

Part 1 GENERAL

1.1 RELATED SECTIONS

- .1 28 13 00 – Access Control System
- .2 28 23 00 – Video Surveillance System
- .3 27 51 23 – Intercom Systems
- .4 11 12 00 – Parking Control Equipment

1.2 DEFINITIONS

- .1 (SAI) Intrusion Detection System (Système de détection intrusion).
- .2 (SSC) Camera Surveillance System (Système de surveillance par caméras).
- .3 (SCA) Access Control System (Système de contrôle d'accès).
- .4 (INT) Intercom System (Système d'interphone).
- .5 (SCB) Barrier Control System (Système de contrôle pour barrière).
- .6 (DND) Department of National Defense
- .7 (DEC) Economic Development Agency of Canada for the Regions of Quebec (EDA)
- .8 (PWGSC) Public Works and Government Services Canada

1.3 REFERENCES

- .1 National Building Code (NBC 2010).
- .2 Canadian Electric Code (1st part, 21st edition and Quebec amendments).

1.4 CONTRACTOR'S RESPONSIBILITIES

- .1 Work includes:
 - .1 The general contractor must be sure to make the necessary coordination of work with all involved subcontractors.
 - .2 ~~Security contractor is responsible for~~ Providing all of the work described in Section 27 10 05 for the IP network infrastructure dedicated to the security system.
 - .3 ~~Security contractor is responsible for~~ Providing all of the work described in Section 11 12 00 for the supply and installation of **three (3)** parking barriers.
 - .4 Design, supply, install, integrate all components and accessories such as enclosures, connectors, finishing and mounting plates, cables and wiring as well as labor and services necessary for the operation of security system.
 - .5 Carefully remove any existing components or equipment (if applicable) and deliver to the Departmental Representative when not reintegrated into the new facility (the delivery of the equipment must be accompanied by a transmission sheet).



- .6 Submit for analysis the data sheets of products that differ from the product number requested or when the product number is not specified.
- .7 Pull the cables as per the manufacturer's requirements and identify as per the requested requirements.
- .8 Take necessary measures to ensure the protection of components from vandalism and damage until final acceptance of the work.
- .9 Drill and finish off walls and ceilings after installation of components and cables.
- .10 Perform tests on all components of the security system.
- .11 Perform data collection regarding the information to be entered in the database. These information shall be provided by Departmental Representative on the Contractor's forms. The Contractor shall guide the Departmental Representative in the data collection.
- .12 Perform system start up, update staff training and prepare the end of contract documentation containing all data sheets and installation drawings identified "as-built".
- .2 Work done by other divisions
 - .1 Electrified architectural hardware as specified in Division 08.
 - .2 The distribution of the 120V AC power supply network 120 VAC as specified in Division 26.
 - .3 The ductwork as specified in Division 26 unless otherwise indicated.

1.5 USE OF THE PREMISES

- .1 The use of the premises is restricted to areas identified for the execution of work and storage. The work must be done without interfering with the movement of people.
- .2 As necessary, determine with Department Representative access roads to the site, storage areas, where it is possible to stack the material and the location of facilities.
- .3 Move stored materials that disrupt the operations of Department Representative or other Contractor.
- .4 As necessary, after obtaining the necessary approvals, pay for the use of storage areas or additional work required for the execution of the work.

1.6 SCHEDULES AND COORDINATION

- .1 Prepare schedule of physical security work in accordance with Section 01 32 16.07 Construction Progress Schedules.

1.7 DESIGN REQUIREMENTS

- .1 All cables must be adapted to the conditions of use according to Table 19 of the Canadian Electrical Code, even if the type of equipment to be connected is not governed by the Code.
- .2 Unless otherwise noted, the cables must meet the following requirements:
 - .1 The manufacturer's requirements with regards to their usage.
 - .2 When installed inside, should be covered with FT4 rated sheath and be installed in ducts.

