

Part 1 **General**

1.1 SECTIONS INCLUDES

- .1 This Section covers common Work requirements for all Electronic Safety and Security Systems.

1.2 RELATED REQUIREMENTS

- .1 All drawings and all sections of the specifications shall apply to and form an integral part of this Section.
- .2 Refer to all Sections of the Technical Specifications and Construction Drawings for all related Work:
 - .1 It is the responsibility of the Contractor to examine the related Contract Documents, Specifications, Construction Drawings, and the Project Manual as a whole.
 - .2 Use cross-referencing to coordinate assemblies or systems which components may span multiple sections and must meet certain performance requirements as an assembly or system.
 - .3 Coordination of the Work is the duty of the Contractor.

1.3 ABBREVIATIONS AND ACRONYMS

- .1 Refer to the following Abbreviations and Acronyms in conjunction with the Division 27 Sections – Communications, Division 28 Sections – Electronic Safety and Security, Electrical, Telecommunications and Security Series of the Construction Drawings, but not limited to:
 - .1 AFF: Above Finished Floor.
 - .2 AHJ: Authority Having Jurisdiction.
 - .3 ASIS: American Society for Industrial Security – International.
 - .4 AWG: American Wire Gauge.
 - .5 CAD: Computer-Aided Design.
 - .6 CAT3: TIA Category 3.
 - .7 CAT5e: TIA Category 5e.
 - .8 CAT6: TIA Category 6.
 - .9 CCTV: Closed Circuit Television.
 - .10 CEC: Canadian Electrical Code.
 - .11 CD: Construction Document.
 - .12 CSA: Canadian Standards Association.
 - .13 cUL: Underwriters’ Laboratories (Tested to Canadian Standards).
 - .14 DEMARC: Demarcation Point.
 - .15 D/N: Day and Night.
 - .16 EMT: Electrical Metallic Tubing.
 - .17 ESS: Electronic Safety and Security.
 - .18 FACP: Fire Alarm Control Panel.
 - .19 FO: Fibre Optic.
 - .20 GUI: Graphical User Interface.
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.21	GRC:	Galvanized Rigid Steel.
.22	IEEE:	Institute of Electrical and Electronics Engineers.
.23	IP:	Internet Protocol.
.24	IT:	Information Technology.
.25	LAN:	Local Area Network.
.26	MP:	Megapixel.
.27	MTC:	Main Telecommunications Closet.
.28	MTR:	Main Telecommunications Room.
.29	NA/ N/A:	Not Applicable.
.30	O&M:	Operations and Maintenance.
.31	PB:	Pull Box.
.32	PB:	Pushbutton.
.33	PM:	Project Manager.
.34	PS:	Power Supply.
.35	PSP:	Physical Security Professional.
.36	RFI:	Request for Information.
.37	RMC:	Rigid Metal Conduit.
.38	RU:	Rack Unit.
.39	SIA:	Security Industry Association.
.40	SFP:	Small Form-factor Pluggable.
.41	TIA:	Telecommunications Industry Association.
.42	TO:	Telecommunications Outlet.
.43	TR:	Telecommunications Room.
.44	ULC:	Underwriters' Laboratories of Canada.
.45	UTP:	Unshielded Twisted Pair.
.46	VMS:	Video Management System.

1.4 REFERENCE STANDARDS

- .1 National Research Council of Canada (NRCC):
 - .1 National Building Code of Canada.
 - .2 National Fire Code of Canada.
 - .3 National Energy Code of Canada for Buildings.
 - .2 Canadian Standards Association (CSA):
 - .1 CSA C22.1, latest Canadian Electrical Code (CEC), Part I.
 - .2 CSA C22.1HB, Canadian Electrical Code Handbook - An Explanation of Rules of the Canadian Electrical Code, Part I.
 - .3 CSA C22.2 No. 0.4, Bonding and Grounding of Electrical Equipment.
 - .3 Building Industry Consulting Services International (BICSI):
 - .1 BICSI ESSDRM, Electronic Safety and Security Design Manual, Latest Edition.
 - .2 BICSI 005-2013, Electronic Safety and Security (ESS) System Design and Implementation Best Practices.
 - .4 Underwriter's Laboratories Canada (ULC):
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- .1 CAN/ULC-S316 – Standard for Performance of Video Surveillance Systems.
- .2 CAN/ULC-S319 - Electronic Access Control.

