

Part 1 General

1.1 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00- Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for wall and corner guards and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit copies of WHMIS MSDS in accordance with Section 01 35 29.06- Health and Safety Requirements. Indicate VOC's for material as follows:
 - .1 Caulking materials during application and curing.
 - .2 Adhesives.
- .3 Installation Drawings:
 - .1 Indicate on drawings large scale details, materials, finishes, dimensions, anchorage and assembly.
- .4 Samples:
 - .1 Submit duplicate 300 mm long samples of profiles for corner guards.

1.2 QUALITY ASSURANCE

- .1 Test Reports:
 - .1 Submit certified test reports showing compliance with specified performance characteristics and physical properties.
- .2 Certificates:
 - .1 Submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.3 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00- Common Product Requirements and manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect corner guards from [nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.
- .4 Packaging Waste Management: remove for reuse and return by manufacturer of padding, crates, pallets and packaging materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

Part 2 Products

2.1 MATERIALS

- .1 Metal corner guards: Type 304 stainless steel with No. 4 finish.
 - .1 Dimensions and shapes: as indicated.

2.2 ACCESSORIES

- .1 Adhesive: water resistant type as recommended by manufacturer for substrate.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for wall and corner guards installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Departmental Representative.
 - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied.

3.2 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

3.3 INSTALLATION

- .1 Install units on solid backing and erect with materials and components straight, tight and in alignment.
- .2 Adhere corner guards as indicated.

3.4 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 00- Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Perform cleaning after installation to remove construction and accumulated environmental dirt.
- .3 Clean surfaces after installation using manufacturer's written recommended cleaning procedures.
- .4 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.
- .5 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00- Cleaning.

- .6 Waste Management: separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.5 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by wall and corner guards installation.

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

- .1 ASTM International
 - .1 ASTM A167-99(2009), Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
 - .2 ASTM A653/A653M-09, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .3 ASTM C1503 - 08(2013), Standard Specification for Silvered Flat Glass Mirror
- .2 CSA International
 - .1 CAN/CSA-G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Provide manufacturer's printed product literature and data sheets and include product characteristics, performance criteria, physical size, finish and limitations.

1.3 CLOSEOUT SUBMITTALS

- .1 Provide maintenance data for toilet and bath accessories for incorporation into manual specified in Section 01 78 00- Closeout Submittals.

1.4 MAINTENANCE MATERIAL SUBMITTALS

- .1 Tools:
 - .1 Provide special tools required for assembly, disassembly or removal for toilet and bath accessories in accordance with requirements specified in Section 01 78 00- Closeout Submittals.
 - .2 Deliver special tools to Departmental Representative.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials off ground, indoors and in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect toilet and bathroom accessories from nicks, scratches, and blemishes.

- .3 Replace defective or damaged materials with new.
- .4 Packaging Waste Management: remove for reuse and return by manufacturer of crates, pallets, packaging materials and padding in accordance with Section 01 74 21- Construction/Demolition Waste Management and Disposal.

Part 2 Products

2.1 MATERIALS

- .1 Sheet steel: to ASTM A653/A653M with ZF001 designation zinc coating.
- .2 Stainless steel sheet metal: to ASTM A167, Type 304, with satin finish.
- .3 Stainless steel tubing: Type 304, commercial grade, seamless welded, 1.2 mm wall thickness.
- .4 Fasteners: concealed screws and bolts hot dip galvanized, exposed fasteners to match face of unit. Expansion shields fibre, lead or rubber as recommended by accessory manufacturer for component and its intended use.

2.2 COMPONENTS

- .1 Toilet tissue dispenser: double roll type, surface mounted, chrome plated steel frame, capacity of 500 double ply roll, roll under spring tension for controlled delivery.
- .2 Combination towel dispenser/waste receptacle: recessed wall unit, approximately 430 mm wide, 1360 mm high, 145 mm deep. Interior of 0.8 mm galvanized steel, exterior of 0.8 mm stainless steel. Suitable for dispensing folded or roll paper towels. Removable galvanized steel waste receptacle, lockable access door with continuous full height stainless steel hinge.
- .3 Wall mounted soap dispenser: surface mounted stainless steel rectangular tank, size 180 wide x 150 high, with 1.2 L capacity, corrosion resistant, push-in valve dispenses viscous lotion soaps, synthetic detergents, vegetable oil liquid soaps and antiseptic soaps, stainless steel piston and spout assembly, locked hinged filler top, 84 mm spout to wall dimension.
- .1 Grab bars: Stainless steel: 32 mm o.d. x 1.2 mm wall tubing of stainless steel, concealed attachment, provided with steel back plates and all accessories, anchored to withstand downward pull of 2.2 kN, anti-slip finish. Provide and install two grab bars at each barrier free toilet location. Shall be mounted horizontally at a height of 750 to 850 mm from the floor, as follows:
 - .1 One L-shaped grab bar that is mounted on the wall adjacent to the toilet with horizontal and vertical components that are at least 760 mm long, such that
 - .1 The vertical component is 150 mm in front of the toilet
 - .2 One grab bar (600 mm long) on the rear wall
 - .1 Centred with the toilet; and
 - .2 At least 600 mm long
- .2 Mirror: to ASTM C1503, wall mounted unit, fixed framed mirror 6 mm, stainless steel frame. Complete with concealed stainless steel mounting clips and butyl tape. Maximum

