SECTION 10 67 10 – SPECIALTY STORAGE EQUIPMENT

PART 1   GENERAL

1.01 SUMMARY

A. Section Includes:
   1. The work specified in this Section consists of furnishing and installing High Level Storage Equipment at the locations shown on the Contract Drawings. It is understood that University of Arizona Facilities Management will be procuring the equipment covered under these specifications as a separate procurement. The Contract Drawings shall be used for the layout and location of such equipment. Refer to Equipment Drawing Q-102 for layout.
   2. Complete installation and start-up and testing of the equipment shall be the responsibility of the Manufacturer/Supplier.

B. Related Sections
   1. Drawings, General Provisions, Special Provisions and Division 1 from the main contract (Reference Client No. 1310210) will also apply to the work of this section.
   2. Division 5 – Structural Steel
   3. Division 5 – Metal Fabrication
   4. Division 9 – Paints and Coating
   5. Section 11 00 50 – Basic Equipment Materials and Methods

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM)
   1. ASTM A 36/A 36 M Specification for Carbon Structural Steel

B. American Society of Civil Engineers (ASCE)
   1. ASCE 7-16 Class D – Seismic Requirements

C. National Fire Protection Association (NFPA)
   1. NFPA 30 Flammable and Combustible Liquids Code

D. Occupational Safety and Health Administration (OSHA)
   1. 29 CFR 1910 Occupational Safety and Health Standards

E. Crane Manufacturers Association of America (CMAA)

1.03 QUALITY ASSURANCE

A. Model numbers indicated are to establish a minimum standard of quality only.
1.04 SUBMITTALS

A. Pursuant to the provision of the General Requirements, Division 1 and Section 110050 Basic Equipment Material and Methods, the Contractor shall submit:
   1. Material and Equipment List including details indicating quantities of storage equipment and unit dimensions;
   2. Product Data including manufacturer's product descriptive literature and color chips for storage equipment types and color selection;
   3. Shop Drawings; and
   4. Installation instructions including bracing and anchoring details.

B. Submit written affidavits on the manufacture’s letterhead stating the manufactures post-consumer material content (35% min.) and pre-consumer material content (0% min).

1.05 JOB CONDITIONS

A. Paint storage equipment in manufacturer's standard finish of color selected by the University of Arizona Representative.

B. Units with damaged or missing parts or components will be rejected.

1.06 WARRANTY

A. Following completion, the Contractor shall provide the University of Arizona Representative with two (2) years of warranty as stipulated in documents starting at project acceptance, covering all parts, materials, and labor. All warranty work shall be performed by a local manufacturer's representative at the Project Site location, who has capabilities of responding to all problems within 24 hours. Any shipping and delivery costs associated with the warranty of this equipment shall be the responsibility of the Contractor.

1.07 DELIVERY, STORAGE AND HANDLING

A. Deliver, store, and handle products without damaging them.
   1. Receive, unload, check, protect, and store equipment in facilities suitable to keep it clean, dry, and free from damage, vandalism, and pilferage.
   2. Pay demurrage charges and claims for damage resulting from unloading operations.
   3. Examine equipment for visible and concealed damage. Report any damage to carrier, supplier, and University of Arizona Representative as soon as possible.

B. Protect equipment from loss, deterioration, and damage until work is complete.
   1. Protect equipment during storage and prior to start-up.
   2. Protect exposed finished surfaces with removable coating for film, cover openings to exclude dirt and fouling materials, and protect unfinished surfaces against rust, corrosion, and other damage.
3. Protect equipment from paint or coating spills and spots.

