GUAM POWER AUTHORITY
ATURIDÅT ILEKTRESEDÅT GUÅHAN
P.O.BOX 2977 • HAGÅTÑA, GUAM U.S.A. 96932-2977

November 21, 2023

AMENDMENT NO.: IV

TO

INVITATION FOR BID NO.: GPA-005-24

FOR

POLE, CONCRETE, 35FT, CLASS B

Prospective Bidders are hereby notified of the following changes, inclusion and response to inquiries received from Bidder No. 1 dated November 16, 2023 and Bidder No. 2 dated November 7, 2023:

*CHANGES:*

1. *REMOVE* Page 3b of 88 and *REPLACE with* Page 3c of 88, REQUIRED DELIVERY TIME is changed (see attached):

   *FROM:*

   8 Weeks Upon Completion of Inspection Testing

* *TO NOW READ:*

   8 Weeks for Production After Acceptance of Purchase Order
   8 Weeks After Acceptance Testing

2. *REMOVE* Page 5 of 88 and *REPLACE with* Page 5a of 88, DELIVERY REQUIREMENT is changed (see attached):

   *FROM:*

   8 Weeks Upon Completion of Inspection Testing

* *TO NOW READ:*

   8 Weeks for Production After Acceptance of Purchase Order
   8 Weeks After Acceptance Testing

*INCLUSION:*

Attachment A - GPA Standard Operating Procedure, Concrete Pole Inspection and Testing Procedure No.: SP-135 (see attached).

Bidder No. 1 inquiry dated 11/16/2023:

QUESTION:

1. In referenced to the various bid invitations listed below, we would like to inquire about your Required Delivery Time for the production of the concrete poles. You have indicated that the Delivery Time shall be 8 weeks upon Completion of Inspection of Testing, but not the estimated date for completion of the production of the poles that will result in the date for Inspection of Testing. Normally the poles should be produced and ready for testing 8 weeks After Receipt of the Confirmed Order.

    1. GPA-005-24 Concrete Poles, 35-ft, Class B
    2. GPA-014-24 Concrete Poles, 45-ft. Class B
    3. GPA-017-24 Concrete Poles, 35-ft, Class B

ANSWER:

Refer *CHANGES* above.

Bidder No. 2 inquiry dated 11/7/2023:

QUESTION:

1. The manufacturer is asking some questions for clarification:

    A.1. – Please confirm the pole index number.

ANSWER:

Refer to Page 6 of 88 - GPA Specifications E-035, Rev.2., Under 12.0 BIRTHMARK, Section 12.1.

QUESTION:

2. A.2 – Is a temporary label acceptable? We typically use tape around the pole.

ANSWER:

The label must be permanent. These poles may sit in the yard for a while. If the mark is not visible it may be more difficult to balance the pole.

QUESTION:

3. A.3. – Attached please find our standard nameplate. Is this acceptable? Dimensions are 2 ½" x 3 ½" .

ANSWER:

Refer to Page 6 of 88 - GPA Specifications E-035, Rev.2, under Section 12.0: BIRTHMARK.

QUESTION:

4. A.4 – Attached please find our standard nameplate. Is this acceptable? Dimensions are 2 ½" x 3 ½".

ANSWER:

Refer to Page 6 of 88 - GPA Specifications E-035, Rev.2, under Section 12.0: BIRTHMARK.

QUESTION:

5. A.5. – Is a temporary label acceptable? We typically use tape around the pole.

ANSWER:

No.

QUESTION:

6. A.6. – Do you require a professional engineering stamp from HI or is our Kansas stamp (where the poles are manufactured) acceptable?

ANSWER:

The Professional Engineer stamping the plans must be certified and proof of certification must be provided.

QUESTION:

7. A.8 – Can you please send us information on this specific standard so we can review [SOP No SP-135].

ANSWER:

Refer to *INCLUSION* above.

All other Terms and Conditions in the bid package shall remain unchanged and in full force.

for JOHN M. BENAVENTE, P.E.
General Manager

# INVITATION FOR BID

ISSUING OFFICE:
Guam Power Authority-Procurement Office
1st. Floor, Room 101
Gloria B. Nelson Public Service Building
688 Route 15
Mangilao, Guam 96913

Attn: JOHN M. BENAVENTE, P.E.
General Manager
c/o JAMIE LYNN C. PANGELINAN
Supply Management Administrator

11/21/2023
for JOHN M. BENAVENTE, P.E. DATE
for General Manager

DATE ISSUED: 10/24/2023
10/31/2023

BID INVITATION NO.: GPA-005-24

BID FOR: Pole, Concrete, 35 Ft., Class B

SPECIFICATION: See Attached

DESTINATION: Guam Power Authority, Dededo Warehouse

* REQUIRED DELIVERY TIME: 8 Weeks for Production After Acceptance of Purchase Order
8 Weeks After Acceptance Testing

INSTRUCTIONS TO BIDDERS:
INDICATE WHETHER: _____ INDIVIDUAL _____ PARTNERSHIP _____ CORPORATION

INCORPORATED IN: _____

This bid shall be submitted in duplicate and sealed to the issuing office above no later than (Time) 10:00 A.M., Date: 11/30/2023 and shall be publicly opened. Bid submitted after the time and date specified above shall be rejected. See attached General Terms and Conditions and Sealed Bid Solicitation for details.

The undersigned offers and agrees to furnish within the time specified, the articles and services at the price stated opposite the respective items listed on the schedule provided, unless otherwise specified by the bidder. In consideration to the expense of the Government in opening, tabulating, and evaluating this and other bids, and other considerations, the undersigned agrees that this bid remain firm and irrevocable within one hundred twenty (120) calendar days from the date opening to supply any or all of the items which prices are quoted.

NAME AND ADDRESS OF BIDDER:

SIGNATURE AND TITLE OF PERSON AUTHORIZED TO SIGN THIS BID:

AWARD: CONTRACT NO.: _____ AMOUNT: _____ DATE: _____

ITEM NO(S). AWARDED: _____

CONTRACTING OFFICER:

JOHN M. BENAVENTE, P.E. DATE
General Manager

NAME AND ADDRESS OF CONTRACTOR:

SIGNATURE AND TITLE OF PERSON

**NOTE:**
**Bidders must state either "Comply" or "Not Comply" against each specification on the bid document.**

NOTE:
Not withstanding the fact that this contract was written by one (1) party, it will be construed that is was written by two (2) parties.

REMARKS / DEVIATIONS:

_____
_____
_____
_____

* DELIVERY REQUIREMENT:
8 Weeks for Production After Acceptance of Purchase Order
8 Weeks After Acceptance Testing

Reasonable delivery extension requests for this specific bid will be duly considered with the supporting manufacturer documentation however, such request are not guaranteed approval due to critical and urgent need of the materials to support the Guam Power Authority's needs.