tolerance permitted from edge of wall is 13 mm on each side. Size: 600 wide x 900 high. Install bottom edge at 1000mm above finished floor.

- .3 Shelf surface mounted, 125 deep, 915 wide, stainless steel.
- .4 Surface-mounted hook (HK2): stainless steel with 40 mm projection, mounting height as indicated.

2.3 FABRICATION

- .1 Weld and grind joints of fabricated components flush and smooth. Use mechanical fasteners only where approved.
- .2 Wherever possible form exposed surfaces from one sheet of stock, free of joints.
- .3 Brake form sheet metal work with 1.5 mm radius bends.
- .4 Form surfaces flat without distortion. Maintain flat surfaces without scratches or dents.
- .5 Back paint components where contact is made with building finishes to prevent electrolysis.
- .6 Hot-dip galvanize concealed ferrous metal anchors and fastening devices to CAN/CSA-G164.
- .7 Shop assemble components and package complete with anchors and fittings.
- .8 Deliver inserts and rough-in frames to job site at appropriate time for building-in. Provide templates, details and instructions for building in anchors and inserts.
- .9 Provide steel anchor plates and components for installation on studding and building framing.

2.4 FINISHES

- .1 Manufacturer's or brand names on face of units not acceptable.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrates and surfaces to receive toilet and bathroom accessories previously installed under other Sections or Contracts are acceptable for product installation in accordance with manufacturer's instructions prior to toilet and bathroom accessories installation.
- .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
- .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval from Departmental Representative.

3.2 INSTALLATION

- .1 Install and secure accessories rigidly in place as follows:
 - .1 Stud walls: install steel back-plate to stud prior to plaster or drywall finish. Provide plate with threaded studs or plugs.

- .2 Hollow masonry units, existing plaster or drywall: use toggle bolts drilled into cell or wall cavity.
- .3 Solid masonry, marble, stone or concrete: use bolt with lead expansion sleeve set into drilled hole.
- .4 Toilet and shower compartments: use male to female through bolts.
- .2 Install grab bars on built-in anchors provided by bar manufacturer.
- .3 Use tamper proof screws/bolts for fasteners.
- .4 Fill units with necessary supplies shortly before final acceptance of building.

3.3 ADJUSTING

- .1 Adjust toilet and bathroom accessories components and systems for correct function and operation in accordance with manufacturer's written instructions.
- .2 Lubricate moving parts to operate smoothly and fit accurately.

3.4 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11- Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11- Cleaning.
- .3 Waste Management: separate waste materials for recycling and reuse in accordance with Section 01 74 21- Construction/Demolition Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.5 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by toilet and bathroom accessories installation.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 All Division 1 Requirements.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00- Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for Fire Extinguishers 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 Saskatchewan, Canada.
 - .2 Provide:
 - .1 Characteristics, performance criteria, physical size, and limitations.
- .4 Sustainable Design Submittals:
 - .1 Construction Waste Management:
 - .1 Submit project Waste Management plan highlighting recycling and salvage requirements.

1.3 CLOSEOUT SUBMITTALS

- .1 Operation and Maintenance Data: submit operation and maintenance data for fire extinguishers for incorporation into manual.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00- Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Replace defective or damaged materials with new.
- .4 Develop Waste Reduction work plan related to Work of this Section.

Part 2 Products

2.1 PORTABLE FIRE EXTINGUISHERS

- .1 General:
 - .1 Provide fire extinguishers of type, size, and capacity for each cabinet and other locations as indicated on mechanical drawings.
- .2 Product:
 - .1 A 4.5-kg, multi-purpose, UL listed, dry chemical fire extinguisher with rating based on spacing and hazard.
 - .2 Mounting Brackets: Manufacturer's standard steel bracket, designed to secure extinguisher, of sizes required for types and capacities of fire extinguisher indicated, with plated or baked-enamel finish.

