Supplemental Report

# CATHODIC PROTECTION for REINFORCED CONCRETE BRIDGE DECKS Volume II

by

Lawrence J. Senkowski
Research Project Manager

Under the Supervision of:

C. Dwight Hixon, P.E.
Research & Development Engineer
Research & Development Division
Oklahoma Department of Transportation

Oklahoma City, Oklahoma

December, 1985

C

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# REINFORCED CONCRETE BRIDGE DECKS
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## BIRD CREEK BRIDGE - TULSA COUNTY
## TEST DATA



## BIRD CREEK OVERFLOW BRIDGE - ROGERS COUNTY
## TEST DATA

# CONTINUITY

Tulsa County Bridge
March 11, 1985

Connection at Rectifier Negative
System Negatives Connected

| READING NUMBER | TEST POINT | RESISTANCE (DC OHMS) | RESISTANCE (DC OHMS) | VOLTAGE DIFFERENCE (millivolts) |
|---|---|---|---|---|
| 1 | Reference Cell Ground 1 | 0.1 | 0.1 | 0.0 |
| 2 | Reference Cell Ground 2 | 0.2 | 0.2 | 0.0 |
| 3 | Reference Cell Ground 3 | 0.3 | 0.1 | 0.1 |
| 4 | Reference Cell Ground 4 | 0.4 | 0.3 | 0.1 |
| 5 | Reference Cell Ground 5 | 0.4 | 0.4 | 0.0 |
| 6 | Reference Cell Ground 6 | 0.5 | 0.4 | 0.0 |
| 7 | Reference Cell Ground 7 | 0.4 | 0.5 | 0.0 |
| 8 | Reference Cell Ground 8 | 0.7 | 0.6 | 0.0 |
| 9 | Reference Cell Ground 9 | 0.7 | 0.8 | 0.0 |

CONTINUITY
Tulsa County Bridge
March 11, 1985

Connection at System Negative 1

| READING NUMBER | TEST POINT | RESISTANCE (DC OHMS) | RESISTANCE (DC OHMS) | VOLTAGE DIFFERENCE (millivolts) |
|---|---|---|---|---|
| 1 | System Negative 2 | 0.1 | 0.1 | 0.0 |
| 2 | System Negative 3 | 0.2 | 0.1 | 0.0 |
| 3 | System Negative 4 | 0.2 | 0.2 | 0.0 |
| 4 | System Negative 5 | 116+ | 23- | 79.6 |
| 5 | Reference Cell Ground 1 | 0.2 | 0.1 | 0.0 |
| 6 | Reference Cell Ground 2 | 0.2 | 0.3 | 0.0 |
| 7 | Reference Cell Ground 3 | 119+ | 22- | 80.0 |

CONTINUITY
Tulsa County Bridge
March 11, 1985

Connection at System Negative 5

| READING NUMBER | TEST POINT | RESISTANCE (DC OHMS) | RESISTANCE (DC OHMS) | VOLTAGE DIFFERENCE (millivolts) |
|---|---|---|---|---|
| 1 | System Negative 6 | 0.3 | 0.3 | 0.0 |
| 2 | System Negative 7 | 0.3 | 0.4 | 0.0 |
| 3 | System Negative 8 | 0.4 | 0.3 | 0.0 |
| 4 | System Negative 9 | 91+ | 29+ | 35.5 |
| 5 | Reference Cell Ground 3 | 0.3 | 0.3 | 0.0 |
| 6 | Reference Cell Ground 4 | 0.4 | 0.4 | 0.0 |

CONTINUITY
Tulsa County Bridge
March 11, 1985

Connection at System Negative 9

| READING NUMBER | TEST POINT | RESISTANCE (DC OHMS) | RESISTANCE (DC OHMS) | VOLTAGE DIFFERENCE (millivolts) |
|---|---|---|---|---|
| 1 | System Negative 10 | 0.5 | 0.5 | 0.0 |
| 2 | System Negative 11 | 0.6 | 0.6 | 0.0 |
| 3 | System Negative 12 | 0.6 | 0.6 | 0.0 |
| 4 | System Negative 13 | 133+ | 87+ | 22+ |
| 5 | Reference Cell Ground 5 | 0.6 | 0.5 | 0.0 |
| 6 | Reference Cell Ground 6 | 0.6 | 0.6 | 0.0 |

CONTINUITY
Tulsa County Bridge
March 11, 1985

Connection at System Negative 13

| READING NUMBER | TEST POINT | RESISTANCE (DC OHMS) | RESISTANCE (DC OHMS) | VOLTAGE DIFFERENCE (millivolts) |
|---|---|---|---|---|
| 1 | System Negative 14 | 0.7 | 0.7 | 0.0 |
| 2 | System Negative 15 | 0.7 | 0.8 | 0.0 |
| 3 | System Negative 16 | 0.8 | 0.7 | 0.0 |
| 4 | System Negative 17 | 285+ | 170+ | 47.5 |
| 5 | Reference Cell Ground 7 | 0.7 | 0.7 | 0.0 |
| 6 | Reference Cell Ground 8 | 0.8 | 0.9 | 0.1 |

CONTINUITY
Tulsa County Bridge
March 11, 1985

Connection at System Negative 17

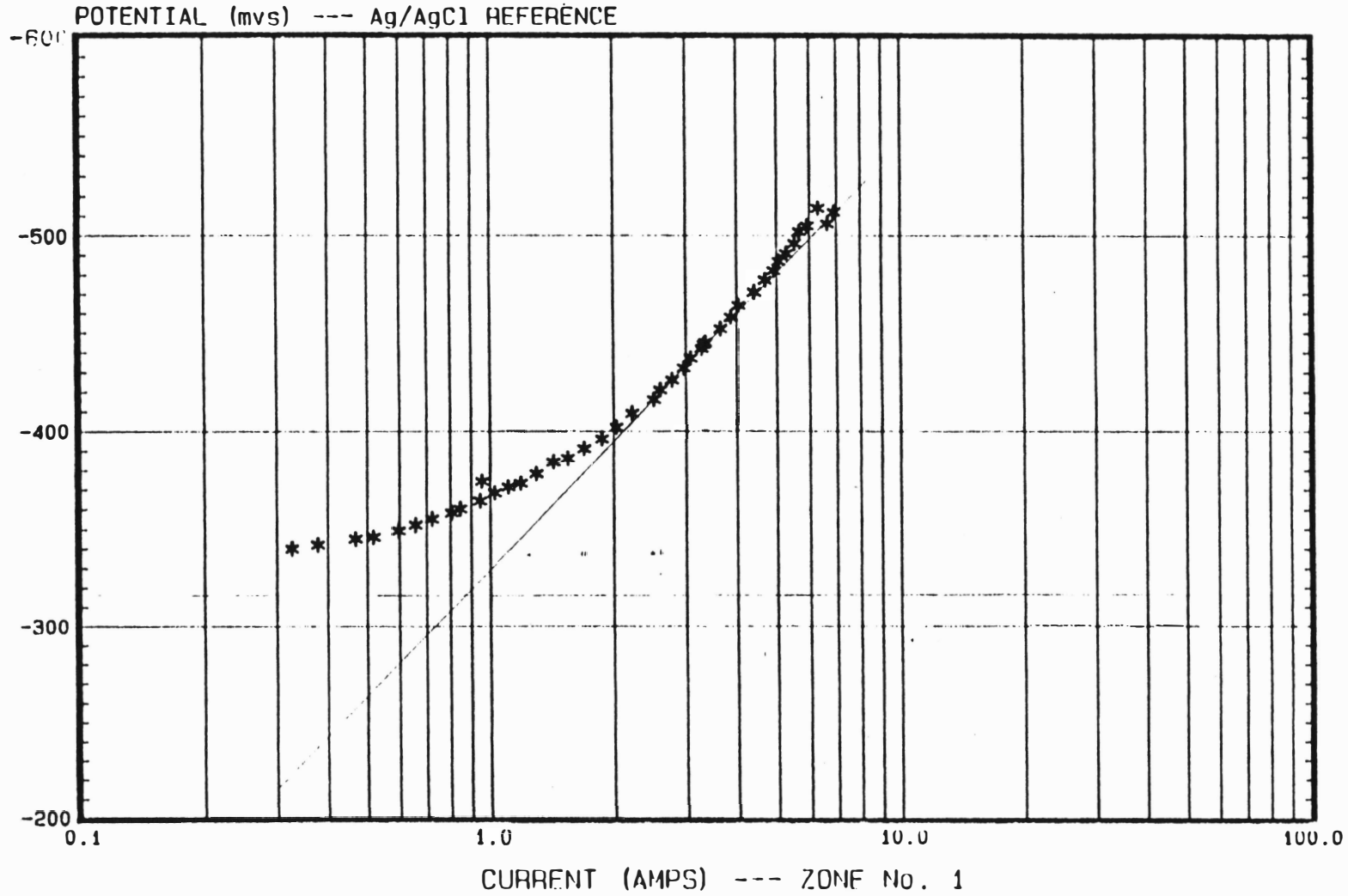
| READING NUMBER | TEST POINT | RESISTANCE (DC OHMS) | RESISTANCE (DC OHMS) | VOLTAGE DIFFERENCE (millivolts) |
|---|---|---|---|---|
| 1 | System Negative 18 | 0.9 | 0.9 | 0.0 |
| 2 | Reference Cell Ground 9 | 0.8 | 0.8 | 0.1 |

# E LOG-I TEST

## OKLAHOMA DEPARTMENT OF TRANSPORTATION -- PROJECT NO. M-8404 (001)

## ZONE No. 1

March 13, 1985



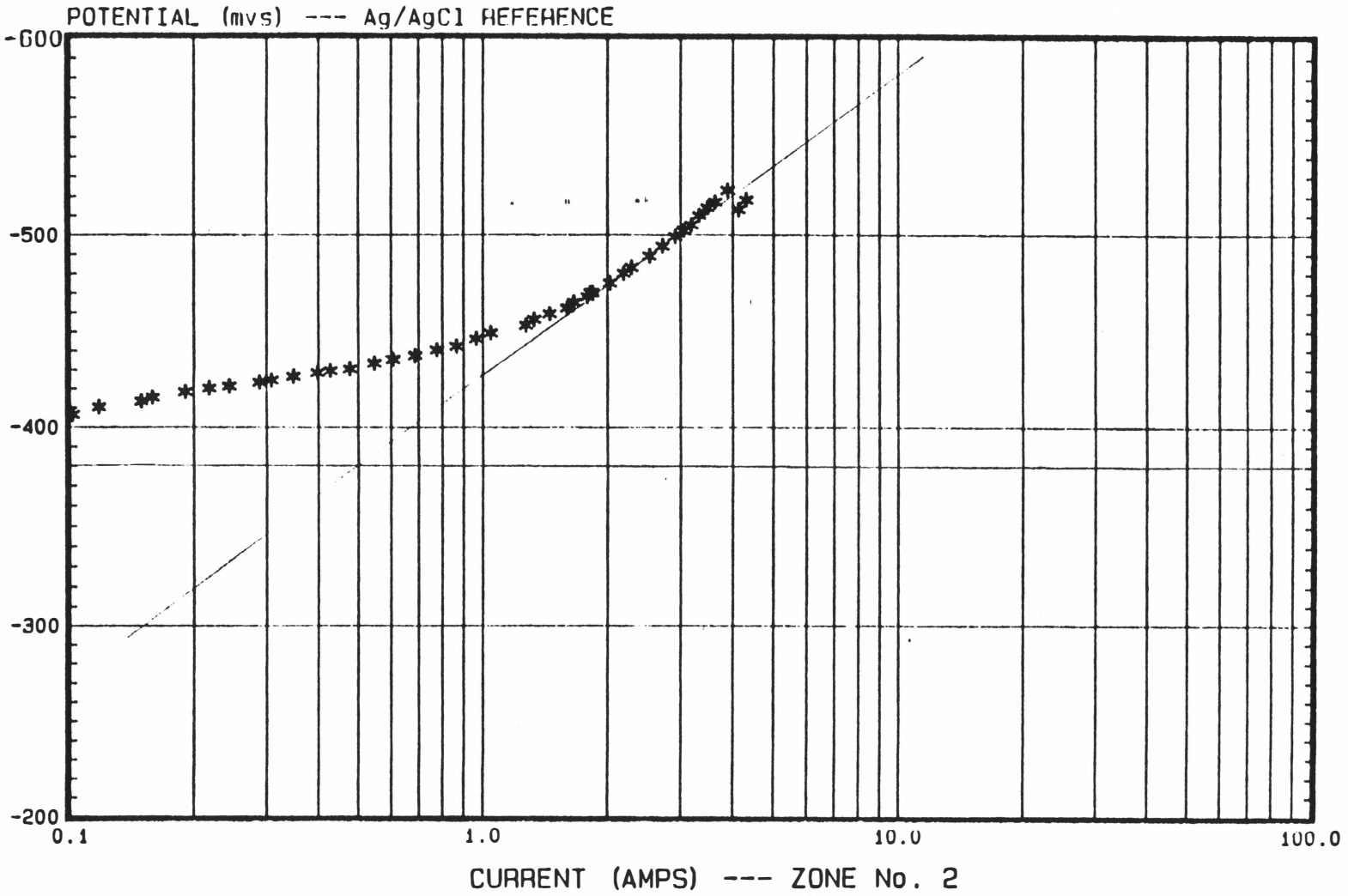

**PREPARED FOR: TWAY CONTRACTING COMPANY *** PREPARED BY: HARCO CORPORATION**

# E LOG-I TEST

## OKLAHOMA DEPARTMENT OF TRANSPORTATION -- PROJECT NO. M-8404 (001)

## ZONE No. 2

March 13, 1985



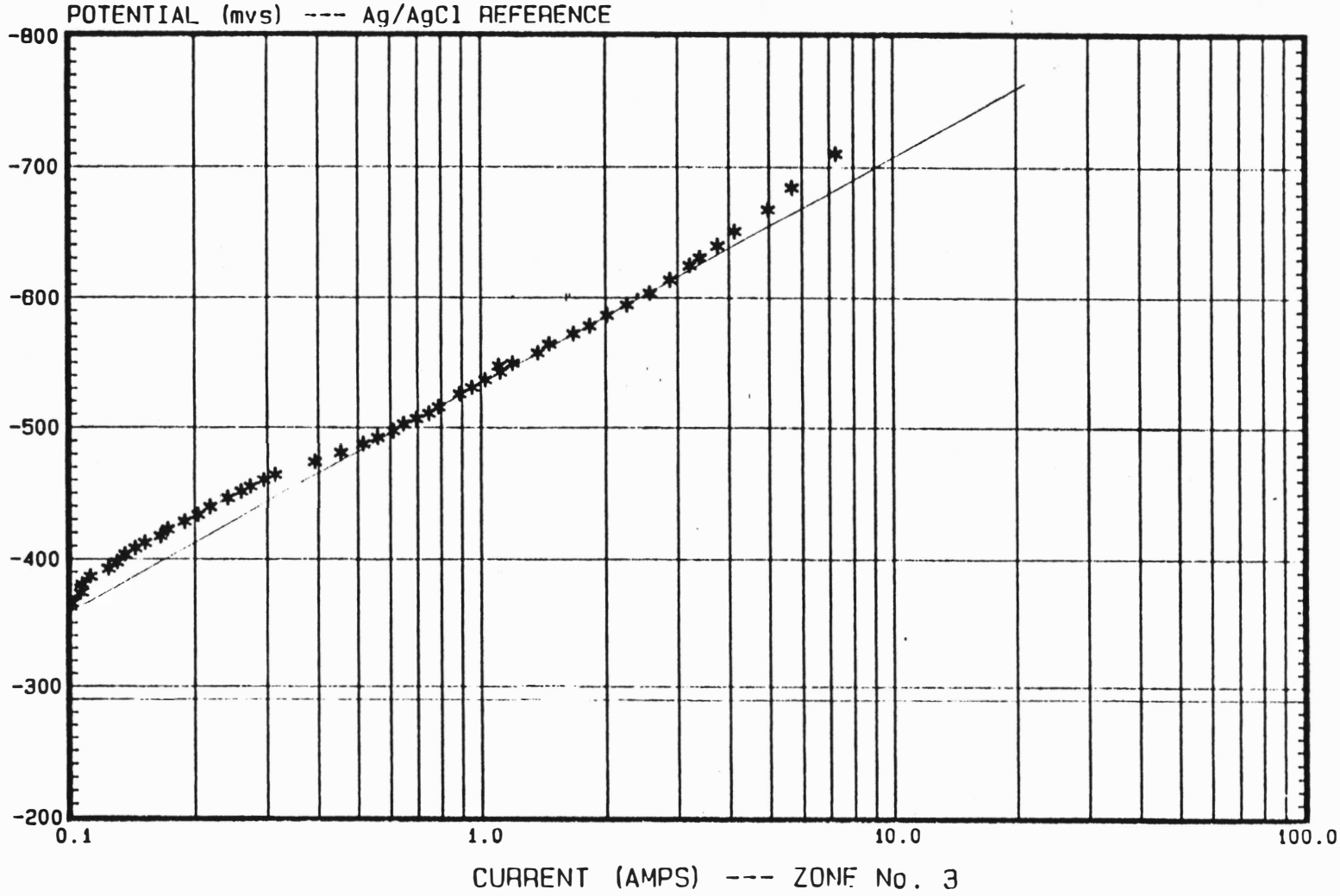

**PREPARED FOR: TWAY CONTRACTING COMPANY *** PREPARED BY: HARCO CORPORATION**

# E LOG-I TEST

## OKLAHOMA DEPARTMENT OF TRANSPORTATION -- PROJECT NO. M-8404 (001)

## ZONE No. 3

March 14, 1985



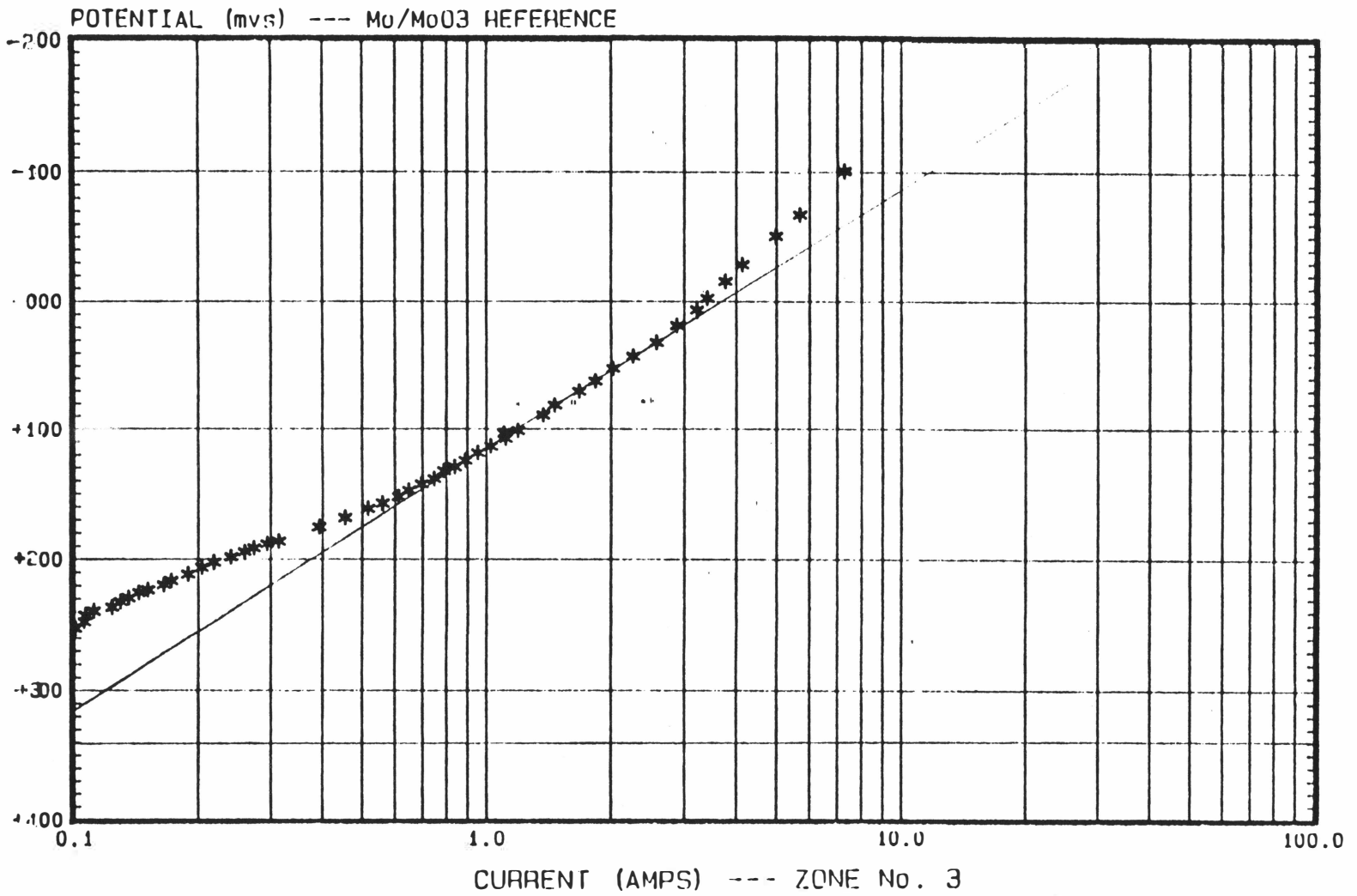

**PREPARED FOR: TWAY CONTRACTING COMPANY *** PREPARED BY: HARCO CORPORATION**

# E LOG-I TEST

## OKLAHOMA DEPARTMENT OF TRANSPORTATION -- PROJECT NO. M-8404(001)

## ZONE No. 3

March 14, 1985



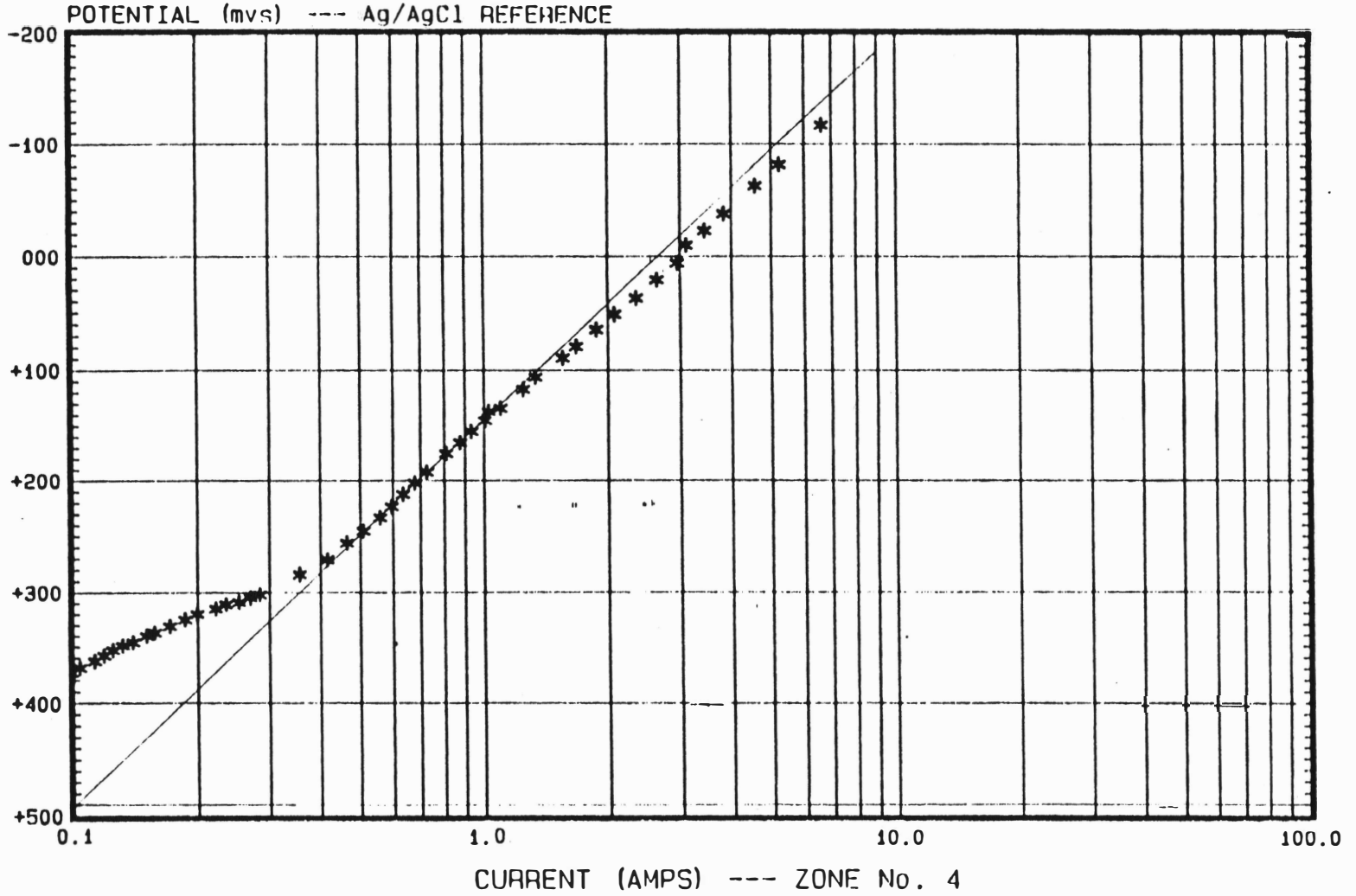

**PREPARED FOR: TWAY CONTRACTING COMPANY *** PREPARED BY: HARCO CORPORATION**

# E LOG-I TEST

## OKLAHOMA DEPARTMENT OF TRANSPORTATION -- PROJECT NO. M-8404 (001)

## ZONE No. 4

March 14, 1985



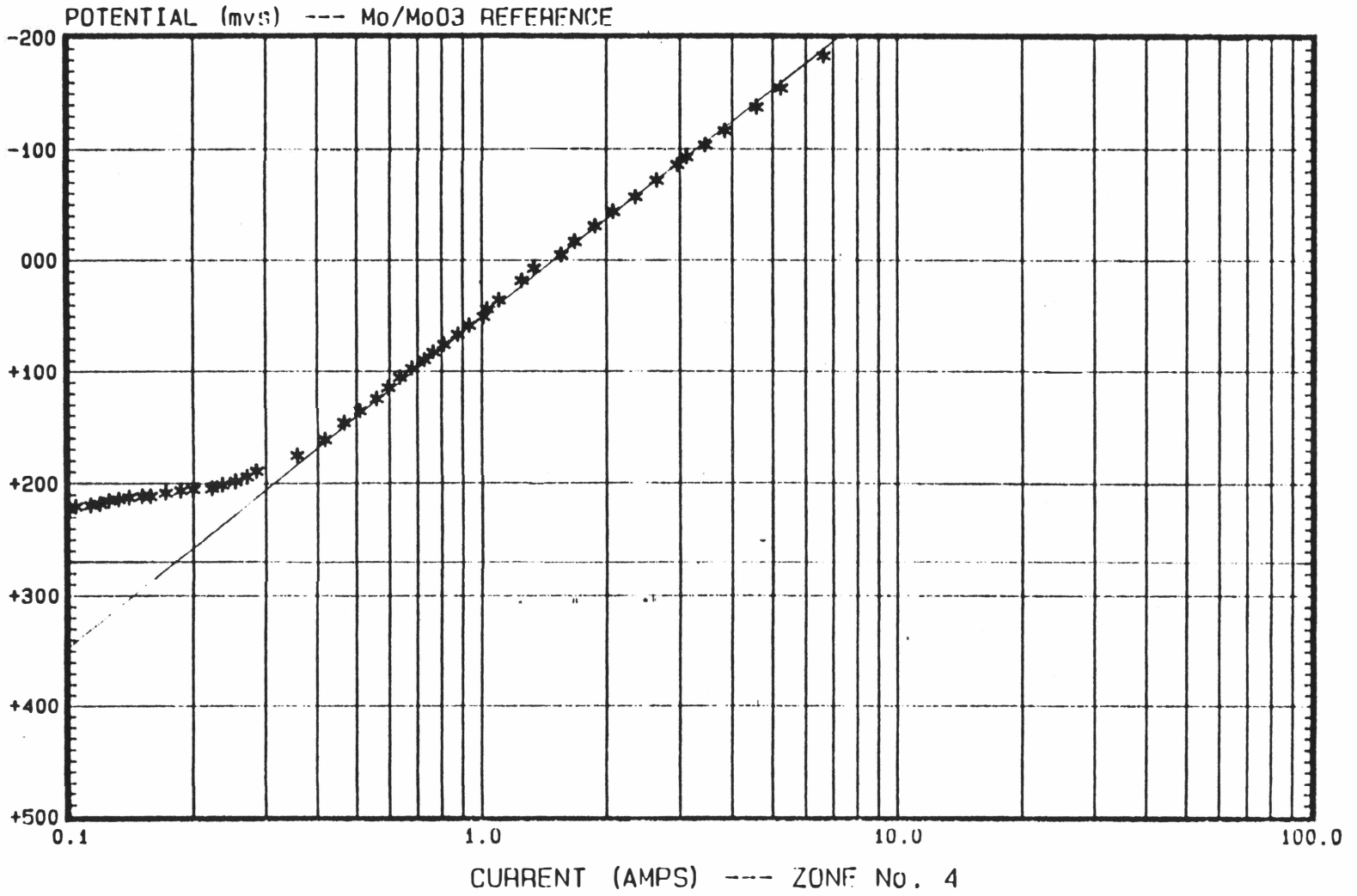

**PREPARED FOR: TWAY CONTRACTING COMPANY *** PREPARED BY: HARCO CORPORATION**

# E LOG-I TEST

## OKLAHOMA DEPARTMENT OF TRANSPORTATION -- PROJECT NO. M-8404 (001)

## ZONE No. 4

**March 14, 1985**



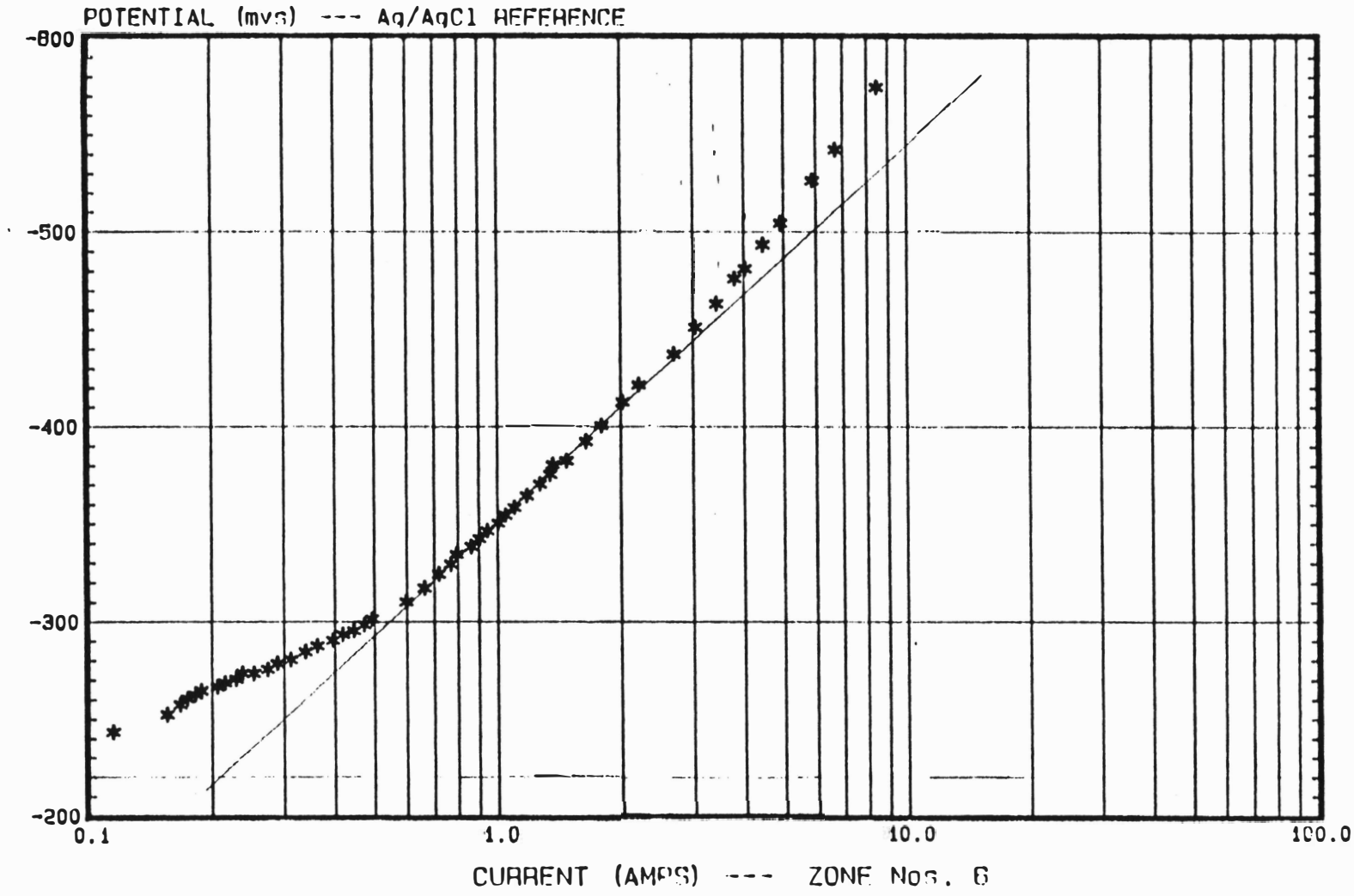

**PREPARED FOR: TWAY CONTRACTING COMPANY *** PREPARED BY: HARCO CORPORATION**

# E LOG I TEST

## OKLAHOMA DEPARTMENT OF TRANSPORTATION -- PROJECT NO. M-8404(001)

## ZONE No. 6

March 14, 1985

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# E LOG-I TEST

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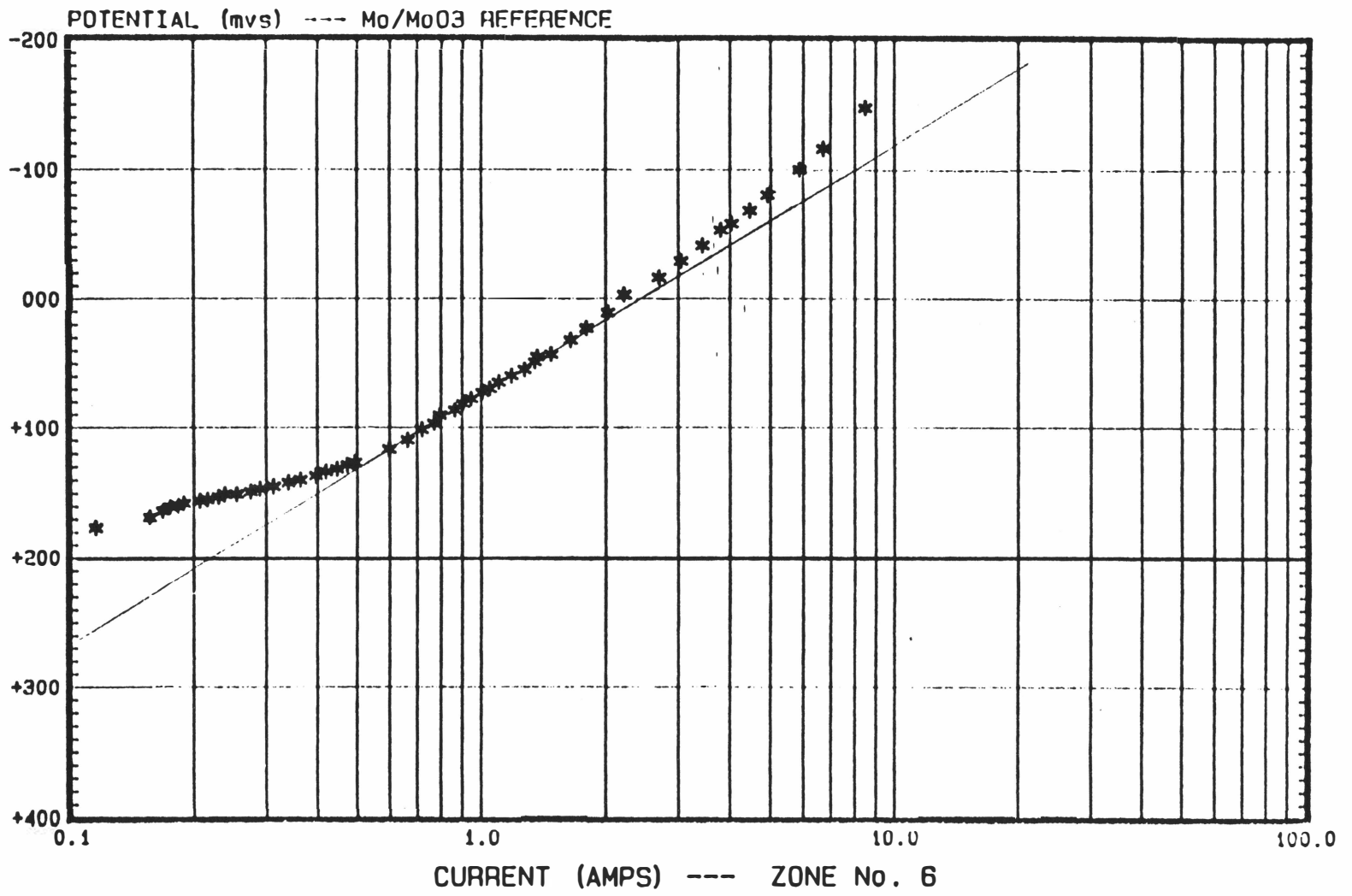
## ZONE No. 6

March 14, 1985



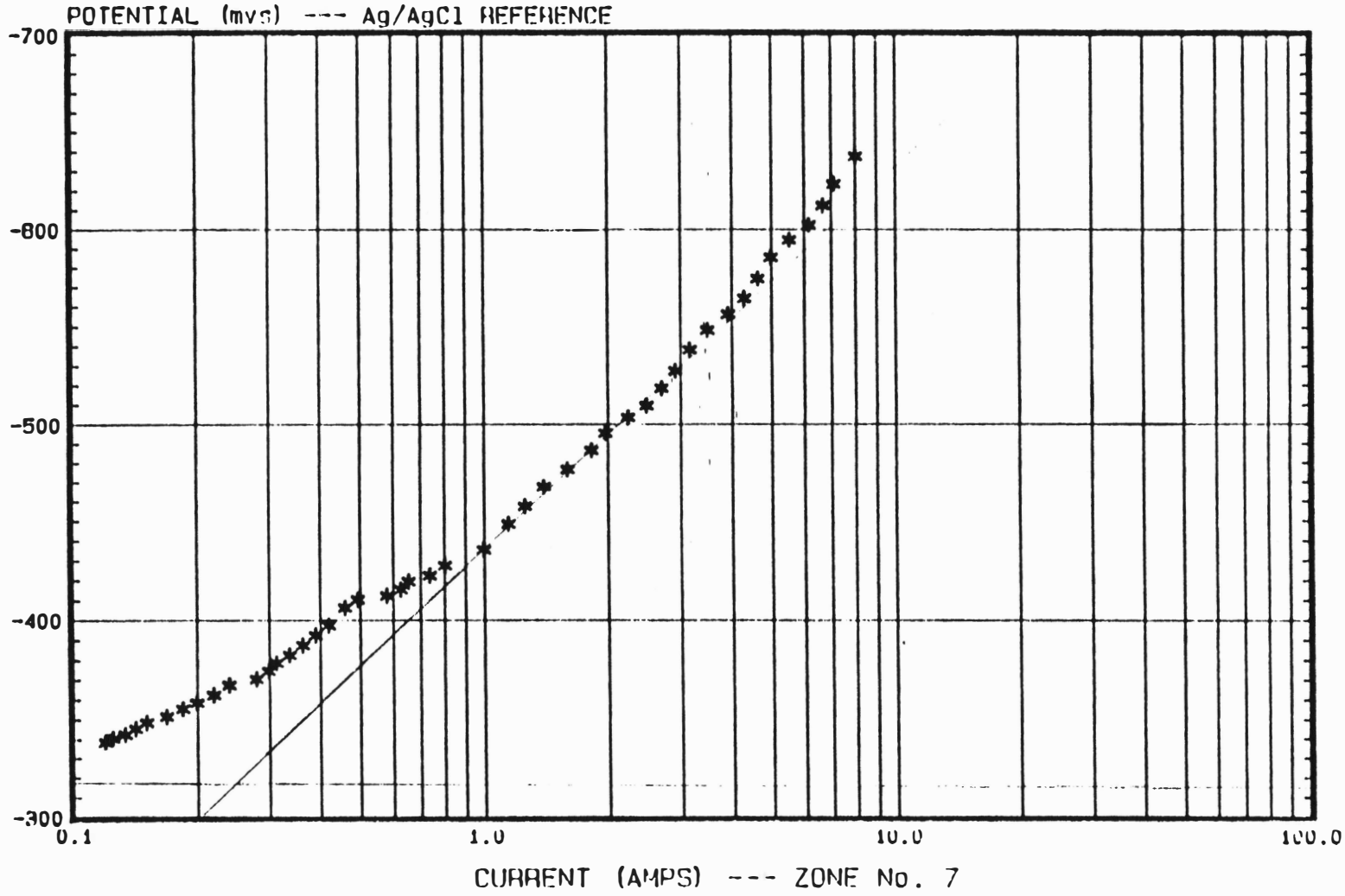

**PREPARED FOR: THAY CONTRACTING COMPANY *** PREPARED BY: HARCO CORPORATION**

# E LOG-I TEST

## OKLAHOMA DEPARTMENT OF TRANSPORTATION -- PROJECT NO. M-8404 (001)

## ZONE No. 7

**March 14, 1985**



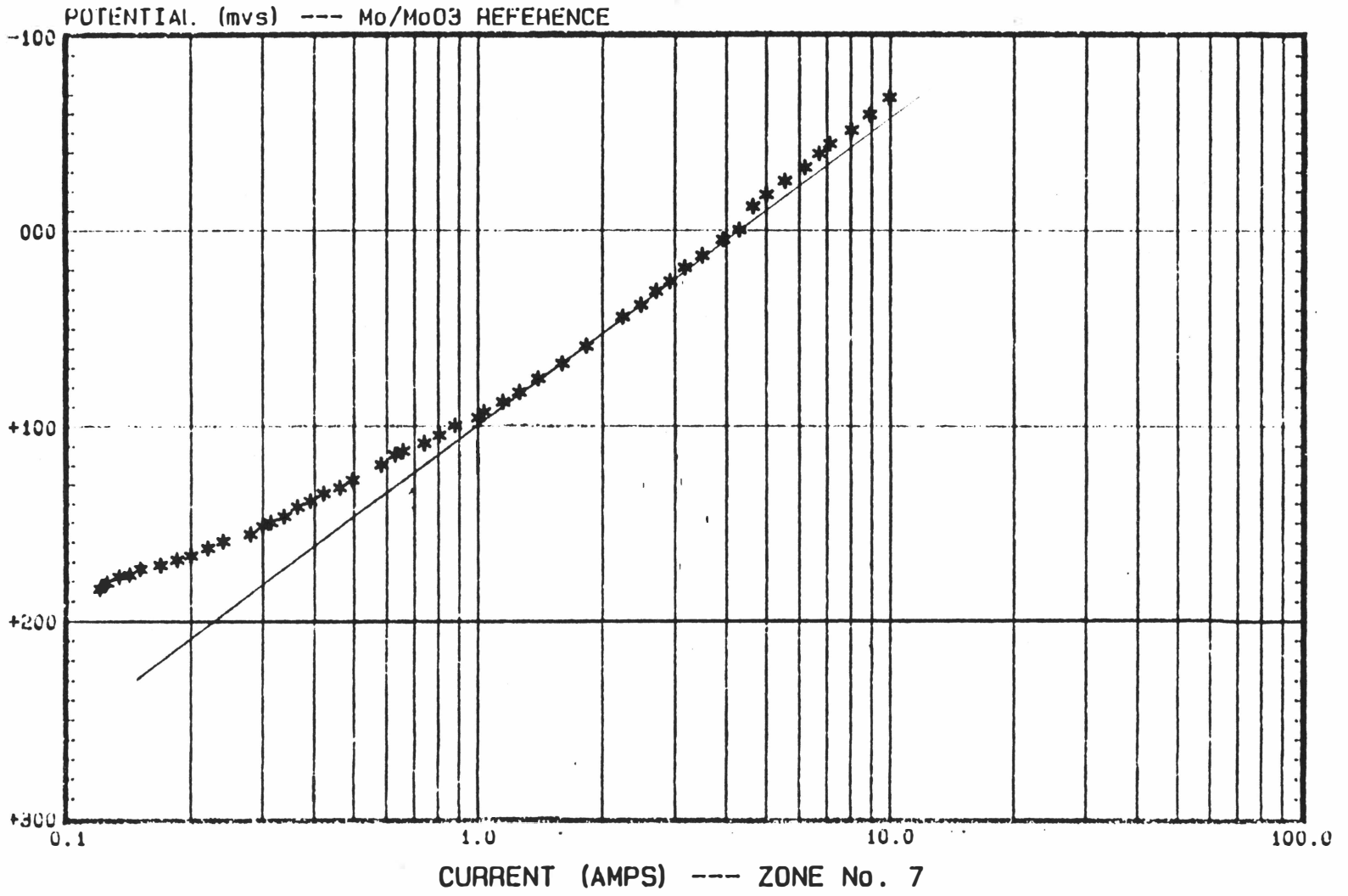

**PREPARED FOR: TWAY CONTRACTING COMPANY *** PREPARED BY: HARCO CORPORATION**

# E LOG-I TEST

## OKLAHOMA DEPARTMENT OF TRANSPORTATION -- PROJECT NO. M-8404(001)

## ZONE No. 7

March 14, 1985



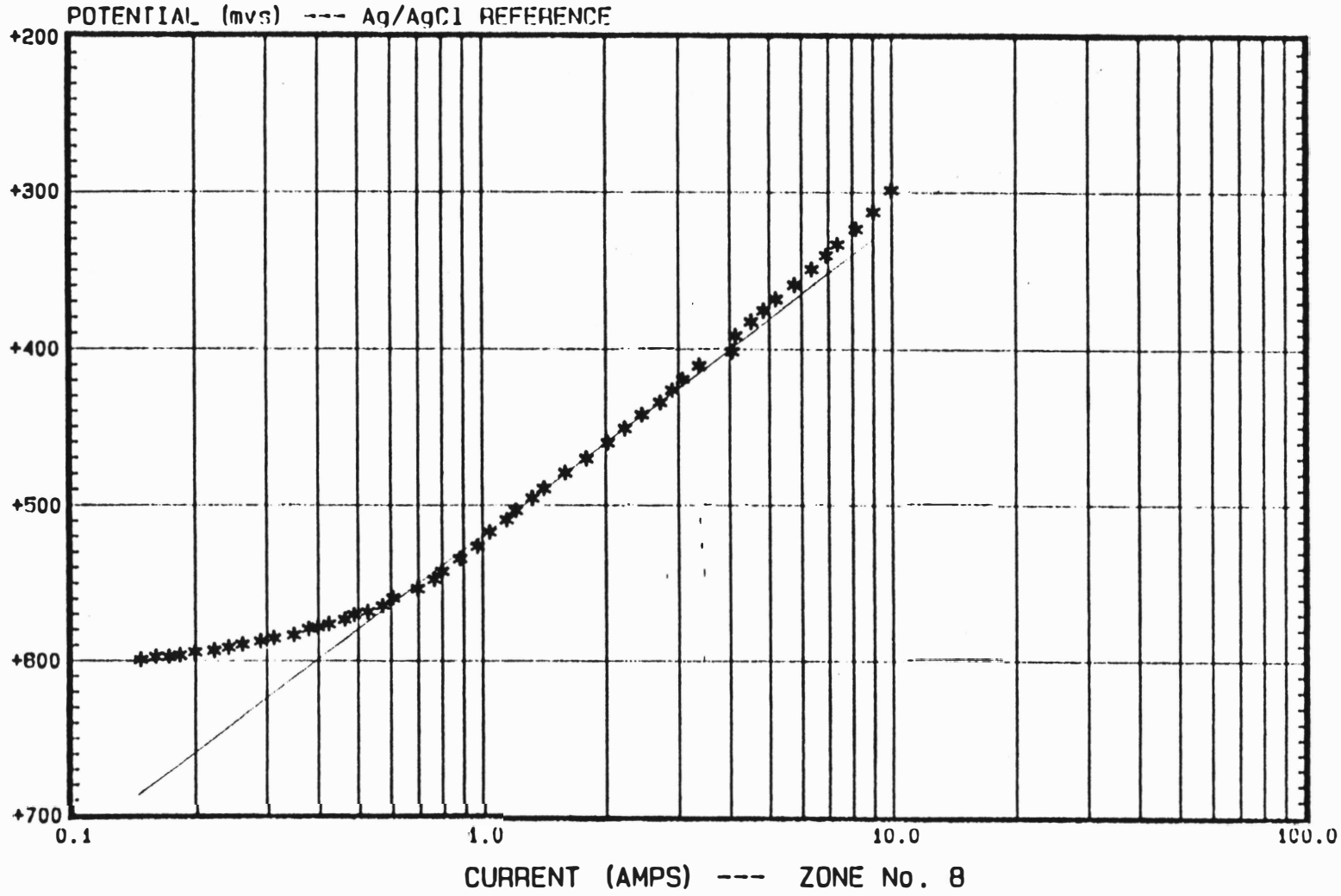

**PREPARED FOR: TWAY CONTRACTING COMPANY *** PREPARED BY: HARCO CORPORATION**

# E LOG-I TEST

## OKLAHOMA DEPARTMENT OF TRANSPORTATION -- PROJECT NO. M-8404 (001)

## ZONE No. 8

March 14, 1985



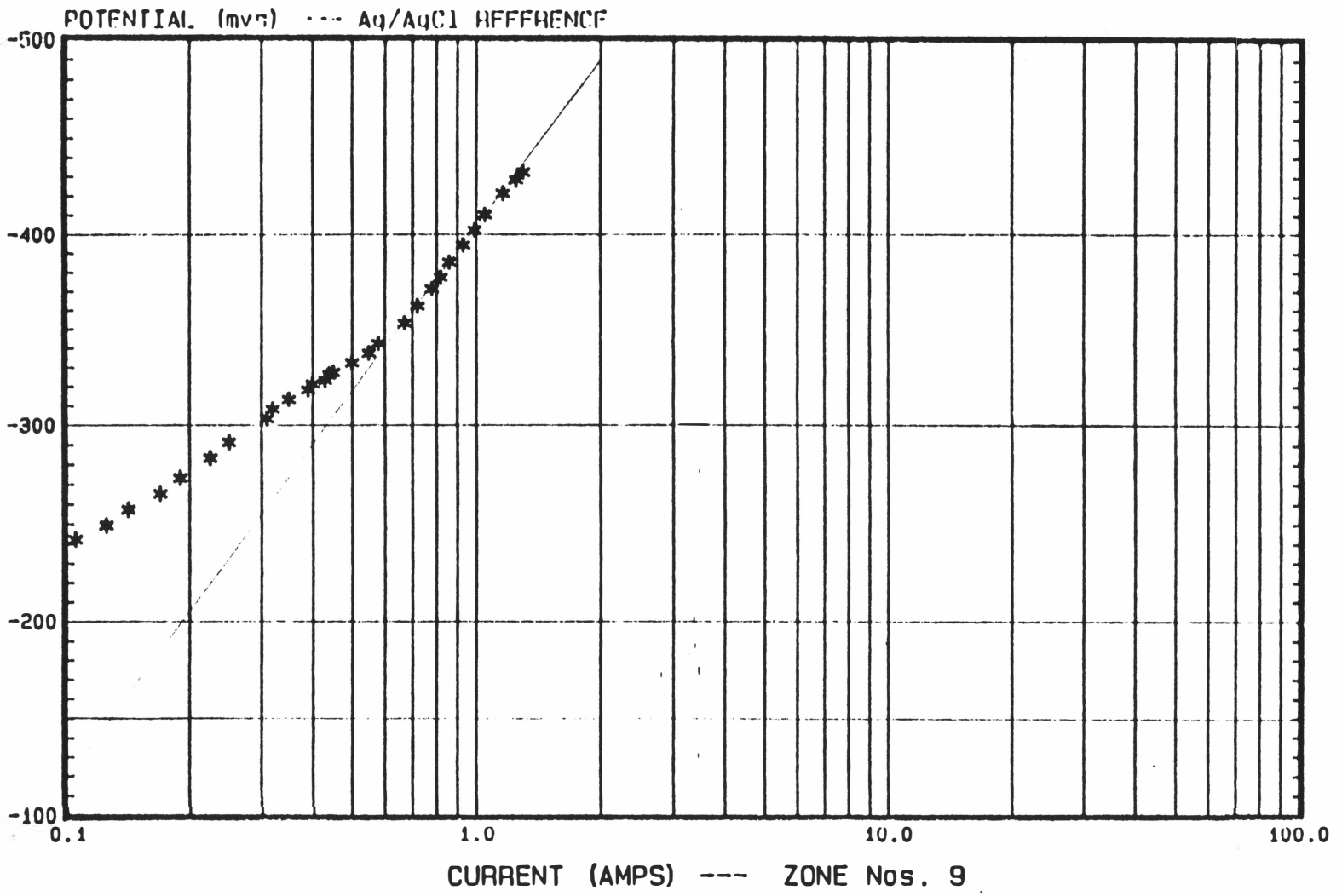

**PREPARED FOR: TWAY CONTRACTING COMPANY *** PREPARED BY: HARCO CORPORATION**

# E LOG-I TEST

## OKLAHOMA DEPARTMENT OF TRANSPORTATION --- PROJECT NO. M-8404(001)

## ZONE No. 9

March 13, 1985

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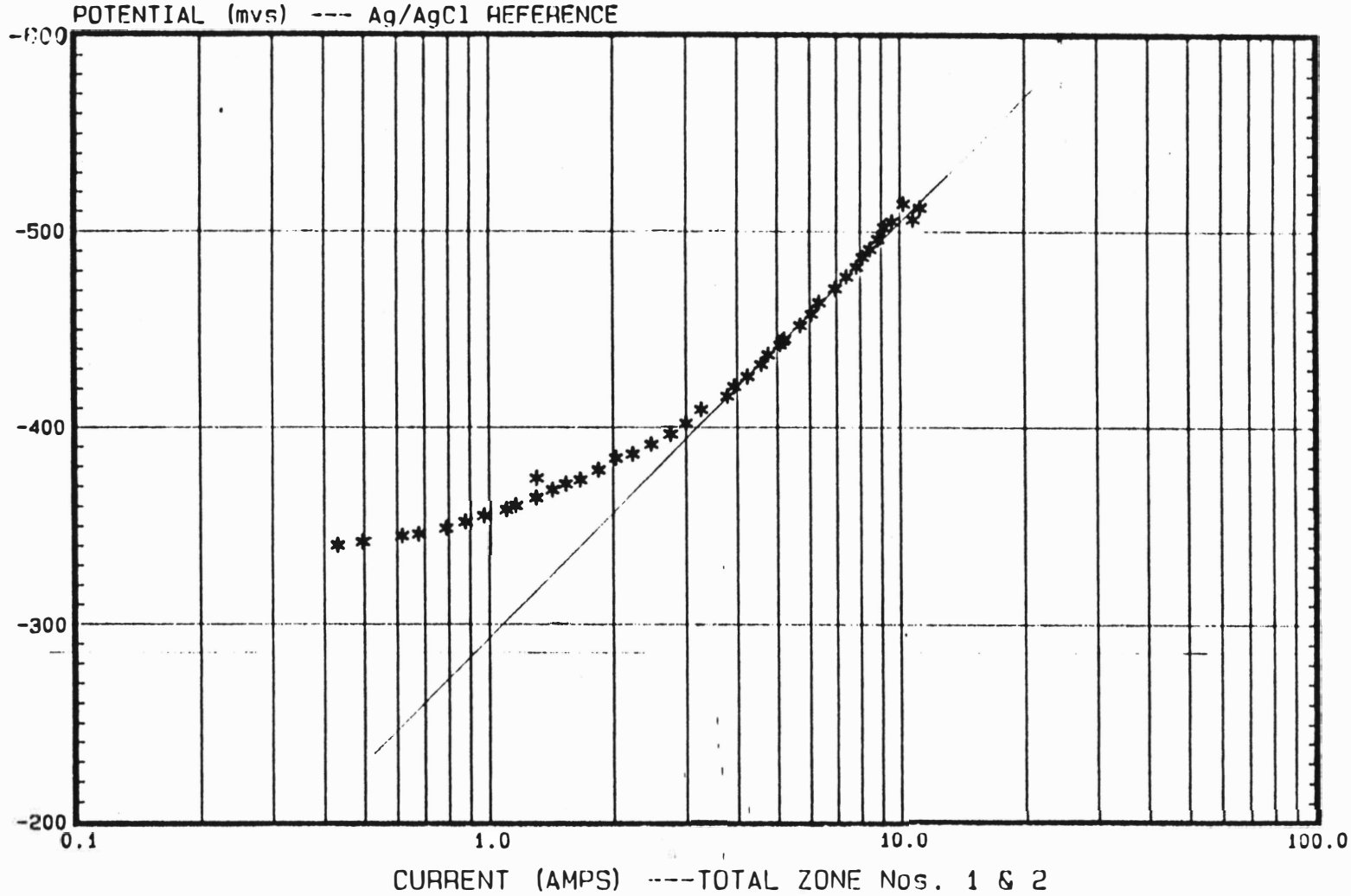
## OKLAHOMA DEPARTMENT OF TRANSPORTATION -- PROJECT NO. M-8404 (001)

