PROJECT SPECIFICATIONS
BID: 27- 013024-000

Metropolitan Education District

Door Hardware Replacement

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SALTO DATA SHEETS

Datasheet-XS4-Original_PLUS-Ax6
VON_DUPRIN_98_99_9957_adapter_kit_KPP03-04_For_XS4_Original_PLUS
Datasheet-Gateway-x3C-ENG
Datasheet-RFNODE3-ENG-17-12

*Located at end of document

END OF SECTION

Door Hardware Sets

Set 1 - SX4 Original Plus Lever Set with Privacy Button

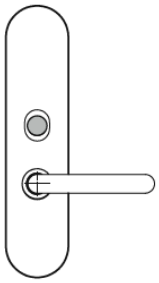
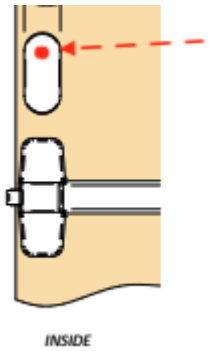
- XS4 ORIGINAL+ AM6xx
- SALTO OUTDOOR KIT - SALTO Outdoor Kit for SALTO Electronic Lock. Required for outdoor all-weather applications.
- Salto BlueNet wireless license

Set 2 - SX4 Original Plus Panic with Privacy Button

- XS4 ORIGINAL+ AM6xx
- SALTO OUTDOOR KIT - SALTO Outdoor Kit for SALTO Electronic Lock. Required for outdoor all-weather applications.
- Salto BlueNet wireless license

Door Hardware Privacy Button Lock from Inside

The district will use the privacy button to lock the door from the inside. The button will have a cover and sticker with information explaining how to lock the door from the inside.

SX4 Original Plus Lever Set with Privacy Button will use the standard privacy button provided by Salto with no modification.	
Set 2 - SX4 Original Plus Panic with Privacy Button doors will require modification for the installation of the privacy button. This button will be installed on the cover of the battery pack and will allow the door to lock from the inside. This status of the door (locked/unlocked) will be visible by the color of the button.	

Non Von Duprin Panic Bar hardware

Contractor will replace the 23 Precision panic bar with a comparable and Salto compatible Von Duprin panic bar for the doors listed in the door schedule.

Door Modifications and Repair

Contractor will provide metal covers and or paint and patch doors as needed throughout the project. The doors will not have visible marks, paint blemishes, lack of paint or holes caused by modification of the locking system.

Wireless Infrastructure Specifications

Wireless Coverage: Salto nodes and gateways will be placed no further than 10 feet away from locking hardware unless adequate coverage is proven and approved by the district. Gateways should be installed with a max of five RFNODE3 to allow one for future expansion.

Adequate Wireless Coverage: Each Salto lock will be tested for adequate wireless coverage, and logs will be reviewed to ensure the lock maintains full connectivity after installation. It is the contractor's responsibility to address inadequate coverage by installing additional nodes or gateways if wireless coverage is determined to be inadequate.

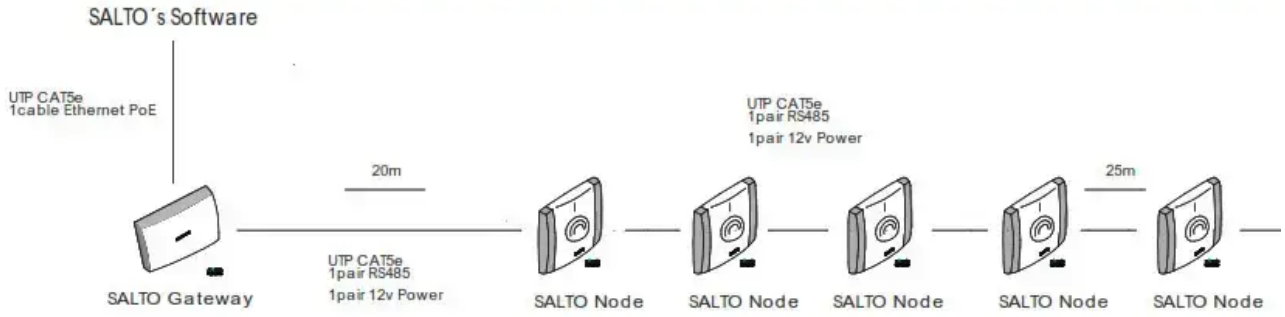
Wireless License

Salto BlueNet licenses will be provided for each wireless lock that is installed plus an additional 20 spare licenses.

Wireless Hardware

Gateway: GATEWAYx3C - BLUEnet Gateway

Node: RFNODE3 - WIRELESS SALTO BLUEnet



Gateway / Node Name Convention

GATEWAY
SITE-BUILDING-GW0X
Example:SVCTE-600-GW01

NODE
SITE-BUILDING-GW0X-NXX
Example:SVCTE-600-GW01-N00
Note: NOO (Node Zero) is the node built into the gateway. The first node on the string will be SVCTE-600-GW01-N01 and so on.

SECTION 09 91 00 – PAINTING-DETAILED SPECIFICATIONS

Manufacturers and Products
Substitutions or Alternates *not permitted* without District Approval

PARTS 1 - GENERAL

1.01 SUMMARY:

A. Section Includes: Painting and finishing of all interior and exterior items and surfaces, unless otherwise indicated or listed under exclusions below:

1. Paint all exposed surfaces, except as otherwise indicated, whether or not colors are designated.
2. Include field painting of exposed exterior and interior plumbing, mechanical and electrical work, except as indicated below.
3. Paint exterior stucco where indicated on Drawings.

B. Work Included:

1. The intent and requirements of this section is that all work, items and surfaces which are normally painted and finished in a building of this type and quality, shall be so included in this contract, whether or not said work, item or surface is specifically called out and included in the schedules and notes on the drawings, or is, or is not, specifically mentioned in these specifications.

C. The following general categories of work and items that are included under other sections, shall not be a part of this section:

1. Shop prime painting of structural and miscellaneous iron or steel.
2. Shop prime painting of hollow metal work.
2. Shop finished work and items.

D. The Room Finish Schedules indicated on the drawings, indicates the location of interior room surfaces to be painted or finished. The schedule indications are general and do not necessarily define the detail requirements. Include all detailed refinements and further instructions as may be given for the required complete finishing of all spaces and rooms.

1.02 SUBMITTALS:

A. Product Data: Submit complete manufacturer's descriptive literature and specifications in accordance with the provisions of Division 1.

1. Materials List: Submit complete lists of materials proposed for use, giving the manufacturer's name, catalog number, and catalog cut for each item when applicable. When required, provide a list of paint and coating materials proposed for use, which equates such materials with the design-basis products specified.

B. Samples: In accordance with provisions of Division 1, submit, on 8-1/2 inch by 11 inch hardboard, samples of each color, gloss, texture and material selected by the Architect from standard colors available for the coatings required.

1. For natural and stained finishes, provide sample on each type and quality of wood used on the project.

C. Manufacturer's Instructions: Submit the manufacturer's current recommended methods of installation, including relevant limitations, safety and environmental cautions, application rates, and composition analysis.

1.03 QUALITY ASSURANCE:

A. Regulatory Requirements: Comply with applicable codes and regulations of governmental agencies having jurisdiction including those having jurisdiction over airborne emissions and industrial waste disposal. Where those requirements conflict with this Specification, comply with the more stringent provisions.

Regulatory changes may affect the formulation, availability, or use of specified coatings. Confirm availability of coatings to be used prior to job going out to bid and before start of painting project.

1. Comply with the current applicable regulations of the California Air Resources Board (CARB) and the Environmental Protection Agency (EPA).

B. Field Sample: When and as directed by the Architect, apply one complete coating system for each color, gloss and texture required. When approved, the sample panel areas will be deemed incorporated into the Work and will serve as the standards by which the subsequent Work of this Section will be judged.

1.04 DELIVERY, STORAGE, AND HANDLING:

A. Storage and Protection: Use all means necessary to protect the materials of this Section before, during, and after installation.

B. Deliver materials to job site in new, original, and unopened containers bearing manufacturer's name and trade name. Store where directed in accordance with manufacturer's instructions.

1.05 PROJECT CONDITIONS:

A. Do not apply exterior materials during fog, rain or mist, or when inclement weather is expected within the dry time specified by the manufacturer. No exterior or interior painting shall be done until the surfaces are thoroughly dry and cured. Do not apply paint when temperature is below 50^{O} F. Avoid painting surfaces when exposed to direct sunlight.

PART 2 - PRODUCTS

2.01 MANUFACTURERS:

A. Manufacturer's catalog names and number of paint types in this Section herein are based on products of Dunn-Edwards Corporation and is the standard of quality against which the Architect will judge equivalency. The quantity of titanium dioxide, the use of clays, aluminum silicate, talc and the purity of acrylic materials are a few of the criteria which will be used by the Architect in determining equivalency of materials.

2.02 MATERIALS:

A. Paints: Provide Ready-Mixed, except field catalyzed coatings. Pigments shall be fully ground maintaining soft paste consistency, capable of being readily and uniformly dispersed to complete

homogeneous mixture. Paints shall have good flowing and brushing properties and be capable of drying or curing free of streaks and sags.

B. Accessory Materials: Linseed oil, shellac, solvents, and other materials not specified but required to achieve required finishes shall be of high quality and approved by manufacturer.

C. Colors shall be selected from color chip samples provided by manufacturer of paint system approved for use. Match approved samples for color, texture and coverage.

2.04 MIXES:

A. Mix, prepare, and store painting and finishing materials in accordance with manufacturer's directions.

PART 3-EXECUTION

3.01 EXAMINATION:

A. Examine surfaces to be painted before beginning painting work. Work of other trades that has been left or installed in a condition not suitable to receive paint, stain, other specified finish shall be repaired or corrected by the applicable trade before painting. Painting of defective or unsuitable surface implies acceptance of the surfaces.

B. Beware of a condition known as "critical lighting". This condition causes shadows that accentuate even the slightest surface variations. A pigmented sealer will provide tooth for succeeding decorative coating, but "does not" equalize smoothness or surface texture. Any corrective action to gypsum board/drywall must be done by the drywall contractor prior to decorating.

3.02 PROTECTION:

A. Protect previously installed work and materials, which may be affected by Work of this Section.

1. Protect prefinished surfaces, lawns, shrubbery and adjacent surfaces against paint and damage.
2. Furnish sufficient drop cloths, shields, and protective equipment to prevent spray or splatter from fouling surfaces not being painted.
3. Protect surfaces, equipment, and fixtures from damage resulting from use of fixed, movable and hanging scaffolding, planking, and staging.

B. Provide WET PAINT signs, barricades, and other devices required to protect newly finished surfaces. Remove temporary protective wrappings provided by others for protection of their work after completion of painting operations.

3.03 PREPARATION:

A. Perform preparation and cleaning procedures in strict accordance with coating manufacturer’s instructions for each substrate condition.

B. Concrete and masonry surfaces shall be dry, clean, and free of dirt, efflorescence, encrustation, and other foreign matter. Glazed surfaces on concrete shall be roughened or etched to uniform texture.

C. Ferrous metal shall be cleaned of oil, grease, and foreign matter with solvent. Prime within 3 hours after preparation.

D. Sand and scrape metal to remove loose primer and rust.

E. Galvanized metal shall be chemically or solvent cleaned and then retreated with an etching-type solution if recommended by the finish manufacturer. Cleaned and retreated galvanized metal shall be primed the same day that cleaning has been performed.

F. Remove dust, grit and foreign matter from wood surfaces. Sand surfaces and dust clean. Spot coat knots, pitch streaks, and sappy section with pigmented stain sealer when surfaces are to be painted. Fill nail holes, cracks and other defects after priming and spot prime repairs when fully cured.

G. Remove hardware and accessories, machined surfaces, plates, lighting fixtures and similar items in place and not-to-be-finish painted, or provide surface-applied protection. Reinstall removed items upon completion of work in each area.

H. Existing surfaces to be recoated shall be thoroughly cleaned and degreased by sanding or other means prior to painting. Patched and bare areas shall be spot primed with same primer as specified for new work.

I. Thoroughly backpaint all surfaces of exterior and interior finish lumber and millwork, including doors and window frames, trim, cabinetwork, etc., which will be concealed after installation. Backpaint items to be painted or enameled with the priming coat. Use a clear sealer for backpriming where transparent finish is required.

3.03 PREPARATION: (Continued)

J. Bar and covered pipes, ducts, hangers, exposed steel and ironwork, and primed metal surfaces of equipment installed under mechanical and electrical work shall be cleaned prior to priming.

K. Preparation of other surfaces shall be performed following specific recommendations of the coatings manufacturer.

L. Bond breakers and curing agents must be removed and the surface cleaned before primers, sealers or finish paints can be applied.

M. All drywall surfaces must be completely dry and dust free before painting. Skim coated drywall must be sealed with an alkyd based sealer or a waterborne sealer recommended by the paint manufacturer for this surface. Use the appropriate light or medium tack masking tape.

3.04 APPLICATION:

A. Apply painting and finishing materials in accordance with the manufacturer's submittals, as approved. Use applicators and techniques best suited for the material and surfaces to which applied.

1. The number of coats specified is the minimum that shall be applied. Apply additional coats when undercoats, stains or other conditions show through final paint coat, until paint film is of uniform finish, color and appearance.
2. All undercoats shall be tinted slightly to approximate the color of the finish coat.

B. Apply each material at not less than the manufacturer's recommended spreading rate:

1. Provide a total dry film thickness of not less than 1.2 mils for each required coat.

C. Apply prime coat to surface, which is required to be painted or finished.

D. Finish exterior doors on tops, bottoms, and edges same as exterior faces, after fitting.

E. Sand lightly and dust clean between succeeding coats.

3.05 CLEANING, TOUCH-UP AND REFINISHING:

A. Carefully remove all spattering, spots and blemishes caused by work under this section from surfaces throughout the project.

B. Upon completion of painting work remove all rubbish, paint cans, and accumulated materials resulting from work in each space or room. All areas shall be left in a clean, orderly condition.

C. Runs, sags, misses, holidays, stains and other defects in the painted surfaces, including inadequate coverage and mil thickness shall be satisfactorily touched up, or refinished, or repainted as necessary.

3.06 FINISH SCHEDULE

A. Apply the following finishes to the surfaces specified and/or as specified on the finish schedule on the Drawings. Apply all materials in accordance with manufacturer's instructions on properly prepared surfaces and foundation coats. All intermediate undercoats must be tinted to approximate the final color.

1. Architect will issue a color schedule prior to start of painting to designate the various colors and locations required for the work.

2. Semi-gloss finish typical, all materials, interior and exterior.

3. District approval required to substitute for semi-gloss, even if the non-semi-gloss finish is noted below.

B. Exterior Systems:

1. Stucco & Plaster

Semi-Gloss – 100% Acrylic

First Coat	EFF-STOP, Acrylic Masonry Primer (W 709)
OR	SUPER-LOC Two-Component Waterborne Epoxy Masonry Sealer (W 718)
Second Coat	EVERSHIELD, 100% Acrylic Semi-Gloss Enamel (EVSH 50)
Third Coat	EVERSHIELD, 100% Acrylic Semi-Gloss Enamel (EVSH 50)

2. Concrete Tilt-Up

Semi-Gloss – 100% Acrylic

First Coat	EFF-STOP, Acrylic Masonry Primer/Sealer (W 709)
OR	SUPER-LOC Two-Component Waterborne Epoxy Masonry Sealer (W 718)
Second Coat	EVERSHIELD, 100% Acrylic Semi-Gloss Enamel (EVSH 50)
Third Coat	EVERSHIELD, 100% Acrylic Semi-Gloss Enamel (EVSH 50)

3. Concrete Block

a. Semi-Gloss – 100% Acrylic

First Coat BLOCFIL, Concrete Block Filler, Smooth (W 305)
Second Coat EVERSHIELD, 100% Acrylic Semi-Gloss Enamel (EVSH 50) Third Coat EVERSHIELD, 100% Acrylic Semi-Gloss Enamel (EVSH 50)

4. Ferrous Metal

a. Semi-Gloss – Alkyd/Acrylic

First Coat SYN-LUSTRO, Water-based Rust-Preventative Acrylic Primer (W 8) OR BLOC-RUST, Red Oxide Alkyd Rust Preventative Primer (43-4)
OR CORROBAR, White Alkyd Rust Preventative Primer (43-5)
Second Coat EVERSHIELD, 100% Acrylic Semi-Gloss Enamel (EVSH 50) Third Coat EVERSHIELD, 100% Acrylic Semi-Gloss Enamel (EVSH 50)

b. Gloss – Rust Preventative Alkyd

First Coat SYN-LUSTRO, Water-based Rust-Preventative Acrylic Primer (W 8) OR BLOC-RUST, Red Oxide Alkyd Rust Preventative Primer (43-4)
OR CORROBAR, White Alkyd Rust Preventative Primer (43-5)
Second Coat SYN-LUSTRO, Rust Preventative Alkyd Gloss Enamel (10 Series)**
Third Coat SYN-LUSTRO, Rust Preventative Alkyd Gloss Enamel (10 Series)** OR SYN-LUSTRO, Water-Based Rust Preventative Gloss Paint (W10)

c. Matte, Industrial High Performance – Inorganic Zinc/Epoxy/Acrylic
First Coat Rust-Oleum 9100 DTM Epoxy Mastic
Second Coat Rust-Oleum 5200 Industrial Choice DTM Acrylic
Third Coat Rust-Oleum 5200 Industrial Choice DTM Acrylic

d. Matte, Industrial High Performance – Epoxy Primer/Epoxy/Acrylic First Coat Rust-Oleum 9100 DTM Epoxy Mastic
Second Coat Rust-Oleum 5200 Industrial Choice DTM Acrylic
Third Coat Rust-Oleum 5200 Industrial Choice DTM Acrylic

e. High Gloss, Industrial High Performance – Inorganic Zinc/Epoxy/Urethane First Coat Rust-Oleum 9100 DTM Epoxy Mastic
Second Coat Rust-Oleum 9100 DTM Epoxy Mastic
Third Coat Rust-Oleum 9700 Low VOC Urethane

f. High Gloss, Industrial High Performance – Epoxy Primer/Epoxy/Urethane
First Coat Rust-Oleum 9100 DTM Epoxy Mastic
Second Coat Rust-Oleum 9100 DTM Epoxy Mastic
Third Coat Rust-Oleum 9700 Low VOC Urethane

