved” shall be understood to mean that the approval of the University as to the proposed item, shall be secured before placing an order for the item.

B. “Or equal”: When any article, material, or thing is specified by proprietary name, trade name, and/or name of manufacturer, with the

addition of such expressions as “or equal” or “approved equal”, it will be understood that the article, material, or thing named is intended as a standard of the quality and performance desired, and any article, material, or thing equal thereto may be used, subject to the prior written approval of the University. It is to be distinctly understood that:

1. The University’s representative will use its own judgment in determining whether or not any article, material, or thing specified is an equal.

2. The decision of the University’s representative on all such questions or quality shall be final and binding upon the Contractor, and No claim of any sort by the Contractor shall be made or allowed against the University or his representatives in the event of any adverse decision by the University’s representatives.

C. Substitution of Equipment: Where items of equipment and/or materials are specifically identified herein by a manufacturer’s name, model, or catalog number, only such specific item may be used in the bid, except hereinafter provided. Alternate material proposals need to be submitted with bids for approval by the University.

D. Prior to the start of the work, substitution of equipment or material of makes other than those specifically named in the contract documents will be approved by the University for the following reasons only:

1. That the equipment proposed for substitution is equal to/or superior to the equipment named in construction, efficiency, and utility.

2. That the equipment or material named in the specifications cannot, due to the conditions beyond control of the Contractor, be delivered to the job in time to complete the work sequence or work of other Contractors.

E. To receive consideration, requests for substitutions must be accompanied by documentary evidence of equality. Difference in price and delivery, if any, in the form of certified quotations from suppliers of both specified and proposed equipment and material must be submitted with the request.

F. In case of a difference in price, the University shall receive all benefit of the difference in cost involved in any substitution. The Contractor shall credit the University with any savings so obtained, if applicable.

WORK ACCEPTANCE

A. The Contractor shall notify the University in writing that the system is ready for Acceptance Testing no less than fourteen 14) calendar days prior to the desired Acceptance Test date. A copy of the Operations & Maintenance Manual and other required documents must be provided to the University with the letter.

B. The University shall direct and the Contractor shall support a complete and comprehensive Installation Audit and Acceptance Test of the installed systems following initial training of the University’s representatives.

A. Prior to the Installation Audit and Acceptance Test, the Contractor shall insure that the installation, setup and documentation of the systems are complete in all respects. The systems shall be fully operational; initial training has been provided, and all required documents have been provided no later than the required completion date.

Access Control products in use at Longwood

1. LeneL 2220 Building Controller
2. Lenel 8000 Multiplexer
3. Lenel 1320 2 Door Controller
4. Lenel 1100 16 Input Module for Fire & Trouble reporting
5. Lenel CTX-6 600ULX-4CB6 (PD 4, 6 or 8) 12/24 VDC Alarm/Access Control Power Supply Charger with B-Back-Up Enclosure
6. Exceed-ID Model XF-2100-B Black
7. Exceed-ID Model XF-1100-B Black
8. Kantech T-Rex-XL PIR
9. UDS 1100 Universal Device Server Lantronix Wired as 12VDC
10. Central Door Contact 3/4 and 1 inch Colors White and Brown
11. IDH Max Mortis Locks
12. IDH Max 1300 Mortis Locks
13. Von-Duprin Electric Strikes-6111-12/24 Volt DC
14. Von-Duprin Exit Devices EL98/99-EL-RX-LX Panic Devices
15. Von-Duprin Exit Devices EL33-EL-RX-LX Panic Devices
16. Best Mortis Locks EL-RX-LX
17. Dynalock Mag-lock 1200 Pounds Force RX-LX
!8. Von-Duprin Door Power-Supply 12/24 VDC PS-873-871-2-With B Back-Up
!9. Altronics Power-Supply 12/24 VDC PD-4, 6, or 8 with B-Back-Up
20. Hes Strike 9600-12/24 VDC-630-LBM with Hes 2005: Smart-Pack 2