

Site Survey

HGST Active Archive System SA-7000

September 2015

1ET0059

Revision 1.1

Long Live Data [™] | www.hgst.com



Copyright

The following paragraph does not apply to the United Kingdom or any country where such provisions are inconsistent with local law: HGST a Western Digital company PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow disclaimer or express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This publication could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. HGST may make improvements or changes in any products or programs described in this publication at any time.

It is possible that this publication may contain reference to, or information about, HGST products (machines and programs), programming, or services that are not announced in your country. Such references or information must not be construed to mean that HGST intends to announce such HGST products, programming, or services in your country.

Technical information about this product is available by contacting your local HGST representative or on the Internet at: www.hgst.com/support

HGST may have patents or pending patent applications covering subject matter in this document. The furnishing of this document does not give you any license to these patents.

© 2015 HGST, Inc. All rights reserved.

HGST, a Western Digital company
3403 Yerba Buena Road
San Jose, CA 95135
Produced in the United States

Long Live Data™ is a trademark of HGST, Inc. and its affiliates in the United States and/or other countries.

HGST trademarks are authorized for use in countries and jurisdictions in which HGST has the right to use, market and advertise the brands.

Other product names are trademarks or registered trademarks of their respective owners.

One MB is equal to one million bytes, one GB is equal to one billion bytes, one TB equals 1,000GB (one trillion bytes) and one PB equals 1,000TB when referring to storage capacity. Usable capacity will vary from the raw capacity due to object storage methodologies and other factors.

References in this publication to HGST products, programs or services do not imply that HGST intends to make these available in all countries in which HGST operates.

Product information is provided for information purposes only and does not constitute a warranty.

Information is true as of the date of publication and is subject to change. Actual results may vary. This publication is for general guidance only. Photographs may show design models.

Contents

List of Figures.....	4
List of Tables.....	5
 Chapter 1 Document Summary.....	 6
1.1 Intended Audience.....	6
1.2 Active Archive System Configuration.....	7
 Chapter 2 For More Information.....	 9
2.1 Points of Contact.....	9
 Chapter 3 General Site Requirements.....	 10
3.1 Enclosure Environmental Requirements.....	10
3.1.1 Facilities.....	11
3.1.1.1 Physical Security.....	11
3.1.1.2 Physical Dimensions.....	11
3.1.2 Cable Requirements.....	11
3.1.3 Power Requirements.....	12
3.2 Shipping and Receiving Requirements.....	12
3.3 Clearance.....	13
3.4 Floor Map.....	13
3.4.1 Flooring.....	13
3.5 Seismic Bracing.....	13
3.5.1 Floor Anchor Kit.....	14
3.6 Active Archive System Configuration.....	14
3.6.1 Local Network Connectivity.....	14
3.6.2 Domain Name System.....	16
3.6.3 System Identification.....	17
3.6.4 Wide Area Network Connectivity.....	17
3.6.5 Network Time Protocol Server.....	17
3.6.6 Simple Mail Transfer Protocol.....	17
3.6.7 Simple Network Management Protocol.....	18
3.6.8 Protocol.....	18
3.7 Site Inspection Checklist.....	18
3.8 Delivery Survey.....	20

List of Figures

Figure 1: Active Archive System.....7

Figure 2: Angle Brackets and Flat Plates..... 14

List of Tables

Table 1: Active Archive System Full Configuration.....	7
Table 2: Non-operating Environmental Requirements.....	10
Table 3: Operational Environmental Requirements.....	10
Table 4: Active Archive System Dimensions.....	11
Table 5: Active Archive System Power Requirements.....	12
Table 6: Active Archive System Power Cords.....	12
Table 7: Floor Weight Support Requirements.....	13
Table 8: Local Network Connectivity.....	15
Table 9: Data Center 1.....	15
Table 10: Data Center 1 Controller.....	15
Table 11: Data Center 2.....	15
Table 12: Data Center 2 Controller.....	16
Table 13: Data Center 3.....	16
Table 14: Data Center 3 Controller.....	16
Table 15: Domain Name System.....	16
Table 16: Simple Mail Transfer Protocol.....	17
Table 17: Secondary Simple Mail Transfer Protocol.....	18
Table 18: Simple Network Managment Protocol.....	18
Table 19: Inspection Checklist.....	18
Table 20: Delivery Checklist.....	20
Table 21: Additional Notes.....	22

1 Document Summary

Topics:

- [Intended Audience](#)
- [Active Archive System Configuration](#)

The following chapter defines the *scope*, *intended audience*, and *references* related to the Active Archive System Site Requirements Document.

