Monitoring Results - Tiltmeters

Notations
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- Notations
Basement Level Tiltmeters (Level A)

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Level B Tiltmeters

- EL-BNW Temperature vs. EL-BNW Data
- EL-BNC Temperature vs. EL-BNC Data
- EL-BNE Temperature vs. EL-BNE Data

Graphs show temperature change over time, with linear fits and correlation coefficients:

- EL-BNW: $\alpha = -4.2008 + 0.072653T$, $R=0.46535$
- EL-BNC: $\alpha = -1.0425 + 0.011656T$, $R=0.18258$
- EL-BNE: $\alpha = -2.0969 + 0.084545T$, $R=0.92657$

Note: Only 5% of the data is shown for clarity.

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Level C Tiltmeters

- **EL-CNW Data**: \( \alpha = -1.8871 + 0.019121T \) \( R = 0.28353 \)
  - Only 5% of the data is shown for clarity

- **EL-CNC Data**: \( \alpha = -0.83365 + 0.013046T \) \( R = 0.26446 \)
  - Only 5% of the data is shown for clarity

- **EL-CNE Data**: \( \alpha = -2.1534 + 0.041912T \) \( R = 0.52366 \)
  - Only 5% of the data is shown for clarity

(Record Dates: 5/1/99, 11/22/99, 6/14/00, 1/5/01, 7/29/01, 2/19/02, 9/12/02, 4/5/03, 10/27/03)
Level D Tiltmeters

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Western Tiltmeters
Western Tiltmeters

Building is undergoing a PERPETUAL Movement away from the soil mass!
VW Displacement Transducers

Sensor ID: VW-BNP (Level B, North Side, Parallel to Joint)

Sensor ID: VW-BSP (Level B, South Side, Parallel to Joint)
VW Displacement Transducers

Sensor ID: VW-BNP (Level B, North Side, Parallel to Joint)

Sensor ID: VW-BSP (Level B, South Side, Parallel to Joint)

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VW Displacement Transducers

Sensor ID: VW-DNP (Roof Level, North Side, Parallel to Joint)

Sensor ID: VW-DSP (Roof Level, South Side, Parallel to Joint)
Monitoring Conclusion

- The structure undergoes perpetual movements away from the soil mass
- The structure undergoes limited expansion movements into the soil mass at the restrained end
- The structure undergoes asymmetrical contraction movements at its ends
- Possible movement of the soil into the gap formed between the soil and the contracted structure
  - Soil movement prevents the structure from reverting to its position before contraction
  - Structure undergoes a cumulative lateral movement away from the soil over several temperature cycles
Monitoring Conclusion
Monitoring Conclusion
Monitoring Conclusion
Interjection
Interjection
Monitoring Conclusion