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SOLICITATION AMENDMENT
MODIFICATION DE L'INVITATION

The referenced document is hereby revised; unless otherwise
indicated, all other terms and conditions of the Solicitation
remain the same.

Ce document est par la présente révisé; sauf indication contraire,
les modalités de l'invitation demeurent les mêmes.

Comments - Commentaires

Vendor/Firm Name and Address
Raison sociale et adresse du
fournisseur/de l'entrepreneur

Issuing Office - Bureau de distribution
Acquisitions
1713 Bedford Row
Halifax, N.S./Halifax, (N.É.)
B3J 3C9

Title - Sujet MOBILE SHELVING SYSTEM	
Solicitation No. - N° de l'invitation K4B20-110364/A	Amendment No. - N° modif. 002
Client Reference No. - N° de référence du client K4B20-110364	Date 2012-10-12
GETS Reference No. - N° de référence de SEAG PW-\$HAL-219-8759	
File No. - N° de dossier HAL-1-66775 (219)	CCC No./N° CCC - FMS No./N° VME
Solicitation Closes - L'invitation prend fin at - à 02:00 PM on - le 2012-10-31	Time Zone Fuseau horaire Atlantic Daylight Saving Time ADT
F.O.B. - F.A.B. Plant-Usine: <input type="checkbox"/> Destination: <input type="checkbox"/> Other-Autre: <input type="checkbox"/>	
Address Enquiries to: - Adresser toutes questions à: Richard, Linda K.	Buyer Id - Id de l'acheteur hal219
Telephone No. - N° de téléphone (902) 496-5261 ()	FAX No. - N° de FAX (902) 496-5016
Destination - of Goods, Services, and Construction: Destination - des biens, services et construction:	

Instructions: See Herein

Instructions: Voir aux présentes

Delivery Required - Livraison exigée	Delivery Offered - Livraison proposée
Vendor/Firm Name and Address Raison sociale et adresse du fournisseur/de l'entrepreneur	
Telephone No. - N° de téléphone Facsimile No. - N° de télécopieur	
Name and title of person authorized to sign on behalf of Vendor/Firm (type or print) Nom et titre de la personne autorisée à signer au nom du fournisseur/ de l'entrepreneur (taper ou écrire en caractères d'imprimerie)	
Signature	Date

AMENDMENT NO. 2

This amendment is issued to reflect the following changes.

1. Closing Date:

Delete: 2012-10-22 2:00 p.m. ADT

Insert: 2012-10-31 2:00 p.m. ADT

2. Annex "A" - Requirement

Delete: In its entirety

Add: See the following new Annex "A" Requirement

**ANNEX "A"
REQUIREMENT**

**IM Integration Project, Atlantic
Requirement -Electrical Moveable High Density Shelving System**

1.0 SCOPE :

- 1.1 The Environment Canada current file load in the Library is 21,600 total linear inches. The Records file load is 5940 total linear inches. Two new and separate electrical moveable high density shelving systems are required to house these 2 separate collections.
- 1.2 Electrical movable high density shelving system must meet HRSDC Requirements for electrical movable high density shelving installed in federal facilities. Total installation including shelving, carriages, deck and track assembly must be performed by factory authorized Service Technicians, leaving installation complete, clean and ready to use.
- 1.3 The requirement may call for the use of materials and or equipment that could be hazardous. The requirement does not purport to address all the safety aspects associated with its use. Contractors have the responsibility to consult with the appropriate authorities and establish appropriate health and safety practices in conjunction with any existing applicable regulatory requirements prior to its use.
- 1.4 Overall weight of the system based on a **full capacity must not exceed 100 pounds per square foot.**
- 1.5 There will be a co-ordination of efforts between multiple responsibilities including but not limited to a representative from Public Works and Government Services Canada, the Contractor, Environment Canada representative from Accommodations, Real Property, Security and Facilities Environment Canada representative for Procurement and Contracting and Environment Canada representative from Information Management and possibly other groups.

2.0 REQUIREMENT:

The Contractor will carry out the following Work on the Environment Canada site ("on-site activities").

2.1 Training

The Contractor will be responsible for training the end users in the operation of the mobile shelving unit.

2.2 Operating and Maintenance Manuals

Upon contract award, the Contractor will be responsible for supplying one complete set operating and maintenance instructions. As a minimum, these manuals must include instructions for operating, cleaning and maintenance of all components and finishes and the names, addresses and telephone numbers for parts and services.

2.3 Installation Services

Installation services must be provided for the products contracted. The minimum level of service required is detailed below. The Contractor must:

- 2.3.1. Receive, unload, store and transport all products/pieces to the staging and/or installation site;
- 2.3.2. Unpack all pieces and inspect products for shipping damage;
- 2.3.3. Install all products in accordance with the manufacturer's specifications;
- 2.3.4. Install shelving units to comply with final floor plan drawings
- 2.3.5. Ensure all products function properly and make minor adjustment/repairs;
- 2.3.6. Touch up all minor nicks and scratches on the product that may have occurred during Installation or remove and replace damaged components and provide and install new replacements;
- 2.3.7. Adjust all pieces to ensure smooth operation;
- 2.3.8. Clean the products once installed;
- 2.3.9. Clean up the installation site. The site must present a neat, orderly and workmanlike appearance at all times. This must be accomplished by the removal of scrap material, debris and the like from the site, as frequently as is necessary.
- 2.3.10. Upon completion of the installation and at the convenience of the Project Authority, the Contractor (or his authorized representative) must walk through the installation site with the Project Authority (or an authorized representative of the Project Authority) to verify the operating condition of all products in accordance with the Deficiency Procedures.
- 2.3.11. Installers will be expected to follow all safety precautions and practices which are standard for installation work in a building under construction.
- 2.3.12. Installers must be aware of other work underway in the building. A building orientation session will be provided by the building contractor, co-ordinated through the Project Authority, on day one of installation, prior to access.
- 2.3.13. Installation must be supervised on a daily basis by the factory trained installation supervisor.
- 2.3.14. Installers may be required to wear safety equipment such as hard hats, safety boots, safety glasses and reflective vests. Installers will be responsible for their own safety equipment.
- 2.3.15. Supplier must repair all damage to building caused by work of this contract;
- 2.3.16. Installation contractor must be an experienced installer who is a manufacturer's authorized representative for the specified project.

2.4 Deficiency Procedures

2.4.1 The Contractor must adhere to the following deficiency procedures:

- a. The Contractor must notify the Project Authority when the installation is completed;
- b. The Project Authority must arrange for the inspection with the Contractor;
- c. The inspection must take place no later than three business days after installation is completed;
- d. The Project Authority, in consultation with the Contractor, must prepare the deficiency list documenting all problems in every installation area;
- e. The deficiency list must be forwarded by the Project Authority to the Contractor;
- f. Within three business days of receipt of this deficiency list, the Contractor must complete all minor deficiencies and make all adjustments not requiring new parts;
- g. For all deficiencies other than those identified in point F, the Contractor must submit the plan of action with delivery dates or completion dates within fourteen calendar days from receipt of the deficiency list from the Project Authority and;
- h. The Contractor must notify the Project Authority when all deficiencies have been completed. If the Project Authority is satisfied with the deficiency corrections, the Project Authority must provide the Contractor a final sign-off that the deficiencies have been satisfied.

3.0 SCHEDULE

- 3.1 The Contractor must provide no less than 72 hours notice to the Project Authority advising that on-site activities will commence.

4.0 GENERAL

4.1 Design Flexibility

The manufacturer must have the ability to install the entire system in any normal construction including a raised floor.