TO BE COMPLETED BY BIDDER:

MANUFACTURED/BRAND NAME: _____

CAT. NO. / MODEL NO.: _____

PLACE OF ORIGIN: _____

EXPORT ABROAD: _____

TIME OF DELIVERY AFTER RECEIPT OF
PURCHASE ORDER: _____

Specifications Generated/Reviewed by:
Angela Jane Balajadia 11/20/2023
ANGELA BALAJADIA Date
Inventory Management Officer

Specifications Reviewed by:
Louis C. Camacho P.E. 11/17/2023
LOUIS C. CAMACHO Date
Engineering Supervisor

Specifications Approved by:
11/21/2023
BEATRICE P. LIMTIACO Date
Assistant General Manager of Administration

**ATTACHMENT A**

# GPA STANDARD OPERATING PROCEDURE, CONCRETE POLE INSPECTION AND TESTING PROCEDURE NO.: SP-135

HRC

| GUAM POWER AUTHORITY<br>Standard Operating Procedure | No.: SP- 135 | Issued: 10-27-05 |
|---|---|---|
| | Prepared By:<br>M.R. CAMACHO, Mgr. Engr. (A) | |
| Title: CONCRETE POLE INSPECTION AND TESTING PROCEDURE | Approved By:<br>JOAQUIN C. FLORES, P.E., Gen. Mgr. | |
| Effective Date: | Supersedes No. | Page 1 of 20 |

1.0 PURPOSE

This procedure is issued to provide guidelines for fabrication and testing of concrete poles to ensure proper manufacturing and testing processes are followed in accordance with GPA specification E-009 and E-035.



2.0 RESPONSIBILITY

The Engineering Division shall be responsible for:

2.1 Reviewing shop drawings of poles prior to fabrication

2.2 Reviewing certified laboratory test reports of materials and equipment during pole manufacturing.

2.3 Witness testing of concrete poles.

2.4 Recording test results and measurements taken on report forms.

3.0 SUBMITALS

Submittal documents shall consist of the following and shall be reviewed and approved by a GPA representative (all items listed shall be provided prior to fabrication).

3.1 Shop Drawings:

3.1.1 Birthmark and longitudinal center of gravity mark.
3.1.2 Elevation view of each pole type.
3.1.3 Section and details to indicate quantities and position of prestressing steel, reinforcing steel, spiral steel, inserts, steel strand lifting loops, through holes, etc.
3.1.4 Location sizes of all openings and holes to be cast in the pole.
3.1.5 Dimensions and finishes.
3.1.6 Pole classification (A or B).
3.1.7 A Professional Structural Engineer shall certify shop drawings.
3.1.8 A Professional Structural Engineer shall certify pole design calculations.

3.2 Certified Laboratory Test Reports:

3.2.1 Cement
3.2.2 Concrete mix design
3.2.3 Reinforcing steel
3.2.4 Prestressing steel
3.2.5 Materials for curing concrete
3.2.6 Concrete admixtures
3.2.7 Aggregates
3.2.8 Water
3.2.9 Certificate of calibration for hydraulic jack
3.2.10 Certificate of calibration for dynamometer

3.3 The pole manufacturer must have approved submittals available during site inspection.

## 4.0 POLE MANUFACTURING PROCESS

4.1 The hydraulic jack equipment used to tension cables must be calibrated per manufacturer's operation manual. The GPA representative shall:

4.1.1 Verify the last time equipment was calibrated. This date should be in accordance with the operation manual.

4.1.2 Verify how often (number of poles) the equipment requires calibration.

a. The person or company calibrating the equipment shall be a calibrator certified by the manufacturer. GPA shall obtain a copy of the certification from the supplier or contractor.

4.1.3 Verify that the equipment tension setting stress is applicable to the structural design criteria requirements. At release of strands, 4,500-psi minimum stresses shall be maintained otherwise the pole is defective.

4.2 The GPA representative shall check the formwork placement and ensure that the steel mold for the concrete pole is correct for the application. Check the following:

4.2.1 Type of pole (Class A or Class B).
4.2.2 Pole length measured.
4.2.3 Pole diameter measured bottom and top.
4.2.4 Complete Concrete Pole Checklist.
4.2.5 Sleeve aligned to opposite sleeve and firmly attached to form.
4.2.6 Mold is cleaned of debris.

4.3 The GPA representative shall ensure that the reinforcing steel placement and the fabrication of steel is as indicated on the approved shop drawings: Check the following:

4.3.1 Type of pole reinforcement (Class A or Class B).

4.3.2 Reinforcing steel size and type.

a. Prestress steel (ASTM A416, Grade 270).
b. Prestress strand size (1/2" dia. seven wires).
c. Prestress steel spacing/ total amount.
d. Rebar length and splice location if any.
e. Spiral wire gage stresses (ASTM A82).
f. Rebar material stresses (ASTM A615, Grade 60).
g. Rebar size.
h. Rebar spacing/ total amount.
i. Rebar length and splice location if any.

4.3.3 There should be a 1.8" clear minimum reinforcing concrete cover (exterior side).

4.3.4 Strands shall be properly tensioned, secured and tied to spiral wire. At release of strands, 4,500-psi minimum stresses shall be maintained otherwise the pole is defective.

4.3.5 Reinforcement shall be free from loose scale.

4.4 Concrete placement – Verify as follows:

4.4.1 Discrepancies that arise from above issues (comments and corrections) must be addressed prior to concrete placement.

4.4.2 6,000 psi is the required strength of the concrete.

4.4.3 If GPA approves any concrete admixtures, concrete manufacturer shall add admixtures.

4.4.4 The supplier shall obtain an independent testing company to take specimens (minimum of 4 cylinders) of the same mix of the concrete and determine the slump in accordance with ASTM C 143.

4.5 Concrete curing shall be conducted in accordance with procedures developed by the manufacturer and approved by GPA.

4.5.1 The concrete strength at release of strands shall be 4,500-psi minimum stress strength otherwise the pole is defective.

a. Compression tests shall be performed on the cylinders obtained during concrete placement at 14, 21 and 28 days.

b. Notify GPA if strength is achieved earlier than expected.

c. Once strength is achieved, notify GPA prior to release of strands.

