1410 and 100 Line Structure Replacement Project

Montville and Ledyard, CT

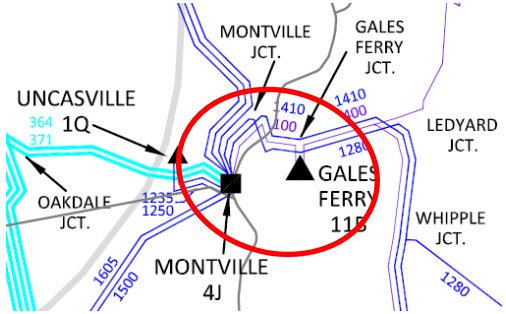
Planning Advisory Committee Meeting

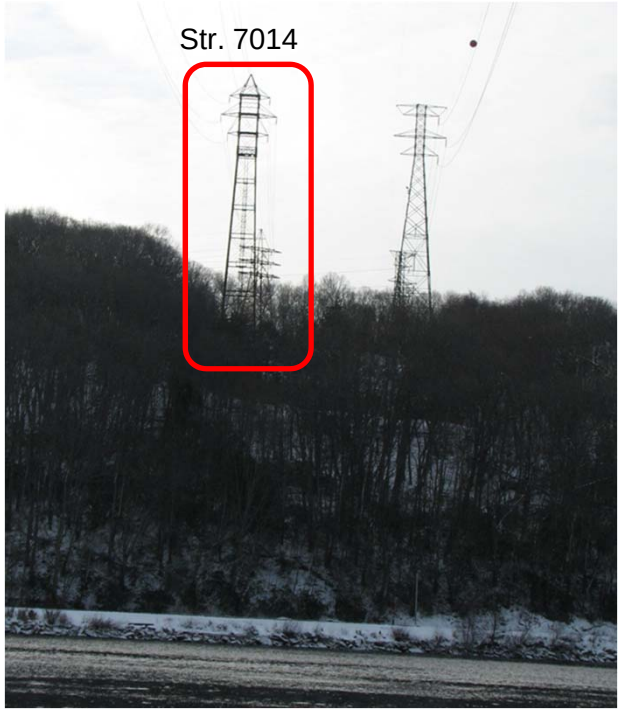
March 22, 2017

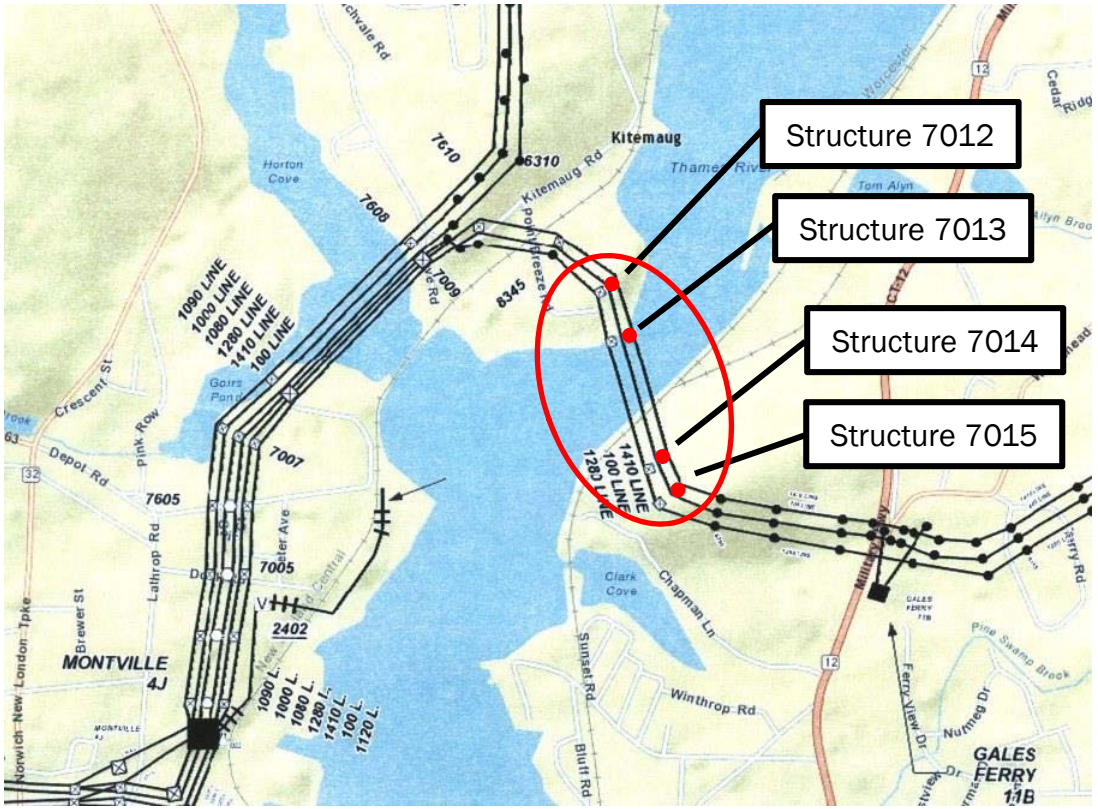
Line Characteristics

- A portion of the 1410/100 Lines from Montville to Gales Ferry Junction shares double-circuit steel lattice towers (DCLT) for approximately half a mile and crosses the Thames River at the Montville-Ledyard border.
- The 1410 Line is a 115-kV line (PTF) which runs from Montville to Buddington Substation through Gales Ferry Junction
  - This line was originally a 69-kV line that was uprated to 115-kV operation in 1990's.
- The 100 Line is a 69-kV line (PTF) which runs from Montville Substation to Gales Ferry Substation.
- Recent inspections revealed significant age-related degradation of several structures supporting a major river crossing on this portion of the 1410/100 lines.
- These structures were constructed in 1921 and have exceeded their planned life.