## ZONE No. 1

**March 13, 1985**

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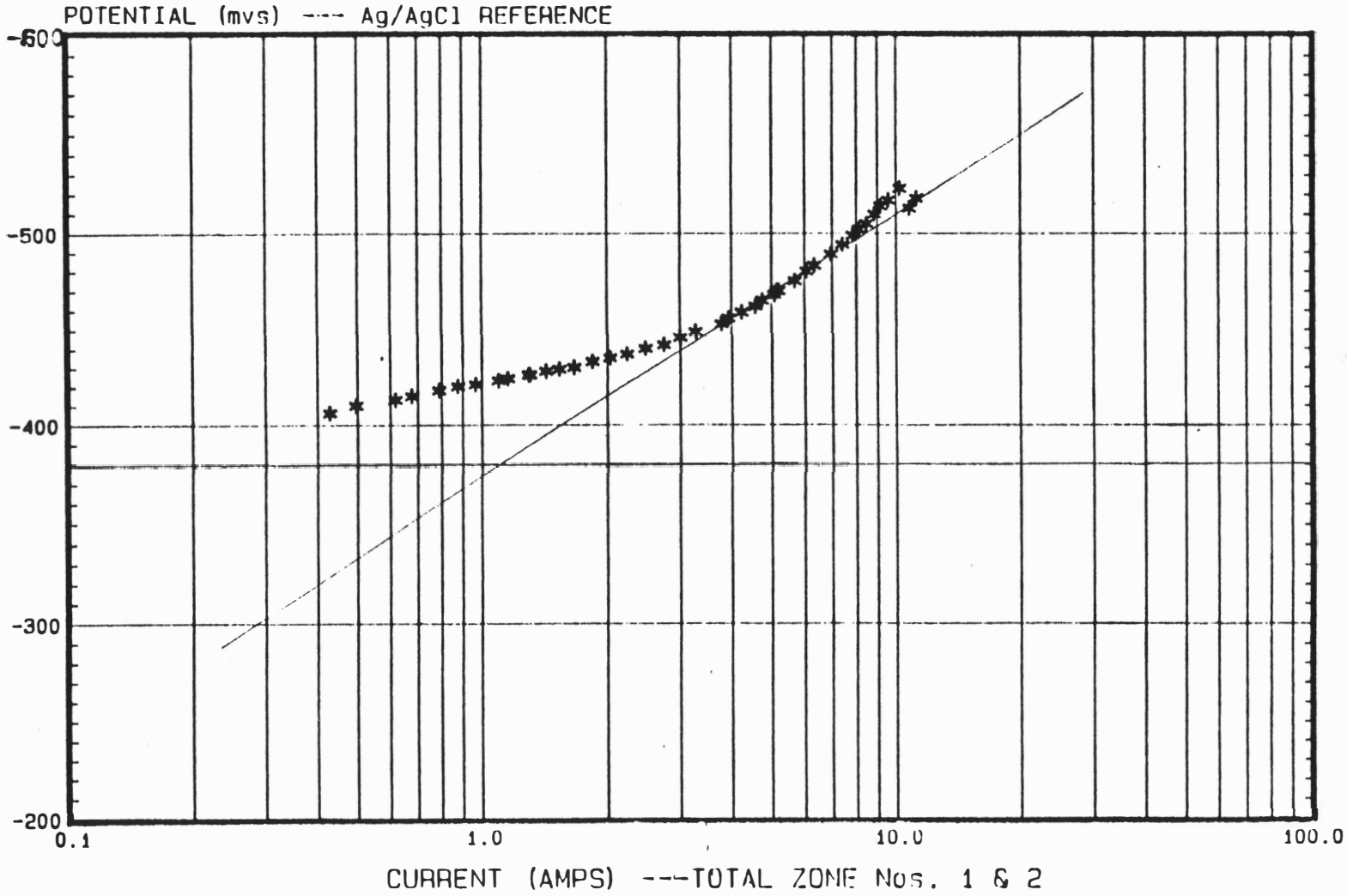
# E LOG-I TEST

## OKLAHOMA DEPARTMENT OF TRANSPORTATION -- PROJECT NO. M-8404 (001)

## ZONE No. 2

March 13, 1985

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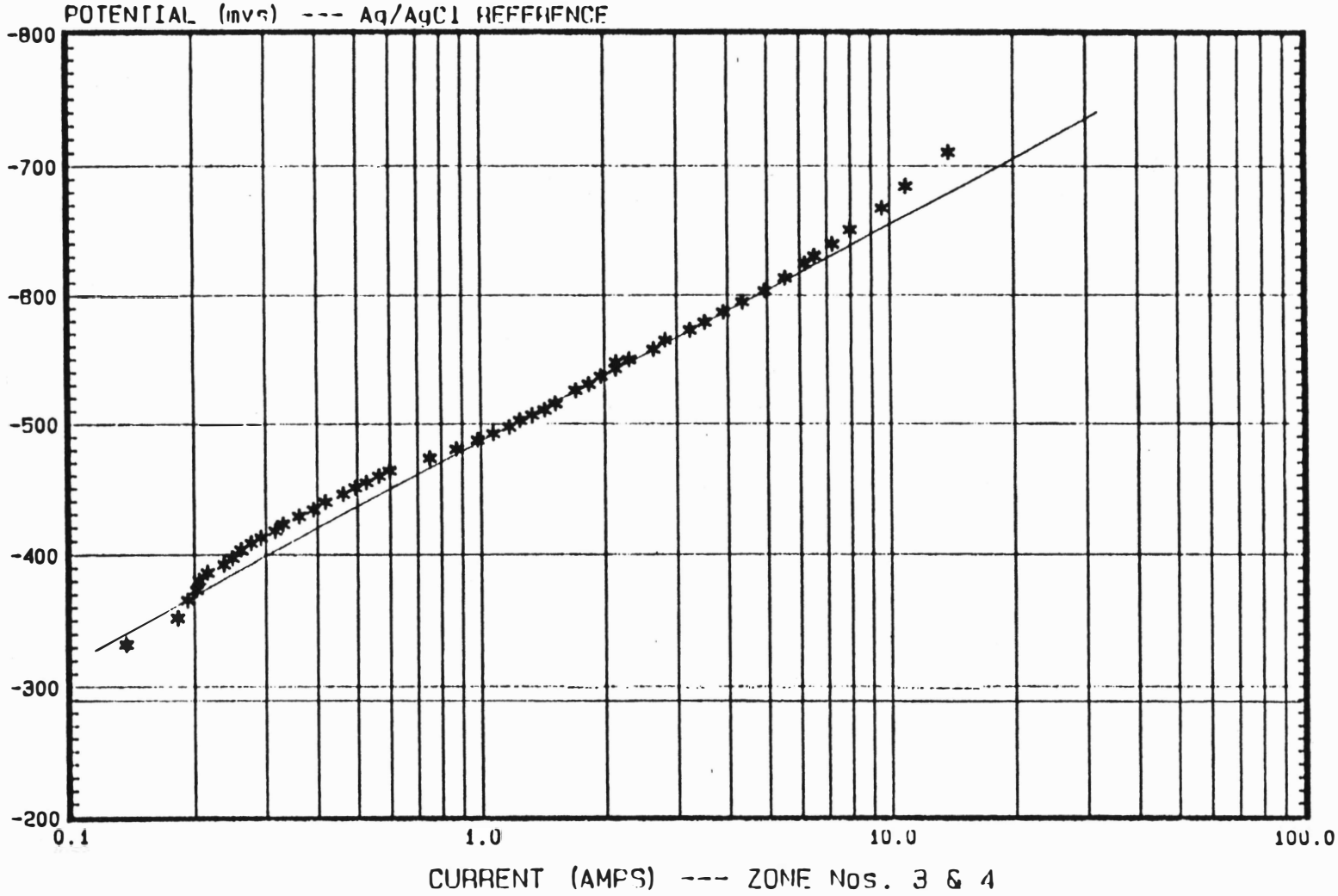
# E LOG-I TEST

## OKLAHOMA DEPARTMENT OF TRANSPORTATION -- PROJECT NO. M-8404 (001)

## ZONE No. 3

March 14, 1985

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## ZONE No. 3

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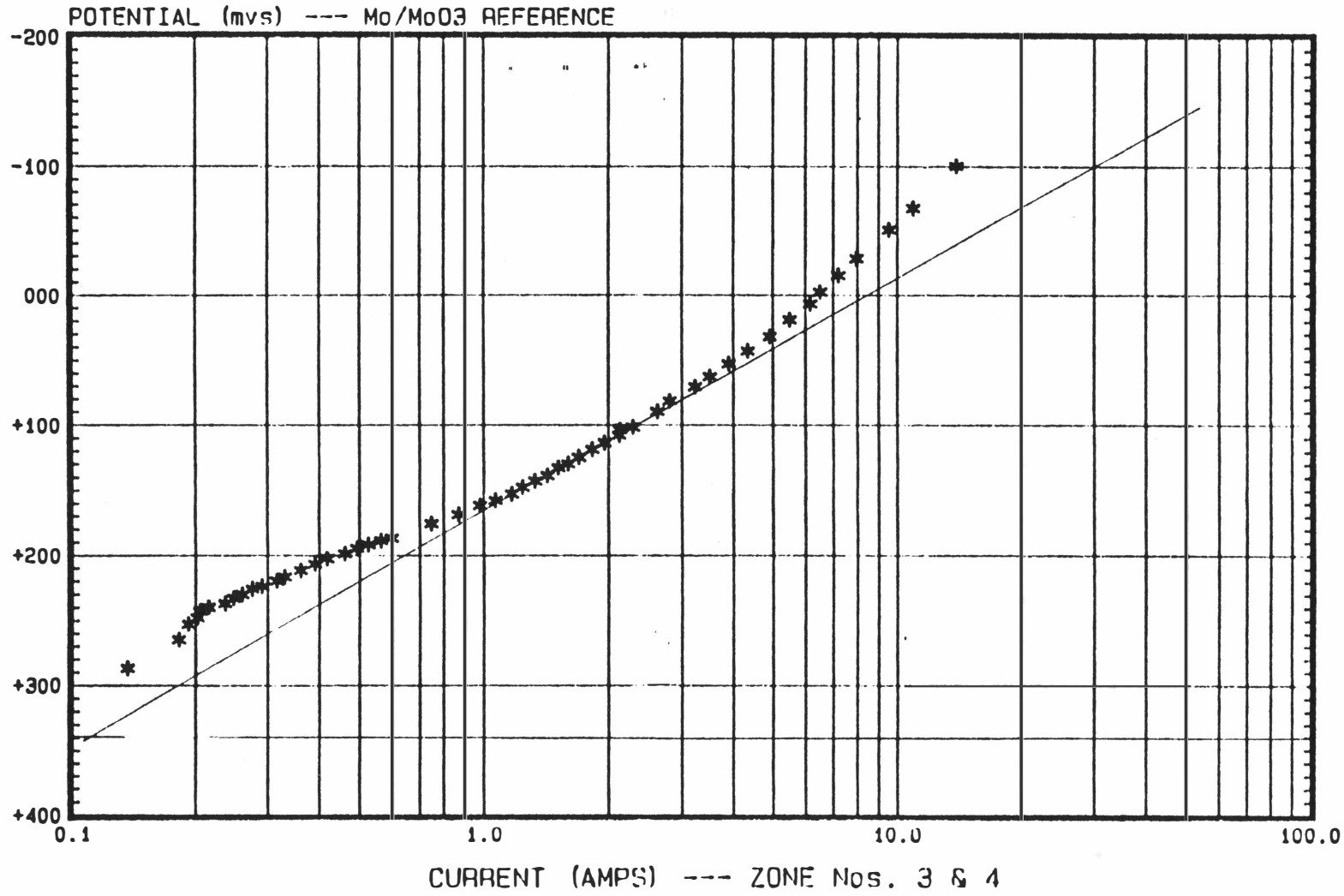


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# E LOG-I TEST

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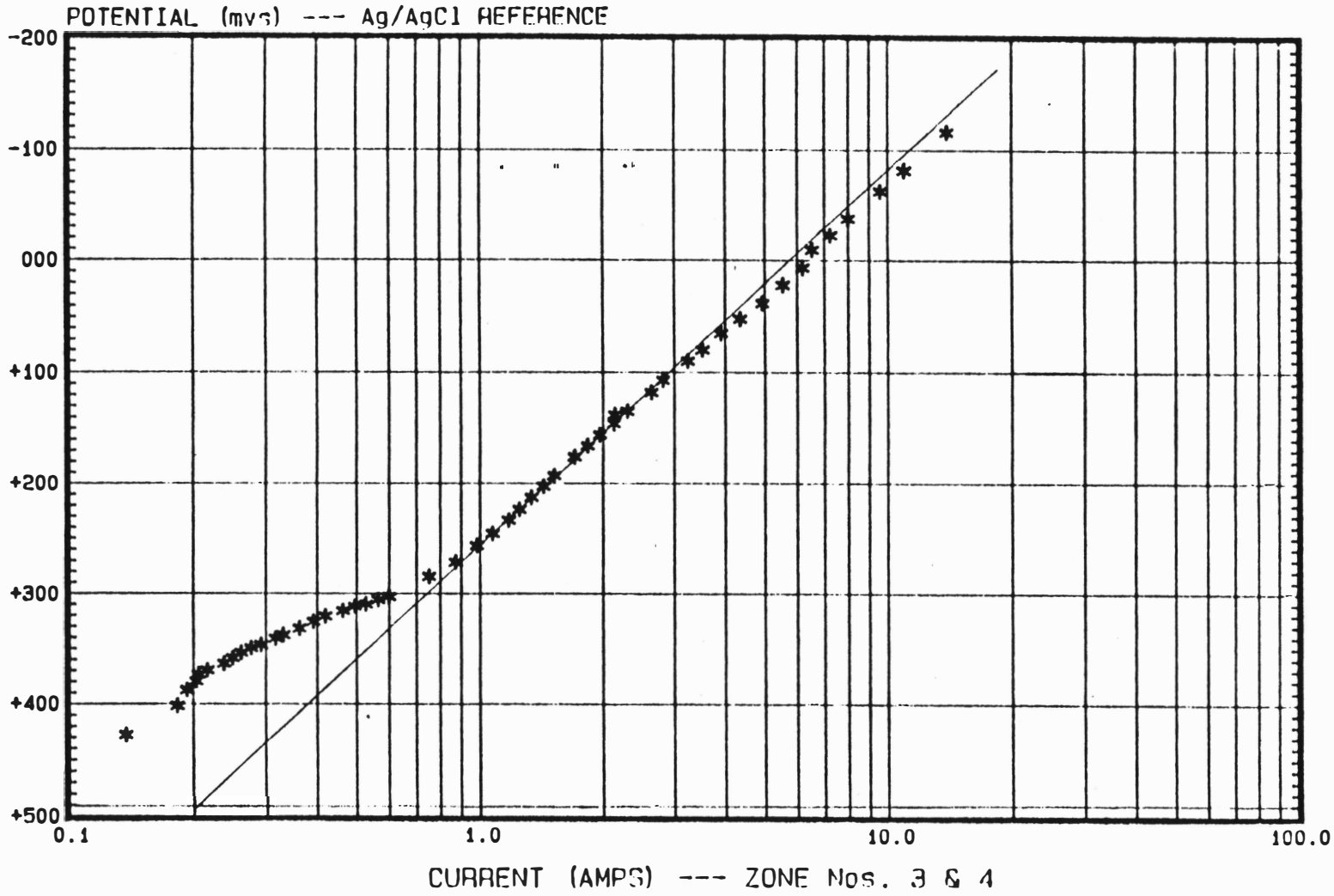
## ZONE No. 4

March 14, 1985

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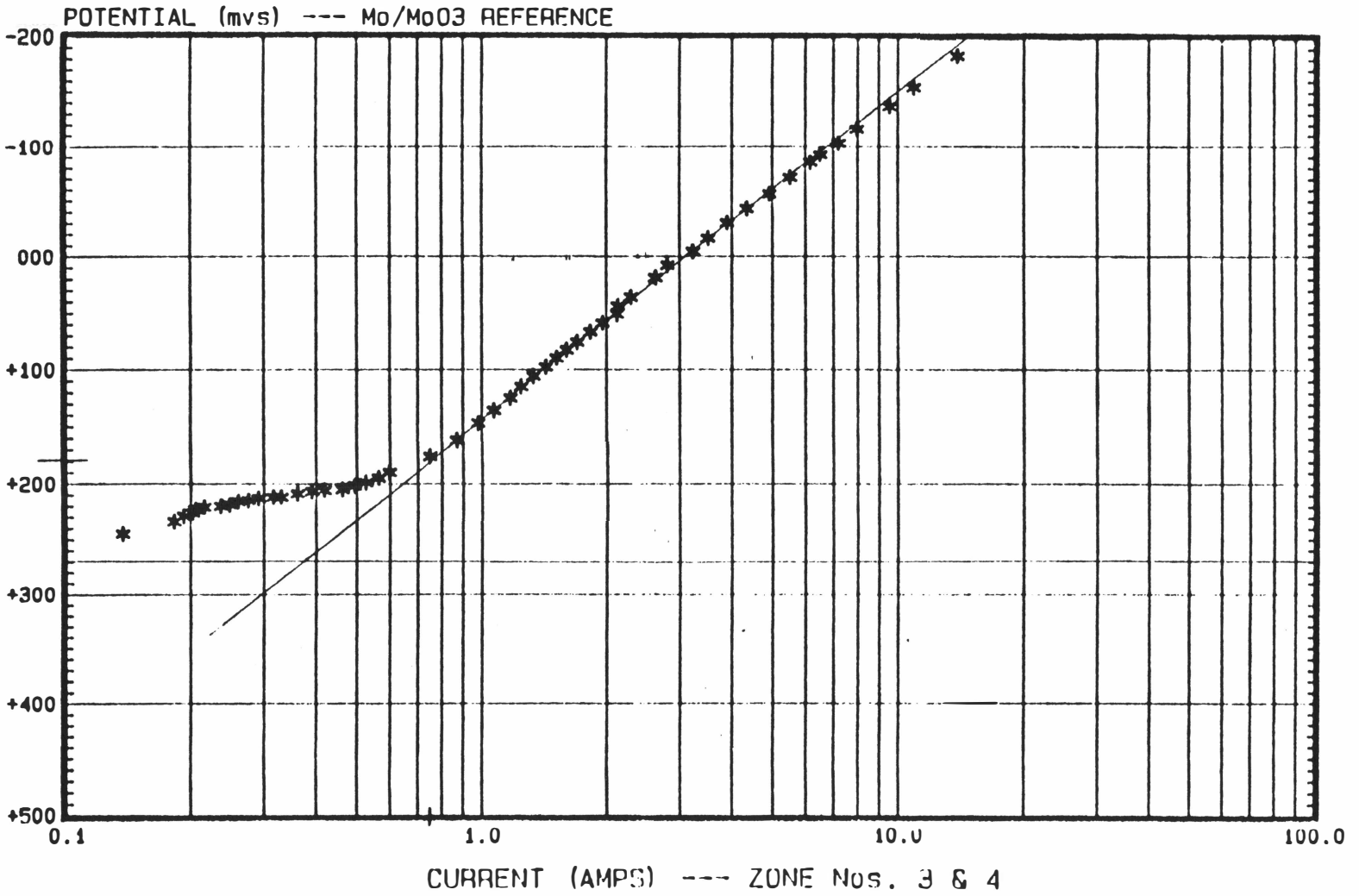
## ZONE No. 4

March 14, 1985

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# E LOG-I TEST

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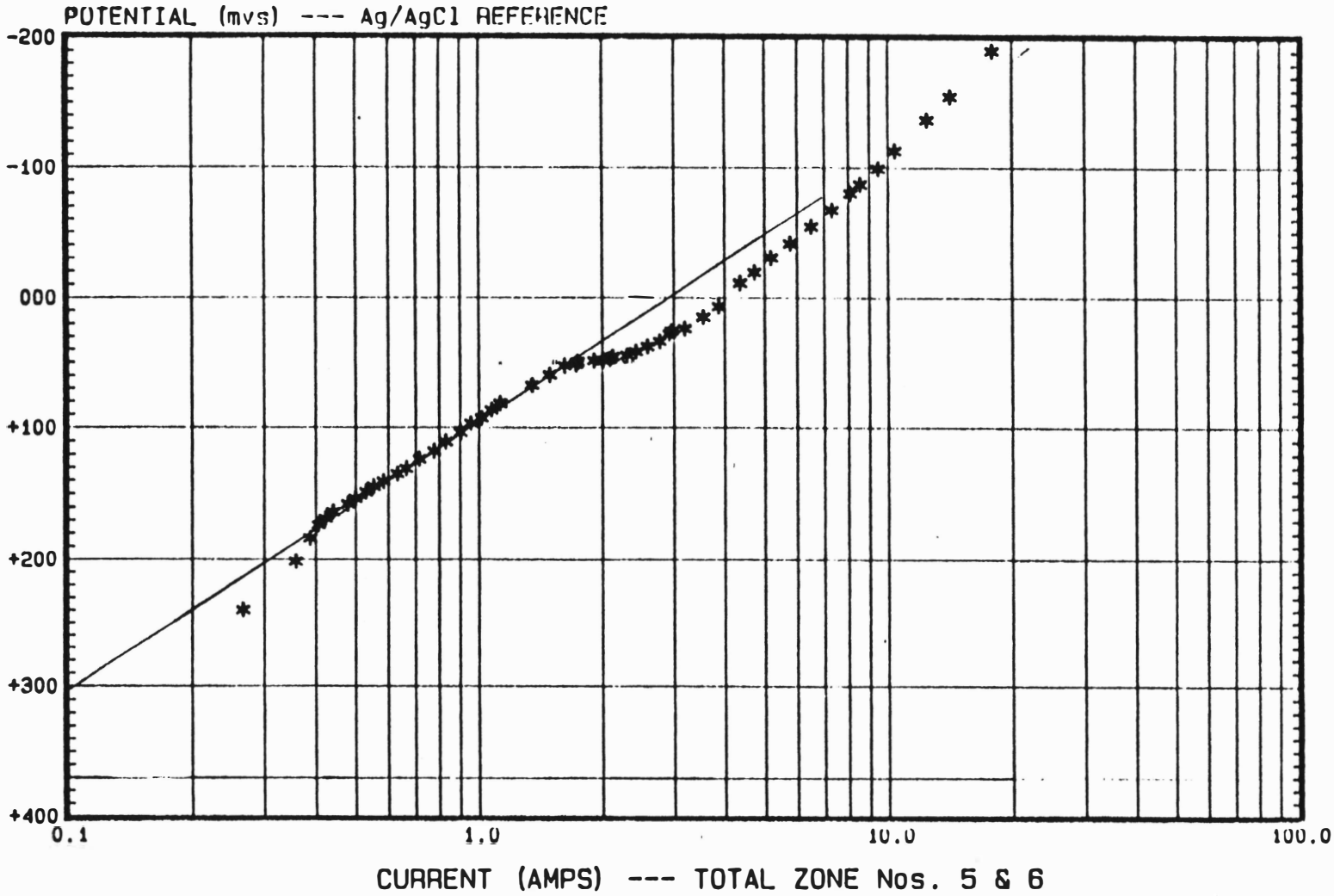
## ZONE No. 5

March 14, 1985

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## ZONE No. 5

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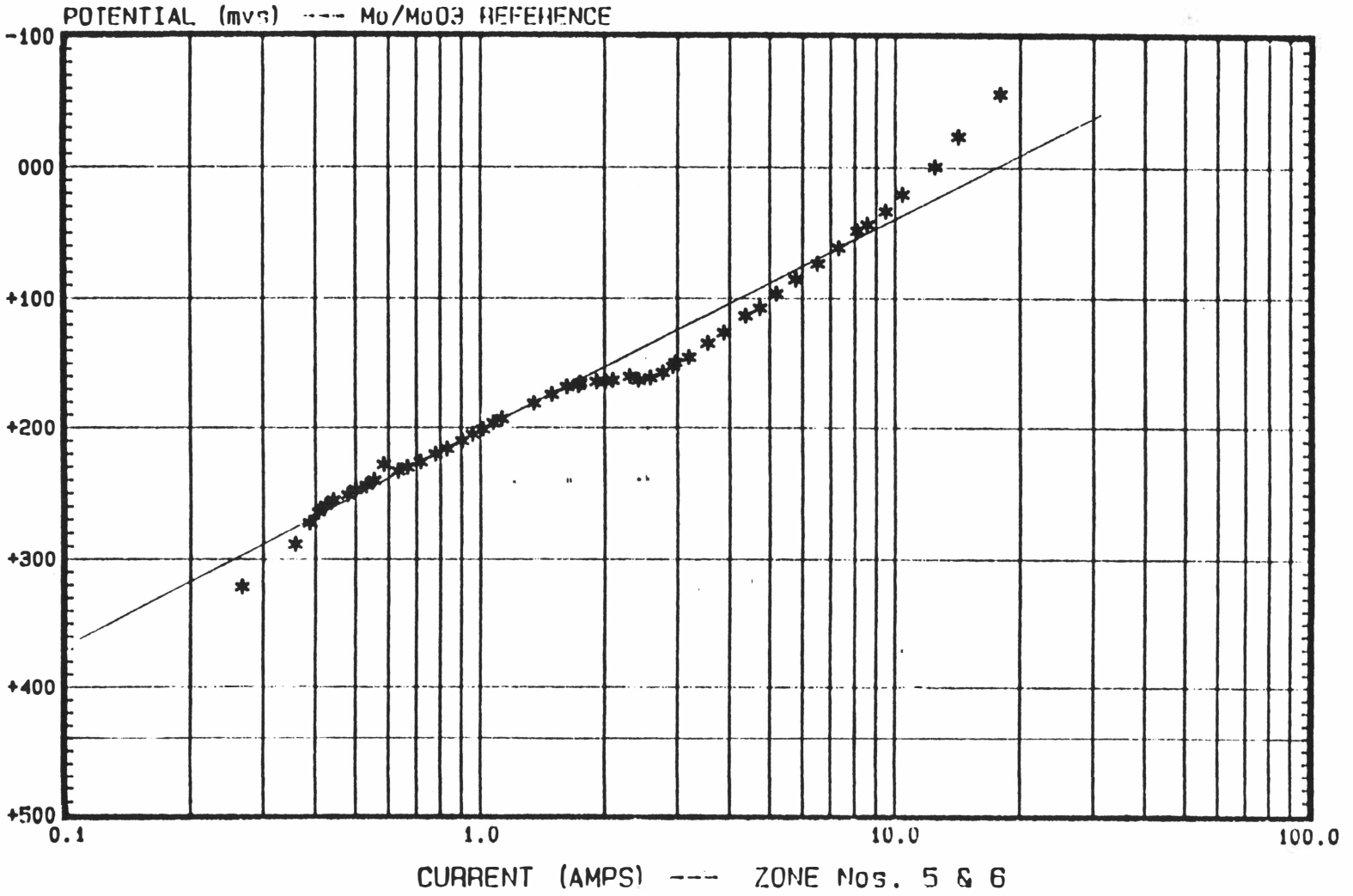


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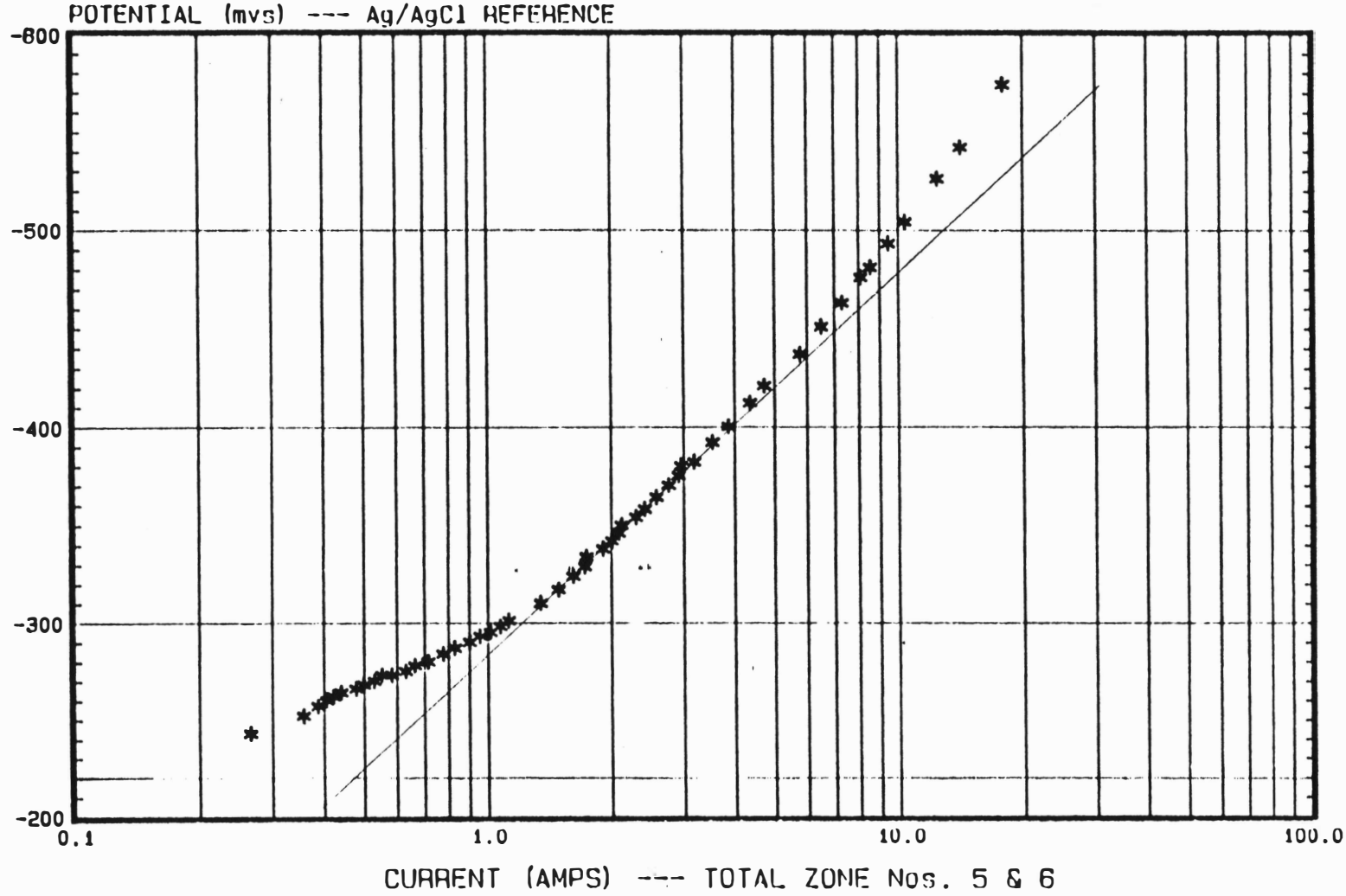
# E LOG-I TEST

## OKLAHOMA DEPARTMENT OF TRANSPORTATION -- PROJECT NO. M-8404(001)

## ZONE No. 6

March 14, 1985



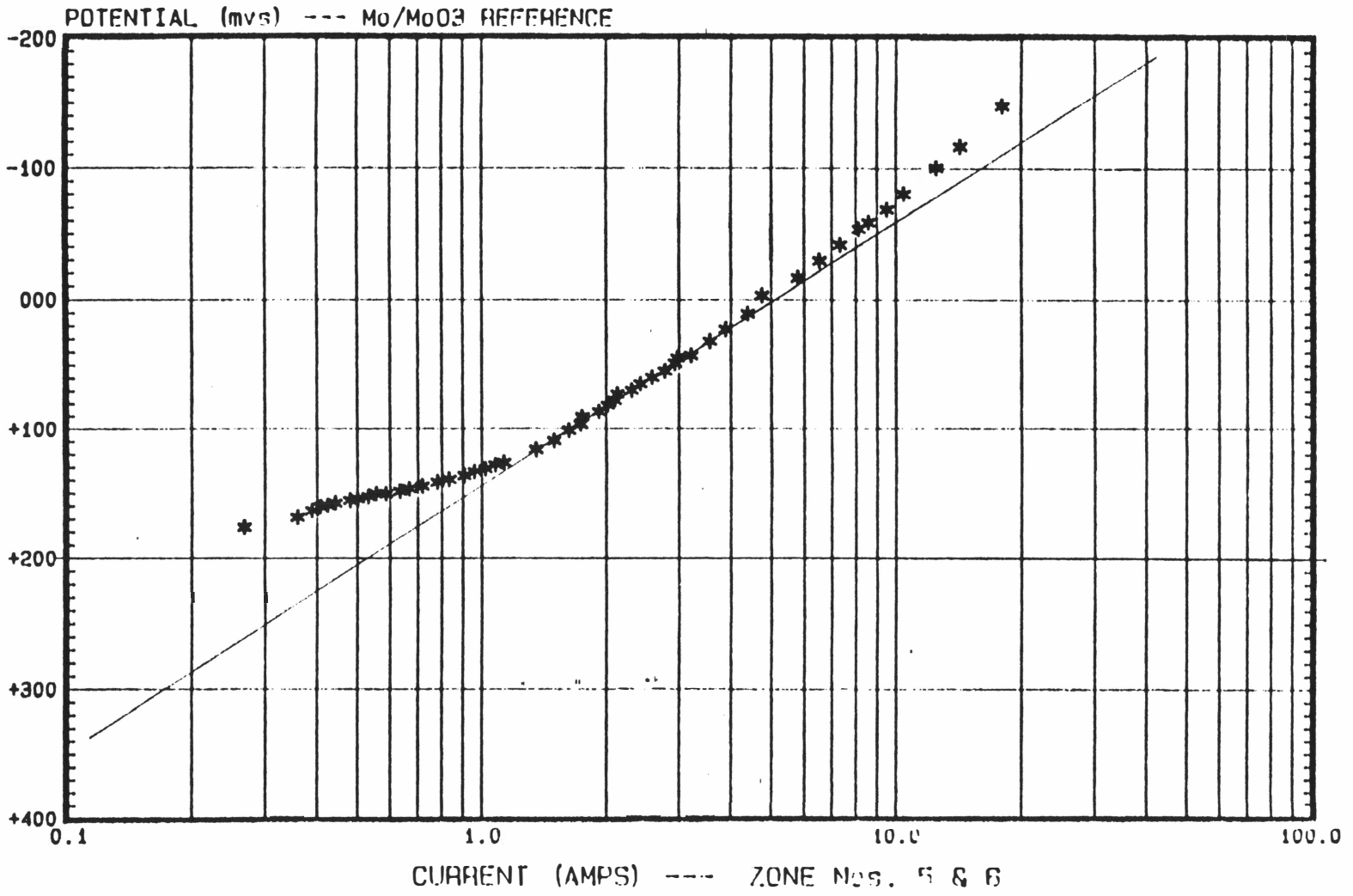

**PREPARED FOR: TWAY CONTRACTING COMPANY *** PREPARED BY: HARCO CORPORATION**

# E LOG-I TEST

## OKLAHOMA DEPARTMENT OF TRANSPORTATION -- PROJECT NO. M-8404(001)

## ZONE No. 6

March 14, 1985

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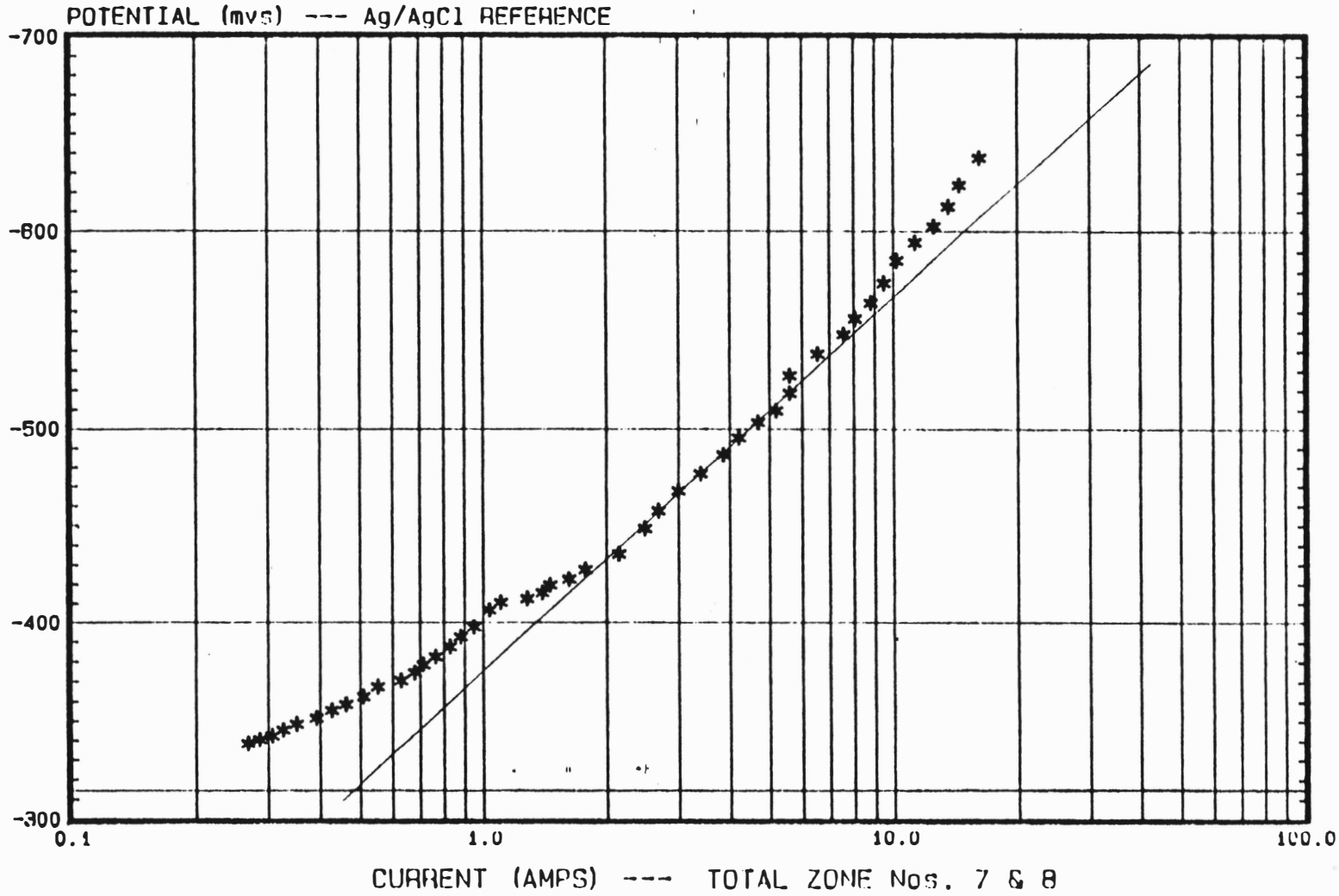
## OKLAHOMA DEPARTMENT OF TRANSPORTATION -- PROJECT NO. M-8404 (001)

## ZONE No. 7

March 14, 1985

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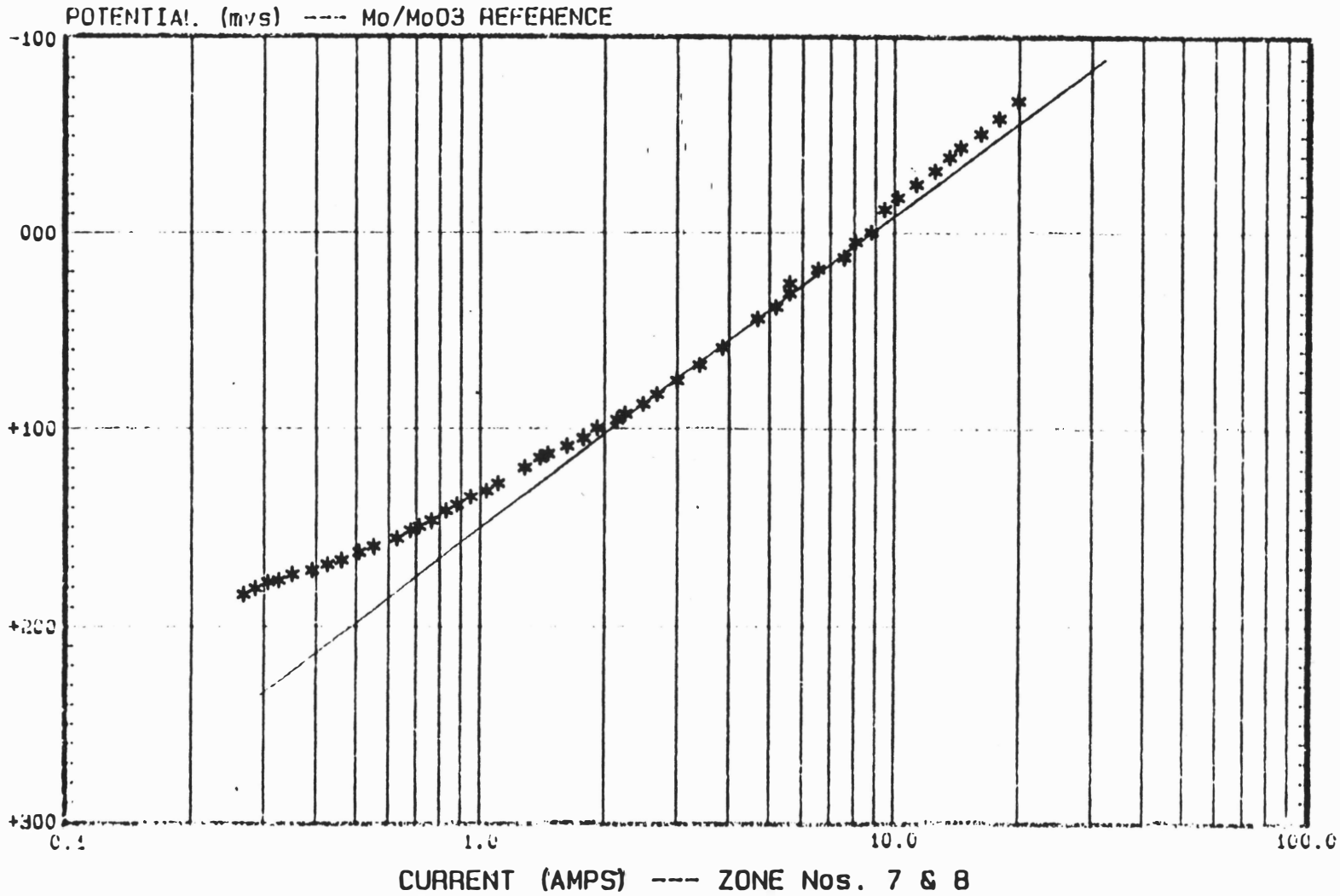
# E LOG-I TEST

## OKLAHOMA DEPARTMENT OF TRANSPORTATION -- PROJECT NO. M-8404(001)

## ZONE No. 7

March 14, 1985



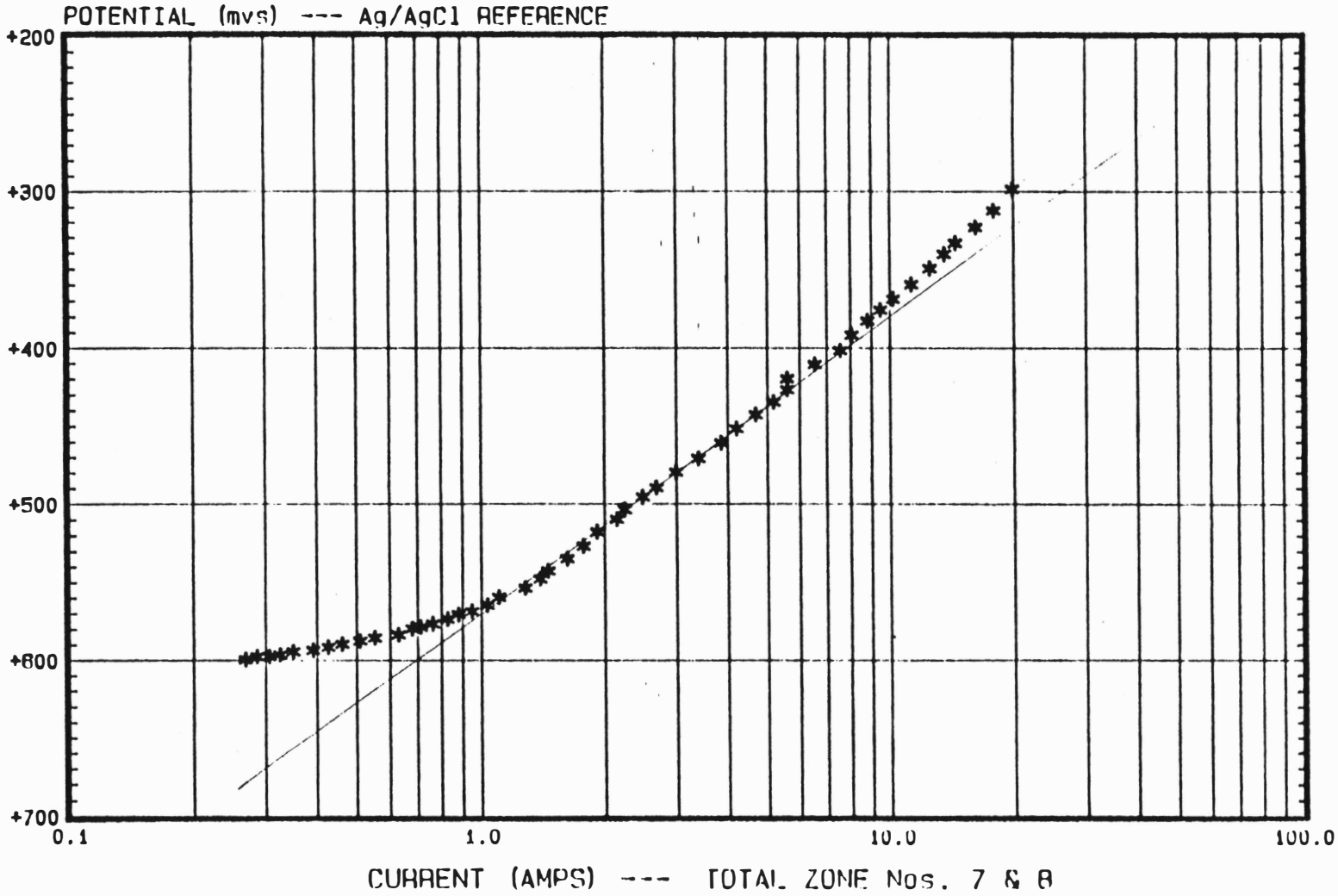

**PREPARED FOR: TWAY CONTRACTING COMPANY *** PREPARED BY: HARCO CORPORATION**

# E LOG-I TEST

## OKLAHOMA DEPARTMENT OF TRANSPORTATION -- PROJECT NO. RS-6620 (100)

## ZONE No. 8

March 14, 1985




**PREPARED FOR: TWAY CONTRACTING COMPANY *** PREPARED BY: HARCO CORPORATION**

## E-LOG I TEST

Tulsa County Bridge
Zone 1
March 13, 1985

### REINFORCING STEEL TO CONCRETE POTENTIAL

| READING NUMBER | CURRENT APPLIED (D.C. AMPS) | VERSUS SILVER/SILVER CHLORIDE REFERENCE ELECTRODE (millivolts) | VERSUS MOLYBDENUM/ MOLYBDENUM OXIDE REFERENCE ELECTRODE (millivolts) |
|---|---|---|---|
| 1 | 0.00 | -315 | ---- |
| 2 | 0.33 | -349 | ---- |
| 3 | 0.38 | -342 | ---- |
| 4 | 0.47 | -345 | ---- |
| 5 | 0.52 | -346 | ---- |
| 6 | 0.60 | -349 | ---- |
| 7 | 0.66 | -350 | ---- |
| 8 | 0.73 | -355 | ---- |
| 9 | 0.81 | -358 | ---- |
| 10 | 0.85 | -360 | ---- |
| 11 | 0.95 | -364 | ---- |
| 12 | 0.96 | -374 | ---- |
| 13 | 1.03 | -368 | ---- |
| 14 | 1.11 | -371 | ---- |
| 15 | 1.19 | -373 | ---- |
| 16 | 1.30 | -378 | ---- |
| 17 | 1.43 | -384 | ---- |
| 18 | 1.55 | -386 | ---- |
| 19 | 1.70 | -391 | ---- |
| 20 | 1.88 | -396 | ---- |
| 21 | 2.04 | -402 | ---- |
| 22 | 2.23 | -309 | ---- |
| 23 | 2.52 | -416 | ---- |
| 24 | 2.61 | -421 | ---- |

| READING NUMBER | CURRENT APPLIED (D.C. AMPS) | REINFORCING STEEL TO CONCRETE POTENTIAL | |
|---|---|---|---|
| | | VERSUS SILVER/SILVER CHLORIDE REFERENCE ELECTRODE (millivolts) | VERSUS MOLYBDENUM/ MOLYBDENUM OXIDE REFERENCE ELECTRODE (millivolts) |
| 25 | 2.79 | -426 | ---- |
| 26 | 2.98 | -432 | ---- |
| 27 | 3.10 | -437 | ---- |
| 28 | 3.30 | -442 | ---- |
| 29 | 3.37 | -445 | ---- |
| 30 | 3.34 | -444 | ---- |
| 31 | 3.67 | -452 | ---- |
| 32 | 3.89 | -458 | ---- |
| 33 | 4.06 | -464 | ---- |
| 34 | 4.43 | -471 | ---- |
| 35 | 4.70 | -477 | ---- |
| 36 | 4.94 | -482 | ---- |
| 37 | 5.08 | -487 | ---- |
| 38 | 5.30 | -491 | ---- |
| 39 | 5.55 | -496 | ---- |
| 40 | 5.70 | -502 | ---- |
| 41 | 5.95 | -505 | ---- |
| 42 | 6.33 | -514 | ---- |
| 43 | 6.67 | -506 | ---- |
| 44 | 6.92 | -512 | ---- |

