



Department of Civil, Structural, and Environmental Engineering

SEESL Structural Engineering and Earthquake Simulation Laboratory SEESL

212 Ketter Hall, North Campus, Buffalo, NY 14260-4300

Fax: (716) 645-3733 Tel: (716) 645 5400 X 16

<http://www.nees.buffalo.edu>

Calibration Certificate

Certificate Number: **UB-2006-07-24-06**

Instrument Description: **RED LC** Three-Channel Load Cell

Location: **SEESL**

Test Equipment

Instrument Identification:

	<u>Type of Instrument:</u>	<u>Instrument Name:</u>	<u>Serial Number:</u>	<u>Instrument Range:</u>
Ax	Force Transducer	5D-12-RED-02	02	± 100 kip
Sx	Force Transducer	5D-12-RED-02	02	± 20 kip
SY	Force Transducer	5D-12-RED-02	02	± 20 kip
MX	Force Transducer	5D-12-RED-02	02	± 200 in
MY	Force Transducer	5D-12-RED-02	02	± 200 in

Conditioner Identification:

	<u>Model Number</u>	<u>Serial Number:</u>	<u>Gain:</u>	<u>Excitation:</u>
Ax	2310	072470	3380	10 V
Sx	2310	072363	7700	10 V
SY	2310	72595	7080	10 V
MX	2310	088779	2460	5 V
MY	2310	088740	2520	5 V

Readout Device Identification:

	<u>Model Number</u>	<u>Serial Number:</u>	<u>Channel:</u>
Ax	Labview 6036 card #2	And PC	1
Sx	Labview 6036 card #2	And PC	2
Mx	Labview 6036 card #2	And PC	3
N1	Labview 6036 card #2	And PC	4
N2	Labview 6036 card #2	And PC	5

Calibration Factors:

	<u>Full Scale Output:</u>	<u>Amplified Output per Eng. Unit:</u>
Ax	± 10 V	± .1 V/kip
Sx	± 10 V	± 2.00 V/kip
SY	± 10 V	± 2.00 V/kip
MX	± 5 V	± 0.05 V/kip in
MY	± 5 V	± 0.05 V/kip in



Department of Civil, Structural, and Environmental Engineering

SEESL Structural Engineering and Earthquake Simulation Laboratory SEESL

212 Ketter Hall, North Campus, Buffalo, NY 14260-4300

Fax: (716) 645-3733 Tel: (716) 645 5400 X 16

<http://www.nees.buffalo.edu>

Reference Equipment

Reference Instrument Identification:

1. Type of Instrument:	Instrument Name:	Serial Number:	Instrument Range:
N1 Fluke 133 Scopemeter	Scopemeter	DM8680589	
Calibration Trace:	Certificate Number:	Cal. Date:	Cal. Exp. Date:
Caltronix	3R394	7/6/2005	7/6/2006
2. Type of Instrument:	Instrument Name:	Serial Number:	Instrument Range:
N2 Fluke 8050A	Dig Voltmeter	4237154	
Calibration Trace:	Certificate Number:	Cal. Date:	Cal. Exp. Date:
Caltronix	3R395	07/06/2005	07/06/2006
3. Type of Instrument:	Instrument Name:	Serial Number:	Instrument Range:
Ref Force Transducer	UB#300kip	LC300-01	300 kip (compression)
Calibration Trace:	Certificate Number:	Cal. Date:	Cal. Exp. Date:
NIST Traceable	NMC - 1044276	6/21/2006	6/21/2007
NEM-8115: 300k Load Cell			
822/2650366-01			

Calibration Factors:

Full Scale Output:	Unamplified Full Scale Output	Amplified Output per Eng. Unit:
1. (update)	(update)	(update)
2. (update)	(update)	(update)
3. (update)	(update)	(update)

Reference Lab Information:

1. Address:	Phone/Website:	Accreditation:
Ketter Hall SEESL	645-2114	
University at Buffalo	www.nees.buffalo.edu	
Buffalo, NY 14225		
2. Address:	Phone/Website:	Accreditation:
Ketter Hall SEESL	645-2114	
University at Buffalo	www.nees.buffalo.edu	
Buffalo, NY 14225		
3. Address:	Phone/Website:	Accreditation:
Northeast Metrology Corp.	716-827-3770	ISO/IEC 17025
2601 Genesee Street	www.vantek-nem.com	
Buffalo, NY 14225-2916		



Department of Civil, Structural, and Environmental Engineering

SEESL Structural Engineering and Earthquake Simulation Laboratory SEESL

212 Ketter Hall, North Campus, Buffalo, NY 14260-4300

Fax: (716) 645-3733 Tel: (716) 645 5400 X 16

<http://www.sees.buffalo.edu>

Calibration Information

Calibration Procedure:

Basic Description:

AXIAL CALIBRATION:

The two load cells (Scopemeter, Dig Voltmeter, and RED LC) were placed on top of the UB#300kip reference load cell in the Tinius Olsen machine.