5. Galvanized Metal

a. Semi-Gloss – Alkyd/Acrylic

Pretreatment JASCO Metal Etch

First Coat GALV-ALUM Epoxy Galvanized/Aluminum Metal Primer (43-7) Second Coat EVERSHIELD, 100% Acrylic Semi-Gloss Enamel (EVSH 50) Third Coat EVERSHIELD, 100% Acrylic Semi-Gloss Enamel (EVSH 50)

b. Gloss – Rust Preventative Alkyd
Pretreatment JASCO Metal Etch
First Coat GALV-ALUM Epoxy Galvanized/Aluminum Metal Primer (43-7)
Second Coat SYN-LUSTRO, Rust Preventative Alkyd Gloss Enamel (10 Series)** Third Coat SYN-LUSTRO, Rust Preventative Alkyd Gloss Enamel (10 Series)** ORSYN-LUSTRO, Water-Based Rust Preventative Gloss Paint (W10)

c. Matte, Industrial High Performance – Epoxy
Primer/Acrylic First Coat Rust-Oleum 9100 DTM Epoxy Mastic
Second Coat Rust-Oleum 5200 Industrial Choice DTM Acrylic
Third Coat Rust-Oleum 5200 Industrial Choice DTM Acrylic

d. High Gloss, Industrial High Performance – Epoxy Primer/Urethane
First Coat Rust-Oleum 9100 DTM Epoxy Mastic
Second Coat Rust-Oleum 9700 Low VOC
Urethane Third Coat Rust-Oleum 9700 Low VOC Urethane

6. Wood – Paint Finish

a. Semi-Gloss – Acrylic

First Coat E-Z PRIME, Ext. 100% Acrylic Wood Primer (W 708)
Second Coat EVERSHIELD, 100% Acrylic Semi-Gloss Enamel (EVSH 50) Third Coat EVERSHIELD, 100% Acrylic Semi-Gloss Enamel (EVSH 50)

C. Interior Systems:

1. Gypsum Board

a. Semi-Gloss - Acrylic

First Coat VINYLASTIC, Interior Pigmented Sealer (W 101V)*
Second Coat SUPREMA, 100% Acrylic Semi-Gloss Enamel (SPMA 50) Third Coat SUPREMA, 100% Acrylic Semi-Gloss Enamel (SPMA 50)

2. Concrete & Plaster:

a. Semi-Gloss – 100% Acrylic

First Coat SUPER-LOC, Two-Component Waterborne Epoxy Sealer (W718) OR EFF-STOP, Acrylic Masonry Primer (W 709)
Second Coat SUPREMA, 100% Acrylic Semi-Gloss Enamel (SPMA 50) Third Coat SUPREMA, 100% Acrylic Semi-Gloss Enamel (SPMA 50)

3. Ferrous Metal

a. Semi-Gloss – Alkyd/100% Acrylic

First Coat	SYN-LUSTRO, Water-based Rust-Preventative Acrylic Primer (W 8) OR CORROBAR, White Alkyd Rust Preventative Primer (43-5)
Second Coat	SUPREMA, 100% Acrylic Semi-Gloss Enamel (SPMA 50) Third Coat SUPREMA, 100% Acrylic Semi-Gloss Enamel (SPMA 50)

b. Semi-Gloss –Rust Preventative Alkyd

First Coat	SYN-LUSTRO, Water-based Rust-Preventative Acrylic Primer (W 8) OR CORROBAR, White Alkyd Rust Preventative Primer (43-5)
Second Coat	SYN-LUSTRO, Alkyd Rust Preventative Semi-Gloss Enamel (9)** Third Coat SYN-LUSTRO, Alkyd Rust Preventative Semi-Gloss Enamel (9)**
OR	SYN-LUSTRO Water-based Rust-Preventative Acrylic Semi-Gloss Paint (W9)

4. Wood – Paint Finish

a. Semi-Gloss – 100% Acrylic

First Coat	UNIKOTE, Int. Acrylic Enamel Undercoater (W707V)
Second Coat	SUPREMA, 100% Acrylic Semi-Gloss Enamel (SPMA 50) Third Coat SUPREMA, 100% Acrylic Semi-Gloss Enamel (SPMA 50)

* Dunn-Edwards does not recommend VINYLASTIC, Interior Pigmented Sealer (W 101) on drywall where "Prep Coat", "First Coat", or other skim coat type materials have been applied. For enamel finishes, use WALLTONE, Flat Wall Finish (W 420) for the first coat. For flat finishes, use two coats of the flat finish material only.

**Yellowing of white and off-white alkyd enamels may occur because of government regulatory limits on solvent content. Substitution of latex enamels would avoid this problem.

END OF SECTION 09 91 00

SECTION 260500

GENERAL ELECTRICAL REQUIREMENTS

PART 1 – GENERAL

1.01 Description of Work:

A. The work of this Section consists of providing all required labor, supervision, materials and equipment to satisfactorily complete all electrical installations that are shown on the Drawings, included in these specifications, or otherwise needed for a complete and fully operating facility.

B. Furnish and install all required in-place equipment, conduits, conductors, cables and any miscellaneous materials for the satisfactory interconnection and operation of all associated electrical systems.

1.02 Related Work:

A. This Section provides the basic Electrical Requirements which supplement the General Requirements of Division 01 and apply to all Sections of Division 26.

1.03 Submittals:

A. As specified in Division 01. Submit to the Architect shop drawings, manufacturer's data and certificates for equipment, materials and finish, and pertinent details for each system specified. Information to be submitted includes manufacturer's descriptive literature of cataloged products, equipment, drawings, diagrams, performance and characteristic curves as applicable, test data and catalog cuts. Obtain written approval before procurement, fabrication, or delivery of the items to the job site. Partial submittals are not acceptable and will be returned without review. Furnish manufacturer's name, trade name, catalog model or number, nameplate data, size, layout dimensions, capacity, project specification and paragraph reference, applicable Federal, Industry and Technical Society Publication References, and years of satisfactory service of each item required to establish contract compliance. Photographs of existing installations and data submitted in lieu of catalog data are not acceptable and will be returned without approval.

B. Organize submittals for equipment and items related to each specification section together as a package.

C. Proposed substitutions of products will not be reviewed or approved prior to awarding of the Contract.

D. Substitutions shall be proven to the Architect or Engineer to be equal or superior to the specified product. Architect’s decision is final. The Contractor shall pay all costs incurred by the Architect and Engineer in reviewing and processing any proposed substitutions whether or not a proposed substitution is accepted.

E. If a proposed substitution is rejected, the contractor shall furnish the specified product at no increase in contract price.

F. If a proposed substitution is accepted, the contractor shall be completely responsible for all dimensional changes, electrical changes, or changes to other work which are a result of the substitution. The accepted substitution shall be made at no additional cost to the owner or design consultants.

1.04 Quality Assurance:

A. Codes: All electrical equipment and materials, including installation and testing, shall conform to the latest editions following applicable codes:

1. California Electrical Code (CEC).

2. Occupational Safety and Health Act (OSHA) standards.

3. All applicable local codes, rules and regulations.

4. Electrical Contractor shall posses a C-10 license and all other licenses as may be required. Licenses shall be in effect at start of this contract and be maintained throughout the duration of this contract.

B. Variances: In instances where two or more codes are at variance, the most restrictive requirement shall apply.

C. Standards: Equipment shall conform to applicable standards of American National Standards Institute (ANSI), Electronics Industries Association (EIA), Institute of Electrical and Electronics Engineers (IEEE), and National Electrical Manufacturers Association (NEMA).

D. Underwriter Laboratories (UL) listing is required for all equipment and materials where such listing is offered by the Underwriters Laboratories. Provide service entrance labels for all equipment required by the NEC to have such labels.

E. The electrical contractor shall guarantee all work and materials installed under this contract for a period of one (1) year from date of acceptance by owner.

F. All work and materials covered by this specification shall be subject to inspection at any and all times by representatives of the owner. Work shall not be closed in or covered before inspection and approval by the owner or his representative. Any material found not conforming with these specifications shall, within 3 days after being notified by the owner, be removed from premises; if said material has been installed, entire expense of removing and replacing same, including any cutting and patching that may be necessary, shall be borne by the contractor.

1.05 Contract Documents:

A. Drawings and Specifications:

1. In the case of conflict between the drawings and specifications, the specifications shall take precedence.

2. Drawings and specifications are intended to comply with all law, ordinances, rules and regulations of constituted authorities having jurisdiction, and where referred to in the Contract Documents, said laws, ordinance, rules and regulations shall be considered as a part of said Contract Documents within the limits specified. The Contractor shall bear all expenses of correcting work done contrary to said laws, ordinance, rules and regulations if the Contractor knew or should have known that the work as performed is contrary to said laws, ordinances, rules and regulations and if the Contractor performed same (1) without first consulting the Architect for further instructions regarding said work and/or (2) disregarded the Architect’s instructions regarding said work.

B. Drawings: The Electrical Drawings shall govern the general layout of the completed construction.

1. Locations of equipment, panels, pullboxes, conduits, stub-ups, ground connections are approximate unless dimensioned; verify locations with the Architect prior to installation.

2. Review the Drawings and Specification Divisions of other trades and perform the electrical work that will be required for those installations.

3. Should there be a need to deviate from the Electrical Drawings and Specifications, submit written details and reasons for all changes to the Architect for approval.

4. The general arrangement and location of existing conduits, piping, apparatus, etc., is approximate. The drawings and specifications are for the assistance and guidance of the contractor, exact locations, distances and elevations are governed by actual field conditions. Accuracy of data given herein and on the drawings is not guaranteed. Minor changes may be necessary to accommodate work. The contractor is responsible for verifying existing conditions. Should it be necessary to deviate from the design due to interference with existing conditions or work in progress, claims for additional compensation shall be limited to those for work required by unforeseen conditions as determined by the Architect.

5. All drawings and divisions of these specifications shall be considered as whole. The contractor shall report any apparent discrepancies to the Architect prior to submitting bids.

6. The contractor shall be held responsible to have examined the site and compared it with the specifications and plans and to have satisfied himself as to the conditions under which the work is to be performed. He shall be held responsible for knowledge of all existing conditions whether or not accurately described. No subsequent allowance shall be made for any extra expense due to failure to make such examination.

1.06 Closeout Submittals:

A. Manuals: Furnish manuals for equipment where manuals are specified in the equipment specifications or are specified in Division 01.

1.07 Coordination:

A. Coordinate the electrical work with the other trades, code authorities, utilities and the Architect.

B. Provide and install all trenching, backfilling, conduit, pull boxes, splice boxes, etc. for all Utility Company services to the locations indicated on the Drawings. All materials and construction shall be in accordance with the requirements for all the Utility Companies. Prior to performing any work, the Electrical Contractor shall coordinate with the various Utility Companies and obtain utility company engineering drawings. Verify that all such work and materials shown on the Drawings are of sufficient sizes and correctly located to provide services on the site. The Electrical Contractor shall verify with all the Utility Companies that additional contractor furnished and installed work is not required. If additional work, materials, or changes are required by any of the Utility Companies, the Electrical Contractor shall advise the Architect of such changes and no further work shall then be performed until instructed to do so by the Architect. The Electrical Contractor shall coordinate with the various Utility Companies to schedule inspections and to obtain service connections.

C. The Electrical Contractor shall schedule all utility work necessary for utility inspections, connections, cable installation, etc. for the new electrical service to meet the construction schedule.

D. Utility Company charges shall be paid by the Owner.

E. Contractor shall pay all inspection and other applicable fees and procure all permits necessary for the completion of this work.

F. Where connections must be made to existing installations, properly schedule all the required work, including the power shutdown periods.

G. When two trades join together in an area, make certain that no electrical work is omitted.

1.08 Job Conditions:

A. Operations: Perform all work in compliance with Division 01.

1. Keep the number and duration of power shutdown periods to a minimum.

2. Show all proposed shutdowns and their expected duration on the construction schedule. Schedule and carry out shutdowns so as to cause the least disruption to operation of the Owner's facilities.

3. Carry out shutdown only after the schedule has been approved, in writing, by the owner. Submit power interruption schedule 15 days prior to date of interruption.

B. Construction Power: Unless otherwise noted in Division 01 of these specifications, contractor shall make all arrangements and provide all necessary facilities for temporary construction power from the owner’s on site source. Energy costs shall be paid for by the Owner.

C. Storage: Provide adequate storage for all equipment and materials which will become part of the completed facility so that it is protected from weather, dust, water, or construction operations.

1.09 Damaged Products:

A. Notify the Architect in writing in the event that any equipment or material is damaged. Obtain approval from the Architect before making repairs to damaged products.

1.10 Locations:

A. General: Use equipment, materials and wiring methods suitable for the types of locations in which they are located.

B. Dry Locations: All those indoor areas which do not fall within the definition below for Wet Locations and which are not otherwise designated on the Drawings.

C. Wet Locations: All locations exposed to the weather, whether under a roof or not, unless otherwise designated on the Drawings.

1.11 Safety and Indemnity:

A. The Contractor is solely and completely responsible for conditions of the job site including safety of all persons and property during performance of the work. This requirement will apply continually and not be limited to normal working hours. The contractor shall provide and maintain throughout the work site proper safeguards including, but not limited to, enclosures, barriers, warning signs, lights, etc. to prevent accidental injury to people or damage to property.

B. No act, service, drawing review or construction review by the Owner, the Engineer or their Consultants is intended to include reviews of the adequacy of the Contractors safety measures in or near the construction site.

C. The Contractor performing work under this Division of the Specifications shall hold harmless, indemnify, and defend the Owner, the Engineer, their consultants, and each of their officers, agents and employees from any and all liability claims, losses, or damage arising out of or alleged to arise from bodily injury, sickness, or death of a person or persons and for all damages arising out of injury to or destruction of property arising directly or indirectly out of or in connection with the performance of the work under this Division of the Specifications, and from the Contractor's negligence in the performance of the work described in the construction contract documents, but not including liability that may be due to the sole negligence of the Owner, the Engineer, their Consultants or their officers, agents and employees.

D. If a work area is encountered that contains hazardous materials, the contractor is advised to coordinate with the owner and it's abatement consultant for abatement of hazardous material by the Owner's Representative. "Hazardous materials" means any toxic substance regulated or controlled by OSHA, EPA, State of California or local rules, regulations and laws. Nothing herein shall be construed to create a liability for Aurum Consulting Engineers regarding hazardous materials abatement measures, or discovery of hazardous materials.

1.12 Access Doors:

A. The contractor shall install access panels as required where floors, walls or ceilings must be penetrated for access to electrical, control, fire alarm or other specified electrical devices. The minimum size panel shall be 14" x 14" in usable opening. Where access by a service person is required, minimum usable opening shall be 18" x 24".

B. All access doors installed lower than 7'-0" above finished floor and exposed to public access shall have keyed locks.

C. Where specific information or details relating to access panels differ from Division 26 paragraph 1.12 of these specifications, or shown on the electrical drawings and details or under other Divisions of work, those requirements shall supersede these specifications.

1.13 Arc Flash:

A. The contractor shall install a clearly visible arc flash warning to the inside door of all panelboards and industrial control panels, as well as to the front of all switchboards and motor control centers that are a part of this project.

B. The warning shall have the following wording: line 1 "WARNING" (in large letters), line 2 "Potential Arc Flash Hazard" (in medium letters), line 3 & 4 "Appropriate Personal Protective Equipment and Tools required when working on this equipment".

1.14 Emergency Boxes:

A. All boxes and enclosures for emergency circuits shall be permanently marked with a readily visible red spray painted mark.

PART 2 - PRODUCTS

2.01 Standard of Quality:

A. Products that are specified by manufacturer, trade name or catalog number establish a standard of quality and do not prohibit the use of equal products of other manufacturers provided they are established to be equal to the specified product and approved by the Architect prior to installation.

B. Material and Equipment: Provide materials and equipment that are new and are current products of manufacturers regularly engaged in the production of such products. The standard products shall have been in satisfactory commercial or industrial use for two years prior to bid opening. The two-year period includes use of equipment and materials of similar size under similar circumstances. For uniformity, only one manufacturer will be accepted for each type of product.

C. Service Support: Submit a certified list of qualified permanent service organizations including their addresses and qualification for support of the equipment. These service organizations shall be convenient to the equipment installation and able to render service to the equipment on a regular and emergency basis during the warranty period of the contract.

D. Manufacturer's Recommendations: Where installation procedures are required to be in accordance with manufacturer's recommendations, furnish printed copies of the recommendations prior to installation. Installation of the item shall not proceed until recommendations are received. Failure to furnish recommendation shall be cause for rejection of the equipment or material.

2.02 Nameplates:

A. For each piece of electrical equipment, provide a manufacturer's nameplate showing his name, location, the pertinent ratings, the model designation, and shop order number.

B. Identify each piece of equipment and related controls with a rigid laminated engraved plastic nameplate. Unless otherwise noted, nameplates shall be melamine plastic 0.125 inch thick, white with black center core. Surface shall be matte finish. Corners shall be square. Accurately align lettering and engrave into the core. Minimum size of nameplates shall be 0.5 by 2.5 inches unless otherwise noted. Where not otherwise specified, lettering shall be a minimum of 0.25 inch high normal block style. Engrave nameplates with the inscriptions indicated on the Drawings and, if not so indicated, with the equipment name. Securely fasten nameplates in place using two stainless steel or brass screws.

2.03 Fasteners:

A. Fasteners for securing equipment to walls, floors and the like shall be either hot-dip galvanized after fabrication or stainless steel.

2.04 Finish requirements:

A. Equipment: Refer to each electrical equipment section of these Specifications for painting requirements of equipment enclosures. Repair any final paint finish which has been damaged or is otherwise unsatisfactory, to the satisfaction of the Architect.

B. Wiring System: In finished areas, paint all exposed conduits, boxes and fittings to match the color of the surface to which they are affixed.

PART 3 - EXECUTION

3.01 Workmanship:

A. Ensure that all equipment and materials fit properly in their installation.

B. Perform any required work to correct improperly fit installation at no additional expense to the owner.

C. All electrical equipment and materials shall be installed in a neat and workmanship manner in accordance with the “NECA-1 Standard Practices for Good Workmanship in Electrical Contracting”. Workmanship of the entire job shall be first class in every respect.

3.02 Equipment Installations:

A. Provide the required inserts, bolts and anchors, and securely attach all equipment and materials to their supports.

B. Do all the cutting and patching necessary for the proper installation of work and repair any damage done.

C. Earthquake restraints: all electrical equipment, including conduits over 2 inches in diameter, shall be braced or anchored to resist a horizontal force acting in any direction as per CBC Section 1616A Title 24, part 2 and ASCE7-10, Sections 13.3 and 13.6 and Table 13.6-1.

D. Structural work: All core drilling, bolt anchor insertion, or cutting of existing structural concrete shall be approved by a California registered structural consulting engineer prior to the execution of any construction. At all floor slabs and structural concrete walls to be drilled, cut or bolt anchors inserted, the contractor shall find and mark all reinforcing in both faces located by means of x-ray, pach-ometer, or prof-ometer. Submit sketch showing location of rebar and proposed cuts, cores, or bolt anchor locations for approval.

3.03 Field Test:

A. Test shall be in accordance with Acceptance testing specifications issued by the National Electrical Testing Association (NETA).

B. Perform equipment field tests and adjustments. Properly calibrate, adjust and operationally check all circuits and components, and demonstrate as ready for service. Make additional calibration and adjustments if it is determined later that the initial adjustments are not satisfactory for proper performance. Perform equipment field test for equipment where equipment field tests are specified in the equipment Specifications. Give sufficient notice to the Architect prior to any test so that the tests may be witnessed.

