S P E C I F I C A T I O N S

for

KAWARTHA LAKES POLICE SERVICES PROPERTY ROOM RENOVATIONS
PHASE ONE
Lindsay, Ontario

for the

CITY OF KAWARTHA LAKES

+VG ARCHITECTS, The Ventin Group (Toronto) Limited
72 Stafford Street, Suite 200
Toronto, Ontario M6J 2R8
T: (416) 588-6370

Vanderwesten & Rutherford
Mechanical & Electrical Consultants
7242 Colonel Talbot Road
London, Ontario N6L 1H8
T: (519) 652-5047

'ISSUED FOR PERMIT & TENDER'

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S P E C I F I C A T I O N S

DIVISION	SECTION	TITLE	NUMBER OF PAGES
	00010	Table of Contents	2
	00015	List of Drawings	1
1		**GENERAL REQUIREMENTS**	
	01010	General Instructions	10
	01015	General Work	11
	01020	Allowances	3
	01045	Cutting and Patching	3
	01300	Submittals	6
	01301	Architect's Scheduled Inspections and Approvals	2
	01305	Interference Drawings	1
	01310	Construction Schedules	4
	01500	Substitutions	2
	01545	Safety Requirements	4
	01700	Contract Close Out	2
	01800	Architect's Administrative Forms	1
	01805	Architect's Administration System Software	1
2		**SITE WORK**	
	02220	Selective Demolition	6
4		**MASONRY**	
	04100	Mortar	3
	04200	Unit Masonry	12
5		**METALS, STRUCTURAL & MISCELLANEOUS**	
	05500	Miscellaneous Metals	8
6		**WOODWORK**	
	06100	Rough Carpentry	4
	06200	Finish Carpentry	6
7		**MOISTURE PROTECTION**	
	07900	Sealants	9
8		**DOORS, GLASS AND WINDOWS**	
	08110	Steel Doors and Frames	9
	08320	Security Doors, Frames and Screens	14
	08700	Finishing Hardware	9
	08780	Security Finish Hardware	10
	08800	Glass & Glazing	3
9		**FINISHES**	
	09110	Metal Stud and Ceiling Suspension Systems	6

09250 Gypsum Wallboard 8

S P E C I F I C A T I O N S

DIVISION	SECTION	TITLE	NUMBER OF PAGES

09500 Acoustical Ceiling System 6
09655 Sheet Flooring 6
09680 Carpet 7
09900 Painting and Finishing 13

10 **SPECIALTIES**
10560 Manual Mobile Storage Shelving 8
10950 Manufactured Specialties 2

15 **MECHANICAL –** Refer to Mechanical & Electrical Specifications prepared by Vanderwesten & Rutherford

16 **ELECTRICAL –** Refer to Mechanical & Electrical Specifications prepared by Vanderwesten & Rutherford

END OF SECTION

ARCHITECTURAL

A0.1	COVER PAGE
A2.1	DEMOLITION AND PROPOSED PLAN
A6.1	REFLECTED CEILING PLAN AND LEGEND

MECHANICAL

M100	MECHANICAL DRAWING LIST, LEGENDS AND NOTES
M300	ENLARGED FLOOR PLAN – NEW PLUMBING
M400	ENLARGED FLOOR PLAN – PIPING DEMOLITION
M401	ENLARGED FLOOR PLAN – HVAC DEMOLITION
M500	ENLARGED FLOOR PLAN – PIPING NEW
M501	ENLARGED FLOOR PLAN – HVAC NEW
M600	MECHANICAL SCHEDULES AND DETAILS

ELECTRICAL

E100	DRAWING LIST, LEGEND, SHEDULES AND NOTES
E200	PARTIAL FLOOR PLAN – DEMOLITION – ELECTRICAL
E300	PARTIAL FLOOR PLAN – LIGHTING
E400	PARTIAL FLOOR PLAN – POWER AND SYSTEMS
E500	SINGLE LINE DIAGRAM, PANEL SCHEDULE

1. GENERAL

1. Unless specified otherwise, the following instructions shall apply to all sections of the work.

2. Conform to The 2012 Ontario Building Code, CEC CSA C22, (latest Edition) CAN3-B44 and CSA W59.1 - latest editions, where applicable, to the Canadian Code for Construction Safety, as currently amended, and to the Construction Safety Act, Ont. as currently amended, and to all other applicable codes and Building By-Laws hereinafter referred to as Codes; and to the requirements of the authorities having jurisdiction, including public utilities, referred to in the Contract Documents as the authorities.

3. Conform to regulations of Municipality having jurisdiction regarding cleanup of tracking on streets and protection of sidewalks and curbs, and all other applicable laws, By-laws and Regulations.

4. Read General Work - Section 01015, for instructions and requirements regarding General Work and Services, Miscellaneous Work and Services and Temporary Work and Services. Trades requiring own offices, sheds, etc. shall provide, maintain, relocate and remove same in a manner satisfactory to Contractor.

5. Establish rates of wages, hours and conditions of work, in accordance with Provincial Codes and as generally recognized and accepted in locality. Wherever possible, give preference to use of local labour, building mechanics, suppliers and subcontractors.

6. Install and arrange ducts, piping, tubing, conduit, equipment and fixtures in such a way as to conserve head room and space as much as possible, to provide minimum interference and to be neat, orderly and tidy. Unless otherwise noted, run pipes, ducts, tubing and conduit vertical, horizontal and square with building grid. Conceal pipes, ducts, tubing and conduit above ceilings, behind furrings, in walls, except in mechanical rooms, equipment rooms and unfinished spaces, unless indicated or specified otherwise.

7. In all cases where a device or part of the equipment is herein referred to in the singular number, it is intended that such reference shall apply to as many such devices as are required to complete the installation.

8. Definitions

1. Wherever the words 'approved', 'satisfactory', 'directed', 'permitted', 'inspected', 'instructed', 'required', 'submit', 'ordered', or similar words or phrases are used in the Contract Documents, it shall be understood, unless the context provides otherwise, that the words 'by (to) the Architect' follow.

2. The words 'by others' when used in the Specifications or on the Drawings

shall not mean by someone other than the Trade Contractor. The only means by which something shown or specified shall be indicated as not being in the Contract is by the use of the initials 'NIC' or the words 'not in (the) Contract', 'by owner', or by another Contractor.

3. Exposed: means when visible by the occupants at completion of the work, unless scheduled or specified otherwise.

4. The use of scope, related work, or similar articles in the specifications shall not relieve the contractor from their responsibility to assign the various parts of the work to the appropriate subcontractors and forces and shall not impose upon the Architect or Owner the duty to arbitrate disputes between the Contractor and the Subcontractor, nor shall it relieve the subcontractors from their responsibility for carefully examining all the Drawings and Specifications and coordinating their work with each other and the Contractor.

2. CO-OPERATION

1. Co-operate and co-ordinate with other trades as required, for satisfactory and expeditious completion of work. Take field dimensions relative to work. Fabricate and erect work to suit field dimensions and field conditions. Provide forms, templates, anchors, sleeves, inserts and accessories required to be fixed to, or inserted in work, and set in place or instruct related trades as to their location. Pay cost of extra work caused by and make up time lost, as a result of failure to provide inadequate time, the necessary co-operative information of items to be fixed to, or built in.

3. MATERIALS

1. See Article 20 of the General Conditions.

2. Reject material damaged in transit. Store packaged materials in original undamaged containers with manufacturer's labels and seals intact. Handle and store materials in accordance with manufacturers' and suppliers' recommendations. Prevent damage. Remove from site and replace damaged materials.

3. Conform to the Products, tables for the minimum standards in Section 01016 for the following:

1. Metals

2. Gauges & Equivalent Thickness

3. Glass

4. Concrete, Masonry, Paving

5. Finish for Aluminum, Baked on Coatings

6. Pencil Hardness Test

7. Finish for Aluminum, Hard Anodizing

4. EXAMINATION

1. The Contractor affirms that before tendering, they did examine the site and ascertain the extent and nature of all conditions affecting the performance of the work including the existing conditions; and including the location of all buried services which may have to be protected, removed or relocated. No extras will be allowed for anything which would have been revealed in the course of such an examination.
2. The Contractor affirms that before tendering they did examine the Specifications, Drawings, and other tender documents thoroughly. It shall be assumed that the Contractor thoroughly understands these documents, including those particular items about which questions have been asked and written instructions given.

3. Examine work upon which your work depends. Application of your work or any part of it shall be deemed acceptance of work upon which your work, or that part of it which has been applied, depends.

4. Drawings are in part, diagrammatic and incomplete, and are intended to convey scope of work and indicate general and approximate location, arrangement and size of fixtures, equipment, ducts, piping, conduit and outlets. Obtain more accurate information about locations, arrangement and sizes, from study and coordination of construction drawings, including architectural, structural, mechanical and electrical and become familiar with conditions and spaces affecting these matters before proceeding with work.

5. Where job conditions require reasonable changes in indicated location and arrangements, make changes at no extra cost to Owner. Install and arrange ducts, piping, conduit, equipment and fixtures in such a way as to conserve head room and space as much as possible.

5. SCAFFOLDING

1. The Contractor shall provide at their own expense all manner of materials, labour, scaffolding, ladders, hand tools, and appliances necessary for the due execution and proper completion of work described herein, unless otherwise specified in tender specifications.

2. Erect scaffolding independent of walls. Use scaffolding so as to interfere as little as possible with other trades. When not in use, move scaffolding as necessary to permit installation of other work. Construct and maintain scaffolding in rigid, secure and safe manner. Remove scaffolding promptly when no longer required. Scaffolding must be Engineer Designed and Stamped to comply to Occupational Health and Safety Act.

6. FLOOR SURFACES

1. Adequately protect existing and new floors and finishes from damage. Take special measures when moving heavy loads or equipment on them.

2. Keep floors free of oils, grease, or other material likely to damage them, discolour them, or affect bond of applied finishes.

3. Once building is enclosed, keep floors as dry as possible after curing.

7. PROTECTION AND MAKING GOOD

1. Protect existing property, adjacent public and private property and work of other sections from damage while doing work.

2. Damaged work and property shall be made good wherever possible by those performing work originally, but at expense of those causing damage.

3. Attach and fasten fixtures and fittings in place in safe, sturdy, secure manner so that they cannot work loose or fall or shift out of position during occupancy of building as a result of vibration or other causes in normal use of building.

4. If, during work, any buildings, curbs, walks, roads or landscaping are damaged, repair or replace them to the satisfaction of Architect and the local jurisdiction.

5. Protect glass and other finishes against heat, slag and weld spatter, by erecting sturdy plywood or other heavy shield.

6. If tape or strippable coatings are used to protect finished metal surfaces, do not allow them to become baked on or to thermoset.

8. IMPACT DRIVEN FASTENINGS

1. Do not use impact driven (explosive, hammer, etc., but not twist driven) fastening devices without written approval. Properly size holes in concrete and drill cleanly to avoid oversizing for expansion anchors. When drilling upward, use jig to hold drill steady and plumb.

9. ALTERATIONS AND MAKING GOOD

1. Wherever it becomes necessary to cut or interfere in any manner with existing services and apparatus, do so at such times as approved by the Architect. Give minimum advance notice of one week and provide sufficient information of such requirements.

2. Take into account existing installations to ensure best arrangement of pipes, conduit, ducts and mechanical, electrical and other equipment in available space. For critical locations, prepare interference and installation drawings showing work of various sections as well as existing installations, for approval, before commencing work.

3. Comply with Section 01045 Cutting and Patching for additional information

10. STANDARDS

1. Where initials of an organization are used, followed by number or combination of numerals and letters, this designates a standard produced by the organization. Conform to issue of standard so designated, as amended and revised to date of contract. When designation does not indicate particular edition of standard edition current at date of Contract shall apply.

2. Wherever a standard confers upon a person, a body politic or a body corporate the right to approve, to select, to exercise authority or to interpret the standard, and refers to that person, body politic or body corporate as the Authority having jurisdiction, the Authority, the Engineer, the Department, the Purchaser, the Contracting Officer or by some other such designation, the Architect shall have the right to exercise the powers of any such person, body politic, or body corporate.

3. Where standards and manufacturer's instructions conflict with the Contract Documents, the Contract Documents shall govern.

11. FINISHED DIMENSIONS AND ELEVATIONS

1. See Article on Setting Out, in Section 01015. Give particular attention to finished dimensions and elevations of the work. Make finished work fit indicated spaces accurately. Make finished work flush, plumb, true to lines and levels and accurate in all respects

12. NON-PAYMENT

1. All those doing work or supplying materials shall notify the Architect in writing if the Contractor fails to make payment when due. Failing such notice, the Architect will assume that payments have been duly made.

13. CLEANING AND CONTRACT CLOSE-OUT

1. Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.

2. Store volatile wastes in covered metal containers, and remove from premises daily.

3. Prevent accumulation of wastes which create hazardous conditions.

4. Provide adequate ventilation during use of volatile or noxious substances.

5. Use only cleaning materials recommended by manufacturer on surface to be cleaned, and as recommended by cleaning material manufacturer.

6. See G.C. 3 of the General Conditions of the Contract.

7. Cleaning During Construction

    1. The successful Contractor will be responsible to maintain the work areas and designated storage areas in a neat, orderly and clean condition and remove all excess materials and/or garbage from the site, daily.

    2. Provide on-site containers for collection of waste materials and rubbish. Location to be co-ordinated with Architect.

    3. Remove waste materials and rubbish from site on an ongoing basis.

    4. Clean interior building work areas daily or as needed, until work is complete

    5. Schedule cleaning operations so that dust and other contaminants resulting from cleaning process will not fall on wet, newly painted surfaces.

    6. Promptly as the work proceeds and on completion, each Contractor shall clean up and remove from the premises all rubbish, surplus materials and equipment resulting from their work. Follow General Contractor's instructions regarding disposal of rubbish.

    7. Before final inspection, replace glass and mirrors that have been broken, damaged and/or etched during construction, or which are otherwise defective.

    8. Include in Work final cleaning by skilled cleaning specialists on completion of construction.

    9. Remove temporary protections and make good defects before commencement of final cleaning.

10. Remove dust, stains, paint spots, soil, grease, fingerprints and accumulations of construction materials, interior and exterior to the building. Perform cleaning in accordance with installer's instructions for each material. Final cleaning shall include:

    1. Cleaning and polishing of glass; porcelain, enamel and finish metals; washroom accessories.

    2. Vacuum cleaning of ceilings, walls and floors.

    3. Cleaning of floors and waxing of all waxed floors.

    4. Cleaning of glazed wall surfaces.

    5. Cleaning of hardware, mechanical fixtures, lighting fixtures, cover plates, and equipment, including polishing of their finish metal, porcelain, vitreous, and glass components.

    6. Removing of visible labels and temporary protection coverings left on materials, components and equipment.

    7. Cleaning of masonry and concrete, if so directed by the Architect.

    8. Cleaning of wood panelling, millwork and doors.

8. Final Inspection and Closeout

    1. Submit proposed closeout procedures and schedule of inspection to Architect for approval before final inspections commence.

    2. Arrange for, conduct and document final inspections, closeout and take-over at completion of work of this specification in accordance with procedures described in the contract OAA/OGCA TAKE-OVER PROCEDURES, OAA/OCGA Document No. 100.

    3. Substantial completion cannot be applied for until the building is approved for occupancy by the local Building Authority, maintenance manuals and as-builts have been submitted, operating instructions to the Owner have been completed and percentage of completion as per the Construction Lien Act has been obtained.

    4. Comply with Section 01700.

14. TRADEMARKS AND LABELS

1. Trademarks and labels shall not be visible in the finished work except for labels of ULC and other similar authorities and except where necessary to identify mechanical and electrical equipment, for maintenance and replacement and except where specified otherwise.

2. Except as provided in the foregoing paragraph, locate trademarks and labels on concealed or inconspicuous surfaces or remove by grinding if necessary or paint out where surface painted, if located conspicuously.

15. MAINTENANCE MANUALS

1. Under Section 01015-General Work, the Contractor is required to assemble maintenance manuals. All Sub-contractors shall cooperate by submitting shop drawings and maintenance instructions in accordance with Section 01015. Submit instructions for cleaning, repairing, refinishing and freshening all finished surfaces. Submit operating, lubricating, repair and other instructions to keep all equipment in good working order. All materials and equipment which suffers damage as a result of inadequate instructions or improper maintenance not covered by instruction or failure to warn of imperfect or harmful maintenance materials or procedures, shall be made good by the contractor at no extra cost to the Owner.

16. BURIED SERVICES

1. The Contractor shall be responsible for keeping records of all buried services. The subcontractors concerned shall provide the Contractor with all necessary dimensions required to accurately locate those services.

17. EXISTING SERVICES

1. Before commencing work, establish location and extent of all existing service lines underground or otherwise in area of work and notify Architect of findings.

2. Where work involves breaking into or connecting existing services, carry out work at times directed by governing authorities, with minimum of disturbance to the operation of the facility, pedestrian and vehicular traffic.

3. Where unknown services are encountered, immediately advise Architect and confirm findings in writing.

4. Provide adequate bridging over trenches which cross sidewalks or roads to permit normal traffic.

5. Remove abandoned service lines to distance of six feet from foundations. Cap or otherwise seal lines at cut-off points, in manner approved by authorities having

jurisdiction over service.

6. Record locations of maintained, re-routed and abandoned service lines. The sub-contractors concerned shall provide the General Contractor with all necessary dimensions required to accurately locate those services.

7. The appropriate Sub-contractor shall assume full responsibility for the locations and protection of all under and above ground utilities, such as water, sewer and gas mains and building connections, hydro and telephone poles, wires and conduits, etc. when excavating or digging below grade whether they are shown on the plans or not.

8. Where the location of any of these utilities has been shown on the plans, such information is not guaranteed. It is the appropriate Sub-contractor's responsibility to verify locations, invert elevations, etc., immediately after moving on the site. If for any reason the information obtained necessitates changes in procedures or design, advise the Architect at once. If this verification of existing conditions is not done at the outset and any problems arise, the responsibility for same will be entirely the Contractor's.

9. Contractor to provide temporary support of existing service lines and pipes where work requires excavation below existing lines for construction of new footings, foundations, etc. Services shall be maintained at all times while hospital is occupied.

18. EMBEDDED CONDUIT, PIPE AND SLEEVES

1. Concrete Slabs

1. All pipes and conduits shall be depressed to pass under concrete slabs on grade.

2. Sleeves, conduits and pipes which pass through suspended slabs, beams or walls, shall be in approved locations which do not impair the strength of the construction. Space them all not less than three diameters o.c.

19. SOUND ATTENUATING PARTITIONS

1. Avoid “short circuiting” sound attenuating partitions by the careful location and treatment of ducts, grilles, diffusers, etc., and of electrical outlets and boxes, etc. Where electrical boxes are back to back, serving each side, locate them at least 10 inches (250 mm) apart laterally and if interconnected, use flexible connections.

20. SAFETY

1. The General Contractor will be responsible for submitting their safety program

used in the ongoing operation of their company and any safety recommendations specifically relating to the tendered project.

2. Safety measures or procedures taken by the General Contractor i.e. site safety meetings, site construction fences, etc., will not relieve the Contractor of their responsibilities for the safety of persons and property, and for compliance with the federal, provincial and local statutes, rules, regulations and orders applicable to the conduct of the work.

3. Submit copies of all Safety Meeting Minutes to Architect and Owner.

4. Comply with Section 01545.

End of Section

1. EXAMINATION

    1. Throughout the project, examine the work of all trades and promptly notify the Architect if any conditions do not or will not comply with the drawings and specifications.

2. SETTING OUT

    1. Protect and preserve benchmarks and reference points. Inform Consultant immediately if bench marks or reference points are disturbed or damaged by any work and pay for their repair and/or replacement.

    2. Locate and fix grid lines and locations of walls, partitions, shafts and all parts of the construction as work proceeds.

3. PROTECTION

    1. Conform to Ontario Building Code 2012, and The Construction Health and Safety Act, all as currently amended.

    2. Provide spare safety helmets for and enforce their use by Owner, Architect, their representatives, and any authorized visitors to site.

    3. Protect excavation, trenches, and buildings from damage by rain, water, ground water, backing up of drains or sewers and other water, frost and all other weather conditions. Do not allow footings or slabs to be placed on frozen ground. Do not permit excavations to reach full depth indicated when freezing temperature may be expected unless footings or slabs can be placed immediately after excavation has been completed. Protect excavations from frost by placing of suitable approved insulating material to adequate depth, if placing of concrete is delayed and after placing of concrete until backfilling occurs or freezing conditions terminate. Provide necessary pumps (including spare pumps) and temporary drainage for keeping project free of water throughout construction period. Pump water to public sewers or ditches by approved means. Refer to soils report for details. Control grading around excavations to prevent surface water from draining into excavation and from damaging adjoining property.

    4. Protect building from movement and damage, especially during filling and compaction and until elements are securely anchored and cannot be damaged or moved by filling or compaction. Obtain approval of authorities having jurisdiction for such work and make changes as required by them.

    5. Provide temporary 6'-0" (1800 mm) high chain link fences complete with steel tubular top rail supports and steel posts, with chain link gates and locks, (conforming to Section 02711 Fencing), to enclose construction area, and pavement protection as required for protection of public, and of public and private property and as required by law and by authorities having jurisdiction. Layout and extent of fencing to be proposed by the Contractor and approved by the Architect and Owner. Erect sturdy railings around shafts, stair wells and the like to protect workers and public from injury. Equip foregoing protection with warning

lights and signs. Alter, remove and relocate or replace hoardings, barriers, and entrances therein as required by authorities having jurisdiction and by the work. Hazards requiring such protection shall be eliminated as soon as possible and protection devices removed. Maintain fences, gates until construction is complete. Keep free from unauthorized signs.

6. Provide wood hoarding protection as required and in conformance with the local authorities along all streets where construction is within 6 metres of the street sidewalk.

7. Provide and maintain in working order, adequate, temporary Canadian Underwriters labelled, chemical solution (soda acid) Class A.1, fire extinguishers and locate in prominent positions to approval of authorities having jurisdiction.

8. Utilities and Services - Before starting the work contact the Public Utilities for location of underground services.

4. AS-BUILT DRAWINGS

1. Maintain as work progresses, accurate records of changes to the Drawings and concealed services. Accurate locations, depth, size, and type of underground utilities shall be included in these record drawings. The General Contractor will be supplied with clear prints of the floor plans for making these recordings. As-built drawings will be reviewed at each site meeting and must be properly maintained to receive Architect's approval before the monthly certificate draw will be approved.

2. Keep a daily record showing progress of the work and all factors affecting the work, i.e., weather, strikes, accidents, shipping delay, etc.

3. The General Contractor shall also supply as-built drawings in AutoCad 2012 (or later) by a professional drafting service. Approval shall be obtained by the Architect for approval of the professional drafting service.

4. Completed as-built drawings and instruction and warranty manuals shall be submitted prior to requesting substantial completion.

5. FIELD OFFICE

1. Field Office: General Contractor to provide field office at site for Contractor's and Consultants' use. Provide janitor service for periodic dusting, cleaning, and removal of rubbish. Include construction and operating hardware, with security locks, as required. Locate office where directed by Architect.

2. Storage Area: General Contractor to provide storage area at site for products and tools. Include construction and operating hardware, with security locks, as required. Separate storage for painter's materials and tools from other storage areas. Locate storage area where directed by Architect and provide security.

6. WASHROOM CONVENIENCES

1. General Contractor to provide washroom facilities as per the Construction Health

and Safety Act for use of subcontractors and employees. Facilities shall be provided with a screen and contents shall be removed regularly during construction. Maintain it without offense to neighbourhood. At completion of building, washroom facilities and contents shall be removed and the ground carefully levelled and cleared. It shall be to the satisfaction of local Health Authority.

2. Use of permanent toilets is forbidden.

7. TEMPORARY DRAINS

1. Excavations and building site shall be kept free from water at all times by means of trenches to sewers or pits from which it shall be pumped away and disposed from the site.

8. TEMPORARY WATER SERVICE

1. The General Contractor shall provide and pay for all temporary water supply and connections for water used for construction operations until the building is complete and turned over to the Owner. The Contractor will pay for the supply cost from the local municipality. Water for compaction and watering of sod shall be trucked to the site and paid by for the General Contractor.

9. TEMPORARY TELEPHONE AND FACSIMILE

1. The General Contractor shall provide and pay for a private telephone, data and facsimile until their work is complete.

10. TEMPORARY ELECTRICAL SERVICE

1. The General Contractor shall pay all temporary light and power necessary to the operations under this contract, including all connections necessary to supply to the Trade Contractors on site. The Contractor will pay for the cost of electrical power supply from the local P.U.C. utility only.

11. TEMPORARY HEATING

1. Provide temporary heat, heating equipment, and shelter, to keep that work which requires protection from cold, adequately warm and sheltered from elements and to allow it to be done safely and well, maintaining minimum temperature of 16 degrees Celsius (60 degrees F.) when finishing is being done and when building is closed in, until completion of work. Provide heating for materials affected by cold, both in storage and during construction. Construction requiring heat shall be suitably enclosed.

2. Do not use salamanders. Use temporary heaters of forced warm air type, operated in well-ventilated location and vented to exterior, or radiant panel type. If used in areas of completed building, provide protection on floors and adjacent surfaces to prevent damage to floors and adjacent surfaces, particularly when re-fuelling.

3. Provide temporary heat for interior spaces to maintain a minimum temperature of

16 degrees Celsius (60 degrees F.) throughout the building at all times once the building is enclosed.

12. TEMPORARY USE OF PERMANENT HEATING SYSTEM

1. Permanent heating and ventilation system may be used for temporary heating and ventilation only if the Architect gives their approval to do so in writing, and when piping is complete, all units are connected, all pumps and valves are installed and operating properly, all strainers are installed and permanent or temporary filters are installed, and entire system has been tested and is safe operating condition, and when no further shut-down of system will be necessary for future conditions.

2. Do not use air distribution system until permanent or temporary filters are in place. Filter air distribution system to prevent dirt and dust from entering units via return air. Keep unused ducts sealed to prevent entry of air. Replace or clean filters frequently during construction to minimize entry of dirt. Clean (if cleanable) or replace filters before turning over system to Owner.

3. Put system in charge of fully trained and experienced operator at all times. Operators shall qualify as set out in Operating Engineers Act, if applicable.

4. Clean, maintain and repair heating and ventilation system as require throughout its use during construction. Notify manufacturer and Architect immediately before turning over new heating equipment to Owner so that heating items may be checked for possible damage during temporary heating period. Make good damage to heating and air distribution equipment. Replace all worn parts and turn over system to Owner in clean, new condition, operating with circulating water properly treated chemically.

5. Permission might be given by the Architect in writing only upon 100% operation completeness of the systems. Neither the Owner nor the Architect is under any obligation to grant permission to use permanent heating system during construction period.

13. TEMPORARY SERVICE ROADS

1. The Contractor shall construct and maintain in good condition, such temporary service roads, culverts and mud mats that may be necessary to provide safe, convenient and adequate access for materials, and other supplies at all times while the General Contractor is working on site, all to the approval of the Architect. NOTE: The Contractor shall protect existing roads, sidewalks, curbs and provide mud mats to the satisfaction of the local authorities and replace any that become damaged due to any operations under this contract.

14. STORAGE SHED

1. Provide and erect where directed, weathertight shed of suitable size, with loose plank floor at least 12" off ground for storage of cement and lime. Contractors and subcontractors shall provide their own workshops and storage sheds for entire length of construction. At no time may existing buildings or new construction be used for storage of materials.

15. DELIVERY AND STORAGE OF MATERIALS

1. Arrange for early deliveries necessary for execution of work without delay and have materials on job well in advance of the time it is needed.

2. Deliver, store and handle materials to exclude foreign material and prevent damage, soiling or breakage.

3. Materials to be stored on site, which need to be protected from weather shall be so protected.

4. Packaged materials shall be delivered in packages with manufacturer's seals and all labels intact.

16. BUILDING AND PREMISES

1. Owner reserves right to take over any completed portion prior to specified completion date, provided it does not affect completion of remaining work.

2. If Owner is forced to occupy building or parts thereof prior to completion, but after date of Substantial Performance, Contractor shall not be entitled to indemnity for interference with the performance of the work.

17. OWNERSHIP OF MATERIALS

1. All work or material delivered on the site or premises to form part of the works shall be considered the property of the Owner and shall not be removed without the consent of the Architect, but the Contractor shall have the right to and shall remove the surplus materials after he has completed the work. If so directed by the Architect, such surplus materials shall be removed at any time prior to the completion of the work.

2. All materials which are to be removed from the existing site and are not called for to be re-used or specifically called for in the specifications to be turned over to the Owner, shall become the property of the General Contractor and shall be removed from the site.

18. DETAILS AND MEASUREMENTS

1. Ensure that necessary job dimensions are taken and trades are coordinated for the proper execution of the work. Assume complete responsibility for the accuracy and completeness of such dimensions, and for co-ordination.

2. Verify that work, as it proceeds, is executed in accordance with dimensions and positions indicated which maintain levels and clearances to adjacent work, as set out by requirements of the drawings, and ensure that work installed in error is rectified before construction continues.

3. Check and verify dimensions referring to work and interfacing of services. Dimensions, when pertaining to work of other trades, shall be verified with trade concerned.

4. Do not scale directly from the drawings. If there is ambiguity or lack of information, immediately inform the Consultant and await his instructions before proceeding. Be fully responsible for rectifying, altering or redoing any work resulting from disregarding this clause.

5. All details and measurements of any work which is to fit or to conform with work installed shall be taken at the site.

6. Should revised drawings be issued after work has commenced, Contractor shall immediately return to Architect previous drawings which refer to said work. The Contractor will be held responsible for work being carried out in accordance with said revised drawings.

19. WORKMANSHIP

1. Work shall be done in accordance with best standard practice. Only skilled mechanics shall be used where such are required to produce a first class job.

2. Use, install and handle manufactured materials, equipment and appliances in strict accordance with manufacturer's directions and instructions, unless specified otherwise.

20. FROST PROTECTION

1. Provide proper frost protection, including heating for materials to ensure scheduling of work without delay.

2. Similar protection shall be given to work done.

3. Work or materials damaged by frost shall be replaced by Contractor.

4. Snow and ice shall not be allowed to remain on any part of structure, except finished roofs, and shall be removed by Contractor.

21. PROJECT MEETINGS

1. Arrange regular meetings at two week intervals and notify the representatives of the Owner, Architect, Engineer and each subcontractor concerned with the current progress.

2. Contact all subcontractors concerned at least 24 hours in advance and request their presence at job meeting.

3. Review approved progress schedule for rapid and efficient completion of work according to Contract requirements, with suppliers of materials and sub-contractors.

4. Post and forward copies of progress schedule for advice of interested parties.

5. Record the minutes of each meeting and send copies to all attending and interested parties not later than two working days after the meeting. In addition,

send copies to the Architect, Consultants and Owner. Contractor to provide updated Site Instruction, Proposed Change and Change Order logs and shop drawing logs attached to each record of minutes to indicate exactly what has been issued and the status of approvals and/or distribution.

6. If requested, the General Contractor will provide a copy of each site meeting minutes in WORD format to the Architect for review before the minutes are issued. Any modifications will be highlighted.

7. Keep Architect informed of progress, delays and of potential delays during all stages of work to avoid delays.

22. BROKEN GLASS

1. Replace all broken, damaged or scratched glass and mirrors. Glass which has been broken, scratched or damaged in installation shall be replaced by installer.

23. TREE PROTECTION

1. Protect tops, trunks and roots of existing trees on project site that are to remain. Box, fence or otherwise protect trunks of existing trees which may be subject to construction damage before any work is started. Do not permit heavy equipment or stockpiles within branch spread. When approved, remove interfering branches without injury to trunks and cover scars with tree paint.

2. Wherever excavating is required within branch spread of trees that are to remain, do not cut tree roots, but tunnel or trench under or around roots by careful hand digging and without injury to roots.

24. PROGRESS SCHEDULE

1. Further to GC 3.5 of the General Conditions of the Contract, carefully prepare full progress schedules of the work in form to be mutually agreed upon by Contractor and Architect.

2. Prepare schedule immediately upon award of Contract and present three (3) copies to the Architect within a maximum of one week from Contract awarding date.

25. MAINTENANCE MANUALS

1. As soon as possible and in no event later than request for substantial completion check and assemble in three ring binder, all shop drawings, all warranties and guarantees submitted by manufacturers, suppliers and subcontractors and as called for throughout Specifications. Assemble three copies of recommended operation and maintenance procedures (such as flooring, equipment, roofing). Present three matching binders to Architect for submission to Owner. Furnish a complete index in each binder listing its contents in detail and stamp and sign the cover page of each and every manual. Also ensure that the manuals are stamped and signed on the cover page by subcontractor submitting them. Note: An amount of $5,000.00 will be retained for this purpose and will only be released when all documents approved by the Consultants have been turned over to the

Owner.

2. Recommended maintenance procedures shall contain warnings concerning the use of maintenance materials or practices which might injure the product covered by the recommended maintenance procedure. Should any product be injured or damaged by faulty maintenance or practices not warned against in the maintenance manual, then the Contractor shall rectify such damage or injury.

3. Complete maintenance manuals shall be submitted prior to requesting release of Holdback.

26. CHECK FLOOR DRAINS

1. Just before acceptance of building by Owner, check floor drains and see that they are clean, clear and functioning properly.

27. FIRE PROTECTION AND ACCESS TO EQUIPMENT AND EXITS

1. Take necessary precautions to eliminate fire hazards and to prevent damage to work, equipment and other property both public and private having to do with the work. Inspect work of this contract at least once a week for this purpose.

2. Provide and maintain in working order suitable Underwriters' labelled fire extinguishers and locate in prominent positions, to approval of authorities.

3. When welding, brazing and performing any operation with an open flame, a portable fire extinguisher shall be kept within 10 feet (3000 mm) of the operator at all times.

4. Store and locate materials and equipment packed in cardboard cartons, wood crates and other combustible containers in orderly and accessible manner. Place approved types of firefighting equipment in vicinity of materials or equipment packed in this type of crate or carton until permanent fire protection and equipment are available.

5. Store all rags and waste containing oil, grease or other flammable materials in an approved metal container and remove from the site at the end of each working day.

6. Only fire resistant tarpaulins are permitted on site.

7. Locate temporary buildings and storage areas in relation to their hazards and probability of damage to existing buildings under construction. Unless constructed of noncombustible materials, wherever possible locate them at least 33 feet (10 m) away from buildings. If constructed of combustible materials separate these structures into small detached units.

8. Provide and maintain free access at all times from the street to fire hydrants and to outside connections for standpipes or other fire extinguishing equipment whether permanent or temporary. Do not place material or construction equipment within 10 feet (3 m) of hydrants or connection, nor between them and centre line of the street.

Maintain free access at all times to control valves and hose on fire lines within building and to all portable extinguishers.

9. Install fire doors and put into operating condition at the earliest possible time.

10. Comply with requirements of Section 01545 Safety Requirements.

28. SAFETY

1. Take all precautions necessary to protect and safeguard workers from dangerous conditions including fumes; lead paints, etc.; asbestos; and silica hazardous to health.

2. Comply with requirements of Section 01545 Safety Requirements.

29. ADJACENT BUILDING

1. Particular attention shall be paid to prevention of fire and elimination of fire hazards which would endanger new work or existing property.

2. No existing footings, foundations, pipe lines, electrical conduit and wiring shall be undermined or otherwise damaged or endangered by digging, butting of any other operation in the performance of the work of this Contract. Any existing work so affected shall be immediately repaired and made good to the Architect's satisfaction at the Contractor's expense.

3. Active services to the adjacent buildings shall be protected.

4. In case of damage to active services, notify Architect, Utilities and Authorities immediately and make all required repairs under direction of appropriate utility. Carry out repairs during off hours if required.

30. NOTES TO GENERAL CONTRACTOR

1. Ensure that the building is maintained weathertight and secure. The General Contractor shall furnish all temporary protection, enclosures, tarpaulins, etc., as may be required to weatherproof openings in the work.

2. Demolish and clean up all existing trees, scrub and debris and any other items found on the site not indicated to remain.

3. The General Contractor shall carry out all removal and disposal of all resultant debris.

4. In case of damage to active services, notify Architect, Utilities and authorities immediately and make all required repairs under direction of appropriate utility. Carry out repairs during off hours if required. In absence of specific requirements or direction, plug or cap unused or abandoned utility lines at least 3 feet (1000 mm) outside of new building walls, or as required by utilities, codes and authorities.

5. The location of construction storage containers and trailers to be approved by the Architect and Owner.

6. Take all precautions necessary to protect and safeguard workers from dangerous conditions including fumes, lead and silica products that may be present during the construction that are hazardous to health.