1410/100 Line - Replace 4 Structures Geographic Location

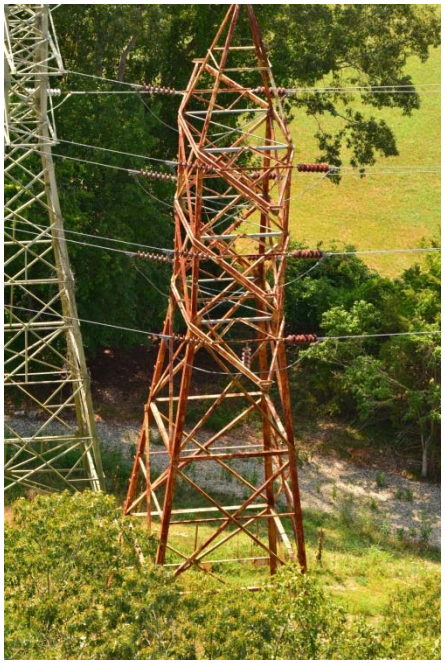




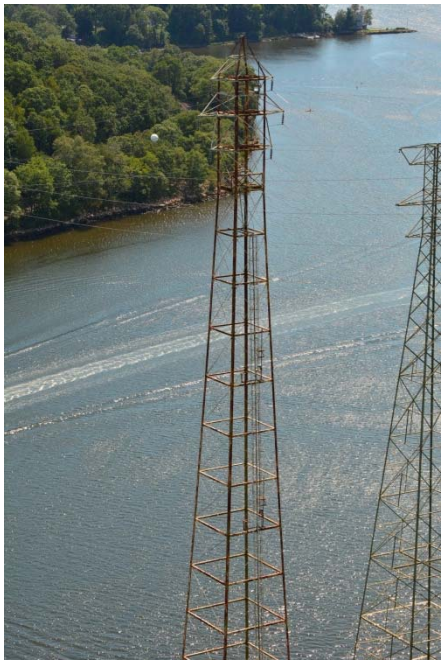


Current Structures

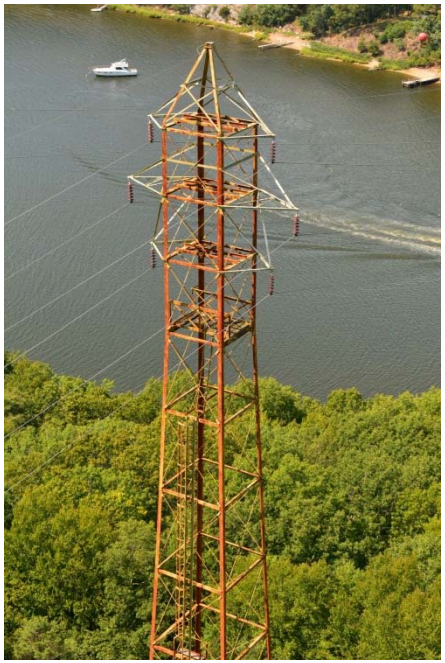
7012



7013



7014



7015

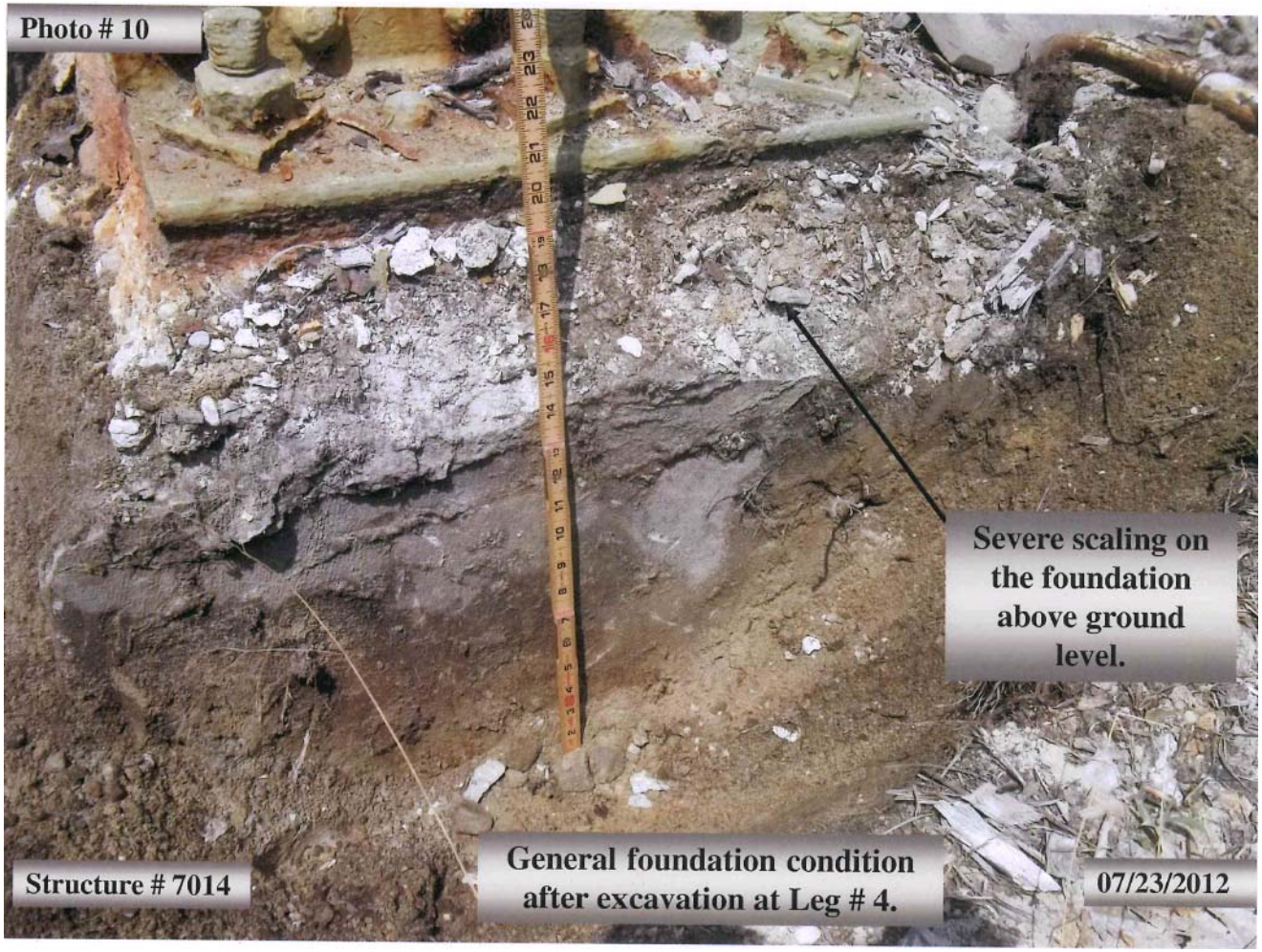
Project Driver

- Asset Condition and Safety

  Structure Inspections have identified asset conditions (degradation of structures and/or components) that have necessitated the need for replacement to ensure safety of line workers and public.