- .3 When installed outside under ground level, they must be covered with a sheath adapted for wet conditions.
- .4 If part of the cable must be installed below ground level and the other part in a building, the cable must be both FT4 rated and adapted for wet conditions.
- .5 The cable size must be increased if the voltage drop is greater than 5%.
- .6 No splicing is accepted.
- .7 Of sufficient length to allow a minimum of 5 connections to the component in case of accidental breakage.
- .8 With the exception of network cables for the horizontal cable subsystem, all cable cores for security equipments must be stranded (no solid conductors).

1.8 SUBMITTALS

- .1 Submit all required documentation in accordance with Section 01 33 00 Submittal Procedures.
- .2 Submit the following data sheets
 - .1 Data sheets for all cable types.
 - .2 All data sheets for equipment to be provided in this section.
 - .3 Manufacturer's instructions for installing their equipment.
 - .4 Manufacturer's manuals for the use of its equipment.
 - .5 Submit a list of cables that covers all the cables and wiring set up and that includes the following:
 - .1 Cable number.
 - .2 Termination.
 - .3 Origin.
 - .4 Function and specifications on equipment interconnections.
 - .5 Cable type.
 - .6 Submit a design specification including notably an overall configuration diagram of security systems.
 - .7 Submit maintenance manuals that will include the following for each piece of equipment:
 - .1 A description of the maintenance tasks required including inspection methods.
 - .2 The procedure for preventive periodic maintenance.
- .3 Submit the following shop drawings:
 - .1 Wiring diagrams and details of equipment installation must indicate the location, proposed layout, cable route and arrangement, control panels, accessories, piping, conduits and all other elements which must be shown in order to achieve a coordinated system.
 - .2 Wiring diagrams should indicate the circuit terminals, the internal wiring of each device as well as the interconnections between different devices.
 - .3 Drawings must indicate clearances required for the operation, maintenance and replacement of equipment.

- .4 If changes are required, notify the Departmental Representative before they are made.
- .4 Documents to be kept on site:
 - .1 Departmental Representative will provide two (2) sets of drawings. On one of the sets, indicate, as they are made, all changes made during the execution of the work.
 - .2 At the end of the work, transfer to the second set the information recorded on the first set so as to show the systems and devices as they were installed.
 - .3 Keep these drawings on site and make them available for the purposes of reference and verification.
- .5 Documents marked “as built” to submit to Departmental Representative:
 - .1 Identify each drawing in the lower right corner, in letters at least 12 mm in height, as follows: "DRAWING" AS BUILT ": THIS DRAWING HAS BEEN REVISED AND INDICATES SYSTEMS AND DEVICES AS THEY HAVE INSTALLED”, “Name of Contractor” and “Date.”
 - .2 Submit drawings to Departmental Representative for approval and then make corrections as directed.

1.9 QUALITY ASSURANCE

- .1 Workforce Qualifications: security work must be performed by qualified personnel in good standing under the terms of the law of the Province of Quebec on vocational training and workforce qualifications. In addition, the staff assigned to programming or supervision of security systems work must hold manufacturer's certification demonstrating that they have received and successfully completed training courses to install and start up the security system that is under their responsibility. Employees enrolled in a provincial apprenticeship program may perform specific tasks if they are under the direct supervision of a skilled worker.
- .2 Specialized Contractor Qualifications: security work must be performed by a specialized firm as per the Private Security Act (LRQ chapter S-3.5) prescribed by the local authorities of the province of Quebec, including personnel assigned to connection work and commissioning of systems.
- .3 Take necessary measures relating to construction health and safety in accordance with Section 01 35 29.06. The Contractor specialist shall perform the health and safety tasks on construction sites.

1.10 TRANSPORTATION, STORAGE AND MAINTENANCE

- .1 Delivery Schedule of equipment: submit a delivery schedule to the Engineer within two (2) weeks of contract award.

1.11 WASTE MANAGEMENT

- .1 Remove from site all packing materials and route them to the appropriate recycling facilities.

