EXHIBIT A-1

SERVER ROOM REQUIREMENTS

1. Data Center
   a. The size of the room should be around 24’ x 20’, or approximately 480 square feet.
   b. The walls should be floor to ceiling deck, not just to ceiling tiles, and should comply with the requirements specified on Section V.B.

2. HVAC
   a. CRAC (Computer Room Air Conditioner) Units:
      i. Cooling and related equipment must be sized to account for:
         1. Cooling load of all equipment and future growth.
         2. Cooling load of the building (lighting, power equipment, personnel, building envelope).
         3. Over sizing to account for humidification effects.
         4. Over sizing to account for redundancy should a unit fail.
         5. Over sizing to account for appropriate future growth projections.
         6. All cooling equipment must be designed, installed, and maintained by qualified technicians that meet local and state codes. All cooling equipment must follow the vendor’s recommended maintenance schedule.
         7. Air filtration media should be installed at air intake points. Media should be replaced on a regular schedule based on the manufacturer recommended filter lifespan.
         8. Humidity/temperature control must be maintained at a level that is compliant with the equipment installed on the data center floor.
         9. Redundant cooling units are required. They should be designed and installed to eliminate single point of failure.
         10. Cooling units must be maintained by qualified maintenance technicians following factory guidelines.
         11. Cooling units must automatically restart after power failure.
         12. Redundant cooling units must have a different power source to allow time for a controlled shutdown of supported areas.
         13. Air delivery and return management:
             a. Cold air delivery must be managed such that the required amount of air can be delivered to any necessary equipment location.
             b. Hot air return must be managed to extract air directly to CRAC units without mixing with cold air delivery.
14. Must furnish 35A feeder circuits to cooling systems, breakers, 60 A disconnects and terminations for each of the redundant systems. 
   ii. Size of Cooling system is estimated at (2) 10-ton cooling units for redundancy and to accommodate the requirements above

3. Electrical Systems
   a. Main and step-down transformers: 
      i. Must be in a secure mechanical room. 
      ii. Must have HVAC systems to support heat load and correct humidity levels for each unit. 
      iii. Must be maintained by a qualified technician to factory standards and be supportable by extended factory warranty. 

   b. Main power control panel: 
      i. Must be maintained by a qualified technician to factory standards. 
      ii. Must be in a secure mechanical room. 
      iii. Must have HVAC systems to support heat load and correct humidity levels for each unit. 
      iv. Must have surge suppression sufficient to prevent large surges from damaging panels and equipment supported by panel. 

   c. Uninterruptable Power Supply (UPS) systems: 
      i. UPS systems in the data center must be sized to meet current and future needs, with sufficient battery backup to allow for a controlled shutdown of primary servers. 
      ii. UPS systems and batteries must be designed, installed, and maintained by authorized electricians and technicians and housed in a secure location. UPS systems follow manufacturer’s recommended maintenance schedule. 
      iii. UPS systems must have bypass capability to allow for periodic maintenance. 
      iv. UPS batteries must follow manufacturer’s recommendations and approved for system to be of sufficient quality and capacity to ensure a long life thus limiting breaks in the battery strings. 
      v. Comparable specification to Liebert 50KVA / 40KW Npower three phase Uninterruptible power supply Model No. 37SA050C0C6EA42 with the following features and characteristics: 
         1. AC Input voltage 208V (three-phase, three-wire plus ground) 
         2. AC Output voltage 208V (three-phase, four-wire plus ground) 

   d. Sub-panels: 
      i. Must be sized to meet current and future needs. 
      ii. Must be in the data center to minimize power runs to desired equipment.
iii. Panel maps must be maintained to reflect their most current usage.
iv. Sub-panels must never be opened at the face plate by anyone other than qualified electricians.

e. Outlets:
   i. Minimum of 10 dedicated, isolated, separately fused 20-amp branch circuits, each with an 110V 2-gang electrical outlet with four (4) receptacles. Location TBD.
   ii. (4) non NEMA Locking Receptacles and (4) 50 AMP 2 pole dedicated circuit breakers for these circuits in Sub-Panel. Location TBD.
   iii. (4) NEMA L6-30 amp locking receptacles and (4) 30 AMP dedicated circuit breakers for these circuits in Sub panel. Location TBD.
   iv. (16) NEMA L6-20 Locking Receptacles and (16) 20 AMP dedicated circuit breakers for these circuits in Sub-Panel. Location TBD

f. Power cable layout:
   i. The power pathways must maintain a minimum separation from data cable pathway in accordance with for Telecommunication Systems.

g. Grounding systems:
   i. All data center and data closet equipment must be grounded in compliance with state and local codes.
   ii. Data center equipment grounds must be independent of all other building grounds (such as lightning protection systems).
   iii. All metal objects must be bonded to ground including cabinets, racks, PDUs (Power Distribution Units), CRACs, cable pathway, and any raised floor systems.

h. Monitoring and Maintenance:
   i. All electrical equipment must be monitored and maintained.
   ii. System must be able to report alarms.
   iii. Monitoring system must have analysis and reporting function.
   iv. System must be able to retain log files of equipment performance and incident history.
   v. All electrical system components should be regularly inspected.
   vi. Main power switches, transformers, automatic transfer switches, and other major electrical system equipment must be maintained by qualified technicians per factory specifications and recommendations for service cycles.

4. Access Control and Safety
   a. Door security:
i. Door access control must be maintained.
ii. An electronic card access control system should be in place and log all access to secure data center areas.
iii. Minnesota Attorney General’s I.T. department must authorize who has access to data center. Access must only be granted to essential personnel.
iv. Access logs should be maintained for a minimum of one year or longer as specified by site security policy.
v. Enforcement of strict polices and sign in/out logs is mandatory. Non-Attorney General employees, or vendors must be supervised by Attorney General staff at all times.
vi. Review of procedures and sign in/out logs must be done on a regular basis.
vii. Secured doors must fail open in a fire emergency.

b. Video security:
   i. Allows for local and remote surveillance of secured and public spaces. The security camera would be required inside and outside of the datacenter to ensure visibility of all areas.
   ii. Recording device (hard disk) must be in a secure area.
   iii. Recording must be done on a regular basis to ensure proper operation of the video security system.
   iv. All security recordings must be saved for no less than 30 days.

5. Fire alarm and suppression systems:
   a. Must be designed specifically for use in data centers.
   b. Must comply with all state and local building codes.
   c. Suppression systems must be designed to minimize risk of equipment damage.
   d. Suppression systems must be gas or dry pipe system.
   e. Suppression system must minimize risk to building occupants.
   f. Must be maintained by qualified technicians.

6. Raised Floor System.
   a. Must support fully loaded server cabinets, data racks, UPS and cooling systems.
   b. Under floor space management:
      i. Must remain clean and corrosion free.
      ii. Constant air pressure must be always maintained.
      iii. Must remain obstruction free for proper air flow.
c. Floor structure maintenance:
   i. Must be corrosion and rust free.
   ii. Damaged pedestals, cross members, tiles, or missing fasteners must be replaced immediately to maintain floor integrity.

d. Floor grounding:
   i. Must be separate from building ground.
   ii. Must comply with all state and local codes.

7. Server Cabinet Systems:
   a. Standards:
      i. (4) HPE Data Enclosure cabinets.
      ii. Required 42 U vendor neutral mounting rails
      iii. Inside Dimensions = 120 cm depth, 60 cm width
      iv. Outside Dimensions (H x W x D) (200.66 x 130.02 x 59.78 cm)
      v. Cabinets must have access points for power and data pathways at the top and bottom of the cabinet.
      vi. The data center site must have a standardized set of cabinets tailored to the site’s specific needs.

   b. Layout:
      i. Cabinets will be configured in a standard hot aisle/cold aisle configuration.
      ii. Cold aisle edge of the equipment enclosures must line up with the edge of the floor tiles.
      iii. Hot and cold aisles must be wide enough to insure adequate access to equipment and safe staff workspace.
      iv. Blanking panels will be installed in any unused rack space to minimize cold/hot air mixing.

   c. Security:
      i. All cabinets must be lockable.
      ii. All cabinet must reside in secure area within the data center.

8. Data Racks:
   a. (2) Standard 19” data racks in line with server cabinets

   b. (4) Standard 48 port CAT 6 patch panels for each data rack

   c. (4) Standard 2U horizontal wire management

   d. (4) Standard vertical 2U wire management
e. (1) Standard 96 port fiber box

9. Cable Plant:
   a. Overhead delivery system cable layout:
      i. The data room must have a system to support overhead delivery of data
         connections to the equipment cabinets.
         1. The data pathways must maintain a minimum separation from high
            voltage power and lighting in accordance with standards.

   2. Fiber standards:
      a. All fiber must be compatible with current MN State standards.
      b. All data closets fiber runs will be terminated in data closet’s
         rack mounted fiber termination box to data center’s rack
         mounted fiber termination box.
      c. MPOP Fiber termination will be terminated in MPOP’s rack
         mounted fiber termination box to data center’s rack mounted
         fiber termination box All fiber installations must be labeled

   3. Copper standards:
      a. Copper jumpers must be CAT6 with Booted RJ45 connectors.
      b. All copper data cables must be labeled

   4. Grounding:
      a. All cabinets and cable delivery pathways must be grounded in
         compliance with state standards.

10. Telecommunications/Data Connections
    a. See Section V.J and V.K of the RFP.