

**SCHEDULE 4
TO THE
COMPREHENSIVE INFRASTRUCTURE AGREEMENT
Data Center Facilities Requirements**

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Data Center Facilities Requirements

1.0 Data Center Facilities Services

This Schedule describes the overall activities and Services that are required to be provided to provision, maintain and manage the Data Center facilities where the Commonwealth's centralized IT computing infrastructure and management operations solution will reside and be supported by Vendor. At a minimum, Vendor shall provide facilities equal to or better than a Tier 3 data center facility. At any time, Vendor may upgrade the facilities in order to provide increased redundancy, security and efficiency. Vendor may not downgrade the facilities in any way that will reduce the redundancy, security or efficiency as described in this Schedule. Vendor shall maintain facilities during the Term of the Agreement to ensure reliable, secure Systems and a safe and efficient workplace. Vendor will make necessary upgrades and changes to the facilities to accommodate any new technology, equipment, configurations, and staffing necessary to fulfill the Service requirements of future contract modifications.

Vendor will be responsible for relocating or moving servers, networks, storage, other equipment, Services, personnel and related items from the Commonwealth's existing Data Center located at 110 S. 7th Street, Richmond, VA. (hereinafter, the "RPB Data Center"), and other Commonwealth Locations as reasonably necessary, to a new Data Center facility to be mutually agreed upon by the Parties. Any such Data Center moves will be completed within a timeframe and downtime period for critical applications that is acceptable to the Commonwealth.

Vendor shall not physically move the existing Commonwealth IT infrastructure components to a Vendor IT hosting facility other than the one specified in this SOW without prior written consent from VITA.

1.1 RPB Data Center Relocation Requirements

Vendor shall relocate the existing RPB Data Center to a mutually agreed upon new Data Center facility including all computing infrastructure and all personnel (VITA and Vendor) to allow VITA to vacate the RPB facility and terminate lease on or before the commencement of the seventeenth month following the end of the Interim Phase. Vendor shall develop and recommend a written transition and migration plan for the RPB Data Center, which shall be presented to VITA for review and approval. Vendor shall optimize the implementation and migration to ensure there is no disruption of service and to minimize the overall costs to the Commonwealth.

1.2 Physical Site

Vendor has attached Addendum 1 to this Schedule 4, which describes more fully Vendor's solution to meet the following requirements.

1.2.1 Hardened Site

The Vendor facilities housing the VITA IT Data Center solution must meet numerous physical criteria, ranging from Tier 3 or Tier 4 standards (as defined by The Uptime Institute) to local Uniform Building Code ("UBC") seismic specifications.

The exterior walls of the facilities shall be made of double reinforced concrete and shall be anonymous, with no identifying signage outside the building. Concrete bollards or other similar barriers shall be placed around the perimeter of each facility to prevent ground-based vehicles from penetrating an exterior wall. External mechanical or equipment yards must be secured by fences and concrete bollards and must be under 24-hour motion-sensitive video surveillance.

Conduits and exterior walls must be tightly sealed to prevent moisture intrusion. Inside the facilities, flooring must be constructed with minimum live load criteria of 150 pounds per square foot ("PSF"). Cabinets or open racks must be bolted to the floor.

1.2.2 Power

The entire electrical system in each Vendor-provided and managed Data Center shall have multiple levels of built-in redundancy to enable the Commonwealth to have continuous operations of its centralized IT Services.

Power will enter the Data Center facilities via two services from the local electric utility and shall be configured as required to support the Commonwealth IT infrastructure requirements. In addition, Vendor shall provide redundant power distribution throughout each data center. The overall electrical system shall be 2N redundant and each component within the system must be N+1 redundant. The incoming power will feed into two busses, Bus A and Bus B, providing the option for diverse power distribution to the floor areas within the Data Center environment.

Other power system specifications are to include:

- Isolation K factor transformers used for 480 volt IPS to 208/120 volt
- K factor of K13
- 80 degrees Centigrade rise
- Copper winding
- DC system fuse protection
- 48-volt delivery via fuse panels.

1.2.2.1 UPS and Generator Systems

Vendor shall design, implement, maintain, monitor, test, and manage an Uninterrupted Power Supply ("UPS") power backup system that includes onsite battery and electrical generation backup power sources, which will be automatically initiated in the event of an interruption or failure of the primary power source(s) that will ensure a continuous, uninterrupted source of

electrical power to the Data Center facilities and the Commonwealth IT infrastructure equipment. Power will be continuously monitored via the Automated Logic Control system, and automatic throw-over switches will handle all changeovers from commercial power to generator-supplied power. Once the generator logic control system senses a power interruption, the generators must be online within nine (9) seconds.

This backup electrical power system shall be powered by diesel generator units located in a secure, protected equipment yard on site at the Data Center facilities. UPS batteries can sustain AC power supplies under full load. Redundant, on-site fuel tanks will provide 48 hours worth of generator fuel. To help supply sufficient fuel, Vendor shall maintain a minimum of two fuel refill contracts with separate fuel providers. Contract terms with these two fuel suppliers shall include a preferred delivery contract clause with four-hour delivery response time.

UPS and generator systems will be tested on a weekly basis and run under full load conditions once per month. Vendor shall test the UPS environment on a weekly basis and run under full load conditions once per month to ensure that they function as designed. Based on the results of these tests, Vendor shall upgrade generator and battery capacity as needed.

1.2.2.2 Electrical Power

Vendor shall provide the Data Center facilities with conditioned AC power delivered via parallel, redundant UPS systems. Power quality monitoring will be done by Vendor to protect the Commonwealth equipment and prevent data loss by eliminating surges and other irregularities in power.

Power distribution systems post-Transition shall be designed to meet electrical power draw necessary for the Commonwealth Systems environment.

1.2.3 HVAC

Vendor shall provide, maintain, and manage environment conditions within the Data Center facilities, which will provide adequate heating, ventilation and air conditioning ("HVAC") in order to minimize downtime due to equipment failure. Vendor shall ensure that HVAC controls are put in place to provide appropriate airflow, temperature, and humidity and such HVAC controls will be designed according to N+1 redundancy specifications.

Vendor shall monitor the mechanical systems supplying the HVAC Services both on site within the Data Center facilities and from a remotely managed operations center in order to provide additional protection for the Commonwealth's infrastructure. Vendor will maintain documented procedures for routine maintenance on the HVAC equipment and will maintain service contracts with local vendors that specify a maximum four-hour response time for emergency service.

Vendor will target a consistent temperature of 70° F or 20° C (+/-2° F) in the Data Center computing equipment areas, with a relative humidity of 45% (+/- 5%). Air conditioning is to be provided through overhead or subfloor ducts by means of a hydronic chilled-water closed-loop system that will feed multiple air-handling units. There will be two independent primary/secondary pump systems for chilled water, each of which is capable of handling the total cooling needs of the Data Center facility.

Following are the environmental parameter targets for the Data Center facilities governed by this Agreement.

Table 1. Environmental Parameter Targets

68° to 72° F	Mainframe and Server Area Temperature (+/-2° F)
45% Relative Humidity	Mainframe and Server Area Humidity (+/- 5%)
72° to 76° F	Office Area Temperature
20% - 55% Relative Humidity	Office and storage areas Humidity
77° F	Battery Rooms; No Humidification
68° to 85° F	Electrical/UPS Rooms; No Humidification
60° F Min. Ambient Temp. + 10° F Max.	Mechanical Rooms
50° F Min. Ambient Temp. + 35° F Max.	Generator Rooms

1.2.4 Fire and Flood Protection

1.2.4.1 Advanced Fire Detection and Suppression

Vendor will install, monitor, maintain, and manage an advanced fire detection system within the Data Center facilities that continuously samples the air for any indication of fire and warns on-site staff of potential fire hazards, initiating extensive and localized emergency procedures to extinguish any fire at the source. In addition, Vendor will take the proper precautions and implement the proper industry standard safeguards to ensure unnecessary activation of fire-suppression equipment.

Vendor shall ensure that the Data Center facilities are protected with a dual-alarmed, dual-interlock, multi-zoned, dry-pipe, water-based fire suppression system armed with sensory mechanisms (“HSSD”) to sample the air and give alarms prior to pressurization.

This system must be kept pressurized and filled with air (not water) to enable system leak detection. In order for the system to trip, multiple cross-linked events (heat and smoke) must occur. Sensory mechanisms (sniffers) shall be used to sample air and provide alarms prior to pressurization of the system with water. Once two separate sensors detect the presence of smoke, the system will be pressurized with water. Sprinkler heads will only be activated when the temperature at the sprinkler head reaches 135° F. Authorized personnel will manually drain the dry-pipe system once the fire threat has been suppressed.

1.2.4.2 Flood Protection

Vendor shall ensure that the Data Center facilities are properly sited, designed, protected, and monitored to ensure against any type of flooding or water incursion that could potentially damage any Data Center facility and any of the equipment housed within the facility used to deliver and support the Commonwealth’s IT Services computing environment.. This includes automatic water detection sensors, as well as proper drainage of water flooding within any Data Center facility. In addition, the Vendor shall ensure that any Data Center facility is not situated within a designated flood zone.

1.2.4.3 Site Selection

The Commonwealth prefers a Data Center facility and site location as per industry best practices with the primary characteristics of single-story, suburban location within the Richmond, VA. metropolitan vicinity.

Vendor shall take into account the following risks and provide a written risk assessment summary report to VITA when proposing a Data Center site. If risks are identified, then Vendor shall propose a risk mitigation strategy and shall at minimum identify:

- a) Mixed tenancy
- b) Environment conditions, including weather, hurricane paths, earthquake statistics, flood data, etc.
- c) Fuel availability and delivery
- d) Electrical substation capacity and performance
- e) Location and proximity to high-visibility public or private-sector structures, main railroad line, shipyard, nuclear power plant, military installation, container storage, hazardous waste dump, airports, HAZMAT storage tanks, high-crime areas, and/or major highway.

1.2.5 Site Access and Security

Vendor shall ensure that precautions are taken to protect the Data Center facilities from unauthorized physical access. To achieve this, Vendor will provide multilevel physical security features and enforce security policies and procedures. Vendor shall provide and maintain the following external and internal premise access security features at each Commonwealth Data Center:

- a) Provide and monitor controlled-access to the main data center from the welcome area to be controlled by automated mantraps and industry standard electronic authentication devices to prevent forced entry into the facility.
- b) Provide and monitor controlled-access to all internal secured areas within the Data Center facility, including the production floor and the shipping/receiving areas, using industry-standard electronic authentication devices (e.g., magnetic card readers, cipher locks, biometric controls, etc.).
- c) Provide and monitor high-density, motion-sensing digital color closed-circuit television cameras (“CCTV”) which are strategically located throughout the facility to minimize egress/exit blind spots and to monitor activity and traffic.
- d) Provide and monitor motion detectors and alarm systems located throughout the Data Center, with a silent alarm and automatic notification of appropriate law enforcement officials protecting all exterior entrances.
- e) Provide and monitor electromagnetic locks on all exit with mechanical lock backups to prevent forced entry through fire exits.

1.2.5.1 Site and Production Floor Access

Vendor shall provide 24x7x365 access to the Data Center facilities for Commonwealth authorized individuals. Tour groups will be approved by VITA prior to the tour date.

Table 2. General Site and Production Floor Access Roles and Responsibilities

General Site and Production Floor Access Roles and Responsibilities	Vendor	VITA
1. Develop and recommend site and production floor access policies and procedures	X	

General Site and Production Floor Access Roles and Responsibilities	Vendor	VITA
2. Review and approve site and production floor access policies and procedures		X
3. Develop policies and procedures for shared space and customer collocation, visits and tours	X	
4. Review and approve policies and procedures shared space and customer collocation, visits and tours		X
5. Maintain a database of access history to the Data Center facilities	X	
6. Audit of procedures and access history to the Data Center facilities on a periodic basis		X
7. Recommend procedures for checking the security of shipments, packages, deliveries, equipment etc. coming into the Data Center sites	X	

1.2.5.2 CCTV Digital Recorders

All aspects of the Data Center facilities shall be monitored and recorded 24x7x365 using high-resolution, motion-activated color digital video cameras with pan, zoom and tilt capabilities. The recorded data shall be archived to disk for 30 days.

Interior cameras must cover all areas of the production floor and all corridors, all egress/exit points for secured areas within the facility, all mechanical areas, and all shipping and receiving areas. Exterior cameras must cover building all entrances, parking lots, the roof and exterior utilities and premise facilities such as generators and mechanical equipment. Camera feeds shall be monitored 24x7 from the building security guard station as well as from the operations center inside the facility.

1.2.5.3 Additional Security and Operational Requirements

Vendor will be responsible for checking all equipment brought into the Data Center before that equipment is allowed into a customer staging area or onto the production floor. Shipping and receiving areas must be walled off from the production area, with access controlled by industry standard electronic authentication and identification mechanisms.

All shipments must be scheduled in advance or they will not be accepted. Delivery vehicles must go to the designated delivery dock area. Ordinary mail and parcel deliveries (e.g., FedEx/UPS) shall come directly through the building entrance that customers use and are received by building security. Proper authorization must also be required for removal of any equipment.

Vendor will provide ongoing operational support, maintenance, and upgrades for the Data Center facilities, supporting real estate and related facilities infrastructure. This includes but is not limited to proper data center cleaning, physical structure maintenance, and all related real estate maintenance and upgrades

2.0 Network Services Connectivity

Vendor will provide and manage connectivity, including all necessary Network circuitry, hardware and software, that will enable VITA’s secure access to Commonwealth Systems, data, and records located at the Data Center facilities from VITA’s designated locations.

2.1 General Network Back-End Connectivity

The following identifies the activities, roles and responsibilities associated with Engineering/Development Services that are specific to this SOW.

Table 3. General Network Back-End Roles and Responsibilities

General Network Back-End Roles and Responsibilities	Vendor	VITA
1. Recommend WAN / LAN/ VPN / firewall requirements for Data Center Network connectivity and redundancy to the Data Center based on industry best practices and capacity requirements to support Service Levels across all Towers	X	
2. Review and approve requirements for WAN / LAN / VPN / firewall services for connectivity and redundancy to the Data Center		X
3. Perform business liaison function to Eligible Customers		X
4. Recommend Network capacity thresholds for Data Center connectivity and redundancy	X	
5. Approve Network capacity planning thresholds for Data Center connectivity and redundancy		X
6. Provide capacity and performance reports on a monthly basis	X	
7. Procure/provision and maintain all Data Center Network components and circuits	X	
8. Report performance against Service Level requirements	X	

2.2 Engineering/Development

The following identifies the activities, roles and responsibilities associated with Engineering/Development Services that are specific to this SOW.

Table 4. Engineering/Development Roles and Responsibilities

Engineering/Development Roles and Responsibilities	Vendor	VITA
1. Develop Network design, engineering and security testing and integration procedures that meet requirements and adhere to defined policies for the Data Center connectivity	X	
2. Approve Network design engineering, security testing and integration procedures for data center connectivity		X
3. Prepare Network design, engineering and security, plans and schedules to support new and enhanced applications, architectures and standards for the data center network	X	
4. Review and approve Network design, engineering and security plans and schedules		X
5. Approve the scheduling of major changes to the data center Network environment. Major changes are those that will substantially change service delivery, affect end user customers, improve Service Levels or increase costs to VITA.		X
6. Coordinate with VITA and the other Eligible Customers affiliated entities, and public carriers, as required	X	

2.3 Asset Acquisition and Network Provisioning

Vendor will perform all necessary Asset Acquisition and Provisioning activities associated with acquisition, engineering, provisioning, build-out, relocation, testing, and production activation for

the new Data Center facilities and their respective IT computing resources. This shall include presentation of all requested planning documents to VITA and the Commonwealth for review and approval.

Figure 1. VITA Data Center Infrastructure Design

Please see attached Addendum 1.