1.5 CODE AND STANDARDS

- .1 Complete installation in accordance with CSA C22.1, ANSI/TIA/EIA, J-STD, BICSI, except where specified otherwise.
- .2 While not identified and specified by number in these Divisions, comply with CSA, ANSI/TIA, EIA, BICSI Bulletins in force at time of tender submission. Comply with the requirements of all provincial and local laws, rules, ordinances, and codes.
- .3 Installation shall be in accordance with current edition of above Code and Standards, Provincial and other codes, rules and regulations. It is not the intention of the drawings and specifications to reiterate the Code and Standards. It is expected that the Contractor will be responsible for methods, types of conduits and cable tray support, fire rating of cables, coordination of ancillary devices, specialty ratings for cable for elevators etc. Notify, the City of any detected code deficiencies prior to submission of tender. In the absence of such notifications, it will be assumed that the Contractor has accepted responsibility for a complete code-compliant installation, and no additional compensation will be provided for code-related items.
- .4 Supply materials and labour required to meet requirements of codes, rules, and regulations, whether or not such Work is indicated on the drawings or in specifications.
- .5 Where Divisions 26, 27 and 28 specifies better quality of construction (or materials) than minimum code requirements, the more stringent of the two will be provided.
- .6 Electronic Safety and Security Systems installation shall be in accordance with the requirements of the Authority having Jurisdiction and local inspections authority.

1.6 REQUIREMENTS OF SYSTEM INTEGRATOR

- .1 The Contractor shall employ or be a Genetec Certified Partner for all installation and integration work.
- .2 It is anticipated that the successful proponent will have the capabilities to properly coordinate installation, communication and commissioning of a Genetec access control system provisioned via Security Center.
- .3 The system integrator shall be identified with a submission for work at each site.
- .4 The system integrator will advise the Contractor of all licencing requirements for Genetec and supply all required licenses for cameras, access control and servers.

1.7 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit Action and Information Submittals including Contractor's Scope of Work (in response to Statement of Work provided in these Specifications), Compliance/Non-compliance Statement, Shop Drawings and Product Data.
 - .2 Action and Informational Submittals including Product Data (Data Sheets, Cut Sheets), Shop Drawings (Risers, Single Line, and Schematic Diagrams), Compliance/Non-compliance Statement, Certificates, Qualifications Statement shall be reviewed by the City.
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- .3 Procurement of products shall not commence until Action and Informational Submittals e.g., Shop Drawings have been reviewed.
 - .4 Submit different systems and specification sections in separate documents.
 - .5 Include "TABLE OF CONTENTS" in all submittals including, but not limited to Product Data (Data Sheets, Cut Sheets), Shop Drawings (Risers, Single Line, and Schematic Diagrams), Compliance/ Non-compliance Statement, Certificates, Qualifications Statement and other required submittals.
 - .6 Product Data:
 - .1 Submit Manufacturer's instructions, printed product literature and data sheets for security equipment and include product characteristics, performance criteria, physical size, finish, and limitations.
 - .2 Submit:
 - .1 Functional description of equipment.
 - .2 Technical data for all devices.
 - .3 Device location plans and cable lists.
 - .4 Devices mounting location detail drawings.
 - .5 Typical devices connection detail drawings.
 - .6 Detailed construction, dimension, capacities, weights and electrical performance characteristics of equipment or material.
 - .7 Shop Drawings:
 - .1 Submit drawings stamped and signed by the factory-trained certified installers/ technicians.
 - .2 Shop drawings to indicate project layout, including details:
 - .1 Shop drawings to indicate, mounting heights and locations, wiring diagrams.
 - .2 Submit zone layout drawing indicating number and location of zones and areas covered.
 - .3 Submit wiring diagrams including but not limited to:
 - .1 Riser Diagrams.
 - .2 Single Line Diagrams.
 - .3 Schematic Diagrams.
 - .4 System Integration and Interconnections.
 - .4 Submit complete equipment list including but not limited to:
 - .1 Bill of Materials.
 - .2 Bill of Quantities.
 - .3 Hardware Schedules.
 - .5 Submit the following calculations for Video Surveillance System:
 - .1 Bandwidth Calculations.
 - .2 Storage Calculations.
 - .8 Compliance/ Non-compliance Statement:
 - .1 Submit Compliance/ Non-compliance Statement using a copy of each specification section with "Comply" or "Non-comply" comments on the end of each paragraph and sub-paragraphs).
 - .2 Provide comments to items that are "NON-COMPLIANT".