PART 2 PRODUCTS

2.01 VERTICAL LIFT MODULE

A. Equipment Item No. WH-3

B. Manufacturer’s Reference:
   1. Prime manufacturer: Specifications are based on equipment identified herein by manufacturer’s name and model to establish minimal acceptable standards of quality, features, performance, and construction.
      a. SSI Schafer Inc.,
      b. Model: LogiMat #4025-815-8950/590 as specified herein.
   2. Alternate manufacturers: Contingent upon compliance with these specifications and documentation requirements set forth in SUBMITTALS, equipment produced by other manufacturers, including the following, may be considered as equal.
      a. Modula, Inc. - Lewiston, ME (207) 440-5100

C. Capacities/Dimensions:
   1. Capacities/Dimensions are project specific, verify with Contract Documents
   2. Overall dimensions, approximate:
      a. Width: 180 inches
      b. Depth: 122 inches
      c. Height: 352 inches
   3. Tray quantity: As required to provide 77 total trays.
   4. Usable tray size, approximate:
      a. Width: 158 inches
      b. Depth: 32 inches
      c. Height: 6 inches
      d. Usable area: 35.3 square feet
      e. Maximum tray load capacity (distributed evenly): 1,300 lbs.
   5. Tray adjustment: 1-inch increments compression throughout the full height of the system
   6. Load capacity:
      a. Maximum load per tray: 1,300 lbs.
      b. Maximum Empty Weight (No Trays): 3.9 Tons
      c. Maximum Payload with Trays: 60.6 Tons
      d. Total Weight: 64.9 Tons
   7. Access time:
      a. Singler Access: 21 seconds
      b. Single Access Maximum: 25 Seconds
      c. Tray Change: 41 Seconds
      d. Tray Change Maximum: 50 Seconds
D. Features/Performance/Construction:

1. The unit shall be equipped with double tray access from the same opening to allow the operator to have the system automatically retrieve the next desired tray and deliver at the operator’s command. This system should also be able to deliver trays to an ergonomic height within the access opening set to meet individual’s needs.

2. Trays: Steel Construction, galvanized.

3. Access Opening: Chrome Steel

4. System will come complete with lockable security doors.

5. Unit shall be ESD protected.

6. System shall be provided with a locking tray hold for loading and unloading of individual trays.

7. Programmable Logic Controller

8. The integrated software shall provide advanced levels of inventory control, kitting, order picking, light directed picking, managerial reports, automatic input of orders directly from the customers host system and control of multiple units.

9. System shall include adequate lighting at access point.

10. Must be able to secure access to any number or all specified trays by approved operator(s) with password.

11. All components shall be UL Listed.

12. Machine must be able to handle (automatically) multiply weight capacity trays with the same machine.


14. Provide seismic bracing and anchoring to meet any local, state, and national codes and provisions. Manufacturer to provide, for review and confirmation, calculations for base plates and anchoring by a Structural Engineer registered in the State of Arizona.

E. Controls:

1. The control package shall be designed to allow customization of operational controls by the user and allow full control of horizontal and vertical speeds. The four operating modes are:
   a. Fixed - each tray has a designated position within the unit
   b. Optimized - each tray is measured for height and stored in the unit to maximize density
   c. Mixed - select whether it is stored in a fixed or optimized mode.
   d. Fixed height mixed - using the mixed mode a maximum tray height may be assigned to each tray. This prevents tray using more height than it should due to box flaps opening or operator placing incorrect item on a tray.

F. Utility Requirements -

1. Electrical: 480 VAC, 3 phase, 40 Amps – Maximum Power Consumption: 21 kVA

2. Control Voltage: 24 VDC

3. Noise Level: 70 +/- 10 dB(A)

G. Finish: Durable enamel in the University of Arizona representative choice of manufacturer’s standard colors.

University of Arizona FM Relocation and Consolidation Facility
Client No. 1310210
100% Construction Documents
2.02 HIGH DENSITY RACK/STACKER SYSTEM (CANTILEVER RACK)

A. Equipment No. WH-1

B. Manufacturer’s Reference:
   1. Prime manufacturer: Specifications are based on equipment identified herein by manufacturer’s name and model to establish minimal acceptable standards of quality, features, performance, and construction.
      a. Rapidstak Corporation, Blasdell, NY (716) 822-2804
   2. Alternate manufacturers: Contingent upon compliance with these specifications and documentation requirements set forth in SUBMITTALS, equipment produced by other manufacturers, including the following, may be considered as equal.
      a. Ridg-U-Rak, Inc. North East, PA (814) 725-8751