## E-LOG I TEST

Tulsa County Bridge
Zone 2
March 13, 1985

### REINFORCING STEEL TO CONCRETE POTENTIAL

| READING NUMBER | CURRENT APPLIED (D.C. AMPS) | VERSUS SILVER/SILVER CHLORIDE REFERENCE ELECTRODE (millivolts) | VERSUS MOLYBDENUM/ MOLYBDENUM OXIDE REFERENCE ELECTRODE (millivolts) |
|---|---|---|---|
| 1 | 0.00 | -380 | ---- |
| 2 | 0.10 | -406 | ---- |
| 3 | 0.12 | -410 | ---- |
| 4 | 0.15 | -413 | ---- |
| 5 | 0.16 | -415 | ---- |
| 6 | 0.19 | -418 | ---- |
| 7 | 0.22 | -420 | ---- |
| 8 | 0.25 | -421 | ---- |
| 9 | 0.29 | -423 | ---- |
| 10 | 0.31 | -424 | ---- |
| 11 | 0.35 | -406 | ---- |
| 12 | 0.35 | -426 | ---- |
| 13 | 0.40 | -428 | ---- |
| 14 | 0.43 | -429 | ---- |
| 15 | 0.48 | -430 | ---- |
| 16 | 0.55 | -433 | ---- |
| 17 | 0.61 | -435 | ---- |
| 18 | 0.69 | -437 | ---- |
| 19 | 0.78 | -440 | ---- |
| 20 | 0.87 | -442 | ---- |
| 21 | 0.97 | -446 | ---- |
| 22 | 1.05 | -449 | ---- |
| 23 | 1.28 | -453 | ---- |
| 24 | 1.34 | -456 | ---- |

## REINFORCING STEEL TO CONCRETE POTENTIAL

| READING NUMBER | CURRENT APPLIED (D.C. AMPS) | VERSUS SILVER/SILVER CHLORIDE REFERENCE ELECTRODE (millivolts) | VERSUS MOLYBDENUM/ MOLYBDENUM OXIDE REFERENCE ELECTRODE (millivolts) |
|---|---|---|---|
| 25 | 1.46 | -459 | ---- |
| 26 | 1.61 | -462 | ---- |
| 27 | 1.67 | -465 | ---- |
| 28 | 1.80 | -468 | ---- |
| 29 | 1.85 | -470 | ---- |
| 30 | 1.83 | -470 | ---- |
| 31 | 2.04 | -475 | ---- |
| 32 | 2.20 | -480 | ---- |
| 33 | 2.30 | -483 | ---- |
| 34 | 2.54 | -489 | ---- |
| 35 | 2.73 | -494 | ---- |
| 36 | 2.93 | -499 | ---- |
| 37 | 3.07 | -502 | ---- |
| 38 | 3.20 | -505 | ---- |
| 39 | 3.34 | -510 | ---- |
| 40 | 3.50 | -514 | ---- |
| 41 | 3.65 | -517 | ---- |
| 42 | 3.91 | -523 | ---- |
| 43 | 4.15 | -513 | ---- |
| 44 | 4.33 | -518 | ---- |

## E-LOG I TEST

Tulsa County Bridge
Zone 3
March 14, 1985

### REINFORCING STEEL TO CONCRETE POTENTIAL

| READING NUMBER | CURRENT APPLIED (D.C. AMPS) | VERSUS SILVER/SILVER CHLORIDE REFERENCE ELECTRODE (millivolts) | VERSUS MOLYBDENUM/ MOLYBDENUM OXIDE REFERENCE ELECTRODE (millivolts) |
|---|---|---|---|
| 1 | 0.00 | -289 | +342 |
| 2 | 0.07 | -332 | +287 |
| 3 | 0.10 | -352 | +265 |
| 4 | 0.10 | -365 | +253 |
| 5 | 0.11 | -373 | +248 |
| 6 | 0.11 | -380 | +243 |
| 7 | 0.11 | -386 | +240 |
| 8 | 0.12 | -392 | +237 |
| 9 | 0.13 | -397 | +233 |
| 10 | 0.14 | -403 | +230 |
| 11 | 0.14 | -408 | +226 |
| 12 | 0.15 | -412 | +224 |
| 13 | 0.17 | -417 | +220 |
| 14 | 0.17 | -422 | +217 |
| 15 | 0.19 | -428 | +212 |
| 16 | 0.21 | -433 | +207 |
| 17 | 0.22 | -439 | +203 |
| 18 | 0.24 | -445 | +199 |
| 19 | 0.26 | -450 | +195 |
| 20 | 0.27 | -454 | +192 |
| 21 | 0.30 | -459 | +189 |
| 22 | 0.32 | -463 | +187 |
| 23 | 0.39 | -473 | +176 |
| 24 | 0.46 | -460 | +169 |

| READING NUMBER | CURRENT APPLIED (D.C. AMPS) | REINFORCING STEEL TO CONCRETE POTENTIAL VERSUS SILVER/SILVER CHLORIDE REFERENCE ELECTRODE (millivolts) | REINFORCING STEEL TO CONCRETE POTENTIAL VERSUS MOLYBDENUM/ MOLYBDENUM OXIDE REFERENCE ELECTRODE (millivolts) |
|---|---|---|---|
| 25 | 0.52 | -487 | +162 |
| 26 | 0.56 | -492 | +158 |
| 27 | 0.61 | -497 | +153 |
| 28 | 0.65 | -502 | +148 |
| 29 | 0.70 | -506 | +143 |
| 30 | 0.75 | -510 | +139 |
| 31 | 0.79 | -515 | +133 |
| 32 | 0.84 | -520 | +130 |
| 33 | 0.89 | -525 | +125 |
| 34 | 0.96 | -530 | +119 |
| 35 | 1.03 | -536 | +114 |
| 36 | 1.12 | -542 | +108 |
| 37 | 1.11 | -547 | +104 |
| 38 | 1.20 | -549 | +102 |
| 39 | 1.38 | -557 | +090 |
| 40 | 1.47 | -564 | +082 |
| 41 | 1.68 | -572 | +071 |
| 42 | 1.84 | -578 | +063 |
| 43 | 2.03 | -586 | +053 |
| 44 | 2.27 | -594 | +043 |
| 45 | 2.58 | -603 | +032 |
| 46 | 2.89 | -613 | +019 |
| 47 | 3.23 | -624 | +007 |
| 48 | 3.42 | -630 | -002 |
| 49 | 3.78 | -639 | -015 |
| 50 | 4.15 | -650 | -028 |
| 51 | 5.00 | -667 | -050 |
| 52 | 5.71 | -684 | -067 |
| 53 | 7.30 | -710 | -100 |

## E-LOG I TEST

Tulsa County Bridge
Zone 4
March 14, 1985

### REINFORCING STEEL TO CONCRETE POTENTIAL

| READING NUMBER | CURRENT APPLIED (D.C. AMPS) | VERSUS SILVER/SILVER CHLORIDE REFERENCE ELECTRODE (millivolts) | VERSUS MOLYBDENUM/ MOLYBDENUM OXIDE REFERENCE ELECTRODE (millivolts) |
|---|---|---|---|
| 1 | 0.00 | +488 | +270 |
| 2 | 0.07 | +428 | +245 |
| 3 | 0.09 | +402 | +234 |
| 4 | 0.09 | +388 | +229 |
| 5 | 0.10 | +380 | +226 |
| 6 | 0.10 | +374 | +223 |
| 7 | 0.10 | +370 | +221 |
| 8 | 0.11 | +364 | +220 |
| 9 | 0.12 | +359 | +219 |
| 10 | 0.13 | +354 | +216 |
| 11 | 0.13 | +350 | +215 |
| 12 | 0.14 | +347 | +213 |
| 13 | 0.15 | +341 | +212 |
| 14 | 0.16 | +338 | +212 |
| 15 | 0.17 | +332 | +209 |
| 16 | 0.19 | +326 | +207 |
| 17 | 0.20 | +321 | +206 |
| 18 | 0.22 | +316 | +205 |
| 19 | 0.24 | +312 | +202 |
| 20 | 0.25 | +310 | +199 |
| 21 | 0.27 | +306 | +195 |
| 22 | 0.29 | +303 | +190 |
| 23 | 0.36 | +285 | +176 |
| 24 | 0.42 | +272 | +162 |

| READING NUMBER | CURRENT APPLIED (D.C. AMPS) | REINFORCING STEEL TO CONCRETE POTENTIAL VERSUS SILVER/SILVER CHLORIDE REFERENCE ELECTRODE (millivolts) | REINFORCING STEEL TO CONCRETE POTENTIAL VERSUS MOLYBDENUM/ MOLYBDENUM OXIDE REFERENCE ELECTRODE (millivolts) |
|---|---|---|---|
| 25 | 0.47 | +257 | +147 |
| 26 | 0.51 | +246 | +136 |
| 27 | 0.56 | +234 | +125 |
| 28 | 0.60 | +224 | +115 |
| 29 | 0.64 | +213 | +106 |
| 30 | 0.68 | +203 | +098 |
| 31 | 0.73 | +193 | +090 |
| 32 | 0.77 | +185 | +083 |
| 33 | 0.81 | +176 | +076 |
| 34 | 0.88 | +166 | +067 |
| 35 | 0.93 | +156 | +059 |
| 36 | 1.01 | +146 | +051 |
| 37 | 1.03 | +138 | +044 |
| 38 | 1.10 | +135 | +036 |
| 39 | 1.25 | +118 | +019 |
| 40 | 1.34 | +107 | +008 |
| 41 | 1.56 | +090 | -004 |
| 42 | 1.68 | +080 | -016 |
| 43 | 1.88 | +065 | -030 |
| 44 | 2.08 | +052 | -043 |
| 45 | 2.35 | +038 | -056 |
| 46 | 2.64 | +022 | -071 |
| 47 | 2.96 | +007 | -085 |
| 48 | 3.11 | -009 | -092 |
| 49 | 3.45 | -022 | -103 |
| 50 | 3.84 | -037 | -116 |
| 51 | 4.58 | -062 | -137 |
| 52 | 5.24 | -081 | -154 |
| 53 | 6.64 | -116 | -183 |

## E-LOG I TEST

Tulsa County Bridge
Zone 5
March 14, 1985

### REINFORCING STEEL TO CONCRETE POTENTIAL

| READING NUMBER | CURRENT APPLIED (D.C. AMPS) | VERSUS SILVER/SILVER CHLORIDE REFERENCE ELECTRODE (millivolts) | VERSUS MOLYBDENUM/ MOLYBDENUM OXIDE REFERENCE ELECTRODE (millivolts) |
|---|---|---|---|
| 1 | 0.00 | +371 | +440 |
| 2 | 0.15 | +240 | +322 |
| 3 | 0.20 | +202 | +289 |
| 4 | 0.22 | +184 | +273 |
| 5 | 0.23 | +174 | +265 |
| 6 | 0.24 | +169 | +260 |
| 7 | 0.25 | +164 | +256 |
| 8 | 0.27 | +158 | +252 |
| 9 | 0.29 | +154 | +248 |
| 10 | 0.30 | +149 | +245 |
| 11 | 0.32 | +145 | +241 |
| 12 | 0.33 | +141 | +239 |
| 13 | 0.36 | +135 | +234 |
| 14 | 0.38 | +131 | +231 |
| 15 | 0.41 | +124 | +227 |
| 16 | 0.44 | +118 | +221 |
| 17 | 0.47 | +111 | +217 |
| 18 | 0.51 | +104 | +211 |
| 19 | 0.54 | +097 | +206 |
| 20 | 0.57 | +093 | +202 |
| 21 | 0.60 | +087 | +197 |
| 22 | 0.64 | +082 | +194 |
| 23 | 0.75 | +068 | +182 |
| 24 | 0.83 | +060 | +175 |

| READING NUMBER | CURRENT APPLIED (D.C. AMPS) | REINFORCING STEEL TO CONCRETE POTENTIAL VERSUS SILVER/SILVER CHLORIDE REFERENCE ELECTRODE (millivolts) | REINFORCING STEEL TO CONCRETE POTENTIAL VERSUS MOLYBDENUM/ MOLYBDENUM OXIDE REFERENCE ELECTRODE (millivolts) |
|---|---|---|---|
| 25 | 0.90 | +053 | +169 |
| 26 | 0.96 | +052 | +168 |
| 27 | 0.95 | +050 | +166 |
| 28 | 1.05 | +049 | +165 |
| 29 | 1.11 | +049 | +165 |
| 30 | 1.15 | +048 | +164 |
| 31 | 1.22 | +046 | ---- |
| 32 | 1.26 | +045 | +161 |
| 33 | 1.32 | +042 | +164 |
| 34 | 1.40 | +038 | +162 |
| 35 | 1.50 | +034 | +158 |
| 36 | 1.58 | +028 | +153 |
| 37 | 1.60 | +026 | +150 |
| 38 | 1.72 | +024 | +146 |
| 39 | 1.90 | +015 | +135 |
| 40 | 2.08 | +007 | +107 |
| 41 | 2.35 | -011 | +114 |
| 42 | 2.52 | -019 | +108 |
| 43 | 2.77 | -030 | +097 |
| 44 | 3.09 | -041 | +086 |
| 45 | 3.48 | -054 | +074 |
| 46 | 3.89 | -067 | +062 |
| 47 | 4.32 | -080 | +049 |
| 48 | 4.54 | -087 | +044 |
| 49 | 5.03 | -099 | +034 |
| 50 | 5.50 | -113 | +021 |
| 51 | 6.60 | -137 | +000 |
| 52 | 7.52 | -155 | -023 |
| 53 | 9.50 | -190 | -056 |

## E-LOG I TEST

Tulsa County Bridge
Zone 6
March 14, 1985

REINFORCING STEEL TO-CONCRETE POTENTIAL

| READING NUMBER | CURRENT APPLIED (D.C. AMPS) | VERSUS SILVER/SILVER CHLORIDE REFERENCE ELECTRODE (millivolts) | VERSUS MOLYBDENUM/ MOLYBDENUM OXIDE REFERENCE ELECTRODE (millivolts) |
|---|---|---|---|
| 1 | 0.00 | -218 | +200 |
| 2 | 0.12 | -243 | +177 |
| 3 | 0.16 | -252 | +169 |
| 4 | 0.17 | -257 | +164 |
| 5 | 0.18 | -260 | +161 |
| 6 | 0.18 | -262 | +160 |
| 7 | 0.19 | -264 | +158 |
| 8 | 0.21 | -266 | +156 |
| 9 | 0.22 | -268 | +155 |
| 10 | 0.23 | -270 | +153 |
| 11 | 0.24 | -273 | +151 |
| 12 | 0.25 | -273 | +151 |
| 13 | 0.28 | -275 | +149 |
| 14 | 0.29 | -278 | +147 |
| 15 | 0.31 | -280 | +145 |
| 16 | 0.34 | -284 | +142 |
| 17 | 0.36 | -287 | +140 |
| 18 | 0.40 | -290 | +137 |
| 19 | 0.42 | -293 | +134 |
| 20 | 0.45 | -295 | +132 |
| 21 | 0.47 | -298 | +129 |
| 22 | 0.50 | -301 | +127 |
| 23 | 0.60 | -310 | +117 |
| 24 | 0.67 | -317 | +110 |

| READING NUMBER | CURRENT APPLIED (D.C. AMPS) | REINFORCING STEEL TO CONCRETE POTENTIAL VERSUS SILVER/SILVER CHLORIDE REFERENCE ELECTRODE (millivolts) | REINFORCING STEEL TO CONCRETE POTENTIAL VERSUS MOLYBDENUM/ MOLYBDENUM OXIDE REFERENCE ELECTRODE (millivolts) |
|---|---|---|---|
| 25 | 0.72 | -324 | +102 |
| 26 | 0.77 | -329 | +097 |
| 27 | 0.80 | -334 | +091 |
| 28 | 0.87 | -338 | +087 |
| 29 | 0.91 | -342 | +082 |
| 30 | 0.95 | -346 | +078 |
| 31 | 1.01 | -350 | +073 |
| 32 | 1.05 | -354 | +070 |
| 33 | 1.10 | -358 | +065 |
| 34 | 1.19 | -364 | +060 |
| 35 | 1.28 | -370 | +055 |
| 36 | 1.35 | -375 | +049 |
| 37 | 1.37 | -380 | +045 |
| 38 | 1.48 | -382 | +043 |
| 39 | 1.65 | -392 | +032 |
| 40 | 1.80 | -400 | +023 |
| 41 | 2.03 | -412 | +011 |
| 42 | 2.21 | -421 | -003 |
| 43 | 2.43 | ---- | ---- |
| 44 | 2.70 | -437 | -016 |
| 45 | 3.05 | -451 | -029 |
| 46 | 3.44 | -463 | -041 |
| 47 | 3.81 | -476 | -053 |
| 48 | 4.04 | -481 | -058 |
| 49 | 4.47 | -493 | -068 |
| 50 | 4.93 | -504 | -080 |
| 51 | 5.90 | -526 | -100 |
| 52 | 6.73 | -542 | -116 |
| 53 | 8.50 | -574 | -147 |

## E-LOG I TEST

Tulsa County Bridge
Zone 7
March 14, 1985

| READING NUMBER | CURRENT APPLIED (D.C. AMPS) | REINFORCING STEEL TO CONCRETE POTENTIAL VERSUS SILVER/SILVER CHLORIDE REFERENCE ELECTRODE (millivolts) | REINFORCING STEEL TO CONCRETE POTENTIAL VERSUS MOLYBDENUM/ MOLYBDENUM OXIDE REFERENCE ELECTRODE (millivolts) |
|---|---|---|---|
| 1 | 0.00 | -315 | +199 |
| 2 | 0.12 | -332 | +184 |
| 3 | 0.13 | -335 | +181 |
| 4 | 0.13 | -338 | +178 |
| 5 | 0.14 | -340 | +177 |
| 6 | 0.15 | -342 | +174 |
| 7 | 0.17 | -345 | +172 |
| 8 | 0.19 | -348 | +169 |
| 9 | 0.20 | -351 | +167 |
| 10 | 0.22 | -355 | +163 |
| 11 | 0.24 | -358 | +160 |
| 12 | 0.28 | -362 | +156 |
| 13 | 0.30 | -367 | +152 |
| 14 | 0.31 | -370 | +150 |
| 15 | 0.34 | -374 | +147 |
| 16 | 0.36 | -378 | +142 |
| 17 | 0.39 | -382 | +139 |
| 18 | 0.42 | -387 | +135 |
| 19 | 0.46 | -392 | +132 |
| 20 | 0.50 | -397 | +128 |
| 21 | 0.58 | -406 | +120 |
| 22 | 0.63 | -410 | +115 |
| 23 | 0.66 | -412 | +113 |
| 24 | 0.74 | -415 | +109 |

| READING NUMBER | CURRENT APPLIED (D.C. AMPS) | REINFORCING STEEL TO CONCRETE POTENTIAL VERSUS SILVER/SILVER CHLORIDE REFERENCE ELECTRODE (millivolts) | REINFORCING STEEL TO CONCRETE POTENTIAL VERSUS MOLYBDENUM/ MOLYBDENUM OXIDE REFERENCE ELECTRODE (millivolts) |
|---|---|---|---|
| 25 | 0.81 | -419 | +105 |
| 26 | 0.88 | -422 | +100 |
| 27 | 1.00 | -427 | +096 |
| 28 | 1.03 | -430 | +093 |
| 29 | 1.15 | -435 | +088 |
| 30 | 1.26 | -440 | +083 |
| 31 | 1.40 | -448 | +076 |
| 32 | 1.60 | -457 | +068 |
| 33 | 1.83 | -467 | +059 |
| 34 | 1.98 | -476 | +052 |
| 35 | 2.24 | -486 | +044 |
| 36 | 2.48 | -495 | +038 |
| 37 | 2.70 | -503 | +031 |
| 38 | 2.92 | -509 | +026 |
| 39 | 3.17 | -518 | +019 |
| 40 | 3.50 | -527 | +013 |
| 41 | 3.93 | -538 | +005 |
| 42 | 4.30 | -548 | +000 |
| 43 | 4.64 | -556 | -012 |
| 44 | 5.00 | -564 | -018 |
| 45 | 5.54 | -574 | -025 |
| 46 | 6.19 | -585 | -032 |
| 47 | 6.70 | -594 | -039 |
| 48 | 7.12 | -602 | -044 |
| 49 | 8.04 | -612 | -051 |
| 50 | 8.91 | -623 | -059 |
| 51 | 9.95 | -637 | -068 |

## E-LOG I TEST

Tulsa County Bridge
Zone 8
March 14, 1985

### REINFORCING STEEL TO CONCRETE POTENTIAL

| READING NUMBER | CURRENT APPLIED (D.C. AMPS) | VERSUS SILVER/SILVER CHLORIDE REFERENCE ELECTRODE (millivolts) | VERSUS MOLYBDENUM/ MOLYBDENUM OXIDE REFERENCE ELECTRODE (millivolts) |
|---|---|---|---|
| 1 | 0.00 | +603 | ---- |
| 2 | 0.15 | +600 | ---- |
| 3 | 0.16 | +598 | ---- |
| 4 | 0.17 | +598 | ---- |
| 5 | 0.18 | +597 | ---- |
| 6 | 0.20 | +595 | ---- |
| 7 | 0.22 | +594 | ---- |
| 8 | 0.24 | +592 | ---- |
| 9 | 0.26 | +590 | ---- |
| 10 | 0.29 | +588 | ---- |
| 11 | 0.31 | +586 | ---- |
| 12 | 0.35 | +584 | ---- |
| 13 | 0.38 | +580 | ---- |
| 14 | 0.40 | +579 | ---- |
| 15 | 0.43 | +577 | ---- |
| 16 | 0.47 | +574 | ---- |
| 17 | 0.49 | +571 | ---- |
| 18 | 0.53 | +569 | ---- |
| 19 | 0.58 | +565 | ---- |
| 20 | 0.61 | +560 | ---- |
| 21 | 0.70 | +554 | ---- |
| 22 | 0.77 | +548 | ---- |
| 23 | 0.80 | +543 | ---- |
| 24 | 0.89 | +535 | ---- |

| READING NUMBER | CURRENT APPLIED (D.C. AMPS) | REINFORCING STEEL TO CONCRETE POTENTIAL VERSUS SILVER/SILVER CHLORIDE REFERENCE ELECTRODE (millivolts) | REINFORCING STEEL TO CONCRETE POTENTIAL VERSUS MOLYBDENUM/ MOLYBDENUM OXIDE REFERENCE ELECTRODE (millivolts) |
|---|---|---|---|
| 25 | 0.89 | +535 | ---- |
| 26 | 0.98 | +527 | ---- |
| 27 | 1.04 | +518 | ---- |
| 28 | 1.15 | +510 | ---- |
| 29 | 1.21 | +504 | ---- |
| 30 | 1.33 | +496 | ---- |
| 31 | 1.42 | +490 | ---- |
| 32 | 1.60 | +480 | ---- |
| 33 | 2.03 | +461 | ---- |
| 34 | 2.23 | +452 | ---- |
| 35 | 2.45 | +443 | ---- |
| 36 | 2.71 | +435 | ---- |
| 37 | 2.90 | +427 | ---- |
| 38 | 3.08 | +420 | ---- |
| 39 | 3.38 | +411 | ---- |
| 40 | 3.70 | +402 | ---- |
| 41 | 4.14 | +392 | ---- |
| 42 | 4.52 | +383 | ---- |
| 43 | 4.85 | +376 | ---- |
| 44 | 5.20 | +369 | ---- |
| 45 | 5.78 | +360 | ---- |
| 46 | 6.38 | +350 | ---- |
| 47 | 6.93 | +341 | ---- |
| 48 | 7.38 | +334 | ---- |
| 49 | 8.19 | +304 | ---- |
| 50 | 9.04 | +313 | ---- |
| 51 | 10.00 | +299 | ---- |

## E-LOG I TEST

Tulsa County Bridge
Zone 9
March 13, 1985

| READING NUMBER | CURRENT APPLIED (D.C. AMPS) | REINFORCING STEEL POTENTIAL VERSUS SILVER/SILVER CHLORIDE REFERENCE ELECTRODE (millivolts) | REINFORCING STEEL POTENTIAL VERSUS MOLYBDENUM/ MOLYBDENUM OXIDE REFERENCE ELECTRODE (millivolts) |
|---|---|---|---|
| 1 | 0.00 | -151 | ---- |
| 2 | 0.01 | -167 | ---- |
| 3 | 0.02 | -169 | ---- |
| 4 | 0.02 | -175 | ---- |
| 5 | 0.02 | -179 | ---- |
| 6 | 0.03 | -185 | ---- |
| 7 | 0.04 | -191 | ---- |
| 8 | 0.04 | -197 | ---- |
| 9 | 0.05 | -204 | ---- |
| 10 | 0.05 | -209 | ---- |
| 11 | 0.06 | -215 | ---- |
| 12 | 0.06 | -216 | ---- |
| 13 | 0.07 | -223 | ---- |
| 14 | 0.08 | -228 | ---- |
| 15 | 0.09 | -233 | ---- |
| 16 | 0.11 | -242 | ---- |
| 17 | 0.13 | -249 | ---- |
| 18 | 0.14 | -257 | ---- |
| 19 | 0.17 | -265 | ---- |
| 20 | 0.19 | -273 | ---- |
| 21 | 0.23 | -283 | ---- |
| 22 | 0.25 | -291 | ---- |
| 23 | 0.31 | -303 | ---- |
| 24 | 0.32 | -308 | ---- |

| READING NUMBER | CURRENT APPLIED (D.C. AMPS) | REINFORCING STEEL POTENTIAL VERSUS SILVER/SILVER CHLORIDE REFERENCE ELECTRODE (millivolts) | REINFORCING STEEL POTENTIAL VERSUS MOLYBDENUM/ MOLYBDENUM OXIDE REFERENCE ELECTRODE (millivolts) |
|---|---|---|---|
| 25 | 0.35 | -313 | ---- |
| 26 | 0.39 | -318 | ---- |
| 27 | 0.40 | -321 | ---- |
| 28 | 0.44 | -326 | ---- |
| 29 | 0.45 | -327 | ---- |
| 30 | 0.43 | -323 | ---- |
| 31 | 0.50 | -332 | ---- |
| 32 | 0.55 | -337 | ---- |
| 33 | 0.58 | -342 | ---- |
| 34 | 0.67 | -353 | ---- |
| 35 | 0.72 | -362 | ---- |
| 36 | 0.78 | -371 | ---- |
| 37 | 0.82 | -377 | ---- |
| 38 | 0.86 | -385 | ---- |
| 39 | 0.93 | -394 | ---- |
| 40 | 0.99 | -402 | ---- |
| 41 | 1.05 | -410 | ---- |
| 42 | 1.16 | -421 | ---- |
| 43 | 1.25 | -428 | ---- |
| 44 | 1.30 | -432 | ---- |

## EMBEDDED STEEL TO CONCRETE POTENTIAL MEASUREMENTS

Versus Portable Copper-Copper Sulfate Reference Electrode

TULSA COUNTY BRIDGE

Static Potentials March 12, 1985
"IR Drop Free" Potentials March 15, 1985

| EADING UMBER | EMBEDDED STEEL TO CONCRETE STATIC POTENTIAL (MILLIVOLTS) | CURRENT APPLIED EMBEDDED STEEL TO CONCRETE "IR DROP FREE" POTENTIAL (MILLIVOLTS) | POLARIZATION (MILLIVOLTS) |
|---|---|---|---|
| 1 | -350 | -420 | 70 |
| 2 | -300 | -370 | 70 |
| 3 | -180 | -300 | 120 |
| 4 | -160 | -310 | 150 |
| 5 | -360 | -490 | 130 |
| 6 | -260 | -390 | 130 |
| 7 | -170 | -270 | 100 |
| 8 | -170 | -290 | 120 |
| 9 | -230 | -500 | 270 |
| 10 | -230 | -410 | 180 |
| 11 | -170 | -210 | 40 |
| 12 | -240 | -390 | 150 |
| 13 | -340 | -400 | 160 |
| 14 | -250 | -440 | 190 |
| 15 | -210 | -430 | 220 |
| 16 | -230 | -380 | 150 |
| 17 | -150 | -170 | 20 |
| 18 | -170 | -170 | 0 |
| 19 | -250 | -380 | 130 |
| 20 | -220 | -410 | 190 |
| 21 | -190 | -450 | 260 |
| 22 | -200 | -440 | 240 |
| 23 | -170 | -480 | 310 |
| 24 | -130 | -390 | 260 |
| 25 | -190 | -480 | 290 |

| READING NUMBER | EMBEDDED STEEL TO CONCRETE STATIC POTENTIAL (MILLIVOLTS) | CURRENT APPLIED EMBEDDED STEEL TO CONCRETE "IR DROP FREE" POTENTIAL (MILLIVOLTS) | POLARIZATION (MILLIVOLTS) |
|---|---|---|---|
| 26 | -200 | -450 | 250 |
| 27 | -160 | -450 | 290 |
| 28 | -200 | -470 | 270 |
| 29 | -150 | -410 | 260 |
| 30 | -170 | -380 | 210 |
| 31 | -180 | -430 | 250 |
| 32 | -180 | -440 | 260 |
| 33 | -170 | -440 | 270 |
| 34 | -290 | -410 | 120 |
| 35 | -170 | -400 | 230 |
| 36 | -140 | -430 | 290 |
| 37 | -160 | -420 | 260 |
| 38 | -180 | -400 | 220 |
| 39 | -190 | -430 | 240 |
| 40 | -210 | -470 | 260 |
| 41 | -190 | -460 | 270 |
| 42 | -190 | -460 | 270 |
| 43 | -220 | -470 | 250 |
| 44 | -230 | -350 | 120 |
| 45 | -180 | -400 | 220 |
| 46 | -190 | -440 | 250 |
| 47 | -200 | -430 | 230 |
| 48 | -180 | -450 | 270 |
| 49 | -200 | -410 | 210 |
| 50 | -200 | -410 | 210 |
| 51 | -200 | -410 | 210 |
| 52 | -220 | -420 | 200 |
| 53 | -220 | -230 | 10 |
| 54 | -220 | -400 | 180 |
| 55 | -210 | -440 | 230 |
| 56 | -200 | -390 | 190 |
| 57 | -150 | -370 | 220 |
| 58 | -160 | -450 | 290 |

| READING NUMBER | EMBEDDED STEEL TO CONCRETE STATIC POTENTIAL (MILLIVOLTS) | CURRENT APPLIED EMBEDDED STEEL TO CONCRETE "IR DROP FREE" POTENTIAL (MILLIVOLTS) | POLARIZATION (MILLIVOLTS) |
|---|---|---|---|
| 59 | -110 | -430 | 320 |
| 60 | -170 | -450 | 280 |
| 61 | -130 | -400 | 270 |
| 62 | -280 | -320 | 40 |
| 63 | -200 | -500 | 300 |
| 64 | -150 | -440 | 290 |
| 65 | -150 | -410 | 260 |
| 66 | -130 | -370 | 240 |
| 67 | -240 | -410 | 170 |
| 68 | -210 | -490 | 280 |
| 69 | -170 | -460 | 290 |
| 70 | -190 | -450 | 260 |
| 71 | -180 | -430 | 250 |
| 72 | -210 | -450 | 240 |
| 73 | -200 | -420 | 220 |
| 74 | -180 | -450 | 270 |
| 75 | -160 | -370 | 210 |
| 76 | -160 | -360 | 200 |
| 77 | -180 | -410 | 230 |
| 78 | -200 | -500 | 300 |
| 79 | -170 | -500 | 330 |
| 80 | -180 | -580 | 400 |
| 81 | -180 | -590 | 410 |
| 82 | -210 | -560 | 350 |
| 83 | -190 | -580 | 390 |
| 84 | -190 | -590 | 400 |
| 85 | -200 | -570 | 370 |
| 86 | -210 | -540 | 330 |
| 87 | -210 | -590 | 380 |

# RECTIFIER SETTING FOR POLARIZATION MEASUREMENTS

TULSA COUNTY BRIDGE

March 14, 1985

| ZONE NUMBER | CURRENT OUTPUT OF RECTIFIER (Amps) |
|---|---|
| 1 | 2.Ø |
| 2 | 2.Ø |
| 3 | Ø.5 |
| 4 | Ø.5 |
| 5 | Ø.5 |
| 6 | Ø.5 |
| 7 | 1.Ø |
| 8 | 1.Ø |
| 9 | Ø.5 |

## EMBEDDED STEEL TO CONCRETE POTENTIAL MEASUREMENTS

Versus Permanent Reference Electrodes

TULSA COUNTY BRIDGE

Static Potentials March 12, 1985
"IR Drop Free" Potentials March 15, 1985

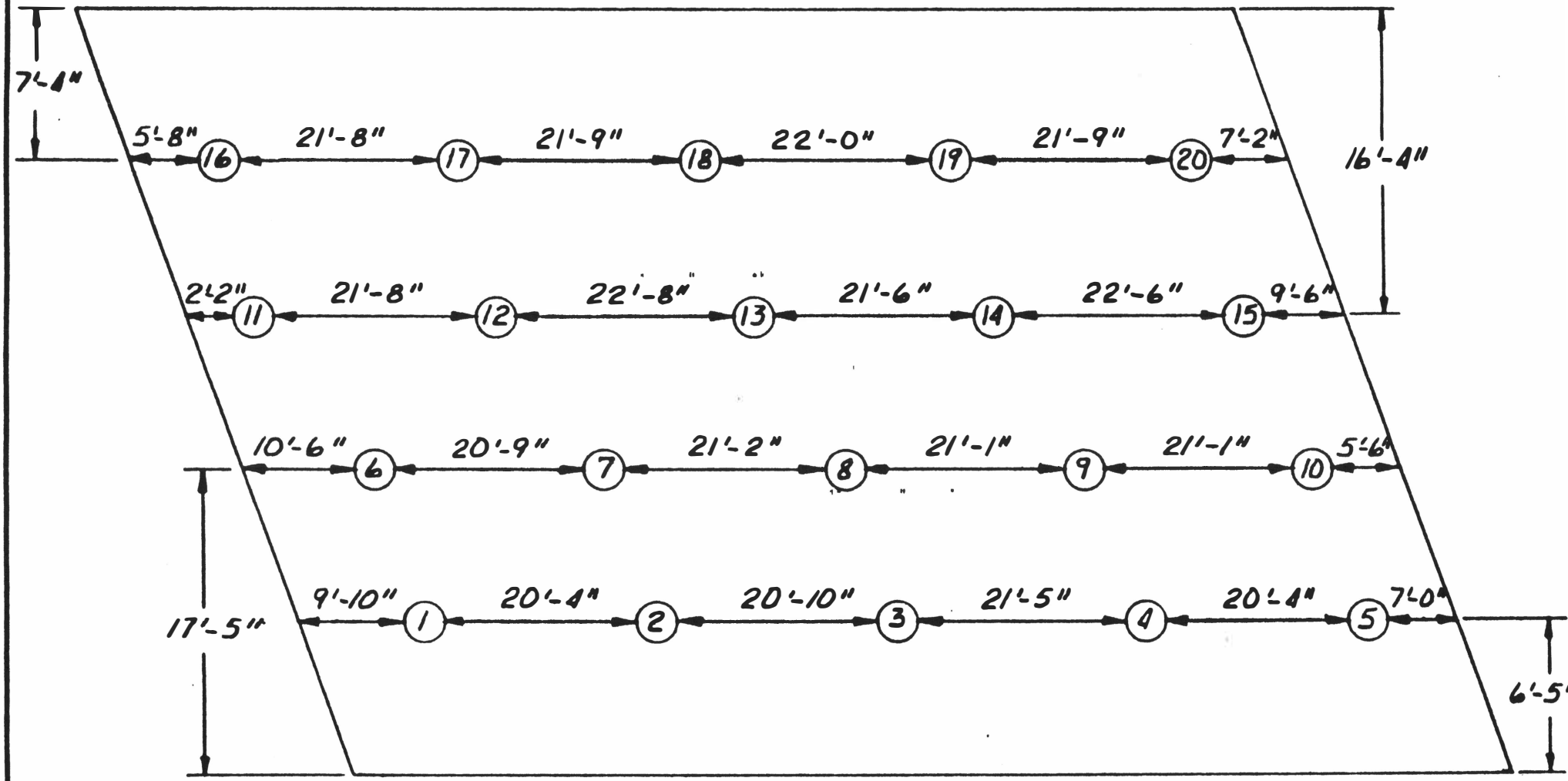
| READING NUMBER | REFERENCE ELECTRODE | EMBEDDED STEEL TO CONCRETE STATIC POTENTIAL (MILLIVOLTS) | CURRENT APPLIED EMBEDDED STEEL TO CONCRETE "IR" DROP FREE POTENTIAL (MILLIVOLTS) | POLARIZATION (MILLIVOLTS) |
|---|---|---|---|---|
| 1 | Zone 1 Silver/Silver Chloride | -314 | -430 | 116 |
| 2 | Zone 1 Molybdenum-Molybdenum Oxide | +293 | +203 | 90 |
| 3 | Zone 2 Silver-Silver Chloride | -401 | -492 | 91 |
| 4 | Zone 2 Molybdenum-Molybdenum Oxide | +184 | +122 | 62 |
| 5 | Zone 3 Silver-Silver Chloride | -246 | -620 | 374 |
| 6 | Zone 3 Molybdenum-Molydenum Oxide | +375 | +103 | 272 |
| 7 | Zone 4 Silver-Silver Chloride (A) | +487 | +159 | 328 |
| 8 | Zone 4 Silver-Silver Chloride (B) | -317 | -423 | 106 |
| 9 | Zone 4 Molybdenum-Molybdenum Oxide | +302 | +062 | 240 |
| 10 | Zone 5 Silver-Silver Chloride (A) | +381 | +063 | 318 |
| 11 | Zone 5 Silver-Silver Chloride (B) | -302 | -454 | 152 |
| 12 | Zone 5 Molybdenum-Molybdenum Oxide | +485 | +167 | 318 |
| 13 | Zone 6 Silver-Silver Chloride | -212 | -331 | 119 |
| 14 | Zone 6 Molybdenum-Molybdenum Oxide | +241 | +072 | 169 |
| 15 | Zone 7 Silver-Silver Chloride | -306 | -408 | 102 |
| 16 | Zone 7 Molybdenum-Molybdenum Oxide | +219 | +105 | 114 |
| 17 | Zone 8 Silver-Silver Chloride (A) | +593 | +322 | 271 |
| 18 | Zone 8 Silver-Silver Chloride (B) | -383 | -579 | 196 |
| 19 | Zone 8 Molybdenum-Molybdenum Oxide | +185 | -1474 | 1659 |
| 20 | Zone 9 Silver-Silver Chloride | -150 | -384 | 234 |
| 21 | Zone 9 Molybdenum-Molybdenum Oxide | +262 | +004 | 258 |

NOTES:

(A) REFERENCE ELECTRODE REPLACED

(B) REPLACEMENT REFERENCE ELECTRODE
STATIC POTENTIAL APRIL 18, 1985
"IR DROP FREE" POTENTIAL APRIL 19, 1985

S-8511




SPAN NUMBER 1

| NO. | DATE | BY | REVISION |
|---|---|---|---|
| | | | |

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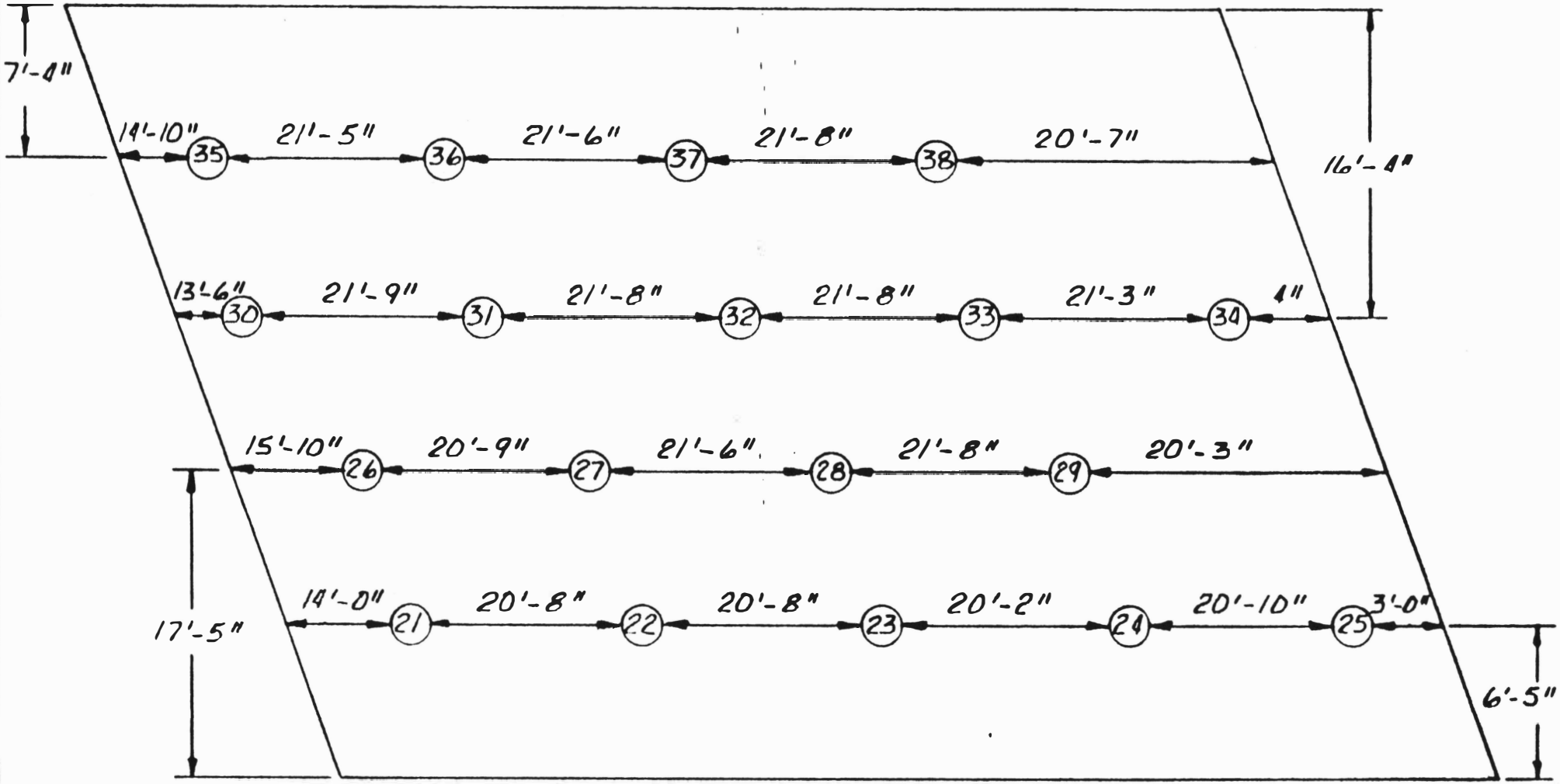
| | |
|---|---|
| DRAWN BY: | R. B. |
| DESIGNED BY: | D. D. |
| DATE: | 8/12/85 |
| DRAWING NUMBER: | E-65350-A-1 |

# POTENTIAL MEASUREMENT LOCATION
# TULSA COUNTY BRIDGE

S-8511




SPAN NUMBER 2

| NO. | DATE | BY | REVISION |
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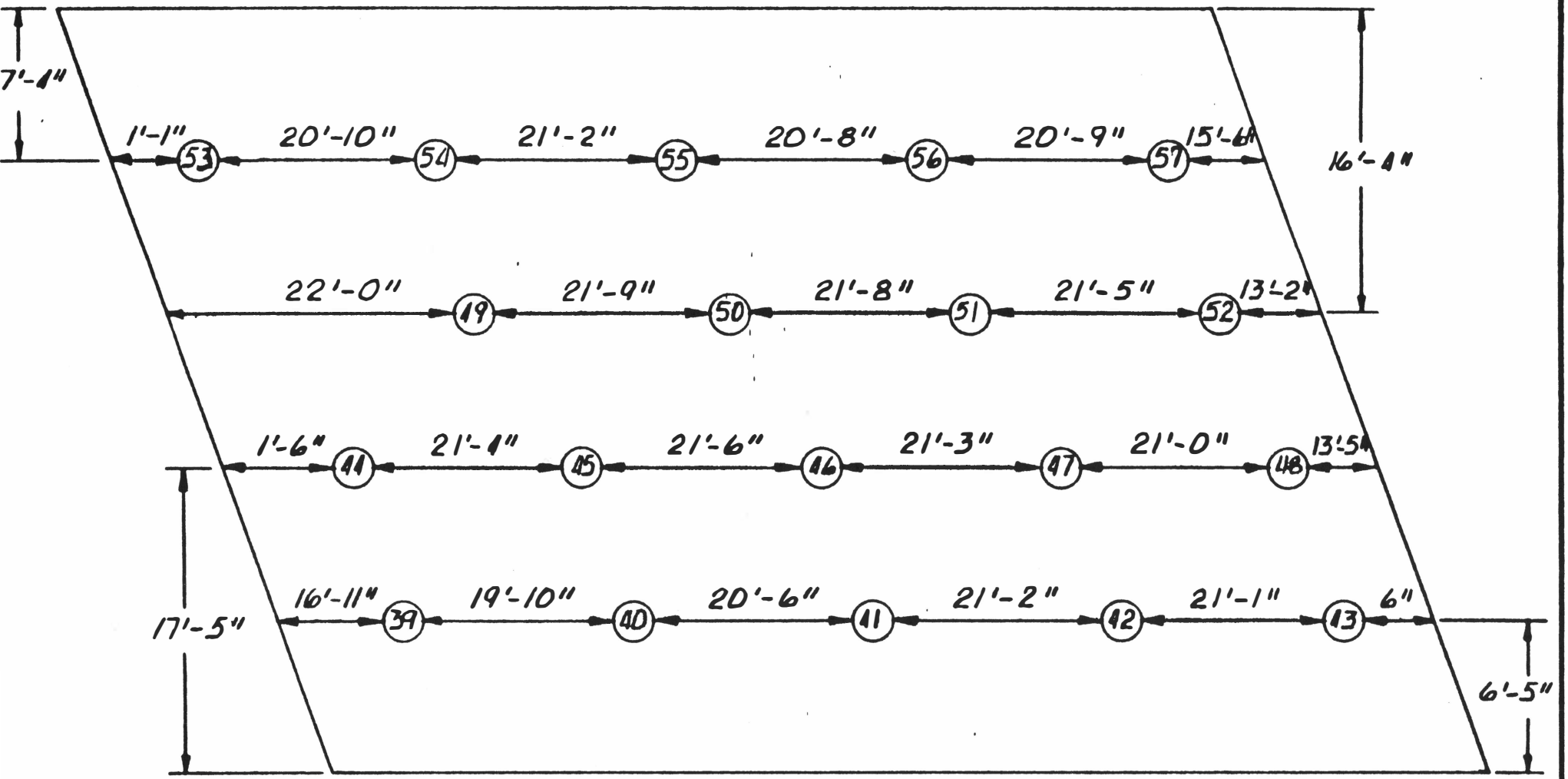
DRAWN BY: R.B.

DESIGNED BY: D.D.

DATE: 8/12/85

DRAWING NUMBER: C-153-A-2

# POTENTIAL MEASUREMENT LOCATION
# TULSA COUNTY BRIDGE




## SPAN NUMBER 3

| NO. | DATE | BY | REVISION |
|---|---|---|---|
| | | | |

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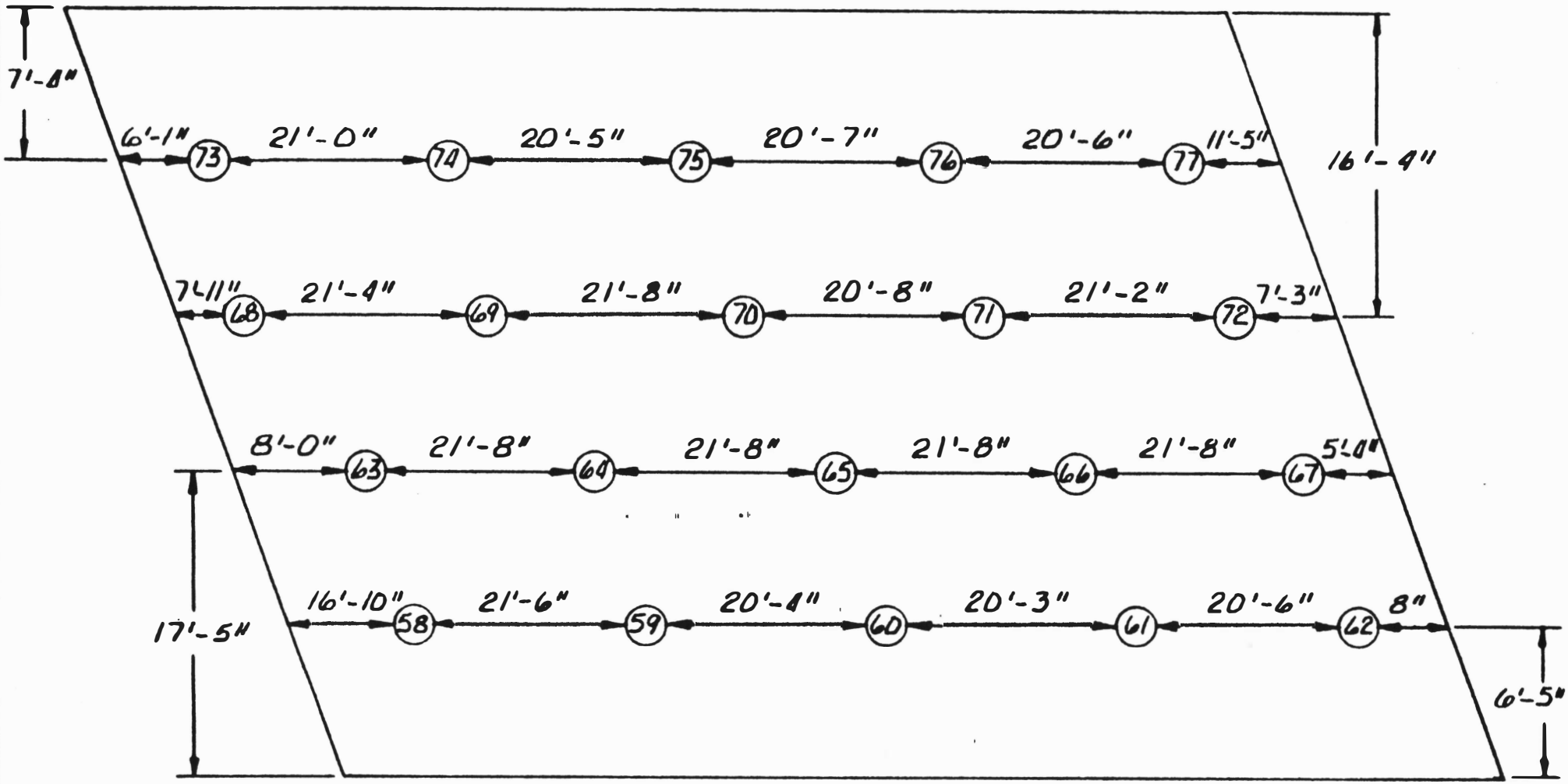
DRAWN BY: R.B.