7. Restore disturbed areas to original condition unless shown otherwise on drawings or stated in specifications.

31. PROTECTIVE FENCING

1. See Item 3.5 of this Specification Section.

32. CONSTRUCTION PARKING

1. Parking will not be permitted on site. Parking is available at a nearby city parking lot.

33. PROTECTION FOR OFF-SITE & PUBLIC PROPERTY

1. Protect surrounding private and public property from damage during performance of work.

2. Be responsible for damage incurred.

34. SIGN AND ADVERTISEMENTS

1. Construction sign to be supplied and installed by Contractor. Locate as directed by Architect. All costs for the installation of the sign to be included in Base Tender Sum (not part of Signage Allowance). The Owner to approve sign layout prior to sign production.

2. Erect no other signs, except those signs which are necessary to give direction or for safety, or warning signs, without the Architect's permission. Where other signs are required or wanted, obtain Architect's approval.

35. PROTECTION OF BUILDING FINISHES & EQUIPMENT

1. Provide protection for finished and partially finished building finishes and equipment during performance of work.

2. Provide necessary screens, covers, hoardings as required.

3. Be responsible for damage incurred due to lack of or improper protection. Replace or repair finishes or equipment so damaged.

36. SECURITY

1. When work at site has progressed as to become attractive for vandalism or theft, engage a recognized security guard agency to provide security service at times when tradesmen are not present in substantial numbers. Continue service until

after time of Substantial Performance.

2. Extent of security services shall be at the discretion of the Contractor. Note that the fit, finish and new appearance of the finished building will not be comprised. Materials, products, finishes, etc. damaged due to vandalism are to be restored and/or replaced to an as-new condition.

End of Section

1. CASH ALLOWANCES

    1. Comply with requirements of G.C. 4.1 Cash Allowances.

    2. Include the following Cash Allowances in the Contract Price. These allowances shall be expended in whole or in part, when authorized by the Architect in writing. The unused portion of the Allowances shall be credited to the Owner.

    3. The Contract Price and not the cash allowance, includes the Contractor's overhead and profit in connection with such cash allowance.

        No refund of overhead and profit will be expected on any unspent portion of Cash Allowances. Likewise, no overhead and profit will be allowed on total amount by which all Cash Allowances are exceeded.

    4. Expend cash allowance as directed by the Consultant in writing. Allowance will be adjusted to actual cost but no adjustment will be made to Contractor's charges including overhead and profit which are included in the Contract Price.

    5. Cash allowances are designed for work and services deemed to be necessary by the Owner, from time to time, throughout the execution of the Work. Where a cash allowance refers to an item or category of work already included in the Contract Documents, it shall be assumed to cover work or services in addition to that included, unless specifically indicated otherwise.

    6. Contractor may be required from time to time, to assist in tendering of certain items of work or services covered by allowance, as directed by Consultant.

    7. Material Supply Items:

        1. Scope for material supply items covered by Cash Allowance includes:

            1. Net cost of material.

            2. Applicable taxes and duties.

            3. Delivery to site.

        2. In addition to above scope covered by Cash Allowance include in Contract Price costs for:

            1. Handling at site, including unloading, uncrating, storage and hoisting.

            2. Protection from elements, from damage.

            3. Labour, installation and finishing.

4. Other expenses required to do cash allowance work (i.e. contract co-ordination).

5. Overhead and Profit.

8. Material and Installation Items:

1. Scope of each material and installation item covered by Cash Allowance includes:

1. Net cost of material.

2. Applicable taxes and duties.

3. Delivery to site.

4. Handling at site, including unloading, uncrating, storage and hoisting.

5. Labour, installation and finishing.

2. In addition to above scope covered by Cash Allowance include in Contract Price costs for:

1. Protection from elements, from damage.

2. Overhead and Profit.

3. Other expenses required to do cash allowance work (i.e. contract co-ordination).

9. Inspection and Testing Work:

1. Scope for inspecting and testing covered by Cash Allowance includes:

1. Net cost of testing laboratory services and field inspection.

2. In addition to above scope covered by Cash Allowance include in Contract Prices for:

1. Overhead and Profit.

2. Supply of material tested, patching and completion of work tested.

3. Other testing on re-testing work specified in Section 01400.

4. Other expenses required to do cash allowance work (i.e. contract co-ordination).

10. The following is a breakdown of the Cash Allowances plus G.S.T. **to be included** in the Contract Price:

1	**Finish Hardware** - supply only of finish hardware - excluding cabinet hardware which is included in Section 06400 (note supply only of Abbloy millwork locks and cylinders to be supplied by Finish Hardware Supplier in this cash allowance) - unless noted otherwise installation is included in Contract / excluded from the Cash Allowance	**$5,000.00**
2	**Interior Signage** - Supply and install - door signage - bulkhead signage	**$1,000.00**
	Total	**$6,000.00**

11. Progress payments on accounts of work authorized under cash allowances shall be included in the Consultant's monthly certificate for payment. Copies of invoices are to be submitted to substantiate claims.

End of Section

1. GENERAL

1. REQUIREMENTS INCLUDED

1. Requirements and limitations for cutting and patching the Work.

2. RELATED REQUIREMENTS

1. General Requirements - Section 01010
2. General Section - Section 01015
3. Individual Sections - Cutting and patching incidental work of the section. Advance notification to other sections required.

3. SUBMITTALS

1. Submit written request in advance of cutting or alteration which affects:

1. Structural integrity of any element of Project.

2. Integrity of weather-exposed or moisture-resistant elements.

3. Efficiency, maintenance, or safety of any operational element.

4. Visual qualities of sight-exposed elements.

5. Work of the Owner or separate contractor.

2. Include in request:

1. Identification of Project.

2. Location and description of affected work.

3. Statement on necessity for cutting or alteration.

4. Description of proposed work, and products to be used.

5. Alternatives to cutting and patching.

6. Effect on work of the Owner or separate contractor.

7. Written permission of affected separate contractor.

8. Date and time work will be executed.

4. GENERAL

1. Execute cutting, fitting, and patching including excavation and fill, to complete the Work.

2. Fit the several parts together, to integrate with other work.

3. Uncover work to install ill-timed work.

4. Remove and replace defective and non-conforming work.

5. Remove samples of installed work for testing if requested by Consultant.

6. Provide openings in non-structural elements of Work for penetrations of mechanical and electrical work.

5. INSPECTION

1. Inspect existing conditions, including elements subject to damage or movement during cutting and patching.

2. After uncovering, inspect conditions affecting performance of work.

3. Beginning of cutting or patching means acceptance of existing conditions.

6. PREPARATION

1. Provide supports to assure structural integrity of surroundings; devices and methods to protect other portions of project from damage.

2. Provide protection from elements for areas which may be exposed by uncovering work; maintain excavations free of water.

7. PERFORMANCE

1. Execute work by methods to avoid damage to other work, and which will provide proper surfaces to receive patching and finishing.

2. Use material to match existing.

3. For a change in material submit request for substitution under provisions of Section 01500.

4. Employ qualified trade contractor to perform cutting and patching for weather-exposed and moisture-resistant elements, and sight exposed surfaces.

5. Cut rigid materials using masonry saw or core drill. Pneumatic or impact

tools not allowed without prior approval.

6. Restore work with new products in accordance with requirements of Contract Documents.

7. Fit work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

8. Refinish surfaces to match adjacent finishes: For continuous surfaces refinish to nearest intersection.

End of Section

1. SHOP DRAWINGS

    1. Submit shop drawings in electronic PDF format in accordance with GC 3.10 of CCDC Document 2 - 2008, and as revised in the Supplementary General Conditions, as required in various sections of these specifications and on the drawings.

2. SAMPLES

    1. Submit samples as listed in List of Samples below.

    2. Samples of materials, both manufactured and otherwise, proposed for the use on the work shall be submitted to the Architect for approval as required by the Contract Document and/or reasonably required by the Architect. The work shall be in accordance with approved samples. All samples shall be supplied and delivered to the Architect free of charge. The approval of samples shall not be construed as an acceptance of work subsequently carried out.

    3. Samples shall be labelled indicating: date of submission, name of project, names of contractor and manufacturer, and complete identification of locations at which materials are to be installed.

3. LIST OF SHOP DRAWINGS & SUBMITTALS

    1. Submit Shop Drawings as specified in the following Sections:

Section	Title
01045	Cutting and Patching
01302	Photography
03105	Interference Drawings
01310	Construction Schedules
01545	Safety Requirements
01560	Environmental Protection
01700	Contract Close Out
04200	Unit Masonry (control and expansion joint layout)
05500	Miscellaneous Metals
06200	Finish Carpentry
06400	Architectural Woodwork
06650	Solid Surface Fabrications
07211	Rigid Insulation
07270	Firestopping and Smoke Seals
07900	Sealants

08110	Steel Doors and Frames
08200	Wood Doors
08320	Security Doors, Frames and Screens
08700	Finishing Hardware
08780	Security Finish Hardware
09110	Metal Stud and Ceiling Suspension Systems
09250	Gypsum Wallboard (control joint layout)
09300	Floor and Wall Tile (control joint layout)
09500	Acoustical Ceiling Systems
09655	Sheet Flooring and Linoleum
09660	Interior Special Coatings
09670	Epoxy Seamless Flooring (Trowel Applied)
09680	Tile Carpeting
10950	Manufactured Specialties
Division 15	Refer to Division 15 Specifications
Division 16	Refer to Division 16 Specifications

4. LIST OF SAMPLES

1. Submit Samples as specified in the following Sections:

Section	Title
01045	Cutting and Patching
01310	Construction Schedules
04200	Unit Masonry
06200	Finish Carpentry
06400	Architectural Woodwork
06650	Solid Surface Fabrications
07270	Firestopping and Smoke Seals
07900	Sealants
08110	Steel Doors and Frames
08200	Wood Doors
08320	Security Doors, Frames and Screens
08700	Finishing Hardware
09250	Gypsum Wallboard

09300	Floor and Wall Tile
09500	Acoustical Ceiling Systems
09650	Resilient Flooring
09655	Sheet Flooring and Linoleum
09660	Interior Special Coatings
09670	Epoxy Seamless Flooring (Trowel Applied)
09680	Tile Carpeting
09900	Painting and Finishing
10950	Manufactured Specialties
Division 15	Refer to Division 15 Specifications
Division 16	Refer to Division 16 Specifications

5. EXTENDED WARRANTIES

1. In addition to the warranty requirements of GC 12.3 of CCDC Document 2, 2008, and as revised in the Supplementary General Conditions, the Contractor shall note that the following extended warranty periods are required by the Contract Documents for the individual items under respective Sections.

Section	Title
06200	Finish Carpentry – 5 years
06400	Architectural Woodwork – 5 years
06650	Solid Surface Fabrications – 2 years
07900	Sealants – 5 years
08200	Wood Doors – 3 years
08320	Security Doors, Frames and Screens – 5 years
08700	Finishing Hardware – 2 years except closers to be 5 years
08780	Security Finish Hardware – 2 years except closers to be 5 years
09500	Acoustical Ceiling Tile - 10 years
09655	Sheet Flooring and Linoleum – 5 years
09660	Interior Special Coatings – 3 years
09670	Epoxy Seamless Flooring (Trowel Applied) – 2 years
09680	Tile Carpeting Material Defects – 10 years Installation – 2 years

10222	Moveable Wall System – 10 years
10820	Louvred Roof Top Equipment Screens – 2 years
10950	Manufactured Specialties – 2 years
12522	Manually Operated and Motorized Rolling Shades – 3 years
14200	Hydraulic Elevator – 1 year service warranty
Division 15	Refer to Division 15 Specifications
Division 16	Refer to Division 16 Specifications

6. MAINTENANCE MANUALS

1. Submit maintenance data, documents, certificates, etc. as specified in the following Sections:

Section	Title
06400	Architectural Woodwork
06650	Solid Surface Fabrications
08320	Security Doors, Frames and Screens
08365	Section Steel Overhead Door
08780	Security Finish Hardware
09300	Floor and Wall Tile
09500	Acoustical Treatment (certification of suspended ceiling system)
09650	Resilient Flooring
09655	Sheet Flooring and Linoleum
09660	Interior Special Coatings
09670	Epoxy Seamless Flooring (Trowel Applied)
09680	Tile Carpeting
09900	Painting and Finishing (products and colour formulae)
10950	Manufactured Specialties
Division 15	Refer to Division 15 Specifications
Division 16	Refer to Division 16 Specifications

7. EXTRA MATERIAL

1. Submit extra material as specified in the following Sections:

Section	Title

04200	Unit Masonry - 1m^2 coverage of brick masonry veneer - 1m^2 manufactured stone veneer
09300	Floor and Wall Tile -2% of each type and colour of ceramic tile and porcelain tile
09500	Acoustical Treatment – 3% of gross ceiling area for each specified product
09650	Resilient Flooring – 2% of each colour, type and size of installed tile
09655	Sheet Flooring and Linoleum – large scrap cuttings plus 3.6m x 3.6m of each design / colour.
09680	Tile Carpeting – 2% of each colour, pattern and type
09900	Painting and Finishing - 4L sealed can of each product in each used colour
Division 15	Refer to Division 15 Specifications
Division 16	Refer to Division 16 Specifications

CERTIFICATE OF PAYMENT APPLICATION FORM

NOTE: HST TO BE INCLUDED IN EACH OF THE FOLLOWING VALUES:

Contractor: _____ Application No. _____

Work: _____ Date: _____

Period Covered: _____

Description	Contract Amount	% To Date	Value Performed To Date	Value Previously Performed	Value Current Period	Balance to Complete
This Section to show breakdown of Contract such details as:						
General Conditions	$	$	$		$	$
Excavation						
Concrete Footings						
Concrete Walls, Cash Allowances, Hardware, etc.						
SUB-TOTAL						
Change Orders No. 1						
TOTAL CONTRACT						

SUMMARY (HST to be included in all items)

Value of Work Completed to date $_____

Less Holdback of 10% $_____

Holdback Released $_____

Current Holdback (Net Retained) $_____

Sub-Total $_____

Less Previous Certificates $_____

Amount of this Claim $_____

Total of H.S.T. included above ($_____)

GENERAL CONTRACTOR'S H.S.T. NO. _____

1. See Specifications for full listing of inspections and approvals.

2. Architect's and / or Consultant's approvals required:

    1. before interfering with existing services and apparatus. One week notice to be given - Section 01010.

    2. of close-out procedures and schedule of inspections – Section 01010.

    3. Use of impact fastening devices – Section 01010.

    4. of as-built drawings and professional drafting service – Section 01015.

    5. for use of permanent heating / ventilation system – Section 01015.

    6. of Maintenance Manuals – Section 01015.

    7. of location of construction storage containers and trailers – Section 01015.

    8. of construction signs and locations – Section 01015.

    9. of use of pneumatic or impact tools – Section 01045.

    10. of samples – Section 01300.

    11. of sign layout, use of other signs, and locations – Section 01303.

    12. of interference drawings – Section 01305.

    13. of work schedule (Progress Schedule) – Section 01310.

    14. of substitutions – Section 01500.

    15. of masonry sample wall – Section 04200.

    16. of sample of exposed fasteners – Section 06400.

    17. of mock-up of solid surface – Section 06650.

    18. of caulking joint samples – Section 07900.

    19. of steel door frame corner sample – Section 08110.

3. Notify Architect:

    1. Notify Architect for Deficiency Inspection upon agreed Substantial Performance.

2. Notify Architect for One-Year Holdback Inspection.

3. Notify Architect for Two Year Inspection of Extended Warranties

4. Notify Architect for Three Year Inspection of Extended Warranties

5. Notify Architect for Five Year Inspection for Extended Warranties

6. Notify Architect for Ten Year Inspection for Extended Warranties.

4. Submit samples for approval.

End of Section

1. INTERFERENCE DRAWINGS

1.1 Before commencing any work, the General Contractor, along with their trade contractors, are to prepare working/interference drawings, to ensure that all components are to be properly accommodated within the spaces provided, ensuring all clearances required by jurisdictional authorities and for proper maintenance are indicated and maintained.

1.2 Schedule meetings on site with all associated trades to review all interference areas until all issues have been coordinated and required interference drawings issued.

1.3 Prepare drawings to indicate coordination and method of installation of a mechanical system with sprinkler, electrical, structural and other systems where their relationship is critical. Ensure all details of equipment, apparatus and connections are coordinated.

1.4 The General Contractor shall provide interference drawings prepared by their Mechanical, Sprinkler and Electrical subtrades. Drawings are to be red-line markups scanned to PDF Format and shall indicate any perceived interference between mechanical, sprinkler, structural, and electrical work and the work of all other Divisions along with proposed solution to such interference.

1.5 Failure to coordinate with all other trades could result in reworking of installed equipment, piping or ducting at the discretion of the Consultant. Any reworking to accommodate the installation of other trades is to be performed at no extra cost.

1.6 All interference drawings shall be submitted and approved prior to the second Certificate of Payment being released.

2. COOPERATION AND COORDINATION

2.1 Cooperate and coordinate with other trades as required, for satisfactory and expeditious completion of work. Take field dimensions relative to work. Fabricate and erect work to suit field dimensions and field conditions. Provide forms, templates, anchors, sleeves, inserts and accessories required to be fixed to, or inserted in work, and set in place or instruct related trades as to their location. Pay cost of extra work caused by and make up time lost, as a result of failure to provide inadequate time, the necessary cooperative information of items to be fixed to, or built in.

End of Section

1. GENERAL

1. GENERAL

1. This section details General Contractor's responsibilities in preparation, submission and maintenance of construction schedules with form and requirements for periodic revisions. The Steel Contractor shall provide the General Contractor with their schedule of work and co-ordinate the work with General Contractor and the Work Progress of other trades on site.

2. REQUIREMENTS INCLUDE

1. Schedule, form, content.

2. Stages/Phased Construction.

3. Schedule Revisions.

4. Weekly schedule updating.

3. RELATED REQUIREMENTS

1. Section 01700 - Contract Closeout.

4. SCHEDULES REQUIRED

1. Submit the following schedules:

1. Construction Progress Schedule

2. Weekly Schedule and Manpower Loading

3. Submittal Schedule for Shop Drawings and Product Data and Colours

4. Product Delivery Schedule if applicable

5. SUBMITTALS SCHEDULE

1. Include schedule for submitting shop drawings, product data, and samples. Co-ordinate with Section 01300 requirements. Incorporate into Preliminary Progress Schedule and Weekly Schedule updates.

2. Indicate dates for submitting, review time, resubmission time, float time, and last date for meeting fabrication schedule.

3. Include dates when SUBMITTALS and delivery will be required for the

Owner-furnished products if applicable.

4. Include dates when reviewed submittals will be required from the Consultant.

6. PRODUCT DELIVERY SCHEDULE

1. Include dates for delivery of products specified in Section 01020 - Allowances, if applicable.

2. Include dates for products furnished by Owner, if applicable.

3. Submit a schedule of required equipment order dates and delivery dates for products and/or assemblies which involve insignificant production time or fabrication time and/or will significantly affect the project schedule if not available when needed.

7. CONSTRUCTION PROGRESS SCHEDULE

1. Submit a bar-chart progress schedule a minimum of seven (7) days before first progress application for payment.

2. On schedule indicate a time bar for each major construction activity to be performed at the site, properly sequenced and co-ordinate with other activities of work. Itemize activities in sufficient detail that no one bar exceeds two months in duration (separate long running trades such as Masonry into Logical Sub-Sections). Allow sufficient space below planned time bar for another time bar to record actual progress.

3. Show dates for commencement and completion of all activities. Estimate duration period and float (contingency) time for each activity.

4. Show projected percentage of completion for each activity as of the date of submission of monthly progress payment applications and/or to the date of submission of schedule when requested.

5. Indicate actual progress of each activity to date of submission of schedule. Indicate current status of all activities to date of submissions of schedule by showing where behind, on or ahead of planned schedule.

6. Show changes occurring since previous submission of schedules:

1. Major changes to scope

2. Activities modified since previous submission

3. Revised projections of progress and completion

4. Other identifiable changes.

7. Confirm commencement, duration and completion dates of all activities with subcontractors, subtrades and suppliers.

8. Deliver to Architect, at the end of each calendar month with progress application a project status report derived from evaluation of Schedule.

9. Include in this report updated schedule together with such supporting narrative and such graphical presentations necessary to clearly outline the progress of Work, areas of current and anticipated problems, effect of changes on schedules of major trade subcontractors and proposed corrective action.

8. STAGED/PHASE CONSTRUCTION

1. Prepare and submit sub-schedules for each separate stage of Work when pertinent to the project.

2. Provide sub-schedules to define critical portions of prime concern to master schedule.

3. Describe start and stop, float time and affected other work.

9. WEEKLY SCHEDULE UPDATE AND MANPOWER LOADING

1. Use the Construction Progress Schedule as a basis for reporting on a weekly basis the complete status of construction progress, scheduled activities and manpower loading on the project.

2. There will be an Owner/Architect/Consultant/General Contractor/Trade Contractor meeting every second week to review the project status. Provide a detailed 2 week work schedule (based upon the Construction Progress Schedule) outlining work activities and manpower requirements planned for that period.

3. Identify current and anticipated problems and delays with respect to the past work period. The effects of said problems on the overall schedule and proposed corrective measures.

4. Submit to Architect two days prior to site meetings (every second week) the following:

1. Updated Construction Progress Schedule.

2. Outline of anticipated work activities for the forthcoming period.

3. Outline of required and/or anticipated manpower levels (by trade) for the forthcoming period.

4. Problems or delays experienced and/or anticipated.

5. Proposed corrective measures to react to problems or delays.

End of Section

1. ACCEPTABLE PRODUCTS

    1. First item named or specified by catalogue number meets specifications in all respects regarding performance, quality of material and workmanship, and is acceptable to the Architect.

    2. Items, other than first named, meeting specifications regarding quality of materials and workmanship only, are acceptable to the Architect, if they also meet performance, match the first named product in colour and texture, etc. and/or capacities specified and can be accommodated within the space allotted.

    3. General approval indicated by inclusion of other manufacturers named is subject to final review of submitted samples of shop drawings, performance data and test reports.

    4. Where the contractor uses equivalent products other than that first named, on which design is based, the contractor shall be responsible for all details of installation including product size, arrangement, fit, colour, etc. and maintenance of all required clearances. Contractor shall prepare and submit revised layouts to indicate arrangement of all affected piping, ductwork, conduit, lighting, equipment, etc. Failure by Contractor to provide such drawings may be considered indication that additional costs associated with equivalent products such as revisions to surrounding architectural finishes, structural components, or the need for larger motor starters, larger power feeders, space revisions to associated product equipment, controls, etc. shall be included in Bid price.

2. APPROVAL REQUIRED

    1. The Contract is based on the materials, equipment, and methods described in the Contract Documents.

    2. The Architect will consider proposals for substitution of materials, equipment, and methods only when such proposals are accompanied by full and complete technical data and all other information required by the Architect to evaluate the proposed substitution.

    3. Do not substitute materials, equipment, or methods unless such substitution has been specifically approved for this work by the Architect, in writing.

3. "OR EQUAL"

    1. Where the phrase "or equal", "approved equal", or "equal as approved by the Architect" occurs in the Contract Documents, do not assume that materials, equipment, or methods will be approved by the Architect.

    2. The decision of the Architect shall be final.

4. AVAILABILITY OF SPECIFIED ITEMS

1. Verify prior to bidding that all specified items will be available in time for installation during orderly and timely progress of the work.

2. In the event specified items will not be so available, notify the Architect prior to receipt of bids.

3. Costs of delays because of non-availability of specified items, when such delays could have been avoided by the Contractor, will be back-charged as necessary and shall not be borne by the Owner.

End of Section

1. GENERAL

1. REQUIREMENTS INCLUDED

1. Safety measures.
2. Fire protection.
3. Overloading precautions.
4. Falsework.
5. Scaffolding.

2. RELATED REQUIREMENTS

1. General Instructions - Section 01010.
2. General Work - Section 01015.
3. Environmental Protection - Section 01560.

3. CONSTRUCTION SAFETY MEASURES

1. Observe and enforce construction safety measures required by National Building Code (2010) Part 8, Provincial Government, Workplace Safety & Insurance Board and municipal statues and authorities.

2. In particular, the Ontario Construction Safety Act, the regulations of the Ontario Department of Labour and Ontario Hydro Safety Requirements shall be strictly enforced.

3. In the event of conflict between any provisions of above authorities the most stringent provisions will apply.

4. MATERIAL SAFETY DATA SHEETS

1. Submit Material Safety Data Sheets (MSDS) for any product to be used, installed or applied inside of the building if said product may emit toxic fumes and/or noxious odours.

2. Submit Material Safety Data Sheets for any product which is known to or suspected of creating a health hazard or discomfort when used in confined spaces, including but not limited to the following:

1. Adhesives.
2. Solvents.
3. Sealants (Caulking, etc.).
4. Other products which may give off air borne particles after installation.
5. Any other product as direct by Architect/Consultants.

3. The required Material Safety Data Sheets to be submitted prior to ordering

material or product for use as a part of the Work

4. The Owner may withhold payment for work of a subtrade or section until MSD Sheets for products supplied by that subtrade or section have been submitted, reviewed by Consultant and found to be acceptable.

5. Refer to Section 01700 - Project Close-Out for requirements regarding Certificates of Compliance.

5. MATERIALS SPECIFICALLY EXCLUDED

1. Asbestos and/or asbestos - containing products are not permitted. Submit Material Safety Data Sheets for any product suspected of containing asbestos if so requested by Consultant. Examples of some materials requiring close scrutiny and/or confirmation include:

    1. Transite drainage pipe - whether buried or above grade - not permitted.
    2. Insulation and/or jacketting for pipes, ducts, motors, pumps, etc. - not permitted if any asbestos is present.

2. Solder for all piping is to be lead-free. "Lead Free" shall mean solder which contains less than 0.030% of lead when dissolved in fluoroboric and nitric acids and tested by inductively coupled argon plasma atomic emission spectroscopy. Steelbond 281 and Silverbrite are acceptable solder products.

3. The Mechanical Subcontractor shall provide an affidavit signed by the Principal of the Company, on Company letterhead, that all of the solder used on the project was either one of the two acceptable products or that the solder used (identified by brand name) meets or exceeds the testing criteria.

4. The Owner shall undertake random testing of the soldered joints. Should testing provide that the solder used was not as specified, the Owner shall take legal action against the contractor as appropriate.

5. All paint and finish coatings are to be lead and mercury-free. Submit Material Safety Data Sheets confirming that these products are free of all lead and/or mercury compounds.

6. FIRE SAFETY REQUIREMENTS

1. Comply with requirements of the local municipal fire department with respect to continuous fire safety on the job site.

2. Comply with fire safety requirements of other construction related authorities (Workplace Safety & Insurance Board, Ministry of Labour, construction trade unions, etc.). If more than one authority issues similar requirements, the more stringent shall govern.

3. The appropriate clauses of the Ontario Building Code relating to fire protection shall be strictly followed.

4. Provide and maintain free access to temporary or permanent fire hydrants and other fire protection equipment during performance of work required by insurance companies having jurisdiction and governing codes, regulations and by-laws.

7. OVERLOADING

1. Ensure no part of Work is subjected to a load which will endanger its safety or cause permanent deformation.

8. FALSEWORK

1. Design and construct falsework in accordance with latest issue of CSA S269.1-.

9. SCAFFOLDING

1. Design and construct scaffolding in accordance with latest issue of CSA-S269.2-.

10. LIST OF MINIMUM SAFETY

1. Include all provisions for construction safety such as fences, hoarding along streets, storage provisions facilities, sanitation facilities, fire protection, electrical supply, temporary heat, ventilation, construction equipment with its supports and guards, stairs, platforms, ladders, scaffolds, guardrails, walkway lighting and morality lighting, work around asbestos lead, silica and fumes, all as required by the Construction Safety Act and Regulation, latest edition of the Province of Ontario, as well as all other applicable regulations of Jurisdictional Authorities.

11. SAFETY REQUIREMENTS

1. The Contractor will take all necessary steps to protect personnel (workers, visitors, general public, etc.) and property from any harm during the course of the contract.

2. All equipment shall be in safe operating condition and appropriate to the task.

3. The Contractor shall ensure that only competent personnel are permitted work on site. The Owner/Architect will throughout the term of the contract also remove from the site any persons not observing or complying with safety requirements.

4. The Contractor shall provide competent personnel to implement their safety programs and ensure that these standards and those of the Ontario Health and Safety Act are being complied with.

5. Ensure that safety requirements are met and that safety records are properly kept and maintained. Continued disregard for safety standards can cause the contract to be cancelled and the Contractor or subcontractors removed from site.

6. The Contractor will report to the Owner, architect and jurisdictional authorities any accident or incident involving Contractor, Owner or public personnel and/or property arising from the contractor's execution of the work.

End of Section

1. GENERAL

1. REQUIREMENTS INCLUDED

1. Systems demonstration.
2. Document submission.
3. Project commissioning.
4. Inspection and takeover procedures.

2. RELATED REQUIREMENTS

1. General Instructions - Section 01010.
2. General Work - Section 01015.
3. Photography – Section 01302.
4. General Conditions of the Contract: Fiscal provisions, legal submittals, and other administrative requirements.

3. SYSTEM DEMONSTRATION

1. Prior to final inspection, demonstrate operation of each system to the Owner and Consultant.

4. DOCUMENTS

1. Collect reviewed submittals in Section 01010 and 01300 and assemble documents executed by Subcontractors, suppliers, and manufacturers. Submit as per requirements in Section 01010 - General Instructions.

2. Provide bonds fully executed and notarized.

3. Submit a final statement of accounting giving total adjusted Contract Sum, previous payments, and monies remaining due.

4. Architect will issue a final change order reflecting approved adjustments to Contract Sum not previously made.

5. PROJECT COMMISSIONING

1. Expedite and complete deficiencies and defects identified by the Consultant.

2. Review record "as-built" drawings for completeness and then have “as-built” AutoCad 2012 or later drawings completed by a professional drafting service and provide “as-builts” on computer disks.

3. Review Cash Allowances in relation to Contract Price, change orders, hold-backs and other Contract Price adjustments.

4. Submit required documentation such as statutory declarations, Workplace Safety & Insurance Board Certificates, certificates of approval or acceptance from regulating bodies.

5. Attend "end-of-work" testing and break-in or start-up demonstrations.

6. Review inspection and testing reports to verify conformance to the intent of the documents and that changes, repairs or replacements have been completed.

7. Meet with structural consultant and inspection and testing consultant to co-ordinate completion, testing approvals.

6. INSPECTION/TAKEOVER PROCEDURES

1. The requirements of OAA/OGCA Document No. 100 "Take-Over Procedures" also govern applicable take-over procedures for this Contract.

2. Prior to application for certificate of Substantial Performance, carefully inspect the Work and ensure it is complete, that major and minor construction deficiencies are complete and/or corrected and the building is clean and in condition for occupancy. Notify the Architect, in writing, of satisfactory completion of the Work and request an inspection.

3. During the Architect/Consultant inspections, lists of deficiencies and defects will be tabulated. Correct same.

4. When the Architect/Consultants consider deficiencies and defects have been corrected and it appears requirements of the Contract have been performed, make application for certificate of Substantial Performance. Refer to General Conditions Article GC 5.4 for specifics to application.

5. All utility meters to be read and transferred into the Owner's name.

End of Section

The printed forms outlined below shall form the basis of communication between the Architect and the General Contractor. Copies of forms unrelated to the issuance of monies, shall be kept on the site; neatly filed and readily accessible to the parties concerned.

1. TRANSMITTAL RECORD

   A record of material issued by the Architect or General Contractor.

2. GENERAL REVIEW REPORT

   A progress report completed by the Architect or Consultant on a regular basis.

3. PROPOSED CHANGE

   A description of contemplated changes to the Contract.

4. CASH ALLOWANCE SITE INSTRUCTION

   Assignment of money for work executed under the Cash Allowance Section.

5. CHANGE ORDER

   Assignment of money for work executed beyond the financial limits of the Contract.

6. CHANGE DIRECTIVE

   A description of a change in the work when the Owner requires the Contractor to proceed with a change in the work prior to the Owner and the Contractor agreeing upon the adjustment in Contract Price and Contract Time.

7. CERTIFICATE FOR PAYMENT

   For release of contract money based on monthly progress draws.

8. SUPPLEMENTAL INSTRUCTIONS

   A description and/or clarification for the purpose of recording a clarification or interpretation of the contract documents or giving directions on problems resulting from field conditions.

End of Section

1. NEWFORMA SOFTWARE SYSTEM

1.1 This project will be administered through the Architect using the NEWFORMA software system.

1.2 The Contractor is required to use this internet based software for ALL project communications, RFIs, quotations, project schedule, shop drawing log, change log, RFI log, etc., including all administrative forms as outlined in Section 01800 and construction schedules as outlined in Section 01310. All shop drawings, interference drawings and as-built drawings shall be submitted electronically through the Newforma Info Exchange in PDF format. Submittals will not be deemed as received unless delivered through Newforma Info Exchange.

1.3 Utilization of this system does not require the purchase or download of the Newforma software. The Architect will send an email notification which will automatically provide online access to the Newforma Info Exchange specific to this project.

2. RELATED SECTIONS

2.1 Architect's Administrative Forms – Section 01800.

End of Section

1 GENERAL

1.1 General Requirements

1. Conform to Sections of Division 1 as applicable.

1.2 Related Work

1. All Divisions

1.3 References

CSA S350-M80 Code of Practice for Safety in Demolition of Structures
Gasoline Handling Act, 1980

1.4 Definitions

1. Hand Demolition/Excavation: systematic demolition/excavation of structures/materials by workers using hand-held tools.

2. Mechanical Demolition: systematic demolition of structures using powered equipment.

3. Systematic Demolition: methodical dismantling of structure piece by piece, usually carried out in reverse order of construction.

1.5 Submittals

1. Where required by authorities having jurisdiction, submit drawings, diagrams or details showing sequence of dismantling work and shoring of structures during demolition.

2. Drawings for structural elements shall bear signed professional seal of Structural Engineer licensed to practice in Ontario.

1.6 Quality Assurance

1. Regulatory Requirements:

.1 Conform to The Occupational Health and Safety Act, and Regulation for Construction Projects.

.2 Conform to OBC, especially Article 2.3.2.3 as applicable.

.3 Conform to Fire Code, Regulation under the Fire Marshals Act Especially Part 8.

2. Qualifications:

.1 Employ for this work demolition company having 5 years Canadian experience in this type of work. If requested, submit proof of experience and list of projects.

.2 Use skilled personnel having substantial experience in careful removal of stone identified to be salvaged for re-use.

3. Mock-Ups: Sample demolition: when and where required, remove materials indicated to assess conditions and to confirm removal methodology and accuracy of cut locations findings.

4. Pre-Demolition Meeting.

.1 Prior to start of work, arrange for Site meeting of all parties associated with work of this Section. Presided over by Consultant, meeting shall include General Contractor, Demolition Subcontractor, Testing Company's Representative and Structural Design Engineer.

.2 Prior to the meeting, examine the site and review the Specification for work included under this section and determine complete understanding of requirements and responsibilities relative to work including, storage and handling of materials, methods to be used, sequence and quality control, project staffing, restrictions due to environmental protection requirements, adjacent building to remain, driveways and other matters affecting demolition, to permit compliance with intent of this Section.

.3 While the drawings indicate parts of the building to be demolished, they do not specifically cover or note all of the items and parts of the building which are to be removed or demolished. Extent of demolition to suit the design intent of the proposed final project.

1.7 Project Conditions

1. Existing Conditions: Elements to be demolished are adjacent to occupied site areas. Note that apart from enclosed work site area, occupants will have free use of site and areas around Project. Take care and provisions for protection of these individuals.

2. Maintaining Traffic:

.1 Do not close or obstruct streets, sidewalks, alleys, exit passageways without permits. Do not place or store materials in streets, alleys or exit passageways.

.2 Conduct operations with minimum interference with roads, streets, driveways, alleys, and exit passageways.

1.8 Co-Ordination and Co-Operation

1. Co-ordinate the work of the Section with the work of all other sections affected to ensure proper sequencing and the safety and stability of the structure at all times.

1.9 Permits

1. Obtain and pay for all necessary Municipal and other permits required to carry out the work of this Section.

1.10 Insurance

1. This Sub-Contractor shall carry General Liability Insurance as well as protect the Contractor and the Owner from all claims of public liability and property damage. This insurance is in addition to the required liability insurance carried by the General Contractor.

2 PRODUCTS

2.1 Materials

1. Except as indicated on Drawings, materials forming permanent part of structure being demolished shall become property of this Section. Remove from Site.

2. Carefully remove, store, and protect stones identified to be salvaged.

3. Remove contaminated and dangerous material from Site and dispose of in safe manner to minimize danger involved at Site or at anytime during disposal.

3 EXECUTION

3.1 Preparation

1. Preliminary Survey:

.1 Before commencing demolition operations, examine Site and when requested, provide engineering survey to determine type of construction, condition of structure and Site conditions. Assess strength and stability of damaged or deteriorated structures.