4.2 Workmanship

- 4.2.1 Manufacturer must be ISO 9001 or equivalent certified for the design, production, installation and service of carriage mounted high-density mobile storage units and support rails. Furnish certificate attesting to manufacturer's ISO 9001 or equivalent quality system registration.
- 4.2.2 Framing parts must be straight, square, and plumb. All parts must be aligned and securely fastened. Any connections requiring welding or bolting must be finished and nonabrasive. Any exposed surface of the installation with which personnel may come in contact must be smooth and nonabrasive.
- 4.2.3 Note all field conditions including examination of existing floor surface for compliance with requirements for installation tolerances and other conditions affecting performance of mobile storage units and verification of site dimensions before fabrication of shelving where field dimensions cannot be made without delaying work, establish dimensions in coordination with Project Authority.

4.3 Environmental

- 4.3.1 Waste Material from the manufacturing process must be minimized and/or recycled.
- 4.3.2 The packaging must be designed to minimize waste, e.g., bulk, reusable such as blanket wrap.

4.4 Colours/Finish

- 4.4.1 Steel carriages and shelves must be painted and finished with factory powder coat paint in textured colors specified by the customer. All aluminum components must be anodized, painted or otherwise treated to prevent oxidation. Bidders must provide a list of available colors with their submission and the color choice will be confirmed at contract award.

4.5 Finishes

- 4.5.1 The metal components must meet the following performance requirements:

1. Adhesion - The adhesion rating of the finish must not be less than 4B when tested in accordance with ASTM D3359 Method B.
2. Abrasion Resistance - The loss of the finish must not exceed 0.020 g per 500 cycles, using at least a CS-10 wheel tested in accordance with ASTM D4060.
3. Scratch Resistance - The finish must meet the requirements of ASTM D3363, hardness H.

4.6 Warranty

- 4.6.1 Warranty must cover the entire installation against defects in material and workmanship.
- 4.6.2 Contractor must provide onsite training session, onsite service agreement, onsite maintenance.
- 4.6.3 Contractor must provide a detailed and written warranty executed by the Contractor, Installer, and Manufacturer at time of tender submission. All aspects of the warranty will include all parts at no cost and all labour at no cost for each specified period. All warranties are applicable based on the date of invoice.
- 4.6.4. Limited lifetime warranty on shelving and mobile carriages (any parts, controls, etc that are not in immediate contact with moving parts)
- 4.6.5. Limited 10 year warranty for motors for all carriage drives
- 4.6.6 The warranty period will be for a period of five (5) years for all equipment other than mobile carriages and motors.

5.0 DELIVERY

- 5.1 Contractor must provide tailgate service delivery and/or hand delivery - no loading dock
- 5.2 Elevator Size and Dimensions:

Height: 87 in.
Width: 80 in., between handrails 73 in.
Depth: 56 in., between hand rails 53 in.
Door Height: 83 in.
Door Width: 42 in.
Capacity: 3000 lbs

* Elevators: If all four are operating one can be locked out through the day except for during rush hours which are 8 - 8:30, 12 - 1pm, and 4 - 4:30. Also the freight elevator should be in service and is 12" higher. Installation can be done during regular hours.

5.3 Travel & accommodations costs will not be covered.

PURCHASE DESCRIPTION ELECTRICAL MOVEABLE HIGH DENSITY SHELVING SYSTEM

1.0 SCOPE

- 1.1 This purchase description applies to the supply, delivery and installation of an Electrical Moveable High Density Shelving System to meet the requirements for Environment Canada Library and Records Services, 45 Alderney Drive, Dartmouth, Nova Scotia, B2Y 2N6.
- 1.2 The installation of new carpet onto the mobile system deck and ramp will be performed by a flooring contractor and is not the responsibility of the supplier. There will be a co-ordination of efforts between multiple responsibilities.
- 1.3 Contractor will provide shop drawings to project authority for review and approval.
- 1.4 Contractor must confirm total carriage width and length

2.0 APPLICABLE PUBLICATIONS

2.1 American Society for Testing and Materials (ASTM)

D 3359 Standard Test Method for Measuring Adhesion by Tape Test
 D 3363 Standard Test Method for Film Hardness by Pencil Test
 D 4060 Standard Test Method for Abrasion Resistance of Organic Coating by the Taber Abraser

2.2 Human Resources and Skills Development Canada (HRSDC) - Mobile Shelving - Fire Protection Design Requirements

2.3 Reference to the above publications, or test methods described, is to the latest issue.

D 3359 Standard Test Method for Measuring Adhesion by Tape Test
 D 3363 Standard Test Method for Film Hardness by Pencil Test
 D 4060 Standard Test Method for Abrasion Resistance of Organic Coating by the Taber Abraser
 HRSDC - Mobile Shelving - Fire Protection Design Requirements
 National Building Code of Canada
 GDP-9 High density mobile shelving mechanical, electrical and manual systems, Public Works and Government Services Canada.

3.0 TERMINOLOGY

- 3.1 Live Load - The weight of the entire mobile storage system applied to the floor area.
- 3.2 Abnormal - Irregular and not typical or usual function of normal working operation.

3.3 Range - One or more shelving bays, single or double faced, connected together and supported by a carriage to form a single movable section.

3.4 Bay - A unit of shelving, single or double faced, consisting of horizontal shelves between uprights or upright frames.

4.0 GENERAL REQUIREMENTS

There will be no damage or fastening of equipment or materials to the existing building floor.

4.1 General - System

4.1.1 The moveable and stationary ranges must be compatible and consistent in overall height, overall length, shelving design, construction and configuration.

4.1.2 The carriages, shelves and related components must be designed, constructed, tested and furnished to support and operate within the specified weight load as stated in the carriage portion of the Detailed Requirements section.

4.1.3 Rails, tracks, wheel and all drive components must exhibit no abnormal friction, abrasion, binding or wear on or between the contact surfaces.

4.1.4 Under normal environmental and use conditions, components must not rust or exhibit any other type of corrosion.

4.1.5 All wiring must be integrated.

4.2 General - Tracks and Rails

4.2.1 Rails must exhibit no movement or deflection during operation of mobile ranges.

4.2.2 All track and rail lengths must extend under all stationary and mobile ranges.

4.2.3 All rail connection joints must provide horizontal and vertical continuity between rail sections.

4.2.4 Rail sections underneath the stationary ranges must be attached in a manner to equally disburse the loaded ranges weight to the rail and to the grout, in a manner of equal or greater surface disbursement, as a moveable range.

4.2.5 Rail guidance gaps must be 12.70mm (1/2 in.) or less.

4.2.6 Assure track remains permanently level and eliminates the possibility of carriage drift by integrated leveling screws so that levelness can be adjusted during installation or once shelving system is in use. There should be no requirement to remove or disassemble equipment for leveling purposes.

4.3 General - Decking and Ramp

4.3.1 The deck must be constructed of 19.05 mm (¾ in.) thick, 6 ply underlayment grade plywood. Carpet tiles will be installed.

