NOTCH TOUGHNESS VARIABILITY IN BRIDGE STEEL PLATES

APPENDIX B

Final Report
Project 12-31

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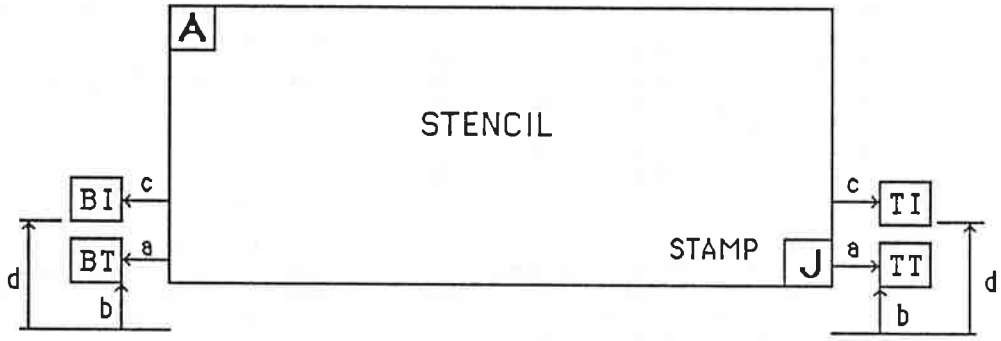
MILL DATA SHEET
Plate No: 1
Manf: 1

Serial Number: X100265
Heat Number: 803Z73690
Yield Point (psi): 64800
Tensile Strength (psi): 84300
Elongation (%): 22 {Gage Length (in): 8}
Steel Type: A588-82 Gr. B
Thickness (in): 1
Length (in): 240 Width (in): 60
Notes: Control Rolled



Bottom
Ba : 3"
Bb : 1"
Bc : 3"
Bd : 22"
Spec. Code : K30

Top
Ta : 3"
Tb : 1"
Tc : 3"
Td : 21"
Spec. Code : K29

CHARPY MILL TESTS (ft-lbs)

	Test Temp	Test #1 CVN	Lt.Ex.	%Sh.	Test #2 CVN	Lt.Ex.	%Sh.	Test #3 CVN	Lt.Ex.	%Sh.	CVN Avg
Top	+10°F	36	39	30	36	41	40	33	37	40	35
Bot	+10°F	30	34	40	30	37	30	29	34	30	30

Chemical Analysis

C	Mn	P	S	Si	Cu	Ni	Cr	V	Al	Cb
.12	1.14	.014	.020	.376	.282	.30	.57	.017	.060	NA

Plate: 1
Date: May 31, 1988 Windage: 0
Spec. Temp: + 10 F Personnel: CAS

Spec. No.	Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
1	10	22.1	24	10
3	10	20.0	21	20
7	10	25.7	27	20
2	-10	12.0	16	10
6	-10	19.5	23	30
8	-10	21.0	21	30

Average Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	22.6	24.0	17
-10	17.5	20.0	23

Spec. No.	Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
2	10	27.9	25	40
6	10	29.0	34	30
8	10	27.0	24	30
1	-10	22.3	25	20
3	-10	22.4	18	30
7	-10	22.8	30	20

Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	28.0	27.7	33
-10	22.5	24.3	23

Spec. No.	Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
2	10	25.6	31	30
3	10	31.5	33	40
8	10	26.0	30	30
1	-10	20.0	21	30
6	-10	20.8	25	20
7	-10	20.0	25	30
11	72.8	56.5	58	70
19	72.8	48.0	53	50
23	72.8	49.2	53	60
12	40	43.2	43	50
22	40	38.7	46	40
28	40	40.5	47	50
14	-40	13.7	15	20
24	-40	11.7	14	10
25	-40	8.2	10	10
13	100	53.0	60	70
16	100	54.0	61	60
27	100	56.5	61	60
4	-60	8.0	10	10
10	-60	7.2	9	10
17	-60	7.2	8	5
5	-25	16.2	17	20
18	-25	14.2	15	20
30	-25	18.0	20	30
15	25	31.0	33	70
9	25	31.0	32	70
29	25	37.0	37	60
20	60	44.5	48	70
21	60	41.0	45	60
26	60	47.2	48	60

Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	27.7	31.3	33
-10	20.3	23.7	27
72.8	51.2	54.7	60
40	40.8	45.3	47
-40	11.2	13.0	13
100	54.5	60.7	63
-60	7.5	9.0	8
-25	16.1	17.3	23
25	33.0	34.0	67
60	44.2	47.0	63

Plate: 1

Spec. No.	Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
1	10	28.1	35	30
6	10	25.2	30	30
7	10	28.2	33	30
2	-10	19.3	21	10
3	-10	19.0	24	30
8	-10	17.6	22	30

Average

Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
10	27.2	32.7	30
-10	18.6	22.3	23

Spec. No.	Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
2	10	26.3	31	40
7	10	26.0	31	30
8	10	30.2	35	40
1	-10	16.0	23	10
3	-10	17.8	19	30
6	-10	18.9	21	30
12	72.8	54.0	52	50
20	72.8	56.5	52	50
22	72.8	55.9	61	60
17	40	40.0	46	40
24	40	35.2	40	40
26	40	37.0	42	30
15	-40	13.8	15	10
21	-40	12.2	16	10
23	-40	13.5	15	10
13	100	58.5	64	70
19	100	60.0	63	85
25	100	56.0	58	70
5	-60	8.3	7	5
27	-60	11.0	14	10
30	-60	8.2	10	10
11	-25	20.0	21	40
16	-25	15.8	15	20
28	-25	15.0	18	30
9	25	28.5	33	50
14	25	34.8	35	60
18	25	43.8	44	70
4	60	51.4	51	60
10	60	55.0	56	85
29	60	50.0	52	70

Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
10	27.5	32.3	37
-10	17.6	21.0	23
72.8	55.5	55.0	53
40	37.4	42.7	37
-40	13.2	15.3	10
100	58.2	61.7	75
-60	9.2	10.3	8
-25	16.9	18.0	30
25	35.7	37.3	60
60	52.1	53.0	72

Spec. No.	Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
3	10	30.5	32	30
6	10	27.8	29	30
8	10	27.8	32	20
2	-10	23.5	28	20
7	-10	19.8	24	20
4	-10	22.8	32	30

Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
10	28.7	31.0	27
-10	22.0	28.0	23

Plate: 1

Spec. No.	Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
1	10	24.0	36	20
3	10	25.0	29	20
8	10	28.5	35	30
2	-10	23.0	26	20
6	-10	27.3	30	40
7	-10	24.2	27	20
11	72.8	55.2	57	60
18	72.8	56.0	56	60
23	72.8	52.3	45	60
10	40	40.0	42	40
15	40	48.7	52	40
30	40	47.2	50	50
4	-40	10.0	11	10
5	-40	10.7	13	10
9	-40	13.5	12	10
12	100	54.5	58	60
20	100	58.0	60	50
24	100	55.0	62	50
13	-60	10.0	12	10
21	-60	6.5	7	10
22	-60	8.5	10	10
14	-25	15.7	20	20
16	-25	21.0	24	30
25	-25	20.0	24	30
17	25	50.0	48	85
19	25	34.2	37	70
29	25	37.0	38	60
26	60	56.2	53	70
27	60	58.5	54	70
28	60	54.2	53	70

Average

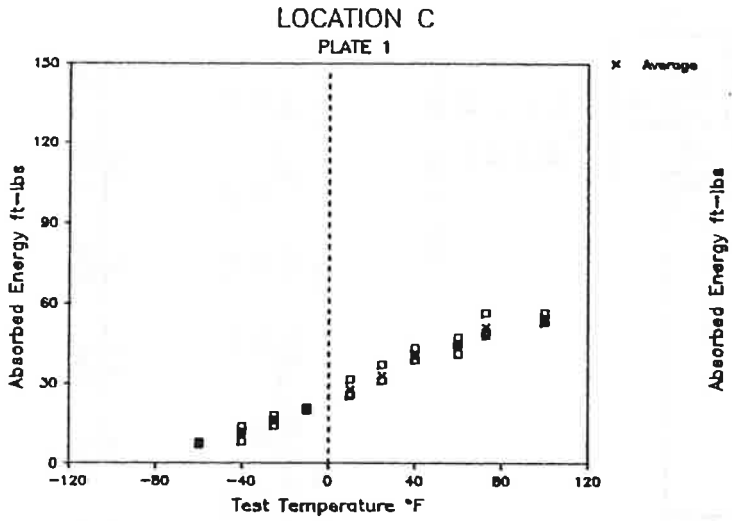
Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
10	25.8	33.3	23
-10	24.8	27.7	27
72.8	54.5	52.7	60
40	45.3	48.0	43
-40	11.4	12.0	10
100	55.8	60.0	53
-60	8.3	9.7	10
-25	18.9	22.7	27
25	40.4	41.0	72
60	56.3	53.3	70

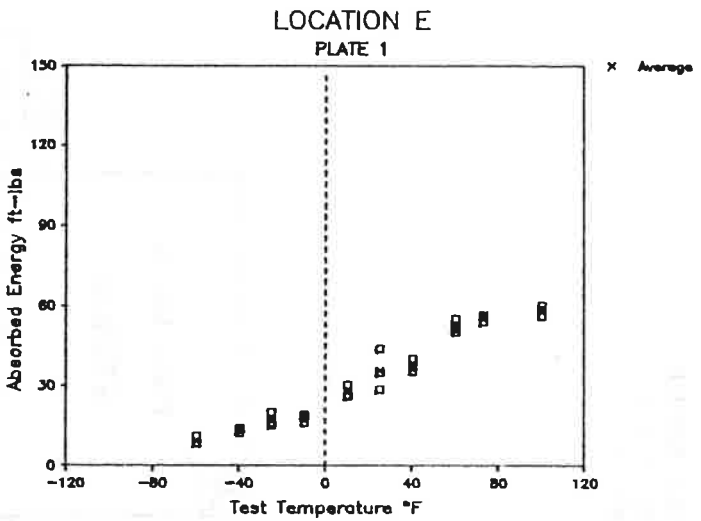
Spec. No.	Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
2	10	28.2	28	30
6	10	33.5	36	40
8	10	30.4	30	30
1	-10	17.5	19	30
3	-10	19.8	20	30
7	-10	23.0	25	20

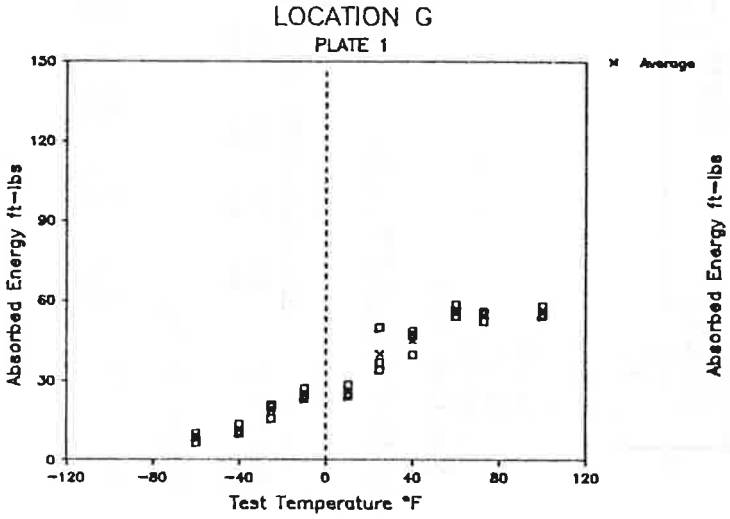
Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
10	30.7	31.3	33
-10	20.1	21.3	27

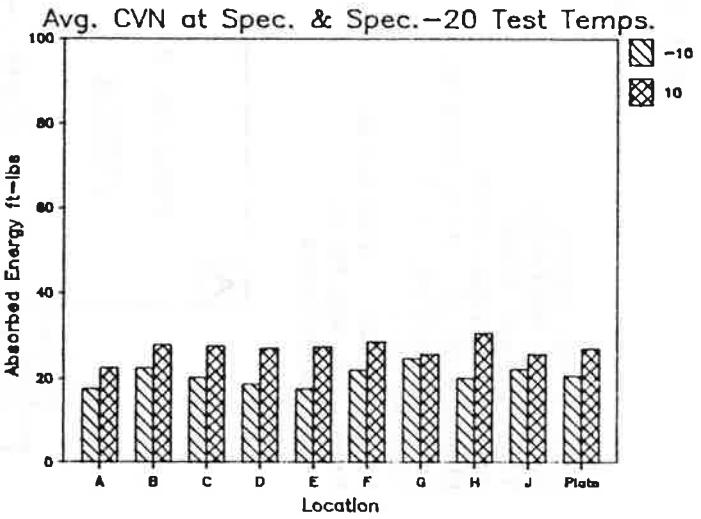
Spec. No.	Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
1	10	25.8	29	20
2	10	25.0	31	40
7	10	26.5	30	40
3	-10	24.3	29	20
6	-10	22.0	24	30
8	-10	20.5	24	20

Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
10	25.8	30.0	33
-10	22.3	25.7	23


LOCATION C
PLATE 1
Average
Absorbed Energy ft-lbs
Test Temperature °F

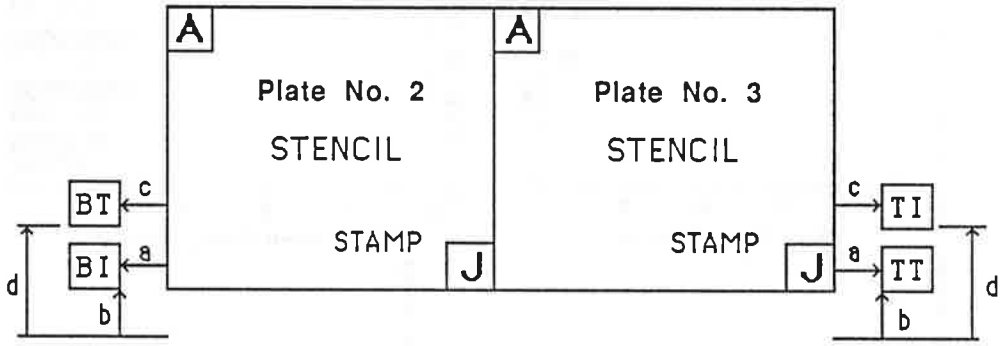

LOCATION E
PLATE 1
Average
Absorbed Energy ft-lbs
Test Temperature °F


LOCATION G
PLATE 1
Average
Absorbed Energy ft-lbs
Test Temperature °F


Avg. CVN at Spec. & Spec.-20 Test Temps.
-10
10
Absorbed Energy ft-lbs
A
B
C
D
E
F
G
H
J
Plate
Location

MILL DATA SHEET
Plate No: 2 & 3
Manf: 1

Serial Number: X40171
Heat Number: 803Y69120
Yield Point (psi): 68500
Tensile Strength (psi): 88200
Elongation (%): 20 {Gage Length (in): 8}
Steel Type: A572-82 Gr. 50
Thickness (in): 1
Length (in): 240 Width (in): 60
Notes: Fine Grain Practice
Control Rolled



Bottom
Ba : 2"
Bb : 13"
Bc : 2"
Bd : 31"
Spec. Code : M78

Top
Ta : 5"
Tb : 2"
Tc : 5"
Td : 18"
Spec. Code : M77

CHARPY MILL TESTS (ft-lbs)

	Test Temp	Test #1 CVN	Lt.Ex.	%Sh.	Test #2 CVN	Lt.Ex.	%Sh.	Test #3 CVN	Lt.Ex.	%Sh.	CVN Avg
Top	-5°F	80	70	60	70	60	60	52	49	40	67
Bot	-5°F	90	69	70	80	80	90	102	88	95	91

Chemical Analysis

C	Mn	P	S	Si	Cu	Ni	Cr	V	Al	Cb
.20	1.24	.011	.014	.235	NA	NA	NA	.050	.060	NA

Plate: 2
Date: July 6, 1988 Windage: 0
Spec. Temp: - 5 F Personnel: CAS

Location A				
Spec. No.	Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
2	-5	60.0	57	60
4	-5	77.8	68	70
6	-5	83.7	72	70
1	-25	38.3	39	50
3	-25	48.0	46	50
5	-25	85.8	75	85

Average Location A			
Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
-5	73.8	65.7	67
-25	57.4	53.3	62

Location B				
Spec. No.	Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
1	-5	46.7	44	30
3	-5	31.0	33	30
5	-5	69.5	58	60
2	-25	31.8	33	20
4	-25	47.4	43	30
6	-25	37.5	36	20

Location B			
Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
-5	49.1	45.0	40
-25	38.9	37.3	23

Location C				
Spec. No.	Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
12	-5	58.0	53	50
16	-5	94.0	79	90
18	-5	58.5	54	50
11	-25	46.9	47	30
15	-25	70.9	65	70
13	-25	48.6	44	40
3	-40	30.2	31	20
6	-40	31.9	32	20
23	-40	37.9	37	30
7	100	113.0	94	95
14	100	111.9	90	95
24	100	110.0	90	95
2	82.5	112.8	92	95
8	82.5	106.0	87	90
21	82.5	108.2	90	90
9	40	105.0	86	90
25	40	99.1	81	85
26	40	107.5	84	85
10	20	87.3	74	70
20	20	88.2	84	90
22	20	88.0	79	85
19	10	96.1	75	80
29	10	79.3	67	80
17	10	100.0	70	80
4	-60	20.8	22	20
28	-60	27.8	25	20
1	-60	24.5	26	20
5	60	107.0	89	95
27	60	110.2	84	95
30	60	117.2	90	95

Location C			
Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
-5	70.2	62.0	63
-25	55.5	52.0	47
-40	33.3	33.3	23
100	111.6	91.3	95
82.5	109.0	89.7	92
40	103.9	83.7	87
20	87.8	79.0	82
10	91.8	70.7	80
-60	24.4	24.3	20
60	111.5	87.7	95

Plate: 2

Spec. No.	Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
2	-5	68.9	59	60
3	-5	72.9	62	70
5	-5	99.9	83	95
1	-25	61.0	54	60
4	-25	61.3	54	60
6	-25	81.3	72	70

Average

Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
-5	80.6	68.0	75
-25	67.9	60.0	63

Spec. No.	Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
21	-5	34.0	34	30
23	-5	52.4	44	40
27	-5	48.8	44	40
22	-25	24.3	24	20
26	-25	28.7	27	20
28	-25	30.0	27	20
8	-40	32.5	31	20
17	-40	10.5	12	10
25	-40	20.0	19	10
3	100	110.0	91	90
18	100	109.2	89	85
29	100	108.1	87	85
1	82.5	104.5	80	85
10	82.5	108.3	88	85
12	82.5	108.5	84	85
4	40	85.3	70	70
24	40	88.2	69	60
20	40	82.3	66	70
2	20	78.2	66	60
5	20	66.7	57	50
13	20	67.0	55	50
6	10	23.0	26	30
9	10	57.8	48	50
14	10	51.6	43	50
7	-60	17.2	21	20
16	-60	9.3	9	10
15	-60	16.8	15	10
11	60	69.0	60	60
19	60	90.2	75	70
30	60	99.5	80	70

Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
-5	45.1	40.7	37
-25	27.7	26.0	20
-40	21.0	20.7	13
100	109.1	89.0	87
82.5	107.1	84.0	85
40	85.3	68.3	67
20	70.6	59.3	53
10	44.1	39.0	43
-60	14.4	15.0	13
60	86.2	71.7	67

Spec. No.	Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
2	-5	38.5	37	30
3	-5	42.3	40	30
4	-5	28.3	31	20
1	-25	23.1	23	20
5	-25	19.1	20	10
6	-25	22.0	22	10

Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
-5	36.4	36.0	27
-25	21.4	21.7	13

Plate: 2

Spec. No.	Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
12	-5	64.9	59	60
16	-5	85.5	72	70
18	-5	84.0	72	70
11	-25	58.0	52	40
13	-25	71.2	60	70
17	-25	90.7	78	90
3	-40	47.8	48	50
15	-40	39.0	41	40
30	-40	43.1	43	50
8	100	104.2	86	90
14	100	101.9	84	90
29	100	110.1	89	95
4	82.5	103.2	85	90
23	82.5	106.0	90	95
26	82.5	113.0	94	95
5	40	71.2	61	50
19	40	108.8	86	95
28	40	103.9	82	95
2	20	88.0	89	85
20	20	86.0	75	70
27	20	84.2	74	85
7	10	63.7	52	60
9	10	83.0	68	70
22	10	64.0	53	60
6	-60	32.0	28	30
1	-60	33.5	30	30
24	-60	37.8	36	20
10	60	88.1	78	85
21	60	106.1	86	90
25	60	109.5	93	85

Average

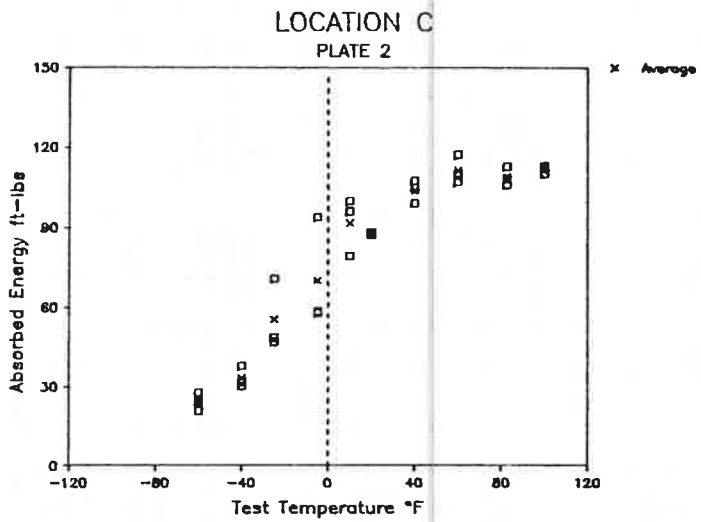
Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
-5	78.1	67.7	67
-25	73.3	63.3	67
-40	43.3	44.0	47
100	105.4	86.3	92
82.5	107.4	89.7	93
40	94.6	76.3	80
20	86.1	79.3	80
10	70.2	57.7	63
-60	34.4	31.3	27
60	101.2	85.7	87

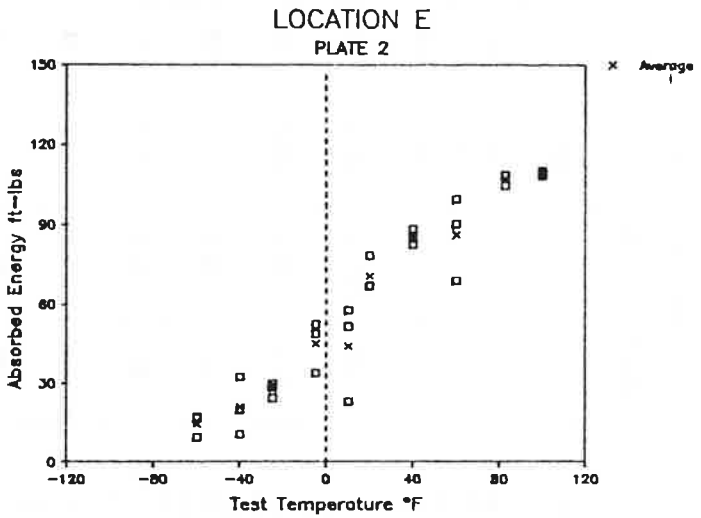
Spec. No.	Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
3	-5	57.9	52	60
5	-5	40.2	40	40
4	-5	34.3	35	30
1	-25	34.8	33	20
2	-25	15.8	19	10
6	-25	55.7	50	40

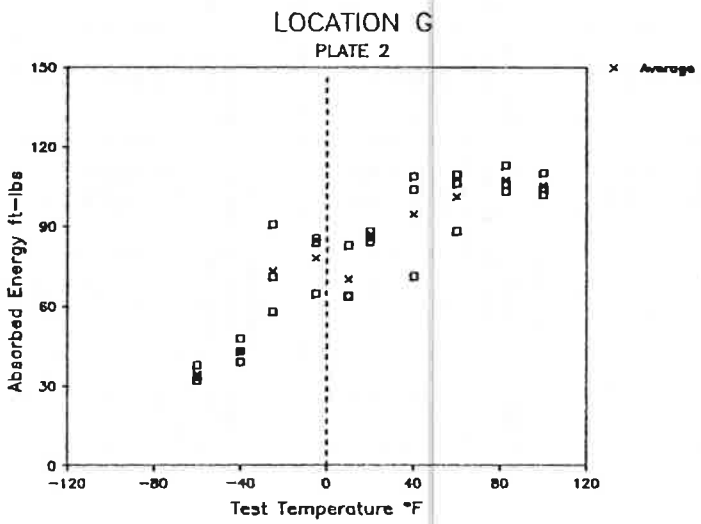
Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
-5	44.1	42.3	43
-25	35.4	34.0	23

Spec. No.	Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
4	-5	46.2	43	40
6	-5	55.2	49	50
2	-5	44.0	41	40
1	-25	33.2	32	20
3	-25	47.8	45	30
5	-25	34.0	33	20

Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
-5	48.5	44.3	43
-25	38.3	36.7	23


LOCATION C
PLATE 2
× Average
Absorbed Energy ft-lbs
Test Temperature °F


LOCATION E
PLATE 2
× Average
Absorbed Energy ft-lbs
Test Temperature °F


LOCATION G
PLATE 2
× Average
Absorbed Energy ft-lbs
Test Temperature °F

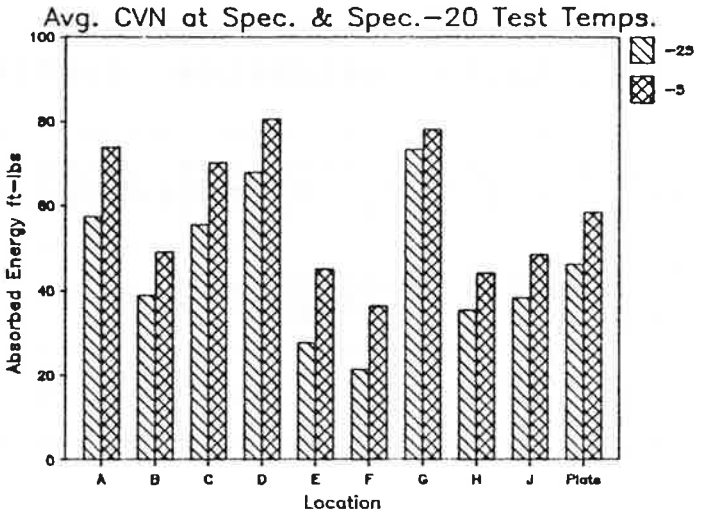

Avg. CVN at Spec. & Spec.−20 Test Temps.
−20
−5
Absorbed Energy ft-lbs
A
B
C
D
E
F
G
H
J
Plate
Location

Plate: 3
Date: July 13, 1988 Windage: 0
Spec. Temp: - 5 F Personnel: CAS

Spec. No.	Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
1	-5	77.7	66	70
3	-5	62.6	56	50
4	-5	96.0	81	85
2	-25	42.5	43	30
5	-25	66.6	62	40
6	-25	48.2	45	30

Average Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
-5	78.8	67.7	68
-25	52.4	50.0	33

Spec. No.	Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
2	-5	52.3	49	30
4	-5	84.0	72	70
6	-5	47.8	45	30
1	-25	36.1	32	30
3	-25	53.5	46	50
5	-25	50.9	46	40

Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
-5	61.4	55.3	43
-25	46.8	41.3	40

Spec. No.	Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
17	-5	41.8	42	50
2	-5	41.3	38	40
28	-5	50.0	46	50
6	-25	40.3	37	30
12	-25	15.8	17	10
24	-25	36.1	34	20
23	100	105.8	88	90
8	100	113.8	96	95
13	100	108.7	89	85
3	72.3	98.3	77	95
16	72.3	108.0	90	90
30	72.3	100.0	85	90
10	40	91.9	76	85
14	40	65.0	55	60
21	40	74.0	64	60
1	-60	9.3	13	0
15	-60	12.8	13	0
29	-60	8.4	10	0
7	-40	23.1	22	10
19	-40	22.0	23	20
25	-40	10.3	13	0
5	10	60.3	52	60
18	10	58.0	55	40
27	10	58.5	51	50
9	25	63.8	58	50
11	25	42.8	42	20
22	25	74.5	64	70
4	60	82.5	62	70
20	60	91.8	74	85
26	60	104.3	82	90

Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
-5	44.4	42.0	47
-25	30.7	29.3	20
100	109.4	91.0	90
72.3	102.1	84.0	92
40	77.0	65.0	68
-60	10.2	12.0	0
-40	18.5	19.3	10
10	58.9	52.7	50
25	60.4	54.7	47
60	92.9	72.7	82

Plate: 3

Spec. No.	Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
2	-5	75.5	74	70
5	-5	68.7	60	60
6	-5	70.1	65	50
1	-25	61.8	55	50
3	-25	37.7	30	30
4	-25	45.0	40	30

Average

Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
-5	71.4	66.3	60
-25	48.2	41.7	37

Spec. No.	Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
4	-5	23.1	39	10
18	-5	41.0	43	20
25	-5	56.2	54	50
3	-25	26.2	24	20
20	-25	21.2	20	20
24	-25	29.2	28	10
21	100	107.9	83	90
16	100	104.1	86	95
5	100	98.1	77	90
8	72.3	92.8	75	85
19	72.3	98.2	79	95
29	72.3	109.8	92	95
7	40	82.3	66	70
14	40	86.2	73	60
28	40	78.0	74	50
1	-60	30.4	26	10
13	-60	29.5	21	10
27	-60	21.8	20	10
2	-40	10.7	12	10
12	-40	33.7	32	20
30	-40	30.3	30	10
6	10	54.3	27	40
11	10	55.1	50	50
22	10	27.9	31	30
10	25	58.9	53	40
15	25	47.2	46	30
23	25	58.5	54	50
9	60	90.0	83	70
17	60	100.0	80	70
26	60	70.9	60	70

Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
-5	40.1	45.3	27
-25	25.5	24.0	17
100	103.4	82.0	92
72.3	100.3	82.0	92
40	82.2	71.0	60
-60	27.2	22.3	10
-40	24.9	24.7	13
10	45.8	36.0	40
25	54.9	51.0	40
60	87.0	74.3	70

Spec. No.	Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
3	-5	53.8	67	50
4	-5	53.7	49	40
5	-5	35.5	36	20
1	-25	47.0	44	30
2	-25	29.7	26	20
6	-25	26.8	30	20

Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
-5	47.7	50.7	37
-25	34.5	33.3	23

Plate: 3

Spec. No.	Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
7	-5	83.0	70	70
15	-5	76.2	63	70
21	-5	80.1	69	85
2	-25	61.5	58	30
12	-25	45.3	39	40
25	-25	54.1	45	30
18	100	107.0	88	95
30	100	109.1	88	95
4	100	115.8	95	90
6	72.3	108.2	87	95
19	72.3	117.5	91	90
26	72.3	111.9	89	90
9	40	96.1	80	90
20	40	77.2	68	70
22	40	107.0	83	90
3	-60	28.0	28	20
17	-60	30.4	31	20
24	-60	35.2	30	10
5	-40	45.6	39	30
16	-40	45.7	42	30
29	-40	38.1	37	30
1	10	72.0	67	70
13	10	75.5	62	70
28	10	86.1	70	85
8	25	82.5	69	70
11	25	88.3	73	70
23	25	80.8	60	70
10	60	109.5	85	95
14	60	98.1	75	85
27	60	105.0	84	95

Average

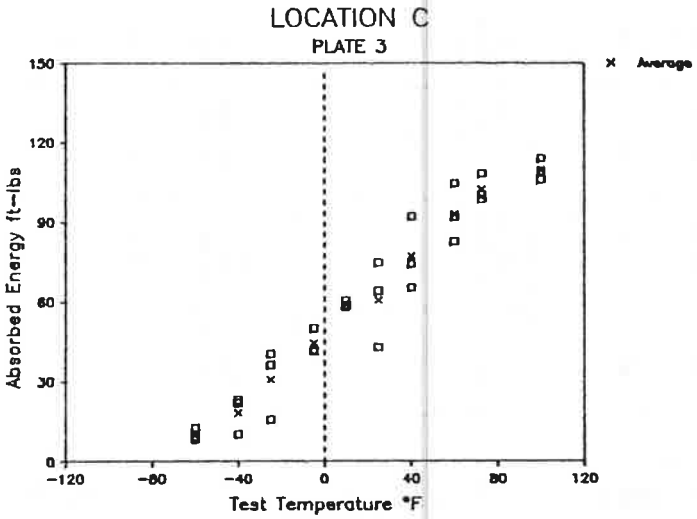
Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
-5	79.8	67.3	75
-25	53.6	47.3	33
100	110.6	90.3	93
72.3	112.5	89.0	92
40	93.4	77.0	83
-60	31.2	29.7	17
-40	43.1	39.3	30
10	77.9	66.3	75
25	83.9	67.3	70
60	104.2	81.3	92

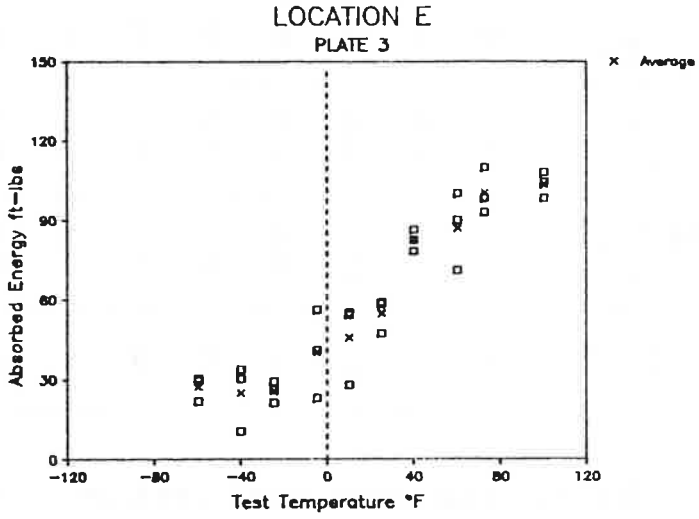
Spec. No.	Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
2	-5	12.7	20	30
5	-5	40.5	39	20
6	-5	60.2	57	50
1	-25	28.3	26	20
3	-25	23.0	21	20
4	-25	47.5	43	40

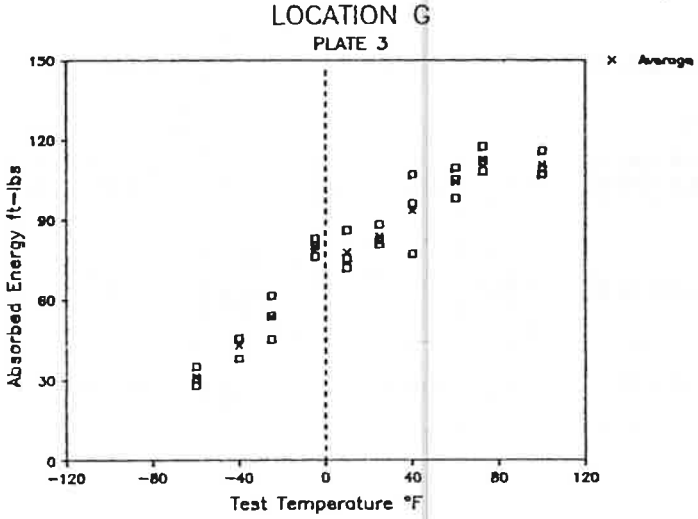
Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
-5	37.8	38.7	33
-25	32.9	30.0	27

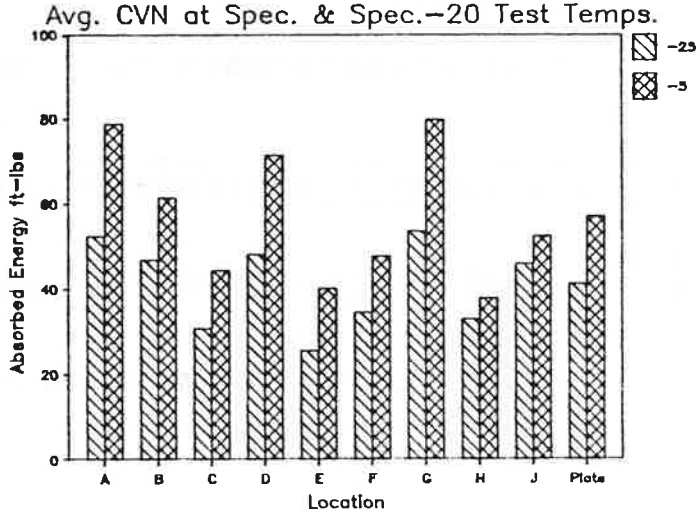
Spec. No.	Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
1	-5	46.5	44	30
3	-5	48.7	56	30
5	-5	62.1	55	50
2	-25	52.1	46	30
4	-25	35.2	31	30
6	-25	50.5	40	40

Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
-5	52.4	51.7	37
-25	45.9	39.0	33


LOCATION C
PLATE 3
× Average
Absorbed Energy ft-lbs
Test Temperature °F
150
120
90
60
30
0
−120
−80
−40
0
40
80
120

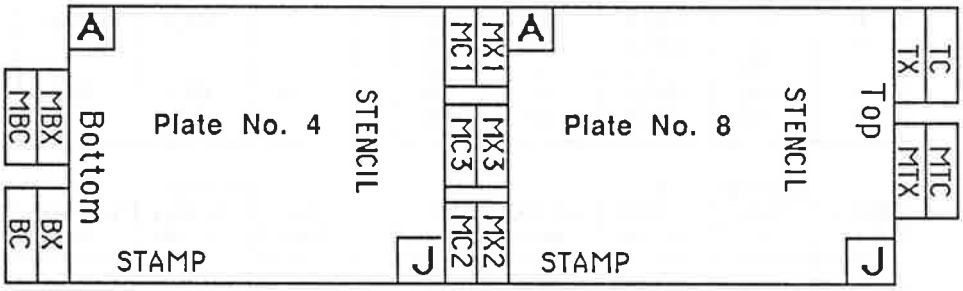

LOCATION E
PLATE 3
× Average
Absorbed Energy ft-lbs
Test Temperature °F
150
120
90
60
30
0
−120
−80
−40
0
40
80
120


LOCATION G
PLATE 3
× Average
Absorbed Energy ft-lbs
Test Temperature °F
150
120
90
60
30
0
−120
−80
−40
0
40
80
120


Avg. CVN at Spec. & Spec.−20 Test Temps.
−25
−5
Absorbed Energy ft-lbs
Location
100
80
60
40
20
0
A
B
C
D
E
F
G
H
J
Plate

MILL DATA SHEET
Plate No: 4 & 8
Manf: 3

Melt/Slab Number: U8434-4C
Yield Point(ksi)
TX: 53.1 BX: 52.7 MTX: 53.5 MBX: 52.6 MX1: 66.6 MX2: 52.7 MX3: 53.3
Tensile Strength(ksi)
TX: 75.6 BX: 75.3 MTX: 76.4 MBX: 75.3 MX1: 75.9 MX2: 74.3 MX3: 75.8
Elongation(%) {Gage Length: 8 in.}
TX: 25 BX: 26 MTX: 25 MBX: 27 MX1: 23 MX2: 24 MX3: 25
Steel Type: A572-85 Gr. 50 Type 2
Thickness (in): 1
Length (in): 240 Width (in): 60
Notes: Fine Grain Practice, Bend Test - Pass
Spec. Code - Top: T216 Bottom: T217



TC,MTC,BC,MBC,MC1,MC2,MC3 - Charpy test locations, 9" x 3"
TX,MTX,BX,MBX,MX1,MX2,MX3 - Tensile test locations, 9" x 2-1/4"

CHARPY MILL TESTS (ft-lbs)

	Test	Test #1			Test #2			Test #3			CVN
	Temp	CVN	Lt.Ex.	%Sh.	CVN	Lt.Ex.	%Sh.	CVN	Lt.Ex.	%Sh.	Avg
TC	+10°F	95	84	60	115	77	60	116	83	60	109
BC	+10°F	88	90	50	92	67	50	120	73	50	100
MTC	+10°F	115	**	**	116	**	**	117	**	**	116
MBC	+10°F	134	**	**	139	**	**	236	**	**	170
MC1	+10°F	104	**	**	104	**	**	135	**	**	114
MC1	-5°F	82	**	**	86	**	**	94	**	**	87
MC2	+10°F	60	**	**	88	**	**	115	**	**	88
MC3	+10°F	115	**	**	115	**	**	117	**	**	116

(** results not reported)

Chemical Analysis

C	Mn	P	S	Si	Cu	Ni	Cr	V	Al	Cb
.13	1.21	.014	.005	.190	NA	NA	NA	.033	NA	NA
Prod. Chemical Analysis										
.14	1.20	.015	.004	.190	NA	NA	NA	.033	NA	NA
.14	1.19	.016	.004	.180	NA	NA	NA	.032	NA	NA

Plate: 4
Date: July 13, 1988 Windage: 0
Spec. Temp: + 10 F Personnel: CAS

Location A

Spec. No.	Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
1	10	21.2	34	20
3	10	140.4	103	95
5	10	112.7	92	95
2	-10	91.9	80	0
4	-10	122.2	91	90
6	-10	121.8	96	90

Average Location A

Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	91.4	76.3	70
-10	112.0	89.0	60

Location B

Spec. No.	Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
2	10	126.5	105	90
4	10	168.7	96	95
6	10	207.0	85	100
1	-10	15.5	14	10
3	-10	127.2	97	90
5	-10	98.8	46	50

Location B

Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	167.4	95.3	95
-10	80.5	52.3	50

Location C

Spec. No.	Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
4	10	76.0	65	30
16	10	231.9	93	100
24	10	61.5	57	40
3	-10	16.4	16	20
18	-10	13.3	12	10
21	-10	24.0	23	20
6	100	263.0	86	100
13	100	253.5	88	90
28	100	245.0	80	100
9	72.3	257.5	83	90
17	72.3	256.5	85	95
22	72.3	204.0	78	95
8	40	260.0	77	100
15	40	137.0	94	90
29	40	254.5	88	85
2	-60	15.0	12	20
19	-60	46.2	41	30
26	-60	14.5	13	10
5	-40	8.5	7	10
20	-40	37.8	36	30
23	-40	12.5	14	10
10	-25	43.8	40	50
14	-25	8.3	6	10
25	-25	8.0	7	20
7	25	108.9	83	80
11	25	141.0	97	85
27	25	221.0	77	90
1	60	263.0	83	90
12	60	206.3	80	85
30	60	254.0	85	90

Location C

Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	123.1	71.7	57
-10	17.9	17.0	17
100	253.8	84.7	97
72.3	239.3	82.0	93
40	217.2	86.3	92
-60	25.2	22.0	20
-40	19.6	19.0	17
-25	20.0	17.7	27
25	157.0	85.7	85
60	241.1	82.7	88

Plate: 4

Spec. No.	Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
1	10	110.0	112	60
2	10	140.0	109	90
6	10	102.0	81	70
3	-10	83.9	74	50
4	-10	74.0	67	40
5	-10	11.0	11	0

Average

Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
10	117.3	100.7	73
-10	56.3	50.7	30

Spec. No.	Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
1	10	103.7	106	85
14	10	33.8	31	20
29	10	104.2	84	70
3	-10	51.0	44	40
20	-10	64.5	58	50
21	-10	109.2	89	70
13	100	251.0	78	90
6	100	202.0	87	95
23	100	255.8	78	95
9	72.3	222.3	89	100
17	72.3	256.2	79	80
30	72.3	208.0	87	100
8	40	100.5	84	70
18	40	142.8	98	95
22	40	126.5	101	85
2	-60	10.2	9	10
15	-60	7.4	8	0
26	-60	22.8	21	10
4	-40	6.2	5	0
19	-40	14.5	13	10
27	-40	56.8	52	40
5	-25	18.0	14	20
16	-25	65.0	60	50
24	-25	12.8	11	10
10	25	96.3	77	70
12	25	121.2	90	85
28	25	140.0	101	90
7	60	233.5	89	0
11	60	135.0	99	85
25	60	224.3	80	90

Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
10	80.6	73.7	58
-10	74.9	63.7	53
100	236.3	81.0	93
72.3	228.8	85.0	93
40	123.3	94.3	83
-60	13.5	12.7	7
-40	25.8	23.3	17
-25	31.9	28.3	27
25	119.2	89.3	82
60	197.6	89.3	58

Spec. No.	Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
1	10	139.0	114	90
2	10	10.5	41	0
6	10	109.3	87	85
3	-10	110.2	91	85
4	-10	68.3	56	60
5	-10	27.9	25	10

Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
10	86.3	80.7	58
-10	68.8	57.3	52

Plate: 4

Spec. No.	Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
7	10	92.3	83	60
16	10	103.8	90	60
23	10	76.5	70	60
2	-10	102.5	79	5
20	-10	40.8	38	30
24	-10	81.0	73	70
25	100	235.9	67	95
11	100	253.8	76	85
8	100	208.3	86	100
10	72.3	253.8	75	85
19	72.3	189.0	88	95
28	72.3	253.7	67	95
3	40	87.0	66	70
13	40	212.3	85	95
30	40	91.8	73	70
6	-60	27.8	26	10
18	-60	7.9	9	0
22	-60	7.3	6	0
5	-40	15.6	17	10
12	-40	37.0	34	50
27	-40	15.3	13	20
4	-25	5.4	3	0
14	-25	67.5	56	40
21	-25	41.5	38	20
1	25	122.0	89	70
15	25	10.0	14	0
26	25	26.2	27	20
9	60	257.9	67	90
17	60	123.0	82	70
29	60	232.3	75	5

Average

Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
10	90.9	81.0	60
-10	74.8	63.3	35
100	232.7	76.3	93
72.3	232.2	76.7	92
40	130.4	74.7	78
-60	14.3	13.7	3
-40	22.6	21.3	27
-25	38.1	32.3	20
25	52.7	43.3	30
60	204.4	74.7	55

Spec. No.	Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
2	10	17.5	16	20
3	10	85.6	75	70
5	10	88.8	80	70
1	-10	104.3	89	80
4	-10	33.8	29	40
6	-10	21.0	18	20

Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
10	64.0	57.0	53
-10	53.0	45.3	47

Spec. No.	Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
1	10	115.8	89	80
3	10	124.3	92	80
5	10	90.0	80	70
2	-10	7.8	5	10
4	-10	73.0	65	60
6	-10	79.4	73	70

Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
10	110.0	87.0	77
-10	53.4	47.7	47

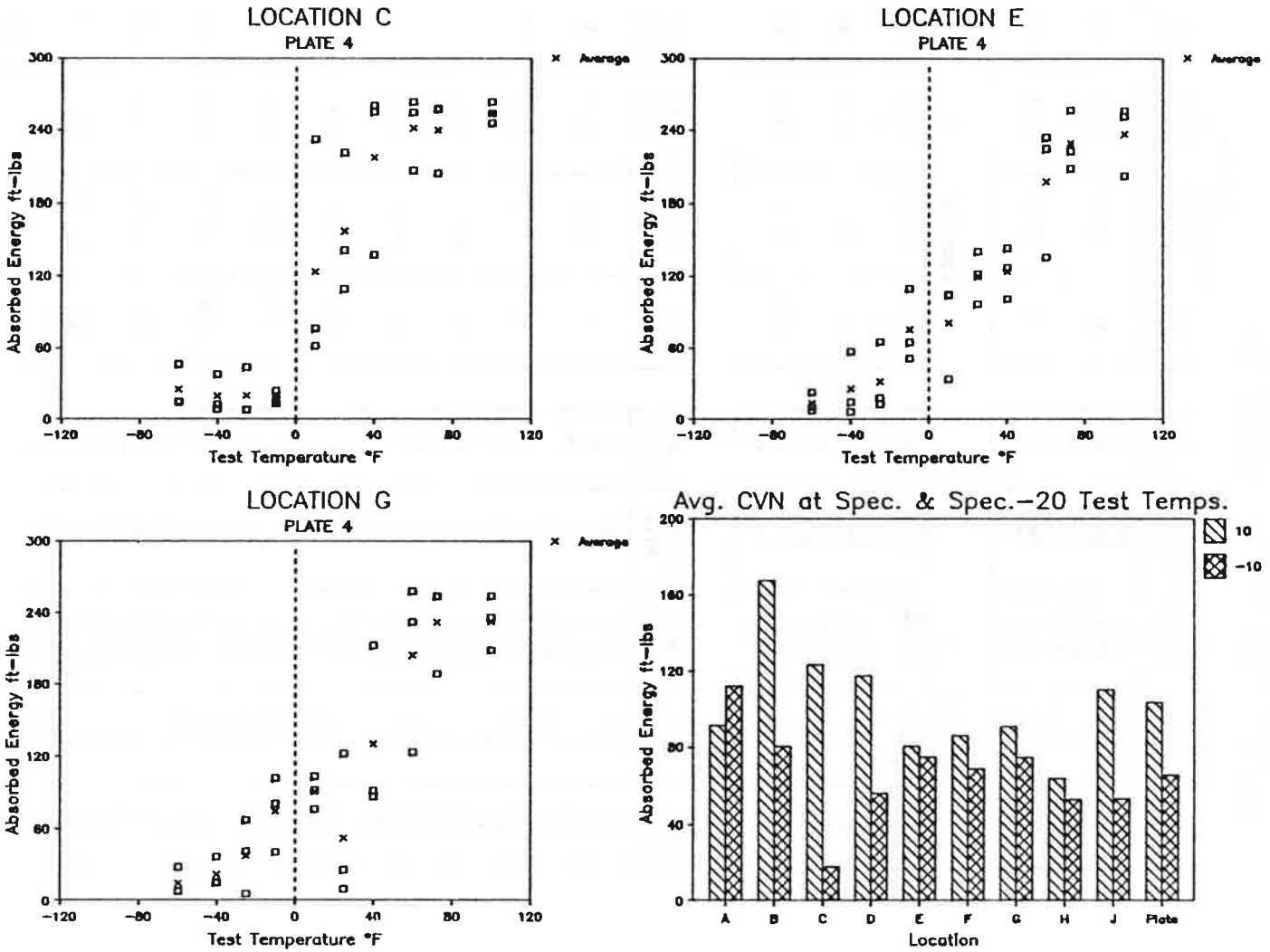

LOCATION C
PLATE 4
Average
Absorbed Energy ft-lbs
Test Temperature °F
LOCATION E
PLATE 4
Average
Absorbed Energy ft-lbs
Test Temperature °F
LOCATION G
PLATE 4
Average
Absorbed Energy ft-lbs
Test Temperature °F
Avg. CVN at Spec. & Spec.-20 Test Temps.
10
-10
Absorbed Energy ft-lbs
A
B
C
D
E
F
G
H
J
Plate
Location

Plate: 8
Date: August 16, 1988 Windage: 0
Spec. Temp: + 10 F Personnel: CAS

Spec. No.	Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
1	10	94.2	80	80
3	10	97.8	85	80
5	10	50.8	47	60
2	-10	78.0	72	60
4	-10	60.3	56	50
6	-10	95.5	77	70

Average Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	80.9	70.7	73
-10	77.9	68.3	60

Spec. No.	Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
2	10	106.4	90	80
4	10	80.8	73	80
6	10	89.8	81	80
1	-10	92.1	81	80
3	-10	4.5	4	0
5	-10	12.5	14	10

Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	92.3	81.3	80
-10	36.4	33.0	30

Spec. No.	Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
2	10	99.2	83	85
15	10	114.1	93	85
30	10	76.2	69	70
9	-10	65.0	60	60
13	-10	68.1	62	70
24	-10	80.0	72	80
3	75	196.0	87	70
20	75	200.0	84	70
23	75	237.2	79	95
10	40	208.8	85	80
12	40	153.8	86	70
25	40	122.3	85	80
5	-70	11.8	10	0
18	-70	6.5	5	0
27	-70	12.0	11	0
4	-50	43.4	41	30
17	-50	4.8	4	0
29	-50	35.8	33	20
1	-30	45.1	45	40
16	-30	35.0	32	50
22	-30	51.0	43	60
7	25	82.0	69	60
11	25	101.8	86	80
28	25	90.8	73	80
8	60	127.9	88	95
14	60	108.0	81	85
26	60	142.0	85	95
6	-90	7.5	6	0
19	-90	9.2	9	0
21	-90	10.0	8	10

Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	96.5	81.7	80
-10	71.0	64.7	70
75	211.1	83.3	78
40	161.6	85.3	77
-70	10.1	8.7	0
-50	28.0	26.0	17
-30	43.7	40.0	50
25	91.5	76.0	73
60	126.0	84.7	92
-90	8.9	7.7	3

Plate: 8

Spec. No.	Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
3	10	117.0	94	80
4	10	116.3	93	85
5	10	110.1	94	85
1	-10	108.5	86	85
2	-10	108.2	88	85
6	-10	40.4	38	40

Average

Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
10	114.5	93.7	83
-10	85.7	70.7	70

Spec. No.	Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
2	10	71.5	60	60
15	10	91.7	76	80
24	10	112.0	90	90
3	-10	100.3	81	80
18	-10	43.2	39	30
21	-10	18.3	16	10
9	75	114.2	85	70
13	75	221.8	80	85
29	75	238.8	76	85
7	40	130.5	94	80
12	40	105.0	77	70
22	40	116.0	85	70
5	-70	6.3	4	0
17	-70	16.2	19	10
30	-70	6.8	17	10
1	-50	8.2	7	5
20	-50	11.3	13	10
23	-50	23.1	19	20
4	-30	19.0	16	20
11	-30	77.5	66	60
28	-30	50.0	46	50
6	25	19.5	21	20
14	25	88.2	71	80
27	25	163.8	96	95
8	60	196.8	87	95
19	60	121.0	93	85
25	60	103.8	77	80
10	-90	8.7	7	0
16	-90	7.1	7	0
26	-90	15.2	18	20

Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
10	91.7	75.3	77
-10	53.9	45.3	40
75	191.6	80.3	80
40	117.2	85.3	73
-70	9.8	13.3	7
-50	14.2	13.0	12
-30	48.8	42.7	43
25	90.5	62.7	65
60	140.5	85.7	87
-90	10.3	10.7	7

Spec. No.	Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
1	10	126.8	92	95
2	10	98.0	79	80
6	10	83.9	78	70
3	-10	99.3	84	85
4	-10	75.0	69	70
5	-10	23.5	22	20

Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
10	102.9	83.0	82
-10	65.9	58.3	58

Plate: 8

Spec. No.	Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
1	10	93.2	77	80
14	10	63.3	57	60
23	10	65.5	55	60
7	-10	48.0	45	30
13	-10	52.3	46	30
30	-10	17.0	17	20
2	75	242.3	74	100
19	75	254.3	81	100
22	75	244.8	78	100
4	40	129.5	100	85
12	40	141.8	90	80
29	40	176.0	86	80
6	-70	15.4	14	5
17	-70	7.3	5	0
24	-70	6.3	6	0
9	-50	12.3	10	10
15	-50	26.7	22	20
21	-50	10.1	8	10
5	-30	75.2	66	60
20	-30	91.5	82	70
26	-30	29.5	29	40
3	25	166.2	99	90
18	25	99.3	90	80
27	25	120.0	80	85
10	60	252.0	73	100
11	60	263.0	72	100
28	60	260.5	83	100
8	-90	8.8	13	0
16	-90	5.3	4	0
25	-90	13.5	12	10

Average

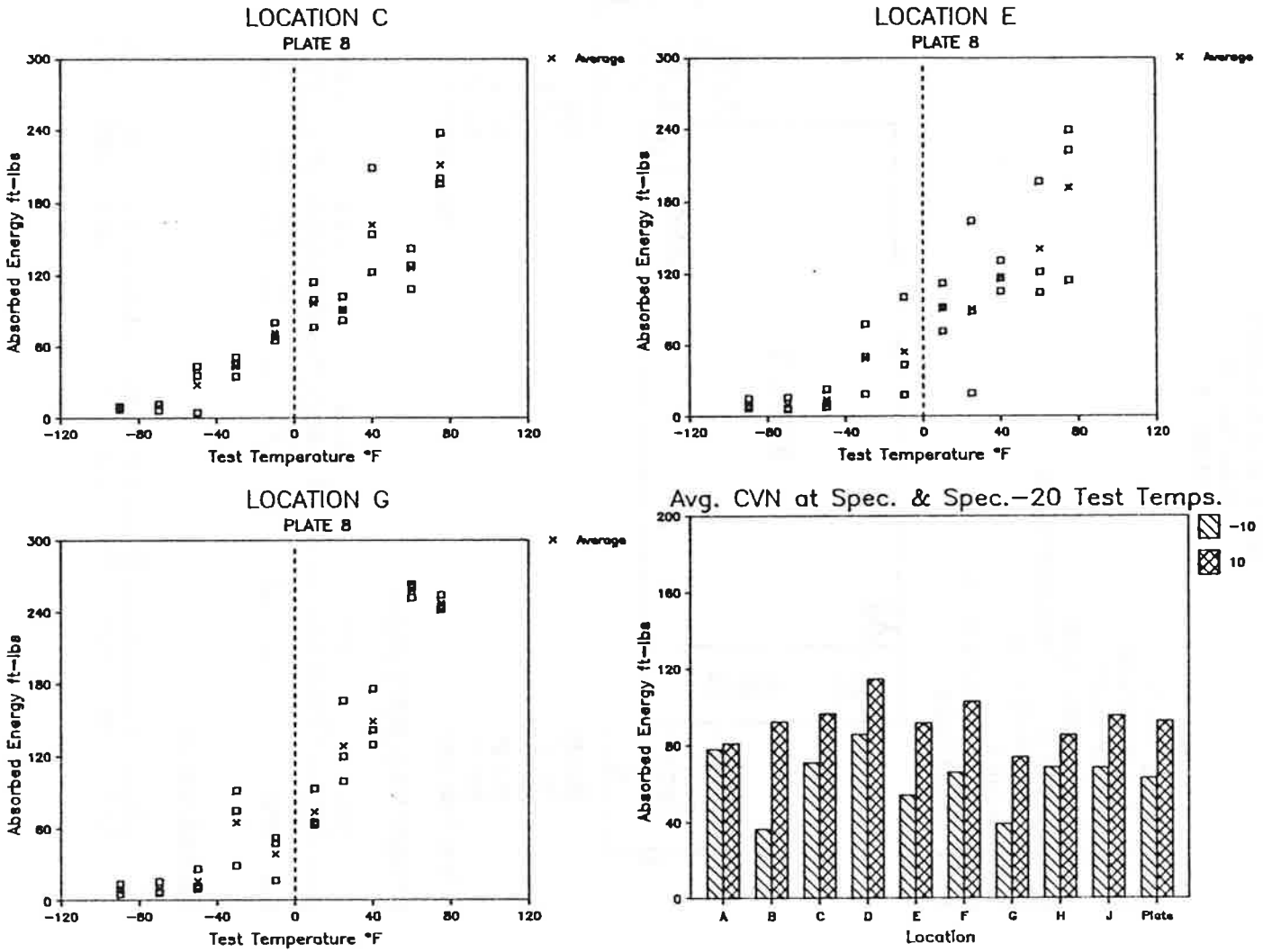
Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
10	74.0	63.0	67
-10	39.1	36.0	27
75	247.1	77.7	100
40	149.1	92.0	82
-70	9.7	8.3	2
-50	16.4	13.3	13
-30	65.4	59.0	57
25	128.5	89.7	85
60	258.5	76.0	100
-90	9.2	9.7	3

Spec. No.	Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
2	10	53.5	48	50
5	10	116.4	101	90
6	10	86.5	78	80
1	-10	97.0	82	80
3	-10	35.0	31	30
4	-10	74.0	69	70

Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
10	85.5	75.7	73
-10	68.7	60.7	60

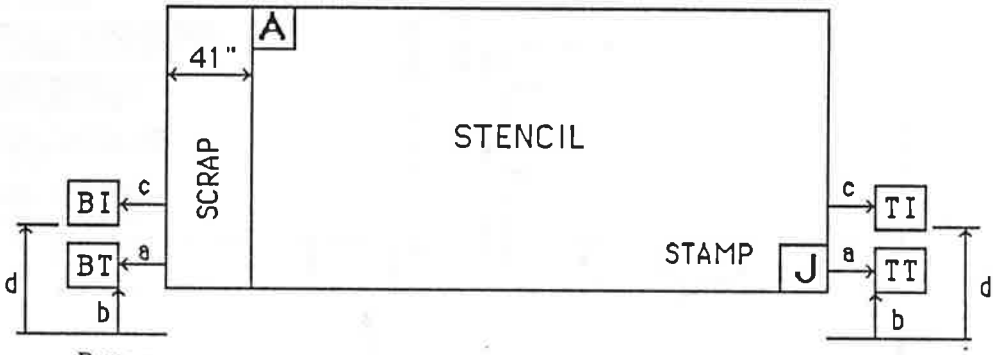
Spec. No.	Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
2	10	84.2	73	85
3	10	86.2	73	85
4	10	116.0	98	95
1	-10	42.5	38	40
5	-10	76.3	68	70
6	-10	86.4	78	80

Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
10	95.5	81.3	88
-10	68.4	61.3	63


LOCATION C
PLATE 8
× Average
Absorbed Energy ft-lbs
Test Temperature °F
LOCATION E
PLATE 8
× Average
Absorbed Energy ft-lbs
Test Temperature °F
LOCATION G
PLATE 8
× Average
Absorbed Energy ft-lbs
Test Temperature °F
Avg. CVN at Spec. & Spec.−20 Test Temps.
−10
10
Absorbed Energy ft-lbs
A
B
C
D
E
F
G
H
J
Plate
Location

MILL DATA SHEET
Plate No: 5
Manf: 1

Serial Number: X049379
Heat Number: 803Z73690
Yield Point (psi): 66300
Tensile Strength (psi): 82700
Elongation (%): 23 {Gage Length (in): 8}
Steel Type: A588-82 Gr. B
Thickness (in): 1
Length (in): 240 Width (in): 60
Notes: Control Rolled



Bottom
Ba : 3"
Bb : 1.5"
Bc : 2"
Bd : 22"
Spec. Code : A52

Top
Ta : 8"
Tb : 2"
Tc : 8"
Td : 17"
Spec. Code : A51

CHARPY MILL TESTS (ft-lbs)

	Test Temp	Test #1 CVN	Lt.Ex.	%Sh.	Test #2 CVN	Lt.Ex.	%Sh.	Test #3 CVN	Lt.Ex.	%Sh.	CVN Avg.
Top	-5°F	88	71	90	78	64	90	65	59	85	77
Bot	-5°F	100	84	95	94	77	90	92	80	90	95

Chemical Analysis

C	Mn	P	S	Si	Cu	Ni	Cr	V	Al	Cb
.12	1.14	.014	.020	.376	.282	.30	.57	.017	.060	NA

Plate: 5
Date: August 4, 1988 Windage: 0
Spec. Temp: - 5 F Personnel: CAS

Spec. No.	Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
2	-5	51.9	45	50
3	-5	102.0	54	60
6	-5	67.0	75	70
1	-25	54.2	48	40
4	-25	48.5	47	50
5	-25	59.3	55	60

Average Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
-5	73.6	58.0	60
-25	54.0	50.0	50

Spec. No.	Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
2	-5	82.3	62	60
3	-5	88.6	67	60
5	-5	50.4	47	50
1	-25	51.0	42	40
4	-25	46.9	42	40
6	-25	40.0	36	40

Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
-5	73.8	58.7	57
-25	46.0	40.0	40

Spec. No.	Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	-5	56.5	53	50
19	-5	42.7	35	40
22	-5	50.5	48	50
5	-25	37.5	33	30
17	-25	29.5	25	30
23	-25	24.0	29	30
8	40	117.7	79	85
11	40	88.0	70	70
29	40	104.3	79	70
7	-70	17.0	22	20
15	-70	14.3	16	20
27	-70	10.2	11	10
6	-55	23.5	21	20
20	-55	15.3	14	20
28	-55	22.0	19	20
4	-40	26.4	26	20
12	-40	27.2	27	30
26	-40	43.0	39	30
9	10	61.5	49	50
16	10	61.0	51	40
21	10	72.0	58	60
3	25	92.0	65	65
14	25	63.8	54	50
24	25	77.8	62	60
1	78	105.0	80	75
13	78	99.0	75	70
25	78	100.0	76	70
2	-90	9.0	8	0
18	-90	9.2	8	0
30	-90	10.2	9	10

Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
-5	49.9	45.3	47
-25	30.3	29.0	30
40	103.3	76.0	75
-70	13.8	16.3	17
-55	20.3	18.0	20
-40	32.2	30.7	27
10	64.8	52.7	50
25	77.9	60.3	58
78	101.3	77.0	72
-90	9.5	8.3	3

Plate: 5

Spec. No.	Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
1	-5	69.1	57	50
3	-5	53.8	46	50
4	-5	57.0	48	50
2	-25	42.0	39	40
5	-25	50.2	43	50
6	-25	51.0	45	50

Average

Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
-5	60.0	50.3	50
-25	47.7	42.3	47

Spec. No.	Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
2	-5	44.3	42	30
20	-5	83.8	68	60
30	-5	80.6	67	60
9	-25	69.2	60	50
12	-25	27.2	14	20
23	-25	62.0	54	50
10	40	102.5	72	70
13	40	80.0	70	60
22	40	101.8	81	70
1	-70	9.0	6	10
14	-70	8.3	8	10
27	-70	16.2	20	20
5	-55	23.7	20	10
15	-55	14.5	14	10
21	-55	32.0	32	20
3	-40	21.0	21	20
18	-40	36.4	35	30
29	-40	59.2	51	50
4	10	67.0	53	60
19	10	72.1	68	70
26	10	95.8	79	70
6	25	97.0	76	70
11	25	81.5	69	70
25	25	93.5	74	70
8	78	109.0	82	85
17	78	93.8	79	80
28	78	106.5	79	85
7	-90	12.7	13	20
16	-90	12.1	12	20
24	-90	10.0	12	10

Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
-5	69.6	59.0	50
-25	52.8	42.7	40
40	94.8	74.3	67
-70	11.2	11.3	13
-55	23.4	22.0	13
-40	38.9	35.7	33
10	78.3	66.7	67
25	90.7	73.0	70
78	103.1	80.0	83
-90	11.6	12.3	17

Spec. No.	Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
1	-5	35.9	39	30
2	-5	46.1	41	40
5	-5	38.8	37	30
3	-25	26.8	38	30
4	-25	40.5	37	30
6	-25	45.6	43	40

Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
-5	40.3	39.0	33
-25	37.6	39.3	33

Plate: 5

Spec. No.	Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
10	-5	86.2	59	70
18	-5	80.0	69	60
22	-5	106.0	71	70
7	-25	72.3	55	50
13	-25	44.7	31	30
25	-25	41.0	39	30
2	40	113.2	81	70
16	40	105.7	76	65
24	40	107.5	73	70
5	-70	17.7	15	20
19	-70	13.6	12	20
27	-70	25.0	29	30
8	-55	29.0	24	20
15	-55	25.5	21	20
29	-55	23.5	25	20
6	-40	38.2	29	20
17	-40	48.0	38	30
21	-40	33.2	29	30
3	10	100.0	69	70
20	10	105.8	78	80
23	10	80.5	60	60
9	25	96.0	68	70
11	25	111.0	82	75
30	25	112.5	79	75
1	78	107.8	88	75
12	78	103.8	69	70
28	78	102.0	74	75
4	-90	10.4	10	10
14	-90	13.5	9	10
26	-90	17.0	16	20

Average

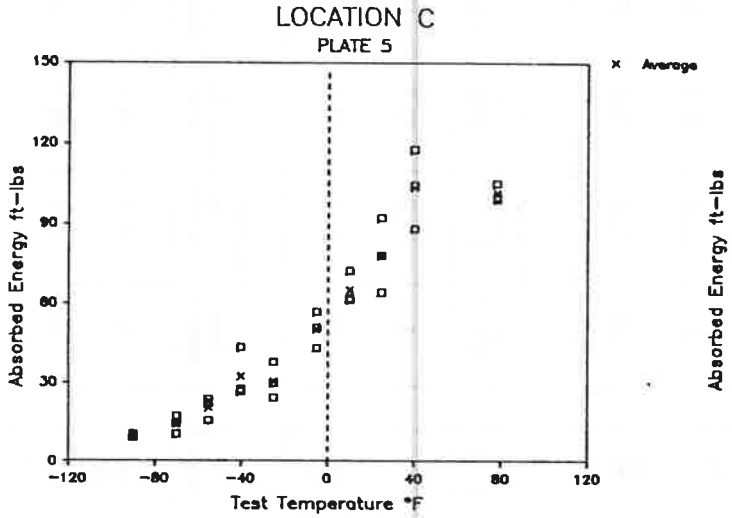
Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
-5	90.7	66.3	67
-25	52.7	41.7	37
40	108.8	76.7	68
-70	18.8	18.7	23
-55	26.0	23.3	20
-40	39.8	32.0	27
10	95.4	69.0	70
25	106.5	76.3	73
78	104.5	77.0	73
-90	13.6	11.7	13

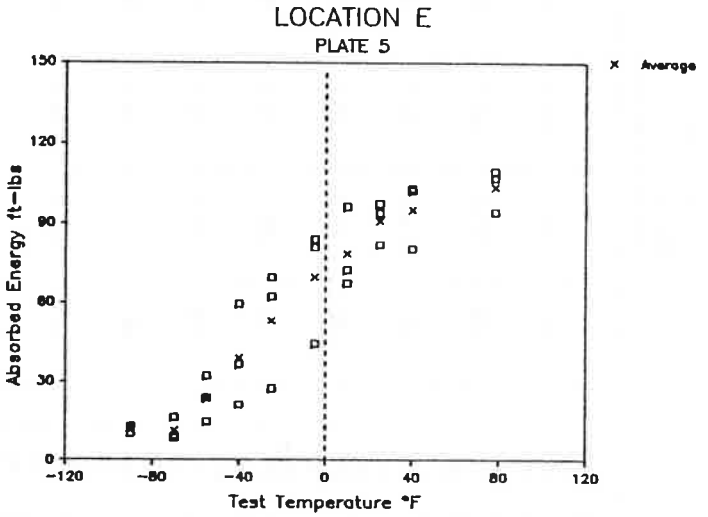
Spec. No.	Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
1	-5	95.2	77	70
3	-5	90.5	66	60
5	-5	96.0	74	70
2	-25	91.3	71	60
4	-25	88.0	66	60
6	-25	74.5	62	50

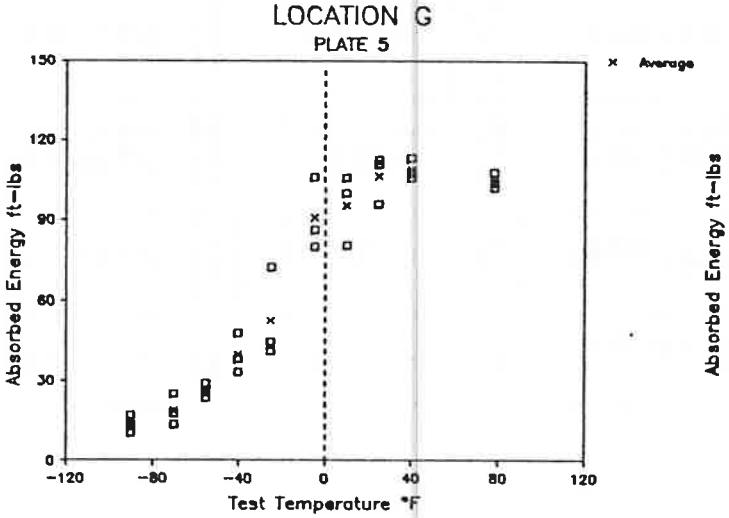
Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
-5	93.9	72.3	67
-25	84.6	66.3	57

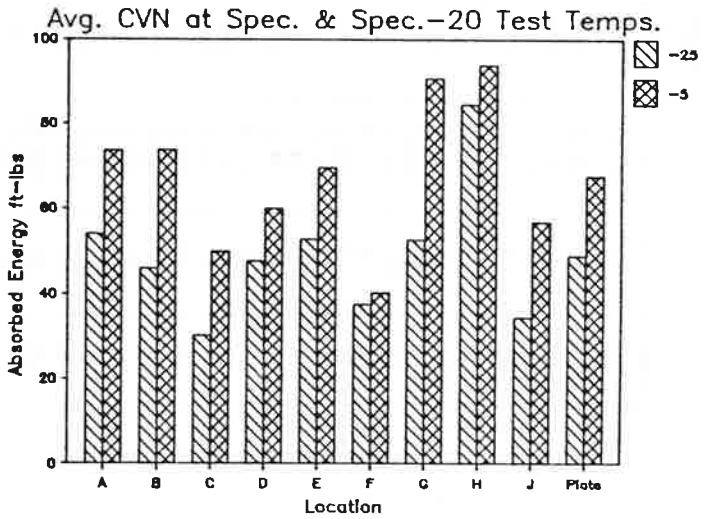
Spec. No.	Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
2	-5	57.5	51	50
4	-5	58.0	50	50
6	-5	54.6	45	50
1	-25	31.8	30	20
3	-25	38.0	34	30
5	-25	33.8	28	30

Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
-5	56.7	48.7	50
-25	34.5	30.7	27


LOCATION C
PLATE 5
Average
Absorbed Energy ft-lbs
Test Temperature °F

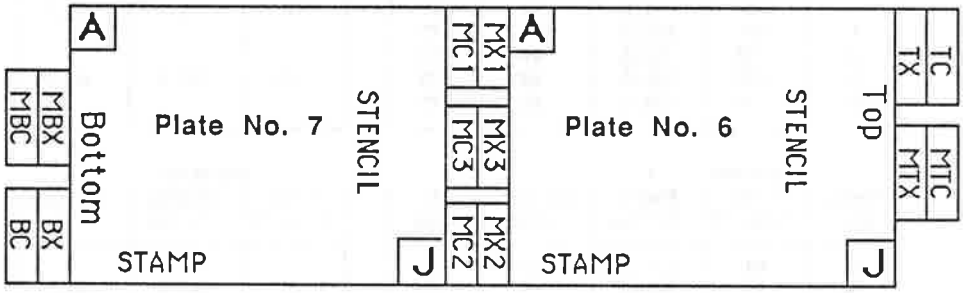

LOCATION E
PLATE 5
Average
Absorbed Energy ft-lbs
Test Temperature °F


LOCATION G
PLATE 5
Average
Absorbed Energy ft-lbs
Test Temperature °F


Avg. CVN at Spec. & Spec.-20 Test Temps.
-25
-5
Absorbed Energy ft-lbs
A
B
C
D
E
F
G
H
J
Plate
Location

MILL DATA SHEET
Plate No: 6 & 7
Manf: 3

Melt/Slab Number: U7808-1H
Yield Point(ksi)
TX: 59.6 BX: 54.6 MTX: 59.2 MBX: 65.6 MX1: 54.9 MX2: 56.0 MX3: 56.5
Tensile Strength(ksi)
TX: 79.5 BX: 78.0 MTX: 83.6 MBX: 77.9 MX1: 77.7 MX2: 78.3 MX3: 79.6
Elongation(%) {Gage Length: 8 in.}
TX: 19 BX: 22 MTX: 22 MBX: 22 MX1: 22 MX2: 26 MX3: 21
Steel Type: A588-85 Gr. A
Thickness (in): 1
Length (in): 240 Width (in): 60
Notes: Fine Grain Practice, Bend Test - Pass
Spec. Code - Top: T185 Bottom: T186



TC,MTC,BC,MBC,MC1,MC2,MC3 - Charpy test locations, 9" x 3"
TX,MTX,BX,MBX,MX1,MX2,MX3 - Tensile test locations, 9" x 2-1/4"

CHARPY MILL TESTS (ft-lbs)

	Test	Test #1			Test #2			Test #3			CVN
	Temp	CVN	Lt.Ex.	%Sh.	CVN	Lt.Ex.	%Sh.	CVN	Lt.Ex.	%Sh.	Avg
TC	+10°F	158	85	80	160	90	80	162	86	80	160
BC	+10°F	183	93	90	187	87	90	192	90	80	187
MTC	+10°F	238	**	**	262	**	**	262	**	**	254
MBC	+10°F	144	**	**	149	**	**	150	**	**	148
MBC	-5°F	90	**	**	113	**	**	128	**	**	110
MC1	+10°F	189	**	**	204	**	**	206	**	**	200
MC2	+10°F	152	**	**	155	**	**	161	**	**	156
MC3	+10°F	200	**	**	201	**	**	206	**	**	202

(** results not reported)

Chemical Analysis

C	Mn	P	S	Si	Cu	Ni	Cr	V	Al	Cb
.12	1.07	.015	.005	.390	.280	.21	.51	.072	NA	NA
Prod. Chemical Analysis										
.13	1.11	.013	.005	.450	.280	.21	.52	.078	NA	NA
.13	1.09	.017	.004	.450	.300	.21	.51	.076	NA	NA

Plate: 6
Date: August 4, 1988 Windage: 0
Spec. Temp: + 10 F Personnel: CAS

Location A

Spec. No.	Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
1	10	138.5	90	90
4	10	136.0	87	85
6	10	162.2	93	85
2	-10	82.0	60	60
3	-10	124.7	90	75
5	-10	121.5	88	85

Average Location A

Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	145.6	90.0	87
-10	109.4	79.3	73

Location B

Spec. No.	Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
1	10	126.3	69	75
2	10	103.8	84	70
4	10	162.0	91	75
3	-10	57.8	49	50
5	-10	105.8	80	70
6	-10	122.0	80	70

Location B

Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	130.7	81.3	73
-10	95.2	69.7	63

Location C

Spec. No.	Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
8	10	131.3	92	85
14	10	102.2	75	70
26	10	133.5	78	80
5	-10	108.0	79	70
16	-10	128.0	91	85
29	-10	121.0	79	70
10	40	247.3	98	100
11	40	188.8	81	95
23	40	225.6	89	95
7	-70	71.0	60	50
19	-70	40.5	34	40
21	-70	16.2	15	10
9	-50	20.5	18	20
15	-50	44.2	41	40
28	-50	86.0	73	70
4	-30	119.0	88	80
12	-30	88.2	73	60
30	-30	105.8	85	70
2	25	150.5	87	95
17	25	131.5	83	90
27	25	183.6	89	95
6	78	236.5	73	95
13	78	195.5	74	95
18	78	206.8	75	95
1	-90	13.6	12	10
3	-90	7.6	6	0
20	-90	36.7	31	40
22	-110	21.8	19	20
24	-110	10.2	10	10
25	-110	8.9	9	10

Location C

Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	122.3	81.7	78
-10	119.0	83.0	75
40	220.6	89.3	97
-70	42.6	36.3	33
-50	50.2	44.0	43
-30	104.3	82.0	70
25	155.2	86.3	93
78	212.9	74.0	95
-90	19.3	16.3	17
-110	13.6	12.7	13

Plate: 6

Spec. No.	Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
1	10	129.0	92	70
3	10	116.0	78	70
4	10	146.8	90	70
2	-10	120.0	90	80
5	-10	123.9	87	80
6	-10	124.0	86	80

Average

Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
10	130.6	86.7	70
-10	122.6	87.7	80

Spec. No.	Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
3	10	116.0	72	80
12	10	137.9	91	80
21	10	112.1	81	70
8	-10	117.0	78	80
14	-10	87.0	71	70
24	-10	119.0	85	85
6	40	208.0	83	90
19	40	180.5	86	90
23	40	124.8	79	85
10	-70	38.5	31	30
18	-70	25.5	22	20
27	-70	33.2	28	30
7	-50	56.2	49	50
15	-50	30.5	29	30
26	-50	69.5	56	60
4	-30	62.0	53	40
20	-30	101.8	84	70
22	-30	103.0	83	70
9	25	208.3	83	95
17	25	230.0	76	95
28	25	263.5	75	100
5	78	144.0	87	95
16	78	226.0	97	100
25	78	235.9	92	100
11	-90	14.0	13	10
13	-90	20.8	21	30
29	-90	49.1	46	50
1	-110	12.7	11	10
2	-110	8.4	8	10
30	-110	20.3	17	20

Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
10	122.0	81.3	77
-10	107.7	78.0	78
40	171.1	82.7	88
-70	32.4	27.0	27
-50	52.1	44.7	47
-30	88.9	73.3	60
25	233.9	78.0	97
78	202.0	92.0	98
-90	28.0	26.7	30
-110	13.8	12.0	13

Spec. No.	Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
1	10	142.0	100	85
5	10	92.2	69	60
6	10	131.9	83	70
2	-10	110.6	86	75
3	-10	129.0	98	85
4	-10	106.0	74	70

Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
10	122.0	84.0	72
-10	115.2	86.0	77

Plate: 6

Spec. No.	Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
5	10	96.4	72	75
16	10	140.5	96	85
27	10	203.5	84	90
7	-10	119.3	86	75
13	-10	111.0	85	75
24	-10	188.5	95	95
2	40	221.5	88	95
19	40	223.0	92	95
28	40	263.0	88	100
9	-70	6.8	4	10
12	-70	65.0	60	50
26	-70	40.0	31	30
8	-50	102.1	78	80
15	-50	78.0	70	70
21	-50	35.8	28	30
3	-30	140.5	102	85
14	-30	66.5	57	60
23	-30	112.5	81	70
4	25	155.8	90	95
11	25	130.5	89	95
29	25	208.3	83	95
1	78	184.0	86	95
6	78	207.0	97	95
18	78	254.0	95	100
17	-90	6.8	5	0
20	-90	13.7	12	10
25	-90	63.0	56	70
10	-110	6.1	4	0
22	-110	7.6	10	0
30	-110	5.3	4	0

Average

Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
10	146.8	84.0	83
-10	139.6	88.7	82
40	235.8	89.3	97
-70	37.3	31.7	30
-50	72.0	58.7	60
-30	106.5	80.0	72
25	164.9	87.3	95
78	215.0	92.7	97
-90	27.8	24.3	27
-110	6.3	6.0	0

Spec. No.	Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
1	10	148.0	97	85
2	10	127.3	85	80
5	10	126.2	86	85
3	-10	105.6	80	70
4	-10	139.0	98	90
6	-10	104.0	79	80

Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
10	133.8	89.3	83
-10	116.2	85.7	80

Spec. No.	Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
2	10	115.6	84	75
4	10	200.3	83	80
5	10	187.5	91	80
1	-10	158.2	93	80
3	-10	114.3	81	70
6	-10	187.0	90	85

Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
10	167.8	86.0	78
-10	153.2	88.0	78