DESIGNED BY: D.D.

DATE: 8/12/85

DRAWING NUMBER: E-65350-A-3

# POTENTIAL MEASUREMENT LOCATION
# TULSA COUNTY BRIDGE




SPAN NUMBER 1

| NO. | DATE | BY | REVISION |
|---|---|---|---|
| | | | |



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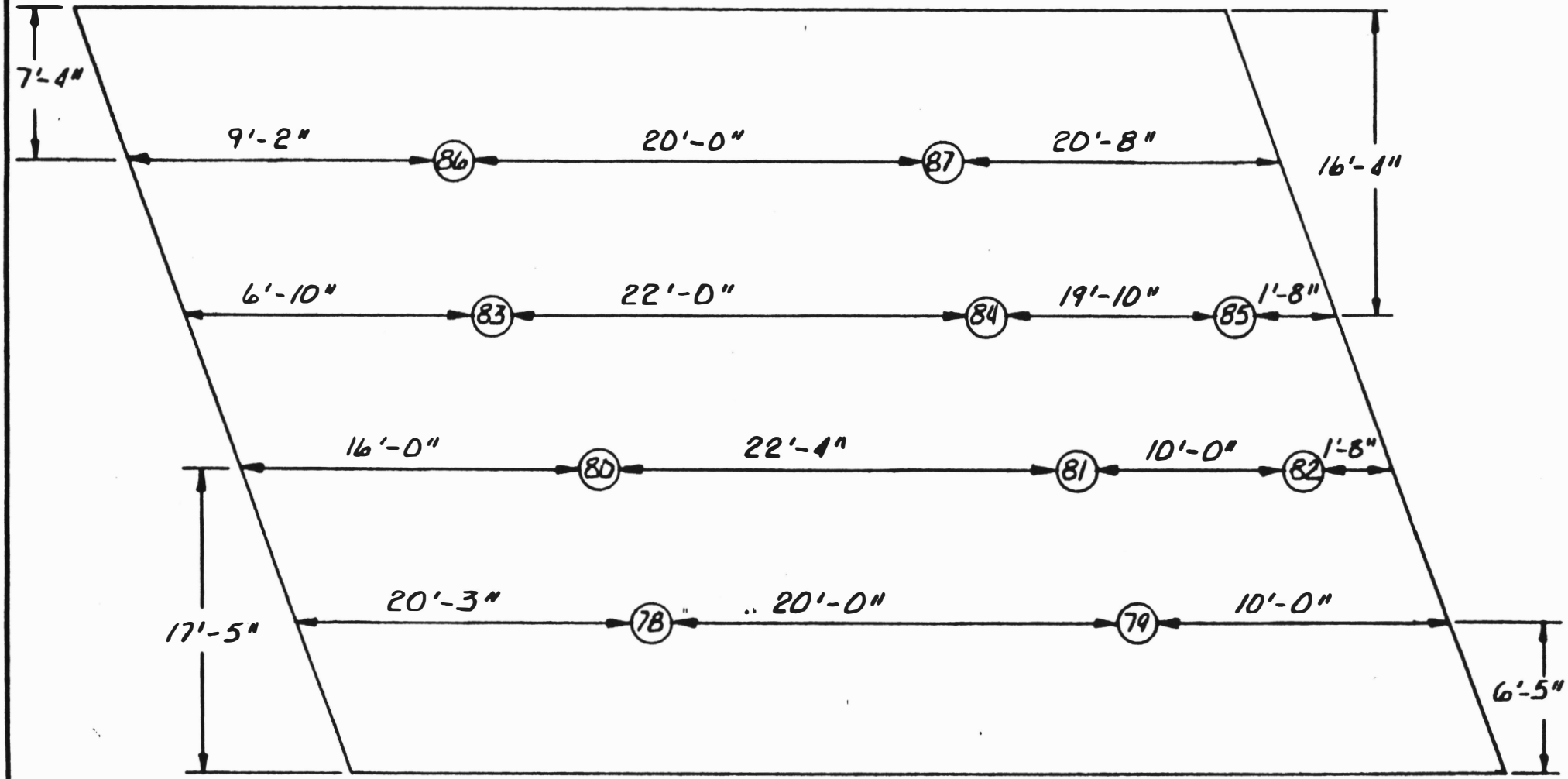
DRAWN BY: R.B.
DESIGNED BY: D.D.
DATE: 8/12/85
DRAWING NUMBER: E-65350-A-1

# POTENTIAL MEASUREMENT LOCATION TULSA COUNTY BRIDGE

S-8511




## SPAN NUMBER 5

| NO. | DATE | BY | REVISION |
|---|---|---|---|
| | | | |

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| | |
|---|---|
| DRAWN BY: | R.B. |
| DESIGNED BY: | D.D. |
| DATE: | 8/12/85 |
| DRAWING NUMBER: | [illegible] |

# POTENTIAL MEASUREMENT LOCATION
# TULSA COUNTY BRIDGE

## REBAR PROBE MEASUREMENTS

TULSA COUNTY BRIDGE

ZONE 1

MARCH 13, 1985

REBAR PROBE PRISM CONTAINS 15 POUNDS CHLORIDE PER CUBIC YARD

| READING NUMBER | CATHODIC PROTECTION CURRENT APPLIED (AMPS) | CURRENT FLOW BETWEEN REBAR PROBE AND REINFORCING STEEL (MILLIAMPS) |
|---|---|---|
| 1 | 0.00 | -0.498 |
| 2 | 0.60 | -0.372 |
| 3 | 1.03 | -0.341 |
| 4 | 1.55 | -0.276 |
| 5 | 2.52 | -0.175 |
| 6 | 3.10 | -0.092 |
| 7 | 3.89 | -0.011 |
| 8 | 5.30 | +0.132 |
| 9 | 6.33 | +0.247 |

## REBAR PROBE MEASUREMENTS

TULSA COUNTY BRIDGE

ZONE 2

MARCH 13, 1985

REBAR PROBE PRISM CONTAINS 15 POUNDS CHLORIDE PER CUBIC YARD

| READING NUMBER | CATHODIC PROTECTION CURRENT APPLIED (AMPS) | CURRENT FLOW BETWEEN REBAR PROBE AND REINFORCING STEEL (MILLIAMPS) |
|---|---|---|
| 1 | 0.00 | -1.483 |
| 2 | 0.19 | -1.220 |
| 3 | 0.40 | -1.214 |
| 4 | 0.69 | -1.142 |
| 5 | 1.28 | -1.030 |
| 6 | 1.67 | -0.926 |
| 7 | 2.20 | -0.792 |
| 8 | 3.20 | -0.653 |
| 9 | 3.91 | -0.520 |

## REBAR PROBE MEASUREMENTS

TULSA COUNTY BRIDGE

ZONE 3

MARCH 14, 1985

REBAR PROBE PRISM CONTAINS 5 POUNDS CHLORIDE PER CUBIC YARD

| READING NUMBER | CATHODIC PROTECTION CURRENT APPLIED (AMPS) | CURRENT FLOW BETWEEN REBAR PROBE AND REINFORCING STEEL (MILLIAMPS) |
|---|---|---|
| 1 | 0.00 | -0.027 |
| 2 | 0.07 | +0.011 |
| 3 | 0.11 | +0.013 |
| 4 | 0.15 | +0.022 |
| 5 | 0.24 | +0.041 |
| 6 | 0.65 | +0.071 |
| 7 | 0.65 | +0.127 |
| 8 | 0.89 | +0.175 |
| 9 | 1.38 | +0.295 |
| 10 | 2.27 | +0.538 |
| 11 | 3.78 | +0.935 |
| 12 | 7.30 | +1.710 |

## REBAR PROBE MEASUREMENTS

TULSA COUNTY BRIDGE

ZONE 4

MARCH 14, 1985

REBAR PROBE PRISM CONTAINS 5 POUNDS CHLORIDE PER CUBIC YARD

| READING NUMBER | CATHODIC PROTECTION CURRENT APPLIED (AMPS) | CURRENT FLOW BETWEEN REBAR PROBE AND REINFORCING STEEL (MILLIAMPS) |
|---|---|---|
| 1 | 0.00 | +0.007 |
| 2 | 0.07 | +0.009 |
| 3 | 0.10 | +0.010 |
| 4 | 0.14 | +0.013 |
| 5 | 0.22 | +0.015 |
| 6 | 0.36 | +0.018 |
| 7 | 0.60 | +0.023 |
| 8 | 0.81 | +0.027 |
| 9 | 1.25 | +0.032 |
| 10 | 2.08 | +0.043 |
| 11 | 3.45 | +0.057 |
| 12 | 6.64 | +0.079 |

## REBAR PROBE MEASUREMENTS

TULSA COUNTY BRIDGE

ZONE 5

MARCH 14, 1985

REBAR PROBE PRISM CONTAINS 10 POUNDS CHLORIDE PER CUBIC YARD

| READING NUMBER | CATHODIC PROTECTION CURRENT APPLIED (AMPS) | CURRENT FLOW BETWEEN REBAR PROBE AND REINFORCING STEEL (MILLIAMPS) |
|---|---|---|
| 1 | 0.00 | +0.004 |
| 2 | 0.15 | +0.008 |
| 3 | 0.25 | +0.014 |
| 4 | 0.33 | +0.021 |
| 5 | 0.51 | +0.030 |
| 6 | 0.75 | +0.042 |
| 7 | 1.05 | +0.051 |
| 8 | 1.32 | +0.059 |
| 9 | 1.90 | +0.075 |
| 10 | 3.09 | +0.105 |
| 11 | 5.03 | +0.146 |
| 12 | 9.50 | +0.214 |

## REBAR PROBE MEASUREMENTS

TULSA COUNTY BRIDGE

ZONE 6

MARCH 14, 1985

REBAR PROBE PRISM CONTAINS 10 POUNDS CHLORIDE PER CUBIC YARD

| READING NUMBER | CATHODIC PROTECTION CURRENT APPLIED (AMPS) | CURRENT FLOW BETWEEN REBAR PROBE AND REINFORCING STEEL (MILLIAMPS) |
|---|---|---|
| 1 | 0.00 | -0.889 |
| 2 | 0.12 | -0.394 |
| 3 | 0.19 | -0.393 |
| 4 | 0.25 | -0.393 |
| 5 | 0.40 | -0.363 |
| 6 | 0.60 | -0.301 |
| 7 | 0.87 | -0.246 |
| 8 | 1.10 | -0.178 |
| 9 | 1.65 | -0.013 |
| 10 | 2.70 | +0.260 |
| 11 | 4.47 | +0.665 |
| 12 | 8.50 | +1.380 |

## REBAR PROBE MEASUREMENTS

TULSA COUNTY BRIDGE

ZONE 7

MARCH 14, 1985

REBAR PROBE PRISM CONTAINS 15 POUNDS CHLORIDE PER CUBIC YARD

| READING NUMBER | CATHODIC PROTECTION CURRENT APPLIED (AMPS) | CURRENT FLOW BETWEEN REBAR PROBE AND REINFORCING STEEL (MILLIAMPS) |
|---|---|---|
| 1 | 0.00 | -1.041 |
| 2 | 0.15 | -0.536 |
| 3 | 0.28 | -0.472 |
| 4 | 0.39 | -0.430 |
| 5 | 0.63 | -0.300 |
| 6 | 0.88 | -0.248 |
| 7 | 1.40 | -0.130 |
| 8 | 2.70 | +0.190 |
| 9 | 4.64 | +0.630 |
| 10 | 7.12 | +1.090 |
| 11 | 9.95 | +1.250 |

## REBAR PROBE MEASUREMENTS

TULSA COUNTY BRIDGE

ZONE 8

MARCH 14, 1985

REBAR PROBE PRISM CONTAINS 15 POUNDS CHLORIDE PER CUBIC YARD

| READING NUMBER | CATHODIC PROTECTION CURRENT APPLIED (AMPS) | CURRENT FLOW BETWEEN REBAR PROBE AND REINFORCING STEEL (MILLIAMPS) |
|---|---|---|
| 1 | 0.00 | +0.035 |
| 2 | 0.20 | +0.039 |
| 3 | 0.35 | +0.044 |
| 4 | 0.49 | +0.043 |
| 5 | 0.77 | +0.049 |
| 6 | 1.04 | +0.056 |
| 7 | 1.60 | +0.070 |
| 8 | 2.90 | +0.094 |
| 9 | 4.85 | +0.123 |
| 10 | 7.38 | +0.152 |
| 11 | 10.00 | +0.170 |

## REBAR PROBE MEASUREMENTS

TULSA COUNTY BRIDGE

ZONE 9

MARCH 13, 1985

REBAR PROBE PRISM CONTAINS 15 POUNDS CHLORIDE PER CUBIC YARD

| READING NUMBER | CATHODIC PROTECTION CURRENT APPLIED (AMPS) | CURRENT FLOW BETWEEN REBAR PROBE AND REINFORCING STEEL (MILLIAMPS) |
|---|---|---|
| 1 | 0.00 | -0.943 |
| 2 | 0.11 | -0.624 |
| 3 | 0.19 | -0.613 |
| 4 | 0.35 | -0.536 |
| 5 | 0.50 | -0.456 |
| 6 | 0.72 | -0.360 |
| 7 | 0.93 | -0.220 |
| 8 | 1.16 | -0.075 |

## ANODE TO REINFORCING STEEL MEASUREMENTS

Tulsa County Bridge

March 11, 1985

| READING NUMBER | TEST POINT | RESISTANCE (DC OHMS) | RESISTANCE (DC OHMS) | RESISTANCE (AC OHMS) | VOLTAGE DIFFERENCE (millivolts) |
|---|---|---|---|---|---|
| 1 | Anode 1 | 5.8- | 7.1- | 0.52 | 7.5 |
| 2 | Anode 2 | 6.5- | 8.0- | 0.58 | 8.2 |
| 3 | Anode 3 | 15.5+ | 18.0+ | 0.90 | 21.0 |
| 4 | Anode 4 | 16.5+ | 18.6+ | 0.92 | 20.8 |
| 5 | Anode 5 | 9.4+ | 11.2+ | 0.78 | 11.9 |
| 6 | Anode 6 | 10.1+ | 11.9+ | 0.81 | 12.3 |
| 7 | Anode 7 | 8.2+ | 10.4+ | 0.97 | 10.8 |
| 8 | Anode 8 | 8.4+ | 10.5+ | 0.95 | 10.5 |
| 9 | Anode 9 | 25.9- | 29.7- | 1.40 | 32.5 |

# TULSA COUNTY BRIDGE

## Cathodic Protection Maintenance Record Sheet
## Bridge Deck Rectifier

LOCATION OF RECTIFIER UNIT: West Abutment

RECTIFIER MANUFACTURED BY: Good-All Electric, Inc.

TYPE OF RECTIFIER UNIT: MODEL NO. CTAYSA 20-10(9)NZ

RECTIFIER UNIT: SERIAL NUMBER: 84H1090

RECTIFIER AC INPUT: 115 VOLTS 1 PHASE 60 HERTZ

INDIVIDUAL ZONE RATINGS: 20 VOLTS 10 AMPERES

NUMBER OF CIRCUITS: 9

TYPE OF PRIMARY ANODES: Platinized Niobium Copper Core Wire

INSTALLATION DATE: March, 1985 BY: Harco Corporation

DATE: 6/24/85 TIME: --- BY: Harco Corporation

TOTAL CURRENT: 16.3 AMPS

ZONE 1

CURRENT: 3.00 AMPS

CURRENT LIMIT SET: 3.00 AMPS

VOLTAGE: ---- VOLTS

VOLTAGE LIMIT SET: --- VOLTS

REFERENCE ELECTRODE FOR TASC CONTROL: Silver-Silver Chloride

SET POTENTIAL: -450 mV.

SILVER-SILVER CHLORIDE ELECTRODE POTENTIAL: -324 mV.

MOLYBDENUM-MOLYBDENUM OXIDE ELECTRODE POTENTIAL: -018 mV.

ZONE 2

CURRENT: 3.00 AMPS

CURRENT LIMIT SET: 3.00 AMPS

VOLTAGE: --- VOLTS

VOLTAGE LIMIT SET: --- VOLTS

REFERENCE ELECTRODE FOR TASC CONTROL: Silver-Silver Chloride

SET POTENTIAL: -500 mV.

SILVER-SILVER CHLORIDE ELECTRODE POTENTIAL: -328 mV.

MOLYBDENUM-MOLYBDENUM OXIDE ELECTRODE POTENTIAL: +225 mV.

ZONE 3

CURRENT: 1.25 AMPS

CURRENT LIMIT SET: 1.25 AMPS

VOLTAGE: --- VOLTS

VOLTAGE LIMIT SET: --- VOLTS

REFERENCE ELECTRODE FOR TASC CONTROL: Silver-Silver Chloride

SET POTENTIAL: -350 mV.

SILVER-SILVER CHLORIDE ELECTRODE POTENTIAL: -167 mV.

MOLYBDENUM-MOLYBDENUM OXIDE ELECTRODE POTENTIAL: -055 mV.

ZONE 4

CURRENT: 1.25 AMPS

CURRENT LIMIT SET: 1.25 AMPS

VOLTAGE: --- VOLTS

VOLTAGE LIMIT SET: --- VOLTS

REFERENCE ELECTRODE FOR TASC CONTROL: Silver-Silver Chloride

SET POTENTIAL: -450 mV.

SILVER-SILVER CHLORIDE ELECTRODE POTENTIAL: -240 mV.

MOLYBDENUM-MOLYBDENUM OXIDE ELECTRODE POTENTIAL: -037 mV.

ZONE 5

CURRENT: 1.25 AMPS

CURRENT LIMIT SET: 1.25 AMPS

VOLTAGE: --- VOLTS

VOLTAGE LIMIT SET: --- VOLTS

REFERENCE ELECTRODE FOR TASC CONTROL: Silver-Silver Chloride

SET POTENTIAL: -525 mV.

SILVER-SILVER CHLORIDE ELECTRODE POTENTIAL: -355 mV.

MOLYBDENUM-MOLYBDENUM OXIDE ELECTRODE POTENTIAL: 257 mV.

ZONE 6

CURRENT: 1.25 AMPS

CURRENT LIMIT SET: 1.25 AMPS

VOLTAGE: --- VOLTS

VOLTAGE LIMIT SET: --- VOLTS

REFERENCE ELECTRODE FOR TASC CONTROL: Silver-Silver Chloride

SET POTENTIAL: -350 mV.

SILVER-SILVER CHLORIDE ELECTRODE POTENTIAL: -177 mV.

MOLYBDENUM-MOLYBDENUM OXIDE ELECTRODE POTENTIAL: +214 mV.

ZONE 7

CURRENT: 2.00 AMPS

CURRENT LIMIT SET: 2.00 AMPS

VOLTAGE: --- VOLTS

VOLTAGE LIMIT SET: --- VOLTS

REFERENCE ELECTRODE FOR TASC CONTROL: Silver-Silver Chloride

SET POTENTIAL: -450 mV.

SILVER-SILVER CHLORIDE ELECTRODE POTENTIAL: -283 mV.

MOLYBDENUM-MOLYBDENUM OXIDE ELECTRODE POTENTIAL: +270 mV.

ZONE 8

CURRENT: 2.00 AMPS

CURRENT LIMIT SET: 2.00 AMPS

VOLTAGE: --- VOLTS

VOLTAGE LIMIT SET: --- VOLTS

REFERENCE ELECTRODE FOR TASC CONTROL: Silver-Silver Chloride

SET POTENTIAL: -525 mV.

SILVER-SILVER CHLORIDE ELECTRODE POTENTIAL: -348 mV.

MOLYBDENUM-MOLYBDENUM OXIDE ELECTRODE POTENTIAL: +219 mV.

ZONE 9

CURRENT: 1.25 AMPS

CURRENT LIMIT SET: 1.25 AMPS

VOLTAGE: --- VOLTS

VOLTAGE LIMIT SET: --- VOLTS

REFERENCE ELECTRODE FOR TASC CONTROL: Silver-Silver Chloride

SET POTENTIAL: -350 mV.

SILVER-SILVER CHLORIDE ELECTRODE POTENTIAL: -133 mV.

MOLYBDENUM-MOLYBDENUM OXIDE ELECTRODE POTENTIAL: +206 mV.

ADDITIONAL COMMENTS:

# CONTINUITY

Rogers County Bridge
April 16, 1985

Connection at Rectifier Negative

System Negatives Connected

| READING NUMBER | TEST POINT | | RESISTANCE (DC OHMS) | RESISTANCE (DC OHMS) | VOLTAGE DIFFERENCE (millivolts) |
|---|---|---|---|---|---|
| 1 | Reference Cell | Ground 1 | 0.0 | 0.0 | 0.0 |
| 2 | Reference Cell | Ground 2 | 0.0 | 0.1 | 0.0 |
| 3 | Reference Cell | Ground 3 | 0.0 | 0.1 | 0.0 |
| 4 | Reference Cell | Ground 4 | 0.0 | 0.4 | 0.1 |
| 5 | Reference Cell | Ground 5 | 0.0 | 0.6 | 0.2 |
| 6 | Reference Cell | Ground 6 | 0.0 | 0.6 | 0.2 |
| 7 | Reference Cell | Ground 7 | 0.3 | 0.6 | 0.0 |
| 8 | Reference Cell | Ground 8 | 0.2 | 0.0 | 0.1 |
| 9 | Reference Cell | Ground 9 | 0.0 | 1.1 | 0.4 |
| 10 | Reference Cell | Ground 10 | 0.2 | 0.9 | 0.4 |
| 11 | Reference Cell | Ground 11 | 0.2 | 0.9 | 0.4 |
| 12 | Reference Cell | Ground 12 | 2.2 | 0.0 | 1.1 |
| 13 | Rebar Probe | Ground 1 | 0.0 | 0.0 | 0.0 |
| 14 | Rebar Probe | Ground 2 | 0.0 | 0.1 | 0.0 |
| 15 | Rebar Probe | Ground 3 | 0.0 | 0.4 | 0.2 |
| 16 | Rebar Probe | Ground 4 | 0.0 | 0.9 | 0.6 |
| 17 | Rebar Probe | Ground 5 | 0.0 | 0.8 | 0.5 |
| 18 | Rebar Probe | Ground 6 | 0.0 | 0.6 | 0.2 |
| 19 | Rebar Probe | Ground 7 | 0.3 | 0.6 | 0.0 |
| 20 | Rebar Probe | Ground 8 | 0.3 | 0.5 | 0.0 |
| 21 | Rebar Probe | Ground 9 | 0.0 | 1.4 | 0.7 |
| 22 | Rebar Probe | Ground 10 | 0.0 | 1.5 | 0.8 |
| 23 | Rebar Probe | Ground 11 | 0.0 | 1.5 | 0.8 |
| 24 | Rebar Probe | Ground 12 | 0.0 | 0.6 | 0.8 |

CONTINUITY
Rogers County Bridge
April 16, 1985

Connection at Reference Cell Ground 1

| READING NUMBER | TEST POINT | | RESISTANCE (DC OHMS) | RESISTANCE (DC OHMS) | VOLTAGE DIFFERENCE (millivolts) |
|---|---|---|---|---|---|
| 1 | System Negative 1 | | 0.0 | 0.0 | 0.0 |
| 2 | System Negative 2 | | 167- | OL | 326 |
| 3 | Reference Cell | Ground 2 | 56- | 1128+ | 114.1 |
| 4 | Rebar Probe | Ground 1 | 0.0 | 0.2 | 0.0 |

CONTINUITY
Rogers County Bridge
April 16, 1985

Connection at Reference Cell Ground 2

| READING NUMBER | TEST POINT | | RESISTANCE (DC OHMS) | RESISTANCE (DC OHMS) | VOLTAGE DIFFERENCE (millivolts) |
|---|---|---|---|---|---|
| 1 | System Negative 2 | | 1161+ | 57- | 116 |
| 2 | System Negative 3 | | 0.2 | 0.1 | 0.0 |
| 3 | System Negative 4 | | 0.1 | 0.2 | 0.0 |
| 4 | System Negative 5 | | 52.5+ | 20.4+ | 13.0 |
| 5 | System Negative 6 | | 53.0+ | 15.0+ | 14.5 |
| 6 | Reference Cell | Ground 3 | 55.6+ | 19.5+ | 14.4 |
| 7 | Rebar Probe | Ground 2 | 0.2 | 0.2 | 0.0 |
| 8 | Rebar Probe | Ground 3 | 55.6+ | 20.2+ | 14.4 |

CONTINUITY
Rogers County Bridge
April 16, 1985

Connection at Reference Cell Ground 3

| READING NUMBER | TEST POINT | | RESISTANCE (DC OHMS) | RESISTANCE (DC OHMS) | VOLTAGE DIFFERENCE (millivolts) |
|---|---|---|---|---|---|
| 1 | System Negative 3 | | 12.8- | 61.8+ | 29.1 |
| 2 | System Negative 4 | | 60.1 | 11.3- | 30.0 |
| 3 | System Negative 5 | | 0.2 | 0.2 | 0.0 |
| 4 | System Negative 6 | | 0.3 | 0.3 | 0.0 |
| 5 | System Negative 7 | | 103- | OL | 244 |
| 6 | Reference Cell | Ground 2 | 21+ | 54+ | 12.8 |
| 7 | Reference Cell | Ground 4 | 97- | OL | 228 |
| 8 | Rebar Probe | Ground 2 | 64+ | 14- | 30.0 |
| 9 | Rebar Probe | Ground 3 | 0.1 | 0.4 | 0.1 |
| 10 | Rebar Probe | Ground 4 | 100- | OL | 242 |

CONTINUITY
Rogers County Bridge
April 16, 1985

Connection at Reference Cell Ground 4

| READING NUMBER | TEST POINT | RESISTANCE (DC OHMS) | RESISTANCE (DC OHMS) | VOLTAGE DIFFERENCE (millivolts) |
|---|---|---|---|---|
| 1 | System Negative 7 | 0.4 | 0.3 | 0.0 |
| 2 | System Negative 8 | 0.4 | 0.3 | 0.0 |
| 3 | System Negative 9 | 11.8+ | 13.7+ | 0.5 |
| 4 | System Negative 10 | 11.8+ | 15+ | 1.0 |
| 5 | Reference Cell Ground 3 | 11.8+ | 13.3+ | 0.8 |
| 6 | Reference Cell Ground 5 | 0.0 | 0.8 | 0.3 |
| 7 | Rebar Probe Ground 4 | 11.8+ | 13.8+ | 0.8 |
| 8 | Rebar Probe Ground 5 | OL | 104- | 246 |

# CONTINUITY

Rogers County Bridge
April 16, 1985

Connection at Reference Cell Ground 5

| READING NUMBER | TEST POINT | RESISTANCE (DC OHMS) | RESISTANCE (DC OHMS) | VOLTAGE DIFFERENCE (millivolts) |
|---|---|---|---|---|
| 1 | System Negative 7 | 8.0- | 28.0+ | 14.0 |
| 2 | System Negative 8 | 9.0- | 31+ | 16.0 |
| 3 | System Negative 9 | 0.4 | 0.4 | 0.0 |
| 4 | System Negative 10 | 0.5 | 0.4 | 0.0 |
| 5 | System Negative 11 | 550- | 130- | 50 |
| 6 | Reference Cell Ground 4 | 13.3+ | 11.8+ | 0.8 |
| 7 | Reference Cell Ground 6 | 530- | 100- | 46 |
| 8 | Rebar Probe Ground 4 | 0.2 | 1.1 | 0.4 |
| 9 | Rebar Probe Ground 5 | 0.2 | 0.7 | 0.1 |
| 10 | Rebar Probe Ground 6 | 540- | 100- | 42 |

CONTINUITY
Rogers County Bridge
April 16, 1985

Connection at Reference Cell Ground 6

| READING NUMBER | TEST POINT | | RESISTANCE (DC OHMS) | RESISTANCE (DC OHMS) | VOLTAGE DIFFERENC (millivolts) |
|---|---|---|---|---|---|
| 1 | System Negative 11 | | 0.5 | 0.5 | 0.0 |
| 2 | System Negative 12 | | 0.6 | 0.5 | 0.0 |
| 3 | System Negative 13 | | 22+ | 8.7+ | 5.3 |
| 4 | System Negative 14 | | 11+ | 14+ | 2.1 |
| 5 | Reference Cell | Ground 7 | 500- | 122+ | 36.3 |
| 6 | Rebar Probe | Ground 6 | 0.5 | 0.6 | 0.0 |
| 7 | Rebar Probe | Ground 7 | 500- | 113- | 35.3 |

CONTINUITY
Rogers County Bridge
April 16, 1985

Connection at Reference Cell Ground 7

| READING NUMBER | TEST POINT | | RESISTANCE (DC OHMS) | RESISTANCE (DC OHMS) | VOLTAGE DIFFERENCE (millivolts) |
|---|---|---|---|---|---|
| 1 | System Negative 11 | | 1060+ | 480+ | 106 |
| 2 | System Negative 12 | | 1030+ | 480+ | 106 |
| 3 | System Negative 13 | | 0.7 | 0.7 | 0.0 |
| 4 | System Negative 14 | | 0.7 | 0.7 | 0.0 |
| 5 | System Negative 15 | | 122+ | 420- | 31 |
| 6 | System Negative 16 | | 128+ | 390+ | 31 |
| 7 | System Negative 17 | | 1.5+ | 18.6+ | 7.4 |
| 8 | System Negative 18 | | 1.2+ | 19.2+ | 7.2 |
| 9 | System Negative 19 | | 60- | 206+ | 12.6 |
| 10 | Reference Cell | Ground 6 | 122+ | 500- | 36.3 |
| 11 | Reference Cell | Ground 8 | 126+ | 424+ | 31.0 |
| 12 | Rebar Probe | Ground 6 | 1050+ | 470+ | 10.6 |
| 13 | Rebar Probe | Ground 7 | 0.7 | 0.8 | 0.0 |
| 14 | Rebar Probe | Ground 8 | 126+ | 420- | 27.0 |

CONTINUITY
Rögers County Bridge
April 16, 1985

Connection at Reference Cell Ground 8

| READING NUMBER | TEST POINT | | RESISTANCE (DC OHMS) | RESISTANCE (DC OHMS) | VOLTAGE DIFFERENCE (millivolts) |
|---|---|---|---|---|---|
| 1 | System Negative 12 | | 8.5+ | 20.9+ | 5.7 |
| 2 | System Negative 13 | | 440- | 120+ | 33.0 |
| 3 | System Negative 14 | | 430- | 120+ | 32.0 |
| 4 | System Negative 15 | | 0.6 | 0.6 | 0.0 |
| 5 | System Negative 16 | | 0.6 | 0.6 | 0.0 |
| 6 | System Negative 17 | | 360- | 130+ | 27.0 |
| 7 | System Negative 18 | | 370- | 130+ | 27.0 |
| 8 | System Negative 19 | | 340- | 150+ | 16.7 |
| 9 | Reference Cell | Ground 9 | 380- | 129- | 23.2 |
| 10 | Rebar Probe | Ground 8 | 0.6 | 0.6 | 0.0 |
| 11 | Rebar Probe | Ground 9 | 360- | 130+ | 22.9 |

CONTINUITY
Rogers County Bridge
April 16, 1985

Connection at Reference Cell Ground 9

| READING NUMBER | TEST POINT | | RESISTANCE (DC OHMS) | RESISTANCE (DC OHMS) | VOLTAGE DIFFERENCE (millivolts) |
|---|---|---|---|---|---|
| 1 | System Negative 14 | | 140+ | 360- | 18.0 |
| 2 | System Negative 15 | | 19.6+ | 0.2 | 7.7 |
| 3 | System Negative 16 | | 20.0+ | 0.2 | 8.2 |
| 4 | System Negative 17 | | 0.8 | 0.8 | 0.0 |
| 5 | System Negative 18 | | 0.9 | 0.9 | 0.0 |
| 6 | System Negative 19 | | 112+ | 124+ | 4.9 |
| 7 | Reference Cell | Ground 8 | 130+ | 340- | 22.6 |
| 8 | Reference Cell | Ground 10 | 120+ | 124+ | 2.0 |
| 9 | Rebar Probe | Ground 7 | 135+ | 340- | 18.0 |
| 10 | Rebar Probe | Ground 8 | 44- | 130+ | 22.3 |
| 11 | Rebar Probe | Ground 9 | 0.5 | 1.2 | 0.2 |
| 12 | Rebar Probe | Ground 10 | 108+ | 130+ | 8.0 |

CONTINUITY
Rogers County Bridge
April 16, 1985

Connection at Reference Cell Ground 10

| READING NUMBER | TEST POINT | | RESISTANCE (DC OHMS) | RESISTANCE (DC OHMS) | VOLTAGE DIFFERENC (millivolts) |
|---|---|---|---|---|---|
| 1 | System Negative 18 | | 130+ | 101+ | 12.5 |
| 2 | System Negative 19 | | 1.1 | 1.0 | 0.0 |
| 3 | System Negative 20 | | 1.1 | 1.0 | 0.0 |
| 4 | System Negative 21 | | 1.1 | 1.0 | 0.0 |
| 5 | System Negative 22 | | 1.1 | 1.1 | 0.0 |
| 6 | System Negative 23 | | OL | 150- | 285 |
| 7 | Reference Cell | Ground 9 | 130+ | 105+ | 7.0 |
| 8 | Reference Cell | Ground 11 | 1.0 | 1.1 | 0.0 |
| 9 | Rebar Probe | Ground 10 | 0.5 | 1.6 | 0.4 |
| 10 | Rebar Probe | Ground 11 | 0.6 | 1.6 | 0.4 |
| 11 | Rebar Probe | Ground 12 | OL | 150- | 283 |

CONTINUITY
Rogers County Bridge
April 16, 1985

Connection at Reference Cell Ground 11

| READING NUMBER | TEST POINT | | RESISTANCE (DC OHMS) | RESISTANCE (DC OHMS) | VOLTAGE DIFFERENCE (millivolts) |
|---|---|---|---|---|---|
| 1 | System Negative 18 | | 122+ | 102+ | 5.1 |
| 2 | System Negative 19 | | 1.1 | 1.0 | 0.0 |
| 3 | System Negative 20 | | 1.1 | 1.0 | 0.0 |
| 4 | System Negative 21 | | 1.1 | 1.0 | 0.0 |
| 5 | System Negative 22 | | 1.1 | 1.1 | 0.0 |
| 6 | System Negative 23 | | OL | 150- | 285 |
| 7 | Reference Cell | Ground 10 | 1.0 | 1.1 | 0.0 |
| 8 | Reference Cell | Ground 12 | OL | 150- | 282 |
| 9 | Rebar Probe | Ground 9 | 129+ | 102+ | 4.1 |
| 10 | Rebar Probe | Ground 10 | 0.5 | 1.6 | 0.4 |
| 11 | Rebar Probe | Ground 11 | 0.6 | 1.6 | 0.4 |
| 12 | Rebar Probe | Ground 12 | OL | 150- | 283 |

# CONTINUITY
Rogers County Bridge
April 16, 1985

Connection at Reference Cell Ground 12

| READING NUMBER | TEST POINT | | RESISTANCE (DC OHMS) | RESISTANCE (DC OHMS) | VOLTAGE DIFFERENCE (millivolts) |
|---|---|---|---|---|---|
| 1 | System Negative 23 | | 1.3 | 1.1 | 0.0 |
| 2 | System Negative 24 | | 1.4 | 1.2 | 0.0 |
| 3 | Rebar Probe | Ground 11 | 150- | OL | 284 |
| 4 | Rebar Probe | Ground 12 | 0.3 | 2.3 | 0.8 |

# CONTINUITY

Rogers County Bridge
April 16, 1985

Connection at System Negative 11

| READING NUMBER | TEST POINT | | RESISTANCE (DC OHMS) | RESISTANCE (DC OHMS) | VOLTAGE DIFFERENCE (millivolts) |
|---|---|---|---|---|---|
| 1 | System Negative 12 | | 0.5 | 0.5 | 0.0 |
| 2 | System Negative 13 | | 22+ | 3.4+ | 17.6 |
| 3 | System Negative 14 | | 23+ | 3.4+ | 8.3 |
| 4 | Reference Cell | Ground 6 | 0.4 | 0.5 | 0.0 |
| 5 | Reference Cell | Ground 7 | 600- | 650- | 48.0 |
| 6 | Rebar Probe | Ground 6 | 0.4 | 0.5 | 0.0 |
| 7 | Rebar Probe | Ground 7 | 600- | 650- | 49.8 |

CONTINUITY
Rogers County Bridge
April 16, 1985

Connection at System Negative 15

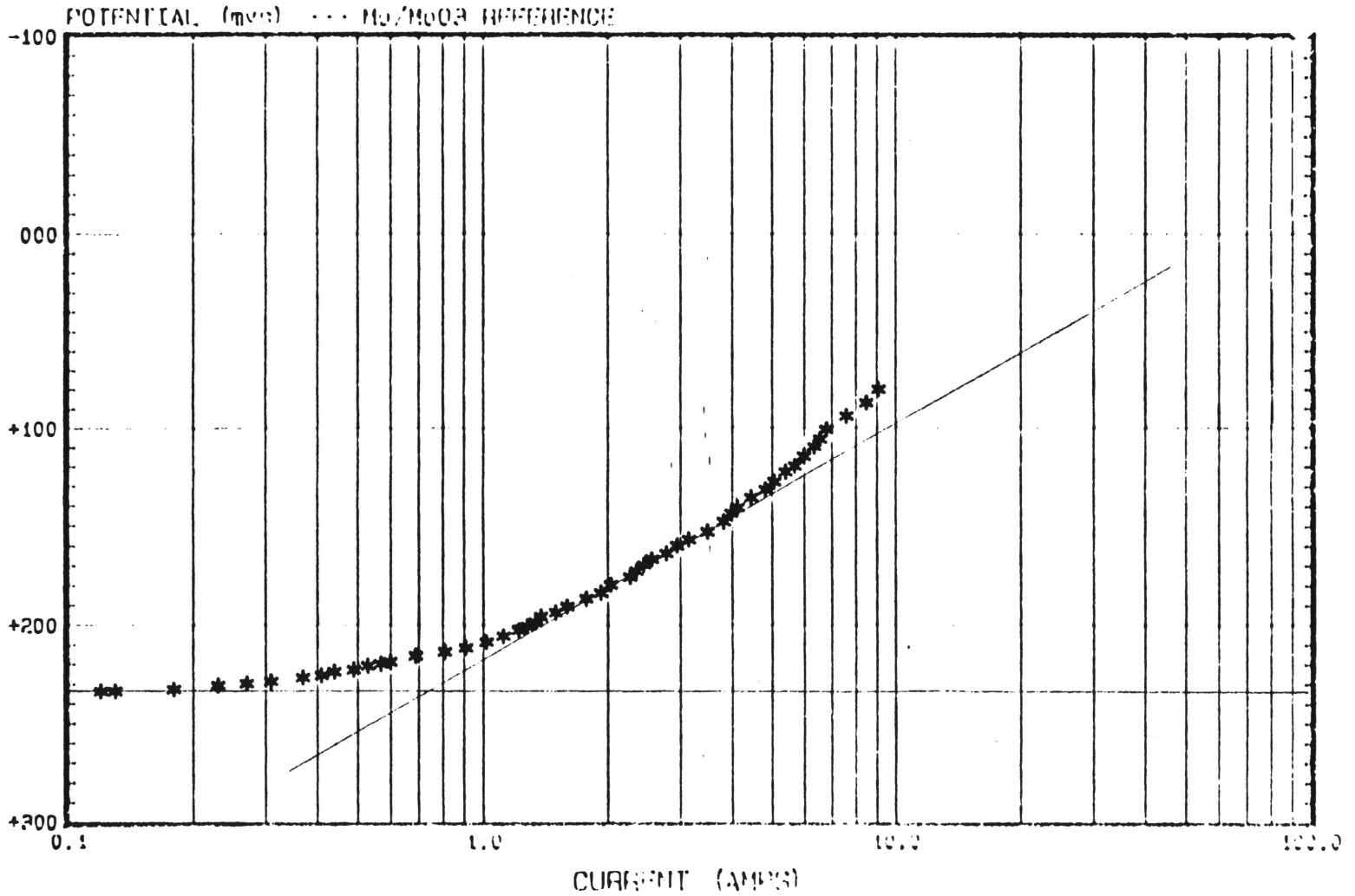
| READING NUMBER | TEST POINT | RESISTANCE (DC OHMS) | RESISTANCE (DC OHMS) | VOLTAGE DIFFERENCE (millivolts) |
|---|---|---|---|---|
| 1 | System Negative 11 | 164+ | 570+ | 50 |
| 2 | System Negative 12 | 110+ | 500+ | 50 |
| 3 | System Negative 13 | 1000+ | 500- | 110 |
| 4 | System Negative 14 | 1000+ | 500- | 110 |
| 5 | System Negative 16 | 0.6 | 0.7 | 0.0 |
| 6 | System Negative 17 | 45- | 78+ | 50 |
| 7 | System Negative 18 | 45- | 78+ | 50 |
| 8 | System Negative 19 | 1000+ | 500- | 110 |
| 9 | System Negative 20 | 1000+ | 500- | 110 |
| 10 | Reference Cell Ground 7 | 120+ | 440- | 113 |
| 11 | Reference Cell Ground 8 | 0.6 | 0.8 | 0.0 |
| 12 | Reference Cell Ground 9 | 47+ | 81+ | 50 |

