CNWRA
CONTROLLED
COPY 016

See page 10 for initial notebook entries Daniel D. Kan

10/4/90 THE FOLLOWING NOTES WERE TRANSFERRED FROM LABORATORY LOG SHEETS. THIS NOTEBOOK WAS RECIEVED ON 10/3/90. P

9/27/90 10:00 AM - PREPARED GROUT FOR SETTING TUFF SAMPLE SRM 25.1.1 IN THE LOWER BOX ASSEMBLY. RECIPE FOR GROUT MIXTURE WAS AS FOLLOWS:

2.5 POUNDS WATER
30 GRAMS LOMAR D
5 POUNDS HI EARLY CEMENT
12.5 POUNDS SAND

THE TEST SAMPLE WAS SUPPORTED BY FOUR SPACERS IN THE BOTTOM OF THE BOX. THE SPACERS WERE SIZED TO OPTIMIZE A LEVEL AS POSSIBLE SURFACE. WITH THE SPECIMEN REMOVED, GROUT WAS ADDED TO JUST ABOVE THE SPACERS. THE TEST SAMPLE WAS LOWERED INTO THE BOX. AN AMOUNT OF GROUT EXTRUDED UP THE SIDES OF THE SPECIMEN. THE SIDES WERE FILLED WITH GROUT AND LEVELED TO THE TOP OF THE BOX.

13:00 - THE TOP BOX WAS PREPARED FOR GROUT. A SEAL WAS CONSTRUCTED OF FOAM RUBBER. THE SEAL WAS PLACED AROUND THE BOTTOM SPECIMEN. THE UPPER BOX, WITH THE TOP PLATE REMOVED, WAS PLACED OVER THE BOTTOM SPECIMEN. THE SIDE PLATES WERE INSTALLED. TOP SPECIMEN SRM 25.1.2 WAS LOWERED INTO PLACE.

14:00 - GROUT WAS MIXED USING THE ABOVE RELIPE. THE GROUT WAS PUT AROUND THE SIDES OF THE TOP SPECIMEN. THE SPECIMEN WAS THEN COVERED WITH GROUT AND ~~COVERED~~ P ~~COVERED~~ LEVELED TO THE TOP OF THE UPPER BOX. THE TOP PLATE WAS INSTALLED. P

9/28/90 09:30 - THE TOP PLATE WAS REMOVED TO EXAMINE ANY SHRINKAGE OF THE GROUT IN THE UPPER BOX. NO SHRINKAGE OR ANOMOLIES WERE NOTED. THE SPECIMEN WAS THEN SEPARATED AND THE FOAM RUBBER SEAL WAS REMOVED FROM THE TOP SPECIMEN. THE GROUT WAS NOT UNIFORM AROUND THE SIDES OF THE SPECIMEN. PER DAN KANA, THE GROUT WAS CHIPPED OUT TO THE POINT OF UNIFORMITY AND NEW GROUT WAS USED TO PATCH AND FILL AROUND THE TOP SPECIMEN. ——— P

10/1/90 08:00 - THE MACHINE WAS REBUILT USING SPECIMEN NUMBER SRM 25.1.1/25.1.2 FOR PHOTOGRAPHING. NO TRANSDUCERS OR SENSORS WERE ATTACHED TO THE SAMPLE AT THIS TIME.
10/2/90 THE APPARATUS WAS PHOTOGRAPHED. A
10/3/90 08:30 - THE APPARATUS WAS TAKEN APART AND THE TEST SPECIMEN SRM 25.1.1/25.1.2 WAS ~~READY~~ PREPARED TO BE PUT INTO THE OVEN.
09:46 - THE SPECIMEN WAS PUT INTO THE OVEN AND THE TEMPERATURE WAS SET AT 105°C. DURATION WAS TO BE 24 HOURS. A

10/3/90 9:46 AM

To Dr. Kama
Date 10/1 Time 8:42

WHILE YOU WERE OUT

M Simon Haining
of
Phone 5209
Area Code Number Extension

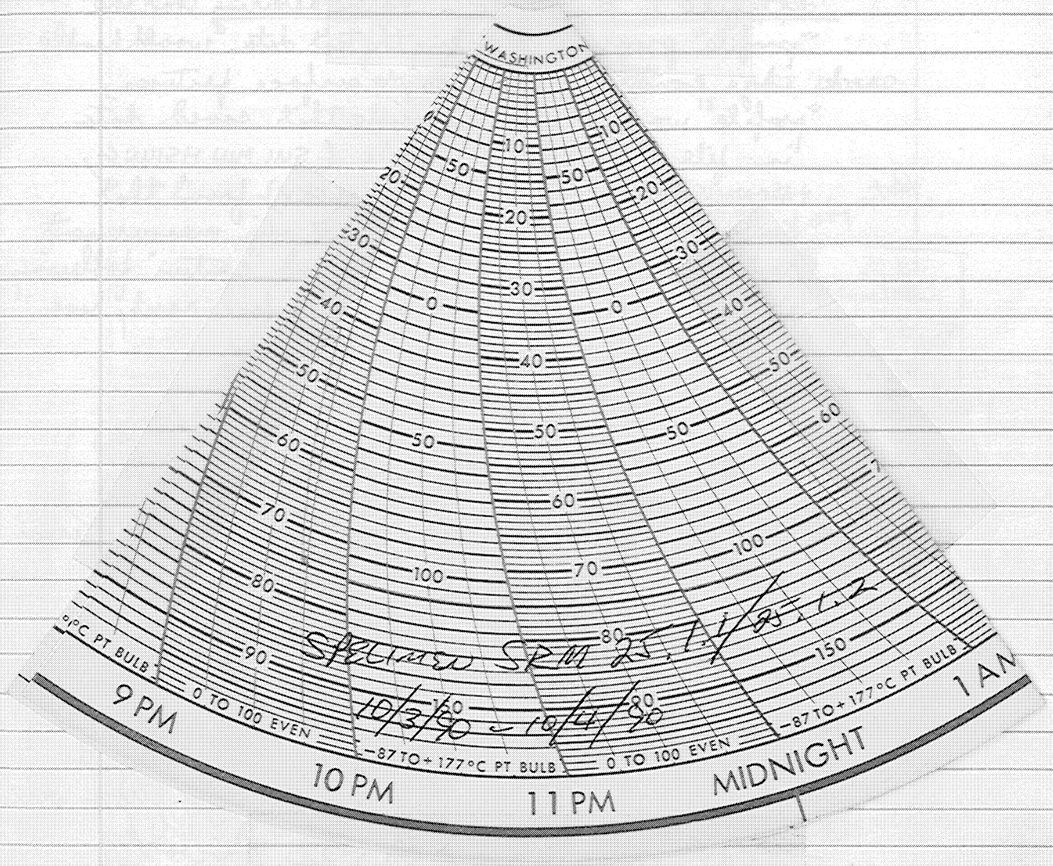
TELEPHONED		PLEASE CALL	
CALLED TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		URGENT	
RETURNED YOUR CALL			

Message "The temperature we are looking at is 105°C ± 3°C. for a period of 24 hours."

DePinna
Operator

AMPAD EFFICIENCY® 23-021 CARBONLESS

10/4/90 09:50 SPECIMEN SRM 25.1.1/25.1.2 WAS REMOVED FROM THE OVEN. A 24 HOUR CHART WAS USED ON THE CHART RECORDER. A 7-DAY CHART SHOULD HAVE BEEN USED. THERE WERE NO VISIBLE CRACKS IN THE GROUT. A



A

A

10/5/90 08:52

Measurement of profile on the joint face of SRM25.1.1 started. Data file test1.srm was assigned. Measurement started from the edge near horizontal actuator side.

NOTES FROM DOUG MICHALSKY

- Reference points for "test1.srm" were placed in datafile "test1.hdr". After assuring that the "profile" program for taking the test data would handle rock edge conditions and abrupt surface features, "profile" was run in a mode that saved data in file "test1.srm". We (SUI MIN HSIUNG, DENNIS SCHEIDT, DOUG MICHALSKY) found that limiting the Keyence LZ-2100 Z-axis measurement range to ±5 mm gave us good "contour" following ability, i.e., points on the rock surface rarely have a slope of ~~less than~~ greater than

  (MAX RANGE) $\frac{\pm 8.8\text{mm} - \pm 5.0\text{mm}}{0.050 \text{ inches}}$.

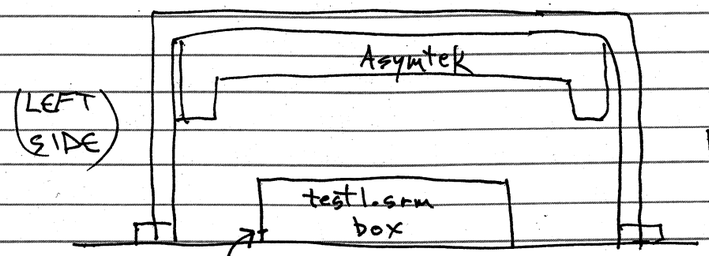
  test1.srm was completed successfully and test2.srm was begun. Only 1 out-of-range error was noted for test1.srm.

- Reference points for test2.srm were placed in computer data file "test2.hdr". Test data points are placed separately in file "test2.srm". 2 out-of-range errors were noted at the beginning of the test on the very front left corner of the rock specimen. 132 out-of-range errors were reported (see sketch next page).

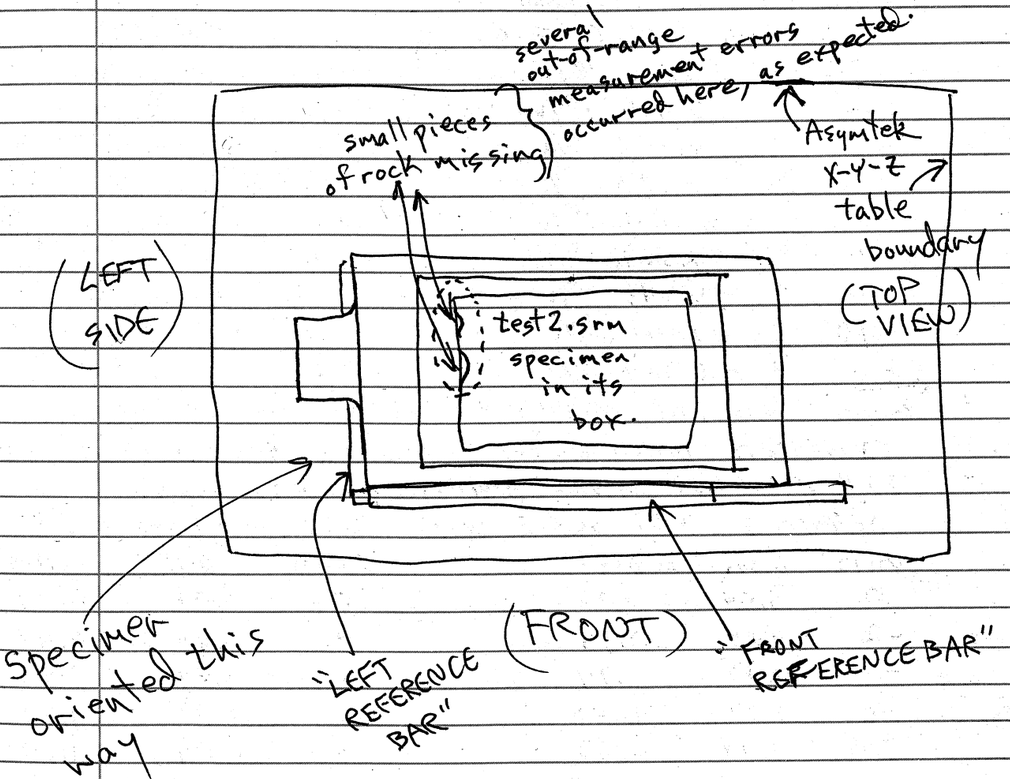
- For both of these tests, the specimen box is registered flush with the FRONT REFERENCE BAR, then, slid to the left as far as possible, hitting the LEFT REFERENCE BAR, but not necessarily flush with it.

Doug Michalsky
10-5-90

10/5/90
DLM



REFERENCE "DIMPLE" ON LEFT LOWER SIDE OF BOX



10/8/90 TEST SPECIMENS SRM 25.1.1/25.1.2 WERE MARKED WITH "LF" ON THE ROCK, GROUT AND BOX TO IDENTIFY ORIENTATION ON THE PROFILE METER. METAL TARGETS WERE MOUNTED TO ~~FHP~~ TEST SPECIMEN SRM 25.1.1 FOR THE VERTICAL DISPLACEMENT DETECTORS. SPACERS WERE MOUNTED TO THE BOX TOP EDGES TO INSURE THE TARGETS WERE PARALLEL TO THE BOX. P

10/9/90 TWO LVDT'S WERE MOUNTED TO SPECIMEN SRM 25.1.1. THE LVDT'S ARE SCHAEVITZ MODEL 2000 DC-E. WITH THE ACTUATOR END OF THE BOX BEING THE FRONT, LVDT SERIAL # 4601 WAS MOUNTED AT THE RIGHT REAR; LVDT SERIAL # 4612 WAS MOUNTED AT THE LEFT REAR. CALIBRATION DATA FOR THE LVDT'S FOLLOWS:

SER # 4601		0" = 0V		SER # 4612		
DISP.	VOLTAGE	IN/V		DISP	VOLTAGE	IN/V
+½"	2.558	.19/V		+½"	2.549	.20/V
+1"	5.153	.19/V		+1"	5.193	.19/V
+1½"	7.722	.19/V		+1½"	7.770	.19/V
+2"	10.326	.19/V		+2"	10.233	.19/V
-½"	-2.559	.19/V		-½"	-2.613	.19/V
-1"	-5.146	.19/V		-1"	-5.196	.19/V
-1½"	-7.611	.20/V		-1½"	-7.709	.19/V
-2"	-10.129	.20/V		-2"	-10.302	.19/V

.19"/VOLT = CAL

4" DIVISIONS P

EQUIP - 6" SCALE, HP DVM 346A # 1716A 17650 — A PICKENS

10/11/90 CALIBRATED DISPLACEMENT TRANSDUCER BUILT INTO MILLER 50K ACTUATOR MODEL H84B2N SERIAL 90170763.

REFERENCE 3 FT SCALE WITH 0.01 INCH GRADUATIONS

VOLTS	DIST.	Δ DIST	VOLTS	DIST	Δ DIST
0	5.04	0.00	0	5.04	0.00
-2	4.65	0.39	8	5.145	0.41
-4	4.25	0.79	4	5.84	0.80
-6	3.84	1.20	6	6.25	1.21
-8	3.44	1.60	8	6.64	1.60
-10	3.04	2.00	9.963	7.04	2.00

READ OUT HP DVM 346CA # 1716A17C50

CAL = 0.20 IN/VOLT ± 0.01 INCH

Dennis C. Arheidt TEMPOSONICS IMP # 23537-02-001 12/9

10/12/90 FOLLOWING IS THE CALIBRATION DATA FOR TEST SPECIMEN # SRM 25.1.1/25.1.2:

CHANNELS 1, 2 AND 3 - VERTICAL LOAD CELLS, REFER TO DATA SHEET IN LABORATORY NOTEBOOK DATED 10/12/89.

CHANNEL 4 - SUM OF VERTICAL LOAD CELLS

CHANNEL 5, 6 AND 7 - RELATIVE VERTICAL DISPLACEMENT DETECTORS, CALIBRATED 12/89, REFERENCE WAS A SCHERR/TUMICO DRUM MIKE, SWRI # 2-1, CAL DUE 3/5/90. SEE DATA SHEETS/GRAPHS IN LABORATORY NOTEBOOK TITLED PROXIMITOR LINEARITY.

CHANNEL 8 AND 9 - ACCELEROMETERS, NOT USED FOR THIS TEST.

CHANNEL 10 - HORIZONTAL LOAD CELL, THE FACTORY CALIBRATION WAS USED. AFTER ACTUAL CALIBRATION, THE DATA WILL BE ADJUSTED IF NECESSARY.

CHANNEL 11 - HORIZONTAL ACTUATOR DISPLACEMENT, SEE PAGE 6, DATE 10/11/90 FOR CALIBRATION.

CHANNEL 12 AND 13 - RELATIVE HORIZONTAL DISPLACEMENT, SEE PAGE 6, DATE 10/9/90 FOR CALIBRATION. (LVDT'S)

FOLLOWING IS A SUMMARY OF THE CALIBRATION VALUES:

CHANNEL 1, 2, 3, 4 - 1000 #/VOLT READOUT TO 10,000 #/VOLT

~~CHANNEL 5, 6 + 7 - 0.19"/VOLT~~ P 4.73 MIL/VOLT P

CHANNEL 5 - 4.73 MIL/VOLT PROX. #1 W/POWER SUPPLY 08

CHANNEL 6 - 4.69 MIL/VOLT PROX. #2 W/POWER SUPPLY 64

CHANNEL 7 - 4.81 MIL/VOLT PROX. #3 W/POWER SUPPLY 07

CHANNEL 8, 9 - NOT USED

CHANNEL 10 - 10,000 #/VOLT

CHANNEL 11 - 0.20"/VOLT

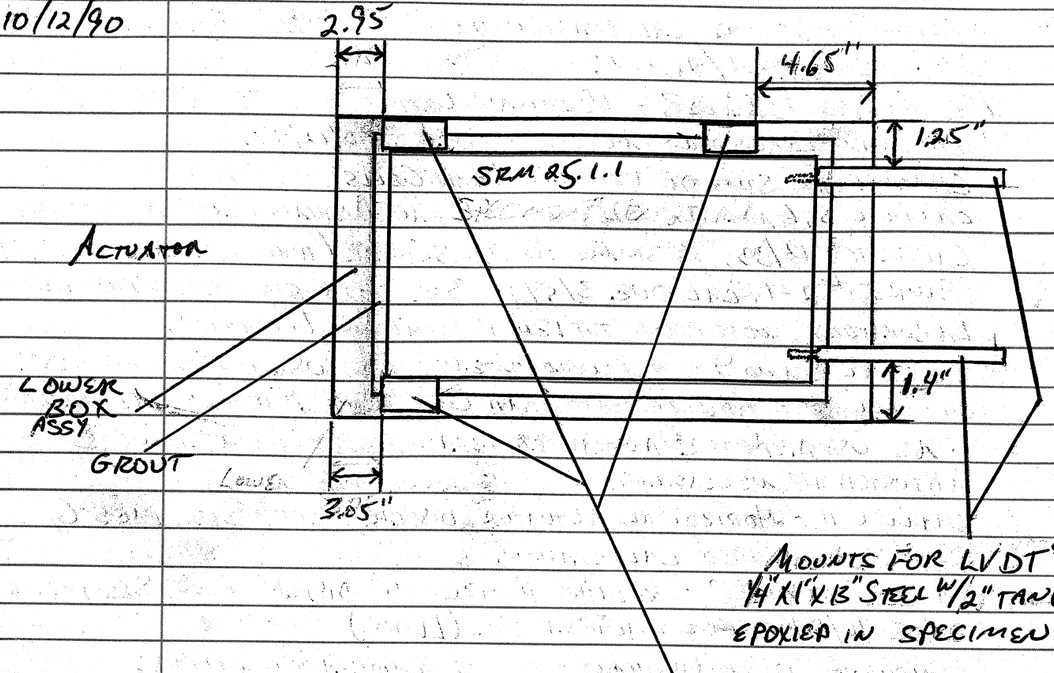
CHANNEL 12, 13 - 0.19"/VOLT

ON 10/11/90 THREE BENTLEY PROXIMETERS WERE MOUNTED TO SPECIMEN # SRM 25.1.2. SEE PAGE 8 FOR DRAWINGS ON SPECIFIC LOCATIONS OF PROBES, TARGETS AND LVDT'S. ALSO TWO CORES FOR THE LVDTS WERE MOUNTED TO SPECIMEN #SRM 25.1.2. — ALAN PICKENS

P

10/12/90

Lower Box Assembly - Instrumentation

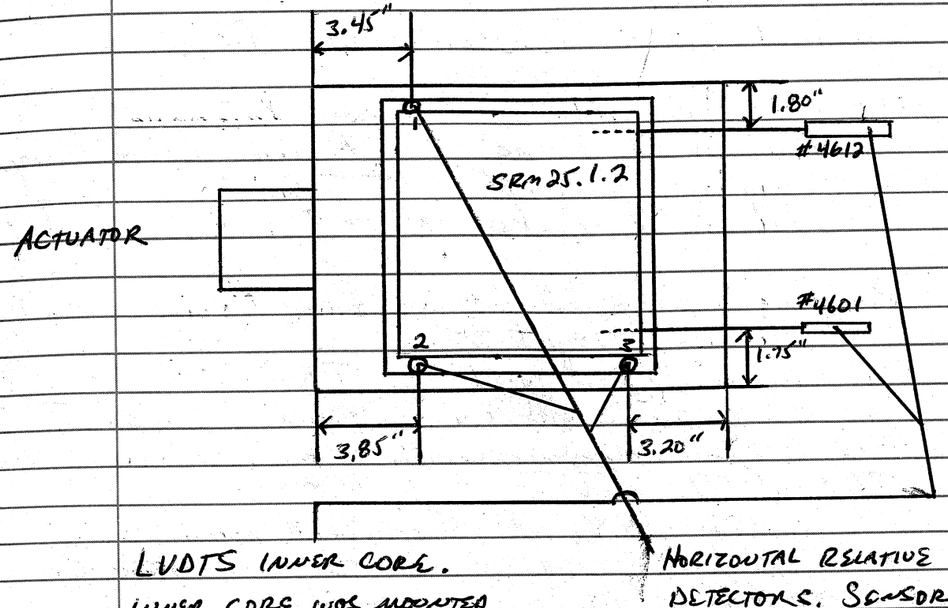


Mounts for LVDTs 1/4"x1"x1 3/8" steel w/ 1/2" tang epoxied in specimen

Targets for relative horizontal displacement detectors. 16 ga steel, 1"x3" target surface. Targets were raised 1/4" from box edge and epoxied to rock specimen.