4.5.2 The concrete stress strength shall be tested and recorded. Provide GPA a copy of the results.

## 5.0 POLE ACCEPTANCE TESTS

5.1 Prior to pole testing, the concrete test report shall be submitted to GPA for review (Section 1.0 - Submittals).

5.2 A GPA representative shall select two (2) poles.

5.3 A dynamometer shall be used to measure the actual lateral loading applied. The dynamometer must be calibrated per manufacturer's operations manual:

5.3.1 Verify the last time the equipment was calibrated. This date should be in accordance with the operations manual.

5.3.2 Verify how often (number of poles) the equipment requires calibration.

a. The person or company calibrating the equipment shall be a calibrator certified by the manufacturer. GPA shall obtain a copy of the certification from the supplier or contractor.

5.3.3 Verify that the equipment tension setting stress is applicable to the structural design criteria requirements.

5.3.4 Pole Bending Test – Refer to pole Class A or B and pole size for schedule.

GPA Concrete Pole Inspection Report

| | | | |
|---|---|---|---|
| Project: | _____ | Date: | _____ |
| Purchase Order: | _____ | Height: | _____ |
| Quantity of Poles: | _____ | Class: | _____ |

The guidelines provided are to be implemented and performed prior to the fabrication and testing of concrete poles in accordance with GPA specifications.

Check mark upon completion of each item.

1.0 Submittal documents: shall consist of the following and shall be reviewed and approved by a GPA representative (all items listed shall be provided prior to fabrication).

1.1 Shop Drawings:

- ☐ Birthmark and longitudinal center of gravity mark.
- ☐ Elevation view of each pole type.
- ☐ Section and details to indicate quantities and position of prestressing steel, reinforcing steel, spiral steel, inserts, steel strand lifting loops, through holes, etc.
- ☐ Location sizes of all openings and holes to be cast in the pole.
- ☐ Dimensions and finishes.
- ☐ Pole classification (A or B).
- ☐ A Professional Structural Engineer shall certify shop drawings.
- ☐ A Professional Structural Engineer shall certify pole design calculations.

1.2 Certified Laboratory Test Reports:

- ☐ Cement
- ☐ Concrete mix design
- ☐ Reinforcing steel
- ☐ Prestressing steel
- ☐ Materials for curing concrete
- ☐ Concrete admixtures
- ☐ Aggregates
- ☐ Water
- ☐ Certificate of calibration for hydraulic jack
- ☐ Certificate of calibration for dynamometer

1.3 Pole manufacturer must have approved submittals available during site inspection.

2.0 Pole Manufacturing Process

2.1 Hydraulic jack equipment – Used to tension cables, must be calibrated per manufacturer's operation manual.

- ☐ Verify last time equipment was calibrated, should be in accordance with operation manual. _____ (Date)
- ☐ Verify how often (number of poles) the equipment requires calibration. _____ (Number of Poles)
- ☐ Person or company calibrating equipment shall be a certified calibrator by the manufacturer. GPA shall obtain a copy of the certification from supplier or contractor.
- ☐ Verify equipment tension setting stress is applicable to structural design criteria requirements. At release of strands 4,500-psi minimum stresses shall be maintained, otherwise the pole is defective.

2.2 Form work placement – Steel mold for concrete pole:

- ☐ Type of pole (Class A or Class B) _____.
- ☐ Pole length measured _____.
- ☐ Pole diameter measured bottom _____ and top _____.
- ☐ Concrete Pole Checklist completed, see attached sheet.
- ☐ Sleeve aligned to opposite sleeve and firmly attached to form.
- ☐ Cleaned of debris.

2.3 Reinforcing steel placement – Fabrication of steel as indicated on the approved shop drawings:

- ☐ Type of pole reinforcement (Class A or Class B) _____.
- ☐ Reinforcing steel size and type.
  - ☐ Prestress steel (ASTM A416, Grade 270).
  - ☐ Prestress strand size (1/2" dia. seven wires) _____.
  - ☐ Prestress steel spacing/ total amount _____.
  - ☐ Rebar length _____ and splice location if any _____.
  - ☐ Spiral wire gage stresses (ASTM A82) _____.
  - ☐ Rebar material stresses (ASTM A615, Grade 60).
  - ☐ Rebar size _____.
  - ☐ Rebar spacing/ total amount _____.
  - ☐ Rebar length _____ and splice location if any _____.
- ☐ 1.8" clear minimum reinforcing concrete cover (exterior side).
- ☐ Strands shall be properly tensioned, secured and tied to spiral wire.
- ☐ At release of strands 4,500 psi minimum stresses shall be maintained, otherwise pole is defective.
- ☐ Reinforcement shall be free from loose scale.

2.4 Concrete placement – Verify as follows:

- ☐ Discrepancies that arise from above issues (comments and corrections) must be addressed prior to concrete placement.

- ☐ 6,000 psi required strength of concrete.
- ☐ If any concrete admixtures are approved by GPA, admixtures shall be added by concrete manufacturer.
- ☐ Concrete Tests: supplier shall obtain an independent testing company to take specimens (minimum of 4 cylinders) of the same mix and determine slump in accordance with ASTM C 143.

2.5 Concrete curing – In accordance with procedures developed by manufacturer and approved by GPA.

- ☐ Concrete strength _____ at release of strands. 4,500 psi minimum stress strength shall be maintained, otherwise pole is defective.
- ☐ Concrete stress strength at 28 days _____.

3.0 Pole Acceptance Tests

3.1 Documentation - Prior to pole testing, the concrete test report shall be submitted for review (Section 1.0 - Submittals).

3.2 Selection – Two (2) poles to be selected by a GPA representative.

3.3 Equipment - Dynamometer measures actual lateral loading applied. Dynamometer must be calibrated per manufacturer's operations manual:

- ☐ Verify last time equipment was calibrated, should be in accordance with operations manual. _____ (Date)
- ☐ Verify how often (number of poles) does the equipment require calibration. _____ (Number of poles)
- ☐ Person or company calibrating equipment shall be a certified calibrator by the manufacturer.
- ☐ Verify equipment tension setting stress is applicable to structural design criteria requirements.