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- 4.3.2 Flush deck to the rails to eliminate any obstructions on the floor, tripping or material falling underneath system. A solid floor allows for use of carts and library ladders/step stools.
- 4.3.3 There must be no open gaps or spaces between the decking and the track and rail except for anti-tip mechanisms
- 4.3.4 Decking and ramp must be installed in a manner that will prevent warping and deformation from normal operation and loading.
- 4.3.5 The ramp must not extend past the front of the units into the main access aisle. The ramp must have a minimum slope of 1:12.
- 4.4 General - Carriages**
- 4.4.1 Fixed carriages must be of the same construction and height as the moveable carriages and anchored to the rails.
- 4.4.2 Carriage splices must be the bolted type designed to maintain proper unit alignment
- 4.4.3 Carriage straightness must have no more than 6.53mm (1/4 in.) maximum deviation from a true straight line. There must be no permanent set or slippage in any joint when exposed to forces encountered in normal operation circumstances.
- 4.4.4 Carriage construction must allow the shelving uprights to be secured to the carriage frame.
- 4.4.5 Each drive wheel must have an axle of appropriate size considering the properties of the material used, and the stress and fatigue factors.
- 4.4.6 Drive shaft and wheel assemblies must exhibit no play or looseness over the entire length of that assembly.
- 4.4.7 Mobile shelving units must be provided with bumpers to provide a fixed clearance between mobile shelving carriages in accordance with the HRSDC - Mobile Shelving - Fire Protection Design Requirements.
- 4.4.8 Integrated anti-tip system will prevent tipping of shelving
- 4.4.9. All carriage faces will contain a smooth and clean appearance without holes or hardware.
- 4.5 General - Shelving, Uprights and Other**
- 4.5.1 Safety brake installed (if necessary for type of shelving)
- 4.5.2 Eight (8) Side panels for all outward facing single rows/range (4 for Records [2 for A1 and 2 for A2] and 4 for Library [3 for B1, 1 for B2]- See Annex.
- 4.5.3 End panels for each end of every row/range. 10 end panels for single sided rows for Records [4 for A1, 6 for A2] and 4 end panels for double sided rows [4 for A1] for Records. 20 end panels for double sided rows in Library [20 for B1], 8 end panels for single sided rows in library [7 for B1, 1 B2

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- 4.5.4 Shelving must have a clean appearance without holes on exposed surfaces except where shelves, back stops and centre stops are slotted or punched for dividers and centre is punched for centre stops
- 4.5.5 Front and back of the shelves are flush with the outside face of the post
- 4.5.6 Shelving must be customized/adjusted to meet the needs of the business and must be adjustable.
- 4.5.7 The successful supplier will provide plans and elevation at time of tender submission.
- 4.5.8 Supplier shop drawings must show :
- a. fabrication, assembly and installation details including descriptions of procedures and diagrams
 - b. complete extent of installation layout including clearances, spacing and relation to adjacent construction in plan, elevations and sections
 - c. indicate clear exit and access aisle widths
 - d. access to concealed components, assemblies connections, attachments, reinforcements and anchorage and deck details
 - e. edge conditions and extent of finish floor within area where units are installed
 - f. show installation details at non-standard conditions
- 4.5.9 Each post will be 16 gauge 1 ¼ x 1 ½" rectangular shaped cold rolled steel.
- 4.5.10 Centre back panels and full back panels consist of 20 gauge steel
- 4.5.11 Shelves and tops must be constructed of 18 gauge steel and a four bend construction creating a safety edge
- 4.5.12 Shelves will be installed between uprights for unimpeded use.
- 4.5.13 Shelves must be adjustable on 1" centers along upright
- 4.5.14 End panels and side closure panels must be constructed of 20 gauge steel and affixed to top and bottom of uprights.
- 4.5.15 Slotted back stops must be 20 gauge steel, clean safety bends on top and bottom and slots are 1" increments for divider adjustment
- 4.5.16 File dividers must be 20 gauge steel and must integrate into slots on the back stop and shelf.

5.0 DETAILED REQUIREMENTS

5.0 Detail - Safety Features

- 5.0.1 Every aisle requires an infrared beam at foot-level on each moveable carriage (both sides).
- 5.0.2 Every aisle requires a signal to indicate occupation on each side of the aisle which will prevent movement/change to another aisle until the open aisle is cleared. The control pad will confirm when carriages are either in locked or unlocked mode. There must be no override capability.

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Amd. No. - N° de la modif.

002

Buyer ID - Id de l'acheteur

hal219

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K4B20-110364

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CCC No./N° CCC - FMS No/ N° VME

5.0.3 Should the safety requirements fail all carriage movement will be prevented.

5.0.4 When excessive pressure is applied the motor will shut-down.

5.1 Detail - General

- 5.1.1 Mobile storage system must not exceed the allowable live load in the effected area which is 100 pounds per square foot.
- 5.1.2 The system alignment must be 6.53 mm (1/4 in.) maximum variation, measured between the edges of end panels within each range in all modules, in all aisle positions.

5.2 Detail - Tracks and Rails

- 5.2.1 Rails must be manufactured to carry a minimum load of 453.6 kg (1,000 pounds) per 0.30 linear meter of carriage.
- 5.2.2 If the width to height ratio exceeds 4 to 1, then the rails must have anti-tip channels to prevent tipping as a minimum safety requirement.
- 5.2.3 Rails must be attached to the top of a floor and must allow for adjustment so that rails can be leveled over an uneven floor.
- 5.2.4 The rail installation must be done in such manner to eliminate rail deflection, maintain alignment and eliminate separation.
- 5.2.5 Levelness of rails equals 1.59 mm (1/16 in.) maximum variation from true level within any module; 1.59 mm (1/16 in.) maximum variation between adjacent rails perpendicular to rail direction.
- 5.2.6 The rail must be 15.875 mm (5/8 in.) square cold-rolled steel. Each section to be a minimum of 243.84 cm (8 feet) with shorter sections used only to terminate each individual rail assembly. In addition, each end of the rail overlaps the track housing and is pinned to the track with a 6.35 mm (¼ in.) diameter roll pin.
- 5.2.7 All rail connection joints must provide horizontal and vertical continuity between rail sections and gradually transfer the concentrated wheel point load to and from adjoining rail sections.
- 5.2.8 Tracks must be designed to be attached on top of a floor and to allow for adjustment so tracks can be leveled over uneven floor.
- 5.2.9 Tracks must be located and positioned properly leveled and grouted, allowing at least (12.7 mm /½ in.) for grout under high point of floor. The void area between the track and floor must be completely filled with a non-shrink grout. Shimming of the rails for leveling and/or support purposes is not acceptable.
- 5.2.10 Each track must have a minimum base area of 101.6 mm (4 in.).
- 5.2.11 The track housing must be extruded from 6063-T5 aluminum alloy, or material of an equivalent strength and grade
- 5.2.12 The grout used must be a ready-mixed high strength, controlled expansive grout with superior dynamic load stability, which when mixed with water will harden rapidly to produce a permanent foundation for the system.

5.2.13 Grout must be non-corrosive and floor leveling instead of shims, nonmetallic and non-shrink. Specifications for the grout after curing are a minimum strength of 7000 PSI. Grout must be worked under the rail, any voids completely filled and trimmed up sides flush with the rails

5.2.14 Grout will reduce rail deflection, maintain alignment and eliminate separation.

5.3 Detail - Carriages

5.3.1 All carriages must be capable of supporting a minimum load of 453.6 kg (1,000 pounds) per 0.30 meter without any distortion.

5.3.2 All carriage components must be capable of moving a carriage load of 453.6 kg (1,000 pounds) per 0.30 linear meter of carriage.

5.3.3 All carriages are to be unit welded steel construction capable of supporting a minimum load of 1000 pounds per carriage foot without distortion

5.3.4 Fixed carriages must be of the same construction and height as the movable carriages and anchored to the rails for a complete, homogenous system

5.3.5. Carriage construction must be designed to allow any type of shelving to be securely anchored to the carriages with vibration proof fasteners no hardware will be visible on the exterior of each carriage

5.3.6 Each drive shell must be fitted with two permanently sealed and shielded bearings housed in a self-aligning flanged pillow block. Drive wheels with a single centre-wheel bearing are unacceptable.