- .3 Items that are for information only are to be reviewed and marked as "NOTED".
 - .4 Items that are provided by other Contractors or Sub-contractors are to be marked as "NOT APPLICABLE" or "N/A" and indicate the Contractor or Sub-contractor responsible for that item or scope.
 - .9 Samples:
 - .1 Submit for review and acceptance of each unit.
 - .2 Samples will be returned for inclusion into the Work.
 - .3 Submit one (1) sample of each component proposed for inclusion into system. Components will be returned for incorporation into the Work.
 - .10 Certificates:
 - .1 Submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
 - .2 Submit Product Safety Certificates from the following testing agencies:
 - .1 CSA
 - .2 ULC
 - .3 cUL
 - .11 Test and Evaluation Reports:
 - .1 Submit certified test reports from approved independent testing laboratories indicating compliance with specifications for specified performance characteristics and physical properties.
 - .12 Manufacturer's Instructions:
 - .1 Submit manufacturer's installation instructions.
 - .13 Manufacturer's Field Reports:
 - .1 Submit Manufacturer's written reports within 10 days of review, verifying Compliance of Work, as described in:
 - .1 PART 3 - FIELD QUALITY CONTROL.
 - .1 Section 28 08 00 – Testing and Commissioning of Electronic Safety and Security Systems.
 - .14 Qualification Statements:
 - .1 Provide a list of project personnel for each system, including manufacturer training certificates.
 - .2 Submit copy of certificates of the Contractor showing proof as a Manufacturer Authorized Reseller, Distributor or System Integrator.
 - .3 Submit copy of specific training certificates of the Installers and Technicians doing the Work and providing demonstration and training.
 - .15 Clearly show division of responsibility. No item, equipment or description of the Work shall be indicated to be supplied or the Work to be done 'By Others' or 'By the City'. Any item, equipment or description of the Work shown on shop drawings shall form part of the Contract, unless specifically noted to the contrary.
 - .16 Provide field dimensions required by electrical supplier and sub-subcontractors. In cases where fabrication is required prior to field dimensions being available, check all related drawings and obtain clarification from City if necessary.
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- .17 Each drawing submission to bear following signed stamp, and include name of project, equipment supplier and clause number equipment is specified under.

CONTRACTORS CERTIFICATION

This drawing has been reviewed by

(Firm name)

All dimensions have been checked and found compatible with the contract drawings and all capacities, quantities, sizes and other data contained in the contract documents have been listed by the supplier on this drawing and have been checked by the undersigned and found correct.

Date

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- .18 Review of the shop drawings by the City shall not relieve the Contractor from responsibility for errors and omissions therein.
- .19 Shop drawings reflecting additional design or change in design shall be reviewed by the City.

1.8 CLOSEOUT SUBMITTALS

- .1 Operation and Maintenance Data:
- .1 Submit operation and maintenance data for incorporation into manual.
- .2 Include:
- .1 System configuration and equipment physical layout.
- .2 Functional description of equipment.
- .3 Instructions of operation of equipment.
- .4 Illustrations and diagrams to supplement procedures.
- .5 Operation instructions provided by manufacturer.
- .6 Cleaning instructions.
- .7 Contact Details of:
- .1 Manufacturers,
- .2 Manufacturer's Representatives,
- .3 Local Distributors,
- .4 Contractors/ Systems Integrators.
- .8 Installation and Start-up Check Lists.
- .9 Product Information Reports.
- .10 Performance Verification Reports.
- .11 As-built/ As-constructed Drawings.
- .12 Verification of licencing for all devices and servers.
- .13 Equipment Schedules.
- .14 Hardware Schedules.