3.4 Pole Bending Test – Refer to pole Class A or B and pole size for schedule.

Class A or B 55 - Foot Concrete Pole Checklist
(Refer to Specification No. E-035 Appendix A1-B and A2-C for pole drawings)

| DIMENSION CHECK | MEASURED | E-035 |
|---|---|---|
| Pole height | _____ | 55'-0" |
| Pole top diameter | _____ | 12" min. – 18" max. |
| Pole bottom diameter | _____ | 20" min. – 28" max. |
| Number of 11/16 inch holes | _____ | 20 ea. |
| Number of 13/16 inch holes | _____ | 11 ea. |

Hole spacing:

*denotes 3/16" diameter holes

| From | - To | MEASURED | E-035 | From | - To | MEASURED | E-035 |
|---|---|---|---|---|---|---|---|
| Tip | A | _____ | 10 ¼" | S | T | _____ | 1'- ¾" |
| A | *B | _____ | 1'-0" | T | U | _____ | 9" |
| *B | *C | _____ | 10" | U | V | _____ | 11 ⅜" |
| *C | *D | _____ | 10 ⅜" | V | W | _____ | 8 ¾" |
| *D | *E | _____ | 10" | W | X | _____ | 1'-0" |
| *E | *F | _____ | 10" | X | Y | _____ | 1'-0" |
| *F | *G | _____ | 8" | Y | Z | _____ | 1'-0" |
| *G | *H | _____ | 10 ⅜" | Z | Z1 | _____ | 1'-0" |
| *H | *I | _____ | 10" | Z1 | Z2 | _____ | 1'-0" |
| *I | *J | _____ | 10" | Z2 | Z3 | _____ | 1'-0" |
| *J | *K | _____ | 10 ⅜" | Z3 | Z4 | _____ | 1'-0" |
| *K | *L | _____ | 10" | Z4 | Ground Hole | _____ | 15'-10" |
| *L | M | _____ | 8" | | | | |
| M | N | _____ | 10" | | | | |
| N | O | _____ | 10 ⅜" | | | | |
| O | P | _____ | 1'-0" | | | | |
| P | Q | _____ | 3'-6" | | | | |
| Q | R | _____ | 9" | | | | |
| R | S | _____ | 11 ⅜" | | | | |

Material for hole insert: _____

Longitudinal center of gravity provided? [ ] YES [ ] NO

Pole birthmark provided? [ ] YES [ ] NO

Class A or B 45 - Foot Concrete Pole Checklist
(Refer to Specification No. E-035 Appendix A1-A and A2-B for pole drawings)

| DIMENSION CHECK | MEASURED | E-035 |
|---|---|---|
| Pole height | _____ | 45'-0" |
| Pole top diameter | _____ | 12" |
| Pole bottom diameter | _____ | 18 5/8" min. – 20" max. |
| All holes shall be 11/16" diameter. | _____ | 14 ea. |

Hole spacing:

| From | - To | MEASURED | E-035 |
|---|---|---|---|
| Tip | A | _____ | 1'-0" |
| A | B | _____ | 9 ⅜" |
| B | C | _____ | 11" |
| C | D | _____ | 10" |
| D | E | _____ | 1'-8 ⅜" |
| E | F | _____ | 2'-0" |
| F | G | _____ | 11 ¼" |
| G | H | _____ | 1'-0" |
| H | I | _____ | 2'-0" |
| I | J | _____ | 1'-0" |
| J | K | _____ | 10" |
| K | L | _____ | 5'-2" |
| L | M | _____ | 1'-0" |
| M | Ground Hole | _____ | 16'-10" |

Material for hole insert:_____

Longitudinal center of gravity provided? [ ] YES [ ] NO

Pole birthmark provided? [ ] YES [ ] NO

Class B 35 - Foot Concrete Pole Checklist
(Refer to Specification No. E-035 Appendix A2-A for pole drawings)

| DIMENSION CHECK | MEASURED | E-035 |
|---|---|---|
| Pole height | _____ | 35'-0" |
| Pole top diameter | _____ | 12" min. |
| Pole bottom diameter | _____ | 17 1/8" min. – 20" max. |
| All holes shall be 11/16" diameter. | _____ | 9 ea. |

Hole spacing:

| From | - To | MEASURED | E-035 |
|---|---|---|---|
| Tip | A | _____ | 9" |
| A | B | _____ | 10" |
| B | C | _____ | 10 ⅜" |
| C | D | _____ | 1'-0" |
| D | E | _____ | 1'-0" |
| E | F | _____ | 1'-8⅜" |
| F | G | _____ | 5'-0" |
| G | H | _____ | 9" |
| H | Ground Hole | _____ | 15'-1 ¼" |

Material for hole insert:_____

Longitudinal center of gravity provided? [ ] YES [ ] NO

Pole birthmark provided? [ ] YES [ ] NO

## Class A 55 – Foot – 1st Pole
## Concrete Pole Bending Test

| | 55' Pole Horizontal Loads | | | |
|---|---|---|---|---|
| | Ultimate Strength (KIPS) | Deflection Measured (FEET) | Service Stress (service load level) (KIPS) | Deflection Measured (FEET) |
| 1st pull | 15.61 (60 %) | | 12.24 | |
| 2nd pull | 16.96 (85 %) | | 13.30 | |
| 3rd pull | 17.98 (100 %) | | 14.10 | |

Note: 1. Visible cracking at service load level shall be cause for pole rejection.
2. Do not perform breaking test unless pole passes bending test.

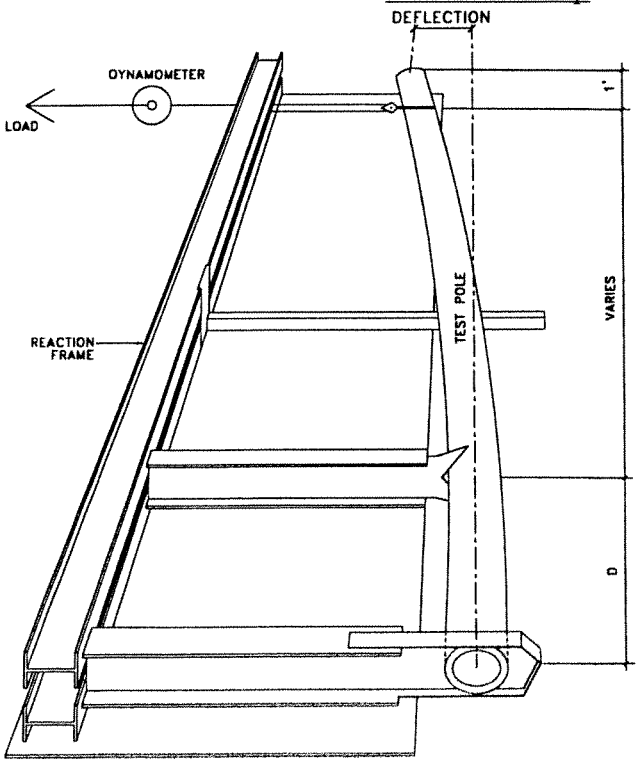
## Concrete Pole Breaking Test

Breaking Load Stress > $\frac{\text{Ultimate Moment Capacity}}{PL - (D + 1)}$ = _____

4th pull Breaking Load Stress _____, Deflection Measured: _____

Ultimate Moment Capacity = Provided by Structural Engineer in Design Calculations.
*Non-attainment of this breaking load criteria shall be cause for pole rejection.

