

PART 1- General

1.1 EXPLANATION

- .1 This section is to be combined with Sections 08 71 00. Refer to Section 11 19 30 - Detention Doors and Frames, Item 1.9 - Co-ordination and Single Source Responsibility of Detention Equipment Contractor (DEC).
- .2 This Section describes detention quality steel doors and frames.
- .3 Detention quality steel doors and frames are identified on the Door and Frame Schedule.
- .4 Details and Drawings provided by Departmental Representative indicate general overall intent and principals of design and function for project Detention Doors and Frames. This Section is responsible for final Design of Detention Doors and Frames that will meet testing, mock-up and warranty requirements within overall constraints of project. Indicate final design information on Shop Drawings for review by Departmental Representative. In particular detailing Detention Doors and Frames to adjacent construction to ensure compatibility with project conditions.

1.2 REQUIREMENTS OF REGULATORY AGENCIES

- .1 ASTM Standards:
 - .1 ASTM A1008/A1008M-15 CS Type B cold-rolled Steel or hot-rolled, pickled and oiled Steel conforming to ASTM A1011/A1011M-15 CS Type B. Steel shall be free of scale, pitting, coil breaks, buckles, waves or other surface blemishes or defects.
 - .2 ASTM A653/A653M-15e1, Standard Specification for Sheet Steel, Zinc-coated applied by the Hot- Dip Process. Coating designation A60 (ZF180) or G60 (Z180).
 - .3 ASTM A666, Type 304 Stainless Steel.
- .2 CGSB Standards:
 - .1 CAN/CGSB-1.40-97, Anti-corrosive Structural Steel Alkyd Primer.
 - .2 CAN/CGSB-1.181-99, Ready-Mixed, Organic

- Zinc Rich Coating
- .3 CSA Standards:
 - .1 CSA-G40.20-13/G40.21-13: General Requirements for Rolled or Welded Structural Quality Steel.
 - .2 CSA W59-13, Welded steel Construction (Metal. Arc Welding).
 - .4 ULC Standards:
 - .1 ULC 702, Standard for Thermal Insulation Mineral Fibre For Buildings.
 - .2 ULC 104: Fire Tests of Door Assemblies.
 - .3 ULC 105: Standard Specification for Fire Door Frames Meeting the Performance Required by ULC 104.
 - .5 CSDFMA Standards: Canadian Steel Door and Frame Manufactures; Association, (CSDFMA) Canadian Manufacturing Specification for Steel Door and Frames, 2006.
 - .6 NAAMM HMMA 863-14, Hollow Metal Manufacturers Association (HMMA) Division of the National Association of Architectural Metal Manufacturers; (NAAMM) Guide Specifications for Detention Security Hollow Metal Doors and Frames, dated 2014 and ASTM F1450-12a.
 - .7 NFPA 80-2016, Fire Doors and Windows.

1.3 PERFORMANCE
REQUIREMENTS
AND TEST REPORTS

- .1 Fabricate detention doors and frames to meet following performance requirements, as established by ANSI/NAAM HMMA 863-14 and ASTM F1450-12a.
 - .1 Static load test.
 - .2 Rack test.
 - .3 Impact load test.
 - .4 Removable glazing stop test.
- .2 Submit test reports from independent testing laboratory-certifying compliance with performance criteria of ANSI/NAAMM HMMA 863-14 and ASTM F1450-12a for static load, rack, impact load and removable glazing stop tests. The following outlines the testing procedures, but is not to be construed as complete in all respects to the performance criteria.

ASTM F 1450, TABLE 1			SECURITY GRADES AND TEST LOAD REQUIREMENTS				
Grade	Recommended	Static Load Test B	Rack Load Test C	Impact Test A Impact Energy -200Ft. Lbf. (271.2J)			ASTM Reference
	Sheet and Frame Thickness In. (mm) gage, Min.	Lbf. (N)	Lbf. (N)	Lock Impacts	Hinge Impacts	Glazing Impacts	Standards
1	0.093 (2.5) 12	14000 62 272	7500 33 360	600	200	100	F 1450, F 1577, F 1643
2	0.093 (2.5) 12	14000 62 272	7500 33 360	400	150	100	F 1450, F 1577, F 1643
3	0.067 (2.0) 14	11000 48 939	5500 24 470	200	75	100	F 1450, F 1577
4	0.067 (2.0) 14	11000 48 939	5500 24 470	100	35	100	F 1450, F 1577