C. Provide instruments, other equipment and material required for the tests. These shall be of the type designed for the type of tests to be performed. Test instrument shall be calibrated by a recognized testing laboratory within three months prior to performing tests.

D. Operational Tests: Operationally test all circuits to demonstrate that the circuits and equipment have been properly installed and adjusted and are ready for full-time service. Demonstrate the proper functioning of circuits in all modes of operation, including alarm conditions.

E. Re-testing will be required for all unsatisfactory tests after the equipment or system has been repaired. Re-test all related equipment and systems if required by the Architect. Repair and re-test equipment and systems which have been satisfactorily tested but later fail, until satisfactory performance is obtained.

F. Maintain records of each test and submit five copies to the Architect when testing is complete. All tests shall be witnessed by the Architect. These records shall include:

1. Name of equipment tested.

2. Date of report.

3. Date of test.

4. Description of test setup.

5. Identification and rating of test equipment.

6. Test results and data.

7. Name of person performing test.

8. Owner or Architect's initials.

G. Items requiring testing shall be as noted in the additional electrical sections of these specifications.

3.04 Cleaning Equipment:

A. Thoroughly clean all soiled surfaces of installed equipment and materials.

3.05 Painting of Equipment:

A. Factory Applied: Electrical equipment shall have factory applied painting system which shall, as a minimum, meet the requirements of NEMA ICS 6 corrosion-resistance test and the additional requirements specified in the technical section.

B. Field Applied: Paint electrical equipment as required to match finish of adjacent surfaces.

3.06 Records:

A. Maintain one copy of the contract Drawing Sheets on the site of the work for recording the "as built" condition. After completion of the work, the Contractor shall carefully mark the work as actually constructed, revising, deleting and adding to the Drawing Sheets as required. The following requirements shall be complied with:

1. Cable Size and Type: Provide the size and type of each cable installed on project.

2. Substructure: Where the location of all underground conduits, pull boxes, stub ups and etc. where are found to be different than shown, carefully mark the correct location on the Drawings. Work shall be dimensioned from existing improvements.

3. Size of all conduit runs.

4. Routes of concealed conduit runs and conduit runs below grade.

5. Homerun points of all branch circuit.

6. Location of all switchgear, panels, MCC, lighting control panels, pullcans, etc.

7. Changes made as a result of all approved change orders, addendums, or field authorized revisions.

8. As Builts: At the completion of the Work the Contractor shall review, certify, correct and turn over the marked up Drawings to the Architect for his use in preparing "as built" plans.

9. As built Drawings shall be delivered to the Architect within ten (10) days of completion of construction.

3.07 Clean Up:

A. Upon completion of electrical work, remove all surplus materials, rubbish, and debris that accumulated during the construction work. Leave the entire area neat, clean, and acceptable to the Architect.

3.08 Mechanical and Plumbing Electrical Work:

A. The requirements for electrical power and/or devices for all mechanical and plumbing equipment supplied and/or installed under this Contract shall be coordinated and verified with the following:

1. Mechanical and Plumbing Drawings.
2. Mechanical and Plumbing sections of these Specifications.
3. Manufacturers of the Mechanical and Plumbing equipment supplied.

B. The coordination and verification shall include the voltage, ampacity, phase, location and type of disconnect, control, and connection required. Any changes that are required as a result of this coordination and verification shall be a part of this Contract.

C. The Electrical Contractor shall furnish and install the following for all mechanical and plumbing equipment:

1. Line voltage conduit and wiring.
2. Disconnect switches.
3. Manual line motor starters.

D. Automatic line voltage controls and magnetic starters shall be furnished by the Mechanical and/or Plumbing Contractor and installed and connected by the Electrical Contractor. When subcontracted for by the Mechanical and/or Plumbing Contractor, all line voltage control wiring installed by the Electrical Contractor shall be done per directions from the Mechanical and/or Plumbing Contractor.

E. All low voltage control wiring for Mechanical and Plumbing equipment shall be installed in conduit. Furnishing, installation and connection of all low voltage conduit, boxes, wiring and controls shall be by the Mechanical and/or Plumbing Contractor.

F. Disconnects (Motor And Circuit)

1. Disconnect switches shall be provided and located at all motors.
2. Switches for three-phase motors shall be heavy-duty, horsepower rated three-pole, and surface mounted except as noted on drawings.
3. Switches containing more than three poles shall be as specified on the drawings.
4. Switches for single-phase, fractional horsepower motors shall be heavy-duty, horsepower rated.
5. Disconnect switches shall be as manufactured by ITE- Siemens, General Electric or Square D.

G. Disconnects (Motor: Fused):

1. Disconnect switches shall be provided and located at all motors.
2. Switches for three-phase motors shall be heavy-duty, horsepower rated three-pole, and surface mounted except as noted on drawings.
3. Switches containing more than three poles shall be as specified on the drawings.
4. Switches for single-phase, fractional horsepower motors shall be heavy-duty, horsepower rated.
5. Disconnect switches shall be as manufactured by ITE- Siemens, General Electric or Square D.

H. Manual motor starters, where required, shall have toggle type operators with pilot light and melting alloy type overload relays, SQUARE D COMPANY, Class 2510, Type FG-1P (surface) or Type FS-1P (flush) or ITE, WESTINGHOUSE or GENERAL ELECTRIC equal.

END OF SECTION

SECTION 260519

LINE VOLTAGE WIRE AND CABLE

PART 1 - GENERAL

1.01 Description of Work:

A. The work of this Section consists of providing all wire and cable rated 600 volts or less, including splices and terminations, as shown on the Drawings and as described herein.

1.02 Related Work:

A. See the following Specification Section for work related to the work in this Section:

1. 260542 Conduits, Raceways and Fittings.

2. 260533 Junction and Pull Boxes.

1.03 Quality Assurance

A. Field tests shall be performed as specified in paragraph 3.04 of this Section.

PART 2 - PRODUCTS

2.01 Conductors:

A. Conductors shall be copper, type THHN/THWN/MTW oil and gasoline resistant, 600 volt rated insulation.

B. Conductors shall be stranded copper.

C. Minimum power and control wire size shall be No. 12 AWG unless otherwise noted.

D. All conductors used on this Project shall be of the same type and conductor material.

2.02 Cables:

A. All individual conductors shall be copper with type THHN/THWN, 600 volt rated insulation.

B. Insulation Marking - All insulated conductors shall be identified with printing colored to contrast with the insulation color.

C. Color Coding - As specified in paragraph 3.03.

D. Special Wiring - Where special wiring is proposed by an equipment manufacturer, submit the special wiring requirements to the Owner's Representative and, if approved, provide same. Special wire shall be the type required by the equipment manufacturer.

E. Other Wiring - Wire or cable not specifically shown on the Drawings or specified, but required, shall be of the type and size required for the application and as approved by the Owner's Representative.

F. Manufacturer - Acceptable manufacturers including Cablec, Southwire, or equal.

2.03 Terminations:

A. Manufacturer - Terminals as manufactured by T&B, Burndy or equal.

B. Wire Terminations – Stranded conductors shall be terminated in clamping type terminations which serve to contain all the strands of the conductor. Curling of a stranded conductor around a screw type terminal is not allowed. For screw type terminations, use a fork type stake-on termination on the stranded conductor. Use only a stake-on tool approved for the fork terminals selected.

C. End Seals - Heat shrink plastic caps of proper size for the wire on which used.

2.04 Tape:

A. Tape used for terminations and cable marking shall be compatible with the insulation and jacket of the cable and shall be of plastic material.

PART 3 - EXECUTION

3.01 Cable Installation:

A. Clean Raceways - Clean all raceways prior to installation of cables as specified in Section 260542 - Conduits Raceway and Fittings.

B. All line voltage wiring shall be installed in conduit.

C. All feeder conductors shall be continuous from equipment to equipment. Splices in feeders are not permitted unless specifically noted or approved by the Electrical Engineer.

D. All branch circuit wiring shall be run concealed in ceiling spaces, walls, below floors or in crawl spaces unless noted otherwise.

E. Cable Pulling - Exercise care in pulling wires and cables into conduit or wireways so as to avoid kinking, putting undue stress on the cables or otherwise abrading them. No grease will be permitted in pulling cables. Only soapstone, talc, or UL listed pulling compound will be permitted. The raceway construction shall be complete and protected from the weather before cable is pulled into it. Swab conduits before installing cables and exercise care in pulling, to avoid damage to conductors.

F. Bending Radius - Cable bending radius shall be per applicable code. Install feeder cables in one continuous length.

G. Equipment Grounding Conductors - Provide an equipment grounding conductor, whether or not it is shown on the Drawings, in all conduits or all raceways.

H. Panelboard Wiring - In panels, bundle incoming wire and cables which are No. 6 AWG and smaller, lace at intervals not greater than 6 inches, neatly spread into trees and connect to their respective terminals. Allow sufficient slack in cables for alterations in terminal connections. Perform lacing with plastic cable ties or linen lacing twine. Where plastic panel wiring duct is provided for cable runs, lacing is not necessary when the cable is properly installed in the duct.

3.02 Cable Terminations and Splices:

A. Splices - UL Listed wirenuts.

B. Terminations - Shall comply with the following:

1. Make up and form cable and orient terminals to minimize cable strain and stress on device being terminated on.

2. Burnish oxide from conductor prior to inserting in oxide breaking compound filled terminal.

3.03 Circuit and Conductor Identification:

A. Color Coding - Provide color coding for all circuit conductors. Insulation color shall be white for neutrals and green for grounding conductors. Conductor colors shall be as follows:

VOLTAGE	208/120V
Phase A	Black
Phase B	Red
Phase C	Blue
Neutral	White
Ground	Green

B. Color coding shall be in the conductor insulation for all conductors #10 AWG and smaller; for larger conductors, color shall be either in the insulation or in colored plastic tape applied at every location where the conductor is readily accessible.

C. Circuit Identification - All underground distribution and service circuits shall be provided with plastic identification tags in each secondary box and at each termination. Tags shall identify the source transformer of the circuit and the building number(s) serviced by the circuit.

3.04 Field Tests:

A. All systems shall test free from short circuits and grounds, shall be free from mechanical and electrical defects, and shall show an insulation resistance between phase conductors and ground of not less than the requirements of the CEC. All circuits shall be tested for proper neutral connections.

B. Insulation Resistance Tests: Perform insulation resistance tests on circuits with #2 AWG and larger conductors to be energized with a line-to-neutral voltage of 120 volts or more. Make these tests before all equipment has been connected. Test the insulation with a 500Vdc insulation resistance tester with a scale reading 100 megohms. The insulation resistance shall be 2 megohms or more. Submit results for review.

END OF SECTION

GROUNDING

PART 1 GENERAL

1.1 Section Includes:

A. Conduits, wires, ground rods and other materials for the electrical grounding system.

1.2 Related Sections:

A. Section 260500 - Electrical General Requirements.

PART 2 PRODUCTS

2.1 Ground Rod:

A. "Copperweld" ground rod conforming to or exceeding requirements of U.L. Specification No. 467 (ANSI C-33.8). Rod shall be 3/4" diameter and 10' in length, unless otherwise noted on the Drawings.

2.2 Below Grade Connections:

A. Compression fittings, Thomas & Betts, Series 52000, 53000 or 54000 or approved equal.

2.3 Hardware:

A. Bolts, nuts and washers shall be bronze, cadmium plated steel or other non-corrosive materials, approved for the purpose.

2.4 Waterproof Sealant:

A. Use Kearney "Aqua Seal" mastic sealant on all below grade clamp or compression type connections.

PART 3 EXECUTION

3.1 Grounding and Bonding:

A. Grounding and bonding shall be as required by codes and local authorities.

B. All electrical equipment shall be grounded, including, but not limited to, panel boards, terminal cabinets and outlet boxes.

C. The ground pole of receptacles shall be connected to their outlet boxes by means of a copper ground wire connecting to a screw in the back of the box.

D. A green insulated copper ground wire, sized to comply with codes, shall be installed in all conduit runs.

E. All metal parts of pull boxes shall be grounded per code requirements.

F. All ground conductors shall be green insulated copper.

G. The ground system electrodes shall be tested for resistance before the equipment ground conductors are connected. Maximum ground system resistance shall be 25 ohms. Install up to two additional ground rods to meet the 25 ohm requirement. Multiple ground rods shall not be less than 10 feet apart.

H. Grounding of the panels shall be completed as indicated on the Drawings.

END OF SECTION

SECTION 26 05 33

OUTLET, JUNCTION AND PULL BOXES

PART 1 - GENERAL

1.01 Description of Work:

A. The work of this Section consists of providing all required labor, supervision, materials and equipment to satisfactorily complete all electrical installations shown on the drawings, included in these Specification, or otherwise needed for a complete and fully operating facility. The work shall include but not be limited to the following:
B. Furnish and install all required material, supports and miscellaneous material for the satisfactory interconnection of all associated electrical systems.

1.02 Related Work:

A. See the following specification sections for work related to the work of this section.

1. 260500 General Electrical Requirements.

2. 260542 Conduits, Raceway and Fittings.

3. 260519 Line Voltage Wire and Cable.

PART 2 - PRODUCTS

2.01 Outlet boxes, Junction and Pull boxes

A. Standard Outlet Boxes: Galvanized, steel, knock-out type of size and configuration best suited to the application indicated on the Drawings. Minimum box size shall be 4 inches square (octagon for most light fixtures) by 1-1/2 inches deep with mud rings as required.

B. Switch boxes: Minimum box size shall be 4 inches square by 1-1/2 inches deep with mud rings as required. Install multiple switches in standard gang boxes with raised device covers suitable for the application indicated.

C. Conduit bodies: Cadmium plated, cast iron alloy. Conduit bodies with threaded conduit hubs and neoprene gasketed, cast iron covers. Bodies shall be used to facilitate pulling of conductors or to make changes in conduit direction only. Splices are not permitted in conduit bodies. Crouse- Hinds Form 8 Condulets, Appleton Form 35 Unilets or equal.

D. Sheet Metal Boxes: Use standard outlet or concrete ring boxes wherever possible; otherwise use a minimum 16 gauge galvanized sheet metal, NEMA I box sized to Code requirements with covers secured by cadmium plated machine screws located six inches on centers. Circle AW Products, Hoffman Engineering Company or equal.

E. Flush Mounted Pull boxes and Junction boxes: Provide overlapping covers with flush head cover retaining screws, prime coated.

PART 3 - EXECUTION

3.01 Outlet Boxes

A. General:

1. All outlet boxes shall finish flush with building walls, ceilings and floors except in mechanical and electrical rooms above accessible ceiling or where exposed work is called for on the Drawings.

2. Install raised device covers (plaster rings) on all switch and receptacle outlet boxes installed in masonry or stud walls or in furred, suspended or exposed concrete ceilings. Covers shall be of a depth to suit the wall or ceiling finish.

3. Leave no unused openings in any box. Install close-up plugs as required to seal openings.

B. Box Layout:

1. Outlet boxes shall be installed at the locations and elevations shown on the drawings or specified herein. Make adjustments to locations as required by structural conditions and to suit coordination requirements of other trades.

2. Locate switch outlet boxes on the latch side of doorways.

3. Outlet boxes shall not be installed back to back nor shall through-wall boxes be permitted. Outlet boxes on opposite sides of a common wall shall be separated horizontally by at least one stud or vertical structural member.

4. For outlets mounted above counters, benches or backsplashes, coordinate location and mounting heights with built-in units. Adjust mounting height to agree with required location for equipment served.

5. On fire rated walls, the total face area of the outlet boxes shall not exceed 100 square inches per 100 square feet of wall area.

C. Supports:

1. Outlet Boxes installed in metal stud walls shall be equipped with brackets designed for attaching directly to the studs or shall be mounted on specified box supports.

2. Fixture outlet boxes installed in suspended ceiling of gypsum board or lath and plaster construction shall be mounted to 16 gauge metal channel bars attached to main ceiling runners.

3. Fixture outlet boxes installed in suspended ceilings supporting acoustical tiles or panels shall be supported directly from the structure above where pendant mounted lighting fixture are to be installed on the box.

4. Fixture Boxes above tile ceilings having exposed suspension systems shall be supported directly from the structure above.

5. Outlet and / or junction boxes shall not be supported by grid or fixture hanger wires at any locations.

3.02 Junction And Pull Boxes

A. General:

1. Install junction or pull boxes where required to limit bends in conduit runs to not more than 360 degrees or where pulling tension achieved would exceed the maximum allowable for the cable to be installed. Note that these boxes are not shown on the Drawings.

2. Locate pull boxes and junction boxes in concealed locations above accessible ceilings or exposed in electrical rooms, utility rooms or storage areas.

3. Install raised covers (plaster rings) on boxes in stud walls or in furred, suspended or exposed concrete ceilings. Covers shall be of a depth to suit the wall or ceiling finish.

4. Leave no unused openings in any box. Install close-up plugs as required to seal openings.

5. Identify circuit numbers and panel on cover of junction box with black marker pen.

B. Box Layouts:

1. Boxes above hung ceilings having concealed suspension systems shall be located adjacent to openings for removable recessed lighting fixtures.

C. Supports:

1. Boxes installed in metal stud walls shall be equipped with brackets designed for attaching directly to the studs or shall be mounted on specified box supports.

2. Boxes installed in suspended ceilings of gypsum board or lath and plaster construction shall be mounted to 16 gauge metal channel bars attached to main ceiling runners.

3. Boxes installed in suspended ceilings supporting acoustical tiles or panels shall be supported directly from the structure above.

4. Boxes mounted above suspended acoustical tile ceilings having exposed suspension systems shall be supported directly from the structure above.

END OF SECTION

SECTION 260542

CONDUITS, RACEWAYS AND FITTINGS

PART 1 - GENERAL

1.01 Description of Work:

A. The work of this section consists of furnishing and installing conduits, raceways and fittings as shown on the Drawings and as described herein.

1.02 Related Work:

A. See the following specification sections for work related to the work in this section:

1. 260543 Underground Ducts

2. 260544 In Grade Pull Boxes

3. 260519 Line Voltage Wire and Cable

4. 260533 Junction and Pull

Boxes PART 2 - PRODUCTS

2.01 Conduits, Raceways:

A. Electrical Metallic Tubing (EMT) shall be hot-dip galvanized after fabrication. Couplings shall be compression or set-screw type.

B. Flexible Conduit: Flexible metal conduit shall be galvanized steel.

C. Galvanized Rigid Steel Conduit (GRS) shall be hot-dip galvanized after fabrication. Couplings shall be threaded type.

D. Rigid Non-metallic Conduit: Rigid non-metallic conduit shall be PVC Schedule 40 (PVC-40 or NEMA Type EPC-40) conduit approved for underground use and for use with 90˚ C wires.

2.02 Conduit Supports:

A. Supports for individual conduits shall be galvanized malleable iron one-hole type with conduit back spacer.

B. Supports for multiple conduits shall be hot-dipped galvanized Unistrut or Superstrut channels, or approved equal. All associated hardware shall be hot-dip galvanized.