The load cells were loaded several cycles to allow the gains of the amplifiers to be adjusted to match the calibrated reference.

Scopemeter and Dig Voltmeter were calibrated to be used as normal force references 1 and 2 respectively.

SHEAR CALIBRATION:

The load cells were set up as shown in Figure 1, then loaded. The gain of the shear conditioner was adjusted such that the shear reading matched that of Dig Voltmeter.

MOMENT CALIBRATION:

The load cells were set up as shown in Figure 2, then loaded. The gain of the moment conditioner was adjusted such that the moment reading matched that of Dig Voltmeter times the distance from the loading point to moment strain gages.

Distance from moment gages to: **top** = **0.000 in** bottom = **0.000 in**



Department of Civil, Structural, and Environmental Engineering

SEESL Structural Engineering and Earthquake Simulation Laboratory SEESL

212 Ketter Hall, North Campus, Buffalo, NY 14260-4300

Fax: (716) 645-3733 Tel: (716) 645 5400 X 16

<http://www.nees.buffalo.edu>

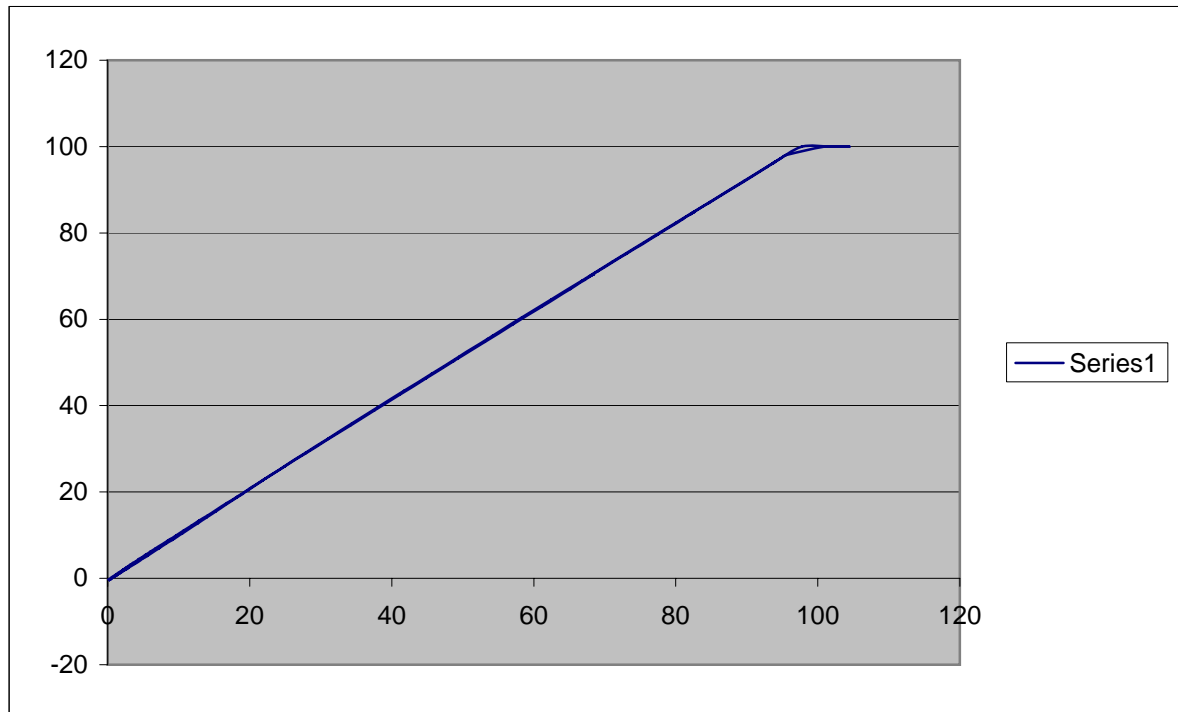
Calibration Data:

Certificate Number: UB-2006-07-24-06

[Normal Calibration Data](#)

Graph:

Normal Calibration





Department of Civil, Structural, and Environmental Engineering

SEESL Structural Engineering and Earthquake Simulation Laboratory SEESL

212 Ketter Hall, North Campus, Buffalo, NY 14260-4300

Fax: (716) 645-3733 Tel: (716) 645 5400 X 16

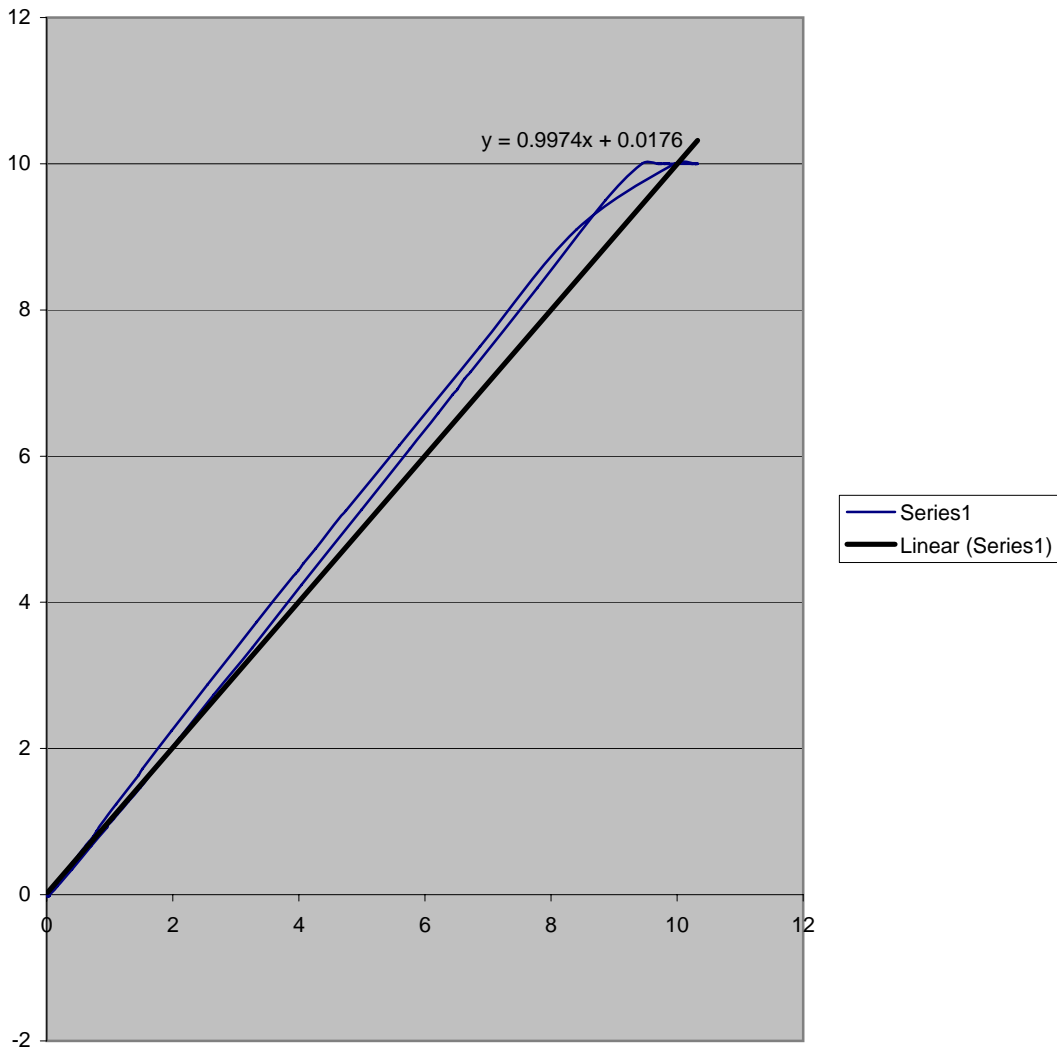
<http://www.nees.buffalo.edu>

[Shear Calibration Data](#)

Graph:

Shear Calibration RED L1 2v/kip

SX





Department of Civil, Structural, and Environmental Engineering

SEESL Structural Engineering and Earthquake Simulation Laboratory SEESL

212 Ketter Hall, North Campus, Buffalo, NY 14260-4300

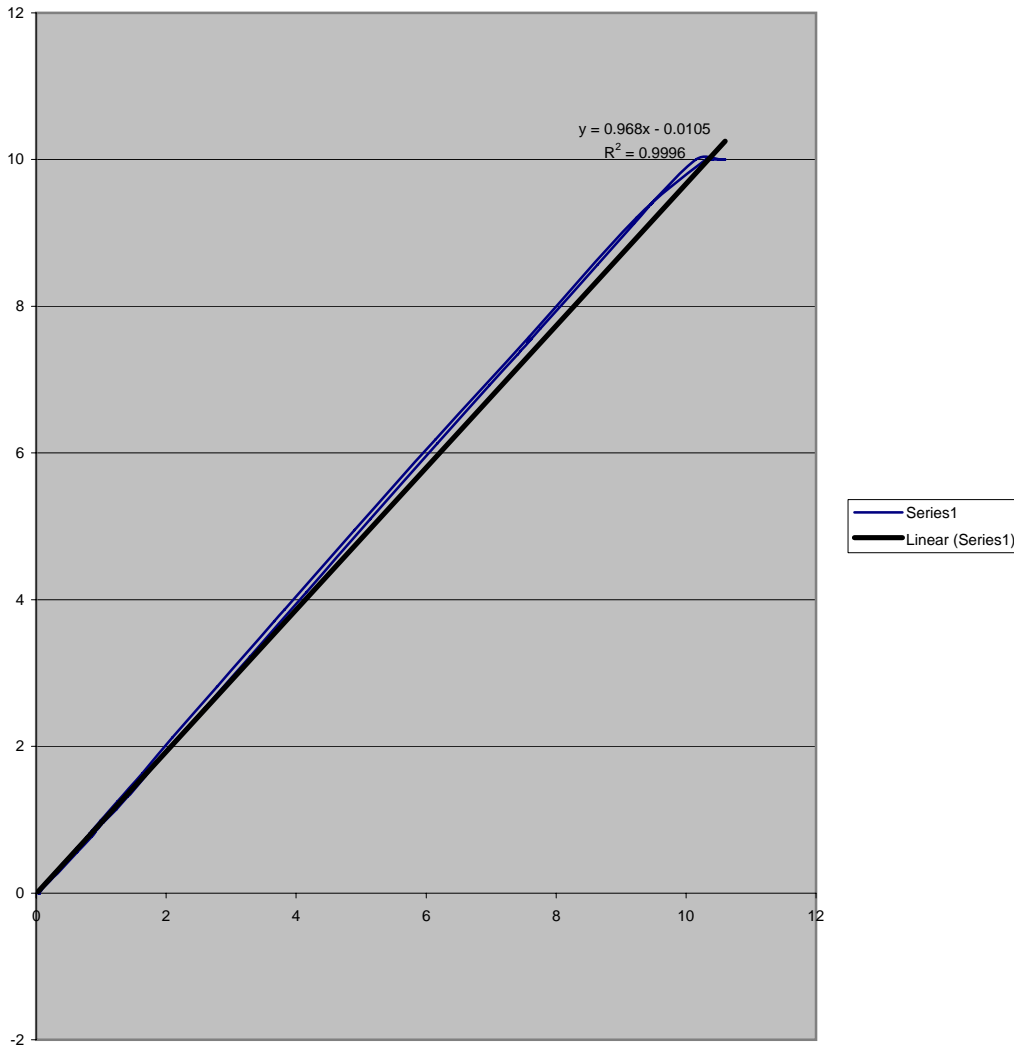
Fax: (716) 645-3733 Tel: (716) 645 5400 X 16

<http://www.nees.buffalo.edu>

Moment Calibration Data

Graph:

Shear Red Load Cell-02
SY





Department of Civil, Structural, and Environmental Engineering

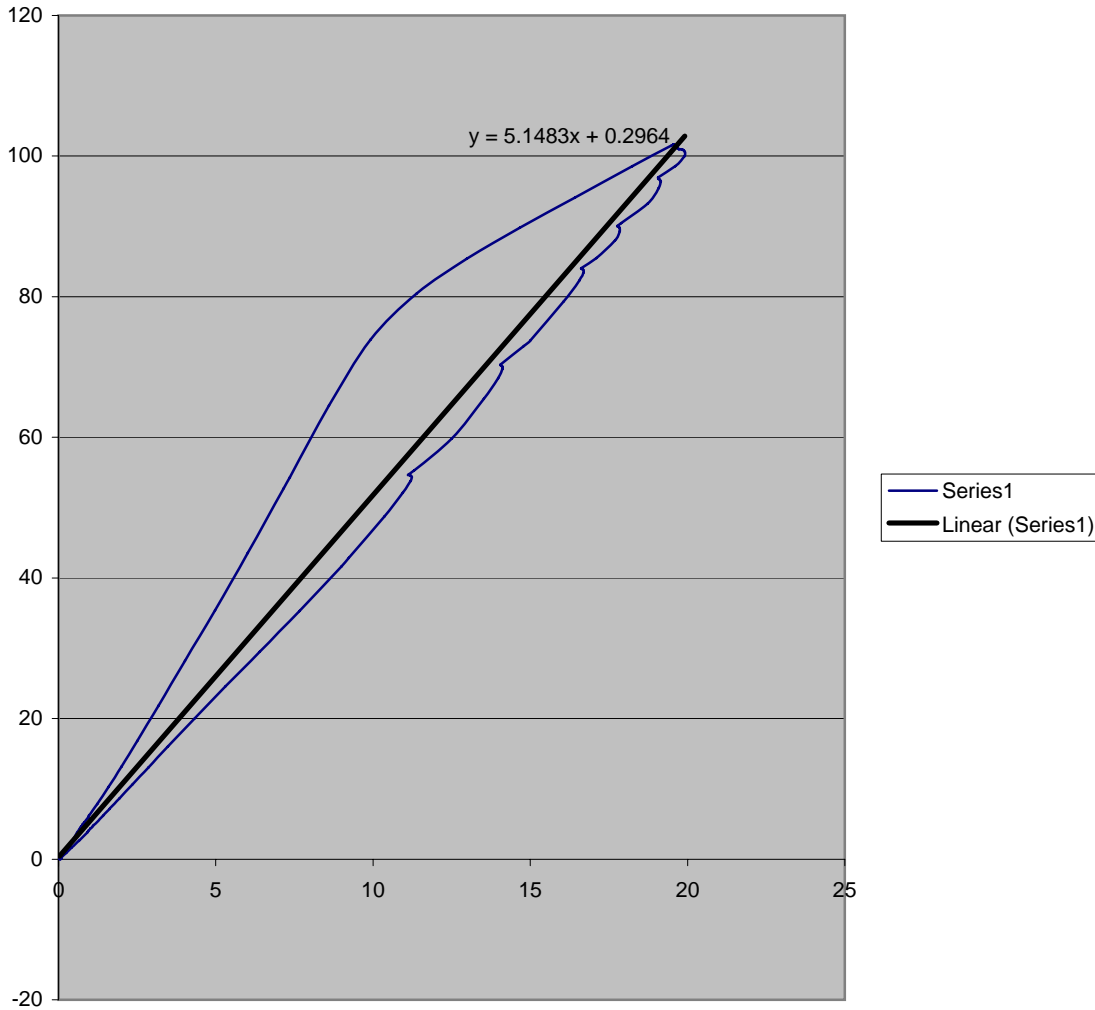
SEESL Structural Engineering and Earthquake Simulation Laboratory **SEESL**

