March 13, 2020

RFP 40685

ADDENDUM 5

ITEM: Hale Library Repair & Restoration, Shelving

DEPARTMENT: Kansas State University – Campus Planning & Project Management

CLOSING DATE: March 6, 2020 at 2 p.m.
March 17, 2020 at 2 p.m.
March 24, 2020 at 2 p.m.

CONDITIONS OF ADDENDUM:

- Closing date has been extended to March 24, 2020
- The following are attached for review and consideration:
  - REVISED: Cost Proposal Form
  - Addenda Acknowledgement Form
  - Responses to vendor questions
  - Responses to bidder questions
  - Addendum 5 narrative from PGAV dated March 12, 2020
  - Revised Specification Section 105626 – Mobile Storage Shelving
  - New Sheet A1000 for the set

Please send a signed copy of this addendum with your bid response.

Cathy Oehm
Assistant Director Purchasing
kspurch@ksu.edu
P: 785-532-6214

I (we) have read and understand this Addendum and agree it is a part of my (our) bid on the above proposal.

NAME OF COMPANY OR FIRM: _____________________________________________

SIGNED BY: _____________________________________________________________

TITLE: ___________________________________________ DATE: ________________

2323 Anderson Avenue, Manhattan, KS 66502 | k-state.edu/finsvcs
COST PROPOSAL
(Revised – Addendum 5, dated 03/13/2020)

Vendor Name: ________________________________

Bid/Proposal Instructions

- **Bid Price 1**: Package 1 – Provide pricing for all shelving components issued on 2/13/2020 that includes floors: 1, 2, 3 and 4. Pricing should be independent of package 2.
- **Bid Price 2**: Package 2 – Provide pricing for mobile shelving unit issued on 3/13/2020 on fifth floor only. Pricing should be independent of package 1.
- **Bid Price 3**: Package 1 and 2 combined – provide pricing if packages were selected together.

Bid Price 1: Package 1 $ _______________
Bid Price 2: Package 2 $ _______________
Bid Price 3: Package 3 $ _______________

Bid price shall include all freight, shipping, handling, insurance, customs charges & installation.

Vendors are to state their best delivery / completion date which may be a factor in making an award.

Best delivery / completion date by: __________________________

Vendor must specify what warranties (including costs) or guarantees are available with any or all equipment bid, as well as the sources and nature of all supplies necessary to maintain and support the system.

Warranty: Parts________________ Labor_________________

Is your pricing available to political subdivisions of the State of Kansas? Yes / No

Electronic Copy Submitted By: _____ E-mail _____ USB _____ CD

Payment Terms: __________ Will P-Card be accepted for payment? Yes / No

Will ACH (direct deposit) be accepted for payment? Yes / No

Proposal responses shall include a list of 5 (minimum) references on a separate sheet. Company name, contact, phone number and email address information shall be included for each reference.
Closing Date: 03/06/2020 03/24/2020

Item: Hale Library Repair & Restoration, Shelving

Department: Campus Planning & Project Management

Vendor Name: ________________________________

ACKNOWLEDGEMENT OF RECEIPT OF ADDENDA

The undersigned, hereby acknowledges the receipt of the following addenda:

Addendum No. 1, dated 02/18/2020

Addendum No. 2, dated 02/18/2020

Addendum No. 3, dated 03/03/2020

Addendum No. 4, dated 03/04/2020

Addendum No. 5, dated 03/13/2020

Addendum No. , dated

Signature ________________________

Printed Name_____________________

Title____________________________

Date____________________________
40675 Campus Engagement Platform
Vendor Questions Received by 5 p.m. on January 27, 2020

**General Questions**

**Q1.** Do you want this system to be linked or merged with any other existing university systems? Or would this platform be net new?

   **A1.** This would need to be linked with the current student information system (PeopleSoft). It also needs to be linked to the campus-wide CRM (TargetX). This will be a new platform addition to campus, but will need additional connections with current standing technologies. Additional integrations would be beneficial such as to the campus calendar (Localist), career services platform (Handshake), organization management (Engage), Canvas, Canvas Pro, mentorship platform (PeopleGrove), micro-internship platform (Parker Dewey), etc.

**Q2.** Do you have a list of requirements/user stories?

   **A2.** Please see the provided set of system requirements established with the initial RFP materials. There are no user stories at this time; user stories may be established during negotiations.

**Q3.** How many departments will be using the platform?
   a. What types of departments?

   **A3.** The tool will be housed out of the Center for Student Involvement and the overall program will be managed out of this office. For badges, this would be open for every department on campus to participate in. Departments represent academic units such as Journalism and Mass Communications and also student service departments such as Powercat Financial. Student organizations would also be allowed to create badges based on strict guidelines. For the additional option of micro-credentialing, Global Campus noncredit office will handle direct connection with the platform.

**Q4.** Who are the user groups
   a. Students (specific classes/cohorts, etc.)
   b. Administrators (e.g. advisors, faculty, etc.)
   c. Non-university (internship advisors, employers, etc.)

   **A4.** A) Students – All undergraduate students. The current program has been marketed heavily to the incoming first year students the past three academic years so in the upcoming academic year all levels should be taking part. B) Administrators – The main administrators would be staff members in the Center for Student Involvement, but other administrators could be throughout campus and would include staff, some faculty, student service administration, and potentially advisors. C) Non-University – Employers would only need to be able to view the student record electronically in some form, but that does not necessarily have to be within the system. For the additional option of micro-credentialing, the non-university members would be non-degree seeking individuals engaging in further learning. This could include high school students, professionals, and other non-degree seeking adults.

**Q5.** Is historical data, e.g. discussions, important to users? Or are we starting fresh?
   a. E.g. Existing competency achievement, current students, etc.

   **A5.** The data will need to be pulled from the current system to the new system. If a student has completed a certain requirement for a competency in the current system, it needs to be transitioned to the new system. The current requirements in the existing system are slightly different then the new curriculum that will be added with the new system so there will need to be some sorting of students’ records. For the additional option of micro-credentialing, there may be historical data pulled from our noncredit platform, but for the most part we haven’t had a badging platform before.
Q6. Will you require data migration?
   a. What data needs to be migrated?
   b. What are the data volumes?
   c. What is the quality of the data? Does it require cleansing?

A6. Yes, data migration is necessary as stated in the previous question. All of the current event participation will need to be moved to the new system. The current data volumes and quality are unknown, but can be discussed during negotiations.

Q7. Do you have any integration middleware (DellBoomi, Mulesoft, or other)?
   a. For each integration
      i. What kind of data?
      ii. Batch or real-time?
      iii. One way or two way?

A7. The university currently has an intervention tool, but will be researching new ones. There is an integrations team on campus that will work with the selected vendor. Near real time is preferred and integrations will need to be two way. More information may be shared during negotiations.

Community Collaboration
Q8. Do you want users to engage by asking Questions and/or utilizing Discussions Forums?
   A8. This is not a necessary feature.

Q9. Do you have an existing moderation process for discussion forums?
   A9. There is currently no desire for discussion forums.

Q10. Should all users be able to see each other? Message each other?
    A10. Yes, unless they have chosen to make their profile private. On the leaderboard students should be able to see who is ranked where. Communication with each other is not necessary.