.1 Static and Rack Tests: Two full flush doors 900 mm x 2100 mm x 50 mm with 125 mm x 635 mm vision panel with door face sheet core thickness according to grade stated in Table 1, prepared and tested as follows: Lock: Type 7C1, located at a height of 985 mm to centre lines of cylinder with door and frame preparation according to lock suppliers, templates or as noted on drawing and specifications, whichever is the most stringent. Hinges: As specified located on edge opposite to the lock and 127 mm from the top of the door to the top of the top hinge, 254 mm from the bottom of the door to the bottom hinge, with the middle two hinges equally spaced between. Two sample doors are required for Static Load Test as well

as Rack Test.

- .1 Static Load Test: Door shall be placed in the horizontal position, and an increasing static load applied at quarter points. Door shall be uniformly supported over its width and no more than 101 mm from each end, apply test load, as per Table 1 for grade of door, equally distributed between the quarter points. The maximum deflection at centre span under full load shall be recorded, and shall not exceed 14.73 mm. After release of load the deformation shall not exceed 2.55 mm.
- .2 Rack Test: Door shall be held in stationary cantilevered position not more than 150 mm from the top, support the lower corner on the hinge edge by a stand whose door contact surface is not more than 150 mm x 150 mm square. Apply test load, as per Table 1 for grade of door, in a downward direction to the unsupported corner.
 - .1 The hydraulic ram shall exert test load on top of unsupported corner with its center line 76 mm from bottom of the door and 76 mm from the lock edge. The maximum corner deflection at full load shall not exceed 90 mm and there shall be no failure of any welds, nor buckling of channel or stiffeners throughout the door structure. After removal of load, the permanent corner deflection shall be recorded and shall not exceed 36 mm.
 - .2 Permanently mark and date both the test doors and retain at the manufacturer's plant for one year after date of project completion.
 - .3 Impact Load Test: Construct door assembly including: wall, door, frame, wall anchors, lock, hinges and other hardware as specified for the doors. Rigidly mount in vertical position, so that the door and locking hardware are operable.
 - .1 Construct a pendulum ram system capable of delivering consistent impacts of 271.2J so that impacts may be delivered to the lock, hinge and glazing panel assemblies. The striking nose of the ram shall be C1010 or C1020 low carbon steel and the striking surface area shall be 25.8 cm². Position the ram so that the door

swings away from the ram, while hanging at rest, just touching the target area.

.2 With the door closed and locked, conduct the tests at 271.2J of energy with each impact as per locations and number of impacts shown in Table 1.

.3 The door shall remain closed and locked throughout the testing procedure, and the assembly shall not be damaged to the extent that forcible egress can be obtained. After testing is completed the door shall be capable of being unlocked and operated to provide egress.

.4 Impact Series for Frame and Glazing/Panel Impact Test for Multi-light Frame and Sidelight Frame shall be in accordance to ASTM F1592. Grade of Impact Test to conform to Grade of adjacent Doors unless stated otherwise in Door & Frame Schedule or Specifications.

.5 Notify Departmental Representative sufficiently in advance of tests to allow for assignment of supervisory personnel.

.3 Fire rated doors and frames: labeled and listed by and organization accredited by Standards Council of Canada in conformance with CAN4-S104 for rating specified.

.4 Submit performance and fire resistance testing data prior to fabrication. Failure to provide required testing data or submission of misrepresented testing data would result in disqualification. In the event of disqualification substitute an acceptable alternate manufacturer / subcontractor, at no additional cost to Departmental Representative.

.5 The Departmental Representative reserves the right to appoint a technical advisor to monitor all aspects of detention doors and frames.

1.4 SAMPLES

.1 Submit in accordance with Section 01 33 00.

.2 Submit one 450 mm x 300 mm corner section of each type of door and reinforcement showing internal construction. Include with glazing stops applied

in one corner to show corner joint.

- .3 Submit one full sized sample of frame showing welded construction, mortar guard boxes for lock and door position switch, conduits junction box and sample of glazing stop applied in one corner to show corner joint.

