



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.seesl.buffalo.edu>

Calibration Certificate

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

Instrument Description: **Black Five-Channel Load Cell 1** Location: **SEESL**

Test Equipment

Instrument Identification:

| | Type of Instrument: | Instrument Name: | Serial Number: | Instrument Range: |
|----|---------------------|------------------|----------------|-------------------|
| N | Force Transducer | LC 1 CH-N | 1 | ± 100 kip |
| Sx | Force Transducer | LC 1 CH-Sx | 1 | ± 20 kip |
| Sy | Force Transducer | LC 1 CH-Sy | 1 | ± 20 kip |
| Mx | Force Transducer | LC 1 CH-Mx | 1 | ± 220 kip-in |
| My | Force Transducer | LC 1 CH-My | 1 | ± 220 kip-in |

Conditioner Identification:

| | Model Number | Serial Number: | Gain: | Excitation: |
|----|--------------|----------------|-------|-------------|
| N | Pacific 6000 | 0: 0: 3 | 1000 | 10 V |
| Sx | Pacific 6000 | 0: 1: 0 | 1000 | 10 V |
| Sy | Pacific 6000 | 0: 1: 1 | 1000 | 10 V |
| Mx | Pacific 6000 | 0: 1: 2 | 500 | 10 V |
| My | Pacific 6000 | 0: 1: 3 | 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: |
| Calibration Trace: | Certificate Number: | Cal. Date: | Cal. Exp. Date: |
| 3. Type of Instrument: | Instrument Name: | Serial Number: | Instrument Range: |
| Calibration Trace: | Certificate Number: | Cal. Date: | Cal. Exp. Date: |

Calibration Factors:

| 1. Full Scale Output: | Unamplified Full Scale Output | Amplified Output per Eng. Unit: |
|-----------------------|-------------------------------|---------------------------------|
| (update) | (update) | (update) |
| (update) | (update) | (update) |
| (update) | (update) | (update) |

Reference Lab Information:

| 1. Address: | Phone/Website: | Accreditation: |
|--|----------------|----------------|
| Ketter Hall SEESL University of Buffalo Buffalo 14225 | | |
| 2. Address: | Phone/Website: | Accreditation: |
| AL Design | | |
| 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".

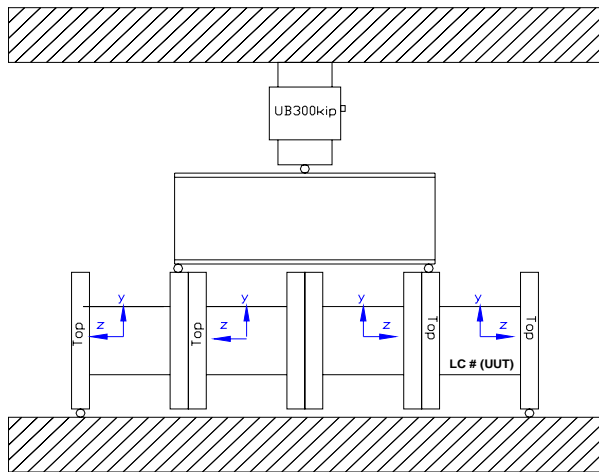


Figure 1: Shear Configuration (-y direction)

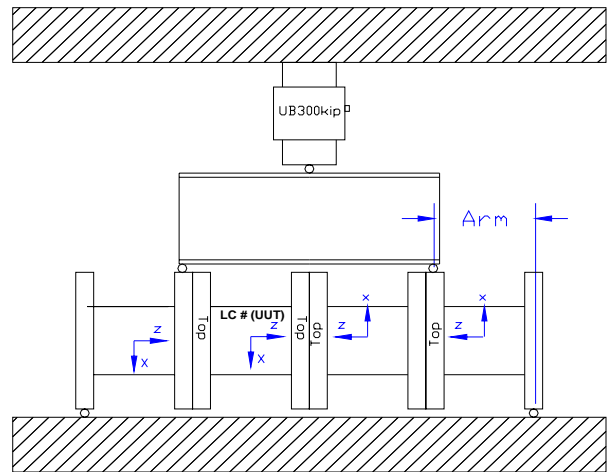


Figure 2: Moment Configuration (x-direction)