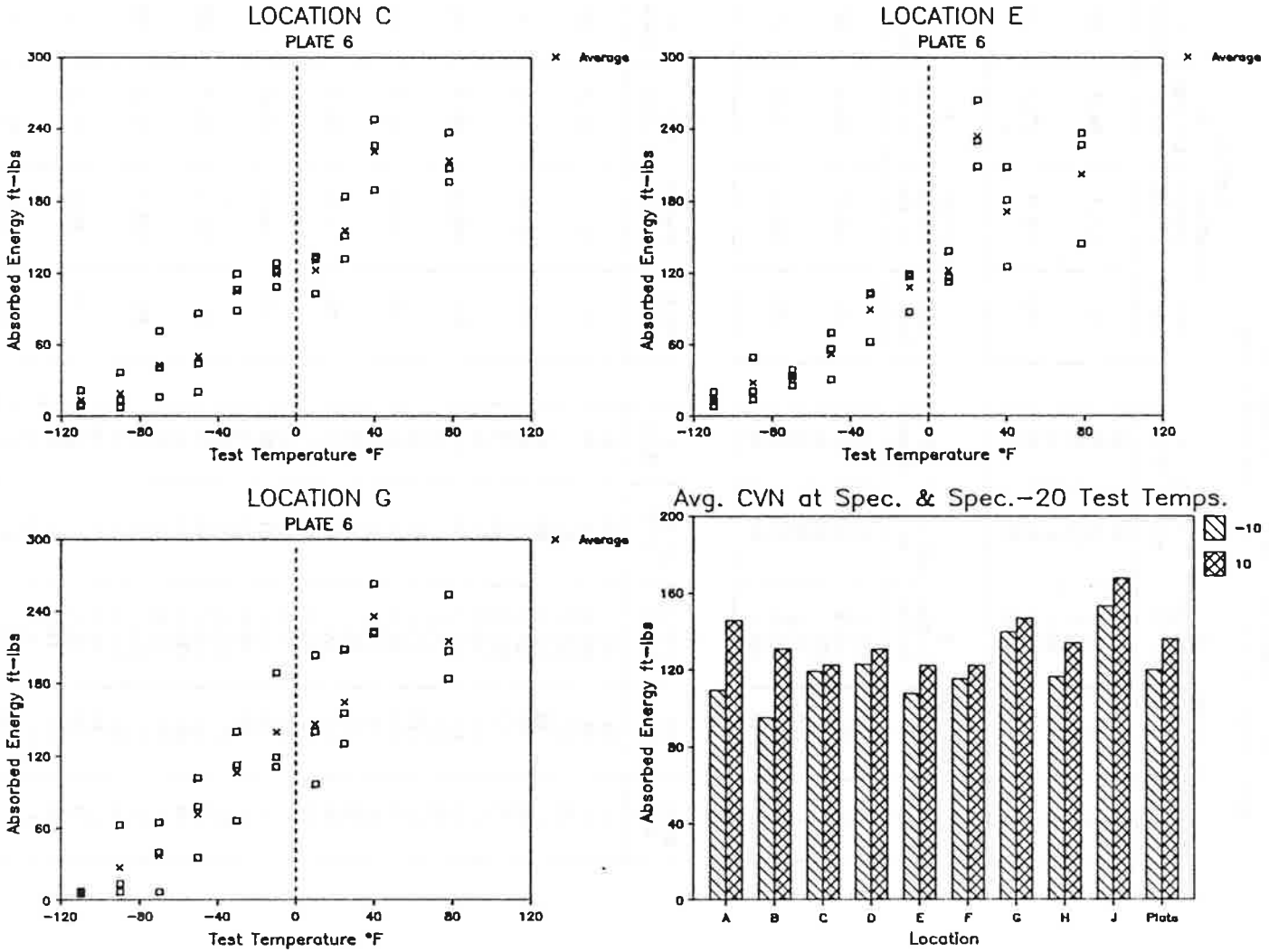

LOCATION C
PLATE 6
× Average
Absorbed Energy ft-lbs
Test Temperature °F
LOCATION E
PLATE 6
× Average
Absorbed Energy ft-lbs
Test Temperature °F
LOCATION G
PLATE 6
× Average
Absorbed Energy ft-lbs
Test Temperature °F
Avg. CVN at Spec. & Spec.-20 Test Temps.
-10
10
Absorbed Energy ft-lbs
A B C D E F G H J Plate
Location

Plate: 7
Date: August 9, 1988 Windage: 0
Spec. Temp: + 10 F Personnel: CAS

Spec. No.	Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
1	10	130.7	90	80
3	10	74.5	64	70
4	10	212.1	100	95
2	-10	69.5	61	60
5	-10	152.0	85	85
6	-10	135.2	91	85

Average Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	139.1	84.7	82
-10	118.9	79.0	77

Spec. No.	Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
1	10	124.0	86	85
3	10	105.9	80	80
5	10	252.2	80	95
2	-10	87.2	76	50
4	-10	116.0	88	85
6	-10	195.7	88	90

Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	160.7	82.0	87
-10	133.0	84.0	75

Spec. No.	Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
9	10	122.3	76	80
11	10	195.0	90	90
23	10	143.9	85	85
4	-10	119.9	88	85
16	-10	107.5	82	70
25	-10	101.3	76	70
2	40	168.2	92	95
19	40	213.2	90	100
22	40	198.3	87	100
5	-70	20.5	19	20
13	-70	23.0	17	20
28	-70	15.3	14	10
10	-50	19.3	16	10
14	-50	65.7	56	50
21	-50	46.8	40	40
7	-30	80.3	69	70
12	-30	99.2	81	80
27	-30	79.0	72	70
8	25	130.0	87	85
18	25	145.2	98	90
29	25	130.0	90	85
1	73	135.9	92	85
15	73	188.5	96	90
26	73	244.8	82	95
6	-90	15.5	15	10
17	-90	16.5	17	20
24	-90	13.1	10	20
3	-110	14.5	16	10
20	-110	6.4	4	0
30	-110	8.6	7	0

Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	153.7	83.7	85
-10	109.6	82.0	75
40	193.2	89.7	98
-70	19.6	16.7	17
-50	43.9	37.3	33
-30	86.2	74.0	73
25	135.1	91.7	87
73	189.7	90.0	90
-90	15.0	14.0	17
-110	9.8	9.0	3

Plate: 7

Spec. No.	Location	D Energy ft-lbs	Lat Exp mils	% Shear
	Test Temp-°F			
1	10	142.2	97	85
3	10	118.4	78	80
5	10	209.0	97	90
2	-10	109.7	74	70
4	-10	123.8	77	85
6	-10	146.8	100	90

Average

Location	D		
Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	156.5	90.7	85
-10	126.8	83.7	82

Spec. No.	Location	E Energy ft-lbs	Lat Exp mils	% Shear
	Test Temp-°F			
3	10	87.0	67	70
12	10	79.2	60	60
29	10	137.8	102	85
2	-10	87.8	83	70
15	-10	68.3	54	60
24	-10	117.5	88	80
1	40	113.0	78	85
14	40	124.0	77	80
27	40	232.0	89	95
7	-70	14.2	20	10
19	-70	26.3	25	20
25	-70	7.2	17	10
5	-50	27.4	25	20
13	-50	19.7	15	10
22	-50	58.2	48	40
8	-30	95.8	83	70
18	-30	49.0	43	50
26	-30	156.2	103	85
6	25	201.0	101	95
11	25	122.3	87	85
23	25	158.2	86	85
4	73	133.2	89	80
17	73	247.8	80	95
28	73	180.7	97	85
9	-90	10.0	9	0
20	-90	10.0	9	0
21	-90	6.7	4	0
10	-110	16.6	15	20
16	-110	9.3	9	10
30	-110	23.2	26	30

Location	E		
Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	101.3	76.3	72
-10	91.2	75.0	70
40	156.3	81.3	87
-70	15.9	20.7	13
-50	35.1	29.3	23
-30	100.3	76.3	68
25	160.5	91.3	88
73	187.2	88.7	87
-90	8.9	7.3	0
-110	16.4	16.7	20

Spec. No.	Location	F Energy ft-lbs	Lat Exp mils	% Shear
	Test Temp-°F			
3	10	113.0	84	80
4	10	117.0	87	85
6	10	121.5	88	85
1	-10	113.2	85	85
2	-10	96.2	77	85
5	-10	113.5	88	85

Location	F		
Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	117.2	86.3	83
-10	107.6	83.3	85

Plate: 7

Spec. No.	Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
10	10	135.9	91	85
13	10	137.3	87	85
28	10	146.0	91	85
4	-10	127.0	91	85
18	-10	135.8	99	85
22	-10	70.1	56	60
3	40	158.2	88	85
16	40	209.3	99	90
30	40	141.8	98	90
2	-70	51.8	46	40
19	-70	84.3	75	70
24	-70	8.5	8	10
8	-50	21.0	22	10
12	-50	7.3	6	5
23	-50	13.2	23	10
1	-30	101.9	79	80
17	-30	114.3	85	85
29	-30	133.0	98	85
5	25	112.0	93	90
15	25	156.9	95	90
25	25	96.2	72	70
7	73	251.8	95	95
14	73	235.9	78	85
21	73	173.8	103	85
9	-90	20.0	19	20
26	-90	31.0	27	30
27	-90	17.9	16	20
6	-110	16.3	16	20
11	-110	13.2	12	10
20	-110	7.6	7	0

Average

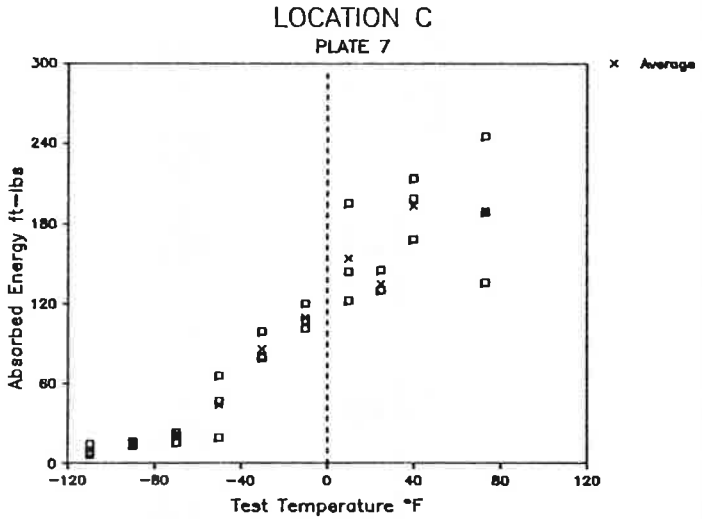
Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
10	139.7	89.7	85
-10	111.0	82.0	77
40	169.8	95.0	88
-70	48.2	43.0	40
-50	13.8	17.0	8
-30	116.4	87.3	83
25	121.7	86.7	83
73	220.5	92.0	88
-90	23.0	20.7	23
-110	12.4	11.7	10

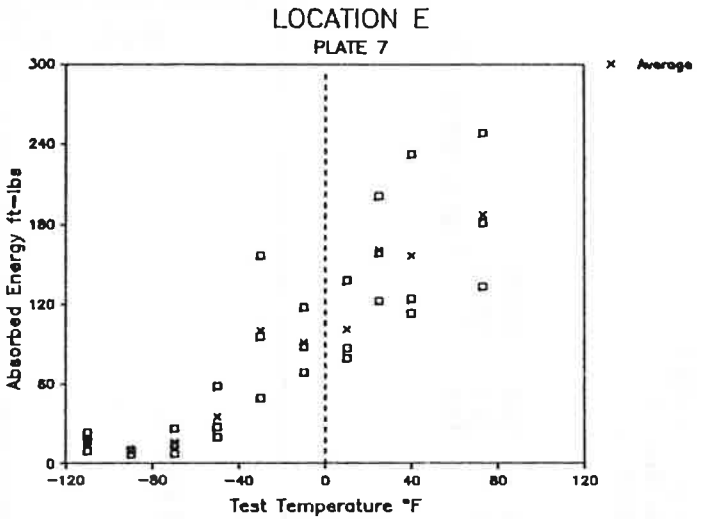
Spec. No.	Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
1	10	125.8	85	80
3	10	80.0	66	0
5	10	140.4	89	85
2	-10	89.5	69	70
4	-10	78.0	71	70
6	-10	200.2	100	90

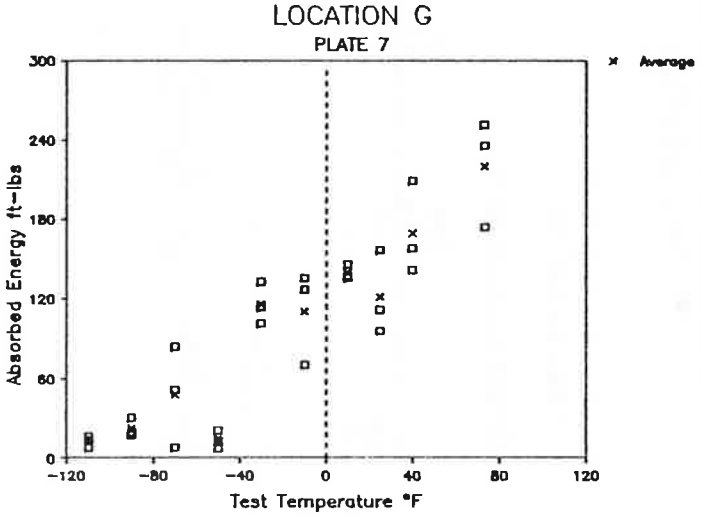
Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
10	115.4	80.0	55
-10	122.6	80.0	77

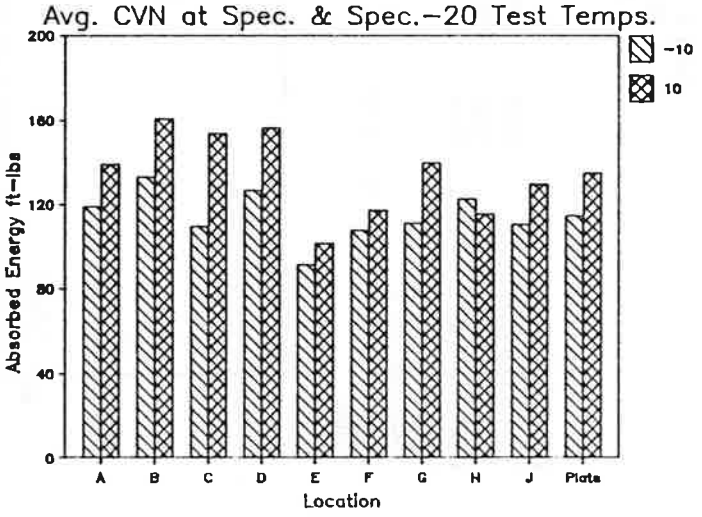
Spec. No.	Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
1	10	122.4	88	80
3	10	127.0	93	85
6	10	139.2	93	85
2	-10	76.9	64	60
4	-10	138.3	104	90
5	-10	116.0	84	85

Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
10	129.5	91.3	83
-10	110.4	84.0	78


LOCATION C
PLATE 7
× Average
Absorbed Energy ft-lbs
Test Temperature °F


LOCATION E
PLATE 7
× Average
Absorbed Energy ft-lbs
Test Temperature °F


LOCATION G
PLATE 7
× Average
Absorbed Energy ft-lbs
Test Temperature °F

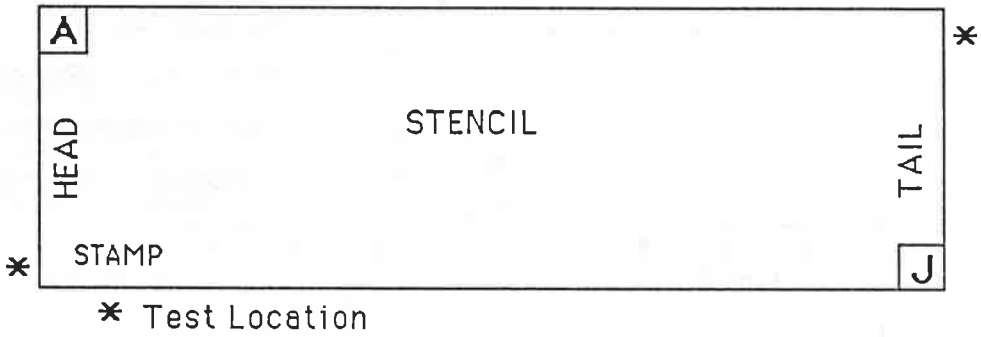

Avg. CVN at Spec. & Spec.−20 Test Temps.
−10
10
Absorbed Energy ft-lbs
A
B
C
D
E
F
G
H
J
Plate
Location

MILL DATA SHEET
Plate No: 9
Manf: 2

Slab Number: 4704
Heat Number: 68270

Yield Point (psi)	Head:	66700	Tail:	65900
Tensile Strength (psi)	Head:	91800	Tail:	90200
Elongation (%)	Head:	27	Tail:	23 {Gage Length (in): 2}

Steel Type: A588-87 Gr. A
Thickness (in): 1
Length (in): 240 Width (in): 60
Notes:



Spec. Code for Head: D632
Spec. Code for Tail: D633

CHARPY MILL TESTS (ft-lbs)

	Test Temp.	Test #1	Test #2	Test #3	CVN Test Avg.
Head	-5°F	89	92	89	91
Tail	-5°F	90	95	80	88

Chemical Analysis

C	Mn	P	S	Si	Cu	Ni	Cr	V	Al	Cb
.13	0.95	.010	.008	.440	.320	.21	.57	.060	NA	NA

Plate: 9
Date: August 17, 1988 Windage: 0
Spec. Temp: - 5 F Personnel: CAS

Spec. No.	Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
1	-5	73.2	60	60
3	-5	96.8	75	70
5	-5	99.0	83	70
2	-25	56.2	47	40
4	-25	62.1	53	40
6	-25	88.0	73	60

Average Location A

Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
-5	89.7	72.7	67
-25	68.8	57.7	47

Spec. No.	Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
2	-5	27.6	22	40
4	-5	95.4	79	70
6	-5	87.0	64	70
1	-25	46.0	37	30
3	-25	12.8	9	10
5	-25	16.5	15	10

Location B

Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
-5	70.0	55.0	60
-25	25.1	20.3	17

Spec. No.	Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
2	-5	49.5	40	40
20	-5	19.8	16	20
24	-5	69.3	55	50
10	-25	58.0	54	50
13	-25	65.6	57	50
22	-25	9.2	12	10
4	74	107.0	71	70
18	74	129.0	85	80
23	74	128.1	87	80
6	40	107.8	81	70
14	40	108.0	77	70
25	40	106.0	78	70
8	-70	10.0	9	10
12	-70	15.7	12	10
21	-70	7.9	7	10
3	-55	14.4	13	10
16	-55	16.6	16	20
26	-55	9.1	9	10
5	-40	44.1	35	40
19	-40	13.6	10	10
29	-40	28.4	25	20
1	10	78.0	64	60
11	10	88.0	67	60
30	10	60.3	48	50
7	25	70.2	58	60
15	25	62.8	50	60
27	25	79.8	65	70
9	100	133.2	90	85
17	100	147.9	97	85
28	100	118.0	84	80

Location C

Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
-5	46.2	37.0	37
-25	44.3	41.0	37
74	121.4	81.0	77
40	107.3	78.7	70
-70	11.2	9.3	10
-55	13.4	12.7	13
-40	28.7	23.3	23
10	75.4	59.7	57
25	70.9	57.7	63
100	133.0	90.3	83

Plate: 9

Spec. No.	Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
1	-5	56.3	50	50
5	-5	74.7	61	60
6	-5	86.4	73	70
2	-25	55.2	47	50
3	-25	12.3	9	10
4	-25	71.8	61	60

Average

Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
-5	72.5	61.3	60
-25	46.4	39.0	40

Spec. No.	Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
7	-5	97.4	81	85
17	-5	71.4	60	70
25	-5	58.0	47	50
6	-25	88.0	80	80
13	-25	10.2	7	10
30	-25	44.0	39	40
2	74	123.5	83	85
19	74	129.3	95	85
26	74	152.5	92	90
3	40	100.7	71	70
18	40	107.3	81	80
24	40	115.9	74	80
4	-70	7.0	4	0
16	-70	40.8	36	30
22	-70	38.5	32	30
5	-55	40.4	32	30
15	-55	47.5	42	40
28	-55	27.4	24	30
9	-40	7.1	9	10
14	-40	10.7	7	10
21	-40	54.9	42	40
8	10	38.0	36	40
12	10	77.8	63	60
27	10	102.8	80	70
1	25	60.4	46	40
20	25	102.0	78	70
29	25	65.0	54	60
10	100	154.2	94	90
11	100	151.9	87	90
23	100	138.1	77	85

Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
-5	75.6	62.7	68
-25	47.4	42.0	43
74	135.1	90.0	87
40	108.0	75.3	77
-70	28.8	24.0	20
-55	38.4	32.7	33
-40	24.2	19.3	20
10	72.9	59.7	57
25	75.8	59.3	57
100	148.1	86.0	88

Spec. No.	Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
1	-5	69.5	56	60
4	-5	69.0	59	60
5	-5	30.8	29	30
2	-25	53.8	44	40
3	-25	67.3	56	60
6	-25	60.7	54	60

Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
-5	56.4	48.0	50
-25	60.6	51.3	53

Plate: 9

Spec. No.	Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
1	-5	85.0	65	70
16	-5	77.8	65	65
24	-5	65.0	55	60
8	-25	56.4	51	50
13	-25	60.5	48	50
29	-25	8.5	10	20
4	74	127.5	85	80
17	74	120.7	84	80
23	74	121.0	81	80
2	40	103.8	72	70
19	40	112.4	80	75
25	40	94.1	71	70
10	-70	39.0	41	30
12	-70	16.3	16	20
30	-70	24.5	25	20
5	-55	43.2	35	40
11	-55	5.6	3	0
27	-55	12.3	11	10
3	-40	32.5	28	30
18	-40	51.8	45	50
21	-40	69.4	55	50
6	10	90.0	74	70
15	10	83.2	64	70
22	10	75.1	60	60
7	25	98.2	78	80
14	25	92.4	64	70
28	25	105.6	81	80
9	100	158.8	95	90
20	100	123.0	75	80
26	100	130.4	85	80

Average

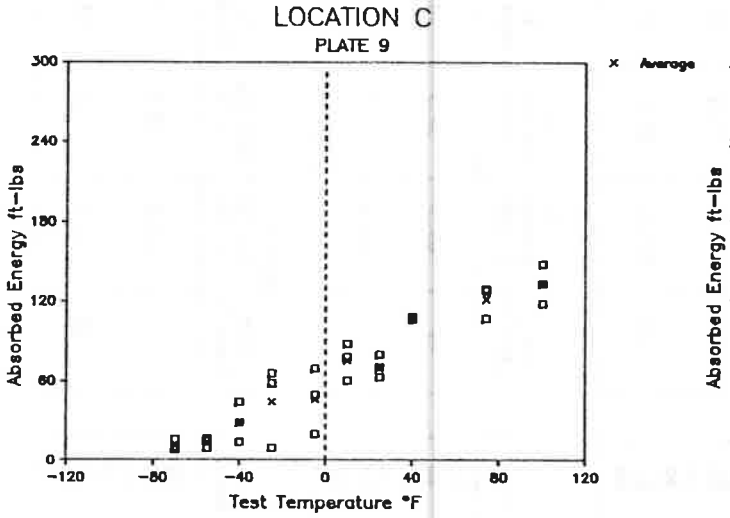
Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
-5	75.9	61.7	65
-25	41.8	36.3	40
74	123.1	83.3	80
40	103.4	74.3	72
-70	26.6	27.3	23
-55	20.4	16.3	17
-40	51.2	42.7	43
10	82.8	66.0	67
25	98.7	74.3	77
100	137.4	85.0	83

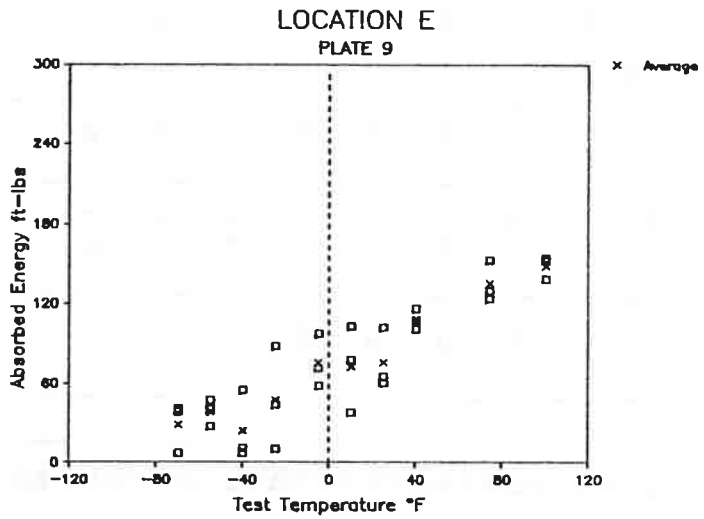
Spec. No.	Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
1	-5	77.0	61	50
3	-5	50.3	39	40
4	-5	69.3	57	60
2	-25	12.5	8	10
5	-25	48.5	39	30
6	-25	59.8	48	50

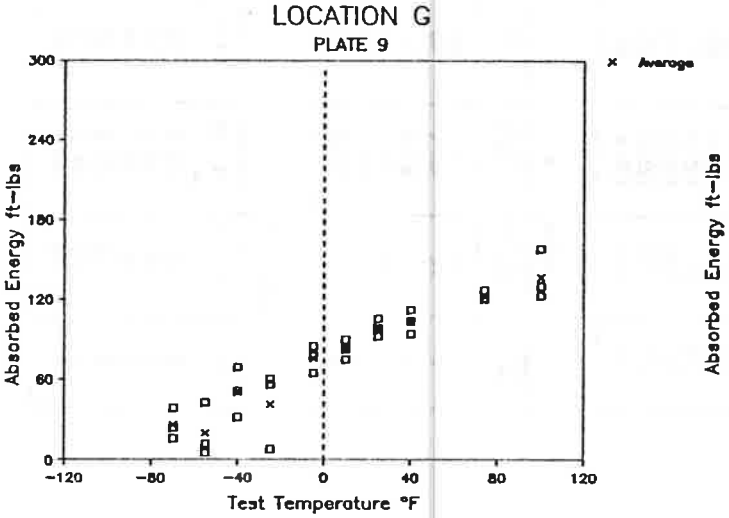
Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
-5	65.5	52.3	50
-25	40.3	31.7	30

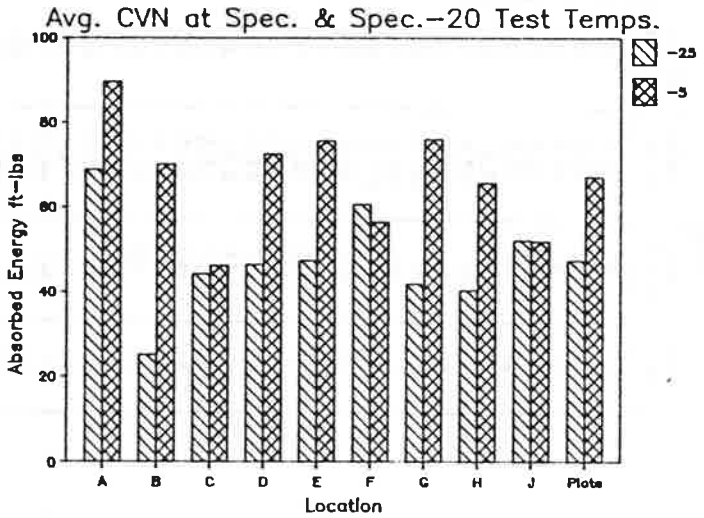
Spec. No.	Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
2	-5	69.8	56	50
3	-5	42.2	35	40
6	-5	43.7	38	40
1	-25	47.8	38	40
4	-25	44.0	39	40
5	-25	64.7	57	50

Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
-5	51.9	43.0	43
-25	52.2	44.7	43


LOCATION C
PLATE 9
× Average
Absorbed Energy ft-lbs
Test Temperature °F
300
240
180
120
60
0
-120
-80
-40
0
40
80
120


LOCATION E
PLATE 9
× Average
Absorbed Energy ft-lbs
Test Temperature °F
300
240
180
120
60
0
-120
-80
-40
0
40
80
120


LOCATION G
PLATE 9
× Average
Absorbed Energy ft-lbs
Test Temperature °F
300
240
180
120
60
0
-120
-80
-40
0
40
80
120

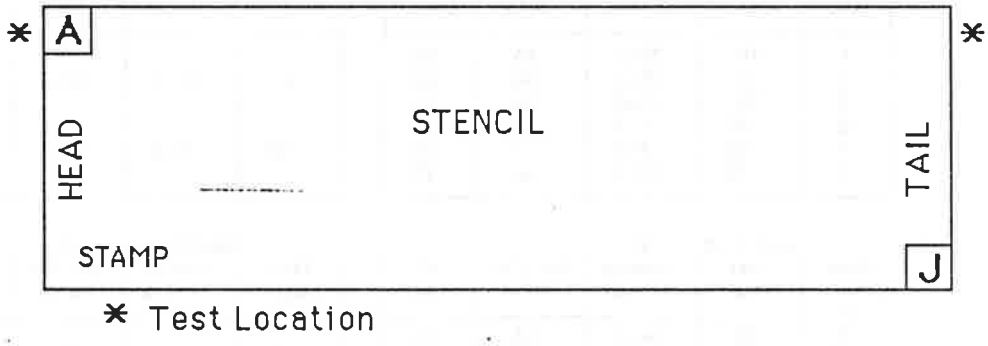

Avg. CVN at Spec. & Spec.-20 Test Temps.
-25
-5
Absorbed Energy ft-lbs
Location
100
80
60
40
20
0
A
B
C
D
E
F
G
H
J
Plate

MILL DATA SHEET
Plate No: 10
Manf: 2

Slab Number: 4034
Heat Number: 57940

Yield Point (psi)	Head:	62400	Tail:	63100	
Tensile Strength (psi)	Head:	85800	Tail:	81600	
Elongation (%)	Head:	27	Tail:	22	{Gage Length (in): 2}

Steel Type: A572-85 Gr. 50
Thickness (in): 1
Length (in): 240 Width (in): 60
Notes:



Spec. Code for Head: D628
Spec. Code for Tail: D629

CHARPY MILL TESTS (ft-lbs)

	Test Temp.	Test #1	Test #2	Test #3	CVN Test Avg.
Head	+10°F	78	78	99	85
Tail	+10°F	84	93	86	88

Chemical Analysis

C	Mn	P	S	Si	Cu	Ni	Cr	V	Al	Cb
.15	1.30	.011	.011	.290	NA	NA	NA	.070	NA	NA

Plate: 10
Date: October 11, 1988 Windage: 0
Spec. Temp: + 10 F Personnel: CAS

Spec. No.	Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
1	10	37.5	34	30
3	10	61.2	57	50
5	10	67.6	60	50
2	-10	69.9	64	60
4	-10	49.0	45	50
6	-10	79.0	70	60

Average Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	55.4	50.3	43
-10	66.0	59.7	57

Spec. No.	Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
1	10	58.8	56	50
3	10	75.0	64	60
5	10	74.8	64	60
2	-10	90.0	75	70
4	-10	49.0	43	40
6	-10	91.3	82	70

Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	69.5	61.3	57
-10	76.8	66.7	60

Spec. No.	Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
3	10	54.5	58	60
18	10	46.8	42	50
29	10	82.3	72	70
1	-10	64.0	58	60
11	-10	55.6	50	60
24	-10	61.0	58	60
6	40	102.1	87	80
16	40	102.6	85	80
22	40	100.0	82	80
2	-70	10.1	29	10
14	-70	10.1	31	10
25	-70	23.7	42	20
7	-50	23.7	21	20
12	-50	31.6	30	30
21	-50	12.8	13	10
8	-30	38.5	34	30
15	-30	49.8	46	40
23	-30	19.2	20	20
9	25	55.3	49	50
19	25	77.8	68	70
28	25	94.8	72	70
5	75.7	118.0	80	85
30	75.7	91.5	80	85
13	75.7	111.9	70	85
10	100	123.9	87	95
20	100	122.4	92	95
26	100	111.9	84	95
4	-20	33.4	31	30
17	-20	44.2	38	50
27	-20	29.8	25	30

Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	61.2	57.3	60
-10	60.2	55.3	60
40	101.6	84.7	80
-70	14.6	34.0	13
-50	22.7	21.3	20
-30	35.8	33.3	30
25	76.0	63.0	63
75.7	107.1	76.7	85
100	119.4	87.7	95
-20	35.8	31.3	37

Plate: 10

Spec. No.	Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
1	10	76.2	64	60
4	10	82.2	72	70
5	10	71.7	63	70
2	-10	36.0	38	30
3	-10	72.1	63	60
6	-10	45.8	41	40

Average

Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
10	76.7	66.3	67
-10	51.3	47.3	43

Spec. No.	Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
9	10	75.1	67	70
18	10	72.5	63	70
22	10	66.0	56	70
1	-10	71.8	62	60
13	-10	40.8	37	40
26	-10	59.0	50	50
2	40	79.4	67	60
16	40	83.8	68	70
24	40	105.3	81	80
6	-70	6.0	6	0
12	-70	9.0	9	10
29	-70	8.7	11	10
7	-50	7.7	8	10
14	-50	37.2	39	30
25	-50	10.6	18	20
8	-30	23.3	20	20
17	-30	17.0	17	20
23	-30	37.4	33	30
4	25	72.1	62	60
15	25	87.8	70	70
30	25	93.0	75	70
5	75.7	103.8	75	70
19	75.7	128.2	88	85
21	75.7	113.5	84	85
10	100	122.3	94	95
20	100	108.0	82	90
27	100	129.0	95	95
3	-20	47.3	38	50
11	-20	20.5	18	20
28	-20	53.7	46	50

Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
10	71.2	62.0	70
-10	57.2	49.7	50
40	89.5	72.0	70
-70	7.9	8.7	7
-50	18.5	21.7	20
-30	25.9	23.3	23
25	84.3	69.0	67
75.7	115.2	82.3	80
100	119.8	90.3	93
-20	40.5	34.0	40

Spec. No.	Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
1	10	72.5	64	60
4	10	79.9	67	70
6	10	85.0	68	70
2	-10	38.0	33	30
3	-10	32.2	29	30
5	-10	61.5	55	50

Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
10	79.1	66.3	67
-10	43.9	39.0	37

Plate: 10

Spec. No.	Location G Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
4	10	68.3	58	60
17	10	80.2	68	60
22	10	81.5	67	70
8	-10	30.0	29	30
11	-10	81.5	70	70
28	-10	70.0	64	70
2	40	102.9	79	80
18	40	101.8	80	80
30	40	101.0	78	80
3	-70	9.4	9	10
13	-70	6.0	6	0
23	-70	6.3	7	0
9	-50	6.1	6	0
16	-50	18.9	16	20
27	-50	23.8	23	20
7	-30	8.8	9	10
14	-30	14.7	17	20
29	-30	51.8	46	30
5	25	77.2	64	60
12	25	84.3	65	70
21	25	86.0	71	70
10	75.7	107.8	76	70
15	75.7	124.5	84	80
26	75.7	110.8	79	80
6	100	142.8	95	95
20	100	111.0	87	90
25	100	142.5	92	95
1	-20	70.0	61	70
19	-20	32.1	28	40
24	-20	54.3	45	60

Average

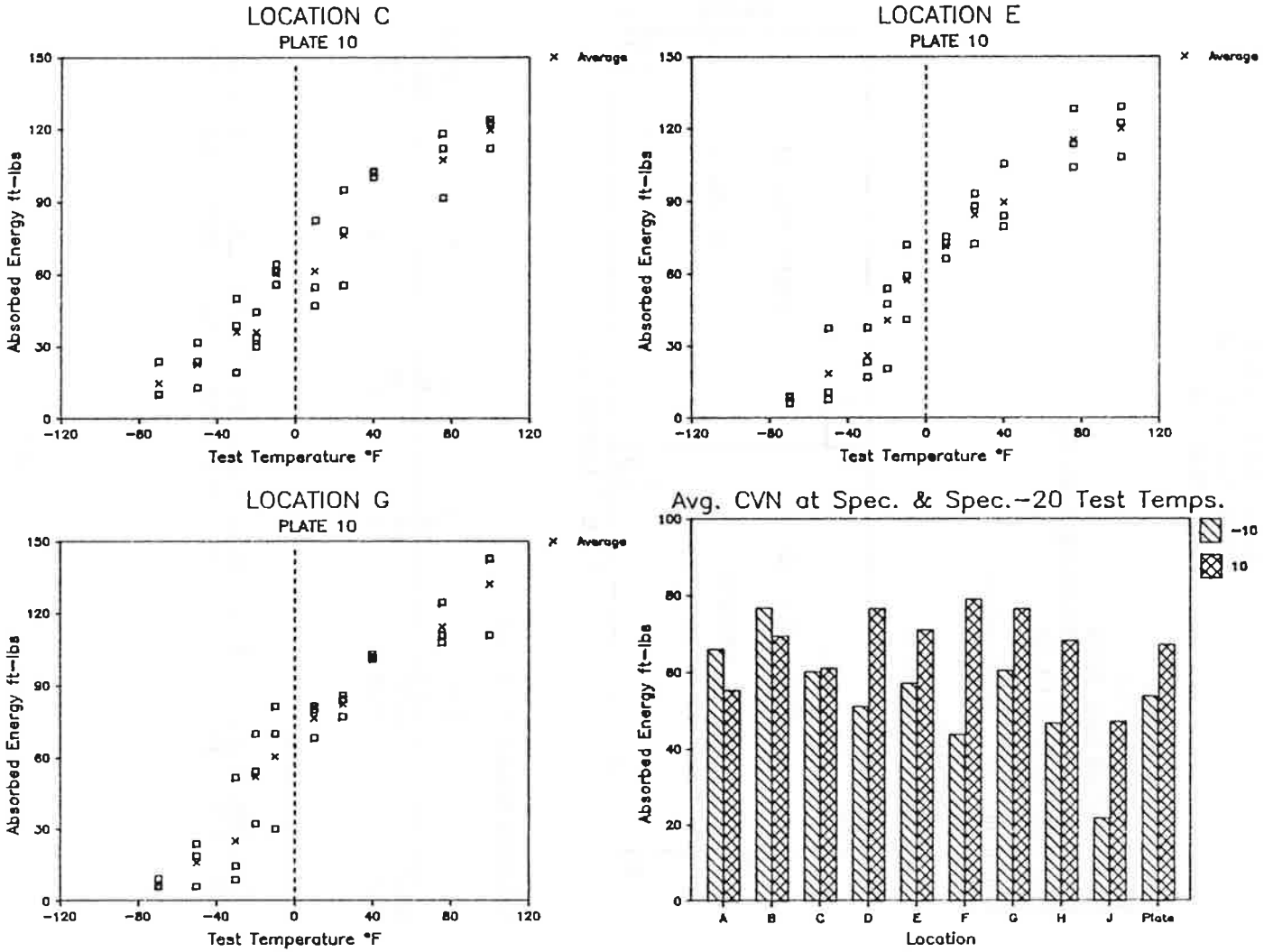
Location G Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	76.7	64.3	63
-10	60.5	54.3	57
40	101.9	79.0	80
-70	7.2	7.3	3
-50	16.3	15.0	13
-30	25.1	24.0	20
25	82.5	66.7	67
75.7	114.4	79.7	77
100	132.1	91.3	93
-20	52.1	44.7	57

Spec. No.	Location H Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
3	10	64.5	54	50
4	10	63.5	54	50
5	10	77.0	68	60
1	-10	28.7	29	20
2	-10	53.2	46	50
6	-10	58.7	52	50

Location H Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	68.3	58.7	53
-10	46.9	42.3	40

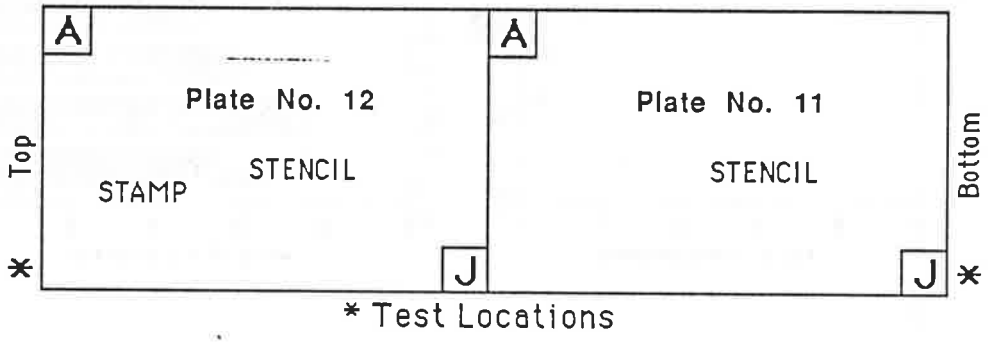
Spec. No.	Location J Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
2	10	68.3	57	40
4	10	29.9	28	30
6	10	43.8	37	30
1	-10	20.3	18	20
3	-10	11.3	9	10
5	-10	33.9	30	30

Location J Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	47.3	40.7	33
-10	21.8	19.0	20


LOCATION C
PLATE 10
× Average
Absorbed Energy ft-lbs
Test Temperature °F
LOCATION E
PLATE 10
× Average
Absorbed Energy ft-lbs
Test Temperature °F
LOCATION G
PLATE 10
× Average
Absorbed Energy ft-lbs
Test Temperature °F
Avg. CVN at Spec. & Spec.-20 Test Temps.
-10
10
Absorbed Energy ft-lbs
A B C D E F G H J Plate
Location

MILL DATA SHEET
Plate No: 11 & 12
Manf: 4

Heat Number: M65063
Yield Point (psi): 58500
Tensile Strength (psi): 80000
Elongation (%): 35.0 (Gage Length (in): 2)
Steel Type: A572-85 Gr. 50
Thickness (in): 1
Length (in): 240 Width (in): 60
Notes: Fine Grain Practice
Normalized
Spec. Code: 01W 02



CHARPY MILL TESTS (ft-lbs)

	Test Temp.	Test #1	Test #2	Test #3	CVN Test Avg.
Head	+10°F	89	96	93	93
Tail	+10°F	73	118	89	93

Chemical Analysis

C	Mn	P	S	Si	Cu	Ni	Cr	V	Al	Cb
.20	1.28	.017	.010	.190	NA	NA	NA	.070	NA	NA

Plate: 11
Date: October 4, 1988 Windage: 0
Spec. Temp: + 10 F Personnel: CAS

Location A

Spec. No.	Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
2	10	82.0	57	70
5	10	65.8	52	60
6	10	85.9	66	70
1	-10	50.0	36	40
3	-10	58.5	41	40
4	-10	68.2	54	50

Average Location A

Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	77.9	58.3	67
-10	58.9	43.7	43

Location B

Spec. No.	Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
1	10	86.0	60	60
5	10	84.8	61	70
6	10	86.5	66	70
2	-10	78.3	55	50
3	-10	57.8	40	50
4	-10	44.5	37	50

Location B

Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	85.8	62.3	67
-10	60.2	44.0	50

Location C

Spec. No.	Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
3	10	73.3	60	60
18	10	84.0	68	80
27	10	76.5	60	70
8	-10	72.3	55	50
11	-10	59.8	44	40
29	-10	42.4	48	40
2	40	93.0	66	70
17	40	105.2	72	80
24	40	122.8	77	80
5	-70	30.5	19	10
16	-70	29.1	20	20
25	-70	22.0	11	10
4	-50	40.5	26	20
19	-50	30.7	22	30
23	-50	33.0	22	30
9	-30	29.8	28	30
14	-30	43.0	23	30
30	-30	54.2	41	40
6	25	93.7	63	85
20	25	73.3	53	80
21	25	84.0	54	80
1	75.6	115.9	67	80
13	75.6	104.1	55	80
26	75.6	113.0	69	80
7	-90	22.0	19	20
15	-90	8.1	6	10
22	-90	15.4	13	20
10	-110	9.6	10	10
12	-110	9.3	8	10
28	-110	6.2	5	0

Location C

Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	77.9	62.7	70
-10	58.2	49.0	43
40	107.0	71.7	77
-70	27.2	16.7	13
-50	34.7	23.3	27
-30	42.3	30.7	33
25	83.7	56.7	82
75.6	111.0	63.7	80
-90	15.2	12.7	17
-110	8.4	7.7	7

Plate: 11

Spec. No.	Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
2	10	76.0	60	70
4	10	70.9	56	70
6	10	80.5	60	70
1	-10	77.3	56	60
3	-10	62.4	49	60
5	-10	64.8	55	60

Average

Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
10	75.8	58.7	70
-10	68.2	53.3	60

Spec. No.	Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
6	10	76.0	66	60
13	10	72.8	48	60
22	10	76.5	48	60
10	-10	52.5	46	40
17	-10	59.6	49	50
30	-10	78.7	62	70
3	40	111.8	68	85
18	40	109.5	70	80
24	40	110.0	64	80
2	-70	28.4	17	10
16	-70	27.8	19	10
25	-70	38.5	24	20
7	-50	34.7	25	10
11	-50	48.3	31	20
29	-50	40.8	30	20
4	-30	51.9	35	40
14	-30	55.2	39	50
28	-30	43.1	35	40
8	25	92.0	64	70
15	25	93.2	63	70
27	25	118.3	77	80
1	75.6	117.5	66	85
20	75.6	120.3	81	90
26	75.6	116.3	76	90
9	-90	14.0	15	10
12	-90	27.3	23	20
23	-90	12.1	10	10
5	-110	9.6	8	0
19	-110	7.6	7	0
21	-110	16.7	13	10

Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
10	75.1	54.0	60
-10	63.6	52.3	53
40	110.4	67.3	82
-70	31.6	20.0	13
-50	41.3	28.7	17
-30	50.1	36.3	43
25	101.2	68.0	73
75.6	118.0	74.3	88
-90	17.8	16.0	13
-110	11.3	9.3	3

Spec. No.	Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
1	10	83.7	62	60
5	10	78.8	61	60
6	10	94.5	64	70
2	-10	75.8	54	50
3	-10	67.0	51	60
4	-10	82.6	62	70

Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
10	85.7	62.3	63
-10	75.1	55.7	60

Plate: 11

Spec. No.	Location G Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
1	10	88.0	51	70
17	10	73.9	60	60
23	10	82.0	54	50
8	-10	77.8	65	70
12	-10	78.5	60	60
30	-10	77.5	61	60
2	40	127.8	72	85
16	40	133.6	82	85
26	40	122.2	79	85
9	-70	19.5	11	10
13	-70	30.2	20	20
28	-70	33.0	22	20
7	-50	32.5	24	20
14	-50	49.6	36	40
25	-50	48.0	33	50
3	-30	62.4	45	60
18	-30	58.0	42	60
24	-30	86.0	56	70
4	25	103.8	64	80
15	25	110.0	69	80
29	25	98.0	67	80
11	75.6	127.2	72	85
20	75.6	123.8	72	85
27	75.6	125.0	78	85
10	-90	18.0	16	10
19	-90	13.2	12	10
21	-90	18.5	15	10
5	-110	11.4	9	10
6	-110	6.7	8	0
22	-110	9.0	9	0

Average

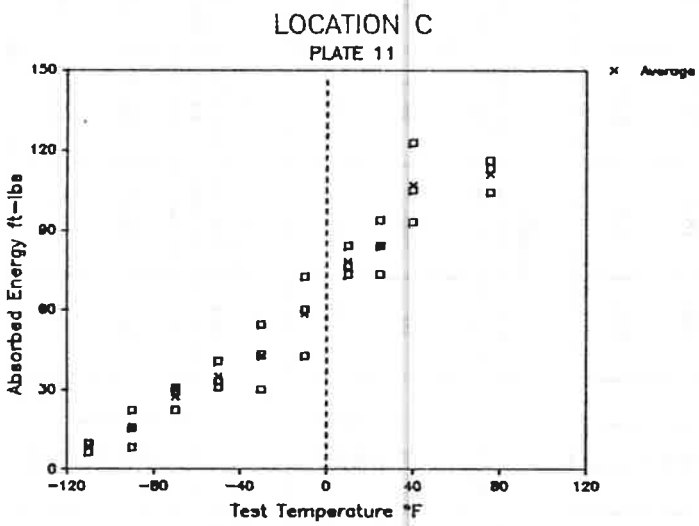
Location G Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	81.3	55.0	60
-10	77.9	62.0	63
40	127.9	77.7	85
-70	27.6	17.7	17
-50	43.4	31.0	37
-30	68.8	47.7	63
25	103.9	66.7	80
75.6	125.3	74.0	85
-90	16.6	14.3	10
-110	9.0	8.7	3

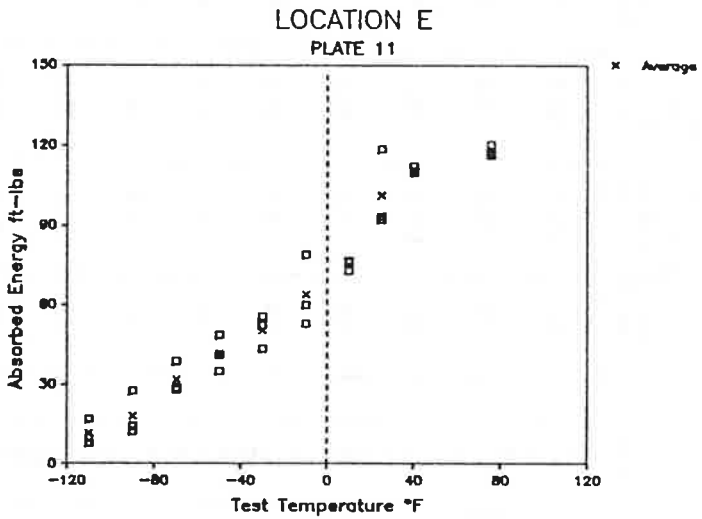
Spec. No.	Location H Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
2	10	104.5	66	80
4	10	93.0	63	70
5	10	102.8	70	80
1	-10	83.0	62	60
3	-10	78.5	62	70
6	-10	76.9	66	70

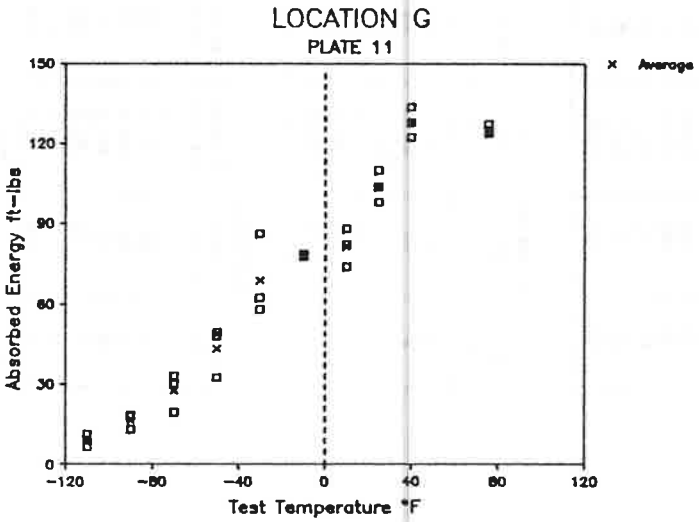
Location H Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	100.1	66.3	77
-10	79.5	63.3	67

Spec. No.	Location J Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
1	10	92.4	62	60
3	10	99.7	70	70
5	10	90.6	67	70
2	-10	79.5	60	50
4	-10	76.4	62	50
6	-10	76.4	62	50

Location J Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	94.2	66.3	67
-10	77.4	61.3	50


LOCATION C
PLATE 11
Average
Absorbed Energy ft-lbs
Test Temperature °F


LOCATION E
PLATE 11
Average
Absorbed Energy ft-lbs
Test Temperature °F


LOCATION G
PLATE 11
Average
Absorbed Energy ft-lbs
Test Temperature °F

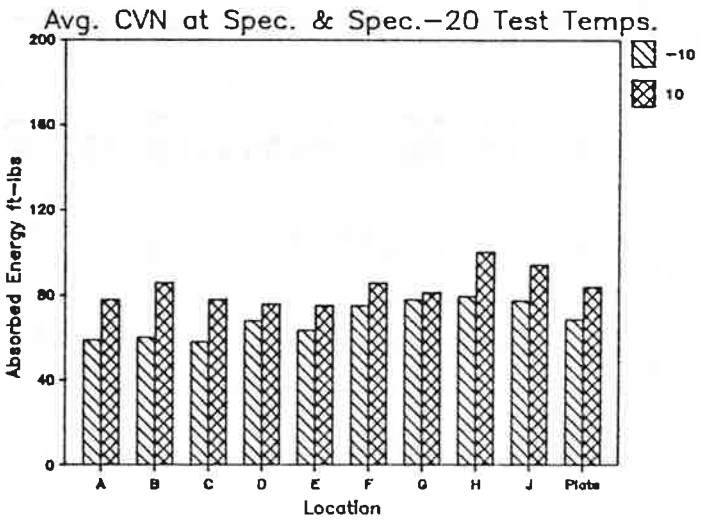

Avg. CVN at Spec. & Spec.-20 Test Temps.
-10
10
Absorbed Energy ft-lbs
A
B
C
D
E
F
G
H
J
Plate
Location

Plate: 12
Date: October 4, 1988 Windage: 0
Spec. Temp: + 10 F Personnel: CAS

Spec. No.	Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
2	10	108.1	66	85
5	10	103.9	68	85
6	10	84.0	62	80
1	-10	87.5	61	60
3	-10	74.8	56	60
4	-10	90.0	66	70

Average Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	98.7	65.3	83
-10	84.1	61.0	63

Spec. No.	Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
1	10	98.7	62	80
5	10	105.9	71	85
6	10	103.5	72	85
2	-10	91.7	62	80
3	-10	76.2	41	70
4	-10	76.0	54	70

Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	102.7	68.3	83
-10	81.3	52.3	73

Spec. No.	Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
6	10	137.3	85	90
19	10	92.5	66	80
27	10	94.4	70	80
5	-10	89.6	57	70
18	-10	81.0	58	70
25	-10	87.0	55	70
3	40	124.8	77	95
13	40	134.1	77	95
23	40	126.3	82	95
8	-70	43.9	34	30
17	-70	35.3	26	30
28	-70	18.3	12	10
4	-50	63.4	45	60
16	-50	50.9	39	50
29	-50	48.4	35	40
1	-30	63.1	42	60
21	-30	62.0	41	60
30	-30	78.3	60	70
10	25	113.1	76	70
11	25	98.0	60	70
22	25	124.3	76	70
2	75.6	125.8	69	90
14	75.6	126.7	71	90
15	75.6	131.5	71	90
7	-90	21.5	20	20
20	-90	22.8	21	20
24	-90	28.0	26	30
9	-110	5.7	6	0
12	-110	20.0	15	20
26	-110	15.3	14	20

Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	108.1	73.7	83
-10	85.9	56.7	70
40	128.4	78.7	95
-70	32.5	24.0	23
-50	54.2	39.7	50
-30	67.8	47.7	63
25	111.8	70.7	70
75.6	128.0	70.3	90
-90	24.1	22.3	23
-110	13.7	11.7	13

Plate: 12

Spec. No.	Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
2	10	94.2	63	70
4	10	89.3	64	70
6	10	91.0	65	70
1	-10	52.2	39	40
3	-10	74.1	50	60
5	-10	47.1	36	30

Average

Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
10	91.5	64.0	70
-10	57.8	41.7	43

Spec. No.	Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
2	10	71.8	51	50
19	10	88.0	65	60
24	10	90.6	61	70
9	-10	56.0	43	50
14	-10	53.8	41	50
30	-10	78.0	61	60
4	40	88.2	62	85
17	40	114.3	79	90
21	40	123.5	76	90
1	-70	24.5	13	10
13	-70	14.6	6	10
27	-70	12.4	6	10
10	-50	33.2	25	20
11	-50	44.8	30	30
26	-50	45.0	34	30
3	-30	52.9	38	50
18	-30	44.2	36	50
23	-30	50.7	37	50
7	25	100.3	70	70
12	25	100.7	66	60
22	25	100.5	63	60
5	75.6	110.6	72	95
20	75.6	114.1	76	95
29	75.6	114.6	74	95
6	-90	23.1	21	20
16	-90	13.5	12	20
25	-90	9.7	7	10
8	-110	7.7	7	0
18	-110	8.6	9	10
28	-110	16.7	15	20

Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
10	83.5	59.0	60
-10	62.6	48.3	53
40	108.7	72.3	88
-70	17.2	8.3	10
-50	41.0	29.7	27
-30	49.3	37.0	50
25	100.5	66.3	63
75.6	113.1	74.0	95
-90	15.4	13.3	17
-110	11.0	10.3	10

Spec. No.	Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
1	10	89.8	61	80
5	10	78.3	59	80
6	10	79.0	60	80
2	-10	55.7	35	50
3	-10	59.2	39	50
4	-10	66.8	50	60

Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
10	82.4	60.0	80
-10	60.6	41.3	53

Plate: 12

Spec. No.	Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
2	10	78.1	51	60
16	10	77.2	58	60
24	10	59.8	45	60
6	-10	52.3	39	30
13	-10	68.5	46	40
29	-10	39.0	29	30
4	40	98.7	68	85
19	40	115.2	82	90
23	40	77.8	56	85
1	-70	32.8	20	30
17	-70	23.7	15	20
25	-70	15.8	8	10
3	-50	46.0	32	30
18	-50	47.3	37	40
22	-50	18.5	9	10
8	-30	36.8	29	30
20	-30	37.8	29	40
21	-30	30.6	19	20
9	25	80.0	58	60
14	25	85.8	52	60
26	25	102.0	68	70
10	75.6	112.5	58	85
11	75.6	122.8	70	95
27	75.6	116.0	76	95
7	-90	21.8	19	20
15	-90	16.2	11	20
30	-90	21.7	19	20
5	-110	16.7	15	20
12	-110	13.8	11	20
28	-110	9.3	8	10

Average

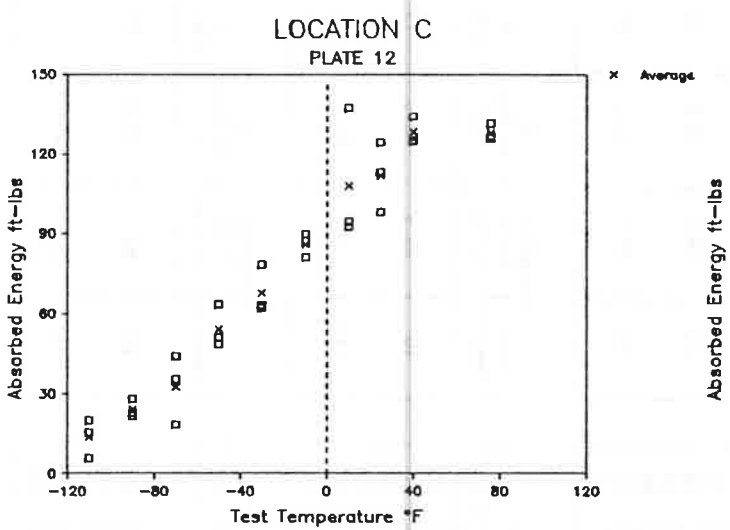
Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
10	71.7	51.3	60
-10	53.3	38.0	33
40	97.2	68.7	87
-70	24.1	14.3	20
-50	37.3	26.0	27
-30	35.1	25.7	30
25	89.3	59.3	63
75.6	117.1	68.0	92
-90	19.9	16.3	20
-110	13.3	11.3	17

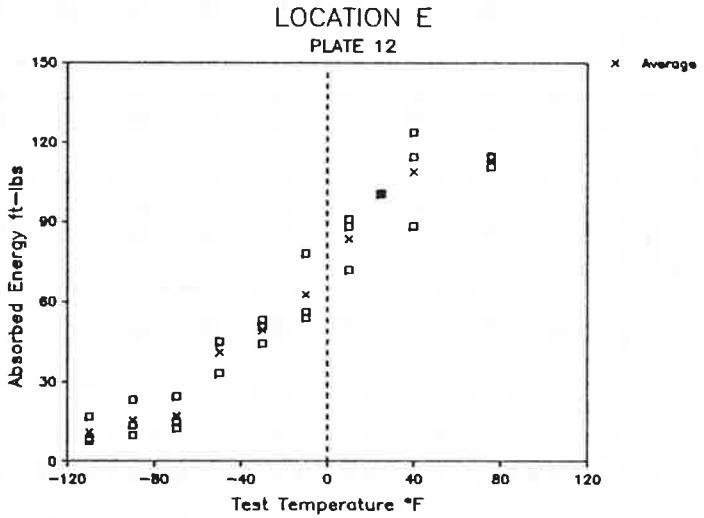
Spec. No.	Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
2	10	81.9	53	70
4	10	80.2	55	70
5	10	94.3	66	80
1	-10	80.3	58	70
3	-10	63.6	46	60
6	-10	63.8	48	60

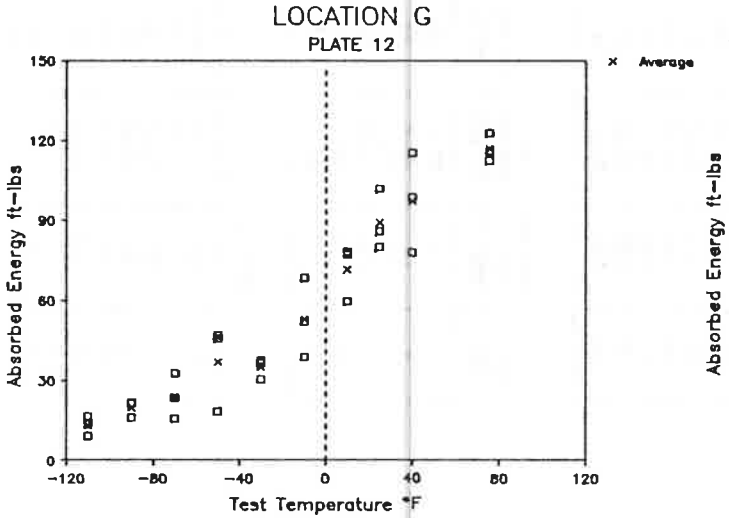
Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
10	85.5	58.0	73
-10	69.2	50.7	63

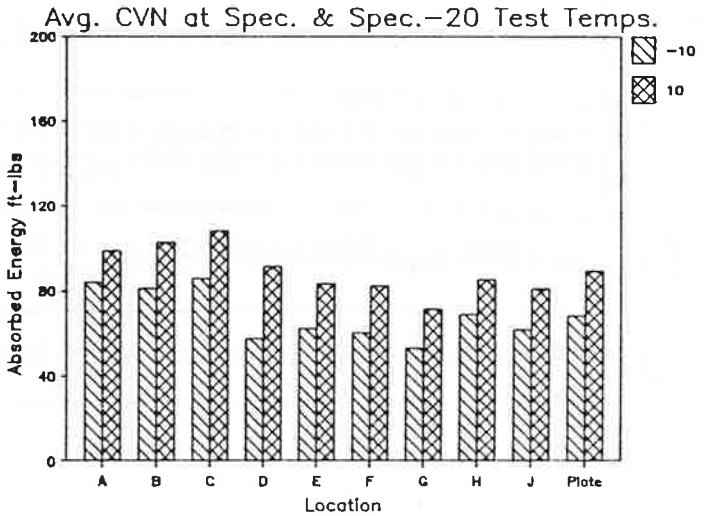
Spec. No.	Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
1	10	74.7	48	50
3	10	83.0	56	50
5	10	85.5	61	60
2	-10	62.0	42	40
4	-10	62.1	48	40
6	-10	62.0	45	60

Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
10	81.1	55.0	53
-10	62.0	45.0	47


LOCATION C
PLATE 12
Average
Absorbed Energy ft-lbs
Test Temperature °F
150
120
90
60
30
0
−120
−80
−40
0
40
80
120


LOCATION E
PLATE 12
Average
Absorbed Energy ft-lbs
Test Temperature °F
150
120
90
60
30
0
−120
−80
−40
0
40
80
120


LOCATION G
PLATE 12
Average
Absorbed Energy ft-lbs
Test Temperature °F
150
120
90
60
30
0
−120
−80
−40
0
40
80
120

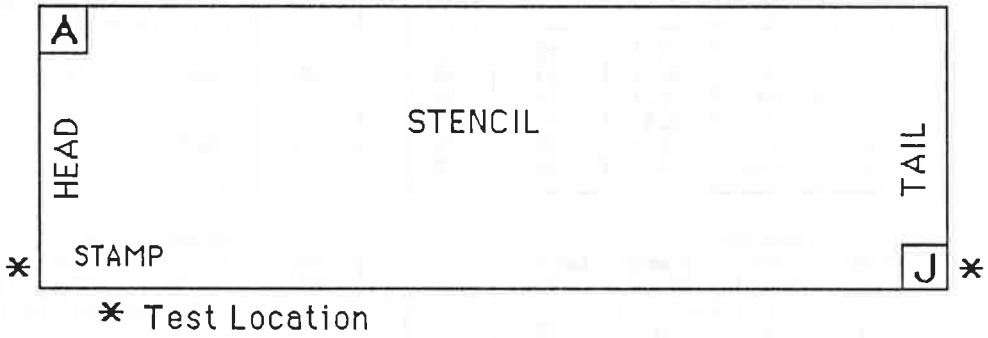

Avg. CVN at Spec. & Spec.−20 Test Temps.
−10
10
Absorbed Energy ft-lbs
200
160
120
80
40
0
A
B
C
D
E
F
G
H
J
Plate
Location

MILL DATA SHEET
Plate No: 13
Manf: 2

Slab Number: 4033
Heat Number: 57940

Yield Point (psi)	Head:	62900	Tail:	62300	
Tensile Strength (psi)	Head:	86900	Tail:	85300	
Elongation (%)	Head:	26	Tail:	30	{Gage Length (in): 2}

Steel Type: A572-85 Gr. 50
Thickness (in): 1
Length (in): 240 Width (in): 60
Notes:



Spec. Code for Head: D626
Spec. Code for Tail: D627

CHARPY MILL TESTS (ft-lbs)

	Test Temp.	Test #1	Test #2	Test #3	CVN Test Avg.
Head	+10°F	80	80	82	80
Tail	+10°F	58	97	40	65

Chemical Analysis

C	Mn	P	S	Si	Cu	Ni	Cr	V	Al	Cb
.15	1.30	.011	.011	.290	NA	NA	NA	.070	NA	NA

Plate: 13
Date: October 27, 1988 Windage: 0
Spec. Temp: + 10 F Personnel: CAS

Spec. No.	Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
2	10	86.4	69	70
4	10	73.2	60	60
6	10	36.9	33	40
1	-10	44.0	37	40
3	-10	39.1	31	30
5	-10	66.4	55	60

Average Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	65.5	54.0	57
-10	49.8	41.0	43

Spec. No.	Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
1	10	77.0	60	60
3	10	84.3	61	60
5	10	21.3	22	20
2	-10	8.3	9	10
4	-10	74.5	65	70
6	-10	74.8	65	70

Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	60.9	47.7	47
-10	52.5	46.3	50

Spec. No.	Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
3	10	93.0	72	70
18	10	56.0	50	50
23	10	87.8	68	70
8	-10	51.5	44	40
13	-10	50.0	41	50
28	-10	24.8	22	30
4	40	76.4	58	60
17	40	90.7	72	70
24	40	85.0	64	70
2	-70	7.0	7	0
16	-70	5.7	6	0
25	-70	9.0	7	0
9	-50	12.6	12	10
15	-50	8.6	7	0
29	-50	7.2	8	0
7	-30	52.0	46	40
14	-30	29.0	24	20
27	-30	8.2	9	10
6	25	89.0	74	85
12	25	90.6	68	80
22	25	82.5	63	70
5	77	109.8	77	85
20	77	82.2	67	80
26	77	115.0	83	85
1	0	42.0	35	40
19	0	49.9	43	50
21	0	47.2	37	40
10	-40	21.3	22	20
11	-40	38.5	34	30
30	-40	20.4	18	20

Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	78.9	63.3	63
-10	42.1	35.7	40
40	84.0	64.7	67
-70	7.2	6.7	0
-50	9.5	9.0	3
-30	29.7	26.3	23
25	87.4	68.3	78
77	102.3	75.7	83
0	46.4	38.3	43
-40	26.7	24.7	23

Plate: 13

Spec. No.	Location D Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
1	10	64.5	55	40
2	10	74.0	62	60
6	10	63.2	57	60
3	-10	57.0	48	60
4	-10	69.6	96	70
5	-10	10.3	12	20

Average

Location D Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	67.2	58.0	53
-10	45.6	52.0	50

Spec. No.	Location E Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
3	10	104.2	72	80
18	10	70.0	63	70
23	10	101.8	75	85
8	-10	38.3	35	30
14	-10	68.3	54	50
28	-10	36.1	33	30
2	40	103.0	68	70
13	40	110.6	82	80
29	40	103.8	81	80
9	-70	7.6	7	0
19	-70	14.4	17	10
24	-70	5.6	9	0
5	-50	52.6	43	40
17	-50	8.0	9	10
22	-50	22.3	20	20
10	-30	37.3	34	30
12	-30	58.0	49	40
27	-30	26.3	25	20
7	25	94.7	75	80
11	25	87.5	66	70
26	25	96.4	71	70
4	77	113.8	79	90
20	77	122.0	87	90
25	77	119.2	81	90
6	0	66.7	60	60
15	0	94.2	75	70
30	0	65.8	58	60
1	-40	19.2	17	20
16	-40	16.0	19	20
21	-40	21.4	37	30

Location E Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	92.0	70.0	78
-10	47.6	40.7	37
40	105.8	77.0	77
-70	9.2	11.0	3
-50	27.6	24.0	23
-30	40.5	36.0	30
25	92.9	70.7	73
77	118.3	82.3	90
0	75.6	64.3	63
-40	18.9	24.3	23

Spec. No.	Location F Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
2	10	90.0	68	80
3	10	89.0	67	80
5	10	78.9	70	80
1	-10	87.5	61	70
4	-10	16.5	16	10
6	-10	72.3	61	70

Location F Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	86.0	68.3	80
-10	58.8	46.0	50

Plate: 13

Spec. No.	Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
8	10	88.0	75	70
13	10	86.0	69	70
24	10	26.5	23	30
3	-10	57.6	45	50
18	-10	57.2	53	60
29	-10	62.0	56	60
1	40	99.9	76	80
12	40	86.4	63	80
28	40	95.0	76	80
9	-70	7.7	7	0
19	-70	10.2	14	0
23	-70	6.6	7	0
7	-50	6.5	8	0
14	-50	5.4	6	0
27	-50	40.0	39	30
4	-30	59.0	48	40
17	-30	9.4	11	10
22	-30	18.0	15	10
10	25	72.4	64	70
15	25	94.1	67	80
30	25	89.9	76	80
5	77	146.0	87	95
16	77	106.5	79	90
25	77	114.5	75	90
2	0	19.2	17	20
20	0	57.0	51	60
26	0	70.6	63	60
6	-40	63.4	60	60
11	-40	25.9	24	30
21	-40	46.5	39	40

Average

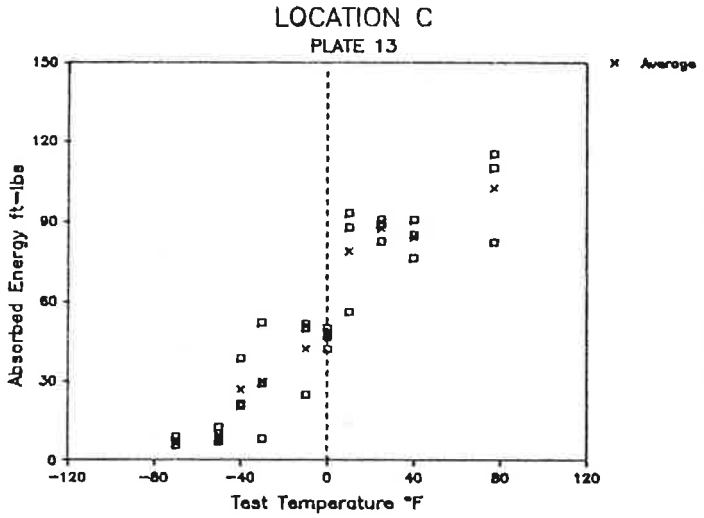
Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
10	66.8	55.7	57
-10	58.9	51.3	57
40	93.8	71.7	80
-70	8.2	9.3	0
-50	17.3	17.7	10
-30	28.8	24.7	20
25	85.5	69.0	77
77	122.3	80.3	92
0	48.9	43.7	47
-40	45.3	41.0	43

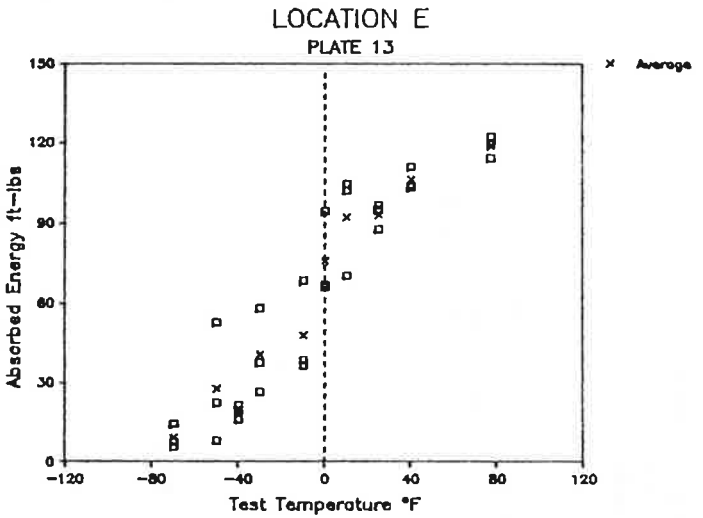
Spec. No.	Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
1	10	37.2	32	30
2	10	94.2	69	85
6	10	86.3	70	85
3	-10	57.9	46	50
4	-10	47.8	41	50
5	-10	82.4	72	85

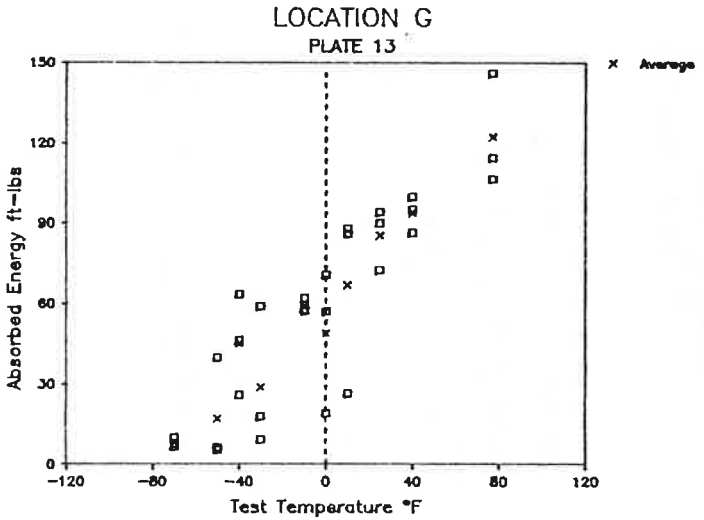
Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
10	72.6	57.0	67
-10	62.7	53.0	62

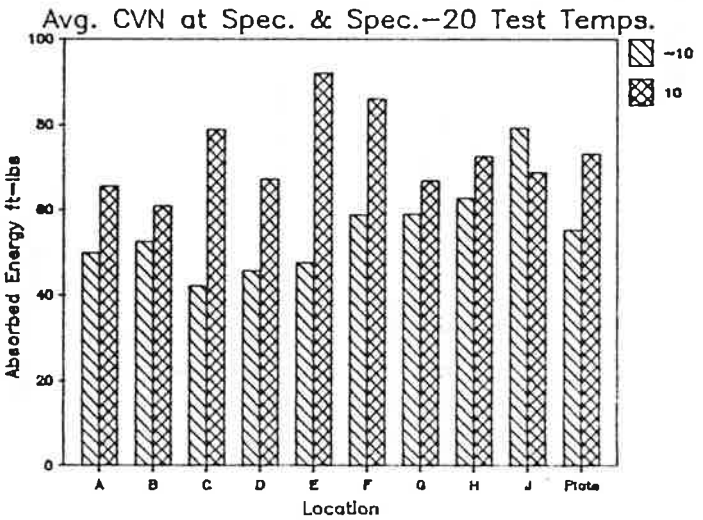
Spec. No.	Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
1	10	40.4	32	40
3	10	85.3	65	70
4	10	81.0	65	70
2	-10	88.7	69	80
5	-10	74.0	59	60
6	-10	75.0	58	70

Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
10	68.9	54.0	60
-10	79.2	62.0	70


LOCATION C
PLATE 13
Average
Absorbed Energy ft-lbs
Test Temperature °F
150
120
90
60
30
0
-120
-80
-40
0
40
80
120


LOCATION E
PLATE 13
Average
Absorbed Energy ft-lbs
Test Temperature °F
150
120
90
60
30
0
-120
-80
-40
0
40
80
120


LOCATION G
PLATE 13
Average
Absorbed Energy ft-lbs
Test Temperature °F
150
120
90
60
30
0
-120
-80
-40
0
40
80
120

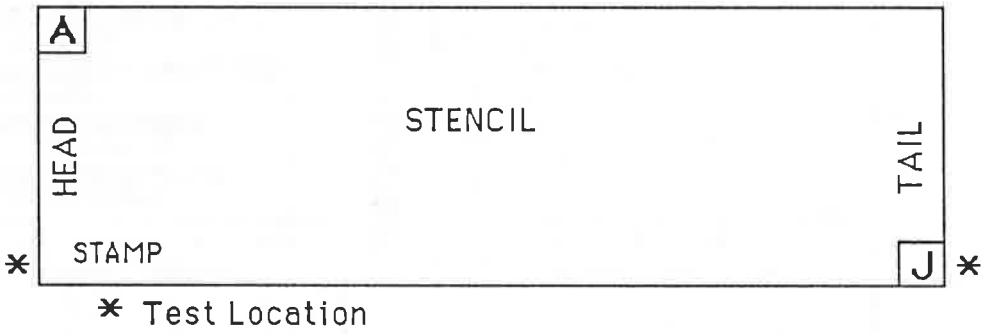

Avg. CVN at Spec. & Spec.-20 Test Temps.
-10
10
Absorbed Energy ft-lbs
Location
100
80
60
40
20
0
A
B
C
D
E
F
G
H
J
Plate

MILL DATA SHEET
Plate No: 14
Manf: 2

Slab Number: 4705
Heat Number: 68270

Yield Point (psi)	Head:	66000	Tail:	67200
Tensile Strength (psi)	Head:	88000	Tail:	94800
Elongation (%)	Head:	26	Tail:	25 {Gage Length (in): 2}

Steel Type: A588-87 Gr. A
Thickness (in): 1
Length (in): 240 Width (in): 60
Notes:



Spec. Code for Head: 2843
Spec. Code for Tail: 2844

CHARPY MILL TESTS (ft-lbs)

	Test Temp.	Test #1	Test #2	Test #3	CVN Test Avg.
Head	-5°F	48	94	98	80
Tail	-5°F	96	105	66	89

Chemical Analysis

C	Mn	P	S	Si	Cu	Ni	Cr	V	Al	Cb
.13	0.95	.010	.008	.440	.320	.21	.57	.060	NA	NA

Plate: 14
Date: October 11, 1988 Windage: 0
Spec. Temp: - 5 F Personnel: CAS

Spec. No.	Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
2	-5	47.3	41	30
4	-5	52.0	43	40
6	-5	71.0	62	50
1	-25	49.9	40	40
3	-25	34.0	28	30
5	-25	31.3	28	30

Average

Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
-5	56.8	48.7	40
-25	38.4	32.0	33

Spec. No.	Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
1	-5	38.5	31	30
3	-5	36.2	29	30
5	-5	12.3	12	10
2	-25	15.8	13	10
4	-25	17.4	15	10
6	-25	19.7	18	20

Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
-5	29.0	24.0	23
-25	17.6	15.3	13

Spec. No.	Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
6	-5	87.8	70	70
12	-5	84.5	64	70
22	-5	98.1	76	70
1	-25	26.9	21	20
11	-25	67.8	57	50
30	-25	70.8	61	50
3	40	97.0	71	60
17	40	95.2	73	60
24	40	108.4	79	70
10	10	79.0	66	60
19	10	66.3	57	60
25	10	75.5	56	60
2	-70	7.8	5	0
16	-70	21.5	21	10
23	-70	9.2	7	0
4	-55	27.9	45	30
20	-55	11.7	32	20
21	-55	29.2	47	30
5	-40	22.3	20	20
13	-40	15.6	12	10
29	-40	29.3	28	20
8	25	92.0	74	70
18	25	96.8	79	80
28	25	103.2	81	80
7	75.7	133.0	79	70
14	75.7	74.0	53	60
27	75.7	136.3	97	80
9	100	125.0	85	90
15	100	96.5	70	90
26	100	138.2	85	95

Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
-5	90.1	70.0	70
-25	55.2	46.3	40
40	100.2	74.3	63
10	73.6	59.7	60
-70	12.8	11.0	3
-55	22.9	41.3	27
-40	22.4	20.0	17
25	97.3	78.0	77
75.7	114.4	76.3	70
100	119.9	80.0	92

Plate: 14

Spec. No.	Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
3	-5	68.0	54	60
4	-5	73.0	64	70
5	-5	73.8	64	70
1	-25	49.2	41	40
2	-25	73.5	60	60
6	-25	48.7	42	40

Average

Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
-5	71.6	60.7	67
-25	57.1	47.7	47

Spec. No.	Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
4	-5	33.3	27	20
16	-5	66.7	57	40
22	-5	32.6	27	30
1	-25	58.0	46	40
11	-25	14.6	15	20
23	-25	17.3	14	20
9	40	101.0	73	60
13	40	83.9	59	50
27	40	124.0	84	70
2	10	68.8	52	50
18	10	94.0	75	70
30	10	29.5	27	30
5	-70	15.0	12	10
17	-70	48.1	39	30
24	-70	10.0	9	0
3	-55	18.7	36	10
19	-55	22.1	39	20
29	-55	29.8	47	20
6	-40	41.0	33	20
12	-40	6.8	6	10
28	-40	20.7	18	10
7	25	100.9	74	80
15	25	48.8	38	40
25	25	36.7	30	30
8	75.7	136.3	84	80
14	75.7	108.2	72	80
21	75.7	113.9	75	80
10	100	155.2	94	90
20	100	139.5	86	90
26	100	127.6	85	90

Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
-5	44.2	37.0	30
-25	30.0	25.0	27
40	103.0	72.0	60
10	64.1	51.3	50
-70	24.4	20.0	13
-55	23.5	40.7	17
-40	22.8	19.0	13
25	62.1	47.3	50
75.7	119.5	77.0	80
100	140.8	88.3	90

Spec. No.	Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
3	-5	22.3	20	30
4	-5	50.6	42	40
5	-5	56.3	46	50
1	-25	35.7	27	20
2	-25	37.4	27	30
6	-25	16.2	15	10

Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
-5	43.1	36.0	40
-25	29.8	23.0	20

Plate: 14

Spec. No.	Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
4	-5	87.3	68	70
16	-5	80.7	70	70
24	-5	49.8	40	50
3	-25	77.3	60	50
20	-25	78.9	67	60
21	-25	54.2	43	50
6	40	77.3	65	60
13	40	98.5	70	70
26	40	73.7	61	60
1	10	96.2	73	85
19	10	98.0	79	85
23	10	87.8	68	85
2	-70	10.7	12	0
18	-70	10.5	10	0
27	-70	13.9	13	0
5	-55	16.8	29	10
17	-55	28.8	38	30
25	-55	18.7	36	20
8	-40	43.4	39	30
15	-40	23.5	20	20
30	-40	30.9	28	20
7	25	82.0	68	60
14	25	83.8	64	60
29	25	82.4	68	60
9	75.7	98.8	72	60
12	75.7	124.0	79	70
28	75.7	132.4	85	80
10	100	121.8	81	85
11	100	140.9	85	95
22	100	137.0	91	95

Average

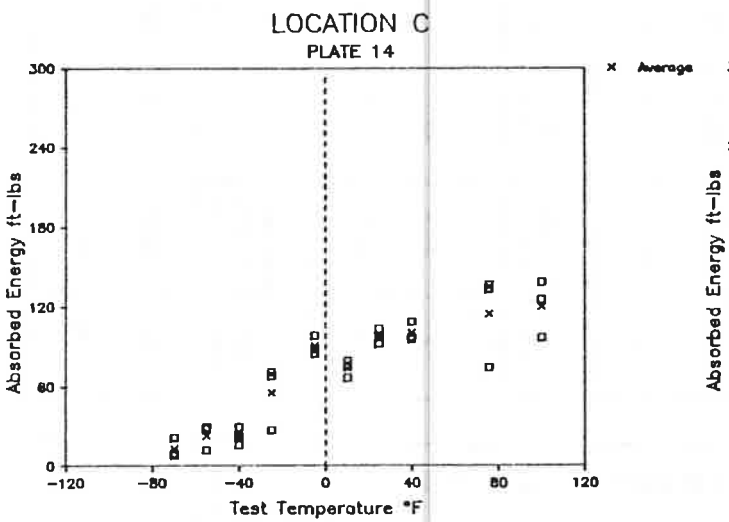
Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
-5	72.6	59.3	63
-25	70.1	56.7	53
40	83.2	65.3	63
10	94.0	73.3	85
-70	11.7	11.7	0
-55	21.4	34.3	20
-40	32.6	29.0	23
25	82.7	66.7	60
75.7	118.4	78.7	70
100	133.2	85.7	92

