



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-2006-01-31-03**

Instrument Description: **Black Five-Channel Load Cell 3** Location: **SEESL**

Test Equipment

Instrument Identification:

	Type of Instrument:	Instrument Name:	Serial Number:	Instrument Range:
N	Force Transducer	LC 3 CH-N	3	± 100 kip
Sx	Force Transducer	LC 3 CH-Sx	3	± 20 kip
Sy	Force Transducer	LC 3 CH-Sy	3	± 20 kip
Mx	Force Transducer	LC 3 CH-Mx	3	± 220 kip-in
My	Force Transducer	LC 3 CH-My	3	± 220 kip-in

Conditioner Identification:

	Model Number	Serial Number:	Gain:	Excitation:
N	Pacific 6000	0: 3: 1	1000	10 V
Sx	Pacific 6000	0: 3: 2	1000	10 V
Sy	Pacific 6000	0: 3: 3	1000	10 V
Mx	Pacific 6000	0: 4: 0	500	10 V
My	Pacific 6000	0: 4: 1	500	10 V

Readout Device Identification:

	Model Number	Serial Number:	Channel:
N	Pacific DAQ		
Sx	Pacific DAQ		
Sy	Pacific DAQ		
Mx	Pacific DAQ		
My	Pacific DAQ		

Calibration Factors:

	Full Scale Output:	Unamplified Full Scale Output	Amplified Output per Eng. Unit:
N	± 10 V	10.0 mV/Full Scale	± 0.100 V/kip
Sx	± 10 V	10.0 mV/Full Scale	± 0.500 V/kip
Sy	± 10 V	10.0 mV/Full Scale	± 0.500 V/kip
Mx	± 10 V	20.0 mV/Full Scale	± 0.045 V/kip-in
My	± 10 V	20.0 mV/Full Scale	± 0.045 V/kip-in



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Reference Equipment

Reference Instrument Identification:

1. 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	UB-2005-03-02	3/2/2005	3/2/2006
UB#300kip			
2. Type of Instrument:	Instrument Name:	Serial Number:	Instrument Range:
DMM	Fluke 123	DM 8680589	NA
Calibration Trace:	Certificate Number:	Cal. Date:	Cal. Exp. Date:
			[7/6/2006
3. Type of Instrument:	Instrument Name:	Serial Number:	Instrument Range:
Signal conditioner	Vishay 2310	088791	10v
Calibration Trace:	Certificate Number:	Cal. Date:	Cal. Exp. Date:
			3-2-2005

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 of Buffalo		
Buffalo NY 14225		
2. Address:	Phone/Website:	Accreditation:
AL Design co.		
3. Address:	Phone/Website:	Accreditation:
Caltronix		

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Calibration Information

Calibration Procedure:

Basic Description:

AXIAL CALIBRATION:

The normal channel of the load cell was calibrated simultaneously and in series with three other identical load cells against the UB#300k reference load cell using the Tinius Olsen machine.

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 one half that of UB#300kip.

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 UB#300kip divided by two times the distance labeled "Arm".

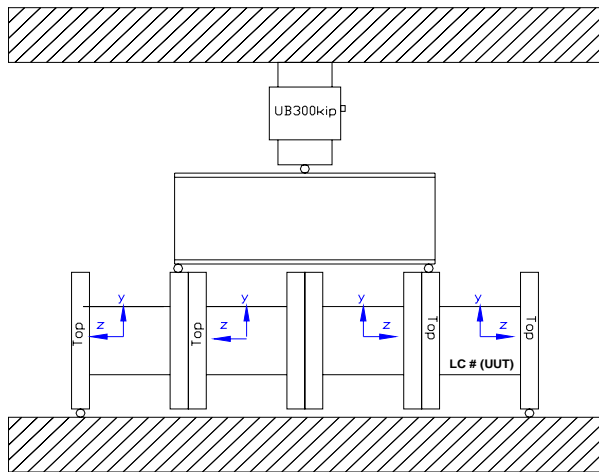


Figure 1: Shear Configuration (-y direction)