.2 Assess potential effect of removal of any part or parts on the remainder of structure before such part(s) are removed.

.3 Assess effects of demolition on adjacent properties and consider need for underpinning, shoring, and/or bracing.

.4 Investigate for following conditions:

- effects of soils, water, lateral pressures on retaining walls
- presence of tanks, wells, other piping systems
- presence of hazardous materials.

.5 Contact municipal authorities or utility companies for assistance in locating and marking services passing under, through, or adjacent to building parts to be demolished. Such services include:

- electrical power lines
- gas mains
- oil pipelines
- communication cables
- water mains
- drainage piping (storm and sanitary)

.6 After determining demolition methods, determine area of possible vibration. Carefully inspect beyond those adjacent areas. List potential damage areas and photograph each for record purposes before starting work.

.7 Obtain permission from adjacent property Ministers regarding use of outriggers, swinging cranes and similar equipment.

.8 Site measure to confirm dimensions shown on drawings. Elements of the new additions or alterations that are to align, co-ordinate, or repeat existing conditions are to be dimensionally verified to existing. All discrepancies to be reported to Consultant.

2. Protection

.1 Provide, erect, and maintain required hoarding and other protection around Site before commencing work. Maintain such areas free of snow, ice, mud, water, and debris. Lighting levels shall be equal to that prior to erection.

.2 Provide flagmen where necessary or appropriate to provide effective and safe access to Site to vehicular traffic and protection to pedestrian traffic.

.3 Ensure scaffolds, ladders, equipment and other such equipments are not accessible to public. Protect with adequate fencing or remove and dismantle at end of each day or when no longer required.

.4 Do not interfere with use and activities of the site. Maintain free and safe passage to and from buildings and other site areas.

.5 Protect existing adjacent work against damages which might occur due to work of this Section.

.6 Where necessary to temporarily seal fire exists, provide other exists in compliance with applicable fire safety and building regulations.

.7 Where demolition operations prevent normal access to buildings, provide and maintain suitable alternative access.

.8 If at any time safety of adjacent buildings appear to be endangered, cease operations, and notify Consultant; take precautions to support buildings; do not resume operations until permission is granted by Consultant.

.9 If Consultant considers additional bracing and shoring necessary to safeguard and prevent such movement or settlement, install bracing or shoring upon Consultants orders. Should Contractor fail to comply promptly with such request, such bracing or shoring may be placed by Consultant at Contractor's expense.

.10 Take precautions to guard against movement or settlement of structure or any component of the building to be retained and adjacent buildings, provide and place bracing or shoring; be responsible for safety and support of such buildings; be liable for any such movement or settlement, any damage or injury caused thereby or resulting there from. If at any time, safety of any adjacent structure or buildings appear to be endangered, cease operations, notify the Architect; take precautions to support such buildings; do not resume operations until permission has been granted. If such movement or settlement of adjacent building is caused by negligence or default of the contractor, he shall install sufficient bracing or shoring with no extra cost to the Owner. If Architect considers additional bracing or shoring necessary to safeguard, prevent such movement or settlement, install bracing or shoring upon Architect's order; if Contractor fails to comply promptly with such order, such bracing, shoring may be placed by Architect, at Contractor's expense.

.11 Erect and maintain dustproof partitions as required to prevent spread of dust, fumes, and smoke to other parts of building. Maintain fire exists from Site. On completion, remove partitions and make good surfaces to match adjacent surfaces of building.

3. Existing Services:

.1 In event of unexpected discovery of buried fuel or other tanks, do no further work and immediately report discovery, orally and in writing to Consultant. Consultant will authorize remedial work, if any, in writing. Do such remedial work as addition to Contract.

3.2 Performance

1. General:

.1 Ensure demolition work is supervised by competent foreman at all times.

.2 Demolition shall proceed safely as specified herein, and as necessary to accommodate remedial work indicated. Work on upper floor levels shall be complete before commencing work on supporting structure. Walls and piers shall not be undermined.

.3 Materials and debris shall not be stacked in building to extent that overloading of any part of structure will occur.

.4 At end of each day's work leave work in safe condition ensuring that no parts of structure are in danger of collapsing.

.5 Until acceptance, maintain and preserve active utilities traversing premises.

.6 Keep work wetted down to minimize dust.

.7 Minimize noise. Avoid use of noise machinery during Owner's times of regularly scheduled use of premises and special events / facility rentals.

.8 Upon completion of selective demolition work, prevent access to excavations by means of fences or hoardings.

.9 Maintain safety of Site by shoring against collapse below grade structures and excavations resulting from demolition. Where required, provide structural supports for adjacent structures.

.10 Protect from weather parts of adjoining structures not previously exposed.

2. Selective Demolition:

.1 Demolish structures, fence enclosure and other building components to the extent shown in contract documents and remove materials from Site. GC is to determine number, location and size of all new floor, wall and roof openings and/or penetrations as required to route and/or install mechanical ductwork, equipment, piping, stacks, drains, raisers, transfers, conduits, cable trays, panels, etc. and all associated mechanical and electrical components prior to tender closing and to include for such costs in the base tender price.

.2 Separate attached structures by hand demolition prior to general demolition.

.3 Demolish masonry, concrete walls, and floors, as well as GWB partitions, ceilings, and roof decks in small sections. Remove and handle structural members and other heavy objects with safe and suitable equipment.

.4 Following demolition, repair, patch and make good wall, floor, ceiling, and roof surfaces to remain as required to receive new work. Re-finish surfaces to match existing in type, finish, and colour. Provide firestopping at all penetrations through floors, walls, and roof.

3. Methods:

.1 Hand and mechanical demolition shall be acceptable methods for work of this Section. Verify with Consultant whether proposed methods of demolition are acceptable.

.2 Following methods of demolition will not be permitted in work of this Contract:

- use of rapid progress failure methods (explosives).
- Mechanical method of demolition whereby wrecking is accomplished by smashing walls or floors with heavy weight suspended by cable from boom or hoist or where walls are collapsed using power shovel, tractor or other mechanical contrivance.

3.3 Disposal of Waste Materials

1. Selling or burning of materials on Site is not permitted.

2. Conform to requirements of municipality's Works Department regarding disposal of waste materials.

.1 Materials prohibited from municipality waste management facilities shall be removed from site and disposed of at recycling companies specializing in recyclable materials.

3.4 Field Quality Control

1. Engage and pay structural engineer to prepare designs for and supervise demolition cutting and shoring necessary for work of this Section with special attention to:

- foundations
- structural members
- shoring and bracing
- sidewalk support

2. Make good any damage to surfaces exposed in the final project caused by the work of this section.

End of Section 02220.

1. GENERAL

1. GENERAL REQUIREMENTS

1. Division One - General Requirements is a part of this Section and shall apply as if repeated here.

2. RELATED WORK SPECIFIED ELSEWHERE

1. Unit Masonry - Section 04200

3. REFERENCE STANDARD

1. Do masonry mortar and grout work in accordance with latest CSA A179-M1994 edition except where specified otherwise.

4. SAMPLES

1. Samples of coloured mortar will be evaluated when built into mock-up wall. Three colours to be built into mock-up for exterior masonry mock-up for the Architect's review.

2. PRODUCTS

1. MATERIALS

1. Masonry Cement: Conform to requirements of CAN/CSA-A8-M93, Masonry Cement.

2. Sand: Conform to requirements of C.S.A. A82.56-M1976 "Aggregate for Masonry Mortar".

3. Water: Potable, free from injurious or other substances detrimental to mortar, or will cause efflorescence.

4. Portland Cement: Conforming to CAN/CSA-A5-M88, white or grey as indicated.

5. Hydrated Lime: Conforming to ASTM C207-79 "Specifications for Hydrated Lime for Masonry Purpose" Type S. Hydrated lime shall be "soaked" 48 hours before paste is mixed with sand.

6. Mortar Colour: for use with Manufactured Stone Veneer only, pigment type as supplied by Harcott Pigment Ltd., or approved equal colour. Colour admixture not to exceed 10% of cement content by mass. For Brick Masonry Veneer and concrete masonry units will utilize natural colour mortar.

7. Use of any admixture to meet cold weather requirements is expressly forbidden.

2. MORTAR TYPES

1. Mortar types shall be as designated and conform to latest C.S.A. A179-M1994 edition, "Mortar and Grout for Unit Masonry".

2. The following mortar types shall be used:

1. For masonry foundation walls and masonry in contact with earth - Type S.

2. For interior block unit masonry above grade - Type S unless noted otherwise on plans.

3. For brick masonry veneer, manufactured stone veneer, and exposed (exterior) concrete masonry units - 1:1:6 Type "N" mortar.

4. For structurally reinforced masonry walls - Type "S".

3. GROUT

1. To current CSA A179-M1994 standard.

2. The following grout types shall be used:

Type	Fine Grout	Coarse Grout
Portland Cement - cu. ft.	1	1
Hydrated Lime (optional cu.ft.)	1/10	1/10
Damp Loose Sand - cu. ft.	2¼ to 3	2¼ to 3
Pea Gravel - cu. ft.	-----	1 to 2

Water - only enough to give creamy pouring consistency. Use a 1 cu. ft. (or metric box) in measuring portions for use in bond beams, lintels, and vertical cells.

3. Low lift grout as per structural drawings.

4. Grout Masonry components where indicated.

3. EXECUTION

1. MIXING

1. Mortar used in the construction of unit masonry walls shall conform to C.S.A. A179-M1994.

2. Material proportions, acceptable compressive strengths, locations of use, incorporation of admixtures included in C.S.A. A-179-M1994, shall be modified as may be required by Jurisdictional Authorities.

3. Mix premixed 1:1:6 mortar as in strict conformance with directions provided

by the manufacturer.

4. All grouting to conform to the requirements of CSA Standard CAN3-A371-M84.

2. MIXING OF COLOURED MORTAR

1. Premix colouring agents with dry cement in large batches (for best control) in strict accordance with pigment manufacturer's instructions, accurately measured to ensure constant and even colour of mortar throughout the job. Submit mortar colour "recipe" in operations and maintenance binders.

2. Maintain sufficient mixers on job site, one for regular mortar and one for each coloured mortar exclusively.

3. TESTING

1. Testing of mortar materials will be carried out by testing laboratory designated by Architect.

2. Submit samples of sand and water for testing to ensure that mortar will not produce efflorescence.

3. Submit samples of sand and water and premixed mortar for testing to ensure that mortar will not produce efflorescence.

4. Mortar shall be tested in accordance with the requirements of clause 4.4.1 in CSA S304.1-94 and CSA A179-94.

5. Testing shall be completed for each 250 m^2 of masonry, for each storey.

End of Section

1. GENERAL

1. GENERAL REQUIREMENTS

1. Division One - General Requirements is part of this section and shall apply as if repeated here.

2. REQUIREMENTS OF REGULATORY AGENCIES

1. Conform to Ontario Building Code 2012, as currently amended and Local Bylaws, except where indicated otherwise on drawings or specified herein. In case of conflict between Codes, the Ontario Building Code will govern.

3. STANDARDS

1. Materials, equipment, and practice shall conform to CSA3-S304-94 and CSA-A371-94, Masonry Code of Practice and CAN/CSA-A82.1-M87 for brick. Brick masonry units must comply to CAN3-A82.2 M78 and concrete masonry units shall comply to CSA3 A165-94. Brick masonry units must not have a greater Saturation Coefficient than .78 as set by test method CAN3-A82.2 M78 and must meet specifications CAN/CSA-A82.1-M87 for SW grade FBX type brick. Brick masonry units will be tested once they are delivered to the site and shall not be installed until testing is complete and units have surpassed the tests.

2. Work of this section to comply with "Plain and Reinforced Masonry-Canadian Structural Design Manual" Supplement to the National Building Code of Canada and CSA-A371-94.

3. Ensure fire rated walls, partitions or separations are in accordance with "Fire Performance Ratings Supplement" of the National Building Code of Canada.

4. SAMPLES

1. Construct 3'-0" (900 mm) high by 6'-0" (1800 mm) long wall with 3'-0" (900 mm) long corner return sample masonry wall on site (separate from building) where directed by the Architect. Construct one cavity wall panel of the types of masonry units. Construct with mortar, masonry specified and approved by the Architect, to show colour range, texture, banding, bond, and flashing, joint reinforcement, flashings, membrane flashings, cavity insulation, air vapour/barrier system, weepers, and mortar joints. Construct as many times as required to provide a wall to the satisfaction of the Architect, before commencing masonry work. Prepare similar panels for approval using all other architectural block types specified.

2. Remove rejected sample walls. Protect approved sample wall from damage and retain in place through duration of project until removal is directed by Architect.

3. Only masonry matching approved sample walls in all respects will be accepted for work of this project.

5. DELIVERY AND STORAGE

1. Stockpile masonry units on platforms or other approved supports to keep units free from ground contact. Prevent staining of masonry units from contact with any material while stored. Secure waterproof covering entirely over each stockpile when masonry work not in progress.

2. Deliver, handle and store masonry units by methods which will guard against soiling or chipping. Protect all holes and reglets from water and ice during freezing weather.

3. Dry out units which fail to meet moisture content limitation during storage on job site and do not lay until tests prove satisfactory.

6. SPECIAL PROTECTION

1. Protect exposed masonry corners and projections by methods which will not mar finished surfaces.

2. Masonry stained or damaged shall be replaced as directed by Architect.

3. Cover tops of all walls with well-secured, approved, non-staining and waterproof material while work is not in progress and until satisfactorily covered by metal deck structure or roof membrane. Cover shall be at least 2'-0" (600 mm) wider than width of wall.

4. In cold weather protect masonry and heat materials as provided in CSA-A371-94 and "Recommended and Guide Specifications for Cold Weather Masonry Construction" available through Ontario Masonry Contractors Association. Maintain dry beds for masonry and use dry masonry units only. Do not wet masonry units in winter.

5. In hot weather, protect freshly laid masonry from drying too rapidly by means of waterproof, non-staining coverings.

7. RELATED WORK SPECIFIED ELSEWHERE

1. Mortar - Section 04100
2. Miscellaneous Metals - Section 05500
3. Rough Carpentry - Section 06100

4. Sealant - Section 07900
5. Steel Doors and Frames - Section 08110
6. Painting - Section 09900
7. Manufactured Specialties - Section 10950
8. Mechanical - Division 15
9. Electrical - Division 16

8. SHOP DRAWINGS

1. Submit shop drawings in accordance with Section 01300 - Shop Drawings, Product Data, Samples and Mock-ups.

2. Show all interior and exterior wall elevations indicating all control joints and expansion joints.

3. Submit shop drawings of masonry ties stamped by a professional engineer licensed in the Province of Ontario.

9. DEFECTS DEFINED

1. In addition to non-compliance with specified requirements or other contract requirements, the following will be considered defects:

1. shrinkage in individual units and erected work;

2. spalling;

3. poor colour of texture blending of units;

4. surface deterioration, dusting;

5. discolouration, crumbling and similar deterioration of mortar;

6. failure of built-in items to remain anchored;

7. chipped units - any chipped area on exposed surface.

10. ADDITIONAL BLOCK FOR MASONRY CHASES:

1. Include in base tender sum labour and material for an additional 10 m² of 190 mm block installed for interior chases.

2. PRODUCTS

1. MATERIALS

1. Water: Clean, free from salts that will cause efflorescence and other

substances detrimental to masonry.

2. Dampproof Coursing and Base Wall Flashing: Blueskin TWF by Bakor.

3. Sealant: Tremco Dymeric 240 as per Section 07900.

4. Asphalt Emulsion: Conform to CSGB-37-GP-2M.

5. Joint Filler: purpose-made elastomer to ASTM D. 2240-81 of size and shape.

6. Control Joint: "Rapid Control Joint" as manufactured by Dur-O-Wal or approved equal.

7. Joint Reinforcement:

    1. **Interior Walls**: 9 3/16" (4.7mm) truss design mill galvanized joint reinforcement at all interior walls as manufactured by Dur-O-Wal Ltd. or Blok-Lok Ltd.

    2. **Sizes:** 2" (50 mm) less than wall thickness.

    3. **Rod Size:** Side rods 3/16" (4.7mm) and cross rods 3/16" (4.7mm) unless noted otherwise.

    4. Provide prefabricated tees and corners at all locations.

    5. **Masonry Piers**: 2" (50 mm) wide stainless steel ladder masonry reinforcing. The brick shall be tied back to the block with stainless steel "Zee" ties.

8. Nailing Inserts: 26 gauge hot dipped galvanized steel 1" x 2¼" (50 mm x 55 mm) all metal wall plugs.

9. Galvanizing: In conformance with ASTM A153 Class B2.

10. Dovetail Anchor Slots and Ties: stainless steel dovetail anchor slots with minimum 9 gauge hot dipped galvanized dovetail triangle ties by Dur-O-Wall Ltd. or Block-Lok Ltd.

11. "Z"-Tie: 3/16" (4.76mm) diameter "Z" Tie. See Structural Drawings for details. Provide galvanized finish at interior wall locations and stainless steel at exterior wall locations.

12. Individual Column and Wall Columns: Hot dipped galvanized. For details see structural drawings.

13. Concrete Masonry Units: Standard Weight and Lightweight Units

    1. **Hollow Concrete Units:** Metric modular size conforming to CSA-A165.4-94 for load bearing block and non-load bearing block.

    2. **Solid Concrete Units:** Metric modular size conforming to CSA-A165.2-94.

    3. **Interior Blocks:** Lightweight concrete blocks in standard height to be used at all interior exposed walls. All outside corners to use bullnose block.

    4. All vertical exposed outside corners and door jambs shall have a 1" (25 mm) radius and window jambs shall be pencil round radius. Provide square edge block for first course above finished floor and bull-nosed edge from the base course on. Round off the edge of first block course above the top of the base to match bull-nosed edge of other courses.

14. Grouting and Steel Reinforcement for Vertical Reinforced Masonry (VRM): Grouting and reinforcement steel to be supplied and installed by this section. All materials and installations to conform to structural drawings and specifications. Provide a mechanical device to hold vertical reinforcement at centres of block cores.

3. EXECUTION

1. ERECTION

1. General Workmanship

1. Install unit masonry work in complete conformance to governing requirements of Jurisdictional Authorities.

2. Lay face work from face side. Perform work by skilled mechanics according to best standard practice.

3. Lay masonry level, true to line, square, plumb, and as detailed. Vertical joints in perpendicular line.

4. Distribute exposed masonry of varying colours, tones and textures, evenly over wall surface to avoid patches and streaks and to produce a homogeneous blend. Avoid using units that are too contrasting in appearance for satisfactory blending.

5. Chipped or blemished units may only be used where concealed. Defective and broken units shall be rejected.

6. Make joints uniform in size and tool to match sample joints. Unless specified or indicated otherwise tool all interior joints whether or not they are behind cabinets or fitments or drywall. Close all cracks and crevices. Strike off flush all joints in unparged masonry covered by earth. Press in flush joints at exterior cavity side of inner block wythe so no voids occur. No mortar shall protrude from joints on wall surfaces to which insulation and waterproofing are to be applied. Rake out joints at juncture of masonry walls and columns on exterior and interior, as necessary to permit caulking detailed or specified, in walls to be plastered upon directly to provide bond, and where otherwise noted on drawings.

7. Fill all joints completely with mortar including webs. Buttering corners of units, throwing mortar scraping into joints, slushing, deep or excessive furrowing of bed joints not permitted. Do not shift or tap units after mortar has taken initial set. When work is resumed on walls previously laid, and which are either partially or totally set, remove all loose brick and mortar from top and adjoining surfaces. Remove mortar completely when masonry is removed and replace with new.

8. Brace walls and piers during construction until structure provides sufficient lateral support.

9. Extend masonry walls to underside of structure above unless indicated otherwise. Cut and fit masonry work as required. Install anchors at top of masonry to provide lateral support, to Structural Consultant's approval. Fill space at block walls at underside of steel deck solid to conform to code at all interior partitions and at fire separations. Install formed metal closures where top of block and bottom of metal deck is exposed.

10. Build in steel lintels, base plates and wall plates, as specified in Division 5 and reinforced concrete lintels as specified in Division 3. Set steel lintels in a bed or mortar. Install steel reinforcement and grouting as noted and detailed on structural drawings.

11. Install hollow metal door frames with lintels where specified in masonry walls, in accordance with manufacturer's instructions to present a rigid, true, plumb installation.
    Note: Completely fill frames with mortar. Keep faces of frames free of mortar during installation and leave clean. Maintain protective coverings.

12. Build in water stops, bellows, bent closures, sheet metal flashings,

accessories, access panels, and anchors required for frames, guards, sills, etc., and as otherwise provided in other sections. Cooperate in the setting and aligning of this work.

13. Work shall include dampproof coursing and membrane reinforced flashing at base flashing as detailed.

14. Consult other trades and make necessary provisions to permit the installation of their work in a manner to avoid cutting, patching and fitting.

15. Supply and locate dovetail anchor slots in time for placing in concrete formwork at locations where masonry walls abut concrete and where anchorage is required. Install slots at 2'-0" (600 mm) on centre horizontally and install joint reinforcement ties at 16" o.c. vertically.

16. Where flashing, membrane reinforced flashing or waterproofing turns out and terminates in horizontal mortar joints at lintels, shelf angles, spandrels, bases and bottom of cavities in cavity walls, provide clear, free drawing weepholes in the mortar joints of outer wythes at 32" (800 mm) apart horizontally.

17. Chases shall be built, not cut.

18. Bearings and piers required for structural members shall be constructed as indicated on structural drawings.

19. Parge before applying dampproofing, waterproofing, rigid insulation and where required. Parge all exposed foundation block where exposed above grade.

20. Cut masonry units to be used in exposed walls with carborundum saw and as per manufacturer's instructions.

21. Where low roof meets high wall leave out one masonry unit every 8'-0" o.c. at weephole level at locations to be selected by Architect. At the appropriate time, this Contractor shall bring this matter to the architect's attention. These masonry units are to be mortared in only when authorized by the architect.

22. A water test will be held by the Architect. This Contractor is to supply hose and water for this test upon Architect's request and carry out test under Architect's directions.

23. Install cavity mortar stop mesh 16" (400 mm) in height in bottom of

air cavity space at all cavity wall locations and tops of all lintels or flashing at doors, windows and high wall low roof locations.

2. Concrete Masonry Workmanship

1. Lay out work to minimize cutting of units.

2. Use power driven abrasive disc for coping units and splitting units, or for cutting units to accommodate flush mounted electrical outlets, grilles, pipes, etc. Leave 1/8" (3 mm) clearance between edge of item and opening in masonry unit.

3. Use solid unit where bonding is required if webs of hollow blocks do not align one over the other.

4. Concrete masonry units will be rejected if face blemishes, smears or slicks appear whether wall is painted or not. Do not use chipped block where exposed to view.

5. KEEP ALL CAVITY SPACES FREE OF MORTAR IN CAVITY WALLS.

6. Use blocks with 1" (25 mm) radius vertical edges for external corners including door jambs and pencil round at window jambs. At bottom block course where quarry tile base is to be installed, install square edge outer corner block at first course for quarry tile installation and grind block external corner edge round to 1" (25 mm) radius above quarry tile base to top of first course.

7. Where beams or lintels bear on concrete block walls, the blocks under the bearing shall be solid or filled with concrete for a depth of two courses and a width of 32" (800 mm) or as noted otherwise.

8. Where joists bear on hollow masonry walls provide minimum 5½" (140 mm) solid masonry under joist bearing, where concealed masonry may be brick.

9. Provide reinforced block lintels:

1. over square head openings where noted and at all other locations as detailed on structural and architectural drawings.

2. over openings not exceeding 5'-0" (1500 mm) where no other support is shown, fill lintels solid with min. 3000 p.s.i. (21 m.p.a.) concrete and reinforce with min. two #5 steel bars; Note: Conform to structural drawings for bond beam reinforcing and concrete detailing

3. cast lintels at least 7 days before setting; provide bearing at ends as detailed on structural drawings min. 8" (200 mm).

10. Where walls 12" (300 mm) and thicker have exposed face on both sides, lay block using two units in wall thickness.

11. Exposed joints shall be concave unless indicated otherwise.

12. Use lightweight concrete units for all exposed interior walls.

13. Provide all structural work at masonry walls as indicated on structural drawings.

3. Dampproof Course

1. Lay dampproof course over tops of all foundation walls. Lap strips a minimum of 4" (100 mm) at junction and angles and install sealant to secure joints.

2. Install dampproof course at floor level for interior partition walls on floor slabs on grade

4. Shrinkage Control Joints

1. Work shall include shrinkage control joints in wall constructed entirely or partially of masonry units manufactured of concrete:

1. At all locations indicated on drawings.

2. Provide additional interior control joints at junction of walls and columns at maximum horizontal spacing not exceeding 20'-0" (6 mm) in runs of walls where no openings occur at all locations where control joints are not indicated. Obtain Architect's approval of additional control joints prior to proceeding. Carry joints from support of wall to top of wall at structure above.

2. Control joints shall be constructed as detailed and shall provide a complete vertical separation through the wall. Joints shall be a nominal 3/8" (10 mm) wide.

3. Form control joints for interior block masonry walls by placing a layer of building paper up the height of the wall separating block on one side from adjacent block or column. Fill void between blocks with mortar. Rake joints back 3/8" (10 mm). Building paper

shall not be exposed.

4. Form shrinkage control joints in exterior masonry walls by placing premoulded joint filler in continuous vertical joint, full height of wall. Leave pre-moulded filler back from face of wall to allow space for joint filler and sealant under Section 07900

5. Expansion Joints

1. Construct expansion joints in unit masonry walls as shown on drawings and specified.

2. Install premoulded expansion joints where called for on drawings.

3. Caulking to be done under Section 07900.

6. Joint Reinforcement

1. Reinforce all walls and partitions of concrete masonry units, solid and cavity, and single wythe block walls with joint reinforcement placed in horizontal joints at alternate courses 16" (400 mm) unless indicated otherwise. DO NOT extend joint reinforcement through control joints. Overlap all joints a minimum 8" (200 mm).

2. Where openings occur in these walls, place joint reinforcement in joints at every 8" (200 mm) course, within 32" (800 mm) above and below openings for a distance of 24" (600 mm) beyond opening.

3. Reinforce all masonry walls where thickness is reduced by a column or chase with a 48" (1200 mm) length of joint reinforcement placed in horizontal joints at 16" (400 mm) centres. Centre reinforcement on column or chase.

4. Install prefabricated corner sections in reinforced joints at corners and prefabricated tee sections at reinforced joints where partitions intersect other partitions or walls, unless lateral support is being provided or walls or partitions are erected on a different foundation.

5. Where intersecting walls are erected on different foundations and lateral support is not required, provide straight joint full height of wall with masonry ties at every second joint. Rake joint 3/8" (10 mm).

6. All exterior wall reinforcing to be hot dipped galvanized two wire truss type with hot dipped galvanized Fero Block Shear Connector Tie with V-Tie leg. All interior partition wall reinforcing and anchors mill galvanizing truss design

7. Provide structural work as detailed on structural drawings.

8. Place masonry reinforcement according to CSA-S304-94.

7. Bonding

1. Wythes of masonry walls shall be bonded by means specified and/or shown on drawings.

2. Use running bond unless otherwise indicated. Specialty bonding, banding, stack bonding, soldier coursing to be as indicated on drawings. Use stack bond at all curved locations. See Stone Type 'A' for stone bonding.

3. Cavity wall wythes shall be bonded with joint reinforcement at 16" (400 mm) o.c. and staggered cross members of reinforcement at alternate courses.

4. Cut masonry units in half length as required to form curved walls. Brick and block masonry to be stack bond at curved wall locations.

8. Built-in Work

1. Set all loose and miscellaneous items of steel and iron, including all isolated beams, lintels, shelf angles, bearing plates, ventilators and all other loose iron and steel work specified for erection or setting by others when built into masonry work. These items shall be grouted in place using cement mortar.

2. Install 30 pound (13600 g) building paper felt under steel lintel bearing on one side only. Locate this bond breaker on the same as the control joint occurs.

3. Supply and install all vertical steel reinforcement and grouting indicated on the structural drawings. Grouting to be installed using at maximum 5'-0" lifts (1525 mm) using low lift grout.

9. Closures, Bellows and Water Stops

1. Provide 16 oz. per sq. ft. preformed copper water stops and closures formed as indicated on drawings.

2. Overlap all joints a min. 6" (150 mm) to obtain water flow to the exterior and apply 3 beads of sealant at joint.

10. Filled Block Partitions

    1. Fill all cavities in block partition with concrete and/or grout where indicated.(detention cells).

2. POINTING AND CLEANING

    1. Point using concave joint at all areas except at single scored block which shall be tooled to match square score in block and provide other joint finishes where directed by Architect.

    2. Point all holes, except weepers in masonry. Cut out all defective joints and repoint them with mortar.

    3. Clean exposed masonry to satisfaction of Architect after mortar has hardened.

    4. Wire brushes or abrasives shall not be used for cleaning.

    5. Use of muriatic acid **shall not be** used for cleaning.

    6. Leave masonry clean and free of mortar daubs and with tight mortar joints. Submit data for Architect's approval of chemical cleaner to be used to remove excess mortar on bricks.

    7. Rinse masonry surfaces with water immediately after cleaning.

    8. Remove and replace defective material at Architect's direction and at no cost to the Owner.

    9. Clean up masonry debris and remove from site.

End of Section

1. GENERAL

1. GENERAL REQUIREMENTS

1. Division One, General Requirements, is a part of this section and shall apply as if repeated here.

2. SHOP DRAWINGS

1. Submit shop drawings in accordance with Article G.C. 3.11 of CCDC Document 2-2008.

2. Submit shop drawings for review by the Architect prior to fabrication.

3. Design Criteria-Applicable Standards:

1. All standards in accordance with latest issue.

2. CSA Standard CAN3-S16.1-M, "Steel Structures for Buildings" Limit States Design.

3. CSA Standard W59, "Welded Steel Construction" (Metal Arc Welding).

4. CSA Standard W.55.2, "Resistance Welding Practice."

5. CSA Standard W55.3, "Resistance Welding Qualification Code for Fabricators of Structural Members Used in Buildings."

6. CSA Standard W.47, "Certification of Companies for Fusion Welding of Steel Structures."

7. CSA Standard S.136, "Cold Formed Steel Structural Members".

8. Ontario Building Code 2012 as currently amended.

4. Certificates:

1. Provide a certificate signed and sealed by the licensed/registered professional engineer responsible for the stair designs and the detailed steel connections (including guards) stating that the stairs and connections have been designed, detailed and fabricated in accordance with the applicable standards.

2. Certification must bear the original seal and signature of the engineer and be dated. Photocopies are not acceptable.

5. Clearly indicate construction details, sizes of steel sections, thickness or gauge of steel sheet, connections, joints, method of anchorage, number of anchors, supports, reinforcement and accessories. Confirm all dimensions on site.

3. STANDARDS

1. Materials and workmanship shall conform to the requirements of the Ontario Building Code - 2006, as currently amended.

2. Do welding work to CSA W59, unless specified otherwise. Welders to qualify under CSA W47, CSA 55.2 and CSA W55.3.

3. Design of steel fabrications, unit stresses and workmanship to conform to CSA CAN3-S16 1-M.

4. DESIGN CRITERIA

1. Design stair: landing construction; guards and railings and connections to conform to the Ontario Building Code.

2. Design detail and fabricate in general to CSA CAN3-S16 1-M.

5. QUALITY ASSURANCE

1. WELDING APPLICABLE STANDARDS:

1. CSA Standard W59, "Welded Steel Construction" (Metal Arc Welding).

2. CSA Standard W.55.2, "Resistance Welding Practice."

3. CSA Standard W55.3, "Resistance Welding Qualification Code for Fabricators of Structural Members Used in Buildings."

4. CSA Standard W.47, "Certification of Companies for Fusion Welding of Steel Structures."

2. QUALITY ASSURANCE

1. Fabrication and erection of **ALL** components to be by companies holding current C.W.B. Certification as Division 1 or Division 2.1. All welding by welders holding current certification for the required welding position.

6. SCOPE

1. Supply and install steel bollards; bench and shelf supports; lateral supports for masonry; miscellaneous items, steel brackets supports and angles, steel for hollow metal screens/parapet wall, steel roof parapet curb, exterior building sign support frame, reduced headroom barriers, door frames for overhead doors, roof access ladder, elevator pit access ladder, prefinished bent aluminum channel, etc..

2. Provide all miscellaneous metals (incl. stainless steel and aluminum) items as detailed and noted under other sections.

3. Provide all additional miscellaneous steel items as required to complete the above work.

5. Provide stainless steel handrail components and stainless steel guards behind structural glazing where indicated on drawings. See Item 2.3.1 below.

2. PRODUCTS

1. MATERIALS

1. Ferrous Metals:

1. Unless otherwise indicated, hot rolled mild steel in .15% to .25% carbon range.

2. Steel sections and plate: CSA G40.21-/M1987, minimum 260W grade.

3. Square steel tube: CSA G40.21-/M1987, Grade 350W.

4. Steel pipe: ASTM A53-76, Type E, Grade A.

5. Sheet Steel: hot dip galvanized, cold rolled, with stretcher level degree of flatness to ASTM A526; zinc coating designation Z275.

2. Aluminum: CSA HA Series - M1980 for aluminum and aluminum alloys, Alcan 50S Alloy.

3. Prime Paint: Oil alkyd type (shop coat) conforming to CGSB-1-GP-40M. Colour to be grey.

4. Expansion Joints: as specified.

5. Welding Materials: CSA W59-1984.

6. Bituminous Enamel: Alkali resistant asphaltic coating conforming to CGSB1-GP-108M.

7. Non-shrink Grout: Por-Rok by Hallemite Products Ltd., or SET 15 Minute Anchoring Cement by SET Products Ltd.

8. Galvanized Touch-Up Paint: Zinc rich, Galvafroid by W.R. Meddows of Canada Ltd. or approved equal.

9. Hot Dipped Galvanizing: conform to CSA G164-M1981.

10. Bolts and Anchor Bolts: to ASTM A307-82a.

11. Stainless Steel:

    1. To have brushed finish, Type 304 finish to be ornamental grade AISI No.4.

2. FABRICATION - GENERAL

1. Fabricate components in the shop in largest size practicable to minimize field jointing.

2. Fabricate components square, straight, true, free from warpage and other defects. Accurately cut, machine file and fit joints, corners, copes and mitres.

3. Reinforce fabricated components to safely withstand expected loads.

4. Make joints in built-up sections with hairline joints in least conspicuous locations and manner.

5. Make allowance for thermal expansion and contraction when fabricating exterior work.

6. Joints shall be welded unless otherwise indicated and unless details of construction do not permit welding. Exposed welds shall be continuous and shall be ground smooth.

7. Close exposed open ends of tubular members with welded on steel plugs.

8. Where work of other Sections is to be attached to work of this section, prepare work by drilling and tapping holes, as required to facilitate installation of such other work.

9. Work of this Section, supplied for installation under other Sections, shall be prepared as required ready for installation by: drilling, countersinking and tapping holes, forming shapes and cutting to required sizes.

10. Grind off mill stampings and fill recessed markings on steel components left exposed to view.

11. Make workmanship of best grade of modern shop and field practice known to recognized manufacturers specializing in this work. Fit joints and intersecting members accurately. Make work in true plumb, true, square, straight, level and accurate to sizes and shapes detailed, free from distortion or defects detrimental to appearance or performance.

12. Insulate metals where necessary to prevent corrosion due to contact between dissimilar metals and between metals and masonry, concrete or plaster. Use bituminous paint, butyl tape, building paper or other approved means.

13. Supply all fastenings, anchors and accessories required for fabrication and erection of the work. Make exposed metal fastenings and accessories of same material, texture, colour and finish as base metal on which they occur unless otherwise shown or specified. Keep exposed fastenings to an absolute minimum and inconspicuous, spacing them evenly and setting them out neatly. Make fastenings of permanent type.

14. Draw mechanical joints to hairline tightness and seal countersunk screws and access holes for locking screws with metal filler where these occur on exposed surface.

3. FINISHES

1. Thoroughly clean steel of lose scale, rust, oil, dirt and other foreign matter. Suitable prepare steel surfaces by power tool cleaning to receive specified finishes.

2. Grind smooth sharp projections.

3. Remove oil and grease by solvent cleaning.

4. Apply coatings in the shop and before assembly. Where size permits, galvanize components after assembly.

5. Shop apply coat of primer to interior components after fabrication except where galvanized finish and stainless steel is required.

6. Hot dip galvanize exterior components and other components, where so indicated, after fabrication in accord with requirements of CSA Standard G164-M1981.

7. Apply coat of bituminous enamel to contact surfaces of metal components in contact with cementitious materials and dissimilar metals.

8. After erection and installation, thoroughly clean the work and apply field touch up of same formula as shop coat to all damaged or unpainted surfaces. Work all paint well into all joints, crevices and open spaces.