C. Supports for EMT conduits shall be galvanized pressed steel single hole straps.

D. Clamp fasteners shall be by wedge anchors. Shot in anchors shall not be allowed.

2.03 Fittings:

A. Provide threaded-type couplings and connectors for rigid steel conduits; provide steel compression (watertight), or steel set-screw type for EMT, (die-cast zinc or malleable iron type

fittings are not allowed). Provide threaded couplings and Meyers hubs for rigid steel conduit exposed to weather.

B. Fittings for flexible conduit shall be Appleton, Chicago, IL, Type ST, O-Z Gedney Series 4Q by General Signal Corp., Terryville, CT, T & B 5300 series, or approved equal.

C. Fittings for use with rigid steel shall be galvanized steel or galvanized cast ferrous metal; access fittings shall have gasketed cast covers and be Crouse Hinds Condulets, Syracuse, NY, Appleton Unilets, Chicago, IL, or approved equal. Provide threaded-type couplings and connectors; set- screw type and compression-type are not acceptable.

D. Fittings for use with rigid non-metallic conduit shall be PVC and have solvent-weld-type conduit connections.

E. Union couplings for conduits shall be the Erickson type and shall be Appleton, Chicago, IL, Type EC, O-Z Gedney 3-piece Series 4 by General Signal Corp., Terryvile, CT, or approved equal. Threadless coupling shall not be used.

F. Bushings:

1. Bushings shall be the insulated type.

2. Bushings for rigid steel shall be insulated grounding type, O-Z Gedney Type HBLG, Appleton Type GIB, or approved equal.

G. Conduit Sealants:

1. Fire Retardant Types: Fire stop material shall be reusable, non-toxic, asbestos-free, expanding, putty type material with a 3-hour rating in accordance with UL Classification 35L4 or as specified on the Drawings.

PART 3 - EXECUTION

3.01 Conduit, Raceway and Fitting Installation:

A. For conduit runs exposed to weather provide rigid metal (GRS).

B. For conduit run underground, in concrete or masonry block wall and under concrete slabs, install minimum ¾" size nonmetallic (PVC) with PVC elbows. Where conduits transition from underground or under slab to above grade install wrapped rigid metal (GRS) elbows and risers.

C. For conduit runs concealed in steel or wood framed walls or in ceiling spaces or exposed in interior spaces above six feet over the finished floor, install EMT.

D. Flexible metal conduit shall be used only for the connection of recessed lighting fixtures and motor connections unless otherwise noted on the Drawings. Liquid-tight steel flexible conduit shall be used for motor connections.

E. The minimum size raceway shall be 1/2-inch unless indicated otherwise on the Drawings.

F. Installation shall comply with the CEC.

G. From pull point to pull point, the sum of the angles of all of the bends and offset shall not exceed 360 degrees.

H. Conduit Supports: Properly support all conduits as required by the NEC. Run all conduits concealed except where otherwise shown on the drawings.

1. Exposed Conduits: Support exposed conduits within three feet of any equipment or device and at intervals not exceeding NEC requirements; wherever possible, group conduits together and support on common supports. Support exposed conduits fastened to the surface of the concrete structure by one-hole clamps, or with channels. Use conduit spacers with one-hole clamps.

    a. Conduits attached to walls or columns shall be as unobtrusive as possible and shall avoid windows. Run all exposed conduits parallel or at right angles to building lines.

    b. Group exposed conduits together. Arrange such conduits uniformly and neatly.

2. Support all conduits within three feet of any junction box, coupling, bend or fixture.

3. Support conduit risers in shafts with Unistrut Superstrut, or approved equal, channels and straps.

I. Moisture Seals: Provide in accordance with NEC paragraphs 230-8 and 300-5(g).

J. Where PVC conduit transitions from underground to above grade, provide rigid steel 90's with risers. Rigid steel shall be half-lap wrapped with 20 mil tape and extend minimum 12" above grade.

K. Provide a nylon pull cord in each empty raceway.

L. Provide galvanized rigid steel factory fittings for galvanized rigid steel conduit.

M. Slope all underground raceways to provide drainage; for example, slope conduit from equipment located inside a building to the pull box or manhole located outside the building.

N. Conduits shall be blown out and swabbed prior to pulling wires, or installation of pull cord in empty conduits.

END OF SECTION

SECTION 262726

DEVICES

WIRING

PART 1 – GENERAL

1.01 Description of Work

A. The work of this section consists of:

1. Furnishing, installing, and connecting all duplex receptacles complete with wall plates and/or covers, as shown on the Drawings.

2. Furnishing, installing and connecting all light switches complete with wall plates and or handle operators, as shown on the Drawings.

1.02 Related Work:

A. See the following specification sections for work related to the work of this section:

1. 26 05 42 Conduits, Raceways and Fittings.

2. 26 05 19 Line Voltage Wire and Cable.

3. 26 05 33 Junction and Pull Boxes.

1.03 Submittals: As specified in Section 26 05 00 and Division 01.

A. Submit manufacturers published descriptive literature properly marked to identify the items to be supplied.

B. A single complete submittal is required for all products covered by this Section.

PART 2 – PRODUCTS

2.01 Receptacles:

A. General - Receptacles shall be heavy duty, high abuse, grounding type.

B. GFCI Receptacles:

1. Device shall be rated 20 ampere, 2-pole, 3-wire, 120 volt, conforming to NEMA 5-20 configuration. Face shall be nylon composition. Unit shall have an LED type red indicator light, test and reset push buttons. Color shall be as selected by the Architect.

2. GFCI component shall meet UL 943 Class A standards with a tripping time of 1/40 second at 5 milliamperes current unbalance. Operating range shall extend from -31
shall have transient voltage protection and shall be ceramic encapsulated for protection against moisture.

3. Manufacturer: Hubbell #GF20_ _LA Series, Leviton #GFNT2 Series.

C. Weather Resistant GFCI Receptacles:

1. Device shall be rated 20 ampere, 2-pole, 3-wire, 120 volt, conforming to NEMA 5-20 configuration, Face shall be nylon composition. Unit shall have a LED type red indicator light, test and reset push buttons. Color shall be as selected by the architect.

2. GFCI component shall meet UL 943 Class A standards with a tripping time of 1/40 second at 5 milliamperes current unbalance. Operating range shall extend from -31
shall have transient voltage protection and shall be ceramic encapsulated for protection against moisture.

3. Manufacturer: Hubbell #GFTR20 _ _ Series, Leviton #GFWR2 Series.

D. Surge Suppression Receptacles:

1. Device shall be rated 20 ampere, 2-pole, 3-wire, 120 volt. Face shall be nylon composition. Unit shall have an LED type "Power-on" indication light and damage-alert audible alarm. Color shall be as selected by the Architect.

2. Surge suppression protection shall be listed to UL standard 1449 and shall instantly absorb a transient surge of 6,000 volts minimum. A minimum of four (4) Metal Oxide Varistors shall be utilized to absorb transients.

3. Manufacturer: Hubbell #HBL8362S Series, Leviton #8380 Series.

2.02 Switches:

A. Switches shall be rated 20 amperes to 120/277 volts ac. Units shall be flush mounted, self-grounding, quiet operating rocker devices. Rocker color shall be as selected by the Architect.

1. Manufacturer: Hubbell #DS_20_ _ Series, Leviton #5621 Series. See plans for single pole, three way and four way requirements.

B. Timed switches: Shall be as designed by Paragon Electric Company # ET2000f or Watt Stopper TS-400 rated for the voltage specified on drawings. Time-out shall be adjustable from 5 minutes up to 12 hours. Unit shall be provided with warning alarm.

C. Dimmer switches: Switch shall be a specified on drawings, color per architect. Heat fins shall not be removed, where dimmer switches are ganged together, care shall be taken to install correct size backbox to accommodate switches without removing fins.

2.03 Plates:

A. General - Plates shall be of the style and color to match the wiring devices, and of the required number of gangs. Plates shall conform with NEMA WD 1 , UL 514 and FS W-P-455A. Plates on finished walls shall be non-metallic or stainless steel. Plates on unfinished walls and on fittings shall be of zinc plated steel or case metal and shall have rounded corners and beveled edges.

B. Non-Metallic: Plates shall be plain with beveled edges and shall be nylon or reinforced fiberglass.

C. Stainless Steel: Plates shall be .040 inches thick with beveled edges and shall be manufactured from No. 430 alloy having a brushed or satin finish.

D. Cast Metal: Plates shall be cast or malleable iron covers with gaskets so as to be moisture resistant or weatherproof.

E. Blank Plates: Cover plates for future telephone outlets shall match adjacent device wall plates in appearance and construction.

F. Weatherproof Plate: Cover plates in wet and damp locations shall have recessed in-use covers, Taymac or equal. Back box shall be suitable for the wall material where it is installed.

G. Labeling: All switch and receptacle plates shall be labeled on the top portion of the plate with the panelboard and circuit number serving that device. Lettering shall be 3/16" minimum high, black color, on clear Mylar 3/8" tape. Manufactured by P-touch or equal.

PART 3 – EXECUTION

3.01 Installation of Wiring Devices:

A. Interior Locations: In finished walls, install each device in a flush mounted box with washers as required to bring the device mounting strap level with the surface of the finished wall. On unfinished walls, surface mount boxes level and plumb.

B. Mounting Heights: Adjust boxes so that the front edge of the box shall not be farther back from the finished wall plane than 1/4-inch. Adjust boxes so that they do not project beyond the finished wall. Height of device shall be as follows unless otherwise noted on the drawings:

1. Receptacles 15 Inches from finished floor to bottom of box.

2. Toggle Switches 48 Inches from finished floor to top of box.

C. Receptacles:

1. Ground each receptacle using a grounding conductor, not a yoke or screw contact.

2. Install receptacles with connections spliced to the branch circuit wiring in such a way that removal of the receptacle will not disrupt neutral continuity and branch circuit power will not be lost to other receptacles in the same circuit.

3.02 Installation of Wall Plates:

A. General - Plates shall match the style of the device and shall be plumb within 1/16-inch of the vertical or horizontal.

B. Interior Locations, Finished Walls: Install non-metallic plates so that all four edges are in continuous contact with the finished wall surfaces. Plaster filling will not be permitted. Do not use oversized plates or sectional plates.

C. Interior (not wet) Locations, Unfinished Walls: Install stainless steel or cast metal cover plates.

D. Wet Locations: Install cast metal plates with gaskets on wiring devices in such a manner as to provide a rain tight weatherproof installation. Cover shall be [lockable] outdoor "in use" type.

E. Future Locations: Install blanking cover plates on all unused outlets.

3.03 Tests:

A. Receptacles:

1. After installation of receptacles, energize circuits and test each receptacle to detect lack of ground continuity, reversed polarity, and open neutral condition.

END OF SECTION

SECTION 271000

STRUCTURED CABLING

PART 1 – GENERAL

1.01 RELATED DOCUMENTS:

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-01 Specification sections, apply to work of this section.

B. Division 26, Basic Materials and Methods sections apply to work specified in this section.

1.02 REFERENCE STANDARDS:

A. ANSI/TIA-492.AAAC-B – Detail Specification for 850-nm Laser-Optimized, 50-um Core Diameter/125-um Cladding Diameter Class 1a Graded-index Multimode Optical Fibers (OM3/OM4). Current Edition

B. ANSI TIA-492.CAAB – Detail Specification for Class IVa Dispersion-Unshifted Single-Mode Optical Fibers with Low Water Peak. Current Edition

C. ANSI/TIA-568-C.0 – Generic Communications Cabling for Customer Premises.

D. ANSI/TIA-568-C.1 – Commercial Building Communications Cabling Standard Part 1: General Requirements.

E. ANSI/TIA-568-C.2 – Balanced Twisted-Pair Telecommunications Cabling and Components Standards

F. ANSI/TIA-568-C.3 – Optical Fiber Cabling Components Standard

G. ANSI/TIA-569-C – Commercial Building Standard for Telecommunications Pathways and Spaces.

H. ANSI/TIA-606-B – Administration Standard for the Commercial Telecommunications Infrastructure.

I. ANSI/JSTD-607-B – Commercial Building Bonding and Grounding (Earthing) Requirements for Telecommunications.

J. NFPA 70 – National Electrical Code (NEC).

K. BICSI – TDMM, Building Industries Consulting Services International, Telecommunications Distribution Methods Manual (TDMM)

1.03 DESCRIPTION OF WORK:

A. The extent of telephone/data system work is indicated and is hereby defined to include, but not be limited to cable, raceway, outlet boxes, device plates, backboard, cabinets, grounding and miscellaneous items required for complete system.

B. Provide complete cable and outlet system as indicated and described herein. Work includes cable, jacks, terminal blocks, wire management, labeling, transient voltage surge suppression, patch cords, and all terminations. Every cable, conductor and fiber strand installed under this Project shall be properly terminated at both ends and tested.

C. Refer to other Division sections for requirements for raceways, boxes and fittings, wiring devices, and supporting devices, and other sections, as applicable.

D. Provide system testing as described herein.

1.04 QUALITY ASSURANCE:

A. Comply with applicable portions of NEC as to type products used and installation of components. Provide products and materials, which have been UL-listed and labeled. Comply with NEMA standards for low loss extended frequency cable and EIA/TIA TSB-36. Comply with EIA/TIA 568- A, EIA/TIA 569 and manufacturer's recommendations. Comply with EIA/TIA testing standards for horizontal cabling.

1.05 SUBMITTALS AND SUBSTITUTIONS:

A. Submit manufacturer’s data and installation details for all devices, plates, cable, terminal blocks, patch cords, TVSS, wire management, labels and similar equipment.

B. Submit a copy of certification documents.

C. Any substitution requests must be submitted in writing, and approved by Owner or Owner’s Representative in writing prior to acceptance of bid.

D. Substitution requests may only be made for products equal to or better than as specified in this document. Proof of “equal or better” status is imposed on the contractor, not the Owner.

E. Where a specific manufacturer is called out by name, this is the preferred standard. If substitutions are allowed, they are at the discretion of the Owner and based on performance, suitability, quality, administrational requirements, warranty and other factors deemed important to the Owner.

F. For the purposes of this Specification, “or approved equal” is implied for all specified, named products.

1.06 CONTRACTOR QUALIFICATIONS AND TRAINING:

A. The contractor shall be fully conversant and capable in the cabling of low voltage applications such as, but not limited to data, voice and imaging network systems. The Contractor shall at a minimum possess the following qualifications:

1. Possess those licenses/permits required to perform telecommunications installations in the specified jurisdiction.

2. Provide references of the type of installation detailed in this specification.

3. Personnel trained and certified in fiber optic cabling, splicing, termination and testing techniques. Personnel must have experience using a light meter and OTDR.

4. Personnel trained in the installation of pathways and support for housing horizontal and backbone cabling.

5. Personnel knowledgeable in local, state, province and national codes, and regulations. All work shall comply with the latest revision of the codes or regulations. When conflict exists between local or national codes or regulations, the most stringent codes or regulations shall be followed.

6. Be in business a minimum of five (5) continuous years with a Contractor's license in the state where the project is located, and appropriate for the type of work expected herein.

7. Member in good standing of the Certified Installer network associated with the products listed in this Specification and authorized for use in this Project. Contractor must be a member of this installer program before, during, and through completion of the system installation. Supporting documentation will be required as part of the submittal.

8. Maintain a certified RCDD on staff and utilize certified BICSI Installers for this project.

1.07 WARRANTY:

A. A Limited Lifetime Product & Performance Warranty covering all components, equipment and workmanship shall be provided to the Owner, submitted in writing with system documentation. The warranty period shall begin on the system's first use by the owner.

1. Horizontal channels shall be completed with end to end solutions, such as the Berk-Tek Leviton Technologies Solutions. Factory-terminated copper and/or fiber optic patch cords from the solutions provider must be used in order to be eligible for the applicable channel performance guarantees.

2. The Contractor must pre-register the project with the Manufacturer before installation has begun. Following project completion, contractor is responsible for completing all warranty registration procedures on behalf of Owner.

3. Should the cabling system fail to perform its expected operation within this warranty period due to inferior or faulty material and/or workmanship, the contractor shall promptly make all required corrections without cost to the owner.

B. Certified Installer shall provide labor, materials, and documentation in accordance with Manufacturer requirements necessary to ensure that the Owner will be furnished with the maximum available Manufacturer's Warranty in force at the time of this project.

C. The installed structured cabling system shall provide a warranty guaranteeing a minimum channel performance above the ANSI/TIA 568-C requirements for all category-rated solutions in this Specification. See Products section for performance criteria. Standards-compliant channel or permanent link performance tests shall be performed in the field with a Manufacturer-approved certification tester in the appropriate channel or permanent link test configuration.

D. Necessary documentation for warranty registration shall be provided to the manufacturer by the installer (within 10 days) following 100 percent testing of cables.

1. Installer shall submit test results to Manufacturer in the certification tester's original software files.

2. Installer shall ensure that the warranty registration is properly submitted, with all required documentation within 10 days of project completion.

3. Certified Contractor/Integrator must adhere to the terms and conditions of the respective manufacturer's warranty programs.

E. Installer shall ensure that the Owner receives the manufacturer issued project warranty certificate within 60 calendar days of warranty registration.

1.08 BACKBONE SUBSYSTEMS:

A. 19" racks, cabinets, patch panels, rack mounting kits for switch and hubs, wire management components, and patch cables shall be furnished and installed by Contractor.

B. Backbone copper and fiber systems form an interconnected infrastructure between MDF, IDF, and zone enclosures, both inside and between buildings. All cable, connectors, panels and support systems shall be installed and tested by contractor.

C. Typical Fiber backbone will be Singlemode low-water-peak (OS2) fiber optic cable or Laser-Optimized Multimode (OM3) fiber optic cable as noted below and on plan drawings. Singlemode is typically run between buildings and Multimode fiber is run within the building. Singlemode fiber will be terminated on LC connectors using pre-polished connectors or fusion splice pigtails. Multimode fiber may be terminated on LC connectors using pre-polished connectors or fusion splice pigtails, or may be factory pre-terminated onto MTP multi-fiber connectors.

D. No splicing of cables will be required or allowed between endpoints. Armored cable must be grounded at both ends if run outdoors. With armored fiber, no innerduct will be required. Check plans for clarification or exceptions.

1.09 WORK AREA SUBSYSTEM:

A. The connection between the information outlet and the station equipment in the work area is provided by the Work Area Subsystem. It consists of cords, outlets, adapters, and other filters/impedance matching devices.

1.10 HORIZONTAL SUBSYSTEM:

A. The Horizontal Subsystem is the portion of the telecommunications cabling system that extends from the work area telecommunications outlet/connector to the horizontal cross-connect in the telecommunications room/closet. It consists of the telecommunications outlet/connector, the horizontal cables, optional consolidation point, wireless access point cabling, and that portion of the cross-connect in the telecommunications room/closet serving the horizontal cable. Each floor of a building should be served by its own Horizontal Subsystem.

1.11 ADMINISTRATION SUBSYSTEMS:

A. The Administration Subsystem links the Horizontal Subsystem and the Backbone Subsystem together. It consists of labeling hardware for providing circuit identification and patch cords or cross connect wire used for creating circuit connection at the cross connects.