## Pole Test Setup




PL (Pole Length) = 55'-0" and D (Depth) = 8'-0"

No. of cracks found _____, No cracks < 0.01 inch found _____ and No. cracks > 0.01 inch found _____.
Draw in approximate location of cracks and indicate measurements.

## Class A 55 – Foot – 2nd Pole
## Concrete Pole Bending Test

| | 55' Pole Horizontal Loads | | | |
|---|---|---|---|---|
| | Ultimate Strength (KIPS) | Deflection Measured (FEET) | Service Stress (service load level) (KIPS) | Deflection Measured (FEET) |
| 1st pull | 15.61 (60 %) | | 12.24 | |
| 2nd pull | 16.96 (85 %) | | 13.30 | |
| 3rd pull | 17.98 (100 %) | | 14.10 | |

Note: 1. Visible cracking at service load level shall be cause for pole rejection.
2. Do not perform breaking test unless pole passes bending test.

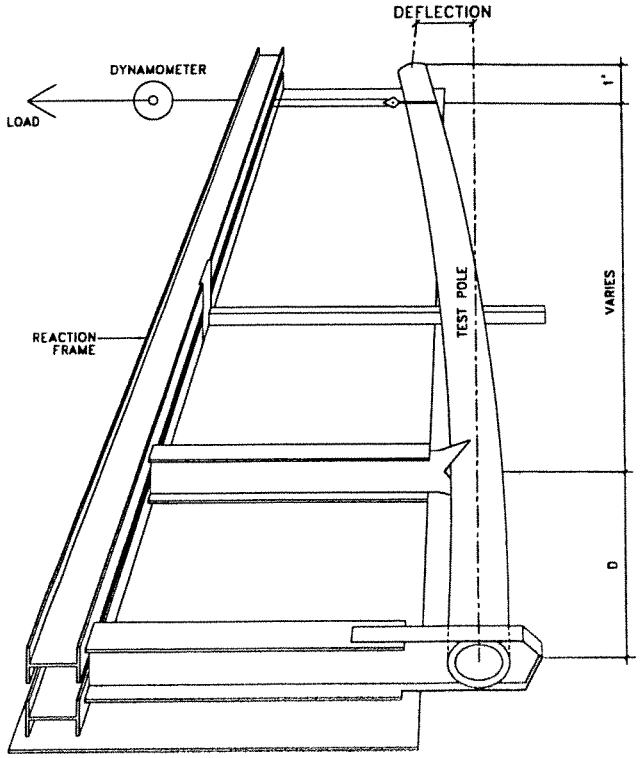
## Concrete Pole Breaking Test

Breaking Load Stress > $\frac{\text{Ultimate Moment Capacity}}{PL - (D + 1)}$ = _____

4th pull Breaking Load Stress _____, Deflection Measured: _____

Ultimate Moment Capacity = Provided by Structural Engineer in Design Calculation.
*Non-attainment of this breaking load criteria shall be cause for pole rejection.

## Pole Test Setup




PL (Pole Length) = 55'-0" and D (Depth) = 8'-0"

No. of cracks found _____, No cracks < 0.01 inch found _____ and No. cracks > 0.01 inch found _____.
Draw in approximate location of cracks and indicate measurements.

## Class B 55 - Foot – 1st Pole
## Concrete Pole Bending Test

| | 55' Pole Horizontal Loads | | | |
|---|---|---|---|---|
| | Ultimate Strength (KIPS) | Deflection Measured (FEET) | Service Stress (service load level) (KIPS) | Deflection Measured (FEET) |
| 1st pull | 10.68 (60 %) | | 8.38 | |
| 2nd pull | 11.26 (85 %) | | 8.83 | |
| 3rd pull | 11.65 (100 %) | | 9.14 | |

Note: 1. Visible cracking at service load level shall be cause for pole rejection.
2. Do not perform breaking test unless pole passes bending test.

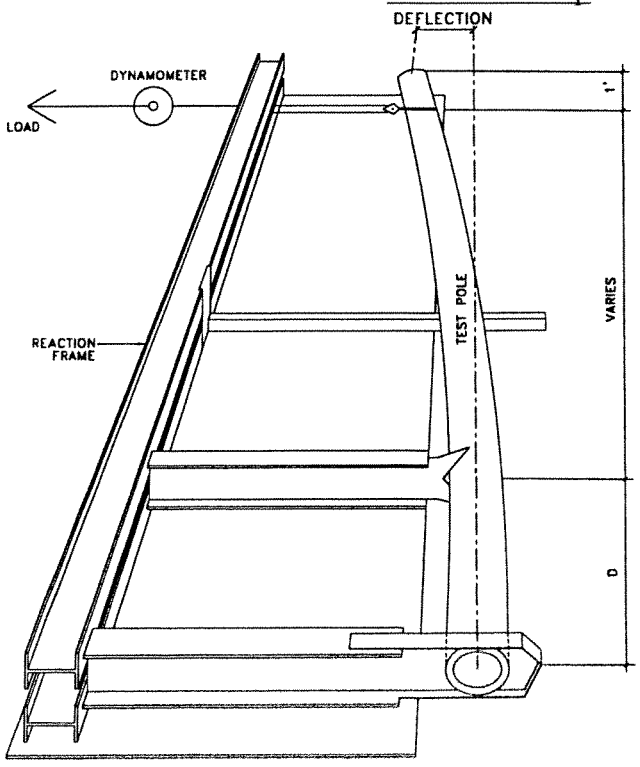
## Concrete Pole Breaking Test

Breaking Load Stress > $\frac{\text{Ultimate Moment Capacity}}{PL - (D + 1)}$ = _____

4th pull Breaking Load Stress _____, Deflection Measured: _____

Ultimate Moment Capacity = Provided by Structural Engineer in Design Calculation.
*Non-attainment of this breaking load criteria shall be cause for pole rejection.

### Pole Test Setup




PL (Pole length) = 55'-0" and D (Depth) = 8'-0"

No. of cracks found _____, No cracks < 0.01 inch found _____ and No. cracks > 0.01 inch found _____.
Draw in approximate location of cracks and indicate measurements.

## Class B 55 - Foot – 2nd Pole
## Concrete Pole Bending Test

| | 55' Pole Horizontal Loads | | | |
|---|---|---|---|---|
| | Ultimate Strength (KIPS) | Deflection Measured (FEET) | Service Stress (service load level) (KIPS) | Deflection Measured (FEET) |
| 1st pull | 10.68 (60 %) | | 8.38 | |
| 2nd pull | 11.26 (85 %) | | 8.83 | |
| 3rd pull | 11.65 (100 %) | | 9.14 | |

Note: 1. Visible cracking at service load level shall be cause for pole rejection.
2. Do not perform breaking test unless pole passes bending test.