5.3.7 A minimum of 4 guide wheels is required per movable carriage.

5.3.8 All mobile carriages must be fitted with full length solid stress proof steel drive shafts connecting all wheels on the drive side of the carriage with couplings.

5.3.9 Complete drive shaft and wheel assemblies must exhibit no play or looseness over the entire length of the carriage

5.3.10 All splices and connections between drive shafts and axles must be done by means of a securely retained coupling method.

5.3.11. Rubber bumpers must be mounted to the carriage fact to protect material that may extend beyond the shelf fact and provide a positive stop for all moveable carriages

5.3.12 All carriages are constructed from 12 gauge steel.

5.3.13 Electrical assist systems are moved by a motor which is operated by a control key pad.

5.3.14 All carriages will have controlled speed when accelerating or decelerating and will have a braking system requirement to stop the carriage when safety features are used.

5.3.15 Movement will be at a controlled speed of 3" (76 mm) per second

5.3.16 Movement of carriages will begin while other carriages are moving to complete the overall moving cycle.

5.3.17 Carriage reversal will be automatic when entering a closing aisle.

5.4 Detail - Wheels and Drive and Motors

5.4.1 All wheels must be the appropriate size considering the properties of the material used, and the stress and fatigue factors and must be equipped with two permanently lubricated bearing assemblies.

5.4.2 There must be no friction between the wheels and the carriage.

5.4.3 All wheels on one side of the carriage must be driven by a steel drive shaft.

5.4.4 Minimum load capacity per wheel 3200 pounds. Wheels shall be precision ground and balanced. All bearings shall be permanently shielded and balanced.

5.4.5 Full-length drive shafts will be provided

5.4.6 Each will operate on 115 Volts 50/60 Hertz, 15 or 30 Amp dedicated circuit depending on specifications pertaining to carriage quantity.

5.4.7 Each carriage will have a minimum of one 90 VDC current limited, fractional horsepower gear motor which will be connected to a full-length shaft at each rail to avoid distortion.

5.5 Detail - Controls

5.5.1 Each movable unit must be equipped with an LCD control pad which will include two "open" buttons for left/right and one "stop" button. Display will be bilingual (English/French) if words and not symbols are used and will have the capability of audio feedback with adjustable (and off) volume control.

5.5.2 Each carriage will have a control pad located on the centre of each face panel located 44" (1118 mm) from the base of the carriage to the base of the control pad.

5.5.3 There must be at least one safety locking pin on each movable carriage.

5.5.4 Control pads must provide visual indication of safety module operation, illuminate feature chosen for confirmation to the user and provide visual status from a distance.

5.5.5 Proximity sensors will be provided for each aisle to easily adjust spacing between closed carriages and adjust to the unique nature of each carriage where material may overhang from the shelves. Manual adjustments of proximity sensors, a computer connection to the control board requirement, and/or mechanical plungers are not acceptable.

5.6 Detail - Decking and Ramp

5.6.1 A 16 gauge stainless steel ramp threshold must be attached, providing smooth entry from existing floor to system floor.

5.6.2 Finished flooring must be flush and level with the top of the rails. There will be no open gaps or spaces between the decking and tracks. The ramp must be constructed and finished in the same material as the deck with the exception of the stainless steel threshold.

5.6.3 Decking and ramp must be installed in a manner that will prevent warping, deformation and movement during normal operation and loading.

6.0 Detail - Shelving and uprights

6.1 All shelving sections must be available as a 4-post design consisting of three basic parts; uprights, shelves and shelf supports. Parts must be assembled without nuts, bolts, studs or clips; and without the need for tools of any kind.

6.2 Overall maximum height of mobile storage system must not exceed 2083mm (82 in.) in height

6.3 Shelving ranges must be complete with tops.

6.4 There will be shelving designated for Records purposes and shelving designated for Library purposes as follows:

6.4.A. Records

6.4.A.1 **Critical note:** Shelving 'A' to be 419 mm (16.5") clear inside depth and 914 mm (36") clear useable shelving width sections. And 324 mm (12.75") clear height dimension between each shelf. The carriage height will not exceed 2083 mm (82 in.).

6.4.A.2 The total linear requirement is 150876 mm (5940 in.). Additional requirements are as follows :

- One retractable work shelf per bay at the second shelf level from the top of the unit" Standard locks
- All bays must have five (5) openings (shelves) in height with three (3) file dividers per opening.
- A1 - There are 2 rows of double sided mobile shelving. Each row has 4 double sided bays and each shelf is 914 mm (36 in.) in clear usable length. Clear inside depth is 419 mm (16.5 in.) per side. Shelving contractor to confirm total carriage width and length.
- A1 - There is one row of single sided fixed shelving. Each row has 4 single sided bays and each shelf is 914 mm (36 in.) in clear usable length. Clear inside depth is 419 mm (16.5 in.) This row has a solid panel the length of the row. See Annex for details. Shelving contractor to confirm total carriage width and length.
- A1 - There is one row of single sided mobile shelving. Each row has 4 single sided bays and each shelf is 914 mm (36 in.) in clear usable length. Clear inside depth is 419 mm (16.5 in.) This row has a solid panel the length of the row. See Annex for details.
- A2 - There are 2 rows of single sided mobile shelving. Each row has 3 single sided bays and each shelf is 914 mm (36 in.) in clear usable length. Clear inside depth is 419 mm (16.5 in.) per side. Each row has a solid panel the length of the row. Shelving contractor to confirm total carriage width and length. See Annex for details.
- A2 - There is 1 row of single sided fixed shelving. Each row has 3 single sided bays and each shelf is 914 mm (36 in.) in clear usable length. Clear inside depth is 419 mm (16.5 in.) per side. Each row has a solid panel the length of the row. Shelving contractor to confirm total carriage width and length. See Annex for details.

6.4.A.3 Shelves must be slotted on 76mm (3 in.) centers to receive dividers. Slots must coincide with the inside edge of the posts so a file divider can be used to provide a flush condition with the post at the shelf end.

6.4.A.4 The front and back flange of the shelf must be flush with the outside face of the post.

6.4.A.5 Shelves must be adjustable on no more than 38mm (1.5 in.) Centers.

6.4.A.6 Back Stop - The face of the back stop must be slotted on the same centers as the shelf to receive and retain file dividers. Back stop must be full height of shelf opening.

6.4.A.7 Center Stop - must be securely fastened at the center of double entry shelves and must be slotted on the same centers as the shelf to receive and retain file dividers.

6.4.A.8 File Dividers - must be a flat shape with at least two tabs to enter slots in shelf and a retaining tab on the back edge to stabilize the dividers against the back stop or center stop.

6.4.A.9 Dividers must be self locking and 152 mm (6 in.) high and 254 mm (10 in.) deep and must be solid without any holes. The tolerance allowed for divider height and depth is $\pm 25.4\text{mm}$ (± 1 in.).

6.4.A.10 Nine (9) card holders and all necessary hardware for a complete installation must be provided.

6.4.B Library

6.4.B.1 **Critical Note** All 'B1' shelves in the library must be 305 mm (12 in.) clear inside depth and 914 mm (36 in.) clear useable length. And 324 mm (12.75") clear height dimension between each shelf. The height for all library shelving (B1, B2) will not exceed 2083 mm (82 in.) in carriage height

6.4.B.2 Total linear requirement is 548640 mm (21600 in.) for B1 and B2 shelves.

B1 - There are 10 rows of double sided mobile shelving (B1). Each row has 5 double sided bays and each shelf is 914 mm (36 in.) in clear usable length. Clear inside depth is 305 mm (12 in.) per side. Clear height dimension between each shelf is 324 mm (12.75 in.) Shelving contractor to confirm total carriage width and length.