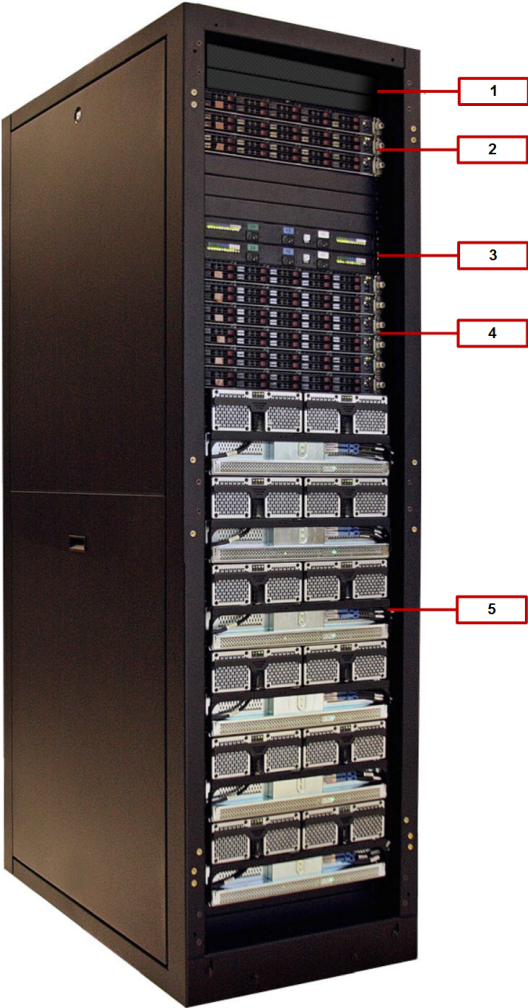
1.1 Intended Audience

The following document is intended for users that require a better understanding of the site requirements involved in the delivery, unpacking, inspection, and care of the Active Archive System.

1.2 Active Archive System Configuration

The following table displays the configuration for the Active Archive System:

Figure 1: Active Archive System



Hardware	Details	Number of Product
(1) Storage Interconnect	Celestica D2020	2
(2) Controller Nodes	Supermicro 1028U-TR4T+	3
(3) Power Distribution Unit	Delta PDU: Chatsworth Horizontal mount PDU, 30A 200-208Vac, 3-Phase or WYE PDU: Chatsworth Horizontal mount PDU, 16A 380-415Vac, 3-Phase	2
(4) Storage Nodes	Supermicro SYS-1018R-WCOR	6
(5) Storage Enclosure Basic	For the basic configuration, there are 98 drives per Storage Enclosure Basic.	6

Table 1: Active Archive System Full Configuration

2 For More Information

Topics:

- [Points of Contact](#)

This chapter provides points of contact for the Active Archive System.

2.1 Points of Contact

For further assistance with the Active Archive System, contact Elastic Storage Platforms support. Please be prepared to provide the following information: serial number (S/N), product name, model number, and a brief description of the issue.

Telephone:

Region	Telephone Numbers	Support Hours and Additional Information
United States/International	1-408-717-7766	24 hours a day, 7 days a week
North America	1-844-717-7766	24 hours a day, 7 days a week Toll-free

Email:
support@hgst.com

Website:
www.hgst.com/support

3 General Site Requirements

Topics:

- [Enclosure Environmental Requirements](#)
- [Shipping and Receiving Requirements](#)
- [Clearance](#)
- [Floor Map](#)
- [Seismic Bracing](#)
- [Active Archive System Configuration](#)
- [Site Inspection Checklist](#)
- [Delivery Survey](#)

The following chapter provides a general site requirements for the Active Archive System.