1.5 SHOP DRAWINGS

- .1 Submit in accordance with Section 01 33 00.
- .2 Indicate each type of door, materials, steel core material thickness, mortises, reinforcements, locations of exposed fasteners, opening for glass, arrangement of hardware and fire ratings.
- .3 Indicate each type of frame, materials, weld types and spacing, steel core material thickness, reinforcements, glazing stops, location of anchors and exposed fastenings, finishes, hardware sets and fire ratings.
- .4 Show fabrication and installation drawings where applicable.
- .5 Reference doors and frames to Door and Frame Schedule provided by Departmental Representative.

1.6 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal paper plastic polystyrene corrugated cardboard and packaging material for recycling in accordance with Waste Management Plan.
- .4 Divert unused metal materials from landfill to metal recycling facility approved by Departmental Representative.
- .5 Fold up metal banding, flatten and place in designated area for recycling.

1.7 QUALITY
ASSURANCE OF
DETENTION
EQUIPMENT
CONTRACTOR

- .1 Manufacture doors and frames using an established company experience in design and production of custom detention security door and frame assemblies together with integration of security hardware and glazing preparations, as they impact upon the scope of work.
- .2 Have lock manufacturer's representative visit door and frame fabricating facility,
 - .1 to review lock and strike preparations and reinforcements,
 - .2 to review lock and strike installation methods and
 - .3 to provide technical assistance as required to ensure proper lock and strike installations.
- .3 Provide the following documentation prior to contract award to substantiate door and frame fabricator qualifications. Failure to provide required information or submission of misrepresented information will result in disqualification.
 - .1 Evidence of ten (10) years prior experience with manufacture and installation of equipment similar to this project.
 - .2 List of employees in supervisory capacity stating respective area of responsibility and experience.
 - .3 List of five (5) jobs completed in size and construction similar to this project, built within last five (5) years. Include job name, contact person with telephone number and contract amount.
- .4 List five (5) jobs comparable in size, which have been in operation for over five (5) years. Include job name, contact person with telephone number and contract amount.
- .5 Name of pneumatic lock supplier proposed for use on this project. Submit evidence that supplier is current manufacturer distributor where not dealing direct with manufacturer's plant.
- .6 Letter of intent to commission each security door installed in accordance with Field Quality Control.

1.8 CO-ORDINATION
AND SINGLE SOURCE
RESPONSIBILITY OF
DETENTION
EQUIPMENT CONTRACTOR

- .1 Co-ordinate work of this section with work of Electrical Contactor (Division 26) Contractor for complete integration of electrical systems, door control systems, and authorities having jurisdiction.
- .2 Perform work of this section under one Subcontractor who will be held responsible for supply and installation of all work of this section including installation of detention hardware specified under Section 08 71 00 and co-ordination of all other work specified under Related Sections as required for completion of work.
 - .1 Include all costs attributed to any change in lock supplier, which would involve changes in sizes of doors and frames at no additional charge to Owner.

1.9 CLOSEOUT
SUBMITTALS

- .1 Submit documentation for incorporation into maintenance manuals specified under Section 01 78 00.
- .2 Documentation to include:
 - .1 Full identification of hardware including part numbers, manufacturer and source of supply.
 - .2 Recommended spare parts lists that Owner should stock for maintenance purposes.
 - .3 Complete operational, adjustment, maintenance and repair procedures.
 - .4 Name, address and telephone number of Subcontractor installing work.
- .3 Provide maintenance material in accordance with Section 01 78 00.
- .4 Provide four (4) sets of drivers and other required tools for each size of security fastener installed, two (2) for hand drivers, and two (2) for drill mount.
- .5 Include full identification, exploded diagrams and cross reference numbering for spares.
- .6 Manufacturer's factory representative must be present to sign off and verify the detention door and hardware system during the final commissioning process.