- B1 - There are 2 rows of single sided mobile shelving (B1). Each row has 5 single sided bays and each shelf is 914 mm (36 in.) in clear usable length. Clear inside depth is 305 mm (12 in.) per side. Clear height dimension between each shelf is 324 mm (12.75 in.). Shelving contractor to confirm total carriage width and length.
- B2 - there is one row (B2) which will be 388 mm (15.3 in.) in depth to allow shelving units to align with front face of column. This row will have 5 single sided bays and each shelf (when possible) will have 914 mm (36 in.) in clear usable length. Clear inside depth is 305 mm (12 in.) as a minimum. Clear height dimension between each shelf is 324 mm (12.75 in.). Shelving contractor to confirm total carriage width and length.

6.4.B.3 Shelves must be slotted on 76mm (3 in.) centers to receive dividers. Slots must coincide with the inside edge of the posts so a file divider can be used to provide a flush condition with the post at the shelf end.

6.4.B.4 The front and back flange of the shelf must be flush with the outside face of the post.

6.4.B.5 Shelves must be adjustable on no more than 38mm (1.5 in.) Centers.

6.4.B.6 Back Stop - The face of the back stop must be slotted on the same centers as the shelf to receive and retain file dividers. Back stop must be full height of shelf opening.

6.4.B.7 Center Stop - must be securely fastened at the center of double entry shelves and must be slotted on the same centers as the shelf to receive and retain file dividers.

6.4.B.8 File Dividers - must be a flat shape with at least two tabs to enter slots in shelf and a retaining tab on the back edge to stabilize the dividers against the back stop or center stop.

6.4.B.9 Dividers must be self locking and 152mm (6 in.) high and 254mm (10 in.) deep and must be solid without any holes. The tolerance allowed for divider height and depth is $\pm 25.4\text{mm}$ ($\pm 1\text{ in.}$).

6.4.B.10 Twenty-Four (24) card holders and all necessary hardware for a complete installation must be provided.

7.0 PERFORMANCE CRITERIA

7.1 Metal Finishes - The metal components must meet the following performance requirements:

7.1.1 Paint Adhesion - The adhesion rating of the finish must not be less than 4B when tested in accordance with ASTM D 3359 Method B.

7.1.2 Abrasion Resistance - The loss of the finish must not exceed 0.04g per 500 cycles, using at least a CS-10 wheel tested in accordance with ASTM D 4060.

7.1.3 Finish Hardness - The finish must meet the requirements of ASTM D3363, hardness H.

7.1.4 Horizontal Surface Deflection Test- Load the shelf surface in accordance with ANSI/BIFMA X5.5 and ANSI/BIFMA X5.9 functional distributed load test. Average the height of the end points and subtract the height of the centre. The resulting dimension is the deflection. The maximum acceptable shelf deflection must be no more than its length divided by 180 (L/180).

7.1.5 All exposed and semi-exposed surfaces must have the same colour and finish as rest of the system.

7.2 Fire Design Requirements

7.2.1 The mobile storage units must comply with HRSDC - Mobile Shelving - Fire Protection Design Requirements.

3. Under "Annex "D" - Mandatory Technical Requirements Cross-Reference

Delete: in its entirety

Replace: with the following "Annex D" - Mandatory Technical Requirements Cross-Reference

ANNEX 'D'
MANDATORY TECHNICAL REQUIREMENTS
CROSS-REFERENCE

Bidders are requested to provide cross-reference below to identify the page(s) where each mandatory specification can be demonstrated in their technical documentation provided with their bid. Canada reserves the right to verify any and all information relating to mandatory requirements.

Reference Section	Technical Requirement	Cross Reference from Literature (ie. Brochure title, page)
1.2	System must be HRSDC Requirements for mobile shelving installed in federal facilities	
1.4	Overall weight of system based on full capacity must not exceed 100 pounds per square foot.	
2.1	Training - The Contractor will be responsible for training the end users in the operation of the mobile shelving unit.	
2.2	Contractor will be responsible for supplying one complete set operating and maintenance instructions. As a minimum, these manuals must include instructions for operating, cleaning and maintenance of all components and finishes and the names, addresses and telephone numbers for parts and services.	
2.3.1	Receive, unload, store and transport all products/pieces to the staging and/or installation site;	
2.3.2	Unpack all pieces and inspect products for shipping damage	
2.3.3	Install all products in accordance with the manufacturer's specifications;	
2.3.4	Install shelving units to comply with final floor plan drawings	
2.3.5	Ensure all products function properly and make minor adjustment/repairs	
2.3.6	Touch up all minor nicks and scratches on the product that may have occurred during installation; or remove and replace damaged components and provide and install new replacements	
2.3.7	Adjust all pieces to ensure smooth operation;	
2.3.8	Clean the products once installed	

2.3.9	Clean up the installation site. The site must present a neat, orderly and workmanlike appearance at all times. This must be accomplished by the removal of scrap material, debris and the like from the site, as frequently as is necessary	
2.3.10	Upon completion of the installation and at the convenience of the Project Authority, the Contractor (or his authorized representative) must walk through the installation site with the Project Authority (or an authorized representative of the Project Authority) to verify the operating condition of all products in accordance with the Deficiency Procedures	
2.3.11	Installers will be expected to follow all safety precautions and practices which are standard for installation work in a building under construction.	
2.3.12	Installers must be aware of other work underway in the building. A building orientation session will be provided by the building contractor, co-ordinated through the Project Authority, on day one of installation, prior to access	
2.3.13	Installation must be supervised on a daily basis by the factory trained installation supervisor	
2.3.14	Installers may be required to wear safety equipment such as hard hats, safety boots, safety glasses and reflective vests. Installers will be responsible for their own safety equipment.	
2.3.15	Supplier must repair all damage to building caused by work of this contract	
2.3.16	Installation contractor must be an experienced installer who is a manufacturer's authorized representative for the specified project.	
2.4.1.a	The Contractor must notify the Project Authority when the installation is completed	
2.4.1.b	The Project Authority must arrange for the inspection with the Contractor;	
2.4.1.c	The inspection must take place no later than three business days after installation is completed	
2.4.1.d	The Project Authority, in consultation with the Contractor, must prepare the deficiency list documenting all problems in every installation area.	

2.4.1.f	Within three business days of receipt of this deficiency list, the Contractor must complete all minor deficiencies and make all adjustments not requiring new parts	
2.4.1.g	For all deficiencies other than those identified in point F, the Contractor must submit the plan of action with delivery dates or completion dates within fourteen calendar days from receipt of the deficiency list from the Project Authority	
2.4.1.h	The Contractor must notify the Project Authority when all deficiencies have been completed. If the Project Authority is satisfied with the deficiency corrections, the Project Authority must provide the Contractor a final sign-off that the deficiencies have been satisfied	
3.1	The Contractor must provide no less than 72 hours notice to the Project Authority advising that the on-site activities will commence	
4.1	The manufacturer must have the ability to install the entire system in any normal construction including a raised floor	
4.2.1	Manufacturer must be ISO 9001 or equivalent certified for the design, production, installation and service of carriage mounted high-density mobile storage units and support rails. Furnish certificate attesting to manufacturer's ISO 9001 or equivalent quality system registration.	
4.2.2	Framing parts must be straight, square, and plumb. All parts must be aligned and securely fastened. Any connections requiring welding or bolting must be finished and nonabrasive. Any exposed surface of the installation with which personnel may come in contact must be Smooth and nonabrasive	
4.2.3	Note all field conditions including examination of existing floor surface for compliance with requirements for installation tolerances and other conditions affecting performance of mobile storage units and verification of site dimensions before fabrication of shelving where field dimensions cannot be made without delaying work, establish dimensions in coordination with Project Authority.	
4.3.1	Waste Material from the manufacturing	