# [illegible] LCG-I TEST

## OKLAHOMA DEPARTMENT OF TRANSPORTATION -- PROJECT NO. RS-6620 (100)

## ZONE No. 12

April 18, 1985



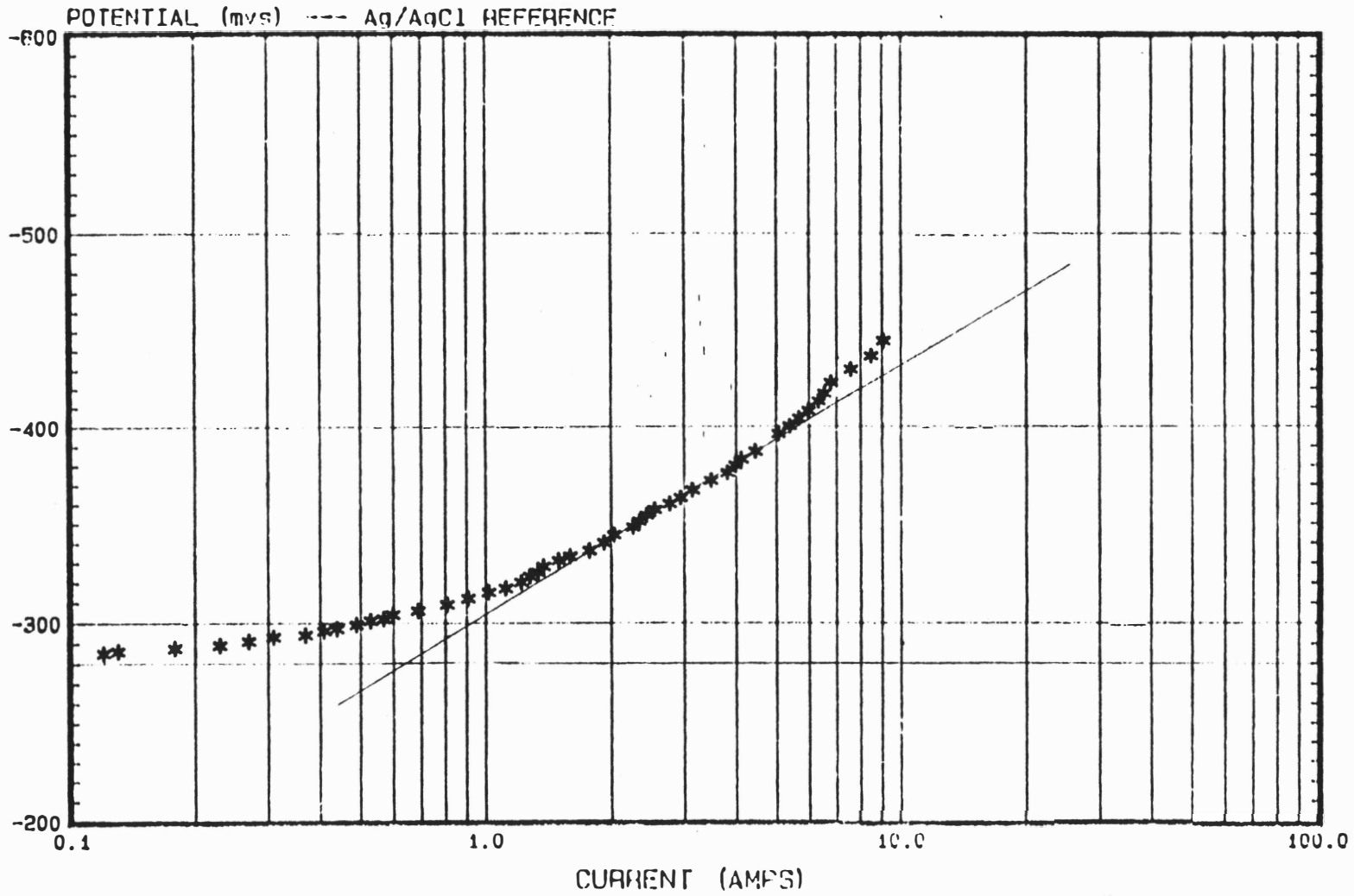

**PREPARED FOR: TWAY CONTRACTING COMPANY *** PREPARED BY: HARCO CORPORATION**

# E LOG-I TEST

## OKLAHOMA DEPARTMENT OF TRANSPORTATION -- PROJECT NO. RS-6620 (100)

## ZONE No. 12

April 18, 1985



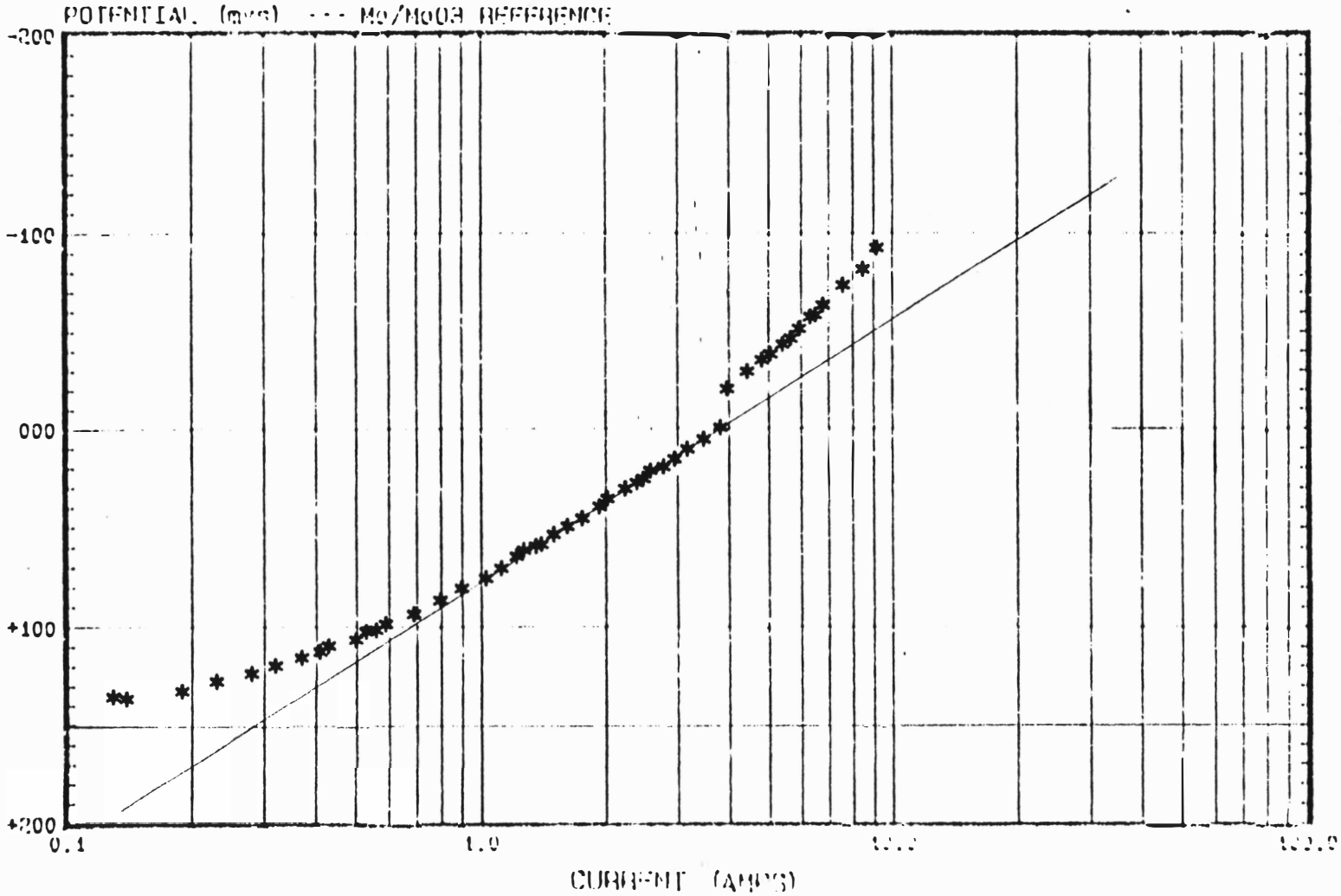

**PREPARED FOR: TWAY CONTRACTING COMPANY *** PREPARED BY: HARCO CORPORATION**

# [illegible] LOCATIONS

## OKLAHOMA DEPARTMENT OF TRANSPORTATION -- PROJECT NO. RS-6620 (100)

## ZONE No. 11

April 18, 1985



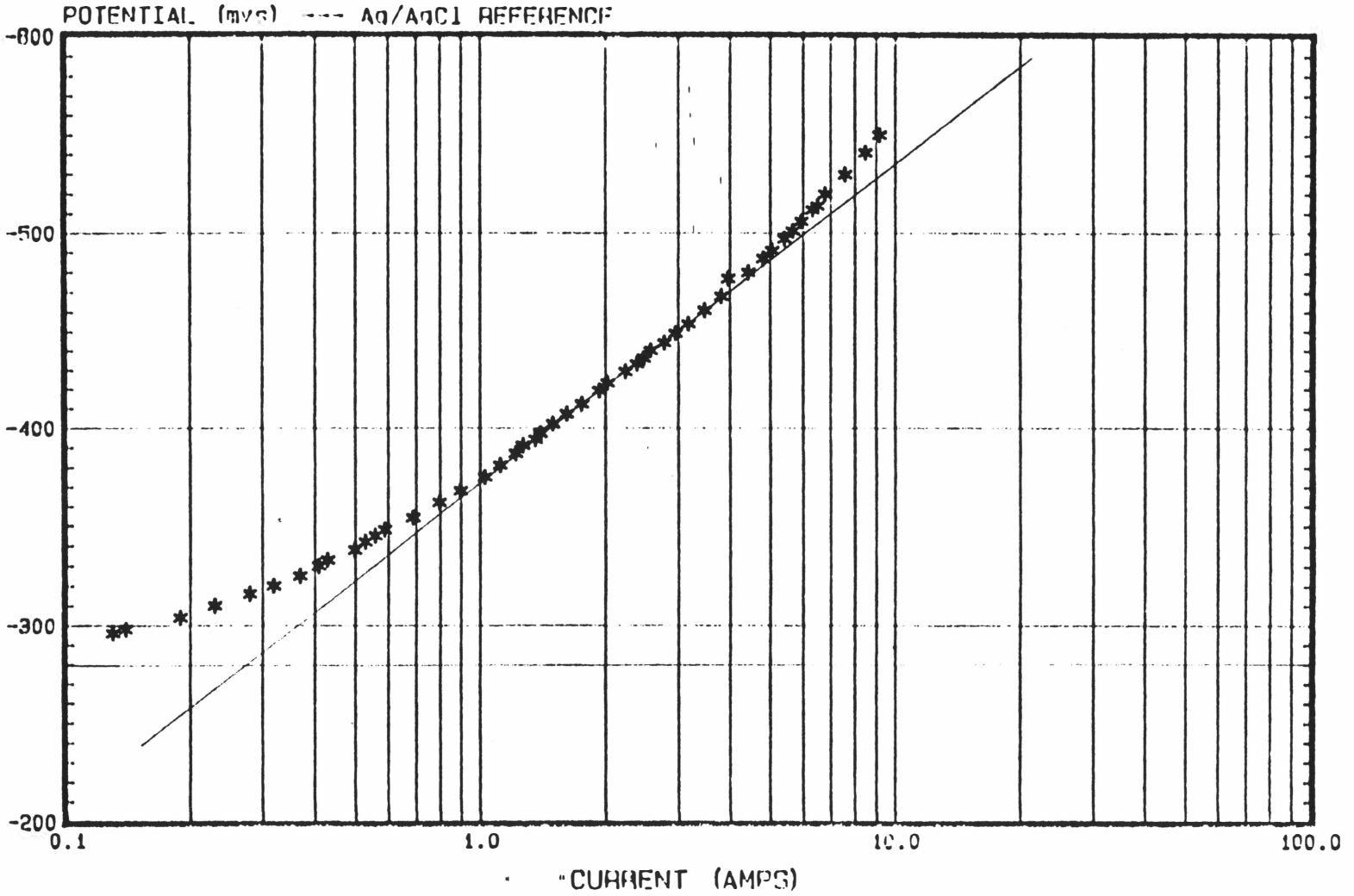

**PREPARED FOR: TWAY CONTRACTING COMPANY *** PREPARED BY: HARCO CORPORATION**

# E LOG-I TEST

## OKLAHOMA DEPARTMENT OF TRANSPORTATION -- PROJECT NO. RS-6620 (100)

## ZONE No. 11

April 18, 1985



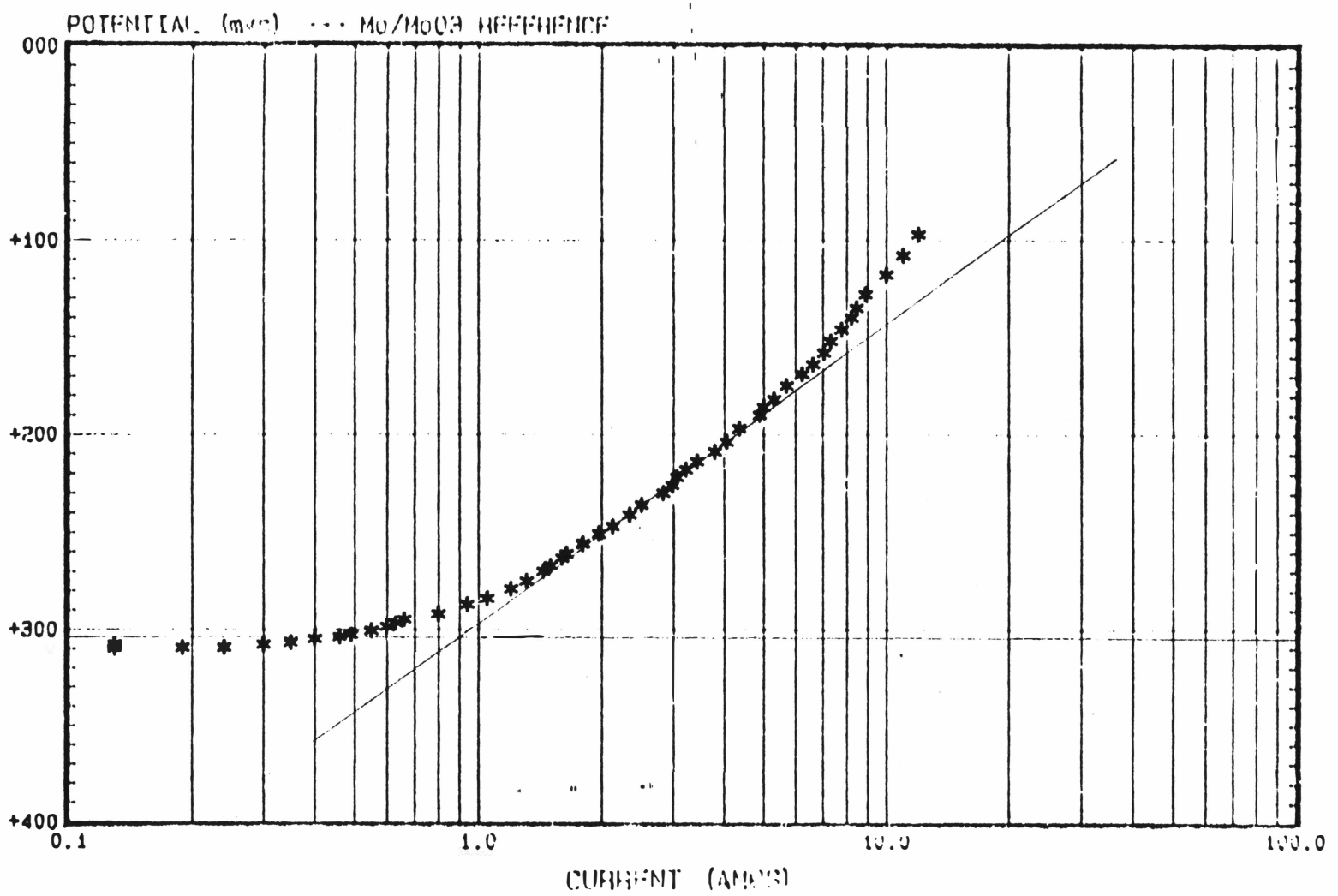

**PREPARED FOR: TWAY CONTRACTING COMPANY *** PREPARED BY: HARCO CORPORATION**

# F LOC I TEST

## OKLAHOMA DEPARTMENT OF TRANSPORTATION -- PROJECT NO. RS-6620 (100)

## ZONE No. 10

April 18, 1985



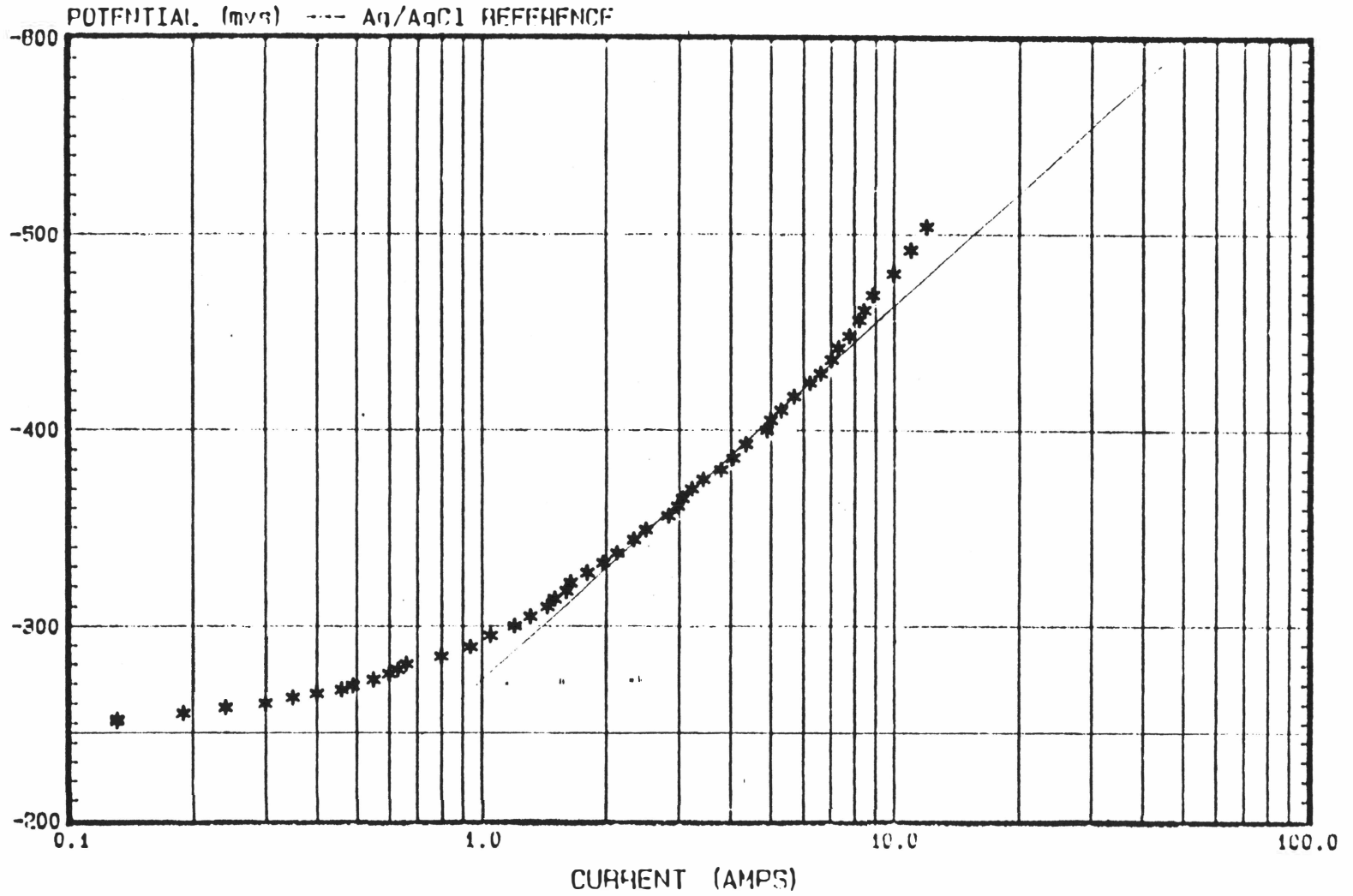

**PREPARED FOR: TWAY CONTRACTING COMPANY *** PREPARED BY: HARCO CORPORATION**

# E LOG-I TEST

## OKLAHOMA DEPARTMENT OF TRANSPORTATION -- PROJECT NO. RS-6620 (100)

## ZONE No. 10

April 18, 1985



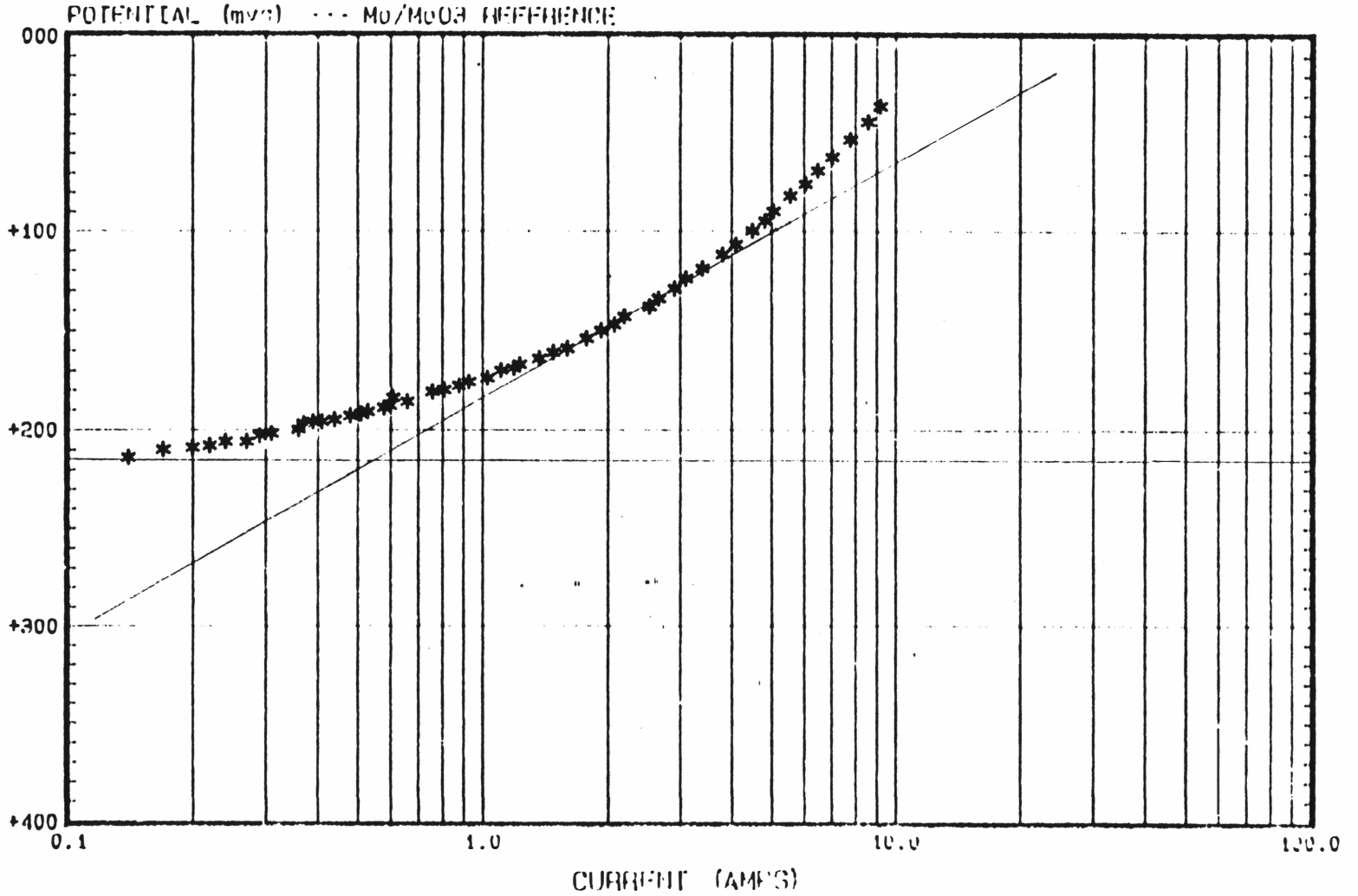

**PREPARED FOR: TWAY CONTRACTING COMPANY *** PREPARED BY: HARCO CORPORATION**

# F LOC I TEST

## OKLAHOMA DEPARTMENT OF TRANSPORTATION -- PROJECT NO. RS-6620 (100)

## ZONE No. 9

April 18, 1985



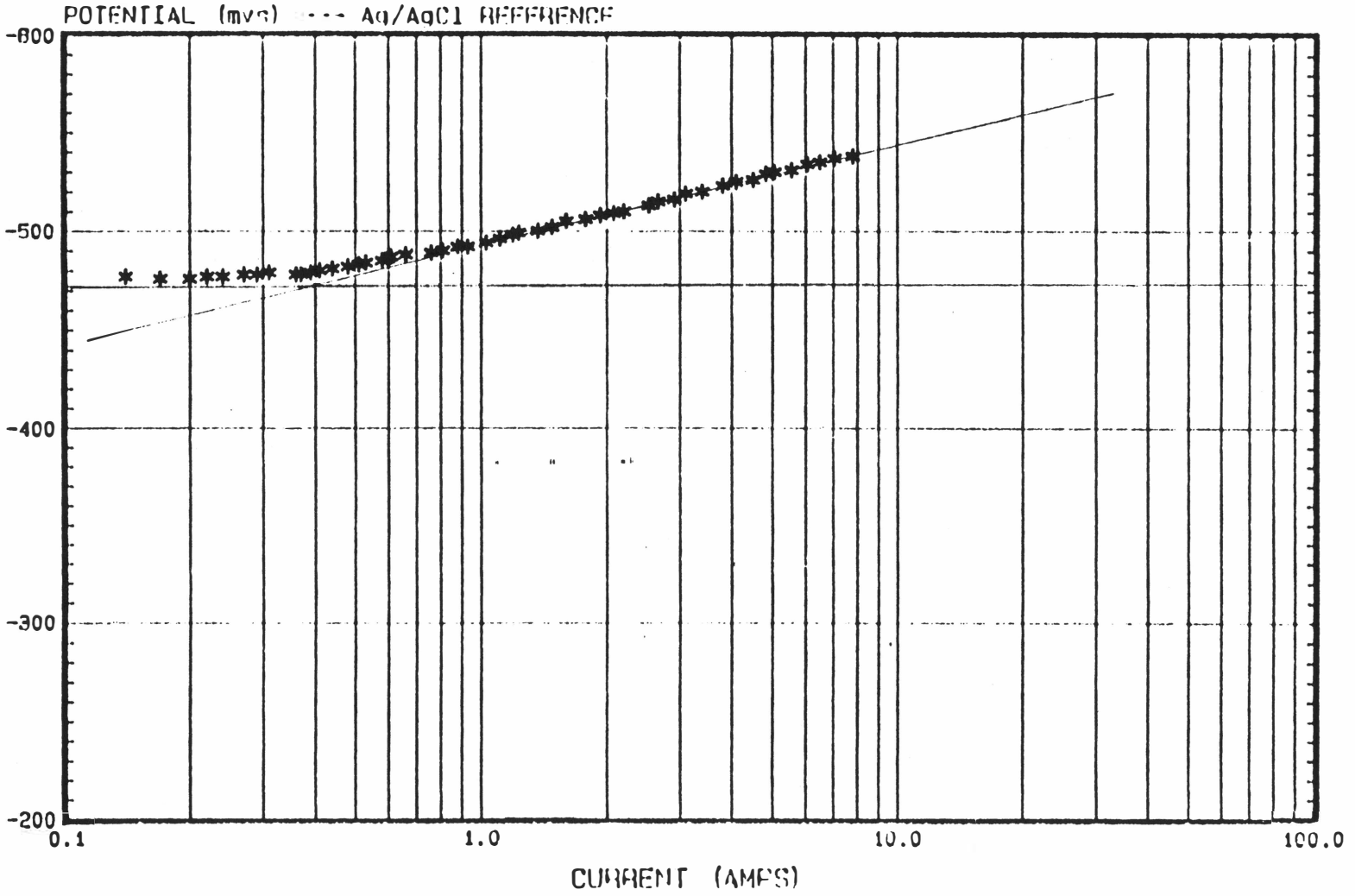

**PREPARED FOR: TWAY CONTRACTING COMPANY *** PREPARED BY: HARCO CORPORATION**

# E LOG-I TEST

## OKLAHOMA DEPARTMENT OF TRANSPORTATION -- PROJECT NO. RS-6620 (100)

## ZONE No. 9

April 18, 1985



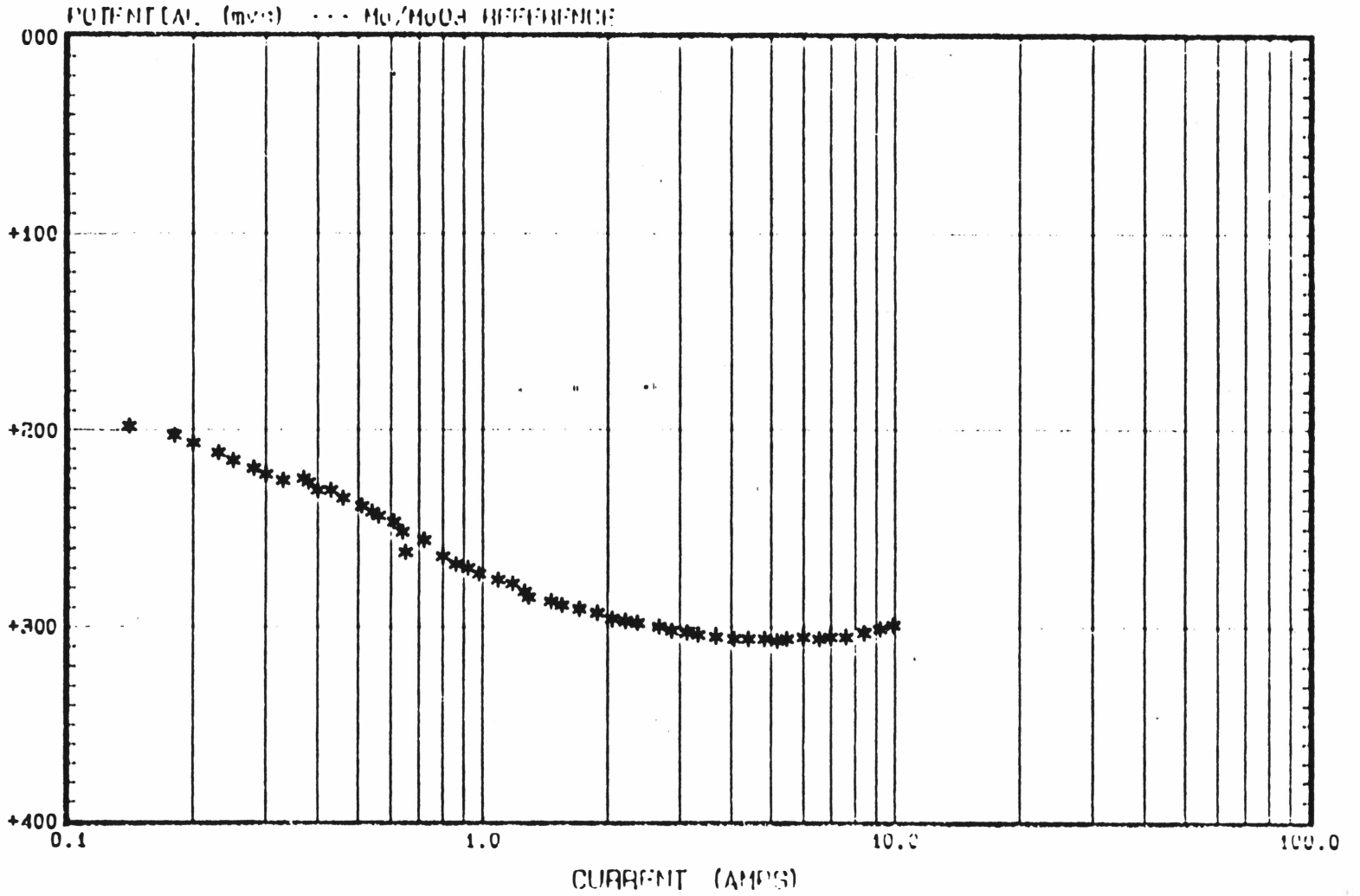

**PREPARED FOR: TWAY CONTRACTING COMPANY *** PREPARED BY: HARCO CORPORATION**

# E LOG-I TEST

## OKLAHOMA DEPARTMENT OF TRANSPORTATION -- PROJECT NO. RS-6620 (100)

## ZONE No. 8

April 17, 1985



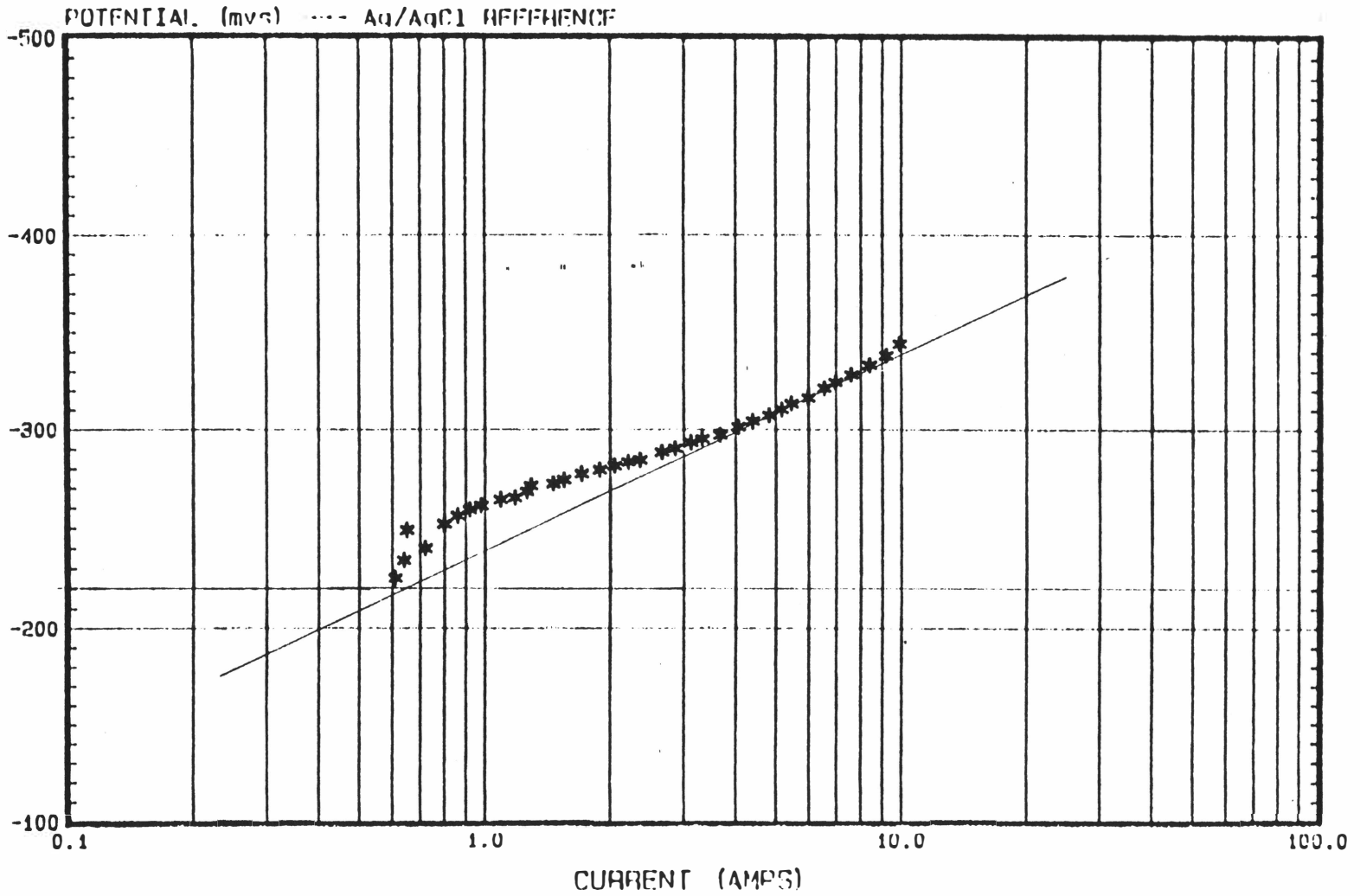

**PREPARED FOR: TWAY CONTRACTING COMPANY *** PREPARED BY: HARCO CORPORATION**

# E LOG-I TEST

## OKLAHOMA DEPARTMENT OF TRANSPORTATION -- PROJECT NO. RS-6620 (100)

## ZONE No. 8

April 17, 1985



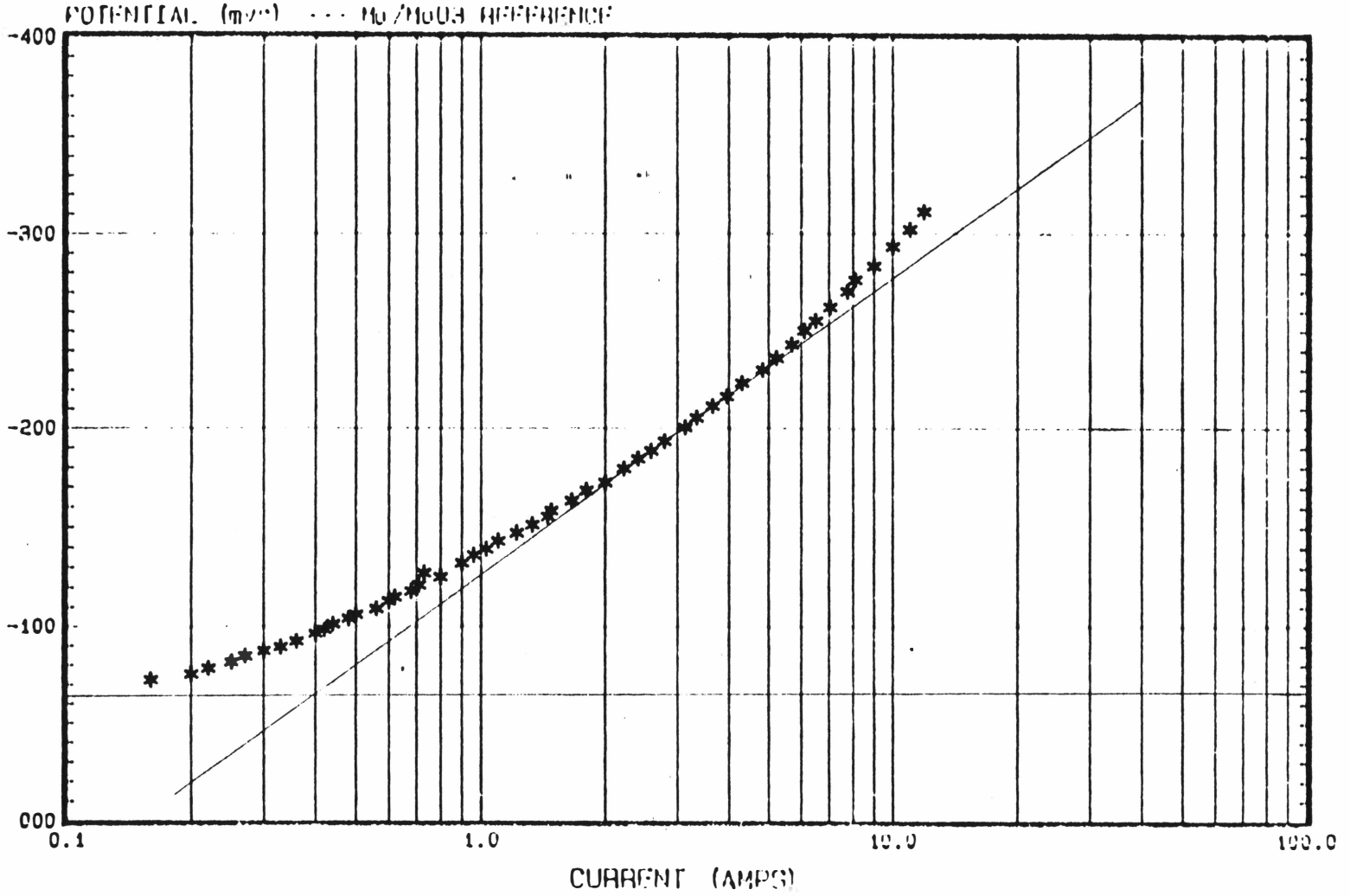

**PREPARED FOR: TWAY CONTRACTING COMPANY *** PREPARED BY: HARCO CORPORATION**

# E LOC I .LSI

## OKLAHOMA DEPARTMENT OF TRANSPORTATION -- PROJECT NO. RS-6620 (100)

## ZONE No. 7

April 17, 1985



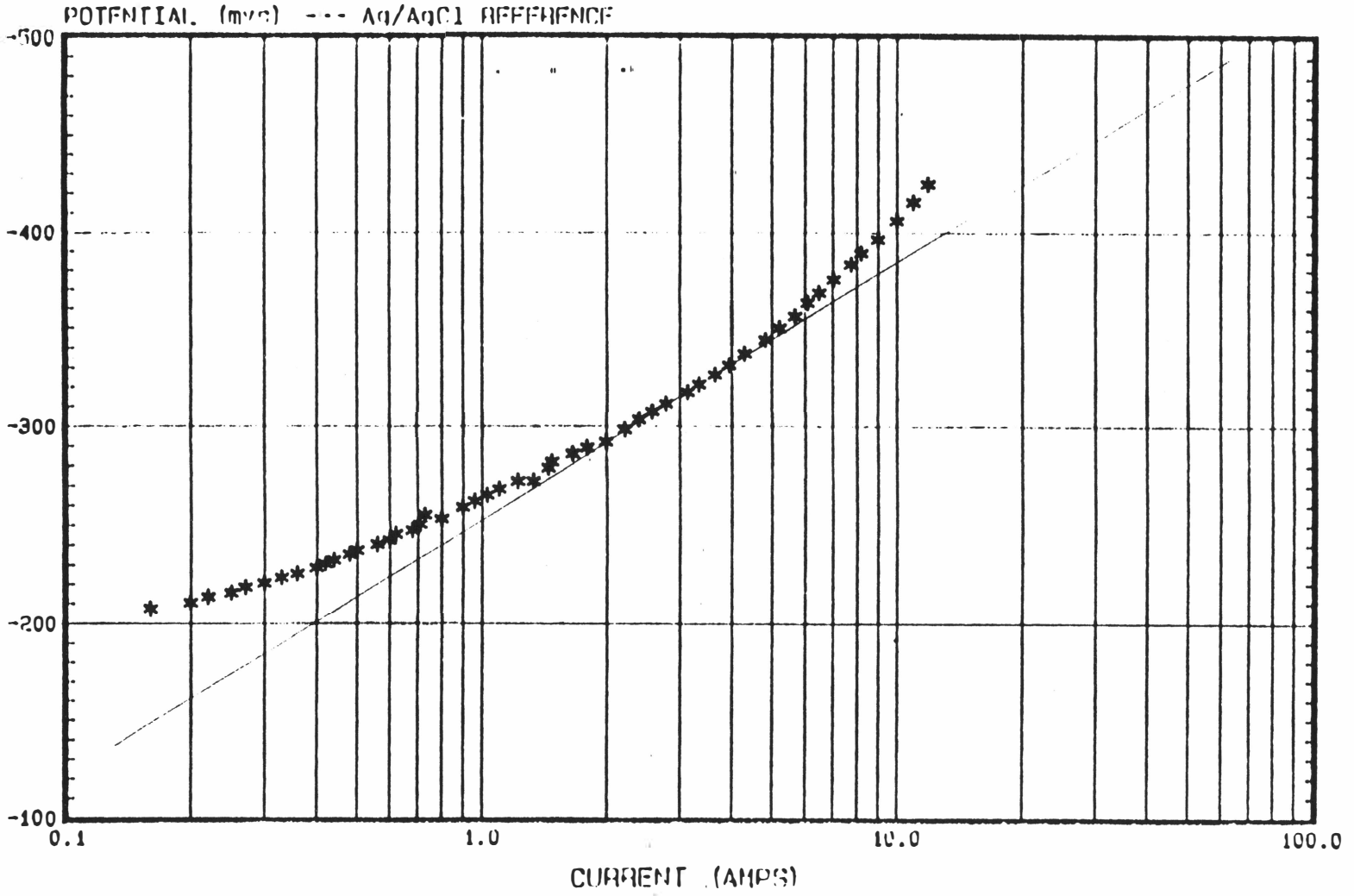

**PREPARED FOR: TWAY CONTRACTING COMPANY *** PREPARED BY: HARCO CORPORATION**

# E LOG-I TEST

## OKLAHOMA DEPARTMENT OF TRANSPORTATION -- PROJECT NO. RS-6620 (100)

## ZONE No. 7

April 17, 1985



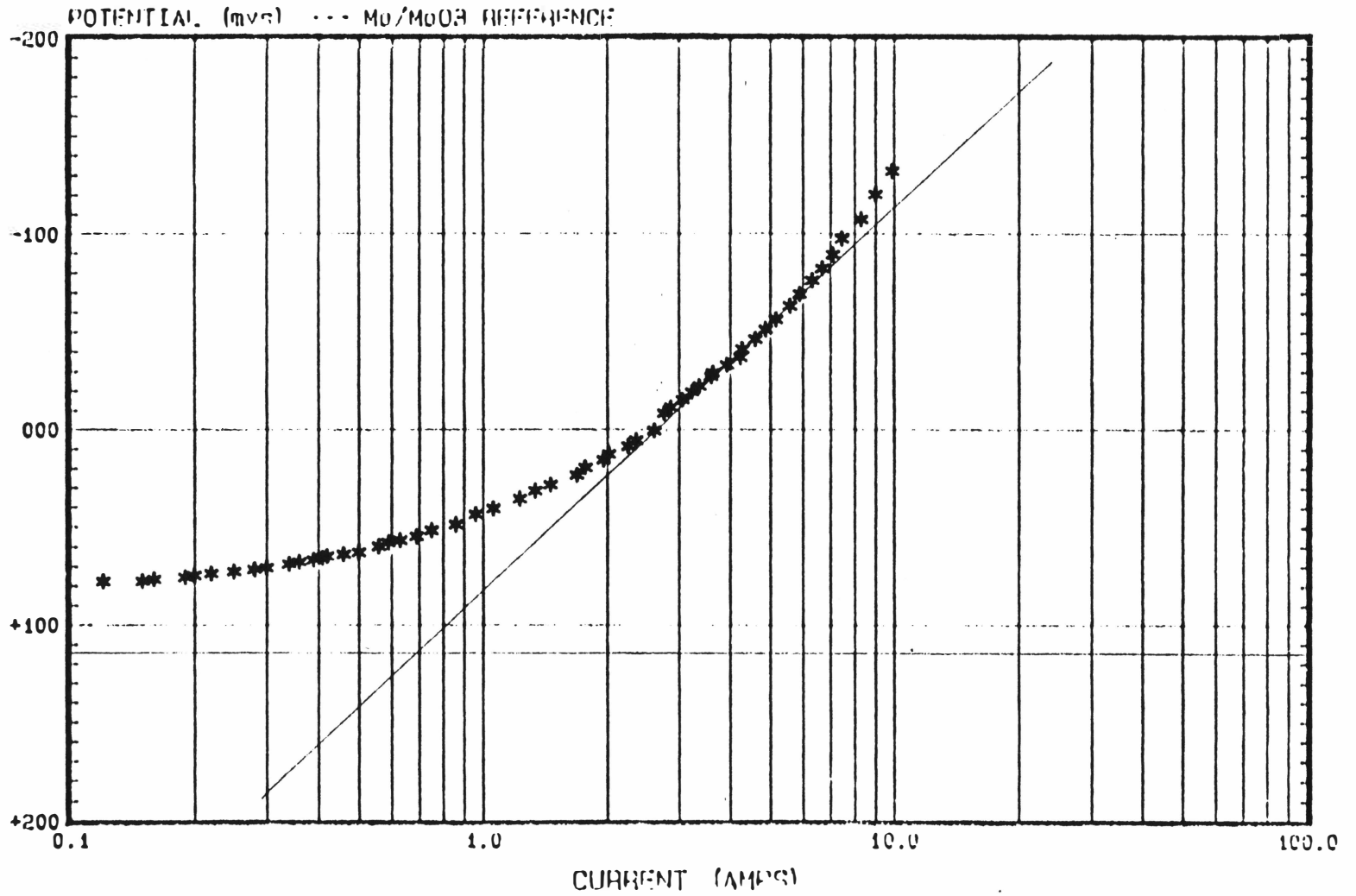

**PREPARED FOR: TWAY CONTRACTING COMPANY *** PREPARED BY: HARCO CORPORATION**

# E LOG I TEST

## OKLAHOMA DEPARTMENT OF TRANSPORTATION -- PROJECT NO. RS-6620 (100)

## ZONE No. 6

April 17, 1985



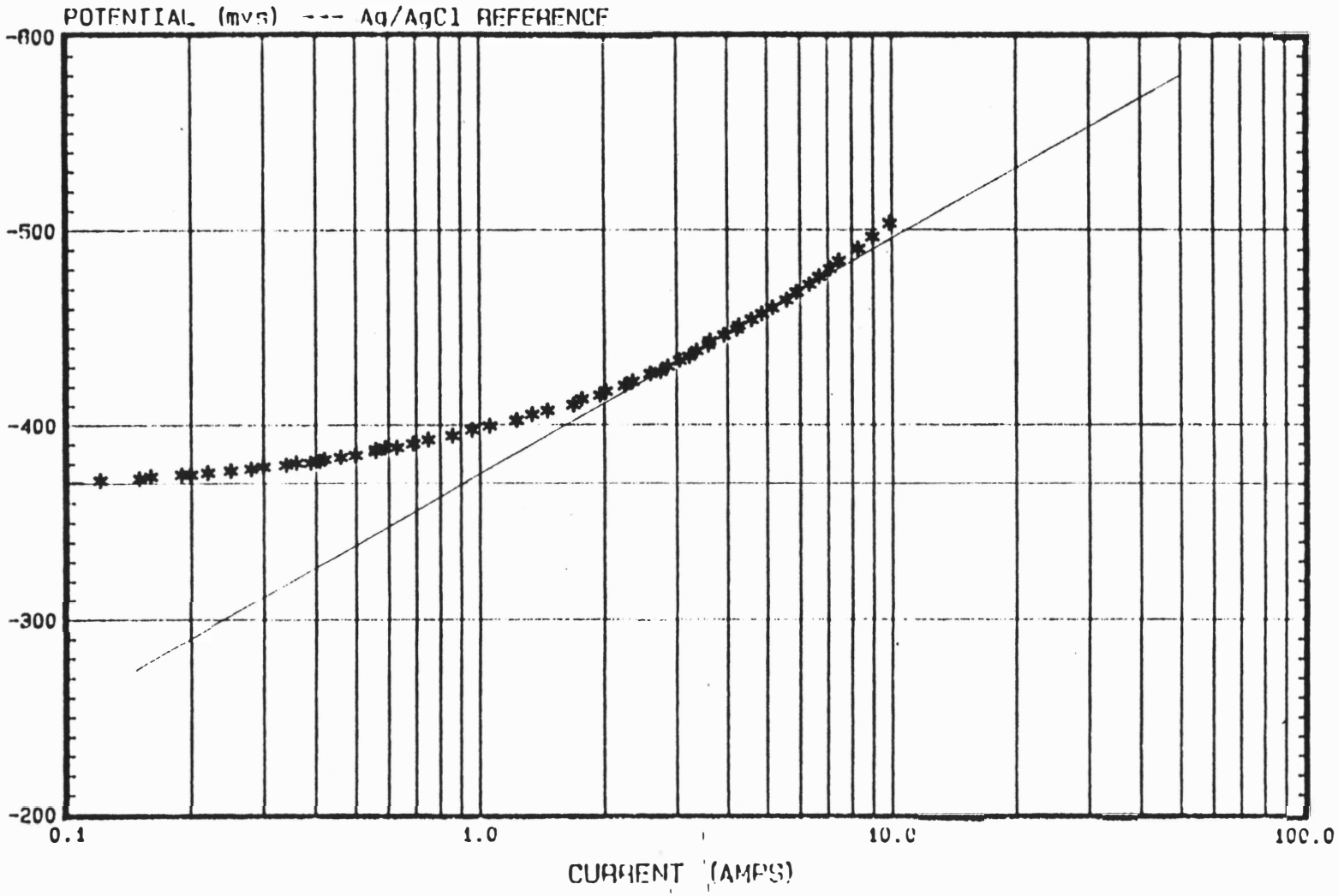

**PREPARED FOR: TWAY CONTRACTING COMPANY *** PREPARED BY: HARCO CORPORATION**

# E LOG-I TEST

## OKLAHOMA DEPARTMENT OF TRANSPORTATION -- PROJECT NO. RS-6620 (100)

## ZONE No. 6

April 17, 1985



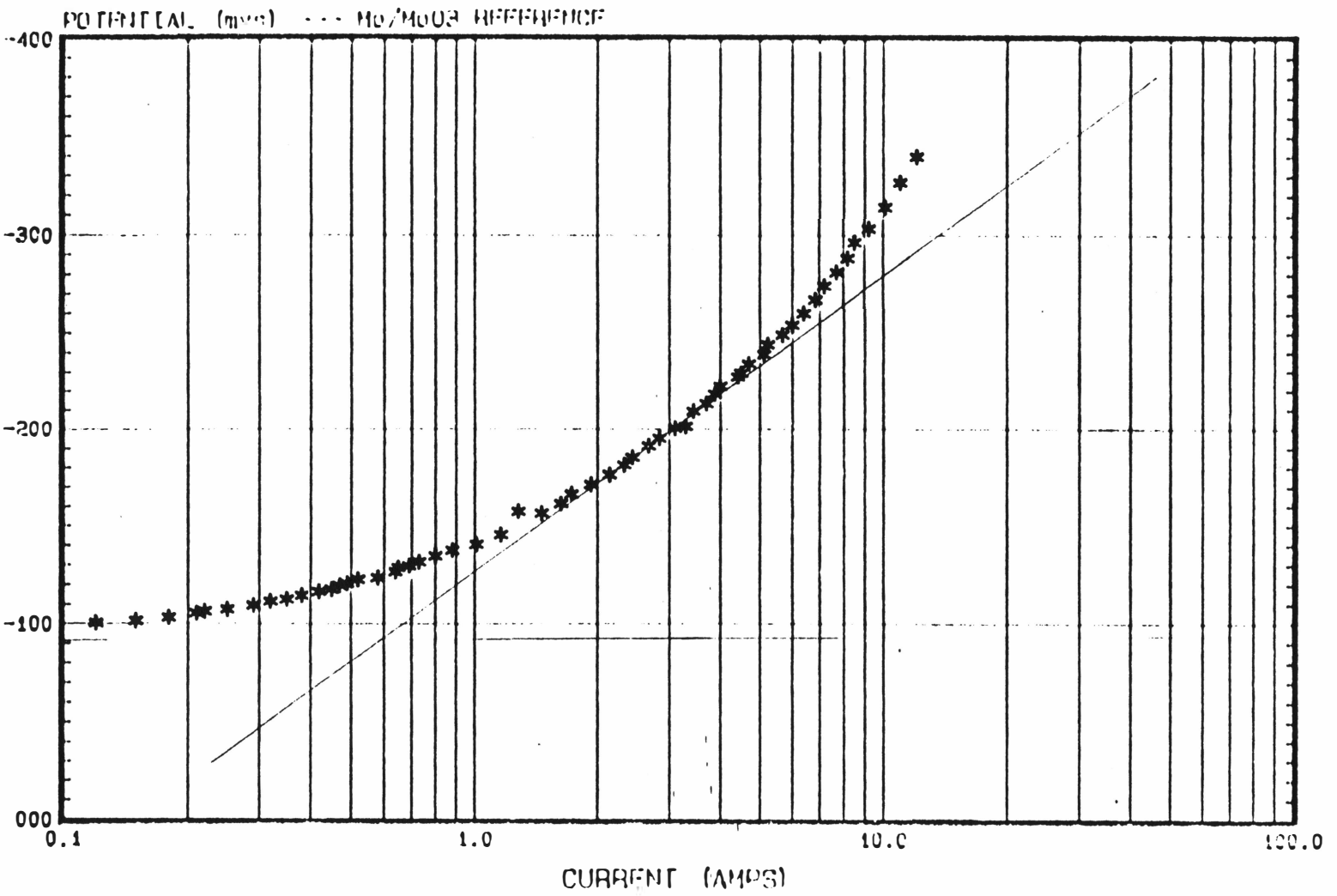

**PREPARED FOR: TWAY CONTRACTING COMPANY *** PREPARED BY: HARCO CORPORATION**

# E LOG I TEST

## OKLAHOMA DEPARTMENT OF TRANSPORTATION -- PROJECT NO. RS-6620 (100)

## ZONE No. 5

April 17, 1985



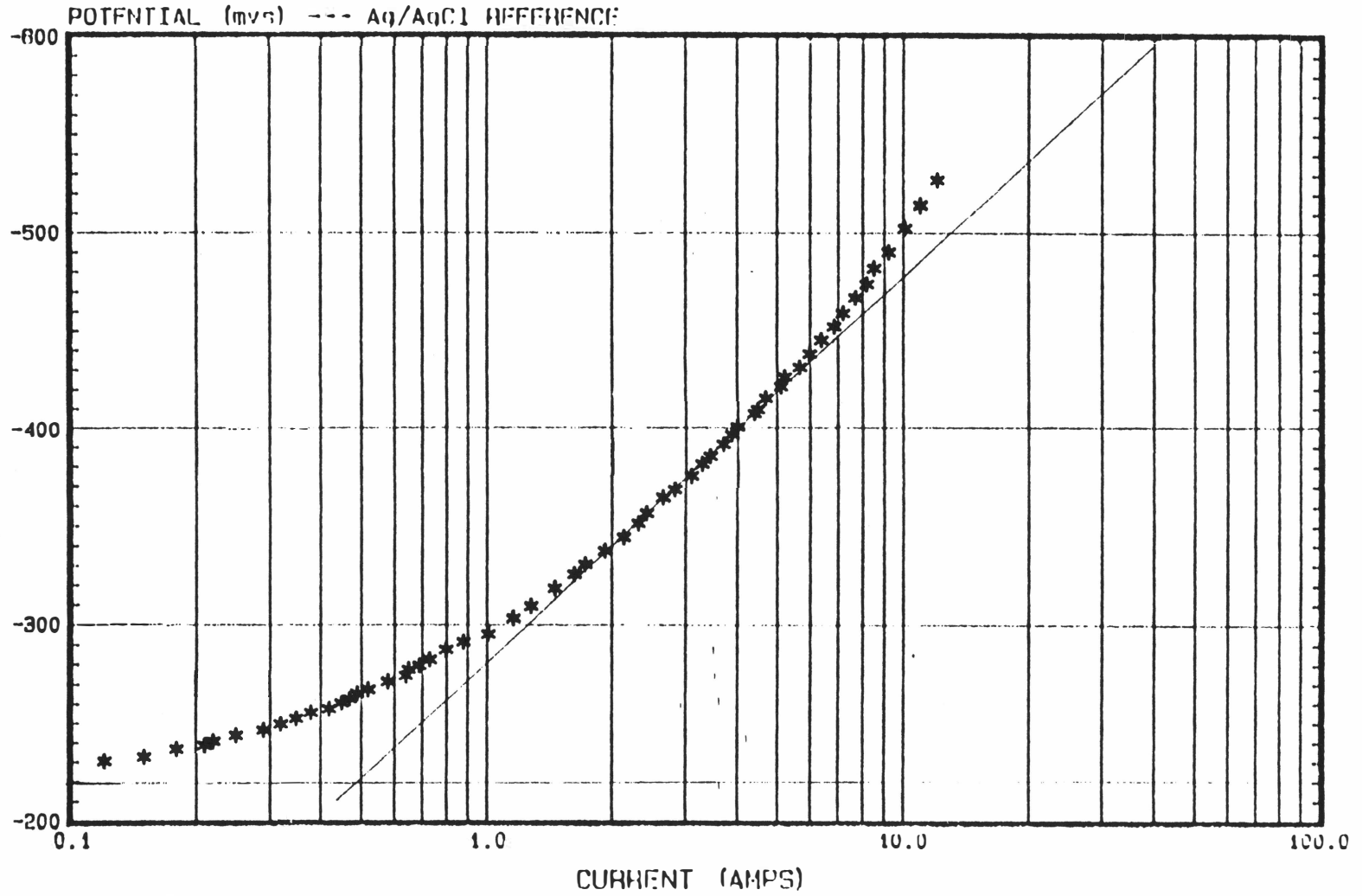

**PREPARED FOR: TWAY CONTRACTING COMPANY *** PREPARED BY: HARCO CORPORATION**

# E LOG-I TEST

## OKLAHOMA DEPARTMENT OF TRANSPORTATION -- PROJECT NO. RS-6620 (100)

## ZONE No. 5

April 17, 1985



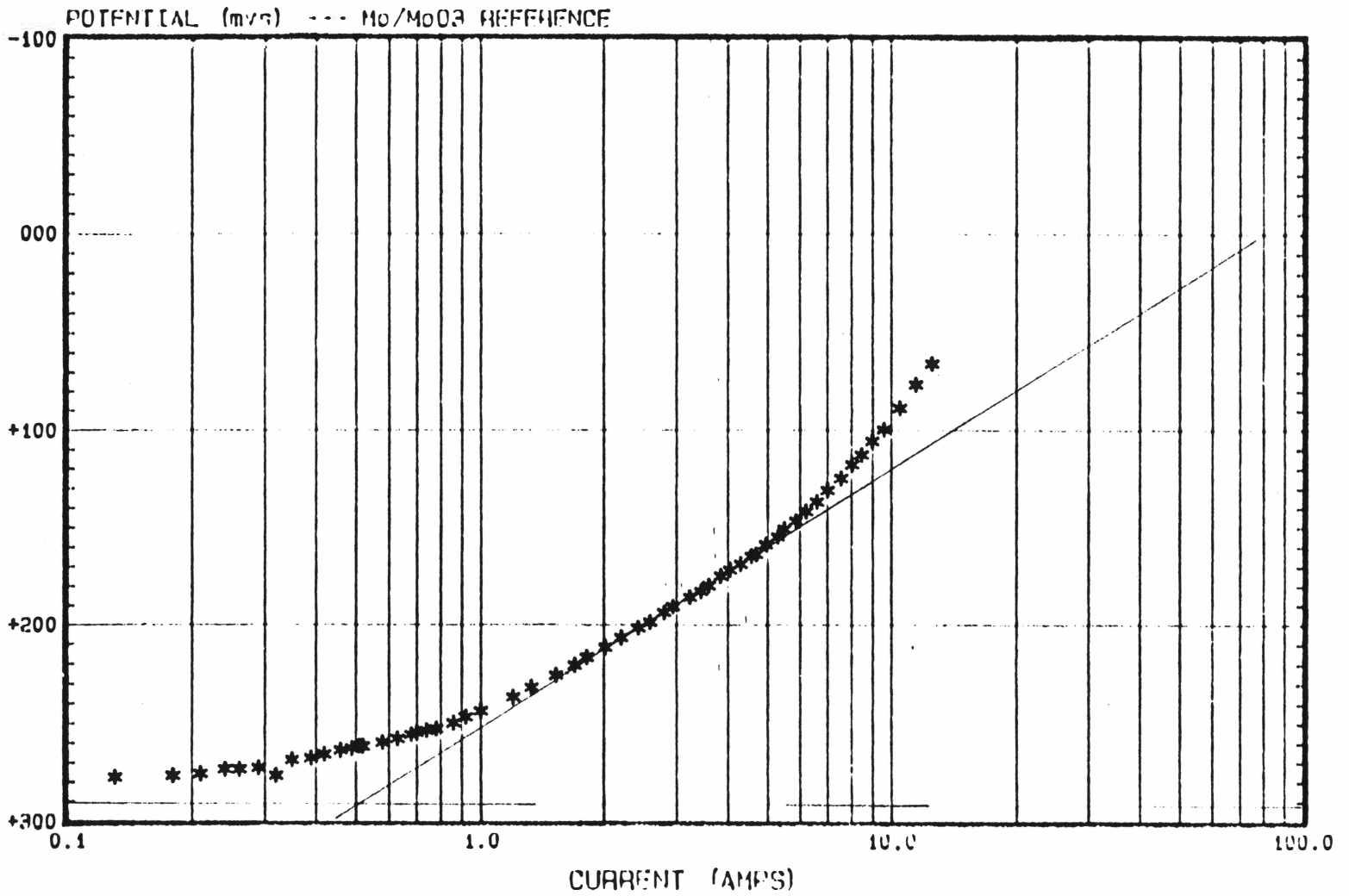

**PREPARED FOR: TWAY CONTRACTING COMPANY *** PREPARED BY: HARCO CORPORATION**

# E LOG-I TEST

## OKLAHOMA DEPARTMENT OF TRANSPORTATION -- PROJECT NO. RS-6620 (100)

## ZONE No. 4

April 17, 1985



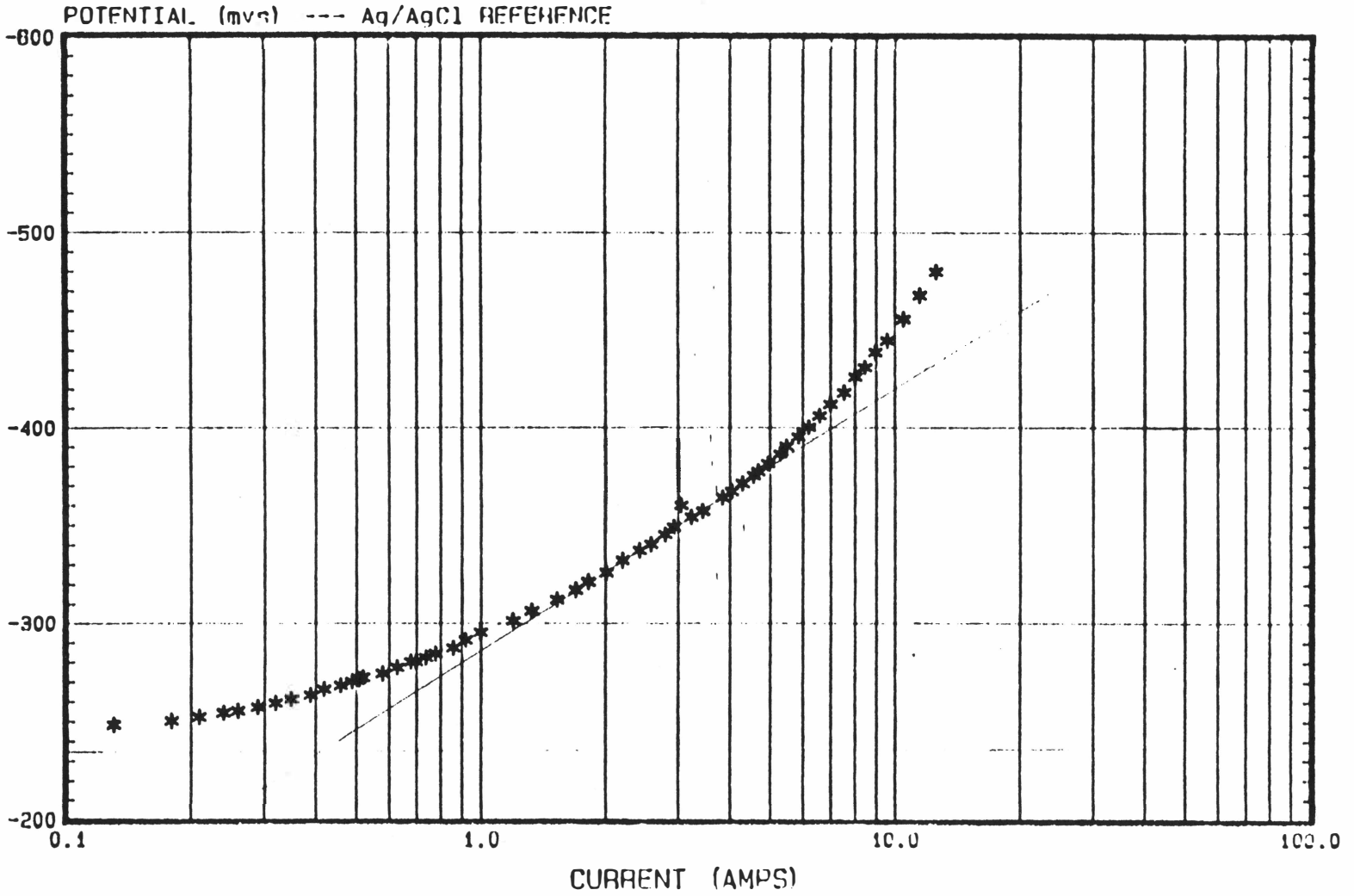

**PREPARED FOR: TWAY CONTRACTING COMPANY *** PREPARED BY: HARCO CORPORATION**

# E LOG-I TEST

## OKLAHOMA DEPARTMENT OF TRANSPORTATION -- PROJECT NO. RS-6620 (100)

## ZONE No. 4

April 17, 1985



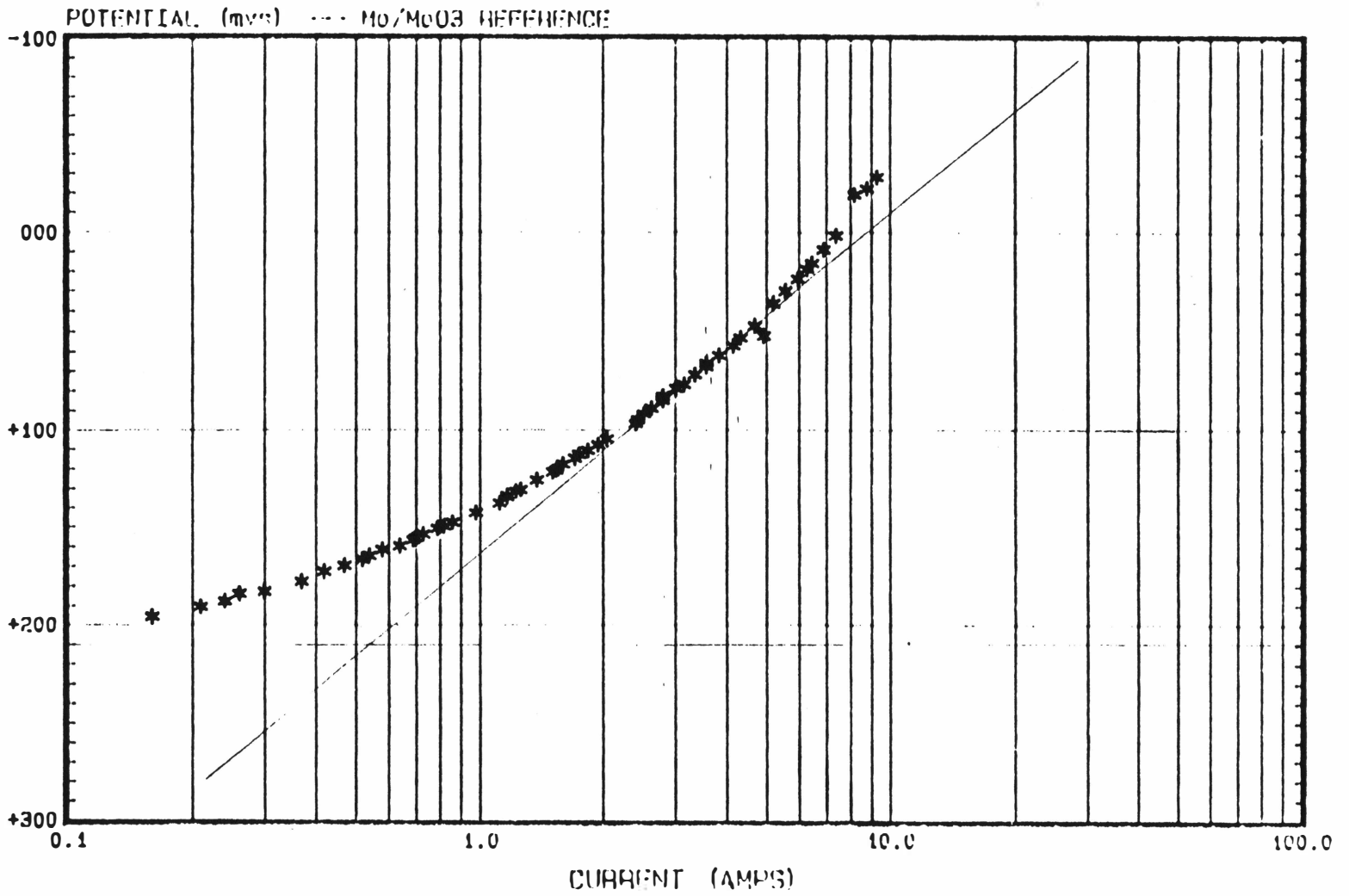

**PREPARED FOR: TWAY CONTRACTING COMPANY *** PREPARED BY: HARCO CORPORATION**

# E LOG-I TEST

## OKLAHOMA DEPARTMENT OF TRANSPORTATION -- PROJECT NO. RS-6620 (100)

## ZONE No. 3

April 17, 1985



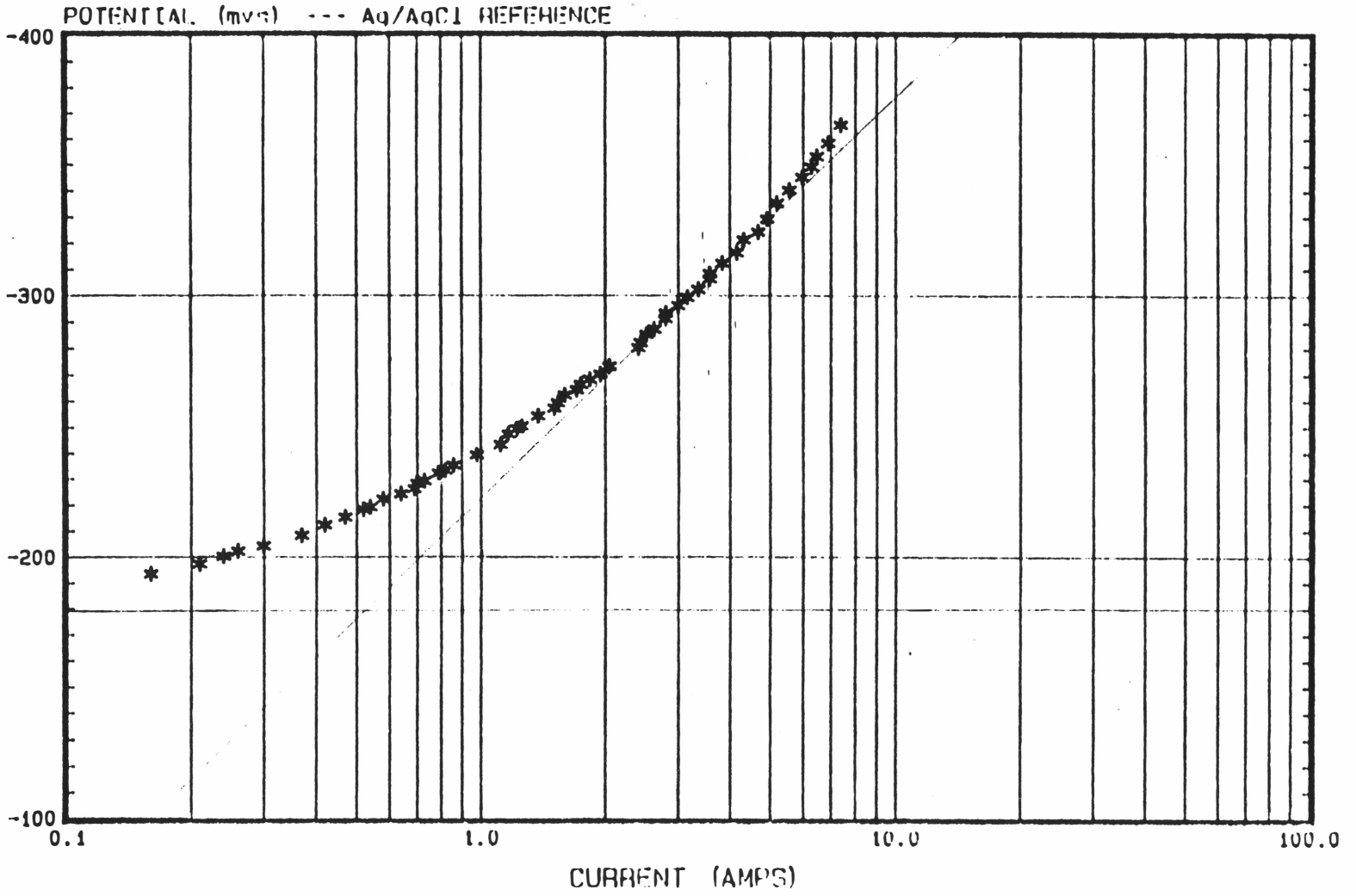

**PREPARED FOR: TWAY CONTRACTING COMPANY *** PREPARED BY: HARCO CORPORATION**

# E LOG-I TEST

## OKLAHOMA DEPARTMENT OF TRANSPORTATION -- PROJECT NO. RS-6620 (100)

## ZONE No. 3

April 17, 1985



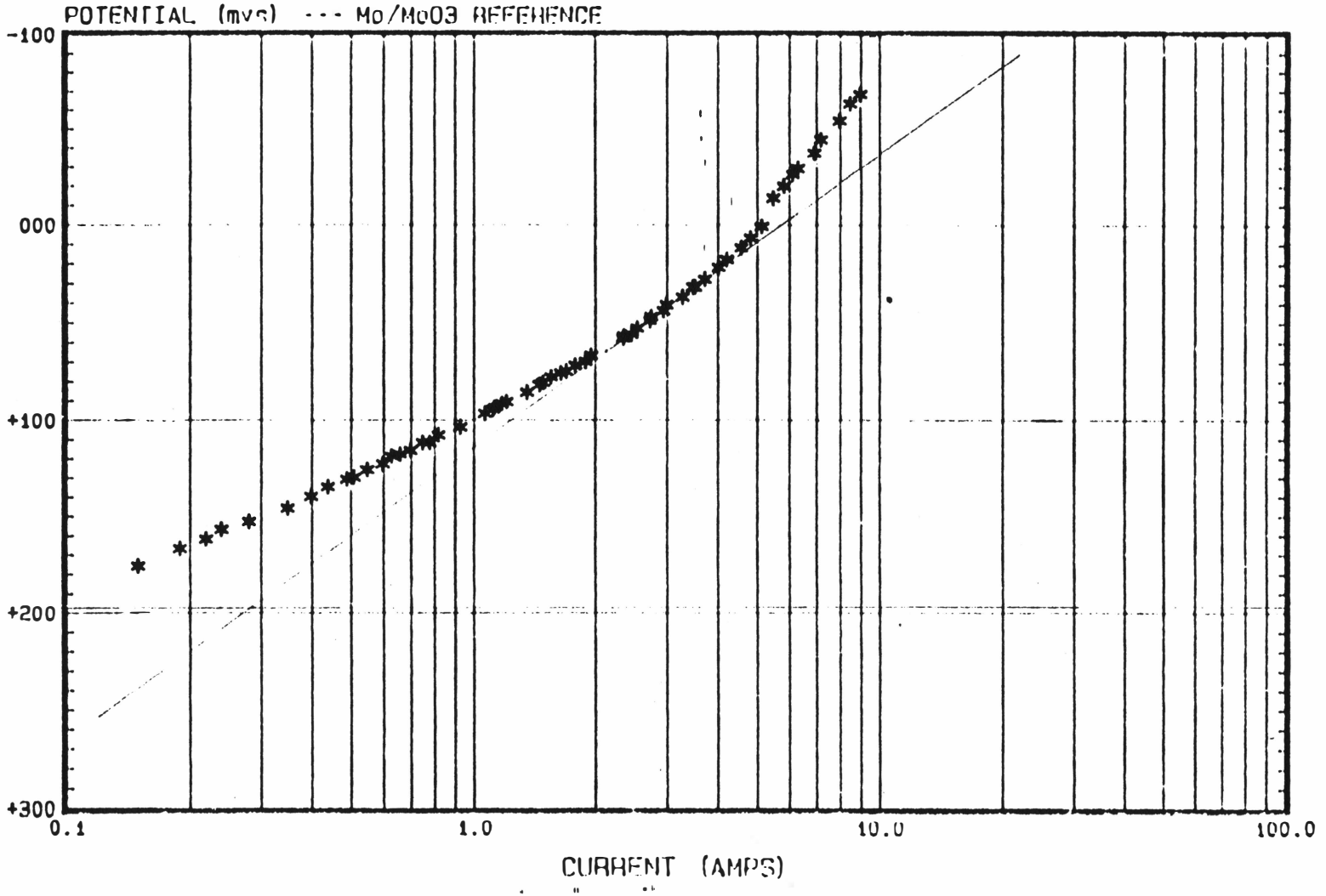

**PREPARED FOR: TWAY CONTRACTING COMPANY *** PREPARED BY: HARCO CORPORATION**

# E LOG-I TEST

## OKLAHOMA DEPARTMENT OF TRANSPORTATION -- PROJECT NO. RS-6620 (100)

## ZONE No. 2

April 17, 1985



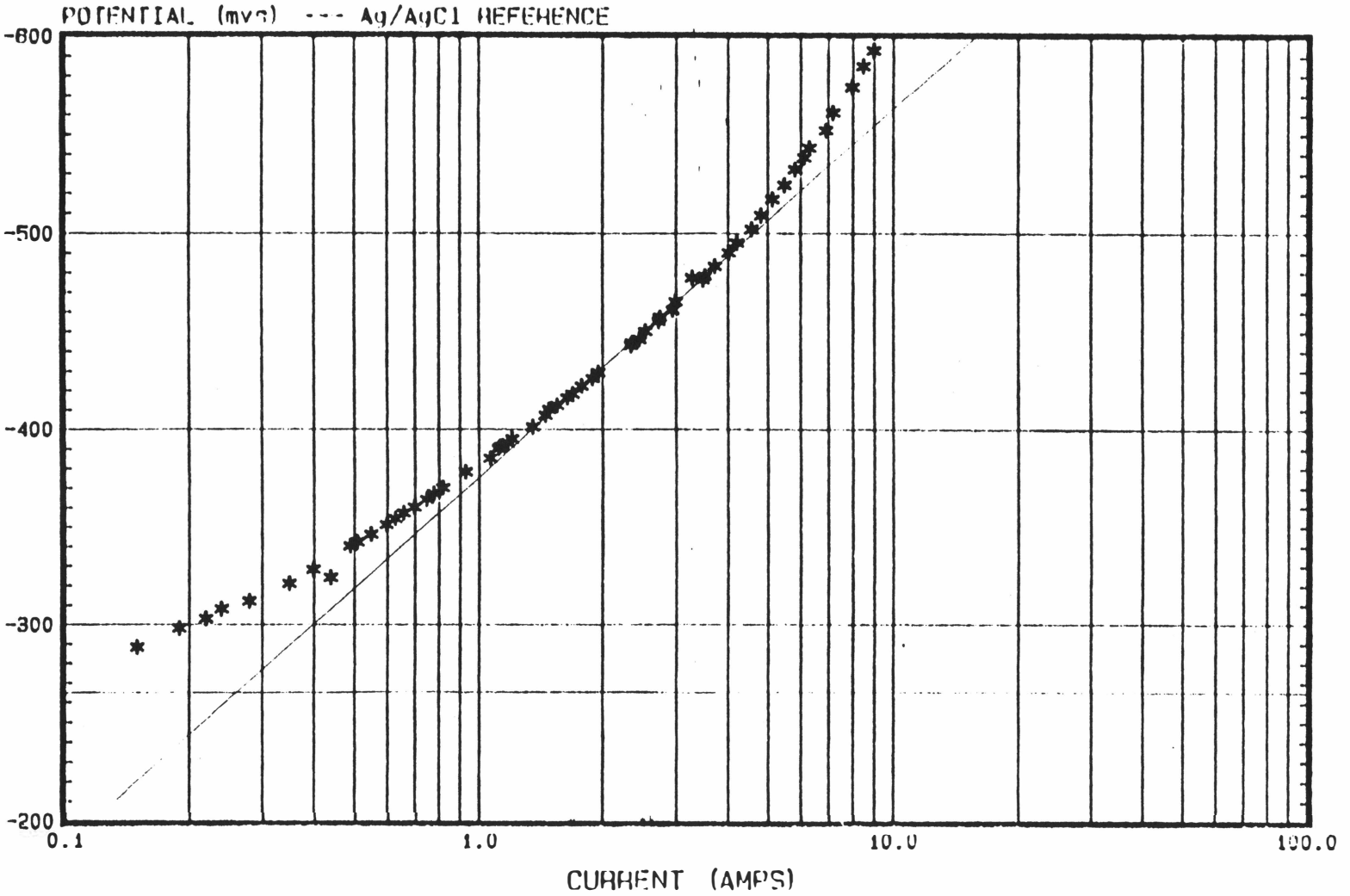

**PREPARED FOR: TWAY CONTRACTING COMPANY *** PREPARED BY: HARCO CORPORATION**

# E LOG-I TEST

## OKLAHOMA DEPARTMENT OF TRANSPORTATION -- PROJECT NO. RS-6620 (100)

## ZONE No. 2

April 17, 1985



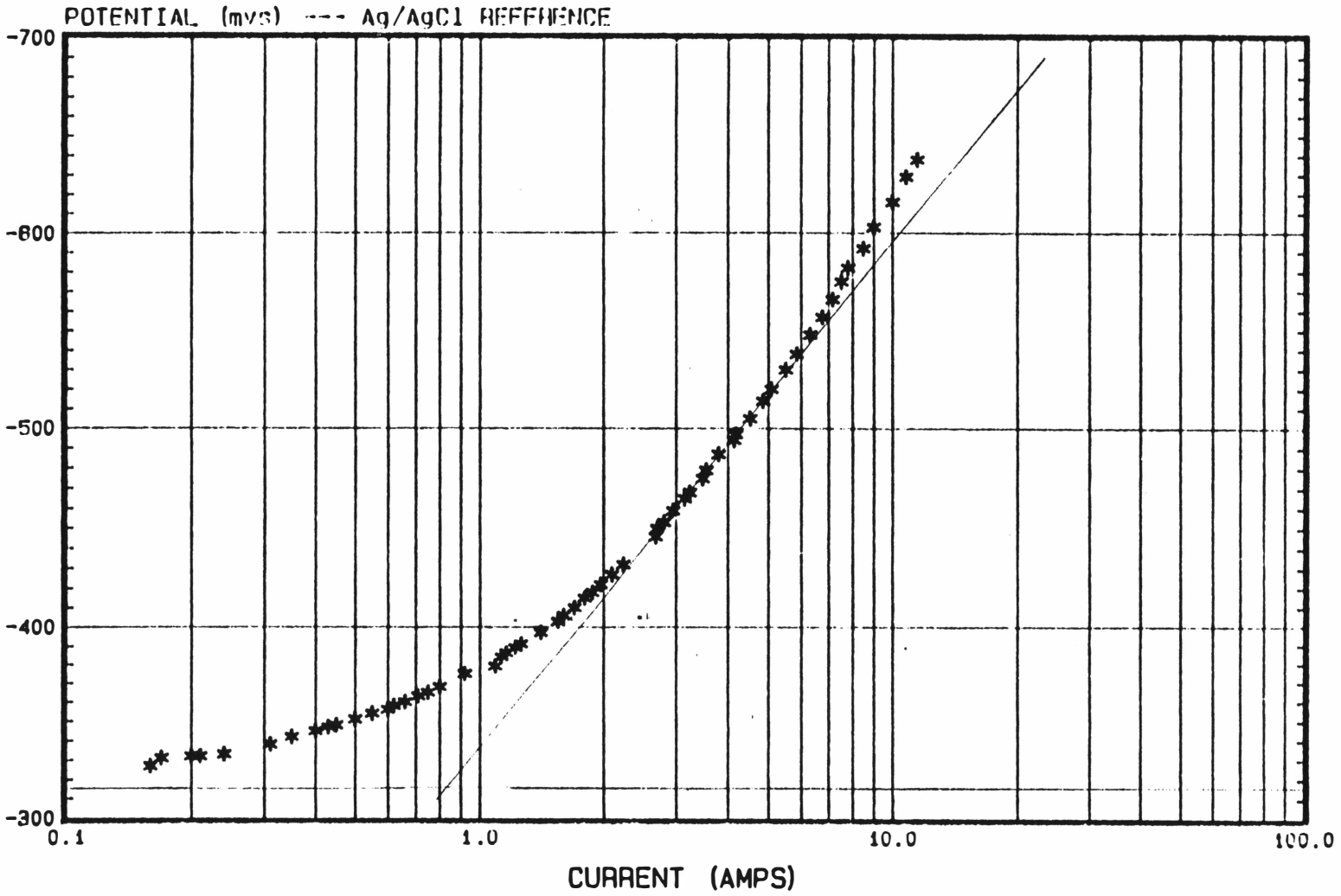

**PREPARED FOR: TWAY CONTRACTING COMPANY *** PREPARED BY: HARCO CORPORATION**

# E LOG-I TEST

## OKLAHOMA DEPARTMENT OF TRANSPORTATION -- PROJECT NO. RS-6620 (100)

## ZONE No. 1

April 17, 1985



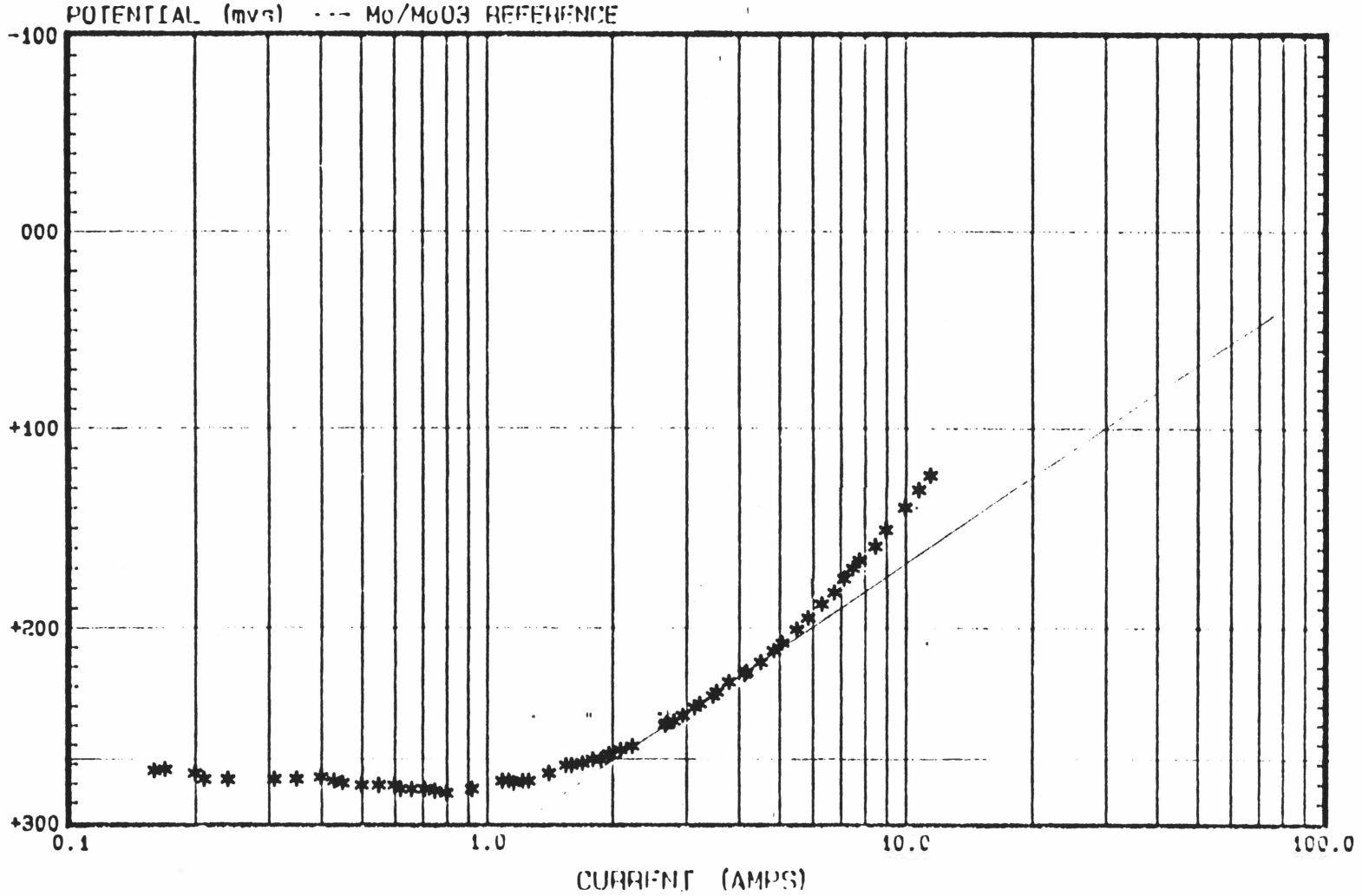

PREPARED FOR: TWAY CONTRACTING COMPANY *** PREPARED BY: HARCO CORPORATION

# E LOG-I TEST

## OKLAHOMA DEPARTMENT OF TRANSPORTATION -- PROJECT NO. RS-6620 (100)

## ZONE No. 1

April 17, 1985




**PREPARED FOR: TWAY CONTRACTING COMPANY *** PREPARED BY: HARCO CORPORATION**

## E-LOG I TEST

Rogers County Bridge
Zone 1
April 17, 1985

| READING NUMBER | CURRENT APPLIED (D.C. AMPS) | REINFORCING STEEL TO CONCRETE POTENTIAL VERSUS SILVER/SILVER CHLORIDE REFERENCE ELECTRODE (millivolts) | REINFORCING STEEL TO CONCRETE POTENTIAL VERSUS MOLYBDENUM/ MOLYBDENUM OXIDE REFERENCE ELECTRODE (millivolts) |
|---|---|---|---|
| 1 | 0.00 | -316 | +268 |
| 2 | 0.00 | -317 | +282 |
| 3 | 0.16 | -327 | +274 |
| 4 | 0.17 | -331 | +273 |
| 5 | 0.20 | -332 | +275 |
| 6 | 0.21 | -332 | +278 |
| 7 | 0.24 | -333 | +278 |
| 8 | 0.31 | -338 | +278 |
| 9 | 0.35 | -342 | +278 |
| 10 | 0.40 | -345 | +277 |
| 11 | 0.43 | -347 | +279 |
| 12 | 0.45 | -348 | +280 |
| 13 | 0.50 | -351 | +281 |
| 14 | 0.55 | -354 | +281 |
| 15 | 0.60 | -356 | +281 |
| 16 | 0.62 | -358 | +283 |
| 17 | 0.66 | -360 | +283 |
| 18 | 0.71 | -363 | +283 |
| 19 | 0.75 | -365 | +284 |
| 20 | 0.80 | -368 | +285 |
| 21 | 0.92 | -375 | +283 |
| 22 | 1.09 | -379 | +279 |
| 23 | 1.13 | -384 | +279 |
| 24 | 1.16 | -386 | +280 |

| READING NUMBER | CURRENT APPLIED (D.C. AMPS) | REINFORCING STEEL TO CONCRETE POTENTIAL | |
|---|---|---|---|
| | | VERSUS SILVER/SILVER CHLORIDE REFERENCE ELECTRODE (millivolts) | VERSUS MOLYBDENUM/ MOLYBDENUM OXIDE REFERENCE ELECTRODE (millivolts) |
| 25 | 1.22 | -389 | +279 |
| 26 | 1.26 | -391 | +279 |
| 27 | 1.41 | -397 | +275 |
| 28 | 1.55 | -403 | +271 |
| 29 | 1.60 | -406 | +271 |
| 30 | 1.70 | -410 | +270 |
| 31 | 1.80 | -415 | +268 |
| 32 | 1.88 | -418 | +268 |
| 33 | 1.97 | -422 | +265 |
| 34 | 2.10 | -427 | +263 |
| 35 | 2.24 | -432 | +261 |
| 36 | 2.68 | -446 | +250 |
| 37 | 2.70 | -450 | +249 |
| 38 | 2.81 | -453 | +248 |
| 39 | 2.95 | -459 | +245 |
| 40 | 3.15 | -465 | +241 |
| 41 | 3.24 | -468 | +239 |
| 42 | 3.48 | -475 | +235 |
| 43 | 3.55 | -479 | +233 |
| 44 | 3.80 | -487 | +228 |
| 45 | 4.14 | -494 | +224 |
| 46 | 4.18 | -497 | +223 |
| 47 | 4.52 | -505 | +218 |
| 48 | 4.86 | -514 | +212 |
| 49 | 5.09 | -520 | +208 |
| 50 | 5.51 | -530 | +207 |
| 51 | 5.86 | -538 | +195 |
| 52 | 6.32 | -548 | +188 |
| 53 | 6.76 | -557 | +182 |
| 54 | 7.16 | -566 | +175 |
| 55 | 7.52 | -575 | +170 |

## REINFORCING STEEL TO CONCRETE POTENTIAL

| READING NUMBER | CURRENT APPLIED (D.C. AMPS) | VERSUS SILVER SILVER CHLORIDE REFERENCE ELECTRODE (millivolts) | VERSUS MOLYBDENUM/ MOLYBDENUM OXIDE REFERENCE ELECTRODE (millivolts) |
|---|---|---|---|
| 56 | 7.80 | -582 | +166 |
| 57 | 8.50 | -592 | +159 |
| 58 | 9.00 | -603 | +151 |
| 59 | 10.00 | -616 | +140 |
| 60 | 10.80 | -629 | +131 |
| 61 | 11.50 | -638 | +125 |

## E-LOG I TEST

Rogers County Bridge
Zone 2
April 17, 1985

REINFORCING STEEL TO CONCRETE POTENTIAL

| READING NUMBER | CURRENT APPLIED (D.C. AMPS) | VERSUS SILVER/SILVER CHLORIDE REFERENCE ELECTRODE (millivolts) | VERSUS MOLYBDENUM/ MOLYBDENUM OXIDE REFERENCE ELECTRODE (millivolts) |
|---|---|---|---|
| 1 | 0.00 | -264 | +197 |
| 2 | 0.00 | -266 | +198 |
| 3 | 0.15 | -288 | +176 |
| 4 | 0.19 | -298 | +167 |
| 5 | 0.22 | -303 | +162 |
| 6 | 0.24 | -308 | +157 |
| 7 | 0.28 | -312 | +153 |
| 8 | 0.35 | -321 | +146 |
| 9 | 0.40 | -328 | +140 |
| 10 | 0.44 | -334 | +135 |
| 11 | 0.49 | -340 | +131 |
