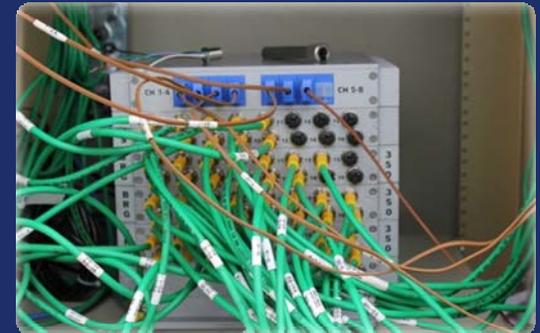


Instrumentation Projects at Airports



Federal Aviation
Administration



Presented to: FAA Working Group Meeting

By: Navneet Garg, Ph.D., FAA ANG-E262

Date: April 17, 2013

FIELD INSTRUMENTATION AND TESTING

- **MAIN OBJECTIVE**

- better understanding of long-term pavement behavior in the field under varied climatic and operating conditions, and
- improved characterization of paving materials.

Improved pavement design and evaluation tools will conserve airport development funds and reduce the downtime of airfield pavements for construction and maintenance activities.

FIELD INSTRUMENTATION AND TESTING

The specific objectives are:

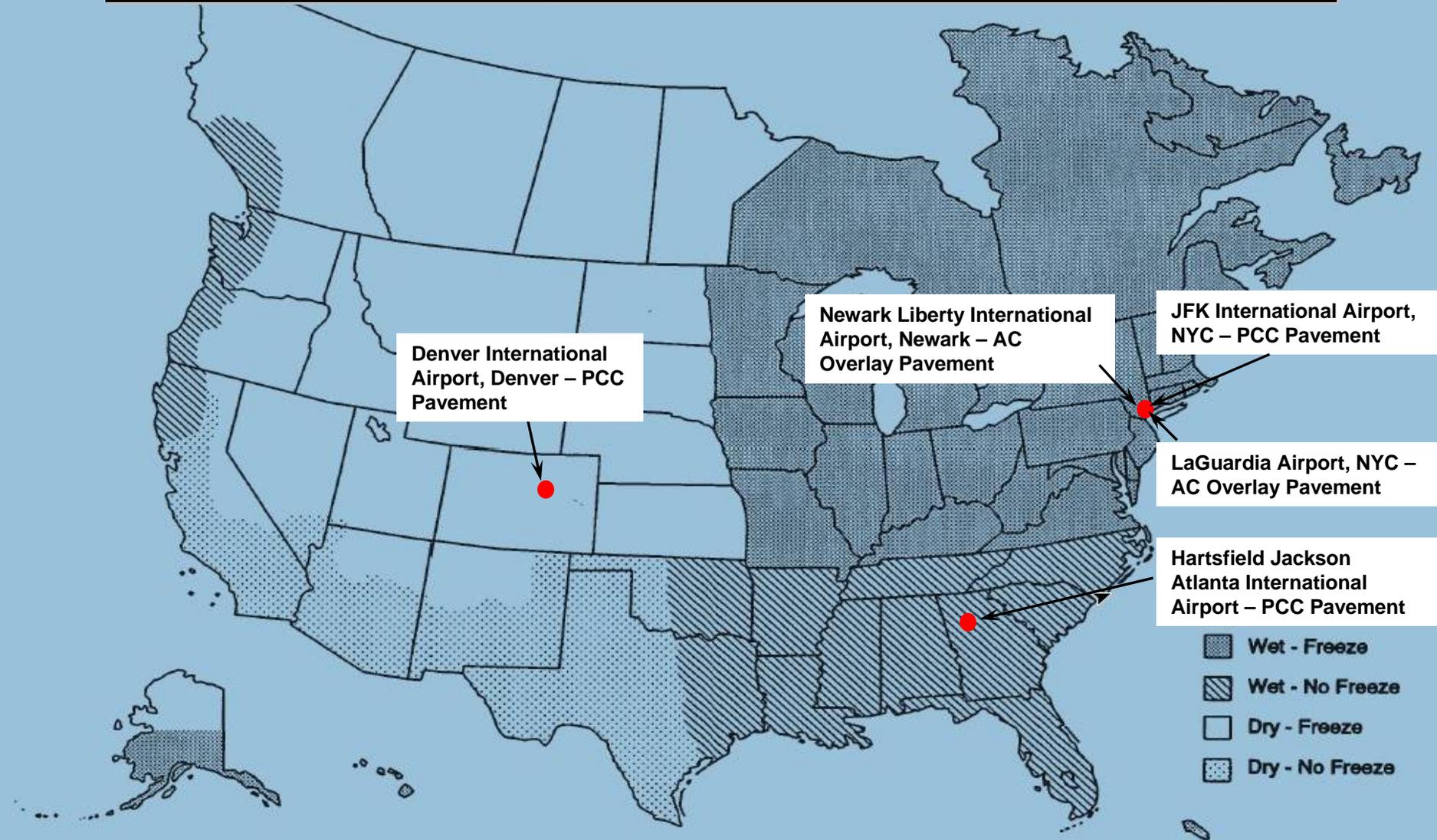
- Evaluate the effects of environment on pavement performance;
- Determine thermal gradients within asphalt and concrete layers;
- Determine the effects of material properties and variability on pavement response and performance;