4. MISCELLANEOUS STEEL SECTIONS

1. Supply all miscellaneous steel angles, plates, lintels, etc., indicated on the architectural drawings & not indicated on the structural drawings or noted on the structural drawings by others. Size according to loads, set plumb and true and securely fix. Continuously weld and grind smooth exposed connections. Others may be welded or bolted.

3. EXECUTION

1. INSTALLATION

1. Install components plumb, square, straight and true to line. Drill, cut and fit as necessary to attach this work to adjoining work.

2. Provide temporary supports and bracing required to position components until they are permanently anchored in place.

3. Securely anchor components in place; unless otherwise indicated, anchor components as follows:

1. To concrete and solid masonry with expansion shields and bolts.

2. To hollow construction with toggle bolts.

3. To thin metal with screws or bolts.

4. To thick metal with bolts or by welding.

5. Fill space between railing members and sleeves with non-shrink grout.

6. To wood with bolts or lag screws.

4. Provide all components required for anchoring. Make anchoring in concealed manner wherever possible. Make exposed fastenings, where approved by Architect neatly and of same material, colour, texture and finish as base metal on which they occur. Keep exposed fastenings evenly spaced.

5. Dissimilar metals and metals in contact with cementitious elements shall have contact surfaces coated with bituminous paint or be isolated by other means as approved by Architect.

6. After installation, clean and refinish injured finishes, welds, bolt heads and nuts. Refinish with zinc rich paint or primer to match original finish.

2. LATERAL SUPPORT FOR MASONRY

    1. Provide deflection and lateral support angles for non-loadbearing masonry walls. Coordinate with structural drawings for details and locations of structural steel joists & beams and locations of structural steel deck.
    NOTE: This item to be provided by Miscellaneous Metals.

3. BENCH AND SHELF SUPPORTS

    1. Provide all metal HHS posts and angles brackets to wood benches. Refer to drawings and details for size and shapes.

    2. Bench posts and brackets are required in Locker Rooms. Refer to drawings for locations and details.

    3. All items to be primed for paint after fabrication.

    4. Prepare all metal work, ready to receive wood members by Section 06200.

4. MISCELLANEOUS ITEMS, STEEL BRACKETS SUPPORTS AND ANGLES

    1. Supply for installation by respective trades, steel brackets, supports, and angles as indicated on drawings. Drill for countersunk screws and anchor bolts. Prime paint for interior, galvanize for exterior.

    2. Provide support brackets for vanities and counters, cabinets and storage units as indicated. These items are part of the allowance of miscellaneous items supplied to the millwork contractor.

    3. Provide hot-dipped galvanized support posts and beams as required by manufacturer for Roof Top Unit and exterior roof-mounted building sign.

    4. Provide 8" min. D. hoist steel beam as requested by Elevator manufacturer.

    5. Provide steel miscellaneous angles and hanger rods as indicated.

    6. Provide other metal fabrications which are not a part of a manufactured item or covered under another section in Division 5. Refer to drawings.

5. STEEL FOR HOLLOW METAL SCREEN/PARAPET WALL

    1. Provide support steel for hollow metal work, refer to drawings. Provide for all support steel including overhead bracing for hollow metal screens where not indicated by structural drawings.

6. BOLLARDS

1. Supply and install hot-dipped galvanized steel bollards as shown on Drawings. Bollards shall be 150 mm x 9.5 mm thick wall x height as noted on drawing, seamless steel pipe as detailed on drawings. Install 1200 mm into a concrete foundation. Fill bollard with 25 MPa concrete and round top. Round top of footing also. Location of Bollards: as indicated on drawings and on Site Plan.

7. STEEL ROOF PARAPET CURB

1. Provide steel roof parapet curb as detailed on drawings.

2. Predrill for fastening wood blocking to it and prime paint.

8. REDUCED HEADROOM BARRIERS

1. Supply and install steel barriers at undersides of Stair #3 and Stair #4 as detailed on the Drawings.

9. INTERIOR ROOF ACCESS LADDER

1. Provide roof access ladder as detailed on drawings to current Ministry Standards.

10. ELEVATOR PIT ACCESS LADDER

1. Provide elevator pit access ladder to current Ministry Standards and to requirements of Elevator Contractor.

11. OVERHEAD DOOR FRAMES

1. Provide 8mm thick galvanized steel bent plate as detailed on the Drawings. Anchor to structure; no exposed fasteners. Coordinate provision to coordinate with work of Section 04200 and Section 05120 so to be built into exterior wall construction and structural steel framing.

12. ANODIZED ALUMINUM BENT CHANNEL

1. Provide 6mm thick anodized aluminum bent channel as detailed on the Drawings. Anchor to structure; no exposed fasteners. Provide in longest continuous lengths but no less than single piece to match window frame sizes (width). Engineer to permit movement of channel and adjacent materials (exterior masonry veneer, aluminum windows, etc.); minimize joints between sections of channel with maximum joint / gap not to exceed 16mm. Coordinate provision to coordinate with work of Section 04200, Section 08400, and Section 08900 so to be built into exterior wall construction, aluminum entrances and aluminum windows.

End of Section

1. GENERAL

1. GENERAL REQUIREMENTS

1. Division One, General Requirements, is a part of this section and shall apply as if repeated here.

2. STORAGE

1. Materials shall be protected from damage and kept dry during delivery and while stored at job site.

2. Do not store materials in areas where glazing is not complete or concrete completely dry.

3. STANDARDS

1. Materials and workmanship shall conform to the requirements of the Ontario Building Code as currently amended.

4. RELATED WORK SPECIFIED ELSEWHERE

1. Concrete Formwork – Section 03100
2. Miscellaneous Metals - Section 05500
3. Finish Carpentry - Section 06200
4. Architectural Woodwork- Section 06400
5. Modified Bitumen Roofing - Section 07520
6. Metal Flashings & Trim - Section 07620
7. Finish Hardware - Section 08700
8. Painting - Section 09900
9. Manufactured Specialties - Section 10950
10. Mechanical - Division 15
11. Electrical - Division 16

2. PRODUCTS

1. MATERIALS

1. Sawn lumber shall be No. 2 spruce, pine or fir of best merchantable lumber, straight and sized, shaped to the correct dimensions from the nominal sizes noted on the drawings and specified herein. Lumber shall be well-seasoned stock, free from large loose resinous knots, shake, waned edges, splits, dry rot or other defects which would impair its strength or durability.

2. Moisture content of all lumber for rough carpentry, at time of building-in, shall not exceed 17%.

3. Wood Preservative: C.C.A. (chromium copper arseniate) by "Wolmanized".

4. Rough Bucks, Battens, Blocking, Framing: Eastern Spruce, Jack Pine or Fir No. 2 or better.

5. Exterior Rough Bucks Batten Blocking, Framing and Plywood and Interior Wood Attached to Masonry or Concrete: Jack Pine No. 2 or better "Wolmanized" pressure treated wood conforming to C.S.A. 081.1-M1983. Sizes as indicated on drawings and/or as required. All pressure treated lumber shall bear the trademark "Wolmanized" and bear a mark certifying conformance with AWPB Standard LP-2 or LP-22.

6. Fire Retardant Lumber: to be CSA 080.20 DRICON FRT Lumber and plywood distributed by J. Brewer (Canada) Ltd; (519) 621-7701. Sizes as indicated on drawings and/or as required.

7. Grounds, Nailing Strips, Strapping, Furring: Eastern Spruce or Jack Pine Construction Grade allowing 10% to 15% standard grade.

8. Plywood Sheathing: Construction grade and paint grade good one side fir plywood sheathing, exterior type, conforming to C.S.A. 0121-M1978. Square edge or T&G as required. Roof Sheathing; 16mm T&G.

9. Galvanized Nails and Spikes, Carriage Bolts, Screws and Washers: Hot dipped galvanized nails and spikes for exterior work and mill galvanized for interior work.

10. Nails, Spikes and Staples: To C.S.A. B111-1974, plain finish. Use spiral thread nails.

11. Adhesive: Waterproof wood adhesive.

3. EXECUTION

1. WORKMANSHIP

1. Work shall be executed by skilled mechanics according to best practice, as specified herein and indicated on drawings.

2. Lay out work carefully and to accommodate work of other trades. Accurately cut and fit, erect in proper position, true to dimensions, align, level, square, plumb, adequately brace and secure permanently in place.

3. Bore holes for bolted work true to line and same size as bolts, drive into place for snug fit, use plate or washer to prevent nut from bearing directly on wood, and turn up nuts, bolts and lag screws tight at time of installation and again immediately before being concealed with other work or at completion of work.

4. Give painter sufficient notice so that untreated or unprimed carpentry items or materials shall be primed immediately upon delivery to site.

5. Co-operate with others engaged in work on the building to the end that proper unity of action will assure the orderly progress of the work. Do necessary boxing and protecting of sills, jambs, corners, and the like. Construct scaffold, ramps, and other temporary staging necessary.

2. WOOD PRESERVATIVE

    1. Treat fresh cut ends of pressure-treated Jack Pine with two coats of end preservative.

3. ROUGH HARDWARE

    1. Supply rough hardware such as nails, bolts, nuts, washer, screws, clips, strap iron, and hardware for temporary enclosures.

4. ROOF CURBS, BASES AND SUPPORTS

    1. Construct pressure treated wood roof curbs for ventilation ducts, fan bases, etc., as detailed or required by other trades. Construct suitable approved pads to receive duct supports. Note tops of all curbs for roof top units shall be a minimum 14" (350 mm) above finished roof surface.

5. ROUGH BUCKS, GROUNDS, BLOCKING, STRAPPING, FURRING

    1. Furring, blocking or strapping indicated is not to be regarded as exact or complete. Location and methods of securing these pieces to option of Contractor. Provide adequate nailing.

    2. Cut grounds and screeds in long lengths as practical with square ends. Erect to create true, plumb planes and fasten rigidly in place.

    3. Provide minimum 2" x 4" (38 mm x 89 mm) blocking as necessary for attachment of base, trim, cabinets, fixtures, hardware, miscellaneous specialties, equipment and the like unless indicated otherwise. Cut ends square and fasten rigidly to building structure.

    4. Rough bucks shall be minimum 2" (38 mm) thick wood of width indicated, set straight, true and plumb, braced and fastened securely in place.

    5. For general strapping, set treated wood strips vertically spaced 16" (400 mm) on centre, unless otherwise indicated. Shim so faces form a true plane. Provide intermediate horizontal strapping at all joints to wall finishes applied over grounds.

6. FRAMING

    1. Frame walls, partitions, roofs, platforms, etc., as indicated. Note: metal studs supplied and installed under Section 09110.

    2. Set wood joists 16" (400 mm) o.c. unless otherwise noted, using a single bottom plate and double top plates. Double studs at openings and triple at corners and partition intersections. Provide one row of horizontal bridging of same material as studs.

7. BLOCKING

    1. Provide minimum 2 x 4 (38 mm x 89 mm) blocking or size as required for secure attachment of base, trims, cabinets, fixtures, miscellaneous specialties, equipment etc. and the like unless specified otherwise. Cut ends square and fasten rigidly to building structure. Cut ends square and fasten rigidly to building structure. Coordinate blocking requirements with work of sections listed in 1.4 of this Section.

    2. In addition to making provision for installation of specified products and equipment, review Drawings for indication of Owner-supplied products and equipment. Coordinate with Owner for provision of blocking suitable for installation and connection of Owner-supplied products and equipment including, but not specifically limited to, wall-mount televisions up to 1524mm [60”] diagonal, adult size change tables within accessible washrooms, laboratory equipment including articulating ventilation arm, storage shelving systems, etc..

8. PARAPETS (Typical)

    1. Supply and install pressure treated wood block and framing as detailed, and exterior grade pressure treated plywood at parapets, and include blocking to allow ventilation from masonry cavity over exterior masonry allowing ventilation behind parapet flashing. Create vented space using 1" x 3" (19 mm x 75 mm) cutouts in blocking at 16" (400 mm) o.c. for ventilation. All cut ends to be primed with 2 coats of end cut wood preservative. Co-ordinate installation of air/vapour barrier membrane at back and top of parapets with roofing and masonry trades. Installation of membrane by masonry/air barrier trade. Refer to drawings for typical detail. Secure parapet wood frame blocking to block and brick securely with tapcon type fasteners into masonry with a min. of two fasteners for each wood member at every 16" o.c.

9. FIRE RETARDANT WOOD

    1. Electric and Telephone Backboards and Panel Boards: Supply and install 19 mm thick backboards and panel boards, fire pressure treated, fir plywood. Consult electrical drawings for locations and requirements. Provide wood strapping as required. Fasten to wall using fasteners and spacing suitable to wall type to provide secure, sturdy installation which will carry equipment load without damaging.

10. WINDOW SILLS

    1. Supply and install first layer of plywood (pressure treated at window sills). Second layer, nosing and plastic laminate by Finish Carpentry. Refer to drawings for detail and locations.

End of Section

1. GENERAL

1. GENERAL REQUIREMENTS

1. Division One - General Requirements, is a part of this Section, and shall apply as if repeated here.

2. REFERENCE STANDARDS

1. Standard of finished carpentry, metal work and cabinet work in accordance with the "Millwork Standards" of the Architectural Woodwork Manufacturers Association of Canada (AWMAC).

3. QUALIFICATIONS

1. The work of this trade shall be executed by a company having a minimum of 5 years proven first class experience in this type of work and having adequate equipment and skilled personnel.

4. SHOP DRAWINGS

1. Submit shop drawings in accordance with Section 01300 Submittals.

2. Before Shop Drawings and fabrication are started, take critical measurements at the site to facilitate installation and fitting of work.

3. Shop drawings shall show fabrication details, materials, jointing, description of anchorage and hardware.

5. DELIVERY AND STORAGE

1. Give Painter sufficient notice so that untreated or unpainted carpentry items or materials can be primed immediately upon delivery to site.

2. No equipment shall be delivered to the site until a portion of the building in which it is to be installed is completely ready for equipment as approved by the Architect.

3. Store finished work properly and keep under cover both in transit and at site. Finish woodwork shall not be delivered to site until concrete and masonry work has dried out.

4. Cover all plastic laminate and melamine faces at shop with heavy Kraft Paper.

5. Check access clearance at site before assembling.

6. RELATED WORK SPECIFIED ELSEWHERE

1. Miscellaneous Metals - Section 05500
2. Architectural Woodwork - Section 06400
3. Steel Doors and Frames - Section 08110
4. Wood Doors - Section 08200
5. Security Doors, Frames and Screens – Section 08320
6. Finishing Hardware - Section 08700
7. Security Finish Hardware – Section 08780
8. Gypsum Drywall - Section 09250
9. Acoustical Treatment – Section 09500
10. Finish Painting for Millwork - Section 09900
11. Washroom Accessories - Section 10800
12. Manufactured Specialties - Section 10950
13. Electrical - Division 16

7. SAMPLES

1. Submit duplicate 12" x 12" (300 mm x 300 mm) samples of each type of panelling and each type of solid wood or plywood to receive stain or natural finish.

2. Submit duplicate 12" (300 mm) long samples of each type of moulding.

3. Submit samples of construction methods and all hardware.

8. WARRANTY

1. The warranty period stipulated in the General Conditions of the Contract shall be extended to five years in writing against defects.

9. MOISTURE CONTENT

1. Finish material to be dried to a uniform maximum moisture content of 12% for exterior work and 6% to 8% for interior work.

10. OWNER EXISTING CASEWORK

1. Work to include the removal, safe transportation, required modification and re-installation of casework from the Owner's existing facilities to Breath / Photo 126.7.

2. PRODUCTS

1. MATERIALS

1. Materials used for finish work shall be sound, free from defects that would mar finished appearance, well-seasoned and air dried and of good quality for intended purposes. Wood laminates pressure bonded.

2. Plywoods: shall be rotary cut oak architectural grade "A" No. 1 Face Grade for select white (varnish grade) veneer both shall comply to C.S.A. 0115-M1982, with plywood core, laminated with waterproof adhesive. Plywood shall be good both sides.

3. Hardwoods - Solid shall be select clear oak Architectural Grade; knots will not be accepted. Wood shall be selected for colours and graining when at stained and varnished items.

4. Cedar: Western Red Cedar or better. Exterior grade, smooth finish. Sizes as indicated and detailed/required by shop drawings and/or structural drawings. Note: warped, twisted, loose or missing lengths in wood will not be accepted.

5. Framing Lumber - No. 2 or better spruce, pine or fir best mercantile lumber.

6. Penetrating Sealer - "Penetrim" by Tremco Mfg. Co. (Canada) Ltd., or "1402" by MacNaughton Brooks Ltd.

7. Painted Hardwood: American Poplar ("White Wood") "C" select grade.

8. Plastic Laminate: 1/16" (1.5 mm) thick decorative, melamine surfaced, high pressure laminated plastic sheeting in surface texture colour and finish as selected by Architect and conforming to CAN3-A172-M1979. Pattern to the Architect's selection. Manufacturer shall thoroughly sand back of sheet to form a homogenous bonding surface. Plastic laminate manufacturer shall be selected by Architect from Formica, Wilsonart, Arborite or Nevamar. Backing Sheet .020" (.5 mm) thick, sanded one side. Products may be selected based upon manufacturer's full range of colours, patterns and surface textures including crystal (stippled) finish. Allow selection of 4 (four) colours by Architect.

9. Adhesive: As recommended by manufacturer for required application and to conform to C.S.A. 0121-M1978.

10. Nails, Spikes and Staples: To C.S.A. B111-1974, plain finish nails. Use spiral thread nails and barbed staples.

11. Pressure Treated Wood: Conforming to Section 06100, sizes as indicated and detailed. **NOTE:** Warped, twisted, loose or missing knots in wood will not accepted.

12. Exposed fasteners: All exposed fasteners to be stainless steel. At exposed screw locations use stainless steel screws and cup washers.

13. Refer to drawings and details for complete list of materials to be installed.

3. EXECUTION

1. WORKMANSHIP

1. Work shall be executed by mechanics skilled in their respective trade, according to best practice, or specified herein and indicated on drawings.

2. Check job dimensions and conditions and notify the Architect in writing of unacceptable conditions. Do not proceed until remedial instructions are received. Commencement of work will imply acceptance of site conditions and re-working or modification of the work as deemed necessary by the Architect will be done at no extra cost to the Owner.

3. As far as practical, assemble work at the shop and deliver to the job ready for installation. Leave ample allowance for fitting and scribing on the job.

4. Fabricate work square and to the required lines.

5. Lay out work carefully as indicated and to accommodate work of other trades. Accurately cut and fit; erect in proper position true to dimensions. Align, level, square, plumb, adequately brace, and secure permanently in place.

6. Use treated lumber for studs, blocking nailers, furring and other wood permanently installed in building. Brush coat freshly cut ends with two coats of concentrated form of preservative.

7. Recess and conceal fasteners and anchor heads. Fill with matching wood plugs. Set nail heads and fasteners occurring within exposed interior carpentry work.

8. Provide wood members free from bruises, blemishes, mineral marks, knots, shake and other defects and select for uniform colour grain and texture. Machine and hand sand surfaces exposed in the finished work to an even, smooth surface free from defects detrimental to appearance.

9. Provide running members in the maximum lengths obtainable. Provide thickness of members in maximum dressed size of standard lumber. Where thickness of width indicated is not available in hardwoods, use glue laminations to obtain sizes required. Provide unexposed backs of veneers having the same physical characteristics as the face veneer.

10. Give painter sufficient notice so that untreated or unprimed carpentry items or materials can be primed immediately upon delivery to site. No exposed end grain of plywood shall be permitted; edging shall be solid 3/8" (10 mm) wide by thickness of plywood and of same species of wood. Finger jointed edging will not be accepted.

11. Co-operate with others engaged in work on the building to the end that proper

unity of action will assure the orderly progress of the work. Do necessary boxing and protecting of sills, jambs, corners and the like. Construct scaffold, ramps, and other temporary staging necessary.

12. Chamfer edges of plastic laminate to avoid chipping.

2. TRIM

1. Work includes miscellaneous trim as required of oak unless indicated otherwise.

2. Trim members shall be of sizes and profiles indicated. Trim members shall be slow-fed work, free from chatter and other machine marks.

3. Install trim after it has been backprimed.

4. Members shall be full length and secured with wire nails, set and holes filled.

5. Mitre all joints.

3. WOOD DOOR INSTALLATION

1. Fit wood doors to frame by dressing off hinge edge before applying butts. Provide 3/32" (2.5 mm) clearance at jambs and heads. Mount so as to swing easily and freely on their hinges and close accurately against the stops on the frames without binding. Latch bolts shall engage positively with the strikes or catches when the doors are slammed shut or closed with moderate force. Doors shall remain stationary in every position without independent motion.

4. WOOD DOOR HARDWARE INSTALLATION

1. Complete preparation of wood doors for all hardware including mortise type latch sets.

2. Install finishing hardware supplied under Section 08700 on wood doors.

3. At completion of the work, moving parts shall be gone over, made to work easily, smoothly and efficiently. Work carefully cleaned down and left in complete and finished condition satisfactory to Architect.

5. WOOD DOOR FRAMES, SCREENS & TRIM

1. Work includes door frames & miscellaneous trim as required of oak unless indicated otherwise.

2. Trim members shall be of sizes and profiles indicated. Trim members shall be slow-fed work, free from chatter and other machine marks.

3. Install trim after it has been backprimed.

4. Members shall be full length and secured with wire nails, set and holes filled.

5. Mitre all joints.

6. HARDWOOD SILLS

1. Construct window sills using 2 layers with exposed as stained and varnished solid maple over plywood wood preservative treated plate with solid hardwood nosings as detailed on drawings. Install over air/vapour barrier. Supply and installation of first layer of plywood by Section 06100, remaining sill by this Section.

2. All wood to have wood preservative installed on all sides.

3. See drawings for details.

7. WASHROOM ACCESSORIES

1. Install all washroom accessories as supplied in Section 10800.

8. STEEL / SECURITY DOORS AND FINISH DOOR / SECURITY DOOR HARDWARE FOR STEEL / SECURITY DOORS INSTALLATION

1. Install/hang all steel doors and security doors. Install as specified in Section 08110 and Section 08320.

2. Install all finish door and security door hardware.

9. INSTALLATION

1. Deliver Finish Carpentry to the site. Provide units of such sizes as will not present difficulty of entry to the place of installation. Where units are shipped in knock-down form provide clear instructions for assembly.

2. Install Finish Carpentry items plumb, square, true, rigid and secure with concealed fastening at exposed areas and with stainless steel screws and cupwashers where secured inside of millwork units.

10. OWNER EXISTING CASEWORK

1. Contractor to include for coordination of arrangement to attend to the Owner's existing facilities to assist in the disassembly, removal and packaging of existing casework to be modified and re-installed within Breath / Photo 126.7. Contractor to coordinate with Owner as to suitable opportunity to remove and safely transport the existing casework and to have such in place at Owner occupancy.

End of Section

1. GENERAL

1. GENERAL REQUIREMENTS

1. Division One, General Requirements, is a part of this section and shall apply as if repeated here.

2. RELATED WORK

1. Concrete Walks - Section 02600
2. Concrete - Section 03300
3. Architectural Precast Concrete- Section 03450
4. Masonry - Section 04200
5. Miscellaneous Metals - Section 05500
6. Architectural Woodwork - Section 06400
7. Air/Vapour Barrier System - Section 07195
8. Sprayed-On Insulation - Section 07215
9. Firestopping and Smoke Seals - Section 07270
10. Caulking for Roofing - Section 07612
11. Steel Doors and Frames - Section 08110
12. Aluminum Entrances Doors, Framing and Screens - Section 08400
13. Glass and Glazing - Section 08800
14. Aluminum Curtain Wall -Section 08900
15. Gypsum Wallboard - Section 09250
16. Floor and Wall Tile - Section 09300
17. Interior Special Coatings - Section 09960
18. Painting - Section 09900
19. Washroom Accessories - Section 10800
20. Manufactured Specialties - Section 10950
21. Mechanical - Division 15
22. Electrical - Division 16

3. SYSTEM DESCRIPTION

1. Supply all labour, materials and equipment necessary for the complete work of this Section as indicated on the drawings, specified herein, or as required by job conditions and normally considered as work covered by this Section.

2. The term "sealant" to be synonymous with the term "caulking" where used on the drawings and/or specifications.

4. SUBMISSIONS

1. Submit complete colour samples for Architect's approval.

2. Supply a sample container of each type of caulking or sealant.

3. Sample joints of each type and colour of caulking shall be prepared at the site in a location directed by the Architect and be approved by the Architect before work commences. Approved joints will represent minimum acceptable for the work.

4. Cure samples and under conditions anticipated at job site during construction.

5. ENVIRONMENTAL CONDITIONS

1. Sealant and substrata materials to be minimum 5 C (41 F).

2. If necessary to apply sealants below 5 C., consult sealant manufacturer and follow their recommendations.

6. DELIVERY AND STORAGE

1. Deliver and store materials in manufacturer's original wrappings and containers.

7. PROTECTION

1. Mask adjacent surfaces as necessary to prevent contamination.

2. Protect sealant against puncture or damage until sealant has attained its final set.

3. Be responsible for any damage to adjacent surfaces caused by the work of this Section. Provide extra protection as required when sandblasting.

4. Provide temporary covers over joints where joints have been cleaned out, but not yet caulked.

8. WARRANTY

1. Provide written warranty, signed, issued in the name of the Owner stating caulking work of this section guaranteed against leakage, cracking, crumbling, melting, shrinkage, running, loss of adhesion, or staining adjacent surfaces, for a period of five years from the date of the Certificate of Substantial Performance and that any defective caulking will be replaced.

2. At completion of the work, provide written statement from manufacturer or authorized manufacturer's representative that material used is the recommended one and that the final application is as recommended by the manufacturer for the construction conditions detailed and for the

performance required. These requirements are applicable to every material included in the work of this Section.

9. QUALIFICATIONS

1. Applicator for the work of this section shall:

1. Be approved by the materials manufacturer and Architects.

2. Have at least five years proven satisfactory experience in this type of work.

3. Have adequate equipment and skilled personnel to expediently complete the work of this section in an efficient and very best workmanlike manner.

4. Be completely familiar with the published recommendations of the manufacturer of the caulking material being used.

2. Indication of lack of skill or defective work to be sufficient grounds for the Consultant to reject the installed caulking and to require its immediate removal and complete recaulking at no additional cost to the Owner during the guaranty period.

3. Co-operate with the Consultant and/or any inspection and testing agency he may appoint.

4. Materials to be utilized shall be inspected and tested as required.

5. Provide cut tests of 6 inches in length in order to ensure correct thickness, hardness, mixing and surface finish. Provide these cut test samples at times and from locations as directed by the Consultant, and make good the areas from which the samples are taken.

6. All tests of the sealant installation shall be inspected by the sealant manufacturer's representative.

2. PRODUCTS

1. MATERIALS

1. Primers: type recommended by sealant manufacturer.

2. Joint Fillers:

1. General: compatible with primers and sealants, outsized 30 to 50%.

2. Polyethylene: extruded closed cell foam, Shore A hardness 20, tensile strength 140 to 200 kPa.

3. Bond Breaker: pressure sensitive plastic tape, which will not bond to sealants.

4. Sealant Type A: Equal three part polyurethane 'Tremco Dymeric 240' conforming to C.G.S.B. CAN2-19-24-M80. Colours to be tinted to specifically match wall colours. Maximum of three exterior colors and five interior colours.

5. Sealant Type B: One part silicone mildew resistant type equal to sanitary sealant 1702 by C.G.E. Silicones and conforming to CGSB 19-GP-22m or Dow Corning 786.

6. Sealant Type C: Equal to Sikaflex - 15 LM. Colours to be tinted to specifically match wall colours. Maximum of four colours.

7. Sealant Type D: Equal to Prison Loc 2 or 30 bySchul International Co.; Sikador 31 Hi-Mod or Injection Gel by Sika Corp.; Foil-Fast Epaxy Injection Gel by Rawl Plug Co. Inc.; or Duracrete LV Gel by Tamms Industries.

8. Colour of Sealants: to be selected by the Architect. Colours of sealant to change where wall colours change (i.e. banding).

9. Joint Cleaner: xylol, methylethyleketon or non-corrosive type recommended by sealant manufacturer and compatible with joint forming materials.

10. Vent Tubing: 6 mm (1/4") inside diameter extruded polyvinyl chloride tubing.

11. Threshold Bedding: oil base caulking compound, to CGSB 19-GP-6.

12. Deliver materials to job site in sealed containers with manufacturer's original labels attached, and accompanied by certification of compliance with the specifications.

3. EXECUTION

1. EXAMINATION

1. Examine all surfaces prior to application and notify the Architect of any conditions detrimental to satisfactory application.

2. Commencement of work shall imply acceptance of surfaces.

2. PREPARATION

1. Use dry, clean, oil free compressed air stream to remove dust and contaminants. Masonry surfaces shall be cleaned with wire brush and blown clean. Any waterproofing treatments contaminating the joint must be completely removed.

2. Remove rust, mill scale and coatings from ferrous metals by wire brush, grinding or sandblasting.

3. Remove oil, grease and other coatings from non-ferrous metals with joint cleaner.

4. Prepare concrete, masonry, glazed and vitreous surfaces to sealant manufacturer's instructions.

5. Examine joint sizes and correct to achieve depth ratio ½ of joint width with minimum width and depth of 6 mm (1/4"), maximum width 25 mm (1").

6. Before caulking, fill spaces deeper than 13 mm (½") with bedding material, packed tightly in place and set below finished surfaces to suit specified sealant depth. Provide joints less than 13 mm (½") deep with an approved joint breaker.

7. Where necessary to prevent staining, mask adjacent surfaces with tape prior to priming and caulking.

8. Apply bond breaker tape where required to manufacturer's directions.

9. Prime sides of joints to sealant manufacturer's instructions immediately prior to caulking.

10. Remove all existing caulking and prepare for replacement.

11. Check form release agent used on concrete for compatibility with sealant and primer. If they are incompatible inform Consultant and change sealant to compatible type approved by Consultant or clean concrete to Architect's approval.

3. APPLICATION

1. Before application of any sealants, confirm that sealant material is compatible with the materials and finishes of the surfaces to which the

material is applied or is in contact with.

2. Apply sealants, primers, joint fillers, bond breakers, to manufacturer's instructions. Apply sealant using a gun with proper size nozzle. Use sufficient pressure to fill voids and joints solid. Superficial pointing with skin bead is not acceptable.

3. Thoroughly mix caulking materials with a mechanical mixer capable of mixing at 80-100 rpm without mixing air into the material. Mix material in accordance with the manufacturer's directions and instructions.

4. Install caulking to the joints using manually operated or power operated guns. Use nozzles of the correct size and shape and provide sufficient pressure to completely fill the joints and make adhesive contact with the backs and sides of the joints. Caulk solidly around entire perimeter of openings.

5. Finish the surface of the caulking with a smooth, full bead, free from ridges, wrinkles, sags, air pockets and embedded impurities. Tool the finish bead with a water wet or dry tool as recommended by the manufacturer, to a slightly concave joint.

6. In masonry cavity construction, vent caulked joints from cavity to 3 mm (1/8") beyond external face of wall by inserting vent tubing at bottom of each joint and maximum of 1500 mm (5'-0") o.c. vertically. Position tube to drain to exterior.

7. Clean adjacent surfaces immediately and leave work neat and clean. Remove excess sealant and droppings using recommended cleaners as work progresses. Remove masking after tooling of joints. Finish work damaged due to this work shall be replaced at this contractor's expense to satisfaction of the Architect.

8. Set thresholds in a full bed of caulking compound at least ½" (12 mm) thick. Remove excess compound after threshold is set and neatly point joints.

9. All hidden joints or joints concealed by metal covers occurring in window and door frames, metal curtain walls, other locations, to be clean, sealant applied and tooled, and inspected and approved prior to the installation of metal covers.

10. Use of sealants specified in the following locations:

1. Type A:Use at all exterior locations and interior control joints and expansion joints. NOTE: this sealant **must not be** painted over.

2. Type B: Joints between flooring (except carpet areas) and door frames; between countertops and walls; all high humidity locations at shower locations.

3. Type C: At all remaining interior locations.

4. Type D: All sealant and caulking applications within the detention areas, secure corridors, cells, booking area, etc.

4. LOCATIONS

1. Do all caulking required (except where specified under other sections).

2. Caulk exposed control joints and expansion joints occurring in masonry and concrete walls. (See item 3.6)

3. Caulk along underside of projecting flashings, except at roof eave detail.

4. Caulk joints between window or door frames to adjacent building components around perimeter of every external window or door opening at interior and exterior sides aluminum units which work shall be performed by Aluminum Curtain Wall Section 08900.

5. Caulk around exterior louvres.

6. Interior hollow metal where it abuts interior finishes.

7. Caulk where shown on drawings and not specified in other sections.

8. Caulk joints at junction of different materials and junction of surfaces in different planes as required or directed (i.e. concrete to metal, concrete to masonry, masonry to metal, masonry to drywall, etc.).

9. Caulking elsewhere to provide a water and weatherproof condition.

10. Caulk areas on interior walls to stop air infiltration.

11. Caulking between resilient flooring and masonry or concrete walls; and between resilient flooring and hollow metal frames (Type 'B' sealant).

12. Caulk joints between masonry and gypsum wallboard or plaster.

13. Caulk control joints in drywall partitions.

14. Caulk around access panels, built-in specialties, grilles, pipes, ducts,

conduit, outlet boxes, etc. penetrating floors, walls and ceilings.

15. Caulk joints around metal items projecting from ceramic tile work (Type "B" sealant).

16. Caulk around toilets, urinals, sinks, bathtubs, showers, etc. at junction with floor and wall surfaces (Type "B" sealant).

17. Caulk joints as required to provide soundproofing where soundproofing walls are indicated.

18. Caulk joints between wood window and wall surfaces and wood door frames and wall surfaces, etc.

19. Caulk perimeter of all countertops and window plastic laminate sills (including underside) with (Type "B" sealant).

20. Caulk around access panels and washroom accessories in ceramic tile faced walls.

21. Caulk secure areas between core-slab and walls, at ceilings, between fixtures and accessories and their surrounding surfaces or any small joints.

5. CAULKING NOT TO BE DONE UNDER THIS SECTION

1. Caulking of Sidewalk Joints - Section 02600

2. Firestopping and smoke seals - Section 07270, Div. 15 and Div. 16

3. Caulking between aluminum work and aluminum work to surrounding surface - Section 08900.

4. Caulking of Roofing - Section 07612

5. Caulking and sealants for glazing - Section 08800

6. Caulking of Acoustic Drywall Partitions - Section 09250

7. Caulking of Ceramic and Quarry Tile - Section 09300

8. Caulking of sheet flooring - Section 09660

6. CAULKING OF MASONRY CONTROL JOINTS

1. Caulk all Masonry Control Joints where shown on drawings. Refer to exterior elevations and interior elevations.

NOTE: For Base Price at each control joint shown on exterior wall

elevation allow for control joint to also be located in back up masonry concrete block wall as per detail, backer rod and Caulking by this Section. Compressible joint filler by Masonry Section 04200.

2. In addition to locations noted in item a. above, allow for the following additional linear quantities for Caulking of interior concrete block control joints, as per drawings as follows:

   50 lineal metres of caulking complete with backer rod.
   NOTE: Linear quantity based on one side/face of exposed concrete block masonry wall.

   NOTE: Verification of linear quantities of control joints to be made later. Locations of all additional required Concrete Block Joints to be finalized later after submission of proposed control joint locations on shop drawings to be submitted by Masonry Contractor as required by Specifications Section 04200.

End of Section

1. GENERAL

1. GENERAL REQUIREMENTS

1. Division One, General Requirements, is a part of this section and shall apply as if repeated here.

2. RELATED SECTIONS

1. Insulation of perimeter member of thermally broken and/or exterior door frames: Section 04200 Masonry.

2. Installation of steel door frames in masonry: Setting in place by Section 06200 Finish Carpentry, building in by Section 04200 Masonry.

3. Caulking of door frames: Section 07900 Sealants.

4. Hardware supplied by Section 08700 Finish Hardware or Section 08780 Security Hardware, installed by Section 06200 Finish Carpentry or Section 06400 Architectural Woodwork, with supervision by Division 16 for devices requiring electrical service.