PART 2 - PRODUCTS

2.01 GENERAL:

A. Provide complete raceway, outlet boxes and miscellaneous items as required.

B. Provide minimum 4-$^{11}/_{16}$" square outlet box at each outlet location with single gang plaster or tile ring and 1.25" conduit to cable tray, backboard, or accessible ceiling or floor space.

C. Provide a complete data cabling and device system as described herein.

2.02 HORIZONTAL CABLING SYSTEMS:

D. NETWORK DATA CABLES

1. Provide 4-pair, 100-Ohm balanced unshielded twisted pair (UTP) Cables for each data outlet designated.

2. All UTP cables passing through air handling space shall be PLENUM-rated (CMP). Cables not passing through air handling spaces may be PVC (CMR) jacketed. Some buildings will require the use of Plenum cable. The contractor is solely responsible for verifying the construction requirements and installing the correct cable. Failure to provide CMP cable in Plenum required spaces will result in the contractor removing and replacing the cable at their own expense.

3. CAT6 UTP cable shall conform to the following requirements:

a. All cables shall be made in the USA of solid annealed copper conductors, 23 AWG, with four individually twisted pairs in a single round cable sheath.
b. Characterized to 750 MHz, 250 MHz greater than the standard
c. Outer diameter 0.300" (7.6mm), CMP
d. Be made by an ISO 9001 and 14001 Certified Manufacturer.
e. Channel margin guarantees for ANSI/TIA 568-C.2 CAT6A and ISO/IEC 11801 Class E_A (margin vs. ANSI/TIA-568-C.2 and margin guarantees are for a standard 2- connector channel).

Insertion Loss	3%
NEXT	2 dB
PSNEXT	3 dB
ACR-F (ELFEXT)	5 dB
PSACR-F (PSELFEXT)	6 dB
Return Loss	1 dB
ACR-N	4 dB
PSACR-N	5 dB

E. DATA INFORMATION OUTLETS:

1. CAT6 JACKS: Provide modular type Category 6 information outlets for 23-AWG copper cable. These Category 6 (CAT6) connectors shall be individual snap-in style, and exceed compliance with TIA/EIA-568-C.2 specifications. The connectors shall comply with the following:

a. Be 8-position/ 8 conductor (8P8C, RJ45-style) modular jacks.

b. Utilize a universal Keystone-style insertion footprint as the manufacturer's main "flagship" line of products.
c. Comply with FCC Part 68; UL listed and CSA Certified. Verified to exceed all channel performance requirements in TIA-568-B.2-10 from 1 MHz to 500MHz to support the IEEE 802.an standard for 10 Gigabit Ethernet over UTP Cable.
d. Each 10G connector is to feature an injection molded Cone of Silence™ technology to eliminate alien crosstalk (AXT).
e. Every 10G connector to include polymer springs above the tines ("Retention Force Technology" or similar functionality) to promote return of tines to original position and protect against deformation due to stress of patch cords or inappropriate materials insertion
f. Connector shall have Pair Separation Towers on IDC to facilitate quick, easy terminations without a complete untwist of each pair of conductors.
g. The connector shall be rear 110-type insulation displacement connectors (IDC) with solder-plated phosphor bronze contacts, configured in a 180° orientation such that the punch down field is in the back, allowing for rear termination.
h. The connector shall provide a ledge directly adjacent to the 110-style termination against which the wires can be directly terminated and cut in one action by the installation craftsperson.
i. Connector wiring label shall provide installation color codes for both T568A and T568B wiring schemes on separate labels.

F. LABELING:

A. The contractor shall provide tags, straps, and adhesive labels. These tags, straps, and adhesive labels shall be of high quality that will endure heat, water, and time.

B. Shall meet the legibility, defacement, exposure, and adhesion requirements of UL 969.

C. Shall be pre-printed using a mechanical means of printing.

D. Where used for cable marking, provide vinyl substrate with a white printing area and a clear "tail" that self laminates the printed area when wrapped around the cable. The cable marking shall be immediately visible and within two inches from termination point.

E. Where insert type labels are used, provide clear plastic cover over label.

F. Copper patch panel labeling shall be completed with adhesive labeling kit specifically designed for the panel, Leviton 49257-QHD.

G. Labeling P-touch font size 4MM bold, black on White, 3/8" labeling tape on all work stations, panels and devices.

H. A round Avery label green in color Product Number: 5463 and a station label utilizing the same font size as on work station face plate must be installed on ceiling grid below each wireless cable location for identification. See type "D" Wireless Location Detail.

I. Labels shall be numbered consecutively and separate for each type of use. Refer to Work Station Details for additional information.

J. The contractor shall develop and submit for approval a labeling scheme for the cable installation. The Owner will negotiate an appropriate labeling scheme with the successful contractor. At a minimum, the labeling system shall clearly identify all components of the system: racks, cables, panels and outlets. The labeling system shall designate the cables origin and destination and a unique identifier for the cable within the system. Racks and

patch panels shall be labeled to identify the location within the cable system infrastructure. All labeling information shall be recorded on the as-built drawings and all test documents shall reflect the appropriate labeling scheme. Labeling shall conform to the owner's Labeling Grammar and the TIA/EIA-606A standard.

K. GATEWATE CAT6 Labeling:

1. IDF side labeling should follow SITE-BUILDING-GW0X-01. Example: SVCTE-600-GW01

PART 3 - EXECUTION

3.01 INSTALLATION OF TELEPHONE/DATA SYSTEM:

A. Install raceway and cable system and specified equipment as indicated to comply with NEC and recognized industry practices.

B. PRE-INSTALLATION CONFERENCE:

1. Schedule a conference a minimum of five calendar days prior to beginning work of this section.

2. Agenda: Clarify questions related to work to be performed, scheduling, coordination, etc.

3. Attendance: Communications system installer, General Contractor, Owners Representatives and any additional parties affected by work of this section.

4. Copy of Manufacturer warranty pre-application, RCDD qualifications, and other material not include in submittals will be provided by Contractor at this time.

C. WARRANTY:

1. A lifetime performance warranty covering all components, equipment and workmanship shall be submitted in writing with system documentation. The warranty period shall begin on the systems first use by the Owner.

2. The project must be pre-registered with Manufacturer before installation has begun.

3. Should the cabling system fail to perform within its expected operation within this warranty period due to inferior or faulty material and/or workmanship, the Contractor shall promptly make all required corrections without cost to Owner.

D. PATHWAYS AND TOPOLOGY:

1. Prior to placing any cable pathways or cable, the contractor shall survey the site to determine job conditions will not impose any obstructions that would interfere with the safe

and satisfactory placement of the cables. The arrangements to remove any obstructions with the Project Manager need to be determined at that time.

2. Provide NEC-sized pull boxes for any run greater than 100 feet, or with more than two ninety-degree bends.

3. Maintain a distance of at least 12 inches from all power conduits and cables, and 6 inches from all fluorescent lighting fixtures. Do not install power feeders 100 amps or greater above or within 5 feet of telecommunications backboard. Do not install telecommunications conduits above power panels or switchboards.

4. The backbone subsystem shall include cable installed in a vertical manner between floor telecommunications room/closets (TCs or IDFs) and the main or intermediate cross-connect in a multi-story building and cable installed horizontally between telecommunications room/closets and the main or intermediate cross-connect in a long single story building.

5. Unless otherwise recommended by the Owner, all fiber cables will be encased in interlocking armor. All fibers will be terminated in the Telecom Rooms or Cabinets in new fiber enclosures equipped with sufficient ports, slack storage space and splice trays if required to terminate and secure all fibers.

6. Adequate riser sleeve/slot space shall be available with the ability to ingress the area at a later date in all Telecommunications rooms/closets, such that no drilling of additional sleeves/slots is necessary.

7. The backbone cables shall be installed in a star topology, emanating from the main cross-connect to each telecommunications room/closet. An intermediate cross-connect may be present between the main cross-connect and the horizontal cross-connect. This is known as a hierarchical star topology.

8. Backbone pathways shall be installed or selected such that the minimum bend radius of backbone cables is kept within manufacturer specifications both during and after installation.
9. Do not run fiber cables in conduits which are less than 2” in diameter.

10. All horizontal cables, regardless of media type, shall not exceed 90 m (295 ft) from the telecommunications outlets in the work area to the horizontal cross connect.

11. The combined length of jumpers, or patch cords and equipment cables in the telecommunications room/closet and the work area shall not exceed 10m (33 ft).

12. Horizontal pathways shall be installed or selected such that the minimum bend radius of horizontal cables is kept within manufacturer specifications both during and after installation.

13. For voice or data applications, 4-pair UTP or fiber optic cables shall be run using a star topology from the telecommunications room/closet serving that floor to every individual information outlet.

14. The Contractor shall observe the bending radius and pulling strength requirements of the 4-pair UTP and fiber optic cable during handling and installation.

15. Each run of UTP cable between horizontal portions of the cross-connect in the telecommunication closet and the information outlet shall not contain splices.

16. In a false ceiling environment, a minimum of 3 inches (75 mm) shall be observed between the cable supports and the false ceiling.

17. All horizontal pathways shall be designed, installed and grounded to meet applicable local and national building and electrical codes.

18. J-hooks shall be provided for all suspended cable, at a semi-irregular spacing not to exceed 5 feet between supports.

19. Install ¾" x 4' x 8' fire-rated plywood across all walls in telecom rooms, from 6" AFF to 8'-6" AFF. Coat with 2 coats of white paint. Do not paint over fire rating stamp.

20. Contractor shall firestop all used pathways which enter or leave the telecom rooms via conduit, cable tray or slot. Contractor is responsible for installing sleeves at each wall or partition penetration, and firestopping all fire-rated penetrations. Intumescent caulk shall be applied around the outside of each sleeve, and intumescent putty inside the sleeve or conduits around the cables. Appropriate fill ratios must be followed when penetrating fire rated walls.

E. GROUNDING:

1. All grounding / earthing and bonding shall be done to applicable codes, standards and regulations.

2. Telecom Contractor shall bond and ground all telecom room metals. Telecom Contractor shall provide and install TIA-rated Telecommunications Grounding Busbar (TGB) at all MDF and IDF locations, and an in-cabinet grounding busbar at each remote wall-mounted cabinet or telecom enclosure. All ground lugs shall be 2-hole make-up.

3. Electrician will provide connection between TGB and building ground; Telecom contractor (if separate, otherwise electrician) will provide a busbar and ground all equipment and telecom metals to the busbar.

4. Telecom installer will ground and bond all armored and/or shielded cables, racks, cabinets, cable tray, ladder racking, and shielded panels to telecom grounding busbar.

5. All grounding and bonding conductors shall be copper and may be insulated. When conductors are insulated, the sheath shall be green or marked with a distinctive green color, and shall be listed for the application. The minimum bonding conductor size shall be #6 AWG.

6. The Telecommunications Ground Busbar (TGB) shall be dedicated and pre-drilled copper busbar provided with holes for use with standard sized lugs. This busbar shall have minimum dimensions of .25 inch thick, 4 inches wide, and be variable in length.

7. Two-hole compression ground lugs shall be Chatsworth 40162-901, 40162-904, 40162-909, and 40162-911, or equal, based on the size of the copper conductor to be terminated.

8. All low voltage systems in this project shall be grounded and bonded.

F. CABLES AND TERMINATIONS:

1. Check plans and symbology for final determination of faceplate constitution or consult with Owner prior to bid.

2. Install additional cables as indicated on the drawings. Do not exceed manufacturers' recommendations for maximum allowable pulling tension, side wall pressure or minimum bending radius. Use pulling compound as recommended by cabling manufacturer.

3. Install CAT6A cables for Wireless Access Points and cameras, and CAT6 everywhere else unless otherwise noted.

4. Provide a full-size service loop (at least once around the inside edge of the box) in each J- box in the communications system.
5. Install all cable in plenum spaces with J-hooks of at least 1" in width to disperse the weight on the bottom cables. Homerun all cable to nearest TR Cabinet.

6. Coordinate with EIA/TIA 569 tables 4.4-1 and 4.4-2 for conduit and splice box sizing.

7. Install modular jacks at all outlets shown; one data jack for each data cable at each faceplate or termination point. Install additional cables and modular jacks as indicated on the drawings.

8. Terminate cables at each jack location and at termination board or patch panel. Follow industry guidelines and manufacturers' recommendations and procedures as required. All termination hardware shall be rated to exceed Category 6 specifications as specified above.

9. Label and identify each outlet and cable for data circuits. Label at outlet end and at termination board or patch panel with matching designations.

10. Provide data outlets in surface raceway at 26" on center unless otherwise indicated.

3.02 LABELING:

A. Provide labels appropriate for all components supplied and installed.

B. Each faceplate, cable or data outlet (drop) will be numbered with a unique identifier based on coordination with Owner prior to labeling. Contractor must present labeling system for approval, with all shop drawings, prior to start of construction.

3.03 TESTING:

A. Test all equipment and each outlet, horizontal cable, termination block, patch cords, etc. to verify compliance with requirements. Testing shall consist of attenuation and NEXT across all splices and devices installed in the field and shall meet latest requirements of EIA/TIA. Re-terminate any cable or connection found to be defective.

B. Tester is to be configured with the specific cable installed, and the Permanent Link test will be performed according to the CAT6A standard methodology. All parameters must exhibit a PASS test result prior to project completion. PASS*, FAIL* or FAIL test results will not be accepted.

C. Repair and resolve any shortcomings in the test results. Mitigation efforts may require re-termination or replacement of the jack, outlet or cable. Repairs or attempts to resolve test failures will be completed solely at the expense of the Contractor.

D. Provide test results to Manufacturer and Owner representative in native Tester format. Upon request, provide a copy of the tester software and license, if needed, at no charge to Owner representative.

E. Include PDF of full test results, summary index in electronic format on CD or memory stick in the O&M package upon project completion.

Approved Tester Products:

Fluke DTX or VERSIV platform Cable Certification testers
Linkware Record Management Software

3.04 PROJECT CLOSEOUT:

A. Operating and maintenance manuals shall be submitted prior to testing of the system. A total of (4) manuals shall be delivered to the Owner. Manuals shall include all service, installation, and programming information.

B. Provide a full set of “as-built” (redline) drawings in AutoCAD DWG and PDF format. Drawings to depict final location and drop/cable identification numbers and labels which match the test reports. Include (1) hard copy paper format of all as-builts in 30”x42” size or equivalent.

C. Contractor to provide all warranty information to Leviton for processing. Leviton will send warranty documents directly to Owner.

3.05 TRAINING:

A. Provide four (8) hours training on the operation and installation of the data system, at job site, at no cost to the owner.

END OF SECTION

SECTION 281000

ELECTRONIC ACCESS CONTROL

PART 1 GENERAL

1.1 The intent of this document is to specify the criteria for the design, supply, installation, and commissioning of the Wireless Electric Battery operated Access Control System.

1.2 SECTION INCLUDES

A. Battery operated access and security management system and software
B. Wireless electric battery operated access and security management system
C. Card Reader Units - with and without keypad
D. Door Locks - Salto Virtual Network and wireless versions
E. Control units - relay and expansion boards
F. UPS network for locks
G. Power reader switches
H. Portable programmer devices

1.3 RELATED SECTIONS

Specifier Notes: Edit the following list as required for the project. List other sections with work directly related to the electronic access control system.

A. 01 60 00 Product Requirements.
B. 08 00 00 Openings (Division 08)
    1. 08 10 10 Doors and Frames
    2. 08 30 00 Specialty Doors & Frames
        a. 08 31 13 Access Doors & Frames
    3. 08 40 00 Entrances, Storefronts and Curtain Walls
        a. 08 42 00 Entrances

C. 26 00 00 Electrical (Division 26)

D. 27 00 00 Structured Cabling (Division 27)

E. 28 00 00 Electronic Safety & Security (Division 28)
    1. 28 16 00 Intrusion Alarm System

1.4 REFERENCES

A. Underwriters Laboratories (UL)
    1. UL10B Fire Rating
    2. UN294 Access Control System Units

1.5 DEFINITIONS

A. The following definitions apply to this section:
    1. Controller: An intelligent peripheral control unit that uses a computer for controlling its operation. Where this term is presented with an initial capital letter, this definition applies.
    2. CPU: Central processing unit.
    3. Credential: Data assigned to an entity and used to identify that entity, also called a Token or ID Card
    4. CU: Control Unit, Control unit either stand alone or hardwired
    5. I/O: Input/Output.
    6. LAN: Local area network.
    7. LED: Light-emitting diode.
    8. Mantrap: A man-trap in physical security protocols refers to a space having two sets of interlocking doors such that the first set of doors must close before the second set opens.
    9. PC: Personal computer. This acronym applies to the workstations Computers, and file Server Computers.
    10. USB: Universal Serial Bus – The most widely used hardware interface for attaching peripherals to a computer.
    11. MSSQL: Database engine, a Microsoft product
    12. WiFi: Wireless Communication (802.15.4 – ZigBee)
    13. RS-232: A TIA/EIA standard for asynchronous serial data communications between terminal devices. This standard defines a 25-pin connector and certain signal characteristics for interfacing computer equipment.
    14. RS-485: A TIA/EIA standard for multipoint communications.
    15. TCP/IP: Transport Control Protocol/Internet protocol incorporated into Microsoft Windows.
    16. Smart Card: ID Token or Credential that can retain or store data and information and transmit the data upon request. (read & write of data)
    17. Contactless Smart Card: ID Token or Credential that can retain or store data and information and transmit the data without contact with a reading device (read & write of data).
    18. NFC: Near Field Communication
    19. BLE: Low Energy Blue Tooth
    20. RFID: Radio Frequency Identification Device

21. Black List: A list of invalid tokens/cards stored in the door unit
22. UPS: Uninterruptible Power Supply
23. WAN: Wide area network.
24. LAN: Local area network
25. POE: Power Over Ethernet
26. PIN: Personal Identification Number
27. MTBF: Mean Time Between Failures
28. Wiegand: Patented magnetic principle that uses specially treated wires embedded in the credential card.
29. Windows: Operating System by Microsoft Corporation
30. Workstation: A PC with software that is configured for specific limited security system functions.
31. API: Application Programming Interface
32. EAC: Electronic Access Control
33. SHIP: Salto Host Interface Protocol
34. SALLIS: Salto wireless interface
35. SVN: Salto Virtual Network
36. mSVN: Mobile Salto Virtual Network
37. LDAP: Lightweight Directory Access Protocol. A repository which may include Microsoft Active Directory and provides central management of PC users, computers, etc.
38. BLUEnet: Salto Low Energy Bluetooth Network
39. RFnet: Salto Wireless Network

1.6 SUBMITTALS

A. General: Submittals shall be made in accordance with the Conditions of the Contract and Submittal Procedures Section.
B. Shop Drawings and Schematics: Shall depict the Physical Access Control System in final proposed “as built” configuration. The following shall be provided:
C. Connection diagrams for interfacing equipment.
D. Network IP and or MAC addresses of field device.
E. List of connected equipment.
F. Locations for all major equipment components to be installed under this specification.
G. Product Data: The following shall be provided:
    1. Technical data sheets for each piece of proposed equipment.
    2. A complete set of user, and maintenance manuals.