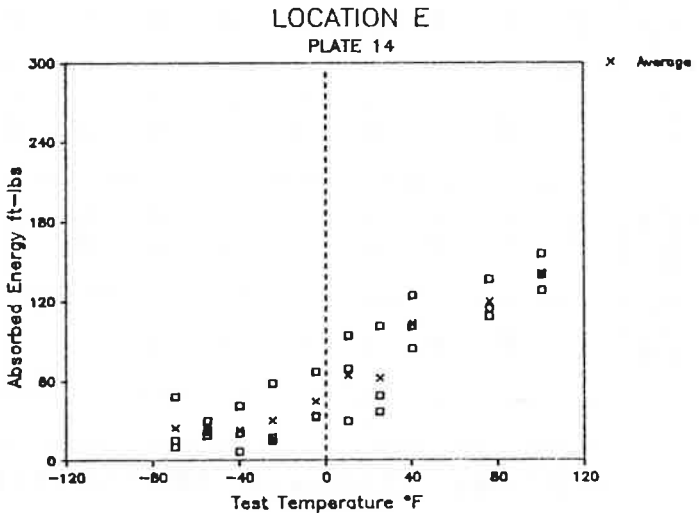
Spec. No.	Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
1	-5	78.9	61	70
4	-5	11.1	14	20
5	-5	65.8	56	50
2	-25	52.1	41	40
3	-25	72.1	55	60
6	-25	62.2	53	50

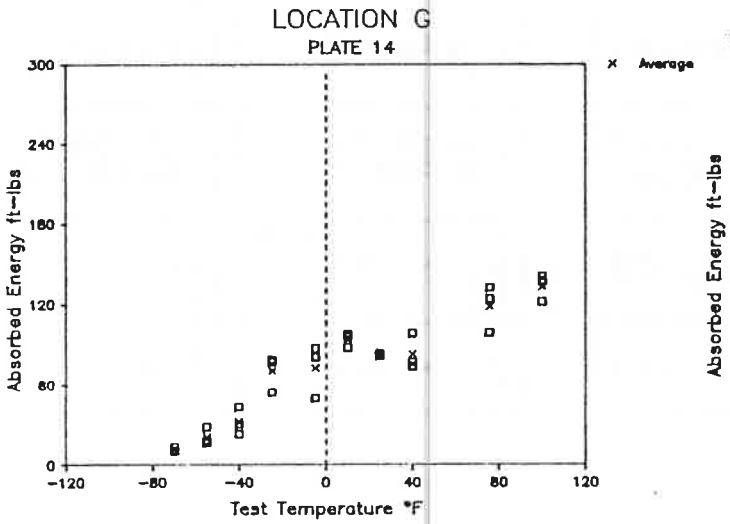
Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
-5	51.9	43.7	47
-25	62.1	49.7	50

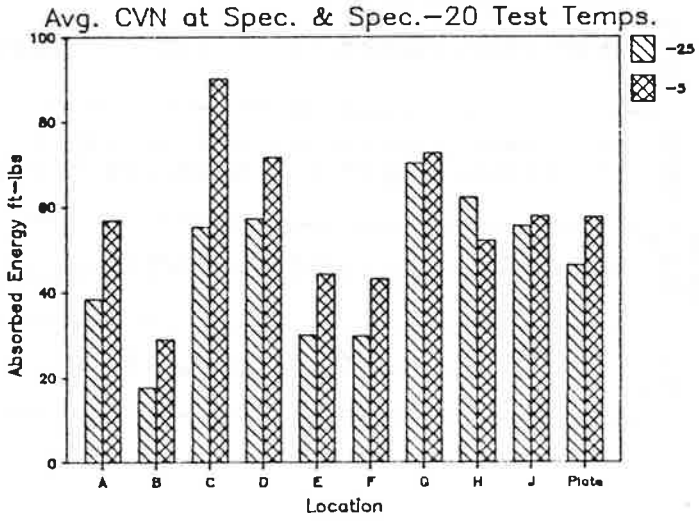
Spec. No.	Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
1	-5	58.2	47	50
5	-5	48.9	42	40
6	-5	66.1	57	50
2	-25	62.3	51	50
3	-25	48.8	39	50
4	-25	55.0	46	40

Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
-5	57.7	48.7	47
-25	55.4	45.3	47


LOCATION C
PLATE 14
Average
Absorbed Energy ft-lbs
Test Temperature °F

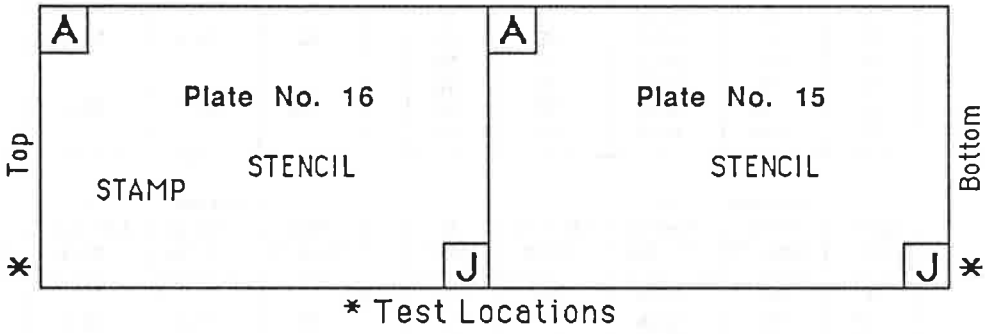

LOCATION E
PLATE 14
Average
Absorbed Energy ft-lbs
Test Temperature °F


LOCATION G
PLATE 14
Average
Absorbed Energy ft-lbs
Test Temperature °F


Avg. CVN at Spec. & Spec.-20 Test Temps.
-25
-5
Absorbed Energy ft-lbs
A
B
C
D
E
F
G
H
J
Plate
Location

MILL DATA SHEET
Plate No: 15 & 16
Manf: 4

Heat Number: 1R2580
Yield Point (psi): 59500
Tensile Strength (psi): 85500
Elongation (%): 30.0 {Gage Length (in): 2}
Steel Type: A588-85 Gr. A
Thickness (in): 1
Length (in): 240 Width (in): 60
Notes: Fine Grain Practice
Normalized
Spec. Code: 05W 03



CHARPY MILL TESTS (ft-lbs)

	Test Temp.	Test #1	Test #2	Test #3	CVN Test Avg.
Head	+10°F	80	60	65	68
Tail	+10°F	66	66	61	64

Chemical Analysis

C	Mn	P	S	Si	Cu	Ni	Cr	V	Al	Cb
.16	1.15	.012	.011	.460	.310	.23	.60	.060	.034	NA

Plate: 15
Date: October 27, 1988 Windage: 0
Spec. Temp: + 10 F Personnel: CAS

Spec. No.	Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
1	10	55.8	44	50
3	10	66.0	50	60
5	10	56.0	53	60
2	-10	45.0	35	40
4	-10	51.0	45	50
6	-10	46.9	45	50

Average Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	59.3	49.0	57
-10	47.6	41.7	47

Spec. No.	Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
1	10	57.3	50	50
2	10	61.0	48	50
6	10	58.8	52	50
3	-10	46.5	35	40
4	-10	47.8	37	50
5	-10	44.0	45	50

Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	59.0	50.0	50
-10	46.1	39.0	47

Spec. No.	Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
3	10	55.0	38	40
18	10	58.8	52	50
23	10	70.9	54	50
8	-10	47.6	45	40
13	-10	49.0	38	50
28	-10	47.5	45	50
4	40	87.9	64	70
19	40	79.3	68	70
22	40	76.4	56	70
5	-70	36.5	25	30
16	-70	27.8	26	30
29	-70	32.1	30	30
9	-50	32.1	31	30
14	-50	31.0	25	30
24	-50	30.3	25	30
2	-30	43.6	32	30
15	-30	43.2	37	40
30	-30	39.0	37	40
7	25	64.2	56	60
12	25	58.8	47	60
21	25	56.1	44	50
1	77	85.8	61	85
17	77	77.4	68	85
27	77	76.2	70	85
6	-90	29.5	28	40
11	-90	26.0	25	30
26	-90	26.7	23	20
10	-110	19.5	21	10
20	-110	17.9	15	10
25	-110	22.3	18	20

Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	61.6	48.0	47
-10	48.0	42.7	47
40	81.2	62.7	70
-70	32.1	27.0	30
-50	31.1	27.0	30
-30	41.9	35.3	37
25	59.7	49.0	57
77	79.8	66.3	85
-90	27.4	25.3	30
-110	19.9	18.0	13

Plate: 15

Spec. No.	Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
2	10	65.6	52	50
3	10	69.0	50	50
5	10	65.0	56	50
1	-10	53.0	38	40
4	-10	52.3	45	50
6	-10	49.3	48	50

Average

Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
10	66.5	52.7	50
-10	51.5	43.7	47

Spec. No.	Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
3	10	68.5	49	50
18	10	59.6	46	50
28	10	80.5	70	70
8	-10	40.3	40	40
13	-10	49.2	44	40
23	-10	58.9	46	50
6	40	70.8	58	70
12	40	82.1	61	70
29	40	77.5	66	70
2	-70	23.4	19	20
19	-70	24.8	20	20
25	-70	24.8	20	20
7	-50	27.9	28	30
14	-50	31.8	20	20
22	-50	27.9	23	20
5	-30	44.1	35	40
17	-30	43.5	40	50
27	-30	43.3	41	50
4	25	66.7	56	60
16	25	77.4	64	70
26	25	74.7	66	70
9	77	74.0	68	85
15	77	79.7	65	80
24	77	83.0	65	80
10	-90	24.0	22	30
11	-90	24.6	21	20
21	-90	17.3	14	10
1	-110	11.6	9	10
20	-110	9.7	9	10
30	-110	19.4	16	20

Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
10	69.5	55.0	57
-10	49.5	43.3	43
40	76.8	61.7	70
-70	24.3	19.7	20
-50	29.2	23.7	23
-30	43.6	38.7	47
25	72.9	62.0	67
77	78.9	66.0	82
-90	22.0	19.0	20
-110	13.6	11.3	13

Spec. No.	Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
1	10	72.2	56	60
3	10	62.8	48	60
4	10	69.0	62	60
2	-10	51.3	39	40
5	-10	47.2	45	50
6	-10	47.0	44	40

Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
10	68.0	55.3	60
-10	48.5	42.7	43

Plate: 15

Spec. No.	Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
9	10	53.4	49	40
13	10	64.0	48	50
28	10	61.9	54	60
3	-10	50.4	41	40
18	-10	53.0	48	40
23	-10	46.0	37	40
7	40	72.4	64	70
19	40	76.8	66	60
22	40	85.2	64	70
8	-70	23.6	25	30
12	-70	42.1	32	30
29	-70	31.0	29	30
2	-50	31.4	26	40
20	-50	32.3	33	40
21	-50	32.2	26	30
1	-30	43.0	37	40
11	-30	43.3	33	40
30	-30	37.0	39	40
10	25	70.0	60	60
14	25	73.6	56	60
24	25	70.2	60	60
4	77	80.8	64	80
17	77	79.0	67	80
27	77	76.0	69	80
5	-90	19.0	15	10
16	-90	21.0	20	20
26	-90	15.2	11	10
6	-110	11.4	12	10
15	-110	13.5	9	10
25	-110	10.0	7	0

Average

Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
10	59.8	50.3	50
-10	49.8	42.0	40
40	78.1	64.7	67
-70	32.2	28.7	30
-50	32.0	28.3	37
-30	41.1	36.3	40
25	71.3	58.7	60
77	78.6	66.7	80
-90	18.4	15.3	13
-110	11.6	9.3	7

Spec. No.	Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
1	10	58.1	46	50
3	10	62.0	47	50
5	10	60.4	57	60
2	-10	51.4	41	40
4	-10	50.0	48	60
6	-10	46.0	44	50

Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
10	60.2	50.0	53
-10	49.1	44.3	50

Spec. No.	Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
1	10	67.1	53	60
2	10	52.8	38	40
6	10	64.0	57	50
3	-10	47.0	38	40
4	-10	53.1	50	50
5	-10	48.7	45	50

Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
10	61.3	49.3	50
-10	49.6	44.3	47

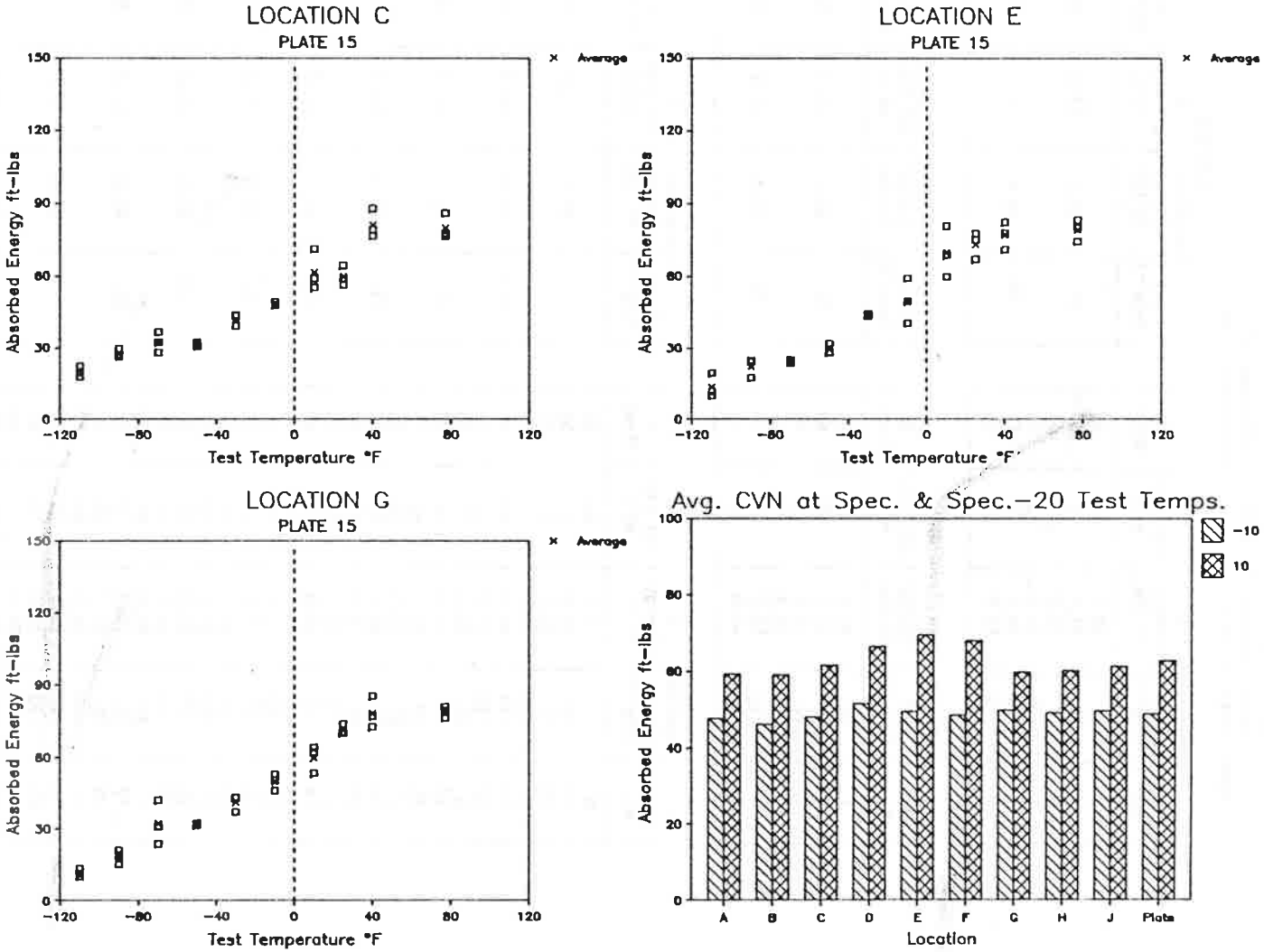

LOCATION C
PLATE 15
× Average
Absorbed Energy ft-lbs
Test Temperature °F
LOCATION E
PLATE 15
× Average
Absorbed Energy ft-lbs
Test Temperature °F
LOCATION G
PLATE 15
× Average
Absorbed Energy ft-lbs
Test Temperature °F
Avg. CVN at Spec. & Spec.-20 Test Temps.
-10
10
Absorbed Energy ft-lbs
A
B
C
D
E
F
G
H
J
Plate
Location

Plate: 16
Date: November 1, 1988 Windage: 0
Spec. Temp: + 10 F Personnel: CAS

Spec. No.	Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
2	10	68.7	50	60
4	10	61.1	52	60
6	10	66.2	57	60
1	-10	54.0	43	50
3	-10	56.3	42	50
5	-10	58.9	54	60

Average Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	65.3	53.0	60
-10	56.4	46.3	53

Spec. No.	Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
1	10	57.4	42	50
2	10	61.0	48	60
4	10	62.2	55	60
3	-10	58.6	45	60
5	-10	53.2	47	60
6	-10	40.0	40	50

Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	60.2	48.3	57
-10	50.6	44.0	57

Spec. No.	Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
8	10	53.5	46	50
13	10	58.6	47	50
28	10	60.0	45	50
3	-10	45.0	35	40
18	-10	40.3	40	40
22	-10	48.0	35	40
6	40	84.0	71	70
12	40	81.0	61	70
24	40	84.5	62	70
2	25	77.3	58	70
19	25	63.4	55	70
27	25	73.3	53	60
9	-30	39.5	34	40
14	-30	49.0	38	40
30	-30	45.7	41	40
4	-50	34.3	30	30
20	-50	28.8	31	30
23	-50	29.9	24	30
7	-70	34.8	30	30
15	-70	20.0	15	20
29	-70	24.9	24	30
1	76	91.0	61	80
17	76	79.8	72	80
25	76	85.9	63	80
5	-90	26.3	20	30
16	-90	26.1	23	30
21	-90	13.4	14	20
10	-110	20.9	21	20
11	-110	23.8	21	20
26	-110	23.2	19	20

Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	57.4	46.0	50
-10	44.4	36.7	40
40	83.2	64.7	70
25	71.3	55.3	67
-30	44.7	37.7	40
-50	31.0	28.3	30
-70	26.6	23.0	27
76	85.6	65.3	80
-90	21.9	19.0	27
-110	22.6	20.3	20

Plate: 16

Spec. No.	Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
1	10	63.3	47	60
3	10	66.2	48	60
5	10	69.4	60	70
2	-10	57.5	44	50
4	-10	49.1	46	50
6	-10	62.4	57	60

Average

Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
10	66.3	51.7	63
-10	56.3	49.0	53

Spec. No.	Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
3	10	58.0	44	50
18	10	57.8	50	50
22	10	68.8	50	60
8	-10	48.8	45	40
15	-10	41.7	33	40
30	-10	49.4	46	50
1	40	80.6	59	70
13	40	95.5	70	80
29	40	80.0	69	80
9	25	72.7	62	60
19	25	68.7	56	60
23	25	60.8	44	50
4	-30	49.1	38	30
17	-30	39.0	38	30
21	-30	41.3	32	30
7	-50	27.0	28	30
12	-50	30.5	25	30
27	-50	35.0	34	30
10	-70	21.0	20	10
11	-70	21.8	17	10
25	-70	35.3	26	20
2	76	87.7	63	85
20	76	84.8	74	85
28	76	89.0	76	90
6	-90	17.6	16	20
14	-90	19.3	15	20
16	-90	37.2	32	40
5	-110	8.9	6	0
24	-110	8.3	7	0
26	-110	22.0	22	20

Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
10	61.5	48.0	53
-10	46.6	41.3	43
40	85.4	66.0	77
25	67.4	54.0	57
-30	43.1	36.0	30
-50	30.8	29.0	30
-70	26.0	21.0	13
76	87.2	71.0	87
-90	24.7	21.0	27
-110	13.1	11.7	7

Spec. No.	Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
2	10	83.0	58	60
3	10	58.0	47	50
5	10	60.7	53	50
1	-10	45.2	38	40
4	-10	50.4	46	50
6	-10	41.3	41	40

Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
10	67.2	52.7	53
-10	45.6	41.7	43

Plate: 16

Spec. No.	Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
8	10	75.2	63	70
13	10	62.1	49	60
29	10	66.3	57	60
2	-10	56.0	44	50
19	-10	66.1	56	60
23	-10	53.2	43	50
7	40	84.1	70	70
12	40	86.0	65	70
30	40	87.2	73	80
3	25	76.9	57	70
18	25	83.0	68	80
22	25	82.1	61	70
9	-30	42.0	41	40
15	-30	43.3	36	40
21	-30	39.7	32	30
4	-50	37.8	28	30
17	-50	41.0	38	40
27	-50	38.4	37	40
10	-70	29.3	29	20
14	-70	24.5	19	20
28	-70	41.7	37	30
1	76	81.5	66	85
20	76	80.0	70	85
24	76	91.0	69	85
5	-90	43.0	33	40
16	-90	14.0	14	20
26	-90	35.1	31	30
6	-110	23.8	20	20
11	-110	21.8	16	20
25	-110	10.2	8	10

Average G

Location Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	67.9	56.3	63
-10	58.4	47.7	53
40	85.8	69.3	73
25	80.7	62.0	73
-30	41.7	36.3	37
-50	39.1	34.3	37
-70	31.8	28.3	23
76	84.2	68.3	85
-90	30.7	26.0	30
-110	18.6	14.7	17

Spec. No.	Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
2	10	62.0	45	50
4	10	59.9	53	50
6	10	65.0	58	60
1	-10	56.5	41	40
3	-10	58.7	43	50
5	-10	46.2	45	50

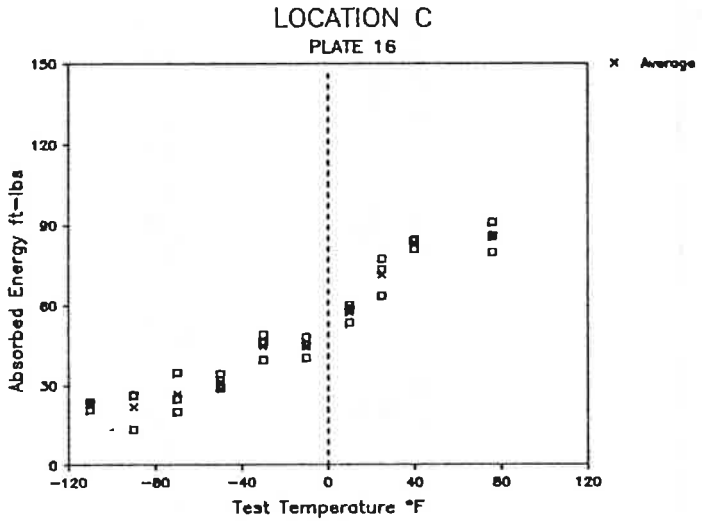
Average H

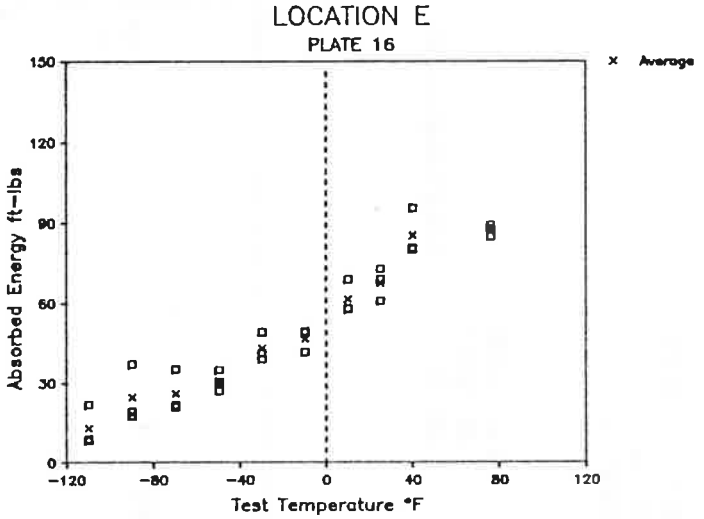
Location Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	62.3	52.0	53
-10	53.8	43.0	47

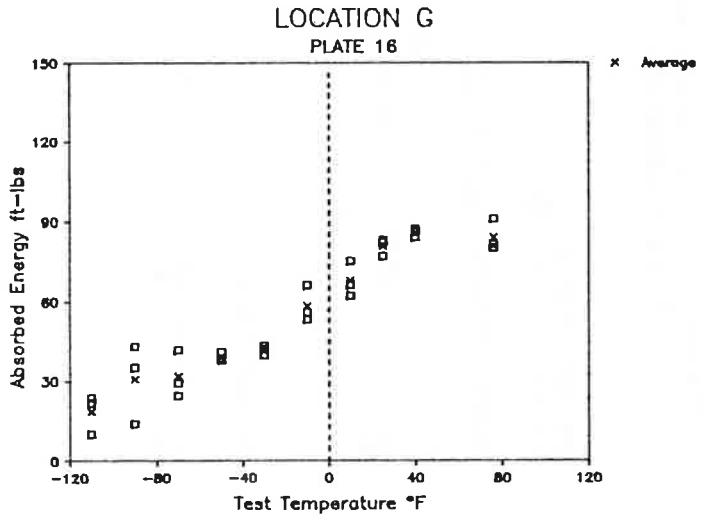
Spec. No.	Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
1	10	79.2	61	70
3	10	58.9	48	60
5	10	55.5	51	60
2	-10	47.0	38	40
4	-10	45.1	44	50
6	-10	43.4	44	50

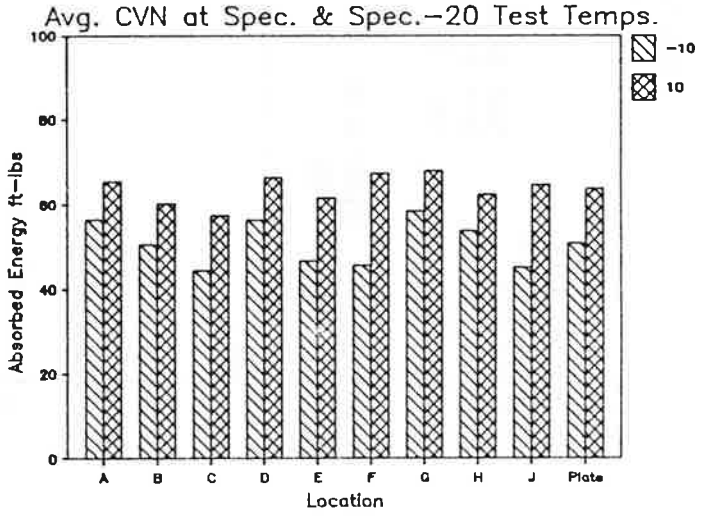
Average J

Location Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	64.5	53.3	63
-10	45.2	42.0	47


LOCATION C
PLATE 16
Average
Absorbed Energy ft-lbs
Test Temperature °F


LOCATION E
PLATE 16
Average
Absorbed Energy ft-lbs
Test Temperature °F


LOCATION G
PLATE 16
Average
Absorbed Energy ft-lbs
Test Temperature °F

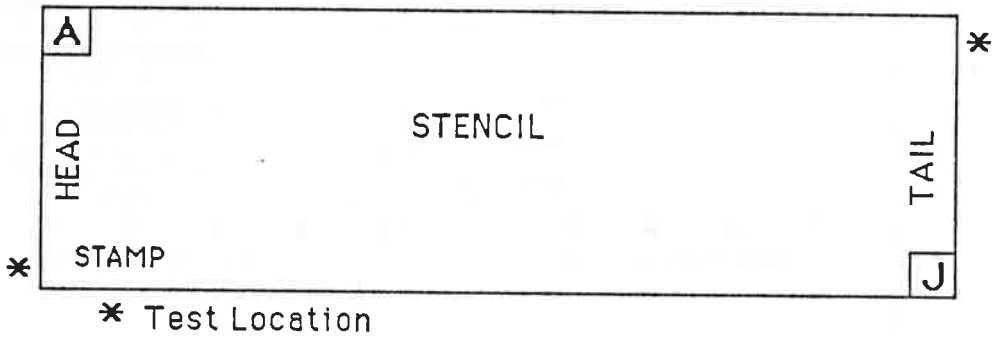

Avg. CVN at Spec. & Spec.-20 Test Temps.
-10
10
Absorbed Energy ft-lbs
A
B
C
D
E
F
G
H
J
Plate
Location

MILL DATA SHEET
Plate No: 17
Manf: 2

Slab Number: 4213
Heat Number: 53730

Yield Point (psi)	Head: 60900	Tail: 57100	
Tensile Strength (psi)	Head: 86200	Tail: 83900	
Elongation (%)	Head: 24	Tail: 22	{Gage Length (in): 2}

Steel Type: A572-85 Gr. 50
Thickness (in): 2
Length (in): 240 Width (in): 84
Notes: Plate width is 7 feet



Spec. Code for Head: 2907
Spec. Code for Tail: 2908

CHARPY IMPACT MILL TESTS (foot-lbs)

	Test Temp. (°F)	Test #1	Test #2	Test #3	CVN Test Avg.
Head	+10	38	25	35	33
Tail	+10	31	35	29	32

Chemical Analysis

C	Mn	P	S	Si	Cu	Ni	Cr	V	Al	Cb
.19	1.30	.010	.009	.260	NA	NA	NA	.100	NA	NA

MILL VERIFICATION CVN RESULTS

Plate No: 17

Manf: 2

Location	Replicate	CVN Absorbed Energy (ft-lbs)			
		Test #1	Test #2	Test #3	CVN Avg.
C	1	28	37	28	31.0
C	2	25	31	31	29.0
C	3	17	17	27	19.3
J	1	43	44	7	31.3
J	2	32	37	38	35.7
J	3	34	32	35	33.7
J	4	26	26	23	25.1
J	5	19	27	22	22.8
J	6	19	17	24	19.7
J	7	30	18	27	25.0

Plate: 17
Date: January 21, 1989 Windage: 0
Spec. Temp: + 10 F Personnel: CAS

Spec. No.	Location	A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
1		10	22.1	20	10
3		10	7.7	8	5
5		10	22.9	20	25
2		-10	17.1	15	0
4		-10	18.5	18	5
6		-10	10.0	7	0

Average

Location	A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
	10	17.6	16.0	13
	-10	15.2	13.3	2

Spec. No.	Location	B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
2		10	19.1	19	15
4		10	30.5	27	35
6		10	25.8	22	15
1		-10	12.2	12	0
3		-10	8.3	8	0
5		-10	10.0	9	5

Location	B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
	10	25.1	22.7	22
	-10	10.2	9.7	2

Spec. No.	Location	C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
3		10	21.5	20	30
17		10	21.9	18	20
22		10	9.0	9	5
7		-10	16.0	17	5
14		-10	8.7	7	0
29		-10	18.9	15	10
5		70	35.6	32	30
16		70	39.0	37	40
21		70	39.1	37	40
10		40	27.4	24	30
11		40	23.0	20	20
30		40	41.5	36	30
9		25	26.0	24	20
12		25	22.2	21	20
25		25	19.5	17	10
4		-30	9.2	10	10
20		-30	9.6	8	10
26		-30	9.3	9	10
6		-50	11.0	9	10
15		-50	4.8	8	10
27		-50	6.2	9	10
1		-70	5.3	8	0
18		-70	7.8	9	5
23		-70	3.0	1	0
8		100	44.6	43	50
13		100	42.2	42	50
28		100	47.3	43	60
2		119	51.2	44	50
19		119	55.0	48	50
24		119	43.9	40	45

Location	C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
	10	17.5	15.7	18
	-10	14.5	13.0	5
	69.8	37.9	35.3	37
	40	30.6	26.7	27
	25	22.6	20.7	17
	-30	9.4	9.0	10
	-50	7.3	8.7	10
	-70	5.4	6.0	2
	100	44.7	42.7	53
	119	50.0	44.0	48

Plate: 17

Spec. No.	Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
1	10	13.2	14	10
2	10	31.5	29	20
5	10	51.3	45	45
3	-10	19.5	17	20
4	-10	30.8	28	40
6	-10	20.7	21	20

Average

Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
10	32.0	29.3	25
-10	23.7	22.0	27

Spec. No.	Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
2	10	28.0	29	20
19	10	30.8	29	10
22	10	40.2	38	30
8	-10	30.8	31	20
15	-10	5.2	5	5
27	-10	15.1	15	5
6	70	76.3	68	50
11	70	57.0	48	40
21	70	46.5	48	40
1	40	33.8	36	30
16	40	63.0	56	50
26	40	46.7	45	40
10	25	38.3	35	30
13	25	39.5	38	40
28	25	37.8	37	40
5	-30	6.7	7	10
17	-30	17.9	17	20
23	-30	6.1	5	10
9	-50	5.2	4	0
14	-50	5.4	5	0
25	-50	5.5	5	0
4	-70	5.6	9	10
20	-70	5.8	5	0
30	-70	6.0	5	0
7	100	85.0	73	85
12	100	63.7	60	70
29	100	81.4	70	70
3	119	80.7	68	70
18	119	97.5	77	75
24	119	77.0	64	70

Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
10	33.0	32.0	20
-10	17.0	17.0	10
69.8	59.9	54.7	43
40	47.8	45.7	40
25	38.5	36.7	37
-30	10.2	9.7	13
-50	5.4	4.7	0
-70	5.8	6.3	3
100	76.7	67.7	75
119	85.1	69.7	72

Spec. No.	Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
3	10	29.2	27	25
4	10	30.5	27	30
6	10	29.0	27	25
1	-10	33.7	30	30
2	-10	25.2	23	20
5	-10	21.4	20	15

Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
10	29.6	27.0	27
-10	26.8	24.3	22

Plate: 17

Spec. No.	Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
2	10	20.1	18	20
17	10	29.0	29	35
24	10	23.0	19	15
7	-10	24.8	23	20
14	-10	10.7	10	10
29	-10	15.5	12	10
3	70	34.2	32	50
16	70	36.7	34	50
23	70	36.0	35	35
8	40	28.7	26	40
13	40	26.0	22	30
27	40	30.0	27	30
9	25	25.7	22	25
12	25	26.8	22	20
30	25	16.3	15	10
4	-30	8.5	8	0
18	-30	14.5	18	10
22	-30	13.3	13	5
5	-50	5.4	10	5
19	-50	11.0	11	5
26	-50	11.6	12	10
10	-70	5.4	4	5
15	-70	4.2	1	0
21	-70	6.3	5	0
1	100	45.9	41	60
20	100	39.2	40	60
28	100	33.9	33	40
6	119	48.4	40	40
11	119	49.9	42	45
25	119	38.5	36	30

Average

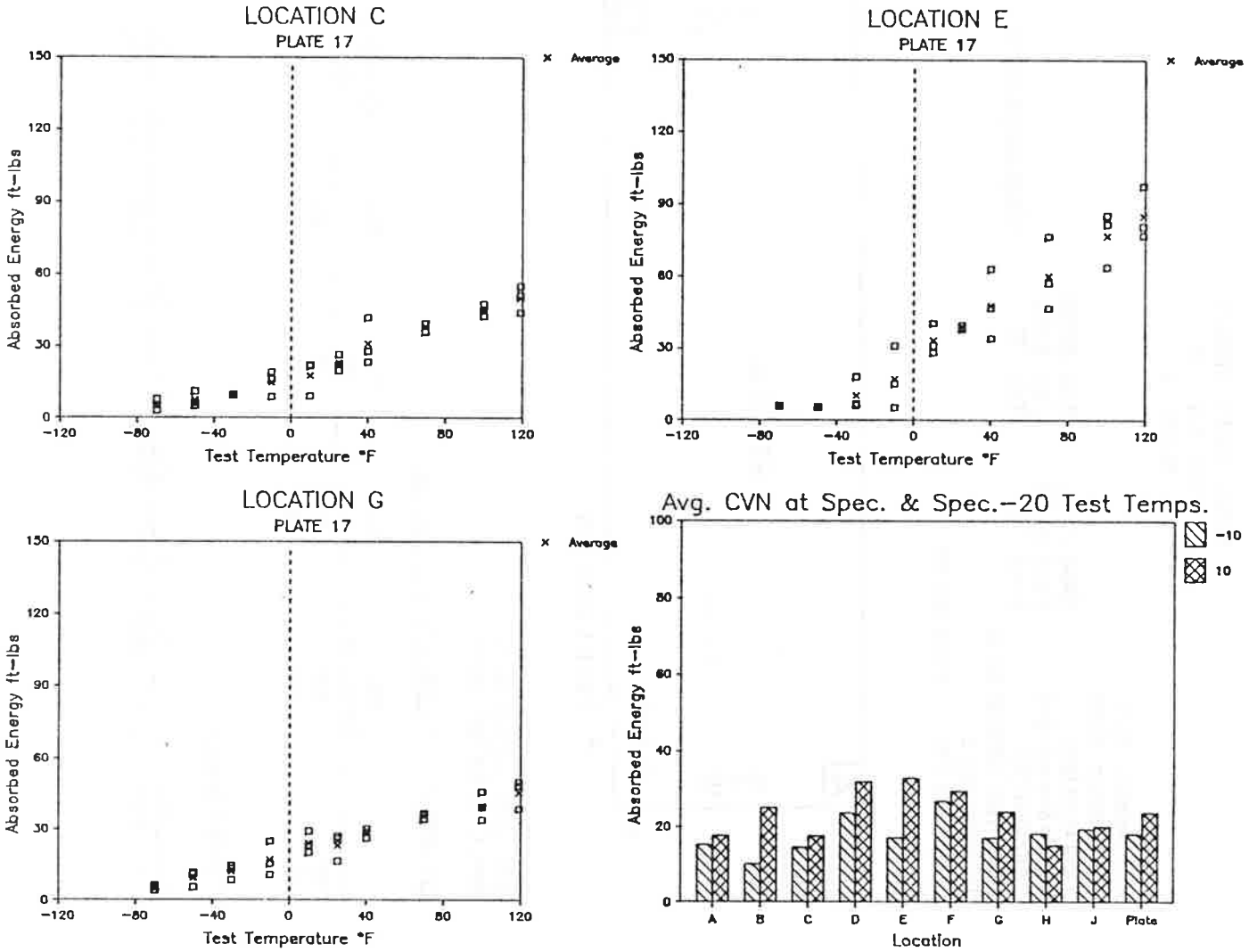
Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
10	24.0	22.0	23
-10	17.0	15.0	13
69.8	35.6	33.7	45
40	28.2	25.0	33
25	22.9	19.7	18
-30	12.1	13.0	5
-50	9.3	11.0	7
-70	5.3	3.3	2
100	39.7	38.0	53
119	45.6	39.3	38

Spec. No.	Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
3	10	13.8	12	5
5	10	22.0	19	20
6	10	9.3	10	5
1	-10	17.4	17	30
2	-10	17.8	18	20
4	-10	19.2	16	20

Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
10	15.0	13.7	10
-10	18.1	17.0	23

Spec. No.	Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
1	10	26.0	23	25
2	10	24.8	23	20
4	10	9.0	9	10
3	-10	15.6	15	10
5	-10	19.5	16	25
6	-10	22.8	21	20

Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
10	19.9	18.3	18
-10	19.3	17.3	18

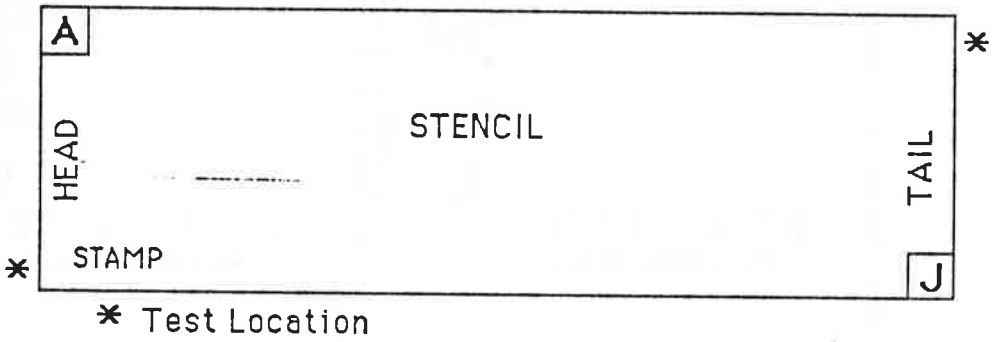

LOCATION C
PLATE 17
× Average
Absorbed Energy ft-lbs
Test Temperature °F
LOCATION E
PLATE 17
× Average
Absorbed Energy ft-lbs
Test Temperature °F
LOCATION G
PLATE 17
× Average
Absorbed Energy ft-lbs
Test Temperature °F
Avg. CVN at Spec. & Spec.-20 Test Temps.
-10
10
Absorbed Energy ft-lbs
A
B
C
D
E
F
G
H
J
Plate
Location

MILL DATA SHEET
Plate No: 18
Manf: 2

Slab Number: 4525
Heat Number: 53885

Yield Point (psi)	Head: 55400	Tail: 60300	
Tensile Strength (psi)	Head: 84300	Tail: 90700	
Elongation (%)	Head: 28	Tail: 27	{Gage Length (in): 2}

Steel Type: A588-87 Gr. A
Thickness (in): 2
Length (in): 336 Width (in): 60
Notes:



Spec. Code for Head: D634
Spec. Code for Tail: D640

CHARPY IMPACT MILL TESTS (foot-lbs)

	Test Temp. (°F)	Test #1	Test #2	Test #3	CVN Test Avg.
Head	+10	54	75	86	72
Tail	+10	96	73	71	80

Chemical Analysis

C	Mn	P	S	Si	Cu	Ni	Cr	V	Al	Cb
.15	0.98	.009	.012	.470	.320	.19	.56	.050	NA	NA

MILL VERIFICATION CVN RESULTS

Plate No: 18

Manf: 2

Location	Replicate	CVN Absorbed Energy (ft-lbs)			
		Test #1	Test #2	Test #3	CVN Avg.
C	1	83	104	95	94.0
C	2	97	106	107	103.3
C	3	79	109	84	90.7
C	4	74	60	84	72.7
C	5	61	67	55	61.0
C	6	79	79	32	63.3
C	7	55	61	59	58.3
C [a]	1	42	21	112	58.3
C [a]	2	88	55	110	84.3
G	1	73	88	91	84.0
G	2	61	89	72	74.0
G	3	77	79	86	80.7
G [a]	1	40	38	62	46.7
G [a]	2	34	41	42	39.0
G [b]	1	67	55	67	63.0
G [b]	2	64	61	40	55.0
G [b]	3	44	61	51	52.0

[a] Tested at the mill's research laboratory.

[b] Specimens taken from a second blank of steel from that location.

Plate: 18
Date: January 25, 1989 Windage: 0
Spec. Temp: + 10 F Personnel: CAS

Spec. No.	Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
1	10	51.7	45	50
3	10	58.2	51	50
6	10	39.5	37	40
2	-10	18.2	16	10
4	-10	49.5	43	40
5	-10	57.1	51	50

Average Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	49.8	44.3	47
-10	41.6	36.7	33

Spec. No.	Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
1	10	58.8	53	50
2	10	39.3	35	40
4	10	56.0	51	50
3	-10	13.6	14	10
5	-10	33.5	30	20
6	-10	38.4	36	30

Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	51.4	46.3	47
-10	28.5	26.7	20

Spec. No.	Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
4	10	54.3	49	50
17	10	38.3	35	30
29	10	48.8	39	30
10	-10	44.0	38	40
14	-10	47.3	41	40
23	-10	49.2	44	40
3	73	97.8	77	70
18	73	89.3	69	70
22	73	99.0	80	80
8	40	58.0	53	40
13	40	72.5	63	60
28	40	67.6	54	60
12	25	74.3	67	70
20	25	63.4	55	60
25	25	65.7	60	60
5	-30	4.8	5	5
9	-30	6.7	8	5
19	-30	9.6	11	10
2	-50	6.3	6	0
24	-50	5.8	6	0
30	-50	16.8	15	10
7	100	109.0	74	85
15	100	90.8	77	80
27	100	94.0	74	80
16	58	81.6	67	75
21	58	66.8	56	70
26	58	86.3	71	80
1	119	127.2	85	85
6	119	114.9	77	80
11	119	96.3	70	75

Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	47.1	41.0	37
-10	46.8	41.0	40
73.4	95.4	75.3	73
40	66.0	56.7	53
25	67.8	60.7	63
-30	7.0	8.0	7
-50	9.6	9.0	3
100	97.9	75.0	82
58	78.2	64.7	75
119	112.8	77.3	80

Plate: 18

Spec. No.	Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
1	10	22.7	23	20
4	10	54.5	47	50
6	10	44.0	38	50
2	-10	42.5	38	40
3	-10	39.2	34	40
5	-10	54.6	49	50

Average

Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
10	40.4	36.0	40
-10	45.4	40.3	43

Spec. No.	Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
9	10	12.7	19	20
14	10	47.1	43	40
29	10	13.5	18	20
3	-10	8.3	12	10
19	-10	14.4	18	20
25	-10	9.0	12	10
10	73	98.8	78	70
15	73	81.0	66	60
30	73	99.5	77	70
5	40	33.8	35	30
20	40	46.0	43	40
28	40	44.1	43	40
8	25	55.2	51	50
13	25	22.2	24	30
24	25	30.1	29	30
4	-30	4.8	6	5
18	-30	11.3	13	10
23	-30	10.0	11	10
2	-50	5.5	4	0
17	-50	10.6	12	10
27	-50	5.8	6	0
7	100	117.2	86	90
12	100	116.0	86	90
22	100	80.4	65	70
1	58	43.5	39	40
16	58	70.7	58	65
21	58	42.3	36	25
6	119	101.6	75	80
11	119	108.4	80	80
26	119	119.5	80	80

Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
10	24.4	26.7	27
-10	10.6	14.0	13
73.4	93.1	73.7	67
40	41.3	40.3	37
25	35.8	34.7	37
-30	8.7	10.0	8
-50	7.3	7.3	3
100	104.5	79.0	83
58	52.2	44.3	43
119	109.8	78.3	80

Spec. No.	Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
2	10	30.5	28	20
4	10	35.5	33	30
5	10	44.1	40	40
1	-10	17.2	17	20
3	-10	30.3	27	30
6	-10	45.8	39	40

Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
10	36.7	33.7	30
-10	31.1	27.7	30

Plate: 18

Spec. No.	Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
8	10	50.1	45	40
14	10	6.1	10	10
29	10	42.7	38	40
2	-10	35.9	32	30
18	-10	27.3	26	20
22	-10	48.0	42	40
9	73	91.6	74	70
15	73	63.5	55	60
25	73	70.0	60	60
4	40	58.5	52	60
19	40	66.6	59	60
28	40	79.5	69	70
7	25	52.5	47	50
12	25	64.4	57	60
27	25	12.6	15	10
1	-30	7.5	7	5
16	-30	14.8	15	10
24	-30	16.5	16	10
6	-50	10.3	11	5
17	-50	7.5	7	0
23	-50	8.1	9	0
3	100	102.4	81	85
13	100	80.0	68	70
30	100	83.0	67	70
5	58	41.1	35	45
20	58	70.2	59	65
21	58	61.9	53	60
10	119	105.8	78	80
11	119	90.8	68	65
26	119	78.4	60	70

Average

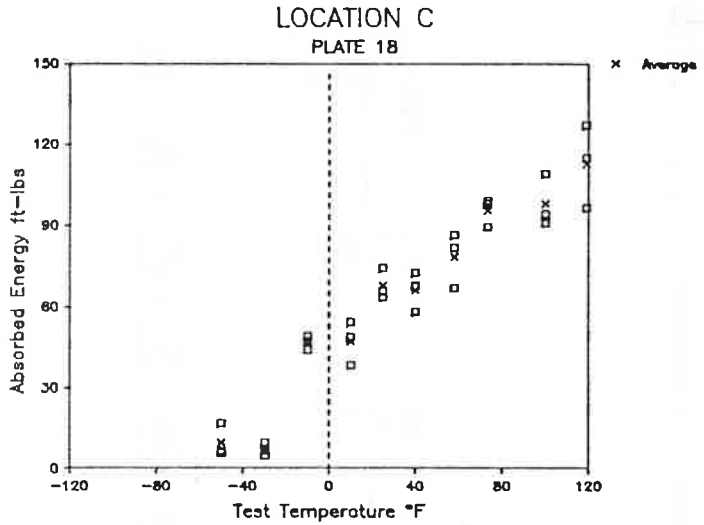
Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
10	33.0	31.0	30
-10	37.1	33.3	30
73.4	75.0	63.0	63
40	68.2	60.0	63
25	43.2	39.7	40
-30	12.9	12.7	8
-50	8.6	9.0	2
100	88.5	72.0	75
58	57.7	49.0	57
119	91.7	68.7	72

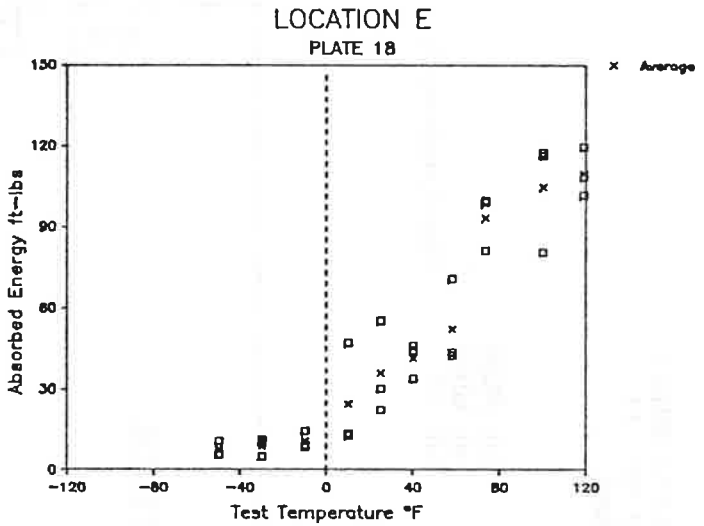
Spec. No.	Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
3	10	30.2	27	30
5	10	47.8	43	40
6	10	56.0	48	40
1	-10	8.0	9	5
2	-10	32.1	29	30
4	-10	12.4	12	10

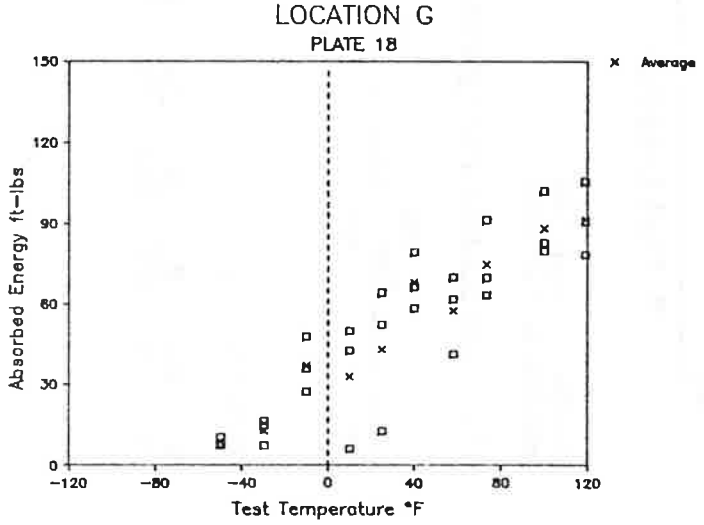
Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
10	44.7	39.3	37
-10	17.5	16.7	15

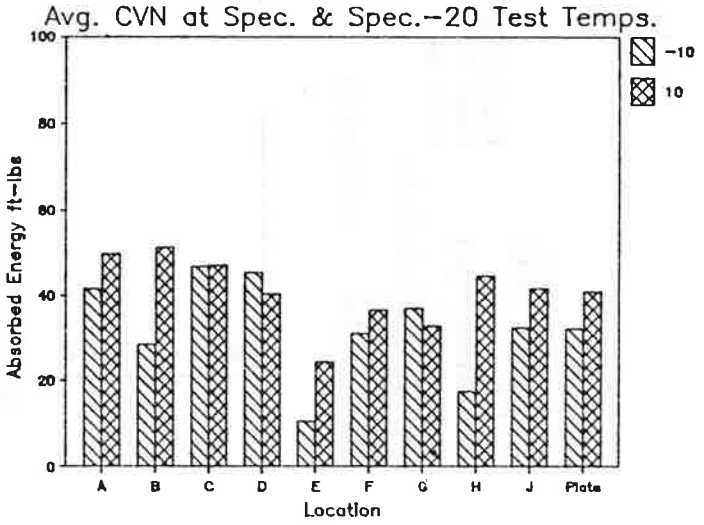
Spec. No.	Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
2	10	53.9	45	50
3	10	58.3	51	50
5	10	13.0	15	20
1	-10	41.8	35	40
4	-10	16.7	15	20
6	-10	39.0	36	30

Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
10	41.7	37.0	40
-10	32.5	28.7	30


LOCATION C
PLATE 18
Average
Absorbed Energy ft-lbs
Test Temperature °F
150
120
90
60
30
0
-120
-80
-40
0
40
80
120


LOCATION E
PLATE 18
Average
Absorbed Energy ft-lbs
Test Temperature °F
150
120
90
60
30
0
-120
-80
-40
0
40
80
120


LOCATION G
PLATE 18
Average
Absorbed Energy ft-lbs
Test Temperature °F
150
120
90
60
30
0
-120
-80
-40
0
40
80
120

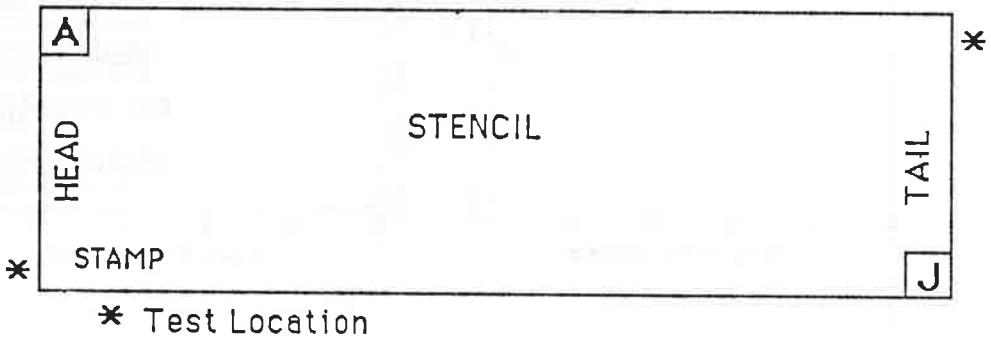

Avg. CVN at Spec. & Spec.-20 Test Temps.
-10
10
Absorbed Energy ft-lbs
Location
100
80
60
40
20
0
A
B
C
D
E
F
G
H
J
Plate

MILL DATA SHEET
Plate No: 19
Manf: 2

Slab Number: 5176
Heat Number: 69066

Yield Point (psi)	Head: 52800	Tail: 53200	
Tensile Strength (psi)	Head: 79500	Tail: 80100	
Elongation (%)	Head: 24	Tail: 25	{Gage Length (in): 2}

Steel Type: A572-85 Gr. 50
Thickness (in): 2
Length (in): 336 Width (in): 60
Notes:



Spec. Code for Head: 2909
Spec. Code for Tail: 2910

CHARPY IMPACT MILL TESTS (foot-lbs)

	Test Temp. (°F)	Test #1	Test #2	Test #3	CVN Test Avg.
Head	+10	31	51	46	43
Tail	+10	35	52	51	46

Chemical Analysis

C	Mn	P	S	Si	Cu	Ni	Cr	V	Al	Cb
.20	1.21	.013	.010	.230	NA	NA	NA	.090	NA	NA

MILL VERIFICATION CVN RESULTS

Plate No: 19

Manf: 2

Location	Replicate	CVN Absorbed Energy (ft-lbs)			
		Test #1	Test #2	Test #3	CVN Avg.
C	1	23	24	24	23.7
C	2	26	23	36	28.3
C	3	22	19	26	22.3
G	1	9	36	26	23.7
G	2	30	24	17	23.7
G	3	7	30	27	21.3

Plate: 19
Date: January 25, 1989 Windage: 0
Spec. Temp: + 10 F Personnel: CAS

Location A

Spec. No.	Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
1	10	30.0	27	30
3	10	29.5	28	30
5	10	24.0	24	30
2	-10	23.5	22	20
4	-10	24.2	23	20
6	-10	20.8	21	20

Average Location A

Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	27.8	26.3	30
-10	22.8	22.0	20

Location B

Spec. No.	Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
2	10	26.0	24	20
3	10	28.4	27	30
4	10	33.0	29	30
1	-10	6.7	7	10
5	-10	4.0	2	0
6	-10	16.4	15	10

Location B

Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	29.1	26.7	27
-10	9.0	8.0	7

Location C

Spec. No.	Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
4	10	30.3	28	30
17	10	31.0	29	30
22	10	26.8	26	20
9	-10	21.8	20	10
12	-10	5.6	6	5
28	-10	27.2	25	20
8	73	52.5	49	50
13	73	74.2	63	60
29	73	55.3	51	60
3	40	28.5	28	30
18	40	39.3	37	40
21	40	38.6	35	40
2	25	31.4	30	20
19	25	34.3	32	30
24	25	27.0	26	20
7	-30	20.8	20	20
14	-30	19.0	17	20
27	-30	15.2	15	20
5	-50	11.8	11	10
16	-50	6.4	5	5
25	-50	7.6	7	5
10	100	77.5	66	70
11	100	48.2	47	60
30	100	69.5	62	70
1	119	68.9	58	55
20	119	77.7	63	60
23	119	80.2	64	70
6	-70	6.3	7	0
15	-70	4.4	6	0
26	-70	3.4	1	0

Location C

Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	29.4	27.7	27
-10	18.2	17.0	12
73.4	60.7	54.3	57
40	35.5	33.3	37
25	30.9	29.3	23
-30	18.3	17.3	20
-50	8.6	7.7	7
100	65.1	58.3	67
119	75.6	61.7	62
-70	4.7	4.7	0

Plate: 19

Spec. No.	Location	Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
2		10	38.0	35	40
4		10	43.9	40	50
6		10	35.1	35	40
1		-10	25.7	26	20
3		-10	31.3	28	30
5		-10	35.0	32	30

Average

Location	Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
	10	39.0	36.7	43
	-10	30.7	28.7	27

Spec. No.	Location	Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
9		10	35.8	36	40
12		10	37.5	36	40
29		10	62.0	56	60
4		-10	17.9	18	20
17		-10	50.8	47	50
22		-10	7.6	11	10
8		73	94.7	78	85
13		73	78.9	66	80
28		73	119.0	90	90
3		40	55.0	49	50
18		40	75.8	65	60
23		40	54.5	47	50
2		25	36.8	36	40
19		25	63.5	58	60
24		25	55.0	50	50
7		-30	36.9	33	30
11		-30	36.2	32	40
27		-30	29.1	26	20
5		-50	4.6	6	0
16		-50	6.8	8	5
21		-50	16.4	18	20
10		100	110.0	84	85
14		100	88.8	75	80
26		100	117.0	89	85
6		119	120.1	87	85
15		119	95.8	78	70
30		119	106.3	82	75
1		-70	7.9	8	0
20		-70	8.6	6	0
25		-70	5.7	4	0

Location	Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
	10	45.1	42.7	47
	-10	25.4	25.3	27
	73.4	97.5	78.0	85
	40	61.8	53.7	53
	25	51.8	48.0	50
	-30	34.1	30.3	30
	-50	9.3	10.7	8
	100	105.3	82.7	83
	119	107.4	82.3	77
	-70	7.4	6.0	0

Spec. No.	Location	Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
1		10	47.0	42	40
2		10	30.8	30	30
6		10	45.9	43	50
3		-10	37.3	34	30
4		-10	48.2	43	40
5		-10	32.0	31	30

Location	Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
	10	41.2	38.3	40
	-10	39.2	36.0	33

Plate: 19

Spec. No.	Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
9	10	28.0	27	30
11	10	28.2	26	30
29	10	23.8	22	20
4	-10	7.8	9	10
17	-10	25.2	24	20
22	-10	17.6	17	20
3	73	58.0	53	50
19	73	56.7	53	50
23	73	54.0	50	60
8	40	39.0	37	30
13	40	38.2	35	40
28	40	36.8	33	30
2	25	40.0	37	40
18	25	34.0	32	40
25	25	35.8	34	30
10	-30	17.2	16	10
12	-30	14.3	13	10
26	-30	17.8	16	20
5	-50	10.0	11	10
16	-50	7.2	11	10
21	-50	7.4	9	10
7	100	71.1	62	60
14	100	46.8	44	50
27	100	68.5	60	50
1	119	75.8	61	60
20	119	79.7	67	60
24	119	66.9	57	45
6	-70	6.2	5	0
15	-70	7.1	7	0
30	-70	8.5	5	5

Average

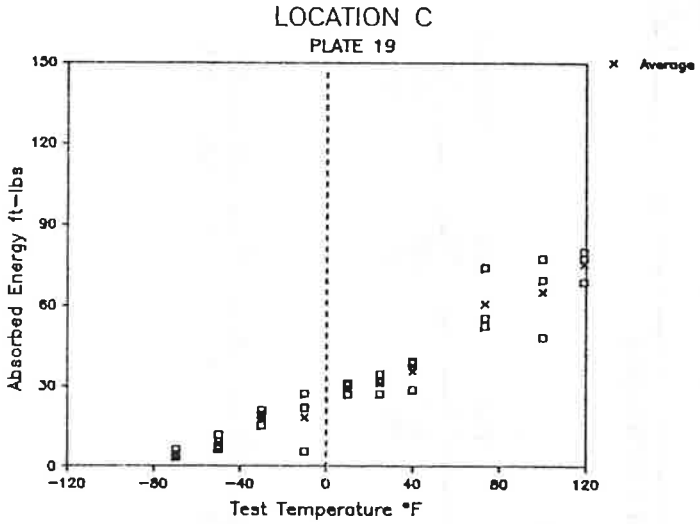
Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
10	26.7	25.0	27
-10	16.9	16.7	17
73.4	56.2	52.0	53
40	38.0	35.0	33
25	36.6	34.3	37
-30	16.4	15.0	13
-50	8.2	10.3	10
100	62.1	55.3	53
119	74.1	61.7	55
-70	7.3	5.7	2

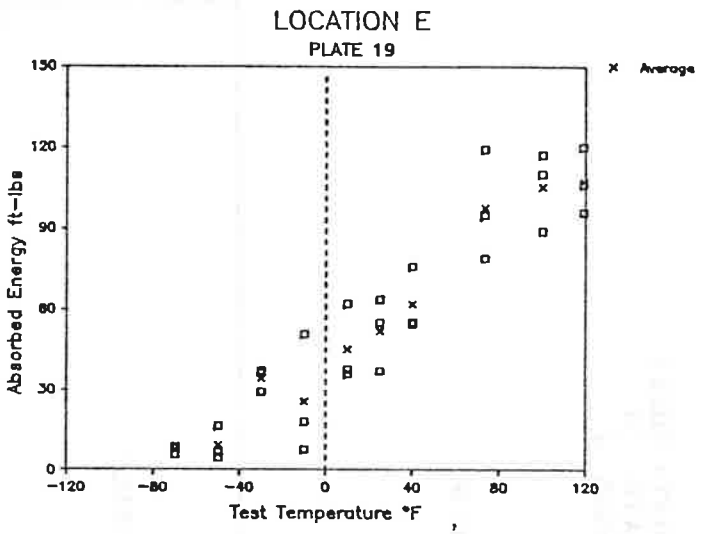
Spec. No.	Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
2	10	16.5	16	10
4	10	12.0	13	10
5	10	33.3	30	30
1	-10	21.8	19	20
3	-10	16.5	16	20
6	-10	5.7	8	20

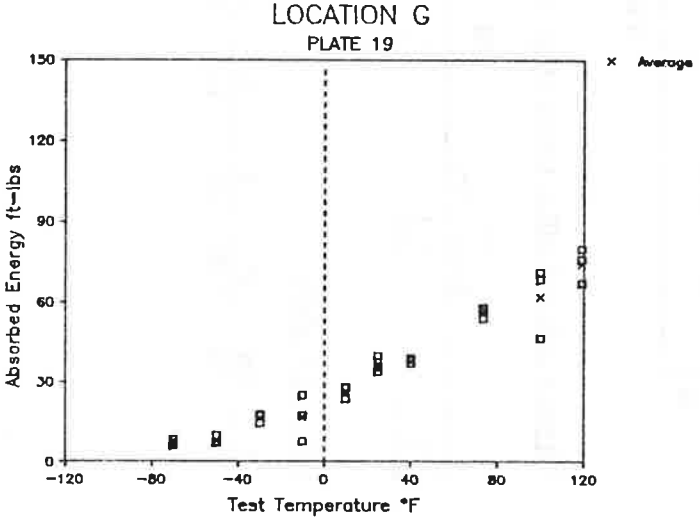
Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
10	20.6	19.7	17
-10	14.7	14.3	20

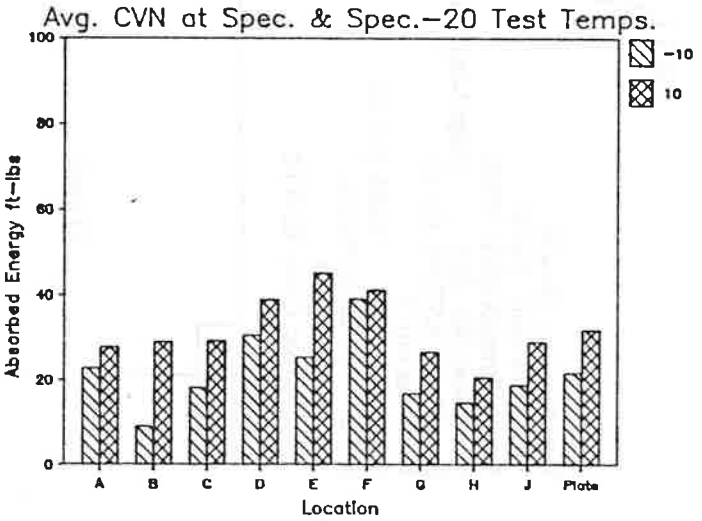
Spec. No.	Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
2	10	28.2	26	20
5	10	33.0	30	30
6	10	26.1	27	30
1	-10	5.7	7	5
3	-10	23.0	22	20
4	-10	27.7	25	20

Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
10	29.1	27.7	27
-10	18.8	18.0	15


LOCATION C
PLATE 19
Average
Absorbed Energy ft-lbs
Test Temperature °F

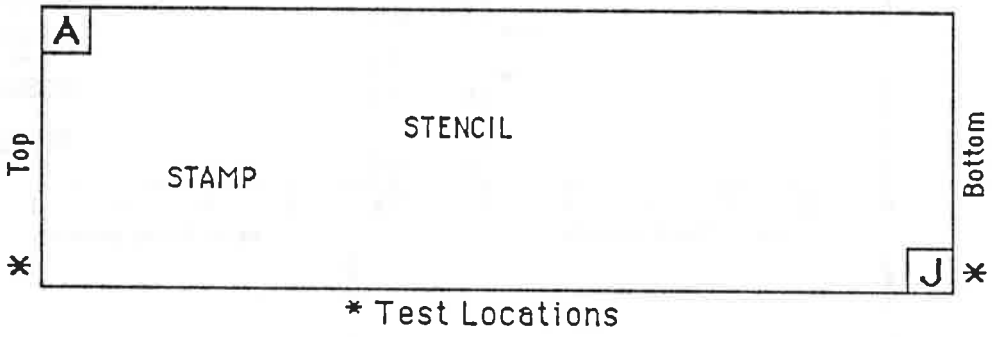

LOCATION E
PLATE 19
Average
Absorbed Energy ft-lbs
Test Temperature °F


LOCATION G
PLATE 19
Average
Absorbed Energy ft-lbs
Test Temperature °F


Avg. CVN at Spec. & Spec.-20 Test Temps.
-10
10
Absorbed Energy ft-lbs
A
B
C
D
E
F
G
H
J
Plate
Location

MILL DATA SHEET
PLATE: 20
Manf: 4

Heat Number: 2R4498
Yield Point (psi): 51000
Tensile Strength (psi): 77500
Elongation (%): 30.0 {Gage Length (in): 2}
Steel Type: A572-85 Gr. 50
Thickness (in): 2
Length (in): 480 Width (in): 60
Notes: Fine Grain Practice
Normalized
Spec. Code: 02W 02



CHARPY IMPACT MILL TESTS (foot-lbs)

	Test Temp. (°F)	Test #1	Test #2	Test #3	CVN Test Avg.
Top	+10	91	139	105	112
Bottom	+10	94	90	88	91

Chemical Analysis

C	Mn	P	S	Si	Cu	Ni	Cr	V	Al	Cb
.21	1.18	.010	.010	.180	NA	NA	NA	.070	NA	NA

Plate: 20
Date: February 17, 1989 Windage: 0
Spec. Temp: + 10 F Personnel: DAG

Spec. No.	Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
1	10	80.2	59	70
2	10	84.9	66	60
6	10	76.3	62	50
3	-10	83.6	63	70
4	-10	61.7	55	50
5	-10	76.1	58	60

Average Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	80.5	62.3	60
-10	73.8	58.7	60

Spec. No.	Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
1	10	76.1	66	65
3	10	62.5	58	55
5	10	99.8	77	70
2	-10	77.8	65	55
4	-10	82.3	66	60
6	-10	79.6	62	60

Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	79.5	67.0	63
-10	79.9	64.3	58

Spec. No.	Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
3	10	83.9	67	60
17	10	81.1	68	60
24	10	78.1	64	65
6	-10	62.5	53	50
13	-10	83.6	64	60
29	-10	65.8	57	50
5	70	125.4	90	65
19	70	118.3	87	70
22	70	138.2	90	65
8	40	108.2	82	70
11	40	123.3	85	70
27	40	103.8	78	70
4	25	79.7	65	60
20	25	102.6	77	70
21	25	109.8	82	70
10	-30	45.4	42	30
15	-30	55.7	49	50
26	-30	65.8	55	20
2	-50	52.4	47	30
16	-50	30.5	31	20
25	-50	53.8	48	40
9	-70	36.9	32	30
14	-70	46.3	43	40
30	-70	33.8	31	30
7	-100	8.6	4	10
12	-100	10.4	6	15
28	-100	15.9	11	15
1	119	132.2	86	85
18	119	117.9	83	80
23	119	134.3	87	80

Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	81.0	66.3	62
-10	70.6	58.0	53
70.3	127.3	89.0	67
40	111.8	81.7	70
25	97.4	74.7	67
-30	55.6	48.7	33
-50	45.6	42.0	30
-70	39.0	35.3	33
-100	11.6	7.0	13
119	128.1	85.3	82

Plate: 20

Spec. No.	Location	D Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
2		10	86.4	72	70
4		10	53.0	51	40
6		10	47.5	45	30
1		-10	68.5	56	45
3		-10	76.6	63	60
5		-10	62.8	50	55

Average

Location	D Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
	10	62.3	56.0	47
	-10	69.3	56.3	53

Spec. No.	Location	E Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
3		10	76.5	63	65
18		10	87.0	75	65
22		10	72.5	61	70
9		-10	69.9	62	60
12		-10	36.4	39	20
26		-10	59.7	52	55
1		70	117.8	86	80
20		70	109.5	78	80
24		70	111.8	88	70
7		40	103.7	81	75
14		40	118.3	87	85
28		40	108.7	78	80
4		25	98.5	67	70
17		25	83.9	67	65
25		25	80.1	67	70
10		-30	24.5	27	10
11		-30	42.4	39	30
30		-30	43.6	42	30
8		-50	26.3	24	20
15		-50	47.1	40	20
29		-50	23.4	20	15
5		-70	23.4	20	10
16		-70	20.9	22	10
23		-70	18.3	20	10
6		-100	5.4	2	5
13		-100	12.7	12	15
27		-100	5.8	4	0
2		119	109.9	79	80
19		119	109.3	76	80
21		119	117.6	78	75

Location	E Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
	10	78.7	66.3	67
	-10	55.3	51.0	45
	70.3	113.0	84.0	77
	40	110.2	82.0	80
	25	87.5	67.0	68
	-30	36.8	36.0	23
	-50	32.3	28.0	18
	-70	20.9	20.7	10
	-100	8.0	6.0	7
	119	112.3	77.7	78

Spec. No.	Location	F Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
1		10	62.7	54	50
2		10	81.8	63	60
6		10	74.8	60	60
3		-10	54.1	46	50
4		-10	51.4	49	50
5		-10	40.4	40	30

Location	F Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
	10	73.1	59.0	57
	-10	48.6	45.0	43

Plate: 20

Spec. No.	Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
1	10	75.6	67	50
18	10	100.3	79	75
24	10	68.9	56	30
7	-10	77.6	63	60
12	-10	67.6	55	60
27	-10	68.8	57	60
3	70	117.3	84	70
19	70	111.8	86	70
22	70	119.9	88	70
9	40	110.9	84	75
14	40	99.8	79	70
28	40	97.7	72	70
2	25	84.1	68	60
20	25	91.6	74	70
25	25	112.2	86	70
6	-30	39.8	37	30
11	-30	62.0	53	20
29	-30	54.8	48	20
10	-50	31.2	30	20
13	-50	47.9	43	35
30	-50	41.3	39	35
5	-70	12.1	14	10
16	-70	33.8	31	20
23	-70	30.9	30	20
4	-100	7.4	5	0
17	-100	8.9	7	0
21	-100	9.1	5	5
8	119	120.0	88	85
15	119	120.0	81	75
26	119	119.4	84	85

Average

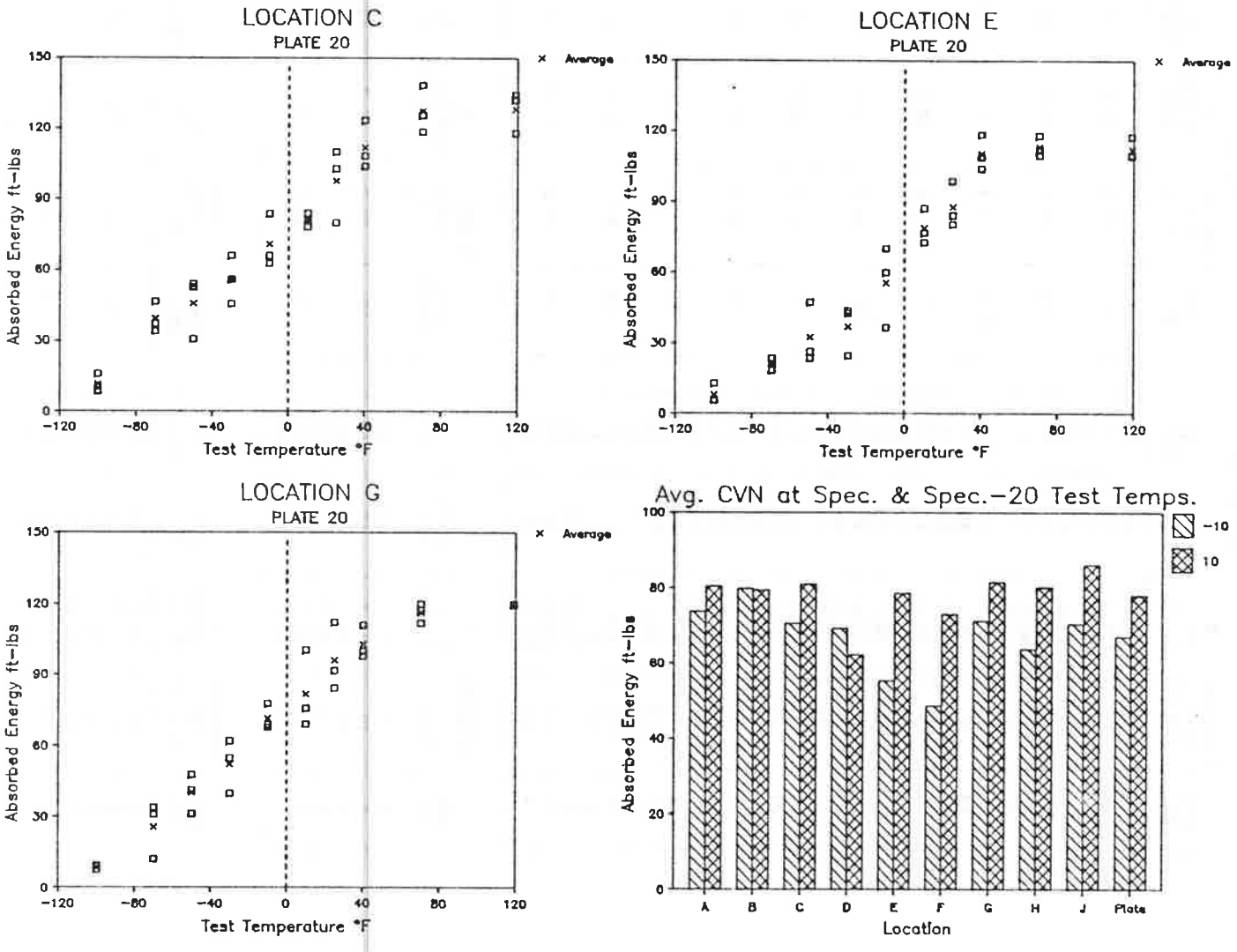
Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
10	81.6	67.3	52
-10	71.3	58.3	60
70.3	116.3	86.0	70
40	102.8	78.3	72
25	96.0	76.0	67
-30	52.2	46.0	23
-50	40.1	37.3	30
-70	25.6	25.0	17
-100	8.5	5.7	2
119	119.8	84.3	82

Spec. No.	Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
2	10	84.2	70	65
3	10	82.3	63	60
4	10	74.1	64	65
1	-10	70.9	54	60
5	-10	58.1	50	60
6	-10	62.1	56	60

Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
10	80.2	65.7	63
-10	63.7	53.3	60

Spec. No.	Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
1	10	104.2	80	70
3	10	77.9	61	60
5	10	76.2	63	60
2	-10	82.4	67	60
4	-10	74.2	60	60
6	-10	54.8	49	60

Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
10	86.1	68.0	63
-10	70.5	58.7	60

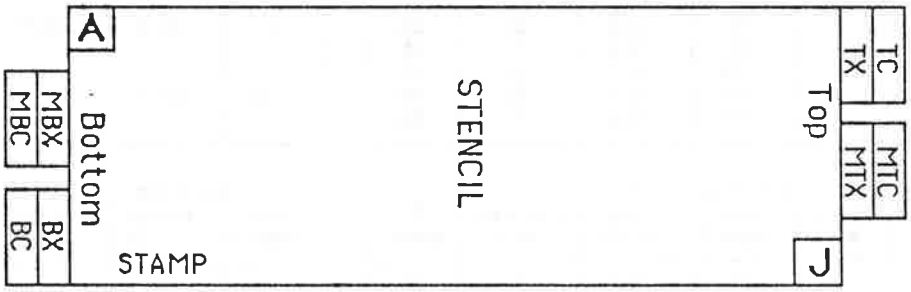

LOCATION C
PLATE 20
Average
Absorbed Energy ft-lbs
Test Temperature °F
LOCATION E
PLATE 20
Average
Absorbed Energy ft-lbs
Test Temperature °F
LOCATION G
PLATE 20
Average
Absorbed Energy ft-lbs
Test Temperature °F
Avg. CVN at Spec. & Spec.-20 Test Temps.
-10
10
Absorbed Energy ft-lbs
A
B
C
D
E
F
G
H
J
Plate
Location

MILL DATA SHEET
Plate No: 21
Manf: 3

Melt/Slab Number: U8855-2A

Yield Point (ksi)	TX: 50.4	BX: 54.4	MTX: 51.5	MBX: 53.5
Tensile Strength (ksi)	TX: 77.4	BX: 77.4	MTX: 77.2	MBX: 78.2
Elongation (%)	TX: 26	BX: 28	MTX: 28	MBX: 26

{Gage Length (in): 2}
Steel Type: A588-A
Thickness (in): 2
Length (in): 240 Width (in): 60
Notes: Normalized at 1650 °F for 135 min. - Air cool
Fine Grain Practice
Bend Test - Pass
Spec. Code - Top: F923 Bottom: F858



TC,MTC,BC,MBC - Charpy test locations, 9" x 3"
TX,MTX,BX,MBX - Tensile test locations, 9" x 2-1/4"

CHARPY IMPACT MILL TESTS (foot-lbs)

	Test Temp	Test #1 CVN	Lt.Ex.	%Sh.	Test #2 CVN	Lt.Ex.	%Sh.	Test #3 CVN	Lt.Ex.	%Sh.	CVN Avg
TC	+10°F	72	61	60	80	65	60	85	71	70	79
BC	+10°F	52	42	40	54	45	40	55	48	50	54
MTC	+10°F	90	**	**	98	**	**	101	**	**	96
MBC	+10°F	75	**	**	84	**	**	87	**	**	82

(** results not reported)

Chemical Analysis

C	Mn	P	S	Si	Cu	Ni	Cr	V	Al	Cb
.14	0.95	.013	.019	.380	.280	.12	.52	.068	NA	NA

Prod. Chemical Analysis

.15	0.95	.011	.017	.390	.290	.12	.52	.067	NA	NA
.14	0.94	.014	.018	.370	.270	.12	.53	.067	NA	NA

Plate: 21
Date: March 3, 1989 Windage: 0
Spec. Temp: + 10 F Personnel: DAG

Spec. No.	Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
1	10	76.1	65	65
3	10	81.0	66	65
6	10	63.2	62	60
2	-10	62.5	56	65
4	-10	64.9	57	60
5	-10	53.9	49	60

Average Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	73.4	64.3	63
-10	60.4	54.0	62

Spec. No.	Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
1	10	72.9	61	65
2	10	60.2	54	65
5	10	73.8	64	65
3	-10	62.7	59	70
4	-10	63.1	56	65
6	-10	57.2	52	50

Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	69.0	59.7	65
-10	61.0	55.7	62

Spec. No.	Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
8	10	74.8	63	65
12	10	85.9	72	75
21	10	81.4	70	70
5	-10	72.4	60	70
16	-10	77.5	70	70
24	-10	62.2	52	55
3	75	96.1	78	75
20	75	95.8	80	80
28	75	108.3	77	85
1	40	95.1	80	80
13	40	78.7	66	75
27	40	88.3	67	70
10	25	86.9	57	70
14	25	78.9	63	60
30	25	74.0	52	60
4	-30	57.8	47	60
17	-30	55.6	50	60
26	-30	64.9	55	65
6	-50	46.1	42	35
19	-50	45.3	41	35
25	-50	39.1	34	30
2	-70	27.4	22	30
18	-70	50.9	45	70
22	-70	38.9	34	35
7	120	112.2	76	75
15	120	105.1	78	75
29	120	106.8	69	75
9	58	83.4	65	70
11	58	86.7	71	75
23	58	92.8	73	75

Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	80.7	68.3	70
-10	70.7	60.7	65
75.2	100.1	78.3	80
40	87.4	71.0	75
25	79.9	57.3	63
-30	59.4	50.7	62
-50	43.5	39.0	33
-70	39.1	33.7	45
120	108.0	74.3	75
58	87.6	69.7	73

Plate: 21

Spec. No.	Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
1	10	74.3	62	65
2	10	74.1	62	70
4	10	65.1	56	60
3	-10	67.1	59	70
5	-10	75.2	65	80
6	-10	66.3	57	70

Average

Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
10	71.2	60.0	65
-10	69.5	60.3	73

Spec. No.	Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
2	10	84.9	67	70
14	10	67.8	54	60
29	10	76.7	65	60
6	-10	73.0	69	65
11	-10	65.1	59	70
28	-10	51.7	46	50
10	75	109.9	82	75
13	75	107.7	80	75
21	75	99.8	81	85
9	40	93.8	71	75
19	40	72.3	62	65
23	40	90.6	72	70
4	25	71.8	71	70
16	25	78.9	66	75
22	25	81.7	65	60
1	-30	62.8	59	60
17	-30	68.3	63	60
30	-30	67.3	61	70
3	-50	46.2	40	40
12	-50	33.9	33	20
27	-50	70.5	63	45
8	-70	37.2	32	50
15	-70	35.9	27	30
26	-70	21.7	19	20
5	120	109.6	76	75
18	120	105.7	73	75
25	120	103.6	80	80
7	58	114.4	82	80
20	58	105.8	80	80
24	58	93.6	77	70

Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
10	76.5	62.0	63
-10	63.3	58.0	62
75.2	105.8	81.0	78
40	85.6	68.3	70
25	77.5	67.3	68
-30	66.1	61.0	63
-50	50.2	45.3	35
-70	31.6	26.0	33
120	106.3	76.3	77
58	104.6	79.7	77

Spec. No.	Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
1	10	74.9	60	50
3	10	69.3	59	75
5	10	78.1	66	70
2	-10	44.1	41	50
4	-10	52.9	46	70
6	-10	64.2	56	70

Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
10	74.1	61.7	65
-10	53.7	47.7	63

Plate: 21

Spec. No.	Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
1	10	78.3	67	75
12	10	78.5	65	75
28	10	60.4	58	50
9	-10	48.2	46	40
15	-10	70.2	62	60
26	-10	62.5	55	60
7	75	100.4	77	85
13	75	108.3	82	85
24	75	111.6	86	90
5	40	76.8	67	60
16	40	68.9	59	50
27	40	79.9	64	60
3	25	72.5	56	70
14	25	108.4	84	80
29	25	78.8	68	60
10	-30	45.1	42	35
11	-30	79.4	69	70
22	-30	66.2	59	60
4	-50	41.0	39	35
18	-50	44.1	40	40
21	-50	82.3	63	85
8	-70	30.8	28	30
17	-70	9.2	8	15
23	-70	75.5	66	75
6	120	110.7	77	75
20	120	109.1	78	85
25	120	132.2	89	100
2	58	93.8	73	75
19	58	79.8	64	65
30	58	102.1	83	80

Average

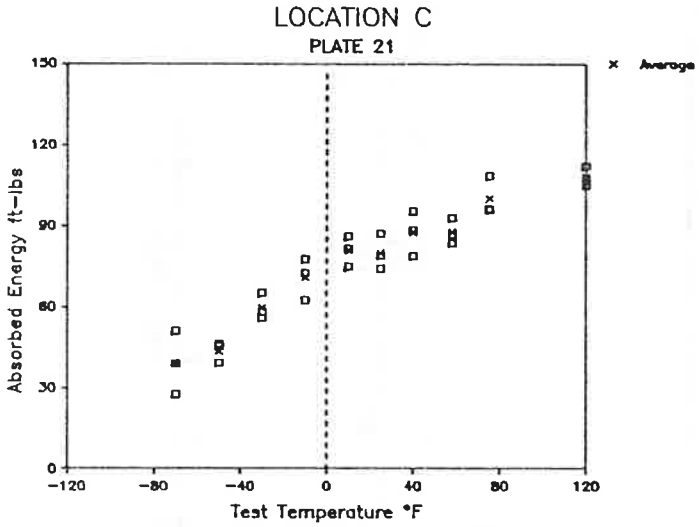
Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
10	72.4	63.3	67
-10	60.3	54.3	53
75.2	106.8	81.7	87
40	75.2	63.3	57
25	86.6	69.3	70
-30	63.6	56.7	55
-50	55.8	47.3	53
-70	38.5	34.0	40
120	117.3	81.3	87
58	91.9	73.3	73

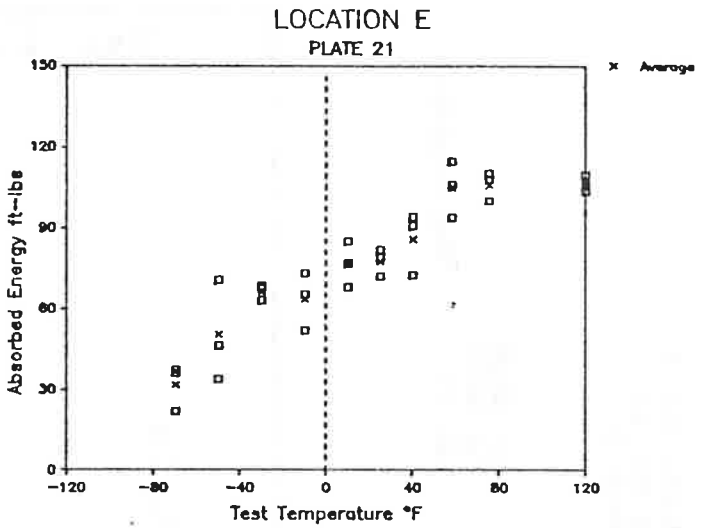
Spec. No.	Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
2	10	61.9	55	55
3	10	70.3	61	70
6	10	74.9	68	60
1	-10	44.3	39	40
4	-10	68.2	61	75
5	-10	72.0	61	75

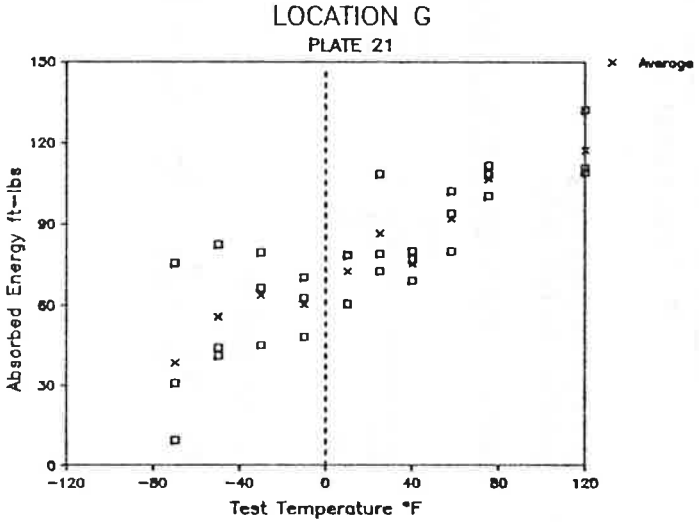
Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
10	69.0	61.3	62
-10	61.5	53.7	63

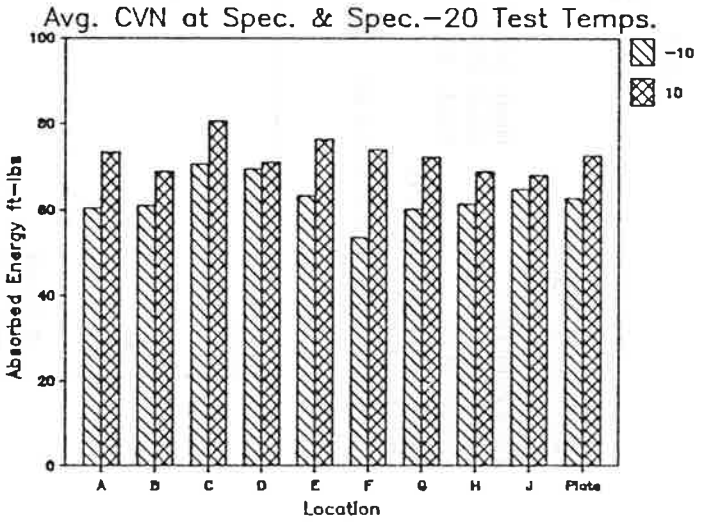
Spec. No.	Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
2	10	85.1	72	75
3	10	62.5	54	55
4	10	56.9	52	50
1	-10	74.9	67	75
5	-10	46.9	43	80
6	-10	72.9	66	60

Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
10	68.2	59.3	60
-10	64.9	58.7	72


LOCATION C
PLATE 21
Average
Absorbed Energy ft-lbs
Test Temperature °F


LOCATION E
PLATE 21
Average
Absorbed Energy ft-lbs
Test Temperature °F


LOCATION G
PLATE 21
Average
Absorbed Energy ft-lbs
Test Temperature °F

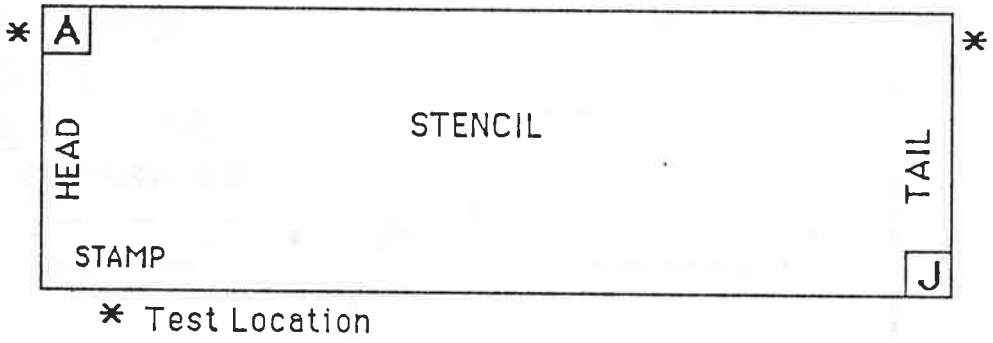

Avg. CVN at Spec. & Spec.-20 Test Temps.
-10
10
Absorbed Energy ft-lbs
A
B
C
D
E
F
G
H
J
Plate
Location

MILL DATA SHEET
Plate No: 22
Manf: 2

Slab Number: 4510
Heat Number: 53884

Yield Point (psi)	Head: 56200	Tail: 58300	
Tensile Strength (psi)	Head: 85300	Tail: 86700	
Elongation (%)	Head: 30	Tail: 25	{Gage Length (in): 2}

Steel Type: A588-87 Gr. A
Thickness (in): 2
Length (in): 240 Width (in): 60
Notes:



Spec. Code for Head: D638
Spec. Code for Tail: D643

CHARPY IMPACT MILL TESTS (foot-lbs)

	Test Temp. (°F)	Test #1	Test #2	Test #3	CVN Test Avg.
Head	+10	85	45	104	78
Tail	+10	58	88	91	79

Chemical Analysis

C	Mn	P	S	Si	Cu	Ni	Cr	V	Al	Cb
.14	1.07	.010	.014	.500	.340	.20	.580	.050	NA	NA

MILL VERIFICATION CVN RESULTS

Plate No: 22

Manf: 2

Location	Replicate	CVN Absorbed Energy (ft-lbs)			
		Test #1	Test #2	Test #3	CVN Avg.
A	1	46	26	35	35.7
A	2	44	11	26	27.0
A	3	31	30	47	36.0
A	4	63	35	47	48.3
A	5	54	42	40	45.3
A	6	32	50	42	41.3
A	7	58	58	44	53.3
C	1	28	21	28	25.7
C	2	57	46	46	49.7
C	3	11	58	32	33.7
C	4	34	39	18	30.6
C	5	15	39	24	25.8
C	6	16	53	55	41.2
C	7	64	76	32	57.3
F	1	54	53	49	52.0
F	2	75	39	54	56.0
F	3	69	73	53	65.0
F	4	59	74	55	62.7
F	5	57	69	81	69.0
F	6	78	99	70	82.3
F	7	93	83	84	86.7
G	1	17	13	59	29.7
G	2	41	14	54	36.3
G	3	50	61	70	60.3
G	4	86	101	99	95.3
G	5	97	114	62	91.0
G	6	130	125	122	125.7
G	7	62	117	130	103.0

Plate: 22
Date: March 17, 1989 Windage: 0
Spec. Temp: + 10 F Personnel: DAG

Spec. No.	Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
2	10	32.4	26	30
4	10	33.8	29	20
6	10	52.2	42	40
1	-10	19.3	15	15
3	-10	13.7	12	20
5	-10	48.6	39	45

Average Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	39.5	32.3	30
-10	27.2	22.0	27

Spec. No.	Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
3	10	20.8	18	15
4	10	15.2	13	10
5	10	30.2	26	20
1	-10	8.4	7	10
2	-10	15.2	11	10
6	-10	36.6	30	40

Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	22.1	19.0	15
-10	20.1	16.0	20

Spec. No.	Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
1	10	13.9	12	10
14	10	7.6	8	10
28	10	23.6	21	15
6	-10	14.9	12	15
12	-10	9.0	7	10
23	-10	11.2	9	10
3	75	83.9	68	40
19	75	90.8	76	65
26	75	31.6	31	20
4	40	21.3	20	10
17	40	62.8	50	45
24	40	32.9	25	10
9	25	43.2	36	40
13	25	49.1	40	30
21	25	21.3	17	10
5	-30	15.1	11	10
18	-30	13.4	9	15
27	-30	6.1	5	15
8	-50	7.1	4	5
15	-50	9.6	7	10
29	-50	3.6	3	0
10	-70	9.7	6	5
20	-70	5.6	2	5
22	-70	3.2	0	5
7	120	99.6	73	70
16	120	89.5	64	70
25	120	103.8	72	80
2	58	27.2	24	25
11	58	19.3	19	10
30	58	63.8	52	60

Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	15.0	13.7	12
-10	11.7	9.3	12
75	68.8	58.3	42
40	39.0	31.7	22
25	37.9	31.0	27
-30	11.5	8.3	13
-50	6.8	4.7	5
-70	6.2	2.7	5
120	97.6	69.7	73
58	36.8	31.7	32

Plate: 22

Spec. No.	Location	D Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
1		10	56.7	49	45
5		10	12.1	15	10
6		10	30.6	27	25
2		-10	32.6	28	20
3		-10	22.0	19	15
4		-10	17.4	18	10

Average

Location	D Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
	10	33.1	30.3	27
	-10	24.0	21.7	15

Spec. No.	Location	E Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
1		10	64.5	55	50
14		10	16.9	15	10
27		10	51.7	44	40
9		-10	46.8	40	60
17		-10	53.4	45	60
24		-10	32.4	28	25
4		75	98.2	71	70
19		75	106.3	80	75
23		75	112.0	78	85
3		40	93.2	71	75
18		40	71.2	54	50
22		40	72.4	60	60
8		25	78.2	66	70
12		25	42.4	36	35
25		25	70.8	56	45
2		-30	21.2	17	15
16		-30	6.6	6	10
30		-30	25.1	21	20
7		-50	12.2	11	10
11		-50	10.2	8	5
29		-50	17.6	14	10
5		-70	9.1	6	5
13		-70	4.3	1	5
21		-70	6.1	3	5
10		120	133.8	82	75
15		120	127.5	82	80
28		120	135.8	90	85
6		58	92.8	70	75
20		58	91.6	72	75
26		58	87.9	68	75

Location	E Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
	10	44.4	38.0	33
	-10	44.2	37.7	48
	75	105.5	76.3	77
	40	78.9	61.7	62
	25	63.8	52.7	50
	-30	17.6	14.7	15
	-50	13.3	11.0	8
	-70	6.5	3.3	5
	120	132.4	84.7	80
	58	90.8	70.0	75

Spec. No.	Location	F Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
2		10	35.3	30	35
3		10	59.8	52	50
5		10	65.7	57	75
1		-10	42.3	34	40
4		-10	48.9	42	50
6		-10	42.4	36	40

Location	F Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
	10	53.6	46.3	53
	-10	44.5	37.3	43

Plate: 22

Spec. No.	Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
3	10	10.7	11	10
14	10	37.8	32	40
28	10	47.9	41	50
2	-10	15.8	13	10
19	-10	30.1	25	15
30	-10	27.8	21	25
8	75	61.8	53	60
12	75	95.6	78	75
26	75	89.4	73	75
10	40	58.8	48	30
17	40	47.6	40	30
25	40	23.1	19	10
5	25	59.2	50	60
20	25	58.4	48	40
21	25	55.2	47	40
9	-30	5.7	3	10
16	-30	34.4	27	20
23	-30	8.9	7	10
4	-50	5.2	3	5
13	-50	8.0	4	10
29	-50	4.9	3	0
1	-70	6.1	2	5
18	-70	4.7	2	5
27	-70	8.3	6	5
7	120	104.6	75	75
11	120	99.1	72	75
24	120	95.5	71	70
6	58	64.9	57	50
15	58	81.6	65	65
22	58	65.9	56	60

Average

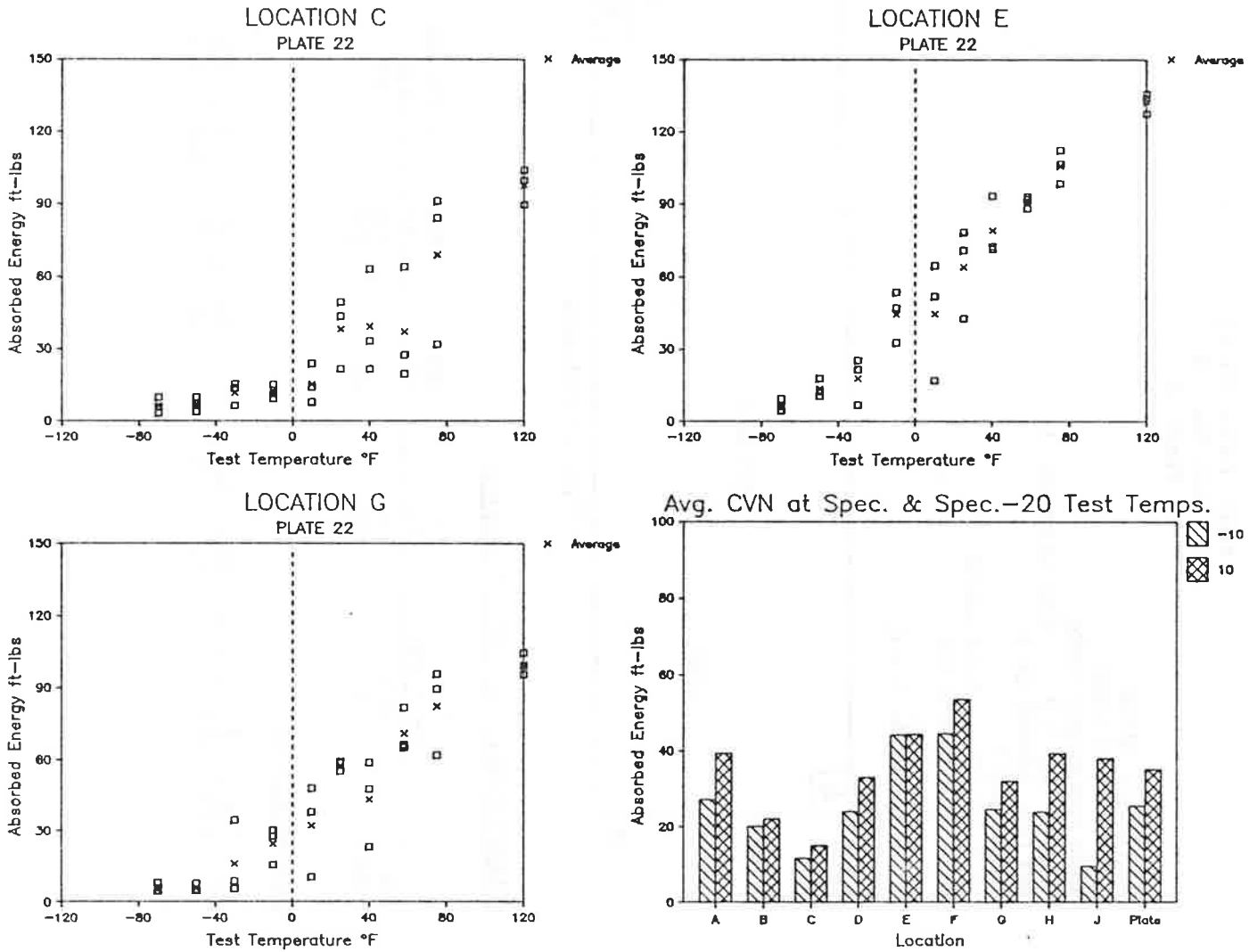
Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
10	32.1	28.0	33
-10	24.6	19.7	17
75	82.3	68.0	70
40	43.2	35.7	23
25	57.6	48.3	47
-30	16.3	12.3	13
-50	6.0	3.3	5
-70	6.4	3.3	5
120	99.7	72.7	73
58	70.8	59.3	58

Spec. No.	Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
1	10	32.8	26	40
4	10	56.7	48	60
5	10	28.8	25	30
2	-10	10.3	7	10
3	-10	10.8	11	10
6	-10	50.5	43	50

Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
10	39.4	33.0	43
-10	23.9	20.3	23

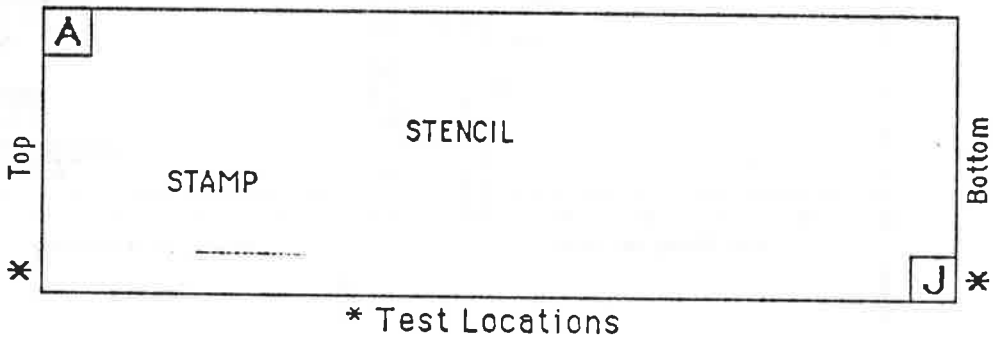
Spec. No.	Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
1	10	30.5	26	20
3	10	17.8	15	15
6	10	66.2	57	70
2	-10	6.5	5	10
4	-10	14.9	12	10
5	-10	7.4	5	10

Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
10	38.2	32.7	35
-10	9.6	7.3	10


LOCATION C
PLATE 22
Average
Absorbed Energy ft-lbs
Test Temperature °F
LOCATION E
PLATE 22
Average
Absorbed Energy ft-lbs
Test Temperature °F
LOCATION G
PLATE 22
Average
Absorbed Energy ft-lbs
Test Temperature °F
Avg. CVN at Spec. & Spec.-20 Test Temps.
-10
10
Absorbed Energy ft-lbs
A
B
C
D
E
F
G
H
J
Plate
Location

MILL DATA SHEET
Plate No: 23
Manf: 4

Heat Number: 1R2580
Yield Point (psi): 54000
Tensile Strength (psi): 81500
Elongation (%): 31.0 (Gage Length (in): 2)
Steel Type: A588-85 Gr. A
Thickness (in): 2
Length (in): 480 Width (in): 60
Notes: Fine Grain Practice
Normalized
Spec. Code: 01W 02



CHARPY IMPACT MILL TESTS (foot-lbs)

	Test Temp. (°F)	Test #1	Test #2	Test #3	CVN Test Avg.
Top	+10	124	98	116	113
Bottom	+10	100	100	126	109

Chemical Analysis

C	Mn	P	S	Si	Cu	Ni	Cr	V	Al	Cb
.16	1.15	.012	.011	.460	.310	.23	.60	.060	.034	NA

Plate: 23
Date: June 2, 1989 Windage: 0
Spec. Temp: + 10 F Personnel: DAG

Spec. No.	Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
1	10	120.1	83	95
3	10	106.4	74	90
6	10	91.7	69	85
2	-10	82.9	66	70
4	-10	64.8	56	65
5	-10	77.7	62	75

Average Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	106.1	75.3	90
-10	75.1	61.3	70

Spec. No.	Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
2	10	112.9	79	100
3	10	111.8	78	95
5	10	74.7	57	85
1	-10	98.2	76	90
4	-10	74.9	59	75
6	-10	88.1	68	85

Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	99.8	71.3	93
-10	87.1	67.7	83

Spec. No.	Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
5	10	97.8	71	85
12	10	112.3	78	95
29	10	124.7	83	100
1	-10	123.1	79	100
15	-10	83.9	63	85
26	-10	76.8	58	85
3	75	149.3	94	100
19	75	163.8	92	100
25	75	160.2	87	100
10	40	139.1	89	100
13	40	139.9	79	100
27	40	164.3	88	100
8	25	112.4	76	95
16	25	123.8	78	100
23	25	131.6	81	100
7	-30	82.3	66	75
17	-30	76.1	61	70
22	-30	90.1	73	80
2	-50	73.4	60	60
18	-50	56.2	46	55
30	-50	77.3	63	65
6	-70	67.9	56	60
11	-70	28.1	64	65
28	-70	48.9	40	50
9	-100	47.0	41	35
14	-100	7.5	4	0
21	-100	30.7	27	30
4	100	155.2	92	100
20	100	149.4	84	95
24	100	157.6	89	95

Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	111.6	77.3	93
-10	94.6	66.7	90
75	157.8	91.0	100
40	147.8	85.3	100
25	122.6	78.3	98
-30	82.8	66.7	75
-50	69.0	56.3	60
-70	48.3	53.3	58
-100	28.4	24.0	22
100	154.1	88.3	97

Plate: 23

Spec. No.	Location	D Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
3		10	72.3	54	65
5		10	74.7	55	70
6		10	108.2	76	75
1		-10	66.1	52	65
2		-10	80.2	62	75
4		-10	97.8	76	85

Average

Location	D Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
	10	85.1	61.7	70
	-10	81.4	63.3	75

Spec. No.	Location	E Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
9		10	81.8	61	85
12		10	61.9	49	70
22		10	96.2	71	85
3		-10	29.3	32	30
19		-10	77.8	61	65
28		-10	49.6	40	55
7		75	134.4	89	100
20		75	127.2	89	100
24		75	155.4	83	100
5		40	106.9	80	90
13		40	127.1	78	95
27		40	116.8	82	95
4		25	87.0	62	80
16		25	120.9	78	90
30		25	99.7	76	90
1		-30	60.1	49	55
18		-30	60.0	49	60
23		-30	58.8	48	60
8		-50	28.8	24	20
14		-50	30.6	27	20
29		-50	47.8	38	30
10		-70	38.4	31	30
11		-70	30.6	25	30
21		-70	54.3	43	40
2		-100	14.2	12	5
17		-100	28.4	26	20
25		-100	10.7	10	0
6		100	138.7	85	95
15		100	150.1	77	80
26		100	147.6	87	95

Location	E Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
	10	80.0	60.3	80
	-10	52.2	44.3	50
	75	139.0	87.0	100
	40	116.9	80.0	93
	25	102.5	72.0	87
	-30	59.6	48.7	58
	-50	35.7	29.7	23
	-70	41.1	33.0	33
	-100	17.8	16.0	8
	100	145.5	83.0	90

Spec. No.	Location	F Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
2		10	107.0	81	100
4		10	70.4	53	75
5		10	84.5	64	75
1		-10	65.9	51	70
3		-10	89.8	71	85
6		-10	99.3	73	85

Location	F Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
	10	87.3	66.0	83
	-10	85.0	65.0	80

Plate: 23

Spec. No.	Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
8	10	108.4	72	95
14	10	90.1	65	80
21	10	92.5	69	90
4	-10	108.4	77	100
16	-10	93.6	67	100
23	-10	111.8	80	100
10	75	143.6	89	100
13	75	147.5	87	100
27	75	150.2	86	100
2	40	127.2	78	100
19	40	127.5	78	100
25	40	108.4	78	100
5	25	131.3	91	100
17	25	112.4	75	85
29	25	120.2	83	95
7	-30	104.2	81	85
11	-30	84.1	65	80
28	-30	75.2	61	70
1	-50	54.2	44	55
15	-50	64.7	52	55
26	-50	63.9	51	55
6	-70	60.8	49	50
18	-70	51.4	42	40
24	-70	63.8	51	60
3	-100	16.8	15	5
12	-100	44.3	38	40
30	-100	35.9	33	30
9	100	167.2	89	95
20	100	150.3	88	90
22	100	158.0	91	95

Average

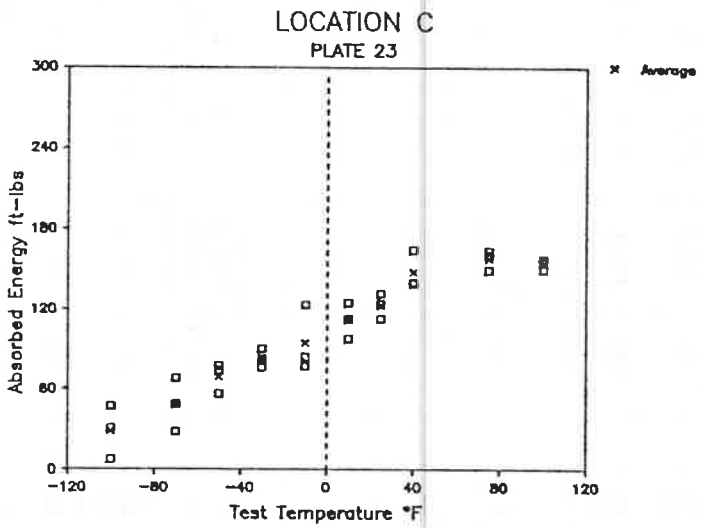
Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
10	97.0	68.7	88
-10	104.6	74.7	100
75	147.1	87.3	100
40	121.0	78.0	100
25	121.3	83.0	93
-30	87.8	69.0	78
-50	60.9	49.0	55
-70	58.7	47.3	50
-100	32.3	28.7	25
100	158.5	89.3	93

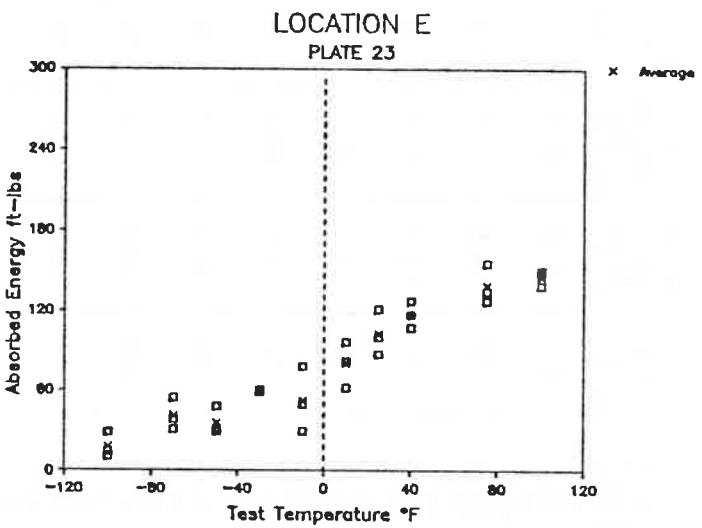
Spec. No.	Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
1	10	113.8	77	100
5	10	83.8	64	80
6	10	91.3	66	85
2	-10	101.6	76	85
3	-10	65.1	51	65
4	-10	83.0	63	80

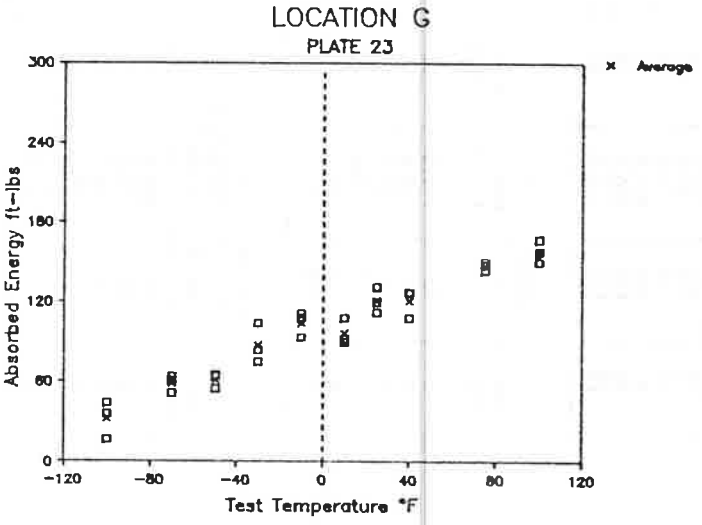
Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
10	96.3	69.0	88
-10	83.2	63.3	77

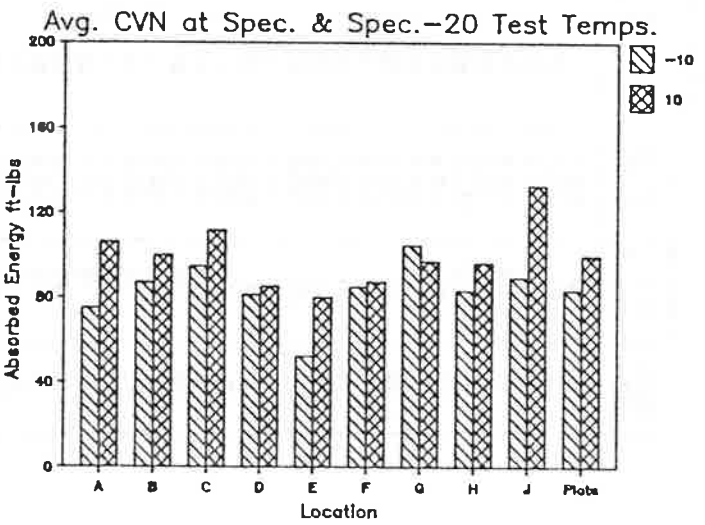
Spec. No.	Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
1	10	164.9	87	100
3	10	126.2	79	95
5	10	108.1	73	85
2	-10	88.3	67	90
4	-10	94.3	74	85
6	-10	85.8	66	80

Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
10	133.1	79.7	93
-10	89.5	69.0	85


LOCATION C
PLATE 23
× Average
Absorbed Energy ft-lbs
300
240
180
120
60
0
−120
−80
−40
0
40
80
120
Test Temperature °F

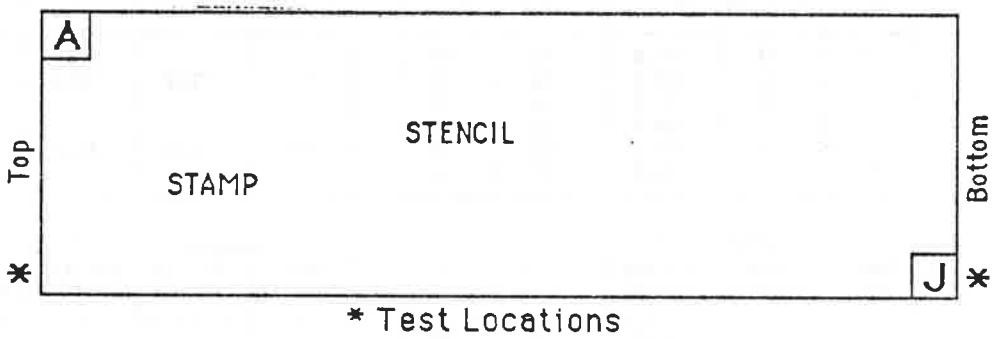

LOCATION E
PLATE 23
× Average
Absorbed Energy ft-lbs
300
240
180
120
60
0
−120
−80
−40
0
40
80
120
Test Temperature °F


LOCATION G
PLATE 23
× Average
Absorbed Energy ft-lbs
300
240
180
120
60
0
−120
−80
−40
0
40
80
120
Test Temperature °F


Avg. CVN at Spec. & Spec.−20 Test Temps.
−10
10
Absorbed Energy ft-lbs
200
160
120
80
40
0
A
B
C
D
E
F
G
H
J
Plots
Location

MILL DATA SHEET
Plate No: 24
Manf: 4

Heat Number: 1R2580
Yield Point (psi): 57000
Tensile Strength (psi): 83000
Elongation (%): 30.0 (Gage Length (in): 2)
Steel Type: A588-85 Gr. A
Thickness (in): 2
Length (in): 240 Width (in): 60
Notes: Fine Grain Practice
Normalized
Spec. Code: 04W 01



CHARPY IMPACT MILL TESTS (foot-lbs)

	Test Temp. (°F)	Test #1	Test #2	Test #3	CVN Test Avg.
Top	+10	85	92	70	82
Bottom	+10	94	81	90	88

Chemical Analysis

C	Mn	P	S	Si	Cu	Ni	Cr	V	Al	Cb
.16	1.15	.012	.011	.460	.310	.23	.60	.060	.034	NA

Plate: 24
Date: June 6, 1989 Windage: 0
Spec. Temp: + 10 F Personnel: DAG

Spec. No.	Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
2	10	69.8	58	70
4	10	81.0	64	95
5	10	73.1	56	80
1	-10	72.3	63	75
3	-10	73.5	61	65
6	-10	77.9	62	75

Average Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	74.6	59.3	82
-10	74.6	62.0	72

Spec. No.	Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
1	10	80.8	64	95
3	10	69.0	56	70
6	10	68.8	54	70
2	-10	69.9	56	50
4	-10	56.2	51	45
5	-10	70.3	57	60

Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	72.9	58.0	78
-10	65.5	54.7	52

Spec. No.	Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
2	10	94.9	72	90
14	10	64.9	61	70
30	10	68.8	55	75
6	-10	60.4	50	60
16	-10	45.5	39	35
23	-10	54.1	44	50
4	75	122.3	87	95
18	75	110.4	77	90
27	75	115.5	79	90
9	40	76.4	63	75
11	40	101.2	77	85
24	40	91.8	70	90
1	25	105.8	74	60
19	25	90.7	72	80
22	25	85.8	66	85
10	-30	51.6	44	40
13	-30	51.9	20	35
29	-30	52.2	45	40
8	-50	33.1	31	15
17	-50	45.7	39	40
25	-50	45.6	39	40
5	-70	38.3	32	25
12	-70	35.7	34	20
28	-70	32.8	32	20
3	-100	25.7	23	10
20	-100	11.6	10	0
26	-100	26.9	27	20
7	100	114.7	89	85
15	100	122.7	92	90
21	100	119.6	85	85

Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	76.2	62.7	78
-10	53.3	44.3	48
75	116.1	81.0	92
40	89.8	70.0	83
25	94.1	70.7	75
-30	51.9	36.3	38
-50	41.5	36.3	32
-70	35.6	32.7	22
-100	21.4	20.0	10
100	119.0	88.7	87

Plate: 24

Spec. No.	Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
2	10	84.9	67	95
3	10	74.7	59	75
5	10	70.6	54	70
1	-10	63.4	52	50
4	-10	77.1	61	65
6	-10	68.9	54	60

Average

Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
10	76.7	60.0	80
-10	69.8	55.7	58

Spec. No.	Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
4	10	63.8	52	85
16	10	78.2	63	95
28	10	65.5	49	70
6	-10	67.9	67	60
13	-10	54.2	48	40
25	-10	59.1	50	45
2	75	117.4	83	100
15	75	107.8	81	95
29	75	107.8	80	95
9	40	112.8	80	90
18	40	100.4	74	70
21	40	106.7	82	85
8	25	75.7	61	90
12	25	75.9	61	90
26	25	81.8	66	95
1	-30	59.3	50	45
19	-30	40.4	38	30
23	-30	32.8	31	15
5	-50	30.3	29	20
17	-50	26.8	25	10
22	-50	38.5	32	25
10	-70	33.8	28	25
14	-70	9.8	12	0
27	-70	26.9	23	15
3	-100	21.6	21	10
11	-100	4.2	3	0
30	-100	8.3	7	0
7	100	106.8	84	85
20	100	110.9	79	85
24	100	101.9	78	85

Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
10	69.2	54.7	83
-10	60.4	55.0	48
75	111.0	81.3	97
40	106.6	78.7	82
25	77.8	62.7	92
-30	44.2	39.7	30
-50	31.9	28.7	18
-70	23.5	21.0	13
-100	11.4	10.3	3
100	106.5	80.3	85

Spec. No.	Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
1	10	69.0	58	80
4	10	71.6	59	80
6	10	82.9	68	100
2	-10	58.1	48	60
3	-10	72.4	59	70
5	-10	69.9	49	70

Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
10	74.5	61.7	87
-10	66.8	52.0	67

Plate: 24

Spec. No.	Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
9	10	74.2	59	85
19	10	72.1	62	85
22	10	60.9	49	70
3	-10	65.3	55	60
15	-10	72.1	58	70
27	-10	74.5	59	65
7	75	108.6	81	100
11	75	99.5	74	95
24	75	109.9	84	100
1	40	122.2	87	90
17	40	83.0	66	85
29	40	86.2	69	85
4	25	90.8	69	90
20	25	123.4	89	95
23	25	78.9	62	75
8	-30	55.4	45	40
14	-30	55.9	47	40
30	-30	42.8	31	25
2	-50	49.6	44	35
12	-50	41.1	35	30
28	-50	30.2	28	25
6	-70	38.9	35	35
18	-70	33.2	28	20
21	-70	10.6	12	0
10	-100	6.2	4	0
16	-100	14.2	13	5
25	-100	8.3	9	0
5	100	125.8	84	90
13	100	118.3	76	85
26	100	115.6	85	95

Average

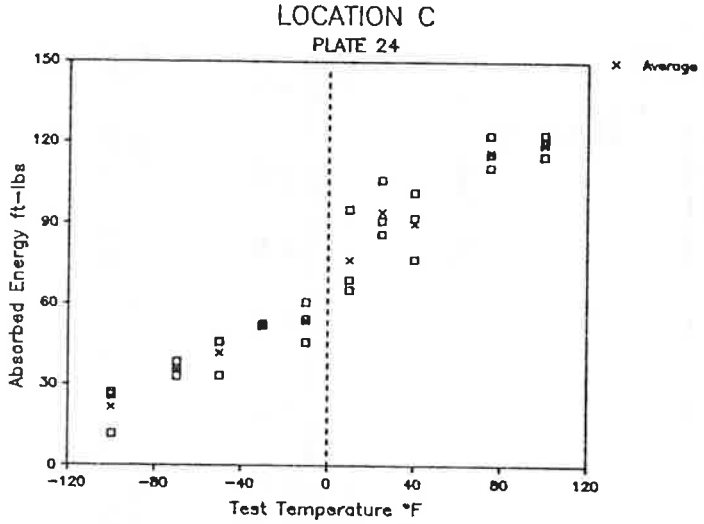
Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
10	69.1	56.7	80
-10	70.6	57.3	65
75	106.0	79.7	98
40	97.1	74.0	87
25	97.7	73.3	87
-30	51.4	41.0	35
-50	40.3	35.7	30
-70	27.6	25.0	18
-100	9.6	8.7	2
100	119.9	81.7	90

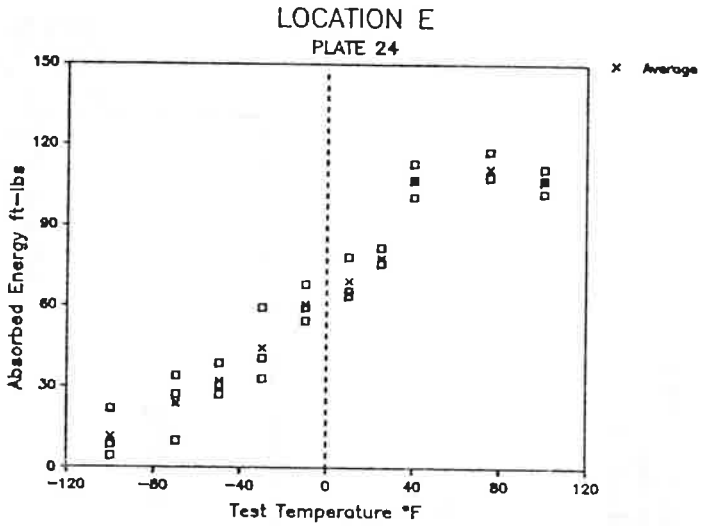
Spec. No.	Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
1	10	85.4	74	95
2	10	86.0	78	90
4	10	63.7	52	70
3	-10	64.8	54	55
5	-10	44.2	39	30
6	-10	54.9	46	40

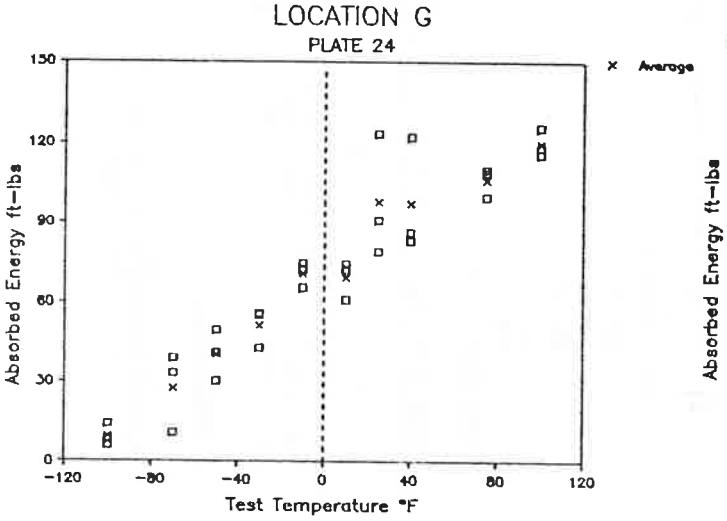
Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
10	78.4	68.0	85
-10	54.6	46.3	42

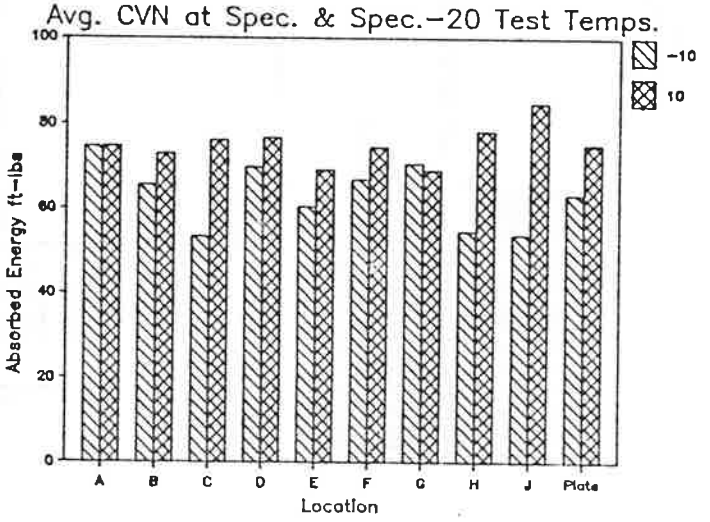
Spec. No.	Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
3	10	82.2	62	90
5	10	86.3	64	90
6	10	86.1	78	100
1	-10	62.3	52	45
2	-10	54.4	50	40
4	-10	44.9	44	30

Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
10	84.9	68.0	93
-10	53.9	48.7	38


LOCATION C
PLATE 24
× Average
Absorbed Energy ft-lbs
Test Temperature °F

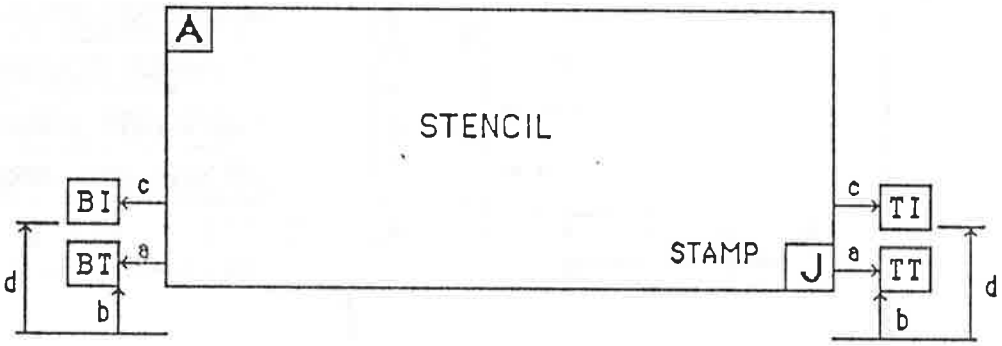

LOCATION E
PLATE 24
× Average
Absorbed Energy ft-lbs
Test Temperature °F


LOCATION G
PLATE 24
× Average
Absorbed Energy ft-lbs
Test Temperature °F


Avg. CVN at Spec. & Spec.-20 Test Temps.
-10
10
Absorbed Energy ft-lbs
A
B
C
D
E
F
G
H
J
Plate
Location

MILL DATA SHEET
Plate No: 25
Manf: 1

Serial Number: X056425
Heat Number: 803Z73690
Yield Point (psi): 59500
Tensile Strength (psi): 81300
Elongation (%): 26 - (Gage Length (in): 2)
Steel Type: A588-82 Gr. B
Thickness (in): 2
Length (in): 480 Width (in): 60
Notes: Control Rolled



Bottom
Ba : 0"
Bb : 1"
Bc : 0"
Bd : 17"
Spec. Code : T45

Top
Ta : 0"
Tb : 1"
Tc : 0"
Td : 17"
Spec. Code : T44

CHARPY IMPACT MILL TESTS (foot-lbs)

	Test Temp	Test #1 CVN	Lt.Ex.	%Sh.	Test #2 CVN	Lt.Ex.	%Sh.	Test #3 CVN	Lt.Ex.	%Sh.	CVN Avg
Top	+10°F	35	-36----	10	25	35	20	45	51	40	35
Bot	+10°F	40	40	30	39	37	30	51	49	50	43

Chemical Analysis

C	Mn	P	S	Si	Cu	Ni	Cr	V	Al	Cb
.12	1.14	.014	.020	.376	.282	.30	.57	.017	.060	NA

Plate: 25
Date: June 9, 1989 Windage: 0
Spec. Temp: + 10 F Personnel: DAG

Spec. No.	Location Test Temp-°F	A Energy ft-lbs	Lat Exp mils	% Shear
1	10	22.3	27	5
5	10	24.5	27	10
6	10	33.2	34	25
2	-10	19.4	23	5
3	-10	26.3	26	15
4	-10	14.6	28	0

Average Location Test Temp-°F	A Energy ft-lbs	Lat Exp mils	% Shear
10	26.7	29.3	13
-10	20.1	25.7	7

Spec. No.	Location Test Temp-°F	B Energy ft-lbs	Lat Exp mils	% Shear
1	10	23.2	31	5
3	10	60.8	59	50
4	10	54.4	51	40
2	-10	33.7	33	20
5	-10	24.2	25	10
6	-10	15.2	20	0

Location Test Temp-°F	B Energy ft-lbs	Lat Exp mils	% Shear
10	46.1	47.0	32
-10	24.4	26.0	10

Spec. No.	Location Test Temp-°F	C Energy ft-lbs	Lat Exp mils	% Shear
7	10	57.2	51	40
12	10	50.9	48	35
25	10	18.1	22	5
5	-10	26.3	27	10
19	-10	45.4	41	40
29	-10	21.8	28	0
3	77	154.2	95	100
11	77	108.7	79	85
27	77	123.9	90	95
10	40	88.1	77	85
17	40	103.2	86	90
23	40	92.6	77	85
8	25	72.1	66	75
15	25	77.8	66	65
28	25	24.7	38	20
1	-30	9.8	13	0
16	-30	27.9	26	20
22	-30	17.7	20	10
2	-50	12.0	14	0
13	-50	9.6	11	0
30	-50	10.2	15	0
6	-70	6.6	6	0
18	-70	6.7	7	0
24	-70	8.2	9	0
4	60	93.6	70	90
20	60	223.8	100	100
21	60	130.7	78	95
9	100	229.5	96	100
14	100	172.4	82	85
26	100	157.4	88	90

Location Test Temp-°F	C Energy ft-lbs	Lat Exp mils	% Shear
10	42.1	40.3	27
-10	31.2	32.0	17
77	128.9	88.0	93
40	94.6	80.0	87
25	58.2	56.7	53
-30	18.5	19.7	10
-50	10.6	13.3	0
-70	7.2	7.3	0
60	149.4	82.7	95
100	186.4	88.7	92

Plate: 25

Spec. No.	Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
2	10	50.1	48	40
3	10	43.1	41	20
5	10	26.7	33	10
1	-10	24.9	45	20
4	-10	35.8	34	20
6	-10	17.1	21	5

Average

Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
10	40.0	40.7	23
-10	25.9	33.3	15

Spec. No.	Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
4	10	45.3	55	40
16	10	56.1	52	50
24	10	63.0	59	50
9	-10	17.4	22	0
15	-10	16.7	21	5
27	-10	27.9	30	15
2	77	123.8	88	95
18	77	126.1	96	100
29	77	119.8	85	95
6	40	59.8	59	80
12	40	78.8	72	95
22	40	56.2	51	80
10	25	60.1	55	50
17	25	82.7	68	80
23	25	73.2	70	70
5	-30	16.1	18	0
13	-30	43.8	43	40
28	-30	8.4	10	0
7	-50	9.8	10	0
14	-50	7.8	18	0
21	-50	8.6	9	0
3	-70	4.7	4	0
19	-70	9.4	9	0
30	-70	7.4	7	0
1	60	118.6	94	90
20	60	118.4	86	90
25	60	123.6	88	95
8	100	129.8	97	100
11	100	125.7	84	90
26	100	127.2	83	90

Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
10	54.8	55.3	47
-10	20.7	24.3	7
77	123.2	89.7	97
40	64.9	60.7	85
25	72.0	64.3	67
-30	22.8	23.7	13
-50	8.7	12.3	0
-70	7.2	6.7	0
60	120.2	89.3	92
100	127.6	88.0	93

Spec. No.	Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
2	10	29.2	31	25
4	10	23.5	27	0
5	10	37.0	36	20
1	-10	17.6	19	5
3	-10	43.9	43	35
6	-10	13.1	17	0

Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
10	29.9	31.3	15
-10	24.9	26.3	13

Plate: 25

Spec. No.	Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
2	10	27.9	29	10
14	10	12.5	17	5
30	10	10.6	12	5
6	-10	10.4	14	0
17	-10	19.2	19	5
22	-10	12.9	19	5
9	77	117.9	93	100
12	77	87.5	69	95
21	77	82.7	69	90
3	40	43.4	42	70
16	40	38.5	41	65
28	40	42.7	41	70
5	25	58.0	60	50
19	25	39.3	43	30
24	25	31.0	32	20
8	-30	17.0	15	0
15	-30	12.2	16	0
27	-30	6.6	7	0
1	-50	4.1	6	0
18	-50	5.1	4	0
29	-50	7.8	7	0
7	-70	5.6	4	0
11	-70	2.6	3	0
23	-70	4.6	4	0
10	60	62.3	54	50
13	60	61.6	54	50
26	60	64.2	54	50
4	100	100.0	87	85
20	100	103.4	77	80
25	100	132.0	90	85

Average

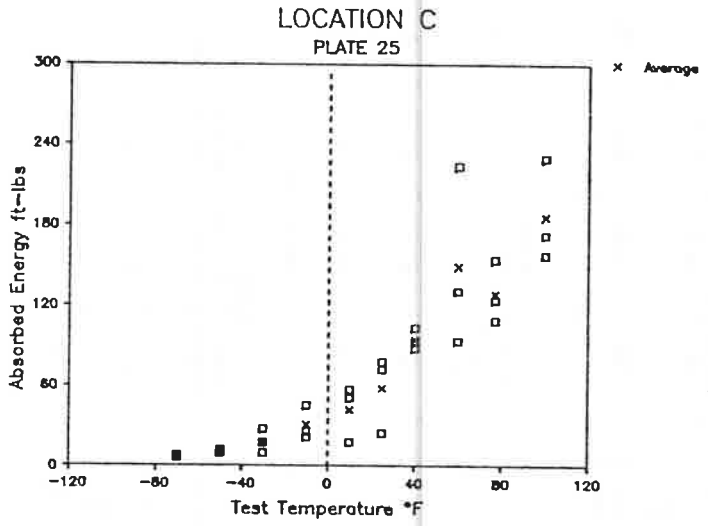
Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
10	17.0	19.3	7
-10	14.2	17.3	3
77	96.0	77.0	95
40	41.5	41.3	68
25	42.8	45.0	33
-30	11.9	12.7	0
-50	5.7	5.7	0
-70	4.3	3.7	0
60	62.7	54.0	50
100	111.8	84.7	83

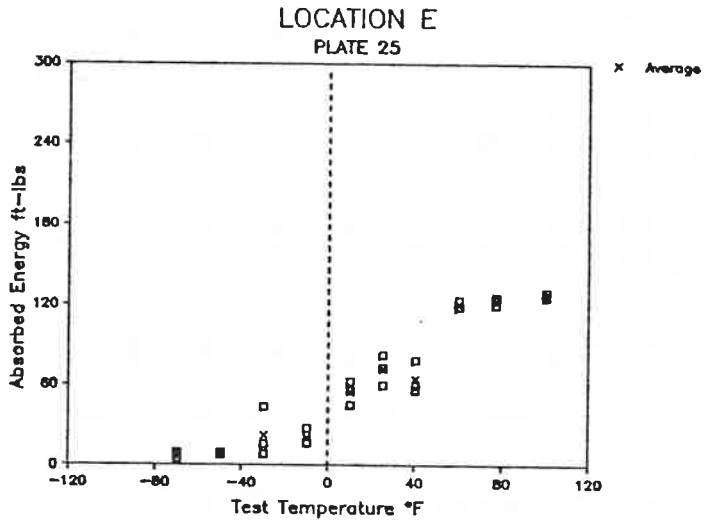
Spec. No.	Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
1	10	25.4	28	5
4	10	17.3	25	0
5	10	22.8	24	5
2	-10	14.4	16	5
3	-10	52.5	48	45
6	-10	12.3	20	0

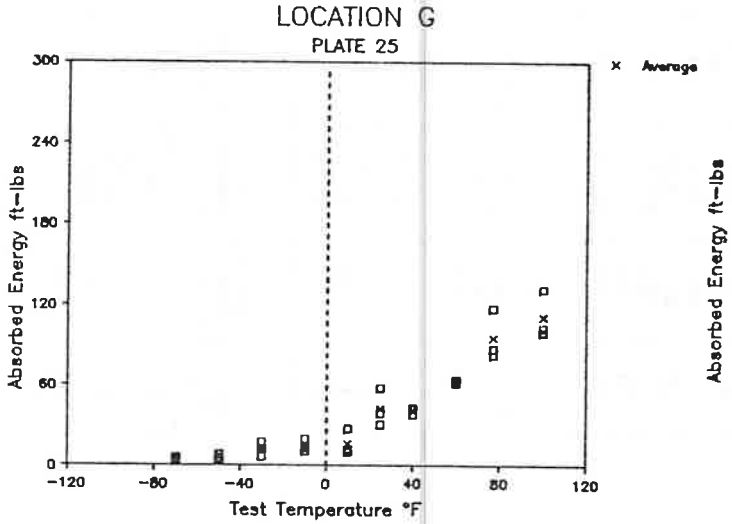
Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
10	21.8	25.7	3
-10	26.4	28.0	17

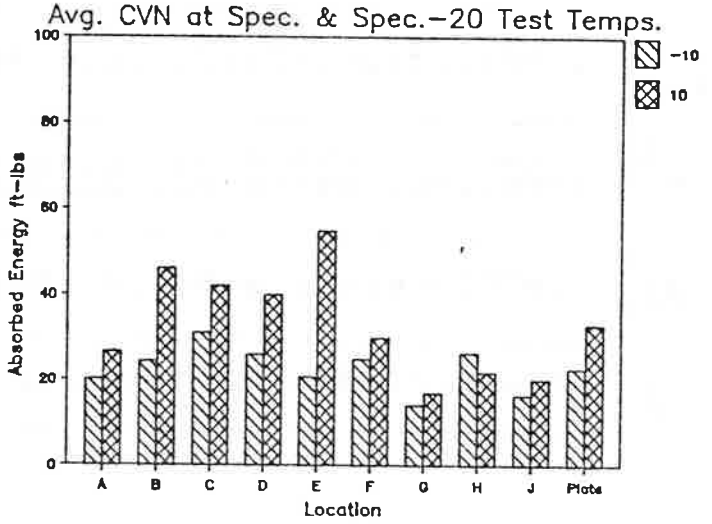
Spec. No.	Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
3	10	19.1	22	0
4	10	25.7	27	5
6	10	15.6	17	0
1	-10	8.9	15	0
2	-10	31.8	31	20
5	-10	8.7	14	0

Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
10	20.1	22.0	2
-10	16.5	20.0	7


LOCATION C
PLATE 25
× Average
Absorbed Energy ft-lbs
300
240
180
120
60
0
−120
−80
−40
0
40
80
120
Test Temperature °F

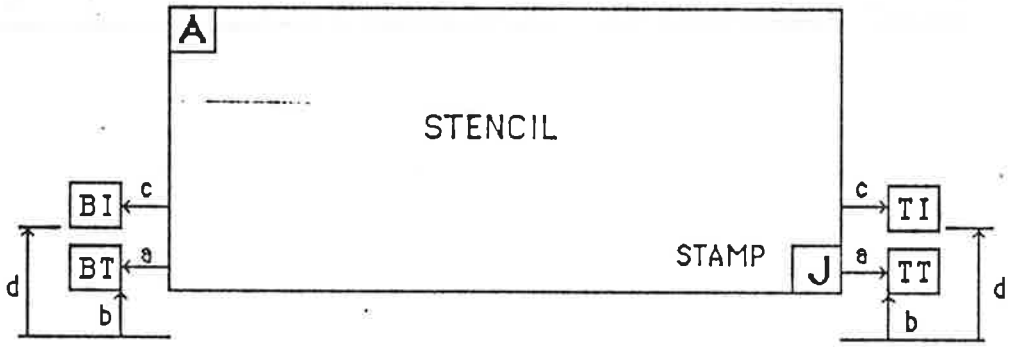

LOCATION E
PLATE 25
× Average
Absorbed Energy ft-lbs
300
240
180
120
60
0
−120
−80
−40
0
40
80
120
Test Temperature °F


LOCATION G
PLATE 25
× Average
Absorbed Energy ft-lbs
300
240
180
120
60
0
−120
−80
−40
0
40
80
120
Test Temperature °F


Avg. CVN at Spec. & Spec.−20 Test Temps.
−10
10
Absorbed Energy ft-lbs
100
80
60
40
20
0
A
B
C
D
E
F
G
H
J
Plate
Location

MILL DATA SHEET
Plate No: 26
Manf: 1

Serial Number: W169738
Heat Number: 802Z34680
Yield Point (psi): 59200
Tensile Strength (psi): 83100
Elongation (%): 25 {Gage Length (in): 2}
Steel Type: A572-85 Gr. 50
Thickness (in): 2
Length (in): 480 Width (in): 60
Notes: Control Rolled
Fine Grain Practice



Bottom
Ba : 0"
Bb : 1.5"
Bc : 0"
Bd : 9.5"
Spec. Code : V34

Top
Ta : 0"
Tb : 1.5"
Tc : 0"
Td : 9.5"
Spec. Code : V33

CHARPY IMPACT MILL TESTS (foot-lbs)

	Test Temp	Test #1 CVN	Lt.Ex.	%Sh.	Test #2 CVN	Lt.Ex.	%Sh.	Test #3 CVN	Lt.Ex.	%Sh.	CVN Avg
Top	+10°F	54	51	50	79	73	70	59	55	40	64
Bot	+10°F	87	77	70	94	76	85	86	72	70	89

Chemical Analysis

C	Mn	P	S	Si	Cu	Ni	Cr	V	Al	Cb
.18	1.25	.014	.013	.233	NA	NA	NA	.055	.053	NA

MILL VERIFICATION CVN RESULTS

Plate No: 26

Manf: 1

Location	Replicate	CVN Absorbed Energy (ft-lbs)			
		Test #1	Test #2	Test #3	CVN Avg.
C	1	32	29	5	22.0
C	2	35	14	14	21.0
J	1	79	81	85	81.7
J	2	57	82	85	74.7

Plate: 26
Date: June 12, 1989 Windage: 0
Spec. Temp: + 10 F Personnel: DAG

Spec. No.	Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
2	10	4.3	3	0
3	10	10.9	10	0
5	10	13.8	11	5
1	-10	10.2	8	5
4	-10	8.3	7	0
6	-10	2.8	3	0

Average Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	9.7	8.0	2
-10	7.1	6.0	2

Spec. No.	Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
1	10	25.7	21	10
3	10	9.6	10	0
4	10	34.1	29	20
2	-10	4.1	4	0
5	-10	10.2	10	5
6	-10	8.6	8	0

Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	23.1	20.0	10
-10	7.6	7.3	2

Spec. No.	Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
2	10	7.5	6	0
15	10	21.2	16	10
27	10	25.8	22	15
10	-10	10.0	8	5
18	-10	15.2	16	10
24	-10	6.1	4	0
7	80	47.7	38	35
13	80	43.4	37	40
25	80	40.1	36	40
1	40	43.2	35	40
19	40	30.1	27	20
28	40	16.4	14	0
9	25	15.8	14	5
12	25	9.4	9	0
26	25	25.2	21	20
4	-30	7.1	5	0
16	-30	4.6	5	0
23	-30	4.2	1	0
5	-50	6.2	9	0
14	-50	6.1	9	5
29	-50	3.4	5	0
8	60	43.2	41	40
20	60	41.1	35	30
22	60	30.3	25	20
6	100	54.9	47	50
17	100	64.6	55	60
21	100	51.4	50	50
3	-70	3.2	1	0
11	-70	4.2	6	0
30	-70	4.2	6	0

Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	18.2	14.7	8
-10	10.4	9.3	5
80.2	43.7	37.0	38
40	29.9	25.3	20
25	16.8	14.7	8
-30	5.3	3.7	0
-50	5.2	7.7	2
60	38.2	33.7	30
100	57.0	50.7	53
-70	3.9	4.3	0

Plate: 26

Spec. No.	Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
1	10	24.2	25	20
2	10	35.3	31	25
6	10	25.9	24	15
3	-10	37.4	32	30
4	-10	10.1	9	0
5	-10	13.6	12	5

Average

Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
10	28.5	26.7	20
-10	20.4	17.7	12

Spec. No.	Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
6	10	45.3	39	30
18	10	41.0	48	45
24	10	50.4	44	40
5	-10	19.6	19	10
14	-10	40.1	34	30
26	-10	28.4	26	20
3	80	81.2	82	90
16	80	57.3	53	70
29	80	78.8	66	85
8	40	62.7	55	50
11	40	21.9	32	10
23	40	57.8	52	40
1	25	50.8	55	45
19	25	56.8	49	40
25	25	50.6	46	45
7	-30	21.3	23	15
13	-30	11.2	11	0
30	-30	5.7	5	0
9	-50	6.7	5	0
12	-50	4.8	4	0
21	-50	3.8	2	0
4	60	61.7	57	55
17	60	57.3	50	50
28	60	64.6	52	45
2	100	104.3	82	90
20	100	92.7	74	80
27	100	95.3	74	80
10	-70	3.7	4	0
15	-70	3.3	4	0
22	-70	8.6	7	0

Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
10	45.6	43.7	38
-10	29.4	26.3	20
80.2	72.4	67.0	82
40	47.5	46.3	33
25	52.7	50.0	43
-30	12.7	13.0	5
-50	5.1	3.7	0
60	61.2	53.0	50
100	97.4	76.7	83
-70	5.2	5.0	0

Spec. No.	Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
3	10	15.1	12	0
5	10	47.9	44	40
6	10	14.0	13	5
1	-10	8.2	7	0
2	-10	17.4	15	5
4	-10	8.1	7	0

Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
10	25.7	23.0	15
-10	11.2	9.7	2

Plate: 26

Spec. No.	Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
3	10	71.5	59	50
20	10	49.6	49	40
22	10	68.1	57	50
8	-10	66.3	56	55
11	-10	61.4	53	50
29	-10	70.9	59	65
5	80	126.4	87	95
14	80	131.2	91	95
30	80	89.7	75	90
10	40	86.5	71	65
17	40	67.2	67	60
24	40	99.5	77	80
6	25	67.1	52	50
15	25	90.4	73	65
23	25	77.3	62	60
2	-30	57.1	50	50
18	-30	34.4	21	15
26	-30	33.2	28	20
4	-50	43.3	38	35
19	-50	9.5	9	0
25	-50	50.8	43	40
9	60	78.2	65	70
12	60	130.8	91	85
21	60	131.9	92	90
7	100	114.8	93	95
13	100	115.2	86	85
28	100	114.3	87	85
1	-70	49.7	45	40
16	-70	9.0	7	0
27	-70	4.3	3	0

Average G

Location Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	63.1	55.0	47
-10	66.2	56.0	57
80.2	115.8	84.3	93
40	84.4	71.7	68
25	78.3	62.3	58
-30	41.6	33.0	28
-50	34.5	30.0	25
60	113.6	82.7	82
100	114.8	88.7	88
-70	21.0	18.3	13

Spec. No.	Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
2	10	64.8	54	45
4	10	57.0	47	40
6	10	67.9	58	50
1	-10	64.8	54	50
3	-10	75.4	64	60
5	-10	55.9	47	50

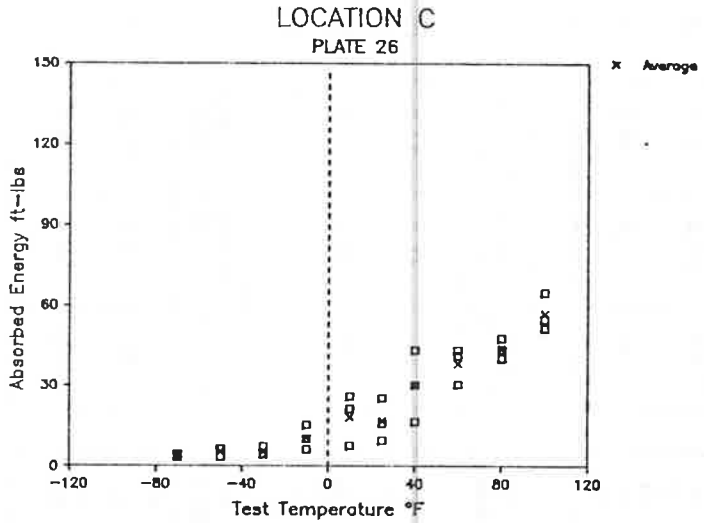
H

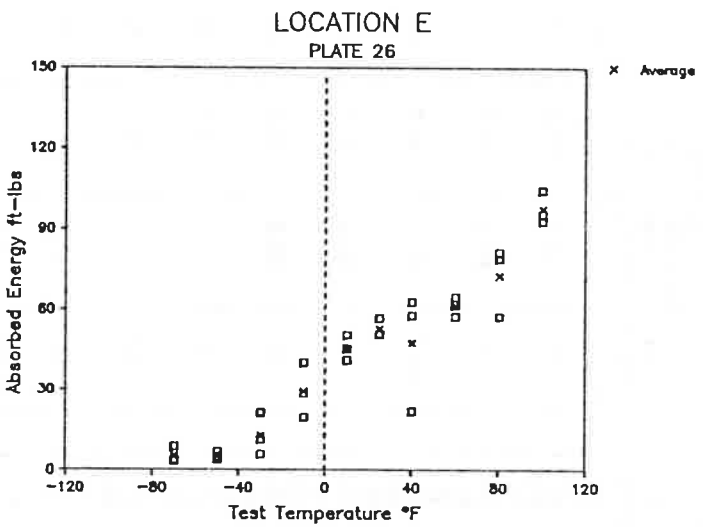
Location Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	63.2	53.0	45
-10	65.4	55.0	53

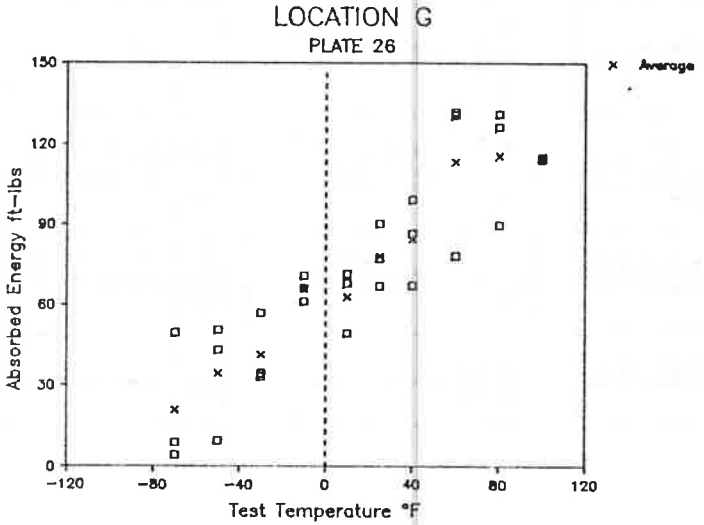
Spec. No.	Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
1	10	75.8	63	60
4	10	54.4	43	40
5	10	56.3	49	55
2	-10	53.5	47	45
3	-10	72.1	61	60
6	-10	43.6	38	40

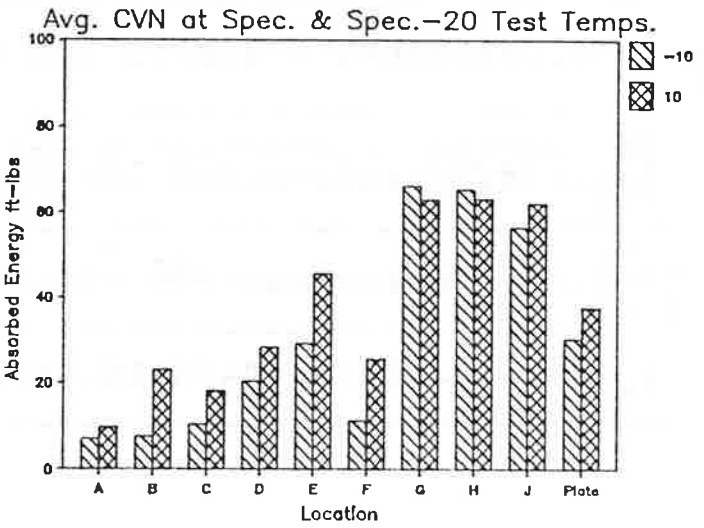
J

Location Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	62.2	51.7	52
-10	56.4	48.7	48


LOCATION C
PLATE 26
Average
Absorbed Energy ft-lbs
Test Temperature °F

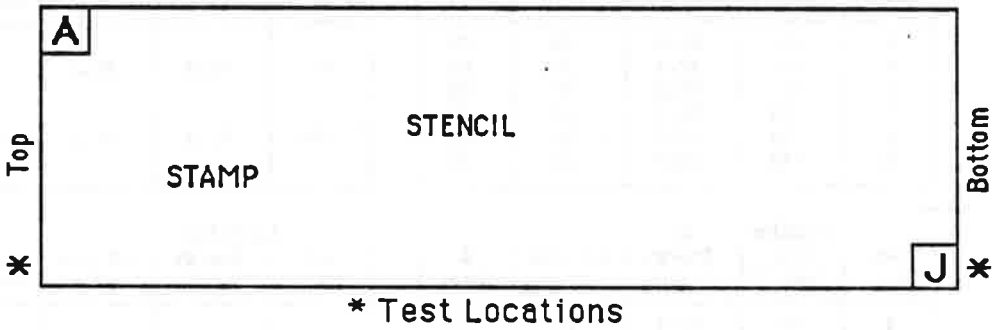

LOCATION E
PLATE 26
Average
Absorbed Energy ft-lbs
Test Temperature °F


LOCATION G
PLATE 26
Average
Absorbed Energy ft-lbs
Test Temperature °F


Avg. CVN at Spec. & Spec.-20 Test Temps.
-10
10
Absorbed Energy ft-lbs
A
B
C
D
E
F
G
H
J
Plate
Location

MILL DATA SHEET
Plate No: 27
Manf: 4

Heat Number: 2R4498
Yield Point (psi): 54000
Tensile Strength (psi): 79000
Elongation (%): 30.0 (Gage Length (in): 2)
Steel Type: A572-85 Gr. 50
Thickness (in): 2
Length (in): 240 Width (in): 60
Notes: Fine Grain Practice
Normalized
Spec. Code: 03W 02



CHARPY IMPACT MILL TESTS (foot-lbs)

	Test Temp. (°F)	Test #1	Test #2	Test #3	CVN Test Avg.
Top	+10	75	80	77	77
Bottom	+10	74	108	72	85

Chemical Analysis

C	Mn	P	S	Si	Cu	Ni	Cr	V	Al	Cb
.21	1.18	.010	.010	.180	NA	NA	NA	.070	NA	NA

Plate: 27
Date: June 14, 1989 Windage: 0
Spec. Temp: + 10 F Personnel: DAG

Spec. No.	Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
1	10	98.3	76	75
2	10	89.2	68	70
4	10	71.5	59	50
3	-10	78.4	63	55
5	-10	64.5	54	50
6	-10	89.0	67	65

Average Location A

Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	86.3	67.7	65
-10	77.3	61.3	57

Spec. No.	Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
3	10	93.9	76	75
4	10	97.1	77	80
5	10	90.8	81	80
1	-10	85.3	67	65
2	-10	67.7	56	45
6	-10	78.8	70	70

Location B

Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	93.9	78.0	78
-10	77.3	64.3	60

Spec. No.	Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
3	10	67.1	61	50
12	10	61.9	52	40
26	10	69.0	56	50
8	-10	59.4	60	50
20	-10	50.9	52	45
24	-10	57.0	49	45
4	75	93.9	82	75
17	75	101.4	86	85
30	75	92.8	77	70
7	40	84.5	72	60
14	40	75.2	60	60
21	40	96.4	76	70
2	25	73.9	63	55
16	25	83.8	66	60
23	25	80.3	65	55
10	-30	31.2	21	5
15	-30	36.9	38	15
27	-30	29.5	23	10
5	-50	26.7	33	20
18	-50	29.8	30	20
29	-50	30.5	31	20
6	-70	19.6	19	5
11	-70	9.6	10	0
22	-70	16.2	13	0
9	-100	9.2	9	0
19	-100	16.1	12	5
25	-100	14.9	9	0
1	100	96.3	76	85
13	100	98.1	74	80
28	100	95.7	75	80

Location C

Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	66.0	56.3	47
-10	55.8	53.7	47
75.4	96.0	81.7	77
40	85.4	69.3	63
25	79.3	64.7	57
-30	32.5	27.3	10
-50	29.0	31.3	20
-70	15.1	14.0	2
-100	13.4	10.0	2
100	96.7	75.0	82

Plate: 27

Spec. No.	Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
1	10	93.0	73	70
3	10	112.4	83	75
5	10	80.4	67	60
2	-10	62.5	53	40
4	-10	76.1	60	45
6	-10	90.2	76	70

Average

Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
10	95.3	74.3	68
-10	76.3	63.0	52

Spec. No.	Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
10	10	71.8	62	50
18	10	79.9	66	70
24	10	89.5	64	65
1	-10	69.2	69	55
12	-10	72.8	60	60
27	-10	67.2	54	55
8	75	94.6	72	80
15	75	103.2	72	75
21	75	109.9	79	85
5	40	102.8	77	75
17	40	105.2	75	70
28	40	92.9	76	60
6	25	89.0	70	55
14	25	99.4	71	60
30	25	105.7	75	70
4	-30	53.5	49	35
16	-30	51.1	49	40
23	-30	36.4	36	20
9	-50	29.8	29	10
19	-50	50.2	42	30
25	-50	38.3	30	25
3	-70	22.5	23	5
11	-70	35.2	30	15
29	-70	23.6	23	10
7	-100	13.4	9	0
13	-100	10.2	10	0
26	-100	14.8	13	5
2	100	108.9	80	85
20	100	101.7	79	80
22	100	113.5	83	95

Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
10	80.4	64.0	62
-10	69.7	61.0	57
75.4	102.6	74.3	80
40	100.3	76.0	68
25	98.0	72.0	62
-30	47.0	44.7	32
-50	39.4	33.7	22
-70	27.1	25.3	10
-100	12.8	10.7	2
100	108.0	80.7	87

Spec. No.	Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
2	10	79.0	64	50
3	10	88.4	72	70
4	10	67.3	63	50
1	-10	56.0	46	35
5	-10	56.7	49	40
6	-10	78.8	66	60

Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
10	78.2	66.3	57
-10	63.8	53.7	45

Plate: 27

Spec. No.	Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
4	10	67.1	61	45
11	10	82.3	66	60
29	10	79.9	65	50
6	-10	59.6	52	40
18	-10	68.8	66	50
22	-10	61.4	50	40
1	75	114.2	85	90
16	75	113.7	84	95
27	75	116.1	78	85
8	40	96.3	78	70
15	40	111.0	76	70
24	40	114.2	78	70
5	25	92.2	81	80
17	25	72.9	61	50
21	25	117.0	80	85
10	-30	57.1	52	45
14	-30	57.3	56	45
28	-30	57.6	50	40
3	-50	36.7	40	20
12	-50	48.6	42	20
26	-50	41.7	38	20
9	-70	31.2	29	20
20	-70	25.3	23	15
23	-70	34.0	30	20
2	-100	26.5	24	15
19	-100	13.7	14	5
30	-100	11.6	11	5
7	100	117.9	81	85
13	100	117.3	81	85
25	100	125.6	85	90

Average

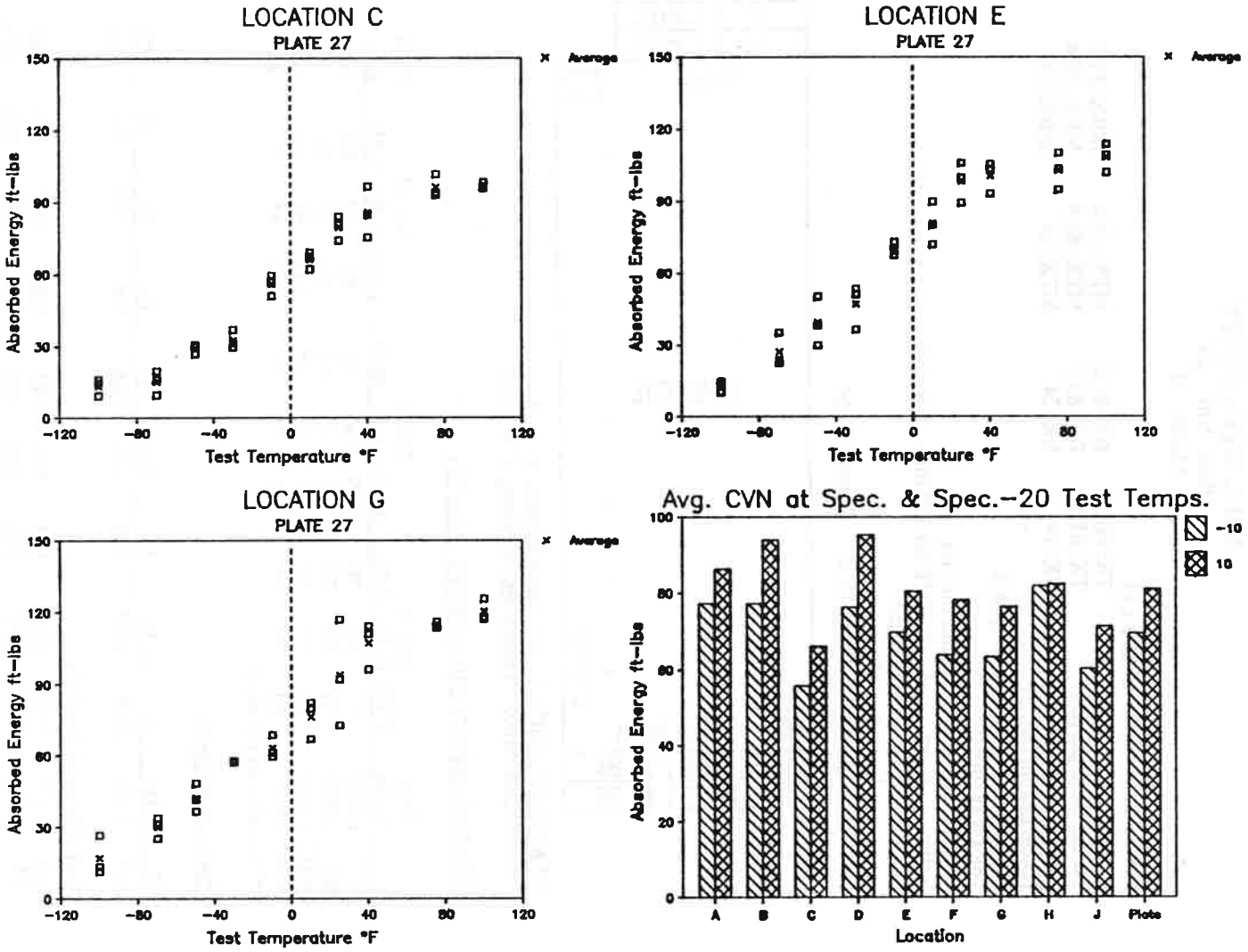
Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
10	76.4	64.0	52
-10	63.3	56.0	43
75.4	114.7	82.3	90
40	107.2	77.3	70
25	94.0	74.0	72
-30	57.3	52.7	43
-50	42.3	40.0	20
-70	30.2	27.3	18
-100	17.3	16.3	8
100	120.3	82.3	87