5. Thermally broken threshold supplied by Section 08710 Finish Hardware, installed by Section 06200 Finish Carpentry.

6. Glazing: Section 08800 Glass and Glazing.

7. Finish painting: Section 09900 Painting and Finishing.

8. Metal grilles supplied by Division 15 Mechanical, installed by Section 06200 Finish Carpentry.

9. Conduit for electronic hardware in frame product: Division 16 Electrical.

3. REFERENCES

1. ASTM A 653/A653M03 - Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

2. ASTM A568M-03 - Specification for Steel, Sheet, Carbon, and High-Strength, Low-Alloy, Hot-Rolled and Cold Rolled, General Requirements for

3. CGSB 41-GP-19-01 - Rigid Vinyl Extrusions for Windows and Doors

4. CAN/CGSB-82.5-M88 - Insulated Steel Doors

5. CAN/ULC-S702-97 - Thermal Insulation, Mineral Fibre, for Buildings

6. CSA W59-M89 (R2001) - Welded Steel Construction (Metal Arc Welding)

7. CAN4-S104-M80(R1985) - Fire Tests of Door Assemblies
8. CAN4-S105-M85(R1992) - Standard Specification for Fire Door Frames Meeting the Performance Required by CAN4-S104

9. NFPA 80-90 - Fire Doors and Windows

10. Canadian Steel Door and Frame Manufacturer's Association Specification Standards for steel doors and frames.

4. SUBMITTALS

1. Submit shop drawings in accordance with Section 01300 Submittals.

2. Indicate each type of frame, door, core, metal thicknesses and finishes, openings glazed, louvred, fire ratings, location of exposed fasteners, hardware blanking, reinforcing, tapping and drilling arrangements. Show large scale frame sections and anchoring details. Submit door and frame schedule identifying each unit. Ensure each unit bears legible identifying mark corresponding to that listed in door and frame schedule.

3. Submit for the Architect's approval, sample of frame corner showing construction, workmanship and finish.

4. Submit test report to the Architect's upon request, from accredited testing laboratory certifying that thermally broken frames meet or exceed CAN/CGSB-82.5-M.

5. Submit in addition to fire label, certificate to substantiate design and construction of fire-rated assemblies, if required by the Architect or authorities having jurisdiction.

5. DELIVERY, STORAGE AND HANDLING

1. Protect doors and frames during shipping and storage.

2. Note damage incurred during shipping.

3. Make good immediately any damage done. Clean scratches and touch up with rust-inhibitive primer. Replace damaged work which cannot be repaired, restored or cleaned.

4. Store materials on wood sleepers in dry area and cover to protect from damage. Coordinate this requirement with Section 06200 Finish Carpentry installing doors.

5. Remove wrappings or coverings from doors upon delivery at Site. Store doors in vertical position, spaced by blocking to permit air circulation between them.

2. PRODUCTS

1. MATERIALS

1. Products of following manufacturers are acceptable subject to conformance to requirements of Drawings, Schedules and Specifications:

1. Ambico Ltd.
2. Artek Door Limited
3. Baron Metal Industries
4. Daybar Industries Ltd.
5. Macotta Company of Canada Ltd.
6. Metal Door Hardware Ltd.
7. S.W. Fleming Ltd.
8. Stanley-Bumeda Ltd.
9. Vision Hollow Metal

2. Sheet Steel: Commercial grade steel to ASTM A568M, Class 1, hot-dip galvanized to ASTM A 653/A653M-96-Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process, ZF 75 (A25), known commercially as "Colourbond", "Satincoat", or "Galvanneal".

2. STEEL CORE THICKNESS (MINIMUM)

		Metric Thickness	Gauge
1.	Door Frames (and Transom Frames)	1.519 mm	16
2.	Side Light and Window Frame Assemblies	1.519 mm	16
3.	Doors (and Transom Panels):		
	1. Hollow Steel Construction		
	- Face Sheets	1.519 mm	1620
	- Vertical Stiffeners	0.912 mm	20
	2. Honeycomb Core Construction		
	-Face sheet	1.214 mm	18
4.	Accessories (Doors and Frames)		
	1. Reinforcements		
	- Lock and Strike Reinforcements	1.519 mm	16
	- Hinge Reinforcements	3.416 mm	10
	- Flush Bolt Reinforcement	1.519 mm	16

	- Reinforcement for Surface Applied Hardware	1.214 mm	18
	- Concealed Door Closer or Holder Reinforcements	2.657 mm	12
	- Top and Bottom End Channels	1.214 mm	18
5.	Steel Top Caps	0.912 mm	20
6.	Mortar Guard Boxes	0.759 mm	22
7.	Glass Trim (Screw Fixed or Snap-In Types)	0.912 mm	20
8.	Floor Anchors	1.519 mm	16
9.	Jamb Spreaders	0.912 mm	20
10.	Wall Anchors		
	- Masonry T-strap Type	1.214 mm	18
	- Existing Masonry/Concrete Wall Type	0.912 mm	20
	- Masonry Wire Type	4.0 mm dia.	-
	- Masonry Stirrup-strap Type 50 mm x 250 mm (2" x 10" min.)	1.519 mm	16
	- Steel/Wood Stud Type	0.912 mm	20
	- Steel/Wood Stud Tension and Associated Wall Type	0.912 mm	20

11. Door Cores

    1. Honeycomb for Hollow Core Doors: Structural small cell 24.5 mm (1") maximum, kraft paper 'honeycomb'; weight: 36.3 kg (80 lb) per ream (min), density: 16.5 kg/m (1.03 pcf) (min) sanded to required thickness.

    2. Glass Fibre for Hollow Steel Doors With Stiffeners: Mineral wool insulation, minimum density 24 kg/m3 (1.5 pcf) minimum consisting of durable fibrous material processed from rock, slag or glass, bound with deterioration resistant binders, CSA A101-M, Type 1A.

    3. Temperature Rated Rise (TRR) Required for Fire Rated Doors: Core composition to limit temperature rise on unexposed side of door to conform to OBC requirements. Core tested as part of complete door assembly in accordance with CAN4-S104-M and listed by nationally recognized testing agency having factory inspection service.

    4. Polystyrene for Insulated Doors: Rigid extruded fire retardant closed cell board. Density 0.32 kg/m3 (2.0 pcf), minimum R-value of RSI 1.0 (R6.0).

OR Polyurethane for Insulated Doors: Rigid, modified polyisocyanurate, closed cell board. Density 0.32 kg/m3 (2.0 pcf) minimum, R-value of RSI 1.9 (R11) minimum.

12. Primer: Rust inhibitive touch-up only.

13. Fire Rated Door and Frame Assemblies: Conform to CAN4-S104-M,CAN4-S105-M and NFPA 80.

14. Adhesives

    1. Honeycomb Cores and Steel Components: Heat resistant, spray grade, resin reinforced neoprene/rubber (polychloroprene) based, low viscosity, contact cement.

    2. Polystyrene and Polyurethane Cores: Heat resistant, epoxy resin based, low viscosity, contact cement.

    3. Lock-Seam Doors: Fire resistant, resin reinforced polychloroprene, high viscosity, sealant / adhesive.

15. Door Silencers: Single stud rubber/neoprene type.

16. Exterior Top Caps: Rigid polyvinyl chloride extrusion conforming to CGSB 41-GP-19Ma.

17. Frame Thermal Breaks: Rigid polyvinyl chloride extrusion conforming to CGSB 41-GP-19Ma.

18. Fasteners for Stops: Cadmium plated steel, counter sunk flat or oval head sheet metal Phillips screws.

2. FABRICATION

    1. Permit access by an approved inspection and testing company for purpose of inspecting at random doors under fabrication.

    2. Welding: CSA W59-M.

        1. Grind exposed welds smooth and flush. Fill open joints, seams and depressions with filler or by continuous brazing or welding. Grind smooth to true sharp arrises and profiles, and sand down to smooth, true, uniform finish.

    3. Hardware Requirements: Blank, mortise, reinforce, drill and tap doors and frames to receive mortised templated hardware. Check hardware list for requirements.

    4. Frames-General

1. Fabricate frames for doors, screens and borrowed lights to profiles indicated.

2. Exterior frames shall be 1.897 mm (14 gauge) welded type construction (thermally broken).

3. Interior frames shall be 1.897 mm (14 gauge) welded type construction.

4. Reinforce frame as required for surface mounted hardware. For door frames wider than 1.5 mm (5'), reinforce door frame head and jamb and mullions at junction of head.

5. Where frames occur in masonry provide strip strap, T-strap or wire type anchors. Where frames occur in gypsum board provide stud type anchors.

6. Locate each wall anchor immediately above or below each hinge reinforcement on hinge jamb and directly opposite on strike jamb. Provide 2 anchors for rebate opening heights up to and including 1.5 mm (5') and 1 additional anchor for each additional 760 mm (30") of height or fraction thereof, except as indicated below. For frames in previously placed concrete, masonry or structural steel provide anchors located not more than 150 mm (6") from top and bottom of each jamb and intermediate anchors at 660 mm (26") on centre maximum.

7. Where floor finishes allow, fabricate frames to extend 38 mm (1-1/2") below finished floor level. Where frames are to terminate at finished floor level, provide plates for anchorage to slabs.

8. Prepare each door opening for single stud door silencers: 3 for single door openings placed opposite hinges: 2 for double door openings approximately 150 mm (6") each side of centreline of head stop.

9. Supply removable portion of stop and frame where required for overhead concealed door closers and properly connect to frame and prepare for attachment to closer prior to shipment.

10. Install door anchor clips to gypsum board installers' directions for steel door frames in solid gypsum board partitions. Ensure clips are supplied by Section 09250 Gypsum Board.

11. Fabricate thermally broken door frames in accordance with shop drawings. Provide wall and floor anchors suitable for installation conditions. Anchoring devices must not permit thermal conductivity from exterior frames to interior frame sections. Provide thermal break to separate interior and exterior frame sections.

12. Factory apply touch-up primer to areas where zinc coating has been removed during fabrication.

13. Construct door frames of labelled fire doors as detailed in Follow-up Service Procedures/Factory Inspection Manuals issued by nationally recognized listing agency to individual manufacturers and tested in conformance with CAN4-S104-M. Ensure ratings for frames match doors as minimum requirement. Locate label on frame jamb on hinge side, so it is concealed when door is closed.

14. Undercut 19 mm (3/4") for air intake at washrooms and other doors indicated on Door Schedule.

5. Welded Type Frames

1. Mitre corners of frames. Cut frame mitres accurately and weld continuously on inside of frame.

2. Protect mortise cut outs with mortar guard boxes. Omit for gypsum board applications.

3. When required due to large size of frame product, fabricate and ship to Site in sections. Indicate joints for field assembly on shop drawings.

4. Cope and weld butt joints of mullions, transom bars, centre rails and sills. Grind welded joints to smooth uniform finish.

5. Attach floor anchors to inside of each jamb profile.

6. Weld in 2 temporary jamb spreaders at each frame to maintain alignment during shipment.

7. Form glazing stops into channels, minimum 16 mm (5/8") height, accurately fitted, butted at corners and fastened to frame sections with counter-sunk oval head sheet metal screws.

8. Mortar boxes to be installed at all electronic hardware.

6. Doors - General

1. Fabricate doors to be swing type flush with 1 continuous face free from joints, tool markings and abrasions and with provisions for glass and/or louvre openings as indicated on Door Schedule and Drawings.

2. Coordinate louvre openings with Division 15 Mechanical.

3. Fabricate exterior doors to be (insulated) (or) (hollow steel) construction with continuous welded longitudinal edges. Fabricate interior doors to be (honeycomb) (or) (hollow steel) construction.

4. For honeycomb doors longitudinal edges shall have mechanically interlocked, adhesive assisted seams, filled and sanded flush. For

hollow steel doors longitudinal edges shall have seams welded, filled and sanded flush.

5. Fabricate doors with top and bottom inverted recessed spot welded channels.

6. Provide flush (PVC) (or) (steel) top cap on exterior doors.

7. Reinforce, blank, drill and tap doors for mortised, templated hardware.

8. Reinforce doors for surface mounted hardware.

9. Factory prepare holes 13 mm (1/2") diameter and larger. Factory prepare holes less than 13 mm (1/2") when required for function of device for knob, lever, cylinder, turnpieces or when these holes overlap function holes.

10. Fabricate fire rated door assemblies as detailed in Follow-up Service Procedures/Factory Inspection Manuals issued by nationally recognized listing agency to individual manufacturer and tested in conformance with CAN4-S104-M. Provide labels for fire rated doors.

11. Fabricate fire rated doors where indicated in Door Schedule or Drawings, to meet required maximum temperature rise on unexposed side of door in accordance with OBC and ULC requirements.

12. Construct rail and stile doors in same manner as flush doors.

13. Construct panels to match doors.

14. Reinforce panels to prevent oil canning. Install panels with concealed fasteners and reinforce to accommodate hardware as required. Provide door top and rebated matching panel where no transom mullion occurs.

15. Where required prepare doors for electronic hardware.

7. Doors: Hollow Steel Construction

1. For exterior doors fabricate door faces in single sheet of 1.519 mm (16 ga) steel thickness.

2. For interior doors fabricate door faces in single sheet of 1.519 mm (16 ga) steel thickness.

3. Reinforce hollow steel doors with vertical stiffeners spaced 150 mm (6") o.c. maximum. Spot weld stiffeners to internal face of doors at top and bottom.

4. Fill voids between stiffeners with polyurethane core for exterior doors and glass fibre core for interior doors.

8. Doors: Honeycomb Core Construction

1. Fabricate each face sheet for exterior door from 1.519 mm (16 ga) sheet steel and laminate under pressure to honeycomb core. Core shall completely fill inside hollow of door.

2. Fabricate each face sheet for interior door from 1.519 mm (16 ga) sheet steel and laminate under pressure to honeycomb core.

3. Reinforce, stiffen and sound deaden doors with core laminated to inside faces of panels. Core shall completely fill inside hollow of door.

9. Prime Painting: Apply factory touch up primer at areas where zinc coating has been damaged during fabrication.

10. Doors: Acoustical Assembled Doors & Frames

1. Equal to “Acoustical Assemblies” – SF 14 Frame SD 16 Doors Series as manufactured by SW Fleming. Sound attenuating core with STC rating 46, surface mounted adjustable automatic door bottoms

2. Acoustic frames shall be equal to SF-14 SUW by SW Fleming with STC rating of 46. Frames shall be supplied with factory installed surface mounted acoustic gasket/stop, protectors and cap wall anchors.

2. EXECUTION

1. Installation

1. Supply steel doors and frames to Section 06200, Finish Carpentry for installation.

End of Section

1. GENERAL

1. GENERAL CONDITIONS

1. Division One, General Requirements, is a part of this section and shall apply as if repeated here.

2. RELATED WORK SPECIFIED ELSEWHERE

1. Installation of formed steel channel frames for access doors and security doors: Section 04200, Masonry.
2. Supply of security hardware: Section 08780, Security Finish Hardware.
3. Finish painting: Section 09900, Painting and Finishing.
4. Cell grille doors: Section 11190, Security Grille Doors, Screens and Equipment.
5. Supply and installation of wiring and conduits between Control Rooms and doors with electric hardware: Division 16, Electrical.

3. REFERENCES

1. ANSI Z97.1-1984 (R-1994) - Safety Performance Specifications and Methods of Test for Safety Glazing used in Buildings

2. ASTM A167-99 - Standard Specifications and Methods of Test for Safety Glazing used in Buildings.

3. ASTM A1008/A1008M-02 - Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low Alloy with Improved Formability (replaced A366)

4. ASTM A370-02 - Test Methods and Definition for Mechanical Testing of Steel Products

5. ASTM A1011/A1011M-02 - Specification for Steel, Sheet and Strip, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low Alloy with Improved Formability (replaced A569

6. ASTM A627-95 - Specification for Homogeneous Tool-Resisting Steel Bars for Security Applications

7. ASTM A629-88(R1994) - Specification for Tool-Resisting Steel Flat Bars and Shapes for Security Applications

8. ASTM A635-02 - Specifications for Steel Sheet, Zinc-coated (Galvanized) by Hot Dipped Process, Commercial Quality.

9. ASTM B117-02 - Method of Salt Spray (Fog) Testing

10. ASTM D256 –02e1 - Standard Test methods for Impact Resistance of Plastics and Electrical Insulating Materials

11. ASTM D638-02a - Standard Test Methods for Tensile Properties of Plastics

12. ASTM D 790-02 - Standard Test Methods for Flexural Properties of Un-reinforced and Reinforced Plastics and Electrical Insulating Materials

13. ASTM D 792-00 - Standard Test Methods for Specific Gravity (Relative Density) and Density of Plastics by Displacement

14. ASTM D1735-02 - Practice of Testing Water Resistance of Coating Using Water Fog Application

15. ASTM D 1929(R2001)e1 - Standard Test Method for Ignition

16. ASTM E 2074-00 - Method of Fire Tests of Door Assemblies Including Positive Pressure Testing of Side-Hinged and Positive Swinging Door Assemblies

17. ASTM F 1233-98 - Standard Test Method for Security Glazing Materials and Systems

18. ASTM F-1450-97 - Standard Test Methods for Hollow Metal Swing Door Assemblies for Detention Centre

19. ASTM F-1577-01 - Standard Test Methods for Detention Locks for Swing Doors.

20. CAN/CGSB-1.40-97 - Primer, Structural Steel, Oil Alkyd Type

21. CAN/CGSB-12.1-M90 - Tempered or Laminated Safety Glass

22. CGSB 31-GP-105Ma - Zinc Phosphate Conversion Coatings for Paint Base

23. CAN/ULC S702-97 - Thermal Insulation, Mineral Fibre, for Buildings

24. CAN/CSA-G40.20/G40.21M98 - General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steels

25. CSA W59-M89(r2001) - Welded Steel Construction (Metal Arc Welding)

26. CAN4-S104-M80 (R1985)

27. NFPA 80 - Fire Doors and Windows

28. NFPA 252-95 - Standard Methods of Fire Tests of Door Assemblies

4. SUBMITTALS

    1. Product Data

        1. Submit manufacturer's product, fabrication and installation instructions to suit Project requirements including Site conditions. Provide instructions for installation in concrete block work complete with frame bracing detail and frame tolerances.

        2. Submit manufacturer's printed product information that includes physical properties and recommended installation and glazing procedures including edge engagement guidelines.

    2. Shop Drawings

        1. Submit shop drawings in accordance with Specification Section 01300 Submittals. Show actual plans, elevations and sections of each type of unit, complete with materials, core thicknesses, finishes, connection and joints, methods of anchorage, number of anchors, supports, reinforcement and accessories.

    3. Samples

        1. Submit verification samples for each glazing type specified, not less than 12 inches square and framed on two adjacent sides to indicate glazing system.

        2. Submit samples for following components:

            1. Door corner section with hinge preparation showing top of door and door construction.

            2. Door frame corner section showing weld joint of head to jamb; hinge mortice, reinforcement and glazing stop assemblies.

    4. Operation and Maintenance Data

        1. Submit operating and maintenance data for all equipment supplied.

5. QUALITY ASSURANCE

    1. Qualifications

1. If requested, manufacturers shall provide evidence of having personnel and plant and equipment capable of fabricating hollow metal security door and frame assemblies of type specified. Provide evidence of having qualified welders capable to weld material types, thicknesses and joint types typical for hollow metal doors and frames on this Project. Manufacturers shall have a minimum of 5 (five) years of experience of regularly and successfully providing types of security doors and frames required for this Project. Substantiate with list of representative Projects where security door and frames were installed including dates of Projection completion.

2. Work of this Section shall be by MS Security Products Ltd, Steelgate Security Products Ltd. or Strongbar Industries Inc. RL Institutional Security, Nudorco Specialty Door Products, Kach Inc, provided they meet all specified requirements.

2. Quality Control

1. Check and verify each frame opening for tolerances. At masonry wall check initial setting, masonry support and anchorage system and masonry grout including masonry placing around frame.

3. Test Reports

1. Submit Test Reports listed herein. Test Reports shall include details of test samples and details and if requested photographs of testing apparatus. Test samples shall be retained at manufacturer's facilities for possible review.

2. Tool Resistant Steel: Submit test reports from qualified independent testing laboratory showing that tool-resistant steel used as part of work of this Section conforms with ASTM A627 and A629.

3. Static Load Test: To measure integrity of door construction. Support 3'-0" x 7'-0" flush door without any preparations for hardware and place beams across door at quarter points and then place third beam perpendicular to and top of first sets of beams. Apply load as listed herein employing a calibrated hydraulic ram. Measure panel deflection at centre point on panel using dial indicator.

1. Door Face Thickness: 14 gauge (2.00 mm)

2. Static Load: 14, 000 lb (6400 kg)

3. Max Deflection: 0.58" (15 mm)

4. Rack Test: To measure deflection due to racking load (twisting attack). Clamp 3'-0" x 7'-0" flush door without any preparations for hardware and place beams across door at quarter points and then place third beam perpendicular to and top of first sets of beams. Apply load as listed herein employing a calibrated hydraulic ram. Measure panel deflection at centre point on panel using dial indicator.

    1. Door Face Thickness: 14 gauge (2.00 mm

    2. Racking Load: 7,500 lb (3400 kg)

    3. Max Deflection: 3.5" (89 mm)

5. Impact Test: To assess full functionality of door under repeated bashing blows anticipated under riot conditions. Mount door in vertical position with required security hardware, maintain door in closed and locked position throughout test. Apply repeated blows when door is maintained in this position. Subject mounted door to 200 ft/lh blows, delivered from a pendulum mechanism utilizing 80 lb weight. Deliver blows at location within 6" of its lock and 6" from of hinges.

    1. Door Face Thickness: 14 gauge (2.00 mm)

    2. Number of Impacts at lock area: 400

    3. Number of Impacts at hinge area: 450

    4. After impact loading door shall be fully functional.

4. Regulatory Requirements

    1. Fire rated door assemblies including frame and hardware shall comply with NFPA 80 and shall be tested, listed and labelled in accordance with CAN4-S104-M and shall carry label for fire rating indicated on Door Schedule. Marking shall be ULC Master label on each door, ULC Component label on each frame.

6. WARRANTY

    1. Warrant bullet-resistant security glazing against delamination and any other defects and deficiencies for period of 5 years in accordance with General Conditions of the Contract. Promptly make good any defects or deficiencies which become apparent during warranty period, to satisfaction of the Architect and at no extra cost to the Owner. Such warranty shall include replacement of defective security glazing

complete with installation at Owner's convenience.

2. Further warrant that installation of bullet-resistant security glazing is in accordance with Specifications and GANA (formerly Flat Glass Marketing Association (FGMA) recommendations for security glazing; and that no compounds nor solvent thinners or cleaners have been used in connection with installation and cleaning of security glazing which are deemed by glazing manufacturer to be incompatible with or hazardous to security glazing and its laminations.

2. PRODUCTS

1. INCLUDED

1. Supply and deliver to Site following items of work as well as items specified herein and indicated on the drawings.

1. Non-fire rated security doors and frames, complete with hinges and locksets with keys, including electro-mechanical locks where required and view panels.

2. Grille doors and surrounding grille walls, complete with hinges and locksets with keys.

3. Access doors and frames complete with locks and keys.

4. Security windows, each complete with its finishing frame, bullet resistant security glazing, stops and keeper frame with security screws, and including security bars where indicated.

5. Special deal trays and speaking ports.

2. MATERIALS

1. Steel: CAN/CSA-G40.20-M and CAN/CSA-G40.21-M, Grade 300W.

2. Hollow Structural Sections: CAN/CSA-G40.20-M and CAN/CSA-G40.21-M, Grade 350W.

3. Sheet Steel: Cold or hot rolled, commercial quality stretcher levelled carbon steel sheet coated to requirements of ASTM A653 with minimum zinc coating designation of Z275 or uncoated, ASTM A366M of following minimum thickness in mm (inches).

(Gauge)	Coated (gsg)	Uncoated (msg)

Door Frames	(10)	3.54 (0.1382)	3.50 (0.1345)
Door Faces	(14)	2.04 (0.0785)	2.0 (0.0747)
Top, Bottom and Side Channels	(12)	2.84 (0.1084)	2.8 (0.1046)
Horizontal Stiffeners	(12)	2.84 (0.1084)	2.8 (0.1046)
Vertical Core Reinforcement	(26)	0.49 (0.0217)	0.45 (0.0179)
Reinforcements for Hardware	Manufacturer's standard to suit design requirements		

Note: Hardware reinforcements for full mortice hinges and pivots, for surface applied security hinges, for hanger attachment on sliding doors, reinforcements for lock fronts, concealed and surface mounted holders, and internal reinforcements for surface applied hardware.

1. Glazing Stops Removable to suit design and as indicated on Drawings.

    1. Removable glazing stop may be pressed steel angle or surface mounted glazing stop secured in place with temper proof screws .

2. Tool Resisting Steel Bars: ASTM A627, 32 mm (1-1/4") dia round, ribbed, hexagonal or other shaped bars of homogeneous tool resisting steel having Rockwell hardness C60 to depth of 2.78 mm (0.109") (7/64") from outer surfaces but not penetrating to core. Case hardened open hearth steel is not acceptable. Tool resisting steel tested in accordance with ASTM A370 and ASTM E18.

3. Tool Resisting Steel Flat Bars and Shapes: ASTM A629, flat bars and shapes of tool resisting steel having Rockwell hardness C45 to depth of 2.78 mm (0.109") (7/64") from outer surfaces but not penetrating to core. Case hardened open hearth steel is not acceptable. Tool resisting steel tested in accordance with ASTM A370 and ASTM E18.

4. Stainless Steel

    1. Sheet: AISI Type 30, No. 4 finish or ASTM A167, Type 304, 2.78 mm thick (12 ga),

    2. Tube: AISI Type 302 or 304, wall thickness 1.65 mm (0.065"), No. 4 (180 grit) finish.

5. Welding Materials: CSA W59-M.

6. Door Fill: Mineral wool, CSA A101-M or rigid fibreglass, minimum density 96 kg/m^3 (6 lb/cu ft).

7. Phosphatizing: CGSB 31-GP-105Ma.

8. Prime Paint: CAN/CGSB-1.40-M.

9. Metal Filler: Polyester based filler.

10. Fastening Devices

    1. Exposed screws, bolts and nuts shall be security type. Fasteners in areas where not required to be removed and those on prisoner side of any construction, shall be either flat or round head, having extra head which will twist off when fully secured, leaving main head flush or projected without slots.

    2. In areas where it is necessary to remove items, screws shall have slots or holes that require special security tool for their removal and shall be such that standard tools will not fit.

    3. Expansion shields for setting in concrete shall be by recognized manufacturer. Each type of fastener shall be clearly indicated on shop drawings.

11. Reinforcements and Anchor Systems

    1. Minimum thicknesses of hardware reinforcing plates shall be as follows:

        1. Hinge and pivot reinforcements 5 mm x 38 mm 250 mm (3/16" x 1 1/2" x 10") long

        2. Strike reinforcements 5 mm (3/16")

        3. Closer reinforcements 5 mm (3/16")

        4. Flushbolt reinforcements 5 mm (3/16")

    2. For electrically operated hardware provide hardware enclosure and junction box interconnected using ULC approved conduits and connectors. Provide access plates of same gauge as frame and fastened with temper resistant machine screws to facilitate installation of electrical wiring.

3. Floor Anchors: Provide floor anchors of same gauge as frame with minimum 2 holes for fastening to floors and spot welded to inside jamb. Provide adjustable floor anchors where required to suit design requirements.

4. Jamb Anchors for Installation in Masonry Wall: Provide strap and stirrup type adjustable jamb anchors from same gauge steel as frames. Stirrups shall be no less than 50 mm x 250 mm (2" x 10"). Number of anchors to suit design, spaced 450 mm (18") maximum between anchors. Provide additional anchors for fire rated doors in accordance with ULC requirements.

12. Bullet Resistant Polycarbonate

1. Polycarbonate Sheet complying with ANSI Z97.1 and with following characteristics:

1. Specific Gravity: 1.2 in accordance with ASTM D792;

2. Tensile Strength, yield 62 MPa (9000 psi)in accordance with ASTM D638;

3. Tensile Modulus: 234 MPa (340,000 psi) per ASTM D638;

4. Flexural Strength at 5% strain: 93 MPa (13,500 psi) in accordance with ASTM D790;

5. Flexural Modulus: 237 MPa (345,000 psi) in accordance with ASTM D790;

6. Izod Impact Strength (3.2 mm (0.125 inch) notched): 2.5 kP/cm (14-18 ft. lb./in) in accordance with ASTM D256;

7. Self Ignition temperatures: 581 C (1077 F) in accordance with ASTM D 1929;

8. Flash Ignition temperature: 467 C (872 F) in accordance with ASTM D1929

2. Provide factory laminated three ply polycarbonate and acrylic laminate. Exterior layers shall be UV stabilized, treated with mar-resistant and anti-graffiti application to exposed surfaces. Bullet resistant glazing assembly shall be minimum 19 mm (3/4") thick made up of 3.2 mm (1/8") exterior layers bonded with manufacturer's interlayers and central core of minimum 12. 7 mm (1/2") thick with following properties:

1. Ballistic ratings: UL 752 Level 1, MPSA .38 Super Automatic

2. Gauge: 20 mm (0.800) +/- 5% tolerance;

3. Weight: 24.9 kg/sq. m (5.1 lbs/sq.ft).;

4. Shading Coefficient: 0.89;

5. Light Transmission: Clear, 88%

6. Forced Entry Ratings in accordance with ASTM F1233; Class to suit project requirements.

3. Following products are acceptable provided they meet above requirements:

1. General Electrical Co, 19 mm (3/4") Bullet Resistant Glazing, Lexgard MP750

2. Sheffield Plastics Inc, 19 mm (3/4") Bullet Resistant Glazing, Hygard BR 750

4. No deviations in finished laminated product shall result in objectionable visual distortion as determined by Architect.

5. Provide proof, satisfactory to Architect that bullet-resistant glazing assemblies meets specified requirements.

6. Glazing Bedding Compounds and Tapes: Solvent-free, of type compatible with security glazing system. Solvent-free polysulphide, silicone or butyl rubber based sealants maybe used.

2. FABRICATION

1. General

1. Metal shall be formed true to shop drawings, free from defects impairing strength, durability and appearance. Do not weld tool resisting bars.

2. Components shall be fabricated with required structural properties to safely withstand or abstain strain and stresses to which they will be subjected.

3. Steel plates shall be free from buckles and waves.

4. Fit and assemble work in shop where possible. Where shop fabrication is not possible make trial assembly in shop.

5. Supply anchoring devices required for fabrication and erection of this Section.

6. After fabrication remove mill scale, scrape and clean all ferrous metals and apply 1 coat of primer. Brush on and work well into crevices and interstices.

2. Welding: CSA W59-M.

    1. Grind exposed welds smooth and flush. Fill open joints, seams and depressions with filler or by continuous brazing or welding. Grind smooth to true sharp arrises and profiles, and sand down to smooth, true, uniform finish.

3. Hardware Requirements: Blank, mortise, reinforce, drill and tap doors and frames to receive templated hinges and other hardware as required. Check hardware lists for requirements.

4. Frames for Doors and Screens

    1. Fabricate frame to profiles indicated.

    2. Mitre corners of frame.

    3. Where Site welding or splicing is required due to size of unit, location of field joints shall be indicated on shop drawings and strictly adhered to.

    4. Fabricate frames with plates for anchorage to slabs.

    5. Provide tubular or solid stops for glazing and panels as indicated on Drawings.

5. Door Fabrication

    1. Fabricate door with face sheets both sides to overall thickness of 50.8 mm (2") or 57.2 mm (2-1/4"). Each face sheet shall be 1 piece construction formed to corner and meet at middle of door thickness with continuous weld on edges.

    2. Reinforce core of door by 1 of following methods:

        1. With fluted inner reinforcement extending full width and height of door. Reinforcement shall be of truss design with triangular form having flat apexes 70 mm (2-3/4") oc.

Resistance weld faces to reinforcement at each apex across width of door and vertically at 75 mm (3") oc along full height of door.

2. With reinforcing channels placed horizontally and continuously from side to side as follows:

    1. Half way between horizontal centre line of door and top.

    2. Half way between horizontal centre line of door and bottom.

    3. Not more than 127 mm (5") above horizontal centre line of door.

    4. Not more than 127 mm (5") below horizontal centre line of door.

    5. Where any opening or accessory in door prevents horizontal reinforcing channel from being located as described above, provide 1 immediately above and below such opening.

3. Completely fill voids of core with specified filler.

4. Close edges of door with steel channels welded to both faces of door. Bevel lock side of stile 3 mm (1/8").

5. Weld continuous steel channels around observation port openings and around lock mounting boxes.

6. Provide glazing stops; weld inner stop in position and affix outer stop with twist off security screws.

7. Provide reinforcements to inside of door to receive security hinges.

6. Prime Painting

    1. Steel surfaces shall be shop painted as follows:

        1. Wipe coat galvanized and prime painted or

        2. mill phosphatized and prime painted or

        3. shop degreased, phosphatized and prime painted.

2. EXECUTION

1. INSPECTION

1. Inspect surface and conditions to which work is to be attached and report any deficiencies.

2. Inspect frames priot to installation for size, swing, squareness, alignment, twist and plumbness. Tolerances shall not exceed following:

1. Squareness : 1.6 mm (1/16") measured on a line 90?from one jamb, at upper corner of frame at other jamb.

2. Alignment : 1.6 mm (1/16") measured on jamb on a horizontal line parallel to plane of wall.

3. Twist : 1.6 mm (1/16") measured at face corners of jamb on parallel lines perpendicular to plane of wall.

4. Plumbness: 1.6 mm (1/16") measured on jamb at floor.

5. Prior to installation, check and correct frames to permissible installation tolerances.

2. PREPARATION

1. Take accurate field measurements of openings to receive work and make any required adjustments.

3. INSTALLATION

1. Erect work square, plumb, straight and true, accurately fitted, with tight joints and intersections.

2. Install doors in frames, adjust to close without binding. Joint width between door shall be 3 mm (1/8") maximum on each edge or as per hardware requirement

3. Secure door frames to existing structure with dowels, anchor clips, bolts, bar anchors, toggles and related fasteners as required.

4. Touch up rivets, field welds, bolts and burnt or scratched surfaces with primer after completion of erection.

5. Install security glazing in work of this Section as scheduled. Conform to recommendation of Glazing Manual of GANA (formerly Flat Glass

Marketing Association (FGMA), for security glazing work.

6. Do not use oil base or solvent compounds, nor solvent thinners or cleaners or any other detrimental product in connection with installation and cleaning of security glazing.

7. Finished installation shall be rigidly sitting in place and free of movement upon impact. Surfaces shall be smooth and free from abrasive or sharp corners.

8. Set, fit and adjust hardware according to manufacturer's directions as per shop drawings. Hardware shall operate freely. Wherever practicable, obtain and mount security hardware on work furnished by this Section prior to delivery to Site.

End of Section

1. GENERAL

1. GENERAL REQUIREMENTS

1. Division One is a part of this Section and shall apply as if repeated here.

2. RELATED SECTIONS

1. Installation of finish hardware: Section 06200 Finish Carpentry or 06400 Architectural Woodwork.

2. Requirement for field quality control: Section 06200 Finish Carpentry or 06400 Architectural Woodwork.

3. Installation of hardware for aluminum entrance doors specified by Section 08400 Aluminum Entrance Framing & Doors and Section 08900 Aluminum Curtain Wall.

3. REFERENCES

1. CAN/CGSB 69.25 M90 - Cabinet Hardware
2. ANSI/BHMA 156.9-1982
3. CAN/CGSB-69.34-93 - Materials and Finishes
4. ULC - Underwriters Laboratories of Canada
5. WH - Warnock Hersey

4. SYSTEM DESCRIPTION

1. Keying System

1. Lay out keying system for building in consultation with the Architect. Keying system shall include keying alike, keying differently, keying in groups, sub-master keying and grand-master keying locks as required.

2. Prepare and submit keying chart and related explanatory data to the Architect for approval. Do not commence lock work until written confirmation of keying arrangements is received from the Architect.

3. Supply following keys:

1. 3 grand-master keys

2. 3 sub-master keys.

3. 2 change keys for each lock.

4. Hand over keys to the Owner.

5. SUBMITTALS

    1. Samples

        1. Submit samples of complete line of hardware and finishes to the Architect for approval, if and when requested, to accompany any proposal for substitution.

        2. Hardware shall not be ordered from manufacturer until samples have been approved by the Architect and hardware and finishes supplied shall be identical with approved samples.

6. DELIVERY, STORAGE AND HANDLING

    1. Pack hardware in suitable wrappings and containers to protect it from injury during shipping and storage. Accessories, fastening devices and other loose items shall be enclosed with each applicable item of hardware. Mark packages for easy identification as indicated on approved delivery schedule.

    2. Deliver to building finish hardware for door listed in Door Schedule and hardware for cabinet work. Hand hardware over to trades which are designated to install it.

7. INSPECTION

    1. Hardware supplier shall check all hardware when it has been installed and shall notify the Architect of any cases where it has not been properly installed, is defective, or is not as specified. Replace defective hardware. Hardware supplier or closer manufacturer on his behalf shall check all door closers after they have been installed to make sure that all adjustments such as back checking degree have been properly made. Notify the Architect of any closers which have not been properly adjusted.