212 Ketter Hall, North Campus, Buffalo, NY 14260-4300

Fax: (716) 645-3733 Tel: (716) 645 5400 X 16

<http://www.sees.buffalo.edu>

Moment Red Load Cell
MX





Department of Civil, Structural, and Environmental Engineering

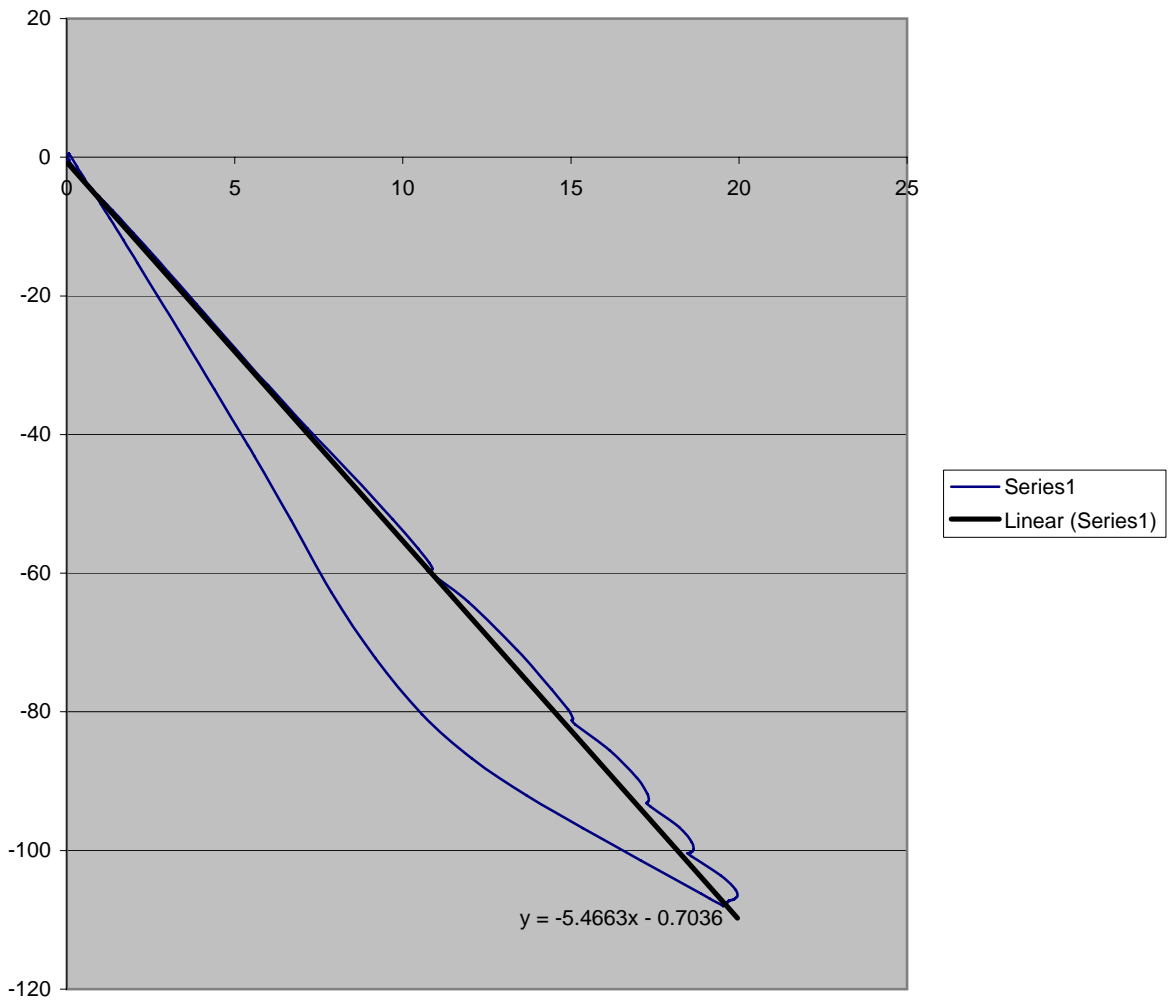
SEESL Structural Engineering and Earthquake Simulation Laboratory SEESL

212 Ketter Hall, North Campus, Buffalo, NY 14260-4300

Fax: (716) 645-3733 Tel: (716) 645 5400 X 16

<http://www.nees.buffalo.edu>

Moment Red Load Cell
MY





Department of Civil, Structural, and Environmental Engineering

SEESL Structural Engineering and Earthquake Simulation Laboratory SEESL

212 Ketter Hall, North Campus, Buffalo, NY 14260-4300

Fax: (716) 645-3733 Tel: (716) 645 5400 X 16

<http://www.sees.buffalo.edu>

Calibration Factors:

Comments:

Ax ± 0.1 V/kip

Sx 2V/kip

SY 2V/kip

MX .05V/kip/in

MY .05V/kip/in

Personnel Identification:

Name:

Chris Budden

Company:

UB

Signature:

Date:

7/21/2006

Calibration Period:

Cal. Date:

7/21/2006

Cal. Exp. Date:

7/21/2007