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MTS Systems Corporation
14000 Technology Drive
Eden Prairie, MN 55344-2290 USA
Telephone 952-937-4000

Installation Report

Customer Information
Institute for Building Science and
Technology (IBST)

Installation Start Date: 4/14/2008
Installation Ended Date: 9/24/2008

Notification:
Service Order Number:

Business Unit MTD

PO/Charge Number:

Job Complete Yes

Functional Location:

WBS/Project Number: US1.34643.EQT
-40

Activity Type:

Contact:

Project Engineer Roger Duemke

Order Type: ZSM3

Phone Number:

Fax Number:

Email:

Master Data Updates

Customer ☐ Phone ☐ Contact ☐
Zone ☐ Email ☐

Assigned Zone:

Change Pre-Notification ☐ Month
Add Pre-Notification ☐ Cycle

Total
Hours:

The following checks were made during the installation of this system. These checks should in no way be considered a substitute for reading and becoming familiar with the operators guide and safety guidelines provided with the system documentation.

System has been inventoried and is complete	Yes
System interconnections have been finished	Yes
System connections to utilities have been checked and meet MTS requirements	Yes
All equipment has been checked and demonstrated to function properly	Yes
Customer has been instructed in the correct methods of equipment operation by means of demonstration and the use of supplied manuals	Yes
System interlocks are functional	Yes
HPU over temperature limit switch has been set to	55 Deg C
HPU temperature/cooling water valve has been set to	45 Deg C
Safety pressure relief valve checked and is set to	3250psi
HPU operation pressure control valve is set to	3000psi
Customer has been informed about possible safety hazards, and has been shown the accident prevention placards on the equipment	Yes
Customer acknowledges the services performed but does not accept the equipment pending resolution of the items listed below. Until acceptance the customer is not authorized by MTS to use the equipment	
Customer Accepts the equipment with the understanding that MTS will resolve all issues listed below, and is authorized to use the equipment. Acceptance initiates the start of the system warranty.	
Customer accepts the equipment or services provided, and MTS authorizes the customer to use the equipment. Acceptance also initiates the start of the system warranty.	

FSE: Robin Tan Kok Pin
Signature: _____

Customer Contact:
Signature: _____

22.XII-2008

1st installation visit: 14th – 26th April 2008

Engineers: James Young, Robin Tan.

Preassembled hardline sections between stations 4 and 5 could not be brought down to the tunnel for installation as they were too long. Shorter sections would be sent from MTS for installation in the next scheduled trip.

Remaining hardlines were laid out, connected and secured to the floor mounts and uni-struts in the tunnel.

2nd installation visit: 2nd June – 14th June 2008

Engineers: James Young, Robin Tan, Kevin Chua

A hardline section in the tunnel was found bent, and the fitting was damaged. This section of hardlines was swapped with the hardlines in the trench leading to the seismic table pit.

The hardlines that were sent from MTS- to replace the ones that were found to be too long during the previous visit- were installed and all the fittings were tightened.

Station manifolds were anchored to the strong floor, and the hydraulic hoses were connected between the manifolds and the hardlines. Hoses were connected between the HPU and the hardlines in the tunnel.

HPU was commissioned after the electrical and water connections were made by the local contractors. Pressure check and flushing of the hardlines and hoses were carried out.

GT controller for the structural system was installed and cable interconnections were made between the controller and the HSM and structural actuators.

Configuration: The 4-channel hydraulic manifold was connected to channel 1 of the HSM, while the two 244.51 actuators were connected to the other 2 HSM channels. The two 244.31 and two 244.41 actuators were connected to the 4-channel manifold.

The structural system was commissioned. However, the servovalve of a 244.41 actuator was not working. Replacement servovalve would be sent and installed in the next visit.

Training in the operation of the HPU and 793 software, including MPT, was carried out for the IBST operators.

3rd installation visit: 10th -24th September 2008

Engineer: Robin Tan

Faulty servovalve on the 244.41 actuator was replaced.

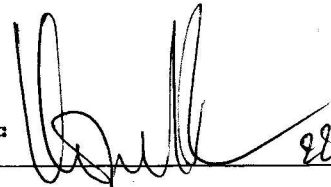
The power supply of the PC that was connected to the GT controller failed. Spare part was not available locally, and a new PC was purchased and installed.

Refresher training on the 793 software was carried out for the IBST operators and Sieuviet engineer.

The structural system is accepted by the customer. Warranty will commence when the seismic system (Project number: US1.34643.EQT-42) is accepted.

FSE: Robin Tan Kok Pin
Signature: _____

Customer Contact
Signature: _____

 22.11.2008

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Please enter information in all yellow fields. The gray fields contain a drop-down list and are also required.

System has been inventoried and is complete	
System interconnections have been finished	
System connections to utilities have been checked and meet MTS requirements	
All equipment has been checked and demonstrated to function properly	
Customer has been instructed in the correct methods of equipment operation by means of demonstration and the use of supplied manuals	
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Acceptance date (warranty start)	
Issues or special circumstances encountered (details of installation for customer)	
Installation engineering text (details of installation for Mnpls)	
FSE signature	<i>[Signature]</i>
Customer contact signature	<i>[Signature]</i>

Warranty for the structural system will commence after the Seismic system (Project number: US1-348-43 EQT-42) has been accepted.