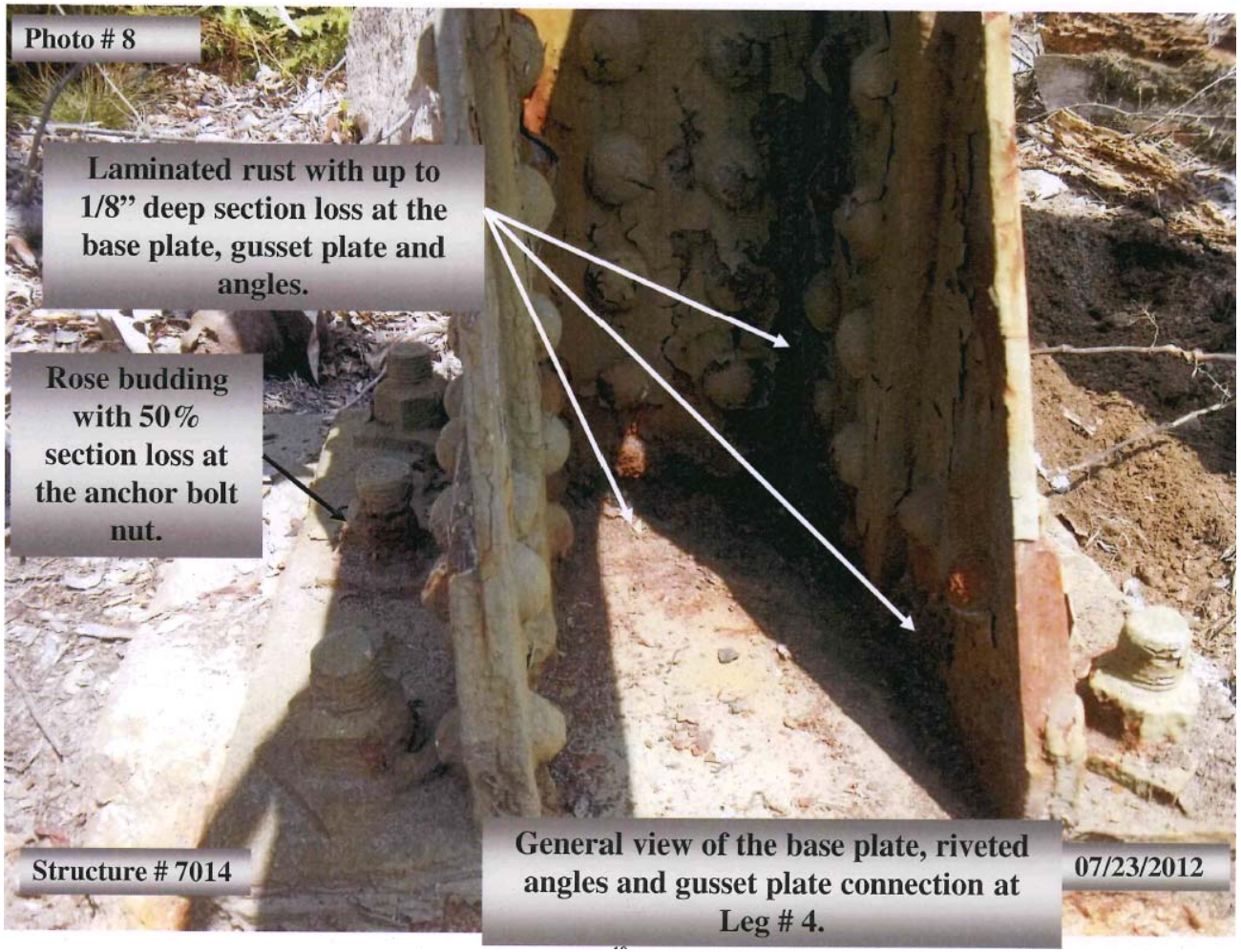
  – Transmission Structure Condition Inspections
    - Indicated moderate to severe corrosion on structure foundations
    - Structure members found to be in poor condition
    - Hardware/Insulation found to be in poor condition, and non-standard
  – Analysis and Temporary Repair –
    - Structures were analyzed based on as-found conditions
    - Temporary repairs were made, pending replacement