Allan Pickens

Upper Box Assembly - Instrumentation



LVDTs inner core. Inner core was mounted to a threaded 1/8" brass rod. The rod was cut to fit. The rod was epoxied in the rock specimen.

Horizontal relative displacement detectors. Sensors were mounted to 16ga steel. This assembly was then epoxied to the rock surface approximately 60 mils above the target surface on lower specimen.

Allan Pickens

Initial Notebook Entries

10/15/90 ~~Solid Rock~~ DDK

Seismic Rock Mechanics Project —
Direct Shear Tests on Jointed Rock

Div. 04 Personnel:
Daniel D. Kana
Dennis C. Scheidt
Allen M. Pickens

Div. 20 Personnel:
Asad Chowdhary
Simon Hsiung

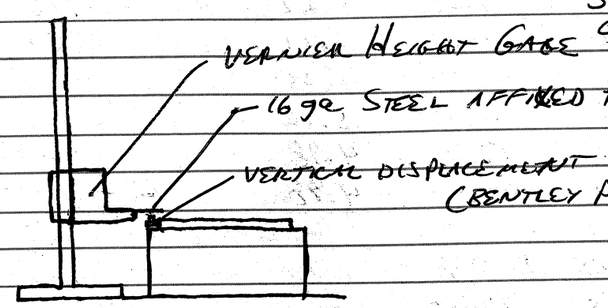
Purpose identified in Seismic Rock Mechanics Project Plan
Procedures identified in TOP-007 as also are materials and equipment.
Calibration requirements covered in TOP-007.

Required levels of Measurement Accuracy:
Vertical Load (Ch 1,2,3,4) - 5% (1250# each)
Relative Vert. Disp (Ch 5,6,7) - 5% (0.004 in)
Horizontal Acceleration (Ch 8,9) - 5% (1-g)
Horiz load Cell (Ch 10) - 5% (2500#)
Horiz. Actuator Disp. (Ch 11) - 5% (0.05 in)
Specimen Rel. Horiz. Disp. (Ch 12, 13) - 5% (0.004 in)

Div. 04 Personnel training covered in Division Nuclear Projects Operating Procedures. No other special training required.

Daniel D. Kana

10/15/90 WITH THE BENTLEY VERTICAL DISPLACEMENT DETECTORS IN PLACE, A VERNIER HEIGHT GAGE WAS USED TO RECALIBRATE THE DETECTORS. THE FOLLOWING SKETCH ILLUSTRATES THE PROCEDURE DESCRIBED BELOW.



THE 16 ga STEEL USED TO CALIBRATE THE PROBES WAS CUT FROM THE SAME SHEET AS THE TARGETS MOUNTED TO SPECIMEN # SRM 2T. 1.1. THE STEEL WAS CLAMPED TO THE VERNIER HEIGHT GAGE AND LOWERED TO JUST TOUCH THE TOP OF THE PROBE. THE VERNIER HEIGHT GAGE WAS THEN RAISED AT 5 MIL INCREMENTS FROM 0 TO 105 MILS AND VOLTAGE READINGS WERE TAKEN USING A FLUKE MODEL 77, S/N 3393148, CAL DUE 9 MAY 91. FOLLOWING ARE THE READINGS ~~OF~~ OBTAINED IN THE CALIBRATION:

PROXIMETER #1 WITH POWER SUPPLY 08

MILS	VOLTS	CAL	
10	1.732	5.77	
20	3.49	5.73	
30	5.11	5.87	
40	7.11	5.62	~~CAL = 5.46 MILS/VOLT~~
50	9.21	5.43	CAL = 5.00 MILS/VOLT
60	11.20	5.36	
70	13.28	5.27	
80	15.28	5.24	
90	17.37	5.18	
100	19.66	5.08	

ALLEN PICKENS

10/15/90

PROX 2 PS64

MILS	VOLT	CAL
10	1.71	5.85
20	3.64	5.49
30	5.35	5.60
40	7.77	5.14
50	9.58	5.22
60	11.52	5.21
70	14.00	5.00
80	15.70	5.10
90	18.06	4.98
100	20.08	4.98

~~CAL = 5.26 MILS/VOLT~~
CAL = 4.87 MILS/VOLT

PROX 3 PS07

MILS	VOLTS	CAL
10	1.58	6.32
20	3.18	6.29
30	5.22	5.75
40	7.29	5.49
50	9.01	5.55
60	11.33	5.30
70	13.23	5.29
80	15.14	5.28
90	17.26	5.21
100	19.13	5.23

~~CAL = 5.57 MILS/VOLT~~ A
CAL = 5.06 MILS/VOLT

SPECIMEN #SRM 25.1.1 WAS PUT INTO THE PROFILE METER TO MEASURE THE SURFACE OF THE VERTICAL DISPLACEMENT TARGETS. FOLLOWING ARE THE READINGS FROM THE MEASUREMENTS:

TARGET #1	TARGET #2	TARGET #3
0"-0.007 mm	0"- 0.039 mm	0"- 0.298 mm
1"- 0.073 mm	1"- 0.165 mm	1"- 0.184 mm
2"- 0.078 mm	2"- 0.241 mm	2"- 0.172 mm

A

10/15/90 THE TEST APPARATUS WAS ASSEMBLED IN ACCORDANCE WITH TOP-007 SECTION 5.2, WITH THE EXCEPTION OF ALL ACTUATOR RELATED INSTRUMENTATION. A

10/16/90 THE BALANCE OF THE INSTRUMENTATION WAS CONNECTED TO THE DAS. CALIBRATION OF CHANNELS 1-4 WERE CHANGED FROM 1000#/VOLT TO 10,000#/VOLT BY REDUCING THE GAIN ON THE SIGNAL CONDITIONER BY A FACTOR OF 10. CALIBRATION VALUES FOR CHANNELS 1-4 FOLLOWS:

CHANNEL 1 - SWITCH IN CAL "A" - 0.295V = 10,000#/VOLT
CHANNEL 2 - SWITCH IN CAL "A" - 0.291V = 10,000#/VOLT
CHANNEL 3 - SWITCH IN CAL "A" - 0.298V = 10,000#/VOLT
CHANNEL 4 - SWITCH IN CAL "A" - 0.584V = 10,000#/VOLT *

* USING FACTORY CALIBRATION. A

10/17/90 CONNECTED ALL COMPUTER INPUTS TO VARIABLE DC POWER SUPPLY. A 0.991 VDC CALIBRATION SIGNAL WAS INPUT TO THE COMPUTER. THE COMPUTER REFLECTED THE SAME 0.991 VDC ON ALL CHANNELS. A FLUKE MODEL 77 WAS USED TO MONITOR THE INPUT VOLTAGE. (FLUKE 77, S/N 3393148, CAL DUE 9MAY91; ACOPIAN DC POWER SUPPLY, CAL NOT REQUIRED.) THE CONFIGURATION FILE FOR CALIBRATION IS C:/DYNOLOG CAL.CNF. A 9.0 VDC SIGNAL WAS INPUT TO THE COMPUTER. ALL CHANNELS READ 8.989V. RAN NORMAL STRESS TEST - TECHNICIANS - DENNIS SCHEIDT AND ALLAN PICKENS. TEST PARAMETERS WERE AS FOLLOWS: START AT ZERO VERTICAL LOAD FOR ONE MINUTE, RAMP TO APPROXIMATELY 73,600 POUNDS VERTICAL FORCE IN FIVE MINUTES, HOLD FOR ONE MINUTE, RAMP BACK TO ZERO IN FIVE MINUTES. DATA WAS SAMPLED EVERY FIVE SECONDS ON 13 CHANNELS. THE DATA IS SAVED IN FILE NAMED NS1.DAT. THE BOTTOM ROCK CRACKED AT THE ~~HORN~~ VERTICAL DISPLACEMENT DETECTOR #1 TARGET. TOTAL VERTICAL PRESSURE REACHED APPROXIMATELY 61,000 POUNDS. PRESSURE ON THE SUPPLY WILL BE INCREASED ON SUBSEQUENT TESTS TO PRODUCE THE REQUIRED 73,600 POUNDS. A

ALLAN PICKENS

10/17/90 14:20 — SECOND NORMAL STRESS TEST #2 WAS RAN WITH THE FOLLOWING PARAMETERS: HOLD ZERO VALUES FOR ONE MINUTE, RAMP TO 73,600 POUNDS IN A FIVE MINUTE PERIOD, HOLD 73,600 POUNDS FOR ONE MINUTE, RAMP DOWN TO ZERO IN A FIVE MINUTE PERIOD. DATA WAS STORED IN FILENAME NS2.DAT. TOTAL VERTICAL PRESSURE REACHED APPROXIMATELY ~~71,700~~ 71,700 POUNDS. #

14:55 — RAN NORMAL STRESS TEST #3 WITH THE SAME PARAMETERS AS ABOVE IN TEST 2. #

15:01 — TEST WAS STOPPED. VERTICAL PRESSURE EXCEEDED INDIVIDUAL LOAD CELL CAPABILITIES. FILENAME FOR TEST #3 IS NS3.DAT. TOTAL VERTICAL PRESSURE EXCEEDED 75,000 POUNDS WHEN TEST WAS STOPPED. #

8:30 — NORMAL STRESS TEST #4 WAS RUN. ~~THE FOLLOWING~~ # TOTAL VERTICAL LOAD REACHED APPROXIMATELY 74,400 POUNDS. THE FOLLOWING IS THE PARAMETERS OUTLINED IN THE CONFIGURATION COMMAND FILE: (DA.PFL) #

TEST #1

5 - BREAK POINTS

0,0,0, - CUMULITIVE TIME, VERT INPUT, HORIZ INPUT

60,0,0 - HOLD ZERO FOR 1 MINUTE

360,7.36,0 - RAMP TO 73,600 IN 5 MINTES

420, ~~720~~, 7.36, 0 HOLD 73,600 FOR 1 MINUTE

720,0,0 RAMP DOWN TO ZERO IN 5 MINTES #

TEST #2

5

0,0,0

60,0,0

360,8.8,0 → VERTICAL INPUT COMMAND WAS 88,000

420,8.8,0 POUNDS, BUT TOTAL VERTICAL PRESSURE

720,0,0 REACHED APPROX 71,700 #. #

10/17/90 TEST #3

5

0,0,0

60,0,0

~~36070,0~~ #

360,8.8,0 → COMMAND INPUT WAS 88,000# BUT THE TOTA

420,8.8,0 VERTICAL LOAD EXCEEDED 75,000# AND TEST

720,0,0 WAS STOPPED. #

TEST #4

5

0,0,0

60,0,0

360,7.4,0 → COMMAND INPUT WAS 74,000 POUNDS, AND

420,7.4,0 TOTAL VERTICAL LOAD REACHED 74,400 #. #

720,0,0

16:00 — STARTED NORMAL SHEAR TEST #5. PARAMETERS WERE THE SAME AS IN TEST #4. FILENAME WAS NS5.DAT. TOTAL VERTICAL LOAD REACHED 73,900 #. #

10/18/90 — RAN COMBINED NORMAL AND DIRECT SHEAR TEST #1. THE PARAMETERS FOR THE TEST WERE: FILENAME CUD05.DAT

7

0, 0, 0

60, 0 0

120 0.464 0

1320 0.464 10

1380 0.464 10

2580 0.464 0

2640 0 0

REMOVED TARGET #1 FROM BOTTOM ROCK AS IT WAS BROKEN OFF WITH A PIECE OF SPECIMEN. PHOTOGRAPHS WERE TAKEN. SEVERAL CHIPS OF ROCK WERE REMOVED FROM THE FRONT AND REAR SECTIONS OF THE SPECIMEN. #

ALLAN PICKENS

10/18/90 10:08 STARTED SECOND COMBINED TEST. PARAMETERS WERE AS FOLLOWS: FILENAME CND16.DAT AP

9

0, 0, 0
60, 0, 0
120, 0.928, 0
180, 0.928, 0
1380, 0.928, 10
1440, 0.928, 10
2640, 0.928, 0
2700, 0.928, 0
2760, 0, 0 AP

TARGET #3 FOR THE VERTICAL DISPLACEMENT DETECTOR ~~AP~~ WAS REMOVED DURING TEST #1. THE VERTICAL PRESSURE DOES NOT MAINTAIN THE REQUIRED PRESSURE FOR THE TEST. TARGET PRESSURE WAS 9,280#. THE PRESSURE REACHED APPROXIMATELY 8,600 POUNDS DURING TENSION AND DROPPED TO APPROXIMATELY 7,600# DURING COMPRESSION. AP

10/18/90 AN ADJUSTMENT WAS MADE TO THE CONTROLLER FOR THE VERTICAL LOAD TO OPTIMIZE LOAD CONTROL. AP

13:58 STARTED COMBINED NORMAL AND DIRECT TEST #3. TEST PARAMETERS WERE AS FOLLOWS: FILENAME CND15.DAT AP

9

0, 0, 0
60, 0, 0
240, 1.392, 0
300, 1.392, 0
1500, 1.392, 10
1560, 1.392, 10
2760, 1.392, 0
2820, 1.392, 0
3000, 0, 0 AP

10/18/90 STARTED COMBINED NORMAL AND DIRECT SHEAR TEST #4. TEST PARAMETERS WERE AS FOLLOWS: FILENAME CND20.DAT

9

0, 0, 0
60, 0, 0
300, ~~0~~ 1.856, 0 AP
360, 1.856, 0
1560, 1.856, 10
1620, 1.856, 10
2820, 1.856, 0
2880, 1.856, 0
3120, 0, 0

16:12 STARTED COMBINED NORMAL AND DIRECT SHEAR TEST #5. TEST PARAMETERS WERE AS FOLLOWS: FILENAME CND40.DAT

9

0, 0, 0
60, 0, 0
540, 3.712, 0
600, 3.712, 0
1800, 3.712, 10
1860, 3.712, 10
3060, 3.712, 0
3120, 3.712, 0
3600, 0, 0

~~AGAP~~ A GAP OF APPROXIMATELY .040" WAS FOUND BETWEEN THE ~~LEFT~~ RIGHT AP FRONT ROLLER AND TOP BOX. THE CONDITION WAS LEFT AS IS. THE FRONT BEING THE ACTUATOR END OF BOX. AP

17:30 STARTED COMBINED NORMAL AND DIRECT SHEAR TEST #6, TEST PARAMETERS WERE AS FOLLOWS! FILENAME CND60.DAT.

9

0, 0, 0
60, 0, 0
780, 5.568, 0
840, 5.568, 0
2040, 5.568, 10
2100, 5.568, 10
3300, 5.568, 0
4080, 0, 0

ALAN PICKOS

10-23-90

Doug Micklethwaite

- Performed profiling on SRM25.1.2 sample (first sample to be profiled, top specimen) after destructive testing. About 15-20 rows after row 102, almost all data was recorded as "99.9999" due to a large chunk of rock missing on the back right edge. The depression left caused the laser profiler to lower to an extreme that left leading edge samples too "NEAR" to be measured by the probe. The next revision of the "profile.exe" program will eliminate this problem. A piece of flat cardboard was contoured to fit the depression, and "profile.exe" was run in RESTART mode to re-sample all rows beyond 102.

Rock sample SRM.25.1.1 (first bottom sample to be profiled) was profiled without incident.

NOTE:

data filename	description
t1pbbbt.dat	"test1.srm" was renamed to this to establish a systematic nomenclature.
t1ptbbt.dat	"test2.srm" was renamed to this.
t1pbbat.dat	After destructive test profile of sample SRM.25.1.1.
t1ptbat.dat	After destructive test profile of sample SRM.25.1.2.
t1ptbat.ext	Re-profile of last rows (y=103 and greater) for file t1ptbat.dat due to "out-of-range" problem discussed above.

10-23-90
Doug Micklethwaite

- Spot check of before and after destructive test data:

	sample	x	y	before z	after z	Δ
(A)	t1pbbbt.dat	10	32	1.4293	1.4437	-0.0144
&	t1pbbat.dat	11	32	1.4240	1.4444	-0.0204
		12	32	1.4206	1.4428	-0.0222
(B)	t1ptbbt.dat	10	15	0.8606	0.8569	0.0037
&	t1ptbat.dat	11	15	0.8647	0.8613	0.0034
		12	15	0.8619	0.8560	0.0059
				(from *.dat)	(from *.ext)	
(C)	t1ptbat.dat	10	130	0.9617	0.9589	0.0028
#	t1ptbat.ext	11	130	0.9680	0.9660	0.002
		12	130	0.9728	0.9698	0.003

Conclusions: I chose only slightly rubbed areas of the after test data of sets (A) & (B) above to spot check. The Z-readings changed only slightly, ~20 mils for the first few (A) samples, and ~4 mils for the first few (B) samples. This looks reasonable to me. Note that I chose x=10 to reflect changes just beyond the rock edge.

Data (C) above indicates the repeatability between two profils of the same area to be about 3 mils, though a longer data comparison should be done to more accurately establish this.

DM

10/19/90 THE TEST APPARATUS WAS DISASSEMBLED. THE TEST SPECIMEN #SRM25.1.1/25.1.2 WAS REMOVED, INSPECTED, AND PHOTOGRAPHED. SEVERAL LARGE CHUNKS OF ROCK WERE FOUND WITH A CONSIDERABLE AMOUNT OF DUST. THE SAMPLES WERE DUSTED AND PUT ON THE PROFILE METER FOR MEASUREMENT. A

~~10/22/90~~ THE BOTTOM BOX SLID ON THE MOUNTING SURFACE APPROXIMATELY 0.15". ALSO A GAP OF APPROXIMATELY 0.20" WAS FOUND BETWEEN THE GROUT AND THE TOP BOX. A

10/22/90 SPECIMEN # SRM 29.2.3/29.2.4 WAS RECIEVED. #29.2.3 IS THE TOP SPECIMEN AND 29.2.4 IS THE BOTTOM.

10/23/90 SPECIMEN #29.2.4 WAS GROUTED INTO THE LOWER BOX ASSEMBLY. THE FOLLOWING RECIPE WAS USED FOR THE GROUT: (SCALED DOWN TO REDUCE WASTE)

- 1 POUND 10 OUNCES OF WATER
- 20 GRAMS OF LOMAR D
- 3 POUNDS 5 OUNCES OF HI-EARLY CEMENT
- 8 POUNDS 5 OUNCES OF SAND

AN ADDITIONAL 50-100 GRAMS OF WATER WAS USED TO ADJUST THE GROUT TO A USEABLE CONSISTENCY. A

10/24/90 SPECIMEN # 29.2.3 WAS GROUTED INTO THE UPPER BOX ASSEMBLY. THE GROUT RECIPE WAS AS ABOVE FOR THE BOTTOM SPECIMEN. A WOODEN FRAME WAS CONSTRUCTED INSTEAD OF USING FOAM RUBBER FOR THE BARRIER. A

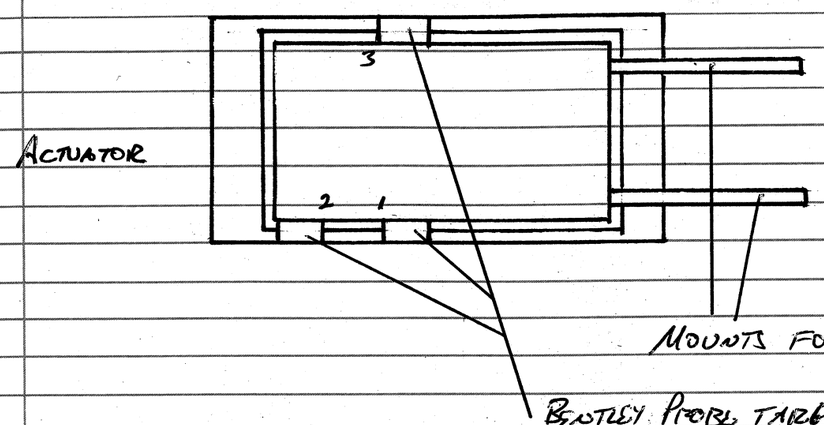
10/25/90 09:00 SPECIMEN #SRM 29.2.3/29.2.4 WAS PLACED IN AN OVEN AT 105°C. A

10/26/90 - 09:00 REMOVED SPECIMEN FROM OVEN. A SEE LAB NOTEBOOK FOR CHART. A

10/29/90 PREPARED SAMPLES FOR INSTRUMENTATION. THE SPECIMEN WAS PROFILED. A

10/30/90 THE BENTLEY PROBES WERE MOUNTED TO THE UPPER BOX ASSEMBLY USING EPOXY. UPON HANDLING THE SPECIMEN, PROBE #2 WAS DAMAGED. ALSO THE LOCATIONS OF THE PROBES WERE CHANGED. A

10/31/90 LOWER BOX ASSEMBLY INSTRUMENTION



LOWER BOX ASSY INSTRUMENTATION WAS MODELED IN THE SAME WAY AS TEST #1. FOLLOWING IS THE READINGS FROM THE PROFILE METER OF THE TARGETS. STARTING POINT OR "0" INCH READING IS AT THE ACTUATOR END OF THE TARGETS.