Q11. What security requirements do you have for each user group?
    a. Are there any aspects of the system that should only be visible to specific user groups?

A11. Please refer to the system requirements provided regarding any security requirements. Further explanation and discussion may happen during negotiations.

Q12. What type of content would you like users to be able to submit?
    a. Is it posted in real-time or is there an approval process?

A12. Please refer to the system requirements provided. Users need to be able to submit reflection answers which can either be in one textbox or in multiple textboxes. They also need to be able to submit documents, photos, and spreadsheets. In certain cases, this would need to go through an approval process and in other cases it would need to update the record in real-time. For the additional option of micro-credentialing, there will not be submissions on this platform.

Q13. Are there any limitations on what content/events each user type can view/access?
    A13. All non-administrative users should be able to see all regular events. Certain events may not appear on the main page because they are badge specific. This would be the only case when certain users would not be able to see an event and that is because the event would only be listed within that badge. The view for a non-administrative faculty/staff member should be similar to what a student can see. Students and non-administrative faculty/staff should be able to search other students and see their record (again if not private). Department administrators should have the ability to see everything that the administrator can see if given access. For the additional option of micro-credentialing, their visibility will probably be separate from the other participants - they do not need to see the leaderboard and campus events.
Q14. Do you envision any page variations? E.g. different home pages for different user types?
   A14. That is not a part of the requirements, but it would be a beneficial feature for the home page to look
different for students than non-administrative faculty/staff. There should be some variation for administrators.
They should be able to view the pages the same as students, but also have an administrator view. For the
additional option of micro-credentialing, their home page should be very different from the regular users as we
want to remove the gamification/leaderboard.

Q15. Are you using any external events software? (i.e. Eventbrite)?
   A15. No, all event management should be handled through this system. Events may also be submitted via
university calendar and student organization management system (Engage).

Q16. What student user engagement experience do you envision? If they were to use a dashboard where they could
monitor achievement and engage in a "gamified" experience, what do you envision?
   a. Dashboards?
   b. Leader boards visible to peers?
   c. Messaging with advisors?
   d. University metrics?
   A16. For the student user one of the most important pieces is having a user-friendly experience. The platform
should be straightforward and not confusing. It should run smoothly and quickly. They should be able to easily
navigate to see what is expected of them and what their current progress is.
   A) Within their dashboard they should immediately see their progress towards each competency. From their
dashboard they should be able to navigate to the following: badges, events, incentives, leaderboard, and
record.
   B) The leaderboard should be visible to peers. They should be able to see exactly where they are in the
rankings whether they are #5 or #5,000. Leaderboards of different groups of users might also be beneficial
for engagement purposes.
   C) This is not a requirement but would be a beneficial feature.
   D) The only metrics the student would need to be able to see is the points and rank comparison for individuals
and by groupings.
   For the additional option of micro-credentialing, the vision is for a simplified badging platform that would
not contain any of the gamification dashboard.

Personas:
Q17. What is the total number of users that will be on the platform?
   a. Faculty:
   b. Staff:
   c. Students:
   d. What is the organizational hierarchy for users?
   A17.
   A) An unknown number of faculty/staff will utilize the program due to the nature of the program being focused
towards students.
   B) See above
   C) About 18,000
   D) Students will be the primary users followed by system administrators.
   E) For the additional option of micro-credentialing, these are non-degree seeking participants and we
   honestly don’t have a count at this time.
Community Access:
Q18. How would you like users to access the platform?
   a. Link from your website?
   b. Link from your software product?
   c. Single Sign-on?
   d. Public-facing view?
   e. Social Sign-on: Facebook, Google, Twitter...?
   f. Do you want users to Self-register?

A18. The main way the majority of users should access the platform would be from within a mobile application.
   A) There will need to be a link from the K-State 360 website and also the ability to add the link to other campus pages via a web-button.
   B) It would be nice to have a link from other software currently in use, but not mandatory.
   C) Single sign-on is required.
   D) There should be a way for employers to see students records without having an account.
   E) There should not be a way to utilize social sign-on such as Facebook login.
   F) All university students will automatically be “registered” with the platform upon enrollment and they should not have to self-register. The ability to add further information to strengthen their profile is beneficial.
   For the additional option of micro-credentialing, users will need to be registered automatically when micro-credential is completed.

Integrations:
Q19. What third party applications are meaningful to your community users?
   a. e.g., LMS, knowledge systems

A19. This would need to be linked with the current student information system (PeopleSoft). It also needs to be linked to the campus-wide CRM (TargetX). This will be a new platform addition to campus, but will need additional connections with current standing technologies. Additional integrations would be beneficial such as to the campus calendar (Localist), career services platform (Handshake), organization management (Engage), Canvas, Canvas Pro, mentorship platform (PeopleGrove), micro-internship platform (Parker Dewey), etc.

Q20. Do you have external data sources that you would like to expose in the community?
   a. Links to external systems?

A20. Please refer to question 19 response.

Languages:
Q21. Do you need multiple languages in the Community?
   A21. Not a requirement due to the University requiring minimum English language proficiency.

Gamification:
Q22. Do you need users to be able to submit Feature Requests or Ideas?
   A22. Not necessary, but could be an added benefit.

Q23. Do you want users to gain Reputation points for engaging in community - e.g. ask/answer questions?
   A23. Not necessary, but student users should gain points towards leaderboard rank and other incentive structures.

Q24. Do you want to customize Reputation points with other Salesforce data sources?
   A24. Not necessary
Q25. Do you want to activate knowledgeable people?
   A25. Not necessary

Q26. Do you want upvoting/downvoting?
   A26. Not necessary

Q27. Would you like users to be able to create badges for each other?
   A27. Not necessary, badges will be created by administrators.

Community Administration:
Q28. Who will administer the platform from an access perspective and a content perspective?
   A28. The administration of the platform will be run by the K-State 360 program coordinator out of the Center for
       Student Involvement. They will be in charge of granting access to other administrators and having the final edit
       on all content.
       For the additional option of micro-credentialing, the program coordinator from Global Campus

Q29. Do you have moderators identified? (if discussion forums are in scope)
   A29. No – discussion forums are not necessary.

Q30. Do you have any specific moderation rules?
   A30. No – discussion forums are not necessary.

Q31. Does a student determine if a competency applies to an activity or is it institution-defined?
   A31. For most events the competency is institution-defined. In certain cases, a student may self-report
       attendance to an event. They would be able to suggest the competency on their submission. This submission
       would go to an administrator for approval and they would have the final say on what competency the
       event/activity is designated.
       For the additional option of micro-credentialing, these will be institution defined.