3.1 Enclosure Environmental Requirements

The enclosure based upon the drive maximum environmental specifications will be designed around the following environmental requirements:

Non-operating	Active Archive System
Temperature	-40°C to +66°C
Temperature Gradient	35°C per hour
Temperature De-rating	1°C per 300m above 3000m
Relative Humidity	8% to 90% (non-condensing)
Relative Humidity Gradient	30% per hour maximum
Altitude	-300m to 12,000m de-rated 300m per 1°C above 40°C
Altitude Gradient	22860m per hour maximum

Table 2: Non-operating Environmental Requirements

Operational	Active Archive System
Temperature	20° to 40°C de-rated 2% per 1,000 feet altitude increase
Temperature Gradient	20°C per hour
Temperature De-rating	1°C per 125m above 950m
Relative Humidity	Up to 95%
Relative Humidity Gradient	30% per hour maximum
Altitude	-300m to 3048m

Table 3: Operational Environmental Requirements**3.1.1 Facilities**

The facility in which Active Archive System will be deployed in should be minimum Tier 3, per Uptime Institute specifications, providing contiguous rack space, a minimum of 10 kVA (A+B) power density per cabinet, accessible on a 24/7 schedule in support of SLA commitments with adequate HVAC. Due to the **lights-out** nature of the solution the facility shall provide equipment staging (up to 30 days) and provide a protocol for accepting shipment on behalf of Solution Provider. Our rack is set up to direct all exhaust towards the rear of the cabinet, and we install blanking plates for open space in the rack layout.

Once the rack is installed in its final destination, it is recommended that < list the amount > clearance around the rack for serviceability and optimal airflow for cooling.

1. Does the client require seismic bracing for the rack equipment? (Yes or No)
2. What are the dimensions of the floor mounts?

If the plan includes adding additional racks for capacity growth at each site:

1. Is there contiguous rackspace capable of supporting expansion?
2. What is the cable distance between contiguous racks?

Note: A 40Gb interconnect is used for connecting the local racks into a single cluster: distance for QSFP + to QSFP+ active copper 3 meters; distance for QSFP 40Gb short reach optics 150 meters.

3.1.1.1 Physical Security

The rack is shipped with no doors. It is recommended, that you deploy the Active Archive System within a physically secure environment.

3.1.1.2 Physical Dimensions

The following section provides a description of the physical dimensions.

Physical Dimensions and Weight**Rack:**

The following table displays the dimensions of the Active Archive System:

Hardware	Dimensions and Weight
Active Archive System	(height x width x depth)
	82.52 inches x 23.62 inches x 40.35 inches
	2,041 millimeters x 600 millimeters x 1,025 millimeters
	(weight)
	2,250 lbs.
	1,020 kg.

Table 4: Active Archive System Dimensions**3.1.2 Cable Requirements**

The Active Archive System requires 6 10Gb Ethernet connections to the client network. The network connection from the controller node are qualified 10Gb Intel SFP+ supporting OM-3 and OM-4 fiber cables.

3.1.3 Power Requirements

The power requirements of the Active Archive System are displayed in the following table:

Hardware	Power
Power Supply	Redundant intelligent PDUs
Power Consumption - typical	7,890 Watts
Power Consumption - maximum	10,484 Watts

Table 5: Active Archive System Power Requirements



PDU Type	Visual Representation	Plug Standard	Outlet Standard	Frequency	Phase	Amps (per phase)	Supply Range
Delta		NEMA L15-30P	L15-30R	50/60Hz	3-Phase	30A	200-240V
WYE		IEC 60309 16A 4P+E plug	IEC 60309 16A 4P+E outlet	50/60Hz	3-Phase	16A	380-415V

Table 6: Active Archive System Power Cords

3.2 Shipping and Receiving Requirements

The following should be considered when receiving the rack at the loading dock and moving it to its final destination in the data center:

1. Rack installation location details

A. Is installation planned on a raised floor?

- a. Is the raised floor capable of supporting 2,500 to 3,000 lbs. system weight per rack location?
- b. Additional supports may be required in portions of the floor to support this weight range.

2. Rack anchoring

A. Rack based anchors

B. Upper rack stabilization

3. Shipping and receiving requirements

A. Loading dock

Note: The transporting truck requires a 7.5 ft. compartment and door with a 4 ft. lift gate or a lift gate height that matches the loading dock height.

B. Electrical/Mechanical Pallet Jack

3.3 Clearance

It is very important that the doorways, hallways, and elevators clearance allow for enough room to deliver the system. The route to the data center or computer room location should have a clearance of 96 inches (2,438.4 millimeters) high and 45 inches (1,143 millimeters) wide to allow for maneuverability.

3.4 Floor Map

Notice: Please insert a floor map with the path that the rack is expected to take from the loading dock to its final location within the data center.

Please consider the following while generating the floor map:

1. Door heights
2. Elevator weight capacity

Note: The elevator must support the weight of the system with packing materials and the pallet jack. The weight capacity should be able to handle approximately 3,000 lbs. The floor and elevator should also be at the same level.

3. Floor protection for transit from receiving location to installation should be provided by the data center.

Note: It is recommended that floor boards, plywood sheets, or other form of covering be used as protective covering on the floor to prevent damage and tipping of the system.

3.4.1 Flooring

It is very important that the flooring en route to and in the computer room or data center are rated to support the weight of the system. Ensure that the data center or computer room route and location have a floor rated at approximately 3,000 lbs to allow for adequate support.

If there are ramps, it is important that they are also rated at approximately 3,000 lbs.

During delivery, it is very important that Masonite or a like material is utilized to cover the floor. This is to reduce the probability of tipping the rack if the pallet jack gets caught in a crack in the tile. It also provides protection for the floors while the system is being transported on the pallet jack.

The following table displays the floor weight support requirements for Active Archive System:

Model	Floor Reinforcement Area
SA-7000	82.52 inches x 23.62 inches x 40.35 inches 2,041 millimeters x 600 millimeters x 1,025 millimeters

Table 7: Floor Weight Support Requirements

3.5 Seismic Bracing

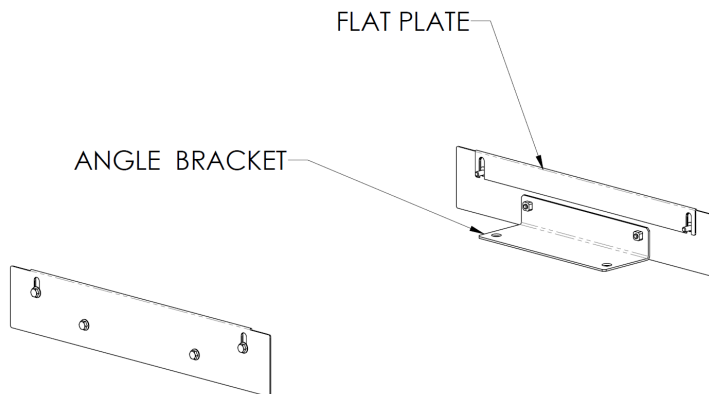
The following section provides information on seismic bracing, using the floor anchor kit provided, for the Active Archive System.

3.5.1 Floor Anchor Kit

Attention: The Active Archive System is not designed to resist vigorous earthquakes. The floor anchor bracing mitigates potential damage caused by seismic activity, but does not guarantee full protection of the system and internal components.

The floor anchor kit is designed to attach the Active Archive System to the data center floor for protection from seismic activity. The hardware, angle brackets (quantity 2) and flat plates (quantity 2), are attached to the bottom right and left hand sides of the system during shipment.

Figure 2: Angle Brackets and Flat Plates



The system ships with the required M8 bolts (quantity 4) that are utilized to attach the floor anchor kit to the front and rear of the system. The floor kit allows for attachment to either stud bolts or concrete bolts.

Attention: It is the responsibility of the data center to properly install the stud or concrete bolts prior to the installation of the Active Archive System.

For the proper protection, the rack feet have to be adjusted so that the weight is taken off of the casters. This is done by lowering the feet, positioned at four points around the bottom of the system, until the casters are about 3/16 inch from the floor.

For specific Floor Anchor Kit installation steps, refer to the Active Archive System Installation Guide.

3.6 Active Archive System Configuration

The following chapter provides configurations for the Active Archive System.

3.6.1 Local Network Connectivity

Each Controller Node in the Active Archive System requires two 10Gb Ethernet to support client traffic and there are total of three Controller Nodes per rack. The client side IP addresses are configured during the first time bring at the customer site.

1. What is the brand and model of the Ethernet switch for client connectivity?
2. Does client use Jumbo Frames? Yes or No. If so, what size?
3. While load balancers are not required, it is recommended the public facing Controller Node Ethernet ports connect to a load balancer. If a load balancer already exists, What is the vendor & model?

4.

Controller Node	IP Address	Network Mask	Comment
CN1- Port 1			
CN1- Port 2			
CN2- Port 1			
CN2- Port 2			
CN3- Port 1			
CN3- Port 2			

Table 8: Local Network Connectivity

Network	Network Address	Netmask	Gateway	Start IP	End IP
Public1	192.168.1.0	255.255.255.0	192.168.1.1		
Public2	192.168.2.0	255.255.255.0	192.168.2.1		

Table 9: Data Center 1

Controller	IP	Netmask
CN01 - Public1		
CN01 - Public1		
CN01 - Public2		
CN01 - Public2 V		
CN02 - Public1		
CN02 - Public2		
CN03 - Public1		
CN03 - Public2		

Table 10: Data Center 1 Controller

Network	Network Address	Netmask	Gateway	Start IP	End IP
Public1	192.168.3.0	255.255.255.0	192.168.3.1		
Public2	192.168.4.0	255.255.255.0	192.168.4.1		

Table 11: Data Center 2

Note: The configuration wizard uses the Start IP and End IP values as a sanity check on all IP addresses you give it. These values are the lower and upper (inclusive) bounds for all IP addresses for this public network. This boundary also applies to any virtual IP addresses you are prompted for within this public network. Therefore, the range between Start IP and End IP must accommodate all IP addresses for this public network (in other words, at least 4). If, at some point during the running of the configuration

wizard, you enter an IP address outside of this boundary, the wizard eventually fails, and you must reconfigure the system by hand.

Controller	IP	Netmask
CN01 - Public1		
CN01 - Public2		
CN02 - Public1		
CN02 - Public2		
CN03 - Public1		
CN03 - Public2		

Table 12: Data Center 2 Controller

Network	Network Address	Netmask	Gateway	Start IP	End IP
Public1	192.168.5.0	255.255.255.0	192.168.5.1		
Public2	192.168.6.0	255.255.255.0	192.168.6.1		

Table 13: Data Center 3

Note: The configuration wizard uses the Start IP and End IP values as a sanity check on all IP addresses you give it. These values are the lower and upper (inclusive) bounds for all IP addresses for this public network. This boundary also applies to any virtual IP addresses you are prompted for within this public network. Therefore, the range between Start IP and End IP must accommodate all IP addresses for this public network (in other words, at least 4). If, at some point during the running of the configuration wizard, you enter an IP address outside of this boundary, the wizard eventually fails, and you must reconfigure the system by hand.

Controller	IP	Netmask
CN01 - Public1		
CN01 - Public2		
CN02 - Public1		
CN02 - Public2		
CN03 - Public1		
CN03 - Public2		

Table 14: Data Center 3 Controller

3.6.2 Domain Name System

DNS setup	Parameter	Comment
DNS Server IP address(es)		
DNS S3 domain		

Table 15: Domain Name System**3.6.3 System Identification**

Active Archive System provides the ability for customers to define a **System ID** which represents the HOSTNAME for the entire system (for all the racks under the same namespace or environment).

System ID for the 3-Geo cluster (letters and numbers only, limited to 16 characters): _____

Note: System ID : <String> - is unique ID typically represents the customer name or vendor ID . For supporting multiple independent environments within a customer's environment the System ID should be appended by additional information identifying the deployment. This name is provided by the customer. (Default System ID is the Serial number of the primary controller).

3.6.4 Wide Area Network Connectivity

1. What is the WAN bandwidth between the 3 data centers?
2. What is the latency between the 3 data centers?
3. What is the band and model of the router/gateway for WAN access?
4. Specifications on the client network connection to the WAN link (speeds, connectivity (SR/LR fiber, CAT6, and so on).
5. Will the Active Archive System require routing to access customer gateway?

Note: The solution supports IPv4 only.

3.6.5 Network Time Protocol Server

IP Address(es) or Domain Name(s) for preferred NTP servers. Multiple servers can be specified as a comma-separated list.

NTP Server(s): _____

Time Zone: _____

3.6.6 Simple Mail Transfer Protocol

Simple Mail Transfer Protocol configuration:

SMTP setup	Parameters	Comment
SMTP Server IP address or domain name		
SMTP Server Port		
Email From Address		
Is authorization required for outgoing mail?		
SMTP User Name (if authorization is required)		
SMTP Password (if authorization is required)		

Table 16: Simple Mail Transfer Protocol

Secondary Simple Mail Transfer Protocol configuration: (Optional):

SMTP setup	Parameters	Comment
SMTP Server IP address or domain name		
SMTP Server Port		
Email From Address		
Is authorization required for outgoing mail?		
SMTP User Name (if authorization is required)		
SMTP Password (if authorization is required)		

Table 17: Secondary Simple Mail Transfer Protocol

3.6.7 Simple Network Management Protocol

Simple Network Management Protocol configuration:

SNMP setup		
Version		
Trap IP address		
Community name		

Table 18: Simple Network Management Protocol

3.6.8 Protocol

The Active Archive System natively supports S3. Details for your environment:

1. Do you require non-secure or SSL/TLS secure connectivity?

A. What is your CA (Certification Authority) information?

2. What version of S3 authentication is required?

3.7 Site Inspection Checklist

The following checklist is intended to be used for inspection of the Active Archive System:

No.		Yes	No	Comment or Date
Facility				
1.	Will the rack be unpacked in a different location than it is installed in?			