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| <u>1.10 WARRANTY</u> | .1 | Provide a warranty of 3 years for all labour and materials in this Section. |
| | .2 | Warrant in writing doors and frames against failure and defects in material, weld, fasteners, anchors and workmanship. |
| <u>1.11 SCHEDULES</u> | .1 | Refer to drawings for Door and Frame Schedules indicating door numbers, types, sizes frame types, sheet core thickness, finishes, and label requirements for fire-rated doors and frames, where applicable. |
| | .2 | Doors listed in Schedules are nominal size only. Fabricator shall make necessary allowance for all clearances. |
| | .3 | All core thickness dimensions are nominal dimensions. |
| | .4 | Frames which, upon delivery exhibit rust, distortion or surface irregularities due to improper fabrication or handling will be rejected and shall be replaced at no increase in Contract Price. |
| <u>1.12 DELIVERY</u> | .1 | Label or identify doors as to their location of installation to avoid errors. |
| | .2 | Deliver removable glass stops, and security screws for glass stops, and turn over to Prime Contractor for installation. Sort glass stops as to Building Wing in which they are to be installed, and identify their location of installation. |

PART 2 Products

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| <u>2.1 MATERIALS</u> | .1 | Face sheet steel: Commercial grade steel to ASTM A568/A568M, Class1, hot dipped galvanized to ASTM A653/A653M - commercial quality, coating designation to ASTM A924/A924M, ZF075, commercially known as "Colourbond", Satincoat", |
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or "Galvanneal".

- .2 Steel shapes, plates and bars: Structural quality to CAN/CSA-G40.21-M81, type 230G or 260W; free of scale, pitting and other surface blemishes.
- .3 Guard Boxes: ZF075 coating designation zinc finish, 1.6 mm core thickness steel unless noted otherwise.
- .4 Door insulation: rock wool or rigid fiberglass for sound deadening and fire insulation to CAN/ULC-S702, minimum 24 kg/m density.
- .5 Shop coat primer: to CAN/CGSB-1.40 M.
- .6 Zinc primer: Zinc rich, ready mix to CAN/CGSB-1.181.
- .7 Filler: Polyester type automotive body spot filler compound.
- .8 Door Bumpers: grey neoprene/rubber type; pop rivet to door frame with aluminum rivets. Mask bumpers for painting.

2.2 FASTENING DEVICES

- .1 Provide security screws, security nuts, rivets, spanner screws or other equally secure approved devices for affixing various components.
- .2 Use only rivets, security screws, or security nuts at locations where maximum security against removal is required.
- .3 Use spanner screws only at locations where security against removal is not as important and where it is necessary to remove and repair items from time to time.
- .4 Security screws and nuts to have an extra head which twists off when screw or nut is fully secured, leaving main head without holes or slots for insertion of tool for removal.
- .5 Security Spanner screws to be torx with pin requiring a special spanner tool to remove screws.
- .6 Round head screws not acceptable except at locations approved where material is not thick enough to permit counter-sinking.

.7 Standard screws not acceptable.

2.3 FABRICATION OF DETENTION HOLLOW METAL DOORS

- .1 Fabrication of Detention Hollow Metal Doors:
- .2 Fabrication of Detention Hollow Metal Doors to meet requirements of this Section.
- .3 Fabricate doors with flush faces and provisions for glass openings as indicated on Door and Frame Schedule.
- .4 Fabricate doors square and free of distortion and twists. Accurately form and fit components and sections, to close fitting tolerances. Form edge bends true, straight and of minimum radius for metal thickness of sheet steel used.
- .5 Install special pockets, brackets and back-up plates required for door mounted manual locks. Confirm requirements with hardware manufacturer. Detention side of doors are to be finished flush and have minimum 4.5 mm thick structural quality steel back-up plates to protect locks. Brackets are to firmly support lock cases on both faces, preventing them from moving in event of impact attack. Design pockets so that removal of locks are impossible when lock bolts are extended.
- .6 Use one full sheet of sheet steel per door face, formed accurately at longitudinal edges to wrap around each strike and hinge edge. Arrange sheets to overlap each other at strike and hinges edges. Continuous weld face sheets together along exposed lap edges, grind, fill sand smooth and flush to requirements stated under Finishing.
- .2 Components for Detention Hollow Metal Doors:
 - .1 Refer to drawings for Door and Frame Schedule indicating location of Detention Hollow Metal Doors. Detention doors are all security doors receiving door face sheets of 2.0 mm or 2.5 mm core thickness meeting ASTM F1450 Grade No. to locations noted in Door and Frame Schedule.
 - .2 All doors shall be custom made, of the types and sizes shown on the approved shop drawings, and shall be prepared for hardware as per the final approved shop drawings, and shall be prepared for hardware as per the final approved hardware schedule. Door edge reinforcements and internal reinforcements: either commercial quality sheet steel or structural quality steel designed to meet requirements specified in Article 1.3 Performance Requirements and Test Reports, but shall not be

less than the following:

.1 Door thickness shall be either 45 mm or 50 mm; to locations as noted in the Door and Frame Schedule. All doors shall be rigid, neat in appearance, and free from warpage or buckle. Edge bends shall be true and straight and of minimum radius for the thickness of metal used.