Q32. What sort of incentives will students receive?
   a. Badges in the system?
   b. Tangible items? Selected by the university or through a market place?
   c. Will they make their achievements/competencies visible to more than just themselves?
      i. Advisor
      ii. Peers
   A32.
       a) Badges in the system will be a part of the incentive.
       b) At certain point levels, completion of competencies, and completion of certain badges students will earn
          other tangible incentives. Some of the incentives will be tangible such as a t-shirt. One of the incentives we
          will include will be raffle tickets to our annual event “Points Palooza”. At this event students can use the
          raffle tickets to enter to win different prizes. They would electronically need to get a coupon that they could
          then redeem at the event at the end of the year.
       c) They should be able to share their accomplishments electronically. The hope is they could also share
          certain parts, such as earned badges, in other places such as LinkedIn.
          For the additional option of micro-credentialing, the only incentive will be the badge in the system that can
          be shared through LinkedIn, etc.
Q33. Are there competency goals for students? As in, is there a measurable endpoint? Do they visualize their progress across competencies?
   A33. Yes, there are competency goals for students. We have a written-out curriculum for the competencies that has a list of required items and a list of optional items to complete. For the optional items, there may be a list of five options, but the student only has to complete two. It is very clear to them as they are progressing what they still need to do to complete each competency. Visual representation of the completion of these competencies is desired.
   For the additional option of micro-credentialing, each micro-credential will have measured outcomes.

Q34. Is there interest in credentials that are available on other platforms such as LinkedIn?
   A34. We hope to link our credentials to be able to be visible on other platforms such as LinkedIn but are not interested in students gaining credentials from other platforms.
   For the additional option of micro-credentialing, this should be linked to the Open Badges 2.0

Q35. What is the experience they want to support post-graduation?
   A35. Post-graduation, students should still be able to access their profile for at least five years, but will no longer be able to complete competency activities/events.
   For the additional option of micro-credentialing, this needs to be unrelated to graduation with perpetual access.

Q36. Is the list of competencies static? How often are they updated?
   A36. The list of competencies is static. This past academic year we did update the competencies by adding a well-being competency. Requirements in events/activities within the competencies may be updated on an as needed basis.
   For the additional option of micro-credentialing, these will be variable based on the micro-credentials created. This is a new endeavor, so there will be numerous updates.

Q37. Have you selected a credentialing or portfolio platform?
   A37. The hopes are that this platform would be the credentialing platform. This program is not intended to serve as a portfolio.

System Requirements:

Q38. Data-3,4,5 - The Software Requirements list makes several references to "real-time automated reports". Can you provide more detail on what you mean when you say "real-time" and "automated"?
   A38. The hope is that all data will automatically update as an event is taking place. For example, as students check-in at an event the event owner would be able to have a dashboard, or the like, open and able to see exactly how many students are checking in at the event. The same is true for the competencies and badges. If a student completes a task on their computer, it would be expected that it is automatically updated on the administrative end and the data reflects the requirement being completed. There should not be a lag in something being submitted and it appearing on the administrative end. The automated piece is that all of this is happening without an administrator having to go in and pull reports or push items through. It should just be occurring within the system automatically. Further, a report should be able to be pulled at any point regarding curriculum requirements, competency progress, or event attendance.

Q39. Evt-3 – Will this handle all Event Management functionality for student involvement organizations and university departments?
   A39. This system is not meant to handle all student organization event management as there are other systems on campus for that purpose. However, organizations and their members can submit events within this system for program inclusion. For example, this is meant to house campus-wide events that add to students’ competency growth. If an organization is having a large event open to campus, then this is where they could list it. As far as university departments, this is hoped to be where they list their events that are directed at undergraduate students.
Question 37: Will the exposed bottom of laminate panels require a finished edge?

- Answer: All exposed faces of plastic laminate panels to be finished. Per specifications edges are to be color matching PVC edge banding.

Question 38: Please clarify metal portion of Steel End Panel with Plastic Laminate. Can it be steel in lieu of aluminum?

- Design Intent of end panels: Painted metal panel with a plastic laminate panel attached. The metal panel shall extend the full height and width of shelf and is a gauge substantial enough to not bend upon impact (18 gauge acceptable). The plastic laminate shall be finished per drawings with all edges finished in PVC edge banding to match the face, shape per drawings. Plastic Laminate Panel to be attached to metal panel with concealed fasteners. Installer to attached panel to shelf with manufacturer standard concealed fasteners.
  - Bidder can use either steel or aluminum end panels. Standard shelving end panel is acceptable if intent of shelving design is achieved.
Question 39: Addendum 3 – Drawing A999, General Stacks (mobile) end panel elevation
  a. Please confirm the dimensions at bottom of end panel, showing exposed metal panel are to
     match other details (17” & 5”). No dimensions are shown.

  • Answer: Yes, dimensions at bottom of end panel with plastic laminate over metal is the same at
     all locations including the General Collection (mobile).
KSU HALE LIBRARY  1927                          ADDENDUM #5

PGAV project # 53530
A-013567
K-State Project # 2013-099
March 12, 2020

This addendum is hereby made part of the Contract Documents for the above-named project. It supplements and modifies the drawings and specifications as prepared by Peckham Guyton Albers & Viets, Inc. This addendum is part of the Bid Documents and Contract Documents and shall govern in the performance of the work. Revisions on the documents are described below but are not necessarily limited to the narrative description. A reissued sheet should be reviewed for changes throughout.

Receipt of this addendum shall be acknowledged on the Bid Form.

Bid Information

REVISE Notice to Vendors as follows:

On page 8, at Project Schedule, add the following:
Deliver & install 5th floor mobile shelving system                Can begin June 15, 2020
                Complete by July 31, 2020

Schedule may be delayed due to other construction activities; selected vendor shall coordinate with University.

Bidder Questions and Responses dated 03.12.2020

Document Revisions

Specifications:

10 5626 Mobile Storage Shelving
  1. Revised to include information for Special Collections Mobile Shelving

Drawings:

A999:
  1. Shelving Material Legend:
     a. SPL-1 Plastic Laminate End Panel  Formica Corporation  HPL
        Sarum Twill 8827-58 Matte Finish

A1000
  1. Sheet added showing 5th Floor Special Collections mobile shelving and Details.
Attachments:
Bidders Questions, 10 5626, A1000

END OF BID ADDENDUM #5
SECTION 105626 - MOBILE STORAGE SHELVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other related specifications sections, apply to this section.

1.2 SUMMARY
A. This section includes the following:
   1. High-density mobile storage units mounted on powered carriage, support rails, fabrication and installation including leveling of support rails.
   2. Verification of floor levelness and provisions for leveling all systems.
   3. Verification of height of systems to allow minimum 18 inch clearance above top of units to fire suppression system sprinklers consistent with NFPA13 requirements. Coordinate with General Contractor.
      a. Provide shelving units which comply with this requirement. Height of shelving units may vary from that shown on the drawings or indicated herein in order to comply with this requirement.
   4. Verification of power requirements and coordination with General Contractor. Final layout of system install locations and coordination with General Contractor for systems and floor finish installation. Coordinate interface to the building’s fire alarm system, lighting system, power generator or building management system for security and fire protection with the General Contractor.

B. Related Work, Not Furnished:
   1. Structural floor system capable of supporting live and dead loads required by prevailing building codes, including loads of storage units to be installed. Provide a maximum allowable sub floor deflection of under specified mobile storage loads.
   2. Finish floor covering and edging materials and installation on raised floors and ramps, or when on concrete with recessed rail installation.
   3. Power wiring to units from adequate power supply. Final connections to units shall be provided by installer.
   4. Fire suppression system is by others.