Spec. No.	Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
1	10	88.9	65	60
4	10	89.0	70	60
5	10	69.3	60	45
2	-10	66.7	54	40
3	-10	100.8	76	70
6	-10	78.1	67	60

Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
10	82.4	65.0	55
-10	81.9	65.7	57

Spec. No.	Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
2	10	59.0	53	40
5	10	70.0	59	50
6	10	85.1	72	65
1	-10	66.8	56	45
3	-10	63.1	57	45
4	-10	51.0	49	40

Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
10	71.4	61.3	52
-10	60.3	54.0	43

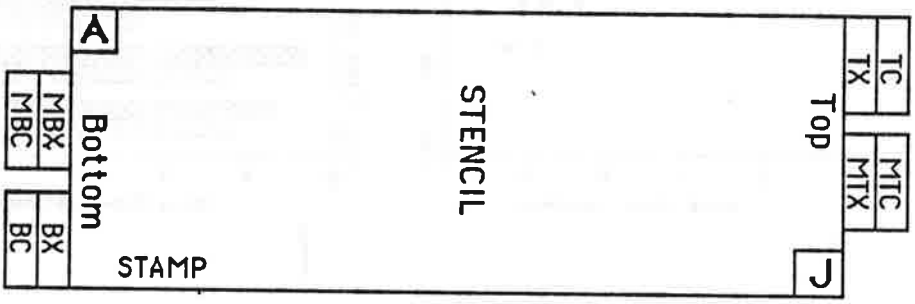

LOCATION C
PLATE 27
Absorbed Energy ft-lbs
Test Temperature °F
x Average
LOCATION E
PLATE 27
Absorbed Energy ft-lbs
Test Temperature °F
x Average
LOCATION G
PLATE 27
Absorbed Energy ft-lbs
Test Temperature °F
x Average
Avg. CVN at Spec. & Spec.-20 Test Temps.
Absorbed Energy ft-lbs
Location
A
B
C
D
E
F
G
H
J
Plate
-10
10

MILL DATA SHEET
Plate No: 28
Manf: 3

Melt/Slab Number: U8880-13A

Yield Point (ksi)	TX: 60.3	BX: 61.6	MTX: 56.4	MBX: 57.8
Tensile Strength (ksi)	TX: 85.5	BX: 85.9	MTX: 85.4	MBX: 85.4
Elongation (%)	TX: 24	BX: 24	MTX: 24	MBX: 24

{Gage Length (in): 2}
Steel Type: A572 Gr. 50 type 2
Thickness (in): 2
Length (in): 480 Width (in): 60
Notes: Normalized at 1650 °F for 105 min. - Air cool
Fine Grain Practice
Bend Test - Pass
Spec. Code - Top: F855 Bottom: F854



TC,MTC,BC,MBC - Charpy test locations, 9" x 3"
TX,MTX,BX,MBX - Tensile test locations, 9" x 2-1/4"

CHARPY IMPACT MILL TESTS (foot-lbs)

	Test Temp	Test #1 CVN	Lt.Ex.	%Sh.	Test #2 CVN	Lt.Ex.	%Sh.	Test #3 CVN	Lt.Ex.	%Sh.	CVN Avg
TC	+10°F	73	62	70	85	66	80	86	67	80	81
BC	+10°F	70	56	70	82	65	60	86	70	80	79
MTC	+10°F	89	**	**	94	**	**	113	**	**	99
MBC	+10°F	60	**	**	64	**	**	84	**	**	69

(** results not reported)

Chemical Analysis

C	Mn	P	S	Si	Cu	Ni	Cr	V	Al	Cb
.23	1.23	.013	.017	.200	NA	NA	NA	.057	NA	NA

Prod. Chemical Analysis

.23	1.25	.011	.018	.190	NA	NA	NA	.057	NA	NA
.23	1.25	.011	.017	.200	NA	NA	NA	.058	NA	NA

Plate: 28
Date: June 14, 1989 Windage: 0
Spec. Temp: + 10 F Personnel: DAG

Spec. No.	Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
3	10	63.7	52	40
4	10	71.1	60	50
5	10	60.1	47	40
1	-10	53.4	43	30
2	-10	64.1	51	40
6	-10	68.0	55	60

Average Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	65.0	53.0	43
-10	61.8	49.7	43

Spec. No.	Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
1	10	89.8	64	60
4	10	67.6	53	40
5	10	73.6	57	55
2	-10	73.8	59	55
3	-10	73.9	59	55
6	-10	52.2	43	30

Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	77.0	58.0	52
-10	66.6	53.7	47

Spec. No.	Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
5	10	70.5	58	45
15	10	89.8	67	55
27	10	75.5	60	50
10	-10	66.9	58	55
17	-10	70.2	56	50
23	-10	58.8	54	40
3	75	107.1	81	85
20	75	107.4	81	80
29	75	111.9	79	80
9	40	72.8	57	50
11	40	87.9	66	60
25	40	108.3	78	75
1	25	81.9	57	55
18	25	82.6	63	60
24	25	82.3	63	60
7	-30	54.5	46	40
13	-30	38.7	34	20
30	-30	49.9	41	40
4	-50	31.5	27	15
14	-50	29.8	25	15
26	-50	35.9	31	20
8	-70	26.8	23	10
16	-70	27.6	24	15
21	-70	26.6	21	10
2	-100	14.5	13	5
19	-100	21.1	14	5
22	-100	25.5	20	20
6	100	105.4	80	85
12	100	108.5	79	85
28	100	107.6	76	85

Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	78.6	61.7	50
-10	65.3	56.0	48
75.4	108.8	80.3	82
40	89.7	67.0	62
25	82.3	61.0	58
-30	47.7	40.3	33
-50	32.4	27.7	17
-70	27.0	22.7	12
-100	20.4	15.7	10
100	107.2	78.3	85

Plate: 28

Spec. No.	Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
2	10	80.1	58	50
3	10	113.8	78	80
5	10	68.5	56	40
1	-10	48.7	43	30
4	-10	62.1	44	40
6	-10	59.1	57	40

Average

Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
10	87.5	64.0	57
-10	56.6	48.0	37

Spec. No.	Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
6	10	86.4	69	65
17	10	68.3	50	40
23	10	83.0	65	60
5	-10	54.6	55	45
11	-10	73.8	57	50
29	-10	74.7	59	50
9	75	110.3	79	80
13	75	107.8	78	75
25	75	108.3	80	75
3	40	113.4	80	80
16	40	104.4	76	75
27	40	101.0	78	75
8	25	91.8	68	70
15	25	72.2	56	50
26	25	88.9	78	65
2	-30	44.4	42	40
18	-30	57.4	46	45
21	-30	58.2	46	40
1	-50	40.6	33	25
19	-50	54.5	44	40
22	-50	35.8	29	20
7	-70	27.5	22	15
12	-70	33.9	28	20
30	-70	30.7	25	15
4	-100	20.7	16	5
20	-100	13.8	11	5
28	-100	12.2	9	5
10	100	110.1	79	85
14	100	110.3	78	85
24	100	115.4	80	85

Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
10	79.2	61.3	55
-10	67.7	57.0	48
75.4	108.8	79.0	77
40	106.3	78.0	77
25	84.3	67.3	62
-30	53.3	44.7	42
-50	43.6	35.3	28
-70	30.7	25.0	17
-100	15.6	12.0	5
100	111.9	79.0	85

Spec. No.	Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
1	10	68.2	50	50
3	10	69.1	54	50
6	10	62.4	49	40
2	-10	50.8	43	40
4	-10	51.5	44	40
5	-10	68.0	57	50

Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
10	66.6	51.0	47
-10	56.8	48.0	43

Plate: 28

Spec. No.	Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
7	10	79.2	61	50
20	10	74.5	53	40
22	10	91.0	68	70
3	-10	70.1	57	50
14	-10	59.6	47	40
26	-10	65.2	53	40
8	75	113.4	81	85
12	75	110.1	83	90
21	75	122.2	83	90
1	40	94.3	69	70
18	40	89.2	68	60
29	40	105.1	78	70
10	25	78.4	62	60
13	25	88.3	62	60
27	25	75.2	56	45
5	-30	65.8	54	50
17	-30	51.7	43	35
25	-30	56.8	47	40
2	-50	50.4	42	40
16	-50	46.0	39	35
28	-50	44.9	38	30
6	-70	10.8	11	0
11	-70	38.0	31	30
24	-70	55.5	45	40
9	-100	16.4	14	5
15	-100	17.6	14	5
23	-100	10.1	8	0
4	100	113.8	77	85
19	100	110.9	84	90
30	100	110.8	78	85

Average

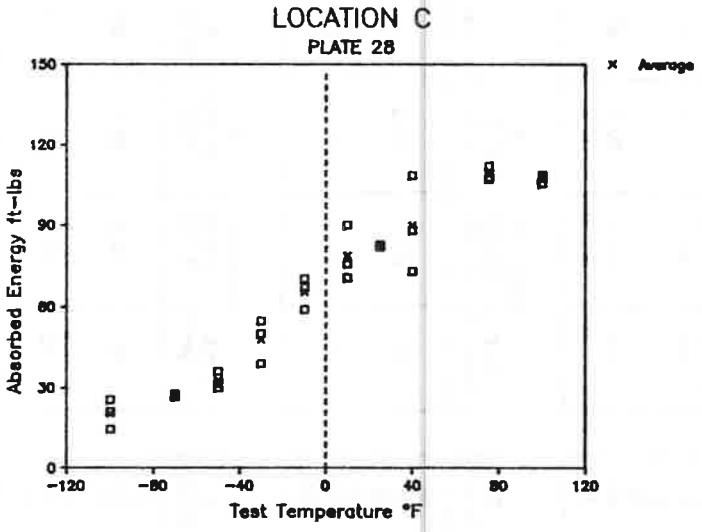
Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
10	81.6	60.7	53
-10	65.0	52.3	43
75.4	115.2	82.3	88
40	96.2	71.7	67
25	80.6	60.0	55
-30	58.1	48.0	42
-50	47.1	39.7	35
-70	34.8	29.0	23
-100	14.7	12.0	3
100	111.8	79.7	87

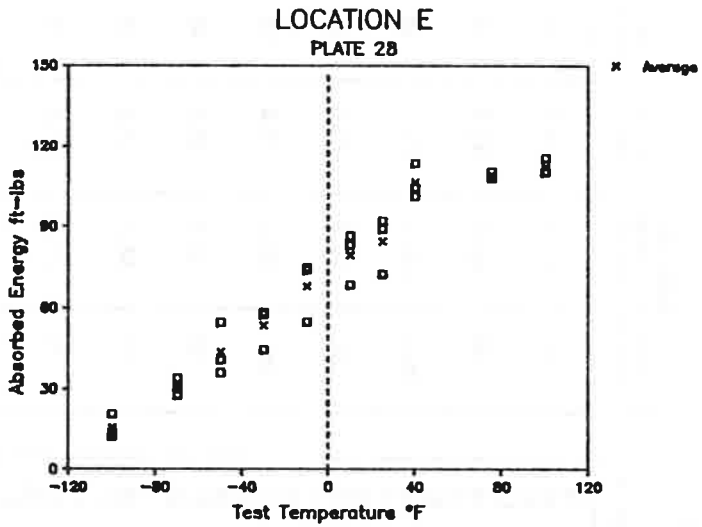
Spec. No.	Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
2	10	86.9	69	65
5	10	77.8	60	55
6	10	85.9	64	55
1	-10	67.8	54	50
3	-10	68.9	54	50
4	-10	64.1	51	50

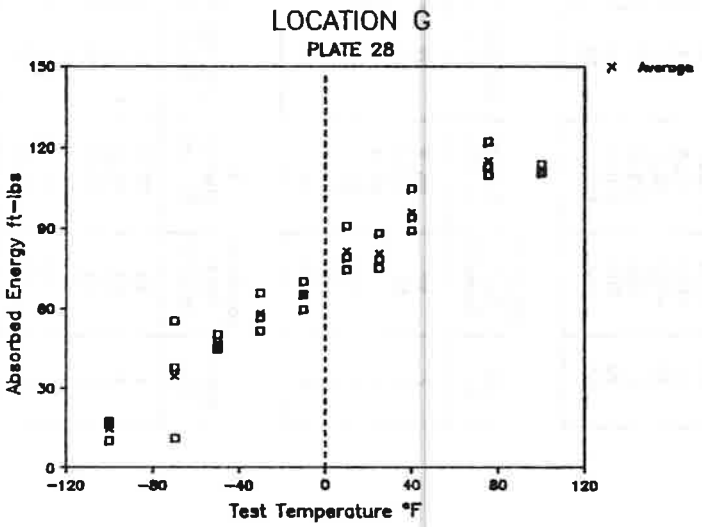
Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
10	83.5	64.3	58
-10	66.9	53.0	50

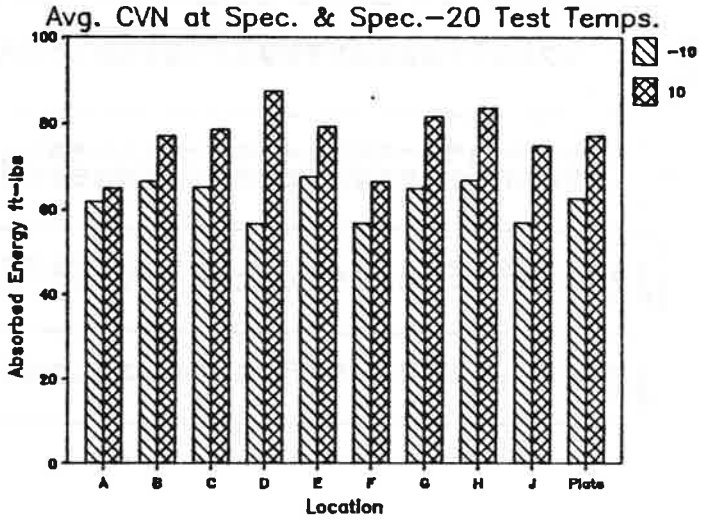
Spec. No.	Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
1	10	77.5	62	55
2	10	74.2	57	50
5	10	72.8	60	45
3	-10	62.5	50	40
4	-10	66.3	54	55
6	-10	42.0	39	25

Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
10	74.8	59.7	50
-10	56.9	47.7	40


LOCATION C
PLATE 28
x Average
Absorbed Energy ft-lbs
Test Temperature °F


LOCATION E
PLATE 28
x Average
Absorbed Energy ft-lbs
Test Temperature °F


LOCATION G
PLATE 28
x Average
Absorbed Energy ft-lbs
Test Temperature °F

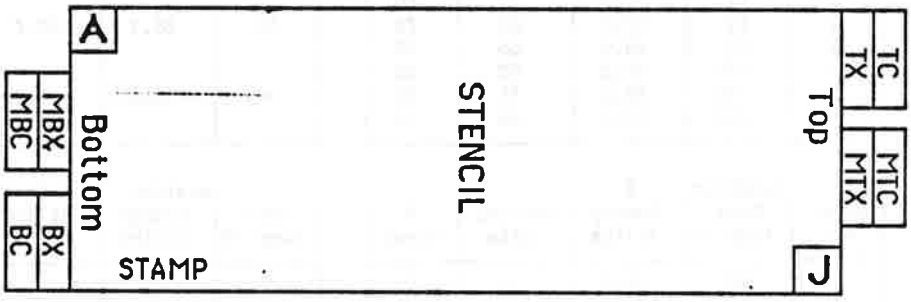

Avg. CVN at Spec. & Spec.-20 Test Temps.
-10
10
Absorbed Energy ft-lbs
A
B
C
D
E
F
G
H
J
Plate
Location

MILL DATA SHEET
Plate No: 29
Manf: 3

Melt/Slab Number: U8855-2B

Yield Point (ksi)	TX: 53.4	BX: 53.3	MTX: 54.6	MBX: 55.6
Tensile Strength (ksi)	TX: 77.4	BX: 77.0	MTX: 78.7	MBX: 78.7
Elongation (%)	TX: 27	BX: 25	MTX: 25	MBX: 24

{Gage Length (in): 2}
Steel Type: A588 - A
Thickness (in): 2
Length (in): 480 Width (in): 60
Notes: Normalized at 1650 °F for 105 min. - Air cool
Fine Grain Practice
Bend Test - Pass
Spec. Code - Top: F701 Bottom: F700



TC,MTC,BC,MBC - Charpy test locations, 9" x 3"
TX,MTX,BX,MBX - Tensile test locations, 9" x 2-1/4"

CHARPY IMPACT MILL TESTS (foot-lbs)

	Test Temp	Test #1 CVN	Lt.Ex.	%Sh.	Test #2 CVN	Lt.Ex.	%Sh.	Test #3 CVN	Lt.Ex.	%Sh.	CVN Avg
TC	+10°F	68	61	60	93	78	80	95	79	90	85
BC	+10°F	62	56	50	81	67	60	90	75	80	78
MTC	+10°F	94	**	**	100	**	**	107	**	**	100
MBC	+10°F	79	**	**	84	**	**	88	**	**	85

(** results not reported)

Chemical Analysis

C	Mn	P	S	Si	Cu	Ni	Cr	V	Al	Cb
.14	0.95	.013	.019	.380	.280	.12	.52	.068	NA	NA
Prod. Chemical Analysis										
.14	0.93	.012	.018	.370	.270	.11	.51	.066	NA	NA
.14	0.96	.010	.021	.380	.280	.12	.53	.069	NA	NA

Plate: 29
Date: June 19, 1989 Windage: 0
Spec. Temp: + 10 F Personnel: DAG

Spec. No.	Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
1	10	98.7	73	85
2	10	96.8	78	85
5	10	103.5	77	85
3	-10	81.2	70	80
4	-10	90.3	74	85
6	-10	123.1	91	100

Average Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	99.7	76.0	85
-10	98.2	78.3	88

Spec. No.	Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
2	10	95.7	71	80
4	10	87.8	66	70
5	10	80.9	66	70
1	-10	70.8	58	60
3	-10	88.2	71	85
6	-10	76.5	65	75

Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	88.1	67.7	73
-10	78.5	64.7	73

Spec. No.	Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
5	10	74.4	59	65
12	10	84.3	67	70
28	10	92.2	74	85
8	-10	69.9	58	60
16	-10	68.8	56	60
23	-10	80.0	63	60
3	76	121.2	88	90
18	76	127.6	92	95
26	76	126.0	87	90
6	40	110.9	84	95
13	40	98.6	80	90
21	40	108.3	79	90
4	25	93.1	70	80
20	25	104.7	83	90
24	25	105.6	81	90
9	-30	45.2	40	45
15	-30	68.1	60	65
30	-30	74.3	67	75
1	-50	35.9	33	20
14	-50	39.4	34	20
27	-50	66.9	61	70
7	-70	28.9	27	10
19	-70	63.4	56	60
25	-70	20.2	17	5
2	-94	19.7	17	10
11	-94	26.0	24	10
29	-94	27.8	15	0
10	100	109.6	78	80
17	100	128.7	93	95
22	100	115.7	84	85

Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	83.6	66.7	73
-10	72.9	59.0	60
75.6	124.9	89.0	92
40	105.9	81.0	92
25	101.1	78.0	87
-30	62.5	55.7	62
-50	47.4	42.7	37
-70	37.5	33.3	25
-94	24.5	18.7	7
100	118.0	85.0	87

Plate: 29

Spec. No.	Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
2	10	98.6	76	85
3	10	104.8	77	85
4	10	107.3	80	95
1	-10	81.8	71	80
5	-10	70.4	59	60
6	-10	76.1	75	80

Average

Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
10	103.6	77.7	88
-10	76.1	68.3	73

Spec. No.	Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
2	10	93.6	75	85
15	10	91.1	74	85
27	10	82.3	67	70
10	-10	127.6	84	85
18	-10	67.3	57	45
25	-10	41.5	39	20
5	76	122.8	83	85
19	76	127.3	86	95
28	76	125.7	86	90
8	40	111.2	81	85
11	40	115.5	80	85
23	40	117.2	86	90
1	25	98.5	73	85
17	25	114.7	79	95
22	25	83.0	66	75
6	-30	79.7	66	75
13	-30	68.5	59	65
29	-30	85.4	71	85
4	-50	70.2	63	70
12	-50	72.8	62	70
26	-50	65.9	58	70
9	-70	63.5	54	70
16	-70	35.8	30	40
21	-70	24.6	23	10
3	-94	29.3	27	20
14	-94	28.7	25	15
30	-94	23.3	20	10
7	100	119.8	87	90
20	100	124.5	77	80
24	100	125.8	88	95

Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
10	89.0	72.0	80
-10	78.8	60.0	50
75.6	125.3	85.0	90
40	114.6	82.3	87
25	98.7	72.7	85
-30	77.9	65.3	75
-50	69.6	61.0	70
-70	41.3	35.7	40
-94	27.1	24.0	15
100	123.4	84.0	88

Spec. No.	Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
3	10	96.1	72	75
5	10	89.5	70	75
6	10	93.1	77	85
1	-10	76.0	63	65
2	-10	82.4	71	75
4	-10	72.3	60	60

Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
10	92.9	73.0	78
-10	76.9	64.7	67

Plate: 29

Spec. No.	Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
7	10	101.3	79	85
19	10	118.9	85	100
25	10	97.4	77	85
4	-10	80.2	67	65
11	-10	83.7	69	65
28	-10	64.5	58	55
8	76	145.2	95	100
15	76	121.2	84	85
22	76	143.9	89	95
2	40	103.4	81	95
16	40	123.3	84	100
29	40	110.8	79	95
10	25	99.8	77	85
14	25	103.7	82	90
26	25	107.6	79	85
5	-30	86.0	76	85
17	-30	88.4	73	85
23	-30	100.8	84	95
6	-50	73.7	67	75
20	-50	73.9	65	70
24	-50	63.0	54	60
3	-70	54.6	49	50
12	-70	26.0	22	20
30	-70	45.1	36	35
9	-94	23.7	21	15
18	-94	56.0	52	50
21	-94	33.2	29	20
1	100	121.6	82	85
13	100	141.4	85	90
27	100	131.7	86	95

Average

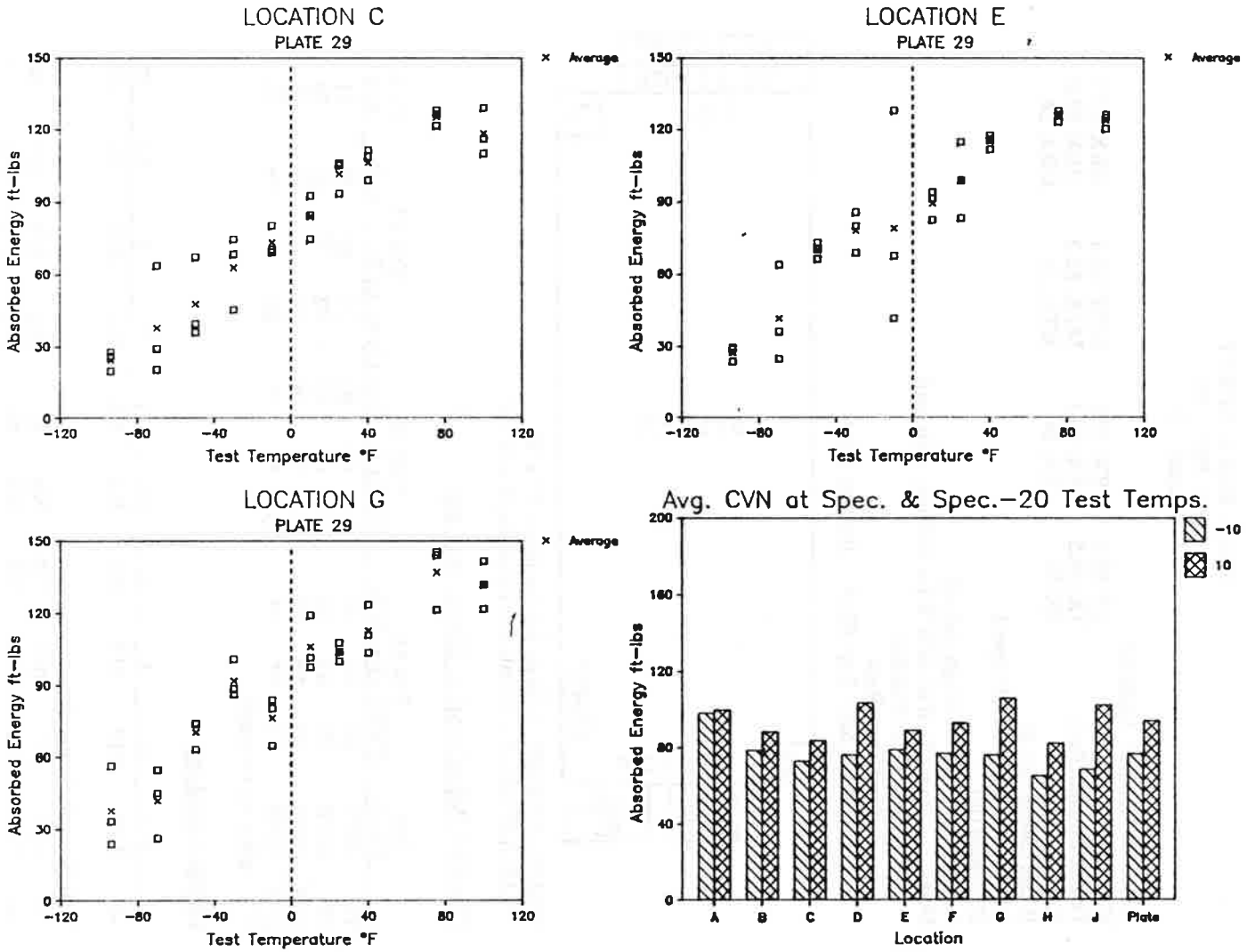
Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
10	105.9	80.3	90
-10	76.1	64.7	62
75.6	136.8	89.3	93
40	112.5	81.3	97
25	103.7	79.3	87
-30	91.7	77.7	88
-50	70.2	62.0	68
-70	41.9	35.7	35
-94	37.6	34.0	28
100	131.6	84.3	90

Spec. No.	Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
2	10	71.7	63	70
4	10	91.6	71	80
6	10	83.3	70	80
1	-10	61.2	51	45
3	-10	54.3	48	35
5	-10	80.8	72	65

Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
10	82.2	68.0	77
-10	65.4	57.0	48

Spec. No.	Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
1	10	109.4	84	90
4	10	95.3	75	80
5	10	102.4	80	90
2	-10	67.1	59	60
3	-10	71.2	57	60
6	-10	67.7	51	50

Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
10	102.4	79.7	87
-10	68.7	55.7	57

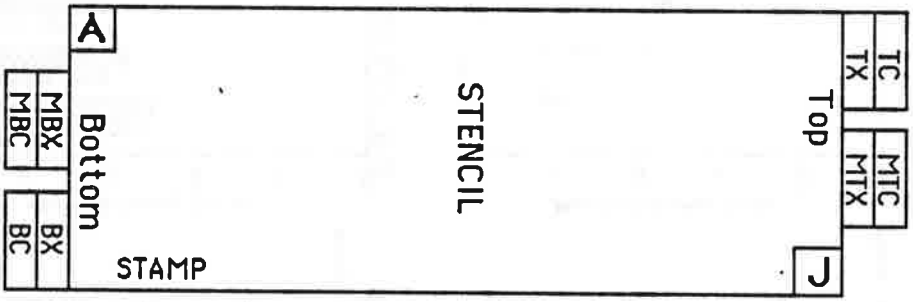

LOCATION C
PLATE 29
× Average
Absorbed Energy ft-lbs
Test Temperature °F
LOCATION E
PLATE 29
× Average
Absorbed Energy ft-lbs
Test Temperature °F
LOCATION G
PLATE 29
× Average
Absorbed Energy ft-lbs
Test Temperature °F
Avg. CVN at Spec. & Spec.−20 Test Temps.
−10
10
Absorbed Energy ft-lbs
A
B
C
D
E
F
G
H
J
Plate
Location

MILL DATA SHEET
Plate No: 30
Manf: 3

Melt/Slab Number: U8880-2

Yield Point (ksi)	TX: 60.3	BX: 60.1	MTX: 55.7	MBX: 57.3
Tensile Strength (ksi)	TX: 84.5	BX: 83.7	MTX: 83.5	MBX: 83.0
Elongation (%)	TX: 24	BX: 24	MTX: 24	MBX: 24

[Gage Length (in): 2]
Steel Type: A572 Gr. 50 type 2
Thickness (in): 2
Length (in): 240 Width (in): 60
Notes: Normalized at 1660 °F for 110 min. - Air cool
Fine Grain Practice
Bend Test - Pass
Spec. Code - Top: F319 Bottom: F318



TC,MTC,BC,MBC - Charpy test locations, 9" x 3"
TX,MTX,BX,MBX - Tensile test locations, 9" x 2-1/4"

CHARPY IMPACT MILL TESTS (foot-lbs)

	Test Temp	Test #1 CVN	Lt.Ex.	%Sh.	Test #2 CVN	Lt.Ex.	%Sh.	Test #3 CVN	Lt.Ex.	%Sh.	CVN Avg
TC	+10°F	68	60	60	71	62	60	73	64	70	71
BC	+10°F	77	65	80	79	67	80	82	72	80	79
MTC	+10°F	47	**	**	52	**	**	57	**	**	52
MBC	+10°F	75	**	**	79	**	**	82	**	**	79

(** results not reported)

Chemical Analysis

C	Mn	P	S	Si	Cu	Ni	Cr	V	Al	Cb
.23	1.23	.013	.017	.200	NA	NA	NA	.057	NA	NA

Prod. Chemical Analysis

.23	1.25	.011	.019	.210	NA	NA	NA	.059	NA	NA
.22	1.25	.012	.018	.200	NA	NA	NA	.058	NA	NA

Plate: 30
Date: June 19, 1989 Windage: 0
Spec. Temp: + 10 F Personnel: DAG

Spec. No.	Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
1	10	60.2	51	40
5	10	59.7	50	40
6	10	53.4	46	20
2	-10	46.5	42	30
3	-10	53.4	48	35
4	-10	42.4	42	30

Average Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	57.8	49.0	33
-10	47.4	44.0	32

Spec. No.	Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
2	10	54.4	48	35
4	10	58.1	51	40
6	10	54.8	58	45
1	-10	50.1	31	30
3	-10	51.2	46	40
5	-10	43.6	39	35

Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	55.8	52.3	40
-10	48.3	38.7	35

Spec. No.	Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
1	10	59.4	51	40
13	10	55.5	51	40
29	10	63.6	55	40
7	-10	55.1	47	40
16	-10	47.2	41	30
22	-10	39.8	37	20
3	76	86.0	75	75
17	76	86.7	70	75
26	76	81.8	72	75
10	40	88.7	71	70
14	40	68.8	58	60
24	40	89.2	70	75
4	25	72.2	58	45
20	25	56.9	52	40
25	25	67.2	56	45
6	-30	35.4	33	20
12	-30	44.2	39	35
27	-30	36.7	35	20
2	-50	26.2	25	10
11	-50	26.3	25	10
28	-50	27.6	20	5
8	-70	23.8	21	10
18	-70	24.3	20	10
21	-70	24.9	21	10
5	60	78.9	65	65
19	60	87.8	72	80
23	60	81.5	69	70
9	100	86.3	78	70
15	100	85.9	67	50
30	100	85.3	67	50

Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	59.5	52.3	40
-10	47.4	41.7	30
75.6	84.8	72.3	75
40	82.2	66.3	68
25	65.4	55.3	43
-30	38.8	35.7	25
-50	26.7	23.3	8
-70	24.3	20.7	10
60	82.7	68.7	72
100	85.8	70.7	57

Plate: 30

Spec. No.	Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
3	10	50.1	46	35
4	10	56.3	48	35
5	10	45.2	42	20
1	-10	35.3	32	10
2	-10	42.5	39	20
6	-10	30.7	31	10

Average

Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
10	50.5	45.3	30
-10	36.2	34.0	13

Spec. No.	Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
2	10	53.1	47	30
11	10	50.8	49	35
28	10	46.5	43	30
8	-10	35.4	32	15
17	-10	47.4	42	30
21	-10	46.7	40	25
5	76	81.6	67	70
18	76	81.3	67	70
29	76	76.8	67	70
9	40	66.5	56	50
15	40	75.4	54	50
25	40	59.9	53	50
1	25	51.4	47	35
19	25	52.6	51	40
22	25	55.7	52	40
7	-30	24.6	25	15
12	-30	33.7	32	20
26	-30	30.4	27	20
4	-50	23.3	22	5
13	-50	23.8	19	5
30	-50	20.6	22	5
10	-70	22.1	18	10
16	-70	22.0	19	10
23	-70	20.6	12	5
3	60	73.1	65	70
20	60	78.7	63	70
24	60	68.9	52	50
6	100	79.7	69	75
14	100	81.3	66	70
27	100	77.6	68	75

Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
10	50.1	46.3	32
-10	43.2	38.0	23
75.6	79.9	67.0	70
40	67.3	54.3	50
25	53.2	50.0	38
-30	29.6	28.0	18
-50	22.6	21.0	5
-70	21.6	16.3	8
60	73.6	60.0	63
100	79.5	67.7	73

Spec. No.	Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
2	10	52.8	47	30
3	10	45.9	43	20
5	10	43.5	41	20
1	-10	38.3	36	20
4	-10	39.8	38	20
6	-10	43.6	40	25

Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
10	47.4	43.7	23
-10	40.6	38.0	22

Plate: 30

Spec. No.	Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
8	10	39.2	40	25
19	10	47.3	44	30
25	10	49.1	37	25
1	-10	40.3	38	20
13	-10	27.2	32	10
28	-10	37.5	35	20
7	76	74.6	64	65
15	76	84.2	72	75
21	76	80.1	68	70
5	40	55.8	47	35
17	40	65.2	56	45
29	40	71.6	62	55
9	25	53.2	48	35
11	25	67.9	58	45
27	25	56.6	52	40
3	-30	34.6	34	20
16	-30	27.2	27	10
22	-30	37.3	25	10
10	-50	19.7	19	0
18	-50	29.3	27	10
23	-50	21.5	21	0
4	-70	17.8	15	0
12	-70	14.7	13	0
26	-70	20.6	18	5
6	60	70.9	57	50
14	60	79.0	70	70
30	60	70.3	62	55
2	100	79.6	75	85
20	100	77.6	65	60
24	100	81.5	69	80

Average

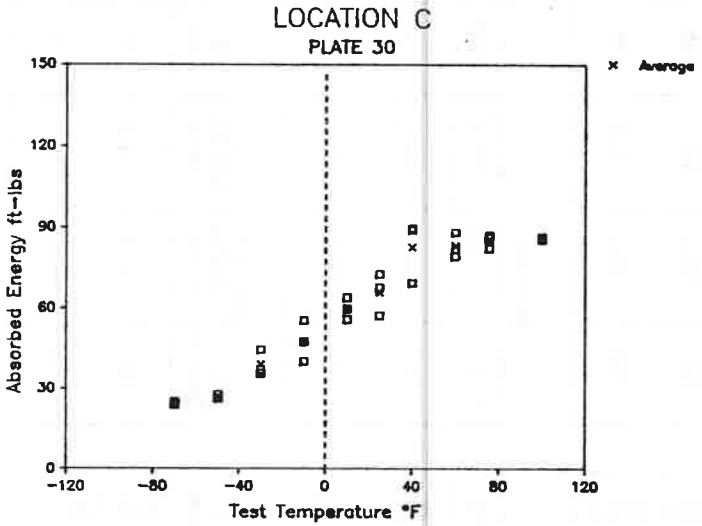
Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
10	45.2	40.3	27
-10	35.0	35.0	17
75.6	79.6	68.0	70
40	64.2	55.0	45
25	59.2	52.7	40
-30	33.0	28.7	13
-50	23.5	22.3	3
-70	17.7	15.3	2
60	73.4	63.0	58
100	79.6	69.7	75

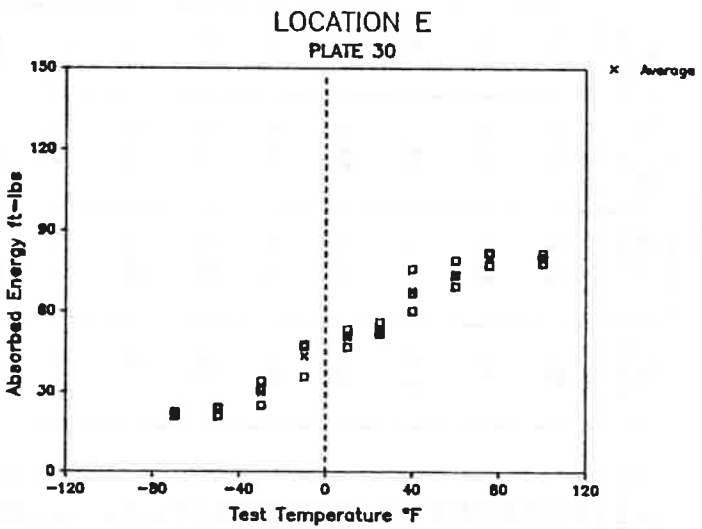
Spec. No.	Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
1	10	48.4	45	30
3	10	50.8	49	35
6	10	49.5	42	30
2	-10	33.8	32	20
4	-10	42.3	38	30
5	-10	40.1	34	20

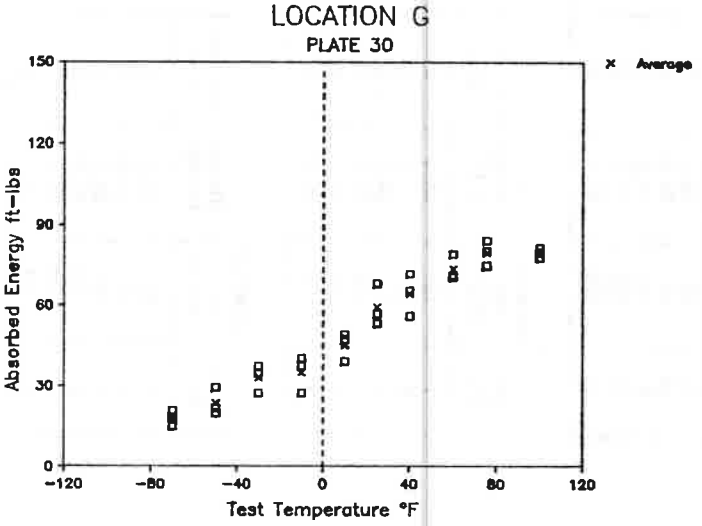
Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
10	49.6	45.3	32
-10	38.7	34.7	23

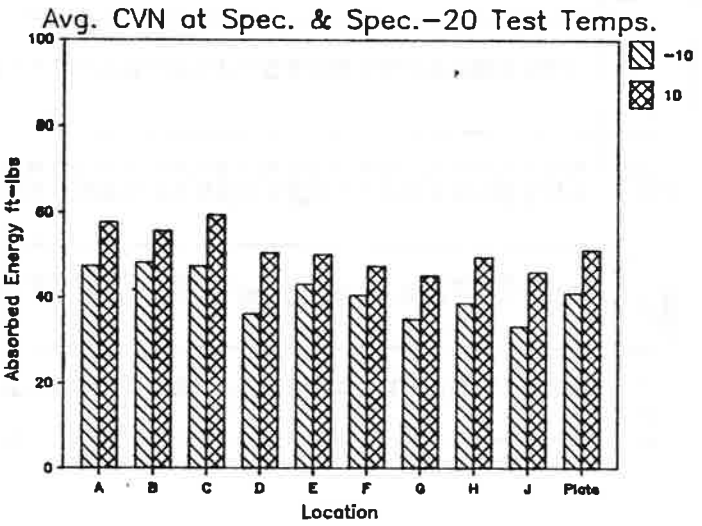
Spec. No.	Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
1	10	50.4	45	30
2	10	51.0	47	30
4	10	36.7	38	20
3	-10	36.7	33	15
5	-10	36.3	35	15
6	-10	26.9	27	15

Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
10	46.0	43.3	27
-10	33.3	31.7	15


LOCATION C
PLATE 30
× Average
Absorbed Energy ft-lbs
Test Temperature °F
150
120
90
60
30
0
-120
-80
-40
0
40
80
120

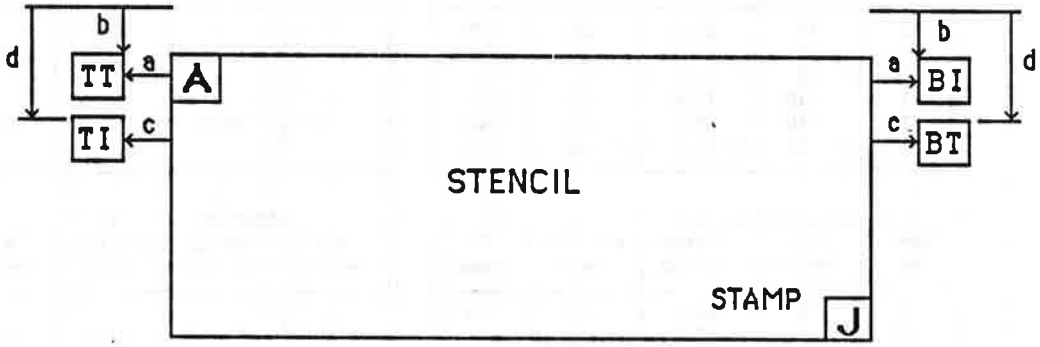

LOCATION E
PLATE 30
× Average
Absorbed Energy ft-lbs
Test Temperature °F
150
120
90
60
30
0
-120
-80
-40
0
40
80
120


LOCATION G
PLATE 30
× Average
Absorbed Energy ft-lbs
Test Temperature °F
150
120
90
60
30
0
-120
-80
-40
0
40
80
120


Avg. CVN at Spec. & Spec.-20 Test Temps.
-10
10
Absorbed Energy ft-lbs
Location
100
80
60
40
20
0
A
B
C
D
E
F
G
H
J
Plate

MILL DATA SHEET
Plate No: 31
Manf: 1

Serial Number: W169739
Heat Number: 803Y64460
Yield Point (psi): 62100
Tensile Strength (psi): 85400
Elongation (%): 23 {Gage Length (in): 2}
Steel Type: A572-85 Gr. 50
Thickness (in): 2
Length (in): 240 Width (in): 60
Notes: Control Rolled
Fine Grain Practice



Top
Ta : 0"
Tb : 2"
Tc : 0"
Td : 10"
Spec. Code : V55

Bottom
Ba : 0"
Bb : 2"
Bc : 0"
Bd : 10"
Spec. Code : V56

CHARPY IMPACT MILL TESTS (foot-lbs)

	Test Temp	Test #1 CVN	Lt.Ex.	%Sh.	Test #2 CVN	Lt.Ex.	%Sh.	Test #3 CVN	Lt.Ex.	%Sh.	CVN Avg
Top	+10°F	55	49	30	73	63	40	28	29	10	52
Bot	+10°F	53	43	30	65	60	40	33	32	20	50

Chemical Analysis

C	Mn	P	S	Si	Cu	Ni	Cr	V	Al	Cb
.18	1.27	.019	.022	.234	NA	NA	NA	.052	.047	NA

Plate: 31
Date: June 21, 1989 Windage: 0
Spec. Temp: + 10 F Personnel: DAG

Spec. No.	Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
1	10	64.7	54	50
2	10	45.3	41	35
4	10	40.3	29	20
3	-10	38.4	32	25
5	-10	50.4	40	40
6	-10	18.2	17	5

Average Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	50.1	41.3	35
-10	35.7	29.7	23

Spec. No.	Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
2	10	27.6	26	20
4	10	46.7	44	40
6	10	8.6	7	0
1	-10	11.6	12	0
3	-10	49.7	44	40
5	-10	34.6	29	25

Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	27.6	25.7	20
-10	32.0	28.3	22

Spec. No.	Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
1	10	46.2	41	40
18	10	19.1	19	5
24	10	39.8	34	30
8	-10	9.6	13	0
15	-10	5.6	7	0
28	-10	26.5	24	15
3	75	82.9	70	85
12	75	87.5	70	85
26	75	50.6	46	40
10	40	52.7	47	40
19	40	44.8	37	30
25	40	56.3	48	40
4	25	21.2	22	0
16	25	61.7	54	50
27	25	36.4	31	20
6	-30	8.2	6	0
13	-30	12.6	16	0
21	-30	20.1	11	0
5	-50	8.4	7	0
17	-50	6.7	7	0
22	-50	6.8	9	0
9	-70	4.4	3	0
14	-70	6.3	5	0
30	-70	3.2	3	0
2	60	64.0	55	55
11	60	64.3	54	50
29	60	71.6	59	55
7	100	53.7	52	40
20	100	114.2	92	95
23	100	84.6	70	80

Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	35.0	31.3	25
-10	13.9	14.7	5
74.7	73.7	62.0	70
40	51.3	44.0	37
25	39.8	35.7	23
-30	13.6	11.0	0
-50	7.3	7.7	0
-70	4.6	3.7	0
60	66.6	56.0	53
100	84.2	71.3	72

Plate: 31

Spec. No.	Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
1	10	46.8	39	35
3	10	46.2	41	30
6	10	49.6	50	45
2	-10	37.5	31	20
4	-10	26.2	24	10
5	-10	36.7	31	20

Average

Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
10	47.5	43.3	37
-10	33.5	28.7	17

Spec. No.	Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
3	10	70.4	61	70
20	10	27.6	25	5
24	10	70.3	63	70
6	-10	10.4	13	0
13	-10	20.8	20	10
28	-10	23.7	21	10
5	75	87.4	71	85
14	75	90.3	73	85
26	75	99.3	81	90
9	40	75.2	62	65
16	40	68.9	57	50
22	40	61.3	55	50
1	25	44.2	40	35
17	25	43.6	38	40
29	25	72.8	58	65
8	-30	35.2	28	20
11	-30	6.7	7	0
23	-30	24.6	22	10
4	-50	4.6	4	0
18	-50	15.2	13	0
21	-50	3.6	1	0
10	-70	4.2	5	0
12	-70	4.6	4	0
30	-70	4.7	4	0
2	60	67.4	58	55
15	60	80.3	65	65
27	60	79.7	64	60
7	100	109.7	80	85
19	100	115.2	83	95
25	100	103.7	80	90

Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
10	56.1	49.7	48
-10	18.3	18.0	7
74.7	92.3	75.0	87
40	68.5	58.0	55
25	53.5	45.3	47
-30	22.2	19.0	10
-50	7.8	6.0	0
-70	4.5	4.3	0
60	75.8	62.3	60
100	109.5	81.0	90

Spec. No.	Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
3	10	29.3	28	20
4	10	49.0	43	35
5	10	44.7	39	30
1	-10	27.3	23	10
2	-10	21.3	19	5
6	-10	13.0	12	0

Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
10	41.0	36.7	28
-10	20.5	18.0	5

Plate: 31

Spec. No.	Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
9	10	51.2	45	40
15	10	46.6	41	40
27	10	53.8	46	50
1	-10	43.2	38	35
17	-10	28.6	17	5
22	-10	39.2	37	35
7	75	101.7	81	95
16	75	98.2	75	85
23	75	91.6	79	90
3	40	77.4	64	70
12	40	84.4	71	75
30	40	70.3	59	60
10	25	49.0	44	40
13	25	45.6	42	35
24	25	69.6	59	65
4	-30	14.7	12	0
20	-30	11.8	11	0
28	-30	26.4	23	15
6	-50	8.7	7	0
11	-50	25.9	25	10
29	-50	16.6	13	5
5	-70	12.7	10	0
18	-70	5.6	5	0
21	-70	7.1	7	0
8	60	89.9	70	70
19	60	71.9	64	60
25	60	85.3	71	70
2	100	115.8	88	95
14	100	115.4	88	95
26	100	122.6	87	85

Average

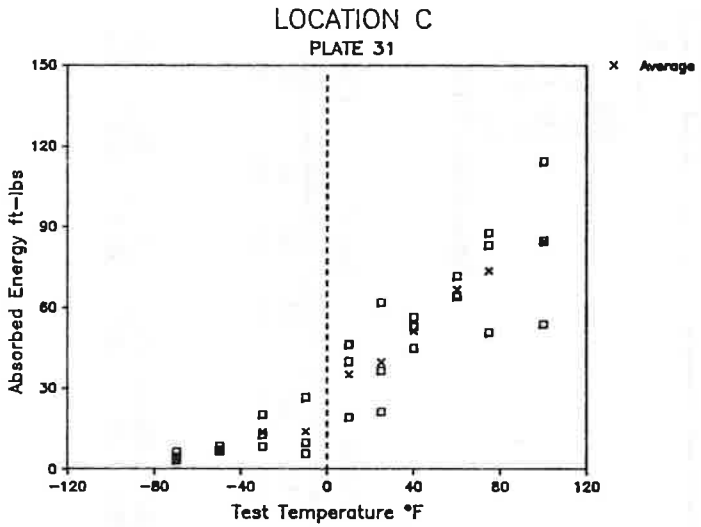
Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
10	50.5	44.0	43
-10	37.0	30.7	25
74.7	97.2	78.3	90
40	77.4	64.7	68
25	54.7	48.3	47
-30	17.6	15.3	5
-50	17.1	15.0	5
-70	8.5	7.3	0
60	82.4	68.3	67
100	117.9	87.7	92

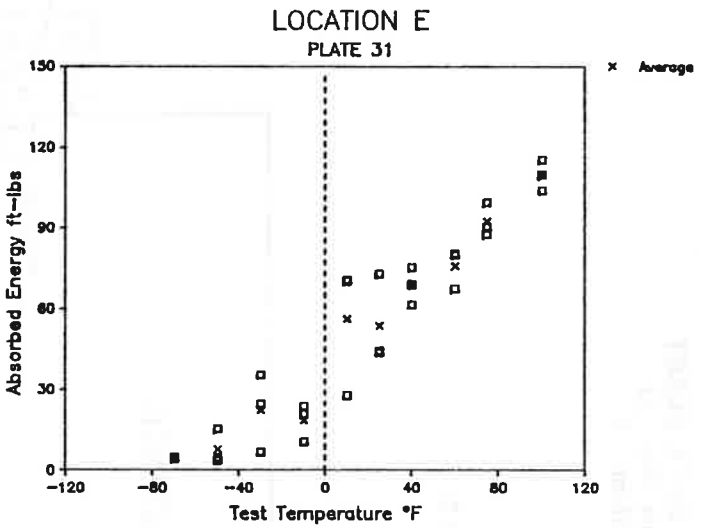
Spec. No.	Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
2	10	39.5	38	30
3	10	17.2	22	0
5	10	14.6	20	0
1	-10	13.5	11	0
4	-10	17.3	17	0
6	-10	24.4	21	5

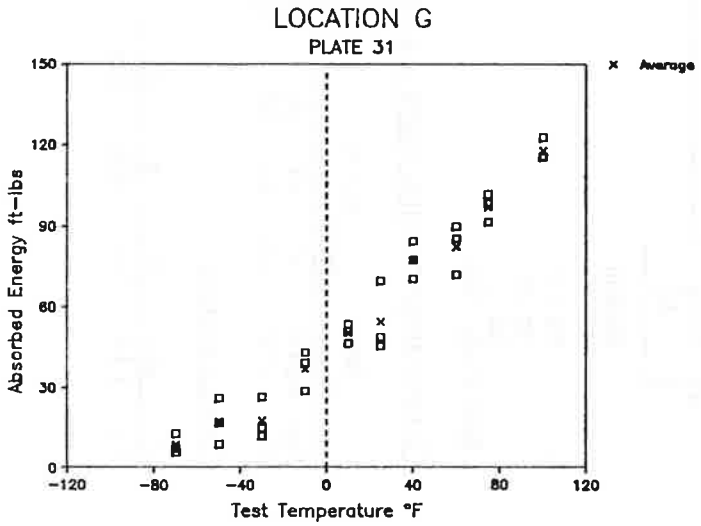
Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
10	23.8	26.7	10
-10	18.4	16.3	2

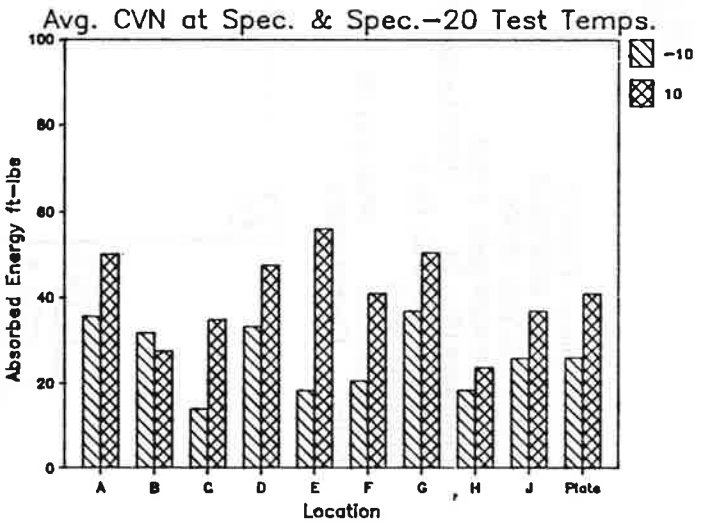
Spec. No.	Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
1	10	31.6	28	15
5	10	43.7	36	30
6	10	35.8	37	20
2	-10	24.9	21	10
3	-10	27.3	24	10
4	-10	25.6	18	10

Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
10	37.0	33.7	22
-10	25.9	21.0	10


LOCATION C
PLATE 31
Average
Absorbed Energy ft-lbs
Test Temperature °F

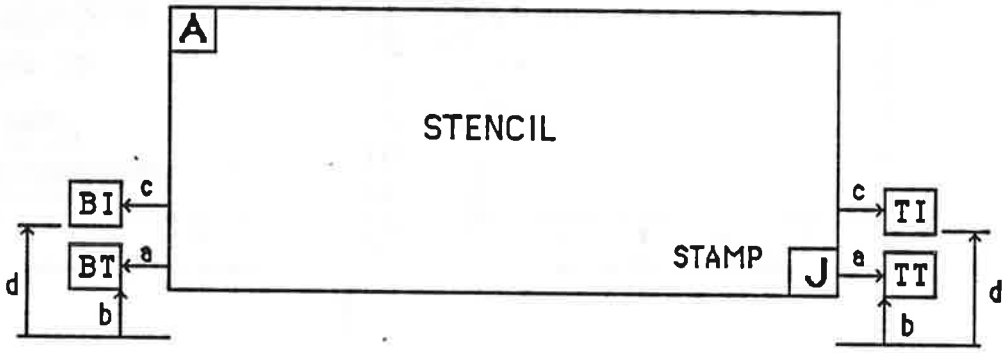

LOCATION E
PLATE 31
Average
Absorbed Energy ft-lbs
Test Temperature °F


LOCATION G
PLATE 31
Average
Absorbed Energy ft-lbs
Test Temperature °F


Avg. CVN at Spec. & Spec.-20 Test Temps.
-10
10
Absorbed Energy ft-lbs
A
B
C
D
E
F
G
H
J
Plate
Location

MILL DATA SHEET
Plate No: 32
Manf: 1

Serial Number: X056433
Heat Number: 803Z73690
Yield Point (psi): 61900
Tensile Strength (psi): 87000
Elongation (%): 24 {Gage Length (in): 2}
Steel Type: A588-82 Gr. B
Thickness (in): 2
Length (in): 240 Width (in): 60
Notes: Control Rolled



Bottom
Ba : 0"
Bb : 1"
Bc : 0"
Bd : 17"
Spec. Code : T43

Top
Ta : 0"
Tb : 1"
Tc : 0"
Td : 17"
Spec. Code : W15

CHARPY IMPACT MILL TESTS (foot-lbs)

	Test Temp	Test #1 CVN	Lt.Ex.	%Sh.	Test #2 CVN	Lt.Ex.	%Sh.	Test #3 CVN	Lt.Ex.	%Sh.	CVN Avg
Top	+10°F	43	41	30	57	55	40	43	44	40	48
Bot	+10°F	100	84	95	75	65	70	40	34	20	72

Chemical Analysis

C	Mn	P	S	Si	Cu	Ni	Cr	V	Al	Cb
.12	1.14	.014	.020	.376	.282	.30	.57	.017	.060	NA

Plate: 32
Date: June 21, 1989 Windage: 0
Spec. Temp: + 10 F Personnel: DAG

Spec. No.	Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
1	10	50.4	47	45
2	10	42.7	40	30
4	10	75.0	68	70
3	-10	37.2	35	30
5	-10	28.9	28	10
6	-10	17.2	22	5

Average Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	56.0	51.7	48
-10	27.8	28.3	15

Spec. No.	Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
3	10	47.8	45	45
4	10	26.6	27	10
5	10	25.3	28	10
1	-10	13.0	17	0
2	-10	7.5	10	0
6	-10	11.2	16	0

Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	33.2	33.3	22
-10	10.6	14.3	0

Spec. No.	Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
2	10	12.0	5	5
16	10	12.7	5	5
25	10	11.8	0	0
10	-10	6.8	0	0
13	-10	10.0	0	0
28	-10	7.1	0	0
5	75	76.3	68	70
12	75	51.8	48	40
27	75	86.4	69	75
6	40	34.5	32	15
18	40	26.9	28	10
23	40	49.9	47	40
1	25	12.6	15	0
19	25	24.5	25	10
26	25	30.2	31	20
7	-30	4.7	4	0
15	-30	5.4	9	0
24	-30	6.7	8	0
4	-50	6.7	5	0
20	-50	6.2	6	0
22	-50	4.8	5	0
8	60	85.8	68	70
11	60	46.6	42	30
29	60	46.8	40	30
3	100	77.9	65	60
14	100	87.7	71	65
30	100	110.0	77	80
9	120	103.8	86	85
17	120	105.4	85	85
21	120	95.7	78	75

Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	12.2	3.3	3
-10	8.0	.0	0
74.7	71.5	61.7	62
40	37.1	35.7	22
25	22.4	23.7	10
-30	5.6	7.0	0
-50	5.9	5.3	0
60	59.7	50.0	43
100	91.9	71.0	68
120	101.6	83.0	82

Plate: 32

Spec. No.	Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
1	10	59.5	54	50
3	10	48.2	47	40
6	10	65.3	55	60
2	-10	44.2	40	40
4	-10	45.1	41	40
5	-10	39.5	47	35

Average

Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
10	57.7	52.0	50
-10	42.9	42.7	38

Spec. No.	Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
5	10	105.1	88	95
18	10	73.9	65	75
22	10	82.9	72	85
8	-10	27.6	29	15
14	-10	47.9	44	45
26	-10	17.7	19	5
3	75	120.3	78	85
11	75	148.8	84	90
29	75	102.1	83	90
7	40	95.2	79	85
16	40	88.7	78	85
24	40	142.3	96	100
4	25	233.1	105	100
20	25	83.2	67	65
27	25	48.7	42	30
6	-30	7.5	11	0
12	-30	25.8	27	20
21	-30	11.7	13	0
2	-50	9.8	11	0
17	-50	9.7	10	0
25	-50	7.2	8	0
9	60	107.5	81	95
13	60	112.3	71	90
30	60	97.4	79	95
1	100	149.3	92	100
15	100	144.9	89	100
28	100	119.3	82	85
10	120	165.6	90	95
19	120	122.0	88	85
23	120	127.8	87	85

Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
10	87.3	75.0	85
-10	31.1	30.7	22
74.7	123.7	81.7	88
40	108.7	84.3	90
25	121.7	71.3	65
-30	15.0	17.0	7
-50	8.9	9.7	0
60	105.7	77.0	93
100	137.8	87.7	95
120	138.5	88.3	88

Spec. No.	Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
2	10	35.4	35	20
5	10	17.1	20	5
6	10	15.7	19	5
1	-10	16.6	16	0
3	-10	17.2	17	0
4	-10	12.3	17	0

Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
10	22.7	24.7	10
-10	15.4	16.7	0

Plate: 32

Spec. No.	Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
6	10	58.9	52	50
12	10	103.4	85	95
28	10	89.9	76	90
3	-10	56.1	51	55
16	-10	58.8	49	50
25	-10	51.2	47	50
8	75	120.7	87	95
17	75	116.2	80	85
21	75	132.3	89	95
5	40	61.8	54	55
13	40	107.4	79	85
27	40	74.4	63	70
7	25	52.5	46	40
15	25	79.9	67	70
2	25	62.4	56	50
2	-30	17.2	20	10
18	-30	13.2	14	5
26	-30	31.7	26	25
10	-50	8.7	10	0
14	-50	21.7	22	10
29	-50	22.0	18	10
1	60	99.5	75	85
19	60	115.1	90	95
23	60	102.4	82	85
9	100	118.0	89	95
20	100	126.4	83	85
24	100	133.5	85	90
4	120	114.9	78	85
11	120	ERROR	78	85
30	120	123.8	90	95

Average

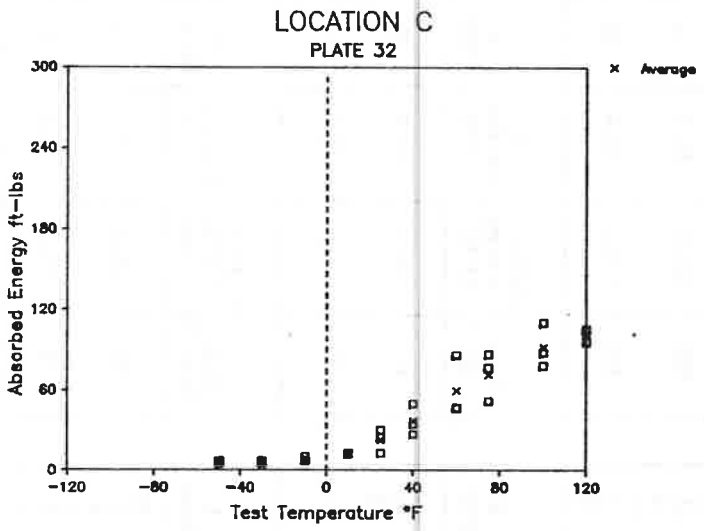
Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
10	84.1	71.0	78
-10	55.4	49.0	52
74.7	123.1	85.3	92
40	81.2	65.3	70
25	64.9	56.3	53
-30	20.7	20.0	13
-50	17.5	16.7	7
60	105.7	82.3	88
100	126.0	85.7	90
120	119.4	82.0	88

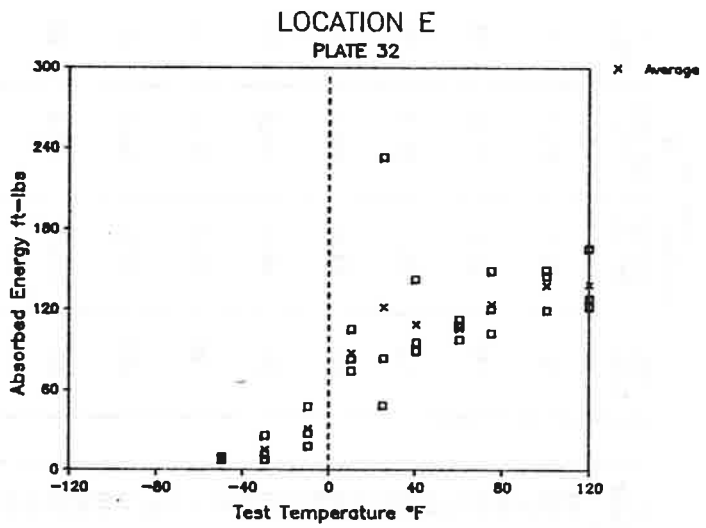
Spec. No.	Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
2	10	33.4	36	20
3	10	34.9	36	30
4	10	54.4	49	45
1	-10	27.1	27	5
5	-10	37.4	34	20
6	-10	11.6	10	0

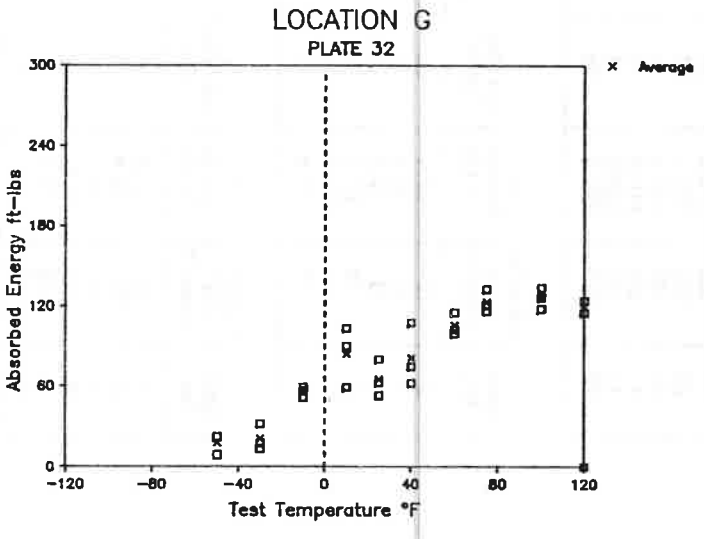
Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
10	40.9	40.3	32
-10	25.4	23.7	8

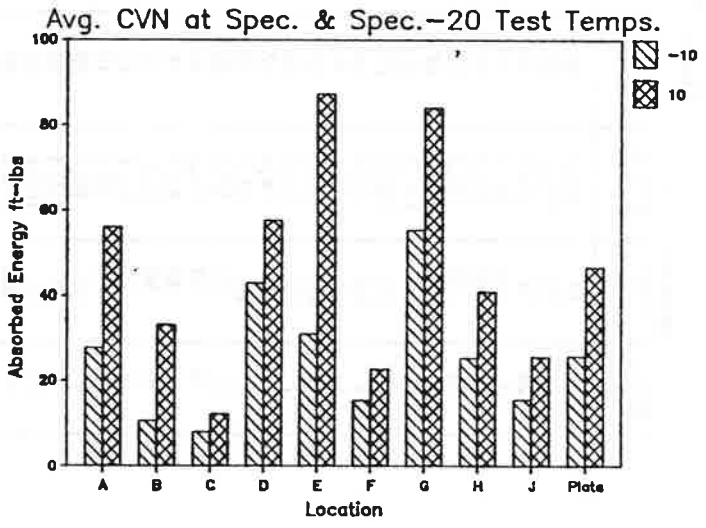
Spec. No.	Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
1	10	45.3	41	35
4	10	16.9	13	0
6	10	14.7	17	0
2	-10	9.3	9	0
3	-10	18.5	18	5
5	-10	18.9	17	5

Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
10	25.6	23.7	12
-10	15.6	14.7	3


LOCATION C
PLATE 32
× Average
Absorbed Energy ft-lbs
300
240
180
120
60
0
−120
−80
−40
0
40
80
120
Test Temperature °F

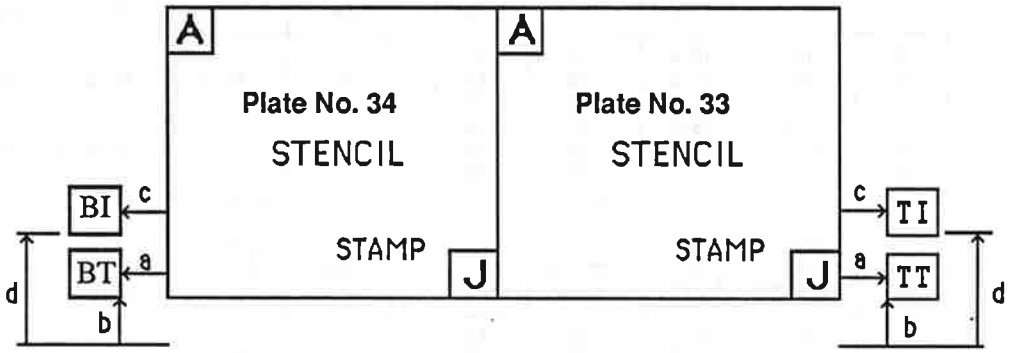

LOCATION E
PLATE 32
× Average
Absorbed Energy ft-lbs
300
240
180
120
60
0
−120
−80
−40
0
40
80
120
Test Temperature °F


LOCATION G
PLATE 32
× Average
Absorbed Energy ft-lbs
300
240
180
120
60
0
−120
−80
−40
0
40
80
120
Test Temperature °F


Avg. CVN at Spec. & Spec.−20 Test Temps.
−10
10
Absorbed Energy ft-lbs
100
80
60
40
20
0
A
B
C
D
E
F
G
H
J
Plate
Location

MILL DATA SHEET
Plate No: 33 & 34
Manf: 1

Serial Number: X30009
Heat Number: 803Z73600
Yield Point (psi): 54200
Tensile Strength (psi): 78500
Elongation (%): 26 {Gage Length (in): 2}
Steel Type: A588-82 Gr. B
Thickness (in): 4
Length (in): 120 Width (in): 60
Notes: Normalized at 1650 °F for 230 min.



Bottom
Ba : 2"
Bb : 4"
Bc : 2"
Bd : 15"
Spec. Code : P49

Top
Ta : 8"
Tb : 2"
Tc : 8"
Td : 17"
Spec. Code : P48

CHARPY MILL TESTS (ft-lbs)

	Test Temp	Test #1 CVN	Lt.Ex.	%Sh.	Test #2 CVN	Lt.Ex.	%Sh.	Test #3 CVN	Lt.Ex.	%Sh.	CVN Avg
Top	+10°F	56	52	40	35	35	20	44	42	30	45
Bot	+10°F	86	72	70	75	64	60	94	75	70	85

Chemical Analysis

C	Mn	P	S	Si	Cu	Ni	Cr	V	Al	Cb
.16	1.18	.013	.025	.350	.277	.30	.54	.062	.042	NA

Plate: 33 Q
Date: August 3, 1989 Windage: 0
Spec. Temp: + 10 F Personnel: DAG

Spec. No.	Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
1	10	40.0	38	40
2	10	19.6	25	10
5	10	72.4	63	70
3	-10	29.7	25	10
4	-10	64.4	58	60
6	-10	72.3	61	60

Average Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	44.0	42.0	40
-10	55.5	48.0	43

Spec. No.	Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
3	10	12.6	15	5
5	10	87.8	70	85
6	10	77.6	66	70
1	-10	23.1	21	10
2	-10	22.2	23	10
4	-10	68.2	55	70

Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	59.3	50.3	53
-10	37.8	33.0	30

Spec. No.	Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
2	10	56.8	49	60
11	10	47.3	37	30
28	10	73.4	61	70
10	-10	80.7	77	90
18	-10	82.1	70	85
24	-10	41.8	40	30
4	75	93.5	74	85
16	75	105.6	79	90
27	75	111.3	80	90
7	40	122.3	86	95
13	40	53.6	50	40
21	40	94.4	78	90
5	25	68.7	60	70
19	25	87.6	68	80
23	25	63.7	67	75
8	-30	49.8	48	40
14	-30	45.4	43	40
26	-30	47.9	44	40
1	-50	17.9	11	0
12	-50	35.0	33	25
29	-50	39.9	37	30
9	-70	42.2	39	40
17	-70	52.4	47	45
25	-70	37.4	35	30
3	100	99.9	70	85
20	100	122.7	78	95
22	100	114.0	72	90
6	-100	ERROR	21	20
15	-100	10.9	11	5
30	-100	29.3	27	30

Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	59.2	49.0	53
-10	68.2	62.3	68
74.6	103.5	77.7	88
40	90.1	71.3	75
25	73.3	65.0	75
-30	47.7	45.0	40
-50	30.9	27.0	18
-70	44.0	40.3	38
100	112.2	73.3	90
-100	20.1	19.7	18

Plate: 33 Q

Spec. No.	Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
2	10	94.1	71	75
4	10	85.4	70	85
5	10	79.6	64	80
1	-10	69.7	65	70
3	-10	76.6	66	70
6	-10	62.3	57	60

Average

Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
10	86.4	68.3	80
-10	69.5	62.7	67

Spec. No.	Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
4	10	80.9	67	80
11	10	75.6	62	75
27	10	72.0	60	70
6	-10	52.0	45	35
20	-10	64.6	55	60
24	-10	73.9	60	60
1	75	106.7	82	95
17	75	117.8	78	85
30	75	115.8	85	95
9	40	79.2	63	85
14	40	85.9	69	85
21	40	113.3	81	90
5	25	89.9	71	85
18	25	117.8	86	95
23	25	81.8	78	90
8	-30	65.9	58	70
15	-30	47.7	47	40
28	-30	42.6	42	30
3	-50	46.7	43	40
12	-50	52.3	48	40
26	-50	34.6	32	10
10	-70	20.6	21	5
19	-70	34.3	32	30
22	-70	35.5	32	30
2	100	115.2	80	95
16	100	106.5	82	90
25	100	99.7	72	85
7	-100	24.9	23	25
13	-100	22.7	22	25
29	-100	12.1	13	15

Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
10	76.2	63.0	75
-10	63.5	53.3	52
74.6	113.4	81.7	92
40	92.8	71.0	87
25	96.5	78.3	90
-30	52.1	49.0	47
-50	44.5	41.0	30
-70	30.1	28.3	22
100	107.1	78.0	90
-100	19.9	19.3	22

Spec. No.	Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
1	10	76.4	67	75
3	10	75.9	62	70
4	10	54.5	48	40
2	-10	65.8	58	60
5	-10	60.9	54	60
6	-10	60.3	54	60

Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
10	68.9	59.0	62
-10	62.3	55.3	60

Plate: 33 Q

Spec. No.	Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
8	10	70.7	60	80
16	10	75.7	59	80
24	10	72.9	60	85
1	-10	73.7	66	80
13	-10	57.6	53	60
27	-10	67.3	58	70
6	75	119.9	83	95
15	75	109.3	80	95
22	75	108.9	75	85
4	40	96.5	82	90
19	40	93.2	74	85
30	40	100.9	75	85
10	25	71.5	60	50
14	25	70.4	61	50
28	25	107.9	87	100
5	-30	55.2	51	50
18	-30	53.9	49	50
21	-30	54.4	49	50
9	-50	44.4	42	35
17	-50	43.0	39	30
25	-50	42.7	39	30
3	-70	31.4	30	20
11	-70	18.2	20	0
29	-70	48.0	43	40
7	100	118.0	84	100
12	100	121.6	82	100
26	100	115.2	72	90
2	-100	28.9	29	30
20	-100	22.0	24	25
23	-100	21.3	18	20

Average

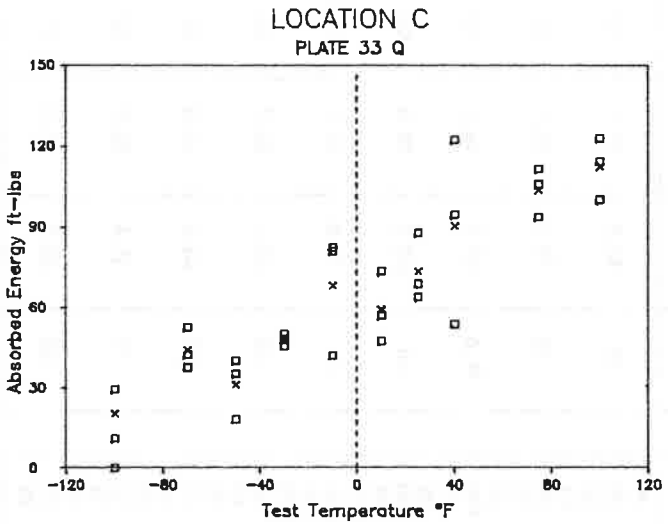
Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
10	73.1	59.7	82
-10	66.2	59.0	70
74.6	112.7	79.3	92
40	96.9	77.0	87
25	83.3	69.3	67
-30	54.5	49.7	50
-50	43.4	40.0	32
-70	32.5	31.0	20
100	118.3	79.3	97
-100	24.1	23.7	25

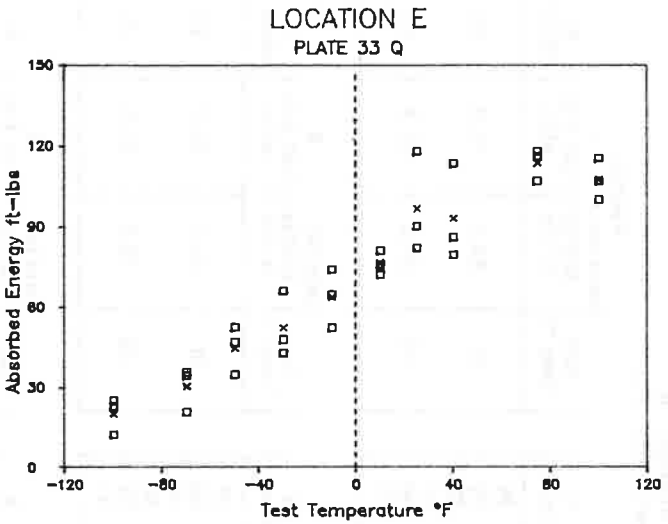
Spec. No.	Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
2	10	83.8	64	70
3	10	63.4	55	50
6	10	69.7	60	60
1	-10	58.7	50	50
4	-10	65.0	57	60
5	-10	56.3	53	50

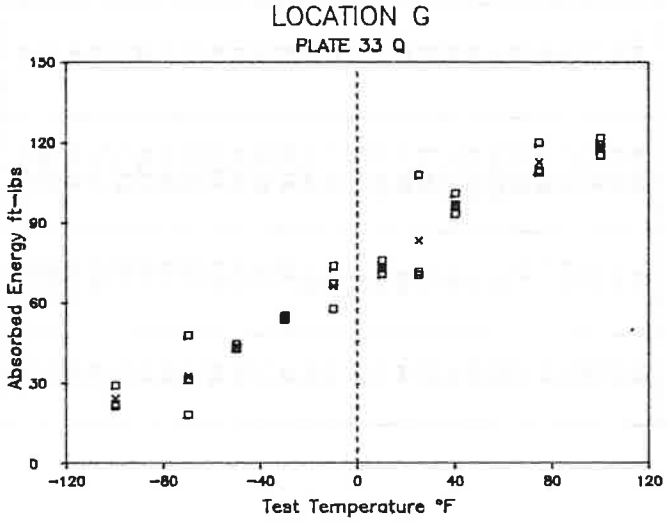
Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
10	72.3	59.7	60
-10	60.0	53.3	53

Spec. No.	Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
1	10	78.1	62	60
4	10	53.8	49	50
6	10	57.6	51	50
2	-10	61.7	54	55
3	-10	55.6	51	55
5	-10	65.3	58	70

Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
10	63.2	54.0	53
-10	60.9	54.3	60


LOCATION C
PLATE 33 Q
Absorbed Energy ft-lbs
Test Temperature °F


LOCATION E
PLATE 33 Q
Absorbed Energy ft-lbs
Test Temperature °F


LOCATION G
PLATE 33 Q
Absorbed Energy ft-lbs
Test Temperature °F

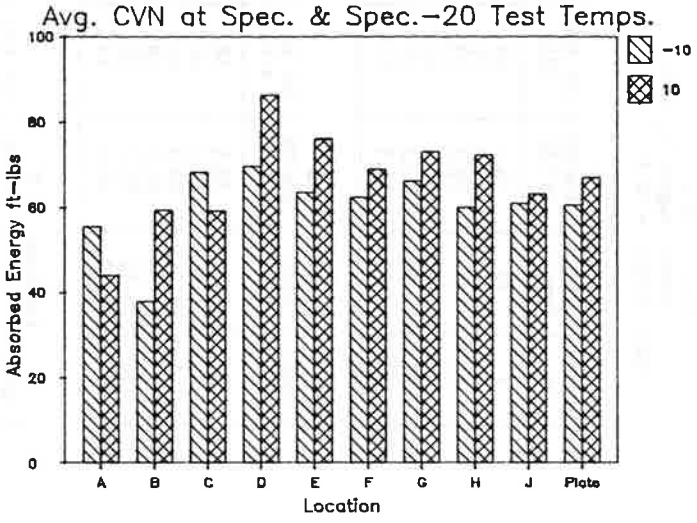

Avg. CVN at Spec. & Spec.-20 Test Temps.
-10
10
Absorbed Energy ft-lbs
A
B
C
D
E
F
G
H
J
Plate
Location

Plate: 33 C
Date: August 3, 1989 Windage: 0
Spec. Temp: + 10 F Personnel: DAG

Spec. No.	Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
7	10	76.1	68	75
10	10	84.8	76	90
11	10	79.7	72	85
8	-10	48.4	45	40
9	-10	62.3	55	60
12	-10	56.1	51	50

Average Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	80.2	72.0	83
-10	55.6	50.3	50

Spec. No.	Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
8	10	78.5	68	75
9	10	71.2	62	60
11	10	48.3	46	40
7	-10	51.8	49	50
10	-10	55.7	52	50
12	-10	42.5	41	35

Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	66.0	58.7	58
-10	50.0	47.3	45

Spec. No.	Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
32	10	83.8	70	75
45	10	89.3	70	75
56	10	72.6	61	60
37	-10	57.1	52	45
41	-10	89.2	70	85
54	-10	63.6	60	55
35	75	113.2	80	90
48	75	122.3	88	100
51	75	116.4	85	95
38	40	95.8	73	85
44	40	87.4	78	90
52	40	126.8	86	95
36	25	63.7	51	50
43	25	85.2	70	85
50	25	84.7	71	85
34	-30	71.9	63	70
47	-30	61.6	52	60
49	-30	68.4	61	65
31	-50	39.8	37	35
46	-50	40.3	40	40
53	-50	54.2	49	50
39	-70	33.9	32	20
42	-70	43.7	38	30
55	-70	28.7	28	15
33	-100	37.8	34	35
40	-100	22.2	22	25
57	-100	26.3	25	25

Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	81.9	67.0	70
-10	70.0	60.7	62
74.6	117.3	84.3	95
40	103.3	79.0	90
25	77.9	64.0	73
-30	67.3	58.7	65
-50	44.8	42.0	42
-70	35.4	32.7	22
-100	28.8	27.0	28

Plate: 33 C

Spec. No.	Location	D Energy ft-lbs	Lat Exp mils	% Shear
	Test Temp-°F			
7	10	72.8	66	60
9	10	84.8	73	70
12	10	65.9	69	70
8	-10	53.8	52	50
10	-10	55.2	49	45
11	-10	54.5	46	40

Average

Location	D Energy ft-lbs	Lat Exp mils	% Shear
Test Temp-°F			
10	74.5	69.3	67
-10	54.5	49.0	45

Spec. No.	Location	E Energy ft-lbs	Lat Exp mils	% Shear
	Test Temp-°F			
33	10	64.0	54	50
44	10	73.2	62	60
55	10	68.7	60	55
37	-10	56.2	48	40
42	-10	48.3	47	40
50	-10	55.7	51	45
39	75	107.6	82	95
43	75	102.4	77	90
54	75	114.7	86	100
31	40	94.2	65	75
47	40	98.9	78	90
53	40	90.2	72	85
35	25	64.2	56	40
40	25	75.8	64	70
52	25	82.4	67	70
38	-30	38.7	35	30
41	-30	43.5	43	35
56	-30	37.8	37	30
36	-50	38.6	37	30
45	-50	40.4	37	25
51	-50	28.3	30	15
32	-70	30.1	28	10
46	-70	12.4	15	0
57	-70	8.6	12	0
34	-100	10.7	11	10
48	-100	19.6	17	20
49	-100	10.4	12	15

Location	E Energy ft-lbs	Lat Exp mils	% Shear
Test Temp-°F			
10	68.6	58.7	55
-10	53.4	48.7	42
74.6	108.2	81.7	95
40	94.4	71.7	83
25	74.1	62.3	60
-30	40.0	38.3	32
-50	35.8	34.7	23
-70	17.0	18.3	3
-100	13.6	13.3	15