.2 Face sheets shall be stiffened by continuous full height double hat channel design; spanning the full thickness of the interior space between door faces. These stiffeners shall be 1.6 mm minimum thickness. Flat at sheets are to be resistance spot welded at 75 mm. o.c. horizontally and 75 mm. o.c. vertically.

.3 Alternatively face sheets shall be stiffened by continuous full height true truss design with triangular form, of shape which cannot be altered without changing the length of the sides; spanning the full thickness of the interior space between door faces. These stiffeners shall be 0.5 mm minimum thickness. Flat apexes to be resistance spot welded at 75 mm. o.c. horizontally and 75 mm. o.c. vertically.

.4 Fill all voids between each flute of reinforcement with door insulation.

.5 The vertical edges shall be reinforced by a continuous steel channel, not less than 3.5 mm, extending the full length of the door. The top and bottom edges shall be closed with a continuous channel, also not less than 3.5 mm, welded to both face sheets not less than 75 mm o.c. The 3.5 mm end channels shall be continuously welded to vertical reinforcing channel at all 4 corners producing a fully welded perimeter reinforcing channel.

.6 The top end channel shall be fitted with a flush closing channel of not less than 1.6 mm. The flush closing channel shall be welded in place at the corners and at the centre. Installation of closer channel using screws, security or otherwise, shall be deemed unacceptable. The end channel and flush closer channel shall be installed such that they are permanent and non-removable. Provide weep holes in exterior door bottom channel.

- .7 Provide preparation for door position switch.
 - .8 Bevel vertical door strike edges 3 mm in 50 mm, unless required otherwise by security or hardware design.
 - .9 Lock bolt pockets: 9.5 mm steel plate recessed and fully welded to door edge, complete with holes for lock bolt and 1.2 mm steel bolt pocket fully welded to steel plate. Steel plate to have screw holes tapped ready to receive strike plate and security screws supplied by lock manufacturer.
 - .10 Provide drilled and tapped holes for all hardware according to template furnished by hardware suppliers.
- .3 Hardware Reinforcements: Doors shall be mortised, reinforced, drilled and tapped at the factory for all templated hardware in accordance with the final approved hardware schedule and templates provided by the hardware supplier. Indicate clearly on shop drawings exact location of internal hardware reinforcing within hollow metal door to ensure proper alignment of surface mounted hardware. Minimum core thickness for hardware reinforcements shall be as follows:
 - .1 For recessed pulls: minimum 3.5 mm thick plates.
 - .2 For surface mounted security pulls: minimum 10 mm thick plates.
 - .3 For lock fronts, closures and stays: minimum 3 mm thick plates.
 - .4 For all other surface applied hardware: 3 mm thick plates
 - .5 For glass openings: 3.5 mm channel with corners fully welded to form a continuous perimeter channel frame.
- .4 Glass Moldings and stops: where specified, doors shall be provided with steel moldings to secure glazing by others in accordance with glass sizes and thickness specified in section 08 80 50.
 - .1 Fixed glass molding shall be no less than 3.5 mm, and shall be spot-welded to door face sheets at 100 mm o.c. minimum.
 - .2 Removable glass stops shall be pressed steel angles not less than 3.5 mm. Stops shall be tight fitting at the corner joints, and secured with 6 mm 20 button-head, self-tapping spanner screws located 150 mm o.c. maximum.

.3 Where glass thickness dictates, 3.5 mm, off set surface-mounted glass stop shall be used. The corners shall be tight fitting and the glass stop shall be secured to the face of the door using 6 mm 20 button-head, self-tapping spanner security screws spaced 150 mm maximum. With the fasteners located not more than 50 mm from each end of each stop.

.4 Orient glass stops on secure side of doors. Confirm secure side with Departmental Representative. Verify glass thickness with Departmental Representative prior to fabrication.