1.7 DELIVERY STORAGE AND HANDLING

A. General: Delivery, storage, and handling of the Access control hardware shall be in accordance with the manufacturer's recommendations.
B. Ordering: The manufacturer's ordering instructions and lead-time requirements shall be followed to avoid installation delays.
C. Delivery: The Physical Access Control System shall be delivered in the manufacturer's original, unopened, undamaged container with identification labels intact.
D. Storage and Protection: The Physical Access Control System shall be stored and protected from exposure to harmful weather conditions and at the environmental conditions recommended by the manufacturer.

1.8 WARRANTY

A. Warranty Period will be a minimum of one (1) year from the date of purchase.
B. All equipment and systems will be warranted by the Contractor for a period of two (2) years commencing with the filing date of the Notice of Completion, provided the system has been inspected and signed off by the Manufacturer and at the conclusion of satisfactory acceptance of the entire system by the end user.
C. The warranty shall cover all costs for service, including parts.
D. The contract for service will cover the period starting with the first expected activation of each system for installation and test and will continue for an initial period of two (2) years. A partial- year extension will be acquired to cover the period to the end of the two year warranty and will be handled such that a smooth transition to a customer maintenance agreement can be achieved with no lapse in coverage.
E. Service response shall be within 2 hours of the initial request for service; the response may be by phone or remote VPN access into the system. This service should be provided during the warranty period at no added cost. This will be a 24 hour per day, 7 days per week, and inclusive of all holidays.
F. Service requests will be reported via phone call to a designated service number provided by Security Contractor, or via a service web site or e-mail account as designated by the security contractor.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURER

A. Salto Systems
1780 Corporate Drive Suite 400

Norcross, GA 30093
866-GO SALTO (866-467 2586)
Email: info@Salto.us, Internet: www.Salto.us

B. Substitutions: Not Permitted
C. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.

2.2 ACCESS AND SECURITY MANAGEMENT SYSTEM

A. All modules shall be supplied by SALTO inclusive of:
   1. Card Readers Units with and without Keypad
   2. Door Locks- SVN and Wireless Versions
   3. Control Units- Relay and Expansion Boards
   4. POE Network Gateway
   5. RFnet/BLUEnet Node
   6. UPS Network for Locks
   7. Power Reader Switches
   8. Card Encoders or Enrollment Reader
   9. Portable Programmer Devices
B. The Physical Access Control System shall have two primary component areas: door control hardware and the management application software.
C. The system shall provide for a combination of wireless (Salto RFnet, Salto BLUEnet) and online (hardwired) wall readers to secure perimeter doors as well as battery powered electronic locks to secure all interior doors, manufactured in the and supported by the same manufacturer.
D. The system shall be centrally managed by one single database/software application and one single credential system for all doors in the System.
E. Token, Credentials, and RFID Contact-less Smart Card Features and Technical Requirements:
   1. Secured Contactless smart card technology provides high-speed, reliable communications with data integrity.
   2. Read/write capability is mandatory; any system that does not use a two way encrypted Smart Card (RFID) communication format will be considered unacceptable.
   3. Multi-application cards have to be capable of storing information for future applications and integration.
   4. Card readers and electronic locks shell be compatible with a wide range of smart card (RFID) Technologies, operating on the industry standard frequency of 13.56MHz as listed below:

a) HID iClass: Memory capacity: 32K bit with 2 application area configurations. The HID-IClass credential shall have a minimum of 16 kb, 32kb preferred of available memory and allow the possibility for use with multiple vendors across multiple applications.
b) MIFARE: 4k Bytes
c) DESFire: 4k Bytes
d) Desfire EVI: 4K Bytes
e) Sony FeliCa: 4K Bytes
f) Legic: 4K Bytes
g) Pico Pass: 4k Bytes
h) BLE: Blue Tooth Low Energy from smartphones with Salto JustIn MobileKey.
i) NFC: Near Field Communication at 13.56 MHz

5. Access profile for the individual user, encoded on the card, shall be encrypted and in such a format as to negate the potential for cloning.
6. Standard 16 kb or 32kb preferred memory on each credential shall be secured with a unique set of Keys- A&B for the Electronic Access Control (EAC) system and to enable, as and when required, the collection and transfer of information pertaining to audit trails, lost and stolen cards etc via a data on card functionality
7. Tokens or credentials shall be available in multiple form factors. They include, but not limited to: standard ID card format, printable ID card format, key fob format, wrist watch format, rubber wrist band format, BLE mobile and NFC tokens.

F. Online Control Unit and wall readers
1. Shall be manufactured and supported by the same manufacturer of the electronic door locks and system software.
2. Provide real time door access monitoring with on-line capability.
3. Shall continue operating and store historical data (audit trail) in the event of a network or server failure. System door units shall buffer a minimum of 1000 transactions.
4. Shall provide Ethernet connectivity of all on-line devices via IP4 or IP6 addressing, either hardwired or through a Salto ZigBee 16 Channel WIFI Connection (802.15.4).
5. Shall provide the ability to use 1 IP address, and connect 4 additional controllers using RS485 (10 card readers per IP address)
6. Shall provide automatic card updating to all contactless smart cards regardless of type.
7. Shall provide the ability to support 2 readers and 2 locking devices with on board programmable relays.
8. Shall provide a minimum of 4 on-board outputs (relays) available per controller, without the use of an auxiliary output board.
9. Shall support a minimum of 400’ in cable length for each card reader.
10. Shall support Anti-Pass back on controller, in and out firing the same relay.
11. Shall provide encryption between the controller and each supported card reader.

12. Shall provide a minimum of 6 auxiliary inputs for use as door position, request to exit, or for any non-door purpose required. Must support a minimum of 60 inputs per IP address without the use of a auxiliary input board or device.
13. Shall provide for up to 16 auxiliary output boards with a total of not less than 128 outputs available for end user programming.
14. Shall provide the flexibility for either online wireless or offline battery operated locks, allowing for the two system types to be integrated into the same facility.
15. Shall provide 2 on board tamper option, input and switch.
16. Must be able to be powered by a standard 12vdc power supply.
17. Shall provide support for POE as an option.
18. Controller shall be certified to the following standards: CE, UL 294, FCC part 15.

G. Battery Powered Wireless Networked locks
    1. Wireless locks shall be compatible with Salto RFnet or Salto BLUEnet.
    2. RFID Keycard operated: unlocking by means of contact-less smart carriers, which most include the following formats; card, key-fob, wrist watch, RFID stickers and wrist band. All devices will perform at the same level.
    3. The EAC Locking Unit shall have typical access control features and be able to mimic traditional door hardware functions. The following is a minimum of the required door operational features:
        a. Standard
        b. Office
        c. Automatic Changes
        d. Automatic Opening
        e. Automatic Opening Plus Office
        f. Automatic Opening Plus Toggle
        g. Key Card Plus Pin Number (Keypad)
        h. Pin Number Only (Keypad)
        i. Timed Key Card Plus Pin Number (Keypad)
        j. Timed Pin Number (Keypad)
        k. Timed Office
        l. Timed Toggle
        m. Toggle Only
        n. Emergency Lockdown (AMOK Crisis)
        o. Anti Passback – Soft/Timed
    4. Internal door lock audit trail memory shall be at minimum, 1,000 transactions. This shall include valid access, invalid attempts, request to exit, door status, door ajar and mechanical override key used.
    5. Automatic Unlocking: all locks shall be able to be programmed to remain unlocked during certain hours and days, automatically changing to a locked down mode outside of these times i.e.- go into office, card only, card plus PIN mode, etc. Each lock shall have a

minimum of 8 different automatic locking and unlock schedules. This feature shall be able to be manipulated by day of the week and by system holidays for each door lock.

6. Automatic Locking (lockdown mode), all locks shall be able to lock down from the inside in an emergency. While the lock is in lockdown mode, one designated token will be able to enter the locked down door unit. Once the unit is returned to normal programming mode, it will operate as previously programmed. Activation and resetting of the lockdown mode (AMOK) shall be done with a card holders token. This privilege will be given to the desired card holder on a person by person basis. Blanket lockdown setting or lockdown by a lock thumb turn will be unacceptable.
7. Lost cards shall be able to be deleted from the system without waiting for card expiration or having to visit the locks with a handheld programmer.
8. Water resistance application lock units must be an option for outdoor and wet environments.
9. Battery life benchmarked to 48,000 Operations or 2.5 - 3.0 years.
10. Shall be powered by standard off the shelf alkaline type batteries (AA).
11. Proprietary batteries or proprietary battery packs are not acceptable.
12. Low battery warning shall be at minimum via visual LEDs and shall also automatically report through the system software. This shall be accomplished without the need to visit the door lock with a programming device. For wireless lock units, they will also report via a link through the RFID Cards through a hotspot (on line reader) for direct communications to the software to report current battery status.
13. Shall automatically adjust for daylight saving time. This feature will be flexible enough to provide changeable dates from year to year. This feature shall not require a visit to the lock with a programming device.
14. A door lockset shall be deemed to include all of the components necessary for the EAC to function as per manufacturer's specification; namely UL approved and listed internal and external lock parts. The following locking hardware types shall be available:
    a) UL Listed, ANSI Grade 1 American Mortise Lock
    b) UL Listed, ANSI Grade 1 American Mortise Lock, with deadbolt
    c) UL Listed, ANSI Grade 1 Glass Door Lock
    d) UL Listed, ANSI Grade 1 American Cylindrical Lock
    e) UL Listed, ANSI Grade 2 American Cylindrical Lock
    f) UL Listed Locker Lock, Padlock
    g) UL Listed, ANSI Grade 1 Exit Device
    h) UL Listed, European Mortise Lock
    i) Mortise Cylinder (Salto GEO)
    j) Rim Cylinder (Salto GEO)
    k) Padlock (Salto GEO)
    l) Keypad and Card Lock- XS4
    m) Salto Mini Card Lock- XS4 Mini
    n) Salto Cabinet Lock

o) Salto Mortised Controller Lock -Aelement Fusion

14. External and internal lever handles shall comply with ADA requirements and specifications, and shall also be available with antibacterial Salto BioCote® finishes.
15. The length of time that is allowed to open the door after a valid credential is presented shall be variable and managed by the software, allowing for users with physical disabilities additional time when needed to access their quarters.
16. At all times the internal lever shall be free to operate and retract all latches and deadbolts, allowing free egress by way of a single action.
17. A mechanical master key override shall be provided where necessary and shall operate in conjunction with the lever clutching mechanism, rather than directly on the door latch. Operation of the key override will be recorded in the lock unit audit trail memory to provide increased security and to track key usage. A standard American mortise cylinder shall provide the key override function.

H. Off-line Reader and Battery Powered SVN Lock Operations
    1. The smart card shall transfer data to/from both off-line locksets to the on-line hot-spots. Tokens may be card, wrist watch or band, key fob formats. All formats shall have the same system performance.
    2. A door lockset shall be deemed to include all of the components necessary for the EAC to function as per manufacturer's specification; namely UL approved and listed internal and external lock parts. The following locking hardware types shall be available:
        a. UL Listed, ANSI Grade 1 American Mortise Lock
        b. UL Listed, ANSI Grade 1 American Mortise Lock, with deadbolt
        c. UL Listed, ANSI Grade 1 Glass Door Lock
        d. UL Listed, ANSI Grade 1 American Cylindrical Lock
        e. UL Listed, ANSI Grade 2 American Cylindrical Lock
        f. UL Listed Locker Lock, Pad Lock
        g. UL Listed, European Mortise Lock
        h. UL Listed, ANSI Grade 1 Exit Device
        i. Mortise Cylinder (Salto GEO)
        j. Rim Cylinder (Salto GEO)
        k. Keypad and Card Units (SaltoXS4)
        l. Cam Lock- GxCL (Salto GEO)
        m. Heavy Duty Deadbolt- GxB3 (Salto GEO)
        n. Locker 9000 (Salto XS4)
        o. Salto Mini XS4 Lock
        p. Salto Aelement minimalist ANSI mortise lock
        q. Salto Aelement minimalist European mortise lock
        r. Salto Mortised Controller Lock -Aelement Fusion

3. Retrofit locks, wherever possible and as needed, the manufacturer shall have a option to reuse existing locks that are in good working order and can support the new Salto trim and controls.
4. Hardware units shall have a minimum UL 10B fire rating of 45 minutes.
5. External and Internal Lever handles shall comply with ADA requirements and specifications. Lever and trim shall also be available with antibacterial finishes. Traditional door hardware finishes and a choice of lever styles to as closely as possible match existing door hardware.
6. At all times the internal lever shall be free to operate and retract all latches and deadbolts, allowing free egress by way of a single action.
7. A mechanical key override shall be provided where required and shall operate in conjunction with the lever clutching mechanism, rather than directly on the door latch. To provide increased security the key operation will leave an audit in the lock memory that the mechanical key was used to open the door. This shall be available on mortise or cylindrical type locks.
8. The unit shall initially be delivered with 3 standard alkaline AA batteries, sufficient for up to 48,000 transactions or approximately 2.5 – 3.0 years operational life. No proprietary or rechargeable battery packs shall be accepted.
9. Low battery status shall be, by default, recorded on the user's credential and transferred to the management system when the credential is used at an on-line wall reader or update point (hot spot). No handheld Device will be needed to retrieve battery status.
10. In the event of a battery failure, the door shall be able to be opened with a small portable handheld device in conjunction with a valid credential (smart card or token).
10. Networked and non-networked locks of all hardware styles shall always allow free egress if the batteries fail.
11. An audit trail of the last 1,000 events (including failed attempts at access by unauthorized key holders) shall be stored on the networked lock's memory for collection using the portable handheld device at anytime and without requiring access to the inside component of the door lock.
12. The networked lock shall hold its designation, the zones that it belongs to, operational configuration, audit trail and the list of cancelled keys in non-volatile memory.
13. The current date and time shall be synchronized with the server on a time basis, and/or when collecting audit trails with the portable handheld device or replacing batteries.

14. The networked lock shall incorporate such measures as hardened high resistance steel drill plates, floating axes and steel ball bearings to prevent unauthorized access or tampering by physical means.
15. The external lever mechanism shall incorporate a clutching system to minimize the potential for vandal damage by allowing free travel up and down until a valid credential is presented for the door to be opened.
16. The length of time allowed to open the door after a valid credential is presented shall be variable and managed by the software, allowing for users with physical disabilities additional time when needed for access.
17. When the lever returns to the zero position, no matter how much time elapsed since the valid credential was presented, the clutch shall automatically disengage, limiting the potential for an unauthorized person to enter after the authorized entry.
18. Internal covers shall be secured with tamper resistant screws to restrict access to authorized personnel only.
19. Where appropriate the internal clock of the networked lock shall be programmed to allow for the start and finish of daylight saving time.
20. In an office, meeting room or services environment (where applicable) the networked lock shall be able to either automatically or manually be set into “free passage” mode by authorized users, reverting to standard operating mode at a prescribed time.
21. In the event a user key is lost, an authorized operator shall be able to cancel and re-issue a new key for the user. Information regarding cancelled keys shall be transmitted to all off line doors via the “black list”, placed on credentials when passing through an on-line “hot spot” or by visiting the doors with the portable programming device.
22. When the system is being operated using the hotel functionality, if a room key is reported lost or stolen (or the user is missing), simply presenting a “Guest cancel key” shall cancel access for that key without providing access to the room.
23. The locking unit shall have typical access control features and be able to mimic traditional door hardware functions. The following is a minimum of the required door operational features:
    a) Standard
    b) Office
    c) Automatic Changes
    d) Automatic Opening
    e) Automatic Opening Plus Office
    f) Automatic Opening Plus Toggle
    g) Key Card Plus PIN (Keypad)
    h) Pin Only (Keypad)
    i) Timed Key Card Plus PIN (Keypad)
    j) Timed PIN (Keypad)

k) Timed Office
l) Timed Toggle
m) Toggle Only
n) Emergency Lockdown
o) Anti Passback – Soft/Timed

I. On Line Wall Reader Operations

1. An XS4 wall reader device shall include support for one (1) or two (2) wall readers. These readers may be; Mifare, Mifare Plus, DESfire, DESfire EV1, Pico Pass, IClass and NFC, and BLE, Card Plus PIN will also be available if needed. The unit will control access and egress, where applicable, secured to the wall with a vandal resistant frame and tamper-proof fixings; plus a Control Unit (CU) housed with 12V DC power supply, ready for connection to a 120V AC outlet. Additionally the power supply shall be prepared to interface with the local fire alarm system to cut power to the door locks, if required, and have connections for 12V DC battery back-up supply (provided by others). POE shall be available as an option.
2. Shall be ISO 15.93 and FCC Part 15 compliant.
3. The wall reader control unit set shall have the capability to operate both as an off-line stand-alone door controller or, be easily upgraded with additional (not replacement) hardware to function as an integrated part of the on-line EAC system.
4. The XS4 wall reader shall have a keypad available as an option.
5. Connection between the Wall Reader and Control Unit shall be via CAT6 or better cable.
6. If required for security or logistical reasons the CU shall be able to be placed up to 122 meters or 400 feet remotely from the wall reader(s).
7. The C.U. shall hold its designation, the zones that it belongs to, operational configuration, audit trail and a list of canceled keys in non-volatile memory.
8. The on-line CU shall connect directly to the EAC application and be capable of making changes to the individual user access profile when a credential is presented. At the same time the CU shall pass the list of recent canceled cards on to the key and upload any stored “on key” audits of attempts to access doors and any low battery warnings from the stand-alone locks.
9. The current list of canceled cards is placed onto every card when it is presented to an on-line reader (hot-spot), and the updated card shall then transfer that list to the off-line readers each time they are used, allowing for the upgraded list to be transmitted throughout the facilities by the users as they go about accessing doors.
10. The EAC system shall synchronize the server clock with the on-line CU approximately every 30 seconds.

11. The (off-line and on-line) CU shall be capable of integrating with the elevator management system to control access to individual floors for individual users. Connection to the CU shall be via a RS485 serial connection to Extension Relay Boards (ERB) consisting of 8 NO/NC 12VDC dry contact relays. The EAC system shall allow for up to 16 ERB to be connected in series to each control unit.
12. For the off-line reader the date and time shall synchronize with the handheld programming unit any time an audit is retrieved.

J. Basic System Performance Requirements
    1. Shall provide central management of user rights, access policies, and credentialing.
    2. The application shall be capable of implementing access policies through the assignment of entry permission based on door groupings and time schedules.
    3. The system shall allow for schedules to be applied at doors, governing their remaining open or locked condition.
    4. The application shall permit flexible assignment of user rights and privileges.
    5. The application shall allow for creation and editing of cardholder credentials, including system wide card formats.
    6. The application shall provide views of events and alarms throughout the installation and shall be capable of triggering hardware and communicative actions, based on system configuration.
    7. The application shall be capable of generating standard and custom reports, and provide a detailed and complete log of all system events, as defined by the system operator.