C. Capacities/Dimensions:
   1. Pallet racks: Dimensions are project specific, verify with Contract Documents
      a. Overall system dimensions, nominal:
         1) Cantilever Rack Length: 32 feet, 6 inches
         2) Rail Length: 54 feet, 3-3/8 inches
         3) Rack Width: 16 feet, 3-5/8 inches
         4) Full Height of Rack: 26 feet
   2. Number of Rack Towers: 10
      a. Number of arms per tower: 7 plus base
      b. Rack tower design: Structural steel
   3. Number of Bar Cradles: 32 units
      a. Cradle Size: 8 feet, 6 inches long X 3 feet deep x 1 foot high
      b. Capacity: 1000-pound capacity wire mesh tray
   4. Aisle width: 8 feet, 6 inches
   5. Fork Length: 3 feet, 0 inches
   6. Column spacing: 8 feet
   7. Rail extension: 1 foot, 10-1/2 inches on each end.
   8. Number of Stackers: One per system
   9. Number of Systems: One
   10. Aisle Configuration: Single
   11. Fork Centers: Adjustable from 5 inches to 24 inches
   12. Rail: 30# ASCE Rail
   13. Crane system:
      a. Bridge crane (one each aisle):
         1) Overall dimensions:
            a) Span: 12 feet 7 inches
            b) Crane height: 2 feet, 12-1/16 inches
            c) Overall Height: 26 feet
         2) Lifting capacity: Rated at 2,000 pounds.
         3) CMAA Classification: Class “C”
4) Lift dimensions:
   a) Span: 12 feet, 7 inches
   b) Runway length with extension: 54 feet, 3-3/8 inches

b. Speeds:
   1) Hoist: Maximum high speed 32 FPM; Minimum low speed 16 FPM
   2) Trolley: Maximum high 25 FPM Maximum with VFC
   3) Bridge: Maximum high 120 FPM Maximum with VFC
   4) Rotation: 2 RPM Maximum with VFC

D. Features/Performance/Construction:

1. Racking:
   a. Structural columns W10x26 with crane mounts
   b. Structural base: W10x26x36
   c. Sloped arms: 36 inches x S3x5.7
   d. Vertical bracing 96 inches
   e. Horizontal bracing 96 inches
   f. Cross beams with end plates W8x24x14 feet, 11-5/8 inches
   g. Tower height: 26 feet
   h. Stool height: 21 feet, 11-5/8 inches

2. Mast:
   a. Mast rotation shall be 360 degrees continuous fully motorized at a maximum of 2 rpm utilizing SEW Euro-drive or equal gearbox/motors.
   b. Mast shall be constructed of a minimum of 7-inch structural steel channel and utilize 1.5 inches wide x 2 inches high hardened guide bars rated at 125,000 PSI to 146,000 PSI for maximum wear resistance.
   c. Mast construction shall be such that mast deflection is held to a maximum of 1” deflection.
   d. Mast shall be constructed utilizing 2 inches x 1 inch structural cross tube supports spaced at 16 inches.
   e. Mast bearing mount surface shall be a machined surface.
   f. Bottom of mast shall have an adjustable toe guard/kick plate.
   g. Mast shall have a mast mounted back stop and separate mast mounted 22” wide x 19.5 inches deep operator canopy.
   h. Mast shall have 7 gage formed steel hand guards.
   i. Mast shall have protective expanded metal on operator side to 36 inches high.
   j. Mast shall have polycarbonate viewing window 36” from floor to 87 inches from floor.
   k. Mast shall have one LED flood light mounted on the front of the mast and rotates with the load on the forks.

3. Carriage:
   a. Carriage width: 30 inches
   b. Pallet Forks 36 inches long Class III with fork centers adjustable at 24 inches.
   c. Carriage main rollers shall be a minimum 2-inch diameter, hardened steel roller spaced at 12.5 inches.
d. Carriage side guide rollers shall be a minimum 1.5-inch diameter, hardened steel roller spaced at 8.75 inches and designed to handle up to 2,000 pounds of side load.

e. Carriage shall be constructed with standard ITA class II fork carriage bars 1.5 inches tall x 5 inches wide (no shaft mount)

f. Carriage shall be constructed utilizing a dual arm free fall prevention device capable of stopping and holding the full rated load. This device shall not engage the mast guide bar.

g. Fork deflection designed to be 1.25" maximum at full load.

4. Hoist:
   a. Hoist shall be rated to handle 2,000-pound working load plus weight of carriage, forks, and pallet.
   b. Minimum hoist lift rating shall be 2,750-pounds (3.75HP).
   c. Hoist shall be of two speeds magnetic at 32/8 FPM.

5. Bridge:
   a. Bridge Crane Model: P2B-333-3696-4-312 – Service Class C.
   b. Bridge operation shall be fully motorized at a maximum of 120 FPM with VFC Drive and shall be top running and constructed of a minimum 10 inch wide flange structural beam with a maximum deflection of 1/8 inch and utilize 9.25 inch diameter double flanged wheels with double sealed precision ball bearings rated at 2500-pounds minimum per wheel.
   c. Motorized bridges shall be top running and constructed of a minimum 10-inch-wide flange structural beam and utilize modular wheel block assemblies and SEW Euro-drive or equal gearbox/motors.
   d. Bridge rail shall be square bar welded on center of beams.

6. Trolley:
   a. Trolley operation shall be fully motorized at a maximum of 25 FPM and shall be top running and constructed of structural steel tube framing with 5/8 inch thick bearing mount plate and utilize 6 inch diameter double flanged wheels with double sealed precision ball bearings rated at 2500-pounds minimum per wheel.
   b. Motorized trolley shall be top running and constructed of structural steel tube framing with a 5/8-inch-thick bearing mount plate and utilize modular wheel block assemblies and SEW Euro-drive or equal gearbox/motors.
   c. Trolley bearing mount surface shall be a machined surface.

7. Runway Rail:
   a. Rack mounted runway rail shall be a minimum of 30# ASCE rail.
   b. System 1 Rail Length: 54 feet, 3-3/8 inches long for access to the OH door.
   c. Rail splices must be designed to fall on rack frame top supports.
   d. Rail splices shall be designed to be offset from one another.

8. Electrification:
a. Motorized stackers shall have flat cable festoon encapsulated in plastic cable track running in a cable tray the full length/span of the bridge.
b. System electrification shall consist of Conductix finger safe 100 amp or equal rigid four bar conductor mounted off the rack with four 50-amp collector shoes mounted off the bridge end truck.
c. Power collector ring shall be rated at a minimum of 15 amps/600V and allow 360-degree continuous rotation.

9. Controls:
   a. Controls shall be a push button detachable pendant attached to the mast.
   b. Control pendant station shall be equipped with a 10-button control with an emergency stop push/pull button, and removable on/off key switch.
   c. Motorized stackers shall have two speed push buttons for hoisting operation and two step buttons for bridge, trolley, and rotation operation utilizing Magnetek or equal VFC (variable frequency controls) drives.

E. Utility Requirements:
   1. 480v/60Hz/3Ph – 4 Bar Rigid Conductor

F. Manufacturer to design rack system following requirements for the IBC 2018 Building Code and CMAA requirements.

G. Installation and anchoring for the RapiStak system shall meet the requirements for Seismic Risk Category II with seismic parameters per ASCE 7-16 Class D. Manufacturer to submit signed and sealed calculations by an Arizona registered Structural Engineer for all anchoring requirements.

H. Paint/Finish:
   1. Durable epoxy and/or powder coat finish in the University of Arizona representative’s choice of manufacturer’s standard colors.

2.03 HIGH DENSITY RACK/STACKER – (PROSTAK SYSTEM)

A. Equipment No. WH-2

B. Manufacturer’s Reference:
   1. Prime manufacturer: Specifications are based on equipment identified herein by manufacturer’s name and model to establish minimal acceptable standards of quality, features, performance, and construction.
      a. Rapidstak Corporation, Blasdell, NY (716) 822-2804
   2. Alternate manufacturers: Contingent upon compliance with these specifications and documentation requirements set forth in SUBMITTALS, equipment produced by other manufacturers, including the following, may be considered as equal.
      a. Ridg-U-Rak, Inc. North East, PA (814) 725-8751

C. Capacities/Dimensions:

University of Arizona FM Relocation and Consolidation Facility
Client No. 1310210
100% Construction Documents
1. Pallet racks: Dimensions are project specific, verify with Contract Documents
   a. Overall system dimensions, nominal:
      1) Rack Length: 39 feet, 9 inches
      2) Rack Width: 32 feet, 10 inches
      3) Height: 23 feet, 4-5/8 inches
         Rack (overall with crane 26 feet, 7-1/8 inches)
   2. Number of pallets:
      a. 162 pallets – 48 inches by 48 inches (Standard Storage)
      b. 12 pallets – 96 inches x 48 inches (Large Flat Storage)
   3. Pallet capacity: 2,000-pounds
   4. Aisle width: 7 feet, 10 inches
   5. Fork Length: 4 feet, 0 inches
   6. Column spacing: 4 feet, 5 inches (center to center) for 48 inch x 48 inch pallets.
   7. Rail extension: 1 foot, 10-½ inches on each end of the rails beyond the rack columns.
   8. Number of Stackers: One per system
   9. Number of Systems: One double aisle system
   10. Aisle Configuration: Double
   11. Fork Centers: Adjustable from 5 inches to 24 inches
   12. Shelving Centers: Four inch adjustable
   13. Rail: 30# ASCE Rail
   14. Crane system:
      a. Bridge crane (one each aisle):
         1) Overall dimensions:
            a) Span: 27 feet, 5 3/4 inches
            b) Crane Height: 26 feet, 7-1/8 inches
            c) Overall Height: 26 feet, 7-1/8 inches
         2) Lifting capacity: Rated at 2,000-pounds
         3) CMAA Classification: Class “C”
         4) Lift dimensions:
            a) Rail length with extension: 43 feet, 1 inch
      b. Speeds:
         1) Hoist: Dual speed magnetic - 32/8 FPM
         2) Trolley: Maximum high 40 FPM Maximum with VFC
         3) Bridge: Maximum high 120 FPM Maximum with VFC
         4) Rotation: 2 RPM Maximum with VFC

D. Features/Performance/Construction:
   1. Racking:
      a. Unit capacity shall be a minimum of 16,000-pounds per section.
      b. Rack frame uprights shall be designed to carry both the load of the crane and
         the loads of the material to be stored.
      c. Rack shall be designed to guidelines and safety factors as set forth by the RMI
         (Rack Manufacturers Institute).
d. Rack shall be constructed with heavy duty individual rear and top x-brace panels constructed of 2 inches x 2 inches x ¼ inch horizontal angles with two ¼ inch x 1-1/2 inch bar diagonal bracing.

e. Rack shall be mounted on two base plates (one front, one rear) that are a minimum of 3/8 inch thick x 8 inches wide x 8 inches deep, approved for Seismic Risk Category II with seismic parameters per ASCE 7-16 Class D utilizing four ½ inch x 6 inches long anchor bolts.

f. Rack frame uprights shall have a 10ga. rear upright with a formed “V” guide for pallet self-alignment during loading of pallets. Rear upright shall have 2.5 inches tall slot cut outs for positive engagement of pallet tabs.

g. Rack frame uprights shall have a 10ga. roll formed front upright utilizing ½-inch diameter bolts on 4-inch vertical increments for positive pallet engagement.

h. Front uprights shall be smooth to prevent operator injury.

i. Front uprights shall be one smooth continuous roll formed piece with bolts/pins for pallet storage and shall not have hooks that can be damaged and result in storage location loss.

2. Pallets:

a. Pallets shall be Flow-Thru type for use with In-Rack sprinkler system.

b. Pallets shall be manufactured with an impact resistant outer frame of ¼-inch steel and a top plate with a minimum thickness of 14 gage steel.

c. Pallet top plates shall be pre-punched to accept bolt on pallet options.

d. Pallets shall feature full length fork pockets running from front to rear of the pallet, encapsulating the entire length of the fork.

e. Pallets shall utilize formed flat bar hooks to engage and lock into front rack frame upright bolts and flat bar tab to engage rear rack frame upright slots.

f. Pallets shall have 100% surface utilization (rear rack pallet supports must not protrude into pallet surface area)

3. Mast:

a. Mast rotation shall be 360 degrees fully motorized at a maximum of 2 rpm utilizing SEW Euro-drive or equal gearbox/motors.

b. Mast shall be constructed of a minimum of 7-inch structural steel channel and utilize 1.5 inches wide x 2 inches high hardened guide bars rated at 125,000 PSI to 146,000 PSI for maximum wear resistance.

c. Mast construction shall be such that mast deflection is held to a maximum of 1” deflection.

d. Mast shall be constructed utilizing 2 inches x 1 inch structural cross tube supports spaced at 16 inches.

e. Mast bearing mount surface shall be a machined surface.

f. Bottom of mast shall have an adjustable toe guard/kick plate.

g. Mast shall have a mast mounted back stop and separate mast mounted 22 inches wide x 19.5 inches deep operator canopy.

h. Mast shall have 7 gage formed steel hand guards.

i. Mast shall have protective expanded metal on operator side to 36 inches high.

j. Mast shall have polycarbonate viewing window 36 inches from floor to 87 inches from floor.
k. Mast shall have one LED flood light mounted on the front of the mast that rotates with the load on the forks.

4. Carriage:
   a. Carriage width: 30 inches
   b. Pallet forks: 48 inches long Class III with fork centers adjustable at 24 inches.
   c. Carriage main rollers shall be a minimum 2-inch diameter, hardened steel roller spaced at 12.5 inches.
   d. Carriage side guide rollers shall be a minimum 1.5-inch diameter, hardened steel roller spaced at 8.75 inches and designed to handle up to 1,000-pounds of side load.
   e. Carriage shall be constructed with standard ITA class II fork carriage bars 1.5 inches tall x 5 inches wide (no shaft mount)
   f. Carriage shall be constructed utilizing a dual arm free fall prevention device capable of stopping and holding the full rated load. This device shall not engage the mast guide bar.
   g. Fork deflection designed to be 1.25 inches maximum at full load.

5. Hoist:
   a. Hoist shall be rated to handle 2,000-pound working load and weight of carriage, forks, and pallet.
   b. Minimum hoist lift rating shall be 2,750-pound (3.75HP).
   c. Hoist shall have two lifting speeds, magnetic at 32/8 FPM,
   d. Hoist shall be of single fall chain arrangement for smooth lifting/lowering.

6. Bridge:
   a. Bridge crane Model # P2C-333-964848-8/6-280 with maximum allowable load of 2,000 lbs. – Service Class “C”
   b. Bridge operation shall be fully motorized at a maximum of 120 fpm & shall be top running and constructed of a minimum 10-inch wide flange structural beam with a maximum deflection of 1/8 inch and utilize 9.25 inch diameter double flanged wheels with double sealed precision ball bearings rated at 2500-pound minimum per wheel.
   c. Motorized bridges shall be top running and constructed of a minimum 10-inch wide flange structural beam and utilize modular wheel block assemblies and SEW Euro-drive or equal gearbox/motors.
   d. Bridge rail shall be square bar welded on center of beams.
   e. Bridge end trucks shall be equipped with rubber bumpers.

7. Trolley:
   a. Trolley operation shall be fully motorized at a maximum of 40 fpm and shall be top running and constructed of structural steel tube framing with 5/8 inch thick bearing mount plate and utilize 6 inch diameter double flanged wheels with double sealed precision ball bearings rated at 2500-pound minimum per wheel.
   b. Motorized trolley shall be top running and constructed of structural steel tube framing with a 5/8-inch thick bearing mount plate and utilize modular wheel block assemblies and SEW Euro-drive or equal gearbox/motors.
   c. Trolley bearing mount surface shall be a machined surface.
d. Trolley rotation bearing shall be 34-inch diameter with 44 attachment bolts that are ½-inch diameter.

8. Runway Rail:
   a. Rack mounted runway rail shall be a minimum of 30# ASCE rail.
   b. System 2 Rail Length: 43 feet, 1 inch long including overhang.
   c. Rail splices must be designed to fall on rack frame top supports.
   d. Rail splices shall be designed to be offset from one another.

9. Electrification:
   a. Motorized stackers shall have flat cable festoon encapsulated in plastic cable track running in a cable tray the full length/span of the bridge.
   b. System electrification shall consist of Conductix finger safe 100-amp or equal rigid four bar conductor mounted off the rack with four 50-amp collector shoes mounted off the bridge end truck.
   c. Power collector ring shall be rated at a minimum of 15-amps/600v and allow 360-degree continuous rotation.

10. Controls:
    a. Controls shall be a push button detachable pendant attached to the mast.
    b. Control pendant station shall be equipped with 10 button control with an emergency stop push/pull button, and removable on/off key switch.
    c. Motorized stackers shall have two speed push buttons for hoisting operation and two step buttons for bridge, trolley, and rotation operation utilizing Magnetek or equal VFC (variable frequency controls) drives.

E. Utility Requirements:
   1. 480v/60Hz/3Ph – 4 Bar Rigid Conductor

F. Manufacturer to design rack system following requirements for the IBC 2018 Building Code and ASCE 7-10 Chapter 15 and CMAA requirements.

G. Installation and anchoring for the RapiStak system shall meet the requirements for Seismic Risk Category II with Seismic parameters per ASCE 7-16 Class D. Manufacturer to submit signed and sealed calculations by an Arizona registered Structural Engineer for all anchoring requirements.

H. Paint/Finish:
   1. Durable epoxy and/or powder coat finish in the University of Arizona representative’s choice of manufacturer’s standard colors.

PART 3 EXECUTION

3.01 INSTALLATION

A. Complete equipment installation, start-up and testing, and training for the separately procured equipment as listed in these specifications will be the full responsibility of the manufacturer/supplier. The General Contractor involved in the construction of the structure will be involved for coordination between the equipment and the building space and utilities only. All utilities, and coordination during the installation shall be
the responsibility of the General Contractor with support from the University of Arizona representative. The Supplier of the equipment shall be responsible for running all power from the equipment panels to the main distribution panels as provided under the overall construction contract by the General Contractor.

B. Install units in a rigid assembly with each member plumb and in true alignment. Execute component assembling in accordance with the directions and recommendations of the product manufacturers.

C. Attached units as required to meet any seismic design category requirements as stipulated in all codes having jurisdiction in the State of Arizona. These shall include, but not limited to the high-level stacker system and the vertical lift module at minimal. If foot plates are part of the units specified, Contractor shall anchor the unit using the sufficient number of anchors as shown on the footplates provided. If units are not provided with foot plates, supplier/installer shall fasten the units to a structure with coordination from the pre-engineered building manufacturer and the Structural Engineer of Record to meet all seismic codes having jurisdiction in the State of Arizona.

D. Install units at locations as shown on the drawings.

E. Repair all surfaces where the finish has been marred or scratched during installation with paint approved by the manufacturer to the satisfaction of the University of Arizona representative.

F. Install all required electrical and mechanical utilities to satisfy the proper installation requirements of the storage equipment in this section requiring utilities. Contractor is to coordinate between contract documents and conformed shop drawings for proper installation.

3.02 FIELD QUALITY CONTROL

A. Provide the services of a qualified manufacturer's representative to perform the following:
   1. Supervise installation.

3.03 TRAINING PROGRAM AND OPERATION AND MAINTENANCE MANUALS

A. Provide a training program and operation and maintenance manuals in accordance with the requirements specified in Division 1 – General requirements and Section 11 00 50/1.04/A/6.

END OF SECTION 10 67 00