TARGET #1	TARGET #2	TARGET #3
0" ~~0.340~~ 0.0040	0" 0.0340	0" 0.0175
1" 0.0100	1" 0.0750	1" 0.0110
2" 0.1890	2" -0.0190	2" 0.1150

ALAN PARKER

11/1/90 AN 8MM PROBE AND PROXIMITOR WAS CALIBRATED TO REPLACE THE DAMAGED UNIT. THIS UNIT IS ALSO A BENTLEY. FOLLOWING IS THE CAL DATA:
PROXIMITOR SERIAL# 203748, PROBE S/N 350268.

MILS AWAY FROM TARGET	VOLTAGE (NEGATIVE)
18 MILS	0 VOLTS
19 MILS	0.43
24	3.68
29	5.09
34	6.42
39	7.72
44	9.05
49	10.37
54	11.70
59	13.03
64	14.34
69	15.61
74	16.84
79	18.00
84	18.23

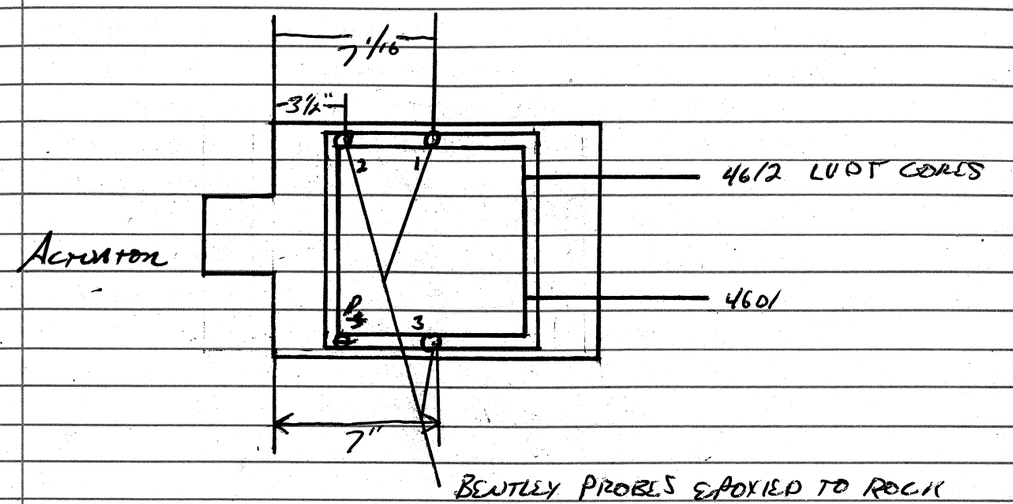
CALIBRATED USING A DRUM MICROMETER, SWRE# 2-1, CAL DUE ON 4/2/91, CALD ON 10/2/90; HP MODEL 3466A DMM, S/N 1716A01910, CAL DUE 12 OCT 91; ACOPIAN POWER SUPPLY, CAL NOT REQ'D; 16GA STEEL TARGET.

11/2/90 THE UPPER BOX ASSEMBLY WAS INSTRUMENTED WITH THE THREE BENTLEY PROBES AND THE LUDT CORE MOUNTS. LOCATIONS ARE ILLUSTRATED ON THE NEXT PAGE. AP

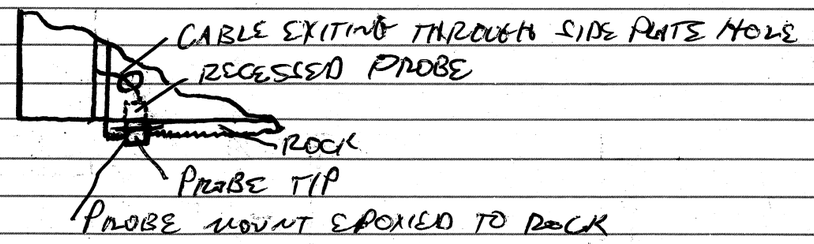
ALAN PICKENS

UPPER BOX ASSEMBLY INSTRUMENTATION

11/2/90



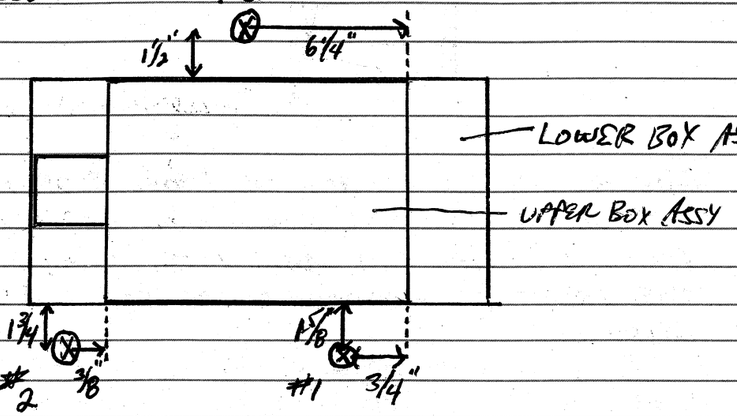
DUE TO THE ORIENTATION OF PROBE #2, THE MOUNTING PROCEDURE DIFFERS FROM THE OTHER TWO. THE PROBE IS A REAR EXIT CABLE TYPE. A HOLE WAS DRILLED INTO THE GROUT TO ACCOMODATE THE CABLE SEE ILLUSTRATION BELOW. AP

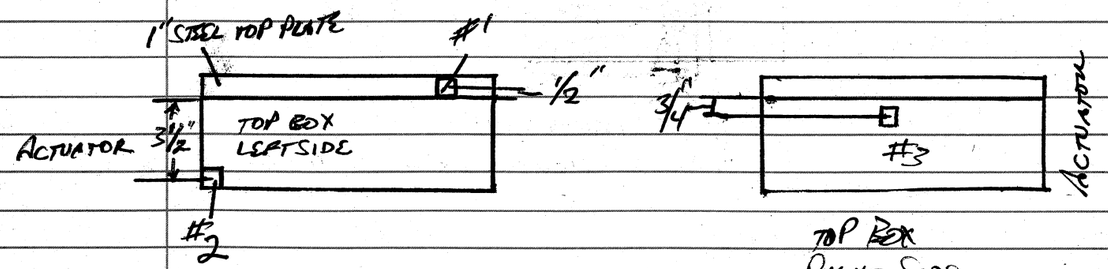


ALAN PICKENS

11/6/90

THREE DIAL GAUGES WERE MOUNTED TO MAGNETS AND STUCK TO THE UPPER BOX ASSEMBLY. THESE WILL BE USED TO TAKE MANUAL READINGS OF COMPRESSION DURING THE VERTICAL TESTS. FROM THE REAR OF THE APPARATUS, THE LOCATIONS WERE AS FOLLOWS: GUAGE #1 WAS ON THE LEFT SIDE, UPPER REAR CORNER OF THE UPPER BOX ASSY; GUAGE #2 WAS ON THE LEFT SIDE, LOWER FRONT CORNER; GUAGE #3 WAS ON THE RIGHT SIDE IN THE MIDDLE OF THE BOX. PHOTOGRAPHS WERE TAKEN OF THESE LOCATIONS. FOLLOWING IS AN ILLUSTRATION OF THE SPECIFIC LOCATIONS: (X = CONTACT POINT OF DIAL GUAGE.)





TOP BOX
RIGHT SIDE

ALLAN PICKENS

11/6/90

RAN NORMAL SHEAR TESTS 1-5. FILENAMES WERE; T2NS1.DAT, T2NS2.DAT, T2NS3.DAT, T2NS4.DAT, T2NS5.DAT. MANUAL READINGS WERE TAKEN ON THE THREE DIAL GUAGES EVERY MINUTE DURING EACH TEST. FOLLOWING IS THE DATA COMPILED FROM THESE READINGS. A

T2NS1.DAT

TIME(MIN)	#1	#2	#3
0	-5	-4	2.5
1	-4.5	-3	3.0
2	3	9	10.0
3	5	15	14.0
4	5.25	24.5	17.5
5	5.25	32.0	20.5
6	5.25	37.0	23.0
7	5.25	38.0	23.5
8	4.25	37.0	23.2
9	4.0	35.0	22.5
10	3.5	32.0	21.2
11	3.0	27.5	19.1
12	~~2.5~~ -2.5	19.0	10.0

T2NS2.DAT

+	0	-1.0	17.5	7.5
X	1	-1.0	18.0	7.6
X	2	3.5	24.0	15.5
X	3	4.0	30.0	19.5
X	4	4.0	34.0	20.6
X	5	5.0	38.0	—
X	6	5.0	40.0	23.5
X	7	5.0	40.0	24.0
X	8	4.0	39.0	23.5
X	9	3.5	37.0	22.8
X	10	3.25	34.0	21.5
X	11	3.0	29.5	19.5
	12	-2.0	20.0	11.0

A

11/6/90

T2NS3.DAT

TIME(min)	#1	#2	#3
0	-3.25	21	8.6
1	-3.0	21	8.6
2	2.5	28	16.5
3	3.0	33.25	19.5
4	3.0	37.0	21.5
5	3.5	40.0	22.8
6	4.0	42.0	24.1
7	4.0	42.5	24.3
8	3.0	41.5	24.0
9	2.0	40.0	23.2
10	2.0	37.0	22.2
11	1.0	32	20.0
12	-4.0	23	11.5

T2NS4.DAT

0	-4	23	10
1	-3	23.5	10
2	2	29	17.2
3	2.5	35	20
4	2.5	39	22
5	3.0	41.5	23
6	3.5	43	24.4
7	3.5	43.5	24.5
8	2.5	42.5	24.2
9	2.0	41.0	23.5
10	1.5	38.0	22.3
11	1.0	33	20.1
12	-4.0	24	11.5

ALLAN PICKENS

11/6/90

T2NS5.DAT

TIME	#1	#2	#3
0	-4.0	23.5	10.0
1	-3.0	24.0	10.3
2	2.0	30.0	17.5
3	2.5	35.5	20.5
4	2.5	39.5	22.2
5	2.75	42.0	23.5
6	3.0	43.5	24.6
7	3.25	44.0	24.7
8	2.5	43.0	24.4
9	2.0	41.5	23.8
10	1.5	38.5	22.5
11	1.0	33.5	20.3
12	-4.0	24.0	11.5

ALLAN PICKENS

11/6/90 THE COMMAND FILE CONFIGURATION, DA.PFL, WAS AS FOLLOWS FOR T2NS1.DAT - T2NS5.DAT:

5	# BREAKPOINTS
0,0,0	FORMAT - CUMALITIVE TIME, VERT INPUT, HORZ. INPUT
60,0,0	HOLD ZERO FOR SIXTY SECONDS
360,7.36,0	RAMP TO 73,600# VERTICAL IN 300 SECONDS
420,7.36,0	HOLD FOR 60 SECONDS
720,0,0	RAMP TO ZERO VERTICAL IN 300 SECONDS

POST TEST INSPECTION REVEALED SOME MINOR CHIPS AND DUST ALONG THE SIDES OF THE SPECIMEN. ALL INSTRUMENTATION APPEARS TO BE INTACT.

ALLAN PICKENS

11/7/90 THE APPARATUS WAS READIED TO RUN THE COMBINED NORMAL AND DIRECT SHEAR TESTS. THE DIAL GUAGES WERE REMOVED. THE FILENAME FOR THE FIRST TEST IS T2CND10.DAT. PARAMETERS IN THE COMMAND FILE WERE AS FOLLOWS:

DA.PFL

9 BREAK POINTS

0,0,0 ZERO

60,0,0 HOLD ZERO FOR 60 SECONDS

180,0.928,0 RAMP TO 9,280 # VERTICAL IN 120 SEC. (0.5MPA/min.)

240,0.928,0 HOLD VERT PRESSURE FOR 60 SEC.

1440,0.928,10 MOVE HORIZONTAL 2" IN 1200 SEC. (10 MM)

1500,0.928,10 HOLD FOR 60 SEC.

2700,0.928,0 RETURN HORIZ. TO ZERO IN 1200 SEC.

2760,0.928,0 HOLD FOR 60 SEC.

2880,0,0 RAMP TO 0 VERT. IN 120 SECONDS

THE BENTLEY VERT DISPLACEMENT DETECTORS WERE REZEROED BEFORE TEST #1.

POST TEST INSPECTION REVEALED SOME SMALL CHIPS AROUND THE SPECIMEN. BENTLEY PROBE #2 WAS RESET TO A POSITION OF 15 MILS CLOSURE AND 50 OPEN.

THE FILENAME FOR TEST #2 IS T2CND20.DAT. PARAMETERS IN THE COMMAND FILE WERE AS FOLLOWS:

9

0,0,0

60,0,0

300,1.856,0

360,1.856,0

1560,1.856,10

1620,1.856,10

2820,1.856,0

2880,1.856,0

3120,0,0

ALLAN PICKENS

11/7/90 TEST 2 POST INSPECTION REVEALED SOME LARGER CHIPS AROUND THE SPECIMEN.

TEST 3 FILENAME IS T2CND30.DAT. COMMAND PARAMETERS WERE AS FOLLOWS:

9

0,0,0

60,0,0

420,2.784,0

480,2.784,0

1680,2.784,10

1740,2.784,10

2940,2.784,0

3000,2.784,0

3360,0,0

TEST 3 POST INSPECTION REVEALED NO CHANGES.

TEST 4 FILENAME IS T2CND40.DAT. COMMAND PARAMETERS WERE AS FOLLOWS:

9

0,0,0

60,0,0

540,3.712,0

600,3.712,0

1800,3.712,10

1860,3.712,10

3060,3.712,0

3120,3.712,0

3600,0,0

DURING TEST 4 IT WAS OBSERVED THAT THE LEFT REAR SIDE ROLLER WAS NOT TOUCHING. (OBSERVED FROM REAR OF APPARATUS) ALL OTHER ROLLERS WERE IN CONTACT WITH THE UPPER BOX ASS'Y. MORE DUST AND CHIPS WERE NOTED DURING THE POST INSPECTION OF TEST #4.

ALLAN PICKENS

11/7/90 TEST 5 FILENAME IS ~~FSA~~ T2CNA50.DAT. COMMAND PARAMETERS FOR THIS TEST WERE AS FOLLOWS:

9

0, 0, 0

60, 0, 0

660, 4.640, 0

720, 4.640, 0

1920, 4.640, 10

1980, 4.640, 10

3180, 4.640, 0

3240, 4.640, 0

3840, 0, 0

THERE WERE NO TRANSDUCERS BROKEN DURING TESTING. SOME ADDITIONAL CHIPS WERE PRESENT. DURING TEST #5 THE TWO REAR MOST SIDE ROLLERS WERE NOT IN CONTACT WITH THE UPPER BOX ASSY. AP

11/8/90 THE APPARATUS WAS DISASSEMBLED. PHOTOGRAPHS WERE TAKEN OF THE LOWER BOX ASSY ~~AS IT~~ AP IN PLACE. THE TOP BOX ASSEMBLY WAS REMOVED, TURNED OVER AND PHOTOGRAPHED. BOTH SPECIMENS WERE BRUSHED OFF AND REPHOTOGRAPHED. THE LOWER BOX ASSEMBLY WAS THEN PUT INTO THE PROFILE METER. AP

11/9/90 THE BOTTOM SPECIMEN WAS REMOVED FROM THE PROFILE METER. DATA IS CONTAINED IN FILENAME T2PBBAT.DAT. THE TOP BLOCK WAS PUT INTO THE PROFILE METER. THE FILENAME IS T2PTBAT.DAT. AP RECEIVED SPECIMEN # SRM 28.3.4/28.2.3-A. #28.3.4 IS THE TOP BLOCK AND #28.2.3-A IS THE BOTTOM BLOCK. THE BOTTOM SPECIMEN WAS GROUTED INTO THE LOWER BOX ASSEMBLY. FOLLOWING IS THE RECIPE USED FOR THE GROUT:

1 POUND 10 OZ WATER

20 GMS LOMAR D

3 POUNDS 5 OZ ~~SP~~ HI EARLY CEMENT

8 POUNDS 7 OZ SAND

ALLAN PUTNEY

11/12/90 THE TOP SPECIMEN WAS GROUTED INTO THE ~~UPPER~~ BOX ASSY. THE SAME FORMULA FOR THE GROUT FOR THE BOTTOM WAS USED FOR THE TOP. THE FORM WAS CONSTRUCTED OF 1/4" MASONITE AND 3/4" WOOD.

11/13/90 0:800 THE SPECIMEN WAS PLACED IN AN OVEN AT 105°C, AP

11/14/90 08:00 - THE SPECIMEN WAS REMOVED FROM THE OVEN. AP

11/15/90 THE BOTTOM SPECIMEN WAS MEASURED IN THE PROFILE METER. THE FILENAME IS T3PBBBT.DAT. AP

11/16/90 THE TOP SPECIMEN WAS MEASURED IN THE PROFILE METER. THE FILENAME IS T3PTBBT.DAT. AP

11/18/90 THREE 25 mm BENTEK PROXIMITORS AND PROBES WERE CALIBRATED. EQUIPMENT USED TO CALIBRATE THE PROBES WAS AS FOLLOWS: DMM MICROMETER, SWRF #2-1, CAL DUE 00 4/2/91; HP MODEL 3466A DMM, S/N 1716A17650; ACOPIAN MODEL K32560 POWER SUPPLY, NO CAL REQ'D; ~~#4~~ 9a STEEL TARGET. FOLLOWING IS THE CALIBRATION DATA RECORDED.

PS 1, PROBE #4 MILS	PS 1, PROBE #4 VOLTS		PS 27, PROBE #5 MILS	PS 27, PROBE #5 VOLTS	
0	-1.054		0	-1.125	
50	-1.802		50	-1.877	
100	-2.698		100	-2.804	
150	-3.240		150	-3.863	
200	-4.854		200	-4.880	
250	-7.959		250	-6.066	
300	-6.985		300	-7.082	
350	-7.801		350	-8.017	
400	-8.836		400	-9.015	
450	-9.856		450	-10.131	
500	-10.856		500	-11.247	
550	-11.735		550	-12.267	
600	-12.424		600	-13.135	
650	-12.961		650	-13.790	

57.63 mils/volt; 49.36 mils/volt; CAL

ALLAN PUTNEY

11/19/90 PS80, PROBE #6

MILS	VOLTS
0	-0.973
50	-1.621
100	-2.455
~~200~~ 150	-3.446
200	-4.535
250	-5.644
300	-6.701
350	-7.657
400	-8.583
450	-9.624
500	-10.680
550	-11.658
600	-12.504
650	-12.736

CAL = 51.55 MILS/VOLT

Allen Pickens

12/3/90 EXPERIMENT DELAYED AWAITING LOAD CELL CALIBRATION. FOR PRELIMINARY CALIBRATION, REFER TO ENTRY ON 10/12/90. ALL PRECEDING DATA TO BE RATIONED ACCORDING TO NEW CAL DATA. A

12/14/90 FOLLOWING IS THE CALIBRATION DATA FOR THE #2 BENTLEY PROBE (5 mm). EQUIPMENT LIST: DRUM MICROMETER, SwRI #2-1, CAL DUE 4/2/91; HP3466A DMM, S/N 1716A 22587, CAL DUE 10 MAY 91; ACOPIAN POWER SUPPLY, MODEL #K325G0, CAL NOT REQ'D; 1698 STEEL TARGET. PROBE #2, POWER SUPPLY #64.