| 12 | 0.51 | -342 | +130 |
| 13 | 0.55 | -346 | +126 |
| 14 | 0.60 | -351 | +123 |
| 15 | 0.63 | -354 | +119 |
| 16 | 0.66 | -357 | +118 |
| 17 | 0.70 | -360 | +116 |
| 18 | 0.75 | -364 | +112 |
| 19 | 0.78 | -367 | +112 |
| 20 | 0.82 | -370 | +108 |
| 21 | 0.93 | -378 | +104 |
| 22 | 1.07 | -385 | +097 |
| 23 | 1.12 | -390 | +095 |
| 24 | 1.13 | -391 | +094 |

REINFORCING STEEL TO CONCRETE POTENTIAL

| READING NUMBER | CURRENT APPLIED (D.C. AMPS) | VERSUS SILVER/SILVER CHLORIDE REFERENCE ELECTRODE (millivolts) | VERSUS MOLYBDENUM/ MOLYBDENUM OXIDE REFERENCE ELECTRODE (millivolts) |
|---|---|---|---|
| 25 | 1.18 | -393 | +092 |
| 26 | 1.21 | -395 | +091 |
| 27 | 1.36 | -401 | +086 |
| 28 | 1.46 | -407 | +082 |
| 29 | 1.49 | -410 | +081 |
| 30 | 1.56 | -412 | +078 |
| 31 | 1.65 | -416 | +076 |
| 32 | 1.70 | -418 | +075 |
| 33 | 1.79 | -422 | +072 |
| 34 | 1.90 | -426 | +070 |
| 35 | 1.96 | -429 | +067 |
| 36 | 2.35 | -443 | +058 |
| 37 | 2.36 | -444 | +057 |
| 38 | 2.46 | -446 | +056 |
| 39 | 2.54 | -450 | +053 |
| 40 | 2.73 | -455 | +049 |
| 41 | 2.75 | -457 | +047 |
| 42 | 2.95 | -461 | +044 |
| 43 | 3.00 | -465 | +041 |
| 44 | 3.29 | -477 | +037 |
| 45 | 3.49 | -476 | +032 |
| 46 | 3.53 | -478 | +032 |
| 47 | 3.73 | -483 | +028 |
| 48 | 4.03 | -490 | +022 |
| 49 | 4.22 | -495 | +018 |
| 50 | 4.58 | -502 | +012 |
| 51 | 4.83 | -509 | +007 |
| 52 | 5.14 | -517 | +001 |
| 53 | 5.50 | -524 | -014 |
| 54 | 5.84 | -532 | -020 |
| 55 | 6.14 | -538 | -026 |

## REINFORCING STEEL TO CONCRETE POTENTIAL

| READING NUMBER | CURRENT APPLIED (D.C. AMPS) | VERSUS SILVER SILVER CHLORIDE REFERENCE ELECTRODE (millivolts) | VERSUS MOLYBDENUM/ MOLYBDENUM OXIDE REFERENCE ELECTRODE (millivolts) |
|---|---|---|---|
| 56 | 6.32 | -543 | -029 |
| 57 | 6.83 | -552 | -037 |
| 58 | 7.20 | -561 | -044 |
| 59 | 8.00 | -574 | -054 |
| 60 | 8.50 | -585 | -063 |
| 61 | 9.00 | -593 | -068 |

## E-LOG I TEST

Rogers County Bridge
Zone 3
April 17, 1985

| READING NUMBER | CURRENT APPLIED (D.C. AMPS) | REINFORCING STEEL TO CONCRETE POTENTIAL | |
|---|---|---|---|
| | | VERSUS SILVER/SILVER CHLORIDE REFERENCE ELECTRODE (millivolts) | VERSUS MOLYBDENUM/ MOLYBDENUM OXIDE REFERENCE ELECTRODE (millivolts) |
| 1 | 0.00 | -182 | +209 |
| 2 | 0.00 | -185 | +208 |
| 3 | 0.16 | -193 | +196 |
| 4 | 0.21 | -197 | +191 |
| 5 | 0.24 | -200 | +188 |
| 6 | 0.26 | -202 | +184 |
| 7 | 0.30 | -204 | +183 |
| 8 | 0.37 | -208 | +178 |
| 9 | 0.42 | -212 | +173 |
| 10 | 0.47 | -215 | +170 |
| 11 | 0.52 | -218 | +167 |
| 12 | 0.54 | -219 | +165 |
| 13 | 0.58 | -222 | +162 |
| 14 | 0.64 | -224 | +160 |
| 15 | 0.69 | -226 | +157 |
| 16 | 0.70 | -228 | +156 |
| 17 | 0.73 | -229 | +154 |
| 18 | 0.79 | -232 | +151 |
| 19 | 0.82 | -233 | +150 |
| 20 | 0.86 | -235 | +148 |
| 21 | 0.98 | -239 | +143 |
| 22 | 1.12 | -243 | +138 |
| 23 | 1.17 | -247 | +135 |
| 24 | 1.17 | -247 | +134 |

| READING NUMBER | CURRENT APPLIED (D.C. AMPS) | REINFORCING STEEL TO CONCRETE POTENTIAL | |
|---|---|---|---|
| | | VERSUS SILVER/SILVER CHLORIDE REFERENCE ELECTRODE (millivolts) | VERSUS MOLYBDENUM/ MOLYBDENUM OXIDE REFERENCE ELECTRODE (millivolts) |
| 25 | 1.23 | -249 | +132 |
| 26 | 1.26 | -250 | +131 |
| 27 | 1.38 | -254 | +126 |
| 28 | 1.51 | -257 | +122 |
| 29 | 1.54 | -259 | +121 |
| 30 | 1.60 | -262 | +118 |
| 31 | 1.71 | -264 | +115 |
| 32 | 1.75 | -266 | +113 |
| 33 | 1.84 | -268 | +111 |
| 34 | 1.95 | -270 | +108 |
| 35 | 2.05 | -273 | +105 |
| 36 | 2.41 | -280 | +097 |
| 37 | 2.44 | -282 | +095 |
| 38 | 2.52 | -285 | +092 |
| 39 | 2.63 | -287 | +089 |
| 40 | 2.80 | -291 | +085 |
| 41 | 2.80 | -293 | +083 |
| 42 | 3.02 | -296 | +079 |
| 43 | 3.16 | -299 | +077 |
| 44 | 3.36 | -302 | +072 |
| 45 | 3.58 | -306 | +068 |
| 46 | 3.58 | -308 | +066 |
| 47 | 3.84 | -312 | +062 |
| 48 | 4.16 | -316 | +057 |
| 49 | 4.33 | -321 | +053 |
| 50 | 4.69 | -324 | +047 |
| 51 | 4.93 | -329 | +042 |
| 52 | 5.20 | -335 | +036 |
| 53 | 5.57 | -340 | +030 |
| 54 | 5.98 | -345 | +024 |
| 55 | 6.30 | -349 | +019 |

## REINFORCING STEEL TO CONCRETE POTENTIAL

| READING NUMBER | CURRENT APPLIED (D.C. AMPS) | VERSUS SILVER SILVER CHLORIDE REFERENCE ELECTRODE (millivolts) | VERSUS MOLYBDENUM/ MOLYBDENUM OXIDE REFERENCE ELECTRODE (millivolts) |
|---|---|---|---|
| 56 | 6.48 | -353 | +016 |
| 57 | 6.91 | -358 | +009 |
| 58 | 7.40 | -365 | +002 |
| 59 | 8.20 | -373 | -019 |
| 60 | 8.80 | -380 | -022 |
| 61 | 9.30 | -385 | -028 |

## E-LOG I TEST

Rogers County Bridge
Zone 4
April 17, 1985

### REINFORCING STEEL TO CONCRETE POTENTIAL

| READING NUMBER | CURRENT APPLIED (D.C. AMPS) | VERSUS SILVER/SILVER CHLORIDE REFERENCE ELECTRODE (millivolts) | VERSUS MOLYBDENUM/ MOLYBDENUM OXIDE REFERENCE ELECTRODE (millivolts) |
|---|---|---|---|
| 1 | 0.00 | -235 | +292 |
| 2 | 0.13 | -248 | +278 |
| 3 | 0.18 | -250 | +277 |
| 4 | 0.21 | -252 | +276 |
| 5 | 0.24 | -254 | +274 |
| 6 | 0.26 | -255 | +274 |
| 7 | 0.29 | -257 | +273 |
| 8 | 0.32 | -259 | +277 |
| 9 | 0.35 | -261 | +269 |
| 10 | 0.39 | -263 | +268 |
| 11 | 0.42 | -266 | +266 |
| 12 | 0.46 | -268 | +264 |
| 13 | 0.49 | -270 | +263 |
| 14 | 0.51 | -271 | +262 |
| 15 | 0.52 | -272 | +262 |
| 16 | 0.58 | -274 | +260 |
| 17 | 0.63 | -277 | +258 |
| 18 | 0.68 | -282 | +256 |
| 19 | 0.70 | -280 | +255 |
| 20 | 0.74 | -282 | +254 |
| 21 | 0.78 | -284 | +253 |
| 22 | 0.86 | -287 | +250 |
| 23 | 0.92 | -291 | +247 |
| 24 | 1.00 | -295 | +244 |

| READING NUMBER | CURRENT APPLIED (D.C. AMPS) | REINFORCING STEEL TO CONCRETE POTENTIAL | |
|---|---|---|---|
| | | VERSUS SILVER/SILVER CHLORIDE REFERENCE ELECTRODE (millivolts) | VERSUS MOLYBDENUM/ MOLYBDENUM OXIDE REFERENCE ELECTRODE (millivolts) |
| 25 | 1.20 | -301 | +237 |
| 26 | 1.33 | -306 | +232 |
| 27 | 1.53 | -312 | +226 |
| 28 | 1.70 | -317 | +221 |
| 29 | 1.82 | -321 | +217 |
| 30 | 2.02 | -326 | +212 |
| 31 | 2.21 | -332 | +207 |
| 32 | 2.43 | -337 | +202 |
| 33 | 2.59 | -340 | +199 |
| 34 | 2.80 | -345 | +194 |
| 35 | 2.94 | -349 | +191 |
| 36 | 3.24 | -354 | +186 |
| 37 | 3.45 | -357 | +183 |
| 38 | 3.60 | -360 | +180 |
| 39 | 3.85 | -364 | +175 |
| 40 | 4.05 | -367 | +172 |
| 41 | 4.30 | -371 | +169 |
| 42 | 4.57 | -375 | +165 |
| 43 | 4.69 | -377 | +164 |
| 44 | 4.95 | -381 | +150 |
| 45 | 5.30 | -386 | +155 |
| 46 | 5.50 | -390 | +151 |
| 47 | 5.87 | -395 | +147 |
| 48 | 6.22 | -400 | +142 |
| 49 | 6.60 | -406 | +137 |
| 50 | 7.01 | -412 | +131 |
| 51 | 7.56 | -418 | +125 |
| 52 | 8.04 | -426 | +118 |
| 53 | 8.48 | -431 | +113 |
| 54 | 8.99 | -439 | +106 |
| 55 | 9.60 | -445 | +100 |

REINFORCING STEEL TO CONCRETE POTENTIAL

| READING NUMBER | CURRENT APPLIED (D.C. AMPS) | VERSUS SILVER SILVER CHLORIDE REFERENCE ELECTRODE (millivolts) | VERSUS MOLYBDENUM/ MOLYBDENUM OXIDE REFERENCE ELECTRODE (millivolts) |
|---|---|---|---|
| 56 | 10.50 | -456 | +089 |
| 57 | 11.50 | -468 | +077 |
| 58 | 12.60 | -480 | +066 |

## E-LOG I TEST

Rogers County Bridge
Zone 5
April 17, 1985

### REINFORCING STEEL TO CONCRETE POTENTIAL

| READING NUMBER | CURRENT APPLIED (D.C. AMPS) | VERSUS SILVER/SILVER CHLORIDE REFERENCE ELECTRODE (millivolts) | VERSUS MOLYBDENUM/ MOLYBDENUM OXIDE REFERENCE ELECTRODE (millivolts) |
|---|---|---|---|
| 1 | 0.00 | -218 | -092 |
| 2 | 0.12 | -230 | -100 |
| 3 | 0.15 | -232 | -101 |
| 4 | 0.18 | -236 | -103 |
| 5 | 0.21 | -238 | -105 |
| 6 | 0.22 | -240 | -106 |
| 7 | 0.25 | -243 | -107 |
| 8 | 0.29 | -246 | -109 |
| 9 | 0.32 | -249 | -111 |
| 10 | 0.35 | -252 | -112 |
| 11 | 0.38 | -255 | -114 |
| 12 | 0.42 | -257 | -116 |
| 13 | 0.45 | -260 | -117 |
| 14 | 0.47 | -262 | -119 |
| 15 | 0.49 | -265 | -120 |
| 16 | 0.52 | -267 | -122 |
| 17 | 0.58 | -271 | -123 |
| 18 | 0.64 | -274 | -126 |
| 19 | 0.65 | -277 | -128 |
| 20 | 0.69 | -279 | -129 |
| 21 | 0.73 | -282 | -131 |
| 22 | 0.80 | -287 | -134 |
| 23 | 0.88 | -291 | -137 |
| 24 | 1.01 | -295 | -140 |

REINFORCING STEEL TO CONCRETE POTENTIAL

| READING NUMBER | CURRENT APPLIED (D.C. AMPS) | VERSUS SILVER/SILVER CHLORIDE REFERENCE ELECTRODE (millivolts) | VERSUS MOLYBDENUM/ MOLYBDENUM OXIDE REFERENCE ELECTRODE (millivolts) |
|---|---|---|---|
| 25 | 1.16 | -303 | -145 |
| 26 | 1.28 | -309 | -150 |
| 27 | 1.46 | -318 | -156 |
| 28 | 1.63 | -325 | -161 |
| 29 | 1.73 | -330 | -166 |
| 30 | 1.93 | -337 | -171 |
| 31 | 2.14 | -344 | -176 |
| 32 | 2.32 | -351 | -181 |
| 33 | 2.43 | -356 | -185 |
| 34 | 2.66 | -364 | -191 |
| 35 | 2.83 | -368 | -195 |
| 36 | 3.10 | -375 | -200 |
| 37 | 3.29 | -381 | -204 |
| 38 | 3.44 | -385 | -209 |
| 39 | 3.70 | -391 | -213 |
| 40 | 3.88 | -396 | -218 |
| 41 | 4.00 | -400 | -222 |
| 42 | 4.42 | -407 | -227 |
| 43 | 4.50 | -409 | -229 |
| 44 | 4.70 | -415 | -234 |
| 45 | 5.12 | -421 | -239 |
| 46 | 5.23 | -426 | -244 |
| 47 | 5.68 | -431 | -249 |
| 48 | 6.00 | -438 | -254 |
| 49 | 6.40 | -445 | -260 |
| 50 | 6.86 | -452 | -267 |
| 51 | 7.20 | -459 | -274 |
| 52 | 7.70 | -467 | -281 |
| 53 | 8.19 | -474 | -288 |
| 54 | 8.52 | -482 | -286 |
| 55 | 9.23 | -490 | -303 |