- .2 Provide operation and maintenance data for incorporation into operation and maintenance manuals. Operation and maintenance manuals shall be submitted to the City in time to be used in the commissioning of the project.
- .3 Include detail of design elements, construction features, components function and maintenance requirements, to permit effective start-up, operation, maintenance, repair, modification, extension and expansion of any portion or feature of installation.
- .4 Include technical data, product data; supplement by bulletins, component illustration, exploded views, technical description of items, and parts lists. Advertising or sales literature will not be accepted.
- .5 Include wiring, schematic diagrams and performance curves.
- .6 Include hardware and equipment schedules, verification reports.
- .7 Include name and addresses of local suppliers, vendor representatives, installers and integrators for items included in maintenance manuals.
- .8 Maintenance manuals shall be submitted to the City for review. Manuals that are incomplete shall be returned to electrical subcontractor for completion. Completed manuals must be submitted, to the satisfaction of the City, before final payment may be considered to be due.

1.9 INTERFERENCE DRAWINGS

- .1 The systems drawings are intended to indicate the general extent of the Work, arrangement of equipment, sizes of conduits, cable trays, etc.
- .2 The Contractor shall provide interference drawings of congested locations where required by notes on the drawings, and/or where required in order to perform the Work efficiently for mechanical and electrical, telecommunication, Security and Safety systems.
- .3 Equipment dimensions shown on the Contract Documents are based upon a selected manufacturer's published data in each case. Ensure that equipment by alternative manufacturers, if selected, will fit within the allotted space with adequate room for access and servicing, and make any required adjustments to conduits, cable trays and/or equipment layouts.

1.10 RECORD DOCUMENTS

- .1 Submit three (3) copies of the maintenance manuals to the City, in 3-ring binders. Include a copy of all inspection and testing certificates, shop drawings, name/ address/phone # of each supplier, Contractor and City, table of contents, and a copy of project "as-built" drawings in an envelope at the back of the binder and electronic files on a USB stick. Include all costs in contract. CAD files can be obtained from the City.
 - .2 The Contractor shall keep a set of white prints on the Site at all times on which he shall record all additions or deviations from the contract documents including all changes covered by addenda, change orders, field changes, job conditions, etc. A set of drawings shall be utilized for each system and the Contractor shall obtain prints as required. Drawings to include locations of all junction and pull boxes, routing of cables and conduits, and changes to patch panel identification numbers.
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- .3 All principle below grade or inaccessible conduits, systems, etc. shall be dimensioned at each change in direction. All conduit routes not shown by the City on original drawing shall be shown including pull boxes, zoned conduit runs, etc.
- .4 The Contractor shall provide one set of clean red line marked-up drawings for approval and a final set with changes as may be requested by the City.
- .5 If corrections are required after the second review, due to missing information, the Electrical Subcontractor shall be responsible for the City's time to indicate the required corrective measures and all courier and printing costs.
- .6 The Contractor is responsible for the total cost of mylars, and white prints taken from mylars, and electronic files.
- .7 Corrected, revised white prints, electronic files, etc. will be forwarded to the City by the Contractor. Final payment on the Contract will not be made until correct mark-ups and files are prepared and submitted to the City.