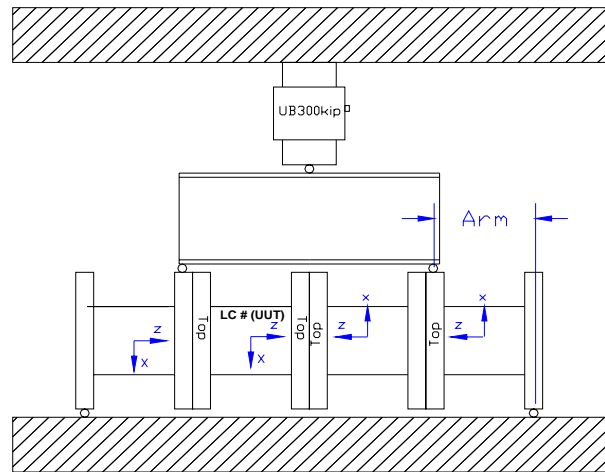


Figure 2: Moment Configuration (x-direction)

Standard:



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Calibration Data:

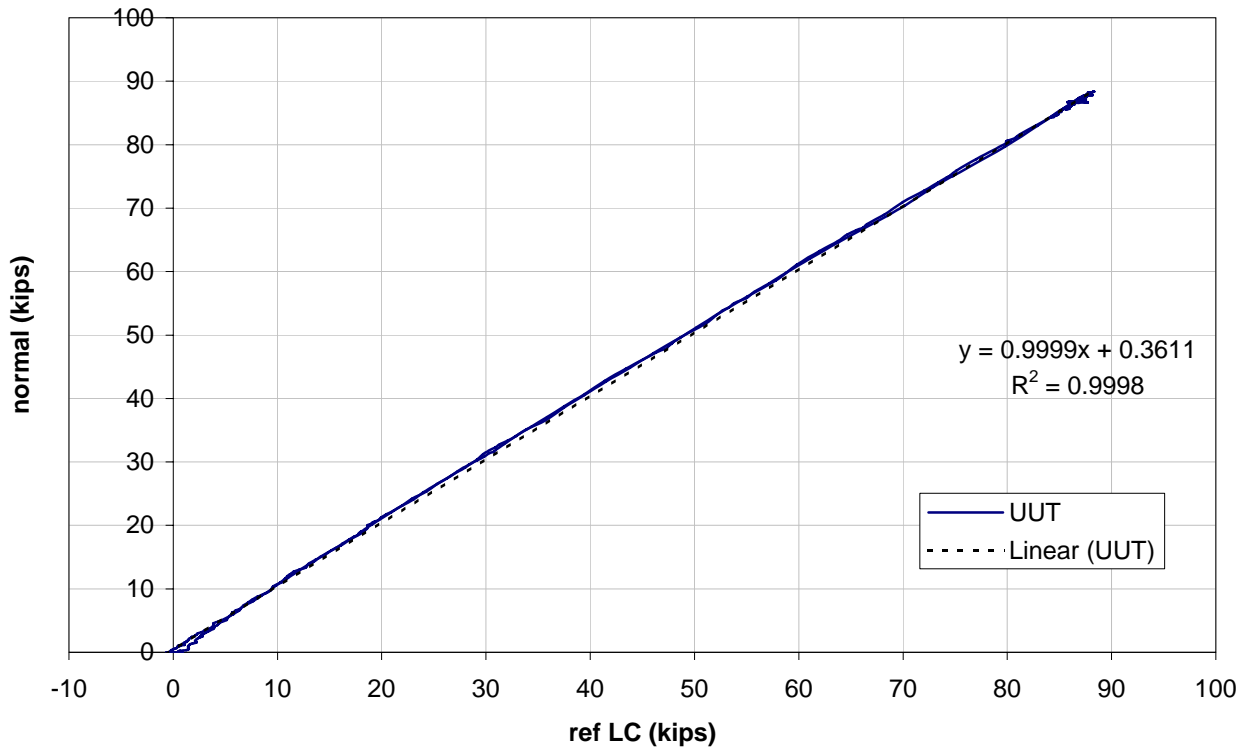
Certificate Number: UB-2006-01-31-03

[Normal Calibration Data](#)

Graph:

Normal Calibration

LC 3 CH-N





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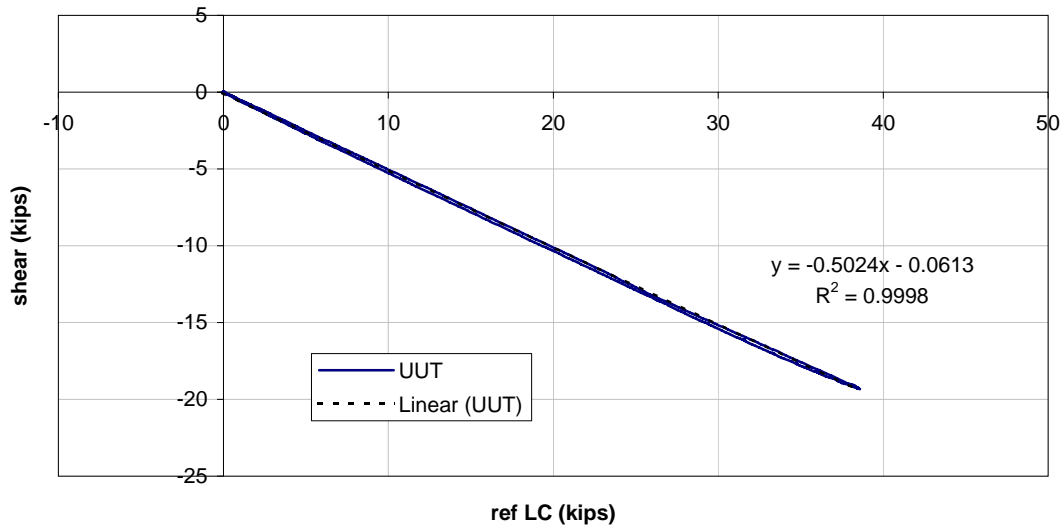
<http://www.nees.buffalo.edu>

[Shear Calibration Data](#)

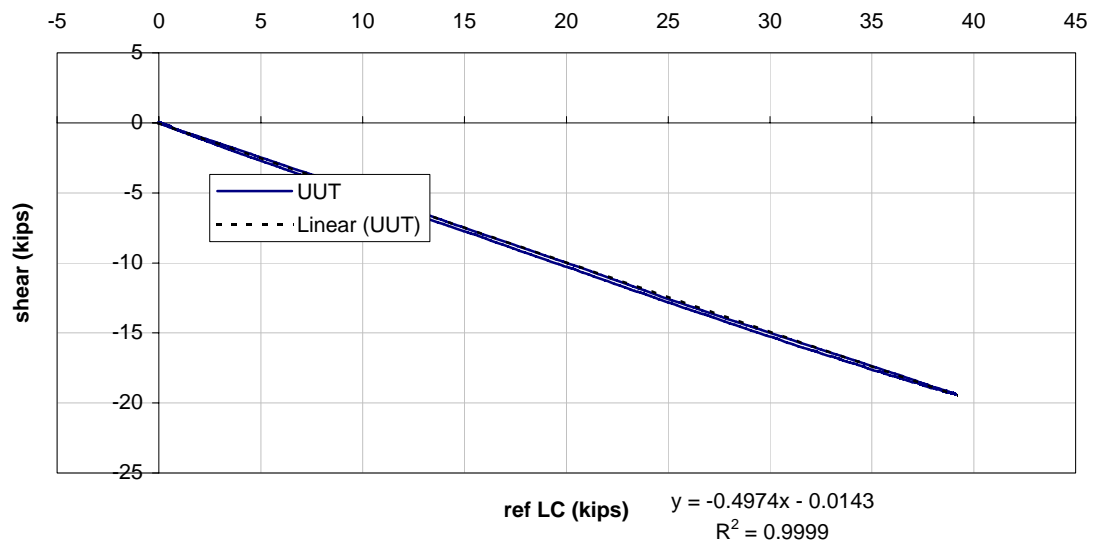
Graph:

Shear Calibration Black Five-Channel Load Cell 3 (± 0.5 V/kip)