## REINFORCING STEEL TO CONCRETE POTENTIAL

| READING NUMBER | CURRENT APPLIED (D.C. AMPS) | VERSUS SILVER SILVER CHLORIDE REFERENCE ELECTRODE (millivolts) | VERSUS MOLYBDENUM/ MOLYBDENUM OXIDE REFERENCE ELECTRODE (millivolts) |
|---|---|---|---|
| 56 | 10.10 | -502 | -314 |
| 57 | 11.00 | -514 | -327 |
| 58 | 12.10 | -527 | -340 |

## E-LOG I TEST

Rogers County Bridge
Zone 6
April 17, 1985

| READING NUMBER | CURRENT APPLIED (D.C. AMPS) | REINFORCING STEEL TO CONCRETE POTENTIAL | |
|---|---|---|---|
| | | VERSUS SILVER/SILVER CHLORIDE REFERENCE ELECTRODE (millivolts) | VERSUS MOLYBDENUM/ MOLYBDENUM OXIDE REFERENCE ELECTRODE (millivolts) |
| 1 | 0.00 | -368 | +084 |
| 2 | 0.12 | -371 | +078 |
| 3 | 0.15 | -372 | +078 |
| 4 | 0.16 | -373 | +077 |
| 5 | 0.19 | -374 | +076 |
| 6 | 0.20 | -374 | +075 |
| 7 | 0.22 | -375 | +074 |
| 8 | 0.25 | -376 | +073 |
| 9 | 0.28 | -377 | +072 |
| 10 | 0.30 | -378 | +071 |
| 11 | 0.34 | -379 | +069 |
| 12 | 0.36 | -380 | +068 |
| 13 | 0.39 | -380 | +067 |
| 14 | 0.41 | -381 | +066 |
| 15 | 0.42 | -382 | +065 |
| 16 | 0.46 | -383 | +064 |
| 17 | 0.50 | -384 | +063 |
| 18 | 0.56 | -386 | +060 |
| 19 | 0.56 | -387 | +060 |
| 20 | 0.59 | -388 | +058 |
| 21 | 0.63 | -388 | +057 |
| 22 | 0.69 | -390 | +055 |
| 23 | 0.75 | -392 | +052 |
| 24 | 0.86 | -394 | +049 |

| READING NUMBER | CURRENT APPLIED (D.C. AMPS) | REINFORCING STEEL TO CONCRETE POTENTIAL | |
|---|---|---|---|
| | | VERSUS SILVER/SILVER CHLORIDE REFERENCE ELECTRODE (millivolts) | VERSUS MOLYBDENUM/ MOLYBDENUM OXIDE REFERENCE ELECTRODE (millivolts) |
| 25 | 0.96 | -397 | +044 |
| 26 | 1.06 | -399 | +041 |
| 27 | 1.23 | -402 | +036 |
| 28 | 1.34 | -405 | +032 |
| 29 | 1.46 | -407 | +029 |
| 30 | 1.69 | -410 | +024 |
| 31 | 1.77 | -413 | +020 |
| 32 | 1.96 | -415 | +016 |
| 33 | 2.02 | -417 | +013 |
| 34 | 2.25 | -420 | +009 |
| 35 | 2.35 | -422 | +006 |
| 36 | 2.60 | -426 | +001 |
| 37 | 2.75 | -427 | -008 |
| 38 | 2.86 | -430 | -011 |
| 39 | 3.06 | -433 | -015 |
| 40 | 3.23 | -435 | -019 |
| 41 | 3.37 | -438 | -022 |
| 42 | 3.60 | -441 | -027 |
| 43 | 3.63 | -443 | -029 |
| 44 | 3.93 | -446 | -033 |
| 45 | 4.23 | -449 | -037 |
| 46 | 4.28 | -451 | -041 |
| 47 | 4.60 | -454 | -046 |
| 48 | 4.87 | -457 | -051 |
| 49 | 4.16 | -460 | -056 |
| 50 | 5.58 | -464 | -063 |
| 51 | 5.90 | -468 | -069 |
| 52 | 6.33 | -472 | -076 |
| 53 | 6.69 | -476 | -082 |
| 54 | 7.10 | -480 | -089 |
| 55 | 7.46 | -484 | -097 |

## REINFORCING STEEL TO CONCRETE POTENTIAL

| READING NUMBER | CURRENT APPLIED (D.C. AMPS) | VERSUS SILVER SILVER CHLORIDE REFERENCE ELECTRODE (millivolts) | VERSUS MOLYBDENUM/ MOLYBDENUM OXIDE REFERENCE ELECTRODE (millivolts) |
|---|---|---|---|
| 56 | 8.30 | -490 | -107 |
| 57 | 9.00 | -496 | -120 |
| 58 | 9.90 | -503 | -132 |

## E-LOG I TEST

Rogers County Bridge
Zone 7
April 17, 1985

| READING NUMBER | CURRENT APPLIED (D.C. AMPS) | REINFORCING STEEL TO CONCRETE POTENTIAL | |
|---|---|---|---|
| | | VERSUS SILVER/SILVER CHLORIDE REFERENCE ELECTRODE (millivolts) | VERSUS MOLYBDENUM/ MOLYBDENUM OXIDE REFERENCE ELECTRODE (millivolts) |
| 1 | 0.00 | -199 | -064 |
| 2 | 0.16 | -207 | -072 |
| 3 | 0.20 | -210 | -075 |
| 4 | 0.22 | -213 | -078 |
| 5 | 0.25 | -215 | -081 |
| 6 | 0.27 | -218 | -084 |
| 7 | 0.30 | -220 | -087 |
| 8 | 0.33 | -223 | -089 |
| 9 | 0.36 | -225 | -092 |
| 10 | 0.40 | -228 | -096 |
| 11 | 0.42 | -230 | -098 |
| 12 | 0.44 | -232 | -101 |
| 13 | 0.48 | -235 | -104 |
| 14 | 0.50 | -237 | -106 |
| 15 | 0.56 | -240 | -109 |
| 16 | 0.60 | -242 | -113 |
| 17 | 0.62 | -245 | -115 |
| 18 | 0.68 | -247 | -118 |
| 19 | 0.71 | -250 | -121 |
| 20 | 0.80 | -253 | -125 |
| 21 | 0.73 | -255 | -127 |
| 22 | 0.90 | -259 | -132 |
| 23 | 0.96 | -262 | -136 |
| 24 | 1.03 | -265 | -139 |

## REINFORCING STEEL TO CONCRETE POTENTIAL

| READING NUMBER | CURRENT APPLIED (D.C. AMPS) | VERSUS SILVER/SILVER CHLORIDE REFERENCE ELECTRODE (millivolts) | VERSUS MOLYBDENUM/ MOLYBDENUM OXIDE REFERENCE ELECTRODE (millivolts) |
|---|---|---|---|
| 25 | 1.10 | -268 | -143 |
| 26 | 1.22 | -272 | -147 |
| 27 | 1.33 | -275 | -151 |
| 28 | 1.45 | -279 | -155 |
| 29 | 1.48 | -282 | -158 |
| 30 | 1.66 | -286 | -163 |
| 31 | 1.80 | -289 | -168 |
| 32 | 2.00 | -292 | -172 |
| 33 | 2.22 | -298 | -179 |
| 34 | 2.40 | -303 | -184 |
| 35 | 2.58 | -307 | -188 |
| 36 | 2.78 | -311 | -193 |
| 37 | 3.13 | -317 | -200 |
| 38 | 3.34 | -321 | -205 |
| 39 | 3.65 | -326 | -211 |
| 40 | 3.95 | -331 | -216 |
| 41 | 4.30 | -337 | -223 |
| 42 | 4.83 | -344 | -230 |
| 43 | 5.22 | -350 | -236 |
| 44 | 5.69 | -356 | -243 |
| 45 | 6.10 | -363 | -250 |
| 46 | 6.50 | -368 | -255 |
| 47 | 7.04 | -375 | -262 |
| 48 | 7.75 | -383 | -270 |
| 49 | 8.20 | -389 | -276 |
| 50 | 9.00 | -396 | -283 |
| 51 | 10.00 | -406 | -203 |
| 52 | 11.00 | -416 | -302 |
| 53 | 11.90 | -425 | -311 |

## E-L0G I TEST

Rogers County Bridge
Zone 8
April 17, 1985

### REINFORCING STEEL TO CONCRETE POTENTIAL

| READING NUMBER | CURRENT APPLIED (D.C. AMPS) | VERSUS SILVER/SILVER CHLORIDE REFERENCE ELECTRODE (millivolts) | VERSUS MOLYBDENUM/ MOLYBDENUM OXIDE REFERENCE ELECTRODE (millivolts) |
|---|---|---|---|
| 1 | 0.00 | -220 | +182 |
| 2 | 0.14 | ---- | +198 |
| 3 | 0.18 | ---- | +203 |
| 4 | 0.20 | ---- | +207 |
| 5 | 0.23 | ---- | +212 |
| 6 | 0.25 | ---- | +216 |
| 7 | 0.28 | ---- | +220 |
| 8 | 0.30 | ---- | +223 |
| 9 | 0.33 | ---- | +226 |
| 10 | 0.37 | ---- | +225 |
| 11 | 0.38 | ---- | +227 |
| 12 | 0.40 | ---- | +231 |
| 13 | 0.43 | ---- | +231 |
| 14 | 0.46 | ---- | +235 |
| 15 | 0.51 | ---- | +239 |
| 16 | 0.54 | ---- | +242 |
| 17 | 0.56 | ---- | +244 |
| 18 | 0.61 | -225 | +247 |
| 19 | 0.64 | -234 | +252 |
| 20 | 0.72 | -240 | +256 |
| 21 | 0.65 | -249 | +262 |
| 22 | 0.80 | -252 | +264 |
| 23 | 0.86 | -256 | +268 |
| 24 | 0.92 | -259 | +270 |

## REINFORCING STEEL TO CONCRETE POTENTIAL

| READING NUMBER | CURRENT APPLIED (D.C. AMPS) | VERSUS SILVER/SILVER CHLORIDE REFERENCE ELECTRODE (millivolts) | VERSUS MOLYBDENUM/ MOLYBDENUM OXIDE REFERENCE ELECTRODE (millivolts) |
|---|---|---|---|
| 25 | 0.98 | -261 | +273 |
| 26 | 1.09 | -264 | +276 |
| 27 | 1.18 | -265 | +278 |
| 28 | 1.26 | -268 | +282 |
| 29 | 1.29 | -271 | +285 |
| 30 | 1.46 | -272 | +287 |
| 31 | 1.55 | -274 | +289 |
| 32 | 1.71 | -277 | +291 |
| 33 | 1.89 | -279 | +293 |
| 34 | 2.05 | -281 | +296 |
| 35 | 2.21 | -283 | +297 |
| 36 | 2.36 | -284 | +298 |
| 37 | 2.66 | -288 | +300 |
| 38 | 2.86 | -290 | +302 |
| 39 | 3.12 | -293 | +303 |
| 40 | 3.32 | -295 | +304 |
| 41 | 3.67 | -297 | +305 |
| 42 | 4.06 | -301 | +306 |
| 43 | 4.40 | -304 | +306 |
| 44 | 4.82 | -307 | +306 |
| 45 | 5.17 | -303 | +307 |
| 46 | 5.46 | -313 | +306 |
| 47 | 5.99 | -316 | +305 |
| 48 | 6.55 | -321 | +306 |
| 49 | 6.97 | -324 | +305 |
| 50 | 7.60 | -328 | +305 |
| 51 | 8.40 | -333 | +303 |
| 52 | 9.20 | -338 | +301 |
| 53 | 9.90 | -344 | +299 |

## E-LOG I TEST

Rogers County Bridge
Zone 9
April 18, 1985

### REINFORCING STEEL TO CONCRETE POTENTIAL

| READING NUMBER | CURRENT APPLIED (D.C. AMPS) | VERSUS SILVER/SILVER CHLORIDE REFERENCE ELECTRODE (millivolts) | VERSUS MOLYBDENUM/ MOLYBDENUM OXIDE REFERENCE ELECTRODE (millivolts) |
|---|---|---|---|
| 1 | 0.00 | -473 | +216 |
| 2 | 0.14 | -477 | +214 |
| 3 | 0.17 | -476 | +210 |
| 4 | 0.20 | -476 | +209 |
| 5 | 0.22 | -477 | +208 |
| 6 | 0.24 | -477 | +206 |
| 7 | 0.27 | -478 | +206 |
| 8 | 0.29 | -478 | +206 |
| 9 | 0.31 | -479 | +202 |
| 10 | 0.36 | -478 | +200 |
| 11 | 0.37 | -478 | +197 |
| 12 | 0.39 | -479 | +196 |
| 13 | 0.41 | -480 | +196 |
| 14 | 0.44 | -481 | +195 |
| 15 | 0.48 | -482 | +193 |
| 16 | 0.51 | -483 | +192 |
| 17 | 0.53 | -484 | +191 |
| 18 | 0.58 | -485 | +189 |
| 19 | 0.60 | -486 | +188 |
| 20 | 0.66 | -488 | +186 |
| 21 | 0.61 | -487 | +184 |
| 22 | 0.76 | -489 | +181 |
| 23 | 0.81 | -490 | +180 |
| 24 | 0.88 | -492 | +178 |

REINFORCING STEEL TO CONCRETE POTENTIAL

| READING NUMBER | CURRENT APPLIED (D.C. AMPS) | VERSUS SILVER/SILVER CHLORIDE REFERENCE ELECTRODE (millivolts) | VERSUS MOLYBDENUM/ MOLYBDENUM OXIDE REFERENCE ELECTRODE (millivolts) |
|---|---|---|---|
| 25 | 0.93 | -492 | +176 |
| 26 | 1.03 | -494 | +174 |
| 27 | 1.11 | -496 | +170 |
| 28 | 1.19 | -498 | +169 |
| 29 | 1.23 | -499 | +167 |
| 30 | 1.37 | -500 | +164 |
| 31 | 1.48 | -502 | +161 |
| 32 | 1.60 | -505 | +159 |
| 33 | 1.78 | -506 | +154 |
| 34 | 1.93 | -508 | +150 |
| 35 | 2.08 | -509 | +147 |
| 36 | 2.20 | -510 | +143 |
| 37 | 2.53 | -513 | +138 |
| 38 | 2.66 | -515 | +134 |
| 39 | 2.91 | -516 | +129 |
| 40 | 3.10 | -519 | +104 |
| 41 | 3.40 | -520 | +119 |
| 42 | 3.81 | -523 | +112 |
| 43 | 4.10 | -525 | +107 |
| 44 | 4.50 | -526 | +100 |
| 45 | 4.83 | -529 | +095 |
| 46 | 5.06 | -530 | +090 |
| 47 | 5.56 | -531 | +082 |
| 48 | 6.06 | -534 | +076 |
| 49 | 6.50 | -535 | +069 |
| 50 | 7.05 | -537 | +062 |
| 51 | 7.80 | -538 | +053 |
| 52 | 8.60 | -540 | +044 |
| 53 | 9.20 | -542 | +036 |

## E-LOG I TEST

Rogers County Bridge
Zone 10
April 18, 1985

| READING NUMBER | CURRENT APPLIED (D.C. AMPS) | REINFORCING STEEL TO CONCRETE POTENTIAL | |
|---|---|---|---|
| | | VERSUS SILVER/SILVER CHLORIDE REFERENCE ELECTRODE (millivolts) | VERSUS MOLYBDENUM/ MOLYBDENUM OXIDE REFERENCE ELECTRODE (millivolts) |
| 1 | 0.00 | -246 | +305 |
| 2 | 0.13 | -251 | +308 |
| 3 | 0.13 | -252 | +310 |
| 4 | 0.19 | -255 | +310 |
| 5 | 0.24 | -258 | +310 |
| 6 | 0.30 | -260 | +308 |
| 7 | 0.35 | -263 | +307 |
| 8 | 0.40 | -265 | +305 |
| 9 | 0.46 | -267 | +304 |
| 10 | 0.49 | -269 | +303 |
| 11 | 0.55 | -272 | +301 |
| 12 | 0.60 | -275 | +299 |
| 13 | 0.63 | -277 | +297 |
| 14 | 0.66 | -280 | +295 |
| 15 | 0.80 | -284 | +292 |
| 16 | 0.94 | -289 | +287 |
| 17 | 1.05 | -295 | +284 |
| 18 | 1.20 | -300 | +279 |
| 19 | 1.31 | -305 | +275 |
| 20 | 1.44 | -310 | +270 |
| 21 | 1.50 | -314 | +267 |
| 22 | 1.60 | -318 | +263 |
| 23 | 1.64 | -322 | +261 |
| 24 | 1.80 | -327 | +256 |

## REINFORCING STEEL TO CONCRETE POTENTIAL

| READING NUMBER | CURRENT APPLIED (D.C. AMPS) | VERSUS SILVER/SILVER CHLORIDE REFERENCE ELECTRODE (millivolts) | VERSUS MOLYBDENUM/ MOLYBDENUM OXIDE REFERENCE ELECTRODE (millivolts) |
|---|---|---|---|
| 25 | 1.97 | -332 | +251 |
| 26 | 2.13 | -337 | +247 |
| 27 | 2.34 | -344 | +241 |
| 28 | 2.50 | -349 | +236 |
| 29 | 2.83 | -356 | +230 |
| 30 | 2.98 | -361 | +226 |
| 31 | 3.06 | -365 | +222 |
| 32 | 3.22 | -370 | +218 |
| 33 | 3.43 | -375 | +214 |
| 34 | 3.79 | -380 | +209 |
| 35 | 4.05 | -386 | +204 |
| 36 | 4.35 | -393 | +197 |
| 37 | 4.89 | -400 | +190 |
| 38 | 5.00 | -405 | +186 |
| 39 | 5.30 | -410 | +182 |
| 40 | 5.70 | -417 | +175 |
| 41 | 6.23 | -424 | +169 |
| 42 | 6.62 | -429 | +164 |
| 43 | 7.04 | -436 | +158 |
| 44 | 7.31 | -442 | +152 |
| 45 | 7.77 | -448 | +146 |
| 46 | 8.22 | -456 | +140 |
| 47 | 8.46 | -461 | +135 |
| 48 | 8.90 | -469 | +128 |
| 49 | 10.00 | -480 | +118 |
| 50 | 11.00 | -492 | +108 |
| 51 | 12.00 | -504 | +097 |

## E-LOG I TEST

Rogers County Bridge
Zone 11
April 18, 1985

### REINFORCING STEEL TO CONCRETE POTENTIAL

| READING NUMBER | CURRENT APPLIED (D.C. AMPS) | VERSUS SILVER/SILVER CHLORIDE REFERENCE ELECTRODE (millivolts) | VERSUS MOLYBDENUM/ MOLYBDENUM OXIDE REFERENCE ELECTRODE (millivolts) |
|---|---|---|---|
| 1 | 0.00 | -277 | +150 |
| 2 | 0.13 | -296 | +136 |
| 3 | 0.14 | -298 | +137 |
| 4 | 0.19 | -304 | +133 |
| 5 | 0.23 | -310 | +128 |
| 6 | 0.28 | -316 | +124 |
| 7 | 0.32 | -320 | +120 |
| 8 | 0.37 | -325 | +116 |
| 9 | 0.41 | -330 | +113 |
| 10 | 0.43 | -333 | +110 |
| 11 | 0.50 | -338 | +107 |
| 12 | 0.53 | -342 | +103 |
| 13 | 0.56 | -345 | +102 |
| 14 | 0.59 | -348 | +099 |
| 15 | 0.69 | -354 | +094 |
| 16 | 0.80 | -362 | +087 |
| 17 | 0.90 | -368 | +081 |
| 18 | 1.03 | -375 | +076 |
| 19 | 1.12 | -381 | +071 |
| 20 | 1.22 | -387 | +065 |
| 21 | 1.27 | -391 | +062 |
| 22 | 1.36 | -394 | +060 |
| 23 | 1.40 | -397 | +059 |
| 24 | 1.50 | -402 | +054 |

## REINFORCING STEEL TO CONCRETE POTENTIAL

| READING NUMBER | CURRENT APPLIED (D.C. AMPS) | VERSUS SILVER/SILVER CHLORIDE REFERENCE ELECTRODE (millivolts) | VERSUS MOLYBDENUM/ MOLYBDENUM OXIDE REFERENCE ELECTRODE (millivolts) |
|---|---|---|---|
| 25 | 1.62 | -407 | +050 |
| 26 | 1.76 | -412 | +046 |
| 27 | 1.94 | -419 | +040 |
| 28 | 2.03 | -423 | +036 |
| 29 | 2.24 | -429 | +031 |
| 30 | 2.39 | -433 | +028 |
| 31 | 2.48 | -436 | +026 |
| 32 | 2.58 | -440 | +022 |
| 33 | 2.78 | -444 | +020 |
| 34 | 2.96 | -449 | +016 |
| 35 | 3.18 | -454 | +011 |
| 36 | 3.48 | -461 | +006 |
| 37 | 3.82 | -468 | +000 |
| 38 | 3.97 | -477 | -020 |
| 39 | 4.13 | -475 | -024 |
| 40 | 4.44 | -480 | -029 |
| 41 | 4.82 | -487 | -035 |
| 42 | 5.06 | -491 | -038 |
| 43 | 5.42 | -497 | -043 |
| 44 | 5.68 | -501 | -046 |
| 45 | 5.96 | -506 | -051 |
| 46 | 6.34 | -512 | -057 |
| 47 | 6.52 | -514 | -058 |
| 48 | 6.80 | -520 | -063 |
| 49 | 7.60 | -530 | -073 |
| 50 | 8.50 | -541 | -082 |
| 51 | 9.20 | -550 | -092 |

## E-LOG I TEST

Rogers County Bridge
Zone 12
April 18, 1985

### REINFORCING STEEL TO CONCRETE POTENTIAL

| READING NUMBER | CURRENT APPLIED (D.C. AMPS) | VERSUS SILVER/SILVER CHLORIDE REFERENCE ELECTRODE (millivolts) | VERSUS MOLYBDENUM/ MOLYBDENUM OXIDE REFERENCE ELECTRODE (millivolts) |
|---|---|---|---|
| 1 | 0.00 | -281 | +234 |
| 2 | 0.12 | -285 | +234 |
| 3 | 0.13 | -286 | +234 |
| 4 | 0.18 | -288 | +233 |
| 5 | 0.23 | -289 | +231 |
| 6 | 0.27 | -291 | +230 |
| 7 | 0.31 | -293 | +229 |
| 8 | 0.37 | -294 | +227 |
| 9 | 0.41 | -296 | +226 |
| 10 | 0.44 | -297 | +224 |
| 11 | 0.49 | -299 | +223 |
| 12 | 0.53 | -301 | +221 |
| 13 | 0.57 | -302 | +220 |
| 14 | 0.60 | -304 | +219 |
| 15 | 0.69 | -306 | +216 |
| 16 | 0.81 | -309 | +214 |
| 17 | 0.91 | -312 | +212 |
| 18 | 1.02 | -315 | +209 |
| 19 | 1.12 | -317 | +206 |
| 20 | 1.22 | -320 | +203 |
| 21 | 1.28 | -323 | +201 |
| 22 | 1.34 | -325 | +199 |
| 23 | 1.38 | -328 | +196 |
| 24 | 1.50 | -331 | +194 |

## REINFORCING STEEL TO CONCRETE POTENTIAL

| READING NUMBER | CURRENT APPLIED (D.C. AMPS) | VERSUS SILVER/SILVER CHLORIDE REFERENCE ELECTRODE (millivolts) | VERSUS MOLYBDENUM/ MOLYBDENUM OXIDE REFERENCE ELECTRODE (millivolts) |
|---|---|---|---|
| 25 | 1.60 | -333 | +191 |
| 26 | 1.78 | -336 | +187 |
| 27 | 1.93 | -340 | +184 |
| 28 | 2.04 | -344 | +180 |
| 29 | 2.27 | -348 | +176 |
| 30 | 2.35 | -351 | +173 |
| 31 | 2.45 | -354 | +170 |
| 32 | 2.56 | -357 | +167 |
| 33 | 2.78 | -360 | +164 |
| 34 | 2.95 | -363 | +160 |
| 35 | 3.15 | -367 | +157 |
| 36 | 3.49 | -372 | +153 |
| 37 | 3.82 | -376 | +148 |
| 38 | 3.99 | -380 | +144 |
| 39 | 4.13 | -383 | +141 |
| 40 | 4.46 | -387 | +136 |
| 41 | 4.83 | -392 | +132 |
| 42 | 5.07 | -396 | +128 |
| 43 | 5.40 | -400 | +123 |
| 44 | 5.69 | -404 | +120 |
| 45 | 6.00 | -408 | +115 |
| 46 | 6.35 | -413 | +110 |
| 47 | 6.56 | -417 | +106 |
| 48 | 6.80 | -423 | +101 |
| 49 | 7.60 | -430 | +094 |
| 50 | 8.50 | -437 | +087 |
| 51 | 9.10 | -445 | +080 |

## EMBEDDED STEEL TO CONCRETE POTENTIAL MEASUREMENTS

### Versus Portable Copper-Copper Sulfate Reference Electrode

### ROGERS COUNTY BRIDGE

**Static Potentials** April 16, 1985
**"IR Drop Free" Potentials** April 19, 1985

| READING NUMBER | EMBEDDED STEEL TO CONCRETE STATIC POTENTIAL (MILLIVOLTS) | CURRENT APPLIED EMBEDDED STEEL TO CONCRETE "IR DROP FREE" POTENTIAL (MILLIVOLTS) | POLARIZATION (MILLIVOLTS) |
|---|---|---|---|
| 1 | -310 | -510 | 200 |
| 2 | -350 | -510 | 160 |
| 3 | -330 | -530 | 200 |
| 4 | -330 | -600 | 270 |
| 5 | -220 | -630 | 410 |
| 6 | -240 | -610 | 370 |
| 7 | -290 | -590 | 300 |
| 8 | -220 | -640 | 420 |
| 9 | -210 | -630 | 420 |
| 10 | -280 | -670 | 390 |
| 11 | -230 | -670 | 440 |
| 12 | -190 | -680 | 490 |
| 13 | -340 | -410 | 70 |
| 14 | -360 | -410 | 50 |
| 15 | -220 | -360 | 140 |
| 16 | -300 | -470 | 170 |
| 17 | -330 | -480 | 150 |
| 18 | -290 | -400 | 110 |
| 19 | -210 | -380 | 170 |
| 20 | -250 | -400 | 150 |
| 21 | -240 | -450 | 210 |
| 22 | -280 | -480 | 200 |
| 23 | -250 | -500 | 250 |
| 24 | -240 | -470 | 230 |
| 25 | -350 | -420 | 70 |

| READING NUMBER | EMBEDDED STEEL TO CONCRETE STATIC POTENTIAL (MILLIVOLTS) | CURRENT APPLIED EMBEDDED STEEL TO CONCRETE "IR DROP FREE" POTENTIAL (MILLIVOLTS) | POLARIZATION (MILLIVOLTS) |
|---|---|---|---|
| 26 | -270 | -430 | 160 |
| 27 | -250 | -480 | 230 |
| 28 | -270 | -500 | 230 |
| 29 | -320 | -500 | 180 |
| 30 | -300 | -510 | 210 |
| 31 | -270 | -520 | 250 |
| 32 | -250 | -540 | 290 |
| 33 | -280 | -390 | 110 |
| 34 | -290 | -390 | 100 |
| 35 | -220 | -370 | 150 |
| 36 | -290 | -460 | 170 |
| 37 | -320 | -480 | 160 |
| 38 | -240 | -430 | 190 |
| 39 | -390 | -480 | 90 |
| 40 | -420 | -500 | 80 |
| 41 | -350 | -460 | 110 |
| 42 | -290 | -460 | 170 |
| 43 | -240 | -480 | 240 |
| 44 | -350 | -470 | 120 |
| 45 | -280 | -350 | 70 |
| 46 | -320 | -360 | 40 |
| 47 | -440 | -480 | 40 |
| 48 | -370 | -460 | 90 |
| 49 | -420 | -490 | 70 |
| 50 | -390 | -500 | 110 |
| 51 | -310 | -450 | 140 |
| 52 | -290 | -470 | 180 |
| 53 | -230 | -420 | 190 |
| 54 | -280 | -390 | 110 |
| 55 | -320 | -470 | 150 |
| 56 | -360 | -510 | 150 |
| 57 | -430 | -540 | 110 |
| 58 | -360 | -480 | 120 |

| READING NUMBER | EMBEDDED STEEL TO CONCRETE STATIC POTENTIAL (MILLIVOLTS) | CURRENT APPLIED EMBEDDED STEEL TO CONCRETE "IR DROP FREE" POTENTIAL (MILLIVOLTS) | POLARIZATION (MILLIVOLTS) |
|---|---|---|---|
| 59 | -410 | -540 | 130 |
| 60 | -390 | -500 | 110 |
| 61 | -350 | -490 | 140 |
| 62 | -370 | -450 | 80 |
| 63 | -300 | -410 | 110 |
| 64 | -310 | -440 | 130 |
| 65 | -330 | -380 | 50 |
| 66 | -240 | -400 | 160 |
| 67 | -320 | -470 | 150 |
| 68 | -350 | -490 | 140 |
| 69 | -420 | -520 | 100 |
| 70 | -430 | -500 | 70 |
| 71 | -310 | -480 | 170 |
| 72 | -400 | -460 | 60 |
| 73 | -230 | -340 | 110 |
| 74 | -240 | -440 | 200 |
| 75 | -280 | -450 | 170 |
| 76 | -340 | -480 | 140 |
| 77 | -360 | -500 | 140 |
| 78 | -370 | -480 | 90 |
| 79 | -440 | -490 | 50 |
| 80 | -430 | -510 | 80 |
| 81 | -410 | -500 | 90 |
| 82 | -270 | -430 | 160 |
| 83 | -380 | -420 | 40 |
| 84 | -310 | -380 | 70 |
| 85 | -320 | -420 | 100 |
| 86 | -340 | -480 | 140 |
| 87 | -380 | -530 | 150 |
| 88 | -330 | -500 | 170 |
| 89 | -370 | -540 | 170 |
| 90 | -390 | -490 | 100 |
| 91 | -380 | -480 | 100 |

| READING NUMBER | EMBEDDED STEEL TO CONCRETE STATIC POTENTIAL (MILLIVOLTS) | CURRENT APPLIED EMBEDDED STEEL TO CONCRETE "IR DROP FREE" POTENTIAL (MILLIVOLTS) | POLARIZATION (MILLIVOLTS) |
|---|---|---|---|
| 92 | -350 | -450 | 100 |
| 93 | -250 | -450 | 200 |
| 94 | -240 | -390 | 150 |
| 95 | -310 | -380 | 70 |
| 96 | -290 | -420 | 130 |
| 97 | -390 | -480 | 90 |
| 98 | -310 | -460 | 150 |
| 99 | -390 | -460 | 70 |
| 100 | -420 | -480 | 60 |
| 101 | -370 | -440 | 70 |
| 102 | -300 | -450 | 150 |
| 103 | -300 | -370 | 70 |
| 104 | -340 | -440 | 100 |
| 105 | -180 | -400 | 220 |
| 106 | -240 | -390 | 150 |
| 107 | -420 | -490 | 70 |
| 108 | -390 | -500 | 110 |
| 109 | -270 | -470 | 200 |
| 110 | -260 | -470 | 210 |
| 111 | -250 | -360 | 110 |
| 112 | -300 | -390 | 90 |
| 113 | -340 | -430 | 90 |
| 114 | -310 | -400 | 90 |
| 115 | -310 | -380 | 70 |
| 116 | -390 | -430 | 40 |
| 117 | -380 | -420 | 40 |
| 118 | -280 | -370 | 90 |
| 119 | -350 | -410 | 60 |
| 120 | -360 | -380 | 20 |
| 121 | -370 | -430 | 60 |
| 122 | -330 | -330 | 0 |
| 123 | -280 | -360 | 80 |
| 124 | -290 | -380 | 90 |

## EMBEDDED STEEL TO CONCRETE POTENTIAL MEASUREMENTS

### Versus Permanent Reference Electrodes

### ROGERS COUNTY BRIDGE

Static Potentials April 16, 1985
"IR Drop Free" Potentials April 19, 1985

| READING NUMBER | REFERENCE ELECTRODE | EMBEDDED STEEL TO CONCRETE STATIC POTENTIAL (MILLIVOLTS) | CURRENT APPLIED EMBEDDED STEEL TO CONCRETE "IR" DROP FREE POTENTIAL (MILLIVOLTS) | POLARIZATION (MILLIVOLTS) |
|---|---|---|---|---|
| 1 | Zone 1 Silver/Silver Chloride | -306 | -487 | 181 |
| 2 | Zone 1 Molybdenum-Molybdenum Oxide | +250 | +098 | 152 |
| 3 | Zone 2 Silver-Silver Chloride | -263 | -390 | 127 |
| 4 | Zone 2 Molybdenum-Molybdenum Oxide | +179 | +062 | 117 |
| 5 | Zone 3 Silver-Silver Chloride | -176 | -275 | 99 |
| 6 | Zone 3 Molybdenum-Molybdenum Oxide | +190 | +100 | 90 |
| 7 | Zone 4 Silver-Silver Chloride | -225 | -360 | 135 |
| 8 | Zone 4 Molybdenum-Molybdenum Oxide | +315 | +215 | 100 |
| 9 | Zone 5 Silver-Silver Chloride | -212 | -400 | 188 |
| 10 | Zone 5 Molybdenum-Molybdenum Oxide | -122 | -267 | 145 |
| 11 | Zone 6 Silver-Silver Chloride | -338 | -450 | 112 |
| 12 | Zone 6 Molybdenum-Molybdenum Oxide | +088 | -090 | 178 |
| 13 | Zone 7 Silver-Silver Chloride | -185 | -370 | 185 |
| 14 | Zone 7 Molybdenum-Molybdenum Oxide | -056 | -218 | 162 |
| 15 | Zone 8 Silver-Silver Chloride | -177 | -360 | 183 |
| 16 | Zone 8 Molybdenum-Molybdenum Oxide | +170 | +176 | +006 |
| 17 | Zone 9 Silver-Silver Chloride (A) | -246 | -470 | 224 |
| 18 | Zone 9 Molybdenum-Molybdenum Oxide | +214 | +042 | 172 |
| 19 | Zone 10 Silver-Silver Chloride | -226 | -430 | 204 |
| 20 | Zone 10 Molybdenum-Molybdenum Oxide | +297 | +133 | 164 |
| 21 | Zone 11 Silver-Silver Chloride | -272 | -460 | 188 |
| 22 | Zone 11 Molybdenum-Molybdenum Oxide | +155 | +000 | 155 |
| 23 | Zone 12 Silver-Silver Chloride | -256 | -440 | 184 |
| 24 | Zone 12 Molybdenum-Molybdenum Oside | +229 | +076 | 153 |

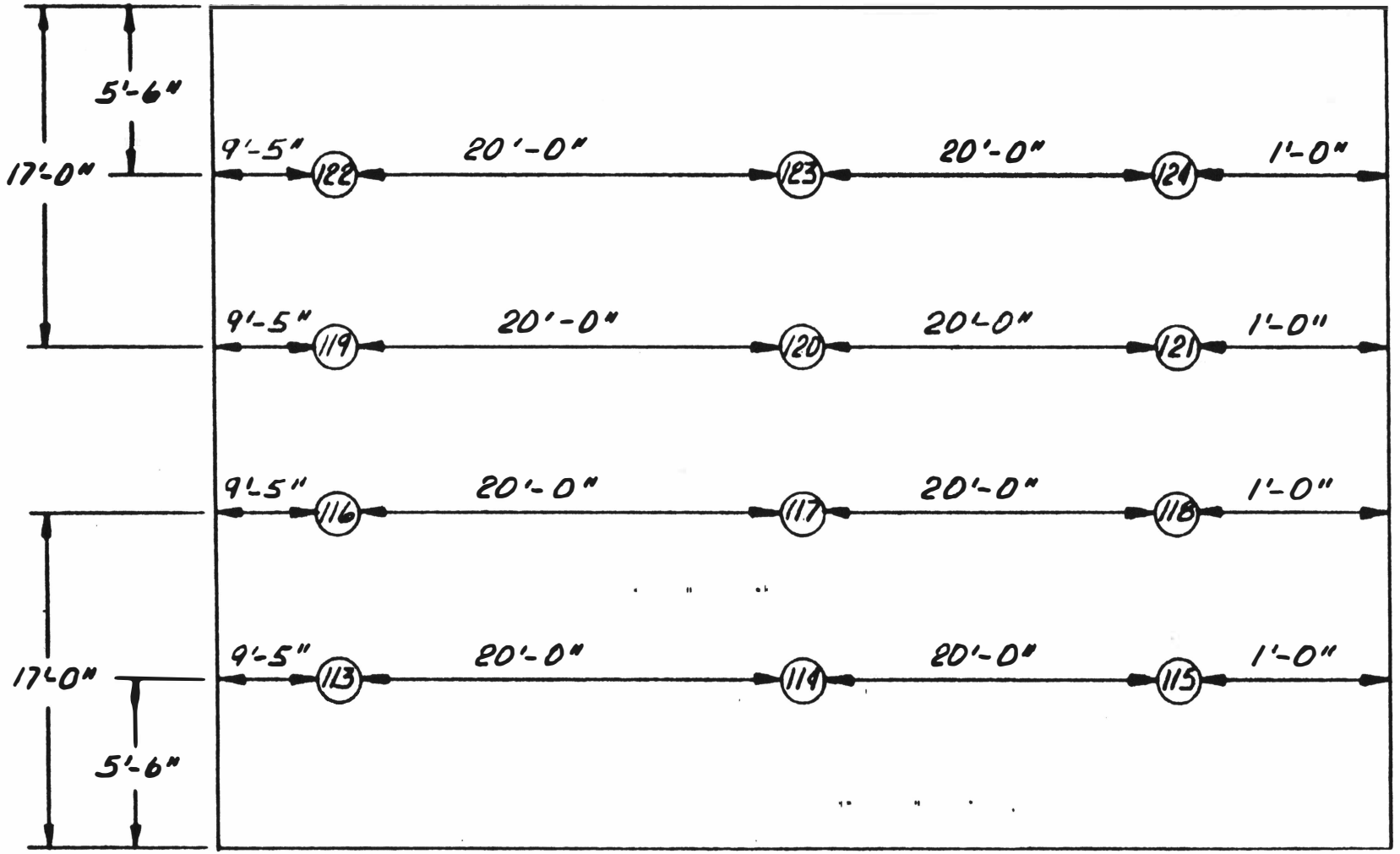
# RECTIFIER SETTING FOR POLARIZATION MEASUREMENTS

## ROGERS COUNTY BRIDGE

## April 18, 1985

| ZONE NUMBER | CURRENT OUTPUT OF RECTIFIER (Amps) |
|---|---|
| 1 | 3.Ø |
| 2 | 2.Ø |
| 3 | 2.Ø |
| 4 | 2.Ø |
| 5 | 2.Ø |
| 6 | 2.5 |
| 7 | 2.Ø |
| 8 | 3.5 |
| 9 | 1.5 |
| 1Ø | 2.Ø |
| 11 | 1.Ø |
| 12 | 2.Ø |

F-0511




SPAN NUMBER 12

| NO. | DATE | BY | REVISION |
|---|---|---|---|
| | | | |

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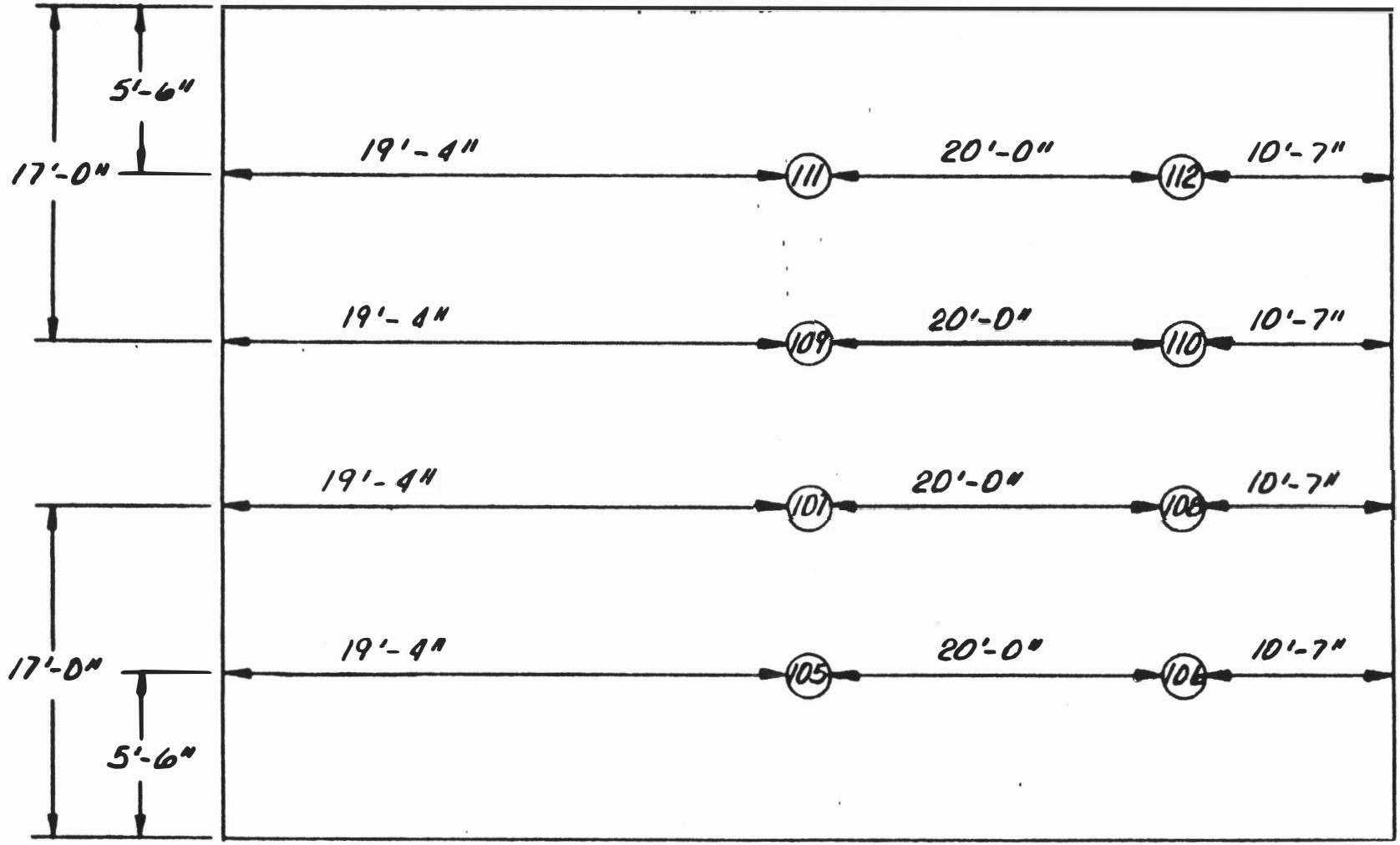
DRAWN BY: R. B.

DESIGNED BY: D. D.

DATE: 8/13/85

DRAWING NUMBER: F-65350-A-17

# POTENTIAL MEASUREMENT LOCATION
# ROGERS COUNTY BRIDGE




SPAN NUMBER 11

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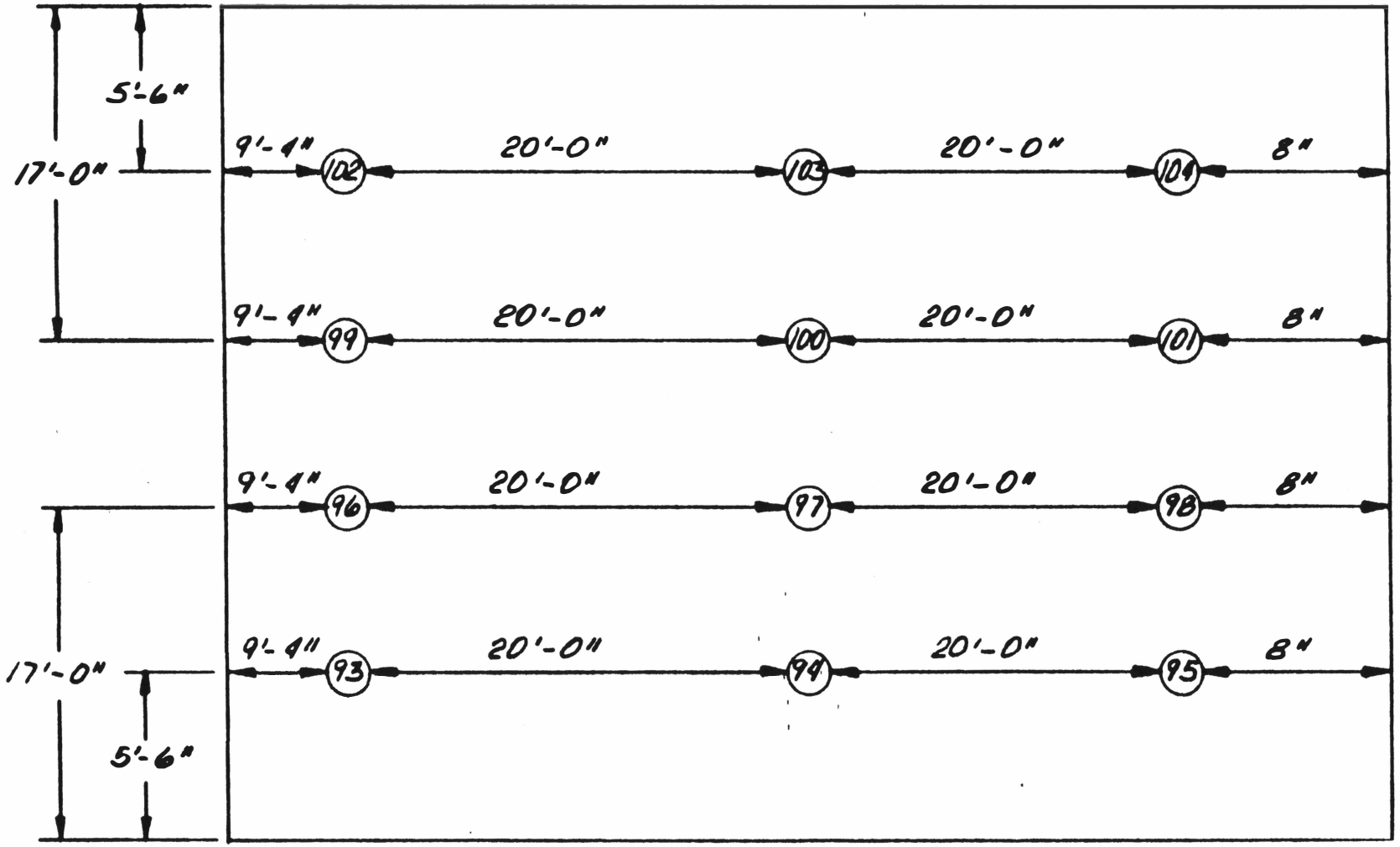
DRAWN BY: P.B.
DESIGNED BY: D.D.
DATE: 8/13/85
DRAWING NUMBER: E-65350-A-16

# POTENTIAL MEASUREMENT LOCATION
# ROGERS COUNTY BRIDGE




SPAN NUMBER 10

| NO. | DATE | BY | REVISION |
|---|---|---|---|
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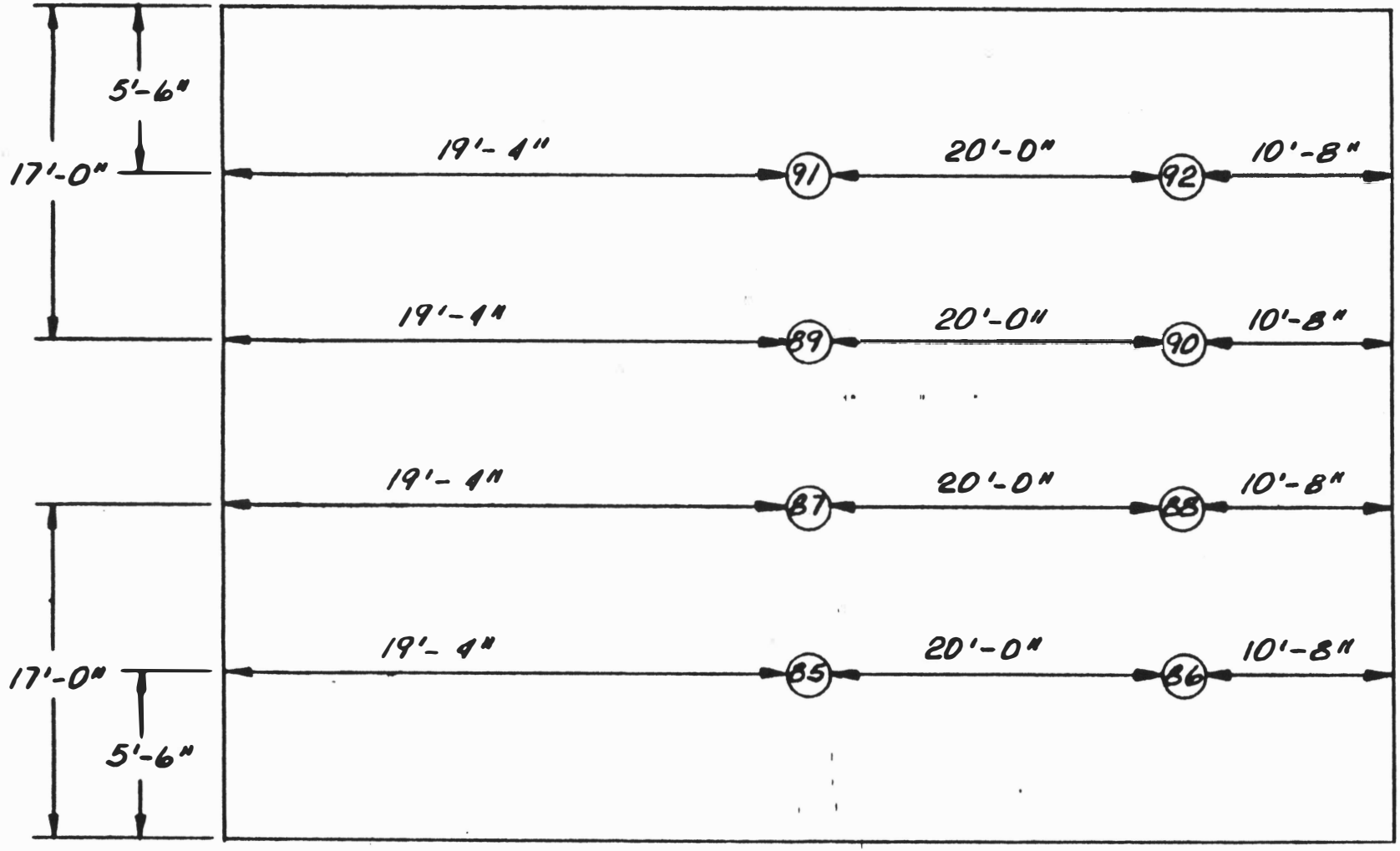
DRAWN BY: R.B.
DESIGNED BY: D.D.
DATE: 8/13/85
DRAWING NUMBER: 5[illegible]-A 5