Structure Inspection – Foundations

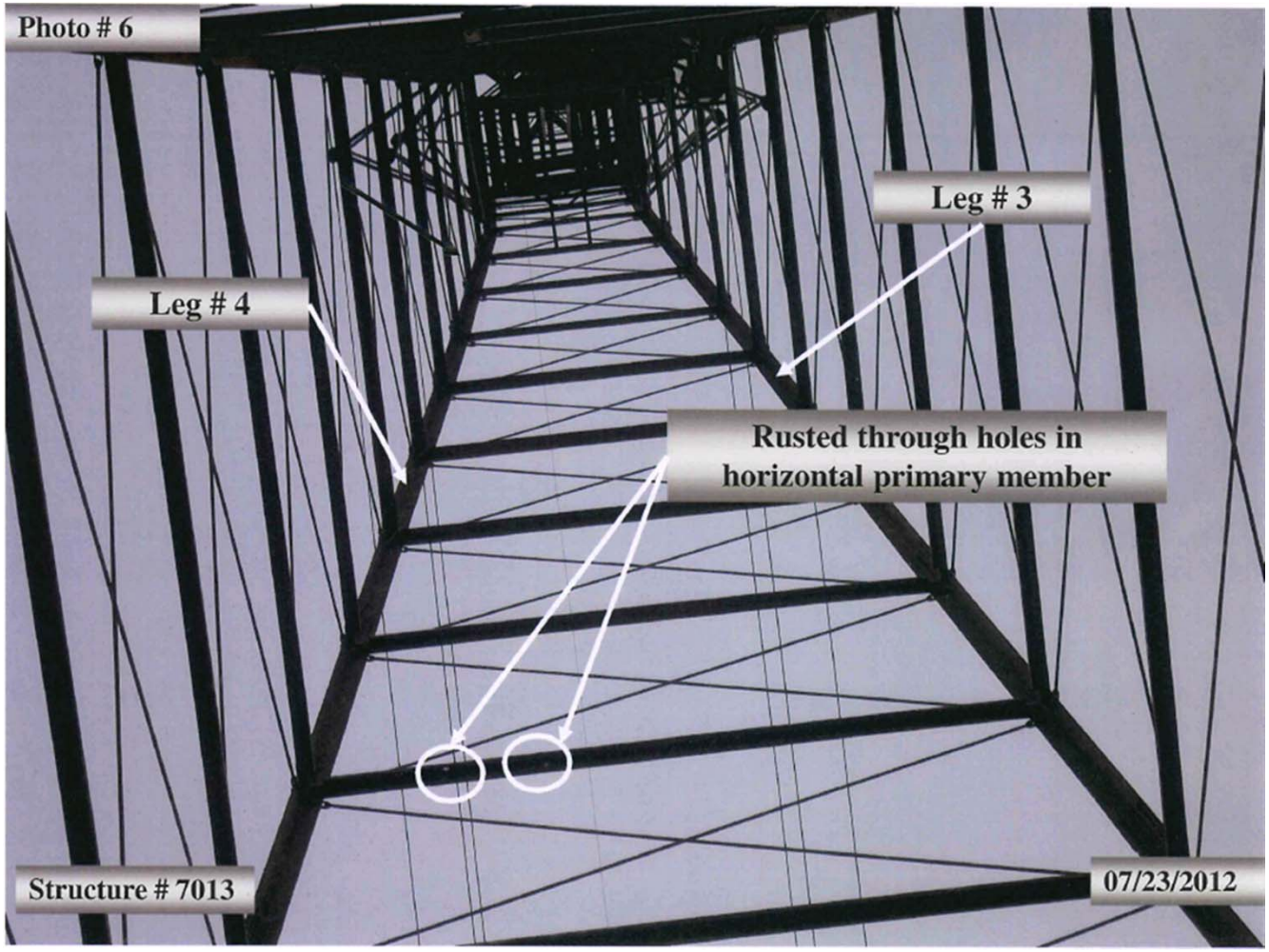


Structure Inspection – Foundations

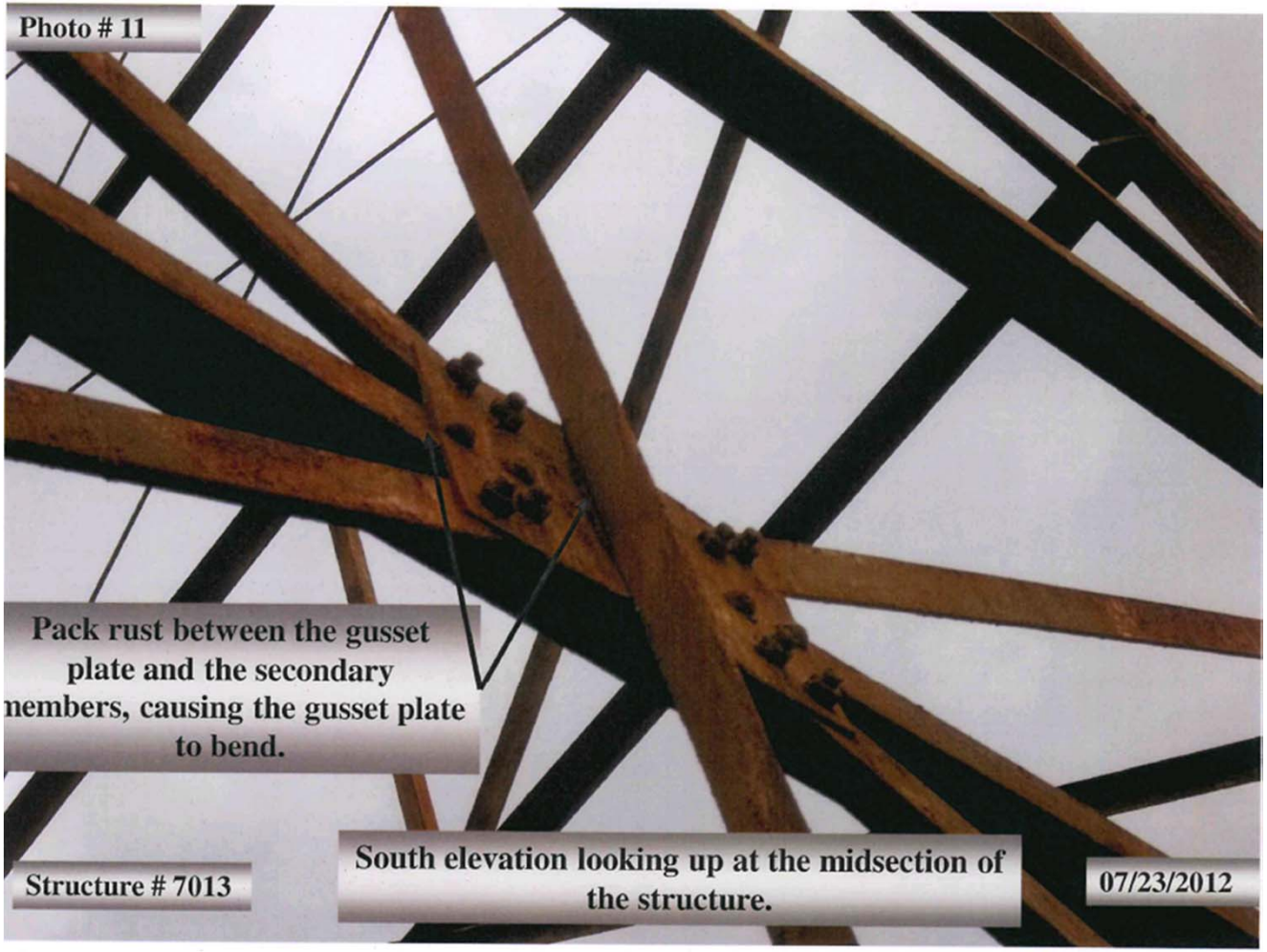