8. WARRANTY

    1. Warrant work of this Section against defects and deficiencies for period of 5 years for door closers, and 2 years for other hardware, in accordance with General Conditions of the Contract. Promptly correct defects and deficiencies which become apparent within warranty period, to satisfaction to the Architect and at no expense to the Owner.

2. PRODUCTS

1. MATERIALS

1. Hardware schedule to be prepared under the Hardware Allowance. Refer to Section 01020- Allowances.

2. Hardware manufactured by following firms are acceptable subject to approval by the Architect of samples and list of items proposed:

1. Hinges

1. Hager Hinge Canada Ltd.
2. Stanley Hardware
3. McKinney

2. Locks:

1. Yale-Corbin Canada Ltd.
2. Schlage Locks-Ingersoll-Rand Door Hardware
3. Sargent of Canada Ltd.
4. Ilco Unican Inc. Dominion Lock Division
5. Best Universal Locks Ltd.

3. Exit Devices:

1. Yale-Corbin Canada Ltd.
2. Sargent of Canada Ltd.
3. Von Duprin -Ingersoll-Rand Door Hardware
4. American Device Mfg. Co. (Dorma Door Controls)

4. Door Closers:

1. LCN Closers-Ingersoll-Rand Door Hardware
2. Sargent of Canada Ltd.
3. Yale-Corbin Canada Limited
4. Yale-Rixson Firemark (Can) Ltd. (floor type only)
5. Norton Closers-Yale-Corbin Canada Ltd.
6. Dorma Door Controls Ltd.

5. Door Holders:

1. Yale-Rixson Firemark (Can) Ltd.
2. Glynn-Johnson Ingersoll-Rand Door Hardware
3. Sargent of Canada Ltd.
4. K.M. Thomas Co. Ltd.

6. Door Stops:

    1. Glynn-Johnson Ingersoll-Rand Door Hardware
    2. Canadian Builders Hardware Manufacturers Ltd.
    3. Hager Architectural Hardware
    4. Standard Metal Hardware Mfg. Ltd.
    5. Ives of Canada Ltd.
    6. Gallery Specialty Hardware

7. Pushplates/Door Pulls:

    1. Canadian Builders Hardware Manufacturers Ltd.
    2. Hager Architectural Hardware
    3. Standard Metal Hardware Mfg. Ltd.
    4. Ives of Canada Ltd.
    5. Gallery Specialty Hardware

8. Kickplates:

    1. Canadian Builders Hardware Manufacturers Ltd.
    2. Hager Architectural Hardware
    3. Standard Metal Hardware Mfg. Ltd.
    4. Ives of Canada Ltd.
    5. Gallery Specialty Hardware

9. Thresholds:

    1. K.N. Crowder Mfg.
    2. Hager Architectural Hardware
    3. Pemko

10. Weatherstripping:

    1. K.N. Crowder Mfg.
    2. Sound Seals: Hager Architectural Hardware
    3. Zero Manufacturing Ltd.
    4. Pemko

11. Miscellaneous:

    1. Canadian Builders Hardware Manufacturers Ltd.
    2. Hager Architectural Hardware
    3. Gallery Specialty Hardware Ltd.
    4. Dominion Brass Products Ltd.
    5. Standard Metal Hardware Mfg. Ltd.

2. FABRICATION

1. Strikes

1. Lock strikes shall be standard template box strikes, with extended lips to protect door frames and trim from marking with bolts, and shall be set flush in hollow metal door frames.

2. Blank standardized template strikes for hollow metal door frames shall be supplied as scheduled for such doors without locks.

2. Door Closers

1. Door closers shall be rack and pinion type with back checking feature and shall be of proper sizes to operate each respective door efficiently. Shaft packing shall be leak-proof.

3. Kick and Bumper Plates

1. Kick and bumper plates shall be as scheduled with edges cut square and smoothed off and shall have countersunk holes and oval head screws which shall be placed at each corner and symmetrically arranged at a maximum spacing of 200 mm (8") along edges.

2. Stainless steel kick plates shall be 1.27 mm (0.05") minimum thickness, satin finish, Type 304.

4. Thresholds

1. Supply thresholds complete with countersunk holes, and with screws and anchors as required for proper anchorage.

5. Fasteners

1. Supply hardware complete with screws, bolts, expansion shields and other fastening devices as required for satisfactory installation and operating of the hardware.

2. Supply fastening devices of same finish as hardware which is to be fastened.

3. Where pull is scheduled on one side of door, and push plate on other side, issue installation directions to trade responsible for fixing, so that the pull shall be secured through door from reverse side and push plate installed to cover screws. Flush pulls shall be supplied with machine screws for attaching as specified above.

6. Finishes

1. Type and finish of hardware shall be equal in all respects to samples of hardware and finishes approved by the Architect.

2. Metal finishes shall be free from defects, clean and unstained, and of uniform colour.

7. Finish hardware for fire rated doors shall meet requirements of ULC as part of fire rated door assembly and shall carry ULC or WH label.

3. EXECUTION

1. EXAMINATION

1. Before furnishing any hardware, carefully check all architectural Drawings of work requiring hardware, verify door swings, door and frame material and operating conditions, and assure that hardware will fit work to which it is to be attached.

2. Check shop drawings and frame and door lists affecting hardware type and installation, and certify to correctness thereof, or advise the Architect in writing of required revisions.

3. Templates: Check Hardware Schedule, Drawings and Specifications, and furnish promptly to applicable trades any templates, template information and manufacturer's literature, required for proper preparation for and application of hardware, in ample time to facilitate progress of work.

2. LOCATION OF HARDWARE

1. Hinge Locations

1. Doors 1981 mm to 2286 mm (6'-6" to 7'-6") in height and requiring 3 hinges.

1. Top Hinge: 298 mm (11-3/4") maximum from centreline of hinge to frame head rabbet.

2. Centre Hinge: equal distance from centre line of top and bottom hinge.

3. Bottom Hinge: 330 mm (13") maximum from centreline of hinge to bottom of frame.

2. Doors 2311 mm (7'-7") and over in height and requiring 4 or more hinges.

1. Top Hinge: 298 mm (11-3/4") maximum from centreline of hinge to frame head of rabbet

2. Centre Hinges: symmetrically spaced between top and bottom hinge.

3. Bottom Hinge: 330 mm (13") maximum from centreline of hinge to bottom of frame.

2. Lock Location: 1024 mm (40-5/16") from centreline of lock to bottom of frame.

3. Deadlock Strike Location: 1219 mm (48") from centreline of strike to bottom of frame.

4. Door Pulls

1. 1067 mm (42") from centreline of grip or push bar to bottom of frame.

2. Hospital Arm Pulls: 1143 mm (45") from centreline of base to bottom of frame.

5. Push Plates: 1143 mm (45") from centreline of plate to bottom of frame.

6. Kick Plate: Within 6 mm (1/4") of door bottom.

1. Single Door Width:

1. Push side; less 40 mm (1½") of door width.

2. Pull side; less 25 mm (1") of door width.

2. Double Door Width:

1. Push side; less 25 mm (1") of door width.

2. Pull side; less 25 mm (1") of door width.

3. FIELD QUALITY CONTROL

1. Provide services of competent mechanic to Section 06200, Finish Carpentry or Section 06410, Carpentry and Millwork without additional cost to Owner to assist with verification of hardware received and operation and adjustment of operating hardware items.

4. SCHEDULES

1. Abbreviations: Abbreviations used in Hardware Schedule are as follows:

Finishes	CGSB	BHMA
Prime Coat	CP	600
Bright Brass (polished)	C3	605
Bright Nickel (polished)	C14	618
Dull Nickel	C15	619

Dull Nickel on Steel (hinges)	C15	649
Bright Chrome (polished)	C26	625
Dull Chrome	C26D	626
Satin Aluminum Anodized	C28	628
Bright Stainless Steel (polished)	C32	629
Dull Stainless Steel	C32D	630
Silver Aluminum Lacquer	SB/EN	628

2. Doors:

HMD	Hollow Metal Door
PL	Plastic Laminate
WD	Wood Door

3. Frames:

CIF	Channel Iron Frame
PSF	Pressed Steel Frame

4. Fastenings:

ATMS	Arm Template Machine Screws
ATB	Arm Through Bolts
BS	Backset
MS	Machine Screws
NRP	Non-Removable Pin
STS	Self Tapping Screws
STMS	Strike Template Machine Screws
TBGN	Through Bolts & Grommet Nuts
TMS	Template Machine Screws
WS	Wood Screws
WS/LS	Wood Screws/Lead Shields

5. Keying:

CMK	Construction Master Keyed

EK	Emergency Key
GMK	Grand Master Keyed
KA	Keyed Alike
KD	Keyed Different
MK	Master Keyed
SMK	Sub Master Key

5. HARDWARE SCHEDULE

1. Hardware schedule to be prepared under the Hardware Allowance; refer to Section 01020- Allowances.

End of Section

1. GENERAL

1. GENERAL REQUIREMENTS

1. Installation of security finish hardware: Section 08320 Security Doors, Frames and Screens.

2. Installation of conventional finish hardware: Section 06200 Finish Carpentry and Section 08110 Steel Doors and Frames

2. SYSTEM DESCRIPTION

1. Key out keying system for building in consultation with Owner, which keying system includes keying alike, keying differently, and keying in groups. No master keys or construction keys of any kind are permitted.

2. Prepare and submit a keying chart and related explanatory data to Owner for his approval. Do not commence lock work until written confirmation of keying arrangements is received from Owner.

3. Provide 3 keys to operate each different key code.

4. Do not delivery keys to Site. Send keys via registered mail with covering letter to Owner.

3. SUBMITTALS

1. Shop Drawings: Submit shop drawings in accordance with Section 01300 Submittals for locking and operating devices.

2. Samples

1. Submit samples of complete line of hardware and finishes to the Architect for approval, if and when requested, to accompany any proposal for substitution.

2. Do not order hardware from manufacturers or proceed with manufacturing until hardware and finishes supplied are identical with approved samples.

3. Operation and Maintenance Data

1. Submit 6 copies of maintenance, operating and repair parts manuals relative to each type of lock and locking device. Ensure manuals contain parts information in a form acceptable to the Architect.

2. Submit installation instructions for hardware installation purposes.

4. DELIVERY, STORAGE AND HANDLING

1. Pack hardware in suitable wrappings and containers to protect it from injury

during shipping and storage. Enclose accessories, fastening devices and other loose items with each applicable item of hardware. Mark packages for each identification as indicated on approved delivery schedule.

2. Deliver to building finish hardware for doors listed in Door Schedule and specified herein. Hand hardware over to trades which are designated to install it.

5. WARRANTY

1. Warrant work of this Section against defects and deficiencies for period of 5 years for door closers and for period of 2 years for other hardware in accordance with General Conditions of the Contract. Promptly correct defects and deficiencies which become apparent within warranty period, to satisfaction of the Architect and at no cost to the Owner.

2. PRODUCTS

1. MANUFACTURERS

1. Before installing any security finish hardware obtain manufacturer's advice on installation procedures applicable to each case.

2. Arrange for a competent representative of manufacturer to visit Site during installation period to ensure security finish hardware is being properly installed.

2. MATERIALS

1. For conventional hardware, (i.e. other than Chubb, Folger Adam or RL Institutional Security) security hardware specified herein, equivalent hardware manufactured by following firms is also acceptable, subject to approval by the Architect of samples and a list of items proposed.

1. Black & Decker Canada Inc. - Corbin Division
2. Dorma Door Controls Ltd.
3. Falcon Locks, Pro-Door Control Co. Ltd.
4. Ilco-Unican, Dominion Lock Division
5. Magnakrom Inc.
6. Medeco Security Locks Inc.
7. Sargent and Co. (Canada) Ltd.
8. Sargent Keso Security System
9. Schlage - LCN - Von Duprin
10. Yale-Rixson Firemark (Can) Ltd.

3. FABRICATION

1. Strikes: Use standard template box strikes for lock strikes, with extended lips to protect door frames and trim from marking with bolts, and set flush in hollow metal door frames.

2. Door Closers: Use rack and pinion type with back checking feature and of proper sizes to operate each respective door efficiently. Ensure shaft packing is

leakproof.

3. Kick and Bumper Plates

    1. Supply with edges cut square and smoothed off, countersunk holes and oval or flat head security torx screws of same material placed at each corner and symmetrically arranged at a maximum spacing of 200 mm (8") along edges.

    2. Supply stainless steel kick plates 1.27 mm (No.0.05") minimum thickness, satin finish.

4. Thresholds: Supply thresholds complete with countersunk holes, screws and anchors as required for proper anchorage.

5. Finish Hardware for Fire Rated Doors: Ensure finish hardware for fire rated door meets requirements of ULC as part of fire rated door assembly and carries ULC component label on each lock together with Model No. and electrical rating on electro-mechanical lock.

6. Electric Locks, Locking Devices and Deadbolts: Ensure electrically operated locks, locking devices and deadbolts remain locked in event of absence of electrical power. They shall not momentarily unlock and re-lock under such circumstances. All shall be so designed as to require electrical power to unlock them, and in the event of power failure each must be capable of being unlocked by key at the door. Operate electric locks and locking devices on 115 volt AC unless otherwise specified.

7. Cylinders

    1. Provide cylinders for security locks of 1 manufacturer unless otherwise specified herein.

    2. For conventional locksets, supplied by manufacturers listed herein.

    3. Mogul Cylinders: Provide "mogul" type key cylinders with 50 mm (2") barrel diameter, containing 5 stainless steel tumblers with stainless steel balls engaging tumblers and key.

8. Keys

    1. Ensure keys or security locks with mogul cylinders are not less than 73 mm (2-7/8") in length, blade 14 mm (9/16") wide x 3 mm (1/8") thick). Provide 25 mm (1") diameter handles.

    2. Ensure keys for lever tumblered prison locks are not less than 114 mm (4-1/2") in length with a blade 4 mm (5/32") thick. Ensure keys have overlapping paracentric grooves matching similar grooves in lock cylinder. Provide oval shaped handle to fit hand. Fabricate key from polished alloy bronze having a tensile strength of not less than 620 MPa (90,000) and hardness, on the Brinell scale, of at least 150.

3. Supply keys for conventional locks from 1 manufacturer unless specified otherwise herein and approved by the Architect. Ensure duplicates are not available at local key shops. Ensure they are available only from controlled Canadian sources explicitly authorized to produce same by cylinder manufacturer. Restrict key section to exclusive use of the Owner. Stamp each key of whatever type with number or letter as directed.

9. Electro-Mechanical Locking and Operating Devices for Sliding Doors:

1. Ensure operating and locking device is quiet in operation.

2. When closed or opened, each door automatically deadlocks at 2 concealed points. Ensure locking pilaster has no openings, and door has no projecting lugs. Ensure locking mechanism operates smoothly and is not dependent on gravity or springs for locking.

3. Ensure device is simple in design without components susceptible to excessive wear. Provide parts subject to wear with large accurately machined wearing surfaces that will maintain essential dimensions. Ensure electrical components conform to applicable CSA Standards. Protect motors with thermal safety devices. Provide sealed or self-lubricating type bearings that do not require oiling or greasing. Provide replaceable motor and gear reducer assembly. Wire motor through disconnect plugs.

4. Arrange device to permit manual unlocking and locking in emergency situations. Ensure mechanical release mechanism is concealed and protected by a security prison deadlock.

5. Operate doors on overhead hangers and bottom guide. Provide door rollers from cold rolled steel material, not less than 95 mm (3-3/4") in diameter. Ensure rollers turn on permanently lubricated ball bearings. Roller track shall be of cold rolled steel bar stock measuring not less than 13 mm (1/2") wide.

6. Ensure door hanger assembly is engaged in tract that it cannot be lifted off or forced out of alignment. Weld hanger assembly and bottom guide to door. Interlock with housing with clearances not greater than 6 mm (1/4") so to resist rocking of door. Design hanger assembly to allow for vertical adjustment of door after it is in place. For maintenance purposes, make it possible to disengage and remove a door from its suspended position on track without damaging door or its hanger and guide, or having to remove rivets or cut welds.

7. Enclose each horizontal locking and operating mechanism in a housing. Construct track box of 4.6 mm thick (7 ga) sheet steel. Ensure slot in which door hanger moves is baffled to prevent tampering. Ensure each track box section has removable cover fabricated from 3.4 mm thick (10 ga) sheet steel. Securely attach cover to track box. Construct horizontal

housing so sound attenuation level of mechanism therein is muted.

8. Extending from horizontal housing to floor, shall be vertical lock bar housing with cover, both made of 4.6 mm thick (7 ga) sheet steel. Ensure vertical cover is removable only when horizontal cover is removed.

9. Operate electric operating and locking device on single phase 115 volt, 60 hertz current and requires not more than 2.5 amperes per door. Operate indicator lights from 24 volt service unless specified otherwise. Conceal wiring within track boxes.

10. Motors, switches, speed reducers and other electrical components shall be of manufacturer's standard design.

11. Fit devices with limit switches to operate signal lights by Div. 16, Electrical on control consoles for purpose of indicating whether doors are closed and locked or not.

10. Fasteners for Security Hardware

1. Provide security type exposed screws, bolts and nuts. Those in areas not required to be removed and those on prisoner side of any construction, shall be either flat head or round head, having an extra head which will twist off or chip off when fully secured, leaving main head flush or projected without slots.

2. In other areas, where it is necessary to remove items screws shall have slots or holes that require a special spanner tool for their removal and shall be such that standard tools will not fit.

3. Ensure fastening devices are same finish as hardware which is to be fastened.

4. Ensure expansion shields for setting in concrete or concrete block are manufactured by a recognized manufacturer. Clearly shown each type of fastener on shop drawings.

11. Fasteners for Conventional Hardware

1. Supply conventional hardware complete with security screws, bolts, expansion shields and other fastening devices as required for satisfactory installation and operating of hardware.

2. Ensure fastening devices are of same finish as hardware to be fastened.

3. Where a pull is scheduled on 1 side of door and a push plate on other side, issue installation directions to trade responsible for fixing, so pull is secured through door from reverse side and push plate installed to cover

screws. Supply flush pulls with machine screws for attaching as specified above.

12. Finishes

1. Type and finish of all hardware supplied under this Section shall be equal in all respects to samples of hardware and finishes approved by Architect.

2. Those items of hardware which will have CP finish shall have 1 shop coat of compatible primer and be ready to receive finish paint specified by Section 09900 Painting and Finishing after installation.

3. Ensure paint finishes are free from defects, clean and unstained, and of a uniform colour.

3. EXECUTION

1. EXAMINATION

1. Before supplying any hardware, carefully check Architectural Drawings of the work requiring hardware. Verify door swings, door and frame material and operating conditions, and assure hardware will fit Work to which it is attached.

2. Check shop drawings and frames and door lists affecting hardware type and installation, and certify correctness thereof, or advise the Architect in writing of required revisions.

3. Check hardware schedule, Drawings and Specifications, and supply promptly to applicable trades any patterns, templates, template information and manufacturer's literature, required for proper preparation for and application of hardware, in ample time to facilitate progress of Work.

2. INSTALLATION

1. Assist and supervise hardware installation supplied by this Section.

3. FIELD QUALITY CONTROL

1. Provide services of a competent mechanic without additional cost to Owner. Ensure mechanic inspects installation of hardware supplied under this Section and supervises adjustments (by trades responsible for fixing) which are necessary to leave hardware in perfect working order.

2. Check over installation of security hardware and coordinate electrical requirements of security locks and their related devices in Division 16 - Electrical.

3. Check door stops to determine if wall or floor types have been installed, as specified.

4. Verify doors are set to swing to maximum allowable opening.

5. Obtain field approval from the Electrical Safety Authority or local authority as necessary, regarding electrical components used in the Work.

6. Assume complete responsibility for all loss and damage to hardware fittings and accessories supplied under this Section, which occurred prior to unloading of such items at Site. Whether such loss and damage were caused in plant or warehouse, or while in storage and during delivery, make good such loss and damage without additional cost to the Owner. Obtain signed, itemized receipts of such items delivered.

4. SCHEDULES

1. Abbreviations used in hardware schedule are as follows:

1. Canadian Standard Finishes:

CP	Prime Coat
CIB	Bright Japanned
C2C	Cadmium Plated
C2G	Bright Zinc
C3	Bright Brass (polished)
C4	Dull Brass
C9	Bright Bronze (polished)
C10	Dull Bronze
C14	Bright Nickel (polished)
C15	Dull Nickel
C19	Satin Black Lacquer
C20D	Dark Anodized, Statuary Bronze
C26	Bright Chrome (polished)
C26D	Dull Chrome
C27	Satin Aluminum Lacquered
C28	Satin Aluminum Anodized
C32	Bright Stainless Steel (polished)
C32D	Dull Stainless Steel

SB	Silver Aluminum Lacquer

2. Symbols:

AL	Aluminum
ASA	Standard Strike for Metal Frames
ATMS	Arm Template Machine Screws
ATB	Arm Through Bolts
BS	Backset
B4E	Bevelled 4 Edges
BL	Bolt Locked Limit Switch in Device
CC	Centre to Centre
Cy	Cylinder
CIF	Channel Iron Frame
CMK	Construction Master Keyed
DS	Dead Stop
Dr	Door
DA	Double Acting
EK	Emergency Key
FC	Flexible Connector
FMS	Full Machine Screw
GALV	Galvanized
GMK	Grand Master Keyed
HM	Hollow Metal
HO	Hold Open
KA	Keyed Alike
KD	Keyed Different
Kal	Kalamein
K1S	Keyed One Side
K2S	Keyed Two Sides

KLE	Knob Lock (Electric) One Side only
KLE2	(Knob Lock (Electric) Two Sides
LS	Lead Shields
MK	Master Keyed
MS	Machine Screws
NK	No Knob
NRP	Non-Removable Pin
PA	Parallel Arm
PHS	Phillips Head Screws
PSF	Pressed Steel Frame
PL	Plastic Laminate
RBL	Reverse Operation and incl. Bolt Locked Limit Switch in Device
SCS	Security Screws (with Twist-off Head)
SK	Security Knob (One Side only)
SMK	Sub Master Key
SMS	Sheet Metal Screws
SPS	Spanner Screws
SW	One Limit Switch included Inside Lock Case.
2SW	Two Limit Switches included Inside Lock Case.
STMS	Strike Template Machine Screws.
STS	Self Tapping Screws
TB	Through Bolts
TBGN	Through Bolts and Grommet Nuts
TMS	Template Machine Screws
TT	Thumb Turn
WBX	Wrought Box

3. Manufacturers:

CI	Chubb Industries Limited
CI/SS	Chubb Industries and Southern Steel Co.
F.A.	Folger Adam Co. (Distributed by Strongbar Industries, Inc.)
K.M.T.	K.M. Thomas Co. Ltd.
K.N.C.	K.N. Crowder Mfg. Ltd.
RL	RL Institutional Security
SS	Southern Steel Co.

2. Hardware Schedule

1. Submit Hardware Schedule for Approval in the following format

Door location: Description of door.

- Manufacturer:

Quantity	Hardware	Type	Finish

2. Prepare hardware schedule for this section per Door and Frame Schedule Drawing A8 Series. Refer to Drawings, Section 08700 for Finish Hardware Schedule, and this Section for location and type of hardware to be supplied.

End of Section

1. GENERAL

1. GENERAL REQUIREMENTS

1. Division One, General Requirements, is a part of this section and shall apply as if repeated here.

2. GUARANTEE

1. The work under this Section shall be guaranteed in accordance with GC 3.11 of CCDC Document 2 - 1994 but for a period of 10 years on insulated units and 5 years on all other work from the date of Architect's Certificate of Substantial Completion.

3. PROTECTION

1. Mark each light with a large white cross to indicate presence of glass. Use flour and water paste for markings.

2. Replace under the work of this section, defective, damaged or broken glass due to faulty setting, handling or storage.

4. RELATED WORK SPECIFIED ELSEWHERE

1. Miscellaneous Metals - Section 05500
2. Steel Doors and Frames - Section 08110

2. PRODUCTS

1. MATERIALS

1. Tempered Glass:

1. 1/4" (6 mm) clear glass tempered conforming to CAN/CGSB - 12.1 M90 equal to Ford Glass.

2. Cap Bead Sealant: one part silicone sealant conforming to CGSB 19-GP-9a.

3. Glazing Tape: Tremco 440 tape and as indicated in other glass sections.

4. Heal Bead Sealant: One part polysulphide or acrylic sealant conforming to CGSB 19-GP-5 and as indicated in other glass sections.

5. Spacer Shims: neoprene, Shore "A" durometer hardness 80, 3" (75 mm) long x 0.08" (2.4 mm) thick and 3/8" (9 mm) high.

6. Setting Blocks: neoprene, Shore "A" durometer hardness, 4" (100 mm) long x ¼" (6 mm) high x width to suit glass thickness.

7. Primer: Sealers and cleaners to glass manufacturer's standard

8. Glass for Hollow Metal Doors

    1. 1/4" clear tempered glass, conforming to CGSB 12-GP-3A.

3. EXECUTION

1. WORKMANSHIP

1. Installation of glass shall be by workmen skilled in this trade and done in strict accordance with material manufacturer's directions to produce a first class installation.

2. Accurately cut glass to fit opening and provide for glass expansion.

3. Carefully remove glazing stops and replace after glazing. Exercise care to prevent damage to stops.

4. Collect all glass cuttings in boxes and remove when cleaning up debris.

5. Cut glass and mirrors from dimensions taken in field.

6. Remove protective coatings and clean contact surfaces with solvents and wipe dry.

7. Apply primer-sealer to contact surfaces.

2. DOORS

1. Interior Lights:

    1. Glaze with glass as indicated, using mastic glazing compound.

    2. Set glass with equal bearing full width of pane. Use setting blocks as per manufacturer's instructions.
    3. Apply thin layer of mastic compound to rebate, set glass, then press until even bed is secured, sprig and run face compound, replace removable stops.

    4. Insert spacer shims to centre glass in space. Place shims at 2'-0" (600 mm) o.c. and keep 1/4" (6mm) below the sight line.

    5. Installation shall be rattle free.

3. HOLLOW METAL DOORS AND SCREENS AND WOOD DOORS

    1. Supply and install glass at all hollow metal doors and screens as indicated on drawings.

4. FINISHING

    1. Immediately remove sealant and compound droppings from finished surfaces. Remove labels after work is completed and inspected by Architect.

End of Section

1. GENERAL

1. GENERAL REQUIREMENTS

1. Division One - General Requirements, is part of this section and shall apply as if repeated here.

2. RELATED WORK

1. Cast-in-place Concrete - Section 03300
2. Unit Masonry - Section 04200
3. Steel Deck - Section 05300
4. Rough Carpentry - Section 06100
5. Finish Carpentry - Section 06200
6. Architectural Woodwork - Section 06400
7. Air / Vapour Barrier System - Section 07195
8. Mineral Fibre Insulation - Section 07213
9. Fire Stopping and Smoke Seals - Section 07270
10. Gypsum Wallboard - Section 09250
11. Acoustical Treatment- Section 09500

3. QUALIFICATIONS

1. Conform to CSA A82.30-M1980 including appendices.

4. SHOP DRAWINGS

1. Submit shop drawings in reproducible vellum form in accordance with Section 01300 Submittals.

2. Shop drawings are to be designed for fabrication to meet all codes and be stamped by a Professional Engineer registered in the Province of Ontario.

3. Clearly indicate construction details, sizes, thickness or gauge of steel studs, connections, joints, method of anchorage, number of anchors, supports, reinforcement and accessories. Confirm all dimensions on site.

4. Indicate control joint and expansion joint locations and framing details.

5. ALLOWANCES

1. Allow for **15 sq. meters of additional wall furring and 30 sq. meters of additional bulkheads** for additional work not indicated on drawings. Locations as per later designation by Architect.

2. PRODUCTS

1. MATERIALS

1. All light gauge metal stud walls and roof framing to be pre-engineered by a single supplier as a structural system. Provide engineered, stamped shop drawings.

2. Non-load-bearing channel stud framing less than 4800 mm long: to ASTM C645-14 size as noted on drawings, roll formed from 25 gauge (0.53 mm) thickness electro galvanized steel sheet; for screw attachment of gypsum board. Knock-out service holes at 1'-6" (460 mm) centres.

3. Extra strength channel stud framing (4800mm long and greater): to CAN 3-S146-M84 for design and ASTM A653 for steel, 3 5/8" (92 mm) or 6" (152 mm) stud size, roll formed from 20 ga. (0.91 mm) thickness hot dipped galvanized steel sheet; for screw attachment of gypsum board. Knock-out service hole a 1'-6" (460mm) centres. Use this type at all exterior framing and partitions designated to have abuse / impact resistant gypsum wallboard. Note interior extra strength stud partitions with drywall on both sides can be electro galvanized finish.

4. Floor and ceiling tracks: to ASTM C645-14; in widths to suit stud sizes, 1 1/4" (32 mm) flange height. Use hot dipped galvanized units at exterior wall and exterior canopy locations.

5. Metal channel stiffener: size to suit studs, 2 mm thick cold rolled steel, coated with rust inhibitive coating. Use hot dipped galvanized units at exterior wall and exterior canopy locations.

6. Bridging channels and diagonal tension straps (load bearing stud systems): material and gauge to match studs, let into or surface fastened to studs for diagonal/lateral bracing and reinforcement.

7. Screws: CGC Branch Screws (or approved equal) of type recommended in the selector guide on Page 5 of Canadian Gypsum Brochure 09250 - 1E. Use hot dipped galvanized or epoxy coated fasteners at exterior walls and canopies.

8. Furring Channels: 7/8" (22 mm) x 2 3/8" (60 mm), 25 MSG cold rolled galvanized after fabrication, types manufactured by Donn Products, Universal Sections or Canadian Gypsum Co. to meet CSA A82.30-M1980. Use hot dipped galvanized units at exterior walls and canopies.

9. Carrying Channels: 1 1/2" (38 mm) x 6 lbs./10 ft. (892 g/m) cold rolled steel after fabrication to meet CSA A82.30-M1980. Use hot dipped galvanized units at exterior walls and canopies.

10. Hangers: 1/4" (6.3 mm) dia. galvanized pencil rods at 4'-0" (1220 mm) o.c. maximum on main tees to meet CSA A82.30-M1980.

11. Tie Wire: No. 16 (1.5 mm) Imperial Wire gauge galvanized soft annealed to meet CSA A82.30 - M1980.

12. Anchors: to meet CSA A82.30-M1980 standard.
13. Heavy Duty Studs: 4" (100 mm) and 6" (150 mm) 16 gauge (1.5 mm) as supplied by Bailey Metal Products Ltd., Toronto, Ontario.

14. Batt Insulation (exterior stud walls): refer to Section 07213 Mineral Fibre Insulation.

15. Vapour Barrier: refer to Section 07195 Air / Vapour Barrier System.

16. Acoustical Sealant: Acoustical sealant to CAN/CGSB-19.21-M87 by Tremco or approved equal.

17. Insulating Strip: Rubberized, moisture resistant 1/8" (3mm) thick foamstrip, ½" (12mm) wide with self-sticking adhesive on one face, lengths as required.

3. EXECUTION

1. GENERAL

1. Installation shall be by mechanics skilled in this trade and done in accordance with best standard practice and material manufacturer's printed directions.

2. Do not cover piping, conduit, duct and the like until inspected and approved by the Architect.

3. Furring indicated shall not be regarded as exact or complete.

4. Method of framing and furring left to Contractor's option but shall result in a rigid, secure, plumb framing and forming, erected to maintain overall sizes as indicated and of adequate strength to support without distortion of the facing indicated. Wall furring and suspended and furred ceilings must be installed to meet CSA A82.31-M91 except where specified otherwise.

5. Do not make fastenings to ducts, pipes, conduit, door frames, backers or inserts of other trades not specifically intended for fastening metal furring.

6. The completed installation of framing and furring must allow drywall to be installed free of waves, depressions, other defects that would mar the finished appearance.

2. PARTITION AND WALL FURRING AT INSIDE OF EXTERIOR WALLS.

1. Install partition tracks at top and bottom of studs, align accurately, and make allowance for deflection under beams and structural slabs to avoid transmission of structural loads to studs. Use 2" (50 mm) leg ceiling track.

2. Secure tracks to concrete and steel with power actuated fasteners at a min. 24" (600 mm) o.c.

3. Install dampproof course (vapour barrier) under stud shoe tracks of partitions on slabs-on-grade.

4. Place studs vertically at 16" (400 mm) centres and not more than 2" (50 mm) from abutting walls, openings and each side of corners. Secure studs to tracks at floor and ceiling using screws or crimp method. Place interior heavy duty studs vertically at 12" (300 mm) centres where indicated on drawings.

5. When necessary, splice studs with 8" (200 mm) nested lap and one positive attachment per stud flange. Place studs in direct contact with door frame jambs, abutting partitions, partition corners and existing construction elements. Where studs are installed directly against uninsulated surfaces install insulating strips between studs and wall surfaces.

6. Anchor studs for shelf-walls and those adjacent to door and window frames, partition intersections and corners to ceiling and floor runner flanges with an approved crimping tool. Securely anchor studs to jamb and head anchor clips of door or borrowed-light frames, place horizontally a cut-to-length section of runner, with a web-flange bent at each end, and secure with one positive attachment per flange. Position a cut-to-length stud (extending to ceiling runner) at vertical panel joints over door frame header.

7. Install heavy gauge single jamb studs at all openings.

8. Erect metal studding to tolerance of 1:1200.

9. Stiffen partitions exceeding 8' (2400 mm) in height and/or 10' (3000 mm) in length with 3/4" (19 mm) channel bracing extending horizontally across the length of the partition. Provide one horizontal stiffener for partitions under 12' (3600 mm) high; at least two horizontal stiffeners for partitions 12 or more feet high (3600 or more mm), at maximum 6' (1800 mm) centres. Install metal strapping securing stud to masonry or concrete walls at every other stud where horizontal stiffeners occur. Provide other partition reinforcing necessary to support wall hung components, cupboards, closets and the like. Use 2 studs at jambs of openings and corners.

10. Where horizontal runs of service lines are to be installed within the partition, erect studs with web openings aligned.

11. Provide reinforcing and necessary stiffeners to support hollow metal screens. Reinforcing to be capable of supporting screens rigidly and solid without deflection.

12. Work includes the installation of hollow metal frames.

13. All fire rated partitions must be installed from floor to underside of floor slab at ceiling above.

14. Provide horizontal 25 ga. metal anchor strips with wood blocking behind it for blocking behind wood base. All wood blocking for trim, base, millwork, miscellaneous specialties, to be installed by Section 06100 after erection of metal studs and ceiling suspension system.

3. BULKHEADS

    1. Work includes fire separations in ceiling space, drywall surfaces above windows and bulkheads to suspended ceilings.

    2. Install steel studs and furring of sizes shown at 16" (400 mm) o.c. or as shown.

    3. Furring indicated shall not be regarded as exact or complete. Provide adequate bracing at bulkheads to structure to ensure a rigid installation and to meet CSA A82.31-M91.

    4. Locate bulkhead furring no more than 2" (50 mm) from corners abutting partitions or other construction.

4. CEILINGS

    1. Supply and install suspension and furring system for exposed gypsum board ceiling.

    2. Do not regard suspension system indicated on drawings as exact or complete. The specification for metal framing contained in Canadian Gypsum Co. Ltd. Brochure 09260 - 1E and CSA-A82.31-M91 shall govern installation conditions not covered by this specification. The more stringent being the acceptable.

    3. Install hangers for suspended bulkhead or ceiling to support the grillage independent of the walls, columns, pipes, ducts and the like. Erect plumb and securely anchor to the structure. Submit details of the proposed method to the consultant for approval. If so requested by the Architect, test hangers to provide that anchorage are adequate to support the proposed loading.

    4. Supply hangers to support the grid in time to be installed in slabs.

    5. Space hangers at maximum 3'-0" (910 mm) centres in the direction of the carrying channels and at 4'-0" (1200 mm) centres at right angles to the carrying channels, within 6" (150 mm) of ends and where normally required in good standard practice.

    6. Space furring channels at maximum 16" (400 mm) o.c.

    7. Erect the grillage for suspended ceilings and beams of required elevation to provide rigid, secure, framing independent of walls.

    8. Frame all openings on all sides with suitable channels. Check clearances with respective trades. Co-operate with others to accommodate diffusers, grilles, light fixtures and access panels in drywall ceilings. Provide additional hangers and supports for fixtures as required.

    9. Level drywall screw channels to a maximum tolerance of 1/8" (3.2 mm) over 12'-0"

(3650 mm).

10. Erect ceiling furring system in strict accordance with system manufacturer's printed directions to allow drywall board installation to be free of waves or loose boards.
11. Frame exterior soffits and walls using hot dipped galvanized framing materials and rustproof fasteners.

5. CONTROL JOINTS

1. Provide metal studs or furring next to end condition of each side of control joint. Control joints to be provided in accordance to the best standard practice to meet the approval of the Architect and as noted on the drawings.