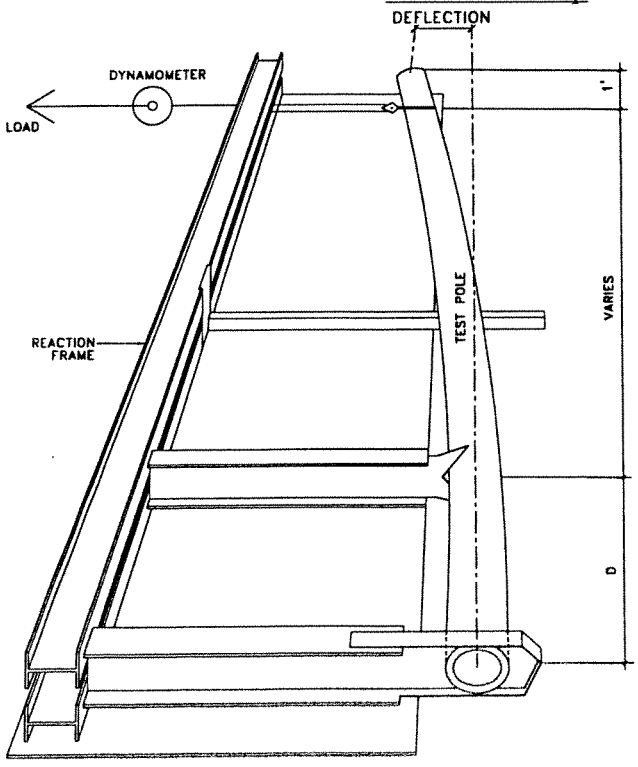
## Concrete Pole Breaking Test

Breaking Load Stress > $\frac{\text{Ultimate Moment Capacity}}{PL - (D + 1)}$ = _____

4h pull Breaking Load Stress _____, Deflection Measured: _____

Ultimate Moment Capacity = Provided by Structural Engineer in Design Calculation.
*Non-attainment of this breaking load criteria shall be the cause for pole rejection.

## Pole Test Setup




PL (Pole length) = 55'-0" and D (Depth) = 8'-0"

No. of cracks found _____, No cracks < 0.01 inch found _____ and No. cracks > 0.01 inch found _____.
Draw in approximate location of cracks and indicate measurements.

## Class A 45 – Foot – 1st Pole
## Concrete Pole Bending Test

| | 45' Pole Horizontal Loads | | | |
|---|---|---|---|---|
| | Ultimate Strength (KIPS) | Deflection Measured (FEET) | Service Stress (service load level) (KIPS) | Deflection Measured (FEET) |
| 1st pull | 8.04 (60 %) | | 6.31 | |
| 2nd pull | 8.28 (85 %) | | 6.49 | |
| 3rd pull | 8.52 (100 %) | | 6.68 | |

Note: 1. Visible cracking at service load level shall be cause for pole rejection.
2. Do not perform breaking test unless pole passes bending test.

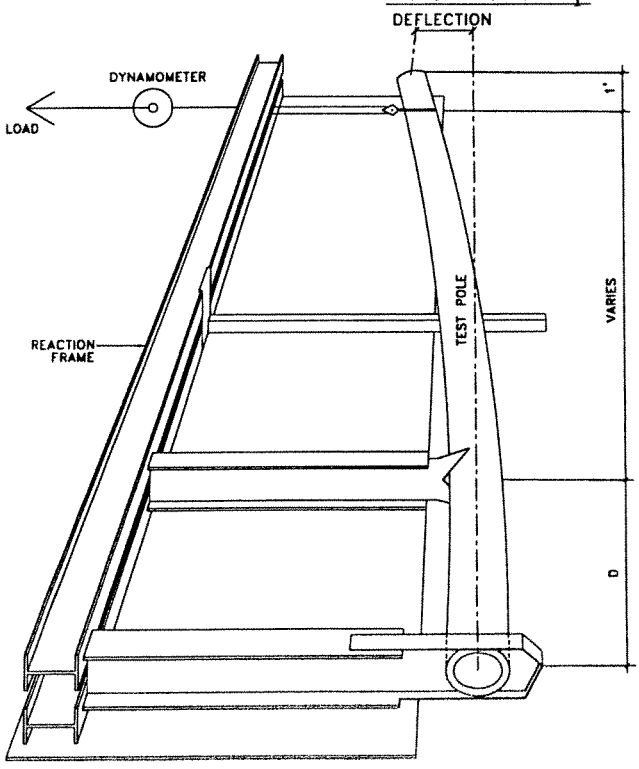
## Concrete Pole Breaking Test

Breaking Load Stress > $\frac{\text{Ultimate Moment Capacity}}{PL - (D + 1)}$ = _____

4th pull Breaking Load Stress _____, Deflection Measured: _____

Ultimate Moment Capacity = Provided by Structural Engineer in Design Calculation.
*Non-attainment of this breaking load criteria shall be cause for pole rejection.

## Pole Test Setup




PL (Pole Length) = 45'-0" and D (Depth) = 7'-0"

No. of cracks found _____, No cracks < 0.01 inch found _____ and No. cracks > 0.01 inch found _____.
Draw in approximate location of cracks and indicate measurements.

## Class A 45 – Foot – 2nd Pole
## Concrete Pole Bending Test

| | 45' Pole Horizontal Loads | | | |
|---|---|---|---|---|
| | Ultimate Strength (KIPS) | Deflection Measured (FEET) | Service Stress (service load level) (KIPS) | Deflection Measured (FEET) |
| 1st pull | 8.04 (60 %) | | 6.31 | |
| 2nd pull | 8.28 (85 %) | | 6.49 | |
| 3rd pull | 8.52 (100 %) | | 6.68 | |

Note: 1. Visible cracking at service load level shall be cause for pole rejection.
2. Do not perform breaking test unless pole passes bending test.