FIELD INSTRUMENTATION AND TESTING

- Type of data collected:
 - Climatic data (pavement & air temperatures).
 - Pavement response data (strains, deflections).
 - Material samples for laboratory testing.
 - In-situ test data (non-destructive tests, vane shear, dynamic cone penetrometer, etc.).
 - Heavy Weight Deflectometer tests.

Current FAA Airport Instrumentation Projects



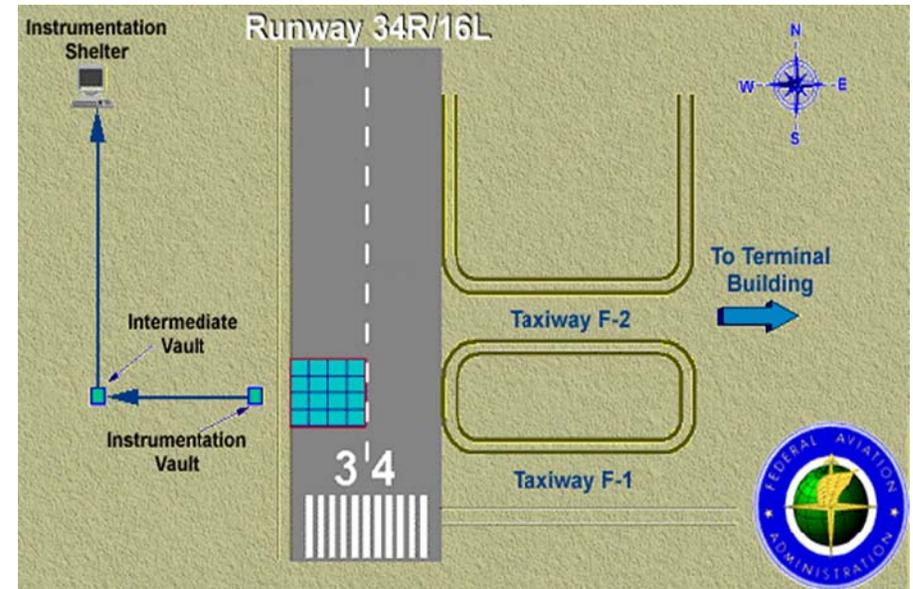
FIELD INSTRUMENTATION AND TESTING

- DIA Restoration Effort:
 - Climatic data (pavement & air temperatures).
 - Pavement response data (strains, deflections).
 - Material samples for laboratory testing.
 - In-situ test data (non-destructive tests, vane shear, dynamic cone penetrometer, etc.).
 - Heavy Weight Deflectometer tests.