MILS	VOLTS	MILS	VOLTS
0	-0.7198	35	-7.15
5	-1.30	40	-8.15
10	-2.23	45	-9.16
15	-3.18	50	-10.16
20	-4.16	55	-11.16
25	-5.15	60	-12.18
30	-6.14	65	-13.22

A

12/14/90 PROBE 2, PS64 (CONT)

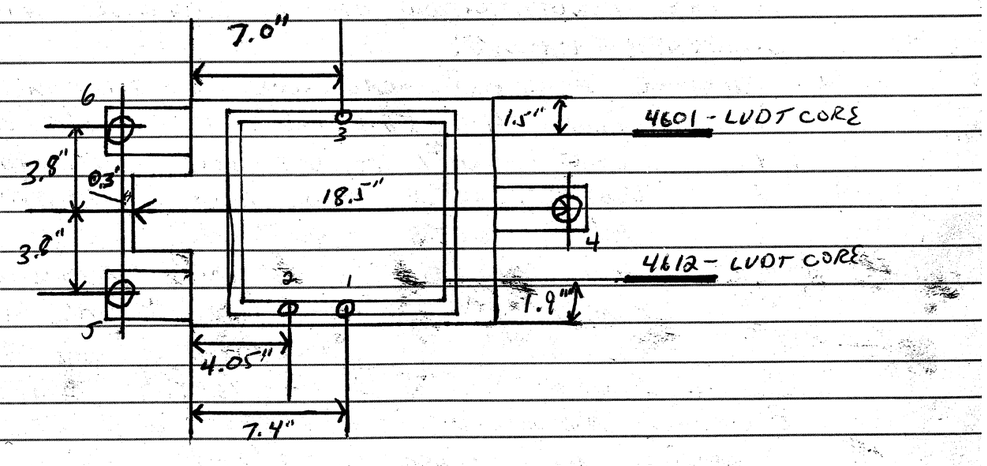
MILS	VOLTS
70	-14.30
75	-15.37
80	-16.44
85	-17.50
90	-18.55
95	-19.58
100	-20.58
105	-21.50
110	-22.26
115	-22.81

CAL = 5 MILS/VOLT

A

12/17/90 RECEIVED CALIBRATED LOADCELLS. THE CALIBRATION VALUES WERE WITHIN 0.1% OF THE VALUES USED FOR THE PRECEEDING EXPERIMENTS. FOLLOWING ARE THE LOCATIONS FOR THE VERTICAL DISPLACEMENT DETECTORS:

UPPER BOX ASSEMBLY



LOWER BOX ASSEMBLY INSTRUMENTATION CONSISTS OF TARGETS CONSTRUCTED OF 1698 STEEL FOR THE BENTLY DISPLACEMENT DETECTORS AND MOUNTS FOR THE BODIES OF THE LVDT'S. SEE FIGURE ON PAGE 21 FOR MOUNTING EXAMPLE. A Pickens

12/18/90 FOLLOWING ARE THE VALUES TAKEN FOR THE TARGETS:

PROBE #1	PROBE #2	PROBE #3
0" -0.021	0" - -0.091	0" -0.018
1" -0.069	1" -0.029	1" -0.012
2" -0.014	2" -0.076	2" -0.108

PROBE #4	PROBE #5	PROBE #6
0" 0.258	0" -0.006	0" -0.157
1" 0.267	1" -0.053	1" -0.174
2" 0.237	2" -0.108	2" -0.242
3" 0.154	3" -0.188	3" -0.292

25mm TARGETS WERE DOUBLE-SIDED TAPED TO THE LOWER BOX. ALL READINGS WERE TAKEN ACROSS THE PATH THE PROBE WILL TRAVEL. A

12/19/90 THE BENTLY PROBES WERE SET TO 20 MILS CLOSE AND 60 MILS OPEN FOR THE 5mm PROBES AND 125 MILS CLOSE AND 375 MILS OPEN FOR THE 25mm PROBES. CURRENT CALIBRATION DATA FOR THE LOADCELLS IS CONTAINED IN THE LABORATORY NOTEBOOK. FOLLOWING IS THE IDENTIFICATION OF THE CHANNELS AND THE CALIBRATION VALUES:

CHANNEL	FUNCTION	CAL. VALUE	LAST CAL DATE
0	BENTLY #4	52.63 MILS/VOLT	11/19/90
1	VERT LD CELL #1	10,000 #/VOLT	12/12/90
2	VERT LD CELL #2	10,000 #/VOLT	12/13/90
3	VERT LD CELL #3	10,000 #/VOLT	12/13/90
4	TOTAL VERT LD	10,000 #/VOLT	BEFORE USE
5	BENTLY #1	5 MILS/VOLT	10/15/90
6	BENTLY #2	5 MILS/VOLT	12/14/90
7	BENTLY #3	5.06 MILS/VOLT	10/15/90
8 (NOT USED)	ACCELLEROMETER	1G/VOLT	BEFORE USE
9 (NOT USED)	ACCELEROMETER	1G/VOLT	BEFORE USE
10	HORIZ LD CELL	10,000 #/VOLT	12/13/90
11	ACTUATOR DISP	0.2"/VOLT	10/11/90

ALAN PICKENS

12/19/90 CHANNEL IDENTIFICATION (CONT.)

CHANNEL	FUNCTION	CAL VALUE	LAST CAL DATE
12	LVDT #4601	0.19"/VOLT	10/9/90
13	LVDT #4612	0.19"/VOLT	10/9/90
14	BENTLY #5	49.36 MILS/VOLT	11/19/90
15	BENTLY #6	51.55 MILS/VOLT	11/18/90 A

12/20/90 RAN NORMAL SHEAR TESTS T3NS1.DAT AND T3NS2.DAT. THE TOTAL VERTICAL LOAD DID NOT REACH THE INTENDED 73,600 #. THE HYDRAULIC PRESSURE WAS INSUFFICIENT TO REACH THIS FORCE. A

12/21/90 THE HYDRAULIC PRESSURE WAS INCREASED TO APPROX. 3000 PSI. RAN TESTS #& T3NS3.DAT THRU T3NS7.DAT. PARAMETERS FOR THE DA.PFL FILE WERE AS FOLLOWS: A

5
0, 0, 0 (SEE PAGE 27 FOR PARAMETER LEGEND)
60, 0, 0
360, 7.36, 0
420, 7.36, 0
720, 0, 0

RAN DIRECT SHEAR TEST T3CND20.DAT. DA.PFL FILE PARAMETERS WERE AS FOLLOWS: A

9
0, 0, 0
60, 0, 0
300, 1.856, 0
360, 1.856, 0
1560, 1.856, 10
1620, 1.856, 10
~~2820~~
2820, 1.856, 0
2880, 1.856, 0
3120, 0, 0

ALAN PICKENS

12/26/90 09:00 - RAN TEST T3CND30.DAT. PARAMETERS FOR THE DA.PFL FILE WERE AS FOLLOWS: A

9
0,0,0
60,0,0
~~420,0~~ A
420, 2.784, 0
480, 2.784, 0
1680, 2.784, 10
1740, 2.784, 10
2940, 2.784, 0
3000, 2.784, 0
3360, 0, 0

(SEE PAGE 27 FOR PARAMETER LEGEND)

10:30 - RAN TEST T3CND40.DAT. PARAMETERS FOR THE DA.PFL FILE WERE AS FOLLOWS: A

9
0, 0, 0
60, 0, 0
~~540, 0~~ A
540, 3.712, 0
600, 3.712, 0
1800, 3.712, 10
1860, 3.712, 10
3060, 3.712, 0
3120, 3.712, 0
3600, 0, 0

12:40 - RAN TEST T3CND50.DAT. PARAMETERS FOR THE DA.PFL FILE WERE AS FOLLOWS: A

9
0, 0, 0
60, 0, 0
660, 4.640, 0
720, 4.640, 0
1920, 4.640, 10
1980, 4.640, 10
3180, 4.640, 0
3240, 4.640, 0
3840, 0, 0

Allan McKinney

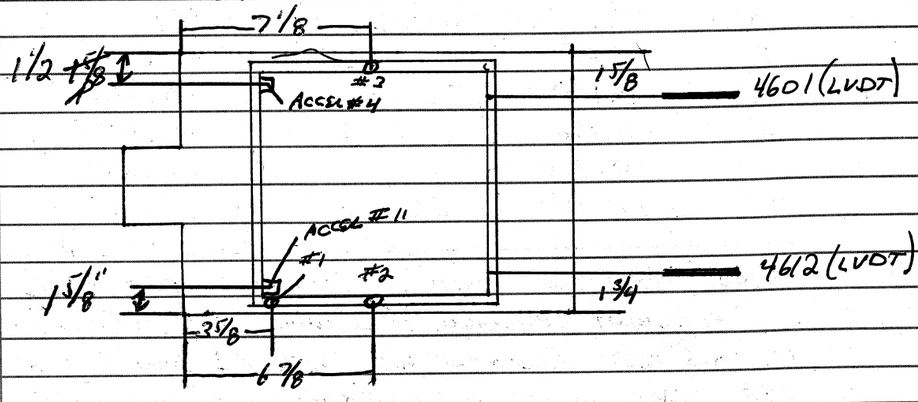
12/31/90 DISASSEMBLED APPARATUS. PHOTOGRAPHED BOTH SPECIMENS BEFORE AND AFTER BRUSHING. THE SPECIMENS WERE PUT IN THE PROFILER. DATA IS CONTAINED IN FILENAME T3PTBAT.DAT AND T3PBBAT.DAT. A

1/3/91 GROUTED CEMENT SPECIMENS IN UPPER AND LOWER BOX ASSEMBLY. THE RECIPE FOR THE GROUT IS ON PAGE 1. A

1/4/91 INSTRUMENTED LOWER BOX ASSEMBLY. TARGET LOCATION IS AS ON PAGE 21. A

1/5/91 INSTRUMENTED UPPER BOX ASSEMBLY. THE FOLLOWING DIAGRAM DETAILS SENSOR LOCATIONS:

UPPER BOX ASSEMBLY



NOTE: LARGE BENTLY PROBES WERE LOCATED THE SAME AS ON PAGE 33.

TWO SINTRAN MODEL ECG ACCELEROMETERS WERE CALIBRATED TO 1g PER VOLT. EQUIPMENT USED WAS AN HP3468A, DMM, S/N 2137A19119, CAL DUE 5/17/91; MEASUREMENTS GROUP CONDITIONER MODEL 2120A, S/N 082100. THE ACCELEROMETERS WERE CALIBRATED USING THE ROLLOVER METHOD. THE GAIN MULTIPLIER WAS SET AT X200 AND THE POT FOR CHANNEL 5 WAS SET AT 0.76. THE POT FOR CHANNEL 6 WAS SET AT 0.80.

Allan Pickens

4/3/90
11/5/91

FOLLOWING ARE THE TARGET SLOPES FOR THE BENTLY PROBES:

TARGET # 1		TARGET #2	
0"	-0.002	0"	-0.012
1"	+0.020	1"	-0.081
2"	-0.016	2"	-0.164
TARGET #3		**TARGET #4**	
0"	-0.096	0"	+0.086
1"	-0.095	1"	+0.227
2"	-0.103	2"	+0.312
		3"	+0.307
TARGET #5		**TARGET #6**	
0"	-0.028	0"	-0.016
1"	-0.139	1"	-0.094
2"	-0.186	2"	-0.157
3"	-0.226	3"	-0.240
4"	-0.150	4"	-0.363

ALLAN PICKENS

4/18/90
1/18/91

09:00 - RAN TEST WITH HORIZONTAL ACTUATOR DETACHED FROM CONCRETE SPECIMEN. FILENAME IS TESTCHK6.DAT. PREVIOUS TEST FILENAMES ARE TESTCKK1 THRU TESTCHK5. THE TRACE ON THE OSCILLISCOPE WAS PHOTOGRAPHED FOR THE COMMAND SIGNALS. THE OSCILLISCOPE IS A TEKTRONIX 5111, CALED ON FEB 26, 90, CAL DUE FEB 26, 91. THE VERTICAL INPUT VOLTAGE WAS NOT DISPLAYED ON THE DATA.
09:40 - RAN TEST WITH SPECIMEN ATTACHED TO ACTUATOR. NO VERTICAL LOAD. FILENAME IS VELP0.DAT. IT WAS DECIDED TO GO DIRECTLY TO 1 MPa INSTEAD OF NO VERTICAL LOAD. FILENAME IS VEL50P1.DAT.
10:20 RAN TEST AT 2 MPa. FILENAME IS VEL50P2.DAT. RAN REMAINING TESTS AT 3, 4 AND 5 MPa LEVELS. FILENAMES ARE VEL50P3.DAT, VEL50P4.DAT, AND VEL50P5.DAT.

ALLAN MCKENZIE

1/18/91

RAN TESTS AT HIGHER VELOCITY. FILENAMES ARE VEL75P1.DAT, VEL75P2.DAT, VEL75P3.DAT, VEL75P4.DAT, AND VEL75P5.DAT. THE NUMBER FOLLOWING THE "P" IN THE FILENAME INDICATES THE MPa LEVEL. PHOTOGRAPHS OF THE COMMAND TRACE AND ONE CHANNEL OF ACCELEROMETER DATA WERE TAKEN ON A STORAGE OSCILLISCOPE. (TEKTRONIX 5111, CAL DUE FEB 26, 1991.) THE FILENAME FOR THE COMMAND SIGNALS WAS DAQTST.CNF. THE FILE WAS AS FOLLOWS:

0,5, 0.0, 0.0	D/A CHAN, SECONDS, BEG. VOLT, END VOLT THIS SIGNAL CONTROLS VERTICAL LOAD. THE VERTICAL LOAD WAS INCREASED AT 1/2 MPa PER MINUTE.
1, .005, 240	D/A CHANNEL, SECONDS BETWEEN DATA POINTS, # OF DATA POINTS. (AFTER VERTICAL LOADING)
0, ~~0.1~~ P, 0	ELAPSED TIME, VOLTAGE
0.1, ~~0.12~~ 0.594 0	THIS CONFIGURATION WAS USED IN THE
0.22, ~~2.953~~ 0.591	VEL 75 SERIES TESTS
0.46, ~~5.906~~ 2.953	
1.06, 5.906	
1.16, 5.906	
0 , 0	THIS CONFIGURATION WAS USED IN THE
0.1 , 0	VEL 75 SERIES TESTS.
0.22, 0.591	
0.38 , 2.953	
0.98 , 5.906	
1.08 , 5.906	

A ZERO FILE WAS USED TO BRING THE COMMAND VOLTAGES BACK TO ZERO BETWEEN TESTS.

ALLAN PICKENS

1/18/91 CHANNEL IDENTIFICATION WAS AS FOLLOWS:

CHANNEL	ID
0	BENTLY #4
1	VERTICAL LD CELL #1
2	VERTICAL LD CELL #2
3	VERTICAL LD CELL #3
4	TOTAL VERTICAL LOAD
5	BENTLY #PP1
6	BENTLY #2
7	BENTLY #3
8	ACCELEROMETER #4
9	ACCELEROMETER #11
10	HORIZONTAL LD CELL
11	ACTUATOR DISPLACEMENT
12	LVDT #4601
13	LVDT #4612
14	BENTLY #5
15	BENTLY #6

SEE PAGE 34 FOR CALIBRATION DATA.

Allen M Parkons

9/23/91 REASSEMBLED APPARATUS FOR DEMONSTRATION. ALL LOAD CELLS WERE CALIBRATED ON 17 AND 18 SEPT 91. SEE LABORATORY NOTEBOOK UNDER "CAL DATA" FOR CALIBRATION RECORDS. A

9/30/91 BEGAN CALIBRATION OF 8mm BENTLY PROXIMITER PROBES. NOTIFIED QA (BOB BRIENT) OF ACTIVITY. EQUIPMENT USED WAS A SCHERR-TUMICO DRUM MICROMETER, SwRI # 2-1, CALED ON 4/18/91; ACOPIAN POWER SUPPLY, MODEL K32560, CAL NOT REQUIRED; 16 GA STEEL TARGET MOUNTED TO DRUM MIKE. FOLLOWING ARE THE READINGS OBTAINED FOR CALIBRATION: READOUT WAS FLUKE MODEL 87, S/N 51502012, CALD ON 13 AUG 91; ANALOG DEVICES MODEL 194 INVERTER OP-AMP MANIFOLD, CAL NOT REQ'D.

~~PS-08 PROX #1~~

~~MILS VOLTS~~

~~0 0.3521~~

~~10 0.7084~~

9/30/91

DOUBLE SIDED TAPE WOULD NOT SECURE PROBE TO FIXTURE. USED 5 MINUTE EPOXY.

PS-08 PROBE #1 (8mm)

MILS	VOLTS
0	0.3570
10	0.7460
20	1.6988
30	2.688
40	3.694
50	4.692
60	5.681
70	6.699
80	7.744
90	8.771
100	9.762
110	10.673
120	11.101
130	11.106

PLOTS DISPLAYED BEST LINEARITY FOR 8mm PROBES BETWEEN 10 AND 110 MILS.

CAL = 10.91 MILS/VOLT, PROBE 1
9.76 MILS/VOLT, PROBE 2
12.32 MILS/VOLT, PROBE 3

CAL VALUES ARE THE AVERAGE OF THE MILS/VOLTS THROUGH THE BEST LINEAR RANGE.

Allen Parkons

9/30/91

PROBE #3 PS 07 (8mm) CAL = 12.32 MILS/VOLT

MILS	VOLTS
0	0.3576
10	0.4878
20	1.4289
30	2.403
40	3.397
50	4.390
60	5.355
70	6.338
80	7.344
90	8.348
100	9.329
110	10.250
120	11.053
130	11.082

PROBE #2 PS 64 (8mm) CAL = 9.76 MILS/VOLT

MILS	VOLTS
0	0.3564
10	1.1315
20	2.089
30	3.069
40	4.052
50	5.038
60	6.031
70	7.070
80	8.114
90	9.137
100	10.131
110	11.002
120	11.045
130	11.048

9/30/91

PROBE #4 PS 81 (25mm) CAL = 49.29 MILS/VOLT

MILS	VOLTS	
0	~~0.69 9/30/91~~ -0.8859	
50	-1.2961	BEST LINEARITY
· 100	-2.049	100 - 600 MILS
150	-2.951	
200	-4.000	
250	-5.136	
300	-6.232	
350	-7.214	
400	-8.136	
450	-9.127	
500	-10.136	
550	-11.118	
· 600	-12.009	
650	-12.674	
700	-13.189	

PROBE #~~4~~5 PS 27 (25mm) CAL = 45.37 MILS/VOLT

MILS	VOLTS	
0	~~-0.80 9/30~~ -0.8584	
50	-1.5337	BEST LINEARITY
100	-2.413	150 - 650 MILS
· 150	-3.423	
200	-4.505	
250	-5.625	
300	-6.682	
350	-7.672	
400	-8.639	
450	-9.769	
500	-10.985	
550	-12.102	
600	-13.083	
· 650	-13.844	
700	-14.080	

9/30/91 PROBE #6 PS 80 (25 mm) CAL = 50.17 MILS/VOLT

MILS	VOLTS	
0	-0.7810	BEST LINEARITY
50	-1.2735	100 - 600 MILS
100	-1.9931	
150	-2.920	
200	-3.830	
250	-5.043	
300	-6.107	
350	-7.098	
400	-8.001	
450	-8.915	
500	-9.968	
550	-10.953	
600	-11.851	
650	-12.630	
700	-13.294	

EQUIPMENT USED FOR PROBES 4,5 AND 6 WAS A STARRETT VERNIER HEIGHT GAGE, MODEL #454F; ACOPIAN POWER SUPPLY, MODEL # K32S60; CAL NOT REQ'D; 16 ga STEEL TARGET; FLUKE MODEL 87, S/N 51502012, CAL'D ON 13 AUG 91. CALIBRATION WAS PERFORMED AS ILLUSTRATED ON PAGE 11. THE REQUIRED ACCURACY OF MEASUREMENT FOR PROBES 4,5 AND 6 IS 5% OR 0.0025". ALL CALIBRATION DATA FOR ALL PROXIMITOR PROBES WAS PLOTTED. THE PLOTS ARE IN THE LABORATORY 3-RING NOTEBOOK UNDER CAL DATA AND ON 3½ DISC WITH FILE NAMES 25mmPROX.WR1, 8mmPROX.WR1, PROX1.PIC, PROX2.PIC, PROX3.PIC, PROX4.PIC, PROX5.PIC, PROX6.PIC.

ALAN M PICKENS

10/1/91 BEGAN CALIBRATION OF LVDT'S. EQUIPMENT WAS 6" STEEL SCALE WITH 0.01" GRADUATIONS; ANALOG DEVICES MODEL 250 POWER SUPPLY, CAL NOT REQ'D; FLUKE MODEL 87 DMM, S/N 51502012, CAL'D ON 13 AUG 91. LVDT'S ARE SCHAEVITZ MODEL 2000 DC-E. NOTIFIED QA OF ACTIVITY.

S/N 4601 - ~~CAL = 5.12 IN/VOLT~~ A 10/1/91

+0.5"	2.51	~~CAL = 0.19 IN/VOLT~~ A 10/1/91
+1.0"	5.12	CAL = 0.20 IN/VOLT
+1.5"	7.66	
+2.0"	10.271	
-½ 0.5"	-2.57	
-1.0"	-5.17	
-1.5"	-7.70	
-2.0"	-10.193	

S/N 4612 - ~~CAL = 5.13 IN/VOLT~~ A 10/1/91

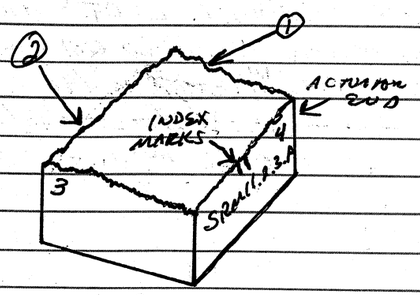
+0.5"	2.59	CAL = 0.19 IN/VOLT
+1.0"	5.11	
+1.5"	7.69	
+2.0"	10.240	
-0.5"	-2.59	
-1.0"	-5.14	
-1.5"	-7.67	
-2.0"	-10.21	

BEGAN CALIBRATION OF ACCELEROMETERS. CALIBRATION WAS DONE BY USING THE ROLLOVER METHOD AND SETTING THE GAIN AT 1g/VOLT. EQUIPMENT USED WAS MICRO MEASUREMENTS MODEL 2120A CONDITIONER, S/N 84077, CAL NOT REQ'D; FLUKE MODEL 87 DMM, S/N 51502012, CAL'D ON 13 AUG 91; TWO ENTRAN MODEL ECG ACCELEROMETERS.

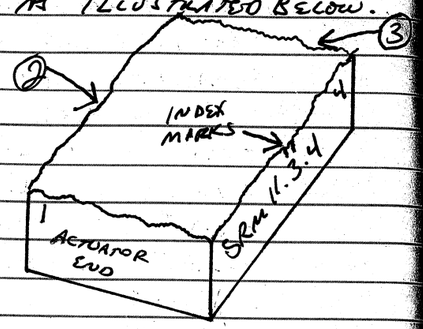
LEFT CHANNEL - ACCEL #4	RIGHT CHANNEL-ACCEL #11
BRIDGE VOLTAGE = 5V	BRIDGE VOLTAGE = 5V
GAIN - X200 KNOB - 1.52	GAIN-X200 KNOB- 1.56

A PICKENS

10/3/91 RECIEVED SPECIMEN # SRM 11.2.3.A FOR THE TOP BLOCK AND SPECIMEN # SRM 11.3.4 FOR THE BOTTOM BLOCK. THE SPECIMENS WERE LABELED AS ILLUSTRATED BELOW.