9/11/2008

9/16



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Installation Report

Customer Information
Institute for Building Science and
Technology (IBST)

Installation Start Date: 4/14/2008
Installation Ended Date: 12/6/2008

Notification:
Service Order Number:

Business Unit MTD

PO/Charge Number:

Job Complete Yes

Functional Location:

WBS/Project Number: US1.34643.EQT
-42

Activity Type:

Contact

Project Engineer Roger Duemke

Order Type: ZSM3

Phone Number:

Fax Number:

Email:

Master Data Updates

Customer ☐ Phone ☐ Contact ☐
Zone ☐ Email ☐
Zone ☐ Email ☐

Assigned Zone:

Change Pre-Notification Month

☐

Total

Hours:

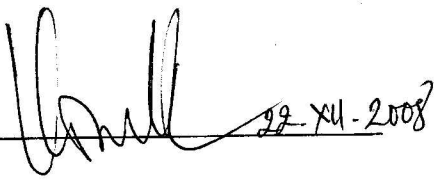
Add Pre-Notification Cycle

☐

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Signature: 

Customer Contact:
Signature:  22-XII-2008

4/6

1st installation visit: 14th – 26th April 2008

Engineers: Omar Rood, Jim Smith, James Young, Robin Tan.

The base-plate for the seismic table was positioned in the pit, and leveling was carried out on the plate. The base-plate was then grouted, and was left to cure for 30 days, before further installation work was carried out.

The actuator plates were positioned and measurements were taken to ensure that all dimensions are adhered to. The plates were then grouted and were left to cure.

2nd installation visit: 2nd June – 14th June 2008

Engineers: James Young, Robin Tan, Kevin Chua

The nuts were installed on the tie-rods to secure the base-plate, and torqued to requirements. The base-plate and bearings were cleaned of dirt, and the shear-plate and table were installed. The 293.32 Hydraulics service manifold (HSM), two 244.40 actuators and hydraulic hoses were installed, and pressure proof test was carried out. The digital controller and all the control cables for the seismic system were installed.

Commissioning would be carried out during the next visit.

3rd installation visit: 15th -19th September 2008

Engineers: Rod Larson, Robin Tan

The commissioning of the seismic system was carried out. Training on the operation of the system was also conducted for the customer and end-users (Sieuviet and IBST).

Acceptance test was carried out on the system. However, during the Maximum Displacement test, the restrictor valve on one of the actuators broke, and the system had to be shut down.

4th installation visit: 27th November – 6th December 2008

Engineers: Rod Larson, Robin Tan

An additional accumulator manifold assembly was installed in the pit to provide additional line accumulation that was needed to meet system performance. Additional fittings and hoses were also installed on the HSM as required.

The original restrictor valves on the actuators (including the broken valve) were replaced with units made of alloy steel.

Due to heavy rain a few weeks before, rain water had drained into the pit, and filled it with water until the level of the trench. As a result, water had gone into the bearings at the bottom of the table, and also into the table through the unused actuator mounting points. The water in the pit had been drained by the customer, and all the bellows that were covering the rails beneath the table were removed for drying.

The rails were cleaned of corrosion, and all the grease blocks of the bearing assemblies were removed to clean off the contaminated grease, and reinstalled. Fresh grease was pumped into all the bearing assemblies while the table was moving slowly. Other work carried out as a result of the flooding in the pit:

1. The HSM coils and cable assemblies were replaced.
2. All the hydraulic hoses that were connected to the actuator with the broken restrictor valve were replaced with new ones.
3. All the plastic wiper seals in the bearing assemblies were replaced.
4. Two oil samples were taken from the HPU (before the commissioning of the system, and after the acceptance test was carried out).

The digital controller for the seismic system as well as the controller for the structural system was not damaged by the flood water. All the structural actuators were also resting on wooden blocks which prevented the water from reaching them.

Additional hardware was installed in the digital controller: 493.76, 493.77, 493.45, 493.46. All qty one each.

Commissioning and acceptance test were carried out on the seismic system in the presence of the customer (Sieuviet). Additional training on the operation of the system was also conducted for the customer and end-users.

FSE: Robin Tan Kok Pin
Signature: _____

Customer Contact:
Signature: _____

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Acceptance date (warranty start)	
Issues or special circumstances encountered (details of installation for customer)	1. Restriction valves on actuators replaced 2. Additional accumulator manifold installed 3. Repair carried out on HSM and bearing assemblies due to damage by flood water
<i>The shaking table shall be tested with full load (15-T) and nominal payload (10-T) for checking its performance in Jan-Feb. 2009</i>	
Installation engineering text (details of installation for Mnpls)	
FSE signature	<i>Atkin</i>
Customer contact signature	<i>22.XI.2008</i>