Standard:



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Calibration Data:

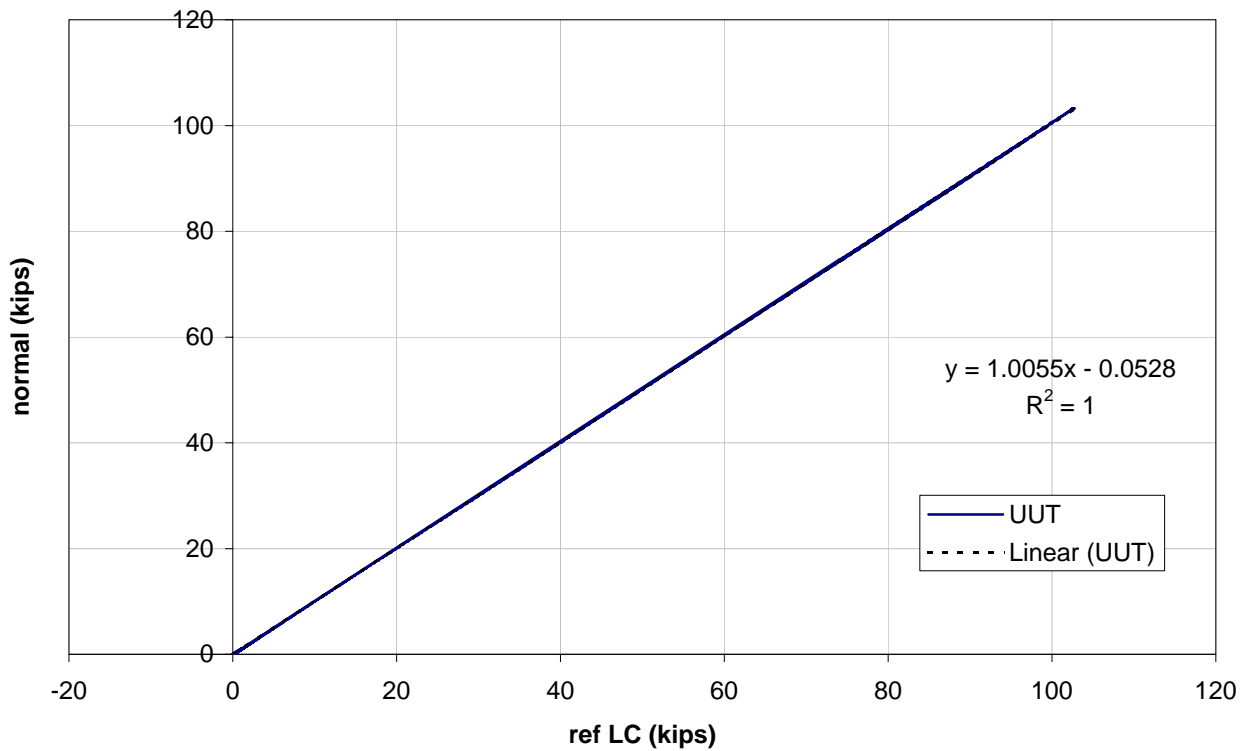
Certificate Number: UB-2006-01-31-01

[Normal Calibration Data](#)

Graph:

Normal Calibration

LC 1 CH-N





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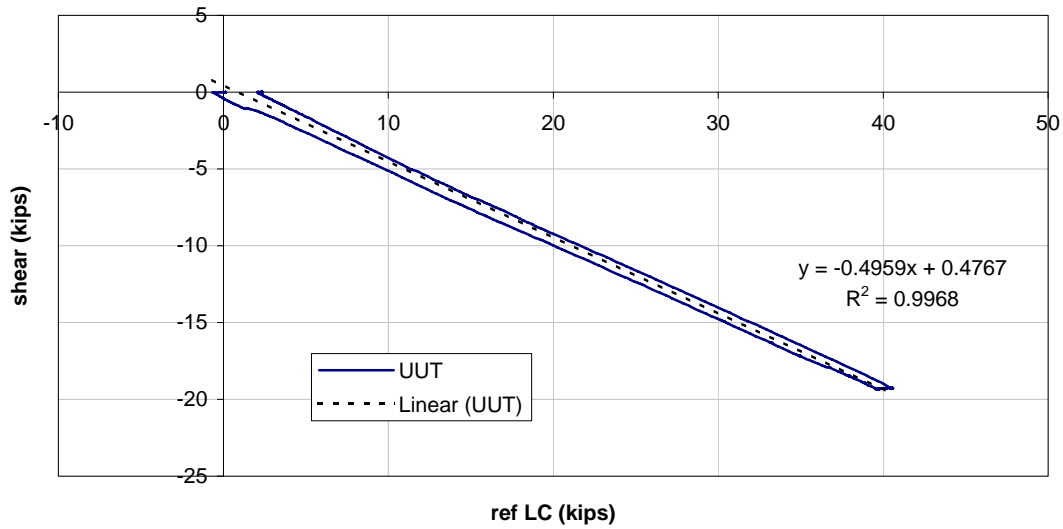
<http://www.nees.buffalo.edu>

[Shear Calibration Data](#)

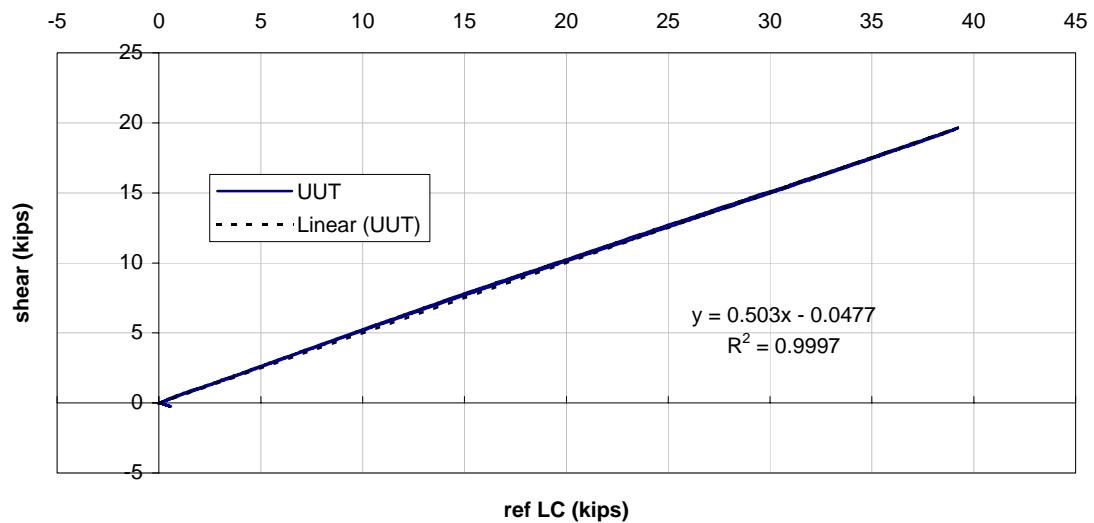
Graph:

Shear Calibration Black Five-Channel Load Cell 1 (± 0.5 V/kip)