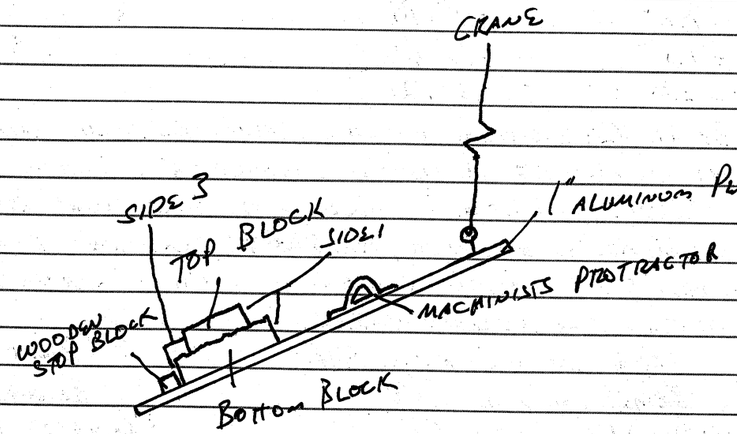


TOP BLOCK
SPECIMEN # 11.2.3.A



BOTTOM BLOCK
SPECIMEN # 11.3.4

DETERMINED TILT ANGLE OF SPECIMEN. THE SPECIMEN SHEARED AT 49° IN THE 1 THROUGH 3 DIRECTION. THE SPECIMEN SHEARED AT 53° IN THE 3 THROUGH 1 DIRECTION. TEST WAS PERFORMED AS ILLUSTRATED BELOW. TILT ANGLE WAS DETERMINED USING A MACHINISTS PROTRACTOR. SIMON HSIUNG WAS PRESENT DURING TESTING.



1 THROUGH 3 DIRECTION

ANNE MARCUS

10/16/91 COMPLETED MODIFICATIONS TO TOP AND BOTTOM BOX SIDE COVERS TO ACCOMODATE 25 MM PROXIMITORS. DRAWINGS FOR MODIFICATIONS ARE IN THE 3-RING LABORATORY NOTEBOOK UNDER "FIGURES". THE SIDE ROLLER BOXES WERE ALSO MODIFIED TO ALLOW PROXIMITOR TARGETS TO CLEAR. THE APPARATUS WAS DISASSEMBLED AND THE BOTTOM SPECIMEN WAS GROUTED INTO THE BOTTOM BOX. THE BOX WAS GROUTED IN THE SIDE 3 THROUGH 1 OR 1-3° ORIENTATION. THE GROUT RECIPE FOR THE BOTTOM BOX WAS AS FOLLOWS:

1 POUND 10 OZ WATER
20 GMS LOMAR D
3 POUNDS 5 OZ CEMENT
8 POUNDS 5 OZ SAND

10/17/91 THE TOP BOX WAS GROUTED USING ¼" MASONITE AND ¾" WOOD FOR FRAMING. THE GROUT RECIPE WAS INCREASED TO ACCOMODATE SHALLOW ROCK. THE RECIPE WAS AS FOLLOWS:

2 POUNDS WATER
25 gms LOMAR D
4 POUNDS 2 OZ CEMENT
10 POUND 6 OZ SAND

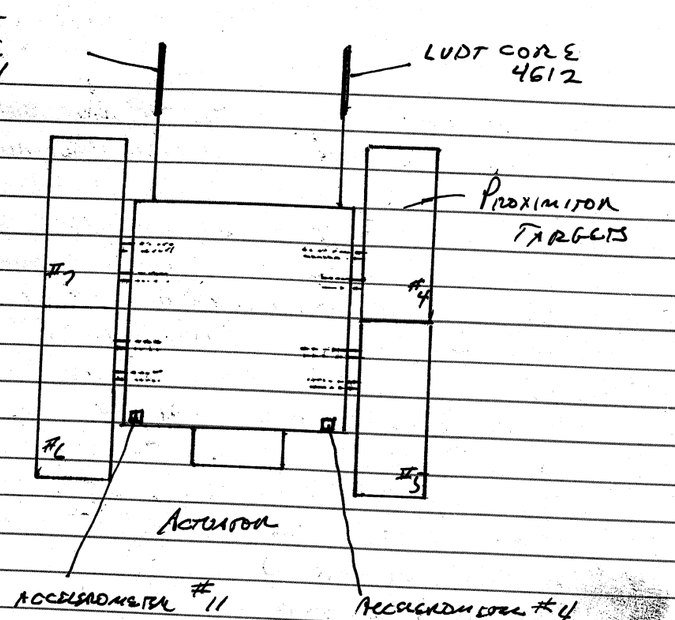
THE GROUT WAS ALLOWED TO SET-UP FOR APPROXIMATELY 2 HRS. BOTH SAMPLES WERE THEN PLACED IN AN OVEN AT 105°C, 4:30 PM.

10/18/91 4:30 PM SAMPLES WERE REMOVED FROM OVEN.

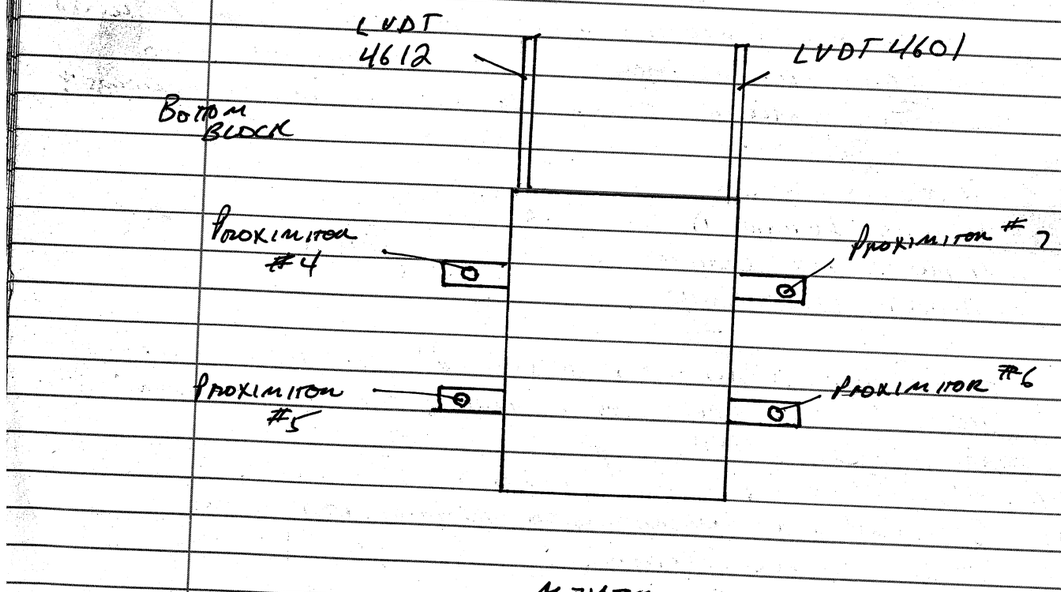
10/26/91 SPECIMENS WERE INSTRUMENTED AS INDICATED IN THE FOLLOWING ILLUSTRATIONS.

ANNE MARCUS

10/21/91



TOP BLOCK (ROCK SIDE UP)



10/22/91 FOLLOWING ARE THE READINGS FOR THE PROXIMITOR TARGETS OBTAINED FROM THE PROFILE METER.

TARGET #	0"	1"	2"	3"	4"
4	0.1565	0.1815	0.1575	0.1810	0.1850
5	0.0820	0.0830	0.1610	0.2350	0.3325
6	-0.0730	-0.120	0.0310	0.1850	0.3180
7	0.0600	0.0200	0.1380	0.1815	0.0550

TARGET #	5"	6"
4	0.2245	0.2515
5	0.4230	0.5560
6	0.5240	0.7410
7	0.0620	0.2200

10/23/91 REASSEMBLED APPARATUS. ONLY THREE BENTLY PROBES WERE AVAILABLE FOR INSTALLATION. HOWEVER ALL 4 MOUNTS WERE INSTALLED WITH TARGETS. THE SPECIMENS USED PRODUCED WITH THE DATA IN FILENAMES T4PTBBT.DAT FOR THE TOP BLOCK AND T4PBBBT.DAT FOR THE BOTTOM BLOCK. P

10/24/91 RECIEVED PROXIMITOR #7. FOLLOWING IS THE CALIBRATION DATA. EQUIPMENT LIST WAS AS USED ON PAGE 44. DATA IS STORED ON SAME DISK WITH FILENAMES 25MM PROX.WR1 AND PROX7.PIC.

PROXIMITOR #7 PS87 (25mm) CAL = 47.19 MILS/VOLT

		MILS	VOLTS
0	0.819		
50	1.4027	500	10.451
~~100~~	2.216	550	11.442
~~150~~	3.194	600	12.299
~~200~~	4.284	650	12.986
~~250~~	5.389	700	13.535
300	6.464		
350	7.448		
400	8.351		
450	9.376		

P 10/24/91

ACCELEROMETERS

10/24/91

CALIBRATED HORIZONTAL ACTUATOR DISPLACEMENT TRANSDUCER. EQUIPMENT USED WAS HP3468A DMM, S/N 2137A19119, CAL DUE 23 MAY 92; CRAFTSMAN 12" STEEL RULE, 1/64" INCREMENTS.

INCHES	VOLTS	CAL = 0.20"/VOLT
0	-9.50	
1/2	-7.11	
1	-4.60	
1 1/2	-2.13	
2	+0.36	
2 1/2	+2.91	
3	+5.35	
3 1/2	+7.87	
3 7/8	+9.78	

FOLLOWING IS A SUMMARY OF COMPUTER CHANNELS AND CALIBRATION VALUES:

CHANNEL	XDCR	CAL VALUE	CAL DATE
0	VERT LD CELL #1	10,000 #/VOLT	18 SEP 91
1	VERT LD CELL #2	10,000 #/VOLT	18 SEP 91
2	VERT LD CELL #3	10,000 #/VOLT	18 SEP 91
3	TOTAL VERT LD	10,000 #/VOLT ~~NOV 91~~	17 SEP 91
4	HORIZ LD CELL	10,000 #/VOLT	17 SEP 91
5	PROXIMITOR #7	47.19 MILS/VOLT	10/24/91
6	PROXIMITOR #6	50.17 MILS/VOLT	9/30/91
7	PROXIMITOR #5	45.37 MILS/VOLT	9/30/91
8	PROXIMITOR #4	49.23 MILS/VOLT	9/30/91
9	LVDT 4601	0.20 INCH/VOLT	10/1/91
10	LVDT 4612	0.18 INCH/VOLT	10/1/91
11	ACCEL #4	1g/VOLT	10/1/91
12	ACCEL #11	1g/VOLT	10/1/91

Ann Arbor

10/28/91

RAN NORMAL SHEAR TESTS 1-5. FILENAMES FOR DATA ARE T4NS1.DAT, T4NS2.DAT, T4NS3.DAT, T4NS4.DAT, AND T4NS5.DAT. THE COMMAND FILE, DA.PFL WAS AS FOLLOWS.

```
5          (SEE PAGE 27 FOR LEGEND)
0 0 0
60 0 0
360 7.36 0
420 7.36 0
720 0 0
```

CHIPS AND DUST ~~AROUND~~ THE EDGES OF THE SPECIMEN WERE NOTED AFTER THIS SERIES OF TESTING.

RAN COMBINED NORMAL AND DIRECT SHEAR TESTS AT 3.0, 4.0 AND 5.0 MPa LEVELS. FILENAMES FOR DATA ARE T4CND30.DAT, T4CND40.DAT, AND T4CND50.DAT. COMMAND FILE PARAMETERS WERE AS FOLLOWS FOR TESTS.

T4CND30.DAT

```
9
0 0 0
60 0 0
420 2.785 0
480 2.785 0
1680 2.785 10
1740 2.785 10
2940 2.785 0
3000 2.785 0
3360 0 0
```

T4CND40.DAT

```
9
0 0 0
60 0 0
540 3.714 0
600 3.714 0
1800 3.714 10
1860 3.714 10
3060 3.714 0
3120 3.714 0
3600 0 0
```

Ann Arbor

10/28/91 T4CND50.DAT

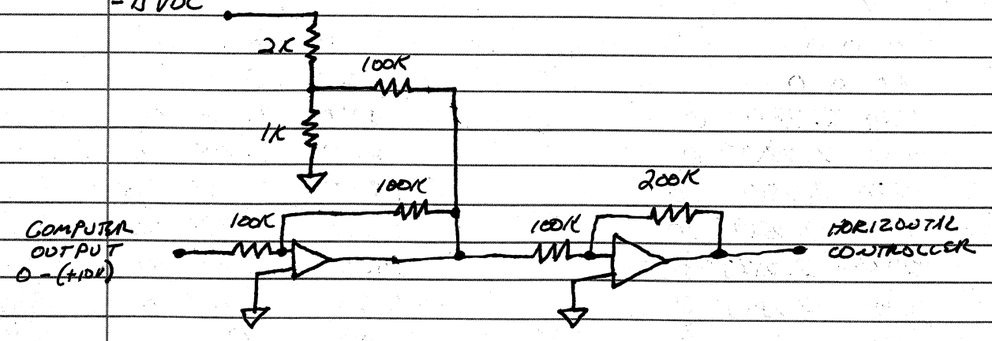
~~0~~	9		
60	0	0	0
~~780~~	60	0	0
~~840~~	660	4.643	0
~~2040~~	720	4.643	0
	1920	4.643	10
	1980	4.643	10
	3180	4.643	0
	3240	4.643	0
	3840	0	0

A 10/28/91

AN ERROR IN ENTERING THIS FILE CAUSED THE APPARATUS TO OSCILLATE WILDLY. THE ERROR WAS FOUND AND CORRECTED.

ALAN PICKENS

10/29/91 THE FOLLOWING BUCK AND GAIN CIRCUIT WAS UTILIZED TO ALLOW THE HORIZONTAL ACTUATOR TO REACH THE BACK 2" OF THE BOTTOM SPECIMEN. THE DYNOLOG PROGRAM WILL NOT ALLOW A NEGATIVE VOLTAGE OUTPUT TO THE HORIZONTAL ACTUATOR.



INPUT	OUTPUT
10V	10V
5V	0V
0V	-10V

ALAN PICKENS

10/29/91 THE SPECIMEN WAS WORN DOWN FOR THE VELOCITY TESTS. THE VERTICAL LOAD WAS INCREASED TO 9,000# AND TOP ROCK WAS MOVED FROM CENTER TO THE BACK OF THE BOTTOM ROCK. THE TOP ROCK WAS MOVED FROM BACK TO FRONT AND BACK AGAIN TWO TIMES. THE VERTICAL LOAD WAS INCREASED TO 11,000#. THE TOP ROCK WAS MOVED TO THE FRONT, BACK AND TO THE FRONT. THE VERTICAL LOAD WAS INCREASED TO 3 Mpa. THE TOP ROCK WAS MOVED FROM THE FRONT TO THE BACK, FRONT AND BACK AGAIN. THE WEAR PROCEDURE WAS STOPPED. DURING THE HIGH ~~VERTICAL~~ VERTICAL PRESSURE A 10/25/91 PORTION OF THE TEST THE VERTICAL SERVO WENT INTO MILD OSCILLATION. FURTHER GAIN ADJUSTMENT ON THE CONTROLLER WAS REQUIRED. A

10/30/91 FINAL GAIN ADJUSTMENTS WERE MADE TO THE VERTICAL SERVO CONTROLLER. ACCELEROMETER #11 WAS CHIPPED AWAY DURING THE EXCURSIZE PERFORMED ON 10/29/91. A

THE FOLLOWING VELOCITY TESTS WERE PERFORMED. THE FIRST SERIES OF FIVE TESTS WERE PERFORMED WITH THE FOLLOWING PARAMETERS. FILENAMES ARE T4V8P1.DAT, T4V8P2.DAT, T4V8P3.DAT, T4V8P4.DAT, AND T4V8P5.DAT; 0-40 mm AT 2.5 mm/SEC., 40-65 mm AT A 7.5 mm/SEC., 65-90 mm AT 2.5 mm/SEC.; 1-5 Mpa. THE Mpa LEVEL IS INDICATED FOLLOWING THE LETTER "P" IN THE FILENAME. KEYSTROKES ARE: QUICKLOG LOGGER.CNF DAQTST.CNF (FILENAME). ~~COMMAND FILE (DAQTST.CNF) WAS AS FOLLOWS.~~ (LEGEND ON PAGE 39

These programs were not run on 10/30/91 A See Page 4

T4V8P1.DAT - T4V8P5.DAT A 10/31/91

0, RAMP TIME	1/2 Mpa/min,	0, Mpa LEVEL
1,	0.005,	2,000
6		
0.0	0.0	
10.0	0.0	
26.0	3.925	
29.33	6.425	
39.33	8.925	
50.00	8.925	

THIS CONFIGURATION WAS NOT USED. ALAN PICKENS 10/31/91

ALAN PICKENS

10/31/91

THE QUICKLOG PROGRAM WOULD NOT ALLOW THE AMOUNT DATA SAMPLES REQUIRED FOR 13 CHANNELS. A MAXIMUM OF ABOUT 16,000 TOTAL SAMPLES ARE AVAILABLE IN THE PROGRAM. TO ALLOW THE TESTING TO CONTINUE ONLY EIGHT CHANNELS OF DATA WERE UTILIZED AS FOLLOWS:

CHNL	XDCR
0	TOTAL VERTICAL LOAD
1	HORIZONTAL LOAD
2	BENTLY PROX #7
3	BENTLY PROX #5
4	BENTLY PROX #4
5	LVDT 4601
6	LVDT 4612
7	ACCEL #4

DUE TO THE LIMITED NUMBER OF SAMPLES AVAILABLE, THE HIGHER VELOCITY TESTS WERE PERFORMED FIRST. PARAMETERS AND FILENAMES ARE AS FOLLOWS: T4V75P1.DAT, T4V75P2.DAT, T4V75P3.DAT, T4V75P4.DAT AND T4V75P5.DAT; 0-40mm AT 25mm/SEC, 40-65mm AT 75 mm/SEC, 65-90mm AT 25mm/SEC 1-5 MPa. THE MPa LEVEL IS INDICATED FOLLOWING THE LETTER "P" IN THE FILENAME. KEYSTROKES WERE: QUICKLOG LOGGER.CNF DAQTST.CNF (FILE NAME)

LOGGER.CNF

```
0 7
0.0 10000 LBS
0.0 10,000 LBS
-372.29 94.4 MILS
-364.876 90.74 MILS
-383.413 98.58 MILS
0 0.2 INCHES
0 0.19 INCHES
0 1.0 g's
```

DAQTST.CNF

```
0 120 0 0.9285
1 .005 600
4
0 0
1.6 3.925
1.93 6.425
2.93 8.925
```

Affixed

10/31/91

T4V75P1.DAT WAS PERFORMED. THE TEST RAN ACCORDING TO SPECIFICATIONS. WHEN RETURNING THE APPARATUS TO THE "-2" OR "0" mm POSITION A PROBLEM IN THE PROGRAM WAS DISCOVERED. WHEN THE VELOCITY TEST ENDS THE COMPUTER MAINTAINS THE NECESSARY OUTPUT VOLTAGE TO KEEP THE HORIZONTAL ACTUATOR IN THE +90mm POSITION. THE "ZERO" PROGRAMS WAS DESIGNED TO UNLOAD THE VERTICAL LOAD SLOWLY AND RETURN THE HORIZONTAL POSITION TO "0" mm OVER A PERIOD OF 15 SECONDS. UPON RUNNING THE ZERO PROGRAM, HOWEVER, THE COMPUTER RETURNED ALL COMMAND VOLTAGES TO ZERO RESULTING IN AN IMMEDIATE RESPONSE ON THE HORIZONTAL POSITION. THE PROGRAM WAS UNLOADING THE VERTICAL LOAD AT THIS POINT. WHEN THE VERTICAL LOAD WAS RETURNED TO ZERO THE HORIZONTAL COMMAND RETURNED TO THE 90mm POSITION AND THEN MOVED BACK TO THE 0mm POSITION OVER A PERIOD OF 15 SECONDS. TO PREVENT THIS FROM RE OCCURING, ~~THE HORIZONTAL HYDRAULICS WILL BE TURNED OFF FOLLOWING THE TEST~~ 10/31/91 THE PROGRAM WAS ADJUSTED TO UNLOAD THE VERTICAL LOAD AND RETURN THE ACTUATOR TO THE "0" mm POSITION. NO "ZERO" FILE WILL BE USED. RAN T4V75P2.DAT, T4V75P3.DAT, T4V75P4.DAT, T4V75P5.DAT. THE VERTICAL LOAD WAS RAMPED AT 0.5 MPa/min. THE SAMPLING RATE WAS 5mSEC. THE LOWER VELOCITY TESTS WERE RAN AS OUTLINED ON PAGE 53. DUE TO THE LIMITED AVAILABILITY OF STORAGE, THE SAMPLING RATE WAS REDUCED TO 20mSEC. RAN TESTS T4V8P1.DAT, T4V8P2.DAT, T4V8P3.DAT, T4V8P4.DAT, T4V8P5.DAT.