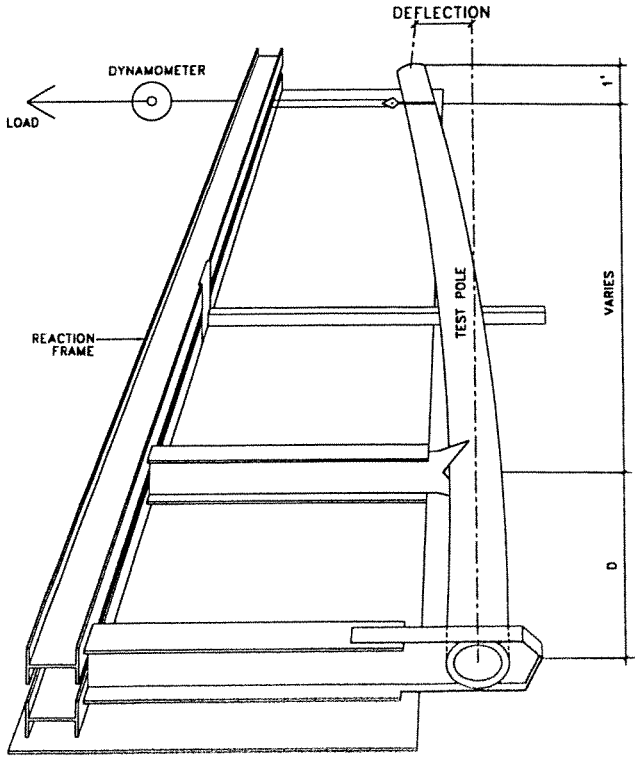
## Concrete Pole Breaking Test

Breaking Load Stress > $\frac{\text{Ultimate Moment Capacity}}{PL - (D + 1)}$ = _____

4th pull Breaking Load Stress _____, Deflection Measured: _____

Ultimate Moment Capacity = Provided by Structural Engineer in Design Calculation.
*Non-attainment of this breaking load criteria shall be cause for pole rejection.

## Pole Test Setup




PL (Pole Length) = 45'-0" and D (Depth) = 7'-0"

No. of cracks found _____, No cracks < 0.01 inch found _____ and No. cracks > 0.01 inch found _____.
Draw in approximate location of cracks and indicate measurements.

## Class B 45 – Foot – 1st Pole
## Concrete Pole Bending Test

| | 45' Pole Horizontal Loads | | | |
|---|---|---|---|---|
| | Ultimate Strength (KIPS) | Deflection Measured (FEET) | Service Stress (service load level) (KIPS) | Deflection Measured (FEET) |
| 1st pull | 6.34 (60 %) | | 4.97 | |
| 2nd pull | 6.62 (85 %) | | 5.19 | |
| 3rd pull | 6.80 (100 %) | | 5.34 | |

Note: 1. Visible cracking at service load level shall be cause for pole rejection.
2. Do not perform breaking test unless pole passes bending test.

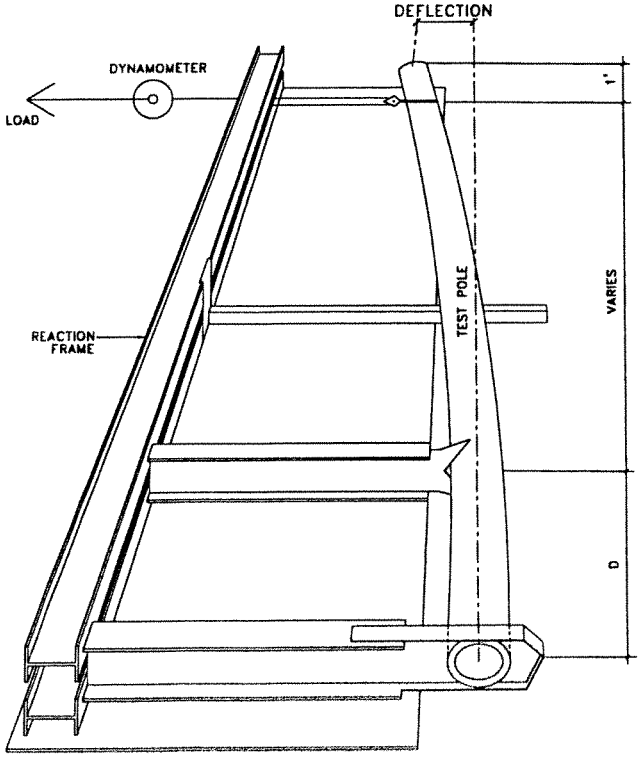
## Concrete Pole Breaking Test

Breaking Load Stress > $\frac{\text{Ultimate Moment Capacity}}{PL - (D + 1)}$ = _____

4th pull Breaking Load Stress _____, Deflection Measured: _____

Ultimate Moment Capacity = Provided by Structural Engineer in Design Calculation.
*Non-attainment of this breaking load criteria shall be cause for rejection.

## Pole Test Setup




PL (Pole Length) = 45'-0" and D (Depth) = 7'-0"

No. of cracks found _____, No cracks < 0.01 inch found _____ and No. cracks > 0.01 inch found _____.
Draw in approximate location of cracks and indicate measurements.

## Class B 45 – Foot 2nd Pole
## Concrete Pole Bending Test

| | 45' Pole Horizontal Loads | | | |
|---|---|---|---|---|
| | Ultimate Strength (KIPS) | Deflection Measured (FEET) | Service Stress (service load level) (KIPS) | Deflection Measured (FEET) |
| 1st pull | 6.34 (60 %) | | 4.97 | |
| 2nd pull | 6.62 (85 %) | | 5.19 | |
| 3rd pull | 6.80 (100 %) | | 5.34 | |

Note: 1. Visible cracking at service load level shall be cause for pole rejection.
2. Do not perform breaking test unless pole passes bending test.

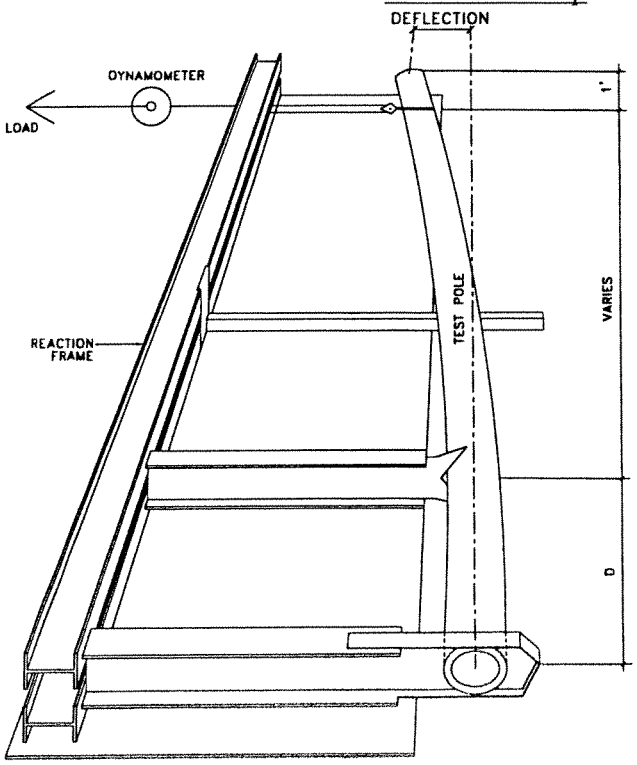
## Concrete Pole Breaking Test

Breaking Load Stress > $\frac{\text{Ultimate Moment Capacity}}{PL - (D + 1)}$ = _____

4th pull Breaking Load Stress _____, Deflection Measured: _____

Ultimate Moment Capacity = Provided by Structural Engineer in Design Calculation.
* Non-attainment of this breaking load criteria shall be cause for pole rejection.

## Pole Test Setup




PL (Pole Length) = 45'-0" and D (Depth) = 7'-0"

No. of cracks found _____, No cracks < 0.01 inch found _____ and No. cracks > 0.01 inch found _____.
Draw in approximate location of cracks and indicate measurements.

## Class B 35 – Foot – 1st Pole
## Concrete Pole Bending Test

| | 35' Pole Horizontal Loads | | | |
|---|---|---|---|---|
| | Ultimate Strength (KIPS) | Deflection Measured (FEET) | Service Stress (service load level) (KIPS) | Deflection Measured (FEET) |
| 1st pull | 5.31 (60 %) | | 4.16 | |
| 2nd pull | 5.58 (85 %) | | 4.37 | |
| 3rd pull | 7.76 (100 %) | | 4.34 | |

Note: 1. Visible cracking at service load level shall be cause for pole rejection.
2. Do not perform breaking test unless pole passes bending test.

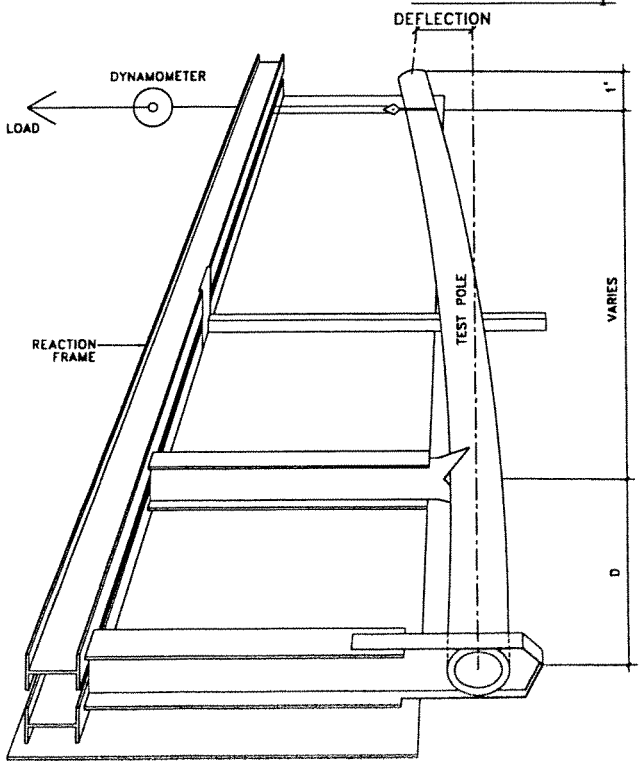
## Concrete Pole Breaking Test

Breaking Load Stress > $\frac{\text{Ultimate Moment Capacity}}{PL - (D + 1)}$ = _____

4th pull Breaking Load Stress _____, Deflection Measured: _____

Ultimate Moment Capacity = Provided by Structural Engineer in Design Calculation.
*Non-attainment of this breaking load criteria shall be cause for pole rejection.

### Pole Test Setup




PL (Pole Length) = 35'-0" and D (Depth) = 6'-0"

No. of cracks found _____, No cracks < 0.01 inch found _____ and No. cracks > 0.01 inch found _____.
Draw in approximate location of cracks and indicate measurements.

## Class B 35 – Foot – 2nd Pole
## Concrete Pole Bending Test

| | 35' Pole Horizontal Loads | | | |
|---|---|---|---|---|
| | Ultimate Strength (KIPS) | Deflection Measured (FEET) | Service Stress (service load level) (KIPS) | Deflection Measured (FEET) |
| 1st pull | 5.31 (60 %) | | 4.16 | |
| 2nd pull | 5.58 (85 %) | | 4.37 | |
| 3rd pull | 7.76 (100 %) | | 4.34 | |

Note: 1. Visible cracking at service load level shall be cause for pole rejection.
2. Do not perform breaking test unless pole passes bending test.

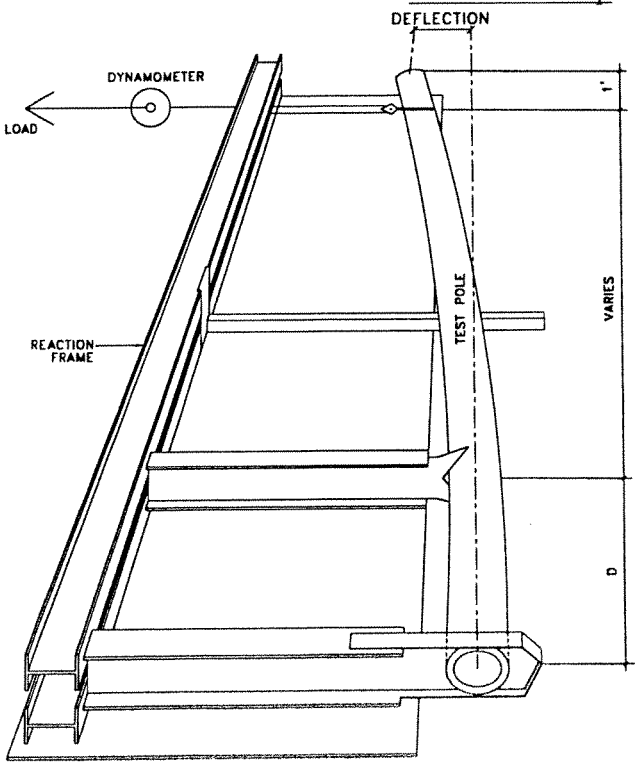
## Concrete Pole Breaking Test

Breaking Load Stress > $\frac{\text{Ultimate Moment Capacity}}{PL - (D + 1)}$ = _____

4th pull Breaking Load Stress _____, Deflection Measured: _____

Ultimate Moment Capacity: Provided by Structural Engineer in Design Calculation.
*Non-attainment of this breaking load criteria shall be the cause for pole rejection.

### Pole Test Setup




PL (Pole Length) = 35'-0" and D (Depth) = 6'-0"

No. of cracks found _____, No cracks < 0.01 inch found _____ and No. cracks > 0.01 inch found _____.
Draw in approximate location of cracks and indicate measurements.