Structure Inspections



Structure Inspections

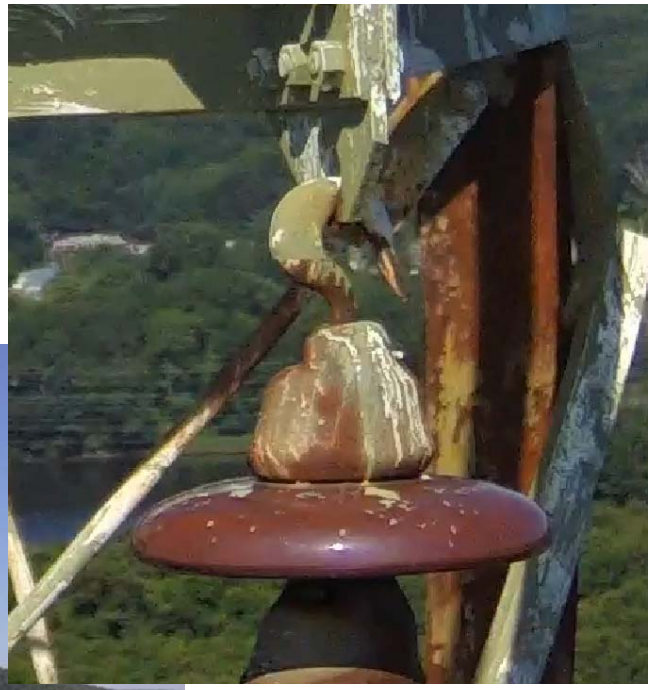


Structure Inspections

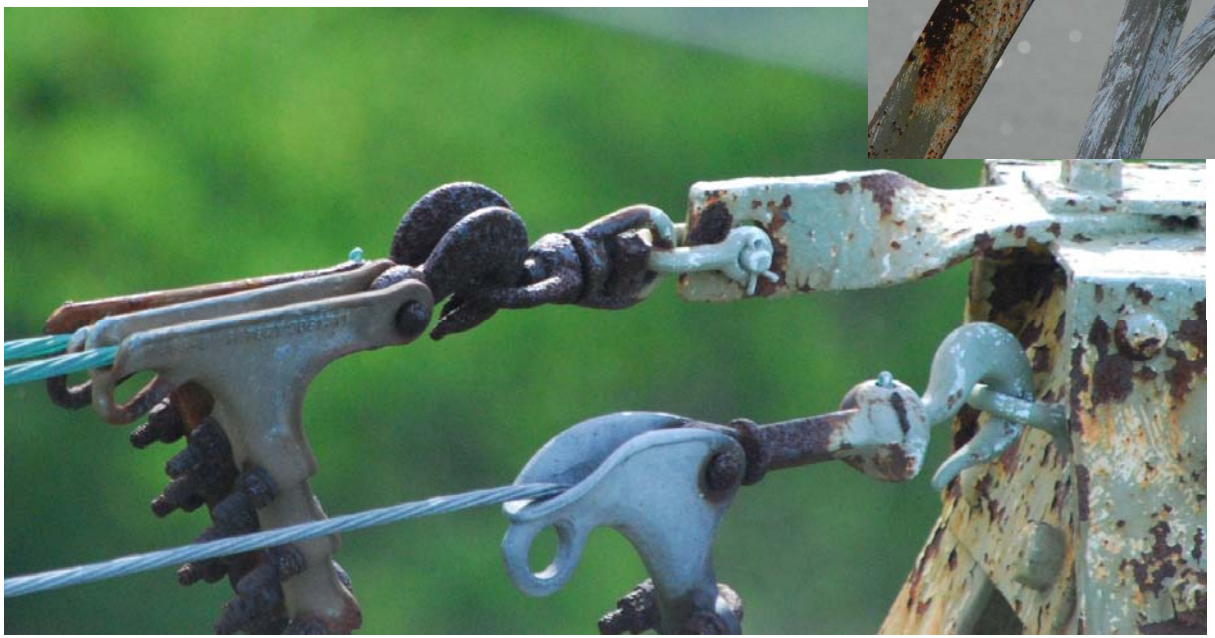