DAQTST.CNF

```
0 120 0 0.925        D/A CHAN, RAMP TIME (SEC), BEGIN VOLT, END VOLT
1 .02 #500 1465      D/A CHAN, SAMPLE RATE, SAMPLE UNITS
4                    BREAK POINTS
0 0                  CUM. TIME (SEC)   VOLTAGE (HORIZ)
16 3.925             "                 "
19.3 6.425           "                 "
29.3 8.925           "                 "
```

11/4/91

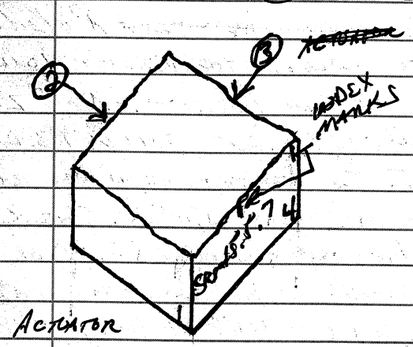
FOLLOWING ARE READINGS OBTAINED FROM THE PROXIMITOR TARGETS AFTER TESTING:

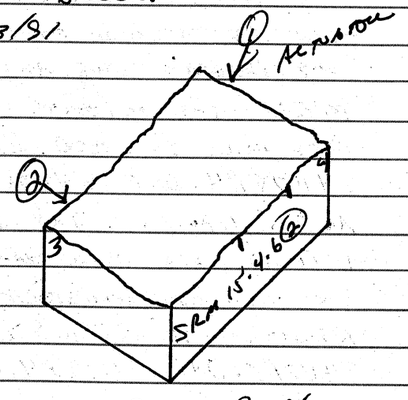
TARGET #	0"	1"	2"	3"	4"	5"	6"
~~4~~	~~0.0020~~	~~0.0740~~					
5	.1075	.0960	.1740	.2400	.2700	.4015	.5185
6	-0.1080	-.0465	.0270	.1590	.3020	.4925	.6910
7	0.0020	0.0740	.1300	.1550	.1080	.0055	-.1625
4	.2260	.2480	.2825	.2830	.3290	.3320	.3260

ON 11/1/91 THE ~~BOTTOM~~ APPARATUS WAS DISASSEMBLED. THE SPECIMENS WERE PHOTOGRAPHED IMMEDIATELY AFTER THE TOP BLOCK WAS REMOVED. THE BOTTOM BLOCK WAS BRUSHED OFF, PHOTOGRAPHED AND PROFILED. THE FILENAME IS T4PBRAT.DAT.

THE TOP BLOCK WAS BRUSHED, PHOTOGRAPHED AND PROFILED. FILENAME IS T4PTBAT.DAT. RELIEVED NEXT SPECIMEN. SRM5.5.7 IS THE TOP BLOCK, SRM15.4.6(2) IS THE BOTTOM BLOCK.

11/13/91





Acoustic Emission

11/4/91

PERFORMED TILT ANGLE TEST. SPECIMEN MOVED AT 54° IN THE SIDE 3 THROUGH 1 CONFIGURATION. SPECIMEN MOVED AT 56° IN THE SIDE 1 THROUGH 3 CONFIGURATION. THE TEST PROCEDURE IS ILLUSTRATED ON PAGE 46.

Schmidt hammer test on the side of top specimen (applied pressure downward vertically)

No. of tests	rebound number	
1	62	4 sides of top specimen (SRM 15.5.7)
2	60	
3	60	
4	62	
5	59	
6	60	
7	56	
8	59	
9	62	
10	60	
11	59	
12	61	
13	57	
14	57	
15	61	
16	60	

Schmidt hammer test on joint surface of top specimen (SRM 15.5.7) (applied pressure vertically downward)

No of Test.	Rebound No.
1	39
2	52
3	52
4	40
5	53
6	52
7	48
8	51

↓over

Test No.	Rebound No.
9	56
10	49
11	47
12	54
13	46
Ave	50.4

(excluding test No. 1, 4, & 9)

Schmidt hammer test on sides of ~~bottom~~ block SRM 15.4.6 (apply pressure vertically downward)

Test #	Rebound #
1	64
2	61
3	63
4	60
5	61
6	63
7	61
8	63
9	63
10	60
11	62
12	62
13	60
14	~~64~~ 62 dw 11/4/91
15	61
16	~~59~~ 58 dw 11/4/91

Schmidt hammer test on joint surface of bottom specimen (SRM 15.4.6) (applied pressure vertically downward)

Test #	Rebound #
1	56
2	50
3	48
4	30

Test #	Rebound #
5	54
6	46
7	50
8	44
9	48
10	52
11	47
12	51
13	50
Ave	48.6

(excluding test No. 1, 4 & 5)

11/4/91 GROUTED SPECIMEN 15.4.6.②. GROUT RECIPE WAS AS ON PAGE 47 UNDER 10/16/91. GROUT WAS ALLOWED TO SET UP OVERNIGHT.

11/5/91 GROUTED SPECIMEN 15.5.7. RECIPE WAS AS IN 11/4/91. DUE TO POSITION OF ROCK ONE ACCELEROMETER WOULD NOT FIT BETWEEN THE ROCK AND THE FRONT OF THE BOX. THE ROCK WAS CHIPPED AWAY TO FACILITATE ACCELEROMETER MOUNTING. 4:00 PM - THE SPECIMENS WERE PUT IN AN OVEN TO CURE. PRIOR TO GROUTING THE TOP ROCK WET WEIGHT WAS 18 POUNDS 14 OZ.

11/6/91 4:00 PM REMOVED SPECIMENS FROM OVEN.

11/7/91 PROFILED BOTTOM ROCK. FILENAME IS TSPBBBT.DAT. MAX X = 11799, MAX Y = 7757, X OFFSET = 3847, Y OFFSET = 1718, INDEX = 1.

PROFILED TOP ROCK. FILNAME IS TSPTBBT.DAT. MAX X = 8039, MAX Y = 7744, X OFFSET = 3791, Y OFFSET = 1919 INDEX = 5

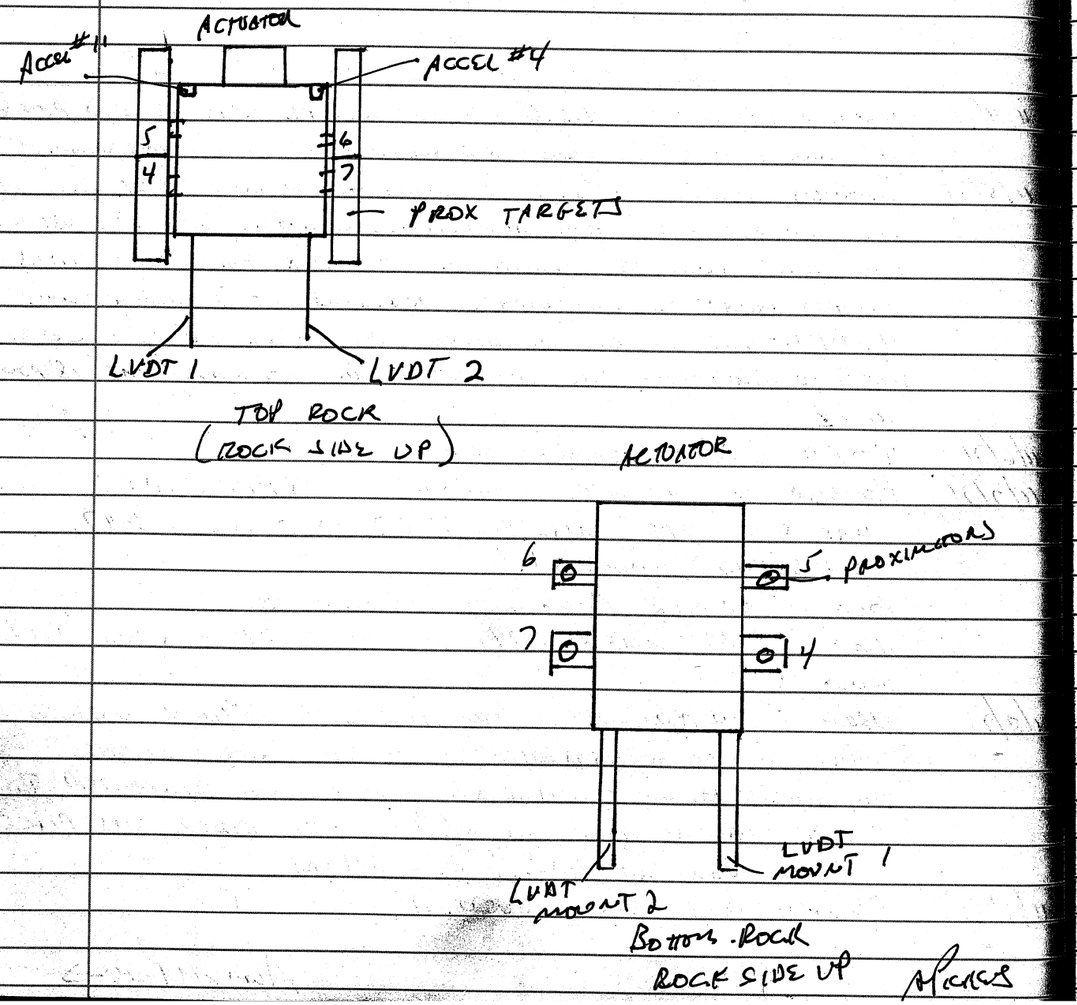
11/8/91 UPON ~~1ST~~ INSTRUMENTING THE TOP ROCK, IT WAS NOTICED THAT THE ROCK HAD SHIFTED IN THE GROUT. THE TOP BLOCK ASSEMBLY WAS DISASSEMBLED AND REGROUTED. THE RECIPE WAS AS ABOVE IN 11/5/91. THE BLOCK WAS PLACED IN AN OVEN AT 105°C FOR 24 HRS.

11/5/91 REMOVED ROCK FROM OVEN. A

Alan Mackey

11/11/91 PROFILED TOP ROCK. FILENAME IS TSPTABT.DAT. MAX "X" = 8046, MAX Y = 7696, X OFFSET = 3697, Y OFFSET = 1624, INDEX = 3.
THE DATA FROM THE SLOWER VELOCITY TESTS READ ZEROES. AFTER TRIAL AND ERROR, THE COMPUTER WILL NOT TAKE DATA WITH A SAMPLE RATE SLOWER THAN 10 m SEC INTERVALS.

11/12/91 THE SPECIMENS WERE INSTRUMENTED AS ILLUSTRATED BELOW.



11/12/91 FOLLOWING ARE THE READINGS OBTAINED FROM THE PROX TARGETS.

TARG #	0"	1"	2"	3"	4"	5"	6"
4	+0.0205	-0.1440	-0.2960	-0.3620	-0.5120	-0.6530	-0.7560
5	-1.0960	-1.2250	-1.3680	-1.4275	-1.5150	-1.5350	-1.5025
6	+0.2255	+0.2390	+0.2710	+0.3480	+0.4635	+0.6550	+0.8325
7	+0.0120	+0.0625	+0.1050	+0.1510	+0.1560	+0.0795	+0.0690

THE APPARATUS WAS REASSEMBLED. PHOTOGRAPHS WERE TAKEN OF THE SPECIMENS PRIOR TO INSTALLATION. FOLLOWING IS THE CHANNEL CONFIGURATION FOR THE NORMAL AND COMBINED TESTS:

CHNL		
0	TOTAL VERTICAL LOAD	
1	HORIZONTAL LOAD	
2	BENTLY PROX #7	OFFSET -394.133 MILS
3	BENTLY PROX #5	OFFSET -381.203 MILS
4	BENTLY PROX #4	OFFSET -388.705 MILS
5	LVDT 1	
6	LVDT 2	
7	ACCEL #4	
8	ACCEL #11	
9	VERTICAL LOAD CELL #1	
10	VERTICAL LOAD CELL #2	
11	VERTICAL LOAD CELL #3	
12	BENTLY PROX #6	OFFSET -390.592 MILS

SEE PAGE 50 FOR CALIBRATION INFO

11/13/91 STARTED NORMAL SHEAR TESTS. FILENAMES ARE TSNS1.DAT, TSNS2.DAT, TSNS3.DAT, TSNS4.DAT, AND TSNS5.DAT.
COMMAND FILE IS DA.PFL AS FOLLOWS

5
005
(LEGEND ON PAGE 27)
60 0 5
360 7.36 5
420 7.36 5
720 0 5.

Alan Parkes
Reviewed Procedures
M. Thiele

11/13/91

AT SOME POINT DURING TEST 4, THE AC POWER WAS LOST TO THE VERTICAL HYDRAULIC CONTROLLER. THE VERTICAL LOAD DID NOT REDUCE AS THE COMMAND VOLTAGE DECREASED. THE HYDRAULICS WERE TURNED OFF AND THE VERTICAL LOAD WAS ALLOWED TO BLEED OFF SLOWLY. THE POWER STRIP WAS REPLACED. TEST 5 RAN NORMALLY. RAN AN ADDITIONAL TEST FOR REPEAT TEST 4. FILENAME IS T5WS6.DAT. AP

STARTED TEST T5CND40.DAT. PARAMETERS WERE SUPPLIED BY MIKRO ANOLA. COMMAND FILE WAS AS FOLLOWS.

```
DA.PFL FOR T5CND40.DAT
   9
   0  0  5
  60  0  5
 540  3.714  5
 600  3.714  5
1800  3.714  10
1860  3.714  10
3060  3.714  5
3120  3.714  5
3600  0  5
```

(LEGEND ON PAGE 27)

THE TEST WAS STOPPED BECAUSE THE HORIZONTAL CONTROLLER WAS NOT TURNED ON. THE FILE WAS OVERWRITTEN.

RAN TEST T5CND50.DAT. COMMAND FILE WAS AS FOLLOWS:

```
DA.PFL FOR T5CND50.DAT
   9
   0  0  5
  60  0  5
 660  4.643  5
 720  4.643  5
1920  4.643  10
1980  4.643  10
3180  4.643  5
3240  4.643  5
3840  0  5
```

Anna Picker

11/13/91

THE ROCK SURFACE WAS WORN DOWN BY CYCLING THE TOP ROCK 7 TIMES ACROSS THE 4" OF TRAVEL AT A VERTICAL LOAD OF 3 MPa. FOLLOWING WAS THE COMMAND FILE FOR THIS PROCEDURE

```
   15
   0  0  5          ZERO
10 20  0  5          ZERO
20 30  0  0          MOVE BACK, ZERO VERTICAL
 70  2.785  0       LOAD VERTICAL TO 3 MPa
 85  2.785  10      MOVE FORWARD
100  2.785  0       MOVE BACK
115  2.785  10      MOVE FORWARD...
130  2.785  0
145  2.785  10
160  2.785  0
175  2.785  10
190  2.785  0
205  2.785  10
220  2.785  0
280  0  0
```

RAN HIGH SPEED STEP VELOCITY TESTS. FILENAMES WERE T5V75P1.DAT, T5V75P2.DAT, T5V75P3.DAT, T5V75P4.DAT, T5V75P5.DAT. FOLLOWING ARE THE PARAMETERS FOR THE COMMAND FILE DAQTST.CNF:

FIRST LINE FOR 1 MPa> 0 120 0 0.9285
2 MPa> 0 240 0 1.857
3 MPa> 0 360 0 2.785
4 MPa> 0 480 0 3.714
5 MPa> 0 600 0 4.643

FOLLOWING LINES:

```
1  .005  550
4
0  0        (SEE PAGE 55 FOR LEGEND)
1  2.5
1.53  6.425
2.53  8.925
```

Anna Picker

11/13/91

RAN LOW SPEED STEP VELOCITY TESTS. FILENAMES ARE TSV15P1.DAT, TSV15P2.DAT, TSV15P3.DAT, TSV15P3.DAT, TSV15P4.DAT AND TSV15P5.DAT. FOLLOWING WAS THE PARAMETERS FOR COMMAND FILE DAQTST.CNF:

FIRST LINE FOR 1 MPH> 0 120 0 0.9285
2 MPH> 0 240 0 1.857
3 MPH> 0 360 0 2.7855
4 MPH> 0 480 0 3.714
5 MPH> 0 600 0 4.643

FOLLOWING LINES 1 0.010 1300
4
0 0
5 2.5
7.67 6.425
12.67 8.925

BOTH SERIES OF STEP VELOCITY TESTS RAN SUCCESSFULLY WITH CONFIRMED DATA IN THE FILES. FOLLOWING IS THE CHANNELS USED ON THE COMPUTER:

CHNL	XDCR
0	TOTAL VERT LOAD
1	HORIZ LOAD
2	BENTLY #7
3	BENTLY #5
4	BENTLY #4
5	LVDT #1
6	LVDT #2
7	ACCEL #4
8	ACCEL #11

11/15/91

THE APPARATUS WAS DISASSEMBLED. THE SPECIMENS WERE ~~BRUSHED~~ PHOTOGRAPHED, BRUSHED AND PHOTOGRAPHED AGAIN. CRACKS IN THE TOP ROCK WERE NOTICED AFTER BRUSHING. SEE PHOTOS TSTBAB. FOLLOWING ARE READINGS TAKEN FROM THE PROXIMITOR TARGETS AFTER TESTING.

Alan Peters

11/15/91

TARG #	0"	1"	2"	3"	4"	5"	6"
4	-0.0015	-0.0210	-0.0740	+0.0940	-0.1170	-0.2040	-0.2200
5	+0.6250	0.5240	0.4765	0.4710	0.4835	0.5200	0.5620
6	-0.6495	-0.6435	-0.5620	-0.4575	-0.2825	-0.0470	+0.1385
7	-1.0785	-0.9100	-0.8190	-0.7705	-0.7340	-0.8180	-0.8755

READINGS WERE TAKEN FROM REAR TO FRONT

11/15/91

Conducted Schmidt hammer tests on all 4 sides of both the top and bottom blocks (Specimen SRM 9.1.1 / 9.2.2). Readings for the 4 sides of top block are as follows (4 readings / side): (Applied pressure vertically downward).

No of Test #	Rebound #
1	60
2	60
3	58
4	60
5	61
6	60
7	60
8	61
9	61
10	61
11	60
12	62
13	61
14	60
15	62
16	63

Schmidt Hammer test on joint surface of top block (SRM 9.1.1) Applied press. vertically

Test #	Rebound #
1	56
2	56
3	50
4	49

M. Hlavac

5	50
6	52
7	50
8	52
9	60
10	51
11	47
12	46
13	51

Schmidt hammer tests on 4 sides of bottom block (SRM 9.2.2) are as follows (Pressure applied vertically)

Test #	Rebound #
1	62
2	61
3	61
4	60
5	60
6	62
7	62
8	59
9	57
10	62
11	63
12	63
13	62
14	62
15	61
16	62

Test on joint surface of bottom block (SRM 9.2.2)

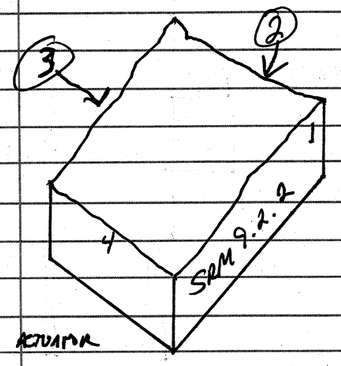
Test #	Rebound #
1	63
2	60
3	46
4	56

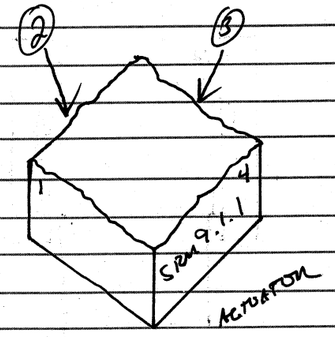
5	58
6	57
7	44
8	52
9	52
10	48
11	52
12	57
13	55

M/Thola

11/18/91 PERFORMED ANGLE TEST ON SPECIMEN SRM 9.1.1/9.2.2. THE TOP SPECIMEN MOVED AT 48° IN THE SIDE 2 THROUGH 4 CONFIGURATION. THE TOP SPECIMEN MOVED AT 49° IN THE SIDE 4 THROUGH 2 CONFIGURATION. ~~THE BOTTOM BLOCK WAS GROUTED USING THE RECIPE LISTED ON PAGE 49 TOTAL~~ #11/19/91 SEE BELOW

THE TOP BLOCK NET WEIGHT WAS 19 POUNDS 14 OZ.