1.12 WORK INSPECTION

- .1 Before requesting the preliminary inspection, the Contractor shall:

- .1 Complete work to 100%, otherwise the Departmental Representative may refuse to issue an excessively long list of deficiencies. In addition, the Contractor may be billed for unnecessary trips by Departmental Representative, due to a lack of coordination or neglect.
- .2 Clean all appliances included in the project and touch up the paint on the equipment, if any.
- .3 Submit all documentation requested under "Submittals."
- .2 During the interim inspection, the Contractor shall:
 - .1 Demonstrate consistently that systems and equipment operate in accordance with the plans and specifications requirements.
 - .2 Possess the devices to measure resistance, voltage and amperage, and tools such as screwdrivers, pliers, flashlight, etc., providing access to the connections of components and re-connection if necessary.
 - .3 Provide Departmental Representative with the means to enable him to perform verifications, such as the availability of a person with required knowledge of the project for the conducting of inspections and tests.
 - .1 Place stepladders and ladders where needed, move ceiling tiles, open access doors, etc.

1.13 ACCEPTANCE OF WORK

- .1 Upon receipt of written notice by the Contractor that his work is complete, the Departmental Representative will conduct a general inspection of the work.
- .2 The Departmental Representative will list all defects that he deems should be corrected. This list will be called "DEFICIENCIES LIST".
- .3 Following confirmation in writing from the Contractor that all work is completed in accordance with the contract documents and the "DEFICIENCIES LIST" issued by the Departmental Representative, the Departmental Representative will make a second verification if necessary. If the installation is in accordance and acceptable, an official document approving the work will be issued.

1.14 FINAL ACCEPTANCE

- .1 A final acceptance certificate is issued by the Departmental Representative when the Supplier:
 - .1 Corrected the deficiencies identified with the provisional approval to the satisfaction of Departmental Representative.
 - .2 Paid in full all of its subcontractors.
 - .3 Meets all the requirements of the contract.
 - .4 Requested such a certificate to the Departmental Representative.
 - .5 Completed and submitted a formal statement regarding the distribution of initial payment by the contractor.

1.15 COMMISSIONING OF THE FACILITY

- .1 Instruct client representative and operations staff of the mode of operation and maintenance practices of the facility, its equipment and its components.
- .2 Should the Contractor fail to control the execution of the work to the satisfaction of the Departmental Representative or when specifically requested for a particular product, retain and pay for the services of the manufacturer to monitor the startup of the work, to check, adjust, balance and calibrate the various elements and to instruct the operations staff.
- .3 Provide these services for a sufficient duration by providing the number of visits required to put the equipment into operation and ensure that operations staff is familiar with all aspects of maintenance and operation.

1.16 OPERATING INSTRUCTIONS

- .1 Provide operating instructions for each main system and for each main unit prescribed in the relevant sections of the specifications for the operating, management and maintenance personnel.
- .2 Operating instructions shall include the following:
 - .1 Wiring diagrams, control diagrams, control sequence for each main system and for each device.
 - .2 Start-up, alignment, adjustment, lubrication, operation and shutdown procedures.
 - .3 Safety Precautions.
 - .4 Procedures to be followed in case of failure.
 - .5 Other instructions, according to the manufacturer's recommendations for each system or device.
- .3 Provide instructions printed or engraved, placed under glass frame or laminated using an approved method.
- .4 Post instructions at approved locations.
- .5 Exposed operating instructions should be on weather-resistant material or they must be placed in a waterproof envelope.
- .6 Ensure that the operating instructions do not fade when exposed to sunlight.

1.17 WARRANTY

- .1 If a part is defective, the Contractor shall arrive on-site within four (4) hours of a service call being placed, identify the source of the problem and repair it immediately if the defect affects protection of building perimeter and internal partition or within a period of two (2) working days in all other cases.
- .2 If the Contractor fails to remedy the defect within the requested time after notice given by the Departmental Representative or repair work is not progressing at a sufficient pace, Departmental Representative can perform repairs or corrections himself or arrange for the repairs to be done by other person designated by him. The cost of this work will be borne by the Contractor.