2. Provide control joints every 25'-0" (7600 mm) o.c. and/or where shown on drawings.

3. Install additional control joints as directed on site by Architect.

6. HEAVY DUTY STUDS

1. Use heavy duty studs where shown on drawings and as required in other locations to give firmness to bulkheads.

2. Secure studs at ends with solid bearing at bulkheads.

End of Section

1. GENERAL

1. GENERAL REQUIREMENTS

1. Division One, General Requirements, is a part of this section and shall apply as if repeated here.

2. DESCRIPTION

1. Work of this Section includes:

1. Gypsum wallboard to partitions, ceilings, bulkheads furring and wall facings at all areas.

2. Related work specified elsewhere:

1. Masonry - Section 04200
2. Rough Carpentry - Section 06100
3. Finish Carpentry - Section 06200
4. Insulation - Division 7
5. Vapour Barriers - Section 07190
6. Insulation Wall Board System - Section 07201
7. Mineral Fibre Insulation - Section 07213
8. Fireproofing - Section 07250
9. Firestopping and Smoke Seals – Section 07270
10. Metal Stud and Ceiling Suspension Systems - Section - 09110
11. Acoustical Treatment - Section 09500
12. Interior Special Coatings – Section 09660
13. Painting and Finishing - Section 09900
14. Mechanical - Division 15
15. Electrical - Division 16

3. QUALIFICATIONS

1. Contractor for this work to have a minimum of five years experience in installation of wallboard.

2. Install work to CSA A82.31-M1980, C.G.C., Drywall Construction Handbook and the Manual of Gypsum Wallboard Construction by Gypsum Drywall Contractor's International except where specified otherwise.

4. DELIVERY, STORAGE

1. Store materials in a dry weather proof enclosure. Store wallboard flat, in piles without overhanging boards.

2. Do not install damaged or deteriorated material but remove from site.

3. Materials as delivered shall bear the manufacturer's name branch name of material and where applicable, CAN/CSA classification.

5. JOB CONDITIONS

1. Air and surface temperature: Minimum 54 degrees F. (12 degrees C.) and maximum 77 degrees F. (25 degrees C.) for 24 hours before, during and until entire installation is complete.

2. Ensure proper ventilation, during and following joint treatment, to eliminate excessive moisture.

3. Examine surfaces in which wallboard is to be attached and check environmental conditions and do not commence work until surfaces and conditions are satisfactory.

4. Commencement of work will denote acceptance of conditions.

6. PROTECTION

1. Protect work of other sections against damage resulting from work of this section. Repair and make good to approval, damage to other sections caused by this work.

7. SUBMITTALS

1. Submit shop drawings showing control joints for Architect's approval.

2. Submit sample of each type of casing bead, corner bead, control joints, reveal moulding, etc.

8. ADDITIONAL DRYWALL AND FURRING

1. Include in base bid quote by this Section 09250 and 09110 for an additional **60 sq. metres of gypsum wallboard** complete with metal furring and finished taping for additional furred in pipes at walls or ceilings, additional bulkheads and other locations as per required by Architect.

2. PRODUCTS

1. MATERIALS

1. Gypsum Wallboard:

1. Gypsum Wallboard: CSA A82.27-M1977. Use Type “X” (special fire retardant) board such as CGC Firecode `C' when fire rating is required.

2. Use board with round or tapered edges unless otherwise called for.

3. Backing Board and Gypsum Coreboard: Dens Shield to CSA A82.27-M1977.

4. Thickness: 5/8" (16 mm) or as noted on drawings or as required.

5. Abuse/Impact Resistant Gypsum Board: Dens Armor Plus, 5/8”(16mm).

6. Exterior Sheathing: Dens Glass Sheathing, 5/8” (16mm).

2. Accessories:

1. Casing beads, corner beads, fill type: 24 ga. (0.5 mm) base thickness commercial grade sheet steel with G90 zinc finish to ASTM A525-80A; perforated flanges; one piece length per location.

   NOTE: Use Beadex U Trim (thickness as required) where "J" mould is indicated on drawings as manufactured by BeadeX Manufacturing Company Inc.

2. Screws: C.G.S. Brand Screws Type S. 1" (25 mm) and 1 1/2" (38 mm) as required to C.S.A. A82.31-M1980. For exterior Sheathing and tile backer board use 1¼” Bugle head fine thread rust resistant drillpoint drywall screw (type S-12).

3. Joint Treatment Material: CGC MC "All-Purpose" and CGC MC "Joint Topping" compounds - to ASTM 0474 and 0475. Use materials recommended by board manufacturer for the proposed use. Material shall be pre-mixed, ready to use, in sealed cans.

4. Reinforcing Tape: Perf-a-Tape by CGC or equal.

5. Adhesive: CGC "Durabond" 90 pre-mixed, ready to use in sealed cans.

6. Manufacturer: Specification is generally based on Canadian Gypsum Co. Ltd. material but equivalent materials by other manufacturers are acceptable.

7. Acoustic Materials:

   1. Acoustical Caulking: Acoustical sealant by Tremco or approved equal to CGSB 19-GP-21M.

   2. Sound Attenuation Batts: refer to Section 07213 Mineral Fibre Insulation.

8. Control Joint: equal to C.G.C. control joint No. 093.

9. Thermal Break: Permanent adhesive faced rubberized cork, 1/8" (3 mm) thick by width required.

10. Stud adhesive: to C.G.S.B. 71 GP-25M.

11. Drywall reveal mouldings:

    1. Drywall reveal moulding Model "DRM 625-75, channel screeds, “F” reveals and “Z” reveals by Fry Reglet.

    2. Provide factory fabricated 'T' and 'L' intersections at reveal locations.

    3. All mouldings to be clear anodized aluminum.

12. Tile Backer Board at washrooms, showers and drinking fountain partitions and ceilings receiving ceramic tile: 16mm (5/8”) thick, Dens-Shield tile backer board by Georgia-Pacific Corporation.

13. Tile Backer Board Joint Treatment Materials: thin set mortar mixed with an acrylic latex. Tape shall be 2" (50 mm) wide alkali resistant fibreglass tape. Screws to be self taping rust resistant screws.

3. EXECUTION

1. EXAMINATION

1. Examine surfaces and other conditions on which work of this Section depends and do not proceed until conditions are suitable.

2. Commencement of work will denote acceptance of conditions.

2. WALLBOARD INSTALLATION

1. General:

1. Do not install gypsum board until work of other Trades which will be covered by the board has been installed and approved.

2. Use board of maximum practical length to reduce number of end joints. Install control joints in long runs of board.

3. Fit ends and edges closely, but do not force together.

4. Attach board to framing using screws, not nails.

2. Installation on Stud Framing:

1. Install board vertically or horizontally whichever results in fewer end joints,

use longest possible lengths. Cut and fit boards around openings, beams, joists, ducts, light fixtures and similar items. Install board up to underside of slab or metal deck above to provide sound insulated walls and fire separations.

2. Position edges over supports for vertical or horizontal application.

3. For single layer vertical application space screws 12" (300 mm) o.c. for field of panel and 6" (150 mm) o.c. staggered, along vertical abutting edges. For horizontal application space screws 12" (300 mm) o.c. in field and 8" (200 mm) and along abutting end joints. For double layer application, stagger joints in second layer of boards, a minimum of one-stud spacing in both directions and fasten with screws as before.

3. Installation on Ceiling Grillage:

1. Install board with long dimension at right angles to furring channels.

2. Position end joints over channel flange and stagger in adjacent rows.

3. Fasten board to channels with 1" (25 mm) type S screws spaced 12" (300 mm) o.c. in field of panels and 8" (200 mm) along abutting edges.

4. Install board continuously above ceiling at exterior walls to support vapour barrier where it occurs.

3. FIRE RATING

1. Conform with following for fire rated partitions, ceilings and bulkheads:

1. Fire resistant ratings called for on drawings and schedules.

2. Appropriate codes and regulations.

3. Use "Firecode C" or approved equivalent gypsum board.

4. FINISHING

1. Mix joint compound (powder) in accordance with manufacturer's printed instructions.

2. Prefill "V" grooves of rounded edges with Durabond 90 compound. Finish flush with tapered surface ready for reinforcing tape application. Allow pre-fill material to dry thoroughly before application of embedding compound and tape.

3. Apply "All-Purpose" compound in thin uniform layer; embed reinforcing tape accurately centred on joint, securely pressed in, leaving sufficient compound under tape to provide proper bond. Immediately apply skim coat over tape application. Allow to dry thoroughly before application of filler coat.

4. Apply filler coat of "Topping" compound such that taper depression is flush with board surfaces. Allow to dry thoroughly before application of finish coat.

5. Apply finish coat of "Topping" compound extending slightly beyond the filler coat and feathered out onto the board surface.

6. Sand between coats and following the finish coat, where necessary, and leave surface smooth and ready for painting.

7. Finish screw depressions with filler material and finish coat as specified in 4. and 5. above.

8. Joint and depression finish shall in no case protrude beyond the plane of the board surface.

9. Finish corner beads and metal trim flush with board surface using filler and finishing coats feathered out approximately 2" (50 mm) and 4" (100 mm) respectively onto the board surface to ensure that metal visible only at arris.

10. Fill and tape joints and internal corners and fill screw depressions in board face and smooth out along corner beads and metal trim with joint compound.

11. Provide specified metal trim and control joints at exposed edges, at junctions of drywall with dissimilar material, at control joints and at junction with columns. Fasten with screws at 12" (300 mm) o.c. along entire length.

12. Cut out a 'V' at all butt joints and install Durabond 90 then complete with filler and topping coats.

13. Avoid sanding adjacent paper surface of boards.

5. CLEANING

1. Clean thoroughly and remove all excess materials from other surfaces.

2. Remove all excess materials as job proceeds and at completion.

6. ACCESSORIES

1. Erect accessories straight, plumb or level, rigid and at proper plane. Use full length pieces where practical. Make joints tight, accurately aligned and rigidly secured. Mitre and fit corners accurately, free from rough edges. Secure at 6" (160 mm) o.c. for full length.

2. Install "J" molds around perimeter of suspended ceilings.

3. Install "J" molds where gypsum board butts against surfaces having no trim concealing junction and where indicated.

4. Install aluminum reveals at all locations as indicated on drawings. Install tape and

joint material tight to edges of tape type "reveals".

7. CONTROL JOINTS

1. Construct control joints using C.G.C. control joint No. 093 set in gypsum board facing and supported independently on both sides of joint.
2. Provide shrinkage control joints in accordance to the best standard practice to meet the approval of the Architect.
3. Locate control joints at approximately 25 feet (7600 mm) in ceilings and walls and where shown on drawings.
4. Locate control joints at changes in substrate construction.
5. Install control joints straight and true.
6. Install additional control joints as directed on site by the Architect and as the subtrade recommends to eliminate future drywall problems.

8. ACCESS PANELS

1. Ceiling access panels to be 18" x 18" (460 mm x 460 mm) drywall to match adjacent ceiling finishes except at fire rated ceilings, and as noted on drawings.
2. Provide "J" molds at exposed drywall edges of panel and at ceiling opening.
3. Reinforce panel with 3/4" (19 mm) fire retardant plywood backer.
4. Install access panels at wall locations provided by Divisions 15 and 16.
5. Rigidly secure frames to furring or framing systems.

9. THERMAL BREAK

1. Provide a continuous moisture resistant insulating material at edges of wallboard in contact with aluminum windows and exterior door frames to provide a thermal break.

10. CERTIFICATION

1. Provide at completion of work a written certification that all drywall work where applicable conform to the required ULC fire rated assemblies.

11. ACOUSTICAL MATERIALS

1. Install a continuous double row of caulking beads around perimeter of partitions which are indicated as containing sound attenuation batts.
2. Install sound attenuation batts in partitions where shown, with air space

consistently on one side. Continue batts behind electrical boxes and conduits and all other services and items installed in partitions.

3. Provide caulking around all ducts, pipes, conduits and other items passing through partitions

4. Caulk all openings in wall and through base and ceiling plates for plumbing.
5. Electrical Outlets: cut holes neatly to reduce leaks. Caulk ir tight around outlets before plate is installed. Do same for wall mounted fixture outlets before fixtures installed.

6. Bring early to General Contractor's attention that no electrical outlets are to be back to back in sound control walls. Consult Electrical Engineer.

7. Caulk edge of drywall to studs at perimeter of wall with 2 beads of caulking.

8. Installation of acoustical walls shall be from floor to bottom of floor or roof above (not ceiling height) and sealed at all perimeters (including voids in metal deck).

12. FIRE STOPPING

1. Provide gypsum wallboard and furring as required to box in around steel joists at top of masonry and gypsum wallboard partitions including cross walls parallel to steel joists as per drawings.

2. All firestop sealants and backup mineral wool by Section 07270-Firestopping and Smoke Seals.

End of Section

1 GENERAL

1.1 General Requirements

1. Division One is a part of this Section and shall apply as if repeated here.

1.2 Description of Systems

1. Lay-in Tile System: Exposed suspended tee-bar system to match existing base building Type 2'-0" x 4'-0" (610 mm x 1220 mm) acoustic panels and tee-bar system. Unless otherwise noted all existing suspended ceiling systems (grids, ACT, etc.) are to be removed, disposed, and replaced with new. Unless otherwise noted existing light fixtures, sprinkler heads, fire/life safety devices and other ceiling-installed devices are to remain. GC is to protect all ceiling devices to remain for the duration of the Work and remove and re-install as required to carry out Work at no extra cost.

2. All tile and suspension systems shall comply to U.L.C. Design as indicated on drawings.

1.3 Samples

1. Submit for approval, two samples of each type of tile to be used in the project.

1.4 Related Work Specified Elsewhere

1. Gypsum Wallboard - Section 09250
2. Mechanical Trades - Division 15
3. Electrical Trades - Division 16
4. Painting - Section 09900

1.5 Work Included

1. This contractor shall supply and install all acoustic tile and required accessories as indicated on the working drawings, room finish schedule, including the following:
   .i All non-combustible ceiling board.
   .ii All exposed "T" grid suspension systems.

1.6 Maintenance Materials

1. Deliver acoustical units in packages for maintenance use amounting to 3% of gross ceiling area for each lay-in panel type. Store where directed. Clearly identify packages.

2. Maintenance materials shall be of same production run as installed materials.

1.7 Environmental Conditions

1. Commence installation only after building has been enclosed and dust generating activities have been completed.

2. Permit wet work to dry completely before commencement of installation.

3. Ensure that a uniform minimum temperature of 15 deg. C. and humidity of 20-40% before, during, and after installation is maintained.

1.8 Letter of Certification

1. The Contractor, together with manufacturer, shall submit a written confirmation, signed by manufacturer's registered professional engineer, stating that the suspended ceiling system will provide adequate support for electrical fixtures, as required by current bulletin of the Electrical Inspection Department of Ontario Hydro. NOTE: all electrical fixtures to have independent supports in fire rated ceilings.

2 PRODUCTS

2.1 1. Lay-in Tile System:

.1 Hangers: Min. No. 12 (2.5 mm) SWG galvanized mild steel hanger wire - 24" (600 mm) o.c. or galvanized steel wire of size capable of safety supporting anticipated ceiling system and loading.

2. Tees – Suprafine XL (exposed tee) suspension system by Armstrong

.1 Main Tees: .021" (.53 mm) thick cold rolled steel, double web, with rectangular bulb section at least I 11/16" (42.9 mm) high. Fabricate with punched cross tee holes at not greater than 16" (400 mm) o.c. and hanger wire holes at 2" (50 mm) o.c. Exposed flange shall be 9/16" (14.3 mm) wide and not less than .009" (.23 mm) thick cold rolled steel.

.2 Cross Tees: Double web design with rectangular bulb; web extending to form a positive interlock with main tees in same exposed flange width.

.3 Finish: to match Axiom trim

3. Accessories

.1 Miscellaneous approved clips, splicers, screws, nails, and other standard types to suit applicable conditions. Provide special accessories as required. Accessories shall be galvanized after forming.

.2 Standard edge moulding as manufactured by system manufacturer to suit applicable details. Moulding shall be formed of coated steel.

.3 Provide Armstrong Impact Clip System Item No. 414 system at areas where clipped down ceilings are required. Provide accessible type clips where access is required.

4. Knife Edge Axiom Trim by Armstrong. Trim channel complete with hanging clips, t-bar connection clips and splice plates. Colour: white.

5. Finish

.1 Tees, edge mouldings, and exposed accessories shall be finished with baked, non-yellowing, low sheen colour to match Axiom trim.

6. Lay-in Panels

.1 Install tile where acoustic tile is indicated on Reflected Ceiling Plan and room finish schedule:

.1 ACT-1: 24" x 48" Cirrus, (medium texture), Panel by Armstrong. Bevelled Tegular. Colour: White. Note: 24" x 48" tile product is scored to simulate a 24" x 24" tile.

7. Tie Wire: 1.2 mm galvanized annealed steel wire.

8. Inserts and attachments to Structure for Hanger Connections: to suit conditions and loadings, galvanized after fabrication.

9. Acoustic Sound Insulations: min. of 4" (100 mm) thick "Roxul AFB" acoustical fire batt insulation by Roxul. *(not in contract)*.

3 EXECUTION

3.1 Workmanship

1. Installation shall be by skilled mechanics and in strict accordance with system manufacturer's printed directions to produce a first class, flush finished surface in true plane and free from drooping, warped, uneven joints, damaged tile, or panels. Butt joints tightly.

2. Consult with mechanical and electrical trades to co-ordinate and arrange work to accommodate recessed fixtures, diffusers, grilles, and other similar items, where indicated on mechanical and electrical drawings. Recessed items shall replace or be centred in acoustical units.

3. Frame around recessed fixtures, diffusers, grilles, and openings and where normally required in good standard practice.

4. Provide all furring required and construct drywall bulkhead, incorporated as part of best standard practice to Architect's approval.

5. Provide and install protection panels and/or five-sided box enclosures at recessed lighting fixtures, speaker boxes, diffusers, duct openings, firestop flaps, etc. as specified in the applicable ULC assembly specification. Approval of enclosures and protection will be by Architect and/or Municipal Authorities.

3.2 Erection

1. Lay-in Tile System

.1 Install ceiling suspension system to ASTM C636-76 and manufacturer's instructions, except where specified otherwise.

.2 Supply hangers and inserts to support the grid in time to be installed in structural system if required.

.3 Hangers for acoustic systems shall be spaced to comply to U.L.C. Design, approximately 4 ft. (1200 mm) centres both ways and where normally required in good standard practice.

.4 Secure hangers firmly.

.5 Erect carrying channels for suspended systems of required elevation and level to tolerance of 1/8" (3.2 mm) over 12 ft. (3650 mm). Frame around recessed fixtures, diffusers, grilles, and openings and where normally required in good standard practice. Furr around ducts, beams, bulkheads, or the like, as shown or required by U.L.C. Standard.

.6 Ensure that the suspension system supports the completed assembly, including all superimposed loads, such as lighting fixtures, diffusers, and grilles, with a maximum deflection of 1/360 of the span. Provide supplemental hangers within 6" (150 mm) of each corner and at maximum 2'-0" (610 mm) around perimeter of light fixtures.

.7 Attach exposed tees at centres required in good standard practice.

.8 Install expansion joints in all main beams as required by U.L.C.

.9 Provide angle wall mouldings at junctions of ceilings and vertical surfaces.

.10 Provide spring clips to ensure tight installation, in rooms having an area less than 20 sq. ft. (1800 mm2).

.11 Provide lay-in tile and grid to meet fire rating at all fire rated ceilings.

.12 Erect ceiling system at required elevation and level to tolerance of 1/8" (3 mm) in 12'-0" (3660 mm).

.13 Cut reveal edges to match factory detail at all reveal edge lay-in ceiling that needs cutting to fit grid size.

3.3 Fixture Suspension

1. Make provisions for carrying flush mounted and recessed fixtures on suspended ceilings, using 4 hangers per fixture. Consult and coordinate with Electrical and Mechanical Trades.

2. The suspended ceiling system must comply with the current bulletin from the Electrical Inspection Department of Ontario Hydro regarding "Lighting Fixtures in Suspended Ceilings".

3. It is the responsibility of this contractor to supply the Architect with a letter stating that the suspension system is capable of holding the electrical fixtures as shown on the electrical drawings and as required by the above bulletin of the Electrical Inspection Department of Ontario Hydro.

3.4 Mitred Joints

1. "T" bar ceiling grid to be mitred at the outside corners.

3.5 Acoustical Units

1. Install acoustical units parallel to building lines to produce uniform borders and with edge units not less than 50% of unit width.

2. Accurately scribe and cut acoustical units to fit recessed items and adjacent work. Butt joints tight; terminate edges with moulding.

3.6 Special Cleaning

1. Keep acoustical panel installation and all components clean.
2. Remove and replace damaged or improperly installed units.

3.7 Mechanical Equipment Access

1. Install "T" bar system to allow it to be removed easily at areas where mechanical units occur to allow units to be easily removed. NOTE: Stop main "T" on each side of equipment access.

3.8 Acoustic Sound Insulation

1. Install a minimum of 4" (100 mm) thickness of Acoustic Sound Insulation on ceiling tile ceilings at all areas where indicated on the drawings. Offset insulation joints of each layer.

3.9 Impact Clips

1. Install Impact Clip System at all acoustic tile ceiling areas indicated on drawings including rooms less than 20 sq. ft., (1800 sq. mm.) and all vestibules.

3.10 Certification

1. Provide at completion of work a written certification that all ceiling conform to the requirements of the ULC design criteria for fire rated assemblies and that the suspended ceiling will provide adequate support electrical fixtures as per current bulletin of the Electrical Inspection Department of Ontario Hydro.

End of Section 09500.

1. GENERAL

1. GENERAL REQUIREMENTS

1. Division One is a part of this Section and shall apply as if repeated here.

2. SUBMITTALS

1. Submit 24" x 24" (600 mm x 600 mm) sample, in each colour or design to be used, for approval of the Architect.

2. Submit 12" (300 mm) long samples of each colour of rubber base.

3. Submit shop drawings in reproducible form in accordance with G.C. 3.11 of CCDC Document 2 - 2008 to show layout, treatment at walls, floor drawings, and other objects. Indicate details of proposed treatment, where flooring material meets other floor materials.

3. SPECIAL PROTECTION

1. Protect finished floors immediately after installation, using heavy cotton reinforced paper or polyethylene lapped 5" (125mm) with taped joints.

4. EXTRA MATERIALS

1. Upon completion of work, deliver to Owner where directed, all large scrap cuttings from flooring and a 12'-0" x 12'-0" (3600 mm x 3600 mm) piece of each design in each colour used.

2. Material to be wrapped packages and fully labelled as to product and colour.

5. ENVIRONMENTAL CONDITIONS

1. Maintain room, surface and materials at minimum temperature of 68 deg. F. (20 deg. C.), for three days before and during laying and after installation, and until floor area is occupied by Owner.

6. RELATED WORK SPECIFIED ELSEWHERE

1. Resilient Flooring - Section 09650
2. Tile Carpet - Section 09680
3. Mechanical - Division 15

7. MAINTENANCE INSTRUCTIONS

1. Submit 3 copies maintenance manual at completion of work in

accordance with Section 01015 - General Work.

8. DELIVERY, STORAGE AND HANDLING

1. Deliver materials in original containers with manufacturer's seals and labels intact. Maintain temperature of storage area at 70 degrees F. for 48 hours prior to installation.

9. WARRANTY

1. The warranty specified in Article GC 12.3 of CCDC Document 2 - 2008 is to be extended for all work of this Section, including materials and workmanship for a period of five (5) years from the date of the Certificate of Substantial Performance.

10. COORDINATION WITH MECHANICAL CONTRACTOR

1. Confirm the following mechanical products are being used to allow proper water tightness:

1. Floor Drains - Must be Zurn ZN401R, ZURN ZN415R, ZURN Z400 "Type R" or ENPOCO E1000FC, ENPOCO E1000R5FC, ANCON FD100FC or similar approved TO ENSURE WATERTIGHTNESS.

2. Trench Drains - Must be ENPOCO E1000RE/FC-412 or ENPOCO F4060FC or similar approved with integral flashing clamp for use with Altro Safety Sheet Flooring TO ENSURE WATERTIGHTNESS.

3. Floor Cleanouts - must be ENPOCO E100R5FCST or similar approved TO ENSURE WATERTIGHTNESS.

2. PRODUCTS

1. MATERIALS

1. Primer and Adhesives: Environmentally friendly products as recommended by seamless floor manufacturer for specified material and which will produce good and permanent waterproof bond between applicable substrate and flooring.

2. Welding of Seams: welded to match flooring using products as recommended by sheet floor manufacturer for specified material.

3. Cleaner: Those recommended by flooring manufacturers.

4. Rubber Base (for areas where sheet flooring cove base is not specified): 1/8" (3 mm) thick, by 4" (100 mm) ht., coloured rubber coved base;

Johnsonite Rubber Co., Roppe or Amtico. (NOTE: use rubber base supplied in roll form not 1220 mm 4'-0" lengths). Colours as selected by Architect (maximum two colours).

5. Vinyl Safety Flooring (VSF): Slip resistant sheet vinyl 2.2mm thick x 2000mm width Altro, Suprema vinyl sheet floor covering with colour coordinated heat weld rods and homogenous and non-layered vinyl wearing surface. One colour to be chosen by Architect from manufacturer's full colour range. Acceptable Alternate by Johnsonite, Armstrong or Forbo.

6. Sub-floor Filler and Leveller: White premix latex requiring water only to produce cementitious paste 2 part latex-type filler requiring no water as recommended by flooring manufacturer for use with their product.

7. Metal Edge Strips: Aluminum extruded smooth, mill finish polished lip to extend under floor finish, shoulder flush with top of adjacent floor finish.

8. Concrete Floor Sealer: to C.G.S.B. 25-GP-20M Type 1.

9. Accessories:

    1. Compass #901 Fillet Strip

    2. Compass Stainless Steel Cap-8 strip at cove bases

    3. Compass GE 25/35 Trench Drain Edging

    4. Compass Altroseal (matching)

    5. Compass CSL No. 160 Sealant

    6. Tarkett welding rod (matching)

3. EXECUTION

1. INSPECTION

    1. Ensure floor surfaces are smooth and flat to plus or minus 1/8" (3 mm) over 10'-0" (3000 mm).

    2. Ensure concrete floors are dry by using test methods recommended by manufacturer, and exhibit negative alkalinity, carbonization or dusting.

    3. Installation of any part shall constitute acceptance of these surfaces as satisfactory.

2. PREPARATION

1. Remove subfloor ridges and bumps. Fill low spots, cracks, joints, holes and other defects with subfloor filler.

2. Clean floor and apply trowel and float filler to leave smooth, flat hard surface. Prohibit traffic until filler cured.

3. Split, bumpy or otherwise deformed flooring resulting from improperly prepared base, will not be accepted.

4. Prime/seal concrete slab sheet flooring by manufacturer's printed instructions.

5. Fill low spots in flooring with latex base flashing compound and gently blend in floor level at a rate of 1/8" per 1'-0" (10.5 mm per 10000 mm) to flush sheet flooring with ceramic tile, quarry tile, etc.

6. Machine sand concrete smooth then dry vacuum entire floor area immediately prior to application of adhesive.

3. INSTALLATION

1. Apply adhesive uniformly to manufacturer's directions and recommended trowel. Do not spread more adhesive than can be covered by flooring before initial set takes place.

2. Lay flooring with seams parallel to building lines to produce a minimum number of seams. Border widths minimum 1/3 width full material.

3. Run sheets in direction of traffic. Double cut sheet joints and continuously heat weld all joints according to manufacturer's printed directions.

4. Set flooring in place, press with 100 lb. (45 kg) minimum roller to ensure full adhesion.

5. Continue flooring over areas which will be under built-in furniture or appliances where flooring will remain visible. Cut flooring neatly around fixed objects.

6. Continue flooring through areas to receive moveable type partitions without interrupting floor pattern.

7. Terminate flooring at centre line of door in door openings where adjacent floor finish is dissimilar. Ensure smooth transition.

8. Terminate flooring 1.5 mm back from wall substrate and seal with Compass Altroseal in selected areas.

9. Install metal edge strips at unprotected or exposed edges where flooring terminates.

10. Install floor patterns as shown on drawings. Refer to Architectural drawings 9 series for grain direction.

11. Provide water tight seal to all pipes and projections coming through floor, using Compass Altroseal.

12. At new flush clamp drains remove clamping ring. Fix sheet flooring / linoleum flooring into body of drain and mechanically clamp with clamping ring. New drains should be surface clamp type; Enpoco E1000 F.C. Type, or similar.

4. INSTALLATION OF RUBBER BASE

1. Layout base to keep number of joints at minimum.

2. Set base in adhesive tightly by using a 7 lb. (3 kg.) hand roller against wall and floor surfaces. Install base tight to surface of flooring avoiding any gaps. Space joints uniformly.

3. Install straight and level to variation of plus or minus 1/8" (3 mm) over 10'-0" (3000 mm) straight edge.

4. Scribe and fit to door frames and other obstructions.

5. Cope internal corners.

6. Use full length pieces where possible. Accumulated short lengths of base not permitted.

5. SPECIAL CLEANING

1. Clean off excess adhesive as work progresses from floor, base and wall surfaces without damage.

2. Upon completion of laying, clean floors in accordance with manufacturer's printed instructions and leave ready for sealing and waxing by Owner.

6. PROTECTION OF FINISHED WORK

1. Protect new floors from time of final set of adhesive after initial waxing, until final waxing and final inspection.

2. Prohibit traffic on floor for 48 hours after installation.

End of Section

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

.1 The General Conditions of the Contract, Supplementary Conditions, and the General Requirements of Division 1, form part of this section, and must be read in conjunction with the requirements of this section and all related sections.

.2 The work of this section, and related work specified in other sections shall comply with all requirements of Division 1 – General Requirements.

1.2 ENVIRONMENTAL REQUIREMENTS

.1 Provide materials in this specification section based on but not limited to the following criteria:

.1 Option: Materials of this section may conform to performance standards for recycled material content (7.5% post-consumer + ½ post industrial) and distance to the job site (500 km).

.2 Requirement: Materials of this section and accessory materials such as adhesives used in their installation must conform to performance standards for low VOC content.

.3 Requirement: carpet products must meet or exceed the requirements of the Carpet and Rug Institute's Green Label Indoor Air Quality Test Program.

.2 Refer to Section 01560 Environmental Protection for additional criteria not listed above.

.3 Contractor shall reference applicable standards specified in Section 01 61 11 and shall require suppliers to provide documentation to verify conformance to these standards and goals, as required to support the Environmental Plan.

1.3 SECTION INCLUDES

.1 Provision of all labour, materials, equipment and incidental services necessary to provide carpet floor finish, including primers, mastics and leveling fillers, adhesives, carpet material, underlay, carpet base, accessories, and protection.

1.4 RELATED SECTIONS

.1 Sheet Flooring – Section 09655

1.5 REFERENCES

.1 CAN/CGSB-4.2- 92, Textile Test Methods.
.2 CAN/CGSB-4.129- 93, Carpets for Commercial Use.
.3 CAN/CGSB-25.20- 95, Surface Sealer Floors.
.4 CAN/ULC-S102- M88, Surface Burning Characteristics of Building Materials and Assemblies.
.5 CAN/ULC-S102.2- M88, Surface Burning Characteristics of Flooring, Floor Covering and Miscellaneous Materials and Assemblies.
.6 Carpet and Rug Institute (CRI) - Contract Carpet Manual, No.001.
.7 Carpet and Rug Institute (CRI) - IAQ Carpet Testing Program.
.8 ASTM D 1055- 90, Specification for Flexible Cellular Materials - Latex Foam.
.9 ASTM E 84- 95, Test Method for Surface Burning Characteristics of Building Materials.

1.6 QUALITY ASSURANCE

.1 Installer shall have a minimum of five (5) years documented experience in the installation of commercial carpet, and be certified by the Manufacturer. Documentation shall be submitted to the General Contractor.

1.7 SUBMITTALS

.1 Submit control submittals in accordance with Section 01300 Submittals.

.2 Submit certificate to demonstrate compliance with CAN/ULC S102 and CAN/ULC S102.2.

.3 Submit proof that carpet has been tested and passed the Indoor Air Quality (IAQ) Carpet Testing Program requirements of the Carpet and Rug Institute.

.4 Manufacturer's Instructions: Provide to indicate special handling criteria, installation sequence, cleaning procedures.

.5 Product Data

.1 Submit product data in accordance with Section 01300 – Submittals.

.2 Submit product data sheet for each carpet tile, adhesive, carpet protection and subfloor filler.

.3 Submit WHMIS MSDS - Material Safety Data Sheets acceptable to Labour Canada and Health and Welfare Canada for carpet adhesive and seam adhesive. Indicate VOC content.

.6 Samples

.1 Submit samples in accordance with Section 01300 Submittals.

.2 Submit duplicate full size pieces of each type carpet tile, duplicate pieces for each selected colour.

.7 Closeout Submittals

.1 Submit operation and maintenance data for incorporation into manual specified in Section 01700 Project Close-Out.

.2 Include information on recycling of carpet including manufacturer's reprocessing program. Indicate which portions of materials are recyclable.

.8 Extra Materials

.1 Provide extra materials of carpet tile and adhesives in accordance with Section 01700 Project Close-Out.

.2 Provide minimum 2% of each colour, pattern and type of carpet tile. Provide in one continuous full width roll.

.3 Extra materials to be from same production run as installed materials.

.4 Identify each package of carpet and each container of adhesive.

.5 Deliver and store where directed by Owner.

1.8 REGULATORY REQUIREMENTS

.1 Prequalification: tested to CAN/ULC-S102.2.

.2 Indoor Air Quality: compliance with CRI Indoor Air Quality Program, CRI -IAQ requirements for maximum total volatile chemicals released into air. Label each carpet product with CRI -IAQ label.

1.9 DELIVERY, STORAGE AND HANDLING

.1 Label packaged materials. For tile products indicate nominal dimensions of tile.

.2 Store packaged materials in original containers or wrapping with manufacturer's seals and labels intact.

.3 Store carpeting and accessories in location as directed by Owner.

.4 Prevent damage to materials during handling and storage. Keep materials under cover and free from dampness.

.5 Maintain temperature of store room at a minimum of 20C, for at least 24 hours immediately before the installation.

1.10 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01560 Environmental Protection.

1.11 PROJECT/SITE ENVIRONMENTAL REQUIREMENTS

.1 Moisture: ensure substrate is within moisture limits prescribed by manufacturer.

.2 Temperature: Maintain ambient temperature of not less than 18°C from 72 hours before installation to at least 72 hours after completion of work.

.3 Relative humidity: Maintain relative humidity between 10 and 65% RH for 48 hours before, during and 48 hours after installation.

.4 Safety: Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials.

1.12 VENTILATION

.1 Ventilate area of work as directed by General Contractor by use of approved portable supply and exhaust fans.

.2 Ventilate enclosed spaces in accordance with Section 01560 Environmental Protection.

.3 Provide continuous ventilation during and after carpet application. Run ventilation system 24 hours per day during installation; provide continuous ventilation for 7 days after completion of carpet installation.

1.13 EXTENDED WARRANTIES

.1 System Warranty

.1 Provide manufacturer's certificate warranting the specified carpet products against defects in materials and manufacture including deterioration of backing, delamination, stretching, wrinkling, fading, or other conditions detrimental to appearance or performance, for a minimum period of 10 years from the date of the Certificate of Substantial Performance. Warranty shall cover complete replacement of affected area including carpet, adhesives, and removal/installation costs.

2. Installation Warranty

.1 Provide a written warranty stating that carpet installation is guaranteed against defects for two (2) years from the date of the Certificate of Substantial Performance.

PART 2 - PRODUCTS

2.1 CARPET

.1 100% nylon loop with bonded monolithic glass backing, carpet rolls, anti-microbial and soil/stain resistance treated; CRI certified;

.1 Tandus Flooring, Aftermath II. Colour to be Merino.

.2 Rubber Base: 1/8" (3mm) thick by 4" ht. "tight-lock" rubber base by Johnsonite or equal by Mannington or Amtico; use rubber base supplied in roll form not 1220mm (48") lengths.

2.2 ACCESSORIES

.1 Adhesive: Acrylic release type: recommended by carpet tile manufacturer; Low VOC content in accordance with CRI requirements.

.2 Carpet protection: non-staining heavy duty kraft paper, or cardboard.

.3 Concrete Floor Sealer/Moisture Barrier: Planiseal™ MRB, by Mapei or approved equal product.

.4 Subfloor Filler and Patch: Portland cement based, premix latex requiring only water to produce cementitious paste; "Planipatch®" by Mapei or approved equal product.

PART 3 - EXECUTION

3.1 EXAMINATION

.1 Examine substrates for defects and determine level of preparation required prior to commencement of installation.