	process must be minimized and/or recycled	
4.3.2	The packaging must be designed to minimize waste, e.g., bulk, reusable such as blanket wrap.	
4.4.1	Steel carriages and shelves must be painted and finished with factory powder coat paint in textured colors specified by the customer. All aluminum components must be anodized, painted or otherwise treated to prevent oxidation. Bidders must provide a list of available colors with their submission and the color choice will be confirmed at contract award.	
4.5.1	The metal components must meet the following performance requirements:	
	<p>1. Adhesion - The adhesion rating of the finish must not be less than 4B when tested in accordance with ASTM D3359 Method B.</p> <p>2. Abrasion Resistance - The loss of the finish must not exceed 0.020 g per 500 cycles, using at least a CS-10 wheel tested in accordance with ASTM D4060.</p> <p>3. Scratch Resistance - The finish must meet the requirements of ASTM D3363, hardness H.</p>	
4.6.1	Warranty must cover the entire installation against defects in material and workmanship	
4.6.2	Contractor must provide onsite training session, onsite service agreement, onsite maintenance	
4.6.3	Contractor must provide a detailed written warranty executed by the Contractor, Installer, and Manufacturer at time of tender submission. . All aspects of the warranty will include all parts at no cost and all labour at no cost for each specified period. All warranties are applicable based on the date of invoice.	
4.6.4	Limited lifetime warranty on shelving and mobile carriages (any parts, controls, etc that are not in immediate contact with moving parts)	
4.6.5	Limited 10 year warranty for motors for all carriage drives	
4.6.6	The warranty period will be for a period of five (5) years for all equipment other than mobile carriages and motors	

5.1	Contractor must provide Tailgate service delivery and/or hand delivery - no loading dock	
5.2	Supplier must deliver within the elevator specifications and times. Elevator Dimensions: Height: 87 in. Width: 80 in., between handrails 73 in. Depth: 56 in., between handrails 53 in. Door Height: 83 in. Door Width: 42 in. Capacity: 3000 lbs.	
1.3 (Scope)	Contractor will provide shop drawings to project authority for review and approval.	
1.4 (Scope)	Contractor must confirm total carriage width and length	
General 4.0	There will be no damage or fastening of equipment or materials to the existing building floor.	
General 4.1.1	The moveable and stationary ranges must be compatible and consistent in overall height, overall length, shelving design, construction and configuration	
General 4.1.2	The carriages, shelves and related components must be designed, constructed, tested and furnished to support and operate within the specified weight load as stated in the carriage portion of the Detailed Requirements section.	
General 4.1.3	Rails, tracks, wheel and all drive components must exhibit no abnormal friction, abrasion, binding or wear on or between the contact surfaces	
General 4.1.4	Under normal environmental and use conditions, components must not rust or exhibit any other type of corrosion	
General 4.1.5	All wiring must be integrated.	
General 4.2.1	Rails must exhibit no movement or deflection during operation of mobile ranges	
General 4.2.2	All track and rail lengths must extend under all stationary and mobile ranges	
General 4.2.3	All rail connection joints must provide horizontal and vertical continuity between rail sections.	
General 4.2.4	Rail sections underneath the stationary ranges must be attached in a manner to equally disburse the loaded ranges weight to the rail and to the grout, in a manner of	

	equal or greater surface disbursement, as a moveable range.	
General 4.2.5	Rail guidance gaps must be 12.70mm (1/2 in.) or less	
General 4.2.6	Assure track remains permanently level and eliminates the possibility of carriage drift by integrated leveling screws so that levelness can be adjusted during installation or once shelving system is in use. There should be no requirement to remove or disassemble equipment for leveling purposes.	
General 4.3.1	The deck must be constructed of 19.05 mm (¾ in.) thick, 6 ply underlayment grade plywood. Carpet tiles will be installed.	
General 4.3.2	Flush deck to the rails to eliminate any obstructions on the floor, tripping or material falling underneath system. A solid floor allows for use of carts and library ladders/step stools.	
General 4.3.3	There must be no open gaps or spaces between the decking and the track and rail except for anti-tip mechanisms	
General 4.3.4	Decking and ramp must be installed in a manner that will prevent warping and deformation from normal operation and loading.	
General 4.3.5	The ramp must not extend past the front of the units into the main access aisle. The ramp must have a minimum slope of 1:12.	
General 4.4.1	Fixed carriages must be of the same construction and height as the moveable carriages and anchored to the rails	
General 4.4.2	Carriage splices must be the bolted type designed to maintain proper unit alignment	
General 4.4.3	Carriage straightness must have no more than 6.53mm (1/4 in.) maximum deviation from a true straight line. There must be no permanent set or slippage in any joint when exposed to forces encountered in normal operation circumstances.	
General 4.4.4	Carriage construction must allow the shelving uprights to be secured to the carriage frame	
General 4.4.5	Each drive wheel must have an axle of appropriate size considering the properties of the material used, and the stress and fatigue factors	

General 4.4.6	Drive shaft and wheel assemblies must exhibit no play or looseness over the entire length of that assembly	
General 4.4.7	Mobile shelving units must be provided with bumpers to provide a fixed clearance between mobile shelving carriages in accordance with the HRSDC - Mobile Shelving - Fire Protection Design Requirements	
General 4.4.8	Integrated anti-tip system will prevent tipping of shelving	
General 4.4.9	All carriage faces will contain a smooth and clean appearance without holes or hardware	
General 4.5.1	Safety brake installed (if necessary for type of shelving)	
General 4.5.2	Eight (8) Side panels for all outward facing single rows/range (4 for Records [2 for A1 and 2 for A2] and 4 for Library [3 for B1, 1 for B2]) - See Annex.	
General 4.5.3	End panels for each end of every row/range. 10 end panels for single sided rows for Records [4 for A1, 6 for A2] and 4 end panels for double sided rows [4 for A1] for Records. 20 end panels for double sided rows in Library [20 for B1], 8 end panels for single sided rows in library [7 for B1 and 1 for B2].	
General 4.5.4	Shelving should have a clean appearance without holes on exposed surfaces except where shelves, back stops and centre stops are slotted or punched for dividers and centre is punched for centre stops	
General 4.5.5.	Front and back of the shelves are flush with the outside face of the post	
General 4.5.6	Shelving must be customized/ designed to meet the needs of the business and must be adjustable	
General 4.5.7	The successful supplier will provide plans and elevation at time of tender submission	
General 4.5.8	Supplier shop drawings must show : a. fabrication, assembly and installation details including descriptions of procedures and diagrams b. complete extent of installation layout including clearances, spacing and relation to adjacent construction in plan, elevations and sections c. indicate clear exit and access aisle widths d. access to concealed components, assemblies connections, attachments,	

	<p>reinforcements and anchorage and deck details</p> <p>e. edge conditions and extent of finish floor within area where units are installed</p> <p>f. show installation details at non-standard conditions</p>	
General 4.5.9	Each post will be 16 gauge 1 ¼ x 1 ½" rectangular shaped cold rolled steel	
General 4.5.10	Centre back panels and full back panels consist of 20 gauge steel	
General 4.5.11	Shelves and tops must be constructed of 18 gauge steel and a four bend construction creating a safety edge	
General 4.5.12	Shelves will be installed between uprights for unimpeded use	
General 4.5.13	Shelves must be adjustable on 1" centers along upright	
General 4.5.14	End panels and side closure panels must be constructed of 20 gauge steel and affixed to top and bottom of uprights	
General 4.5.15	Slotted back stops must be 20 gauge steel, clean safety bends on top and bottom and slots are 1" increments for divider adjustment	
General 4.5.16	File dividers must be 20 gauge steel and must integrate into slots on the back stop and shelf.	
General 5.1	Every aisle requires an infrared beam at foot-level on each moveable carriage (both sides).	
General 5.2	Every aisle requires a signal to indicate occupation on each side of the aisle which will prevent movement/change to another aisle until the open aisle is cleared. The control pad will confirm when carriages are either in locked or unlocked mode. There must be no override capability.	
General 5.3	Should the safety requirements fail all carriage movement will be prevented	
General 5.4	When excessive pressure is applied the motor will shut-down	
Detail 5.1.1	Mobile storage system must not exceed the allowable live load in the effected area which is 100 pounds per square foot.	
Detail 5.1.2	System alignment must be 6.53 mm (1/4 in.) maximum variation, measured between the edges of end panels within each range in all modules, in all aisle positions.	

