

# Conductor and Core UTS for E3X 1431 kcmil Plover ACSS MA3 Conductor

NEETRAC Project: 24-151

**Final Report**

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## NEETRAC

National Electric Energy Testing,  
Research, and Applications Center

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## Conductor and Core UTS for E3X 1431 kcmil Plover ACSS MA3 Conductor NEETRAC

### Project 24-151

#### 1.0 BACKGROUND

Idaho National Lab requested that NEETRAC run an array of tests on multiple advanced transmission line conductors. One of these tests was for ultimate tensile strength, which evaluates the stress at which a sample fails under tension loading. This report exclusively covers UTS testing of the complete conductor and core of the E3X 1431 kcmil Plover ACSS MA3 Conductor. Testing was done in compliance with ASTM B857.

#### 2.0 TEST SAMPLES

The two samples used for this test (complete conductor and core) were samples used in prior stress-strain testing for this project. The conductor sample had an approximate length of 19.5 ft while the core sample had a total length of approximately 21 ft.



Figure 1: Conductor Sample



Figure 2: Core Sample

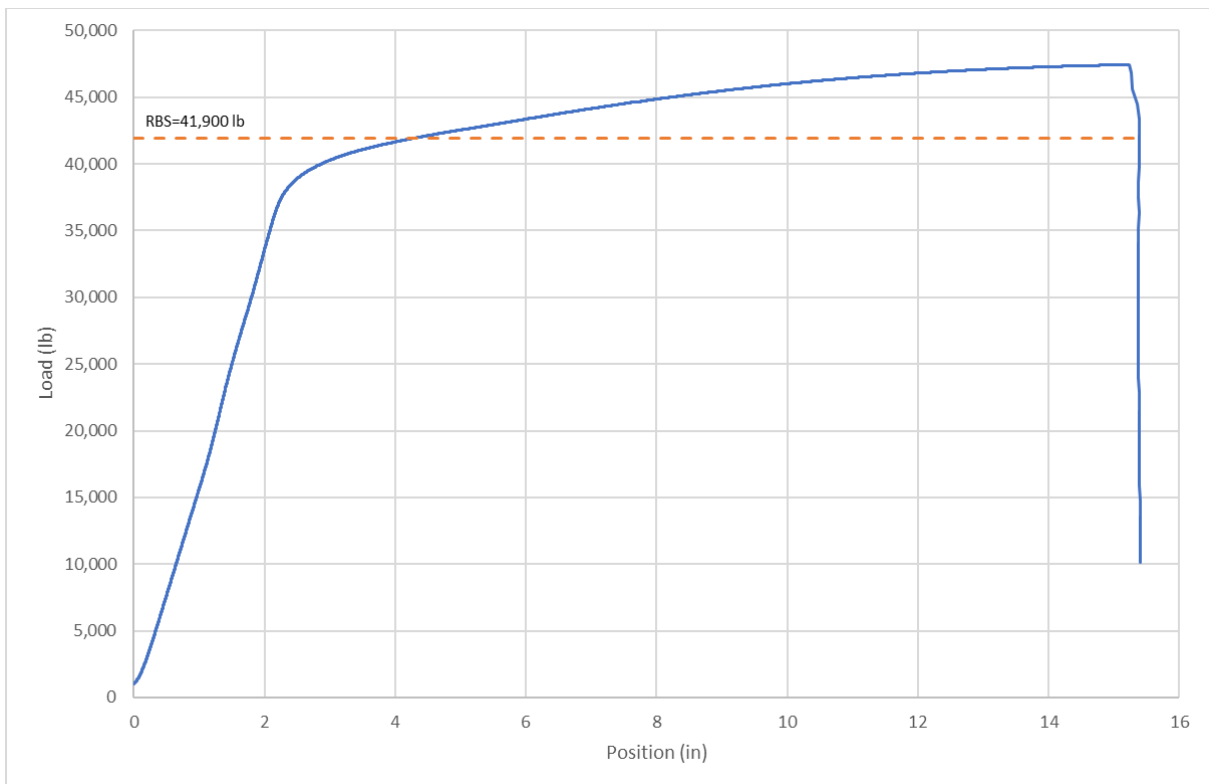
### 3.0 PROCEDURE

The samples were mounted in NEETRAC's MTS machine and pulled until failure. The conductor sample was loaded at a rate of 8,500 lb/min while the core sample was loaded at a rate of 16,000 lb/min.