BOTTOM BLOCK TOP BLOCK

THE BOTTOM BLOCK WAS GROUTED. THE RECIPE FOR THE GROUT WAS AS FOLLOWS:

1 LB 10 OZ WATER
15 GMS DARACEM 100
2 LB 5 OZ CEMENT
8 LB 5 OZ SAND

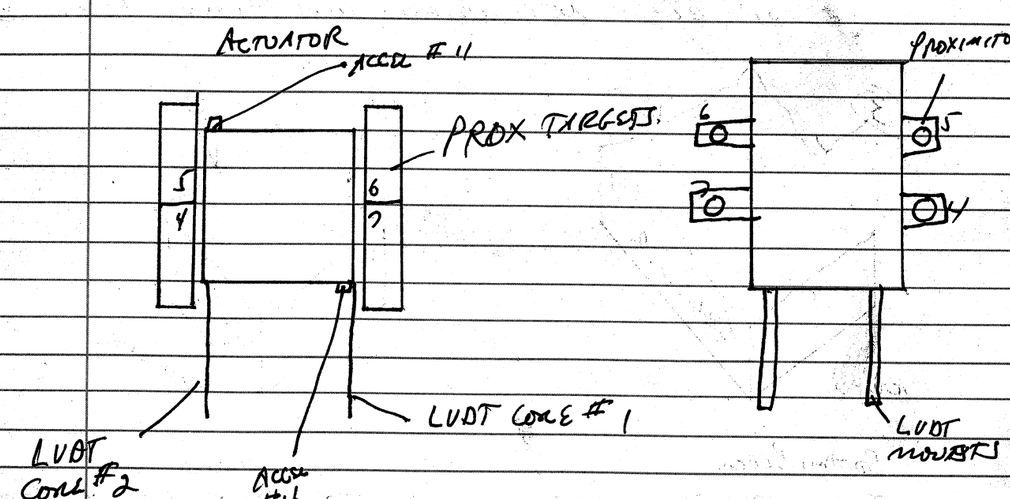
Approved

11/18/91 THE TOP BLOCK WAS GROUTED USING THE RECIPE LISTED ON PAGE 67. THE SPECIMENS WERE PLACED IN AN OVEN AT 105°C.

11/19/91 THE SPECIMENS WERE REMOVED FROM THE OVEN AND ALLOWED TO COOL OVERNIGHT.

11/20/91 THE BOTTOM BLOCK WAS MEASURED ON THE PROFILE METER. FILENAME IS T6PBBBT.DAT. MAX X = 11771, MAX Y = 8007, X OFFSET = 3911, Y OFFSET = 1697, INDEX = 1.
THE TOP BLOCK WAS MEASURED ON THE PROFILE METER. FILENAME IS T6PTBBT.DAT. MAX X = 7824, MAX Y = 7618, X OFFSET = 3837, Y OFFSET = 1595, INDEX = 4

11/21/91 THE SPECIMENS WERE INSTRUMENTED AS ILLUSTRATED BELOW.



11/21/91 FOLLOWING ARE THE READINGS FROM THE PROXIMITOR TARGETS:
(ACTUATOR TO REAR)

#	0"	1"	2"	3"	4"	5"	6"
4	-1.4080	-1.4700	-1.5310	-1.6400	-1.7540	-1.8285	-1.8030
5	+0.0035	-.2355	-.4945	-.7425	-1.0095	-1.AJ5	-1.3220
6	+0.1100	-.1520	-.3475	-.5020	-0.6845	-.7925	-.8215
7	-1.0370	-1.0240	-1.0385	-1.1250	-1.1800	-1.4150	-1.5700

REASSEMBLED APPARATUS. COMPUTER CHANGES ARE THE SAME AS LISTED ON PAGE 61. STARTED NORMAL LOAD TESTS. FILENAMES ARE T6NS1.DAT, T6NS2.DAT, T6NS3.DAT, T6NS4.DAT, AND T6NS5.DAT. COMMAND FILE DA.PFL WAS AS FOLLOWS:

5
0 0 5
60 0 5
360 7.36 5
420 7.36 5
720 0.36 5

(LEGEND ON PAGE 27)

THE ROCK WAS MOVED HORIZONTALLY WITH NO VERTICAL LOAD PRIOR TO TESTING. WHEN THE ROCK WAS RETURNED TO THE CENTER POSITION THE LVDT's WERE RE ZEROED. TEST T6NS1.DAT WAS ALREADY RUN. AN ADDITIONAL NORMAL LOAD TEST WAS RUN. FILENAME IS T6NS6.DAT.
RAN COMBINED NORMAL AND DIRECT SHEAR TEST AT 5 [illegible]. FILENAME IS T6CNDS0.DAT. COMMAND FILE DA.PFL WAS AS FOLLOWS:

9
0 0 5
60 0 5
660 4.643 5
720 4.643 5
820 4.643 10
1980 4.643 10
3180 4.643 5
3240 4.643 5
3840 0 5

(LEGEND ON PAGE 27)

Akram Mokhtar
Mokhtar

11/21/91 STOPPED TEST T6CND50.DAT. INSUFFICIENT PRESSURE WOULD NOT ALLOW THE HORIZONTAL LOAD TO EXCEED APPROXIMATELY 38,000 POUNDS. THE HYDRAULICS WERE TURNED OFF AND THE PRESSORS WERE ADJUSTED. THE TEST WAS RESTARTED WITH FILENAME T6CND50A.DAT.

11/22/91 THE ROCK WAS WORKED DOWN BY CYCLING THE 4" DP TRAVEL 5 TIMES. FOLLOWING IS THE COMMAND FILE CONFIGURATION:

```
      15
 0  0  5          (LEGEND ON PAGE 27)
10  0  5
30  0  0
70  2.785  0
100 2.785  10
130 2.785  0
160 2.785  10
190 2.785  0
220 2.785  10
250 2.785  0
280 2.785  10
310 2.785  0
340 2.785  10
370 2.785  0
400 0  0
```

RAN SLOW VELOCITY TESTS. 0-20mm AT 5mm/SEC, 20-80mm AT 15mm/SEC, 80-90mm AT 5mm/SEC. FILENAMES ARE T6V15P1.DAT, T6V15P2.DAT, T6V15P3.DAT, T6V15P4.DAT, AND T6V15P5.DAT. FOLLOWING WAS THE COMMAND FILE CONFIGURATION:

```
FIRST LINE FOR (Mpa)  0  120  0  0.9285
               2 Mpa  0  240  0  1.857
               3 Mpa  0  360  0  2.785
               4 Mpa  0  480  0  3.714
               5 Mpa  0  600  0  4.643
```

Forms Picked

11/22/91

```
FOLLOWING LINES      1  .010  1000
                     4
                     0  0
                     4  1.975
(LEGEND ON PAGE 55)  8  7.875
                     10 8.850
```

CONFIRMED DATA IN FILES.

RAN HIGH SPEED STEP VELOCITY TESTS. 0-20 AT 25mm/SEC, 20-80 AT 75mm/SEC, 80-80 AT 25mm/SEC. FILENAMES ARE T6V75P1.DAT, T6V75P2.DAT, T6V75P3.DAT, T6V75P4.DAT AND T6V75P5.DAT. FOLLOWING WAS THE COMMAND FILE CONFIGURATION:

```
FIRST LINE FOR  1 Mpa  0  120  0  0.9285
                2 Mpa  0  240  0  1.857
                3 Mpa  0  360  0  2.785
                4 Mpa  0  480  0  3.714
                5 Mpa  0  600  0  4.643
```

```
FOLLOWING LINES  1  .005  400
                 4
                 0  0
               0.8  1.975
               1.6  7.875
               2.0  8.850
```

ALL TEST PARAMETERS WERE SUPPLIED BY NIKKO KOGYO.

12/12/91 Specimen SRM16.3.3/16.2.2-A. RECEIVED SPECIMEN. 16.3.3 IS THE TOP BLOCK. 16.2.2-A IS THE BOTTOM BLOCK

Conducted Schmidt Hammer Tests on all 4 sides of both the top and bottom blocks. Four readings on each side were taken. (Applied pressure vertically downward.)

No. Tests	Rebound No.
1	60
2	61
3	62
4	60
5	62
6	59

No. of Tests	Rebound No.
7	60
8	60
9	64
10	62
11	61
12	61
13	60
14	62
15	60
16	62

Rebound No. for top block joint surface

No. of Tests	Rebound No.
1	56
2	49
3	46
4	54
5	44
6	52
7	44
8	50
9	48
10	48
11	50

Rebound No. for bottom block side surfaces

No. of Tests	Rebound No.
1	62
2	62
3	62
4	61
5	60
6	60
7	58
8	59
9	62
10	60
11	60

No of Tests	Rebound No.
12	58
13	58
14	59
15	58
16	57

Rebound No. for bottom block joint surface

No. of Tests	Rebound No.
1	53
2	54
3	46
4	48
5	50
6	52
7	48
8	46
9	48
10	47

The weight of the top block is 20.06 lbs. Simon H

12/12/91 9.1.1/9.2.2 Disassembled apparatus. Specimens were photographed, reassembled and photographed again. The following readings were obtained from the proximitor targets following test series: (actuation to rear)

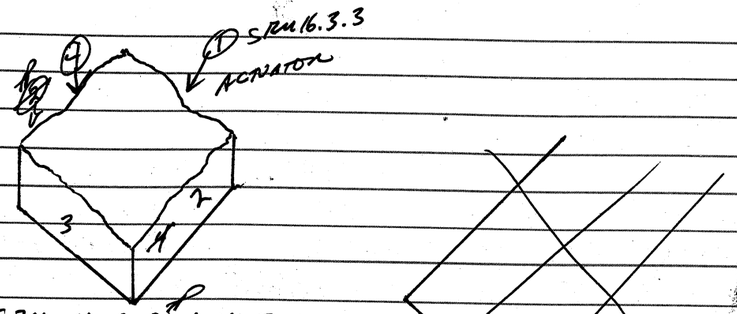
	0"	1"	2"	3"	4"	5"	6"
4)	-1.3370	-1.4130	-1.4840	-1.5910	-1.6900	-1.7700	-1.8260
5)	+.0080	-.2950	-.5020	-.7180	-.9945	-1.1660	-1.2670
6)	+.1500	-.1100	-.3080	-.4650	-.6425	-.7950	-.7860
7)	-1.0100	-1.0045	-1.0160	-1.1070	-1.1685	-1.3900	-1.5375

The bottom block was placed in the profiler. Filename is ~~T6B~~ T6PBBAT.DAT.

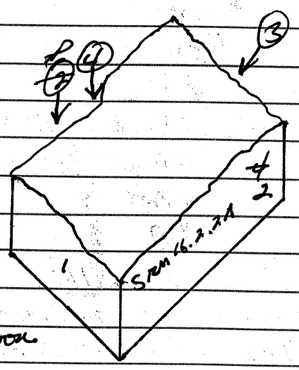
Specimen 16.3.3/16.2.2-A - Tilt test was performed. Specimen moved at 57° in the side 1 through 3 configuration. Specimen moved at 54° in the side 3 through 1 configuration. Sketches are on the following page.

Glenn Ahrens

12/12/91



SRM ~~16.2.2-A~~ 16.3.3
TOP BLOCK



ACTUATOR

~~SRM 16.3.3~~ SRM 16.2.2-A
BOTTOM BLOCK

12/15/91 GROUTED BOTTOM AND TOP BLOCK. FOLLOWING IS GROUT RECIPE USED FOR BOTH BLOCKS:

1 POUND 10 OZ WATER
20 gms DARACEM
3 POUNDS 10Z CEMENT
8 POUNDS 10Z SAND.

SPECIMENS WERE PLACED IN 105° OVEN AT 17:00.

12/16/91 17:00 - REMOVED SPECIMENS FROM OVEN.

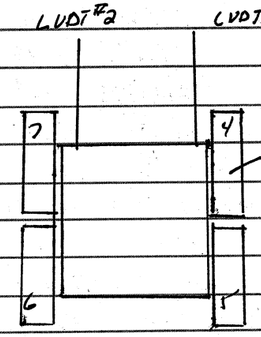
12/17/91 PLACED BOTTOM BLOCK IN PROFILER. FILENAME IS T7PBBRT.DAT.

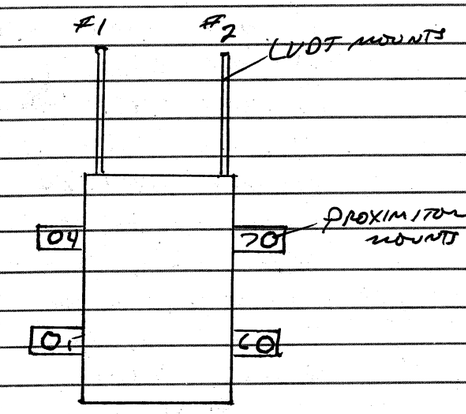
Allen Pickens

12/17/91 T7PBBBT.DAT - CONFIG.PRO = MAX X = 11402, MAX Y = 7893, X OFFSET = 4062, Y OFFSET = 1701, INDEX = 2.

PLACED TOP ROCK IN PROFILER.. FILENAME IS T7PTBBT.DAT. CONFIG.PRO - MAX X = 7983, MAX Y = 7875, X OFFSET = 4042, ~~X~~ Y OFFSET = 1749, INDEX = 6.

12/18/91 INSTRUMENTED SPECIMENS. FOLLOWING ARE TRANSDUCER LOCATIONS.





ACTUATOR
ROCK SIDE UP

SPECIMENS WERE PHOTOGRAPHED. REASSEMBLED APPARATUS.

12/19/91 STATICS TESTS T7NS1.DAT, T7NS2.DAT, T7NS3.DAT, T7NS4.DAT AND T7NS5.DAT. COMMAND FILE DA.PFC WAS AS FOLLOWS:

(LEGEND ON PAGE 27)

```
J
0 0 J
60 0 J
360 7.36 J
420 7.36 J
720 0 J
```

Allen Pickens
MIKE O Absher

12/19/91 STARTED TEST T7CND50.DAT. ALL TEST PARAMETERS WERE PROVIDED BY SIMON NSEUNG. COMPUTER CHANNELS WERE AS LISTED ON PAGE 61.

12/26/91 FOLLOWING ARE PROXIMITOR TARGET READINGS OBTAINED BEFORE TESTING! REAR TO FRONT

	0"	1"	2	3	4	5	6"
4)	0.7720	.5835	.4300	.2425	.0960	-.0810	-.2395
5)	-.1530	-.0700	.0395	.2140	.3655	.5480	.7260
6)	.1400	.1190	.1145	.1885	.2550	.4080	.4940
7)	-.0040	.1160	.2130	.2725	.2310	.1325	.0255

FOLLOWING ARE READINGS OBTAINED AFTER TESTING!
(REAR TO FRONT)

4)	-.0270	-.2015	-.3650	-.4810	-.6760	-.7910	-.9275
5)	-.8715	-.8185	-.6310	-.4965	-.3010	-.1660	+.1020
6)	.4610	.4625	.4460	.5490	.6200	.7500	.5200
7)	.1040	.2250	.3500	.4485	.4550	.3520	.2830

Specimen SRM12.4.4/12.3.3
Conducted Schmidt hammar tests on all sides of both top and bottom blocks. Four readings on each side were taken. Schmidt hammer tests on both joint surfaces were also performed.
(Pressure was applied vertically downward on all tests)
Rebound numbers for top block.

No. of Tests	Rebound No.
1	62
2	62
3	63
4	61
5	63
6	61
7	61
8	63
9	63
10	63
11	59

No. of Tests	Rebound No.
12	63
13	62
14	60
15	63
16	62

Rebound number for top block joint surface.

No. of Tests	Rebound No.
1	51
2	48
3	57
4	57
5	54
6	59
7	52
8	47
9	57
10	52
11	52
12	55
13	54

(Tests 2, 6, and 8 will be excluded in the analysis)
Rebound number on the sides of bottom block

No. of Tests	Rebound No.
1	58
2	62
3	62
4	61
5	63
6	60
7	60
8	58
9	64
10	61
11	64
12	63
13	62

No. of Tests	Rebound No.
14	60
15	61
16	63

Rebound number for the bottom block joint surface

No. of Tests	Rebound No.
1	52
2	56
3	53
4	53
5	42
6	41
7	58
8	40
9	63
10	49
11	48
12	56
13	50
14	48
15	46

12/26/91 SRM 16.2.2-A WAS PUT IN THE PROFILER. FILENAME IS T7PBBAT.DAT.

12/27/91 SRM 16.3.3 WAS PUT IN THE PROFILER. FILENAME IS T7PTBAT.DAT. SPECIMENS WERE PHOTOGRAPHED WHEN APPARATUS WAS DISASSEMBLED. SPECIMENS WERE BRUSHED AND REPHOTOGRAPHED, PRIOR TO PROFILING.

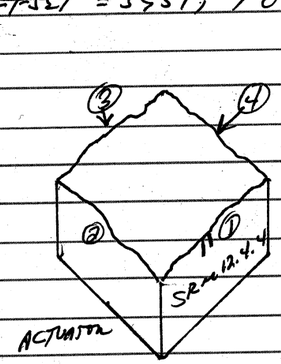
12/27/91 GROUTED SPECIMENS SRM 12.3.3/12.4.4. 12.33 IS THE BOTTOM BLOCK. RECIPE FOR GROUT IS LISTED ON PAGE 74. RECIPE WAS SAME FOR BOTH SPECIMENS. SPECIMENS WERE PLACED IN 105°C OVEN FOR 24 HRS. CHART RECORDER FAILED TO ADVANCE PAPER. NO CHART RECORD OF CURING.

12/30/91 PLACED BOTTOM BLOCK IN PROFILER. FILENAME IS T8PBBBT.DAT. TILT ANGLE TEST WAS PERFORMED PRIOR TO GROUTING. SIDE 2 THROUGH 4 — 57.5°. SIDE 4 THROUGH 2 - 50°. TOP ROCK NET WEIGHT WAS 18.3 POUNDS.

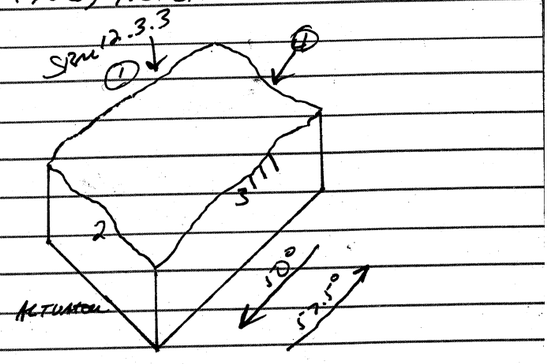
Aslam Pickles

12/30/91 FOR T8PBBBT.DAT - MAX X = 11718, MAX Y = 7795, X OFFSET = 3853, Y OFFSET = 1701, INDEX = 1

~~FOR T8PTBBT.DAT - MAX X = 7767, MAX Y = 7864, X OFFSET = 3531, Y OFFSET = 1753, INDEX = 3~~ As above 1/2/92



TOP BLOCK



BOTTOM BLOCK

12/31/91 THE SPECIMENS WERE INSTRUMENTED AS ILLUSTRATED ON PAGE 75 AND PHOTOGRAPHED. FOLLOWING ARE THE READINGS OBTAINED FROM THE PROXIMITOR TARGETS PRIOR TO TESTING:

	0	1	2	3	4	5	6
4	-.2530	-.2780	-.3040	-.3180	-.3750	-.3860	-.4310
5	.2850	.2840	.3535	.4785	.6045	.7090	.9045 -.2450
6	.4350	.2060	-.0010	-.1710	-.2730	-.2890	-.5840
7	.0550	.1275	.0750	.0385	-.1020	-.2240	-.3200

READINGS WERE TAKEN FROM ~~REAR~~ FRONT TO REAR

1/2/92 TOP BLOCK WAS REGROUTED AND PROFILED. T8PTBBT.DAT MAX X = 7742, MAX Y = 7851, X OFFSET 3894, Y OFFSET 1780, INDEX = 3. THE ABOVE PROXIMITOR TARGET READINGS ARE CORRECT. THE APPARATUS WAS REASSEMBLED. STARTED TEST T8NS1.DAT, T8NS2.DAT, T8NS3.DAT, T8NS4.DAT & T8NS5.DAT. COMMAND FILE DA.PFL WAS AS LISTED ON PAGE 75. COMPUTER CHANNELS WERE AS LISTED ON PAGE 61.

1/3/92 STARTED TESTS T8CN040.DAT AND T8CN050.DAT. TEST PARAMETERS WERE AS LISTED ON PAGE 62. ASAD CHOWDHURY SUPPLIED TEST PARAMETERS.

Aslam Pickle

1/5/92 Tested for the basic friction angle on cylindrical cores (welded tuff from Apache Leap, Arizona) to be used in the Barton-Bandis joint model.

A combination of 4 core samples was used.

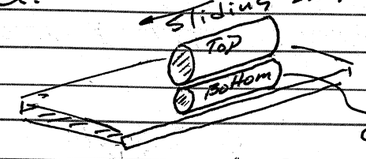


Plate tilted upward until top core began sliding. (Measured angle) at which sliding occurred.

Trial #	Angle.
1	30°
2	29.5°
3	28°
4	30°
5	29°
6	31°

M. Ahola

1/8/92 THE APPARATUS WAS DISASSEMBLED. THE SPECIMENS WERE PHOTOGRAPHED, BRUSHED, AND PHOTOGRAPHED AGAIN. FOLLOWING ARE READINGS OBTAINED FROM THE PROXIMITOR TARGETS AFTER TESTING:

Trial #	0	1	2	3	4	5	6
2&4	-.2880	-.3180	-.3440	-.3180	-.4200	-.4315	-.4715
3&5	.3250	.3150	.3885	.5235	.6445	.7440	.9460
4&6	.3980	.1660	-.0410	-.2060	-.3130	-.3340	-.3350
7	.0150	.0825	.0420	~~-.1370~~ -.0065	~~-.2550~~ -.1370	-.2590	-.3680

THE BOTTOM BLOCK WAS PROFILED. FILENAME IS T8PBBAT.DAT. THE TOP BLOCK WAS PROFILED. FILENAME IS T8PTBAT.DAT.

Adam Peacock

1/8/92 Received specimen SRM 20.1.1 / 20.2.2. 20.1.1 is top block and 20.2.2 is the bottom block. Conducted Schmidt hammer tests on all 4 sides of top and bottom block. (4 readings on each side were taken. Applied pressure vertically downwards)

Rebound # for 4 sides of bottom block (SRM 20.2.2)

No of test.	Rebound #
1	61
2	60
3	57
4	62
5	62
6	63
7	62
8	61
9	63
10	61
11	62
12	63
13	58
14	59
15	62
16	62

Rebound number for bottom block joint surface.