Detail 5.2.1	Rails must be manufactured to carry a minimum load of 453.6 kg (1,000 pounds) per 0.30 linear meter of carriage.	
Detail 5.2.2	If the width to height ratio exceeds 4 to 1, then the rails must have anti-tip channels to prevent tipping as a minimum safety requirement	
Detail 5.2.3	Rails must be attached to the top of a floor and must allow for adjustment so that rails can be leveled over an uneven floor.	
Detail 5.2.4	The rail installation must be done in such manner to eliminate rail deflection, maintain alignment and eliminate separation	
Detail 5.2.5	Levelness of rails equals 1.59 mm (1/16 in.) maximum variation from true level within any module; 1.59 mm (1/16 in.) maximum variation between adjacent rails perpendicular to rail direction.	
Detail 5.2.6	The rail must be 15.875 mm (5/8 in.) square cold-rolled steel. Each section to be a minimum of 243.84 cm (8 feet) with shorter sections used only to terminate each individual rail assembly. In addition, each end of the rail overlaps the track housing and is pinned to the track with a 6.35 mm (¼ in.) diameter roll pin.	
Detail 5.2.7	All rail connection joints must provide horizontal and vertical continuity between rail sections and gradually transfer the concentrated wheel point load to and from adjoining rail sections.	
Detail 5.2.8	Tracks must be designed to be attached on top of a floor and to allow for adjustment so tracks can be leveled over uneven floor.	
Detail 5.2.9	Tracks must be located and positioned properly leveled and grouted, allowing at least (12.7 mm /½ in.) for grout under high point of floor. The void area between the track and floor must be completely filled with a non-shrink grout. Shimming of the rails for leveling and/or support purposes is not acceptable.	
Detail 5.2.10	Each track must have a minimum base area of 101.6 mm (4 in.).	
Detail 5.2.11	The track housing must be extruded from 6063-T5 aluminum alloy, or material of an equivalent strength and grade	
Detail 5.2.12	The grout used must be a ready-mixed high strength, controlled expansive grout with superior dynamic load stability, which	

	when mixed with water will harden rapidly to produce a permanent foundation for the system.	
Detail 5.2.13	Grout must be non-corrosive and floor leveling instead of shims, nonmetallic and non-shrink. Specifications for the grout after curing are a minimum strength of 7000 PSI. Grout must be worked under the rail, any voids completely filled and trimmed up sides flush with the rails	
Detail 5.2.14	Grout will reduce rail deflection, maintain alignment and eliminate separation	
Detail 5.3.1	All carriages must be capable of supporting a minimum load of 453.6 kg (1,000 pounds) per 0.30 meter without any distortion.	
Detail 5.3.2	All carriage components must be capable of moving a carriage load of 453.6 kg (1,000 pounds) per 0.30 linear meter of carriage.	
Detail 5.3.3	All carriages are to be unit welded steel construction capable of supporting a minimum load of 1000 pounds per carriage foot without distortion	
Detail 5.3.4	Fixed carriages must be of the same construction and height as the movable carriages and anchored to the rails for a complete, homogenous system	
Detail 5.3.5	Carriage construction must be designed to allow any type of shelving to be securely anchored to the carriages with vibration proof fasteners no hardware will be visible on the exterior of each carriage	
Detail 5.3.6	Each drive shell must be fitted with two permanently sealed and shielded bearings housed in a self-aligning flanged pillow block. Drive wheels with a single centre-wheel bearing are unacceptable.	
Detail 5.3.7	A minimum of 4 guide wheels is required per movable carriage.	
Detail 5.3.8	All mobile carriages must be fitted with full length solid stress proof steel drive shafts connecting all wheels on the drive side of the carriage with couplings.	
Detail 5.3.9	Complete drive shaft and wheel assemblies must exhibit no play or looseness over the entire length of the carriage	
Detail 5.3.10	All splices and connections between drive shafts and axles must be done by means of a securely retained coupling method.	

Detail 5.3.11	Rubber bumpers must be mounted to the carriage fact to protect material that may extend beyond the shelf fact and provide a positive stop for all moveable carriages	
Detail 5.3.12	All carriages are constructed from 12 gauge steel	
Detail 5.3.13	Electrical assist systems are moved by a motor which is operated by a control key pad.	
Detail 5.3.14	All carriages will have controlled speed when accelerating or decelerating and will have a braking system requirement to stop the carriage when safety features are used.	
Detail 5.3.15	Movement will be at a controlled speed of 3" (76 mm) per second	
Detail 5.3.16	Movement of carriages will begin while other carriages are moving to complete the overall moving cycle	
Detail 5.3.17	Carriage reversal will be automatic when entering a closing aisle	
Detail 5.4.1	All wheels must be the appropriate size considering the properties of the material used, and the stress and fatigue factors and must be equipped with two permanently lubricated bearing assemblies.	
Detail 5.4.2	There must be no friction between the wheels and the carriage	
Detail 5.4.3	All wheels on one side of the carriage must be driven by a steel drive shaft	
Detail 5.4.4	Minimum load capacity per wheel 3200 pounds. Wheels shall be precision ground and balanced. All bearings shall be permanently shielded and balanced	
Detail 5.4.5	Full-length drive shafts will be provided	
Detail 5.4.6	Each will operate on 115 Volts 50/60 Hertz, 15 or 30 Amp dedicated circuit depending on specifications pertaining to carriage quantity	
Detail 5.4.7	Each carriage will have a minimum of one 90 VDC current limited, fractional horsepower gear motor which will be connected to a full-length shaft at each rail to avoid distortion.	
Detail 5.5.1	Each movable unit must be equipped with an LCD control pad which will include two "open" buttons for left/right and one "stop" button. Display will be bilingual (English/French) if words and not symbols	

	are used and will have the capability of audio feedback with adjustable (and off) volume control.	
Detail 5.5.2	Each carriage will have a control pad located on the centre of each face panel located 44" (1118 mm) from the base of the carriage to the base of the control pad.	
Detail 5.5.3	There must be at least one safety locking pin on each movable carriage	
Detail 5.5.4	Control pads must provide visual indication of safety module operation, illuminate feature chosen for confirmation to the user and provide visual status from a distance.	
Detail 5.5.5	Proximity sensors will be provided for each aisle to easily adjust spacing between closed carriages and adjust to the unique nature of each carriage where material may overhang from the shelves. Manual adjustments of proximity sensors, a computer connection to the control board requirement, and/or mechanical plungers are not acceptable.	
Detail 5.6.1	A 16 gauge stainless steel ramp threshold must be attached, providing smooth entry from existing floor to system floor	
Detail 5.6.2	Finished flooring must be flush and level with the top of the rails. There will be no open gaps or spaces between the decking and tracks. The ramp must be constructed and finished in the same material as the deck with the exception of the stainless steel threshold.	
Detail 5.6.3	Decking and ramp must be installed in a manner that will prevent warping, deformation and movement during normal operation and loading	
Detail 6.1	All shelving sections must be available as a 4-post design consisting of three basic parts; uprights, shelves and shelf supports. Parts must be assembled without nuts, bolts, studs or clips; and without the need for tools of any kind.	
Detail 6.2	Overall maximum height of mobile storage system must not exceed 2083mm (82 in.) in height	
Detail 6.3	Shelving ranges must be complete with tops.	
Detail 6.4.A1	Shelving 'A' to be 419 mm (16.5") clear inside depth and 914 mm (36") clear useable shelving width sections. And 324	