.2 Report any major defects such as cracks greater than 1.5mm in width, and variations in elevation greater than 6mm in 3m in any direction or excessive moisture content in concrete slabs.

.3 Ensure concrete floors are dry by using test methods recommended by flooring manufacturer, and exhibit negative alkalinity, carbonization or dusting.

.4 Moisture test results shall meet or exceed the flooring manufacturer's warranty requirements but in no instance shall exceed 0.4kg/100m2/24 hours. Alkali readings shall be 5 to 9.

3.2 PREPARATION

.1 Remove ridges and bumps.

.2 Apply sub-floor filler/patch to low spots and cracks to achieve floor level to a tolerance of 1:500. Allow to cure.

.3 Where moisture tests result in values higher than those specified above, apply floor sealer/moisture barrier to concrete floor surface prior to installation. Re-test moisture levels.

.4 Prepare floor surfaces in accordance with Contract Carpet Manual, Standard for Installation of Textile Floorcovering Materials No.001.

.5 Pre-condition carpeting following manufacturer's printed instructions.

.6 Install resilient base before proceeding with carpeting.

3.3 INSTALLATION

.1 Install in accordance with manufacturer's printed instructions and in accordance with Contract Carpet Manual, Standard for Installation of Textile Floorcovering Materials No.001.

.2 Install carpeting after finishing work is completed but before demountable office partitions and telephone and electrical pedestal outlets are installed.

.3 Finish installation to present smooth wearing surface free from conspicuous seams, burring and other faults.

.4 Use material from same dye lot. Ensure colour, pattern and texture match within any one visual area.

.5 Cut and fit neatly around architectural, mechanical, electrical and telephone outlets, and furniture fitments, around perimeter of rooms into recesses, and around projections.

.6 Cut and install carpet tile in pan type floor access covers.

.7 Carpet:

.1 Apply acrylic release type adhesive and install carpet in accordance with manufacturer's written instructions.

.2 Lay rolls with butt seams.

3.4 PROTECTION OF FINISHED WORK

.1 Vacuum carpet clean immediately after completion of installation. Protect traffic areas.

.2 Prohibit traffic on carpet until adhesive is cured.

.3 Install carpet protection to satisfaction of Architect.

END OF SECTION

1. GENERAL

1. GENERAL REQUIREMENTS

1. Division One, General Requirements, is a part of this Section and shall apply as if repeated here.

2. SUBMITTALS

1. Samples

1. Prepare samples of various finishes for Architect's approval either on site or by submitting samples as directed, at least thirty days before materials are required. Submit samples in triplicate on 8" x 12" (200 mm x 300 mm) material. Identify each sample as to job, finish, formula, colour name, number, sheen name and gloss units, date and name of Subcontractor.

3. PRODUCT HANDLING

1. Delivery and Storage

1. Deliver materials to site in their original containers with label intact and store in spaces directed by Architect. Keep stored materials covered at all times and take all necessary precaution against fire.

2. Provide C02 fire extinguisher of minimum 20 lbs. (9 kg.) capacity in storage area.

4. ENVIRONMENTAL CONDITIONS

1. Do not paint or finish in unclean or improperly ventilated areas. Do not paint in temperatures lower than 50 degrees F. (10 degrees C.) or varnish in temperatures lower than 65 degrees F. (18 degrees C.).

2. Do not undertake exterior painting at temperatures under 50 degrees F. (10 degrees C.) or immediately following rain, frost or dew. Safe levels shall be determined by use of an electronic metre.

3. Test for moisture content in each location immediately before commencing application of paint. Do not apply paint on surfaces where moisture content exceeds 14%. Promptly notify Consultant if such conditions are encountered.

4. Provide approved equipment for testing moisture content of surfaces to receive paint finishes and have available on Site at all times during Work of this Section.

5. Do not apply paint finish in areas where dust is being generated.

5. PROTECTION

1. Provide metal pans or adequate tarpaulin to protect floors in areas assigned for the storage and mixing of paints.

2. Use sufficient drop cloths and protective coverings for the full protection of floors, furnishings and work not being painted.

3. Leave above areas clean and free from evidence of occupancy upon completion of painting.

4. Protect paint materials from fire and freezing.

5. Keep waste rags in metal drums containing water and remove from building at end of each working shift.

6. RELATED WORK SPECIFIED ELSEWHERE

1. Read carefully all other Sections of the specifications to determine the extent of prime and finish coats applied by others.
2. Concrete Floor Sealer - Section 03300
3. Wood preservative for Rough Carpentry - Section 06100.
4. Special Wall Coatings - Section 09800
5. See Division 15 - Mechanical and 16 - Electrical, for extent of baked enamel finish on equipment.

7. FINISH CARPENTRY & ARCHITECTURAL MILLWORK

1. All cabinet millwork must be finished in the shop by Section 06400. All other finish carpentry materials (including miscellaneous brackets for benches) to be finished by Section 09900.

8. SCOPE OF WORK

1. With exceptions noted in 1.6 and 1.7 above or specifically called for in other Sections of the Specification, all paintwork is included in the scope of this Section

2. NOTE: In locations where Drawings do not call for paint or similar finish on walls and/or ceilings, the intent of this Specification is that all exposed, unpainted surfaces shall be painted.

3. Paint exposed drywall and the like in locations where finish is not otherwise specified or noted. Do not paint such surfaces in mechanical shafts, unless specifically noted.

4. In locations where Drawings do not call for paint or similar finish on walls and/or ceilings, the intent of this Specification is that items such as new work, including miscellaneous metal work, shall be painted.

5. Paint pipes, conduit, ducts and related thermal insulation and all prime painted mechanical and electrical equipment and supports located in mechanical and electrical storage and maintenance rooms in allocations where Drawings call for paint or similar finish on walls and/or ceilings.

6. Do not paint pipe, conduit, ducts, insulation and the like where concealed above ceilings (except louvered type ceilings) or in service shafts.
7. Make good paint finish on shop coated work where damaged.
8. Paint visible portions of steel shelf angles, lintels and structural steel.
9. Paint edges and all faces of doors where primed for paint supplied.
10. Stain all top and bottom edges of all plastic laminate doors.
11. Interior of ducts and diffusers visible from exterior on room side.
12. Paint all roof top equipment, stairs, pipes, conduit, vents, ducts, pipe insulation, etc. exposed on roofs (including primed and prefinished items).
13. Allow for ten (3) different paint colours to be used in the building - including field, accent walls and bulkheads and four (2) exterior paint colours.

9. QUALITY ASSURANCE

1. Paint work shall meet or exceed standards set out in C.G.S.B. Specification No.'s 85-GP-1M to 85-GP-33A.
2. Employ fully trained workers who are regularly employed in this field.

10. RETOUCHING

1. Do all retouching, etc. to ensure that the building may be handed over to the Owner in perfect condition, free of spatter, finger prints, rust, watermarks, scratches, blemishes or other disfiguration.

11. TEST AREA

1. A room or area in the building will be designated by the Architect as a test area to establish standard of workmanship, texture, gloss and coverage.
2. Prior to any painting being started, request a meeting on Site between Architect, Contractor, Subcontractor and Material Manufacturer's Representative to review conditions, surfaces, anticipated problems and to clarify quality of workmanship acceptable to Architect.
3. Apply finishes to each type of surface within room with correct material, coats, colour, texture and degree of gloss in sample area and have same approved prior to providing Work of this Section.
4. Retain test area until after completion of Work. Test area to be minimum standard for the Work.
5. Failure to comply with the above will be cause for Architect to request all Work previously painted to be repainted.

2. PRODUCTS

1. MATERIALS

1. "Top Line" products only are acceptable. Use only products of manufacturers whose best quality lines meet or exceed CGSB Specifications for the particular type of material required. Approved manufacturer unless specifically indicated otherwise in specification:

1.	Dulux	4.	Sika
2.	Benjamin Moore	5.	Pratt & Lambert
3.	Sherwin Williams	6.	M. L. Campbell
		7.	Devoe Coatings

Note: Colours will be selected from ICI Glidden colour system. ICI colour formulas must be matched if one of the other approved manufacturers is being used.

2. Block Filler: thick block filler as manufactured by Glidden or Benjamin Moore shall be used for all masonry walls. Benjamin Moore # 595-01 Latex Block Filler, Glidden # 36250 Concrete Block Filler

3. Thinners, cleaners: Type and brand recommended by the paint manufacturer.

4. Materials to be new and first line of manufacturer.

5. Deliver materials to site in original unbroken containers bearing brand and manufacturer's name.

6. Typical Furniture Finish of all Wood Millwork (by Section 06400): shall be polymerizing two component catalytic varnish system equal to “Duravar Plus” manufactured by M. L. Campbell and distributed by W. E. Saunders & Sons Painters Ltd., 519-582-2621. The individual components of the system used must be chemically compatible to assure perfect adhesion and a top quality, durable final finish.

7. Concrete floor primer and paint: Sikafloor 2001 Primer and Sikafloor Polyurethane UV in colour as selected by Architect.

3. EXECUTION

1. CONDITION OF SURFACES

1. Check all surfaces with electric moisture metre and do not proceed if reading is higher than 12-15 without written permission from Architect.

2. Proceed with work only when surfaces and conditions are satisfactory for production of a first class job.

3. Remove dust, grease, rust and extraneous matter from all surfaces (except that rust occurring on items specified to be primed under other sections shall be removed and worked reprimed under these sections).
4. The commencing of work in a specific area shall be construed as acceptance of the surfaces, and thereafter the contractor shall be fully responsible for satisfactory work as required herein.

2. PREPARATION

1. Concrete and Masonry

1. Test surfaces for alkalinity with pink litmus paper or other recognized method.

2. Where extreme alkalinity occurs, wash surface with 4% solution tetrapotassium pyrophosphate (5 oz. per gallon (31 ml./l.) of water) where latex base paint is to be used and with zinc sulphate solution (3 lbs. per gallon (300 g./l.) of water where other paint bases are to be used.)

3. Etch normal concrete surfaces to receive alkyd paint with muriatic acid solution (1 part commercial) 31.45% to 3 parts water. Neutralize and allow to dry before painting.

4. Prepare masonry concrete surfaces to CGSB 85-GP-31M.

5. Exposed Sealed Concrete Floors to be Painted:

1. One coat Sikafloor 2001 Primer
2. One coat Sikafloor polyurethane UV in colour as selected by Architect from complete colour range.
3. Install floor primer and finish coat as per manufacturer's printed installation instructions.

2. Metal

1. Touch-up shop primed metal after first removing loose primer, rust, oil, grease and other contaminants.

2. Feather edges to make touch-up inconspicuous when applying new primer.

3. Prime with zinc chromate primer.

4. Conform to CGSB 1-GP40d.M to CGSB 85-GP-14M.

3. Galvanized Surfaces

1. For Primer Application Type C Corrosive ensure that all surfaces to be painted are clean, dry, and free of all contaminants.

2. Cleaning of existing surfaces to be conducted according to SSPC-SP-4 Flame Cleaning procedure. Pass high temperature, high velocity, oxyacetylene flames over entire surface and then wire brushing. Primer is to be applied before surface is cool.

3. Phosphatize galvanized metal surfaces using CGSB 31-GP-105M pretreatment or prime with galvanized metal primer.

4. Woodwork

1. Inspect millwork to assure surfaces are smooth, free from machine marks and that nailheads have been countersunk. Seal all knots and sapwood in surfaces to receive paint, with a vinyl sealer compatible with finish specified conforming to CGSB 1-GP-125b.

2. Sand smooth all woodwork which is to be finished and clean surfaces free of dust before applying first coat. Fill nail holes, splits and scratches with non-shrinking filler conforming to CGSB 1-GP-103b after first coat is dry. When these occur on a transparent surface, filler shall be stained to match the finish as approved by Architect. Between coats, sand lightly with No. 00 sandpaper and remove dust.

3. Prime all wood noted for paint finish immediately on delivery to site.

4. Back paint all wood noted for stain, varnish or natural finish.

5. Prepare all wood surfaces to CGSB-85-GP-1M.

5. Hardware

1. Remove finishing hardware, electric cover plates and accessories, mask any that are not removable. Replace these when paint is dry and clean them. Do not clean hardware with solvent that will remove permanent lacquer finish.

6. Plaster and Gypsum Wallboard

1. For small holes, scratches or other surface marks fill with patching compound and sand smooth.

2. For larger holes or damaged areas do not proceed until trade for original work has filled or repaired surfaces to acceptable levels.

3. Prepare wallboard surfaces to CGSB-85-GP-33M.

7. Copper

1. Prepare copper piping and accessories to CGSB 85-GP-20M.

8. General

1. Mask specification plates occurring on equipment, switch boxes, and similar items requiring painting.

2. Protect, remove and replace hardware, accessories, lighting fixtures and similar items as required.

3. Conform with Architect's colour schedules and exactly match approved samples.

3. APPLICATION

1. Finishes and number of coats specified in the schedule are intended to cover surfaces perfectly. If they do not, apply further coats until perfect coverage is achieved as required.

2. Any areas exhibiting incomplete or unsatisfactory coverage shall have the entire plane painted. Patching will not be acceptable.

3. Walls needing repainting, entire wall (plane) shall be painted to the satisfaction of the Architect. See drawings for extent of work.

4. Spray painting will not be permitted unless specifically approved in writing by the Architect in each instance. Architect may withdraw approval at any time and prohibit spray painting for reasons such as carelessness, poor masking or protection measures drifting paint fog, disturbance to other Trades or failure to obtain a dense, even, opaque finish. Spray painting shall be full double coat, i.e. at least two passes for each coat. Do not use spray or roller on wood or metal surfaces, brush only unless approved in writing by Architect. Under no circumstances will spray painting be permitted on acoustical concrete blocks as this destroys their acoustical properties.

5. Arrange to have traffic barred from completed areas wherever possible.

6. Apply materials in strict accordance with manufacturer's directions and specifications and be familiar with these directions and specifications.

7. Prime woodwork as soon as possible after woodwork is delivered to site. Prime all surfaces, whether exposed or not, before installation. In case of woodwork which is to be stained, apply one coat of penetrating sealer to all finish surfaces of wood having uneven absorption, such as birch. Woods of uniform density such as oak shall be left unsealed. Back prime stained and varnished woodwork with one coat of gloss varnish reduced 25%. Fill open grain woods with filler tinted to match wood when transparent finish is required, and work well into grain. Before filler sets, wipe excess from surface.

8. Apply primer-sealer coats by brush or roller method.

9. Permit paint to dry before applying succeeding coats, touch up suction spots and sand between coats with No. 00 sandpaper.

10. Where two coats of the same paint are to be applied, the first coat shall be the

same colour as the finish coat and be inspected by the Architect before application of final coat, to allow the Architect to make reasonable modification of colour if necessary. Furnish Architect with a schedule showing expected completion of the respective coats of paint for the various areas and surfaces. Keep this schedule current as the job progresses.

11. Exterior paints shall be factory tinted to required colours.
12. Flat and semi-gloss finishes on plaster and other surfaces of large areas shall be applied by roller and to all other surfaces applied by brush.

13. Paint shall be uniform in sheen, colour and texture, free from brush or roller marks, sags, runs or other defects.

14. Finish edges of doors (top, bottom, sides and cutouts) with paint or stain treatment as required to match face of door. Seal hidden edges of doors with one coat of shellac and one coat gloss varnish or two coats paint. Repaint tops and edges of wood doors after fitting.

15. Even up stained woodwork in colour as required by nature of wood and as directed by Architect. Apply same finish on trim, fitments, cupboards and other protecting ledges as on surrounding work, disregard sight lines.

16. Carefully hand smooth and sandpaper wood between coats (including priming). Apply one coat sealer before applying first coat paint filler to knots or sap blemishes on wood surfaces to receive paint or stain finish.

17. Remove rust, oil, grease and loose shop paint from metal work by brushing or with wire brushes and make good shop coat before proceeding with final finish. Feather out edges to make touch up patches inconspicuous.

18. After first coat, fill nail holes, splits, and scratches, using putty coloured to match finish.

19. Clean castings with wire brush before application of first paint coat.

20. Do not etch galvanized metal. Prepare prime and paint elsewhere in this section. This includes metal door frames and the like with wiped zinc coating.

21. Remove form oil or parting compounds from concrete surfaces. Use Xylol or approved compound.

22. Paint interior of pipe spaces, ducts, etc. visible through grilles or through metal ceilings in black matt finish.

23. Conform with Architect's colour schedule and exactly match approved samples.

24. <u>Mechanical and Electrical Materials</u>

    1. Refer to Mechanical and Electrical Sections of the Specifications and note the instructions regarding painting and finishing of materials and equipment supplied and installed by those trades.

2. Remove grilles, covers, access panels for mechanical and electrical systems from location and paint separately, if these items are not factory finished.

3. Paint work to match adjacent walls and ceilings unless directed otherwise. Note: This includes trim on fixtures exposed, speakers, emergency lights, concealed sprinkler covers, grilles, diffusers, louvres, vents, fire extinguisher cabinets, electrical panels, etc.

4. Paint interior surfaces that are visible through grilles and louvres with one coat of flat black metal paint to limit of sight line.

5. Where walls and ceilings are not scheduled to be painted, the work described above shall be painted a colour selected by Architect.

6. Unless factory painted, all exposed piping, conduits, ductwork hangers, insulation and mechanical equipment shall be painted.

25. Rooms without finished ceilings will have decks, joists, beams, ducts, etc., painted.

26. Paint graphics as shown on drawings. All graphics to be semi-gloss minimum two coat application.

4. ADJUST AND CLEAN

1. Cracks occurring in walls or ceilings requiring patching during "warranty period" shall be repainted in such a way that the patch is not visible at a distance of 5'-0" (1500 mm).

2. If patch painting not acceptable repaint entire wall or ceiling surface.

3. At completion clean entire area of surplus materials and equipment.

5. FIELD QUALITY CONTROL

1. Locate testing area in building to establish standard of workmanship, texture, gloss and coverage where designated.

2. Apply samples of all finishes on each type of surface to be coated with correct material, number of coats, colour, texture and degree of gloss required.

3. Retain test area until completion of work. Use approved work in test areas as standard for corresponding work throughout building. Correct and refinish work which does not compare with approved finishes.

6. FINISH SCHEDULE

1. General

1. Finish the listed exposed surfaces, wherever they occur unless such

surfaces are specifically noted to be left unfinished.

2. Exposed means visible in the completed work and includes the interior of closets, cabinets and drawers.

3. The Architect shall have the option of having wood painted or with transparent finish and of which finish shall be used.

4. In instances where materials specified are not suitable for a particular job application, or are contrary to manufacturer's recommendations for use on a particular surface, such condition shall immediately be brought to the attention of the Architect for clarification and instructions.

5. Finishes shall match approved samples but Architect reserves the right to make reasonable changes to finish specifications to obtain desired results without additional cost or obligation of Owner.

6. A colour chart giving colour schemes for various areas will be prepared after tendering, by the Architect. The final selection of colours and surface textures of all finishes throughout and whether finishes are transparent (natural) or opaque (paint) shall rest solely with the Architect.

7. Where surfaces have been disturbed the entire plane shall be painted.

2. Exterior Schedule

1. Metal (Ferrous): One coat zinc chromate primer (metal surfaces already primed need not receive a field prime coat except for touch up). Two coats exterior alkyd enamel.

   Note: All roof top equipment, pipes, conduit, vents, ducts, grilles, pipe insulation, etc. to be painted.

2. Galvanized Steel: One coat galvanized primer. Use a Polyamide converted epoxy primer by Devoe Coatings, “4170-1000 with 4170-999 - catalyst”. Two coats of galvanized Finish Coat. Use a single package tough, durable alkyd modified urethane coating with water, chemical and solvent resistance by Devoe Coatings “Devoe” Glid Shield Urethane Gloss Enamel No. 4328-0100 Series (installation within 72 hours of installing primer).

   Note: All exterior areas are to be painted including stairs, masonry lintels, etc.

3. Painted Wood Surfaces: One coat wood primer. Two coats exterior alkyd enamel.

4. Stained Pressure Treated Wood: Two coats solid hide stain conforming to 1-GP-145D.

3. Interior Schedule

1. Metal (Ferrous): One coat zinc chromate primer (metal surfaces already primed need not receive a field prime coat except for touch up). Apply one coat enamel undercoat. Apply two coats interior alkyd enamel.

2. Hot Ferrous Metal - (Valve bodies, strainers, etc., on high temperature lines.) - One coat primer, heat resistant, aluminum alkyd - Two coats heat resistant enamel.

3. Galvanized Steel: One coat galvanized primer. Use a Polyamide converted epoxy by Devoe Coatings "4170-1000 with 4170-9999-catalyst". Two coats of galvanized Finish Coat. Use a single package tough, durable alkyd modified urethane coating with water, chemical and solvent resistance by Devoe Coatings "Devoe Glid Shield Urethane Gloss Enamel No. 4328-0100 Series (install within 72 hours of installing primer).

4. Woodwork Painted: One coat wood primer. Two coats interior alkyd trim enamel.

5. Natural or Stained Close Grain Wood: One coat non-bleeding alkyd stain. One coat sanding sealer. Two coats alkyd interior flat, satin or gloss varnish as directed by Architect.

6. Natural or Stained Open Grain Wood: One coat stain filler. One coat sanding sealer. Two coats interior gloss varnish. One coat alkyd interior flat, satin or gloss varnish as directed by Architect.

7. Interior of Wood Drawers: Three coats finish.

8. Concrete Block; One coat block filler Glidden #36250 or Benjamin Moore #595-01 applied at the minimum rate of 80 sq. ft per gallon (1.63 m2 per litre), or as required by block texture to completely fill block. **Pinholes will not be accepted.** One coat primer-sealer CGSB1-GP-119M. Two coats interior Latex Semi-Gloss "Ultra 94800" by Glidden or #224 Moore ECO SPEC by Benjamin Moore.

9. Exposed Insulated Pipes and Ductwork: One coat size. One coat alkyd undercoat. Two coats alkyd flat.

10. Gypsum Wallboard (Drywall): One coat of Latex sealer. Two coats interior flat or velvet alkyd or eggshell paint "Ultra 94800 by Glidden.

11. Surfaces Behind Grilles and Duct Work Where visible Within 12' (300 mm) of Grille:

    1. Two coats vinyl latex matt black.

12. Painted Light Trims, Emergency Lights, Louvres, Diffusers, Vents,

Concealed Sprinkler Covers, Fire Extinguisher Cabinets, and Electrical Panels, Etc.

1. Two coats interior alkyd enamel to match surrounding wall and ceiling colours or as specified by Architect.

13. Exposed Sealed Concrete Floors to be Painted

1. One coat Sikafloor 2001 Primer

2. One coat Sikafloor polyurethane UV in colour as selected by Architect from complete colour range.

3. Install floor primer and finish coat as per manufacturer's printed installation instructions.

14. General Notes

1. See drawings for locations of areas where more than one colour occurs on one wall and one ceiling plane.

2. Each ceiling bulkhead section or level may be a different colour.

3. Wall planes may be designated a different colour from surrounding walls such as stairwells, entrances, corridor intersections. Allow one accent wall colour per room.

4. At stairwells and metal railings, allow for flatbars, pickets and stringers at stairs to be each painted a different colour. Maximum three colours to be chosen by Architect. Clarification detail will be issued with colour schedule after tender.

5. Door frames may be one colour and door another colour.

7. WOOD FURNITURE FINISHES (By Section 06400)

1. Natural or Stained Transparent Wood Furniture Finish: One coat non-bleeding alkyd stain. One coat sanding sealer. Two coats polymerizing two component catalytic conversion varnish system. “Duravar Plus” manufactured by M.L. Campbell and distributed by W. E. Saunders & Sons Painters Ltd. (519-582-2621). Flat, stain or gloss finish as directed by Architect.

2. Interior of Wood Drawers: Three coats tinted sealer to inside sides, back and bottom.

3. Unexposed Millwork Surfaces: Two coats of tinted sealer including backs of all base and wall cabinets, enclosures, etc.

8. MAINTENANCE MATERIAL

1. Provided one sealed can of four litre capacity, of each product in each colour used in the Work for Owner's use in maintenance work.

2. Container to be new fully labelled with manufacturer's name, type of paint, and colour.

3. Provide Owner 3 copies of paint formula for each colour and type of paint for Owner's maintenance manual.

End of Section

1. GENERAL

1. GENERAL REQUIREMENTS

1. Division One - General Requirements is part of this section and shall apply as if repeated here.

2. REFERENCES

1. The Aluminum Association Inc. (AAI)
.1 AAI DAF-45-[2003], Designation System for Aluminum Finishes - 9th Edition.
.1 AA-A31, [Clear Anodized Finish].
.2 AA-A41, [Clear Anodized Finish].

2. American National Standards Institute (ANSI)
.1 ANSI A208.1-[99], Particleboard, Mat-Formed Wood.

3. American Standards for Testing and Materials International (ASTM)
.1 ASTM A 490M-[04a], Standard Specification for High-Strength Steel Bolts, Classes 10.9 and 10.9.3, for Structural Steel Joints [Metric].
.2 ASTM D 523-[89(1999)], Standard Test Method for Specular Gloss.
.3 ASTM D 968-[05], Standard Test Methods for Abrasion Resistance of Organic Coatings by Falling Abrasive.

4. Canadian Standards Association (CSA International)
.1 CSA-B651-[04], Accessible Design for the Built Environment.
.2 CSA-G40.20/G40.21-[04], General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steels.
.3 CSA W59-[03], Welded Steel Construction (Metal Arc Welding).

5. Canadian General Standards Board (CGSB)
.1 CAN/CGSB-1.40-[97], Anticorrosive Structural Steel Alkyd Primer.
.2 CAN/CGSB-1.81-[M90], Air Drying and Baking Alkyd Primer for Vehicles and Equipment
.3 CAN/CGSB-1.88-[92], Gloss Alkyd Enamel, Air Drying and Baking.
.4 CAN/CGSB-1.181-[99], Ready-Mixed Organic Zinc-Rich Coating.

6. The Master Painters Institute (MPI)
.1 MPI ASM-[February 2004], Architectural Painting Specification Manual.
.1 MPI # 18, Organic Zinc Rich Primer.
.2 MPI # 23, Oil Alkyd Primer.
.3 MPI # 76, Quick Dry Alkyd Metal Primer.
.4 MPI # 96, Q.D. Alkyd Enamel Gloss.
.5 MPI INT 5.1[A to Z], Structural Steel and Metal Fabrications Systems.

3. DEFINITIONS

.1 Bay: single shelving section of unit.

.2 Unit: assembly of one or more bays.

.3 Module: grouping of units with one or more access.

.4 System: complete system including units, and track.

4. DESIGN REQUIREMENTS

.1 Track/Rail system:
- .1 Design track to carry minimum [1491] kg per linear m of carriage.
- .2 Design track/rail system flush with floor for barrier free access with no visible gaps between track and adjacent flooring.

.2 Carriage:
- .1 Design carriage of steel to support minimum [1491] kg per m. double gear reduction to allow carriage to move with 0.45 kg of effort at turn handle.
- .2 Provide manual safety lock to prevent carriages from being moved while personnel access open aisle

.3 Shelving:
- .1 Four post, wedge-locking design, consisting of uprights, shelves and shelf supports, assembled without nuts, bolts, studs, clips, sway braces or gussets.
- .2 No holes on exposed surfaces of assembled shelving: not allowed.
- .3 Shelves and backs: flush with outside post.
- .4 Provide sheet metal gables and back between each bay of shelves to prevent tampering.
- .5 Design individual shelves to support uniform load of 128 kg per m of span.
- .6 Adjustment: provide with vertical adjustment of shelves in [38] mm increments.

5. ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01300 - Submittals.

.2 Product Data:
- .1 Submit manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop Drawings:

.1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Ontario, Canada for track type, track installation detail, track and deck assembly, stationary tie down detail, rubber bumpers, drive upright detail, handle detail, crank, carriage detail including splice, and accessories.

.2 Indicate dimensions, layout, number of bays, number of shelves, number and size of drawers and bins, number of dividers, system of bracing against tipping and anchoring devices.

.4 Samples:

.1 Submit representative sample bay of specified shelving showing finish colour and accessories.

.2 Samples to be returned to Contractor for inclusion in Work.

.5 Quality Assurance Submittals: submit following.

.1 Design Data:

.1 Submit floor loading calculations including floor loading diagram.

.2 Provide installation details.

.2 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.

.3 Manufacturer's Instructions: submit manufacturer's installation instructions and special handling criteria, installation sequence, and cleaning procedures.

.6 Closeout Submittals:

.1 Provide operation and maintenance data for incorporation into manual specified in Section 01700 – Contract Closeout.

6. QUALITY ASSURANCE

.1 Qualifications: installation by factory trained, authorized installer, with minimum of 5 years experience installing mobile systems on regular basis.

7. DELIVERY, STORAGE AND HANDLING

.1 Store shipped materials on site only after arrival of installation crew.

.2 Installation personnel to arrange delivery of components on site as required to avoid storing components on site.

8. WARRANTY

.1 Provide a written warranty, executed by contractor, installer, and manufacturer, agreeing to repair or replace equipment which fails in materials or workmanship within the established warranty period.

.2 In addition, shall warrant the high-density mobile storage system against defects in material and workmanship for a minimum of 10 years from date of final acceptance by owner.

2. PRODUCTS

.1 MANUFACTURERS

.1 General: Specifications stated herein are based upon high-density compact mobile storage **Mobile 1000 products supplied by Mayline Company**, 210 Pony Drive, Unit 2, Newmarket, Ont; 905 830 0247. Upon successfully meeting specification requirements, other manufacturers may be included following written acceptance.

2. MATERIALS

.1 Steel sections and plates: to CSA-G40.21, type 400W.

.2 Steel: to CSA-G40.20/G40.21, Grade 300W.

.3 Hollow Structural Sections (HSS): to CSA-G40.20/G40.21, Grade 350W, Class H.

.4 Alkyd primer: oil type to [CAN/CGSB-1.40] [MPI # 23].

.5 Zinc rich primer for galvanized surfaces: zinc rich, ready mix to [CAN/CGSB-1.181] [MPI # 18] .

.6 Steel bolts, nuts and washers: to ASTM A 490M.

.7 Welding materials: to CSA W59.

.8 Aluminum : extrusions to AA DAF-45 [AA-1 [31] [41] clear].

.9 Anchoring and grouting mortar: quick setting hydraulic cement.

3. FABRICATION

.1 Track and raised floor:

.1 Type 1: provide low profile design consisting of minimum [95] mm x [3.18]mm steel baseplate, with [3.06] mm steel U-channel and C1045CRS steel rail 17 mm x 25 mm wide.

.1 Neoprene insert on either side of bar stock to accommodate flanged wheels without gaps.
.2 Supply track with lap joints to provide continuous structure along entire length of track.
.3 Subfloor: to Section [06 10 00 - Rough Carpentry].

.2 Carriages:

.1 Type 1: provide full length [2.28] mm structural frame, with bolted or welded support members.

.3 Wheels:

.1 Type 1: minimum [127] mm diameter, precision machined with [two] sealed lifetime lubricated self aligning flanged bearings.
.2 Two wheels per rail for each movable carriage.
.3 Connect all wheels on one side of carriage by a 25 mm solid steel drive shaft.

.4 Drive mechanism:

.1 Provide [3] spoked handle mechanical assist operation on carriages.
.2 Wheels on one side of each carriage to be driven.
.3 Provide built in chain tightening device to mechanical assist mechanism.
.4 Include push/pull aisle lock mechanism on all mobile units.

.5 Stationary platforms:

.1 Type 1: provide fixed units [as indicated] to be mounted on platforms of same construction and height as carriages only anchored to track for complete homogenous system.

.6 End panels:

.1 Type 1: provide [16] mm thick [melamine,] [laminated [high density] particleboard,] light grey.
.1 Finish edges with black plastic moulding [38] x [25] mm.
.2 Provide nameholders [127] x [76] mm, two per double faced panel and one per single faced panel.

.7 Shelving:

.1 Type 1: provide standard shelves formed of [0.73] mm cold rolled steel with flanges on four sides.
.2 Turned in and up front and rear flanges.
.3 Include [2.03]mm shelf supports for [762] mm wide bays, and [3.06] mm shelf supports for [1067] mm wide bays.
.4 Overall system height: [2134] mm.
.5 Colour: to be selected by Architect from full product range.
.6 Shelf height: [1937] mm high shelf with [6] shelf openings each minimum of [286] mm high plus top shelf.
.7 Double sided shelves: [762] mm deep with [102] mm high centre strop to prevent boxes from being pushed through from one side to other.
.8 Shelves and centre stops slotted every [51] mm for addition of dividers.
.9 Adjustable shelves on [38.1] mm centres.

.8 System configuration: as indicated in drawings.

.9 Accessories:

.1 Security key lock: provide [one] keylock mounted at [900-1100] mm above floor on end of module[s] indicated as secure modules on drawings.

4. FINISH

.1 Finish metal shelving in colour selected by Consultant from manufacturer's standard range.
.2 Finish:
.1 Electrostatic epoxy powder coated:
.1 Specular gloss value: to ASTM D 523.
.2 Abrasion test to ASTM D 968.

3. EXECUTION

1. MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

2. INSTALLATION

.1 Carry out installation by using mobile shelving storage vendors own in-house installers. Do not sub-contract to a third party.

.2 Install metal storage shelving in accordance with reviewed layout, installation and start-up instructions.

.3 Install rail to tolerances of maximum [2.4]mm from true level within module, maximum [1.6] mm between adjacent rails and maximum [0.8] mm in [3048] mm rail length.

.4 Level track anchor and grout between track and floor.

.5 Install raised floor [plywood]deck free of gaps or barriers at track locations.

.1 Install ramp to raised floor in accordance with CSA-B651.

.6 Install components in place, plumb, straight and level.

.7 Brace, secure and anchor components in place.

.8 Install shelving at uniform, equal height spacing, unless instructed otherwise.

.9 Make good finished surfaces damaged during shipment or installation.

3. FIELD QUALITY CONTROL

.1 Manufacturer's Field Services:

.1 Obtain written report from manufacturer verifying compliance of Work, in handling, installing, applying, protecting and cleaning of product and submit Manufacturer's Field Reports as described in PART 1 - SUBMITTALS.

.2 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

.3 Schedule site visits, to review Work, as directed in PART 1 - QUALITY ASSURANCE.

4. CLEANING

.1 Proceed in accordance with Section 01010 General Instructions.

.2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

End of Section

1. GENERAL

1. GENERAL REQUIREMENTS

1. Division One - General Requirements are part of this section and shall apply as if repeated here.

2. SUBMITTALS

1. Submit shop drawings in reproducible vellum form in accordance with Section 01300 Submittals.
2. Submit maintenance information as part of Operations and Maintenance Manuals.

3. WARRANTY

1. Extend the warranty for work of this section to a period of two years, covering material and workmanship but not to include damage due to vandalism.

2. PRODUCTS

1. **EVIDENCE LOCKERS**

1. **Spacesaver Evidence "Pass-Thru" Lockers - ED3-P-05**.
1. Heavy-gauge welded construction
2. Powder coat finish
3. Stainless steel continuous door hinges
4. Sizes as shown on A9 Series, colours as selected by Architect from manufacturer's full colour range. Submit samples for approval. Refer to Architectural drawings for extent of evidence "pass-thru" lockers where shown on Elevations or noted on plans.

2. **Spacesaver Evidence "Pass-Thru" Lockers - ED3-P-04**.
1. Heavy-gauge welded construction
2. Powder coat finish
3. Stainless steel continuous door hinges
4. Sizes as shown on A9 Series, colours as selected by Architect from manufacturer's full colour range. Submit samples for approval. Refer to Architectural drawings for extent of evidence "pass-thru" lockers where shown on Elevations or noted on plans.
5. One mail slot per elevation

3. **Spacesaver Evidence "Pass-Thru" Refrigerated Lockers - RSD4-2.**
1. Heavy-gauge welded construction
2. Powder coat finish
3. Stainless steel continuous door hinges

4. Sizes as shown on A9 Series, colours as selected by Architect from manufacturer's full colour range. Submit samples for approval. Refer to Architectural drawings for extent of evidence "pass-thru" lockers where shown on Elevations or noted on plans.
5. As insert within unit **ED3-P-04** per elevation

2. **STATIONARY STORAGE SHELVES**
   1. **Mayline / Safco #5244 BL.**
      1. 48" x 24" x 72".
      2. Powder coat finish - black.
      3. 18 ga. (post), 22 ga. (shelf).

   2. **Mayline / Safco #5247 BL.**
      1. 36" x 24" x 72".
      2. Powder coat finish - black.
      3. 18 ga. (post), 22 ga. (shelf).

2. EXECUTION
   1. INSTALLATION
      1. Delivery to the job site shall be coordinated by General Contractor.
      2. Coordinate with mechanical and electrical for final connection
      3. Install at locations indicated on drawings all in accordance with manufacturer's directions.

End of Section