1.11 QUALITY ASSURANCE

- .1 The Contractor is required to furnish all labour, supervision, tooling, miscellaneous mounting hardware and consumables for each system installed.
- .2 Qualifications.
 - .1 Communications Installers must have a minimum of Class M Limited – Voice, Data Video – Electrical License issued by the Government of Manitoba.
 - .2 The Contractor shall comply with all Specifications under Division 27 and Division 28 together with, but not limited to the applicable Codes, Standards, and Guidelines listed in this section.
 - .3 The Contractor shall provide technical services in compliance with the labour standards.
 - .4 The Copper and Optical Fibre Structured Cabling under Division 27 and Division 28 shall be installed by a Structured Cabling Contractor trained and certified by the Approved Cable Manufacturer, unless otherwise specified.
 - .5 The Contractor shall hire Sub-contractors that specialize in specific Security System.
 - .6 Installers and technicians conducting testing shall be factory-trained on the use of the Manufacturer's test equipment. The Contractor shall provide proof of this certification ten (10) business days prior to testing method approval.

1.12 PERMITS, FEES, AND INSPECTION

- .1 Where applicable, furnish Certificates of Acceptance from Authority having Jurisdiction upon completion of the Work to the City. Include copies of certificate in maintenance manuals.

1.13 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver all materials to the Site in an orderly fashion.
 - .2 Deliver, store and handle materials in accordance with the Specifications and other related Contract Documents, but not limited to:
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- .1 Manufacturer's Written Instructions.
- .3 Delivery and Acceptance Requirements: deliver materials to Site in original factory packaging, labelled with manufacturer's name and address.
- .4 Storage and Handling Requirements:
 - .1 Store materials off-ground, indoors, in dry location and in accordance with Manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect Communications equipment from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.
 - .4 Store all materials in a clean and dry place, secure from vandalism or theft. All materials to be left in shipping containers until required for use.
- .5 Provide additional protection such as tarps, padding, wood skids, etc., where such is required to ensure protection of equipment and as directed by the Contract Administrator.

1.14 FIELD AND SITE CONDITIONS

- .1 The Contractor shall visit the Site and verify all dimensions and existing conditions prior to submitting their bid.
- .2 Any shutdowns or interruptions shall be coordinated with the City and/ or Service Provider in advance.
- .3 Proposed schedules for shutdowns or interruptions shall be approved by the City.

1.15 WARRANTY

- .1 The system and equipment will be warranted for a period of one (1) year from the final acceptance of the system.
 - .2 The Contractor will maintain sufficient parts in stock to replace items found faulty during the warranty period.
 - .3 Manufacturer's Warranty:
 - .1 Submit for City's acceptance, manufacturer's standard warranty document executed by authorized company official.
 - .4 Where Specification Sections within this Division call for a longer Warranty period, the warranty letter will identify this requirement.
 - .5 All unsatisfactory Work and any equipment that does not perform satisfactorily within the warranty period shall immediately be repaired or replaced at no cost to the City.
 - .6 Any equipment that has been placed in use for any reason prior to beginning of the warranty period (such as for heating during construction), shall be cleaned and provided with whatever maintenance and repair is required so that its condition is equal to that of new equipment, or it shall be replaced, at no cost to the City.
 - .7 Equipment that fails as a result of its use prior to beginning of its warranty period, shall be repaired or replaced at no cost to the City, even after the normal warranty period has expired.
 - .8 All details of warranty repairs shall be documented in letters to the City.
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- .9 No certificate given, payment made, or the use of the equipment by the City, shall be construed as acceptance of defective Work or of improper materials.
- .10 The Contractor's warranty shall not act as a waiver for products that are warranted by the Manufacturer for longer than one (1) year.
- .11 The Contractor shall provide each installation crew with the appropriate number of trained personnel, in accordance with their Manufacturer's warranty contract agreement. After installation, the Contractor shall submit all documentation to support the warranty in accordance with the Manufacturer's warranty requirements, and to apply for the said warranty on behalf of the Customer. The warranty will cover the components and labour associated with the repair and/or replacement of any failed component, within the warranty period.
- .12 The Contractor warranty certificate shall contain at a minimum:
 - .1 Name and Address of Project.
 - .2 Name and Address of the Contractor.
 - .3 Warranty Commencement Date.
 - .4 Duration of Warranty.
 - .5 Clear definition of all included devices in system and indicating what remedial action will be taken under the warranty.
 - .6 Signature and Seal of Warrant.