	mm (12.75") clear height dimension between each shelf.	
Detail 6.4.A2	<p>The total linear requirement is 150876 mm (5940 in.). Additional requirements are as follows :</p> <ul style="list-style-type: none"> - One retractable work shelf per bay at the second shelf level from the top of the unit - Standard locks - All bays must have five (5) openings (shelves) in height with three (3) file dividers per opening - A1 - There are 2 rows of double sided mobile shelving. Each row has 4 double sided bays and each shelf is 914 mm (36 in.) in clear usable length. Clear inside depth is 419 mm (16.5 in.) per side. Shelving contractor to confirm total carriage width and length. - A1 - There is one row of single sided fixed shelving. Each row has 4 single sided bays and each shelf is 914 mm (36 in.) in clear usable length. Clear inside depth is 419 mm (16.5 in.) This row has a solid panel the length of the row. See Annex for details. Shelving contractor to confirm total carriage width and length. - A1 - There is one row of single sided mobile shelving. Each row has 3 single sided bays and each shelf is 914 mm (36 in.) In clear usable length. Clear inside depth is 419 mm (16.5 in.) This row has a solid panel the length of the row. See Annex for details. - A2 - There are 2 rows of single sided mobile shelving. Each row has 3 single sided bays and each shelf is 914 mm (36 in.) in clear usable length. Clear inside depth is 419 mm (16.5 in.) per side. This row has a solid panel the length of the row. Shelving contractor to confirm total carriage width and length. See Annex for details. - A2 - There is 1 row of single sided mobile shelving. Each row has 3 single sided bays and each shelf is 914 mm (36 in.) in clear usable length. Clear inside depth is 419 mm (16.5 in.). Shelving contractor to confirm total carriage width and length. 	
Detail 6.4.A3	Shelves must be slotted on 76mm (3 in.) centers to receive dividers. Slots must coincide with the inside edge of the posts	

	so a file divider can be used to provide a flush condition with the post at the shelf end.	
Detail 6.4.A.4	The front and back flange of the shelf must be flush with the outside face of the post.	
Detail 6.4.A.5	Shelves must be adjustable on no more than 38mm (1.5 in.) centers	
Detail 6.4.A.6	Back Stop - The face of the back stop must be slotted on the same centers as the shelf to receive and retain file dividers. Back stop must be full height of shelf opening.	
Detail 6.4.A.7	Center Stop - must be securely fastened at the center of double entry shelves and must be slotted on the same centers as the shelf to receive and retain file dividers	
Detail 6.4.A.8	File Dividers - must be a flat shape with at least two tabs to enter slots in shelf and a retaining tab on the back edge to stabilize the dividers against the back stop or center stop.	
Detail 6.4.A.9	Dividers must be self locking and 152mm (6 in.) high and 254mm (10 in.) deep and must be solid without any holes. The tolerance allowed for divider height and depth is +/- 25.4mm (-/+ 1 in.).	
Detail 6.4.A.10	Nine (9) card holders and all necessary hardware for a complete installation must be provided	
Detail 6.4.B.1	All 'B1' shelves in the library must be 305 mm (12 in.) clear inside depth and 914 mm (36 in.) clear useable length. And 324 mm (12.75") clear height dimension between each shelf. The height for all library shelving (B1, and B2) will not exceed 2083 mm (82 in.) in carriage height.	
Detail 6.4.B.2	Total linear requirement is 548640 mm (21600 in.) for 'B1' and B2 shelves. B1 - There are 10 rows of double sided mobile shelving (B1). Each row has 5 double sided bays and each shelf is 914 mm (36 in.) in clear usable length. Clear inside depth is 305 mm (12 in.) per side. Clear height dimension between each shelf is 324 mm (12.75 in.) Shelving contractor to confirm total carriage width and length. - B1 - There are 2 rows of single sided mobile shelving (B1). Each row has 5 single sided bays and each shelf is 914 mm (36 in.) in clear usable length. Clear	

	<p>inside depth is 305 mm (12 in.) per side. Clear height dimension between each shelf is 324 mm (12.75 in.). Shelving contractor to confirm total carriage width and length.</p> <p>- B2 - one row (B2) will be 388 mm (15.3 in.) in depth to allow shelving units to align with front face of column. This row will have 5 single sided bays and each shelf (when possible) will have 914 mm (36 in.) in clear usable length. Clear inside depth is 305 mm (12 in.) as a minimum. Clear height dimension between each shelf is 324 mm (12.75 in.). Shelving contractor to confirm total carriage width and length.</p>	
Detail 6.4.B.3	Shelves must be slotted on 76mm (3 in.) centers to receive dividers. Slots must coincide with the inside edge of the posts so a file divider can be used to provide a flush condition with the post at the shelf end.	
Detail 6.4.B.4	The front and back flange of the shelf must be flush with the outside face of the post	
Detail 6.4.B.5	Shelves must be adjustable on no more than 38mm (1.5 in.) centers	
Detail 6.4.B.6	Back Stop - The face of the back stop must be slotted on the same centers as the shelf to receive and retain file dividers. Back stop must be full height of shelf opening.	
Detail 6.4.B.7	Center Stop - must be securely fastened at the center of double entry shelves and must be slotted on the same centers as the shelf to receive and retain file dividers	
Detail 6.4.B.8	File Dividers - must be a flat shape with at least two tabs to enter slots in shelf and a retaining tab on the back edge to stabilize the dividers against the back stop or center stop	
Detail 6.4.B.9	Dividers must be self locking and 152mm (6 in.) high and 254mm (10 in.) deep for printed material in library must be solid without any holes. The tolerance allowed for divider height and depth is +/- 25.4mm (-/+ 1 in.).	
Detail 6.4.B.10	Twenty-four (24) card holders and all necessary hardware for a complete installation must be provided	
Detail 7.1.1	Paint Adhesion - The adhesion rating of the finish must not be less than 4B when	

	tested in accordance with ASTM D 3359 Method B.	
Detail 7.1.2	Abrasion Resistance - The loss of the finish must not exceed 0.04g per 500 cycles, using at least a CS-10 wheel tested in accordance with ASTM D 4060.	
Detail 7.1.3	Finish Hardness - The finish must meet the requirements of ASTM D3363, hardness H.	
Detail 7.1.4	Horizontal Surface Deflection Test- Load the shelf surface in accordance with ANSI/BIFMA X5.5 and ANSI/BIFMA X5.9 functional distributed load test. Average the height of the end points and subtract the height of the centre. The resulting dimension is the deflection. The maximum acceptable shelf deflection must be no more than its length divided by 180 (L/180).	
Detail 7.1.5	All exposed and semi-exposed surfaces must have the same colour and finish as rest of the system	
Detail 7.2.1	The mobile storage units must comply with HRSDC - Mobile Shelving - Fire Protection Design Requirements	

All other terms and conditions remain unchanged.