2.2 FIRE EXTINGUISHER CABINETS

- .1 General:
 - .1 Unless specified otherwise on construction drawings, provide fire extinguisher cabinet of type, size, and rating as indicated below, or equivalent.
 - .2 Cabinet Size: Minimum inside box dimensions shall be 229mm x 610mm x 152mm.
 - .3 Cabinet Construction: Provide manufacturer's standard box, with trim, frame, door, and hardware to suit cabinet type, trim style, and door style indicated.
 - .4 Cabinet Mounting: Suitable for the following:
 - .1 Recessed: Cabinet box recessed in walls of sufficient depth to suit style of trim indicated.
 - .2 Semi recessed: Cabinet box partially recessed in walls of shallow depth to suit style of trim indicated.
 - .3 Surface Mounted: Cabinet box fully exposed and mounted directly on wall.
 - .5 Cabinet Trim Style: Fabricate cabinet trim in one piece with corners mitered, welded and ground smooth.
 - .6 Cabinet Trim Material: Steel sheet.
 - .7 Door Material: Steel sheet.
 - .8 Door Window: Clear Glass
 - .9 Door Hardware: Provide manufacturer's standard door-operating hardware.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of work site and all previously installed work under other Sections or Contracts are acceptable for this contract.
 - .1 Inform consultant of unacceptable conditions immediately upon discovery.
 - .2 Proceed with installation only after unacceptable conditions have been remedied.

- .3 Examine walls and partitions for suitable framing depth and blocking where recessed and semi recessed cabinets are to be installed. Verify openings for cabinets are correctly sized and located.
- .4 Examine fire extinguishers for proper charging and tagging. Remove and replace damaged, defective, or undercharged units.

3.2 FIRE EXTINGUISHER INSTALLATION

- .1 Comply with manufacturer's written instructions for installing fire extinguishers and mounting brackets.
- .2 Mounting Height: Install extinguishers at heights indicated below.
 - .1 Install fire extinguishers mounted on hangers or brackets attached to a wall so that the top of the fire extinguisher is not more than 1065 mm above the floor.
 - .2 In no case shall the clearance between the bottom of the fire extinguisher and the floor be less than 150mm.

Locations:

- .1 Install fire extinguishers at locations specified on the drawings or as directed by the authority having jurisdiction.
- .2 Fire extinguishers shall be conspicuously located, along normal paths of travel, including exits from areas. Extinguishers shall not be obstructed or obscured from view.
- .3 Install portable fire extinguishers on the hanger or in the bracket supplied, or place in the fire extinguisher cabinets as indicated on drawings. Verify that the extinguisher operating instructions face outward.

3.3 FIRE EXTINGUISHER CABINETS

- .1 Comply with manufacturer's written instructions for installing fire extinguisher cabinets.
- .2 Install fire extinguisher cabinets at locations specified on the drawings.
- .3 Repair/paint wall surfaces surrounding fire extinguisher cabinet damaged during installation to match existing wall surface.

3.4 SIGNAGE

- .1 Identify bracket-mounted extinguishers with the words "FIRE EXTINGUISHER" in red letter decals applied to wall surface.
- .2 Where space layout limits ability to see fire extinguisher location, provide a wall sign that is nominally perpendicular to the wall. Sign shall have a fire extinguisher symbol on it.

3.5 FIELD QUALITY CONTROL

- .1 Provide review of product use recommendations and product installation in accordance with manufacturer's instructions.

3.6 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11- Cleaning.
 - .1 Leave Work area clean at end of each day.

- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11- Cleaning.

3.7 PROTECTION

- .1 Protect equipment and systems openings from dirt, dust, and other foreign materials with materials appropriate to system.