# POTENTIAL MEASUREMENT LOCATION
# ROGERS COUNTY BRIDGE




SPAN NUMBER 9

| NO. | DATE | BY | REVISION |
|---|---|---|---|
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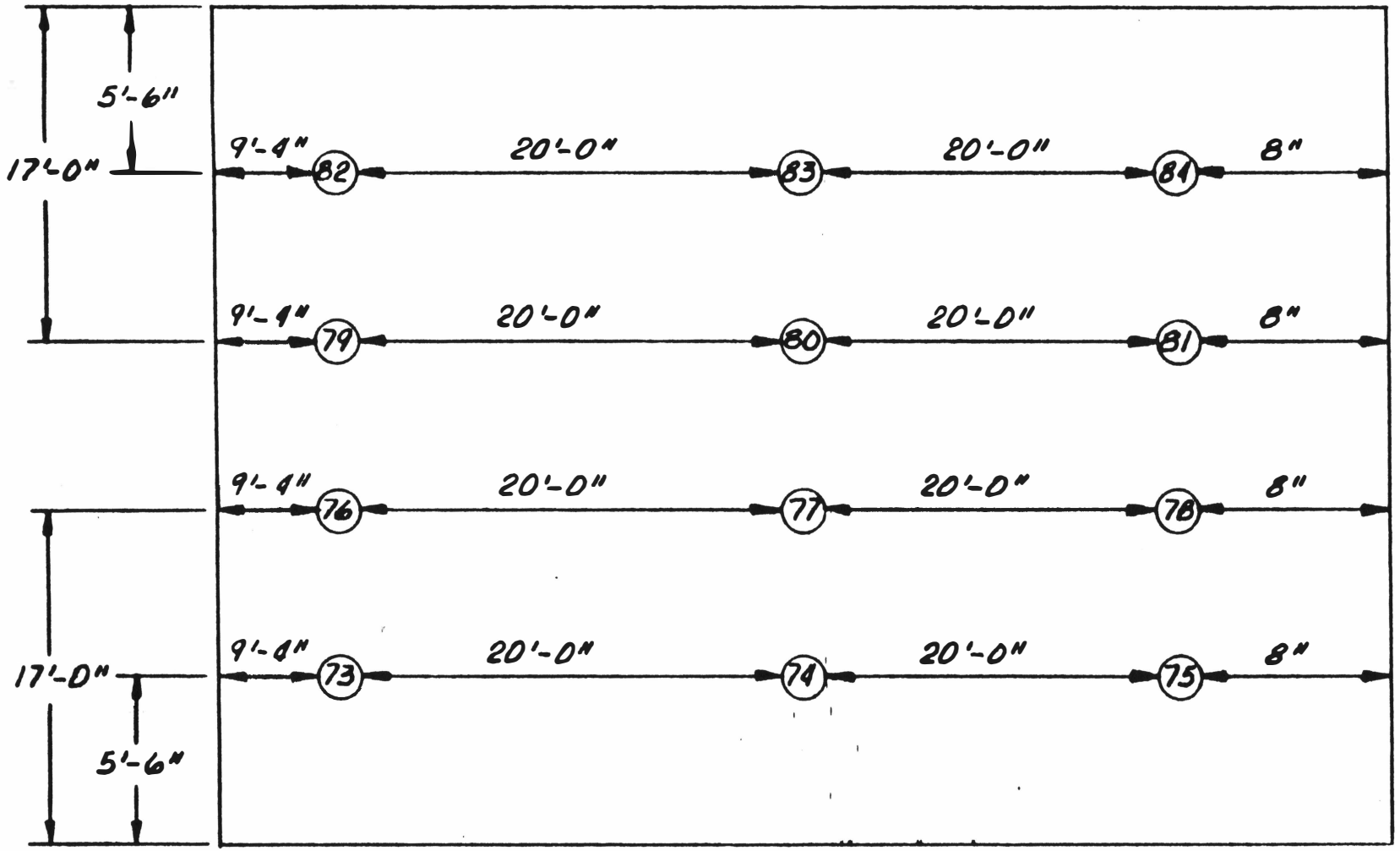
| | |
|---|---|
| DRAWN BY: | R.B. |
| DESIGNED BY: | D.D. |
| DATE: | 8/13/85 |
| DRAWING NUMBER: | E-65350-A-14 |

# POTENTIAL MEASUREMENT LOCATION
# ROGERS COUNTY BRIDGE




SPAN NUMBER 8

| NO. | DATE | BY | REVISION |
|---|---|---|---|
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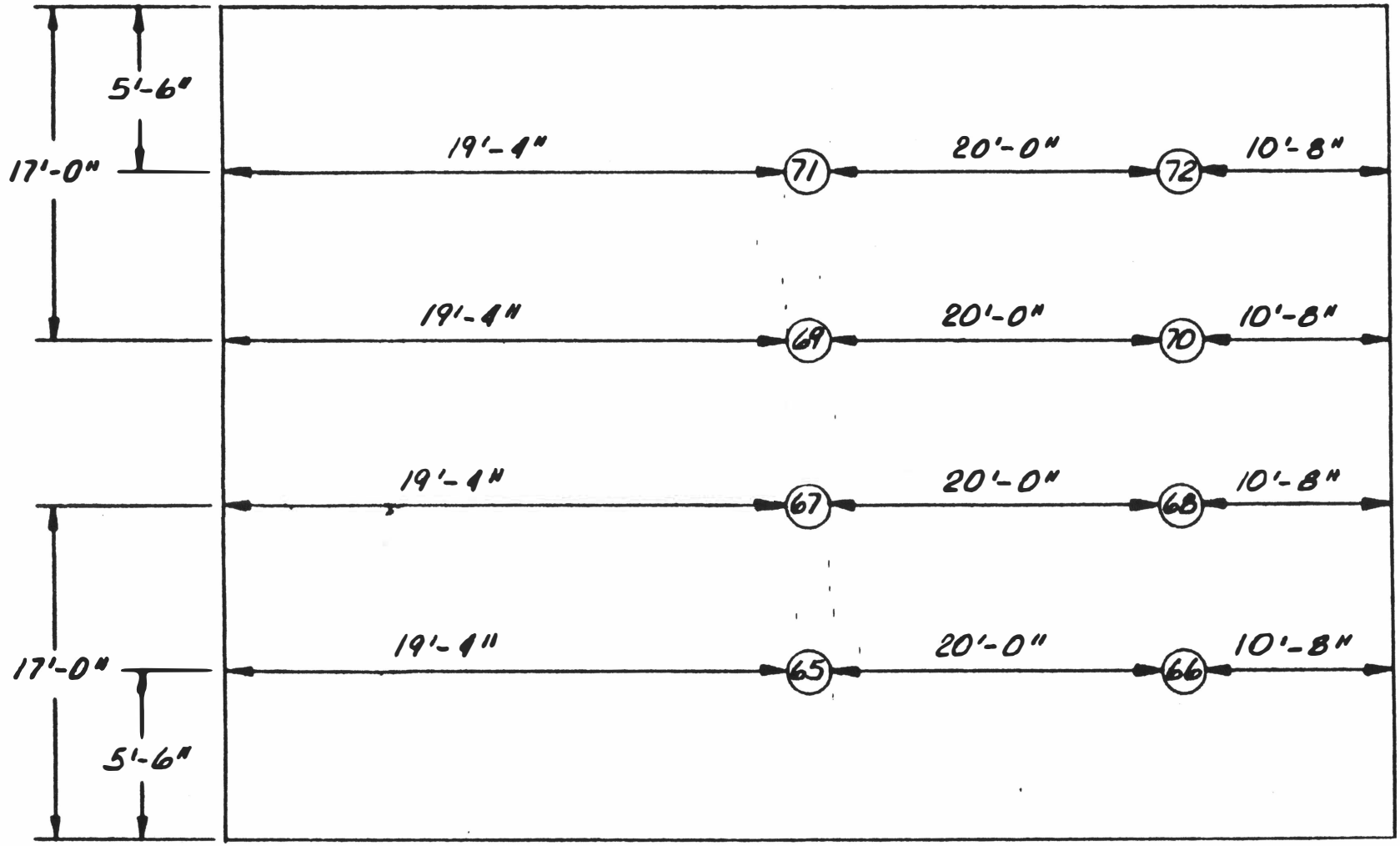
DRAWN BY: R.B.
DESIGNED BY: D.D.
DATE: 8/13/85
DRAWING NUMBER: C-1537-A-17

# POTENTIAL MEASUREMENT LOCATION
# ROGERS COUNTY BRIDGE




SPAN NUMBER 7

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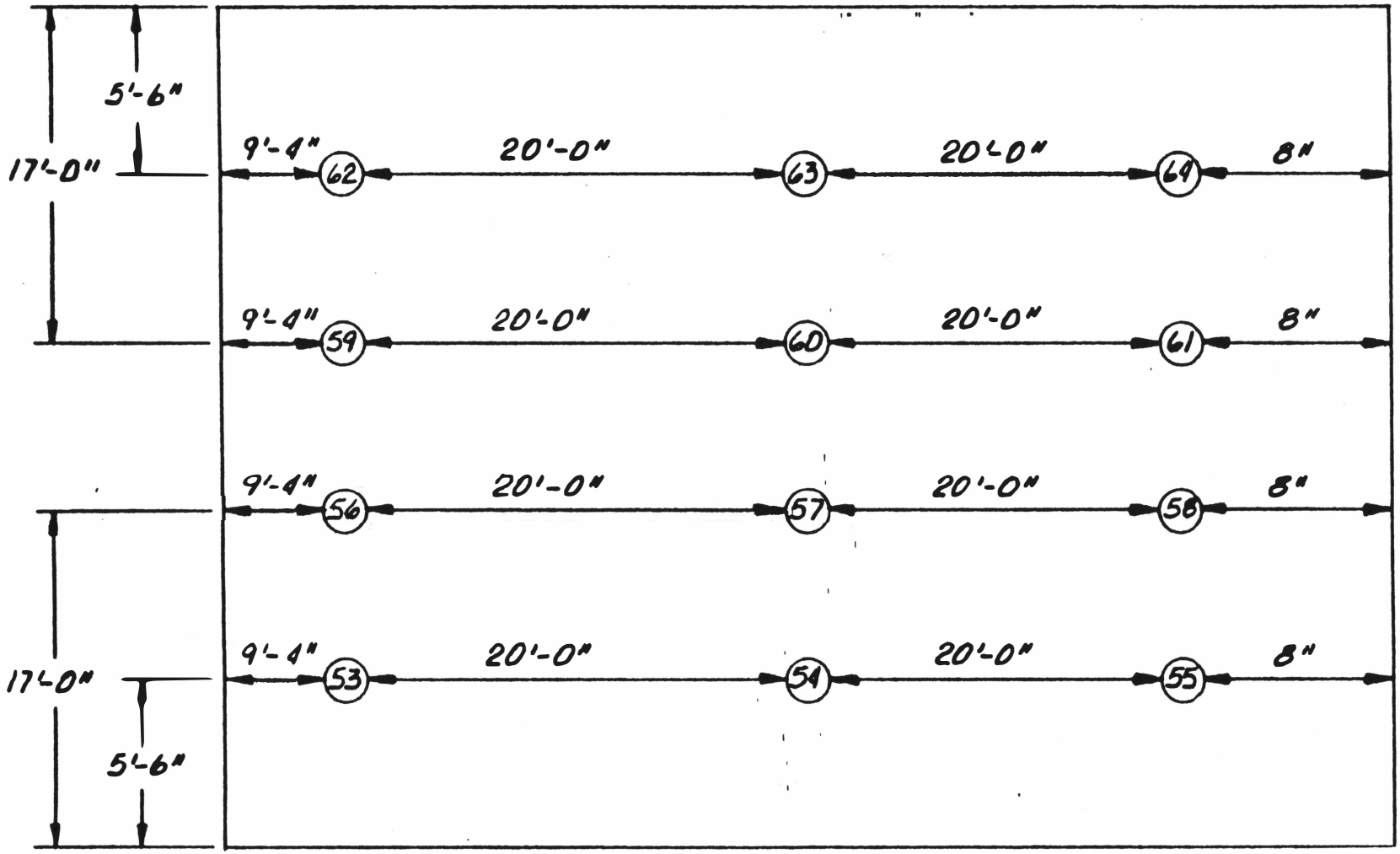
DESIGNED BY: D.D.
DATE: 8/13/85
DRAWING NUMBER: E-65350-A-12

# POTENTIAL MEASUREMENT LOCATION
# ROGERS COUNTY BRIDGE




SPAN NUMBER 6

| NO. | DATE | BY | REVISION |
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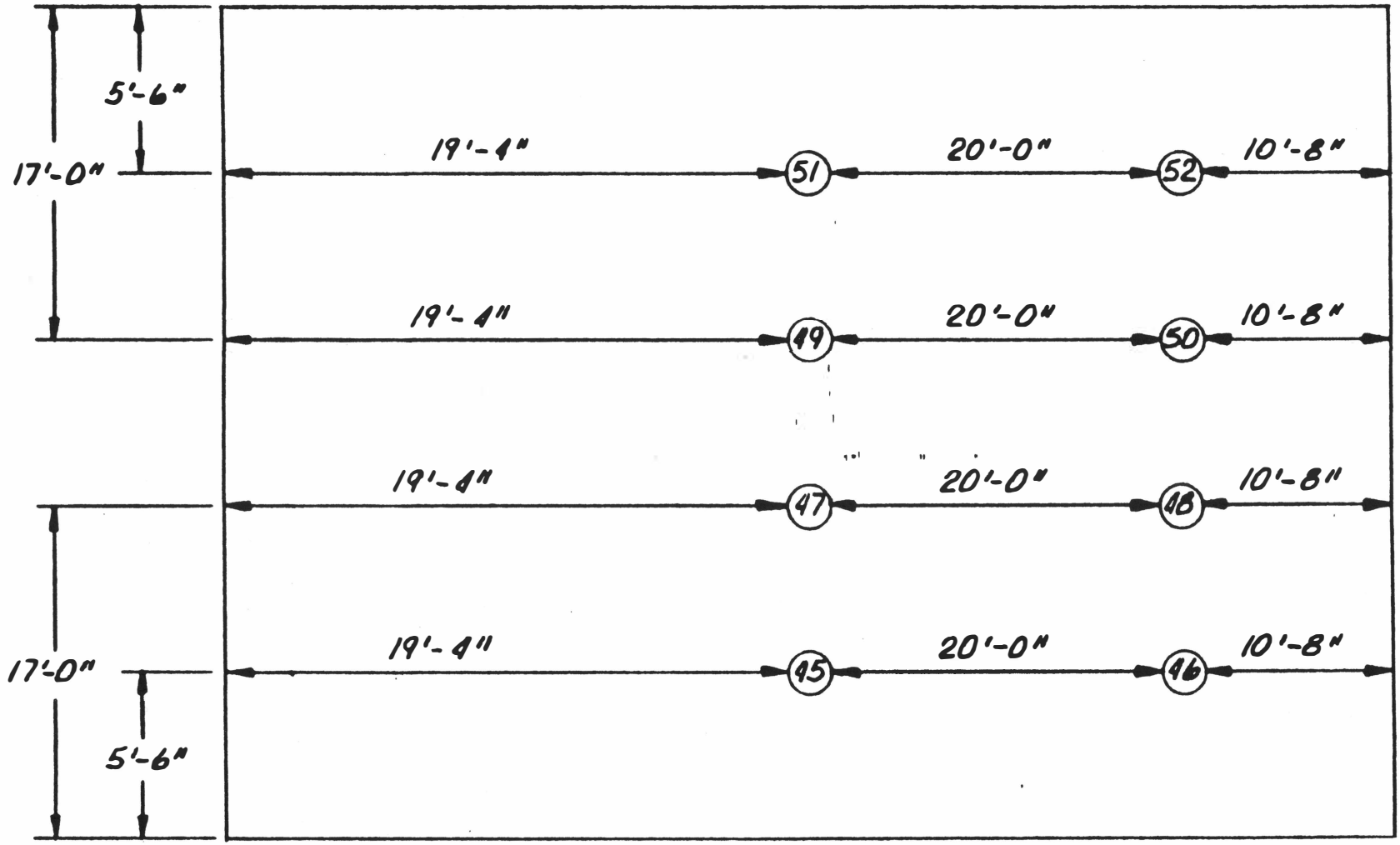
DESIGNED BY: D.D.
DATE: 8/13/85
DRAWING NUMBER: F-65[illegible]-1 -1

# POTENTIAL MEASUREMENT LOCATION
# ROGERS COUNTY BRIDGE

S-8611




SPAN NUMBER 5

| NO. | DATE | BY | REVISION |
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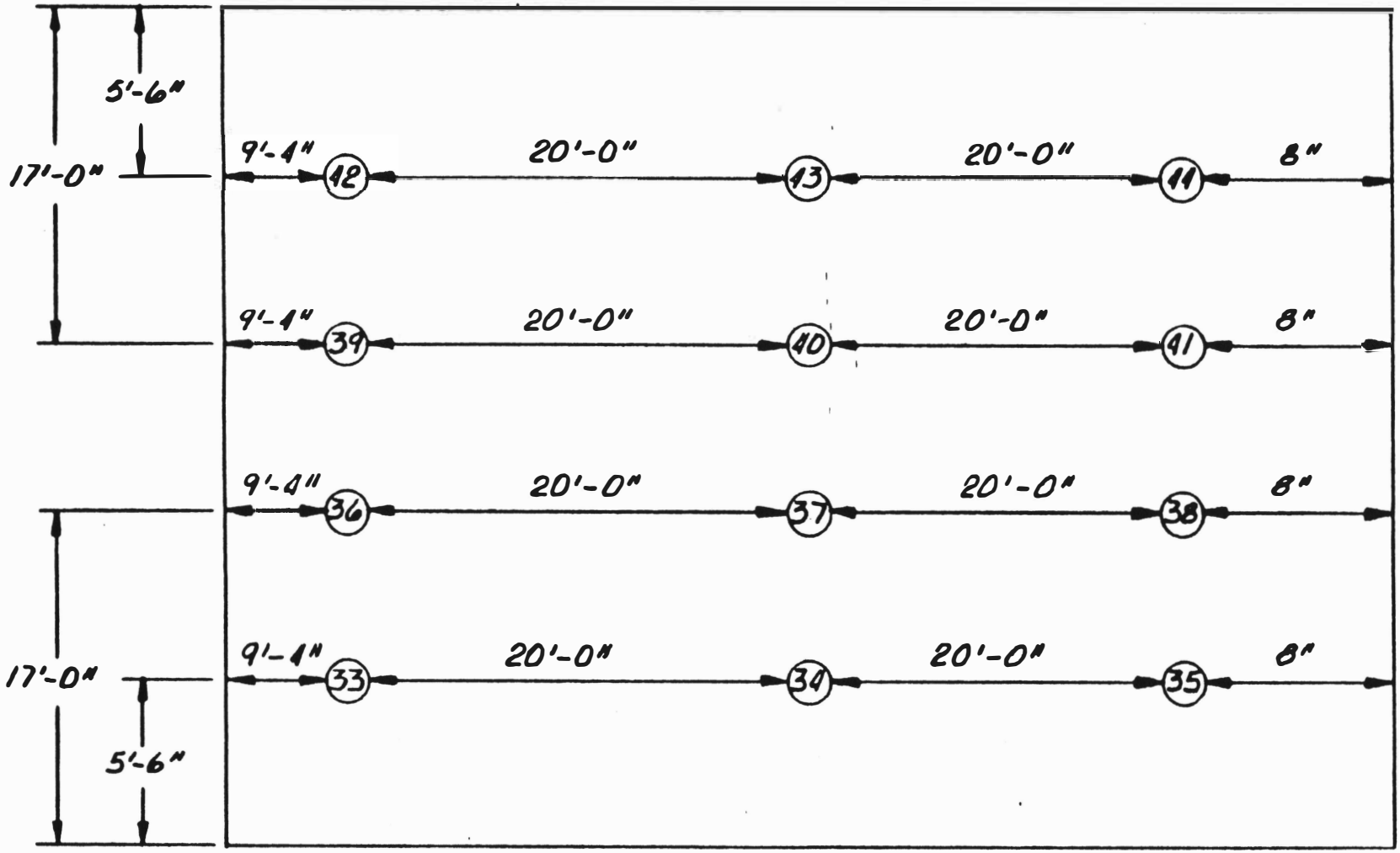
| | |
|---|---|
| DRAWN BY: | R.B. |
| DESIGNED BY: | D.D. |
| DATE: | 8/13/85 |
| DRAWING NUMBER: | E-65350-A-10 |

# POTENTIAL MEASUREMENT LOCATION
# ROGERS COUNTY BRIDGE




SPAN NUMBER 4

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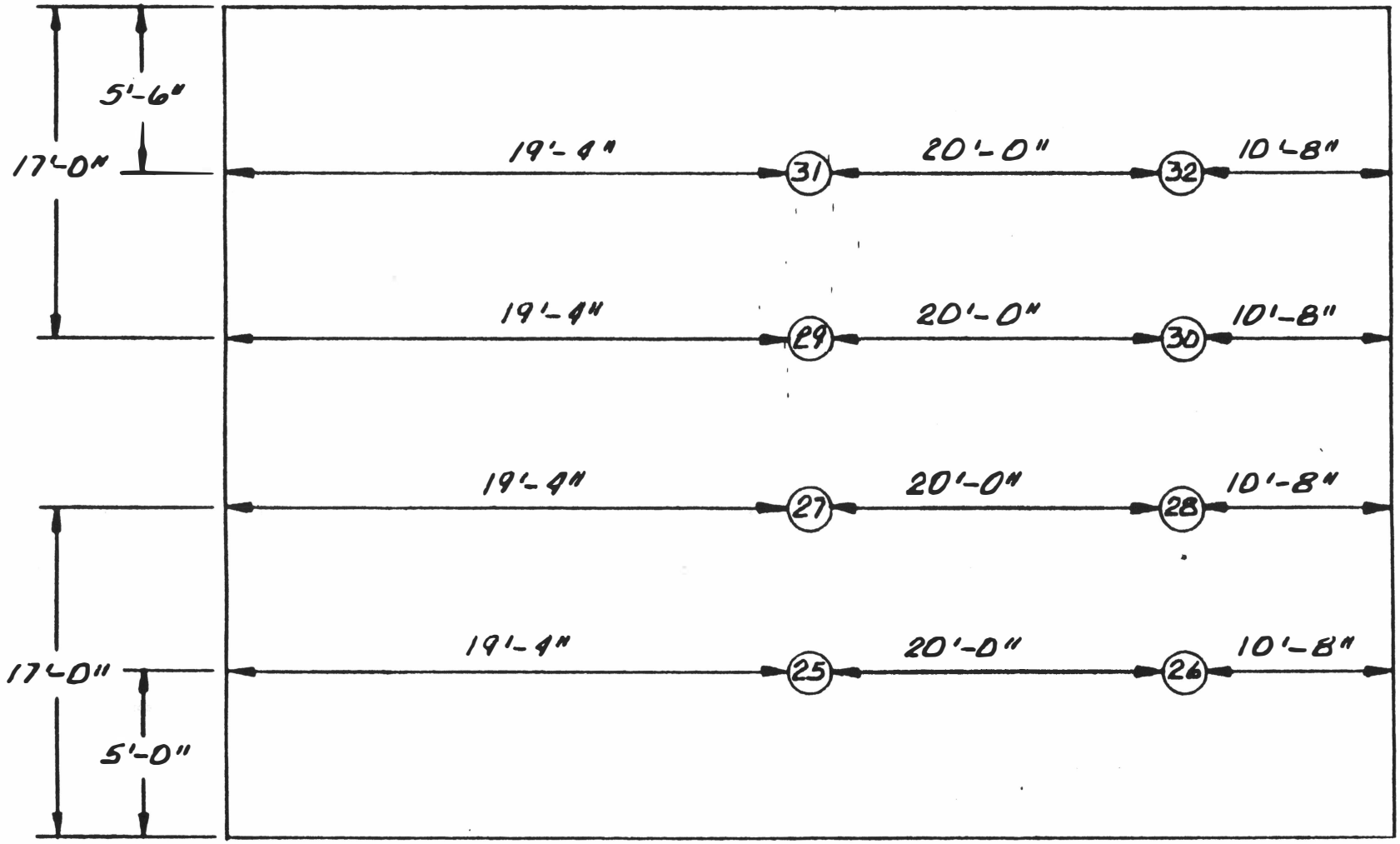
DRAWN BY: R.B.
DESIGNED BY: D.D.
DATE: 8/13/85
DRAWING NUMBER: C-65250-A-2

# POTENTIAL MEASUREMENT LOCATION
# ROGERS COUNTY BRIDGE




SPAN NUMBER 3

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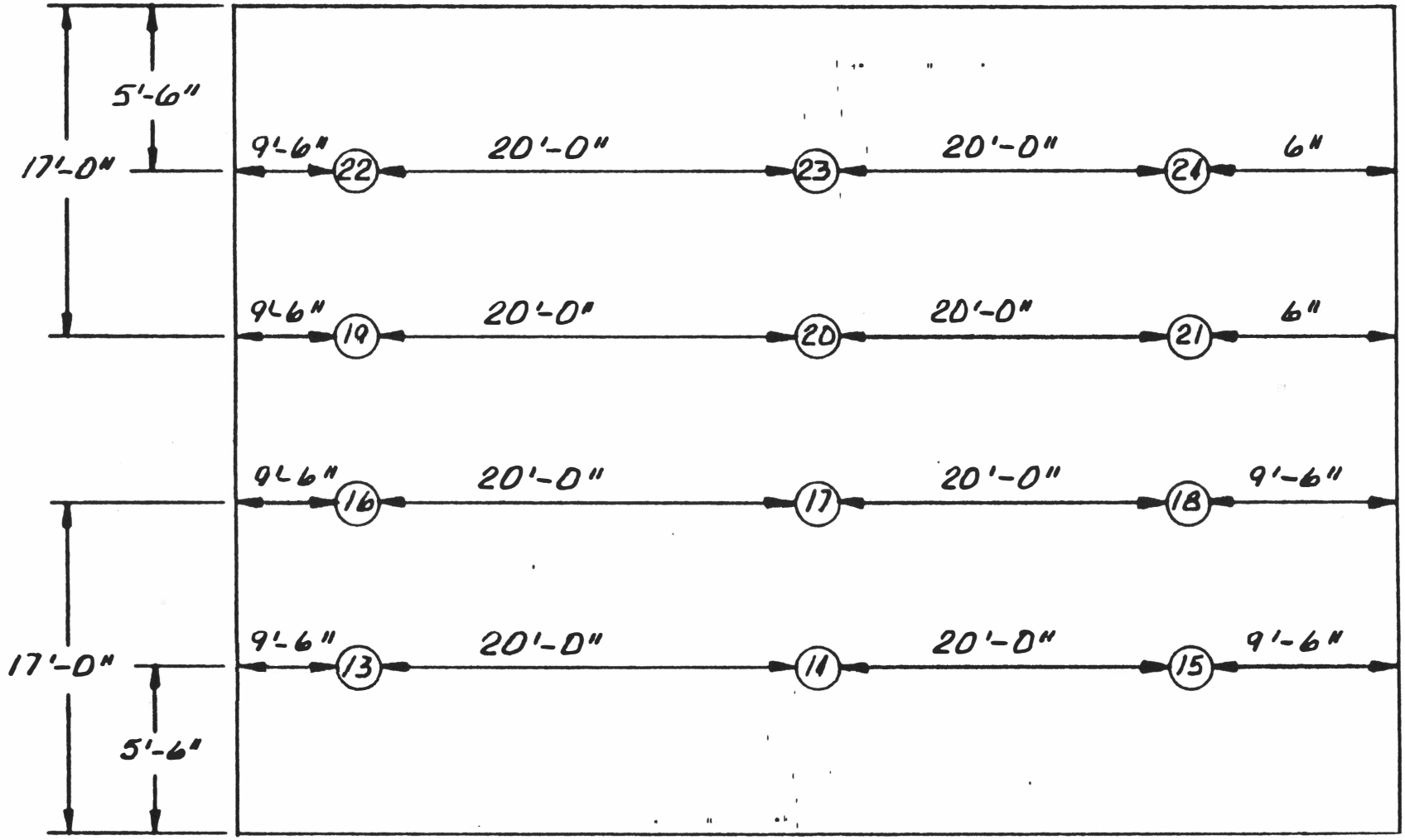
|---|---|
| DRAWN BY: | P.B. |
| DESIGNED BY: | D.D. |
| DATE: | 8/12/85 |
| DRAWING NUMBER: | E-65350-A-8 |

# POTENTIAL MEASUREMENT LOCATION
# ROGERS COUNTY BRIDGE




SPAN NUMBER 2

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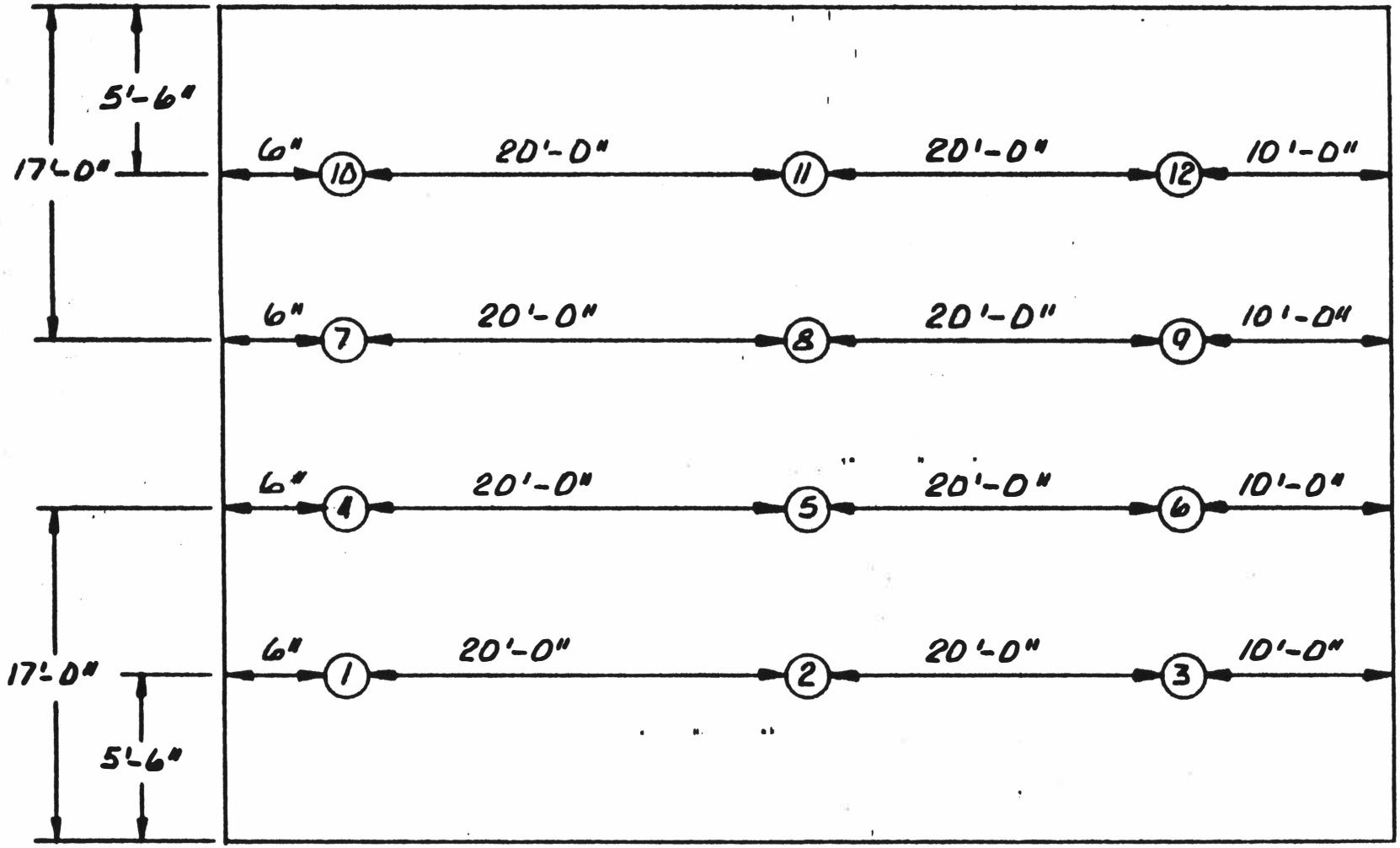
DRAWN BY: R.B.
DESIGNED BY: D.D.
DATE: 8/12/85
DRAWING NUMBER: E-65350-A-7

# POTENTIAL MEASUREMENT LOCATION ROGERS COUNTY BRIDGE




SPAN NUMBER 1

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|---|---|---|---|
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DESIGNED BY: D.D.
DATE: 8/12/85
DRAWING NUMBER: F-[illegible]-A-1

# POTENTIAL MEASUREMENT LOCATION ROGERS COUNTY BRIDGE

## REBAR PROBE MEASUREMENTS

ROGERS COUNTY BRIDGE

ZONE 1

APRIL 17, 1985

REBAR PROBE PRISM CONTAINS 5 POUNDS CHLORIDE PER CUBIC YARD

| READING NUMBER | CATHODIC PROTECTION CURRENT APPLIED (AMPS) | CURRENT FLOW BETWEEN REBAR PROBE AND REINFORCING STEEL (MILLIAMPS) |
|---|---|---|
| 1 | 0.00 | -0.90 |
| 2 | 0.21 | -0.70 |
| 3 | 0.43 | -0.54 |
| 4 | 0.62 | -0.46 |
| 5 | 0.80 | -0.39 |
| 6 | 1.22 | -0.24 |
| 7 | 1.70 | -0.11 |
| 8 | 2.68 | +0.17 |
| 9 | 3.24 | +0.29 |
| 10 | 4.18 | +0.52 |
| 11 | 5.51 | +0.89 |
| 12 | 7.52 | +1.42 |
| 13 | 10.80 | +2.20 |
| 14 | 11.50 | +2.30 |

## REBAR PROBE MEASUREMENTS

ROGERS COUNTY BRIDGE

ZONE 2

APRIL 17, 1985

REBAR PROBE PRISM CONTAINS 15 POUNDS CHLORIDE PER CUBIC YARD

| READING NUMBER | CATHODIC PROTECTION CURRENT APPLIED (AMPS) | CURRENT FLOW BETWEEN REBAR PROBE AND REINFORCING STEEL (MILLIAMPS) |
|---|---|---|
| 1 | 0.00 | +0.00 |
| 2 | 0.24 | +0.01 |
| 3 | 0.49 | +0.02 |
| 4 | 0.66 | +0.02 |
| 5 | 0.82 | +0.03 |
| 6 | 1.18 | +0.05 |
| 7 | 1.56 | +0.07 |
| 8 | 2.35 | +0.12 |
| 9 | 2.75 | +0.16 |
| 10 | 3.53 | +0.21 |
| 11 | 4.58 | +0.29 |
| 12 | 6.14 | +0.41 |
| 13 | 8.50 | +0.60 |
| 14 | 9.00 | +0.60 |

## REBAR PROBE MEASUREMENTS

ROGERS COUNTY BRIDGE

ZONE 3

APRIL 17, 1985

REBAR PROBE PRISM CONTAINS 15 POUNDS CHLORIDE PER CUBIC YARD

| READING NUMBER | CATHODIC PROTECTION CURRENT APPLIED (AMPS) | CURRENT FLOW BETWEEN REBAR PROBE AND REINFORCING STEEL (MILLIAMPS) |
|---|---|---|
| 1 | 0.00 | -0.77 |
| 2 | 0.26 | -0.68 |
| 3 | 0.52 | -0.60 |
| 4 | 0.70 | -0.55 |
| 5 | 0.86 | -0.51 |
| 6 | 1.23 | -0.42 |
| 7 | 1.60 | -0.34 |
| 8 | 2.41 | -0.17 |
| 9 | 2.80 | -0.09 |
| 10 | 3.58 | +0.04 |
| 11 | 4.69 | +0.23 |
| 12 | 6.30 | +0.52 |
| 13 | 8.80 | +0.90 |
| 14 | 9.30 | +1.00 |

# REBAR PROBE MEASUREMENTS

ROGERS COUNTY BRIDGE

ZONE 4

APRIL 17, 1985

REBAR PROBE PRISM CONTAINS 15 POUNDS CHLORIDE PER CUBIC YARD

| READING NUMBER | CATHODIC PROTECTION CURRENT APPLIED (AMPS) | CURRENT FLOW BETWEEN REBAR PROBE AND REINFORCING STEEL (MILLIAMPS) |
|---|---|---|
| 1 | 0.00 | -1.40 |
| 2 | 0.32 | -1.32 |
| 3 | 0.49 | -1.23 |
| 4 | 0.68 | -1.13 |
| 5 | 0.92 | -1.01 |
| 6 | 1.82 | -0.59 |
| 7 | 2.80 | -0.25 |
| 8 | 4.05 | -0.13 |
| 9 | 5.50 | +0.57 |
| 10 | 7.56 | +1.20 |
| 11 | 9.60 | +1.80 |
| 12 | 12.60 | +2.70 |

## REBAR PROBE MEASUREMENTS

ROGERS COUNTY BRIDGE

ZONE 5

APRIL 17, 1985

REBAR PROBE PRISM CONTAINS 10 POUNDS CHLORIDE PER CUBIC YARD

| READING NUMBER | CATHODIC PROTECTION CURRENT APPLIED (AMPS) | CURRENT FLOW BETWEEN REBAR PROBE AND REINFORCING STEEL (MILLIAMPS) |
|---|---|---|
| 1 | 0.00 | -0.96 |
| 2 | 0.29 | -0.89 |
| 3 | 0.45 | -0.82 |
| 4 | 0.64 | -0.74 |
| 5 | 0.88 | -0.66 |
| 6 | 1.73 | -0.40 |
| 7 | 2.66 | -0.16 |
| 8 | 3.88 | -0.09 |
| 9 | 5.23 | +0.36 |
| 10 | 7.20 | +0.71 |
| 11 | 9.23 | +1.06 |
| 12 | 12.10 | +1.50 |

# REBAR PROBE MEASUREMENTS

ROGERS COUNTY BRIDGE

ZONE 6

APRIL 17, 1985

REBAR PROBE PRISM CONTAINS 5 POUNDS CHLORIDE PER CUBIC YARD

| READING NUMBER | CATHODIC PROTECTION CURRENT APPLIED (AMPS) | CURRENT FLOW BETWEEN REBAR PROBE AND REINFORCING STEEL (MILLIAMPS) |
|---|---|---|
| 1 | 0.00 | +0.00 |
| 2 | 0.25 | +0.01 |
| 3 | 0.39 | +0.02 |
| 4 | 0.56 | +0.03 |
| 5 | 0.75 | +0.04 |
| 6 | 1.46 | +0.08 |
| 7 | 2.25 | +0.13 |
| 8 | 3.23 | +0.19 |
| 9 | 4.28 | +0.26 |
| 10 | 5.90 | +0.34 |
| 11 | 7.46 | +0.42 |
| 12 | 9.90 | +0.50 |

## REBAR PROBE MEASUREMENTS

ROGERS COUNTY BRIDGE

ZONE 7

APRIL 18, 1985

REBAR PROBE PRISM CONTAINS 5 POUNDS CHLORIDE PER CUBIC YARD

| READING NUMBER | CATHODIC PROTECTION CURRENT APPLIED (AMPS) | CURRENT FLOW BETWEEN REBAR PROBE AND REINFORCING STEEL (MILLIAMPS) |
|---|---|---|
| 1 | 0.00 | -0.01 |
| 2 | 0.27 | +0.00 |
| 3 | 0.42 | +0.00 |
| 4 | 0.62 | +0.00 |
| 5 | 0.96 | +0.02 |
| 6 | 1.48 | +0.06 |
| 7 | 2.40 | +0.18 |
| 8 | 3.65 | +0.20 |
| 9 | 5.69 | +0.34 |
| 10 | 8.20 | +0.54 |
| 11 | 11.90 | +0.82 |

## REBAR PROBE MEASUREMENTS

ROGERS COUNTY BRIDGE

ZONE 8

APRIL 18, 1985

REBAR PROBE PRISM CONTAINS 5 POUNDS CHLORIDE PER CUBIC YARD

| READING NUMBER | CATHODIC PROTECTION CURRENT APPLIED (AMPS) | CURRENT FLOW BETWEEN REBAR PROBE AND REINFORCING STEEL (MILLIAMPS) |
|---|---|---|
| 1 | 0.00 | +0.01 |
| 2 | 0.25 | +0.01 |
| 3 | 0.38 | +0.02 |
| 4 | 0.56 | +0.02 |
| 5 | 0.86 | +0.02 |
| 6 | 1.29 | +0.03 |
| 7 | 2.05 | +0.05 |
| 8 | 3.12 | +0.08 |
| 9 | 4.82 | +0.14 |
| 10 | 6.97 | +0.23 |
| 11 | 9.90 | +0.36 |

## REBAR PROBE MEASUREMENTS

ROGERS COUNTY BRIDGE

ZONE 9

APRIL 18, 1985

REBAR PROBE PRISM CONTAINS 10 POUNDS CHLORIDE PER CUBIC YARD

| READING NUMBER | CATHODIC PROTECTION CURRENT APPLIED (AMPS) | CURRENT FLOW BETWEEN REBAR PROBE AND REINFORCING STEEL (MILLIAMPS) |
|---|---|---|
| 1 | 0.00 | -0.54 |
| 2 | 0.24 | -0.50 |
| 3 | 0.37 | -0.47 |
| 4 | 0.53 | -0.44 |
| 5 | 0.81 | -0.39 |
| 6 | 1.23 | -0.31 |
| 7 | 1.93 | -0.19 |
| 8 | 2.91 | -0.05 |
| 9 | 4.50 | +0.17 |
| 10 | 6.50 | +0.45 |
| 11 | 9.20 | +0.81 |

## REBAR PROBE MEASUREMENTS

ROGERS COUNTY BRIDGE

ZONE 10

APRIL 18, 1985

REBAR PROBE PRISM CONTAINS 10 POUNDS CHLORIDE PER CUBIC YARD

| READING NUMBER | CATHODIC PROTECTION CURRENT APPLIED (AMPS) | CURRENT FLOW BETWEEN REBAR PROBE AND REINFORCING STEEL (MILLIAMPS) |
|---|---|---|
| 1 | 0.00 | -1.05 |
| 2 | 0.35 | -1.00 |
| 3 | 0.60 | -0.95 |
| 4 | 1.05 | -0.88 |
| 5 | 1.60 | -0.78 |
| 6 | 2.34 | -0.67 |
| 7 | 3.22 | -0.55 |
| 8 | 4.35 | -0.42 |
| 9 | 6.62 | -0.20 |
| 10 | 8.46 | -0.00 |
| 11 | 12.00 | +0.30 |

## REBAR PROBE MEASUREMENTS

ROGERS COUNTY BRIDGE

ZONE 11

APRIL 18, 1985

REBAR PROBE PRISM CONTAINS 10 POUNDS CHLORIDE PER CUBIC YARD

| READING NUMBER | CATHODIC PROTECTION CURRENT APPLIED (AMPS) | CURRENT FLOW BETWEEN REBAR PROBE AND REINFORCING STEEL (MILLIAMPS) |
|---|---|---|
| 1 | 0.00 | -0.93 |
| 2 | 0.32 | -0.75 |
| 3 | 0.53 | -0.66 |
| 4 | 0.90 | -0.51 |
| 5 | 1.36 | -0.37 |
| 6 | 1.94 | -0.21 |
| 7 | 2.58 | -0.06 |
| 8 | 3.48 | +0.12 |
| 9 | 5.06 | +0.42 |
| 10 | 6.52 | +0.68 |
| 11 | 9.20 | +1.16 |

## REBAR PROBE MEASUREMENTS

ROGERS COUNTY BRIDGE

ZONE 12

APRIL 18, 1985

REBAR PROBE PRISM CONTAINS 15 POUNDS CHLORIDE PER CUBIC YARD

| READING NUMBER | CATHODIC PROTECTION CURRENT APPLIED (AMPS) | CURRENT FLOW BETWEEN REBAR PROBE AND REINFORCING STEEL (MILLIAMPS) |
|---|---|---|
| 1 | 0.00 | -1.62 |
| 2 | 0.31 | -1.53 |
| 3 | 0.53 | -1.47 |
| 4 | 0.91 | -1.36 |
| 5 | 1.34 | -1.22 |
| 6 | 1.93 | -1.09 |
| 7 | 2.56 | -0.94 |
| 8 | 3.49 | -0.77 |
| 9 | 5.07 | -0.50 |
| 10 | 6.56 | -0.27 |
| 11 | 9.10 | +0.10 |

## ANODE TO REINFORCING STEEL MEASUREMENTS

Rogers County Bridge

April 16, 1985

| READING NUMBER | TEST POINT | RESISTANCE (DC OHMS) | RESISTANCE (DC OHMS) | RESISTANCE (AC OHMS) | VOLTAGE DIFFERENCE (millivolts) |
|---|---|---|---|---|---|
| 1 | Anode 1 | 1350 | 122- | 0.28 | 136 |
| 2 | Anode 2 | OL | 152- | 0.40 | 186 |
| 3 | Anode 3 | 1936 | 143- | 0.37 | 170 |
| 4 | Anode 4 | OL | 158- | 0.27 | 196 |
| 5 | Anode 5 | OL | 170- | 0.28 | 217 |
| 6 | Anode 6 | OL | 172- | 0.36 | 224 |
| 7 | Anode 7 | OL | 171- | 0.39 | 222 |
| 8 | Anode 8 | OL | 175- | 0.46 | 231 |
| 9 | Anode 9 | OL | 170- | 0.49 | 220 |
| 10 | Anode 10 | OL | 171- | 0.39 | 221 |
| 11 | Anode 11 | OL | 163- | 0.45 | 206 |
| 12 | Anode 12 | OL | 168- | 0.62 | 217 |

# ROGERS COUNTY BRIDGE

## Cathodic Protection Maintenance Record Sheet
## Bridge Deck Rectifier

LOCATION OF RECTIFIER UNIT: West Abutment

RECTIFIER MANUFACTURED BY: Good-All Electric, Inc.

TYPE OF RECTIFIER UNIT: MODEL NO. CTAYSA 20-10(12)NZ

RECTIFIER UNIT: SERIAL NUMBER: 84H1089

RECTIFIER AC INPUT: 115 VOLTS 1 PHASE 60 HERTZ

INDIVIDUAL ZONE RATINGS: 20 VOLTS 10 AMPERES

NUMBER OF CIRCUITS: 12

TYPE OF PRIMARY ANODES: Platinized Niobium Copper Core Wire

INSTALLATION DATE: April, 1985 BY: Harco Corporation

DATE: 6/24/85 TIME: --- BY: Harco Corporation

TOTAL CURRENT: 35.0 AMPS

ZONE 1

CURRENT: 3.50 AMPS

CURRENT LIMIT SET: 3.50 AMPS

VOLTAGE: --- VOLTS

VOLTAGE LIMIT SET: --- VOLTS

REFERENCE ELECTRODE FOR TASC CONTROL: Silver-Silver Chloride

SET POTENTIAL: -475 mV.

SILVER-SILVER CHLORIDE ELECTRODE POTENTIAL: -305 mV.

MOLYBDENUM-MOLYBDENUM OXIDE ELECTRODE POTENTIAL: +261 mV.

ZONE 2

CURRENT: 2.00 AMPS

CURRENT LIMIT SET: 2.00 AMPS

VOLTAGE: --- VOLTS

VOLTAGE LIMIT SET: --- VOLTS

REFERENCE ELECTRODE FOR TASC CONTROL: Silver-Silver Chloride

SET POTENTIAL: -425 mV.

SILVER-SILVER CHLORIDE ELECTRODE POTENTIAL: -225 mV.

MOLYBDENUM-MOLYBDENUM OXIDE ELECTRODE POTENTIAL: +197 mV.

ZONE 3

CURRENT: 3.00 AMPS

CURRENT LIMIT SET: 3.00 AMPS

VOLTAGE: --- VOLTS

VOLTAGE LIMIT SET: --- VOLTS

REFERENCE ELECTRODE FOR TASC CONTROL: Silver-Silver Chloride

SET POTENTIAL: -125 mV.

SILVER-SILVER CHLORIDE ELECTRODE POTENTIAL: +017 mV.

MOLYBDENUM-MOLYBDENUM OXIDE ELECTRODE POTENTIAL: +226 mV.

ZONE 4

CURRENT: 3.00 AMPS

CURRENT LIMIT SET: 3.00 AMPS

VOLTAGE: --- VOLTS

VOLTAGE LIMIT SET: --- VOLTS

REFERENCE ELECTRODE FOR TASC CONTROL: Silver-Silver Chloride

SET POTENTIAL: -350 mV.

SILVER-SILVER CHLORIDE ELECTRODE POTENTIAL: -207 mV.

MOLYBDENUM-MOLYBDENUM OXIDE ELECTRODE POTENTIAL: +287 mV.

ZONE 5

CURRENT: 2.25 AMPS

CURRENT LIMIT SET: 2.25 AMPS

VOLTAGE: --- VOLTS

VOLTAGE LIMIT SET: --- VOLTS

REFERENCE ELECTRODE FOR TASC CONTROL: Silver-Silver Chloride

SET POTENTIAL: -350 mV.

SILVER-SILVER CHLORIDE ELECTRODE POTENTIAL: -163 mV.

MOLYBDENUM-MOLYBDENUM OXIDE ELECTRODE POTENTIAL: -080 mV.

ZONE 6

CURRENT: 4.25 AMPS

CURRENT LIMIT SET: 4.25 AMPS

VOLTAGE: --- VOLTS

VOLTAGE LIMIT SET: --- VOLTS

REFERENCE ELECTRODE FOR TASC CONTROL: Silver-Silver Chloride

SET POTENTIAL: -450 mV.

SILVER-SILVER CHLORIDE ELECTRODE POTENTIAL: -303 mV.

MOLYBDENUM-MOLYBDENUM OXIDE ELECTRODE POTENTIAL: -088 mV.

ZONE 7

CURRENT: 2.40 AMPS

CURRENT LIMIT SET: 2.40 AMPS

VOLTAGE: --- VOLTS

VOLTAGE LIMIT SET: --- VOLTS

REFERENCE ELECTRODE FOR TASC CONTROL: Silver-Silver Chloride

SET POTENTIAL: -300 mV.

SILVER-SILVER CHLORIDE ELECTRODE POTENTIAL: -189 mV.

MOLYBDENUM-MOLYBDENUM OXIDE ELECTRODE POTENTIAL: -067 mV.

ZONE 8

CURRENT: 4.25 AMPS

CURRENT LIMIT SET: 4.25 AMPS

VOLTAGE: --- VOLTS

VOLTAGE LIMIT SET: --- VOLTS

REFERENCE ELECTRODE FOR TASC CONTROL: Silver-Silver Chloride

SET POTENTIAL: -325 mV.

SILVER-SILVER CHLORIDE ELECTRODE POTENTIAL: -130 mV.

MOLYBDENUM-MOLYBDENUM OXIDE ELECTRODE POTENTIAL: +213 mV.

ZONE 9

CURRENT: 1.50 AMPS

CURRENT LIMIT SET: 1.50 AMPS

VOLTAGE: --- VOLTS

VOLTAGE LIMIT SET: --- VOLTS

REFERENCE ELECTRODE FOR TASC CONTROL: Silver-Silver Chloride

SET POTENTIAL: -500 mV.

SILVER-SILVER CHLORIDE ELECTRODE POTENTIAL: -222 mV.

MOLYBDENUM-MOLYBDENUM OXIDE ELECTRODE POTENTIAL: -262 mV.

ZONE 10

CURRENT: 3.50 AMPS

CURRENT LIMIT SET: 3.50 AMPS

VOLTAGE: --- VOLTS

VOLTAGE LIMIT SET: --- VOLTS

REFERENCE ELECTRODE FOR TASC CONTROL: Silver-Silver Chloride

SET POTENTIAL: -375 mV.

SILVER-SILVER CHLORIDE ELECTRODE POTENTIAL: -195 mV.

MOLYBDENUM-MOLYBDENUM OXIDE ELECTRODE POTENTIAL: +231 mV.

ZONE 11

CURRENT: 1.50 AMPS

CURRENT LIMIT SET: 1.50 AMPS

VOLTAGE: --- VOLTS

VOLTAGE LIMIT SET: --- VOLTS

REFERENCE ELECTRODE FOR TASC CONTROL: Silver-Silver Chloride

SET POTENTIAL: -400 mV.

SILVER-SILVER CHLORIDE ELECTRODE POTENTIAL: -230 mV.

MOLYBDENUM-MOLYBDENUM OXIDE ELECTRODE POTENTIAL: +206 mV.

ZONE 12

CURRENT: 3.80 AMPS

CURRENT LIMIT SET: 3.80 AMPS

VOLTAGE: --- VOLTS

VOLTAGE LIMIT SET: --- VOLTS

REFERENCE ELECTRODE FOR TASC CONTROL: Silver-Silver Chloride

SET POTENTIAL: -375 mV.

SILVER-SILVER CHLORIDE ELECTRODE POTENTIAL: -230 mV.

MOLYBDENUM-MOLYBDENUM OXIDE ELECTRODE POTENTIAL: +240 mV.

ADDITIONAL COMMENTS: