

Scope of Work



Server Room Relocation Project

Lazarist Monastery - U.S. Consulate General Jerusalem

Information Resource Management
"technology, quality & commitment"



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Overview

The U.S. Consulate General in Jerusalem has the requirement to move the existing unclassified server room / data center into an adjacent room, currently used for storage, and invites contractors to bid on the construction, installation and technical requirements outlined in this document.

Existing Space: Physical Description

The space into which the data center will be moved is approximately 5 meters square, with domed roof of max height 310 cm, min height 216 cm. Three of the four walls are original stone construction with recessed archways / niches. The fourth wall containing the entrance door is more recent brick / concrete construction. The floor is original stone slab construction on grade.

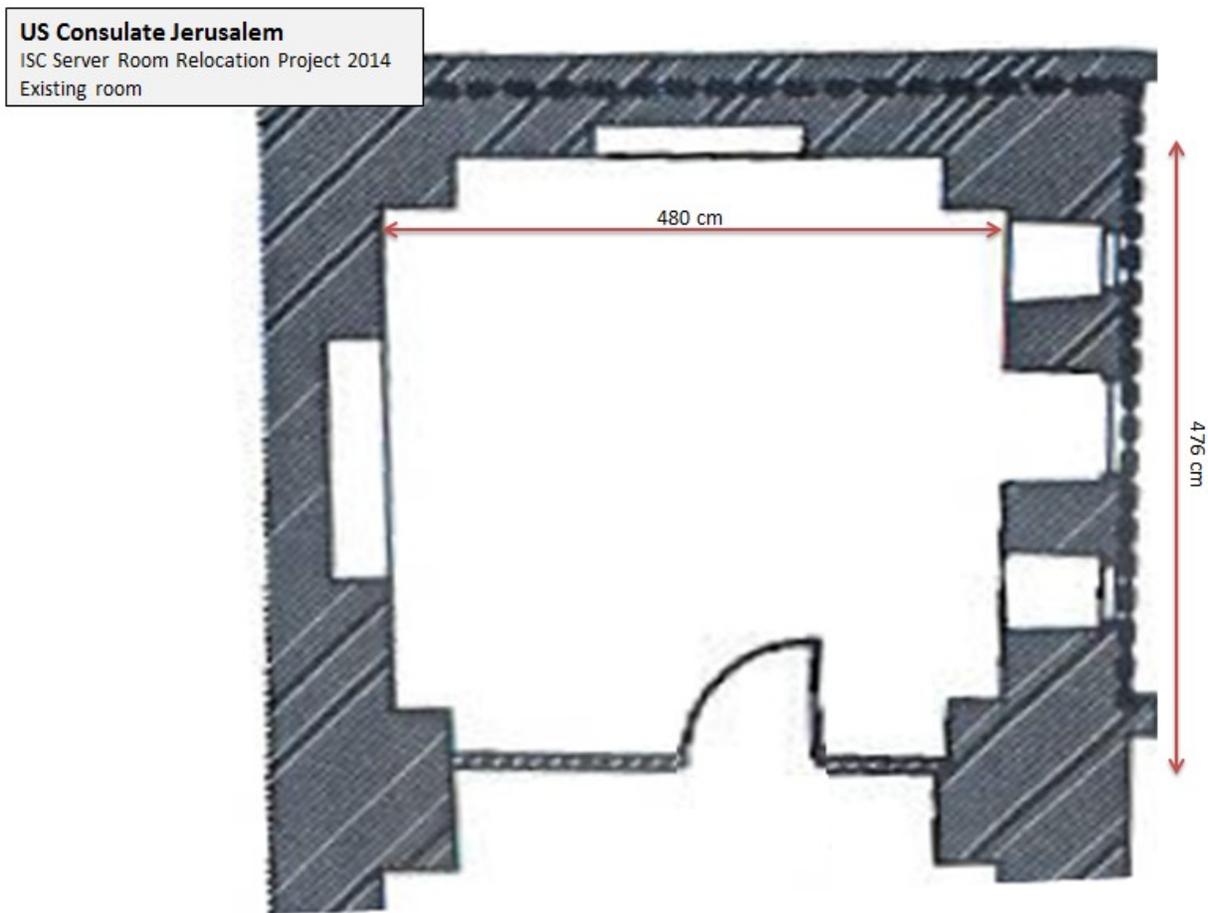


FIGURE : EXISTING STORAGE ROOM

The current room contains no external windows, and wall construction is “slab to slab” on all four sides of the room. The space currently has no HVAC systems, limited lighting and power, and a water-based

fire suppression system that is inappropriate for a data center environment. The room does not currently contain any network infrastructure.

Proposed Server Room

The proposed server room will move servers and network equipment from the adjacent room into the space currently used for storage. Proposed layout of the new data center is below.

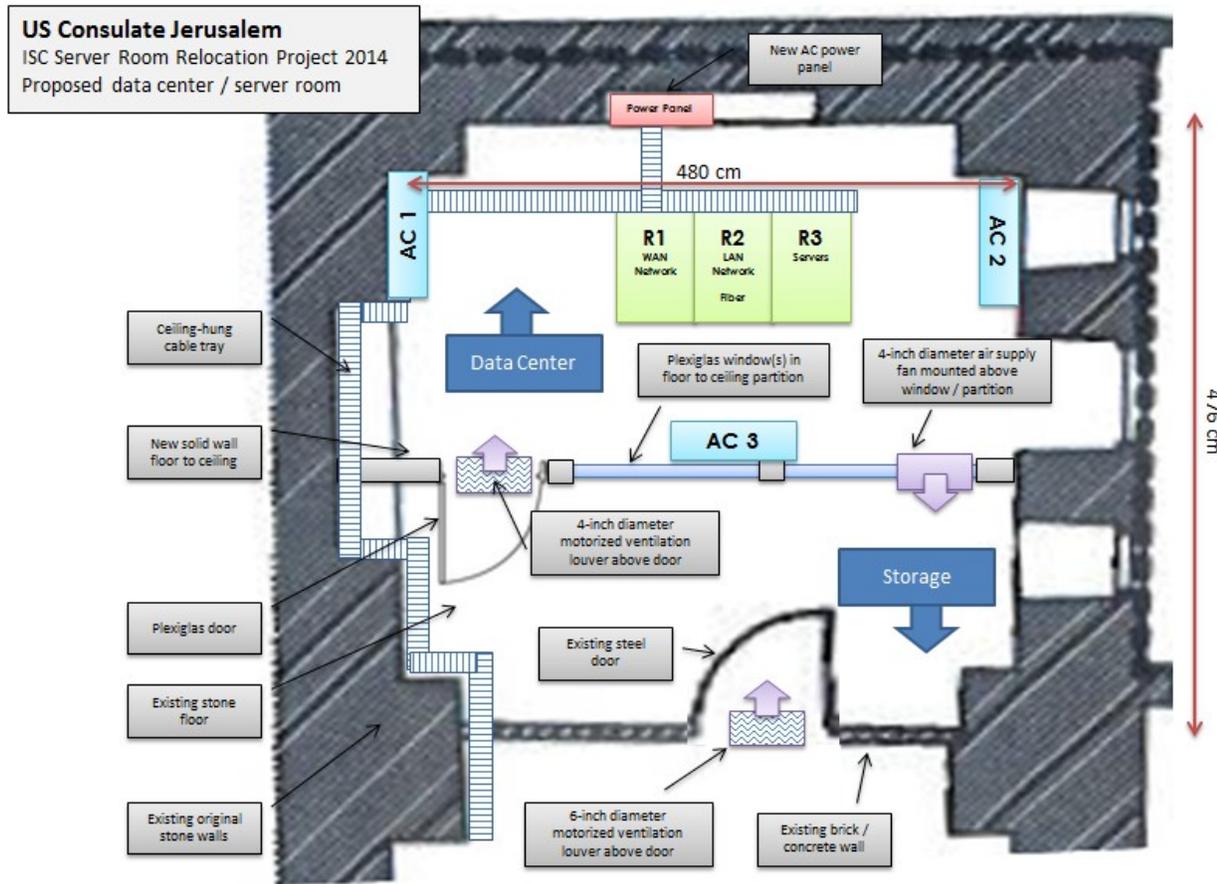


FIGURE : PROPOSED DATA CENTER

Requirements

1. Construct Room Partition

The contractor will construct a partition to divide the existing room into two portions: the rear of the room to be used for the data center, and the front of the room to be used for storage. Partition will consist of support structures, fire-rated drywall, and glass windows and door.

- a. The room partition must be floor to ceiling and sealed to contain fire-suppression gas within the data center portion of the room, should there be a fire event.
- b. Drywall portions of the partition must be of fire-rated “red wall” construction.
- c. Interior room partition and windows / glazing shall be designed for an internal out of plane pressure of .75KPA (15psf). Deflection shall be limited to the maximum allowable deflection of the wall and the toughened safety glass windows / glazing system (minimum of the two). Fire suppression and alarm systems have to be modified to accommodate the toughened safety glass.
- d. Partition must include a toughened safety glass door and one 3 m x 2 m or two 1.5 m x 2 m glass windows to allow for easy observation of the data center equipment from outside the data center. Fire suppression and alarm systems have to be modified to accommodate the toughened safety glass.
- e. A motorized louver and exhaust fan must be installed in the partition wall to permit airflow. The louvers and fan will seal / turn off on activation of the fire suppression system (see section 5 – Air Conditioning and Ventilation systems).
- f. Any wire pathways and cable ladder systems transiting the partition must be sealed
- g. Exact placement of the partition will be determined at installation time, but must allow for adequate space on the data center side to facilitate easy installation / removal of equipment from racks.

2. Install Ceiling-hung Cable Ladder System

The contractor will install an above-rack cable ladder system, to be hung from the ceiling to provide separate pathways for:

- a. Power and grounding wiring between the AC power panel and equipment racks, and power wiring between racks.

- b. Network cabling between racks and network equipment outside the data center; and network cabling running between racks.

3. Install Network and Equipment Racks

The contractor will provide and install two communications racks and one server rack as specified below. Racks shall include internally mounted power distribution systems as specified. Power and network wiring inside racks will be via internal cable management systems. Power and network wiring between racks will be via the above-rack, ceiling mounted cable ladder system.

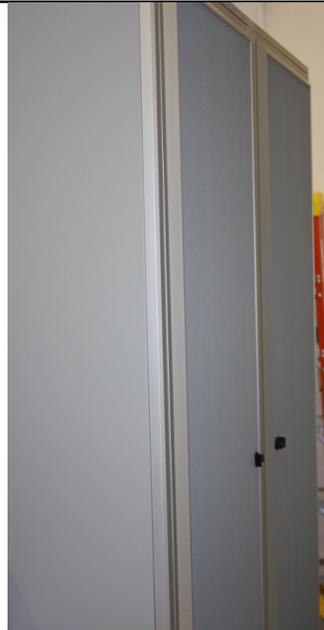
- a. **3 Network/Server Racks:** Contractor will provide and install three 45U (80 cm x 100 cm) network racks, with front and rear doors. Racks must include internal cable management systems, and penetrations at the top of the rack to allow for power and network cables to be run between racks via overhead cable ladder system. Racks must each include two power strips with 16 Amp CEE connectors –connected to the server room power panel.

Sample of similar Network/Server racks:

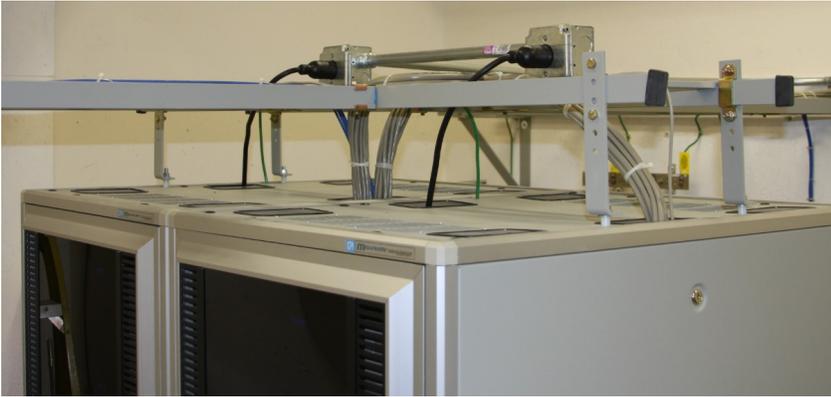
Model label view



Front View of two network racks	Back View of two network racks
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Top View of two network racks



Contractor will supply and install 6 vertical cable management systems, similar to item pictured below:



Contractor will supply and install 15 horizontal cable management systems, similar to item pictured below:



Contractor will supply 8 Rack mount spacers, 1 U, similar to item pictured below:



b. Dual-input power distribution units (PDUs): Contractor will provide and install in the racks, 5 horizontally mounted, dual-input PDUs (similar to <http://www.cdwg.com/shop/products/Tripp-Lite-PDU-Metered-ATS-200V-240V-20A-8-C13-2-C19-2-C20-Horizontal-1URM/2820306.aspx>). Each PDU will support two inputs and 8 C13 and 2 C19 outputs, with total current capacity of 20 Amps. Input sources must automatically failover between primary and secondary power input should power fail to the primary input.

c. Power plugs 2P+T 230V 32A IP 44: Contractor will provide and install two male Power plugs 2P+T on city power ((for connection to 2 UPS (s) and two female Power plugs 2P+T on the UPS(s) end similar to

Male Power plug	Female Power plug
	

d. Single-input power distribution units (PDUs), C13 , 12 ports: Contractor will provide and install in the racks, 4 vertical mounted, single -input PDUs similar to



e. AC Power cords standard length, C19 to C20 (female to male): Contractor will provide a quantity of 10 AC power cords similar to



- f. AC Power cords standard length, C14 to C5 (female to male):** Contractor will provide a quantity of 10 AC power cords similar to



4. Install Rack Power and Grounding

The Consulate will install power to a power panel located in the data center. Contractor will extend power connections to equipment racks as specified below.

- a. Power will be run from power panel to equipment racks via overhead, ceiling mounted “cable ladder” system that is separate from the cable ladder system used for network wiring. Power will be connected to power distribution systems in each rack.
- b. Each equipment rack must be connected to building ground.

5. Install Air Conditioning and Ventilation Systems

The contractor will provide and install air conditioning and ventilation systems in the data center to provide redundant cooling for the room and network / server equipment mounted within.

- a. Provide and install three (3 ea.) 30,000 Btu/hr (9 kW) cooling-only air conditioning systems. Air conditioning systems shall be ductless direct-expansion split-systems with minimum EER of 12.1 rated at 50Hz and 220 volts. Variable refrigerant flow (“VRF” or “VRV”) systems will not be accepted.
- b. Air conditioning systems shall be controlled by separate and independent wall-mounted thermostats. Hand-held remote controls will not be accepted.

- c. Condensate drains for all new air conditioning systems including condensate pumps will be provided if necessary. Condensate drainage piping attached to the outside wall will not be permitted.
- d. Outdoor air conditioner condenser units shall be located on the ground level outside the ISC offices (location to be identified during contractor walkthrough).
- e. Indoor blower-evaporators shall be ceiling or wall mounted; indoor units must not be located immediately above or adjacent to server racks or power panels.
- f. Air-conditioning system must provide redundant cooling. Should one system fail, the other should take over. Ideally, the redundant systems operate in tandem configured to “time-share” to avoid excessive wear on any one component of the system.
- g. Each air-conditioning and ventilation systems must be powered via a separate AC power circuit as described in *section 2*.
- h. Connections between internal air-conditioning systems and any associated external compressor / condenser systems must be run via cable-ladder systems or surface-mounted raceway systems as appropriate.
- i. 6-inch diameter, motor controlled louver shall be installed above the server room door to permit air flow. Louver must be wired to close upon activation of fire suppression system.
- j. 4-inch diameter supply air fan must be mounted in the partition wall between Data Center and Storage sides of the room to permit air flow. Fan must be wired to stop upon activation of fire suppression system.
- k. 4-inch diameter, motor controlled louver shall be installed above the data center internal partition door to permit air flow. Louver must be wired to close upon activation of fire suppression system.