Aerial Inspections –

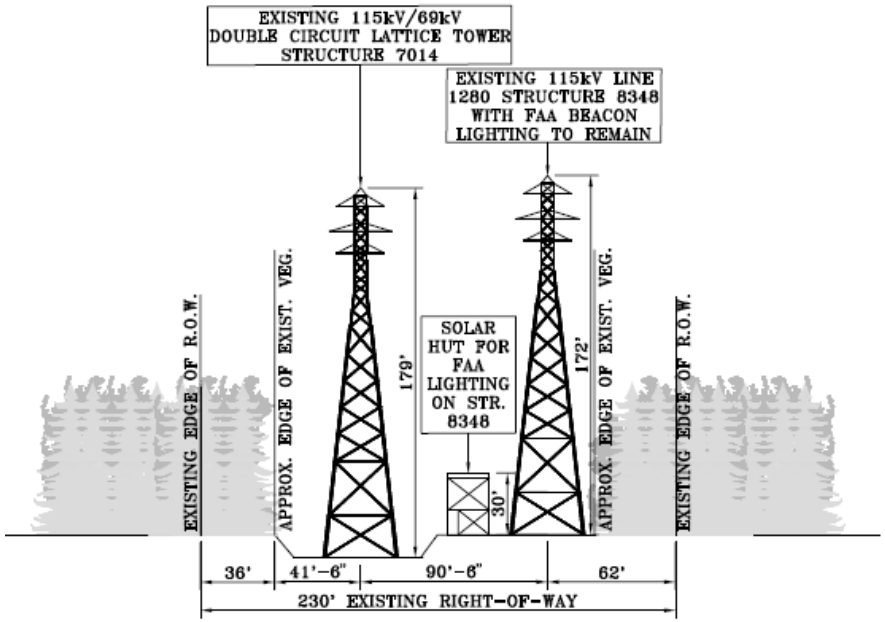
- Thinning plate members
- Non-standard hardware
- Insulator contamination