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

- .1 American National Standards Institute (ANSI)
 - .1 ANSI MH28.1-1997, Industrial Grade Steel Shelving, Specification for the Design, Testing, Utilization, and Application of
- .2 ASTM International
 - .1 ASTM A653/ A653M-09, Specification for Steel Sheet, Zinc Coated (Galvanized) or Zinc Iron Alloy Coated (Galvannealed) by the Hot Dip Process.
- .3 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-1.300-2000, Applied Coating System of Semigloss Baked Finish for Office Furniture.
- .4 CSA Group (CSA)
 - .1 CSA-G40.20-04/G40.21-04, General Requirements for Rolled or Welded Structural Quality Steel / Structural Quality Steels.
- .5 National Electrical Manufacturers' Association (NEMA)
 - .1 NEMA LD-3- 2005, High-pressure decorative laminates

1.2 DEFINITIONS

- .1 Carriage: framing supporting full length of shelving ranges.
- .2 Drifting: movement of mobile ranges along tracks, due to gravity.
- .3 Racking: deformation in the plane of rectangular framing.
- .4 Range: one or more shelving bays, single or double faced, connected together and supported by a carriage. Range length defines the front to back depth of a system.
- .5 Single-Entry Shelving: shelving that is designed to be accessed from one side only, is half-depth of double-faced shelving units, vertically adjustable independently of adjacent half-depth shelves designed to be accessible from the other side of the mobile shelving unit or range.

1.3 SYSTEM DESCRIPTION

- .1 Provide mechanically assisted mobile shelving system, consisting of the following:
 - .1 New shelving.
 - .2 Raised, levelled floor for recessing tracks.
 - .3 Recessed, levelled tracks.
 - .4 Mobile carriages.
 - .5 Drive mechanisms.
 - .6 Safety devices.
 - .7 Accessories.

1.4 DESIGN CRITERIA

- .1 Design system assuming shelf loading of 517 N/m.
- .2 Support shelves with lugs or clips.
- .3 Provide anti-tip devices for any mobile ranges whose height-to-width ratio exceeds 4:1, width being least plan dimension of carriage frame.
- .4 Design raised floor and ramp to support 2.4 kPa with maximum deflection of 1/360 of framing spans. Design as a tightly connected assembly of components, exclusive of floor finish, that can be readily assembled and dis-assembled non-progressively, i.e., starting at any assembly point in the raised floor.
- .5 Locate tracks to prevent ramps from extending past carriage ends.
- .6 Use materials designed not to deform under design loads and adversely affect performance.

1.5 PERFORMANCE CRITERIA

- .1 Systems shall meet performance requirements and design criteria when loaded to design capacity.
- .2 System shall operate smoothly, quietly, safely and consistently.
- .3 Maximum vertical deflection of carriage framing: 1/600 of spans.
- .4 Except as specified otherwise, components shall support design loads without permanent deformation.
- .5 Connections shall not loosen and components shall not be displaced due to vibration or system operation.
- .6 Maximum crank effort required to start and maintain range movement at any location and both directions shall be 45.0 N.
- .7 Drive mechanisms shall not exhibit play or looseness. Cranks shall require maximum ten degree rotation before starting range movement.
- .8 Fixed ranges shall not be displaced when impacted at normal operating speed, by maximum available number of adjacent mobile ranges.
- .9 Mobile ranges shall not drift.
- .10 Except for industrial type shelving, shelving posts and shelves shall be readily assembled, dis-assembled and re-assembled, without tools and with total salvage-ability of all components. Shelf supports shall not damage storage media.

1.6 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00- Submittal Procedures.
- .2 Shop Drawings:
 - .1 Plan layout of system indicating raised floor and ramps, track location, extent and spacing, aisle access, crank locations, fixed and mobile ranges, and dimensions.
 - .2 Range end elevations, indicating dimensions, crank type and location, and aisle locks.

- .3 Clearances to adjacent building elements.
- .4 Large scale details at recessed tracks, raised floor perimeters and ramps, and anti-tip devices.
- .3 Product Data:
 - .1 Data: submit manufacturer's product literature indicating compliance with specified requirements.
 - .2 Submit copies of WHMIS MSDS in accordance with Section 01 35 29.06- Health and Safety Requirements.
- .4 Samples:
 - .1 Submit minimum 100 mm x 100 mm duplicate samples, of colour and type of exposed finishes, on representative substrates. Identify colour and application on each sample.

1.7 CLOSEOUT SUBMITTALS

- .1 Submit in accordance with Section 01 78 00- Closeout Submittals.
- .2 Product Operation and Maintenance Data:
 - .1 Submit operation and maintenance data including the following:
 - .1 Name, address and phone number of nearest firm qualified to service system.
 - .2 Parts lists referenced to drawings illustrating parts.
 - .3 Operating and troubleshooting instructions.
 - .4 Manufacturer's recommendations for servicing frequencies and adjustment.
- .3 Provide tools for assembly and disassembly, standard with storage shelving manufacturer.

1.8 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00- Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials indoors and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect shelving from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.
- .4 Packaging Waste Management: remove for reuse and return by manufacturer of padding, crates, pallets and packaging materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

1.9 INSTALLER QUALIFICATIONS

- .1 Installer shall be a company authorized by the manufacturer to install and service system specified.

Part 2 Products

2.1 MATERIALS

- .1 Sheet Steel: commercial grade, stretcher levelled to ASTM A653M, without visible deformation or surface irregularities.
- .2 Steel Sections and Plates: to CAN/CSA-G40.21.

2.2 FOUR POST AND CASE TYPE SHELVING

- .1 Four post and case style shelving shall meet or exceed requirements of ANSI MH 28.1, American National Standard for the Design, Testing, Utilization and Application of Industrial Grade Steel Shelving, except as follows:
 - .1 Install shelving not more than 13 mm from vertical in 3 m (changed from ANSI MH28.1, 1.4.4).
 - .2 Maximum vertical deflection of shelves shall be 1/200 of shelf span (changed from ANSI MH28.1, 6.2.3 (c)).
 - .3 Maximum permanent deformation must be equal to or less than 15% of L/200 (changed from ANSI MH28.1, 6.3.2).

2.3 SHELVING COMPONENTS

- .1 Posts: steel, shelf support slots at maximum 25 mm o.c., readily visible slot variations at maximum 150 mm centres for alignment of shelves. Integral end panels, full height and flush with both sides of posts.
- .2 Adjustable Shelves: single and double-entry type, sheet steel, front and back edges double bent or rolled more than 180 degrees, and as follows:
 - .1 Depth:
 - .1 Single-entry: 192 mm.
 - .2 Double-entry: 384 mm.
 - .2 Width: 3200 mm nominal.
 - .3 Slots for shelving dividers at 25 mm centres.
- .3 Base Shelf: similar to adjustable shelves.
- .4 Height of Shelving Bays: 2134 mm nominal.
- .5 Number of Shelves Per Bay: 7, including base shelf, but not including top panels.
- .6 Base Kickplate: sheet steel, minimum 1.6 mm thick, edges bent 90 degrees with minimum 13 mm return.
- .7 Shelf backs: sheet steel, slotted for shelf dividers, height to suit dividers, but not less than 125 mm. Slots aligned with slots in shelves. One shelf back per shelf.
- .8 Top panels: sheet steel, thickness to match adjustable shelves.

- .9 Manufacturer's other standard components as required to meet specified requirements.

2.4 SHELVING ACCESSORIES

- .1 Sheet Steel Shelf Dividers: tabs at bottom and back to engage shelves and shelf backs, and as follows:
 - .1 Height: 200 mm.
 - .2 Depth: 380 mm.
 - .3 Number Per Shelf: 3. Do not count end brackets as dividers.
- .2 Back panels: sheet steel, minimum 1.0 mm thick.

2.5 TRACKS

- .1 Material: steel, or a combination of steel and extruded aluminum.
- .2 Designed to be levelled and recessed flush with floor finish.

2.6 CARRIAGES

- .1 Squareness Tolerance: length of diagonals across carriages shall differ by no more than 1/900 of longest diagonal.
- .2 Carriages for Fixed Ranges: same as mobile carriages, except no drive mechanism. Continuous metal support all around carriage frame, matching carriage finish and mobile carriage clearance above floor.

2.7 RAISED FLOORS FOR RECESSING TRACKS

- .1 Finish Substrate: wood panel product to manufacturer's standard.
- .2 Supporting Components: steel, electro or hot-dip galvanized, or aluminum.
- .3 Perimeter Closure: sheet steel, galvanized, finished to match carriages, or wood, finished to match raised floor finish.

2.8 RAMPS

- .1 Structural Component: sheet steel, hot dip galvanized to ASTM A653M, Z275 zinc coating.
- .2 Slope ramp maximum 1:10. Conceal fastening to raised floor support framing and to lower floor at toe of ramp.
- .3 Finish: same as raised floor.

2.9 DRIVE MECHANISMS

- .1 Provide manufacturer's standard, concealed drive mechanism, modified as required to meet specified requirements.
- .2 Provide rotating crank at all mobile range ends adjacent to aisle access.
- .3 Provide suitable ball or roller bearings where rotating components are connected to non-rotating components.

- .4 Mechanism shall transfer operator force from cranks to drive shafts using steel chains and sprockets, and to load-bearing drive wheels via drive shafts.
- .5 Transfer carriage loads to wheels using permanently sealed, self-lubricating ball or roller bearings.
- .6 Provide spacers to eliminate friction between wheels and carriage framing.
- .7 Provide spring-loaded, free-wheeling sprocket assembly designed to maintain chain tension in drive mechanism.
- .8 Aisle Locks: provide manufacturer's standard device to lock drive mechanisms at each mobile range crank.

2.10 END PANELS

- .1 Type: one piece face construction, designed for easy access to drive mechanisms.
- .2 Material: painted sheet steel, minimum 1.0 mm thick exclusive of paint finish, or manufacturer's standard wood panel product, finished as specified. Faces shall be flat, with no visible deformation.
- .3 Panel edge profile thickness: minimum 19 mm. Triple bend sheet steel edge profiles.
- .4 Size: width to match carriage frame, height to extend from carriage frame to above shelving top panels.

2.11 ANTI-TIP DEVICES

- .1 Anti-tip devices shall be continuous along recessed tracks, with concealed modification of underside of carriage as required.
- .2 Secure anti-tip devices to structurally adequate building components.

2.12 ACCESSORIES

- .1 Bumpers: manufacturer's standard, in one colour.
- .2 Grout: non-shrinking, cementitious, pre-mixed type, compressive strength as required to support loads.

2.13 FABRICATION

- .1 Fabricate components square, straight, free of warpage, sharp edges, burrs and other potential hazards.
- .2 Accurately cut, machine, file and fit joints, corners, copes and mitres. Make exposed joints and connections tight, flush and smooth.
- .3 Install bumpers at maximum 1.5 m centres, aligned with bumpers on adjacent ranges.

2.14 FINISHES

- .1 Finish suitably prepared steel surfaces to CAN/CGSB-1.300.
- .2 Paint colour: manufacturer's standard colour closest to CGSB 1-GP-12c, colour 501-214, off-white - grey, semi-gloss.
- .3 Exposed Aluminum: clear anodized.

- .4 Finish metals in contact with cementitious material, as follows:
 - .1 Carbon Steel: electro or hot-dip galvanize, or coat with zinc rich primer.
 - .2 Aluminum: bituminous paint.
- .5 Raised Floor Finish: as specified in Section 09 65 19 - Resilient Tile Flooring.
- .6 Wood Product End Panels:
 - .1 Faces: melamine meeting NEMA Standard LQ1, "Decorative Boards", in manufacturer's standard colour closest to colour specified for sheet steel finish.
 - .2 Edges: PVC T-type, or rigid PVC strip applied with hot-melt adhesive, 3 mm thick, width to match panel thickness, colour selected by Departmental Representative from manufacturer's standard range.

Part 3 Execution

3.1 ASSEMBLY AND INSTALLATION, GENERAL

- .1 Assemble and install mobile shelving system components to manufacturer's recommendations, to meet specified requirements.
- .2 Provide back and side sway bracing for shelving without end and back panels, at end bays of each range and at alternate shelving bays within each range.
- .3 Secure fixed ranges as required to meet performance requirements.
- .4 Install end panels to both ends of mobile and fixed ranges. Conceal fasten end panels.

3.2 TRACK INSTALLATION

- .1 Install in accordance with manufacturer's recommendations and to meet performance requirements and as detailed on drawings.
- .2 Mechanically interlock tracks at joints and secure with tension fastening.
- .3 Anchor tracks to floor structure at spacing recommended by manufacturer, at track ends and at both sides of joints.
- .4 Provide continuous grout bed under tracks.
- .5 Continue tracks under fixed ranges.

3.3 INSTALLATION OF RAISED FLOORS AND RAMPS

- .1 Install raised floor continuously between tracks, along full track lengths. Position as close to tracks as practicable and install so that raised floor finish is same elevation as top of tracks.
- .2 Install ramps continuously along ends of systems serving as access to aisles. Continue ramps under fixed ranges.
- .3 Securely fasten top of ramp to raised floor perimeter support framing and toe of ramp to lower floor, using concealed mechanical fastening.
- .4 Install finish over raised floor and ramps, to finish manufacturer's recommendations.

3.4 SYSTEM DEMONSTRATION

- .1 Arrange suitable time to demonstrate system performance to Departmental Representative and personnel intended to operate system.
- .2 Demonstrate recommended system operation and safety features.

3.5 CLEANING

- .1 Promptly remove debris, surplus materials and tools as work progresses.
- .2 Repair damage caused by work of this Section to existing structures and finishes.

END OF SECTION