6. Install Fire suppression systems

The contractor will relocate the current water fire sprinkler head to the front of the room (storage side of the partition) and install a gas-based fire suppression system for the rear of the room (server room side of the partition).

- a. The contractor will relocate or replace the water fire sprinkler head to cover only the front storage section of the room – located between the glass partition and the entrance door.

- a. The contractor will provide and install a fire suppression system for the data center side of the room (between the glass partition and the rear wall). This system must be gas-based, able to protect electronic equipment while eliminating fire. Local standard FM200 gas or similar system must be installed.
- b. Tanks for fire suppression gas will be placed within a protective enclosure inside the server room. Connections between internal fire-suppression system and any associated tanks must be run via cable-ladder systems, surface-mounted raceway systems, or independent piping as required by local building and safety code.
- c. Fire suppression system must be connected to an outage notification system, alerting IRM staff and/or Marine Security Guard to any fire situation.
- d. Activation of the fire suppression system must close ventilation louvers and turn off the supply air fan (see *section 5 – Air Conditioning and Ventilation Systems*).
- e. Fire suppression system must be powered via a separate AC power circuit terminated at the Server Room power panel.

7. Install and Configure Environmental Alert System

The contractor will install and configure an environmental alert system to alert IRM staff and/or Marine Guards of abnormal environmental conditions in the data center to include:

- a. Temperature monitoring – alerts to be sent should data center temperature fall outside a defined range.
- b. Moisture monitoring – alerts to be sent should data center ambient humidity exceed a defined threshold.
- c. Water detection – alerts to be sent should water be detected on the floor of the data center.
- d. Alert system must be able to interface with additional systems to provide alerts for fire and power outage conditions.
- e. Alert system must be configurable and provide multiple methods of alert, including:
 - i. Visual alerts via alarm lights or display mounted outside of the data center
 - ii. Audible alerts via alarm bell or siren mounted outside of the data center

- iii. Remote alerts sent via email or SMS message

8. Install Lighting

The contractor will install room lighting adequate to meet the needs of the data center, to include:

- a. Fluorescent track-lighting hung from the ceiling and / or wall-mounted.
- b. Emergency lighting, powered by battery, recharged by AC power.
- c. Power for lighting must be supplied via a separate AC power circuit terminated at the Server Room power panel.

Exact placement of lighting will be determined at installation time, but must provide adequate lighting on both sides of the central partition for both general operation and technical installation / maintenance projects.

9. Relocate network connections

The contractor will relocate the termination points of 37 pair fiber-optic network connections from the existing server room to the new server room (see Figure 3).

- a. Where existing fiber optic cable is long enough, contractor will relocate the cable from the current location into the new server room, re-tipping and terminating fiber with SC connectors into fiber patch panels. For existing cables that are not long enough to reach into the new server room space, the contractor will “patch across” the cables as described in b-e below.
- b. Contractor will provide and install one 6U rack cabinet and install at the current termination point of server room fiber cables.
- c. Contractor will provide four 19” Corning fiber optic patch panels, to include 24 double SC female adaptors. Patch panel must be “drawer type”, allowing the shelf of terminated cables to slide out for maintenance without having to remove the patch panel from the rack. Patch panels will be installed in the 6U cabinet (in the old Server Room) and the LAN network rack (in the new server room)



- d. Contractor will connect a 24-pair OM3 fiber optic cable between the 6U cabinet and the LAN network rack, terminating the strands on both ends on fiber optic patch panels via SC connectors. ***Consulate will provide the 24-pair OM3 fiber optic cable.***

- e. On “cutover day,” contractor will relocate existing fiber optic cables inside the 6U rack cabinet, and then patch them across to a patch panel in the LAN rack in the new server room via the 24-pair OM3 fiber optic cable.

- f. Contractor will provide and install feed through patch panel, terminate/tip 15 Cat 5e network connections and run 15 connect cables directly to the core switches in the new server room location.

US Consulate Jerusalem

ISC Server Room Relocation Project 2014
Network extension