1.3 PERFORMANCE REQUIREMENTS
A. Due to the user’s preference and requirements for safety, performance, and flexibility, all following specification line items are mandatory.

B. Seismic Performance: Provide mobile carriages and shelving capable of withstanding the effects of earthquake motions as determined according to IBC 2006 and local building codes.

C. Design Requirements: All mobile carriage and shelving elevations as per attached drawings and described in specifications.

D. All system components are to be finished in the same matching colors. This may necessitate some components to be custom colors. The color of metal shelving as selected by the Architect will govern.

E. Color Samples: Provide sample for each exposed product and for each color required.

F. Selection Samples: For selection of colors and textures, submit manufacturer’s color charts consisting of actual product samples, showing full range of colors and textures available. Vendors must provide a minimum of 12 color selections in powder coat paint finish.

G. Installer Qualifications: Hire an experienced installer who is the manufacturer’s authorized and certified representative.
   1. Minimum Qualifications: 1-year experience installing systems of similar size and complexity to specified project requirements.
   2. Manufacturer Certification: Required by manufacturer on manufacturer’s letterhead required at time of bid. Certifications by sales representatives, dealers, or distributors are unacceptable. Qualification must include resume of certified installation supervisor.
   3. Provide support within 24 hours for service call.

H. Warranty: Submit a written warranty, executed by the Contractor, Installer and Manufacturer, agreeing to repair or replace units that fail in materials or workmanship within the specified warranty period. This warranty shall be in addition to, not limitation of, other rights the Owner may have against the Contractor under Contract Documents.

   LIFETIME LIMITED WARRANTY: for the lifetime of the shelving and mobile carriages (“structural frames”). For the purposes of this warranty, structural frames shall be deemed to exclude all moving parts, controls and guides that have immediate contact with any moving parts.

   10-YEAR LIMITED WARRANTY: for ten (10) years from the date written hereafter*, for all carriage drive motors. During the 10-year warranty period, all parts are included at no cost for 10 years. Labor installation is included at no cost during the first year of the 10-year warranty period.
5-YEAR LIMITED WARRANTY: for five (5) years from the date written hereafter*, for all equipment, other than structural frames, carriage drive motors, new electronic components installed for an electrical upgrade of systems, light fittings and these electronic components: emergency power system (UPS), routers and WIFI remote controls. During the 5-year warranty period, all parts are included at no cost for 5 years. Labor installation is included at no cost during the first year of the 5-year warranty period.

3-YEAR LIMITED WARRANTY: for three (3) years from the date written hereafter*, for all new electronic components installed for an electrical upgrade of systems (logic board, control and distance sensor), other than light fittings and these electronic components: emergency power system (UPS), routers and WIFI remote controls. During the 3-year warranty period, all parts are included at no cost for 3 years. Labor installation is included at no cost during the first year of the 3-year warranty period.

1-YEAR LIMITED WARRANTY: for one (1) year from the date written hereafter*, for light fittings and these electronic components: emergency power system (UPS), routers and WIFI remote controls. During the 1-year warranty period, all parts and labor installation are included at no cost for 1 year.

* 10-year limited warranty, 5-year limited warranty, 3-year limited warranty, and 1-year limited warranty are applicable from the date of warranty registration completed by the end-user. As indicated on the registration form, registration constitutes the customer's written acceptance of installation. If registration has not been activated by the end-user within sixty (60) days from date of factory shipping, the warranty shall be in force from the date of shipping.

I. Project Schedule: Provide a project achievement plan detailing all critical elements necessary to plan, manufacture, ship, and install shelving product. Include critical project milestones and risk mitigation plan.
   1. Coordinate schedule with General Contractor to ensure completion of work.

J. Manufacturer Qualifications:
   2. ISO 14001:2015: Engage an experienced manufacturer who is ISO 14001:2015 certified. This international standard defines a process for monitoring and improving an organization's environmental performance. This process minimizes adverse impacts on the environment caused by the activities of the enterprise and helps to continually improve the environmental performance of the organization. Submit manufacturer's ISO 14001:2015 registration certificate, certifying the environmental performance of manufacturer.
   3. Underwriters Laboratories Inc.: Powered mobile system shall be C-UL US listed certified. Manufacturer shall submit C-UL US certification with proposal.

1.4 SUBMITTALS
   A. Product Data: Submit manufacturer’s product literature, schematics, testing data, and other items as described in this specification. Include data substantiating that products to be furnished comply completely with requirements of the contract documents and specifications. Include installed weight, load criteria, furnished specialties, and accessories.
   B. Shop Drawings: Prepared and detailing fabrication, assembly, and installation of mobile carriages and storage shelving, as well as procedures and diagrams. Include details of layout and installation, as well as clearances, spacing, relation to adjacent construction in plan, elevation, and section, components, assemblies, connections, attachments, reinforcements, and anchorage. Furnish floor layouts, technical, and installation manuals for every unit shipment.

1.5 QUALITY ASSURANCE (Submittals due from all bidding contractors at time of bid, failure to do so shall be cause for disqualification.)
   A. Manufacturer Certifications: Providing separate written certifications by manufacturer on manufacturer’s letterhead at time of bid is required stating compliance with all specifications of shelving systems. Shelving certifications must confirm compliance with all shelf sizes and gauges as noted in these specifications. If bidding different manufacturers for mobile and shelving, two (2) certifications are required.

1.6 PROJECT CONDITIONS
   A. Field Measurements: Verify mobile carriages and shelving unit location by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
   1.1 Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating mobile carriage and shelving units without field measurements. Coordinate construction to ensure actual dimensions correspond to established dimensions.
B. Delivery, Storage, & Handling: Comply with instructions and recommendations of manufacturer for special delivery, storage and handling requirements.

C. Sequence & Scheduling: Sequence mobile carriage and storage shelving system installation with other work to minimize possibility of damage and soiling during remainder of construction period.

D. Pre-Installation Conference: Conduct conference at project site. Review methods and procedures related to installation of mobile carriage and storage units including, but not limited to, the following:
   1. Inspect and discuss condition and levelness of flooring and other preparatory work performed under other contracts.
   2. In addition to the Contractor and the installer, arrange for the attendance of the following:
      a. Other Installers affected by the work of this section.
      b. The Owner’s Representative.
      c. The Architect.
      d. General Contractor and relevant sub-contractors.
      e. Manufacturer’s representative.

PART 2 - PRODUCTS

2.1 MANUFACTURERS
   A. General: Products are based on mobile shelving system products manufactured by Montel as supplied / installed by H2I or Spacesaver. Contingent on meeting all specification requirements.

2.2 BASIC MATERIALS
   A. Grout:
      1. General: The compound shall be cementitious grout which, when mixed with water, will harden to produce a permanent bolt setting anchor. The compound shall conform to the following specifications, all of which are based on the performance of the test specimens at room temperature and in laboratory environment.
      2. Linear Movement: It shall not shrink on setting but shall exhibit a slight expansion of not more than .002 inch per linear inch.
      3. Compression Strength: Two (2) inch cubes made in accordance with ASTM standards tested on a Balding-Southward machine of 60,000 pounds capacity shall have the following minimum average compression strengths:
         a. Age: 1 hour - 4,500 PSI
         b. 7 days - 8,000 PSI
      4. All tracks shall be grouted the entire length of each run, including all track joints. As the grout slightly expands during the cure process, it shall be in permanent contact with the grouted structural members. This provides a continuous support to the system, and optimal weight distribution on the existing floor slab.

2.3 MANUFACTURED COMPONENTS – MOBILE
   A. Tracks:
      1. Rails shall be designed and manufactured to carry loads of 1,000 pounds per linear foot (1,488 kg/m) of carriage. Made of minimum cold rolled steel (CRS) rail assembly of ¾” (19mm) high x 1” (25mm) wide inserted in a surface treated aluminum sub-rail. Rail contact surface shall be minimum 1” (25mm) wide. The inserted steel rail shall be replaceable.
      2. Sub-rails shall be leveled with self-leveling screws above or below the walking surface. Shims shall not be accepted.
      3. Sub-rails shall be designed to be anchored on top of structural concrete floor and to allow for adjustment so sub-rails can be leveled over an uneven floor.
      4. In the sub-rail, the opening adjacent to rail which accommodate manufacturer’s carriages guidance system and/or anti-tip system shall not exceed 7/16” (11mm) wide x ¾” (19mm) deep.
      5. All rail connections shall have interlock steel rail connectors. All sub-rail connections shall have interlock steel sub-rail connectors. All track connections shall be designed to provide horizontal and vertical continuity between rail/sub-rail sections, to gradually transfer the concentrated wheel point load to and from adjoining sections. To insure vertical and horizontal stability, tongue-and-groove connections are not permitted.
      6. Tracks shall be layered and staggered to ensure a smooth weight transfer from one track to the other. Top-to-bottom track shall be without joints to support continuously the top steel rail at the junction point and provide greater structural rigidity. One-piece rails with tongue- and-groove joints and connections are not permitted.
      7. Rail shall be located and positioned properly, leveled and grouted, allowing at least 3/8” (9.5mm) for grout under high point. Anti-slip grooves under sub-rail shall prevent track to slip when grout is poured. Grout shall infiltrate inside the grooves to anchor the sub-rail to the cement. Grout to be worked under rail, any voids completely filled and trimmed upsides and flush with rails. This allows proper weight distribution from rail to existing slab.
8. Levelness of rails: 3/32" (2mm) maximum variation from true level within any system; 1/16" (1.5mm) maximum variation between adjacent rails, perpendicular to rail direction; 1/32" (0.76mm) maximum variation in 10' 0" (3.05m) of rail length, along any rail.

9. Rails are to be verified for integrity of position and levelness, as well as anchored into structural concrete slab, using anchors in sizes and quantities as determined by manufacturer.

10. Sub-rail section shall be a minimum of 12' foot (3.66m) each and rail section shall be provided in shorter section of 10' foot (3.07m). Shorter sections are used to complete each individual rail assembly.

11. Built-in anti-tip device sub-rail shall be provided to meet local building code and high height-to-width ratio.

B. Floor/Ramp:

1. Surface Mounted Floor / Ramp:
   a. Finished elevation of the raised floor shall be flush with the top of the rails.
   b. The ramp shall not extend beyond the end of the carriages and shall have a maximum slope in compliance with ADA requirements. The vertical transition from the ramp edge to the floor shall be a maximum of 1/8". Ramps shall extend under all movable and stationary ranges except as noted differently. Ramps shall be made of 12-gauge steel. Floor panels shall be constructed of a minimum 5/8" underlayment grade plywood. Floor panels must be provided between all rails the full-width of systems, except under stationary platforms.
   a. Coordinate installation of underlayment with Owner’s General contractor.
   c. Floor panels shall be provided with built-in floor anchor to provide a continuous leveled floor surface.
   d. The floor and ramp shall be constructed in a manner preventing any warping or deformation of the floor panels in a normal operating environment.
   e. Floor covering is to be installed and supplied by others.
   a. Coordinate with Owner’s General Contractor for installation of finish floor.

C. Carriages:

1. All carriages shall be riveted-bonding construction for flexibility and potential reconfiguration or welded carriages. Carriages and stationary platforms shall be constructed of a full "C" shape profiles 1 ½" (38mm)
   deep x 5" (127mm) high, minimum 12-gauge steel, with 1,000 pounds (1,488kg/m) per linear foot maximum capacity. Wheel support sections shall be minimum 12-gauge steel and shall be riveted between the main support face sections, one per aisle assembly. Support sections shall be embossed to eliminate the need of filler plates between the shelving/cabinet and the C shape supports.

2. Stationary carriages, as shown on the drawings, shall be of same construction and height as the mobile carriages and anchored to rails. Setting of shelving on floor at ends of mobile runs is unacceptable.

3. Necessary carriage splices shall be bolted type designed to maintain proper unit alignment and weight load distribution.

4. Carriage face sections shall provide a smooth, clean appearance without any assembly holes or protruding hardware.

5. Carriage straightness shall have no more than ¼" (6.35mm) maximum deviation from a true straight line. There shall be no permanent set or slippage in any spliced or welded joint when exposed to forces encountered in normal operating circumstances.

6. Carriage construction shall be designed to allow the shelving uprights to be secured to the carriage frame with two assembly kits per upright of vibration-proof graded 5" bolt, nut, and clamp anchor assemblies and so that there is no visible hardware on carriage face. Recess design carriages are not permitted. Self-drilling screw attachment is not acceptable method of attachment shelving units to the carriage. No shelving or cabinet attachment hardware shall be visible on exterior face of carriages.

7. Each carriage shall have at least two wheels per rail.

8. Carriages shall have powder coat (1.5 mil) finish on all surfaces. Color selection by the Architect or Designer to match shelving. Powder coat paint finish is required for finish durability and elimination of any off gassing. Finish shall be inert, with no volatiles present in finished product. Visible galvanized steel structural carriage components are unacceptable.

D. Drive/Guide System:

1. Direct-Drive System: Provide with full-length drive shaft which prevents carriage whipping, binding and excessive wheel and rail wear under normal operation. All wheels shall be direct-driven at every rail location on one side of carriage. Synchronized drive with multiple chains, trolleys, and drive shafts are not acceptable.

2. Torque-Resistant Tubular Drive Shaft: Minimum of 1 5/16" (33mm) outside diameter by maximum 1 1/8" (29mm) inside diameter. Solid steel rod is not acceptable.

3. Dual-Flange Wheels: Provide positive guidance and tracking. Guidance requiring cam followers and ball bearings running on either side of the rail is unacceptable.

4. Narrow Guidance Channels: Provide a maximum 3/8" (9.5mm) between sub-rail and rail sections to reduce tripping hazards, allow carts to easily roll over, prevent debris accumulation, and facilitate cleaning.

5. Module shall operate on 115 Volts 50/60 Hertz, 15 or 30 Amp dedicated circuit, depending on the quantity of carriages.

E. Wheels:
1. Wheels shall be constructed of solid minimum 1045 cold rolled steel (CRS) for smooth operation. Minimum load capacity per wheel 3,200 pounds (1,452kg). Wheels shall be precision ground, balanced. All bearings shall be permanently shielded and lubricated.

2. All wheels shall be minimum 5" (127mm) diameter (outside dimension). They shall be dual-flanged and sloped to insure efficient guidance. Single center flanged wheels are not acceptable.

3. Due to carriage length and shelving/racking heights, guide wheels shall be at all wheel locations.

F. For Stacks and Special Collections system - Motors:

1. Each carriage shall be equipped with a minimum of one (1) 90 VDC current limited, fractional horsepower gear motor.

2. Gear motor shall be connected to a full-length shaft at all rail locations to avoid potential distortion.

G. For ITAC Mechanical Assist System Drive / Guide System:

1. Direct-Drive System: Provide with full-length drive shaft which prevents carriage whipping, binding and excessive wheel and rail wear under normal operation. All wheels shall be direct-driven at every rail location on one side of carriage. Synchronized drive with multiple chains, trolleys, and drive shafts are not acceptable.

2. Torque-Resistant Tubular Drive Shaft: Minimum of 1 5/16" (33mm) outside diameter by maximum 1 1/8" (29mm) inside diameter. Solid steel rod is not acceptable.

3. Dual-Flange Wheels: Provide positive guidance and tracking. Guidance requiring cam followers and ball bearings running on either side of the rail is unacceptable.

4. Narrow Guidance Channels: Provide a maximum 3/8" (9mm) between sub-rail and rail sections to reduce tripping hazards, allow carts to easily roll over, prevent debris accumulation, and facilitate cleaning.

H. Face Panels:

1. Stacks system shall be Plastic Laminate over Steel end panel
   a. Wood or laminate End Panels: The panel thickness shall be 11/16" (17.5mm) and it shall be installed over a regular metal face panel. It shall be constituted from a 5/8" (16mm) particleboard complying with ANSI A208.1 Grade M-2, and made of at least 90% of recycled wood fiber, covered on both sides with a colored laminate grade 10/HGS. Edges shall be finished with a color matching edge banding.

2. Materials: All exposed face panels shall be steel with a plastic laminate wrapped wood face. Face panels shall be located on all operating ends of ranges as shown on drawings.

3. Finishes: Selected from manufacturer's standard available colors and patterns. Selected by the Architect or Designer.

4. Face panels must cover the full height and width of shelving.

I. Control Boards:

1. Control boards shall offer capability to be upgraded with new generations of software.

2. TCP/IP protocol connectivity shall be provided with control boards.

J. Movement Controls:

1. Simple LCD Controls Access Control: Provide a Simple Control with LCD display on the accessible (open) end of each mobile carriage.
   a. Simple Controls with LCD Display shall include two arrow shaped OPEN backlit buttons, and a STOP backlit button. Provide a 32-character display for mobiles status and additional safety. Display shall be permanently backlit. The multilingual LCD display messages shall be available in at least 3 languages (English, Spanish, French).

2. Each carriage shall have a control centered on each face panel and located at 41" (1041mm) (from the base of the carriage to the base of the control).

3. All controls and indicator lights shall be solid state and shall provide visual indication of safety module operation. Controls shall offer illuminated feature on the stop and the arrow buttons for additional feedback to the user and allow easy visual status from across the room. Only the safe and available operational functional shall be the illuminated functional options for the user. Controls shall feature a module error backlit indicator light in case of any abnormality.

4. The control's housing shall be impact-resistant

5. Sealed membrane control technology to ensure maximum life duration of controls. Mechanical push button controls or membrane activating mechanical push button controls are not acceptable. Membrane controls shall be sealed for water and dust penetration, as well as chemical-resistant.

6. Automatic Aisle Reset: Upon confirmation there are no users or objects in the aisle, the module shall reset automatically and the LED-friendly backlit arrows on the control panel shall display a constant blue indicating the available aisle. Systems requiring manual reset shall not be acceptable.

7. Infrared Distance Measuring Sensors: Provide each aisle with a distance sensor programmable with the PIN-code controls main menu. Distance measuring sensors shall be provided to easily adjust aisle spacing between closed carriages and adjust individual carriages to provide necessary clearance to accommodate and protect objects that are overhanging the shelves. Mechanical plungers are not acceptable, as well as manual adjustment of proximity sensors or the necessity of a computer connected to a control board to adjust aisle spacing.

K. Safety Features:
1. Safety Lock Out: Red STOP indicator shall signal occupation on each side of the aisle and prevent selection of a new aisle until open aisle is cleared. LED-friendly visual directional arrows shall provide verification that carriages are in locked or unlocked mode, and display only the safe available choices for carriage movement.

2. Dual sided Low Safety Activation Height: Safety system shall detect objects as small as 1-1/2” high located anywhere in the aisle. Safety device on both sides of the carriage side members shall not be mounted higher than 1-1/2”.

3. Fail-Safe Technology: Safety system shall be fail-safe design and prevent any carriage movement should the system fail.

4. Electronic Overload Protection: Shall shut off power to the motor when excessive pressure is applied against a carriage. Pressure sensitivity shall be programmable and adjustable with Remote Monitoring Software.

5. Dual sided Aisle-Entry People Counter: Shall monitor users entering and exiting an aisle.

6. Remote System Monitoring Software: Provide PC-based diagnostic system for monitoring and configuring all mobile system’s safety, power, and functionality processes. Monitoring system shall automatically notify specified service personnel of abnormalities with system operation or safety systems.

L. Security Features:

1. Building Interface: Provide the powered mobile to interface with the building’s fire alarm system, lighting system, power generator or building management system for security and fire protection.

M. Carriages Movement:

1. Each carriage shall provide controlled acceleration and deceleration to protect stored books or objects. Each motor shall have a dynamic braking system that will stop the carriage whenever a safety feature is activated.

2. Controls shall provide movement with a controlled running speed of 3” (76 mm) per second. Speed parameters for gentle start-up, cruising speed, and braking movements shall be programmable with the Remote Monitoring Software.

3. Module movement shall start carriages by block to move all carriages at once. Capability to change easily from Sequential Movement to Block Movement with the Remote Monitoring Software. Module movement must not require any modification to the module configuration and without the use of an external device such as a computer.

4. Multi-Tasking Aisles: Carriages movement shall be initiated while other carriages are already moving and completing their move cycle.

5. Keyless Override Mode: Carriage movement shall move one at a time with reduced speed using a 4-digit PIN code. Systems requiring a key to override the system are not permitted.

N. For Stacks and Special Collections system only - Auxiliary Override:

1. Automatic Built-In Battery Backup: Powered mobile system shall be always operational even during power failures. Provide one battery backup per module. Battery must always be recharging. All preprogrammed functionalities safeties, and speed shall remain operational.

2. Mechanical Ratchet Backup: Each carriage shall be equipped with a mechanical ratchet device connected directly to the full-length drive shaft to ensure complete accessibility in case of primary power failure, no operational downtime, simplified system installation, and easy relocation. Provide a mechanical ratchet tool to operate each carriage manually. Ratchet tool shall be easily connected to the mechanical ratchet device without removing the face panel. Removable plastic-molded cap shall be installed at each bottom right corner of each face panel.

O. ITAC Mechanical Assist Movement Controls:

1. The system shall be of the mechanical assist type having a chain sprocket drive system. A driving system is required to provide uniform movement along the total length of the carriage even with unbalanced loads on the carriage. The system shall be a positive drive to ensure that there is no play in the drive handle and the carriage will stop without drifting. All components of the system shall be compatible for smooth non-jerking, even movement along the total length of the carriage. All bearings used in the drive mechanism shall be permanently shielded and lubricated.

2. Operating handles shall be three-spoke type (single spoke handle are unacceptable) of 18 ¾” diameter transmitting power through a chain drive to the drive wheels. Provide operating handles on drive end of carriages as noted on drawings. Each mechanical device shall come with a chain-tensioning adjuster. Handle must be mounted at 39 1/2” from bottom of the carriage.

P. ITAC Safety Features:

1. Aisle Safety Push Button Lock (for single access): Shall be located at the center of the handle. The user shall press the aisle safety push-button, which will lock the respective carriage. After being pressed, the aisle safety push-button shall protrude from the handle face to display a red band visible to users. After being re-pressed, the aisle safety push-button shall return to its unlocked state. Pull-out pins are unacceptable. Both carriages on either side of the aisle must be secured.
2. Toe-Level Safety Sweep (for single or dual access): Consisting of hinged aluminum safety bar running full length of the mobile carriages, flush with bottom of carriage frame and on both sides of carriage. Upon activation of the sweep, an internal device shall interlock with drive train resulting in positive stop anywhere in the module. A one and half (1.5) pound pressure applied on the safety bar will activate the safety. The safety shall automatically reset upon removal of the obstruction or if carriage is backed away from the obstruction. This active safety shall not require any electricity or battery to be activated (mandatory).

Q. Accessories:
1. Dual Controls: Provide additional control panel at end of each powered or mechanical assist carriage for accessing from either end of the aisles.
2. End Panel Signage: Clear Anodized Aluminum C-channel top and bottom frame in size as indicated on drawings with removable protective acrylic face for use with interchangeable owner provided inserts. Height of units to accommodate standard 8 ½” letter paper in landscape orientation. Width of unit per drawings.

2.4 MANUFACTURED COMPONENTS – CANTILEVER SHELVING FOR STACKS MOBILE SHELVING
A. Shelving on Mobile System – please see drawings for layout and use elevations for number of adjustable shelves per section.
1. Welded Frame Upright:
   a. Formed of 14-gauge steel into a channel shape with 3/4" stiffening flanges on the inside of the upright, the channel to measure 2" in the web and 1 1/4" across the front and rear faces. They present a smooth, closed box shape in cross section with either right angle bends when bolted to the adjoining column of the next unit or bolted to an end cover. When bolted to adjacent welded frames, exposed open channels of uprights are unacceptable. Each column is perforated full-height on both faces with a row of slots spaced 1" on vertical centers and located within 5/16" of the outer web surface. Every fifth and sixth slot has square corners as viewed against the remaining rounded corner slots to aid visual alignment of shelves. This pattern is repeated over the full height of the upright.
   b. Top Spreader Tube: Formed of not less than 14-gauge tubular steel measuring 1" x 3" in cross section. The spreader is electrically welded to the uprights.
   c. Bottom Spreader: Formed, channel shape measuring 1" x 1-3/4" in cross section and consists of not less than 16-gauge steel. The outer ends of the channel are punched to receive leveling nuts and floor levelers the bottom channel is electrically welded to the uprights with the open face of the channel positioned upward. Weld Frames heights are as specified, widths are 36" standard. Weld frames are equipped with two (2) adjustable floor levelers.
   d. Non-welded frame cantilever type shelving units are unacceptable.
2. Base Support Brackets:
   a. Closed Base Brackets: Designed to fit snugly in and around the welded frame upright. Material is no less than 16-gauge steel. Brackets have a 90-degree flange at the bottom to rest on the floor covering. Hardware for leveling the book stack is included. Top and front edge of the base bracket are flanged outward approximately 1/4". The profile of the bracket matches that of the adjustable shelf end bracket. The embossed area incorporates a hole to allow attaching of adjoining base brackets with a fastener.
3. Shelf End Brackets:
   a. Formed of not less than 16-gauge steel; with all but the rear edge flared outward approximately 1/4". The rear edge has two crimped hooks at the top for engaging frame upright slots, and a positioning tab at the bottom to prevent accidental dislodgement. The bracket incorporates two lances with protruding dimples in the sides for securing shelf side flanges. Bracket design allow for shelf adjustment upward and downward (i.e. ‘walking the shelf’) without disturbing any of the other shelves. Bracket emboss prevents overlapping of adjoining brackets. Brackets extend at least 6" above the shelf surface.
4. Adjustable Shelves for Mobile
   a. Formed from not less than 18 gauge steel with the front and rear edges having a box-formed, 13/16” high profile. The nominal depth of the shelf is 1” greater than actual dimension. The sides of the shelf are flanged to locking into the base brackets without the use of fasteners.
      a. Plain Shelves for both single and double sided units.
5. Base Shelves for Shelves on Mobile Unit:
   a. Closed Base Shelves: formed from not less than 18-gauge steel into a one piece construction designed to fit snugly around base brackets without the need for fasteners. Front height is 3-5/16”, and sides have stiffening flanges.
      b. Closed Base Shelves, single face and double face
B. Accessories
   a. Provide one (1) book support per new shelf

2.5 MANUFACTURED COMPONENTS – 4-POST SHELVING FOR ITAC MOBILE SHELVING
2.6 MANUFACTURED COMPONENTS – 4-POST SHELVING FOR SPECIAL COLLECTIONS MOBILE SHELVING

A. Shelving on Mobile System – please see drawings for layout and use elevations for number of adjustable shelves per section.

1. Upright Frames: Upright frames are made of two or more cross members welded to the top and bottom (and center if necessary) of the post and forming a rectangular upright frame. Each post shall be made of 16-gauge 1 ¼" x 1 ½" rectangular shaped cold rolled steel. The lateral sides of the posts are slotted at every one inch increment. The slots are 3/16" wide x 5/8" long and are designed to accommodate a variety of shelf and roll-out drawer configurations. The back of the post is also slotted at every 1 ½" increment with two rows of slots side by side from top to bottom. They are 3/16" wide x 5/8" long with 3/8" between the two rows. The uprights must allow for component integration on either 1" or 1 ½" increment depending only on the selected shelf component. Due to aesthetic concerns, user’s performance requirements, safety of users and stored materials, and to provide maximum flexibility, “L & T 4-Post” utility shelving system styles are unacceptable.

2. Cross Members: Cross members are 4" high x ½" wide. They are made of 16-gauge steel folded to create a “U” shape channel. At both ends, hook type design allows to snap the cross members in both rows of slots at the same time. The cross members shall be welded to the post. Non-welded frames must be available to minimize shipping volume, thus reducing truck pollution.

3. Levelers: Each post shall have an integrated leveler, inserted into formed upright tube, which allows for ¾" adjustment to accommodate for uneven floor surface. No temporary shims or other third party leveling device will be accepted.

4. Supported type:
   a. Full-depth shelves: Full-depth shelves are made of box rolled formed 18-gauge steel, with “Four Bend” ¾” edge construction which adds additional strength and capacity as well as it creates a hidden safety edge to protect people and items. The full-depth shelves are supported by two longitudinal shelf supports and the appropriate number reinforcement channels.
   b. Longitudinal supports: 1 ¾” high supports for heavy duty application are made of one “U” shaped 12-gauge steel channel. A standard formed steel claw is welded at each end to form a complete support. These supports are inserted into the slots located at the back of the post.
   c. Front-to-back reinforcement channels: 1 ¾” high reinforcement channels for heavy duty application are made of 12-gauge steel formed in a “U” shaped channel and are sitting on the longitudinal shelf supports.
   d. Base support: A 12-gauge steel special “U” shaped channel is provided for the bottom shelf. The support is inserted at the bottom of each post and anchored to the floor or to the carriage, in compliance with seismic standards.
   e. Maximum deflection under load; must maintain L/140 based on a uniform distributed load of 50 pounds per square foot.

5. End Panels: Shall be constructed of 18 gauge steel, 2” thick, they are bolted to bottom and top upright cross members.

6. Side and / or Back Closure Panels: Shall be constructed of 18-gauge steel, they are formed to be flush with the edge of the shelving upright and bolted to bottom and top upright cross members.
   a. Shall allow for secure locking of system.

7. Slotted Center Stops (double entry): Shall be 4 3/1” high formed of 20-gauge steel with two offset bends. Slots are located on 1” increments for divider adjustment.

8. Locking: provide keyed locking of system.

2.6 MANUFACTURED COMPONENTS – 4-POST SHELVING FOR SPECIAL COLLECTIONS MOBILE SHELVING ON THE 5TH FLOOR

A. Shelving on Mobile System – please see drawings for layout and use elevations for number of adjustable shelves per section.

1. Upright Frames: Upright frames are made of two or more cross members welded to the top and bottom (and center if necessary) of the post and forming a rectangular upright frame. Each post shall be made of 16-gauge 1 ¾” x 1 ½” rectangular shaped cold rolled steel. The lateral sides of the posts are slotted at every one inch increment. The slots are 3/16” wide x 5/8” long and are designed to accommodate a variety of shelf and roll-out drawer configurations. The back of the post is also slotted at every 1 ½” increment with two rows of slots side by side from top to bottom. They are 3/16” wide x 5/8” long with 3/8” between the two rows. The uprights must allow for component integration on either 1” or 1 ½” increment depending only on the selected shelf component. Due to aesthetic concerns, user’s performance requirements, safety of users and stored materials, and to provide maximum flexibility, “L & T 4-Post” utility shelving system styles are unacceptable.

2. Cross Members: Cross members are 4” high x ½” wide. They are made of 16-gauge steel folded to create a “U” shape channel. At both ends, hook type design allows to snap the cross members in both rows of slots at the same time. The cross members shall be welded to the post. Non-welded frames must be available to minimize shipping volume, thus reducing truck pollution.

3. Levelers: Each post shall have an integrated leveler, inserted into formed upright tube, which allows for ¾” adjustment to accommodate for uneven floor surface. No temporary shims or other third party leveling device will be accepted.
4. Supported type:
   a. Full-depth shelves: Full-depth shelves are made of box rolled formed 18-gauge steel, with “Four Bend” \( \frac{3}{4} \)” edge construction which adds additional strength and capacity as well as it creates a hidden safety edge to protect people and items. The full-depth shelves are supported by two longitudinal shelf supports and the appropriate number reinforcement channels.
   b. Longitudinal supports: 1 ¼” high supports for heavy duty application are made of one “U” shaped 12-gauge steel channel. A standard formed steel claw is welded at each end to form a complete support. These supports are inserted into the slots located at the back of the post.
   c. Front-to-back reinforcement channels: 1 ¼” high reinforcement channels for heavy duty application are made of 12-gauge steel formed in a “U” shaped channel and are sitting on the longitudinal shelf supports.
   d. Base support: A 12-gauge steel special “U” shaped channel is provided for the bottom shelf. The support is inserted at the bottom of each post and anchored to the floor or to the carriage, in compliance with seismic standards.
   e. Maximum deflection under load; must maintain L/140 based on a uniform distributed load of 50 pounds per square foot.

5. End Panels: Shall be constructed of 18 gauge steel, 2” thick, they are bolted to bottom and top upright cross members.

6. Side and / or Back Closure Panels: Shall be constructed of 18-gauge steel, they are formed to be flush with the edge of the shelving upright and bolted to bottom and top upright cross members.
   a. Shall allow for secure locking of system.

7. Locking: provide keyed locking of system.

2.7 FINISH SPECIFICATIONS
A. Shall be the finest of their respective kinds and those best adapted to the construction for which they are employed to meet ISO 9001:2015 quality standards. All steel shall be superior quality milled, cold rolled, pickled, and double annealed, free from scale and buckle. All gauges are U.S. standard. The design of all parts shall be such that the completed installation shall present a neat and finished appearance and shall be free from exposed sharp edges or projections. All other special materials shall be as hereinafter specified.
B. All steel components shall be painted with an electrostatically applied powder coat finish. All steel parts shall be machined smoothed and thoroughly cleaned by a process of completely washing in a phosphatizing solution to insure removal of oil, grease or other foreign material which could interfere with the adhesion of the priming coat in any way. Following the cleaning process, all parts shall be coated and confirming every part is thoroughly and completely covered with fine powder coat and baked to the paint manufacturer’s recommendation. The finish for powder coat shall be medium gloss, giving a reading of 35 to 65 degrees on a standard gloss meter and must be capable of withstanding severe hammer and bending tests without flaking. The finish for epoxy-polyester hybrid powder coat shall be a minimum 1.2 mil thickness capable of resisting methyl ethyl ketone, salt spray, abrasion and printing, and all normal usage resistant requirements of a good finish. In addition, powder coat shall not be off gassing to prevent deterioration of collection and other stored materials. Colors to be selected by Architect.

PART 3 - EXECUTION
3.1 EXAMINATION
A. Examine subfloor surfaces, with installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of mobile storage units.
   1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of mobile storage units.
   2. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION
A. Install components and accessories after finishing operations, including painting, have been completed. Install shelving units to comply with final layout drawings, in strict compliance with manufacturer’s printed instructions and structural calculations. Position unit's level and plumb at proper location relative to adjoining units and related work
B. Field Quality Control: Remove and replace components that are chipped, scratched, or otherwise damaged and which do not match adjoining work. Provide new matching units, installed as specified and in manner to eliminate evidence of replacement.
C. Adjust: Adjust components and accessories to provide smoothly operating, visually acceptable installation.
D. Cleaning: Immediately upon completion of installation, clear components and surfaces. Remove surplus materials, rubbish and debris resulting from installation upon completion of work and leave areas of installation in neat, clean condition.
E. Protection: Protect system against damage during remainder of construction period. Advise Owner of additional protection required to ensure shelving units will be without damage or deterioration at time of substantial completion.

3.3 DEMONSTRATION/CUSTOMER TRAINING

A. Provide complete training to end-user’s staff. Training shall include general safety and operation instructions, and basic preventative maintenance procedures.

END OF SECTION