- .3 Once completed, submit a certificate of warranty describing the list of included and excluded items, starting date, duration of the warranty, nature of the services to be provided and the content of the service contract option.
- .4 When a manufacturer offers an extended warranty on a piece of equipment, the Contractor shall transfer the warranty to Departmental Representative and indicate in the certificate of warranty.

1.18 SPECIAL PROVISIONS - SECURITY WORK

- .1 No changes to the original plans and specifications can be performed without the Departmental Representative's request in writing.
- .2 In all cases, the Departmental Representative shall be consulted and he alone can give permission for any changes to be made with respect to plans and specifications. All work that is not in accordance with plans and specifications must be modified by the Contractor at no additional cost.
- .3 During construction, Departmental Representative has the right to request changes to plans and specifications when he sees fit. These changes will not affect nor invalidate the terms of this contract. If they cause an increase or decrease in the cost of the work, an adjustment will be made in the contract, following a conformity assessment.

1.19 SPECIAL PROVISIONS – EQUIPMENT AND MATERIAL

- .1 Quality
 - .1 Unless otherwise specified, equipment and materials used for the execution of work must be new, in perfect condition, manufactured, assembled and tested at the factory, according to the terms of the contract documents. They must be ready to be installed for the purposes for which they are intended. If necessary, provide evidence establishing the nature, origin and quality of products supplied.
 - .2 As required, equipment and materials must have the certification or approval label from a certified body recognized by the Quebec Construction Code.
 - .3 All information on devices and materials (operation or otherwise) must be bilingual.
 - .4 Equipment and material found defective before the end of the work are rejected, regardless of the results of previous inspections. The Contractor shall perform the removal and replacement of defective products at his expense. He is responsible for delays and associated costs.
 - .5 Devices or materials must have the characteristics and dimensions suitable for the places where they are installed. Notify the Departmental Representative prior to the installation of a device or material that does not meet these conditions.
- .2 Availability
 - .1 Parts and products should not be for the exclusive use of the Contractor who gets the contract. The devices and security software must be commercially available in Quebec for a minimum of twelve (12) months from at least three (3) accredited installers and at a price comparable to the competition.

- .2 Immediately after being awarded the contract, the contractor shall deliver equipment and materials according to requirements and anticipate any delays. Order the required quantities at the right time, given the schedule of work and storage capacity on site. If it is possible to anticipate some delays in delivery, notify the Departmental Representative so that measures can be taken to substitute replacement equipment or material or make the necessary corrections and this sufficiently in advance to restrict delaying the work.
 - .1 Should the Departmental Representative not be notified of anticipated delivery delays at the start of work, and should it also seem likely that the execution of the work be delayed, Departmental Representative reserves the right to substitute expected equipment or material with other comparable equipment or material that can be delivered more quickly, provided that the contract price will not be increased.
- .3 Transport
 - .1 Transportation costs of equipment or materials required for the execution of the work are the responsibility of the Contractor.
 - .2 The Contractor is responsible for the inspection, storage of equipment and materials arriving on site.
 - .3 Move and store under lock and key equipment and materials avoiding damage, alterations or soiling, and following the manufacturer's instructions where applicable.
 - .4 Store equipment and materials in their original packaging, taking care to leave intact the manufacturers' label and seal.
 - .5 Replace at no additional charge damaged equipment or materials to the satisfaction of the Departmental Representative.
 - .6 Unless otherwise indicated, install or set up equipment or materials by following the manufacturer's instructions.