Part 2

Products

2.1 MATERIALS AND EQUIPMENT

- .1 Contractor shall utilize a Manufacturer's end-to-end solution meaning all components are from a single manufacturer that will warranty the whole system.
- .2 All equipment shall be new and of the type and quality specified.
- .3 Equipment and material to be CSA certified. Where there is no alternative to supplying equipment, which is not CSA certified, obtain special approval from Electrical Inspection Department.
- .4 Provide labour, materials, transportation, equipment and facilities, etc. required for the complete communication installation as indicated or can be reasonably implied from the drawings and specifications.
- .5 Provide "factory assembled" enclosures, racks, cabinets and component assemblies, as required.

2.2 VOLTAGE RATINGS

- .1 Power supply and equipment to operate satisfactorily at 120V, 60 Hz within normal operating limits established by above standard.
 - .2 All equipment and devices that are installed outdoors to operate in extreme operating conditions without damage to equipment.
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2.3 FIRE STOPPING

- .1 Provide approved fire stopping systems and smoke seals for all electrical penetrations at all fire rated walls and floors to maintain the integrity of wall/floor fire rating being penetrated.

Part 3 Execution

3.1 PROCEDURE SCHEDULE

- .1 All communication work shall be coordinated with the Contract Administrator and Sub-trades involved. Manner and areas of the Work shall be pre-arranged prior to proceeding.

3.2 EXAMINATION

- .1 Verification of Conditions:
 - .1 Verify conditions of substrates previously installed under other Sections or Contracts are acceptable for access control system installation in accordance with manufacturer's written instructions.
 - .2 Visually inspect substrate in presence of Contract Administrator.
 - .3 Inform Contract Administrator of unacceptable conditions immediately upon discovery.
 - .4 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Contract Administrator.

3.3 INSTALLATION

- .1 Install a complete and operational system in accordance with:
 - .1 Manufacturer's Instructions.
 - .2 Reviewed SHOP DRAWINGS.
- .2 Installation shall be in accordance with the requirements of the Authority Having Jurisdiction (AHJ) and local inspections authority.
- .3 Install empty raceway system, including underfloor, overhead, surface distribution system, fish wire, terminal cabinets, outlet boxes, floor boxes, pull boxes, cover plates, conduit, sleeves and caps, cable tray, service raceways, miscellaneous and positioning material to constitute complete system, as applicable.

3.4 WORKMANSHIP

- .1 Install equipment, conduits, and cables in a workmanlike manner to present a neat appearance to the satisfaction of the City. Install conduit and cable runs parallel and perpendicular to building lines, in chases, behind furring or above ceilings, where such concealment is possible. In areas where systems are to be exposed, install neatly and group in a tidy appearance.
 - .2 Install equipment and apparatus requiring maintenance, adjustment or eventual replacement, with adequate clearance and accessibility for same.
 - .3 Include in the Work all requirements shown on the shop drawings or manufacturer's installation instructions.
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- .4 Replace unsatisfactory Work without extra cost to the City.

3.5 SEPARATION FROM OTHER SYSTEMS

- .1 Maintain the following separation from the following Electrical, Communications, and Security systems:

Minimum Separation Distance from Sources of EMI Interference Exceeding 5kVA	
Condition	Minimum Separation Distance
Unshielded Power Lines or Electrical Equipment in proximity to Open or Non-metal Pathways.	600 mm (24 in)
Unshielded Power Lines or Electrical Equipment in proximity to a Grounded Metal Conduit Pathway.	300 mm (12 in)
Power Lines (120/ 230 Vac) enclosed in a Ground Metal Conduit (or Equivalent Shielding) in proximity to a Grounded Metal Conduit Pathway.	150 mm (6 in)
Power Lines (480 Vac) enclosed in a Ground Metal Conduit (or Equivalent Shielding) in proximity to a Grounded Metal Conduit Pathway.	600 mm (24 in)
Electric Motors and Transformers	1,220 mm (48 in)
Bare Light, Power Conductors, and other Electrical systems up to 15 kV.	2,000 mm (79 in)
Bare Light, Power Conductors and other Electrical systems exceeding 15 kV.	3,000 mm (118 in)

