

# Report Attachments

The purpose of this document is to describe and illustrate many of the common elements that you should include as attachments to reports submitted for lab reports in CE207L, CE330L, CE354L and CE415L. Always refer to the course requirements to know whether certain elements must be added to or omitted from the following list.

The elements to include will normally be:

- Summary of the results (Example 1)
  - generally like the example shown below, but with suitable changes for the specific experiment covered
  
- Sample calculations (Example 2)
  - Include a sample of each calculation performed in your analysis so that the reviewer can understand your analysis process. All intermediate spreadsheet calculations must also be demonstrated with a sample calculation.
  - Use actual test data to work through the calculations. You should mention where each numerical value used in the calculation comes from and if it represents a typical value or is for a specific relevant condition or case (i.e, at a maximum or minimum point, for a particular flowrate, a particular moisture content, a specific temperature, etc.).
  - Unless specified otherwise, sample calculations must be typed (e.g., using a word processor, Microsoft Equation, MathCad, or similar program) for a clean, professional appearance.
  - Show all relevant units and how they cancel through the calculation process.
  - The end result for each calculation must be clearly identified.
  
- Data tables (Example 3)
  - Label each table with a table number, title, date, and include appropriate units in the table heading.
  - Show the appropriate number of significant digits.
  
- Graph plots (Example 4)
  - Show data points on all plots unless noted otherwise.
  - Plotted line/curves should be drawn for a best-fit representation of the curvilinear nature of the data -- do not simply connect-the-dots using line segments. You may use a French curve if fitting a curve by hand or may use a software smoothing function that does not simply connect points with curves.
  - If you use color, be sure to use shades that will copy using a photocopier.
  - Label each plot with a figure number, title, date, appropriate axis range and units.
  - Unless noted otherwise, each plot should cover about one-half of an 8½ x 11-inch page. Font size may be varied more than that specified for the report body – strive to keep the report format clean.

**SUMMARY OF RESULTS (example)**  
**FLUID PRESSURE MEASUREMENT CALIBRATIONS – WATER COLUMNS**  
**CE207L Group 4 Report 2**

**student name**

**1/9/2009**

Instrumentation

Pressure transducer model ..... Durham E-120

Pressure transducer serial number ..... 100

Signal conditioner/display model ..... MM50

Signal conditioner/display serial number..... 12

Cylinders

Cylinder A diameter..... 1.9 inch

Cylinder B diameter..... 1.0 inch

Cylinder C diameter..... 0.6 inch

Regression equations

Note: P= calibrated pressure (psi); V= transducer signal output (mV);

H= water column height (inch)

Part A, Calibration ..... $P = 0.503*V+0.043$

Part B, cylinder A ..... $P = 0.153*H+0.048$

" , " B..... $P = 0.150*H+0.053$

" , " C..... $P = 0.152*H+0.033$

Part C, cylinder A ..... $P = 0.151*H+0.043$

" , " B..... $P = 0.152*H+0.035$

" , " C..... $P = 0.153*H+0.038$

**Example 1 – Summary of Results**

Sample Calculations	CE354L Unconfined Compressive Strength Test	1/9/2009	name	1 of 1
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Soil description: light brown silty clay

$$\text{Average initial sample height: } h_0 = \frac{(5.52 + 5.50 + 5.54) \text{ inch}}{3} = \underline{5.52 \text{ inch}}$$

$$\text{Average initial sample diameter: } d_0 = \frac{(2.72 + 2.83 + 2.81) \text{ inch}}{3} = \underline{2.79 \text{ inch}}$$

$$\text{Initial cross-sectional area: } A_0 = \frac{1}{4} \pi d_0^2 = \frac{1}{4} \pi \left( \frac{2.79 \text{ inch}}{\frac{12 \text{ inch}}{1 \text{ ft}}} \right)^2 = \underline{0.0425 \text{ ft}^2}$$

Compute the axial unit strain,  $\varepsilon$ , at a given load level (the remaining calculations correspond to the maximum load level recorded):

$$\text{Axial load applied, } P = 192.7 \text{ lbs}$$

$$\text{Axial deformation, } \Delta h = 0.760 \text{ inch}$$

$$\varepsilon = \frac{\Delta h}{h_0} = \frac{0.760 \text{ inch}}{5.52 \text{ inch}} = \underline{0.138}$$

$$\text{Compute the corresponding cross-sectional area: } A = \frac{A_0}{1 - \varepsilon} = \frac{0.0425 \text{ ft}^2}{1 - 0.138} = \underline{0.0493 \text{ ft}^2}$$

$$\text{Compute the corresponding unit stress: } q_u = \frac{P}{A} = \frac{192.7 \text{ lbs}}{0.0493 \text{ ft}^2} = \underline{3909 \frac{\text{lbs}}{\text{ft}^2}}$$