Part 2 PRODUCTS

2.1 MATERIAL AND EQUIPMENT

- .1 When required by the Canadian Electrical Code, equipment must be CSA certified. In cases where equipment cannot be certified or in the case of an assembly to be connected to an electrical installation and assembly requires certification, submit materials and equipment or assembly to the competent authority before delivery on site or prior to commissioning the assembly.
- .2 The security cable conductors (excluding IP network cables) must be of the multi-strand type (no solid conductor).
- .3 All components must be of appropriate quality for intensive use.
- .4 All components must operate below the recommended manufacturer's limits.

2.2 WIRING TERMINATIONS

- .1 Ensure lugs, terminals, and screws used for termination of wiring are suitable for both copper conductors and aluminum conductors.

- .2 Joint connectors (wire to wire) must be compression type with gel against corrosion and moisture.
- .3 Use grommet type compression endings when connecting to bolts (e.g. Grounding of a piece of equipment). Fork type terminations are to be avoided.
- .4 When connecting to a terminal block, strip the wire to a suitable length. The unsheathed portion should not exceed the depth of the terminal block. For stranded wire less than 22 AWG caliber, the conductor must be unsheathed to a length double to what is normally required and folded on itself, and twisted before being inserted into the terminal.
- .5 Cover with shrink tubing all junctions (wire to wire) when the joint is subjected to external weather conditions or performed outside of a heated building.

2.3 COMPONENT IDENTIFICATION

- .1 The identification of the boxes or cabinets of security components must be done by the use of label plates conforming to the following requirements:

- .1 Nameplates: lamicoid 3mm thick plastic engraving sheet, melamine with black matte finish face and white core, letters accurately aligned and engraved into core, mechanically attached with self tapping screws, aligned letters, etched in the plate.

- .2 Sizes as follows:

NAMEPLATE SIZES			
Size 1	10 x 50 mm	1 line	3 mm high letters
Size 2	12 x 70 mm	1 line	5 mm high letters
Size 3	12 x 70 mm	2 lines	3 mm high letters
Size 4	20 x 90 mm	1 line	8 mm high letters
Size 5	20 x 90 mm	2 lines	5 mm high letters
Size 6	25 x 100 mm	1 line	12 mm high letters
Size 7	25 x 100 mm	2 lines	6 mm high letters

- .3 Wording on nameplates to be approved by the Engineer prior to manufacture.
- .4 Allow for minimum of twenty-five (25) letters per nameplate.
- .5 Equipment cabinet must have a label in Size 3 when the cabinet width is less than 600 mm, and a Size 4 in other cases. Number according to the Departmental Representative directives.

2.4 WIRING IDENTIFICATION

- .1 Both ends of the cables should be marked permanently and indelibly with a self-laminating Brady plastic tape or equivalent. Identification must be carried out according to the following structure:

- .1 When it is a component associated with a door, identification must be AAAA-BBBB (AAAA represents the number of the door and BBBB is the component code).
- .2 In the case of a component that is not associated with a door, the identification must be BBBB-CCCC (CCCC represents the number DES-XXX and BBBB represents the component code).

- .3 Information identifying the components is found on the plans. Do not improvise the numbering if the above requirements are not available. If this is the case, the Representative will provide the missing information.
- .2 Identification method must be uniform for the entire installation.
- .3 Use communication cables and conductors with uniform color coding throughout the network.
- .4 Unless agreed by the Departmental Representative, the color code of the sheaths of cables and conductors shall be uniform throughout the installation for the same type of component.

2.5 ELECTRICAL CONDUIT IDENTIFICATION

- .1 See Division 26 Electrical.

2.6 EQUIPMENT CABINET CONSTRUCTION

- .1 The cabinet must be at least 14-gauge steel unless otherwise noted.
- .2 The mounting plate in the cabinet must be at least 12-gauge steel unless otherwise noted.
- .3 Where the cabinet must be mounted on a shaft, the cabinet must be secured with a stainless steel “U” bolt and be suitable for this type of installation.
- .4 All locking mechanisms for cabinets must be provided with a key lock, two (2) keys per cabinet, with the same key path for all cabinets.
- .5 Cabinet hinges must be the security type.
- .6 Provide ventilation louvers when the heat generation equipment requires louvers to keep the temperature below prescribed limits. Add fans if necessary.