- .2 Maintain the following separation from specific EMI sources:

Separation Requirement Between Metallic Cabling and Specific EMI Sources	
Source of Disturbance	Minimum Separation Distance
Fluorescent Lamps	125 mm (5 in) ¹
Neon Lamps	125 mm (5 in) ¹
Mercury Vapour Lamps	125 mm (5 in) ¹
High-Intensity Discharge Lamps	125 mm (5 in) ¹
Arc Welders	780 mm (31 in) ¹
Frequency Induction Heating	1,000 mm (39 in) ¹
Hospital Equipment	2
Radio Transmitter	2
TV Transmitter	2
Radar	2

¹ The minimum separations may be reduced provided that appropriate cable management system is used or product suppliers' guarantees are provided.
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² Where product suppliers' guarantees do not exist, analysis shall be performed regarding possible disturbances (e.g., frequency range, harmonics, transients, bursts, transmitted power, etc.).

- .3 Where applicable codes, legislations (e.g., CEC) and AHJ requirements require more clearance than the tables above, the larger clearance shall be applied.

3.6 IDENTIFICATION AND LABELLING

- .1 Identify and label cables, terminations, devices and equipment as per communications and security standards, industry best practices and Manufacturer's instructions.

3.7 FIELD QUALITY CONTROL

- .1 Security System Integrator Services:

.1 Security System Integrator of products, supplied under this Section, to review the Work involved in the handling, installation/application, protection and cleaning, of its products and submit written reports, in acceptable format, to verify compliance of the Work with the Contract.

- .2 Security System Integrator Field Services:

.1 Obtain written reports from Security System Integrator verifying Compliance of the Work, in handling, installing, applying, protecting, and cleaning of product.

.2 Submit Security System Integrator field services consisting of product use recommendations and periodic Site visits for inspection of product installation in accordance with manufacturer's instructions.

.3 Ensure Security System Integrator representative is present before and during critical periods of installation, testing and commissioning.

.4 Schedule Site visits to review the Work at stages listed:

.1 After delivery and storage of products, and when preparatory Work on which the Work of this Section depends is complete, but before installation begins.

.2 Twice during progress of the Work at 60% and 90% complete.

.3 Upon completion of the Work, after cleaning is carried out.

3.8 CARE, OPERATION, AND START-UP

- .1 Instruct operating personnel in the operation, care and maintenance of systems, system equipment and components. Arrange care and instructional sessions to be provided at a time convenient to the City.

- .2 Arrange and pay for services of manufacturer's factory service technician to supervise start-up of installation, check, adjust, balance, and calibrate components and instruct operating personnel.

- .3 Provide these services for such period, and for as many visits as necessary to put equipment in operation and ensure that operating personnel are conversant with all aspects of its care and operation.

3.9 TESTING

- .1 Refer to the following Specifications and related Contract Documents and comply with the Testing and Commissioning requirements applicable to this Section, but not limited to:
 - .1 Section 28 08 00 – Testing, Commissioning, Demonstration of Electronic Safety and Security Systems.

3.10 ADJUSTING

- .1 Remove protective coverings from equipment, devices, and components.
- .2 Adjust equipment, devices, and components for correct function.

3.11 CLEANING

- .1 Progress Cleaning:
 - .1 Leave the Work area clean at end of each day.
- .2 Final Cleaning:
 - .1 Upon completion, remove surplus materials, rubbish, tools and equipment.
 - .2 Remove protective coverings from accessories and components.
 - .3 Clean housings and system components, free from marks, packing tape, and fingerprints, in accordance with Manufacturer's written cleaning recommendations.
 - .4 Clean components free from dirt and fingerprints.
- .3 Waste Management:
 - .1 Separate waste materials for recycling and/or re-use.
 - .2 Remove recycling containers and bins from Site and dispose of materials at appropriate facility.

3.12 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by Security and Safety equipment installation.

END OF SECTION