No.		Yes	No	Comment or Date
2.	Is the raised floor capable of supporting up to 3,000 pounds or 1360 kilograms?			
3.	Is floor protection available for delivery?			
<u>Server Room</u>				
4.	Is there adequate space for maintenance needs?			
5.	Is access to the site or server room restricted?			
6.	Are there channels or cutouts for cable routing?			
7.	Are customer supplied cables available and of the proper type?			
8.	Are rack anchors and stabilizers located in the space in which the system will be installed?			
<u>Power and Lighting</u>				
9.	Are lighting levels adequate for maintenance?			
10.	Are A/C outlets available for servicing needs? (for example, vacuuming)?			
11.	Does the input voltage correspond to equipment specifications?			
12.	Does the input frequency correspond to equipment specifications?			
13.	Is power conditioning equipment installed?			
14.	Is there a dedicated branch circuit for equipment?			
15.	Are the input circuit breakers adequate for equipment loads?			
<u>Safety</u>				
16.	Is there an emergency power shut-off switch?			
17.	Is a fire protection system installed in the server room?			
18.	Is antistatic flooring installed?			

No.		Yes	No	Comment or Date
19.	Do any equipment servicing hazards exist (loose ground wires, poor lighting, or others)?			
Cooling				
20.	Can cooling be maintained?			
21.	Can temperature changes be maintained according to equipment specifications?			
22.	Can humidity levels be maintained?			
23.	Are air conditioning filters installed and clean?			

Table 19: Inspection Checklist

3.8 Delivery Survey

Special instructions or recommendations should be documented. The following list gives examples of special instructions or issues:

- Packaging restrictions at the facility (for example, size and weight limitations)
- Special delivery procedures
- Special equipment required for installation (for example, tracking or hoists)
- What time the facility is available for installation (after the equipment is unloaded)
- Special security requirements applicable to the facility

Note:

- To better define answers, please circle options where available.
- HGST does not advocate tipping configured racks to navigate height restricted doorways.

Preparation for Delivery		
1.	What are the hours the facility is open for deliveries?	a.m. or p.m.?
2.	Can delivery be done during the day during normal business hours?	Yes or No
3.	Are appointments required?	Yes or No
4.	Are there any security or building access requirements?	Yes or No
5.	On what floor in building will the equipment be installed? This information should take height and width clearances of various obstacle along the route into consideration	
6.	If equipment is not going on the first floor, is there an elevator?	Yes or No

	<p>Note: For elevator specifics, please see the Elevator section below.</p>	
7.	Is the path from the loading dock to the computer room or server room robust enough to support the weight of the configured system?	Yes or No
Dock Delivery		
8.	Is the dock large enough for a semitrailer?	Yes or No
9.	What is the location of the dock?	
10.	What is the street name if different than company address?	
Street Delivery		
11.	What is the location of the access door?	North, south, east, or west
12.	What is the street name, if different than company address? (cross street)	
13.	What is the height of access door?	feet or meters
14.	What is the width of access door?	feet or meters
15.	Are there any required special permits? Please list the type and agency obtained from.	Yes or No
Elevator		
16.	What is the capacity of the elevator?	pounds or kilograms
17.	What is the depth of the elevator?	feet or meters
18.	What is the height of the elevator?	feet or meters
19.	What is the width of the elevator?	feet or meters
Stairs		
20.	How many flights of stairs are there?	
21.	What is the width of the stairwells?	feet or meters
Installation Space		
22.	Is there a delivery/unpacking/staging area?	Yes or No
23.	Is there a raised floor or are there any thresholds of concern?	Yes or No

24.	If there is a raised floor, how deep is it?	feet or meters
25.	What sort of equipment maneuvering is required to gain access?	
26.	Are there special equipment needs required to place the equipment in the computer room? (for example, steel plates or floor covers)	Yes or No Specify special needs, if any:

Table 20: Delivery Checklist

Notes:

Table 21: Additional Notes