2.7 EQUIPMENT CABINET AND METAL HOUSINGS FINISH

- .1 The surfaces of the metal housings must be finished at the factory and be coated with a rustproof primer, inside and outside, and at have least two (2) layers of enamel finish or equivalent.
- .2 Units installed outdoors must be stainless steel without overlap or white anodized aluminum.

Part 3 EXECUTION

3.1 INSTALLATION

- .1 Unless otherwise indicated, perform all of the installations in accordance with CSA C22.1.

3.2 LABELS, INDICATOR PLATES AND SIGNAGE PLATES

- .1 Ensure CSA labels, indicator plates and signage plates are visible and legible when materials are installed.

3.3 INSTALLATION OF CABLES

- .1 Comply with the manufacturer’s requirements

- .2 Installation of wiring must be done so that all of the cables must be installed in conduits provided in Division 26. Unless there are exceptions approved by the Departmental Representative, all wiring must be inserted in conduits. The security contractor is responsible for completing certain conduits runs over a distance not exceeding 3 meters. For the ends of runs where installing a rigid conduit is not adequate, the security contractor will supply and install flexible ducts.
- .3 The security contractor must ensure that power cables for electrical locks are hidden and are not accessible from the unsecured side. Coordinate with the electrical contractor responsible for installing conduits so that pull-boxes are not accessible from the unsecured side.
- .4 When grouped, cables and wire must be fastened using VELCRO type fasteners. The use of self-locking nylon ties is prohibited.
- .5 All cables and wires (horizontal and vertical) must be free of any cuts and/or seal/splice. The cables from the end of the line components must be continuous to the main panel or control module.
- .6 All cables and wires should be installed as far as possible from any power source and/or electromagnetic source such as electrical cables, ballasts, fluorescents, motors, transformers and other sources. In particular, the following installation distances must be respected.

Source Descriptions	Separation
Shielded wiring or electrical equipment with a power of less than 2 kVA	130 mm
Shielded wiring or electrical equipment with a power of between 2 and 5 kVA	310 mm
Shielded wiring or electrical equipment with a power of more than 5 kVA	620 mm
Motors, transformers, photocopiers, electrical room and other electromagnetic sources	1,000 mm

- .7 All cables and security wiring must be installed and secured in dry places, respecting the traction limits, minimum bend radius and any installation requirement specified by the manufacturer or issued in the applicable installation standards. Shielded cables should be grounded with a single point on each section, unless otherwise stated in the requirements of the manufacturer. If applicable, all cables that may be exposed to lightning must be adequately protected with appropriate device.
- .8 To be impervious to electromagnetic fields, all major metal parts (racks, cabinets and desks) must be grounded to the grounding network of the building. The grounding must be made in accordance with the manufacturer's recommendations.
- .9 Cables and wires should never be in contact with hot surfaces, electrical power cables, machinery or ducts attributed to other services (steam piping, hot water, lighting accessories, motors, transformers, etc.).

- .10 It is the responsibility of the Contractor to make all required openings in the floor, ceiling and walls. Any walls, floors, ceilings, or other existing site structures damaged by the passage of wiring or installation of equipment should be repaired in accordance with existing finishes.
- .11 When the use of a lubricant is necessary to facilitate cable pulling, the Contractor shall use a product that is safe for human contact and the environment. In addition, it must be compatible with all types of sheaths and CSA approved. Product data sheets must be submitted and contractor must obtain authorization before use.