Spec. No.	Location	F Energy ft-lbs	Lat Exp mils	% Shear
	Test Temp-°F			
8	10	71.3	61	70
10	10	98.6	79	90
12	10	69.6	60	70
7	-10	53.6	50	45
9	-10	96.4	87	100
11	-10	51.2	50	45

Location	F Energy ft-lbs	Lat Exp mils	% Shear
Test Temp-°F			
10	79.8	66.7	77
-10	67.1	62.3	63

Plate: 33 C

Spec. No.	Location	G Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
35		10	72.6	62	65
42		10	70.6	59	60
50		10	78.4	64	65
32		-10	36.8	38	30
46		-10	45.6	43	35
53		-10	45.8	42	30
31		75	108.1	82	90
44		75	109.3	74	85
57		75	98.5	71	85
37		40	107.3	71	80
45		40	84.8	72	80
56		40	90.3	67	70
33		25	85.3	68	75
40		25	72.2	58	60
55		25	91.6	72	85
36		-30	26.6	31	20
43		-30	33.4	32	20
54		-30	17.9	25	10
34		-50	17.3	22	5
47		-50	36.4	33	30
51		-50	21.7	23	5
38		-70	8.7	12	0
48		-70	10.8	13	0
49		-70	38.3	36	25
39		-100	6.7	7	5
41		-100	6.9	8	0
52		-100	7.9	7	0

Average

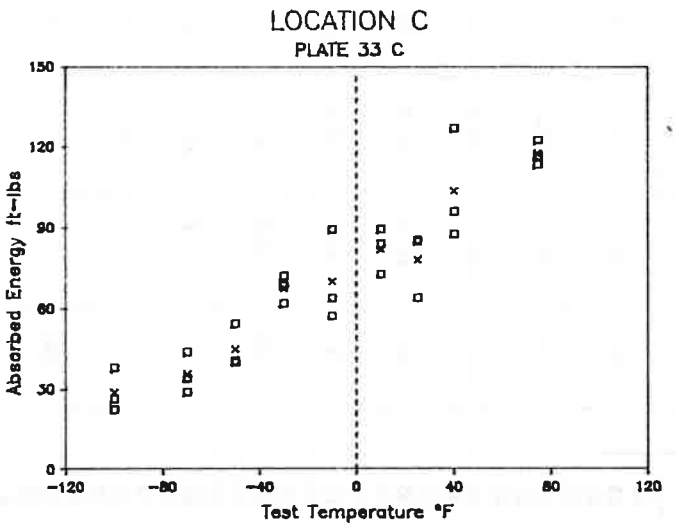
Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
10	73.9	61.7	63
-10	42.7	41.0	32
74.6	105.3	75.7	87
40	94.1	70.0	77
25	83.0	66.0	73
-30	26.0	29.3	17
-50	25.1	26.0	13
-70	19.3	20.3	8
-100	7.2	7.3	2

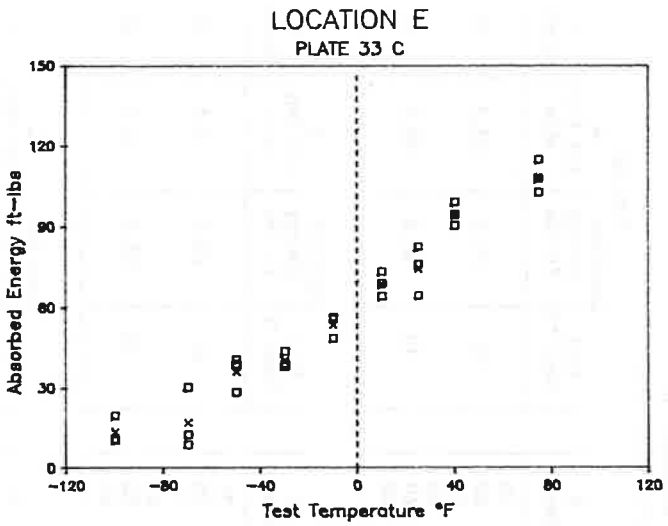
Spec. No.	Location	H Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
7		10	57.6	53	50
8		10	64.4	54	50
12		10	55.9	54	50
9		-10	37.3	38	20
10		-10	41.2	43	30
11		-10	35.0	38	20

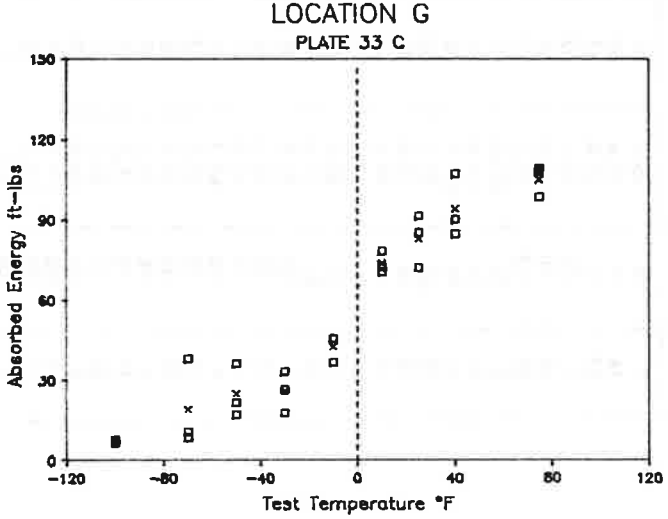
Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
10	59.3	53.7	50
-10	37.8	39.7	23

Spec. No.	Location	J Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
9		10	72.2	59	55
10		10	63.2	51	45
12		10	53.4	46	40
7		-10	58.4	55	60
8		-10	52.3	47	40
11		-10	70.1	57	60

Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
10	62.9	52.0	47
-10	60.3	53.0	53


LOCATION C
PLATE 33 C
Absorbed Energy ft-lbs
Test Temperature °F


LOCATION E
PLATE 33 C
Absorbed Energy ft-lbs
Test Temperature °F


LOCATION G
PLATE 33 C
Absorbed Energy ft-lbs
Test Temperature °F

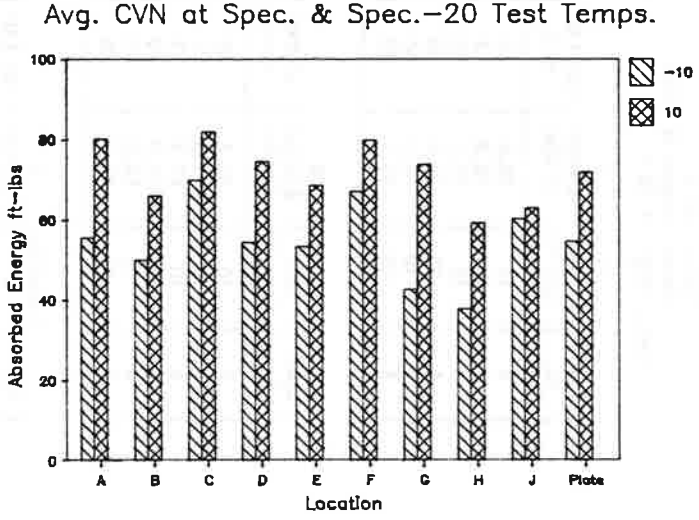

Avg. CVN at Spec. & Spec.−20 Test Temps.
Absorbed Energy ft-lbs
−10
10
A
B
C
D
E
F
G
H
J
Plate
Location

Plate: 34 Q
Date: August 8, 1989 Windage: 0
Spec. Temp: + 10 F Personnel: DAG

Spec. No.	Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
3	10	78.4	68	70
4	10	72.8	63	60
6	10	71.7	60	60
1	-10	70.6	60	60
2	-10	78.6	66	60
5	-10	55.4	50	40

Average Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	74.3	63.7	63
-10	68.2	58.7	53

Spec. No.	Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
2	10	81.6	69	70
3	10	91.6	74	70
6	10	61.5	53	50
1	-10	52.9	49	45
4	-10	54.8	58	50
5	-10	52.3	49	40

Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	78.2	65.3	63
-10	53.3	52.0	45

Spec. No.	Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
1	10	75.7	63	60
14	10	65.4	56	45
27	10	55.6	53	40
7	-10	44.0	42	30
19	-10	42.8	45	30
25	-10	53.8	50	40
3	74	104.2	81	95
17	74	114.6	85	95
21	74	117.5	75	95
10	40	80.1	62	70
12	40	99.8	74	85
29	40	79.6	62	70
8	25	97.6	75	75
13	25	85.6	70	70
24	25	75.8	63	60
5	-30	36.5	38	20
18	-30	44.6	42	30
30	-30	47.8	42	30
6	-50	47.3	44	30
16	-50	38.7	38	20
23	-50	43.7	42	30
4	-70	21.3	23	10
15	-70	35.9	35	20
28	-70	26.7	26	10
2	100	114.0	79	90
20	100	109.9	78	90
22	100	108.0	78	90
9	-100	4.7	3	0
11	-100	21.4	21	20
26	-100	7.9	8	5

Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	65.6	57.3	48
40	86.5	66.0	75
25	86.3	69.3	68
-30	43.0	40.7	27
-50	43.2	41.3	27
-70	28.0	28.0	13
100	110.6	78.3	90
-100	11.3	10.7	8

Plate: 34 Q

Spec. No.	Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
2	10	69.7	57	50
4	10	76.2	63	60
6	10	54.6	51	40
1	-10	69.9	65	60
3	-10	70.6	58	60
5	-10	45.6	44	30

Average

Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
10	66.8	57.0	50
-10	62.0	55.7	50

Spec. No.	Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
8	10	70.2	63	60
14	10	98.6	78	85
26	10	78.8	66	65
2	-10	58.1	52	45
20	-10	58.6	57	50
22	-10	48.0	47	30
3	74	115.3	84	95
16	74	114.8	84	95
29	74	108.9	83	95
6	40	87.6	67	65
17	40	85.4	72	70
24	40	96.8	81	90
5	25	85.7	71	70
18	25	81.6	66	60
23	25	85.4	69	60
10	-30	43.6	44	30
12	-30	45.9	43	30
30	-30	33.8	37	10
9	-50	35.6	35	20
11	-50	49.2	47	30
27	-50	38.9	38	20
4	-70	24.2	25	10
19	-70	12.2	16	0
21	-70	39.3	37	30
7	100	109.1	81	90
15	100	113.8	82	95
25	100	114.0	83	95
1	-100	14.6	14	15
13	-100	15.6	16	20
28	-100	7.4	8	5

Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
10	82.5	69.0	70
-10	54.9	52.0	42
73.8	113.0	83.7	95
40	89.9	73.3	75
25	84.2	68.7	63
-30	41.1	41.3	23
-50	41.2	40.0	23
-70	25.2	26.0	13
100	112.3	82.0	93
-100	12.5	12.7	13

Spec. No.	Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
2	10	64.7	58	55
3	10	61.9	54	45
5	10	65.7	56	55
1	-10	54.8	51	45
4	-10	58.2	53	50
6	-10	52.7	49	40

Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
10	64.1	56.0	52
-10	55.2	51.0	45

Plate: 34 Q

Spec. No.	Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
3	10	71.7	60	50
17	10	78.9	69	70
24	10	91.5	77	85
7	-10	70.8	62	55
14	-10	74.9	65	60
29	-10	62.6	56	50
1	74	118.3	81	90
15	74	117.4	81	90
26	74	111.4	80	90
9	40	89.7	71	65
16	40	101.3	77	75
22	40	110.3	79	75
5	25	110.3	81	80
20	25	89.9	77	70
25	25	95.7	80	75
10	-30	71.5	65	60
12	-30	62.4	55	50
28	-30	48.7	47	30
4	-50	59.7	54	40
13	-50	53.2	46	30
30	-50	32.3	32	20
6	-70	40.4	40	30
18	-70	38.4	37	30
21	-70	34.1	33	20
2	100	119.7	81	90
11	100	117.4	81	90
27	100	115.2	81	90
8	-100	4.7	5	0
19	-100	34.3	34	40
23	-100	30.6	28	35

Average

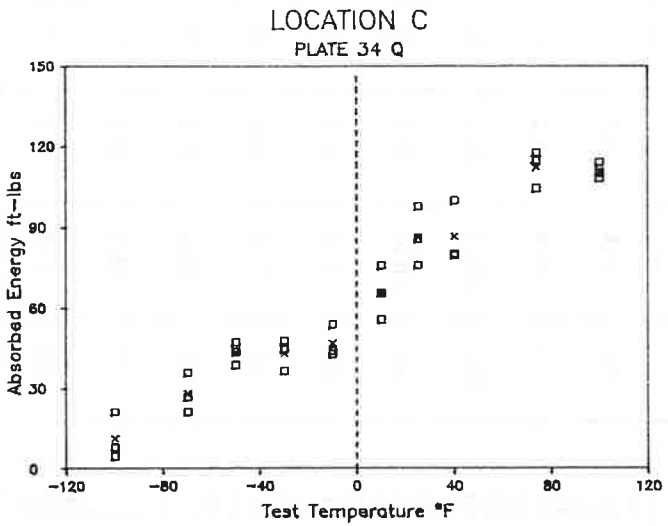
Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
10	80.7	68.7	68
-10	69.4	61.0	55
73.8	115.7	80.7	90
40	100.4	75.7	72
25	98.6	79.3	75
-30	60.9	55.7	47
-50	48.4	44.0	30
-70	37.6	36.7	27
100	117.4	81.0	90
-100	23.2	22.3	25

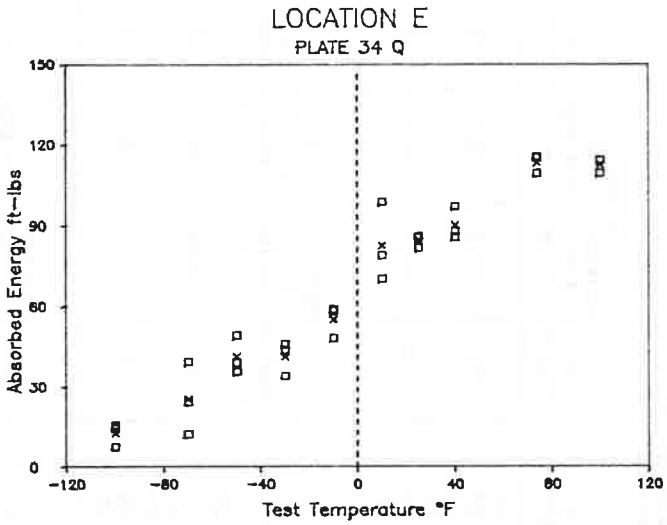
Spec. No.	Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
1	10	72.4	62	60
5	10	77.3	64	60
6	10	77.8	63	60
2	-10	73.6	64	60
3	-10	61.7	56	50
4	-10	58.5	53	50

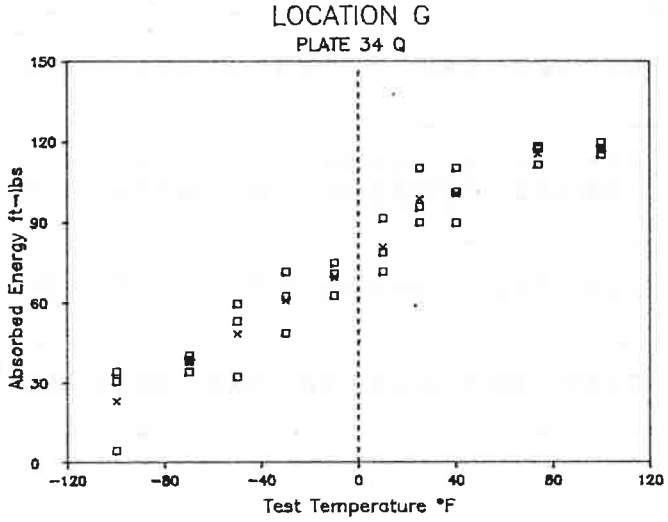
Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
10	75.8	63.0	60
-10	64.6	57.7	53

Spec. No.	Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
1	10	67.8	60	60
3	10	109.9	84	85
4	10	64.0	56	50
2	-10	75.7	65	60
5	-10	71.6	61	60
6	-10	54.3	49	40

Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
10	80.6	66.7	65
-10	67.2	58.3	53


LOCATION C
PLATE 34 Q
Absorbed Energy ft-lbs
Test Temperature °F
150
120
90
60
30
0
-120
-80
-40
0
40
80
120


LOCATION E
PLATE 34 Q
Absorbed Energy ft-lbs
Test Temperature °F
150
120
90
60
30
0
-120
-80
-40
0
40
80
120


LOCATION G
PLATE 34 Q
Absorbed Energy ft-lbs
Test Temperature °F
150
120
90
60
30
0
-120
-80
-40
0
40
80
120

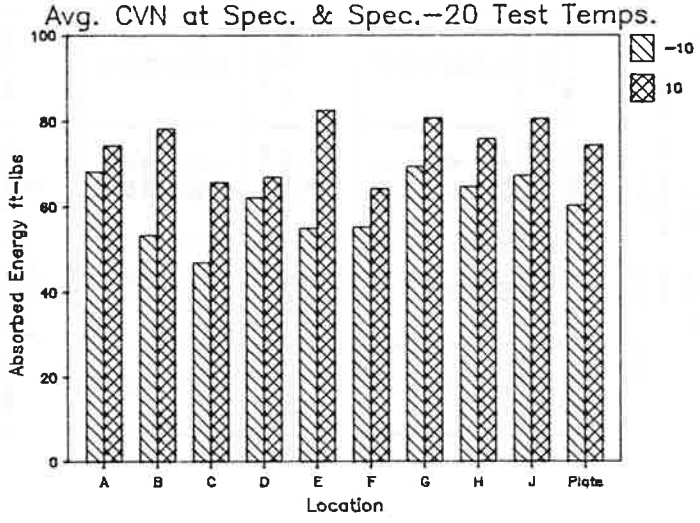

Avg. CVN at Spec. & Spec.-20 Test Temps.
-10
10
Absorbed Energy ft-lbs
Location
100
80
60
40
20
0
A
B
C
D
E
F
G
H
J
Plate

Plate: 34 C
Date: August 8, 1989 Windage: 0
Spec. Temp: + 10 F Personnel: DAG

Spec. No.	Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
8	10	52.3	51	40
10	10	58.4	57	50
11	10	59.6	52	40
7	-10	40.1	42	30
9	-10	46.3	47	30
12	-10	37.0	40	25

Average Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	56.8	53.3	43
-10	41.1	43.0	28

Spec. No.	Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
7	10	48.6	55	40
9	10	61.9	53	45
10	10	56.2	53	45
8	-10	38.6	45	30
11	-10	39.2	39	20
12	-10	50.1	47	40

Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	55.6	53.7	43
-10	42.6	43.7	30

Spec. No.	Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
33	10	54.6	52	40
43	10	60.0	59	50
55	10	58.1	54	50
37	-10	46.4	61	50
41	-10	59.6	56	50
52	-10	58.4	52	40
36	74	96.8	78	90
48	74	115.4	83	90
54	74	115.3	88	95
31	40	107.2	77	70
47	40	104.1	71	70
56	40	121.5	83	80
32	25	81.8	70	70
44	25	79.6	68	65
50	25	71.9	59	55
34	-30	47.7	45	30
46	-30	61.4	58	50
51	-30	58.2	52	40
38	-50	33.6	35	15
45	-50	21.1	23	5
49	-50	22.0	30	10
35	-70	14.6	15	0
42	-70	8.7	13	0
57	-70	17.8	20	5
39	-100	22.6	22	25
40	-100	16.9	15	20
53	-100	12.5	14	15

Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	57.6	55.0	47
-10	54.8	56.3	47
73.8	109.2	83.0	92
40	110.9	77.0	73
25	77.8	65.7	63
-30	55.8	51.7	40
-50	25.6	29.3	10
-70	13.7	16.0	2
-100	17.3	17.0	20

Plate: 34 C

Spec. No.	Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
7	10	64.8	58	50
10	10	51.7	48	40
12	10	58.8	54	40
8	-10	52.0	49	35
9	-10	40.4	40	20
11	-10	38.2	40	20

Average

Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
10	58.4	53.3	43
-10	43.5	43.0	25

Spec. No.	Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
31	10	56.5	49	40
46	10	68.1	61	50
51	10	60.4	54	40
34	-10	51.7	48	40
42	-10	44.9	44	30
53	-10	56.4	50	40
39	74	98.7	84	95
44	74	92.9	75	85
55	74	103.4	73	85
32	40	106.1	82	80
43	40	90.7	76	70
52	40	89.2	76	70
36	25	62.3	67	60
47	25	71.4	62	60
54	25	62.7	53	50
33	-30	40.1	40	20
45	-30	19.8	26	5
56	-30	31.0	32	15
37	-50	25.2	28	10
41	-50	22.9	29	10
50	-50	43.4	42	30
35	-70	9.4	13	10
48	-70	16.9	19	10
49	-70	17.5	19	10
38	-100	5.3	6	0
40	-100	18.2	21	10
57	-100	11.7	12	5

Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
10	61.7	54.7	43
-10	51.0	47.3	37
73.8	98.3	77.3	88
40	95.3	78.0	73
25	65.5	60.7	57
-30	30.3	32.7	13
-50	30.5	33.0	17
-70	14.6	17.0	10
-100	11.7	13.0	5

Spec. No.	Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
9	10	72.3	64	55
10	10	65.5	60	50
12	10	61.4	54	40
7	-10	53.9	52	40
8	-10	58.6	53	45
11	-10	69.2	63	60

Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
10	66.4	59.3	48
-10	60.6	56.0	48

Plate: 34 C

Spec. No.	Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
34	10	60.2	60	50
47	10	82.7	67	55
53	10	68.9	61	50
35	-10	66.0	67	55
44	-10	58.1	59	50
49	-10	62.5	56	50
31	74	116.3	85	90
42	74	116.8	87	95
57	74	109.2	84	90
37	40	116.3	78	75
45	40	123.4	102	100
50	40	99.7	80	75
38	25	96.7	75	70
41	25	91.1	71	65
56	25	90.6	72	70
32	-30	53.7	48	40
43	-30	46.6	45	30
55	-30	43.5	41	20
33	-50	55.8	55	40
40	-50	47.8	55	40
54	-50	31.3	34	15
39	-70	27.8	27	10
46	-70	58.9	55	50
52	-70	35.4	33	20
36	-100	29.1	27	35
48	-100	31.9	32	35
51	-100	23.2	22	15

Average

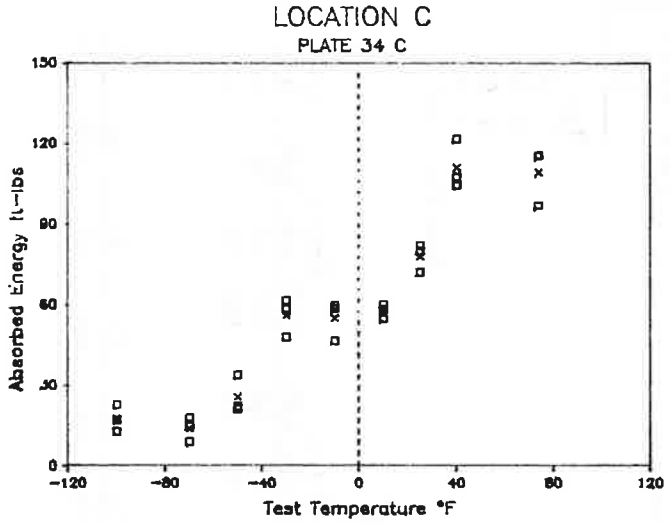
Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
10	70.6	62.7	52
-10	62.2	60.7	52
73.8	114.1	85.3	92
40	113.1	86.7	83
25	92.8	72.7	68
-30	47.9	44.7	30
-50	45.0	48.0	32
-70	40.7	38.3	27
-100	28.1	27.0	28

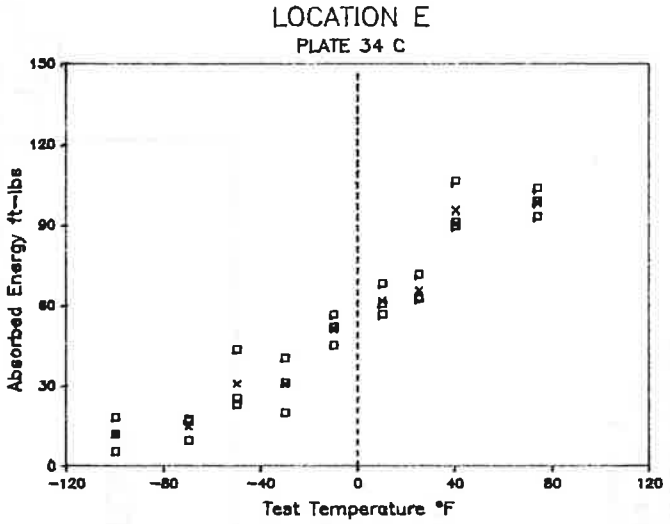
Spec. No.	Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
8	10	78.8	74	60
9	10	70.4	62	50
12	10	103.7	100	100
7	-10	70.3	61	50
10	-10	64.8	65	50
11	-10	70.9	62	50

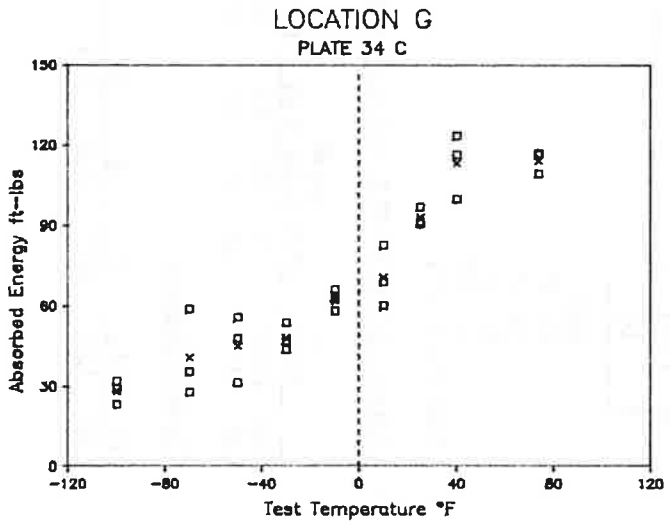
Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
10	84.3	78.7	70
-10	68.7	62.7	50

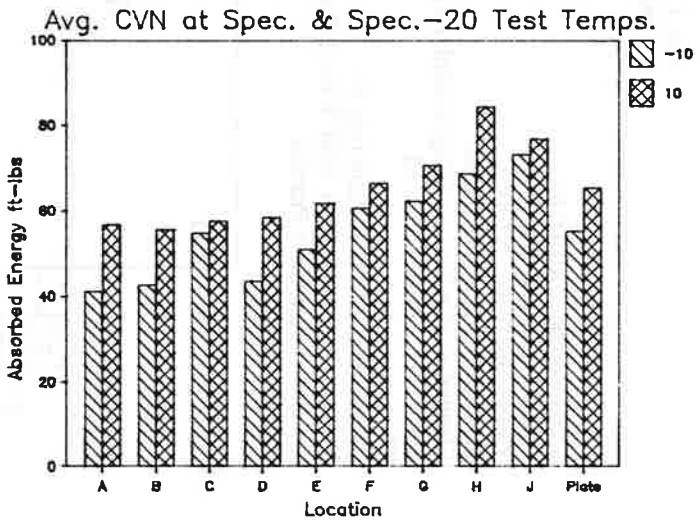
Spec. No.	Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
7	10	76.6	67	60
8	10	75.9	64	60
12	10	77.8	79	70
9	-10	65.2	58	50
10	-10	69.3	61	55
11	-10	84.9	68	70

Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
10	76.8	70.0	63
-10	73.1	62.3	58


LOCATION C
PLATE 34 C
Absorbed Energy ft-lbs
Test Temperature °F

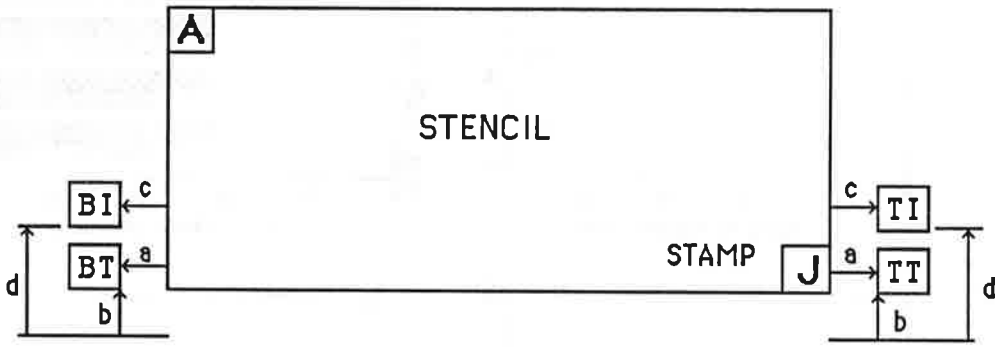

LOCATION E
PLATE 34 C
Absorbed Energy ft-lbs
Test Temperature °F


LOCATION G
PLATE 34 C
Absorbed Energy ft-lbs
Test Temperature °F


Avg. CVN at Spec. & Spec.-20 Test Temps.
-10
10
Absorbed Energy ft-lbs
A
B
C
D
E
F
G
H
J
Plate
Location

MILL DATA SHEET
Plate No: 35
Manf: 1

Serial Number: X010076
Heat Number: 803Y73370
Yield Point (psi): 54100
Tensile Strength (psi): 80600
Elongation (%): 23 {Gage Length (in): 2}
Steel Type: A572-85 Gr. 50
Thickness (in): 4
Length (in): 120 Width (in): 60
Notes: Normalized at 1650 °F for 230 min.
Fine Grain Practice



Bottom
Ba : 0"
Bb : 8"
Bc : 0"
Bd : 32"
Spec. Code : P34

Top
Ta : 0"
Tb : 8"
Tc : 0"
Td : 32"
Spec. Code : L62

CHARPY IMPACT MILL TESTS (foot-lbs)

	Test Temp	Test #1 CVN	Lt.Ex.	%Sh.	Test #2 CVN	Lt.Ex.	%Sh.	Test #3 CVN	Lt.Ex.	%Sh.	CVN Avg
Top	+10°F	150	95	90	162	91	90	132	93	90	148
Bot	+10°F	120	81	85	102	77	85	164	93	90	129

Chemical Analysis

C	Mn	P	S	Si	Cu	Ni	Cr	V	Al	Cb
.19	1.22	.019	.020	.253	NA	NA	NA	.051	.058	.042

Plate: 35 Q
Date: August 9. 1989 Windage: 0
Spec. Temp: + 10 F Personnel: DAG

Spec. No.	Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
1	10	91.4	71	70
3	10	94.7	72	70
5	10	97.9	70	70
2	-10	100.2	72	75
4	-10	82.7	59	60
6	-10	73.6	59	60

Average

Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	94.7	71.0	70
-10	85.5	63.3	65

Spec. No.	Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
2	10	120.0	78	85
5	10	92.6	71	70
6	10	152.3	90	100
1	-10	97.9	71	85
3	-10	102.6	75	85
4	-10	110.8	77	85

Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	121.6	79.7	85
-10	103.8	74.3	85

Spec. No.	Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
3	10	84.7	66	65
19	10	93.4	69	70
26	10	86.0	61	60
7	-10	60.1	53	50
15	-10	51.3	44	40
22	-10	72.7	60	70
9	75	135.2	89	100
11	75	132.4	89	100
30	75	135.6	75	90
1	40	137.5	89	100
18	40	141.3	89	100
24	40	102.6	77	90
4	25	108.7	85	95
20	25	89.8	65	70
27	25	106.7	72	70
8	-30	56.5	53	50
14	-30	73.8	63	70
25	-30	45.3	38	20
5	-50	40.1	36	20
17	-50	17.4	16	0
29	-50	39.8	33	20
6	-70	25.7	23	5
13	-70	29.2	25	10
23	-70	20.6	16	0
2	100	130.5	88	95
16	100	142.7	90	95
21	100	138.9	81	90
10	-100	16.9	15	10
12	-100	10.2	10	10
28	-100	6.0	5	0

Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	88.0	65.3	65
-10	61.4	52.3	53
74.8	134.4	84.3	97
40	127.1	85.0	97
25	101.7	74.0	78
-30	58.5	51.3	47
-50	32.4	28.3	13
-70	25.2	21.3	5
100	137.4	86.3	93
-100	11.0	10.0	7

Plate: 35 Q

Spec. No.	Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
1	10	88.4	69	70
2	10	92.8	69	70
5	10	91.3	63	65
3	-10	85.1	65	80
4	-10	80.2	61	75
6	-10	78.3	63	75

Average

Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
10	90.8	67.0	68
-10	81.2	63.0	77

Spec. No.	Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
6	10	87.6	66	70
14	10	95.4	71	85
27	10	135.1	90	95
3	-10	84.5	66	80
19	-10	87.3	68	85
25	-10	64.4	53	50
2	75	135.1	91	100
17	75	139.5	85	95
30	75	133.7	88	95
8	40	136.7	90	100
11	40	109.3	66	60
22	40	135.5	88	95
4	25	95.8	72	80
20	25	76.4	60	60
24	25	141.6	84	90
10	-30	43.7	38	20
13	-30	62.3	48	40
29	-30	69.5	59	60
9	-50	43.5	38	20
12	-50	25.2	21	5
21	-50	48.7	42	25
1	-70	30.4	26	10
18	-70	49.0	40	25
28	-70	35.9	29	10
7	100	134.7	86	95
15	100	142.4	88	95
26	100	148.1	80	90
5	-100	18.5	16	15
16	-100	5.3	3	0
23	-100	10.4	10	5

Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
10	106.0	75.7	83
-10	78.7	62.3	72
74.8	136.1	88.0	97
40	127.2	81.3	85
25	104.6	72.0	77
-30	58.5	48.3	40
-50	39.1	33.7	17
-70	38.4	31.7	15
100	141.7	84.7	93
-100	11.4	9.7	7

Spec. No.	Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
1	10	87.7	67	70
4	10	99.3	63	60
6	10	93.7	67	75
2	-10	68.3	54	70
3	-10	79.6	60	75
5	-10	71.8	59	75

Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
10	93.6	65.7	68
-10	73.2	57.7	73

Plate: 35 Q

Spec. No.	Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
2	10	90.4	67	75
19	10	83.5	63	70
27	10	66.3	52	50
9	-10	82.4	66	70
12	-10	65.6	48	40
25	-10	71.9	57	65
7	75	135.8	89	95
11	75	134.2	86	95
30	75	121.4	72	85
5	40	110.8	77	85
17	40	135.6	89	95
22	40	103.4	74	85
3	25	104.9	83	95
20	25	105.6	73	80
26	25	99.9	72	80
8	-30	73.0	59	60
15	-30	62.2	53	50
23	-30	55.6	44	30
1	-50	53.8	46	30
16	-50	53.4	47	30
28	-50	46.4	37	20
10	-70	13.7	13	0
13	-70	42.3	38	20
21	-70	35.2	27	10
6	100	133.2	84	85
14	100	134.3	88	100
24	100	136.0	84	90
4	-100	18.3	17	15
18	-100	15.7	15	10
29	-100	24.2	19	20

Average

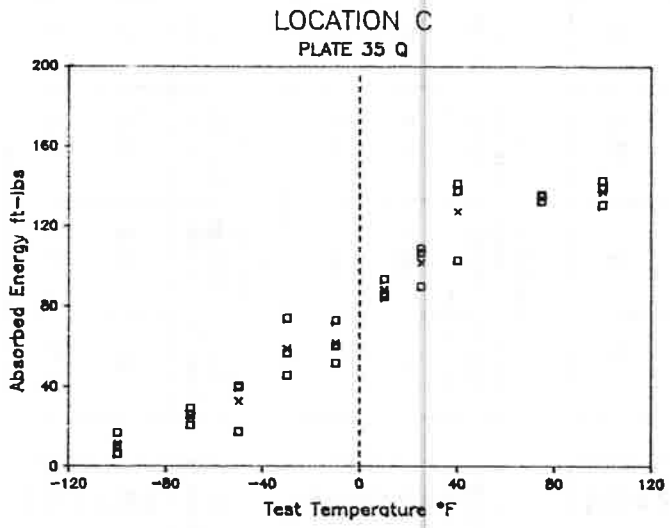
Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
10	80.1	60.7	65
-10	73.3	57.0	58
74.8	130.5	82.3	92
40	116.6	80.0	88
25	103.5	76.0	85
-30	63.6	52.0	47
-50	51.2	43.3	27
-70	30.4	26.0	10
100	134.5	85.3	92
-100	19.4	17.0	15

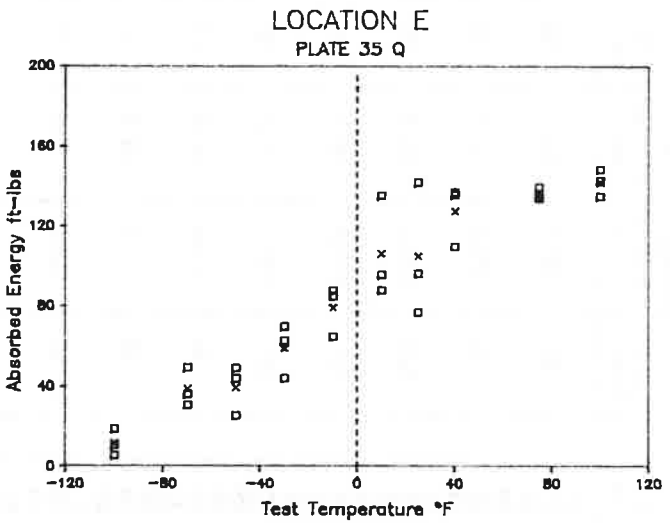
Spec. No.	Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
2	10	91.9	73	85
3	10	100.8	69	80
6	10	95.8	75	85
1	-10	96.5	74	85
4	-10	86.7	63	75
5	-10	76.8	74	85

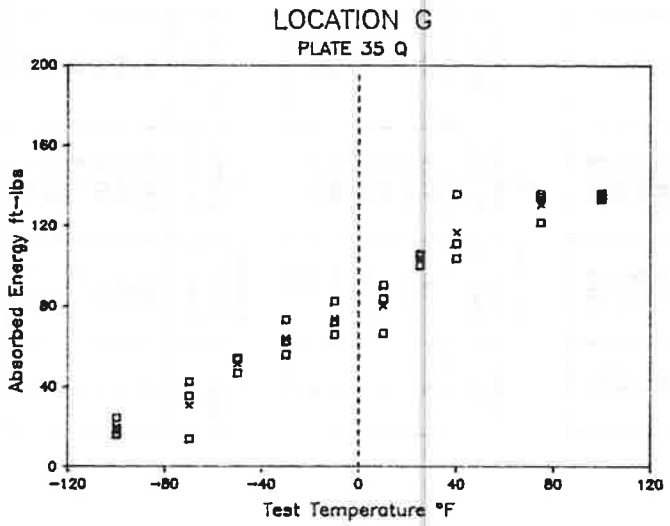
Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
10	96.2	72.3	83
-10	86.7	70.3	82

Spec. No.	Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
3	10	113.0	80	90
4	10	88.9	64	70
5	10	91.6	67	70
1	-10	83.9	68	80
2	-10	82.3	60	70
6	-10	91.4	70	85

Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
10	97.8	70.3	77
-10	85.9	66.0	78


LOCATION C
PLATE 35 Q
Absorbed Energy ft-lbs
Test Temperature °F


LOCATION E
PLATE 35 Q
Absorbed Energy ft-lbs
Test Temperature °F


LOCATION G
PLATE 35 Q
Absorbed Energy ft-lbs
Test Temperature °F

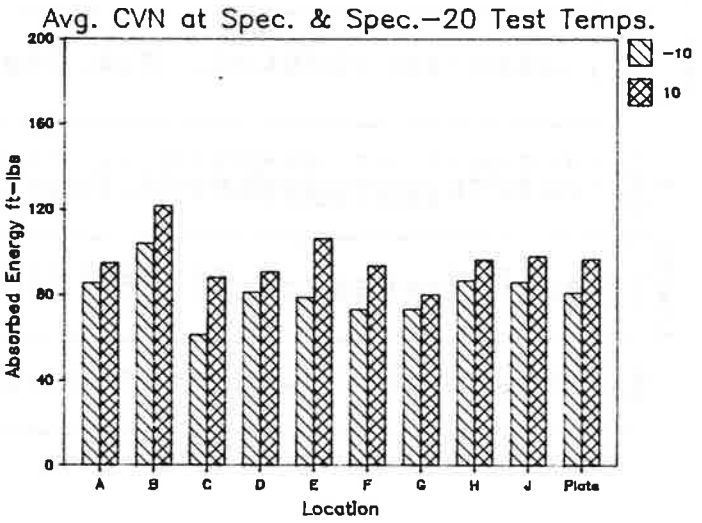

Avg. CVN at Spec. & Spec.−20 Test Temps.
−10
10
Absorbed Energy ft-lbs
A
B
C
D
E
F
G
H
J
Plate
Location

Plate: 35 C
Date: August 9, 1989 Windage: 0
Spec. Temp: + 10 F Personnel: DAG

Spec. No.	Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
7	10	98.3	78	90
8	10	127.2	78	90
12	10	105.3	70	85
9	-10	107.1	78	90
10	-10	107.3	72	85
11	-10	92.9	66	80

Average Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	110.3	75.3	88
-10	102.4	72.0	85

Spec. No.	Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
8	10	23.4	19	0
10	10	26.7	24	10
12	10	27.2	25	10
7	-10	22.5	18	0
9	-10	25.1	22	5
11	-10	23.0	20	0

Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	25.8	22.7	7
-10	23.5	20.0	2

Spec. No.	Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
32	10	86.3	70	75
46	10	100.0	83	95
52	10	95.6	67	80
37	-10	67.9	62	60
41	-10	63.0	47	40
50	-10	91.4	65	75
39	75	160.8	81	90
45	75	148.9	88	95
51	75	146.8	88	95
38	40	148.4	80	90
43	40	130.7	86	90
56	40	156.2	90	100
31	25	102.3	72	85
47	25	150.7	86	95
53	25	124.1	71	85
35	-30	54.6	49	35
42	-30	68.4	58	65
55	-30	57.6	47	35
33	-50	40.3	39	20
44	-50	47.4	45	30
49	-50	42.8	38	20
36	-70	48.2	44	30
48	-70	49.7	46	30
54	-70	51.3	41	25
34	-100	8.6	9	5
40	-100	9.0	8	5
57	-100	12.5	12	10

Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	94.0	73.3	83
-10	74.1	58.0	58
74.8	152.2	85.7	93
40	145.1	85.3	93
25	125.7	76.3	88
-30	60.2	51.3	45
-50	43.5	40.7	23
-70	49.7	43.7	28
-100	10.0	9.7	7

Plate: 35 C

Spec. No.	Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
7	10	86.4	62	75
9	10	99.2	69	80
10	10	104.5	74	85
8	-10	74.3	60	70
11	-10	74.8	64	70
12	-10	70.4	59	70

Average

Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
10	96.7	68.3	80
-10	73.2	61.0	70

Spec. No.	Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
31	10	57.2	50	50
46	10	59.6	48	40
50	10	46.4	43	30
33	-10	47.2	42	40
42	-10	32.1	28	10
53	-10	31.7	33	10
37	75	94.9	74	85
48	75	109.9	80	85
55	75	110.4	80	85
35	40	76.4	64	70
40	40	79.8	58	70
51	40	83.7	68	70
38	25	64.3	55	55
45	25	74.2	54	55
52	25	64.2	54	50
34	-30	29.8	30	10
47	-30	28.1	26	10
49	-30	23.7	22	5
36	-50	22.2	19	0
41	-50	18.2	15	0
56	-50	21.3	21	0
39	-70	9.3	9	0
44	-70	9.6	9	0
54	-70	11.0	17	0
32	-100	6.1	6	0
43	-100	3.9	1	0
57	-100	6.1	5	0

Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
10	54.4	47.0	40
-10	37.0	34.3	20
74.8	105.1	78.0	85
40	80.0	63.3	70
25	67.6	54.3	53
-30	27.2	26.0	8
-50	20.6	18.3	0
-70	10.0	11.7	0
-100	5.4	4.0	0

Spec. No.	Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
9	10	83.1	57	65
10	10	140.9	85	95
12	10	87.3	62	75
7	-10	55.4	44	35
8	-10	79.8	57	60
11	-10	78.0	55	60

Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
10	103.8	68.0	78
-10	71.1	52.0	52

Plate: 35 C

Spec. No.	Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
38	10	96.4	75	90
42	10	93.5	74	90
53	10	104.8	64	80
32	-10	75.7	65	80
47	-10	75.1	64	75
55	-10	78.3	59	70
33	75	123.0	88	95
45	75	138.3	87	95
57	75	132.4	89	95
37	40	141.6	89	95
41	40	108.7	75	85
52	40	115.8	75	85
36	25	111.1	79	85
40	25	92.8	71	65
50	25	90.6	67	60
31	-30	66.2	56	65
46	-30	61.6	52	50
51	-30	48.4	44	30
35	-50	34.5	33	15
44	-50	65.2	56	60
56	-50	37.0	32	10
39	-70	16.8	18	0
43	-70	25.7	23	5
49	-70	46.8	42	25
34	-100	8.4	8	0
48	-100	16.9	17	10
54	-100	17.0	14	10

Average

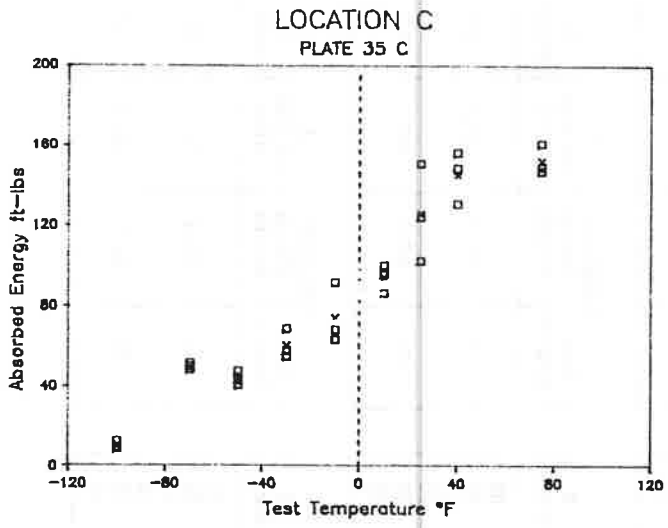
Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
10	98.2	71.0	87
-10	76.4	62.7	75
74.8	131.2	88.0	95
40	122.0	79.7	88
25	98.2	72.3	70
-30	58.7	50.7	48
-50	45.6	40.3	28
-70	29.8	27.7	10
-100	14.1	13.0	7

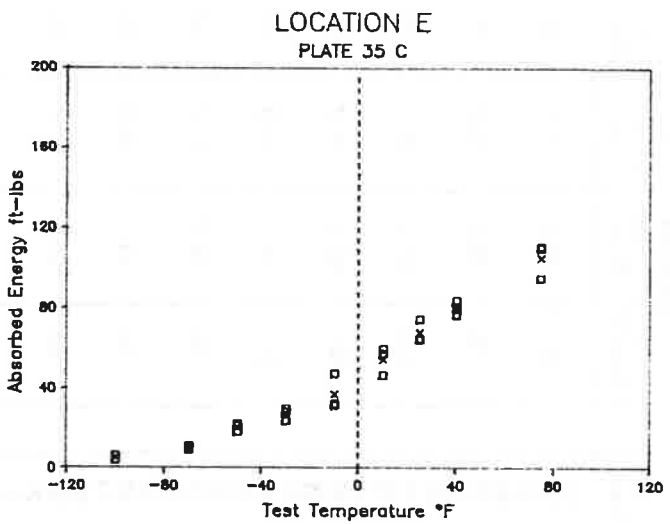
Spec. No.	Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
8	10	92.2	69	80
10	10	86.2	68	80
11	10	65.2	59	65
7	-10	47.2	38	20
9	-10	61.1	48	50
12	-10	64.3	54	60

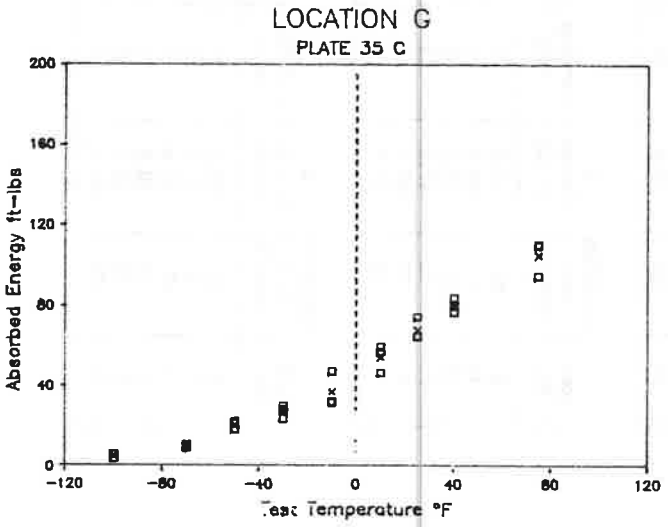
Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
10	81.2	65.3	75
-10	57.5	46.7	43

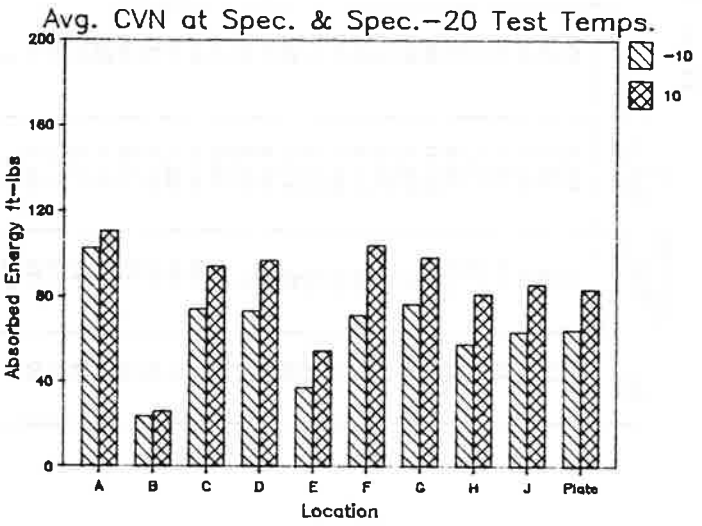
Spec. No.	Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
7	10	91.4	71	80
11	10	92.7	73	90
12	10	72.8	58	70
8	-10	70.0	56	60
9	-10	56.4	50	50
10	-10	63.2	57	60

Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
10	85.6	67.3	80
-10	63.2	54.3	57


LOCATION C
PLATE 35 C
Absorbed Energy ft-lbs
Test Temperature °F


LOCATION E
PLATE 35 C
Absorbed Energy ft-lbs
Test Temperature °F


LOCATION G
PLATE 35 C
Absorbed Energy ft-lbs
Test Temperature °F


Avg. CVN at Spec. & Spec.−20 Test Temps.
−10
10
Absorbed Energy ft-lbs
A
B
C
D
E
F
G
H
J
Plate
Location

MILL DATA SHEET
Plate No: 36 & 39
Manf: 3

Melt/Slab Number: U8842-1
Yield Point(ksi)

TX:51.8	BX:50.0	MTX:53.3	MBX:52.3	MX1:52.6	MX2:52.1	MX3:50.8

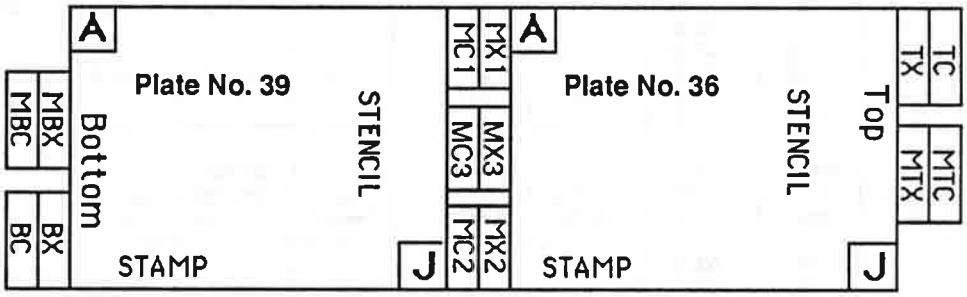
Tensile Strength(ksi)

TX:81.0	BX:78.3	MTX:81.0	MBX:78.5	MX1:79.6	MX2:78.8	MX3:81.0

Elongation(%) {Gage Length (in): 2}

TX: 28	BX: 27	MTX: 27	MBX: 27	MX1: 27	MX2: 28	MX3: 28

Steel Type: A588 - A
Thickness (in): 4
Length (in): 120 Width (in): 60
Notes: Normalized at 1660 °F for 176 min. - Air cool
Fine Grain Practice, Bend Test - Pass
Spec. Code - Top: T453 Bottom: T454



TC,MTC,BC,MBC,MC1,MC2,MC3 - Charpy test locations, 9" x 3"
TX,MTX,BX,MBX,MX1,MX2,MX3 - Tensile test locations, 9" x 2-1/4"

CHARPY IMPACT MILL TESTS (foot-lbs)

	Test Temp	Test #1 CVN	Lt.Ex.	%Sh.	Test #2 CVN	Lt.Ex.	%Sh.	Test #3 CVN	Lt.Ex.	%Sh.	CVN Avg
TC	+10°F	92	72	70	98	73	70	106	80	70	99
BC	+10°F	120	85	80	123	87	80	147	88	80	130
MTC	+10°F	90	**	**	96	**	**	99	**	**	95
MBC	+10°F	117	**	**	122	**	**	136	**	**	125
MC1	+10°F	73	**	**	73	**	**	88	**	**	78
MC2	+10°F	84	**	**	89	**	**	97	**	**	90
MC3	+10°F	57	**	**	58	**	**	63	**	**	59

(** results not reported)

Chemical Analysis

C	Mn	P	S	Si	Cu	Ni	Cr	V	Al	Cb
.16	1.01	.015	.017	.370	.270	.14	.50	.070	NA	NA
Prod. Chemical Analysis										
.17	1.02	.014	.016	.380	.270	.13	.50	.071	NA	NA
.16	1.01	.014	.018	.380	.270	.13	.50	.070	NA	NA

Plate: 36 Q
Date: October 3, 1989 Windage: 0
Spec. Temp: + 10 F Personnel: SG

Spec. No.	Location	A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
2		10	70.5	58	70
3		10	72.2	63	75
5		10	65.9	55	65
1		-10	77.9	68	80
4		-10	53.5	50	60
6		-10	62.4	53	65

Average

Location	A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
	10	69.5	58.7	70
	-10	64.6	57.0	68

Spec. No.	Location	B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
1		10	55.8	50	60
4		10	54.0	49	60
5		10	72.6	62	70
2		-10	43.2	39	50
3		-10	33.8	34	45
6		-10	43.5	41	55

Location	B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
	10	60.8	53.7	63
	-10	40.2	38.0	50

Spec. No.	Location	C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
7		10	53.8	50	65
13		10	55.9	50	60
29		10	68.2	60	70
2		-10	50.0	47	60
19		-10	48.9	45	55
30		-10	56.9	50	65
6		79	88.9	70	85
15		79	101.4	82	95
22		79	103.9	85	95
3		40	80.1	68	75
12		40	74.5	64	70
27		40	75.4	66	75
4		25	57.1	54	65
16		25	68.3	59	70
24		25	61.2	55	70
8		-30	65.1	60	70
14		-30	48.2	45	55
26		-30	39.0	34	45
1		-50	31.8	29	40
17		-50	44.9	41	50
25		-50	30.9	30	40
5		-70	38.8	35	50
20		-70	26.0	26	40
21		-70	23.5	23	35
9		100	106.0	81	85
18		100	118.1	86	100
23		100	112.3	90	100
10		-100	16.5	17	15
11		-100	21.2	19	20
28		-100	12.5	11	10

Location	C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
	10	59.3	53.3	65
	-10	51.9	47.3	60
	79.2	98.1	79.0	92
	40	76.7	66.0	73
	25	62.2	56.0	68
	-30	50.8	46.3	57
	-50	35.9	33.3	43
	-70	29.4	28.0	42
	100	112.1	85.7	95
	-100	16.7	15.7	15

Plate: 36 Q

Spec. No.	Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
1	10	71.3	62	75
2	10	65.9	56	65
4	10	71.5	64	75
3	-10	54.1	48	60
5	-10	54.8	48	60
6	-10	53.9	48	65

Average

Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
10	69.6	60.7	72
-10	54.3	48.0	62

Spec. No.	Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
10	10	63.5	58	70
13	10	49.8	44	55
27	10	61.2	56	65
1	-10	32.2	30	40
14	-10	45.8	44	55
26	-10	41.8	41	50
2	79	87.9	74	85
19	79	98.8	77	90
22	79	95.2	81	95
5	40	64.9	59	70
11	40	72.1	60	70
29	40	89.3	77	85
7	25	70.0	59	70
15	25	58.5	52	65
28	25	74.9	65	75
9	-30	38.4	36	50
12	-30	31.9	32	45
30	-30	47.8	44	55
8	-50	25.3	25	30
16	-50	38.9	35	45
23	-50	27.0	27	40
6	-70	23.2	23	35
18	-70	27.1	26	35
24	-70	19.9	21	30
3	100	96.1	80	85
17	100	100.6	86	90
25	100	102.0	85	85
4	-100	5.8	7	0
20	-100	14.0	13	10
21	-100	13.0	3	10

Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
10	58.2	52.7	63
-10	39.9	38.3	48
79.2	94.0	77.3	90
40	75.4	65.3	75
25	67.8	58.7	70
-30	39.4	37.3	50
-50	30.4	29.0	38
-70	23.4	23.3	33
100	99.6	83.7	87
-100	10.9	7.7	7

Spec. No.	Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
2	10	65.2	56	65
5	10	67.0	58	70
6	10	91.8	81	90
1	-10	64.4	56	70
3	-10	70.0	61	75
4	-10	45.9	44	55

Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
10	74.7	65.0	75
-10	60.1	53.7	67

Plate: 36 Q

Spec. No.	Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
2	10	69.7	57	65
19	10	75.8	62	70
25	10	78.0	65	75
4	-10	74.2	65	75
11	-10	68.2	57	70
28	-10	56.7	51	60
3	79	109.9	82	90
12	79	123.6	88	100
30	79	110.8	87	100
1	40	91.9	74	90
18	40	75.9	63	80
29	40	89.1	76	90
6	25	73.9	62	75
14	25	77.1	64	80
26	25	85.6	68	80
9	-30	54.5	49	60
13	-30	65.0	59	70
23	-30	61.2	55	65
7	-50	20.4	19	25
20	-50	52.1	48	60
24	-50	51.6	47	65
8	-70	22.9	24	35
15	-70	42.5	38	50
27	-70	26.1	26	35
5	100	114.3	89	100
17	100	124.0	87	95
22	100	119.9	87	90
10	-100	15.5	17	15
16	-100	12.7	13	10
21	-100	4.5	5	0

Average

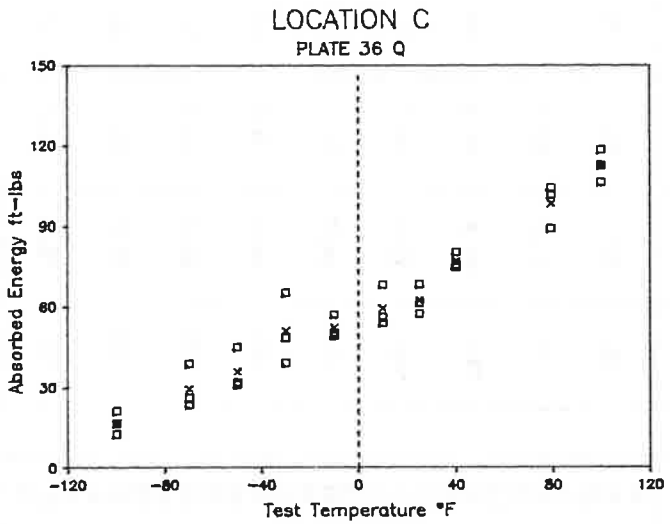
Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
10	74.5	61.3	70
-10	66.4	57.7	68
79.2	114.8	85.7	97
40	85.6	71.0	87
25	78.9	64.7	78
-30	60.2	54.3	65
-50	41.4	38.0	50
-70	30.5	29.3	40
100	119.4	87.7	95
-100	10.9	11.7	8

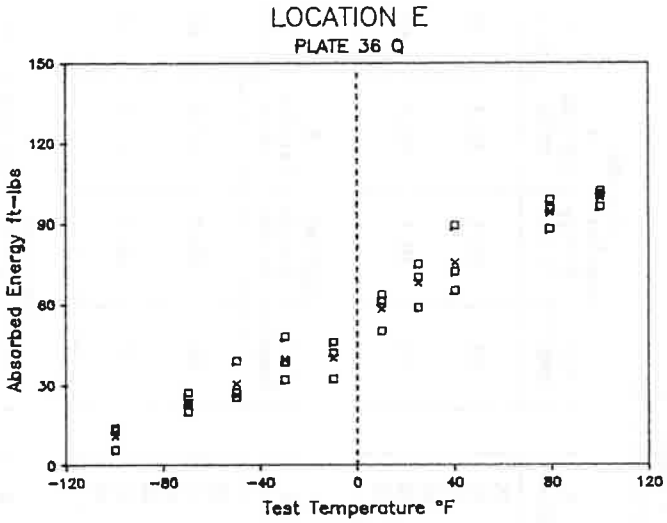
Spec. No.	Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
1	10	79.9	65	80
4	10	83.9	72	85
6	10	86.3	64	75
2	-10	72.3	62	75
3	-10	68.1	59	70
5	-10	66.9	60	75

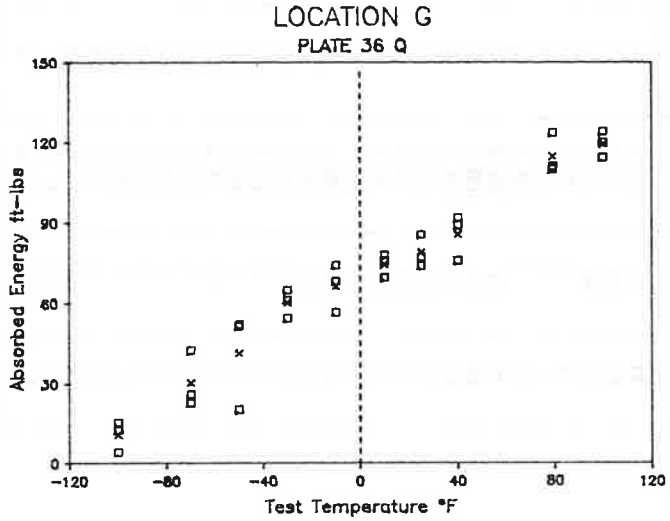
Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
10	83.4	67.0	80
-10	69.1	60.3	73

Spec. No.	Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
1	10	63.1	56	65
2	10	78.9	64	75
6	10	75.9	62	75
3	-10	63.5	55	65
4	-10	80.1	67	75
5	-10	65.9	57	65

Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
10	72.6	60.7	72
-10	69.8	59.7	68


LOCATION C
PLATE 36 Q
Absorbed Energy ft-lbs
Test Temperature °F


LOCATION E
PLATE 36 Q
Absorbed Energy ft-lbs
Test Temperature °F


LOCATION G
PLATE 36 Q
Absorbed Energy ft-lbs
Test Temperature °F

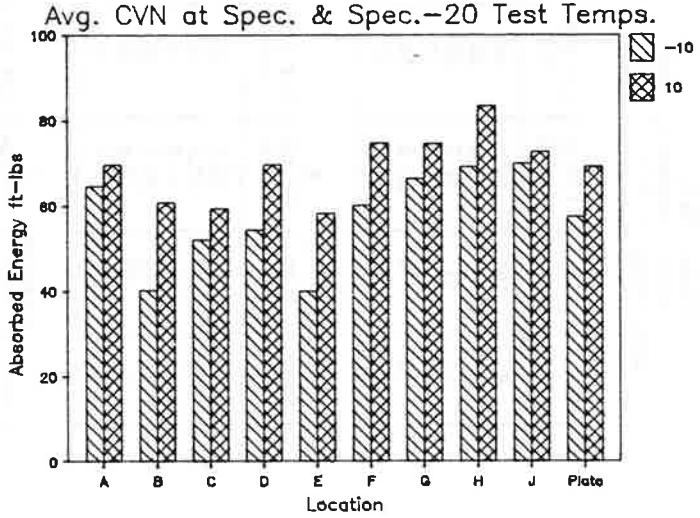

Avg. CVN at Spec. & Spec.−20 Test Temps.
−10
10
Absorbed Energy ft-lbs
A
B
C
D
E
F
G
H
J
Plate
Location

Plate: 36 C
Date: October 3, 1989 Windage: 0
Spec. Temp: + 10 F Personnel: SG

Spec. No.	Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
8	10	66.9	59	75
9	10	70.8	60	70
12	10	73.2	63	75
7	-10	64.2	57	65
10	-10	61.2	54	65
11	-10	51.8	47	60

Average Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	70.3	60.7	73
-10	59.1	52.7	63

Spec. No.	Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
7	10	50.8	47	60
10	10	47.4	45	55
11	10	54.0	49	65
8	-10	29.9	32	40
9	-10	48.8	45	55
12	-10	53.5	48	60

Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	50.7	47.0	60
-10	44.1	41.7	52

Spec. No.	Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
31	10	67.5	60	70
45	10	72.9	62	75
56	10	62.5	55	65
37	-10	75.1	65	80
41	-10	42.4	40	50
55	-10	63.2	56	65
39	79	109.8	88	100
42	79	100.0	82	95
54	79	116.8	83	95
32	40	74.0	65	80
46	40	72.8	62	75
50	40	74.0	64	75
33	25	65.6	60	70
40	25	58.0	53	65
53	25	70.5	60	70
35	-30	56.8	51	65
47	-30	63.9	57	70
49	-30	48.2	44	55
34	-50	41.4	38	50
48	-50	52.4	46	60
51	-50	38.9	37	50
36	-70	42.4	38	50
44	-70	25.6	25	35
57	-70	21.9	23	30
38	-100	21.1	22	20
43	-100	6.7	6	0
52	-100	22.8	19	20

Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	67.6	59.0	70
-10	60.2	53.7	65
79.2	108.9	84.3	97
40	73.6	63.7	77
25	64.7	57.7	68
-30	56.3	50.7	63
-50	44.2	40.3	53
-70	30.0	28.7	38
-100	16.9	15.7	13

Plate: 36 C

Spec. No.	Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
7	10	62.9	55	70
8	10	65.3	56	65
12	10	61.8	55	65
9	-10	70.4	61	75
10	-10	63.0	57	70
11	-10	48.4	46	55

Average

Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
10	63.3	55.3	67
-10	60.6	54.7	67

Spec. No.	Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
31	10	46.2	42	55
46	10	52.4	44	55
51	10	38.8	40	50
32	-10	38.5	36	45
45	-10	28.1	30	40
54	-10	28.7	28	40
36	79	65.2	57	70
43	79	82.4	72	80
57	79	76.1	71	85
35	40	46.9	44	55
41	40	61.9	57	65
56	40	49.9	48	55
34	25	50.5	45	55
47	25	53.4	50	60
50	25	55.9	51	65
37	-30	24.9	25	35
40	-30	33.9	32	40
53	-30	28.1	26	35
33	-50	21.2	23	35
48	-50	24.6	21	35
52	-50	28.2	27	40
39	-70	23.2	23	35
42	-70	13.4	15	20
55	-70	9.9	11	20
38	-100	6.6	6	5
44	-100	5.6	5	0
49	-100	13.3	10	10

Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
10	45.8	42.0	53
-10	31.8	31.3	42
79.2	74.6	66.7	78
40	52.9	49.7	58
25	53.3	48.7	60
-30	29.0	27.7	37
-50	24.7	23.7	37
-70	15.5	16.3	25
-100	8.5	7.0	5

Spec. No.	Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
7	10	64.4	57	70
8	10	75.9	67	80
9	10	59.3	52	60
10	-10	54.6	50	65
11	-10	62.8	55	65
12	-10	61.2	55	70

Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
10	66.5	58.7	70
-10	59.5	53.3	67

Plate: 36 C

Spec. No.	Location G Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
32	10	74.2	60	75
46	10	84.3	65	75
51	10	86.1	67	75
34	-10	62.1	55	70
47	-10	66.8	60	75
50	-10	67.9	57	70
33	79	116.1	89	100
48	79	106.3	81	90
53	79	107.1	79	90
37	40	69.2	60	75
41	40	93.9	78	90
56	40	91.2	70	80
35	25	75.7	65	75
44	25	90.0	72	85
54	25	76.9	65	75
31	-30	56.0	51	60
45	-30	60.2	54	65
52	-30	60.4	53	65
39	-50	38.5	35	45
43	-50	44.0	40	50
55	-50	31.9	29	40
36	-70	29.5	29	40
42	-70	43.3	38	50
57	-70	36.9	34	50
38	-100	18.6	18	20
40	-100	30.0	30	35
49	-100	32.4	29	35

Average

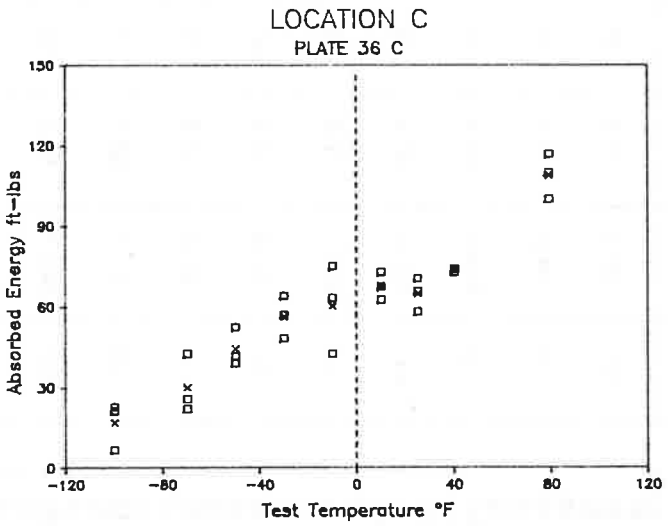
Location G Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	81.5	64.0	75
-10	65.6	57.3	72
79.2	109.8	83.0	93
40	84.8	69.3	82
25	80.9	67.3	78
-30	58.9	52.7	63
-50	38.1	34.7	45
-70	36.6	33.7	47
-100	27.0	25.7	30

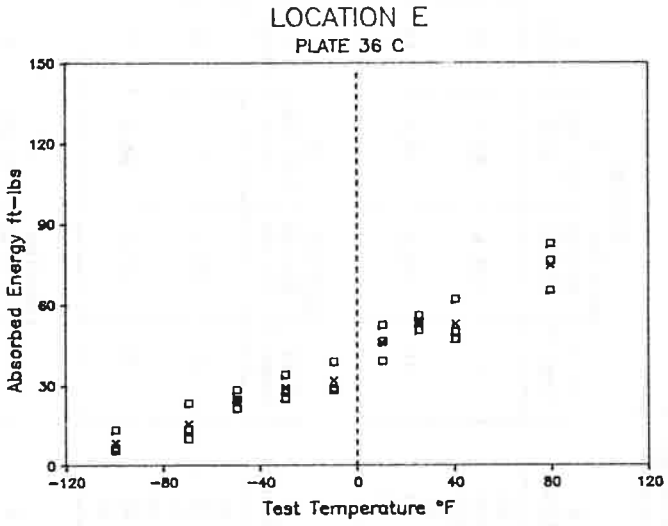
Spec. No.	Location H Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
9	10	61.0	55	65
10	10	59.1	54	65
11	10	69.5	55	70
7	-10	56.9	51	65
8	-10	58.5	54	70
12	-10	71.9	61	75

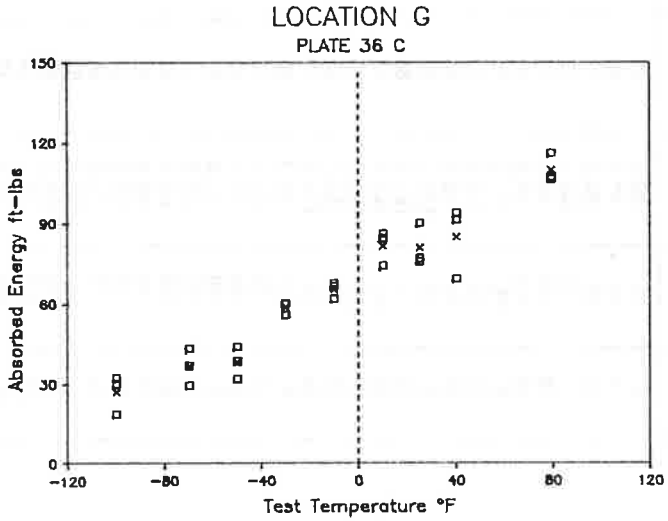
Location H Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	63.2	54.7	67
-10	62.4	55.3	70

Spec. No.	Location J Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
7	10	72.0	62	75
8	10	84.3	70	85
11	10	63.0	55	65
9	-10	57.0	51	65
10	-10	51.1	47	60
12	-10	74.3	66	75

Location J Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	73.1	62.3	75
-10	60.8	54.7	67


LOCATION C
PLATE 36 C
Absorbed Energy ft-lbs
Test Temperature °F
150
120
90
60
30
0
-120
-80
-40
0
40
80
120


LOCATION E
PLATE 36 C
Absorbed Energy ft-lbs
Test Temperature °F
150
120
90
60
30
0
-120
-80
-40
0
40
80
120


LOCATION G
PLATE 36 C
Absorbed Energy ft-lbs
Test Temperature °F
150
120
90
60
30
0
-120
-80
-40
0
40
80
120

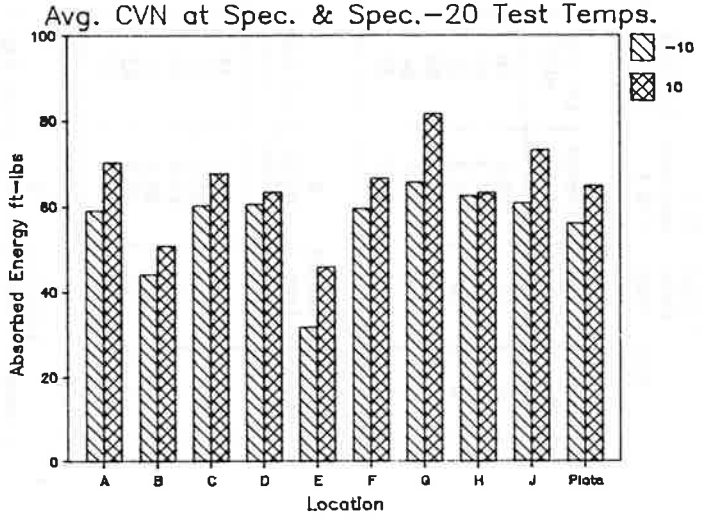

Avg. CVN at Spec. & Spec.-20 Test Temps.
-10
10
Absorbed Energy ft-lbs
Location
100
80
60
40
20
0
A
B
C
D
E
F
G
H
J
Plate

Plate: 39 Q
Date: September 21, 1989 Windage: 0
Spec. Temp: + 10 F Personnel: SG

Spec. No.	Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
2	10	100.3	76	90
3	10	157.2	89	100
4	10	112.8	86	100
1	-10	104.6	89	95
5	-10	75.4	64	80
6	-10	90.0	80	90

Average Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	123.4	83.7	97
-10	90.0	77.7	88

Spec. No.	Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
2	10	79.0	78	90
4	10	81.9	79	95
5	10	65.4	59	70
1	-10	68.4	60	70
3	-10	97.9	82	95
6	-10	65.1	57	65

Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	75.4	72.0	85
-10	77.1	66.3	77

Spec. No.	Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
6	10	89.0	75	85
14	10	91.3	68	80
22	10	84.0	67	80
1	-10	106.9	78	90
18	-10	94.0	79	90
30	-10	97.3	78	95
2	75	119.6	75	90
11	75	150.3	84	100
25	75	150.0	90	100
9	40	130.0	88	100
16	40	121.2	86	95
28	40	147.9	93	100
4	25	106.3	79	95
17	25	136.7	62	95
24	25	114.2	79	90
7	-30	69.2	62	70
13	-30	64.9	58	65
29	-30	57.0	55	65
3	-50	72.5	56	65
12	-50	69.0	62	75
21	-50	62.0	55	70
10	-70	40.0	37	45
19	-70	43.2	40	50
26	-70	70.2	64	75
5	100	138.4	81	85
20	100	158.6	89	100
27	100	149.1	94	100
8	-100	16.3	15	15
15	-100	14.1	13	15
23	-100	22.0	20	25

Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	88.1	70.0	82
-10	99.4	78.3	92
75.2	140.0	83.0	97
40	133.0	89.0	98
25	119.1	73.3	93
-30	63.7	58.3	67
-50	67.8	57.7	70
-70	51.1	47.0	57
100	148.7	88.0	95
-100	17.5	16.0	18

Plate: 39 Q

Spec. No.	Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
1	10	56.3	47	55
2	10	68.9	56	65
6	10	83.2	67	70
3	-10	39.1	37	45
4	-10	49.2	45	60
5	-10	64.0	54	65

Average

Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
10	69.5	56.7	63
-10	50.8	45.3	57

Spec. No.	Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
4	10	56.4	48	60
17	10	60.9	53	65
25	10	61.9	56	70
10	-10	48.0	44	55
11	-10	40.2	38	45
24	-10	41.1	40	50
8	75	94.1	74	85
14	75	81.1	62	70
30	75	94.1	78	85
3	40	57.8	49	55
16	40	63.2	58	65
28	40	57.3	53	60
9	25	62.8	57	65
15	25	52.2	43	50
23	25	53.6	48	60
1	-30	45.4	43	55
19	-30	35.4	33	40
29	-30	45.4	43	50
6	-50	37.9	34	45
13	-50	37.2	33	45
21	-50	32.2	32	45
7	-70	24.2	23	35
12	-70	25.9	25	35
27	-70	28.6	26	35
5	100	97.8	82	90
20	100	95.2	81	90
22	100	95.1	84	95
2	-100	5.6	6	0
18	-100	7.5	7	0
26	-100	16.5	17	10

Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
10	59.7	52.3	65
-10	43.1	40.7	50
75.2	89.8	71.3	80
40	59.4	53.3	60
25	56.2	49.3	58
-30	42.1	39.7	48
-50	35.8	33.0	45
-70	26.2	24.7	35
100	96.0	82.3	92
-100	9.9	10.0	3

Spec. No.	Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
3	10	80.3	68	80
4	10	62.5	46	55
5	10	67.9	57	60
1	-10	63.1	55	65
2	-10	73.6	67	75
6	-10	68.5	53	65

Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
10	70.2	57.0	65
-10	68.4	58.3	68

Plate: 39 Q

Spec. No.	Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
1	10	63.9	56	65
19	10	77.5	65	80
22	10	81.9	67	80
6	-10	63.1	55	65
14	-10	48.9	44	55
27	-10	59.9	54	65
7	75	102.4	78	95
13	75	99.2	83	95
25	75	109.8	86	100
5	40	89.3	74	85
17	40	79.0	66	80
30	40	76.4	65	75
10	25	83.1	67	75
15	25	94.2	78	85
24	25	63.9	56	65
3	-30	44.8	43	50
20	-30	49.5	46	55
26	-30	56.1	50	60
2	-50	52.0	47	60
16	-50	43.0	40	50
28	-50	53.5	48	60
4	-70	33.2	29	40
18	-70	46.0	42	55
23	-70	36.8	34	45
9	100	113.6	86	90
12	100	112.2	87	90
29	100	125.9	89	95
8	-100	14.5	14	10
11	-100	11.0	12	10
21	-100	8.1	8	0

Average

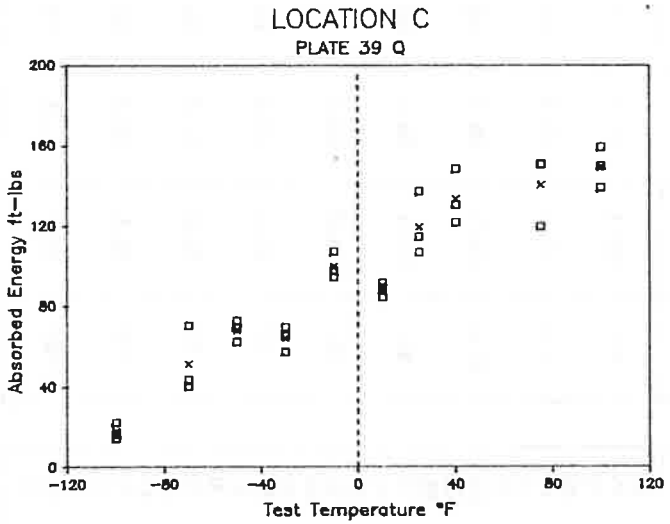
Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
10	74.4	62.7	75
-10	57.3	51.0	62
75.2	103.8	82.3	97
40	81.6	68.3	80
25	80.4	67.0	75
-30	50.1	46.3	55
-50	49.5	45.0	57
-70	38.7	35.0	47
100	117.2	87.3	92
-100	11.2	11.3	7

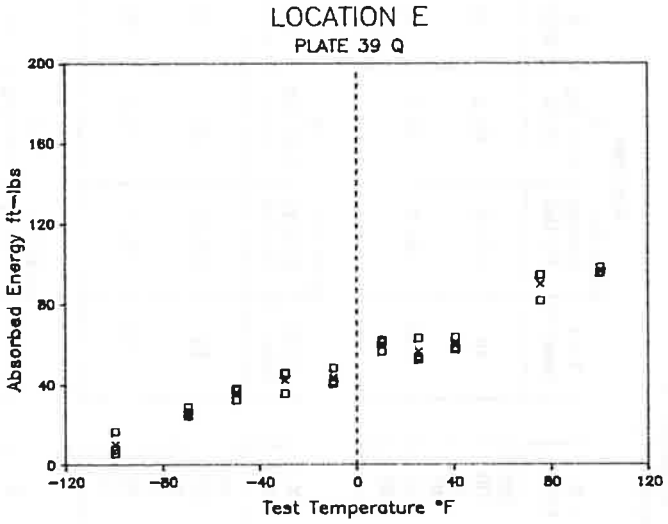
Spec. No.	Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
1	10	66.1	58	70
2	10	47.0	43	50
5	10	62.2	56	65
3	-10	57.1	49	60
4	-10	60.0	52	65
6	-10	50.5	46	55

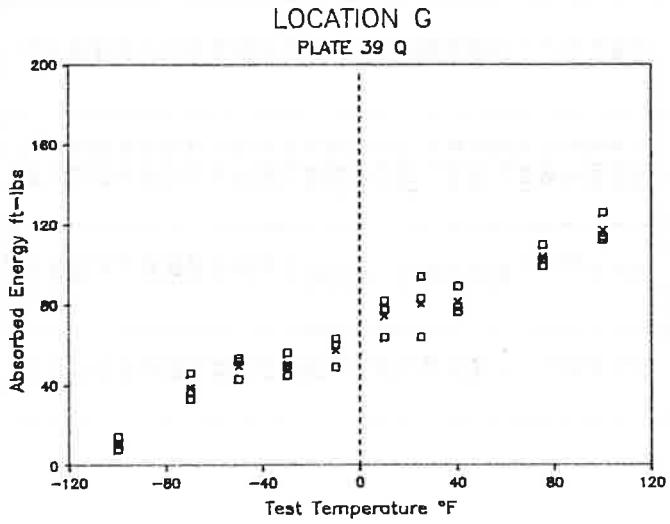
Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
10	58.4	52.3	62
-10	55.9	49.0	60

Spec. No.	Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
1	10	63.2	51	60
4	10	69.0	60	70
6	10	70.2	62	70
2	-10	64.9	57	65
3	-10	66.4	52	65
5	-10	63.4	55	65

Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
10	67.5	57.7	67
-10	64.9	54.7	65


LOCATION C
PLATE 39 Q
Absorbed Energy ft-lbs
Test Temperature °F


LOCATION E
PLATE 39 Q
Absorbed Energy ft-lbs
Test Temperature °F


LOCATION G
PLATE 39 Q
Absorbed Energy ft-lbs
Test Temperature °F

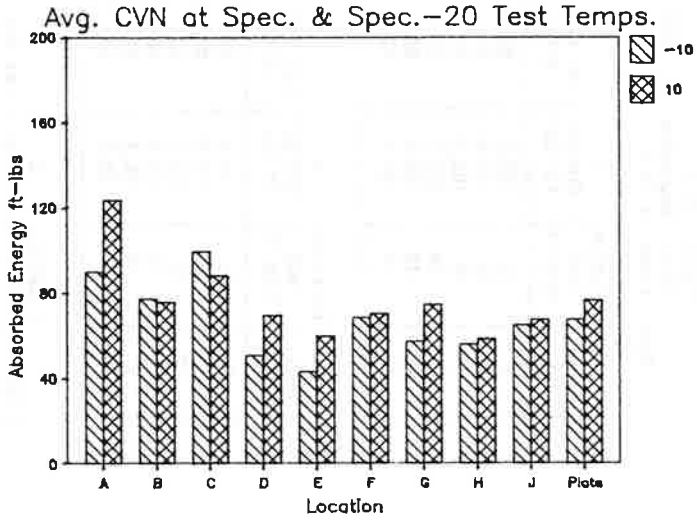

Avg. CVN at Spec. & Spec.-20 Test Temps.
-10
10
Absorbed Energy ft-lbs
A
B
C
D
E
F
G
H
J
Plate
Location

Plate: 39 C
Date: September 21, 1989 Windage: 0
Spec. Temp: + 10 F Personnel: SG

Spec. No.	Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
8	10	127.1	85	100
10	10	109.8	84	100
11	10	102.0	81	95
7	-10	103.1	82	95
9	-10	100.0	82	95
12	-10	85.9	72	85

Average Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	113.0	83.3	98
-10	96.3	78.7	92

Spec. No.	Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
7	10	91.1	74	85
11	10	110.9	89	100
12	10	103.7	82	95
8	-10	82.0	66	75
9	-10	94.6	81	95
10	-10	78.8	66	75

Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	101.9	81.7	93
-10	85.1	71.0	82

Spec. No.	Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
32	10	100.1	79	90
47	10	100.8	85	95
53	10	100.0	77	90
34	-10	84.9	70	85
43	-10	84.5	70	80
56	-10	104.9	84	95
33	75	145.9	80	95
44	75	141.8	89	100
57	75	162.9	88	100
38	40	103.9	80	90
41	40	140.4	89	95
55	40	117.2	82	95
36	25	136.1	74	85
40	25	108.6	79	90
52	25	124.3	96	100
31	-30	78.9	69	80
46	-30	83.8	71	80
54	-30	94.2	77	90
37	-50	68.8	61	70
48	-50	66.5	62	70
50	-50	26.8	26	40
39	-70	37.3	34	45
42	-70	66.9	58	70
51	-70	52.9	48	65
35	-100	41.9	36	40
45	-100	37.2	35	40
49	-100	34.8	32	35

Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	100.3	80.3	92
-10	91.4	74.7	87
75.2	150.2	85.7	98
40	120.5	83.7	93
25	123.0	83.0	92
-30	85.6	72.3	83
-50	54.0	49.7	60
-70	52.4	46.7	60
-100	38.0	34.3	38

Plate: 39 C

Spec. No.	Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
8	10	92.8	74	85
11	10	71.0	58	65
12	10	73.8	60	70
7	-10	49.8	42	55
9	-10	56.4	49	60
10	-10	48.5	45	55

Average

Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
10	79.2	64.0	73
-10	51.6	45.3	57

Spec. No.	Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
31	10	76.8	66	75
46	10	74.4	62	70
51	10	63.5	57	65
37	-10	47.3	43	50
41	-10	57.5	51	65
56	-10	44.1	44	55
39	75	108.9	84	95
42	75	93.7	73	85
54	75	104.8	83	95
34	40	73.9	63	75
47	40	88.1	70	80
52	40	93.4	74	85
36	25	65.7	62	70
40	25	74.4	59	65
55	25	73.4	63	70
33	-30	55.9	54	70
45	-30	36.0	35	50
50	-30	52.5	48	65
32	-50	43.0	40	55
44	-50	41.2	40	50
57	-50	30.6	30	40
35	-70	20.1	18	30
48	-70	46.3	43	55
49	-70	38.4	33	45
38	-100	15.6	15	15
43	-100	4.1	4	0
53	-100	5.0	5	0

Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
10	71.6	61.7	70
-10	49.6	46.0	57
75.2	102.5	80.0	92
40	85.1	69.0	80
25	71.2	61.3	68
-30	48.1	45.7	62
-50	38.3	36.7	48
-70	34.9	31.3	43
-100	8.2	8.0	5

Spec. No.	Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
9	10	83.7	62	70
10	10	77.5	63	75
11	10	82.0	69	75
7	-10	71.6	63	70
8	-10	88.2	77	85
12	-10	95.3	76	85

Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
10	81.1	64.7	73
-10	85.0	72.0	80

Plate: 39 C

Spec. No.	Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
36	10	70.0	62	70
41	10	80.2	69	80
55	10	67.2	57	65
38	-10	68.1	57	65
43	-10	60.0	51	60
50	-10	71.8	58	70
33	75	108.5	84	95
48	75	97.3	77	85
51	75	106.3	83	90
37	40	73.7	63	70
44	40	70.4	59	65
56	40	78.8	66	75
34	25	70.5	60	70
46	25	69.4	62	70
49	25	92.2	72	85
32	-30	57.3	52	65
47	-30	49.9	47	60
52	-30	60.4	52	65
39	-50	48.8	43	55
42	-50	38.3	35	45
54	-50	35.5	34	45
35	-70	40.8	35	45
40	-70	26.9	26	35
57	-70	27.1	24	35
31	-100	7.1	7	0
45	-100	6.9	7	0
53	-100	12.5	12	10

Average

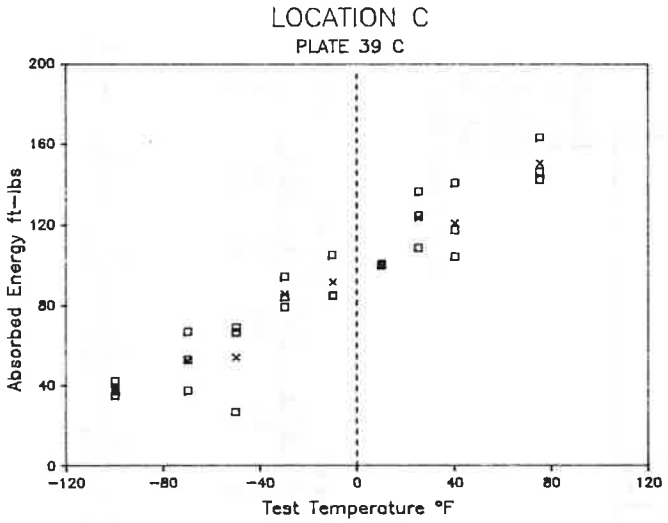
Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
10	72.5	62.7	72
-10	66.6	55.3	65
75.2	104.0	81.3	90
40	74.3	62.7	70
25	77.4	64.7	75
-30	55.9	50.3	63
-50	40.9	37.3	48
-70	31.6	28.3	38
-100	8.8	8.7	3

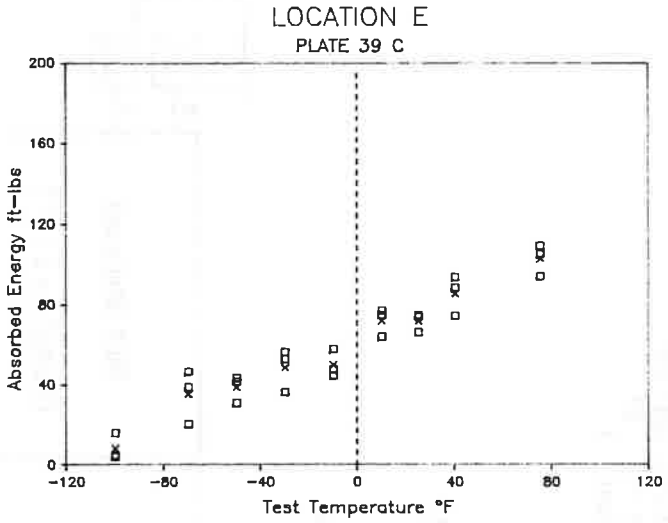
Spec. No.	Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
7	10	52.1	46	55
9	10	50.0	46	55
10	10	53.1	48	60
8	-10	55.9	52	65
11	-10	53.8	51	65
12	-10	41.9	41	50

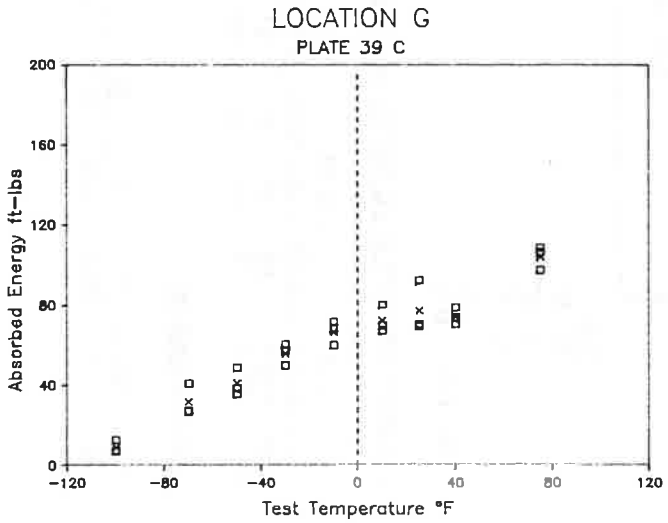
Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
10	51.7	46.7	57
-10	50.5	48.0	60

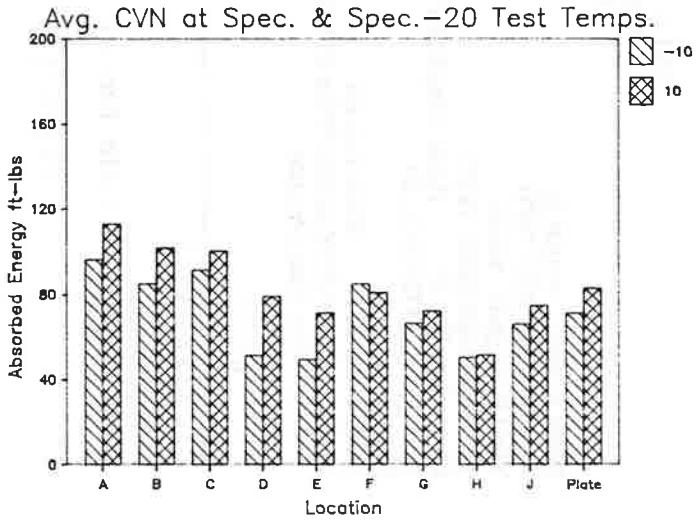
Spec. No.	Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
8	10	73.3	62	70
9	10	76.0	61	70
10	10	75.4	64	75
7	-10	58.2	49	60
11	-10	79.9	65	75
12	-10	60.5	54	65

Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
10	74.9	62.3	72
-10	66.2	56.0	67


LOCATION C
PLATE 39 C
Absorbed Energy ft-lbs
Test Temperature °F
200
160
120
80
40
0
-120
-80
-40
0
40
80
120

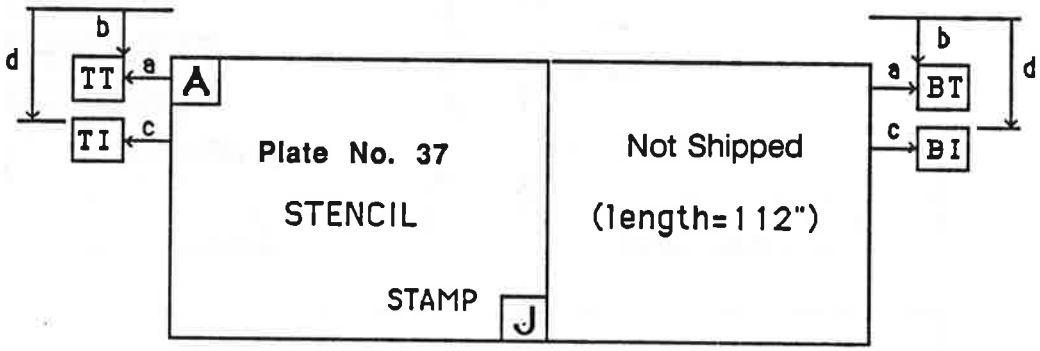

LOCATION E
PLATE 39 C
Absorbed Energy ft-lbs
Test Temperature °F
200
160
120
80
40
0
-120
-80
-40
0
40
80
120


LOCATION G
PLATE 39 C
Absorbed Energy ft-lbs
Test Temperature °F
200
160
120
80
40
0
-120
-80
-40
0
40
80
120


Avg. CVN at Spec. & Spec.-20 Test Temps.
-10
10
Absorbed Energy ft-lbs
Location
200
160
120
80
40
0
A
B
C
D
E
F
G
H
J
Plate

MILL DATA SHEET
Plate No: 37
Manf: 1

Serial Number: W010923
Heat Number: 803Z72670
Yield Point (psi): 52800
Tensile Strength (psi): 78130
Elongation (%): 30 {Gage Length (in): 2}
Steel Type: A572-85 Gr. 50
Thickness (in): 4
Length (in): 120 Width (in): 60
Notes: Normalized at 1650 °F for 230 min.
Fine Grain Practice



Top
Ta : 0"
Tb : 8"
Tc : 0"
Td : 32"
Spec. Code : B13

Bottom
Ba : 0"
Bb : 8"
Bc : 0"
Bd : 32"
Spec. Code : B14

CHARPY IMPACT MILL TESTS (foot-lbs)

	Test Temp	Test #1 CVN	Lt.Ex.	%Sh.	Test #2 CVN	Lt.Ex.	%Sh.	Test #3 CVN	Lt.Ex.	%Sh.	CVN Avg
Top	+10°F	83	70	70	93	79	85	86	72	70	87
Bot	+10°F	73	61	50	80	71	70	55	48	40	69

Chemical Analysis

C	Mn	P	S	Si	Cu	Ni	Cr	V	Al	Cb
.20	1.24	.013	.019	.245	NA	NA	NA	.052	.055	.041

Plate: 37 Q
Date: October 26, 1989 Windage: 0
Spec. Temp: + 10 F Personnel: SG

Spec. No.	Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
1	10	75.8	63	70
2	10	76.9	64	75
4	10	65.8	55	60
3	-10	58.8	51	60
5	-10	54.5	47	60
6	-10	60.0	50	60

Average

Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	72.8	60.7	68
-10	57.8	49.3	60

Spec. No.	Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
3	10	63.4	52	60
4	10	76.1	61	70
6	10	76.4	60	75
1	-10	45.7	40	50
2	-10	50.3	44	50
5	-10	64.9	54	60

Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	72.0	57.7	68
-10	53.6	46.0	53

Spec. No.	Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
3	10	76.8	57	65
17	10	92.0	70	80
23	10	78.3	62	70
10	-10	51.0	43	50
12	-10	64.2	55	60
29	-10	57.3	48	55
1	75	112.4	64	90
14	75	128.3	88	95
28	75	108.9	78	90
4	40	80.8	66	70
15	40	100.4	75	85
21	40	92.2	70	75
9	25	84.3	69	80
18	25	81.8	67	80
30	25	74.3	58	70
6	-30	55.7	41	50
11	-30	52.0	45	55
27	-30	59.9	52	60
5	-50	22.5	18	20
20	-50	41.4	34	40
22	-50	43.0	38	40
7	-70	18.4	17	20
19	-70	31.9	30	35
24	-70	12.5	10	10
2	-100	7.5	5	15
13	-100	8.3	8	15
26	-100	9.1	8	15
8	100	123.7	82	90
16	100	125.1	86	95
25	100	125.8	87	100

Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	82.4	63.0	72
-10	57.5	48.7	55
75.2	116.5	76.7	92
40	91.1	70.3	77
25	80.1	64.7	77
-30	55.9	46.0	55
-50	35.6	30.0	33
-70	20.9	19.0	22
-100	8.3	7.0	15
100	124.9	85.0	95

Plate: 37 Q

Spec. No.	Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
1	10	79.9	57	75
2	10	66.9	55	65
5	10	70.0	53	65
3	-10	56.2	49	55
4	-10	71.0	61	70
6	-10	59.7	55	60

Average

Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
10	72.3	55.0	68
-10	62.3	55.0	62

Spec. No.	Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
2	10	71.7	60	70
20	10	73.3	60	65
24	10	89.1	67	75
1	-10	55.8	44	50
18	-10	65.1	53	60
25	-10	56.0	51	55
7	75	110.4	81	95
11	75	136.9	82	95
28	75	112.5	80	95
10	40	105.5	74	85
19	40	98.8	74	80
23	40	105.9	75	85
3	25	79.9	63	70
14	25	88.0	71	75
26	25	85.9	59	70
4	-30	60.8	53	60
17	-30	56.0	49	55
22	-30	47.7	37	45
9	-50	7.7	11	10
13	-50	41.4	35	40
29	-50	25.1	22	20
8	-70	26.5	23	20
12	-70	26.2	23	25
30	-70	11.5	12	10
6	-100	6.6	5	15
16	-100	8.5	7	15
21	-100	4.4	3	10
5	100	130.1	82	90
15	100	133.7	88	100
27	100	130.0	83	90

Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
10	78.0	62.3	70
-10	59.0	49.3	55
75.2	119.9	81.0	95
40	103.4	74.3	83
25	84.6	64.3	72
-30	54.8	46.3	53
-50	24.7	22.7	23
-70	21.4	19.3	18
-100	6.5	5.0	13
100	131.3	84.3	93

Spec. No.	Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
1	10	73.4	61	70
5	10	63.9	54	65
6	10	76.2	62	70
2	-10	55.5	47	50
3	-10	57.2	51	55
4	-10	65.0	51	60

Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
10	71.2	59.0	68
-10	59.2	49.7	55

Plate: 37 Q

Spec. No.	Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
7	10	87.9	68	80
13	10	90.0	69	80
30	10	87.9	69	85
2	-10	74.0	61	70
19	-10	76.2	61	70
25	-10	66.8	58	65
8	75	121.2	82	95
14	75	133.2	84	90
23	75	119.8	84	95
1	40	100.0	77	85
16	40	96.9	72	80
29	40	92.0	67	70
4	25	93.8	72	80
18	25	82.1	65	75
24	25	101.1	74	85
6	-30	80.0	64	75
12	-30	63.9	56	60
28	-30	38.9	33	35
9	-50	60.0	50	60
15	-50	30.5	29	30
22	-50	33.4	31	30
3	-70	26.2	23	20
17	-70	13.4	13	10
27	-70	6.6	3	0
5	-100	12.0	9	20
20	-100	7.4	8	20
21	-100	8.0	7	15
10	100	132.4	84	95
11	100	131.8	86	95
26	100	132.2	85	95

Average

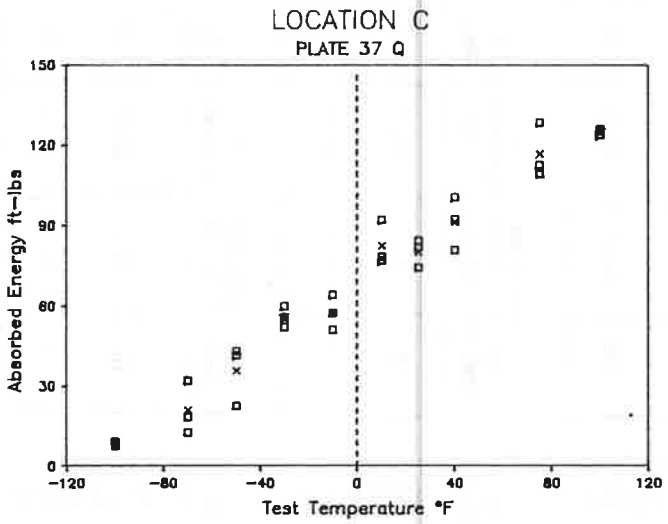
Test Temp-°F	Location Energy ft-lbs	G Lat Exp mils	% Shear
10	88.6	68.7	82
-10	72.3	60.0	68
75.2	124.7	83.3	93
40	96.3	72.0	78
25	92.3	70.3	80
-30	60.9	51.0	57
-50	41.3	36.7	40
-70	15.4	13.0	10
-100	9.1	8.0	18
100	132.1	85.0	95

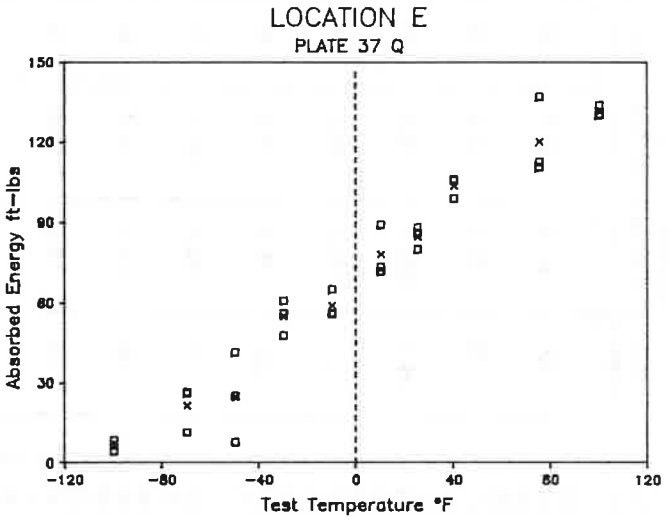
Spec. No.	Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
1	10	98.0	76	85
3	10	64.1	55	65
5	10	80.7	61	70
2	-10	69.0	58	70
4	-10	51.2	40	50
6	-10	50.0	45	50

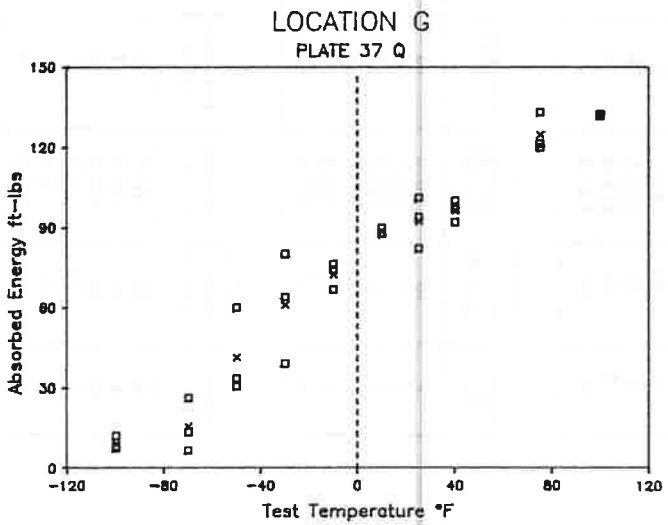
Test Temp-°F	Location Energy ft-lbs	H Lat Exp mils	% Shear
10	80.9	64.0	73
-10	56.7	47.7	57

Spec. No.	Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
3	10	70.3	60	70
4	10	89.8	71	85
5	10	82.6	63	75
1	-10	62.9	53	60
2	-10	73.9	63	70
6	-10	67.0	56	65

Test Temp-°F	Location Energy ft-lbs	J Lat Exp mils	% Shear
10	80.9	64.7	77
-10	67.9	57.3	65


LOCATION C
PLATE 37 Q
Absorbed Energy ft-lbs
Test Temperature °F
150
120
90
60
30
0
-120
-80
-40
0
40
80
120


LOCATION E
PLATE 37 Q
Absorbed Energy ft-lbs
Test Temperature °F
150
120
90
60
30
0
-120
-80
-40
0
40
80
120


LOCATION G
PLATE 37 Q
Absorbed Energy ft-lbs
Test Temperature °F
150
120
90
60
30
0
-120
-80
-40
0
40
80
120

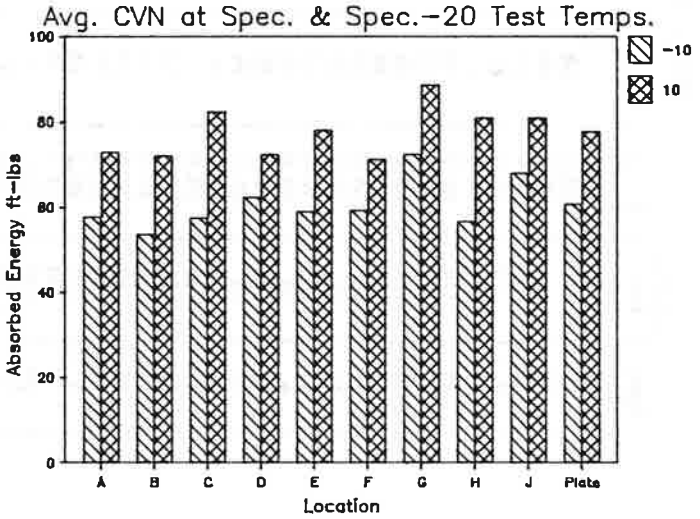

Avg. CVN at Spec. & Spec.-20 Test Temps.
-10
10
Absorbed Energy ft-lbs
Location
100
80
60
40
20
0
A
B
C
D
E
F
G
H
J
Plate

Plate: 37 C
Date: October 26, 1989 Windage: 0
Spec. Temp: + 10 F Personnel: SG

Spec. No.	Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
8	10	74.2	62	70
11	10	76.5	62	75
12	10	83.4	65	75
7	-10	54.9	49	55
9	-10	56.8	49	55
10	-10	56.9	51	60

Average

Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	78.0	63.0	73
-10	56.2	49.7	57

Spec. No.	Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
8	10	75.9	59	70
9	10	62.0	41	50
11	10	78.8	62	70
7	-10	64.9	56	60
10	-10	73.4	66	70
12	-10	57.0	53	60

Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	72.2	54.0	63
-10	65.1	58.3	63

Spec. No.	Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
32	10	71.0	58	65
44	10	61.0	52	60
51	10	56.8	48	50
31	-10	61.3	51	60
42	-10	58.5	50	55
56	-10	70.1	59	60
39	75	127.9	71	90
43	75	107.9	81	95
55	75	126.0	85	95
38	40	102.7	82	90
41	40	95.8	76	85
54	40	106.3	80	90
34	25	87.8	67	75
47	25	97.8	76	85
50	25	66.2	56	65
35	-30	65.3	52	60
46	-30	30.0	28	30
49	-30	41.4	37	40
33	-50	24.8	22	25
48	-50	35.2	32	35
53	-50	36.9	32	35
36	-70	37.8	32	30
45	-70	16.8	16	15
57	-70	17.5	18	15
37	-100	8.5	7	15
40	-100	11.1	11	20
52	-100	5.2	8	20

Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	62.9	52.7	58
-10	63.3	53.3	58
75.2	120.6	79.0	93
40	101.6	79.3	88
25	83.9	66.3	75
-30	45.6	39.0	43
-50	32.3	28.7	32
-70	24.0	22.0	20
-100	8.3	8.7	18

Plate: 37 C

Spec. No.	Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
7	10	82.0	63	70
9	10	96.9	72	85
10	10	81.4	66	75
8	-10	68.0	60	65
11	-10	68.4	59	65
12	-10	81.8	72	85

Average

Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
10	86.8	67.0	77
-10	72.7	63.7	72

Spec. No.	Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
35	10	92.0	73	85
41	10	84.8	68	80
56	10	99.9	75	80
31	-10	70.4	60	70
46	-10	70.2	61	70
50	-10	73.7	58	70
34	75	126.8	89	100
48	75	141.3	88	95
52	75	146.1	84	90
37	40	107.8	76	85
42	40	118.4	87	90
54	40	110.3	76	85
28	25	100.0	76	85
40	25	118.5	77	80
53	25	99.1	76	85
33	-30	50.0	46	50
47	-30	52.9	47	55
49	-30	49.5	46	50
32	-50	65.5	58	65
44	-50	30.1	30	30
57	-50	22.2	25	30
39	-70	11.5	17	10
43	-70	23.2	22	20
55	-70	46.3	40	40
36	-100	8.2	8	20
45	-100	8.1	7	15
51	-100	4.6	5	15

Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
10	92.2	72.0	82
-10	71.4	59.7	70
75.2	138.1	87.0	95
40	112.2	79.7	87
25	105.9	76.3	83
-30	50.8	46.3	52
-50	39.3	37.7	42
-70	27.0	26.3	23
-100	7.0	6.7	17

Spec. No.	Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
7	10	78.4	64	70
10	10	74.5	60	70
11	10	76.7	61	70
8	-10	48.4	43	45
9	-10	53.9	48	50
12	-10	55.2	47	50

Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
10	76.5	61.7	70
-10	52.5	46.0	48

Plate: 37 C

Spec. No.	Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
31	10	84.0	64	75
44	10	83.9	64	75
54	10	61.2	53	60
36	-10	74.9	61	70
40	-10	81.2	63	70
56	-10	77.3	65	75
35	75	124.7	76	85
41	75	117.3	81	85
57	75	138.0	87	95
33	40	107.8	76	85
45	40	95.7	76	80
50	40	102.0	77	85
37	25	98.7	74	80
42	25	104.4	78	90
51	25	89.9	68	80
32	-30	71.9	63	70
46	-30	65.6	56	65
53	-30	17.1	22	20
39	-50	40.5	38	40
43	-50	33.6	29	30
55	-50	9.8	9	5
34	-70	18.6	17	10
48	-70	9.3	9	5
52	-70	30.3	27	30
38	-100	10.0	9	20
47	-100	3.5	2	10
49	-100	7.9	7	15

Average

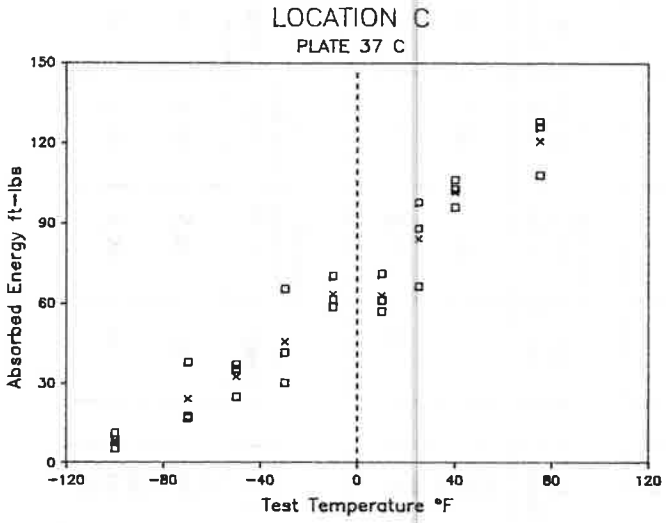
Test Temp-°F	Location Energy ft-lbs	G Lat Exp mils	% Shear
10	76.4	60.3	70
-10	77.8	63.0	72
75.2	126.7	81.3	88
40	101.8	76.3	83
25	97.7	73.3	83
-30	51.5	47.0	52
-50	28.0	25.3	25
-70	19.4	17.7	15
-100	7.1	6.0	15

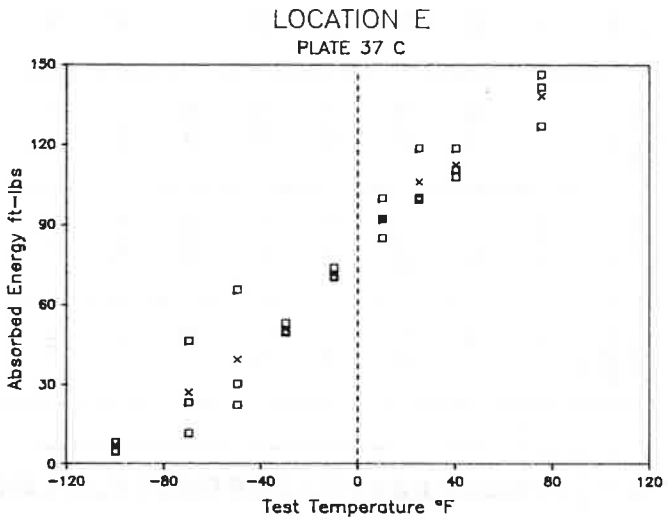
Spec. No.	Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
7	10	90.4	73	85
9	10	96.9	75	90
10	10	66.3	55	60
8	-10	44.5	41	40
11	-10	84.4	72	85
12	-10	78.1	66	75

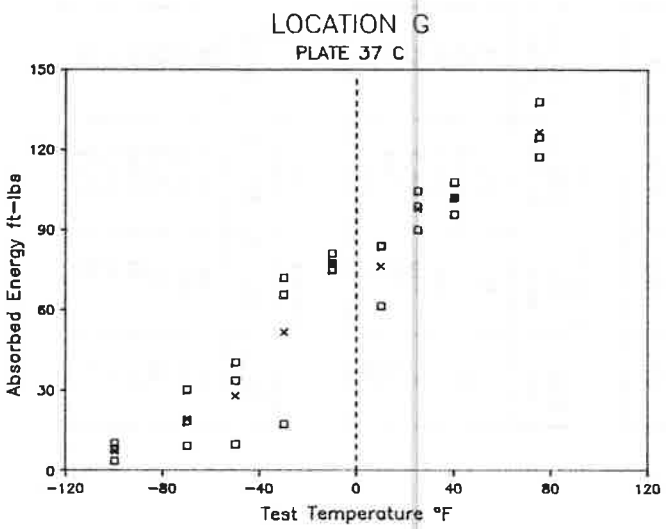
Test Temp-°F	Location Energy ft-lbs	H Lat Exp mils	% Shear
10	84.5	67.7	78
-10	69.0	59.7	67

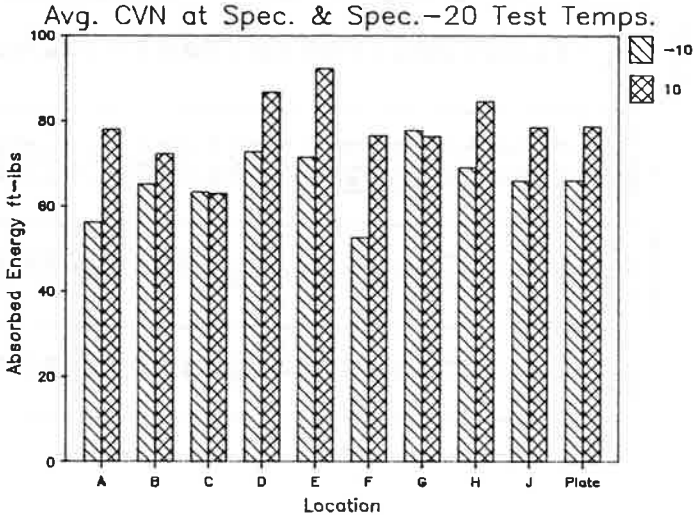
Spec. No.	Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
7	10	77.1	67	70
11	10	82.0	63	70
12	10	76.3	62	70
8	-10	51.0	48	50
9	-10	64.7	53	60
10	-10	81.9	68	85

Test Temp-°F	Location Energy ft-lbs	J Lat Exp mils	% Shear
10	78.5	64.0	70
-10	65.9	56.3	65


LOCATION C
PLATE 37 C
Absorbed Energy ft-lbs
Test Temperature °F


LOCATION E
PLATE 37 C
Absorbed Energy ft-lbs
Test Temperature °F


LOCATION G
PLATE 37 C
Absorbed Energy ft-lbs
Test Temperature °F


Avg. CVN at Spec. & Spec.-20 Test Temps.
-10
10
Absorbed Energy ft-lbs
A
B
C
D
E
F
G
H
J
Plate
Location

MILL DATA SHEET
Plate No: 38 & 44
Manf: 3

Melt/Slab Number: U7897-4A
Yield Point(ksi)

TX:65.0	BX:67.3	MTX:60.2	MBX:62.2	MX1:64.8	MX2:65.3	MX3:59.6

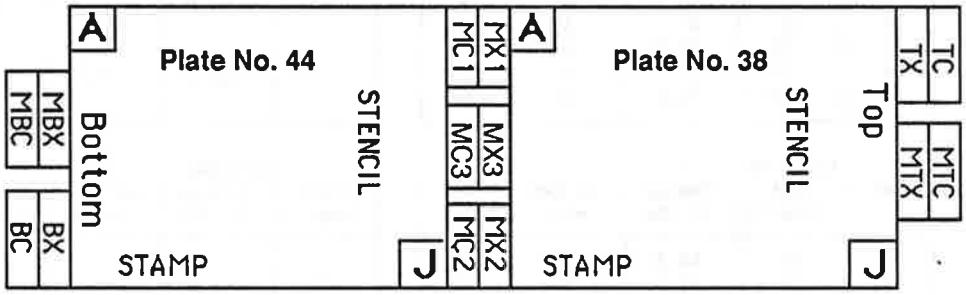
Tensile Strength(ksi)

TX:91.4	BX:91.3	MTX:89.8	MBX:93.4	MX1:93.4	MX2:94.9	MX3:89.1

Elongation(%) {Gage Length (in): 2}

TX: 24	BX: 22	MTX: 22	MBX: 22	MX1: 22	MX2: 23	MX3: 22

Steel Type: A572 Gr. 50 type 2
Thickness (in): 4
Length (in): 120 Width (in): 60
Notes: Normalized at 1650 °F for 195 min. - Air cool
Fine Grain Practice, Bend Test - Pass
Spec. Code - Top: F519 Bottom: F520



TC,MTC,BC,MBC,MC1,MC2,MC3 - Charpy test locations, 9" x 3"
TX,MTX,BX,MBX,MX1,MX2,MX3 - Tensile test locations, 9" x 2-1/4"

CHARPY IMPACT MILL TESTS (foot-lbs)

	Test Temp	Test #1 CVN	Lt.Ex.	%Sh.	Test #2 CVN	Lt.Ex.	%Sh.	Test #3 CVN	Lt.Ex.	%Sh.	CVN Avg
TC	+10°F	78	59	70	80	61	70	86	65	70	81
BC	-05°F	53	42	50	56	43	50	63	49	50	57
MTC	+10°F	82	**	**	89	**	**	94	**	**	88
MBC	+10°F	65	**	**	65	**	**	77	**	**	69
MC1	+10°F	72	**	**	74	**	**	74	**	**	73
MC2	+10°F	63	**	**	69	**	**	72	**	**	68
MC3	+10°F	66	**	**	77	**	**	80	**	**	74

(** results not reported)

Chemical Analysis

C	Mn	P	S	Si	Cu	Ni	Cr	V	Al	Cb
.22	1.29	.021	.014	.240	NA	NA	NA	.075	NA	NA
Prod. Chemical Analysis										
.22	1.31	.020	.013	.250	NA	NA	NA	.078	NA	NA
.22	1.31	.021	.013	.250	NA	NA	NA	.077	NA	NA

Plate: 38 Q
Date: September 19, 1989 Windage: 0
Spec. Temp: + 10 F Personnel: SG

Spec. No.	Location Test Temp-°F	A Energy ft-lbs	Lat Exp mils	% Shear
3	10	36.3	32	40
4	10	40.8	33	45
6	10	50.5	43	50
1	-10	36.1	29	35
2	-10	40.5	36	40
5	-10	40.8	38	40

Average

Location Test Temp-°F	A Energy ft-lbs	Lat Exp mils	% Shear
10	42.5	36.0	45
-10	39.1	34.3	38

Spec. No.	Location Test Temp-°F	B Energy ft-lbs	Lat Exp mils	% Shear
1	10	59.9	50	60
3	10	55.8	46	50
6	10	41.4	37	45
2	-10	29.9	29	30
4	-10	31.9	31	35
5	-10	38.2	35	30

Location Test Temp-°F	B Energy ft-lbs	Lat Exp mils	% Shear
10	52.4	44.3	52
-10	33.3	31.7	32

Spec. No.	Location Test Temp-°F	C Energy ft-lbs	Lat Exp mils	% Shear
3	10	45.8	42	50
13	10	41.3	38	45
27	10	53.7	45	55
6	-10	30.1	24	30
19	-10	36.3	33	30
22	-10	30.8	28	35
5	75	93.8	71	90
18	75	98.2	76	95
23	75	96.5	76	85
8	40	69.9	58	80
12	40	71.9	58	70
29	40	69.8	56	70
2	25	44.3	41	70
16	25	52.7	49	75
28	25	49.6	47	70
7	-30	29.8	28	40
14	-30	23.3	23	35
24	-30	24.9	23	35
9	-50	23.3	21	30
11	-50	9.5	12	15
30	-50	30.9	27	35
4	-70	16.6	13	10
17	-70	23.6	20	20
25	-70	18.6	15	20
10	100	90.1	74	80
15	100	94.9	77	85
26	100	97.9	78	90
1	-100	18.2	15	15
20	-100	7.9	6	0
21	-100	12.9	10	10

Location Test Temp-°F	C Energy ft-lbs	Lat Exp mils	% Shear
10	46.9	41.7	50
-10	32.4	28.3	32
75.2	96.2	74.3	90
40	70.5	57.3	73
25	48.9	45.7	72
-30	26.0	24.7	37
-50	21.2	20.0	27
-70	19.6	16.0	17
100	94.3	76.3	85
-100	13.0	10.3	8

Plate: 38 Q

Spec. No.	Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
3	10	54.4	48	55
4	10	61.1	51	60
5	10	69.3	54	65
1	-10	33.9	33	35
2	-10	43.7	39	45
6	-10	54.5	43	50

Average

Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
10	61.6	51.0	60
-10	44.0	38.3	43

Spec. No.	Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
1	10	53.6	44	50
13	10	63.5	53	60
29	10	63.8	53	65
9	-10	55.5	47	50
17	-10	55.6	45	45
25	-10	52.9	44	50
3	75	109.9	82	95
16	75	111.2	81	100
23	75	99.3	77	85
6	40	85.4	66	85
15	40	77.8	53	70
27	40	95.1	73	90
8	25	82.9	66	85
11	25	71.9	58	80
24	25	51.3	45	65
4	-30	39.3	32	45
18	-30	45.7	39	50
30	-30	45.9	40	50
2	-50	28.9	22	30
12	-50	30.5	28	35
26	-50	34.8	28	40
7	-70	24.9	22	30
19	-70	27.4	23	30
21	-70	32.6	25	35
10	100	113.3	83	85
14	100	114.4	84	90
28	100	112.3	82	90
5	-100	14.4	13	10
20	-100	10.0	7	5
22	-100	16.5	15	10

Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
10	60.3	50.0	58
-10	54.7	45.3	48
75.2	106.8	80.0	93
40	86.1	64.0	82
25	68.7	56.3	77
-30	43.6	37.0	48
-50	31.4	26.0	35
-70	28.3	23.3	32
100	113.3	83.0	88
-100	13.6	11.7	8

Spec. No.	Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
1	10	50.8	44	50
2	10	74.5	61	70
4	10	56.2	45	55
3	-10	57.5	54	65
5	-10	54.2	44	60
6	-10	61.1	52	65

Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
10	60.5	50.0	58
-10	57.6	50.0	63

Plate: 38 Q

Spec. No.	Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
8	10	73.8	57	65
11	10	66.2	54	65
24	10	70.6	58	65
4	-10	57.7	51	60
19	-10	58.2	52	65
27	-10	56.1	51	55
5	75	111.3	85	95
12	75	104.2	81	95
30	75	114.3	85	95
9	40	90.9	70	95
16	40	96.3	69	90
25	40	87.1	69	95
10	25	74.9	62	80
15	25	68.8	59	80
26	25	94.3	65	85
2	-30	39.8	36	45
20	-30	63.9	42	50
21	-30	46.9	53	65
6	-50	41.1	33	45
13	-50	40.9	36	50
22	-50	36.3	31	45
3	-70	22.2	20	30
17	-70	37.2	31	40
28	-70	30.9	27	40
7	100	112.2	83	90
18	100	124.7	84	85
23	100	112.0	86	90
1	-100	18.9	17	15
14	-100	23.0	22	25
29	-100	10.6	13	10

Average

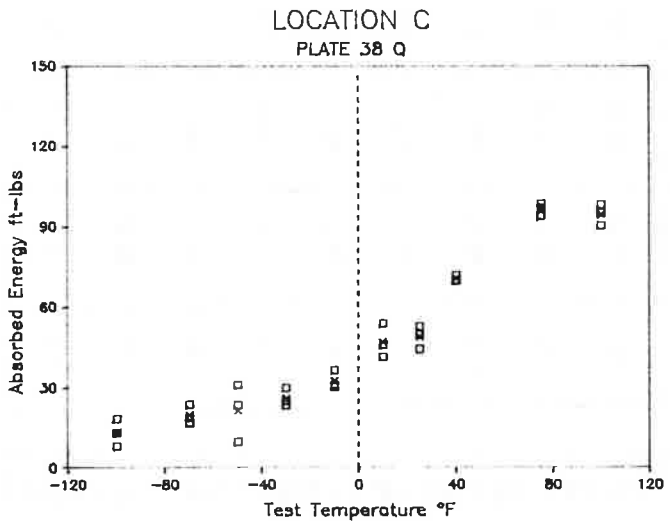
Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
10	70.2	56.3	65
-10	57.3	51.3	60
75.2	109.9	83.7	95
40	91.4	69.3	93
25	79.3	62.0	82
-30	50.2	43.7	53
-50	39.4	33.3	47
-70	30.1	26.0	37
100	116.3	84.3	88
-100	17.5	17.3	17

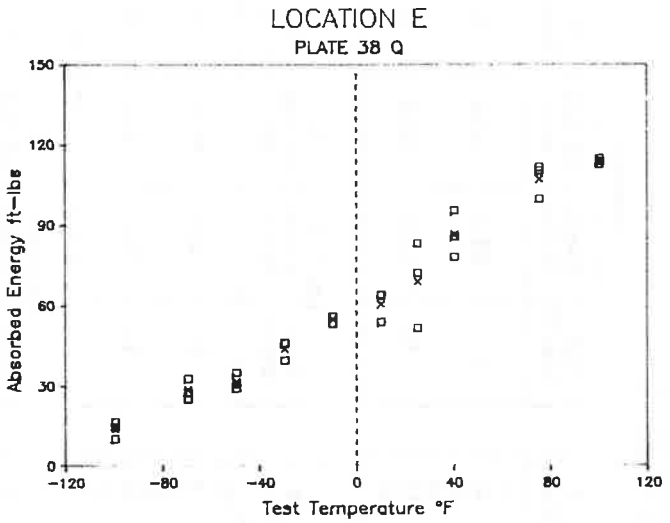
Spec. No.	Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
2	10	66.9	57	65
5	10	71.8	54	65
6	10	61.8	52	70
1	-10	45.1	34	45
3	-10	60.3	46	55
4	-10	60.2	46	60

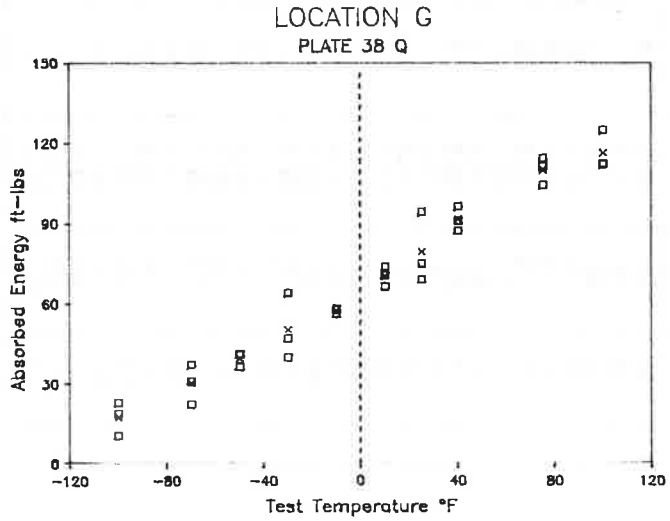
Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
10	66.8	54.3	67
-10	55.2	42.0	53

Spec. No.	Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
1	10	70.6	58	65
2	10	63.6	53	60
5	10	73.8	61	65
3	-10	32.3	26	30
4	-10	60.4	47	50
6	-10	58.3	49	55

Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
10	69.3	57.3	63
-10	50.3	40.7	45


LOCATION C
PLATE 38 Q
Absorbed Energy ft-lbs
Test Temperature °F
150
120
90
60
30
0
−120
−80
−40
0
40
80
120


LOCATION E
PLATE 38 Q
Absorbed Energy ft-lbs
Test Temperature °F
150
120
90
60
30
0
−120
−80
−40
0
40
80
120


LOCATION G
PLATE 38 Q
Absorbed Energy ft-lbs
Test Temperature °F
150
120
90
60
30
0
−120
−80
−40
0
40
80
120

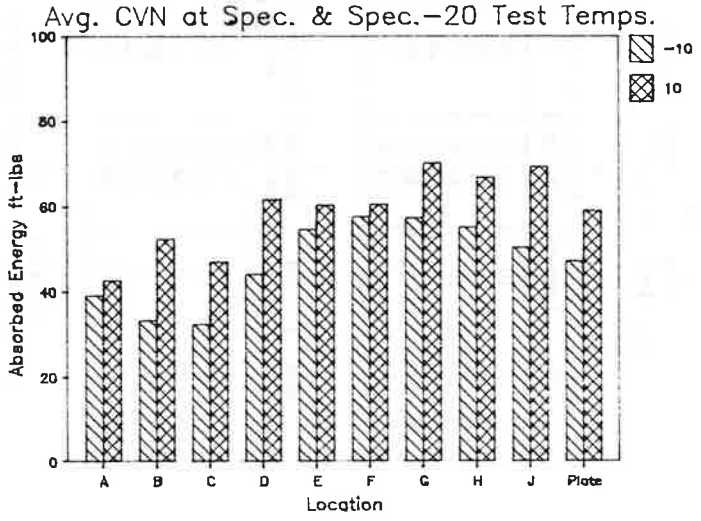

Avg. CVN at Spec. & Spec.−20 Test Temps.
−10
10
Absorbed Energy ft-lbs
Location
100
80
60
40
20
0
A
B
C
D
E
F
G
H
J
Plate

Plate: 38 C
Date: September 19, 1989 Windage: 0
Spec. Temp: + 10 F Personnel: SG

Spec. No.	Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
7	10	52.7	45	50
8	10	37.6	38	40
11	10	55.8	47	45
9	-10	45.2	40	40
10	-10	33.3	38	40
12	-10	52.2	43	45

Average Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	48.7	43.3	45
-10	43.6	40.3	42

Spec. No.	Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
7	10	55.9	44	55
9	10	48.3	42	50
12	10	54.2	46	55
8	-10	23.8	27	35
10	-10	37.7	34	40
11	-10	39.2	24	35

Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	52.8	44.0	53
-10	33.6	28.3	37

Spec. No.	Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
36	10	54.6	47	55
46	10	41.9	41	45
51	10	63.2	51	55
33	-10	49.9	42	50
41	-10	43.9	37	45
55	-10	41.9	36	40
39	75	94.7	74	85
45	75	87.1	70	85
49	75	98.3	77	90
37	40	49.8	44	60
42	40	78.2	62	80
56	40	66.1	56	75
38	25	54.7	47	60
43	25	64.8	54	65
54	25	53.8	45	60
31	-30	35.9	30	40
47	-30	31.8	30	40
50	-30	26.8	27	40
34	-50	28.3	25	35
48	-50	20.5	19	30
52	-50	33.2	30	40
32	-70	18.6	16	25
44	-70	19.9	17	25
57	-70	23.7	19	30
35	-100	13.5	11	10
40	-100	7.3	7	5
53	-100	16.0	17	15

Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	53.2	46.3	52
-10	45.2	38.3	45
75.2	93.4	73.7	87
40	64.7	54.0	72
25	57.8	48.7	62
-30	31.5	29.0	40
-50	27.3	24.7	35
-70	20.7	17.3	27
-100	12.3	11.7	10

Plate: 38 C

Spec. No.	Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
9	10	46.5	42	45
10	10	63.4	52	60
12	10	67.2	54	60
7	-10	49.8	41	50
8	-10	49.2	41	50
11	-10	55.5	45	55

Average

Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
10	59.0	49.3	55
-10	51.5	42.3	52

Spec. No.	Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
31	10	71.8	61	70
43	10	76.5	62	70
56	10	61.5	51	60
32	-10	76.8	61	70
42	-10	62.7	50	55
55	-10	62.2	52	60
39	75	113.8	82	100
44	75	116.3	85	100
50	75	113.3	83	95
33	40	110.4	84	90
40	40	119.7	84	100
52	40	98.2	77	90
38	25	81.1	65	85
41	25	79.9	62	80
51	25	81.8	68	85
37	-30	54.1	47	60
47	-30	35.5	32	40
49	-30	61.5	50	65
34	-50	36.0	30	40
48	-50	39.9	35	45
54	-50	28.5	27	40
36	-70	22.0	20	30
46	-70	30.1	25	35
57	-70	28.1	27	35
35	-100	6.5	6	0
45	-100	17.0	14	15
53	-100	5.0	4	0

Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
10	69.9	58.0	67
-10	67.2	54.3	62
75.2	114.5	83.3	98
40	109.4	81.7	93
25	80.9	65.0	83
-30	50.4	43.0	55
-50	34.8	30.7	42
-70	26.7	24.0	33
-100	9.5	8.0	5

Spec. No.	Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
13	10	59.0	50	60
11	10	85.6	70	75
12	10	64.2	52	65
7	-10	60.0	55	70
8	-10	72.1	58	70
10	-10	40.9	36	40

Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
10	69.6	57.3	67
-10	57.7	49.7	60

Plate: 38 C

Spec. No.	Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
31	10	83.8	62	70
43	10	70.4	53	65
51	10	60.4	51	60
37	-10	55.5	44	55
44	-10	55.9	46	50
49	-10	55.4	46	55
39	75	107.9	82	95
42	75	109.8	80	95
53	75	109.1	80	95
35	40	93.1	71	95
40	40	112.2	70	95
56	40	86.9	66	85
38	25	99.4	77	95
45	25	90.2	71	85
52	25	67.9	56	70
33	-30	48.0	42	55
47	-30	42.5	36	45
54	-30	43.8	40	50
34	-50	50.3	43	55
48	-50	35.5	30	40
50	-50	32.2	29	40
32	-70	40.3	32	70
46	-70	25.5	21	30
57	-70	31.0	27	40
36	-100	14.8	15	15
41	-100	17.4	16	10
55	-100	21.9	18	20

Average

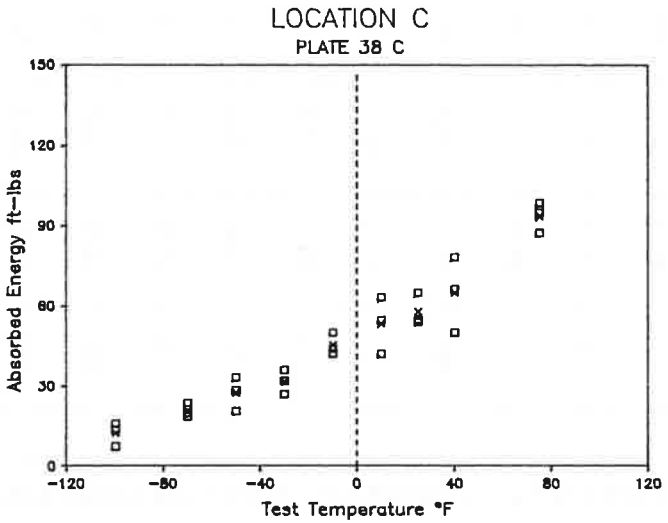
Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
10	71.5	55.3	65
-10	55.6	45.3	53
75.2	108.9	80.7	95
40	97.4	69.0	92
25	85.8	68.0	83
-30	44.8	39.3	50
-50	39.3	34.0	45
-70	32.3	26.7	47
-100	18.0	16.3	15

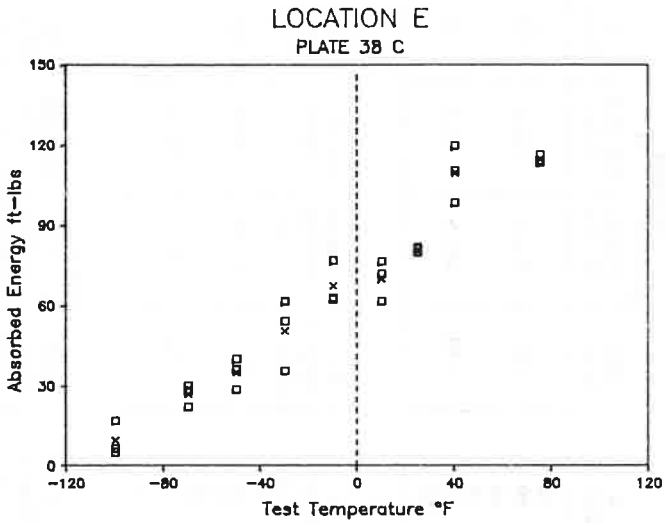
Spec. No.	Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
7	10	77.8	64	75
9	10	74.6	63	75
11	10	70.9	57	70
8	-10	71.4	63	75
10	-10	70.2	57	70
12	-10	79.4	65	80

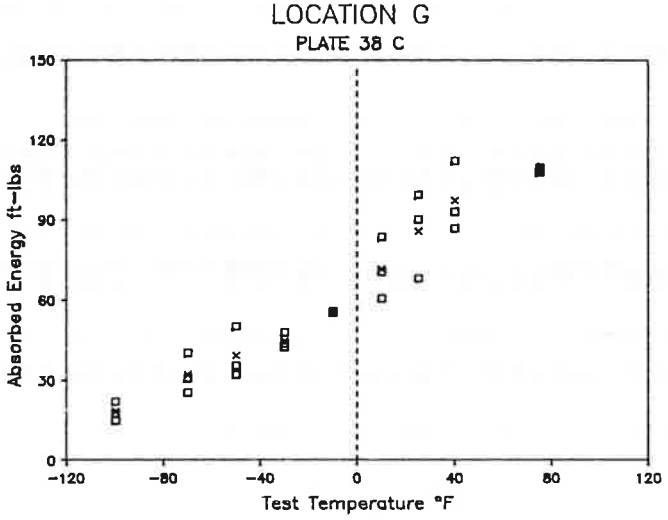
Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
10	74.4	61.3	73
-10	73.7	61.7	75

Spec. No.	Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
7	10	76.1	58	65
10	10	80.9	62	70
11	10	76.8	63	70
8	-10	67.1	57	65
9	-10	57.5	49	55
12	-10	54.4	49	50

Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
10	77.9	61.0	68
-10	59.7	51.7	57


LOCATION C
PLATE 38 C
Absorbed Energy ft-lbs
Test Temperature °F


LOCATION E
PLATE 38 C
Absorbed Energy ft-lbs
Test Temperature °F


LOCATION G
PLATE 38 C
Absorbed Energy ft-lbs
Test Temperature °F

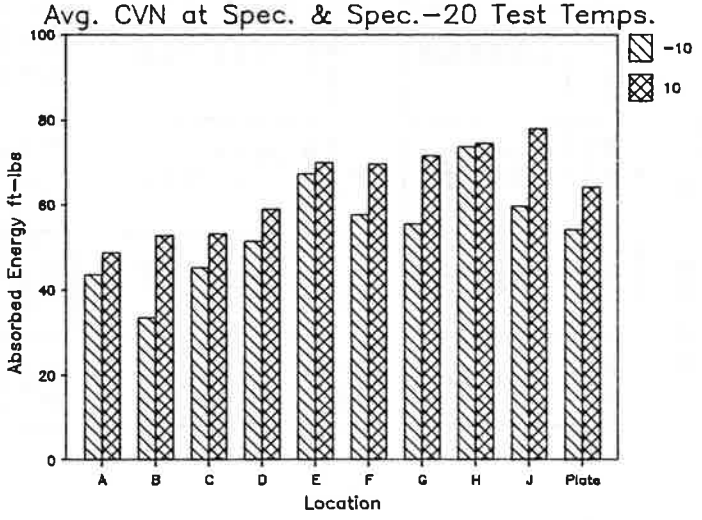

Avg. CVN at Spec. & Spec.-20 Test Temps.
-10
10
Absorbed Energy ft-lbs
A
B
C
D
E
F
G
H
J
Plate
Location

Plate: 44 Q
Date: January 9, 1990 Windage: 0
Spec. Temp: + 10 F Personnel: SG

Spec. No.	Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
1	10	59.7	51	60
3	10	50.0	43	50
6	10	60.5	50	60
2	-10	48.5	39	50
4	-10	44.1	37	45
5	-10	43.2	38	50

Average Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	56.7	48.0	57
-10	45.3	38.0	48

Spec. No.	Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
1	10	49.8	43	50
4	10	47.0	44	50
6	10	50.0	45	55
2	-10	42.9	36	45
3	-10	46.0	41	50
5	-10	45.1	39	50

Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	48.9	44.0	52
-10	44.7	38.7	48

Spec. No.	Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
8	10	54.0	47	60
15	10	48.1	44	55
28	10	53.0	48	60
1	-10	27.0	30	40
17	-10	40.0	41	50
24	-10	36.0	36	45
2	73	93.9	72	80
19	73	94.7	75	85
30	73	95.3	77	85
6	40	67.9	57	70
13	40	61.9	56	65
22	40	61.3	53	65
4	25	50.3	47	55
11	25	60.1	52	60
27	25	51.0	47	55
9	-30	31.0	28	40
16	-30	31.3	39	50
25	-30	29.2	34	45
5	-50	23.6	25	35
18	-50	28.0	24	35
23	-50	25.2	23	35
7	-70	19.9	17	25
14	-70	22.2	18	30
26	-70	27.8	24	35
3	-100	17.0	14	25
20	-100	14.3	14	25
29	-100	18.2	15	25
10	100	92.1	76	85
12	100	100.0	80	90
21	100	96.0	78	90

Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	51.7	46.3	58
-10	34.3	35.7	45
73	94.6	74.7	83
40	63.7	55.3	67
25	53.8	48.7	57
-30	30.5	33.7	45
-50	25.6	24.0	35
-70	23.3	19.7	30
-100	16.5	14.3	25
100	96.0	78.0	88

Plate: 44 Q

Spec. No.	Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
1	10	57.0	49	60
3	10	54.2	46	55
5	10	40.9	38	50
2	-10	41.8	34	45
4	-10	53.1	43	55
6	-10	49.0	43	55

Average

Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
10	50.7	44.3	55
-10	48.0	40.0	52

Spec. No.	Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
7	10	53.5	43	55
13	10	63.4	53	65
30	10	55.0	46	55
4	-10	37.2	36	45
17	-10	47.0	41	50
24	-10	42.8	39	50
8	73	103.2	76	80
19	73	102.9	81	85
22	73	99.9	77	85
2	40	90.0	70	80
15	40	84.0	66	75
27	40	72.0	57	65
1	25	65.9	53	65
16	25	63.2	55	65
25	25	65.9	54	65
9	-30	29.6	35	45
12	-30	26.2	30	40
29	-30	34.0	35	45
3	-50	26.5	24	35
20	-50	33.9	28	40
26	-50	39.0	34	45
6	-70	28.6	25	35
11	-70	26.6	23	35
23	-70	24.2	21	30
5	-100	10.7	10	20
14	-100	7.1	4	15
28	-100	13.5	14	25
10	100	94.0	75	85
18	100	97.3	79	90
21	100	105.2	82	90

Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
10	57.3	47.3	58
-10	42.3	38.7	48
73	102.0	78.0	83
40	82.0	64.3	73
25	65.0	54.0	65
-30	29.9	33.3	43
-50	33.1	28.7	40
-70	26.5	23.0	33
-100	10.4	9.3	20
100	98.8	78.7	88

Spec. No.	Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
3	10	50.5	44	55
4	10	51.0	45	55
5	10	57.9	49	60
1	-10	48.7	40	50
2	-10	45.9	41	50
6	-10	45.6	38	48

Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
10	53.1	46.0	57
-10	46.7	39.7	49

Plate: 44 Q

Spec. No.	Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
2	10	48.9	42	50
19	10	51.9	45	55
23	10	53.0	43	55
7	-10	47.2	39	50
12	-10	46.9	40	50
29	-10	54.0	46	55
8	73	98.3	79	85
14	73	105.6	82	90
27	73	86.4	71	80
4	40	67.7	55	65
18	40	56.0	47	60
25	40	67.1	55	65
6	25	60.3	50	60
17	25	57.2	47	55
22	25	66.1	55	65
1	-30	45.5	43	55
15	-30	31.1	30	40
28	-30	32.2	34	45
9	-50	28.8	26	35
13	-50	35.0	30	40
26	-50	42.9	36	45
3	-70	21.8	19	30
20	-70	20.9	17	25
24	-70	28.0	23	35
5	-100	17.1	16	25
11	-100	9.5	10	20
30	-100	13.4	11	20
10	100	98.0	78	90
16	100	101.2	78	90
21	100	102.3	78	90

Average G

Location Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	51.3	43.3	53
-10	49.4	41.7	52
73	96.8	77.3	85
40	63.6	52.3	63
25	61.2	50.7	60
-30	36.3	35.7	47
-50	35.6	30.7	40
-70	23.6	19.7	30
-100	13.3	12.3	22
100	100.5	78.0	90

Spec. No.	Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
1	10	51.3	45	55
3	10	53.1	45	55
5	10	58.0	48	60
2	-10	41.3	35	45
4	-10	42.2	38	50
6	-10	47.0	38	50

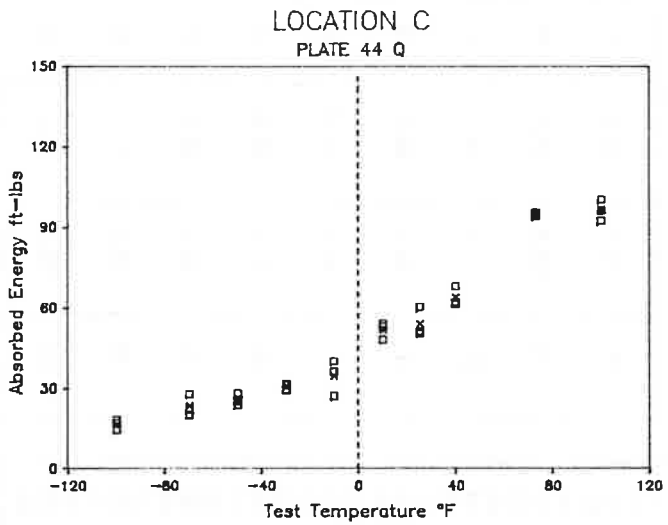
H

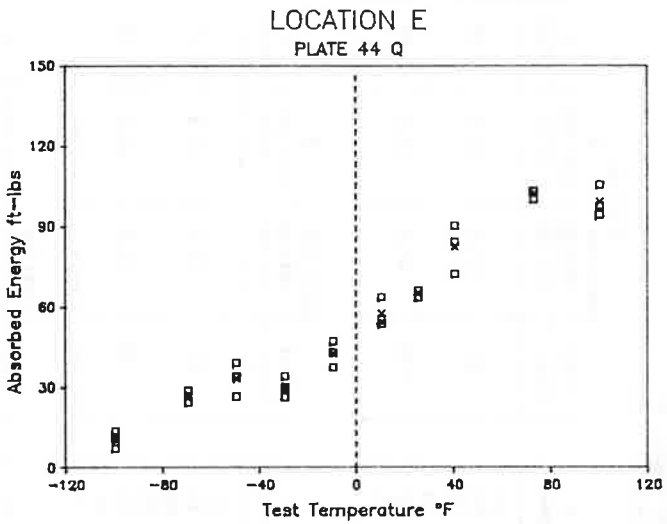
Location Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	54.1	46.0	57
-10	43.5	37.0	48

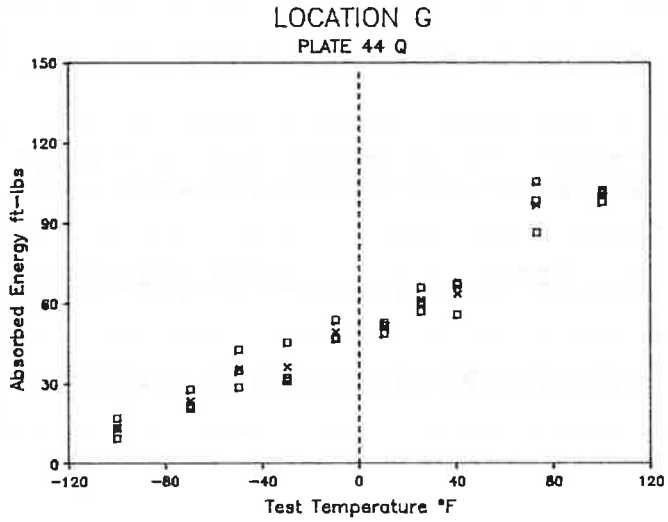
Spec. No.	Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
3	10	49.1	41	50
4	10	43.6	41	50
6	10	49.0	42	50
1	-10	40.6	36	45
2	-10	45.0	39	50
5	-10	40.0	35	45

J

Location Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	47.2	41.3	50
-10	41.9	36.7	47


LOCATION C
PLATE 44 Q
Absorbed Energy ft-lbs
Test Temperature °F


LOCATION E
PLATE 44 Q
Absorbed Energy ft-lbs
Test Temperature °F


LOCATION G
PLATE 44 Q
Absorbed Energy ft-lbs
Test Temperature °F

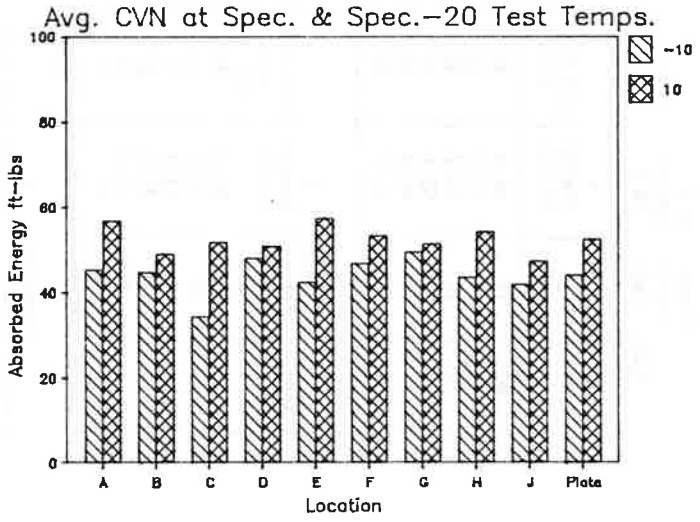

Avg. CVN at Spec. & Spec.-20 Test Temps.
-10
10
Absorbed Energy ft-lbs
A
B
C
D
E
F
G
H
J
Plate
Location

Plate: 44 C
Date: January 9, 1990 Windage: 0
Spec. Temp: + 10 F Personnel: SG

Spec. No.	Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
9	10	42.0	37	50
10	10	54.9	46	55
12	10	56.2	50	60
7	-10	52.1	42	50
8	-10	51.0	43	55
11	-10	40.9	37	45

Average Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	51.0	44.3	55
-10	48.0	40.7	50

Spec. No.	Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
7	10	37.2	38	45
8	10	48.1	42	55
9	10	33.2	32	40
10	-10	22.6	23	35
11	-10	23.0	24	35
12	-10	41.1	38	45

Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	39.5	37.3	47
-10	28.9	28.3	38

Spec. No.	Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
33	10	50.3	43	55
46	10	46.7	43	55
52	10	49.9	44	55
35	-10	42.9	38	50
42	-10	45.2	33	45
54	-10	39.2	39	50
34	73	97.1	77	85
48	73	96.0	75	85
50	73	88.1	72	80
37	40	65.0	56	65
40	40	72.2	58	70
56	40	73.0	61	70
31	25	44.5	41	50
44	25	70.0	62	70
51	25	47.8	46	55
36	-30	23.0	29	40
47	-30	37.0	37	45
53	-30	30.4	31	40
32	-50	22.3	21	30
45	-50	17.0	19	30
57	-50	28.0	27	40
39	-70	19.5	18	25
43	-70	20.0	17	25
55	-70	27.2	22	35
38	100	94.2	78	90
41	100	94.0	59	70
49	100	89.8	71	80

Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	49.0	43.3	55
-10	42.4	36.7	48
73	93.7	74.7	83
40	70.1	58.3	68
25	54.1	49.7	58
-30	30.1	32.3	42
-50	22.4	22.3	33
-70	22.2	19.0	28
100	92.7	69.3	80

Plate: 44 C

Spec. No.	Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
7	10	57.9	49	60
9	10	48.3	35	45
10	10	54.1	38	45
8	-10	46.0	40	50
11	-10	34.6	23	35
12	-10	41.0	28	40

Average

Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
10	53.4	40.7	50
-10	40.5	30.3	42

Spec. No.	Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
37	10	49.3	45	55
41	10	49.8	42	50
52	10	40.0	40	50
32	-10	42.9	39	50
46	-10	36.9	35	45
50	-10	49.0	44	55
35	73	94.4	76	85
45	73	102.7	79	85
57	73	97.2	76	85
31	40	73.0	59	70
44	40	87.6	68	75
51	40	78.7	63	75
34	25	49.0	46	55
47	25	60.0	54	65
49	25	62.5	52	65
36	-30	40.8	38	50
42	-30	33.9	34	45
54	-30	35.0	33	45
39	-50	32.2	26	35
43	-50	24.1	22	30
55	-50	24.6	22	30
33	-70	37.1	34	45
48	-70	19.1	17	25
53	-70	25.1	20	30
38	100	103.9	80	90
40	100	101.8	75	85
56	100	96.3	74	85

Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
10	46.4	42.3	52
-10	42.9	39.3	50
73	98.1	77.0	85
40	79.8	63.3	73
25	57.2	50.7	62
-30	36.6	35.0	47
-50	27.0	23.3	32
-70	27.1	23.7	33
100	100.7	76.3	87

Spec. No.	Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
7	10	47.0	39	50
8	10	44.3	41	50
12	10	46.0	41	50
9	-10	46.1	40	50
10	-10	30.0	30	40
11	-10	50.0	40	50

Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
10	45.8	40.3	50
-10	42.0	36.7	47

Plate: 44 C

Spec. No.	Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
32	10	50.0	45	55
46	10	58.4	49	60
53	10	54.0	45	55
34	-10	44.5	38	40
42	-10	46.9	41	50
50	-10	45.3	38	50
39	73	102.9	76	85
43	73	86.0	69	80
55	73	98.5	77	80
31	40	70.1	57	65
44	40	73.3	60	70
52	40	70.9	58	70
37	25	63.0	54	65
41	25	65.1	55	65
56	25	48.9	46	55
35	-30	35.9	33	45
47	-30	44.0	38	50
54	-30	30.1	30	40
33	-50	29.0	26	35
48	-50	33.2	28	40
51	-50	21.5	20	30
36	-70	20.3	21	30
45	-70	27.9	24	35
57	-70	14.1	15	25
38	100	99.8	79	90
40	100	99.9	79	90
49	100	99.1	78	90

Average

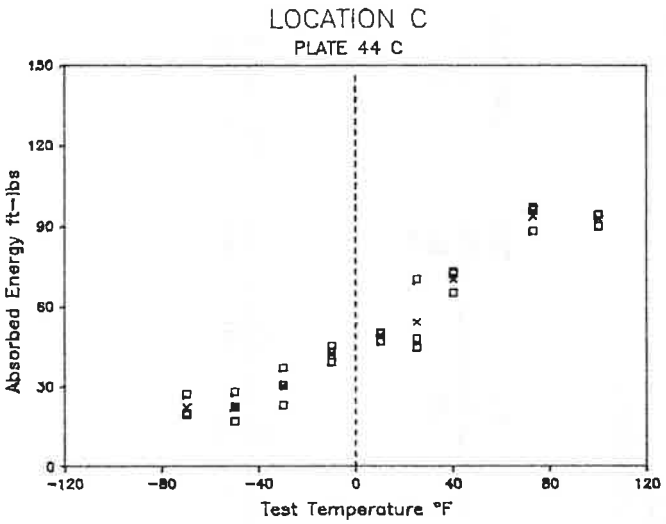
Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
10	54.1	46.3	57
-10	45.6	39.0	47
73	95.8	74.0	82
40	71.4	58.3	68
25	59.0	51.7	62
-30	36.7	33.7	45
-50	27.9	24.7	35
-70	20.8	20.0	30
100	99.6	78.7	90

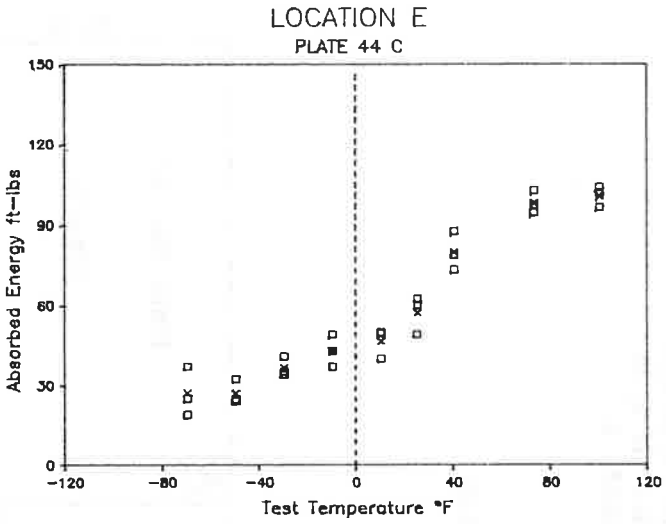
Spec. No.	Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
9	10	62.3	49	60
10	10	50.1	39	50
12	10	50.0	41	50
7	-10	50.3	44	55
8	-10	50.4	42	50
11	-10	59.0	45	55

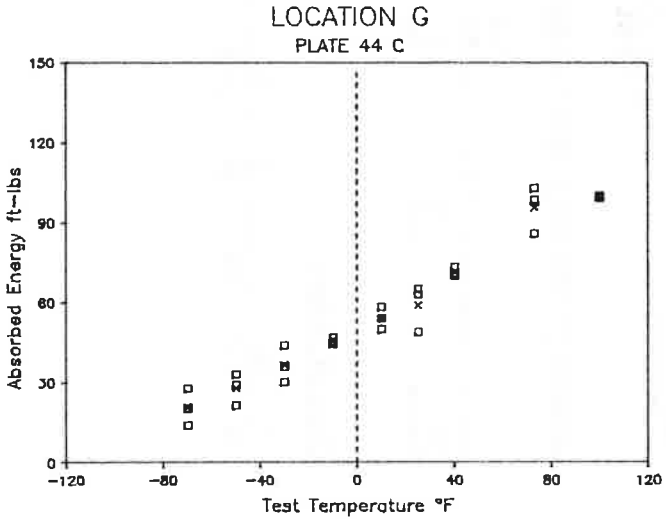
Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
10	54.1	43.0	53
-10	53.2	43.7	53

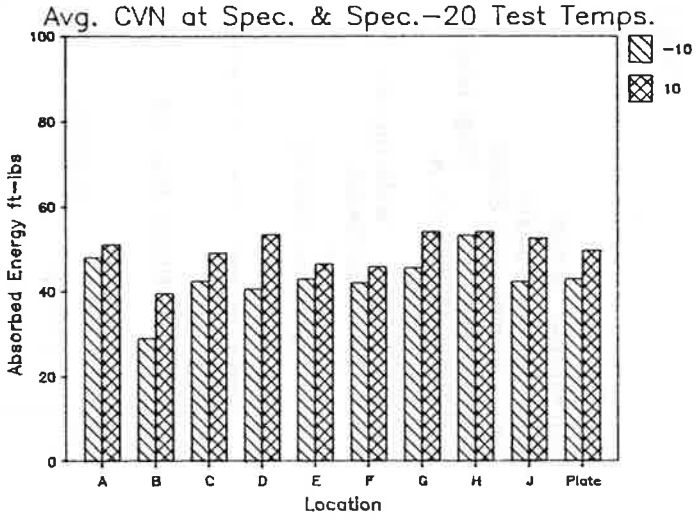
Spec. No.	Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
9	10	48.9	44	55
11	10	57.6	48	60
12	10	51.1	44	55
7	-10	50.0	41	50
8	-10	42.4	38	50
10	-10	34.4	33	45

Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
10	52.5	45.3	57
-10	42.3	37.3	48


LOCATION C
PLATE 44 C
Absorbed Energy ft-lbs
Test Temperature °F

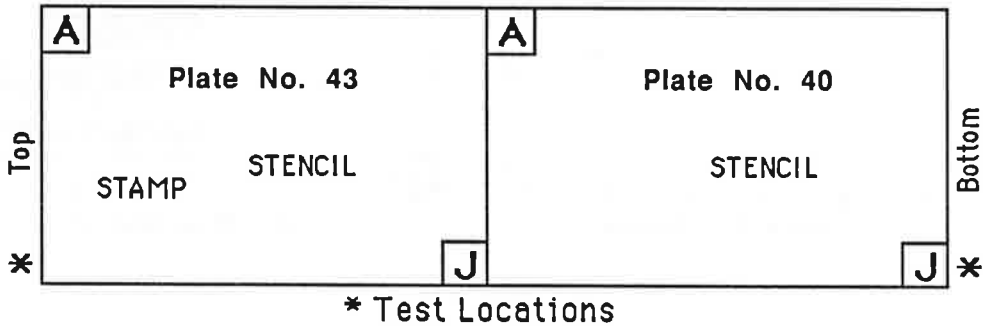

LOCATION E
PLATE 44 C
Absorbed Energy ft-lbs
Test Temperature °F


LOCATION G
PLATE 44 C
Absorbed Energy ft-lbs
Test Temperature °F


Avg. CVN at Spec. & Spec.-20 Test Temps.
-10
10
Absorbed Energy ft-lbs
A
B
C
D
E
F
G
H
J
Plate
Location

MILL DATA SHEET
Plate No: 40 & 43
Manf: 4

Heat Number: 1R2580
Yield Point (psi): 54000
Tensile Strength (psi): 81000
Elongation (%): 30.0 {Gage Length (in): 2}
Steel Type: A588-85 Gr. A
Thickness (in): 4
Length (in): 120 Width (in): 60
Notes: Fine Grain Practice
Normalized
Spec. Code: 04W 02



CHARPY IMPACT MILL TESTS (foot-lbs)

	Test Temp. (°F)	Test #1	Test #2	Test #3	CVN Test Avg.
Top	+10	68	76	62	69
Bottom	+10	68	76	74	73

Chemical Analysis

C	Mn	P	S	Si	Cu	Ni	Cr	V	Al	Cb
.16	1.15	.012	.011	.460	.310	.23	.60	.060	.034	NA

Plate: 40 Q
Date: August 10, 1989 Windage: 0
Spec. Temp: + 10 F Personnel: DAG

Spec. No.	Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
1	10	45.3	47	30
2	10	46.6	42	25
5	10	46.2	55	40
3	-10	43.2	40	25
4	-10	53.7	48	30
6	-10	46.6	44	30

Average

Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	46.0	48.0	32
-10	47.8	44.0	28

Spec. No.	Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
1	10	50.4	48	35
3	10	42.9	45	25
4	10	35.8	39	20
2	-10	47.4	44	30
5	-10	38.5	37	20
6	-10	45.7	42	25

Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	43.0	44.0	27
-10	43.9	41.0	25

Spec. No.	Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
8	10	42.6	36	20
14	10	38.2	38	25
29	10	56.4	51	40
2	-10	41.8	34	15
19	-10	51.9	47	30
25	-10	37.6	41	20
6	75	89.7	70	85
20	75	86.9	72	85
22	75	90.7	71	85
4	40	63.4	42	40
12	40	80.1	64	70
27	40	66.7	52	50
3	25	70.3	54	60
18	25	68.2	57	60
28	25	58.6	49	40
7	-30	40.1	32	10
13	-30	33.6	33	10
24	-30	30.2	23	5
1	-50	31.2	30	10
17	-50	32.6	31	10
21	-50	27.3	26	5
10	-70	11.6	14	25
15	-70	28.1	30	40
26	-70	29.1	30	40
9	-100	14.5	13	25
11	-100	18.9	22	30
30	-100	8.2	8	15
5	100	94.3	67	80
16	100	94.1	76	85
23	100	88.2	63	75

Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	45.7	41.7	28
-10	43.8	40.7	22
74.7	89.1	71.0	85
40	70.1	52.7	53
25	65.7	53.3	53
-30	34.6	29.3	8
-50	30.4	29.0	8
-70	22.9	24.7	35
-100	13.9	14.3	23
100	92.2	68.7	80

Plate: 40 Q

Spec. No.	Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
1	10	61.9	56	60
3	10	55.7	48	40
5	10	53.3	49	40
2	-10	51.6	42	30
4	-10	43.5	40	30
6	-10	44.3	41	30

Average

Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
10	57.0	51.0	47
-10	46.5	41.0	30

Spec. No.	Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
2	10	46.9	46	30
19	10	45.7	45	30
22	10	54.8	53	40
7	-10	39.5	30	10
13	-10	31.1	31	10
29	-10	37.8	38	20
4	75	83.5	64	75
18	75	77.6	67	80
26	75	79.6	65	75
8	40	59.2	50	40
12	40	70.4	61	70
25	40	87.5	73	80
3	25	57.3	50	35
20	25	46.2	42	20
23	25	37.5	42	20
10	-30	24.3	24	5
14	-30	33.9	33	10
27	-30	33.6	31	10
5	-50	22.6	19	5
16	-50	24.8	26	10
21	-50	25.7	27	10
9	-70	24.6	25	35
11	-70	29.0	29	40
30	-70	22.0	22	30
6	-100	14.1	12	20
15	-100	11.0	12	20
28	-100	12.9	15	25
1	100	88.2	72	80
17	100	85.2	72	80
24	100	94.9	78	90

Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
10	49.1	48.0	33
-10	36.1	33.0	13
74.7	80.2	65.3	77
40	72.4	61.3	63
25	47.0	44.7	25
-30	30.6	29.3	8
-50	24.4	24.0	8
-70	25.2	25.3	35
-100	12.7	13.0	22
100	89.4	74.0	83

Spec. No.	Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
1	10	49.2	36	25
4	10	49.6	47	30
5	10	58.6	52	40
2	-10	41.2	30	15
3	-10	44.8	39	20
6	-10	34.6	30	15

Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
10	52.5	45.0	32
-10	40.2	33.0	17

Plate: 40 Q

Spec. No.	Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
7	10	48.3	35	20
11	10	45.8	41	25
26	10	48.7	46	30
4	-10	38.6	40	30
17	-10	43.2	41	30
21	-10	37.6	35	20
1	75	90.5	66	75
15	75	90.0	70	80
29	75	95.4	74	85
8	40	60.3	53	50
20	40	60.4	54	50
23	40	65.9	54	50
2	25	52.8	50	40
19	25	60.7	49	35
25	25	53.2	45	30
10	-30	33.5	30	10
13	-30	35.7	31	10
27	-30	30.6	30	10
3	-50	29.8	26	10
18	-50	23.5	24	5
24	-50	19.8	19	0
5	-70	17.2	17	25
16	-70	10.1	13	25
22	-70	26.3	25	35
9	-100	21.0	19	30
12	-100	17.0	20	30
30	-100	16.1	13	25
6	100	89.8	65	75
14	100	94.9	73	85
28	100	83.8	75	85

Average

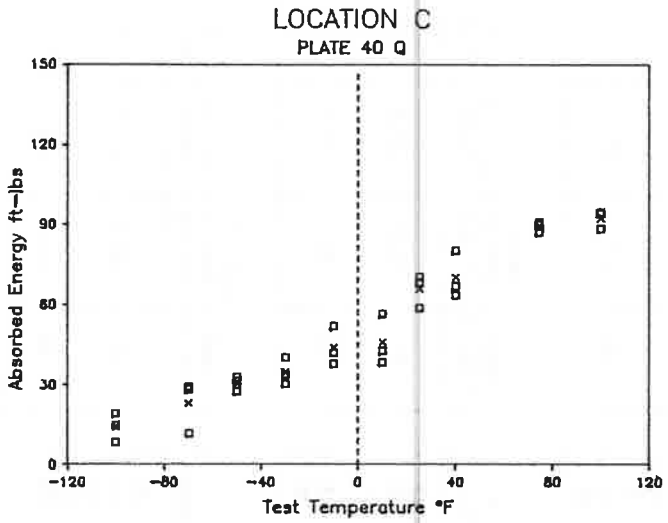
Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
10	47.6	40.7	25
-10	39.8	38.7	27
74.7	92.0	70.0	80
40	62.2	53.7	50
25	55.6	48.0	35
-30	33.3	30.3	10
-50	24.4	23.0	5
-70	17.9	18.3	28
-100	18.0	17.3	28
100	89.5	71.0	82

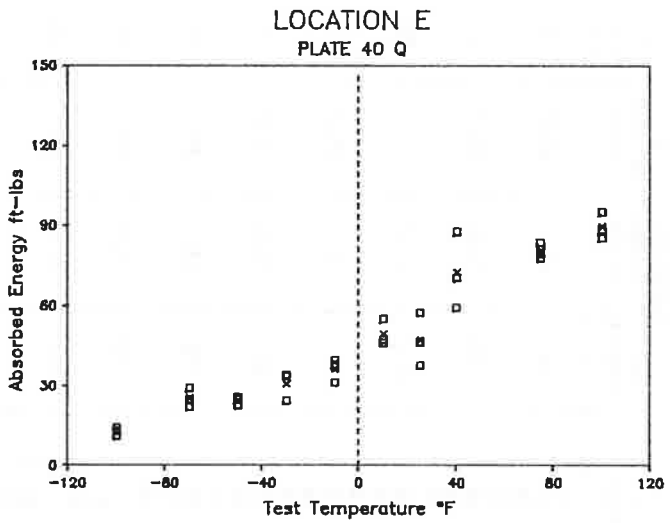
Spec. No.	Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
2	10	43.0	38	25
4	10	36.4	26	10
5	10	52.6	43	30
1	-10	22.6	22	5
3	-10	40.1	31	15
6	-10	42.7	40	20

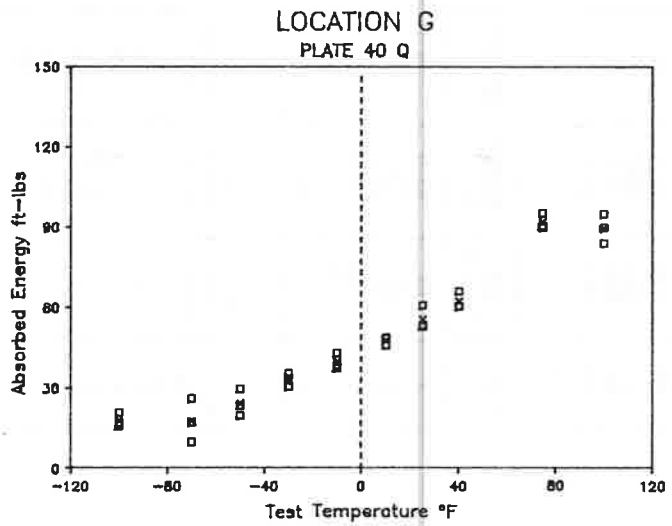
Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
10	44.0	35.7	22
-10	35.1	31.0	13

Spec. No.	Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
2	10	51.8	41	25
4	10	46.3	39	20
6	10	48.2	44	30
1	-10	48.1	37	20
3	-10	47.8	36	20
5	-10	37.5	36	20

Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
10	48.8	41.3	25
-10	44.5	36.3	20


LOCATION C
PLATE 40 Q
Absorbed Energy ft-lbs
Test Temperature °F


LOCATION E
PLATE 40 Q
Absorbed Energy ft-lbs
Test Temperature °F


LOCATION G
PLATE 40 Q
Absorbed Energy ft-lbs
Test Temperature °F

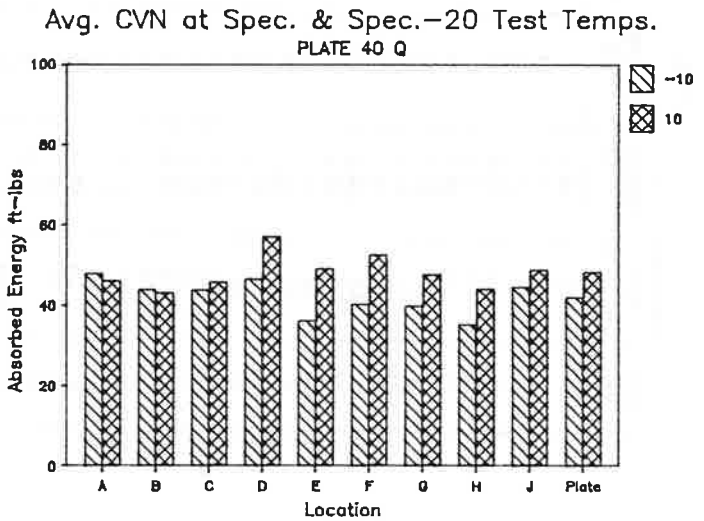

Avg. CVN at Spec. & Spec.−20 Test Temps.
PLATE 40 Q
-10
10
Absorbed Energy ft-lbs
A
B
C
D
E
F
G
H
J
Plate
Location

Plate: 40 C
Date: August 10, 1989 Windage: 0
Spec. Temp: + 10 F Personnel: DAG

Spec. No.	Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
7	10	57.9	52	40
9	10	42.8	42	25
12	10	45.8	43	25
8	-10	35.3	34	10
10	-10	50.4	44	30
11	-10	28.5	32	10

Average

Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	48.8	45.7	30
-10	38.1	36.7	17

Spec. No.	Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
9	10	38.7	40	20
10	10	31.8	33	10
12	10	47.9	49	20
7	-10	47.6	44	35
8	-10	35.0	34	10
11	-10	36.1	36	10

Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	39.5	40.7	17
-10	39.6	38.0	18

Spec. No.	Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
32	10	46.4	33	10
47	10	56.3	56	40
52	10	39.6	38	15
37	-10	35.7	34	10
43	-10	34.6	37	15
49	-10	35.7	36	15
33	75	93.3	73	80
48	75	92.4	69	75
55	75	84.6	67	70
35	40	75.6	60	70
40	40	54.9	50	40
57	40	63.2	55	60
38	25	48.3	44	30
41	25	48.1	49	35
54	25	40.2	25	10
34	-30	42.3	33	15
46	-30	29.6	30	10
50	-30	34.5	32	15
36	-50	18.6	14	0
45	-50	25.7	26	10
51	-50	23.1	22	5
39	-70	34.0	31	40
42	-70	14.0	15	25
56	-70	15.9	15	25
31	100	92.4	67	75
44	100	81.2	68	80
53	100	92.4	78	90

Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	47.4	42.3	22
-10	35.3	35.7	13
74.7	90.1	69.7	75
40	64.6	55.0	57
25	45.5	39.3	25
-30	35.5	31.7	13
-50	22.5	20.7	5
-70	21.3	20.3	30
100	88.7	71.0	82

Plate: 40 C

Spec. No.	Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
7	10	51.7	48	30
10	10	37.8	41	20
12	10	44.1	42	20
8	-10	36.5	35	20
9	-10	37.2	36	25
11	-10	22.1	24	5

Average

Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
10	44.5	43.7	23
-10	31.9	31.7	17

Spec. No.	Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
32	10	37.7	39	20
45	10	38.7	40	20
56	10	36.4	34	15
38	-10	26.3	33	10
47	-10	32.4	33	10
51	-10	32.8	35	10
33	75	91.4	68	75
48	75	72.7	66	70
52	75	86.5	65	70
31	40	64.6	57	50
44	40	59.4	57	50
50	40	50.7	54	50
37	25	51.1	36	20
41	25	44.2	45	30
57	25	47.1	46	30
36	-30	26.1	23	5
40	-30	21.4	24	5
55	-30	33.9	32	10
39	-50	20.4	19	5
43	-50	20.6	22	5
54	-50	23.6	27	10
35	-70	9.0	7	15
46	-70	18.4	18	25
49	-70	10.0	7	15
34	100	91.0	65	75
42	100	80.2	64	75
53	100	81.9	71	80

Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
10	37.6	37.7	18
-10	30.5	33.7	10
74.7	83.5	66.3	72
40	58.2	56.0	50
25	47.5	42.3	27
-30	27.1	26.3	7
-50	21.5	22.7	7
-70	12.5	10.7	18
100	84.4	66.7	77

Spec. No.	Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
7	10	40.6	34	20
8	10	40.5	33	20
10	10	40.5	38	20
9	-10	45.2	38	20
11	-10	36.3	31	10
12	-10	39.9	33	10

Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
10	40.5	35.0	20
-10	40.5	34.0	13

Plate: 40 C

Spec. No.	Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
32	10	42.4	40	20
44	10	55.4	51	35
54	10	42.2	41	20
37	-10	26.6	27	10
41	-10	49.3	43	30
52	-10	38.3	31	10
36	75	79.6	67	75
48	75	81.3	72	80
51	75	83.1	66	70
33	40	53.1	50	50
46	40	71.6	59	60
50	40	64.7	55	50
38	25	48.3	47	40
40	25	53.6	46	40
57	25	58.8	46	40
34	-30	25.8	26	10
47	-30	33.6	31	10
49	-30	32.8	26	10
39	-50	20.8	21	5
45	-50	18.6	20	5
53	-50	27.1	20	5
35	-70	10.0	9	20
42	-70	20.9	19	30
56	-70	8.5	10	20
31	100	77.5	70	80
43	100	91.5	77	90
55	100	98.8	73	85

Average

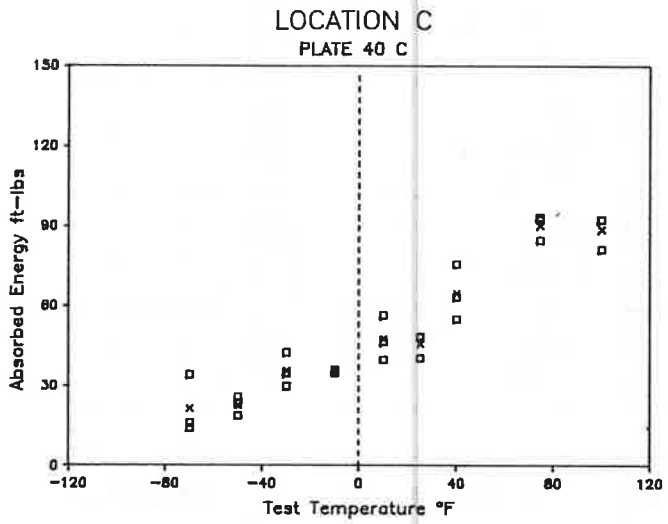
Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
10	46.7	44.0	25
-10	38.1	33.7	17
74.7	81.3	68.3	75
40	63.1	54.7	53
25	53.6	46.3	40
-30	30.7	27.7	10
-50	22.2	20.3	5
-70	13.1	12.7	23
100	89.3	73.3	85

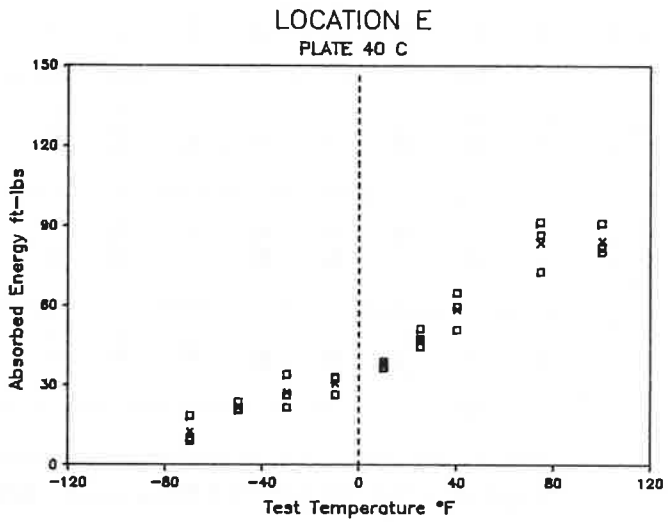
Spec. No.	Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
8	10	51.7	42	25
10	10	47.4	37	25
11	10	53.1	44	35
7	-10	36.6	39	20
9	-10	37.9	39	15
12	-10	38.5	33	10

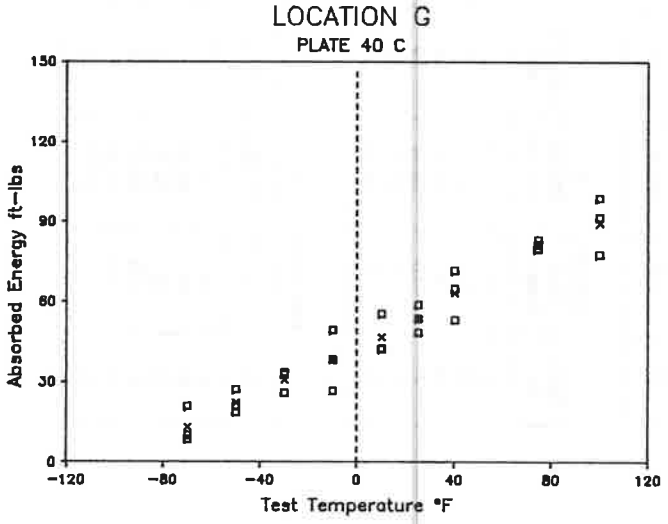
Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
10	50.7	41.0	28
-10	37.7	37.0	15

Spec. No.	Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
7	10	47.4	47	20
9	10	60.6	49	45
10	10	54.3	45	30
8	-10	30.7	26	10
11	-10	41.6	29	10
12	-10	37.8	32	10

Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
10	54.1	47.0	32
-10	36.7	29.0	10


LOCATION C
PLATE 40 C
Absorbed Energy ft-lbs
Test Temperature °F


LOCATION E
PLATE 40 C
Absorbed Energy ft-lbs
Test Temperature °F


LOCATION G
PLATE 40 C
Absorbed Energy ft-lbs
Test Temperature °F

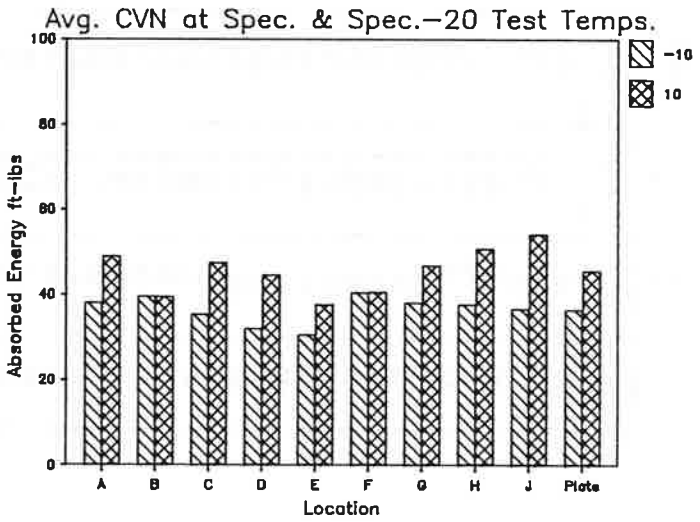

Avg. CVN at Spec. & Spec.−20 Test Temps.
-10
10
Absorbed Energy ft-lbs
A
B
C
D
E
F
G
H
J
Plate
Location

Plate: 43 Q
Date: November 21, 1989 Windage: 0
Spec. Temp: + 10 F Personnel: SG

Spec. No.	Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
2	10	50.2	46	55
3	10	56.0	47	55
6	10	57.9	51	60
1	-10	51.2	45	55
4	-10	41.6	39	50
5	-10	45.0	42	50

Average Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	54.7	48.0	57
-10	45.9	42.0	52

Spec. No.	Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
1	10	56.9	50	60
4	10	65.9	56	65
6	10	49.0	44	55
2	-10	41.1	35	45
3	-10	54.7	48	60
5	-10	40.4	39	50

Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	57.3	50.0	60
-10	45.4	40.7	52

Spec. No.	Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
7	10	63.0	54	65
18	10	56.3	50	60
25	10	52.1	48	55
2	-10	47.2	42	50
14	-10	48.1	44	55
27	-10	37.1	38	50
6	71	94.2	74	85
12	71	97.1	79	90
30	71	91.8	77	85
1	40	67.9	78	85
19	40	70.0	60	70
23	40	77.1	64	75
9	25	66.5	58	70
20	25	60.3	50	60
24	25	61.5	54	65
3	-30	46.1	42	50
13	-30	50.9	44	55
29	-30	36.7	34	45
4	-50	43.9	38	50
17	-50	30.0	29	40
22	-50	37.9	35	45
8	-70	33.2	31	40
11	-70	28.1	29	40
26	-70	26.0	24	35
5	-100	21.6	20	30
15	-100	15.1	14	25
28	-100	26.0	23	35
10	100	91.9	73	85
16	100	97.2	83	90
21	100	96.0	76	85

Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	57.1	50.7	60
-10	44.1	41.3	52
71	94.4	76.7	87
40	71.7	67.3	77
25	62.8	54.0	65
-30	44.6	40.0	50
-50	37.3	34.0	45
-70	29.1	28.0	38
-100	20.9	19.0	30
100	95.0	77.3	87

Plate: 43 Q

Spec. No.	Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
1	10	52.1	48	60
2	10	53.3	46	55
5	10	53.9	45	60
3	-10	50.2	45	55
4	-10	35.4	37	50
6	-10	41.2	38	50

Average

Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
10	53.1	46.3	58
-10	42.3	40.0	52

Spec. No.	Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
4	10	51.1	46	55
17	10	48.6	46	55
27	10	61.4	52	60
9	-10	37.1	38	50
12	-10	48.9	47	60
25	-10	36.5	41	50
2	71	94.0	78	85
18	71	77.9	71	80
24	71	80.2	70	85
7	40	59.2	54	65
14	40	59.1	55	65
29	40	73.0	59	70
5	25	60.1	52	60
16	25	55.9	53	60
28	25	60.0	54	65
8	-30	37.1	36	45
11	-30	36.9	32	40
23	-30	30.3	35	45
10	-50	45.0	40	50
13	-50	34.0	31	40
30	-50	17.5	21	30
1	-70	8.7	12	20
19	-70	28.0	26	35
21	-70	25.1	22	30
6	-100	8.5	8	15
15	-100	25.9	23	35
22	-100	10.0	10	20
3	100	83.3	68	80
20	100	94.2	74	85
26	100	84.8	78	90

Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
10	53.7	48.0	57
-10	40.8	42.0	53
71	84.0	73.0	83
40	63.8	56.0	67
25	58.7	53.0	62
-30	34.8	34.3	43
-50	32.2	30.7	40
-70	20.6	20.0	28
-100	14.8	13.7	23
100	87.4	73.3	85

Spec. No.	Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
2	10	54.1	47	60
4	10	54.8	47	60
5	10	53.4	48	60
1	-10	44.6	40	50
3	-10	47.5	41	50
6	-10	41.1	39	50

Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
10	54.1	47.3	60
-10	44.4	40.0	50

Plate: 43 Q

Spec. No.	Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
2	10	54.2	46	55
14	10	48.1	44	55
30	10	49.9	45	55
7	-10	35.9	40	50
18	-10	35.6	37	45
25	-10	34.9	34	45
8	71	84.9	73	85
15	71	87.6	74	85
28	71	79.4	68	80
1	40	72.1	61	70
17	40	67.2	65	75
23	40	69.8	59	70
5	25	53.0	44	55
20	25	58.9	53	65
24	25	52.9	49	60
4	-30	28.9	30	40
12	-30	28.5	29	40
27	-30	30.0	29	40
9	-50	30.0	30	40
19	-50	27.9	26	65
21	-50	24.4	24	65
3	-70	24.0	20	60
16	-70	12.5	15	25
22	-70	27.9	27	65
6	-100	16.5	15	25
13	-100	7.7	8	15
29	-100	7.8	7	15
10	100	88.2	72	80
11	100	90.3	75	85
26	100	85.8	73	85

Average G

Location Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	50.7	45.0	55
-10	35.5	37.0	47
71	84.0	71.7	83
40	69.7	61.7	72
25	54.9	48.7	60
-30	29.1	29.3	40
-50	27.4	26.7	57
-70	21.5	20.7	50
-100	10.7	10.0	18
100	88.1	73.3	83

Spec. No.	Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
3	10	51.7	46	55
4	10	65.1	55	70
5	10	48.1	44	55
1	-10	42.9	39	50
2	-10	48.3	46	55
6	-10	49.3	42	50

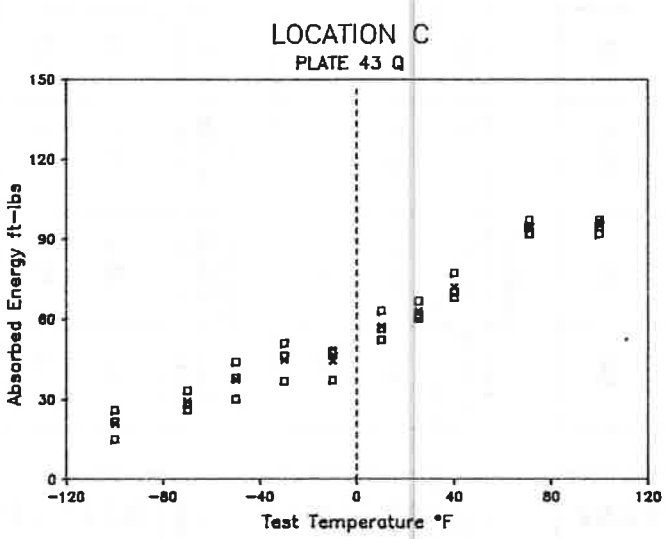
H

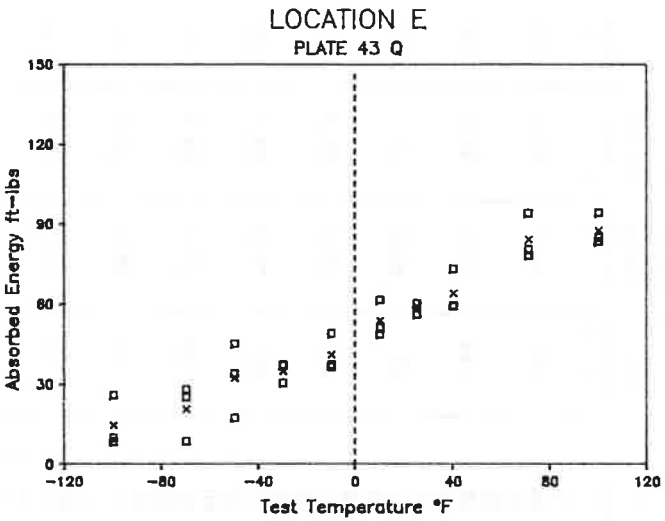
Location Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	55.0	48.3	60
-10	46.8	42.3	52

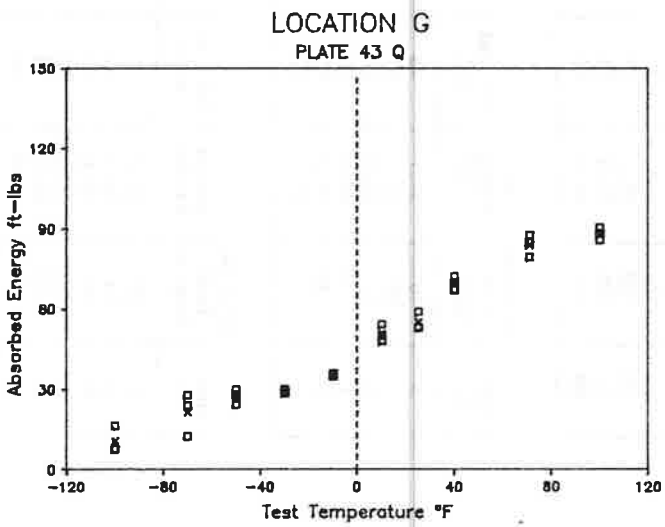
Spec. No.	Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
1	10	61.2	51	60
2	10	58.1	49	60
5	10	77.6	61	70
3	-10	54.4	48	60
4	-10	60.8	55	65
6	-10	50.9	46	55

J

Location Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	65.6	53.7	63
-10	55.4	49.7	60


LOCATION C
PLATE 43 Q
Absorbed Energy ft-lbs
Test Temperature °F


LOCATION E
PLATE 43 Q
Absorbed Energy ft-lbs
Test Temperature °F


LOCATION G
PLATE 43 Q
Absorbed Energy ft-lbs
Test Temperature °F

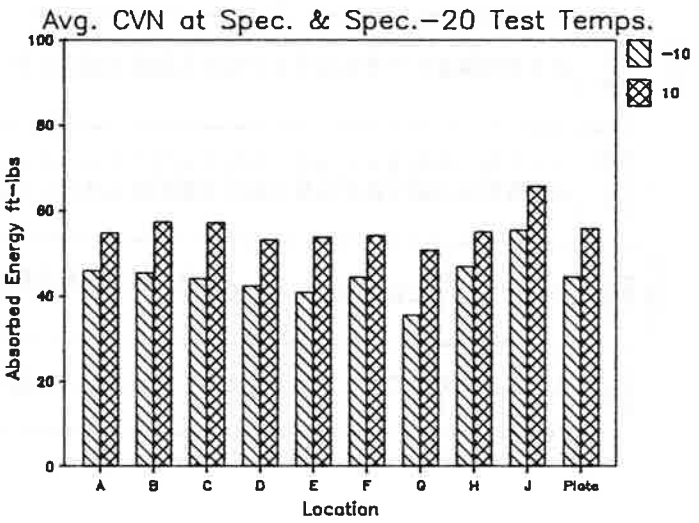

Avg. CVN at Spec. & Spec.-20 Test Temps.
-10
10
Absorbed Energy ft-lbs
A
B
C
D
E
F
G
H
J
Plate
Location

Plate: 43 C
Date: November 21, 1989 Windage: 0
Spec. Temp: + 10 F Personnel: SG

Spec. No.	Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	10	50.0	50	60
11	10	59.9	56	65
12	10	51.0	50	60
7	-10	51.9	48	60
8	-10	50.1	45	55
9	-10	35.2	36	45

Average

Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	53.6	52.0	62
-10	45.7	43.0	53

Spec. No.	Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
9	10	70.2	64	75
11	10	55.8	50	60
12	10	49.8	48	55
7	-10	47.1	43	55
8	-10	37.2	35	45
10	-10	53.0	47	55

Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	58.6	54.0	63
-10	45.8	41.7	52

Spec. No.	Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
32	10	68.0	57	70
46	10	64.2	55	65
54	10	64.1	56	65
37	-10	64.0	58	70
40	-10	55.5	49	60
53	-10	54.6	48	60
36	71	110.0	84	95
42	71	89.9	71	80
57	71	111.3	87	95
31	40	82.3	62	75
45	40	72.6	62	75
56	40	88.1	70	80
35	25	63.9	58	70
47	25	58.4	53	65
50	25	74.9	61	70
38	-30	34.1	33	45
41	-30	49.0	45	55
49	-30	53.8	50	60
39	-50	44.5	41	50
44	-50	35.0	32	40
51	-50	42.2	37	50
33	-70	35.5	31	40
48	-70	32.2	29	40
52	-70	39.2	35	45
34	100	113.1	80	90
43	100	112.5	86	95
55	100	101.6	79	90

Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	65.4	56.0	67
-10	58.0	51.7	63
71	103.7	80.7	90
40	81.0	64.7	77
25	65.7	57.3	68
-30	45.6	42.7	53
-50	40.6	36.7	47
-70	35.6	31.7	42
100	109.1	81.7	92

Plate: 43 C

Spec. No.	Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
7	10	43.9	43	50
8	10	45.9	45	55
12	10	54.0	49	60
9	-10	35.9	36	45
10	-10	37.9	37	45
11	-10	47.0	44	55

Average

Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
10	47.9	45.7	55
-10	40.3	39.0	48

Spec. No.	Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
32	10	40.6	41	50
47	10	57.8	52	60
51	10	50.0	46	55
36	-10	41.9	50	50
44	-10	37.1	36	45
49	-10	9.6	41	50
39	71	87.9	71	80
42	71	92.0	73	85
55	71	90.0	76	85
31	40	71.3	61	70
43	40	68.4	59	70
56	40	60.6	54	65
35	25	50.6	49	90
46	25	53.1	49	90
53	25	57.6	51	90
37	-30	36.0	35	45
40	-30	30.0	29	40
50	-30	27.1	29	40
34	-50	33.9	31	40
45	-50	23.0	24	35
57	-50	38.8	37	45
33	-70	27.0	25	35
48	-70	23.9	23	35
52	-70	17.6	18	30
38	100	89.1	76	85
41	100	100.8	71	80
54	100	86.0	74	85

Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
10	49.5	46.3	55
-10	29.5	42.3	48
71	90.0	73.3	83
40	66.8	58.0	68
25	53.8	49.7	90
-30	31.0	31.0	42
-50	31.9	30.7	40
-70	22.8	22.0	33
100	92.0	73.7	83

Spec. No.	Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
7	10	70.0	60	70
10	10	57.6	48	60
11	10	52.4	49	60
8	-10	47.2	44	55
9	-10	56.1	49	60
12	-10	60.1	54	65

Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
10	60.0	52.3	63
-10	54.5	49.0	60

Plate: 43 C

Spec. No.	Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
32	10	61.0	56	65
46	10	62.7	55	65
53	10	53.9	48	60
35	-10	55.0	50	60
41	-10	46.9	43	55
56	-10	53.1	45	55
36	71	98.3	76	80
48	71	107.2	79	85
52	71	100.0	81	90
34	40	76.9	64	75
47	40	70.0	60	70
54	40	77.9	60	70
38	25	59.0	52	60
43	25	56.3	51	60
50	25	58.2	52	60
37	-30	39.0	36	45
40	-30	30.0	31	40
51	-30	31.9	31	40
31	-50	24.5	23	35
45	-50	28.9	28	40
57	-50	13.4	17	20
39	-70	21.0	20	30
42	-70	23.9	21	30
55	-70	48.1	40	50
33	100	102.4	79	90
44	100	102.1	79	90
49	100	96.1	80	90

Average

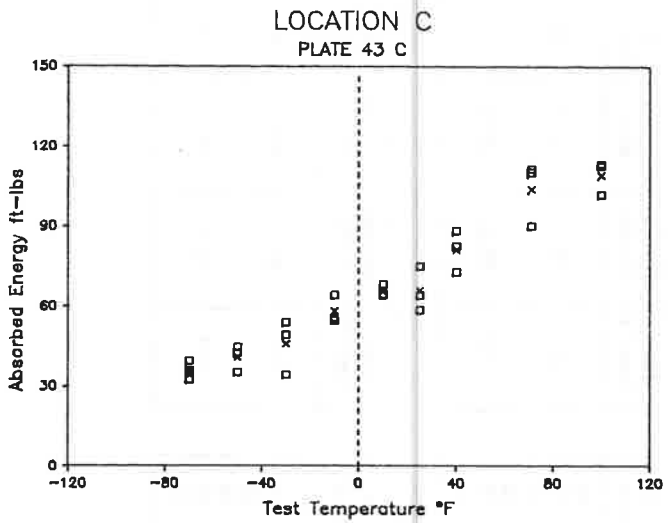
Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
10	59.2	53.0	63
-10	51.7	46.0	57
71	101.8	78.7	85
40	74.9	61.3	72
25	57.8	51.7	60
-30	33.6	32.7	42
-50	22.3	22.7	32
-70	31.0	27.0	37
100	100.2	79.3	90

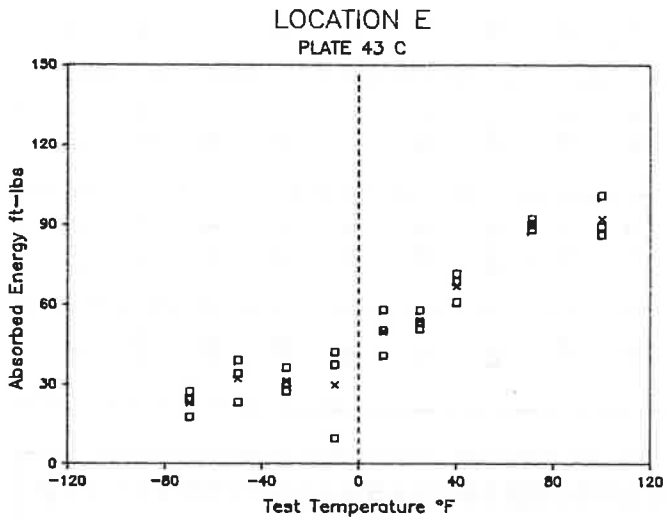
Spec. No.	Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
8	10	57.2	50	60
9	10	66.3	59	70
11	10	51.3	47	60
7	-10	55.1	48	60
10	-10	50.0	45	55
12	-10	55.0	49	60

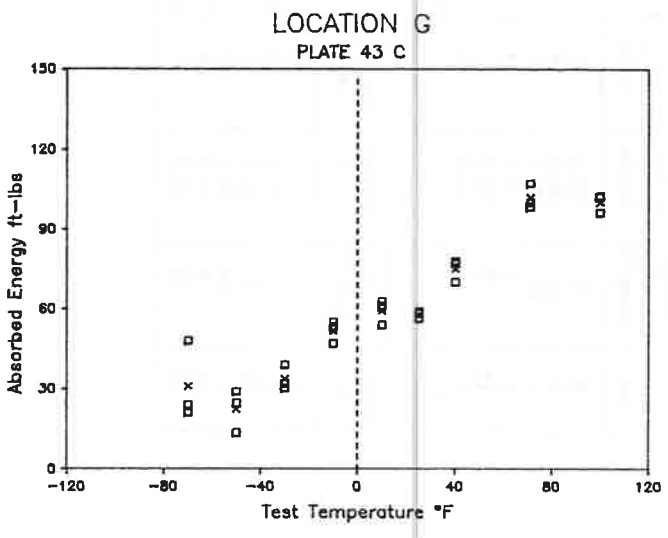
Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
10	58.3	52.0	63
-10	53.4	47.3	58

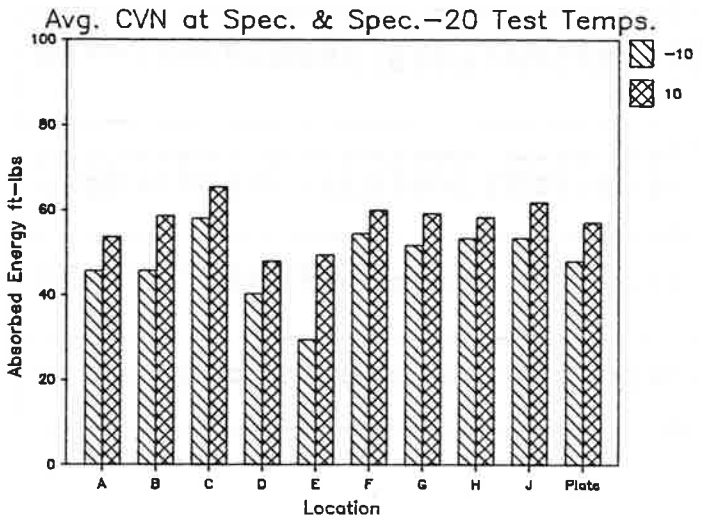
Spec. No.	Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
8	10	71.0	60	70
9	10	53.8	48	60
10	10	60.7	53	65
7	-10	58.0	51	60
11	-10	41.8	40	50
12	-10	60.5	43	55

Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
10	61.8	53.7	65
-10	53.4	44.7	55


LOCATION C
PLATE 43 C
Absorbed Energy ft-lbs
Test Temperature °F

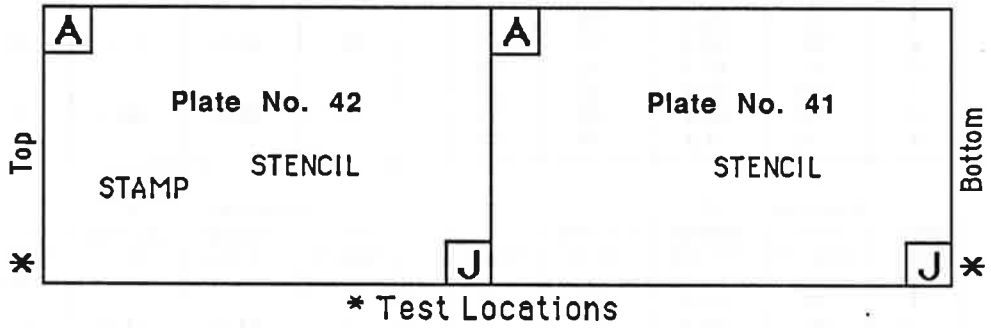

LOCATION E
PLATE 43 C
Absorbed Energy ft-lbs
Test Temperature °F


LOCATION G
PLATE 43 C
Absorbed Energy ft-lbs
Test Temperature °F


Avg. CVN at Spec. & Spec.-20 Test Temps.
-10
10
Absorbed Energy ft-lbs
A
B
C
D
E
F
G
H
J
Plate
Location

MILL DATA SHEET
Plate No: 41 & 42
Manf: 4

Heat Number: 1R2535
Yield Point (psi): 54500
Tensile Strength (psi): 80000
Elongation (%): 30.0 {Gage Length (in): 2}
Steel Type: A572-85 Gr. 50
Thickness (in): 4
Length (in): 120 Width (in): 60
Notes: Fine Grain Practice
Normalized
Spec. Code: 03W 02



CHARPY IMPACT MILL TESTS (foot-lbs)

	Test Temp. (°F)	Test #1	Test #2	Test #3	CVN Test Avg.
Top	+10	68	59	70	66
Bottom	+10	68	80	61	70

Chemical Analysis

C	Mn	P	S	Si	Cu	Ni	Cr	V	Al	Cb
.20	1.23	.014	.008	.230	NA	NA	NA	.090	NA	NA

Plate: 41 Q
Date: November 7, 1987 Windage: 0
Spec. Temp: + 10 F Personnel: SG

Spec. No.	Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
2	10	65.8	56	65
3	10	70.7	60	70
6	10	45.3	43	50
1	-10	48.7	41	50
4	-10	52.0	45	55
5	-10	34.9	32	40

Average Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	60.6	53.0	62
-10	45.2	39.3	48

Spec. No.	Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
3	10	73.1	58	70
4	10	60.0	53	60
6	10	47.2	42	55
1	-10	37.2	35	45
2	-10	44.7	42	55
5	-10	47.4	38	50

Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	60.1	51.0	62
-10	43.1	38.3	50

Spec. No.	Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
1	10	45.3	55	60
18	10	57.9	51	60
23	10	51.8	47	55
9	-10	56.3	51	60
12	-10	53.5	46	55
30	-10	47.9	43	50
4	75	104.0	81	90
17	75	101.2	76	85
29	75	111.3	80	90
6	40	80.0	66	75
14	40	75.0	68	80
21	40	82.6	76	85
3	25	62.2	51	65
16	25	58.3	52	65
28	25	70.0	57	65
2	-30	35.9	35	45
19	-30	27.0	30	40
24	-30	31.5	30	40
7	-50	24.1	25	35
13	-50	34.9	32	40
27	-50	18.6	20	25
8	-70	15.7	14	20
15	-70	30.4	26	35
25	-70	15.3	13	20
10	-100	12.3	15	25
11	-100	7.6	7	15
26	-100	18.8	19	30
5	100	107.3	79	90
20	100	110.0	80	90
22	100	109.9	80	90

Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	51.7	51.0	58
-10	52.6	46.7	55
75.2	105.5	79.0	88
40	79.2	70.0	80
25	63.5	53.3	65
-30	31.5	31.7	42
-50	25.9	25.7	33
-70	20.5	17.7	25
-100	12.9	13.7	23
100	109.1	79.7	90

Plate: 41 Q

Spec. No.	Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
1	10	65.8	54	65
2	10	71.5	56	65
4	10	57.6	42	50
3	-10	37.6	33	40
5	-10	57.0	40	50
6	-10	47.5	30	40

Average

Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
10	65.0	50.7	60
-10	47.4	34.3	43

Spec. No.	Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
1	10	48.5	45	55
19	10	68.9	58	65
22	10	47.4	40	50
8	-10	46.7	42	50
12	-10	46.8	42	50
26	-10	43.7	36	46
2	75	106.9	76	85
20	75	107.3	60	75
24	75	97.2	74	80
6	40	88.9	76	85
13	40	78.5	68	75
28	40	77.8	66	75
7	25	84.0	69	75
14	25	61.5	52	65
30	25	61.2	52	60
4	-30	35.4	33	45
16	-30	41.4	39	50
29	-30	32.3	33	45
5	-50	31.2	29	40
17	-50	29.6	30	40
23	-50	30.9	29	40
9	-70	18.7	18	25
15	-70	26.3	25	30
21	-70	28.1	23	35
10	-100	9.2	9	20
18	-100	14.1	11	20
27	-100	6.9	5	15
3	100	109.8	81	90
11	100	102.5	80	90
25	100	112.3	81	90

Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
10	54.9	47.7	57
-10	45.7	40.0	49
75.2	103.8	70.0	80
40	81.7	70.0	78
25	68.9	57.7	67
-30	36.4	35.0	47
-50	30.6	29.3	40
-70	24.4	22.0	30
-100	10.1	8.3	18
100	108.2	80.7	90

Spec. No.	Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
3	10	74.9	61	70
5	10	63.0	55	65
6	10	72.1	60	70
1	-10	61.1	52	60
2	-10	57.2	49	60
4	-10	55.8	50	60

Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
10	70.0	58.7	68
-10	58.0	50.3	60

Plate: 41 Q

Spec. No.	Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
2	10	71.9	57	65
20	10	54.5	43	55
24	10	56.8	45	55
4	-10	53.5	42	50
17	-10	47.9	36	45
29	-10	48.6	38	50
3	75	98.2	70	80
14	75	110.1	76	85
27	75	96.2	71	75
8	40	78.9	64	75
13	40	93.2	69	80
30	40	83.9	59	70
1	25	76.0	59	65
15	25	78.9	56	65
28	25	72.3	52	60
6	-30	38.9	31	40
19	-30	41.6	32	40
22	-30	47.0	37	50
7	-50	40.2	34	45
18	-50	36.5	29	35
21	-50	31.8	26	35
10	-70	21.2	15	25
12	-70	7.7	5	10
26	-70	23.9	20	25
9	-100	15.4	12	20
11	-100	8.5	7	15
25	-100	9.9	7	15
5	100	107.1	74	85
16	100	105.2	74	85
23	100	110.1	82	90

Average

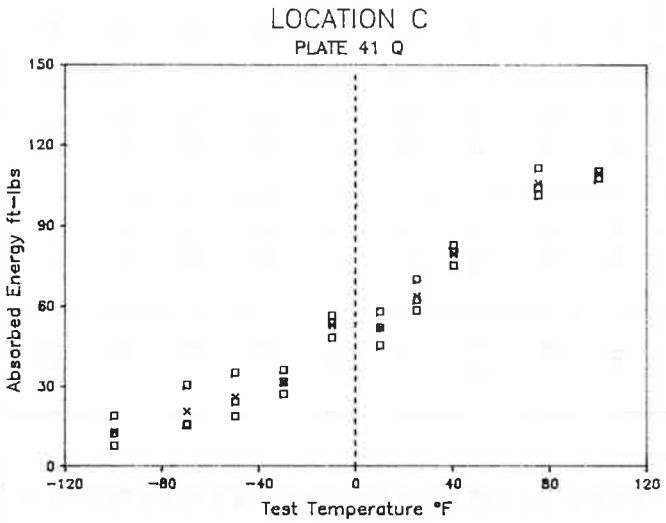
Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
10	61.1	48.3	58
-10	50.0	38.7	48
75.2	101.5	72.3	80
40	85.3	64.0	75
25	75.7	55.7	63
-30	42.5	33.3	43
-50	36.2	29.7	38
-70	17.6	13.3	20
-100	11.3	8.7	17
100	107.5	76.7	87

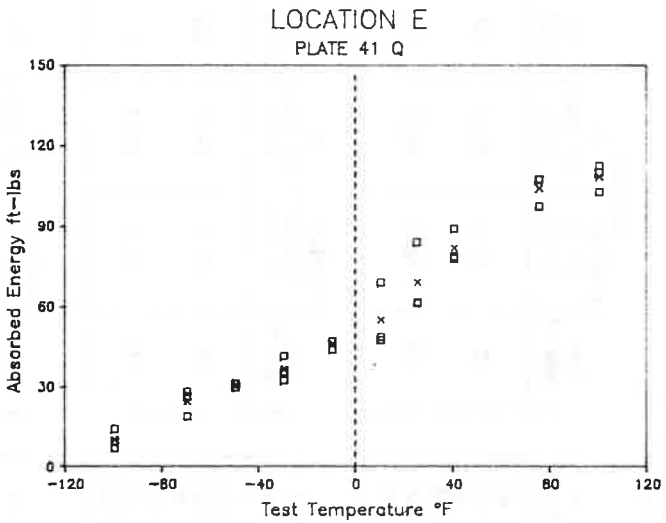
Spec. No.	Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
1	10	70.1	60	65
3	10	56.5	50	60
5	10	67.9	61	70
2	-10	46.5	43	50
4	-10	50.2	41	50
6	-10	50.0	46	55

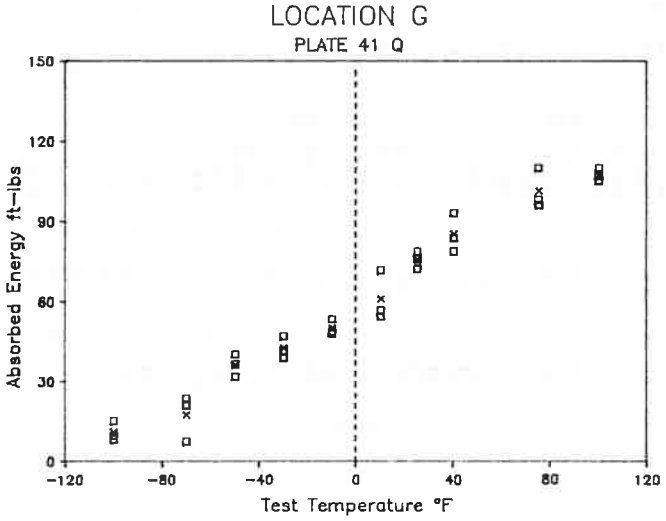
Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
10	64.8	57.0	65
-10	48.9	43.3	52

Spec. No.	Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
1	10	60.2	53	60
2	10	61.2	54	65
5	10	65.0	55	65
3	-10	45.1	45	55
4	-10	60.6	54	65
6	-10	60.0	51	60

Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
10	62.1	54.0	63
-10	55.2	50.0	60


LOCATION C
PLATE 41 Q
Absorbed Energy ft-lbs
Test Temperature °F
150
120
90
60
30
0
-120
-80
-40
0
40
80
120


LOCATION E
PLATE 41 Q
Absorbed Energy ft-lbs
Test Temperature °F
150
120
90
60
30
0
-120
-80
-40
0
40
80
120


LOCATION G
PLATE 41 Q
Absorbed Energy ft-lbs
Test Temperature °F
150
120
90
60
30
0
-120
-80
-40
0
40
80
120

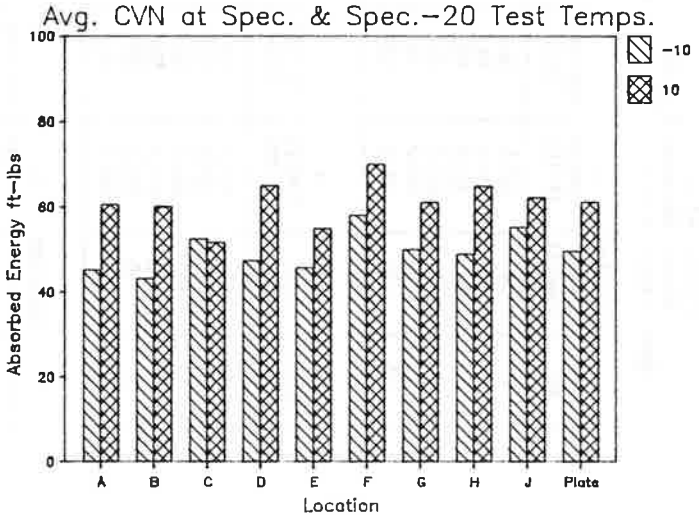

Avg. CVN at Spec. & Spec.-20 Test Temps.
-10
10
Absorbed Energy ft-lbs
Location
100
80
60
40
20
0
A
B
C
D
E
F
G
H
J
Plate

Plate: 41 C
Date: November 7, 1989 Windage: 0
Spec. Temp: + 10 F Personnel: SG

Spec. No.	Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
7	10	67.1	54	65
9	10	59.9	54	65
12	10	69.8	59	70
8	-10	47.7	45	55
10	-10	60.9	52	65
11	-10	48.0	43	55

Average Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	65.6	55.7	67
-10	52.2	46.7	58

Spec. No.	Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
7	10	61.1	53	65
11	10	57.5	51	60
12	10	66.0	58	70
8	-10	61.1	52	65
9	-10	58.3	49	60
10	-10	48.9	44	55

Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	61.5	54.0	65
-10	56.1	48.3	60

Spec. No.	Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
32	10	58.1	52	60
46	10	66.3	57	65
51	10	58.1	51	60
31	-10	47.8	45	55
45	-10	47.0	36	46
56	-10	49.0	44	55
37	75	101.9	79	85
42	75	116.8	84	95
57	75	110.0	81	90
35	40	89.3	74	80
47	40	79.9	67	80
49	40	75.9	61	70
34	25	73.4	60	70
43	25	68.1	59	65
55	25	72.6	57	65
36	-30	32.3	33	40
40	-30	28.7	30	35
54	-30	44.9	40	50
39	-50	40.0	36	45
44	-50	19.9	20	25
50	-50	29.0	30	40
33	-70	18.6	20	25
48	-70	20.2	20	25
53	-70	18.5	17	25
38	-100	7.5	6	15
41	-100	8.0	7	15
52	-100	7.6	8	15

Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	60.8	53.3	62
-10	47.9	41.7	52
75.2	109.6	81.3	90
40	81.7	67.3	77
25	71.4	58.7	67
-30	35.3	34.3	42
-50	29.6	28.7	37
-70	19.1	19.0	25
-100	7.7	7.0	15

Plate: 41 C

Spec. No.	Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
8	10	73.5	55	65
10	10	82.2	65	75
11	10	58.8	47	55
7	-10	77.8	55	65
9	-10	60.0	44	55
12	-10	53.0	43	55

Average

Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
10	71.5	55.7	65
-10	63.6	47.3	58

Spec. No.	Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
32	10	49.0	42	50
46	10	59.0	51	60
56	10	69.2	57	65
36	-10	55.5	49	60
42	-10	56.9	50	60
44	-10	49.9	53	50
39	75	101.9	67	75
41	75	115.2	81	85
57	75	107.7	74	85
37	40	87.7	65	75
40	40	80.0	66	70
45	40	94.2	72	80
33	25	79.0	65	75
47	25	69.3	60	65
58	25	70.4	58	65
31	-30	40.6	33	45
48	-30	38.4	36	45
59	-30	44.0	40	50
34	-50	36.2	34	40
55	-50	50.5	45	55
60	-50	32.2	31	40
35	-70	21.0	20	25
38	-70	13.8	14	20
43	-70	25.5	23	30

Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
10	59.1	50.0	58
-10	54.1	50.7	57
75.2	108.3	74.0	82
40	87.3	67.7	75
25	72.9	61.0	68
-30	41.0	36.3	47
-50	39.6	36.7	45
-70	20.1	19.0	25

Spec. No.	Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
8	10	54.9	46	55
9	10	75.9	62	70
11	10	76.3	63	75
7	-10	59.3	52	60
10	-10	52.4	44	55
12	-10	52.9	47	60

Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
10	69.0	57.0	67
-10	54.9	47.7	58

Plate: 41 C

Spec. No.	Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
32	10	61.4	51	60
45	10	71.0	53	65
53	10	60.0	38	50
35	-10	58.1	49	60
40	-10	52.4	43	55
56	-10	53.3	40	50
33	75	111.1	79	90
43	75	92.8	60	70
57	75	102.1	68	80
31	40	82.3	58	65
46	40	85.1	58	65
51	40	84.2	67	70
37	25	75.2	63	70
44	25	79.9	50	60
55	25	68.1	47	60
36	-30	49.1	43	50
47	-30	43.8	31	40
49	-30	53.8	41	55
34	-50	26.4	25	35
48	-50	35.1	27	35
50	-50	37.2	32	40
39	-70	23.9	20	25
41	-70	25.1	19	30
52	-70	28.1	22	30
38	-100	21.9	20	30
42	-100	9.6	7	15
54	-100	5.6	3	10

Average

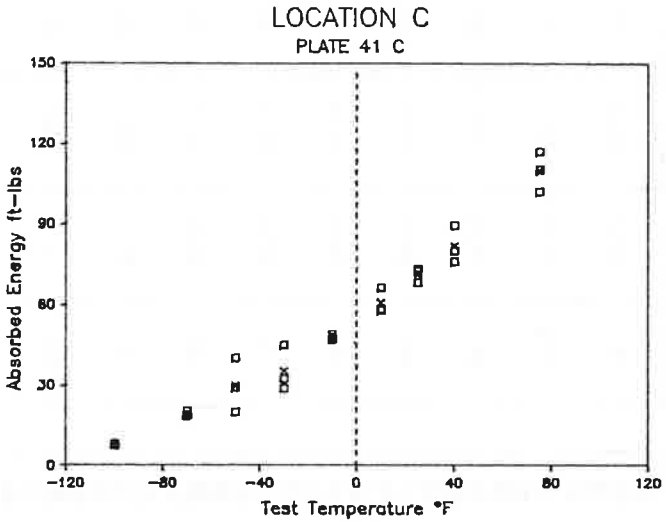
Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
10	64.1	47.3	58
-10	54.6	44.0	55
75.2	102.0	69.0	80
40	83.9	61.0	67
25	74.4	53.3	63
-30	48.9	38.3	48
-50	32.9	28.0	37
-70	25.7	20.3	28
-100	12.4	10.0	18

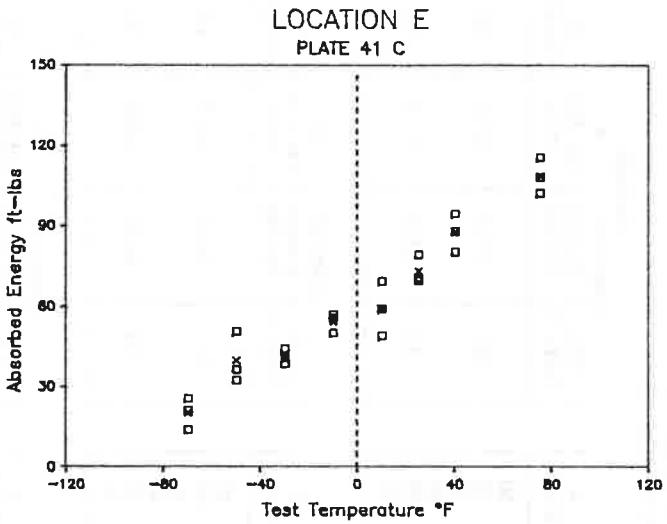
Spec. No.	Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
7	10	61.4	53	65
11	10	91.2	68	75
12	10	68.7	58	70
8	-10	53.9	48	60
9	-10	57.0	46	55
10	-10	47.4	44	55

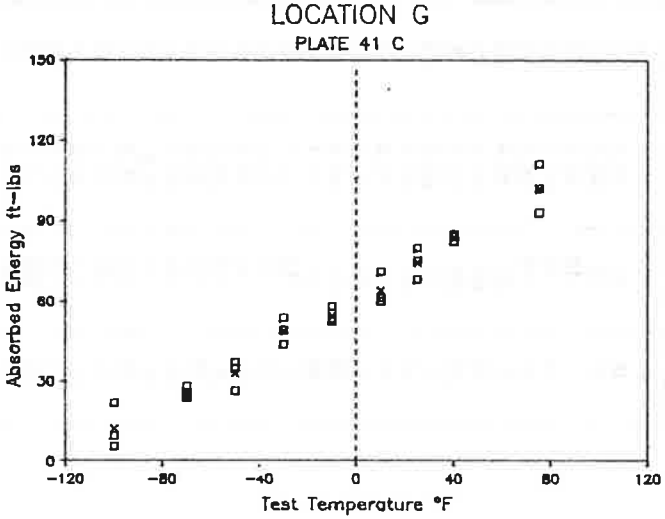
Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
10	73.8	59.7	70
-10	52.8	46.0	57

Spec. No.	Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
7	10	63.5	53	65
8	10	75.8	63	70
11	10	53.4	49	60
9	-10	56.6	49	60
10	-10	48.7	44	55
12	-10	52.0	47	60

Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
10	64.2	55.0	65
-10	52.4	46.7	58


LOCATION C
PLATE 41 C
Absorbed Energy ft-lbs
Test Temperature °F


LOCATION E
PLATE 41 C
Absorbed Energy ft-lbs
Test Temperature °F


LOCATION G
PLATE 41 C
Absorbed Energy ft-lbs
Test Temperature °F

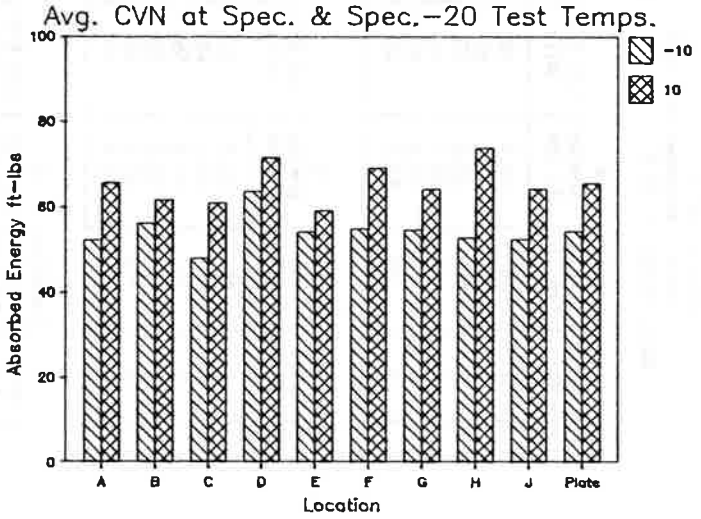

Avg. CVN at Spec. & Spec.-20 Test Temps.
-10
10
Absorbed Energy ft-lbs
A
B
C
D
E
F
G
H
J
Plate
Location

Plate: 42 Q
Date: November 16, 1989 Windage: 0
Spec. Temp: + 10 F Personnel: SG

Spec. No.	Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
1	10	56.9	48	60
3	10	76.0	62	70
5	10	49.0	47	55
2	-10	52.7	46	55
4	-10	41.4	41	50
6	-10	52.7	48	55

Average Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	60.6	52.3	62
-10	48.9	45.0	53

Spec. No.	Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
1	10	55.9	54	65
4	10	51.4	48	60
5	10	61.5	55	65
2	-10	36.5	38	45
3	-10	47.9	43	55
6	-10	50.0	45	55

Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	56.3	52.3	63
-10	44.8	42.0	52

Spec. No.	Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
9	10	48.1	43	55
14	10	50.9	43	55
27	10	48.7	46	55
1	-10	36.3	37	45
17	-10	47.2	43	55
23	-10	53.0	55	65
7	69	95.9	80	90
15	69	90.6	76	85
25	69	96.6	75	85
6	40	63.9	56	65
19	40	65.8	57	65
21	40	70.8	61	70
3	25	54.4	49	60
13	25	60.0	54	65
30	25	56.1	50	60
4	-30	40.1	37	50
20	-30	34.2	34	45
29	-30	39.5	38	50
2	-50	26.1	24	35
18	-50	32.2	28	30
24	-50	24.2	22	30
8	-70	9.6	12	20
12	-70	33.9	30	40
26	-70	18.2	15	25
5	-100	16.9	14	25
11	-100	11.9	12	20
28	-100	13.3	13	20
10	100	100.0	78	90
16	100	94.9	81	90
22	100	110.2	79	90

Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	49.2	44.0	55
-10	45.5	45.0	55
69	94.4	77.0	87
40	66.8	58.0	67
25	56.8	51.0	62
-30	37.9	36.3	48
-50	27.5	24.7	32
-70	20.6	19.0	28
-100	14.0	13.0	22
100	101.7	79.3	90

Plate: 42 Q

Spec. No.	Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
3	10	66.0	56	65
4	10	58.4	51	60
6	10	61.6	48	60
1	-10	50.1	47	55
2	-10	61.5	52	60
5	-10	52.3	45	55

Average

Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
10	62.0	51.7	62
-10	54.6	48.0	57

Spec. No.	Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
7	10	53.8	50	60
13	10	64.3	58	70
30	10	59.9	53	65
10	-10	47.9	50	60
17	-10	43.9	47	55
22	-10	41.7	45	55
1	69	102.8	87	95
14	69	93.2	76	85
28	69	112.3	85	95
3	40	77.9	63	75
19	40	79.9	64	75
24	40	94.5	70	80
8	25	76.1	65	75
11	25	73.9	63	75
27	25	84.3	66	75
5	-30	35.8	37	50
20	-30	46.0	40	50
29	-30	30.8	32	40
2	-50	24.1	27	35
18	-50	14.6	18	30
25	-50	32.0	30	40
9	-70	18.7	25	35
12	-70	21.6	24	35
23	-70	20.0	24	35
6	-100	8.6	14	25
15	-100	7.0	7	15
21	-100	15.1	17	25
4	100	113.0	86	95
16	100	104.0	80	90
26	100	113.7	88	100

Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
10	59.3	53.7	65
-10	44.5	47.3	57
69	102.8	82.7	92
40	84.1	65.7	77
25	78.1	64.7	75
-30	37.5	36.3	47
-50	23.6	25.0	35
-70	20.1	24.3	35
-100	10.2	12.7	22
100	110.2	84.7	95

Spec. No.	Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
1	10	63.1	55	65
2	10	58.6	50	60
6	10	60.1	53	65
3	-10	48.4	45	55
4	-10	48.3	45	55
5	-10	35.2	38	50

Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
10	60.6	52.7	63
-10	44.0	42.7	53

Plate: 42 Q

Spec. No.	Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
7	10	61.9	54	65
12	10	51.2	45	55
30	10	58.2	51	60
6	-10	47.1	52	60
13	-10	54.4	54	65
23	-10	39.2	42	50
4	69	104.0	79	90
18	69	113.4	80	90
29	69	107.8	83	95
8	40	68.8	61	70
17	40	87.9	72	80
21	40	93.1	75	85
10	25	67.1	59	70
19	25	77.2	62	75
25	25	73.7	61	70
2	-30	41.1	40	50
20	-30	40.1	38	50
24	-30	45.0	40	50
3	-50	28.4	28	35
15	-50	35.3	31	40
28	-50	30.9	28	40
9	-70	22.0	25	35
11	-70	18.9	22	30
27	-70	19.5	24	35
1	-100	19.0	17	25
16	-100	13.8	14	25
22	-100	19.8	12	20
5	100	101.1	80	90
14	100	117.1	81	90
26	100	108.0	77	90

Average

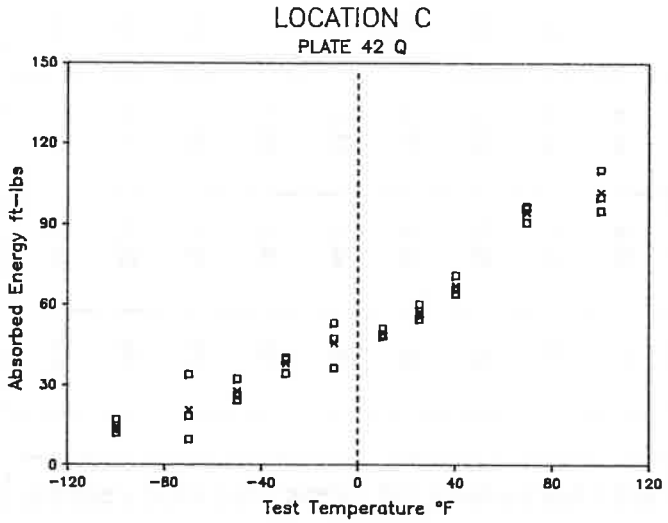
Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
10	57.1	50.0	60
-10	46.9	49.3	58
69	108.4	80.7	92
40	83.3	69.3	78
25	72.7	60.7	72
-30	42.1	39.3	50
-50	31.5	29.0	38
-70	20.1	23.7	33
-100	17.5	14.3	23
100	108.7	79.3	90

Spec. No.	Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
2	10	61.9	55	65
4	10	62.2	54	65
5	10	51.0	48	60
1	-10	53.1	47	60
3	-10	56.2	54	65
6	-10	48.7	46	55

Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
10	58.4	52.3	63
-10	52.7	49.0	60

Spec. No.	Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
2	10	50.8	45	55
3	10	65.2	55	65
4	10	57.3	52	60
1	-10	42.0	44	55
5	-10	40.1	39	50
6	-10	44.1	41	50

Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
10	57.8	50.7	60
-10	42.1	41.3	52


LOCATION C
PLATE 42 Q
Absorbed Energy ft-lbs
Test Temperature °F

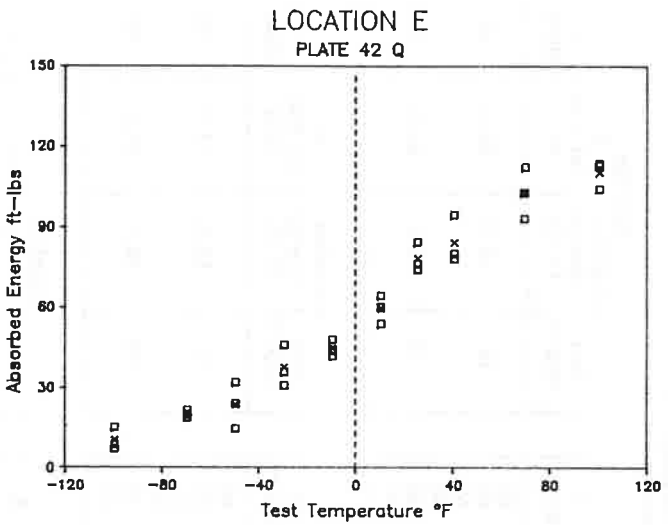

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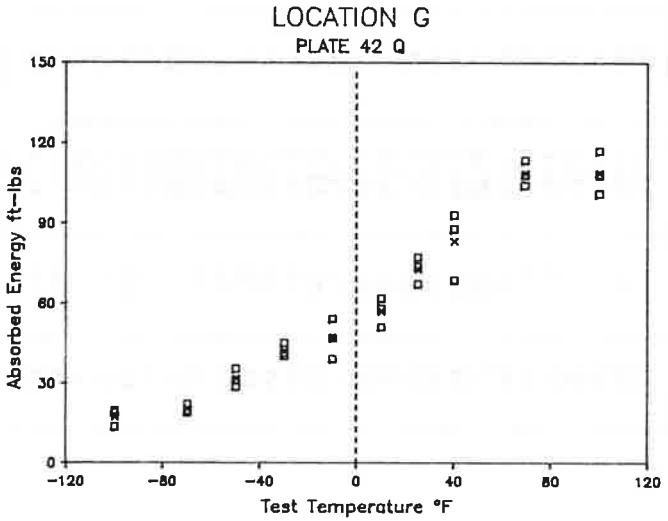
PLATE 42 Q
Absorbed Energy ft-lbs
Test Temperature °F


LOCATION G
PLATE 42 Q
Absorbed Energy ft-lbs
Test Temperature °F

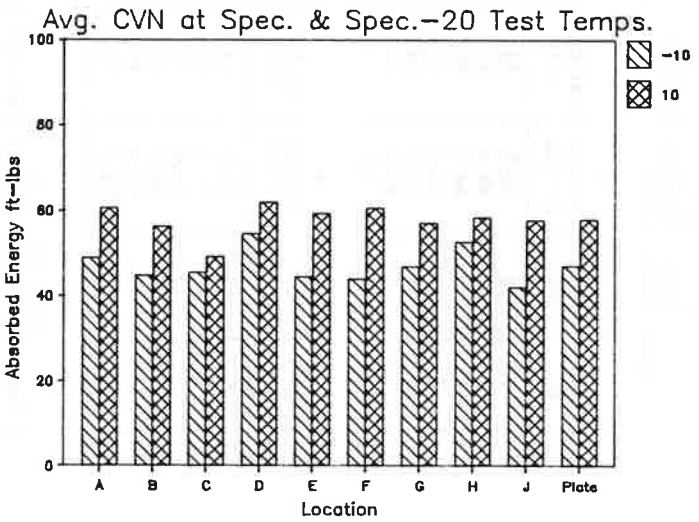

Avg. CVN at Spec. & Spec.-20 Test Temps.
-10
10
Absorbed Energy ft-lbs
A
B
C
D
E
F
G
H
J
Plate
Location

Plate: 42 C
Date: November 16, 1989 Windage: 0
Spec. Temp: + 10 F Personnel: SG

Spec. No.	Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
9	10	58.5	55	65
11	10	68.9	57	65
12	10	62.6	56	65
7	-10	40.0	40	50
8	-10	50.0	49	60
10	-10	39.8	44	55

Average Location A Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	63.3	56.0	65
-10	43.3	44.3	55

Spec. No.	Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
8	10	56.9	51	60
11	10	53.4	50	60
12	10	66.0	58	70
7	-10	46.1	43	55
9	-10	48.2	44	55
10	-10	56.1	50	60

Location B Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	58.8	53.0	63
-10	50.1	45.7	57

Spec. No.	Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
33	10	48.7	44	55
42	10	55.1	48	60
47	10	53.4	46	55
32	-10	45.9	42	50
37	-10	46.2	41	50
45	-10	39.0	38	50
38	69	80.0	72	85
51	69	89.6	72	80
54	69	82.2	63	75
31	40	61.9	54	65
40	40	73.5	63	75
57	40	69.9	60	70
35	25	65.9	57	65
44	25	72.4	62	70
55	25	61.7	40	55
36	-30	34.3	33	45
41	-30	39.2	32	40
53	-30	27.0	26	35
46	-50	38.2	35	45
52	-50	23.0	22	30
56	-50	30.0	26	35
39	-70	10.0	16	25
43	-70	31.9	29	40
58	-70	27.2	24	35
34	-100	19.2	16	25
48	-100	13.6	14	25
59	-100	11.9	11	20

Location C Test Temp-°F	Energy ft-lbs	Lat Exp mils	% Shear
10	52.4	46.0	57
-10	43.7	40.3	50
69	83.9	69.0	80
40	68.4	59.0	70
25	66.7	53.0	63
-30	33.5	30.3	40
-50	30.4	27.7	37
-70	23.0	23.0	33
-100	14.9	13.7	23

Plate: 42 C

Spec. No.	Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
8	10	76.3	59	70
9	10	63.2	51	60
12	10	60.8	50	65
7	-10	45.7	36	50
10	-10	54.8	48	60
11	-10	51.9	41	50

Average

Location Test Temp-°F	D Energy ft-lbs	Lat Exp mils	% Shear
10	66.8	53.3	65
-10	50.8	41.7	53

Spec. No.	Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
32	10	62.1	55	65
44	10	66.5	56	65
51	10	57.0	52	60
31	-10	50.9	47	60
43	-10	44.9	41	50
56	-10	55.8	48	60
37	69	96.3	76	85
48	69	99.3	77	85
52	69	111.8	82	90
33	40	74.0	63	75
46	40	87.9	69	80
50	40	80.4	60	70
36	25	66.9	59	70
41	25	62.8	56	65
55	25	62.3	54	65
35	-30	28.8	31	40
47	-30	40.0	38	50
49	-30	23.0	26	35
39	-50	24.2	25	35
42	-50	14.9	17	25
54	-50	28.3	29	35
34	-70	7.5	9	20
45	-70	10.5	12	20
57	-70	23.1	20	30
38	-100	8.5	12	20
40	-100	9.3	10	20
53	-100	8.6	8	15

Location Test Temp-°F	E Energy ft-lbs	Lat Exp mils	% Shear
10	61.9	54.3	63
-10	50.5	45.3	57
69	102.5	78.3	87
40	80.8	64.0	75
25	64.0	56.3	67
-30	30.6	31.7	42
-50	22.5	23.7	32
-70	13.7	13.7	23
-100	8.8	10.0	18

Spec. No.	Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
8	10	56.4	51	60
9	10	66.9	58	70
11	10	35.1	39	50
7	-10	42.6	43	55
10	-10	63.9	56	65
12	-10	57.0	49	60

Location Test Temp-°F	F Energy ft-lbs	Lat Exp mils	% Shear
10	52.8	49.3	60
-10	54.5	49.3	60

Plate: 42 C

Spec. No.	Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
32	10	58.9	52	60
46	10	71.0	61	70
51	10	77.9	64	75
37	-10	46.5	46	55
41	-10	41.2	46	55
56	-10	50.2	41	50
36	69	89.3	76	85
42	69	89.8	77	85
57	69	111.8	87	95
31	40	81.1	69	80
45	40	97.3	76	85
55	40	88.0	67	75
35	25	65.9	60	70
47	25	59.5	52	60
53	25	82.1	77	85
34	-30	42.6	40	50
43	-30	38.8	38	50
49	-30	50.1	45	55
39	-50	34.0	32	40
44	-50	37.6	34	45
54	-50	29.1	27	35
33	-70	18.9	17	25
48	-70	11.9	12	20
50	-70	28.9	26	35
38	-100	8.4	9	20
40	-100	7.9	7	15
52	-100	14.5	13	25

Average

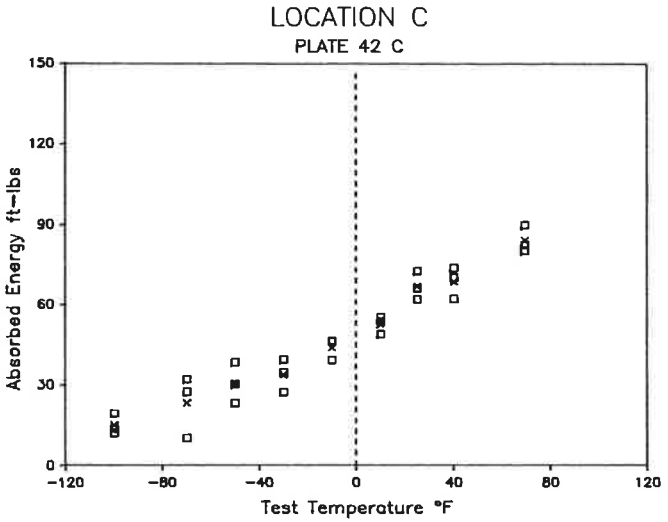
Location Test Temp-°F	G Energy ft-lbs	Lat Exp mils	% Shear
10	69.3	59.0	68
-10	46.0	44.3	53
69	97.0	80.0	88
40	88.8	70.7	80
25	69.2	63.0	72
-30	43.8	41.0	52
-50	33.6	31.0	40
-70	19.9	18.3	27
-100	10.3	9.7	20

Spec. No.	Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
7	10	60.5	50	60
9	10	64.3	57	70
10	10	67.6	57	70
8	-10	46.0	44	55
11	-10	45.9	42	50
12	-10	52.9	48	60

Location Test Temp-°F	H Energy ft-lbs	Lat Exp mils	% Shear
10	64.1	54.7	67
-10	48.3	44.7	55

Spec. No.	Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
7	10	67.5	56	65
8	10	61.9	54	65
10	10	63.8	55	65
9	-10	52.0	46	55
11	-10	38.2	37	45
12	-10	45.4	42	50

Location Test Temp-°F	J Energy ft-lbs	Lat Exp mils	% Shear
10	64.4	55.0	65
-10	45.2	41.7	50


LOCATION C
PLATE 42 C
Absorbed Energy ft-lbs
Test Temperature °F

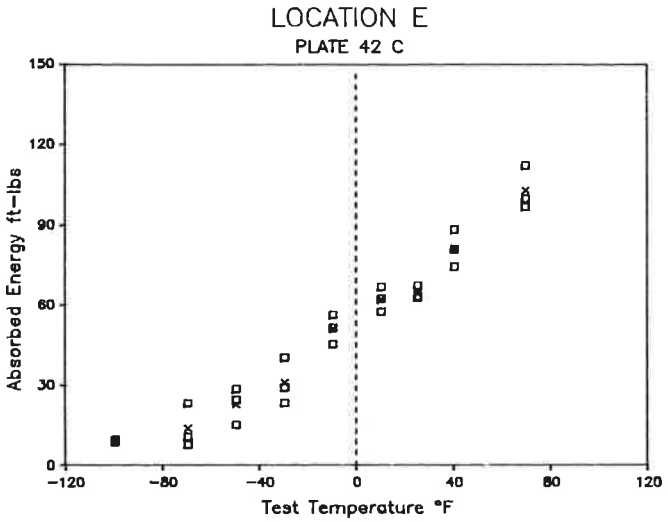

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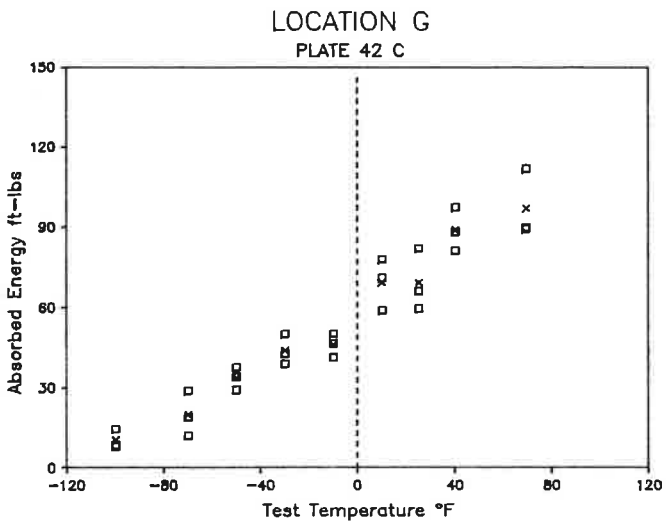
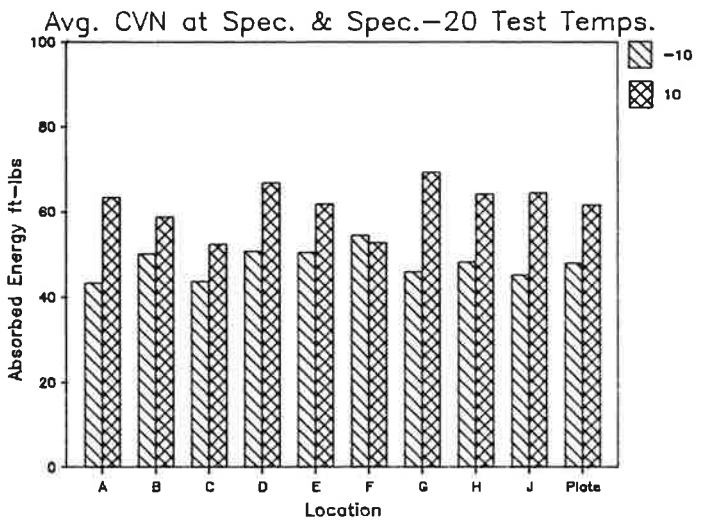
PLATE 42 C
Absorbed Energy ft-lbs
Test Temperature °F


LOCATION G
PLATE 42 C
Absorbed Energy ft-lbs
Test Temperature °F


Avg. CVN at Spec. & Spec.-20 Test Temps.
-10
10
Absorbed Energy ft-lbs
A
B
C
D
E
F
G
H
J
Plate
Location