K. System and Software
    1. The system software shall be Salto ProAccess Space.
    2. The system shall incorporate at minimum128 bit AES encrypted data.
    3. Supported operating systems shall be Microsoft Windows 7, Windows 8, Windows 8.1, Windows 10, Windows Server 2012 or Windows Server 2014.
    4. The software shall provide a web based interface as standard. Loading or licenses for a client application or requiring a download of additional software shall be unacceptable; acceptable browsers shall be Firefox, Chrome, and Safari.
    5. The software shall allow login credentials to be stored either in the Salto database or within LDAP. Systems not supporting LDAP are not acceptable.
    6. The database engine is existing.
    7. The system shall have an operating temperature of 0°C to 50°C, ambient, a storage temperature of -40°C to +85°C, ambient, a relative humidity ability of 0% to 95% (non-condensing) at 50°C, and a MTBF of > 100,000 hours.

8. The system-radiated emissions shall be compliant with FCC Part 15, Class A, and EN55022 specifications.
9. The system must be capable of managing 4 million users, 64,000 doors, 256 calendars, 1024 zones, and 256 time zones, 1024 time periods, both with 8 intervals each.
10. Shall support integration with other software systems through dynamic database synchronization.
11. Shall be able to store all historical data on the system server without having to individually use a handheld device to download audit trail data from individual locks.
12. Shall be capable of being expanded throughout the site. Shall support database partitioning such that each area (department) shall be able to manage their own doors and users without a chance of accidentally interfering with other areas (departments).
13. Capable of dynamic master-keying: each credential can change access privileges transparently “on the fly” without the need to visit the access control administrator to reprogram keycards and without the need to reprogram the electronic locks with a handheld programmer.
14. No predefined profiles shall be necessary to issue keycards. Each and every keycard can be individually enabled to access any combination of doors.
15. Lost keycard cancellation: Contactless smart cards shall be capable of conveying lists of canceled keys to avoid having to reprogram locks with a handheld device any time a keycard is lost.
16. No third party WI-FI or Radio infrastructure shall be required for SVN Operation.
17. The locks shall have built-in anti- passback functionality. The EAC locks shall have the ability to prevent card holders from reentering without presenting their token to the out reader. This feature shall be incorporated in both On Line/Wireless, or in the off-line EAC lock units.
18. The software shall be supplied ready to support any number and configuration of off-line and on-line stand-alone locks and wall readers, with the capacity to manage multiple or single sites.
19. Shall support 1024 time periods that determine the time intervals at which a lock shall operate in a special mode, timed office mode, automatic opening mode etc.
20. Shall support 256 time zones, which determine the interval of time in which a user has access to a particular door or zone
21. Shall support 256 Calendars, for user access or used by the electronic locks when they operate in a timed mode.
22. Shall support a minimum of 1024 zones to group doors into sets making programming user access simpler and more efficient.

23. Incorporate user groups to enable the system administrator to group users according to their privileges of access.
24. Operator Groups shall be defined hierarchically and be password protected to allow only authorized staff to make amendments to sections of the database for which they have responsibility.
25. Shall allow multiple simultaneous access, which allows multiple authorized operators to make dynamic changes to the database at any one time.
26. Shall have a proven API for interfacing with existing and well established traditional access control systems. [SHIP]
27. Shall have a proven API for interfacing with third party access control panels. [SALLIS]
28. Shall have a graphic map feature that will indicate to the operator where a system annunciated alarm is located.
29. Shall support an “Out of Site” feature which shall work in conjunction with IN and OUT hot spot readers to disable user access when leaving a facility and enabling user access when entering it.
30. Shall support a “Limited User Access” feature which can be set to allow a maximum number of users assigned to a door.
31. Shall support a “Limited User Occupancy” monitor which can be set to disallow access after the desired number is reached in an area.
32. Shall support a “Roll Call” feature to provide user tracking.
33. Shall support setting encryption type for Desfire cards.
34. Shall provide features to manage lockers utilizing automated modes such as calendars, free assignments, etc.
35. Shall incorporate auto assignment when using Legic Prime cards.
36. Shall incorporate an activation date and time setting for user cards.
37. Shall allow multiple operator groups to be created with software features able to be individually allowed or denied to the group.
38. Shall feature a Department tab, allowing departments to share users and also add external (users not in a group) access to the department.
39. Shall permit specifying Wiegand codes in decimal, hexadecimal, or binary formats, and bit order.
40. The system software shall support the following optional modules:
    a) Visitor Management
    b) Badging
    c) Partitions
    d) JustIN mSVN (Mobile App)
    e) Third party access system interfaces

f) Software to software API with other wired access control systems
g) Graphical mapping
h) Matrix function to simplify programming users and doors.

41. In the event of an emergency the System Administrator shall have the ability to either lock down or unlock all or some doors/locks connected via the Salto Wireless Network. These doors shall then remain locked or unlocked until the emergency is designated as over by the System Administrator.
42. If an invalid card is presented to an on-line reader an entry is placed immediately in the audit trail and the control unit can trigger a CCTV camera or an alarm (local or remote). This operation can be modified at anytime by changing the dipswitch configuration in the control unit.
43. As a standard feature in all software versions, database import and export utilizing “flat files” shall be supported.

PART 3 EXECUTION

3.1 EXAMINATION

A. Inspect units before installation to verify physical condition and inclusion of all peripheral materials.
B. Modules shall be free of any cosmetic defects or damage.
C. Shipping box shall include the module, power supply (surface mount units) and operations manual.

3.2 PREPARATION

A. Unit shall be mounted on a properly prepared surface adequate for the size and weight of the module. The placement of the unit shall allow provision for installation and maintenance as indicated on the approved detail drawings and in accordance with the installation manual.

3.3 INSTALLATION

A. The Physical Access Control System shall be installed, configured, and tested in accordance with the manufacturer’s instructions.
B. Shall comply with Division 26 Section "Grounding and Bonding for Electrical Systems."
C. Shall comply with IEEE 1100, "Power and Grounding Sensitive Electronic Equipment."
D. Ground cable shields, drain conductors, and equipment to eliminate shock hazard and to minimize ground loops, common-mode returns, noise pickup, cross talk, and other impairments.

E. Bond shields and drain conductors to ground at only one point in each circuit.
F. Signal Ground terminal:
    1. Locate in each equipment room and wiring closet; isolate from power system and equipment grounding.
    2. Bus: Mount on wall of main equipment room with standoff insulators.
    3. Backbone Cable: Extend from signal ground bus to signal ground terminal in each equipment room and wiring closet.
G. Cable installation shall comply with NECA 1, "Good Workmanship in Electrical Contracting" EIA/TIA-569, "Commercial Building Standard for Telecommunications Pathways and Spaces."
    1. Install cables and wiring according to requirements in Division 28.
    2. Access control system wiring color to be gray in color only, Leviton #61110-RG6.
    3. Wiring Method: Install wiring in raceway and cable tray except within consoles, cabinets, desks, and counters and except in accessible ceiling spaces and in gypsum board partitions where unenclosed wiring method may be used. Use NRTL-listed plenum cable in environmental air spaces, including plenum ceilings. Conceal raceway and cables except in unfinished spaces.
    4. Install LAN cables using techniques, practices, and methods that are consistent with Category 6 rating of components and that ensure Category 6 performance of completed and linked signal paths, end to end.
    5. Install cables without damaging conductors, shield, or jacket.
    6. Cable application requirements are minimum requirements and will be exceeded if recommended or required by manufacturer of system hardware.
    7. RS-232 Cabling: Install at a maximum distance of 50 feet.
    8. RS-485 Cabling: Install at a maximum distance of 4000 feet.
    9. CAT6 will be terminated in CAT6 modular jacks per color code.
    10. Berk-Tek LANmark-2000 Blue or comparable
    11. The district will only accept 48 port modular patch panels for data.
    12. The patch panel will be # Lev. #49255-H48
    13. The contractor will provide a 1-foot patch cable for each port installed.
    14. Any CAT6 cables run outside or in the underground conduit will be outdoor rated. Wireless access points will be CAT6A
    15. Please use the campus's rooms and building letters for labeling.
H. Boxes and enclosures containing security system components or cabling, and which are easily accessible to employees or to the public, shall be provided with a lock. Boxes above ceiling level in occupied areas of the building will not be considered to be accessible. Junction boxes and small device enclosures below ceiling level and easily accessible to employees or the public will be covered with a suitable cover plate and secured with

tamper proof screws.

I. Install end-of-line supervision resistors at the field device location and not at the controller or panel location.

3.4 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust field-assembled components and equipment installation, including connections, and to assist in field testing. Report results in writing.

B. Testing Agency: Engage a qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.

1. LAN Cable Procedures: Inspect for physical damage and test each conductor signal path for continuity and shorts. Use Class 2, bidirectional, Category 6 tester. Test for faulty connectors, splices, and terminations. Test according to TIA/EIA-568-1, "Commercial Building Telecommunications Cabling Standards - Part 1 General Requirements." Link performance for UTP cables must comply with minimum criteria in TIA/EIA-568-B.
2. Test each circuit and component of each system. Tests will include, but are not limited to, measurements of power supply output under maximum load, signal loop resistance, and leakage to ground where applicable. System components with battery backup will be operated on battery power for a period of not less than 10 percent of the calculated battery operating time. Provide special equipment and software if testing requires special or dedicated equipment.
3. Operational Test: After installation of cables and connectors, demonstrate product capability and compliance with requirements. Test each signal path for end-to-end performance from each end of all pairs installed. Remove temporary connections when tests have been satisfactorily completed.

3.5 START-UP SERVICE

A. Engage a factory-authorized service representative to supervise and assist with startup service. Complete installation and startup checks according to approved procedures that were developed in the Preparation article and with manufacturer's written instructions.
B. Enroll and prepare badges and access cards for Owner's operators, management, and security personnel.

3.6 TESTING TRAINING AND CERTIFICATION

A. The Contractor shall demonstrate the functionality of the Physical Access Control System upon completion of installation, documenting the result of all tests and providing these results to the Owner. The Physical Access Control System shall be tested in accordance with the following:
B. The Contractor shall conduct a complete inspection and test of all installed Physical Access Control System equipment. This process includes testing and verifying operation with connected equipment and network infrastructure.
C. The Contractor shall provide staff to test all devices and all operational features of the system for witness by the Owner’s representative and the Authority having jurisdiction if need be.
D. The Owner’s representative, prior to acceptance, shall witness all testing.
E. Develop separate training modules for the following:
    1. System Administration personnel to manage and repair the LAN and databases and to update and maintain system and database software.
    2. Computer Operators who prepare and input credentials/tokens to operate workstation on the system.(enrollment station)
    3. Security Personnel**,** Safety Staff
    4. Hardware maintenance personnel.

END OF SECTION

SALTO DATA SHEETS

DATASHEET

XS4 ORIGINAL+ by SALTO

The XS4 Original+ product is a universal state of the art electronic escutcheon that brings the smart lock to a new technology level, combining the latest innovations in security, connectivity and design into a battery operated access control device.

www.saltosystems.com

TECHNICAL SPECIFICATIONS:
XS4 ORIGINAL+ AM6xx

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IP 56 (*)

(*) Optional

TECHNICAL DATA:

Reader dimensions (H x W x D):	11-27/64"x 2-5/8" x 25/32" [290 x 67 x 20 mm]
Weight	2,5 kg
Handle rotation:	52°
Door thicknesses:	1-3/8 to 4-3/4" [32 – 120 mm]
Compatible Override Mortice Cylinder length:	1-1/8"
Square spindles:	7mm diamond, 7mm diamond split, 7,6 mm split, 8 mm, 8mm split
Power source:	3 LR6 batteries (AA size) (optional lithium FR06 batteries)
Number of openings:	40,000 - 60,000 (to be confirmed)
Maximum events on lock audit	2 000 (SVN standalone mode) 1 625 (SVN BLUEnet mode) 1 280 (SALTO KS mode)
Environmental conditions Outdoor:	-35 °C / +60 °C without condensation
Environmental conditions Indoor:	-5 °C / +50 °C without condensation (optional -35°C / +60°C)
IP class:	IP54 (optional E5 - IP56*)
Certifications:	CE, FCC/IC, RCM, EAC, UL10C 180, ANSI / BHMA A156.25 Electrified Locking Devices: Grade 1 (Escutcheon + Mortice Lock LA1Txx) ANSI / BHMA A156.13 Grade 1 (Escutcheon + Mortice Lock LA1Txx)

* External escutcheon

CREDENTIAL TECHNOLOGIES:

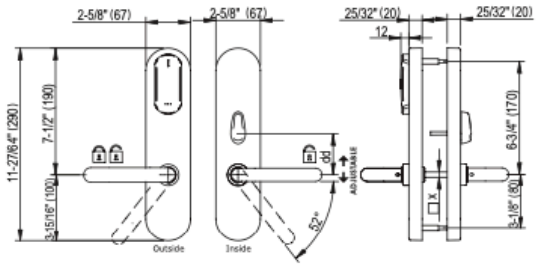
SALTO JustIN Mobile Credentials[1]:	•
NXP MIFARE®[2]:	•
HID®[3]:	—
LEGIC®[4]:	—

[1] Mobile Key Bluetooth and Near Field Communication (NFC) capability.
[2] MIFARE® DESFire® EV1/EV2/ EV3, MIFARE® Plus, MIFARE® Ultralight C, MIFARE® Classic.
[3] iCLASS®, Seos®.
[4] Legic Prime, Legic Advant.

CORE TECHNOLOGIES:

SALTO Native Bluetooth LE wireless connectivity:	•
Hardware Secure Element:	•

TECHNICAL DRAWING:



PLATFORMS:

SALTO Space:

ROM	—
SVN data-on-card	•
Wireless (SALTO RFnet)	—
Wireless (SALTO BLUEnet)	•
SVN-Flex	•

SALTO KS:

Wireless (SALTO RFnet):	—
Wireless (SALTO BLUEnet):	•

OPTIONS:

Reader finish:

Black:	•
White:	•

Finish:

IM Satin stainless steel:	•
IP Bright stainless steel:	•
PP PVD bright brass type:	•
PM PVD satin brass type:	•
NE Black chromium:	•
DB Dark Bronze:	•
BC BioCote anti-microbial:	•

Handles

Compatible handles*	A, U, L, W, H, S, B, P, J, T, Y, Z, O, N, G, K, 2, 3, 4, 7, 5
High Transit:	• (optional)

* Not all the handles are available in all finishes.

Locks:

Euro-DIN:	—
ANSI:	•
Scandinavian:	—
Cylindrical:	• (Only SALTO LC1K)
Tubular:	• (Only SALTO LT2L)

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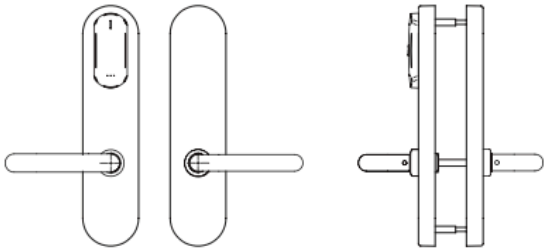
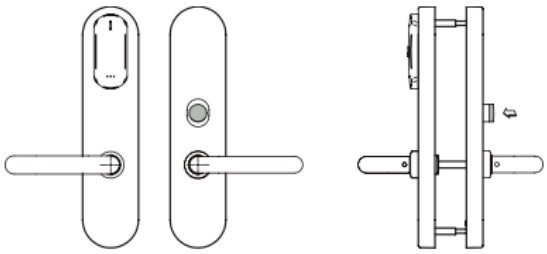
MODELS:

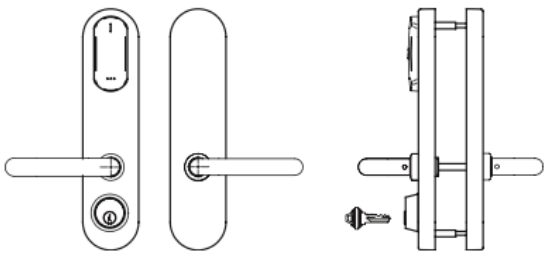
MODEL 50:
- 2 handles any type.



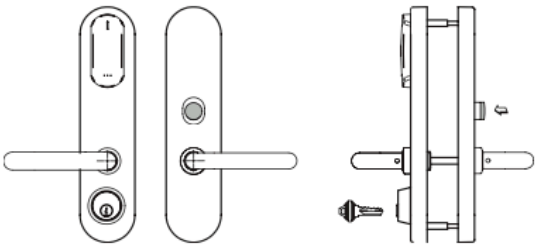
MODEL 56:
- 2 handles any type.
- Electronic "do not disturb" system (Not available in selfprogrammable).



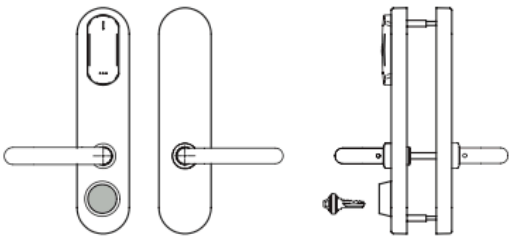
MODEL 60:
- 2 handles any type.
- Built in mechanical override with audit. (Ax660 reference: Mortise cylinder 1 1/8").



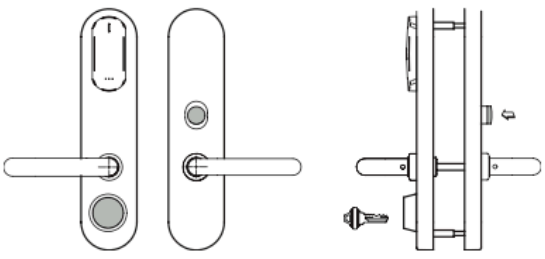
MODEL 66:
- 2 handles any type.
- Electronic "do not disturb" system (Not available in self-programmable).
- Built in mechanical override with audit. (Mortise cylinder 1 1/8").



MODEL 70:
- 2 handles any type.
- Built in mechanical override and cover with audit. (Ax660 reference: Mortise cylinder 1 1/8").



MODEL 76:
- 2 handles any type.
- Electronic "do not disturb" system (Not available in self-programmable).
- Built in mechanical override and cover with audit. (Mortise cylinder 1 1/8").