LC 3 CH-Sx



LC 3 CH-Sy





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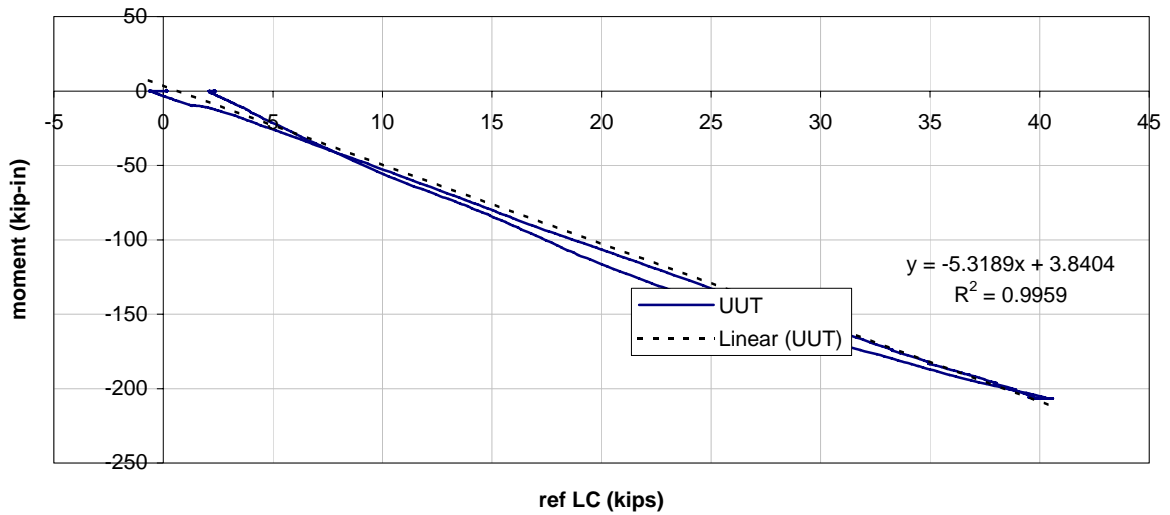
K = 0.9999

Moment Calibration Data

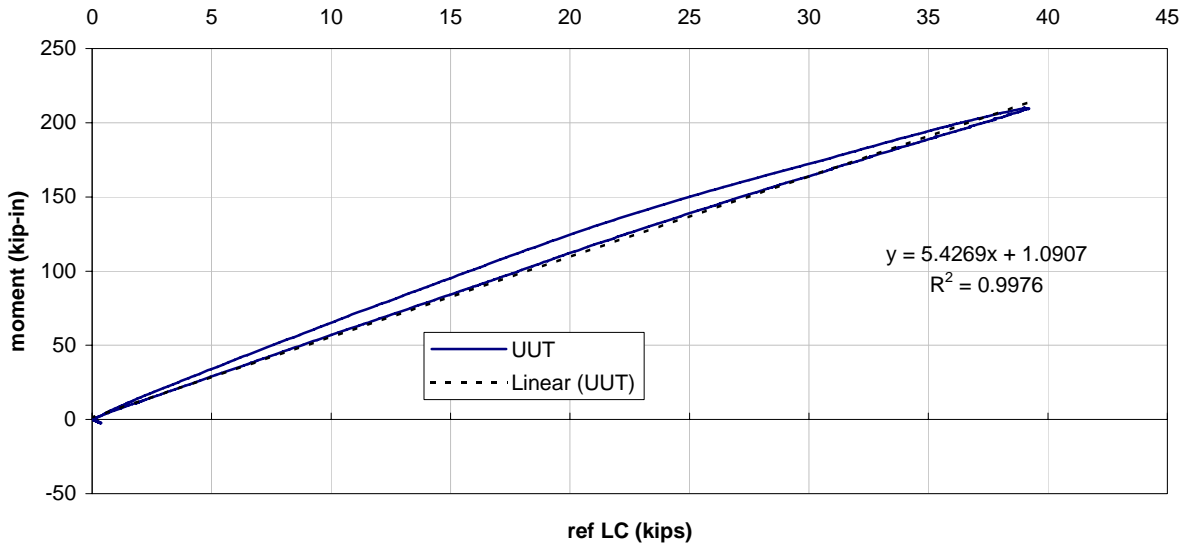
Graph:

Moment Calibration Black Five-Channel Load Cell 3 (± 0.5 V/kip)

LC 3 CH-Mx



LC 3 CH-My





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ref LC (kips)

Calibration Factors:

Comments:

- Ax** ± 0.1 V/kip
- Sx** ± 0.5 V/kip
- Sy** ± 0.5 V/kip
- Mx** ± 0.045 V/kip-in
- My** ± 0.045 V/kip-in

Personnel Identification:

Name:

Christopher Budden

Company:

UB

Signature:

Date:

1/31/2006

Michael Pollino

UB

1/31/2006

Calibration Period:

Cal. Date:

1/31/2006

Cal. Exp. Date:

1/31/2007



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