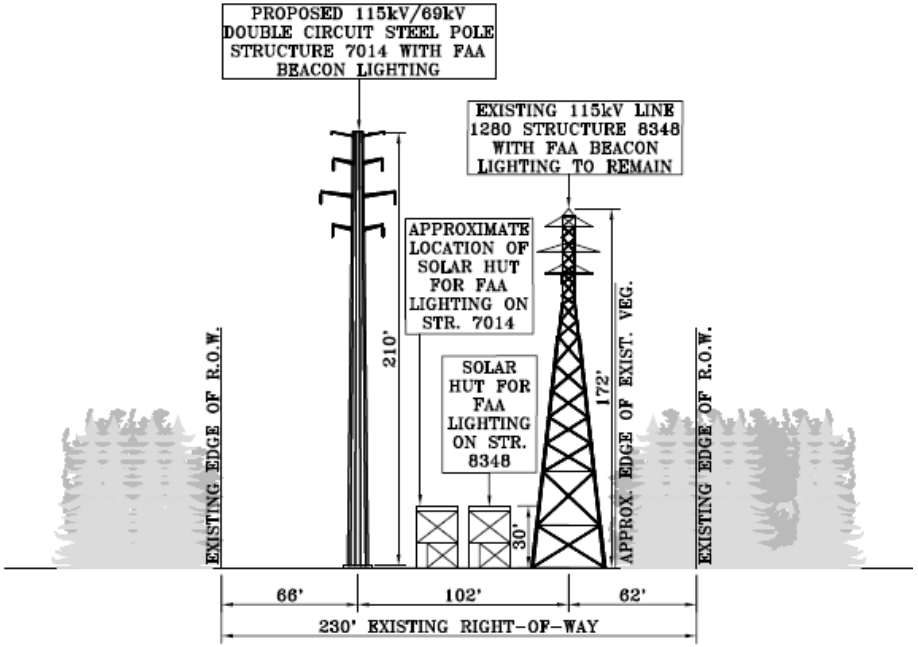
Aerial Inspections



Structure 7014 Cross Section
River Crossing Structures

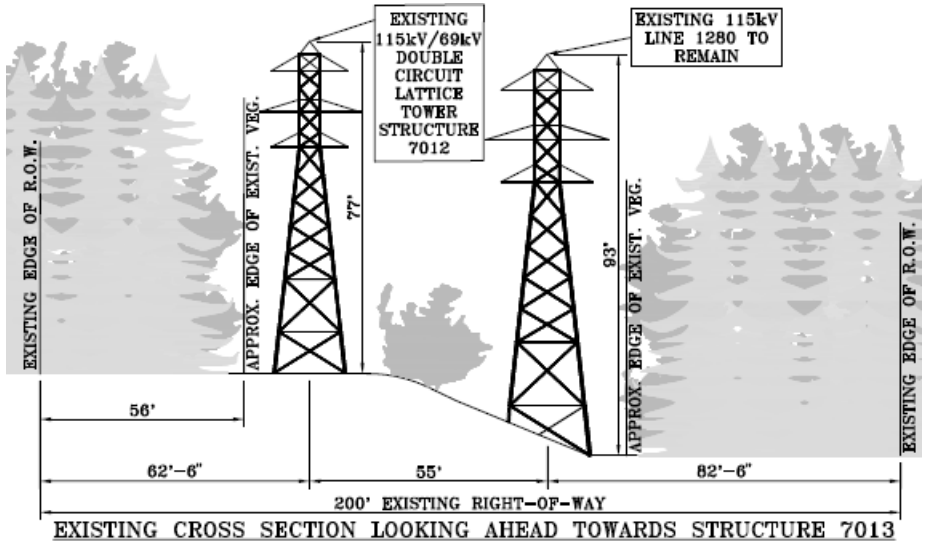


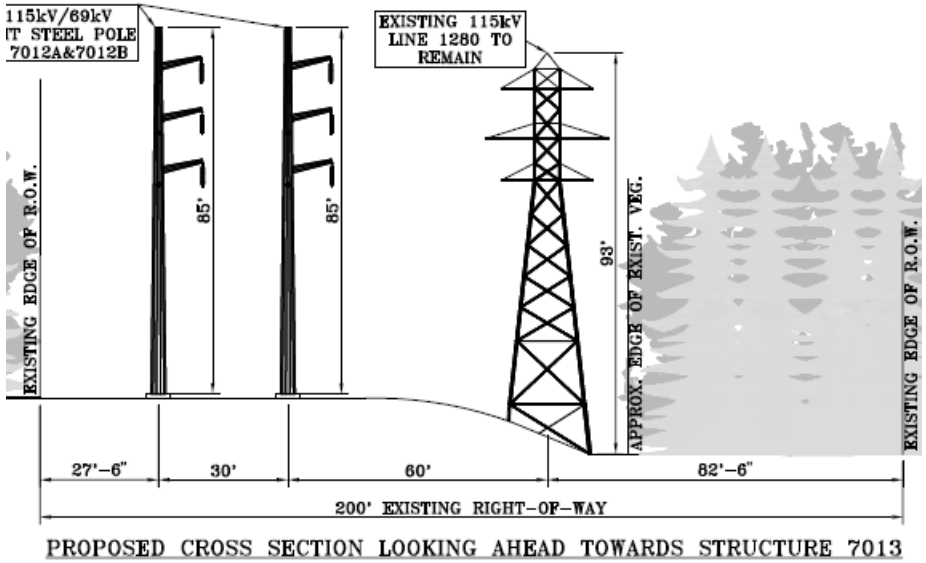
EXISTING CROSS SECTION LOOKING AHEAD TOWARDS STRUCTURE 7015



PROPOSED CROSS SECTION LOOKING AHEAD TOWARDS STRUCTURE 7015

Structure 7012 Cross Section – Anchor Structures





Summary

- The structures currently exhibit severe degradation of the foundation, towers and hardware. which will continue to advance until addressed
- Unknown as-built conditions and non-standard hardware contribute to justification
- Replacing the structures provides an opportunity to bring this portion of the lines up to current standards.
- Replacement of structures and conductor supports future upgrades of the 1410/100 Line, as well as safe and reliable operation.

Conclusion/Recommendation

- Replace 4 steel lattice structures with engineered galvanized steel poles on concrete foundations
  - Engineered Steel - 6 Structures
    - 7012 and 7015 are currently a dead end Double-Circuit Lattice Tower (DCLT). Each will be replaced with two dead end Single-Circuit Steel Poles (SCSP) (4 total).
    - 7013 and 7014 are currently tangent DCLTs. Each will be replaced with one tangent double-circuit steel pole (DCSP_ (2 total).
- Install new conductor (1590 kcmil ACSS), shield wire, and optical ground wire from structure 7012 to structure 7015
- The 1410 and 100 Line Structure Replacement project is estimated at $8.47M (-25%/+50%)