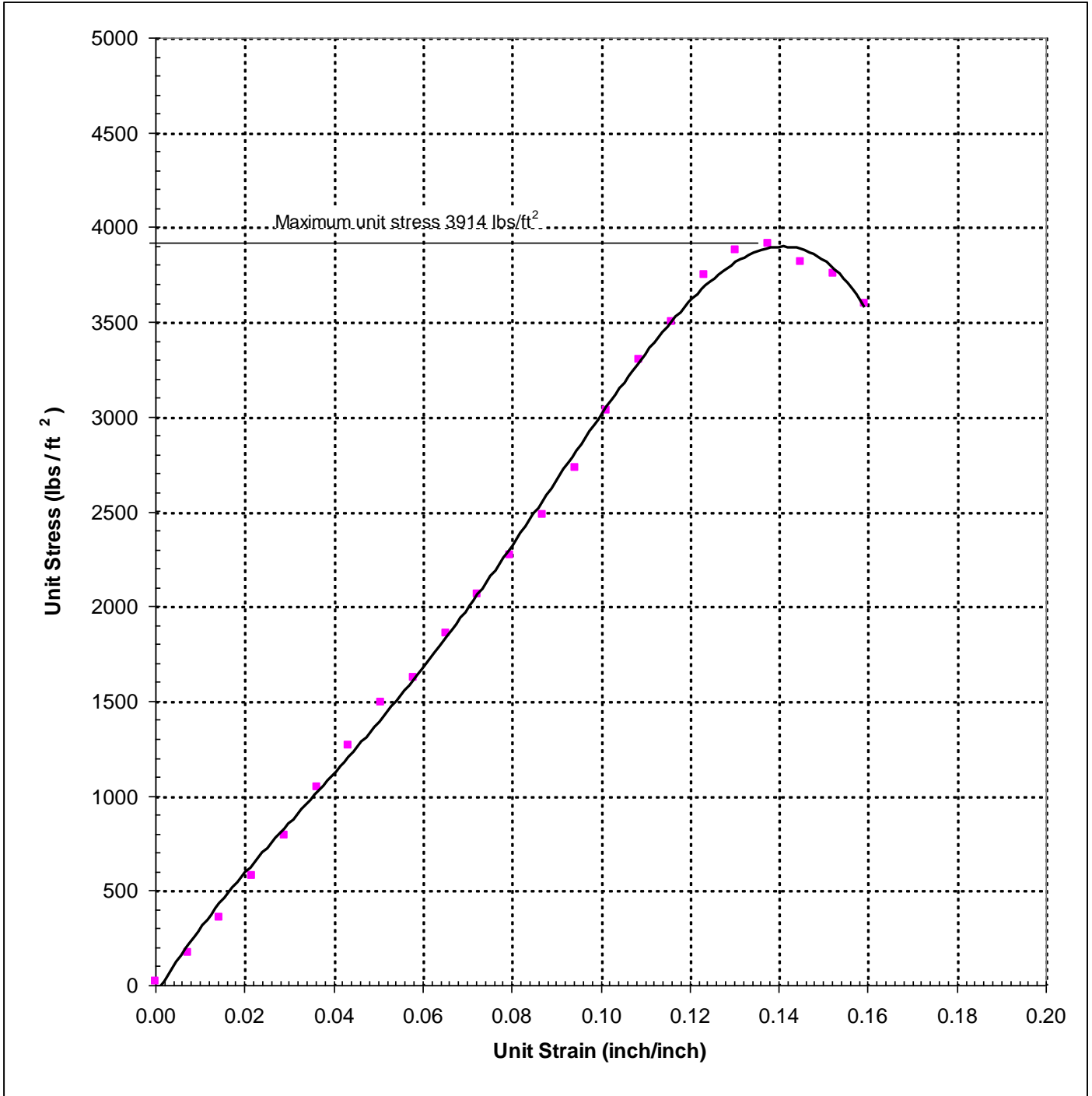
$$\text{Compute the maximum cohesion: } c_u = \frac{q_u}{2} = \frac{3914 \frac{\text{lbs}}{\text{ft}^2}}{2} = \underline{1957 \frac{\text{lbs}}{\text{ft}^2}}$$

**Table 1. Unconfined Compressive Strength Data  
CE354L Group 4  
Date of Test: 1/9/2009  
Clay E. Sample**

		Initial sample height, $h_0$	5.52		<i>inch</i>
		Initial sample diameter, $d_0$	2.79		<i>inch</i>
		Initial cross-sectional area, $A_0$	0.0425		$ft^2$
	<b>Deformation</b>	<b>Load</b>	<b>Unit Strain</b>	<b>Area</b>	<b>Load per Unit Area</b>
	<i>(inch)</i>	<i>(lbs)</i>	<i>(inch/inch)</i>	<i>(<math>ft^2</math>)</i>	<i>(lbs/<math>ft^2</math>)</i>
	0.000	1.0	0	0.0425	24
	0.040	7.4	0.007	0.0428	173
	0.080	15.5	0.014	0.0431	360
	0.120	25.2	0.022	0.0434	581
	0.160	34.6	0.029	0.0437	791
	0.200	46.0	0.036	0.0441	1044
	0.240	56.2	0.043	0.0444	1266
	0.280	66.9	0.051	0.0447	1496
	0.320	73.3	0.058	0.0451	1626
	0.360	84.3	0.065	0.0454	1856
	0.400	94.5	0.072	0.0458	2065
	0.440	104.7	0.080	0.0461	2270
	0.480	115.3	0.087	0.0465	2480
	0.520	127.9	0.094	0.0469	2729
	0.560	143.4	0.101	0.0472	3035
	0.600	157.2	0.109	0.0476	3300
	0.640	168.2	0.116	0.0480	3502
	0.680	181.4	0.123	0.0484	3746
	0.720	189.4	0.130	0.0488	3879
	0.760	192.7	0.138	0.0492	3914
	0.800	189.4	0.145	0.0497	3815
	0.840	188.1	0.152	0.0501	3756
	0.880	181.7	0.159	0.0505	3597

**Example 3 – Table of Test Data**

**Figure 2. Unit Stress vs. Unit Strain  
Unconfined Compressive Strength Test  
Test Date: 1/8/2009  
Clay E. Sample**



**Example 4 – Plot of Test Data**