3.4 INSTALLATION OF CONDUITS

- .1 See Division 26 - Electrical.
- .2 Conduit sizing was based on a fill rate not exceeding 40% using standard cables such as the following products:
 - .1 Low supply voltage cable 2 x 18 multistrand Belden 5300UE.
 - .2 Low supply voltage cable 6 x 18 multistrand Belden 5304UE.
 - .3 Supervision cable 4 x 22 multistrand Belden 5502UE.
- .3 It is the Security Contractor's responsibility to ensure that the sizing of pipes indicated on the plans and specifications are of a size suitable for the security needs based on cables and equipment offered. If the Security Contractor concludes that sizing is insufficient, they shall inform the Departmental Representative and confirm any design problem, well before the Division 26 Contractor has carried out their work.
- .4 Submit plans for review showing wiring distribution in all conduits.
- .5 To minimize the impact of lightning, cables for any outdoor cameras installed on the building must be installed in conduits dedicated to this purpose. Cables for indoor applications shall not be run in conduits serving equipment installed outdoors.

3.5 LOCATION OF EQUIPMENT AND MATERIALS

- .1 Unless otherwise indicated, measure the component installation height from the finished floor to the horizontal centreline of the component.
- .2 Where the mounting height is not listed, check with the Departmental Representative prior to beginning installation.
- .3 Observe Manufacturer's recommended mounting heights and those indicated in the plans. Coordinate the location of components based on expected results and coordinate everything with the Division 26 Contractor for conduit installation.
- .4 The exact location of equipment or materials is defined only schematically on drawings, final positioning must be detailed on site in conjunction with the Departmental Representative. The position on drawings can be changed without additional charge or credit on condition that the displacement does not exceed 3 m.
- .5 Install devices, materials and conduits to limit congestion and keep as much floor space clear as possible, in accordance with the manufacturer's recommendations for safety, access and maintenance.

- .6 Inform Departmental Representative of any problem that could cause any device or material to be installed contrary to the guidelines.
- .7 If hatches must be installed to allow for regular maintenance or access to equipment or materials, make a request to the Departmental Representative. The supply and installation of access hatches is the responsibility of the Departmental Representative.

3.6 PROTECTION OF WORK IN PROGRESS

- .1 Ensure integrity of all finished works or work in progress by utilizing adequate protection. Damaged or altered finished works due to lack of compliance with afore mentioned protection measures must be replaced or repaired free of charge, as specified by the Departmental Representative.
- .2 Unless otherwise specified, you must obtain written authorization of the Departmental Representative before cutting, drilling or installing a sleeve through framework.

3.7 COORDINATION OF PROTECTIVE DEVICES

- .1 Ensure protective devices such as circuit breakers, relays and fuses are installed, and that they are the correct size and set to the required value.
- .2 Provide measuring instruments, indicators, equipment and personnel required for carrying out tests during performance of work and during the completion of work.

3.8 COORDINATION OF PLANS AND SPECIFICATIONS

- .1 Plans and specifications indicate a schematic and approximate location of devices and components.
- .2 Verify dimensions and the exact position of the equipments on site and not according to scale on drawings.

3.9 SYSTEM START-UP?

- .1 Provide services as needed at the end of the work for start up, coordination, integration and adjustment of security systems for optimal operation.
- .2 If unable to demonstrate technical expertise as expected by the Departmental Representative, retain the services of the manufacturer or of a qualified professional to confirm whether the work was carried out according to manufacturer's requirements. The manufacturer or specialist will make recommendations regarding installation, programming and use of components and conduct periodic visits to check if the implementation was performed according to the recommendations.
- .3 All costs incurred by retaining the services of the manufacturer or a qualified professional shall be borne by the Contractor if the Departmental Representative determines that the Contractor does not have full expertise of the work.

3.10 CLEANING

- .1 The Contractor shall keep the site clean and public areas free of debris and waste. Remove trash and debris out of the workplace and dispose of them accordingly. Clean at the end of work.

- .2 Clean and touch up factory painted surfaces that were scratched or damaged during transport and installation; use a paint and color identical to the original painting.
- .3 Clean hooks, brackets, fasteners and other exposed non-galvanized fasteners and apply a primer to protect against rust.

END OF SECTION