KPP03xx

Adapter Kit For VON DUPRIN® 98/99 *Panic Bar*

Single Point

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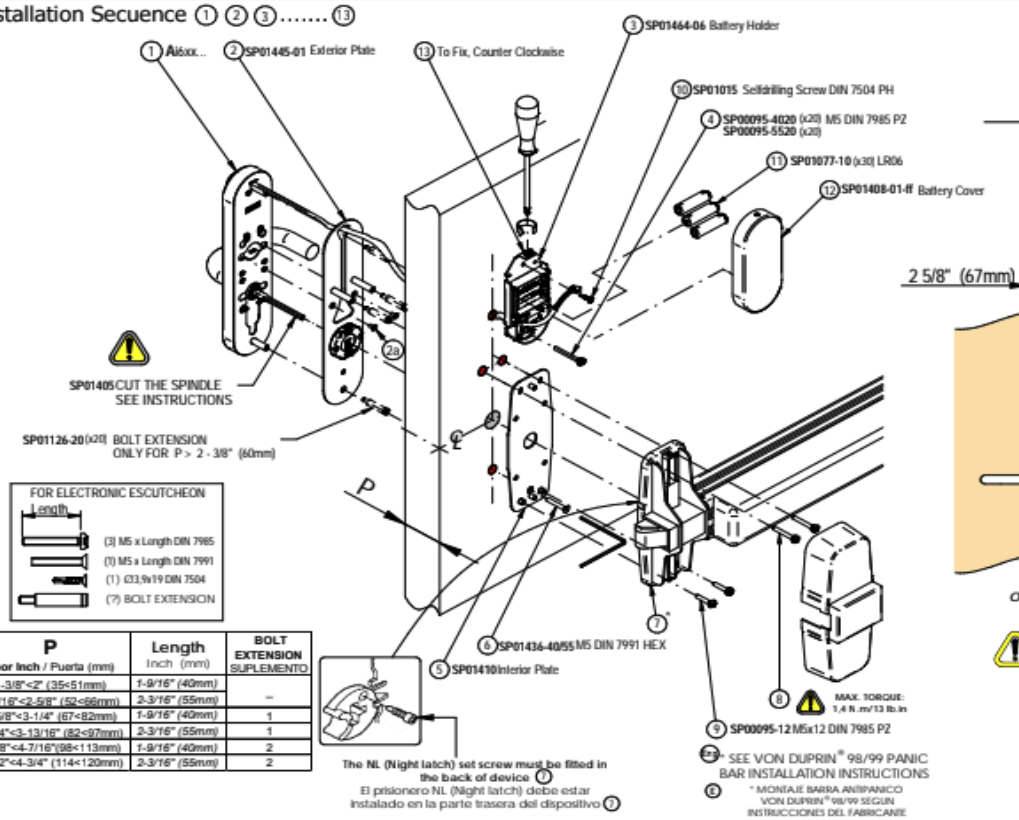
Installation Secuence ① ② ③ ..... ⑬



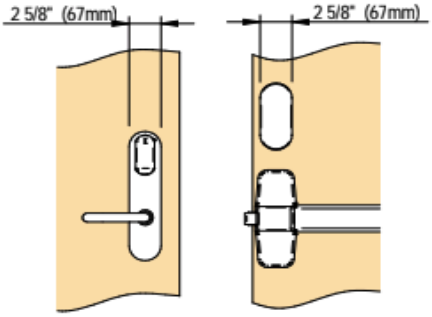
P Door Inch / Puerta (mm)	Length Inch (mm)	BOLT EXTENSION SUPLEMENTO
1-3/8"<2" (35<51mm)	1-9/16" (40mm)	–
2-1/16"<2-5/8" (52<66mm)	2-3/16" (55mm)	–
2-5/8"<3-1/4" (67<82mm)	1-9/16" (40mm)	1
3-1/4"<3-13/16" (82<97mm)	2-3/16" (55mm)	1
3-7/8"<4-7/16"(98<113mm)	1-9/16" (40mm)	2
4-1/2"<4-3/4" (114<120mm)	2-3/16" (55mm)	2

EXTERNAL ELECTRONIC ESCUTCHEONS

COMPATIBLE MODELS

MODELOS COMPATIBLES

Ai650m00ffcH8
Ai660m00ffcH8



AT THIS POINT DO NOT CLOSE THE DOOR TEST THE LOCK FIRST

KPP04xx

Adapter Kit For VON DUPRIN® 98/9957/9827 *Panic Bar*

Three Locking Points

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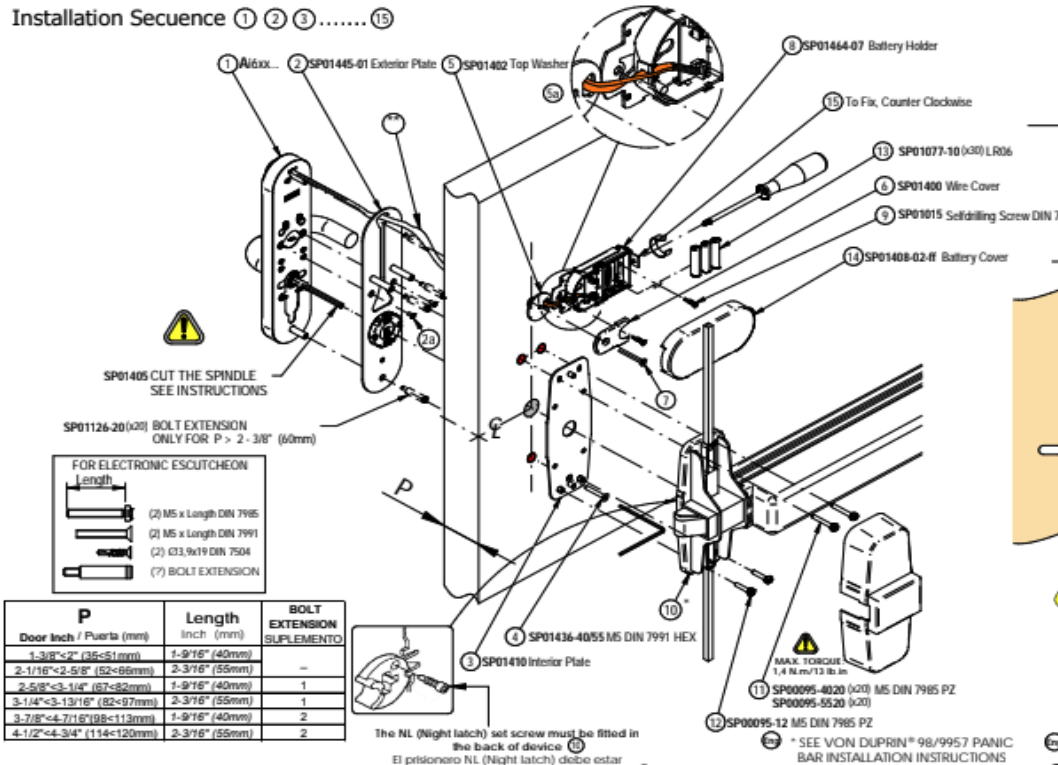
Installation Secuence ① ② ③ ..... ⑮



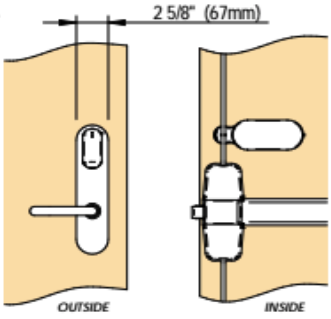
P Door Inch / Puerta (mm)	Length Inch (mm)	BOLT EXTENSION SUPLEMENTO
1-3/8"<2" (35<51mm)	1-9/16" (40mm)	–
2-1/16"<2-5/8" (52<66mm)	2-3/16" (55mm)	–
2-5/8"<3-1/4" (67<82mm)	1-9/16" (40mm)	1
3-1/4"<3-13/16" (82<97mm)	2-3/16" (55mm)	1
3-7/8"<4-7/16"(98<113mm)	1-9/16" (40mm)	2
4-1/2"<4-3/4" (114<120mm)	2-3/16" (55mm)	2

EXTERNAL ELECTRONIC ESCUTCHEONS

COMPATIBLE MODELS

MODELOS COMPATIBLES

Ai650m00ffcH8
Ai660m00ffcH8



AT THIS POINT DO NOT CLOSE THE DOOR TEST THE LOCK FIRST

** For door thickness (P) over 2-9/16" (65mm) Use special wire 01045-350

** Para puertas de espesor (P) mayores de 2-9/16" (65mm), Utilice el cable especial 01045-350

KPP03/04

ADAPTER KIT FOR VON DUPRIN® 98/99 *Panic Bar* 98/9957

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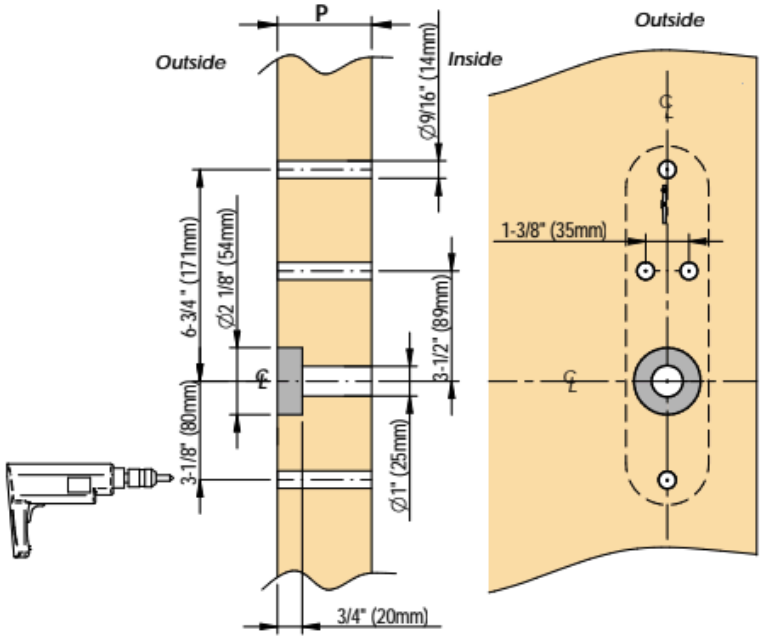
Eng DOOR PREPARATION: 2 STEPS
① -FOLLOW VON DUPRIN® 98/99 DOOR PREPARATION INSTRUCTIONS
② -FOLLOW PRESENT SALTO DOOR PREPARATION SHEET INSTRUCTIONS FOR SALTO/VON DUPRIN® ADAPTER KIT

E *MECANIZADO DE PUERTA: 2 PASOS*
① *-SIGA LAS INSTRUCCIONES DE PREPARACION DE PUERTA VON DUPRIN® 98/99*
② *-SIGA LAS PRESENTES INSTRUCCIONES DE PREPARACION DE PUERTA PARA EL KIT DE ADAPTACION SALTO/VON DUPRIN®*

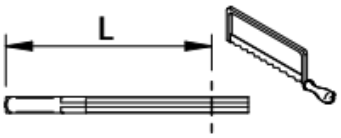


Eng * SEE VON DUPRIN® 98/99 PANIC BAR INSTALLATION INSTRUCTIONS

E * MONTAJE BARRA ANTIPANICO VON DUPRIN® 98/99 SEGUN INSTRUCCIONES DEL FABRICANTE

Eng Cutting the Spindle
E *Corte del Cuadradillo*

Spindle Length L

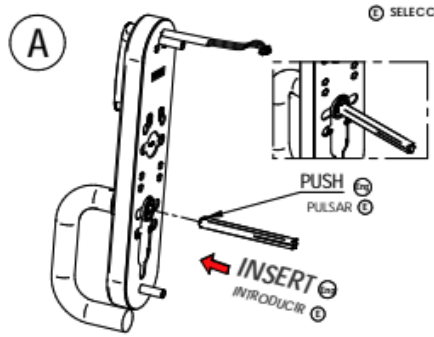


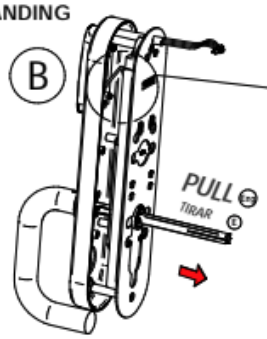
L= P+25/32"

L= P+20mm

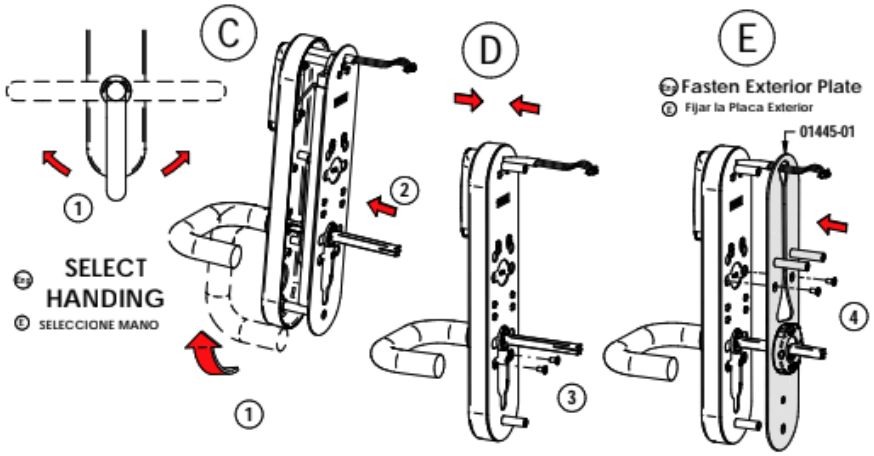
Eng P= Door Thickness
E *P= Espesor de Puerta*

Eng SELECTION OF HANDING
E SELECCIONE MANO





Eng Do not disconnect !
E No desconectar



Eng

Declaration of conformity
By means of the present Salto Systems S.L. (Pol. Lanbarren C/Arkotz, 9 - 20180 Oiartzun - Spain - CIF B20708517), declares that this equipment fulfills the essential requirements and any other applicable or indispensable dispositions of the Directive 1999/5/CE or the Directive 89/336/EEC. You will be able to find a copy of the original declaration of conformity at the following Internet address:
http://www.saltosystems.com

All proximity models are "Receiver class 3".

E

Declaración de conformidad
Por medio de la presente Salto Systems S.L. (Pol. Lanbarren C/Arkotz, 9 - 20180 Oiartzun – Spain - CIF B20708517), declara que este equipo cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 1999/5/CE o la Directiva 89/336/EEC. Podrá encontrar una copia de la declaración de conformidad original en la siguiente dirección de Internet:
http://www.saltosystems.com

Todos los modelos de proximidad son "Receiver class 3".

ONLY FOR PROXIMITY MODELS

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Datasheet

Next-generation technology and smart innovations for a more connected, keyless building experience.

SALTO
inspiredaccess

BLUEnet Gateway - GATEWAYx3C

Technical specifications:

The advanced SALTO online wireless solution is the next step in battery operated access control. SALTO's Wireless solution brings real-time two-way encrypted communication between our wireless locks and the operator.

saltosystems .com

TECHNICAL DATA:

Housing dimensions (H x W x D):	120 x 160 x 34 mm
Weight:	195 g
Cover material:	ABS V0 plastic
IP class:	Not suitable for outdoor use
Certifications:	CE, IC, UKCA, ACMA, SRRC, EAC, IMDA, NCC, UL

ELECTRONIC FEATURES:

Power:	PoE IEEE802.3af, 12V power adapter
Tamper switch:	Built in tamper microswitch
DHCP / Static IP:	DHCP by default (recommended)
Firmware update:	Via ProAccess SPACE though Ethernet connection
LED lamps:	Multi colour led to notify the status of the device

SALTO PLATFORMS:

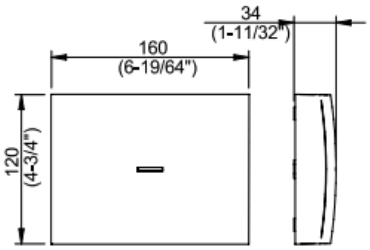
	S [1]
SVN data-on-card	•
JustIN Mobile	•
BLUEnet Wireless	•[2]
Apple Wallet	—

[1] SALTO Space. On-premise access control platform.
[2] RFnet Wireless versions are Not Compatible.

FINISHES:

Black:	•
White:	•

TECHNICAL DRAWING:



ELECTRICAL CHARACTERISTICS:

Operations conditions:

	Min	Typ	Max	Unit
Temperature:	0	25	60	ºC
Humidity:	35	-	85	%

Cable requirements:

Ethernet	UTP CAT5e
Node Connection (AB)	Generic twisted pair wire Note1
Node Connection (Vdd)	24 AWG

BLUEnet Characteristics (if internal node installed):

Frequency range:	2400-2483,5 Mhz
RF standard:	Bluetooth Low Energy
Indoor radio range:	5/10m
Max output power:	8dBm

PoE (IEEE 802.3af):

		Unit
Class:	2	
MaxPower:	5	W
Ethernet Standard:	10 BASE-T/100BASE- TX	

Auxiliary power supply:

	Min	Typ	Max	Unit
InputVoltage Note2	10	12	15	v
Current consumption:	75 Note3	-	500 Note4	mA

SALTO RFnet characteristics (if external node installed via BUS 485):

Frequency range:	2400-2483 Mhz
RF standard:	IEEE 802.15.4
Indoor radio range:	10/15m
Max output power:	5dBm

Note 1: 1x2x24AWG or UTP CAT5e recommended
Note 2: Use provided AC-DC power supply
Note 3: No external/internal node connected
Note 4: 6 external node connected

DATASHEET

RFNODE3 by SALTO

The advanced SALTO online wireless solution is the next step in battery operated access control. SALTO's Wireless solution brings real-time two-way encrypted communication between our wireless locks and the operator.

www.saltosystems.com

TECHNICAL SPECIFICATIONS:
RFNODE3 - WIRELESS SALTO BLUEnet

SALTO
inspiredaccess

TECHNICAL DATA:

Housing dimensions (H x W x D):	83 x 83 x 20 mm
Weight:	118 g
Cover material:	ABS V0 plastic
IP class:	Not suitable for outdoor use
Certifications:	CE, FCC/IC, RCM, SRRC

ELECTRONIC FEATURES:

Power:	12V through a compatible SALTO Gateway
Firmware update:	Via ProAccess SPACE though Ethernet connection
LED lamps:	Blue signalling led
Number of BLUEnet locks:	Max 16
GATEWAY compatibility:	GATEWAYx3C GATEWAYx2C

TECHNOLOGY PLATFORMS:

SALTO SPACE:

Smile - Selfprogrammable	–
ROM:	–
SVN data-on-card:	•
SALTO RFnet:	–
SALTO BLUEnet:	•

SALTO KS:

SALTO KS:	–

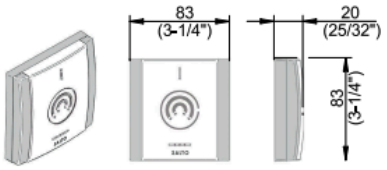
SALTO SALLIS:

SALLIS:	–

FINISHES:

Black:	–
White:	• White cream

TECHNICAL DRAWING:



ELECTRICAL CHARACTERISTICS:

Operations conditions:

	Min	Typ	Max	Unit
Temperature:	-20	25	70	ºC
Humidity:	35	-	85	%

Cable requirements:

RS485 Connection (AB)	Generic twisted pair wire Note1
Power Connection (Vdd)	24 AWG

BLUEnet Characteristics:

Frequency range:	2400-2483,5 Mhz
RF standard:	Bluetooth Low Energy
Indoor radio range:	10/15m
Max output power:	8dBm

Power Supply for BLUEnet:

	Min	Typ	Max	Unit
Input Voltage	7	12	28	v
Current consumption:	-	-	75 Note2	mA

Note 1: 1x2x24AWG or UTP CAT5e recommended.
Note 2: Power supply must be calculated taking into account SALTO Gateway and Nodes current consumption.

SALTO
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END OF SECTION