### 4.0 RESULTS

#### 4.1 Complete Conductor Sample

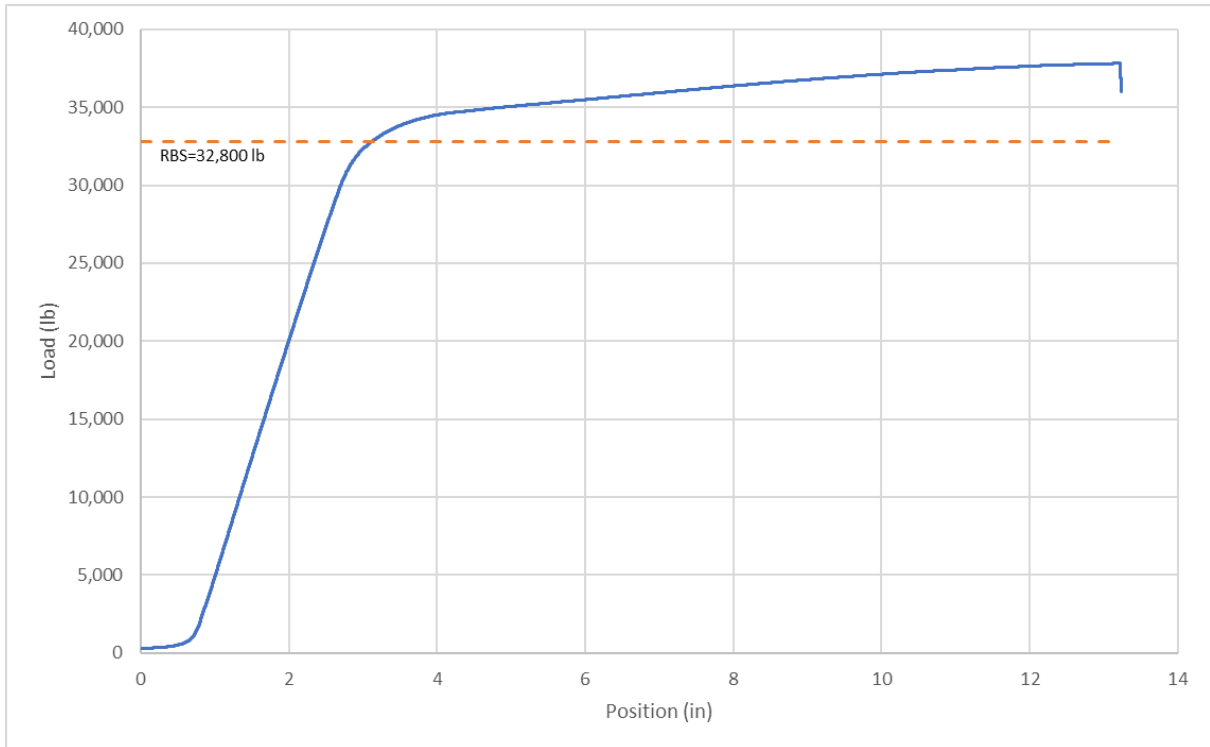
Slipping occurred at both resin socket terminations of the sample. Further dissection would be needed to verify the failure. Nonetheless, the sample surpassed its rated breaking strength (given by ASTM B857) with a maximum load of 47,427.8 lb. Figure 3 below contains the force-deflection curve for this sample.



**Figure 3: Force-Deflection Curve for Complete Conductor Sample**

#### 4.2 Core Sample

Slipping occurred at one resin socket termination of the sample. Further dissection would be needed to verify the failure. Nonetheless, the sample surpassed its rated breaking strength (given by the conductor datasheet) with a maximum load of 37,817.7 lb. Figure 4 below contains the force-deflection curve for this sample.



**Figure 4: Force-Deflection Curve for Core Sample**

## 5.0 EQUIPMENT

MTS 150k Tensile Machine

CQ-0195

## 6.0 REFERENCES

Prysmian Group 1431.0 kcmil 39/19 Plover/ACSS/TW/MA3/E3X (Type 13) Datasheet

## 7.0 STANDARDS

*Standard Specification for Shaped Wire Compact Concentric-Lay-Stranded Aluminum Conductors, Coated-Steel Supported (ACSS/TW), ASTM B857-22*