3.0 VITA Office Space Requirements

Vendor shall provide and manage office space and related office services, including all office furnishings, for VITA staff that work closely with Vendor to monitor services, provide relationship management, procurement, finance, billing, planning, and other VITA internal functions. VITA estimates the staff to be at least 158. Vendor shall plan for growth over five (5) years for office space for VITA personnel to accommodate up to 200 individuals. VITA has derived a sq. ft. per person target of 220 sq. ft. per person based on space studies and direction for the Department of General Services. Vendors shall use that standard when estimating space requirements. The 220 sq. ft. includes office space, conference rooms, hallways, break-rooms, and other associated space to accommodate a normal office environment.

3.1 VITA Staff Environment

The requirements are broken down into:

1. Providing a fully managed facility; and
2. Providing the facilities coordination within the Data Center for IMACS and other day-to-day operational tasks to support VITA staff on site.

Specific requirements in each area are as follows:

- a) Office space shall be adjacent to or in a close campus or other similar arranged space to allow for close coordination between VITA and the Vendor.
- b) Office space will be secured from the Data Center and be generally operational during normal working hours.
- c) VITA and Vendor space arrangements shall allow for both VITA-dedicated conference rooms as well as for the sharing of conference rooms, break-rooms, and other facilities in order to reduce costs and promote a partnership arrangement.
- d) Additionally, Vendor will provide the VITA office with the following services:
 - Office space and associated areas for VITA staff
 - Environmental systems to support a typical office environment (e.g., HVAC, power, water, lighting, sanitation, etc.)
 - Parking spaces
 - Cleaning Services
 - Repairs and maintenance of building structure & grounds, environmental systems, lighting, etc.

- Vendor will build out space based on VITA requirements and in accordance with the VITA space standards and policies
- Satellite or cable TV services and associated equipment within VITA personnel facilities area(s)

3.2 Facilities Management

Vendor will provide facilities coordination services for VITA at the Vendor-provided office facilities and at other locations where VITA central staff are located on an ongoing basis to accommodate staffing facility requirements and IMACS on a day to day basis. Vendor must also manage facility-related programs in accordance with VITA and Commonwealth-specified parameters for those areas occupied by VITA personnel, which include:

- Furniture for VITA staff based on VITA space and furniture policies and standards
- Manage parking spaces and allocation of spaces both at the RPB facility, the new Richmond Enterprise Solution Center and the Southwest Enterprise Solution Center.
- Employee IMACs including coordinating telephone and PC moves and changes
- Surplus property – state program
- PA systems
- OSHA requirements and programs
- Energy Management – state program
- Recycling – state program
- Key and Lock administration
- Employee Safety Management
- Emergency Reaction Plans & Procedures, including fire, building emergencies, and First Aide training and equipment

4.0 Backup Data Center Requirements

VITA requires a Backup Data Center, which must meet the following general parameters:

- a) Designed to house Commonwealth production, test, and development Systems.
- b) Located outside of a 100 mile radius of the Primary Data Center. The selected location must support community development and job growth in a rural and economically depressed area of the Commonwealth.
- c) Must be sufficiently designed, constructed, supported, staffed, and maintained to meet VITA IT Service Continuity and DR requirements and industry-acceptable standards suited to the purposes for a facility of this type.
- d) Must take into account similar risk assessment characteristics as contemplated for the Primary Data Center in Section 1.1.4.3 – Site Selection.

SCHEDULE 4 TO THE COMPREHENSIVE INFRASTRUCTURE AGREEMENT
DATA CENTER FACILITIES REQUIREMENTS

In the event that Vendor proposes a shared-space Backup Data Center facility that would house IT resources used to support customers other than the Commonwealth, then Vendor shall implement additional security parameters to ensure segregation and protection of the Commonwealth IT network infrastructure and data. All other facility infrastructure can be shared based on effective IT security practices.

All Systems within the Primary Data Center shall be designed to accommodate electronic vaulting as a means to store DR data at the Backup Data Center. The Backup Data Center facility shall have a disk mirroring solution (or such other solution approved by the Commonwealth) for disaster recovery that will provide replication of data covered by the Disaster Recovery Plan to the Backup Data Center.

Vendor shall recommend appropriate Systems back-up architecture solution(s) for the Backup Data Center that will optimize utilization of the Commonwealth computing resources to provide System resource flexibility and reconfiguration in the event of a Disaster.