No. of test.	Rebound No.
1	59
2	54
3	59
4	55
5	57
6	57
7	58
8	51
9	51

10	54
11	55
12	52
13	54
14	59
15	60

Rebound No. for 4 sides of top block (SRM 20.1.1

Test No.	Rebound #
1	61
2	60
3	61
4	62
5	62
6	61
7	60
8	61
9	61
10	61
11	60
12	62
13	62
14	60
15	60
16	61

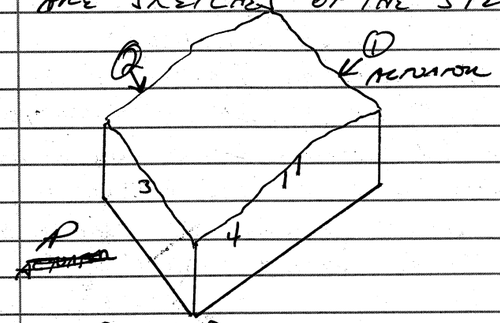
Rebound # for top surface of top block.

Test #	Rebound #
1	58
2	57
3	49
4	56
5	61
6	63
7	57
8	44
9	60
10	57
11	52

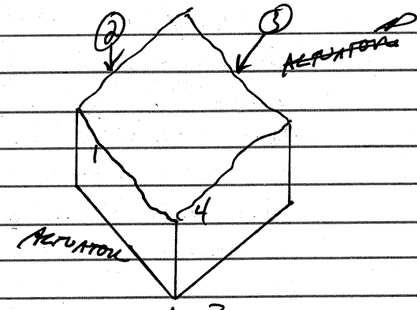
12	62
13	61
14	57
15	56

M. Ahola

1/8/92 Performed tilt test on T9 specimens. Specimen slid at 56° in the side 3 through 1 configuration. Specimen slid at 50° in the side 1 through 3 config. The top block weight was 17.9 pounds. Following are sketches of the specimens.



Bottom Block
SRM 20.2.2



Top Block
SRM 20.1.1

Grouted Bottom specimen. Grout recipe was as listed on page 74. A

1/9/92 Grouted top specimen. Grout recipe was as listed on page 74. Placed specimens in oven at 105°C to cure for 24 hrs. A

1/10/92 Specimens were removed from oven. A

1/13/92 Placed bottom specimen in profile meter. Filename is T9PBBBT.DAT. MAX X = 11753, MAX Y = 7892, X OFFSET = 3856, Y OFFSET = 1698, INDEX = 1. Placed top specimen in profile meter. Filename is T9PTBBT.DAT. MAX X = 7718, MAX Y = 7703, X OFFSET = 3904 Y OFFSET = 1748, INDEX = 1. Specimens were instrumented as illustrated on page 75.

Allan Parker

1/14/92 FOLLOWING THE READINGS OBTAINED FROM PROFILOMETER TARGETS: (REAR TO FRONT)

	0	1	2	3	4	5	6
4	.4475	.3845	.3210	.2640	.2385	.2230	.1875
5	-.3280	-.3160	-.2600	-.1200	-.0070	+.1180	+.2980
6	.6055	.3230	.0980	-.0830	-.2175	-.3420	-.3870
7	-.0020	+.1345	+.2730	.3750	.4900	.4930	.3040

THE APPARATUS WAS REASSEMBLED. STARTER TESTS T9NS1.DAT, T9NS2.DAT, T9NS3.DAT, T9NS4.DAT AND T9NST.DAT. COMMAND FILE NS.PFL WAS AS DA.PFL LISTED ON PAGE 75. STANDARD TESTS T9CND30.DAT, T9CND40.DAT, AND T9CND50.DAT. TEST PARAMETERS WERE AS LISTED ON PAGES 51 AND 52 FOR TEST 4 COMBINED TESTS. ALL TEST PARAMETERS WERE SUPPLIED BY MIKKO ANTOLA. COMPUTER CHANNELS WERE AS LISTED ON PAGE 61.

ALAN MICKAS
M. Ahola

1/17/92 Began schmidt hammer tests on test sample # ID SRM 17.2.3 / 17.3.4
17.2.3 is the top block. Conducted Schmidt hammer tests on all 4 sides of top and bottom block (4 readings per side, as well as joint surfaces. (Applied pressure vertically downward.)

Rebound # for 4 sides of top block (SRM 17.2.3)

Test #	Rebound #
1	58
2	60
3	60
4	59
5	61
6	61
7	62
8	57
9	60
10	59
11	57
12	60
13	62
14	61
15	60
16	61

Rebound # for top block joint surface.

Test #	Rebound #
1	54
2	48
3	47
4	52
5	44
6	45
7	51
8	49
9	54
10	54
11	55
12	36
13	46
14	30
15	40
16	40

Rebound # for 4 sides of bottom block (SRM 17.3.4)

Test #	Rebound #
1	52
2	62
3	63
4	60
5	59

6	60
7	58
8	62
9	61
10	62
11	56
12	59
13	52
14	54
15	44
16	49

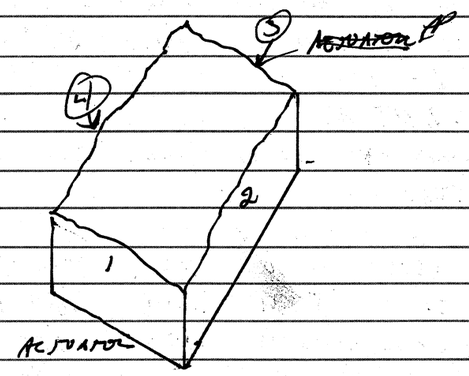
Rebound # for bottom block joint surface

Test #	Rebound #
1	54
2	48
3	31
4	50
5	50
6	53
7	53
8	35
9	55
10	42
11	33
12	36
13	43
14/15	58
16	40
	33

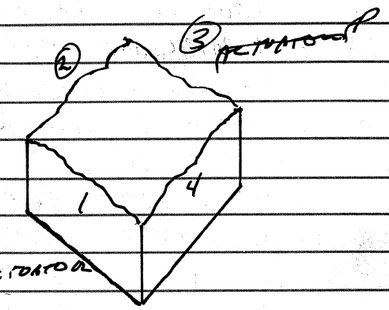
1/17/92 DISASSEMBLED APPARATUS. SPECIMEN T9 WAS PHOTOGRAPHED BRUSHED AND PHOTOGRAPHED AGAIN. THE BOTTOM BLOCK WAS PROFILED. FILENAME IS T9PBBAT.DAT. THE TOP BLOCK WAS PROFILED. FILENAME IS T9PTBAT.DAT.

Adam Pecka

1/17/92 PERFORMED ANGLE TEST ON SPECIMEN SRM 17.3.4/17.2.3. THE TOP BLOCK SLID AT 57° IN THE SIDE 3 THAN 1 CONFIGURATION. THE TOP BLOCK SLID AT 54° IN THE SIDE 1 THAN 3 CONFIG. THE TOP BLOCK NET WEIGHT IS 19 POUNDS 14 oz. A



SRM 17.3.4
BOTTOM BLOCK



SRM 17.2.3
TOP BLOCK

1/19/92 GROUTED BOTH SPECIMENS. GROUT RECIPE IS LISTED ON PAGE 94. THE SPECIMENS WERE PLACED IN AN OVEN AT 105°C FOR 24 HRS. A

1/20/92 REMOVED SPECIMENS FROM OVEN. A

1/21/92 STARTED PROFILE OF BOTTOM ROCK. FILENAME IS T10PBBBT.DAT. MAX X = 11791, MAX Y = 7908, X OFFSET = 3967, Y OFFSET = 1680, INDEX = 2. A

1/22/92 PROFILED T10PTBBT.DAT. MAX X = 7950, MAX Y = 7752, X OFFSET = 3766, Y OFFSET = 1743, INDEX = 2. INSTRUMENTED SPECIMENS AS ILLUSTRATED ON PAGE 75. SPECIMENS WERE PHOTOGRAPHED AND THE APPARATUS WAS REASSEMBLED. FOLLOWING ARE PROX TARGET READINGS:

	0	1	2	3	4	5	6
4	.8160	.2550	.0510	.3160	.2730	.3980	.4880
5	.6670	.6140	.6540	.7640	.8150	.8500	.9080
6	.4000	.2540	.1870	.1165	.1870	.2865	.2550
7	.0320	.2060	.3480	.3830	.4870	.4640	.4810

1/23/92 STARTED TESTS T10NS1.DAT, T10NS2.DAT, T10.NS3.DAT, T10NS4.DAT AND T10NST.DAT. STARTED TESTS T10CND20.DAT, T10CND30.DAT, T10CND40.DAT AND T10CND10.DAT. PARAMETERS USED SUPPLIED BY MIKRO TRACK. COMPUTER CHANNELS USED AS LISTED ON PAGE 61. TEST PARAMETERS USED AS LISTED ON PAGES 35 + 36 (T3)

1/27/92 PROFILED T10PBBAT.DAT.

1/28/92 PROFILED T10PTBAT.DAT.

FOLLOWING ARE READINGS OBTAINED FROM PROXIMITOR TARGETS AFTER TESTING.

	0	1	2	3	4	5	6
4	3260	3640	3610	4240	4820	5060	5580
5	7790	7240	7640	8725	9247	9600	10980
6	5100	3650	2860	2270	2090	3050	3645
7	1410	3160	4590	4925	5920	5840	5500

1/29/92 Conducted schmidt hammer tests on sample SRM 11.1.2-A/11.2.3.

Rebound # for 4 sides of top block (SRM 11.1.2-A)

Test #	Rebound #
1	60
2	59
3	60
4	60
5	61
6	61
7	61
8	60
9	63
10	58
11	62
12	61
13	61
14	56
15	61
16	66

Rebound # for joint surface of top block.

Test #	Rebound #
1	54
2	51
3	63
4	58
5	48
6	52
7	55
8	59
9	50
10	54
11	52
12	55

Rebound # for 4 sides of bottom block (SRM 11.2.3)

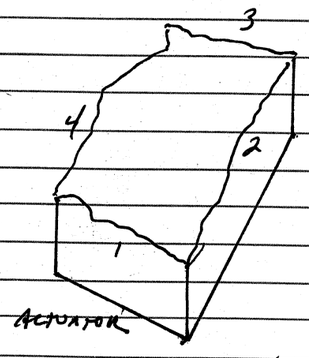
Test #	Rebound #
1	61
2	61
3	62
4	62
5	59
6	61
7	61
8	57
9	63
10	63
11	62
12	62
13	61
14	62
15	60
16	61

Rebound # top joint surface bottom block (SRM 11.2.3)

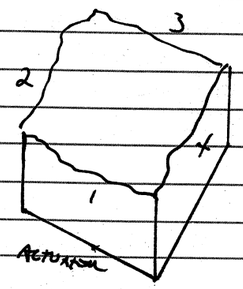
Test #	Rebound #
1	50

2	60
3	52
4	55
5	59
6	56
7	60
8	54
9	52
10	52
11	49
12	55

M. Ahola



SRM 11-2-3 (T11)
BOTTOM BLOCK



SRM 11.1.2-A
TOP BLOCK

1/29/92 CONDUCTED TILT TEST ON T11. THE TOP BLOCK WAS MOVED AT 46.5° IN THE SIDE 3 THROUGH 1 CONFIG., AND 44.5° IN THE SIDE 1 THROUGH 3 CONFIG. THE TOP BLOCK NET WEIGHT WAS 20 POUNDS 3 OZ. THE BOTTOM BLOCK WAS GROUTED. THE GROUT RECIPE IS LISTED ON PAGE 24.

1/30/92 THE TOP BLOCK WAS GROUTED USING THE SAME RECIPE. THE SPECIMENS WERE PLACED IN A 101°C OVEN FOR 24 HRS.

1/31/92 PROFILED T11PBBT.DAT. MAX X = 11640, MAX Y = 7896, X OFFSET = 3866, Y OFFSET = 1669, INDEX = 3

Adam Pickens

1/31/92 PROFILED T11PTBT.DAT. MAX X = 7824, MAX Y = 7766, X OFFSET 3734, Y OFFSET = 1772, INDEX = 3.

2/3/92 THE SPECIMENS WERE INSTRUMENTED AS ILLUSTRATED ON PAGE 75. FOLLOWING ARE READINGS TAKEN FROM THE PROXIMITY TARGETS BEFORE TESTING.

	0	1	2	3	4	5	6
4	-1.6030	-1.645	-1.6130	-1.665	-1.6060	-1.5785	-1.585
5	-1.4240	-1.6090	-1.665	-1.7520	-1.815	-1.8370	-1.8770
6	-1.3130	-1.4445	-1.6000	-1.7215	-1.7330	-1.7185	-1.6830
7	+.0220	-.205	-.415	-.6430	-.9780	-1.2270	-1.5540

THE SPECIMENS WERE PHOTOGRAPHED AND APPARATUS WAS REASSEMBLED. STARTED TESTS T11NS1.DAT, T11NS2.DAT T11NS3.DAT, T11NS4.DAT, AND T11NS5.DAT. STARTED TESTS T11CND10.DAT, T11CND20.DAT, T11CND30.DAT, T11CND40.DAT, T11CND50.DAT. PARAMETERS FOR THE "NS" SERIES TESTS ARE AS LISTED ON PAGE 75. PARAMETERS FOR THE "CND" SERIES TEST ARE LISTED ON PAGES 28-30(T2). TEST PARAMETERS WERE SUPPLIED BY MIKKO AHOLA. COMPUTER CHANNELS WERE AS LISTED ON PAGE 61.

2/10/92 THE APPARATUS WAS DISASSEMBLED. THE SPECIMENS WERE PHOTOGRAPHED, BRUSHED, AND PHOTOGRAPHED AGAIN. RAN PROFILE ON BOTTOM BLOCK OF T11. FILENAME IS T11PBBAT.DAT. RAN PROFILE ON TOP BLOCK. FILENAME IS T11PTBAT.DAT. FOLLOWING ARE READINGS OBTAINED FROM THE PROXIMITY TARGETS AFTER TESTING. READINGS ARE FROM REAR TO FRONT.

	0	1	2	3	4	5	6
4	-.0110	-.0160	-.0005	.0270	.0350	.0701	.0485
5	.1330	.0700	-.0715	-.0780	-.1480	-.1595	-.1310
6	-.0900	-.2705	-.3425	-.4100	-.4345	-.4365	-.3780
7	1.0980	.9250	.7157	.4880	.2170	-.0460	-.4230

Adam Pickens

2/25/92 Performed Schmidt hammer tests on samples SRM 12.1.1 / 12.1.1

Rebound # for 4 sides of top block

Test #	Rebound #
1	58
2	52
3	59
4	60
5	51
6	49
7	50
8	51
9	56
10	62
11	62
12	54
13	61
14	60
15	60
16	61

TOP BLOCK, TOP SIDE (JOINT SURFACE)

1	54
2	53
3	53
4	48
5	52
6	55
7	51
8	49
9	50
10	54
11	54
12	57

Rebound # for 4 sides of bottom block.

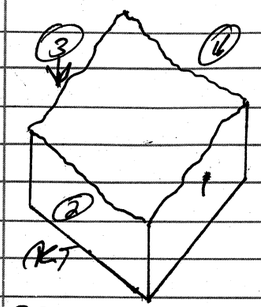
Test #	Rebound #
1	62
2	60
3	62
4	63
5	62
6	61
7	62
8	61
9	62
10	63
11	63
12	63
13	60
14	63
15	62
16	63

Bottom block, top side (Joint Surface)

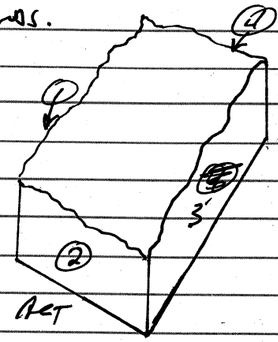
1	52
2	56
3	52
4	53
5	52
6	61
7	56
8	55
9	55
10	58
11	51
12	49

M. Ahlde

2/25/92 PERFORMED TILT TEST ON SPECIMEN. TOP BLOCK MOVED AT 48° IN THE SIDE 4 THROUGH 2 CONFIG. TOP MOVED AT 53° IN THE SIDE 2 THROUGH 4 CONFIG. TOP BLOCK WET WEIGHT WAS 19 POUNDS.



SRM 12.1.1
TOP BLOCK



SRM 12.1.1
BOTTOM BLOCK

2/26/92 GROUTED BOTTOM BLOCK, RECIPE WAS AS LISTED ON PAGE 74. AP

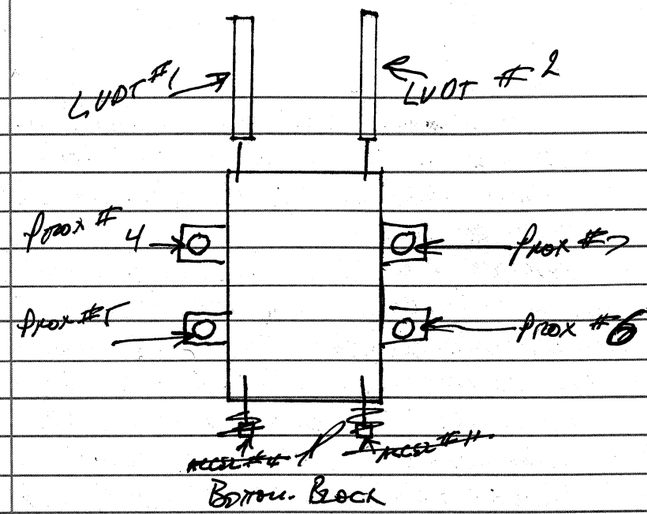
2/27/92 GROUTED TOP BLOCK. RECIPE WAS AS LISTED ON PAGE 74.
SPECIMENS WERE PLACED IN AN OVEN AT 105°C FOR 24 HRS. AP

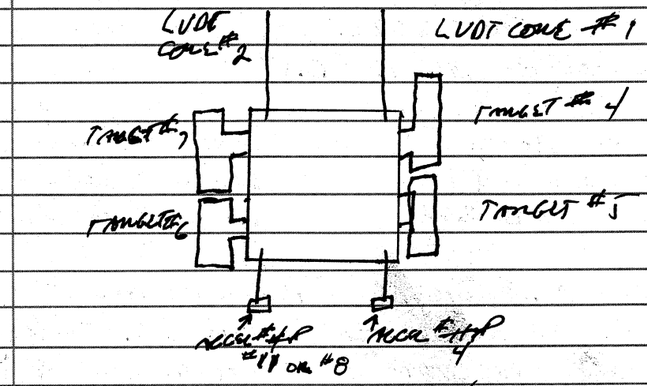
2/28/92 REMOVED SPECIMENS FROM OVEN. THE 20K POUND ACTUATOR WITH INSTRUMENTS ON THE APPARATUS. CALIBRATION WAS AS FOLLOWS: CALD AT ± 80% OF RANGE, -1.681V = 7 28/32"
1.610 VOLTS = 4 27/32"; DIFFERENCE 3.291 VOLTS = 3.25"; 0.988"/VOLT
DISPLACEMENT REFERENCE: ENGINEER SCALE IN 1/64" INCREMENTS;
FLUKE 77, S/N 42470915, CAL DUE MAY 21, 1992. AP

3/4/92 RAN PROFILE DI: BOTTOM BLOCK. FILENAME IS T12PBBBT.DAT.
MAX X = 11547, MAX Y = 7788, X OFFSET = 3792, Y OFFSET = 1662,
INDEX = 1. PROFILED TOP BLOCK. FILENAME IS T12PTBBT.DAT
MAX X = 7829, MAX Y = 7569, X OFFSET = 3866, Y OFFSET = 1894,
INDEX = 1. AP

3/5/92 INSTRUMENTED SPECIMENS AS ILLUSTRATED ON FOLLOWING PAGE.
APPARATUS WAS REASSEMBLED. A HYDRAULIC CIRCUIT WITH AN ACCUMULATOR WAS ADDED TO ACCOMODATE FOR LOSS OF VERTICAL PRESSURE DURING SEISMIC AND STEP VELOCITY TESTS.

ALLAN PORTER





TOP BLOCK (SURFACE SIDE UP)

JOHN PERRY

3/6/92 STARTED NORMAL SWEEP TESTS. FILENAMES ARE T12NS1.DAT,
3/13/92 T12NS2.DAT, T12NS3.DAT, T12NS4.DAT AND T12NS5.DAT.
TEST PARAMETERS WERE SUPPLIED BY SIMON HSIUNG AND WERE AS LISTED ON PAGE 75. RAN TEST T12DYN10.TST. ACTUATOR MOTION WAS VERY SMALL. GAIN WAS INCREASED BY 3.5. RAN TEST T12DYN11.DAT. ADJUSTED SPECTRUM, (SEE SPECTRUM LABELED REF 60). RAN TESTS T12DYN12.DAT, T12DYN13.DAT T12DYN14.DAT AND T12DYN15.DAT. ALL TEST PARAMETERS WERE SUPPLIED BY SIMON HSIUNG WHO WAS PRESENT FOR TESTING. ATTEMPTED TO RUN STEP VELOCITY TESTS. HORIZONTAL ACTUATOR WOULD NOT MOVE TOP ROCK WITH VERTICAL AP