LC 1 CH-Sx



LC 1 CH-Sy





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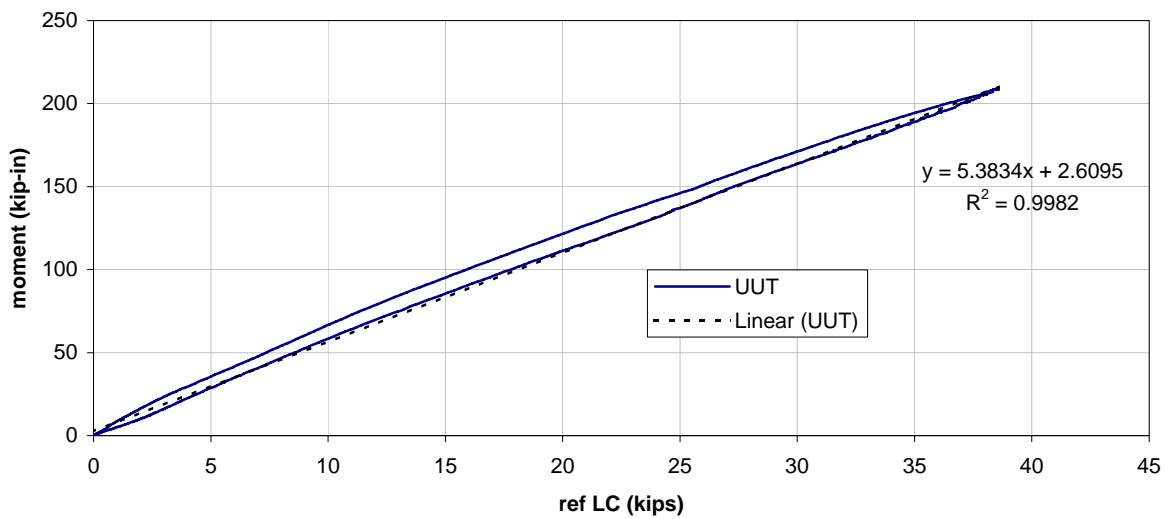
<http://www.nees.buffalo.edu>

Moment Calibration Data

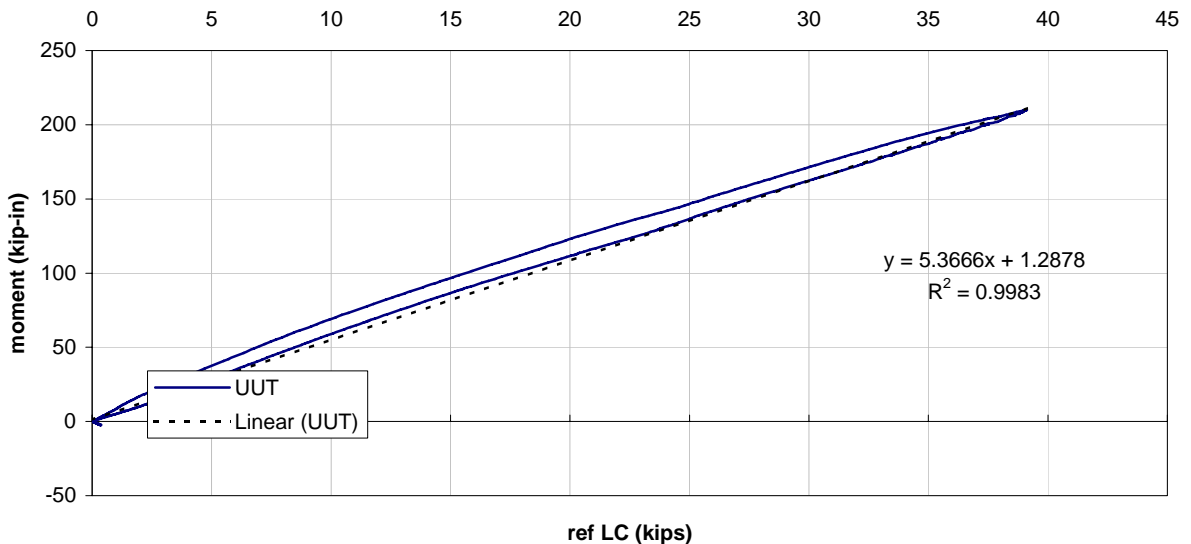
Graph:

Moment Calibration Black Five-Channel Load Cell 1 (± 0.5 V/kip)

LC 1 CH-Mx



LC 1 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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