2.4 CLEARANCES AND TOLERANCES FOR DETENTION DOORS

- .1 Maintain edge clearances as follows:
- .2 Between doors and frames, at head and jambs:
3 mm
- .3 At door sills where no threshold is used:
6 mm maximum above finished floor.
- .4 At door sills where threshold is used: 19
mm maximum above finished floor.

- .2 Maintain fabrication tolerances within following limits:
 - .1 Width, measured between rabbets at head:
nominal opening width: +1.6mm, -0.8 mm.
 - .2 Height (total length of jamb rabbet):
nominal opening height +/- 1.2 mm.
 - .3 Cross sectional profile dimensions:
 - .1 Face: +/- 0.8mm.
 - .2 Stop: +/- 0.8 mm
 - .3 Rabbet: +/- 0.4 mm
 - .4 Depth: +/- 0.8 mm
 - .5 Throat: +/-1.6 mm
 - .4 Hardware cutout dimensions: Template
dimensions +0.4 mm, -0mm.
 - .5 Hardware location: +/-0.8 mm

- .3 Doors:
 - .1 Width: +/- 1.2mm
 - .2 Height: +/- 1.2mm
 - .3 Thickness: +/- 1.6mm

2.5 ACCESSORIES

- .1 Provide accessory components for hollow metal
detention doors and panels as detailed,

including: food pass units as per Details 1 and 2 on drawing A103.

2.6 FINISHING OF
DOORS

- .1 After fabrication, remove welding slag and splatter, grind smooth all sharp edges and welds, fill surface depressions with metallic paste filler and sand all tool marks and surface imperfections and dress to a uniform smooth finish so that all welded joints will not be invisible under painted gloss finish.
- .2 Prime paint steel and ferrous metal with one coat shop coat primer in accordance with manufacturer's instructions.
- .3 Touch up welded, grinds and damaged galvanized and zinc-coated surfaces using zinc primer.

PART 3 Execution

3.1 INSTALLATION

- .1 DEC to protect all hardware devices from work of other trades for the entire duration of the project.
- .2 Install doors, panels, accessory components and hardware in accordance with hardware templates and manufacturer's instructions. Install hardware to requirements specified in Section 08 71 00.
- .3 Adjust operable parts for correct clearances and function.
- .4 Touch up hollow metal work with shop primer, where prime painted surfaces have become scratched or abraded during handling and installation and leave ready for Finish Painting.
- .5 The Detention Door Manufacturer shall be employed as subcontractor to hang and adjust all doors equipped with type 16B locking devices including mechanical installation of the following type 16B locking device components:
 - .1 Mechanism housings at each door complete.
 - .2 Vertical locking columns complete.
 - .3 Bottom door guide assemblies complete.
 - .4 Mechanism housings connecting rows of cell

doors to mechanical control cabinets.
.5 Mechanical control cabinets.
.6 Rubber bumpers in sliding door receiving channels.

3.2 TOOLS FOR MAINTENANCE

- .1 Two fastening tools for each type of fastener shall be delivered to the Owner at Substantial Performance.

3.3 FIELD QUALITY CONTROL

- .1 Contractor's commissioning verification will be required for installation of doors, frames, hardware and associated detention equipment for each scheduled door.
- .2 Co-operate with Departmental Representative's allowing access to work for proper review, inspections and verifications.
- .3 Fulfill following as scope of mandatory commissioning and documentation for each and every door and frame.
 - .1 Check following on delivery to site.
 - .1 Conformance to shop drawings, and specifications.
 - .2 Metal thickness (gauge) of steel, warpage, welding and cutouts.
 - .3 Material (submit applicable lab tests).
 - .4 Construction of doors (sample door for testing as required).
 - .5 Preparation for associated hardware/detention equipment.
 - .6 Size and location of reinforcements and anchors.
 - .2 Check following after doors have been installed.
 - .1 Alignment.
 - .2 Tolerances.
 - .3 Rough-in templates and alignment of all detention equipment.
 - .3 Check following after hardware/ detention equipment had been installed.
 - .1 Function.
 - .2 Cylinder/lock assembly.
 - .3 Peripherals (DPIS, etc.).

.4 Submit three (3) copies of commissioning results to Departmental Representative upon completion of tests and prior to inspection of Substantial Performance of the Work.

.5 Be present and provide required resources during verification and commissioning of door control system as specified.

END OF SECTION