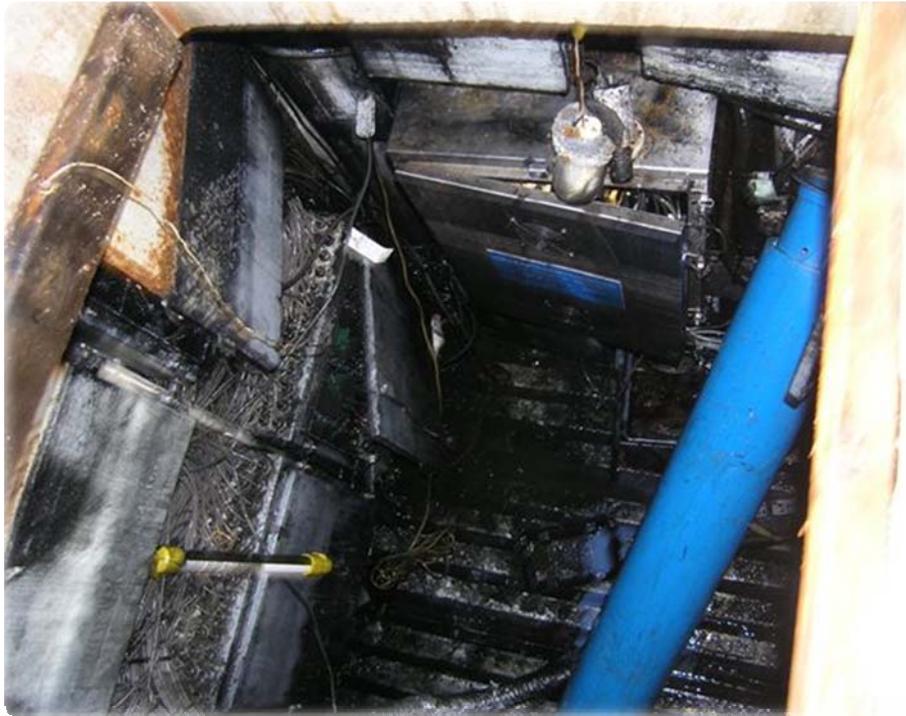


DIA – Restoration Effort

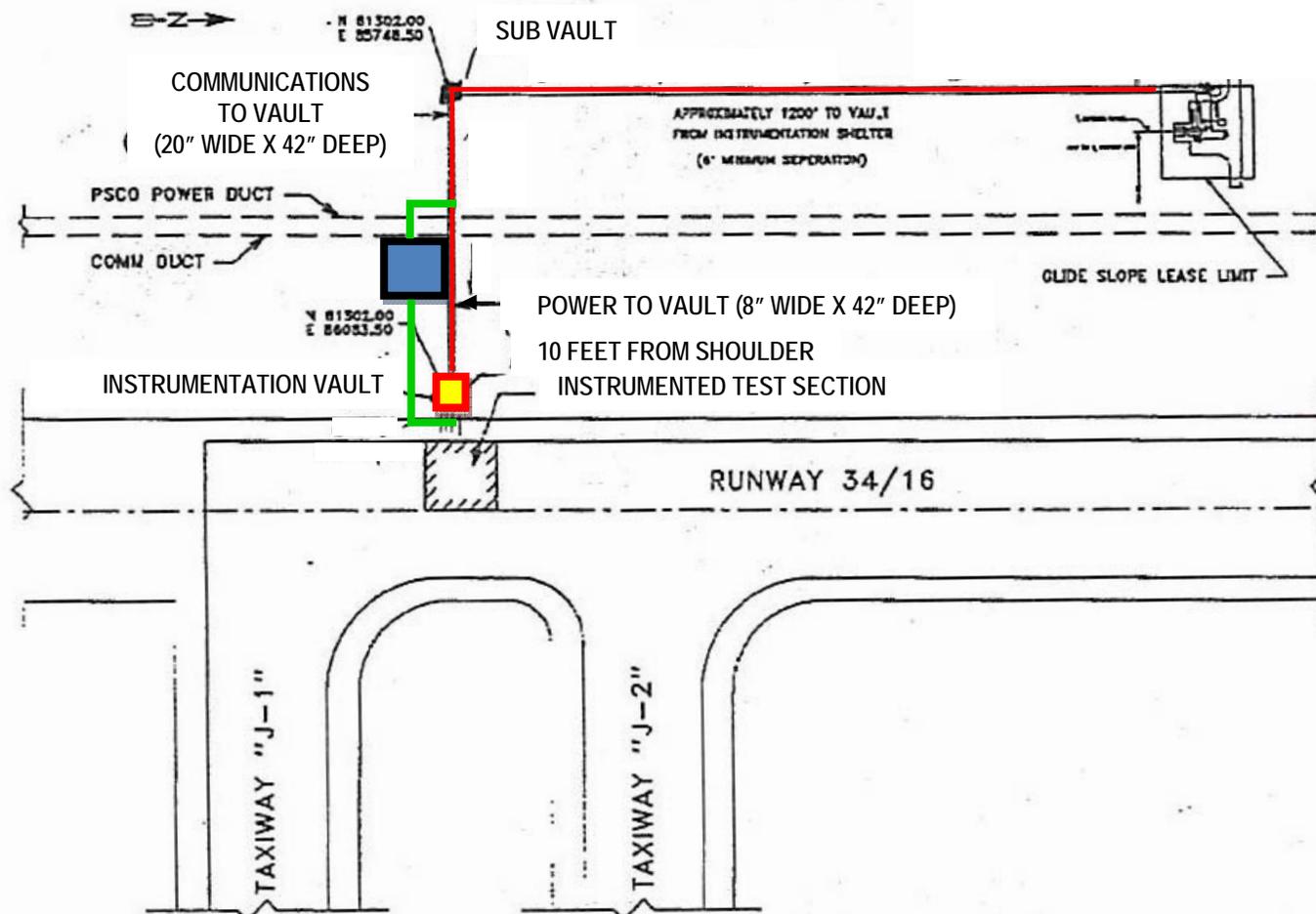
- Initiated in 1992.
- Focused on measuring PCC pavement responses due to different loading conditions
 - Aircraft; and
 - Environment (temperature/moisture).
- 16 slabs in the take-off area of Runway 34R-16L instrumented.
- 460 static and dynamic sensors installed.



DIA – Restoration Effort



TRENCH LAYOUT FROM VAULT TO SHELTER



Proposed Location (200- ft from shoulder)



Existing Instrumentation Vault (10-ft from shoulder)

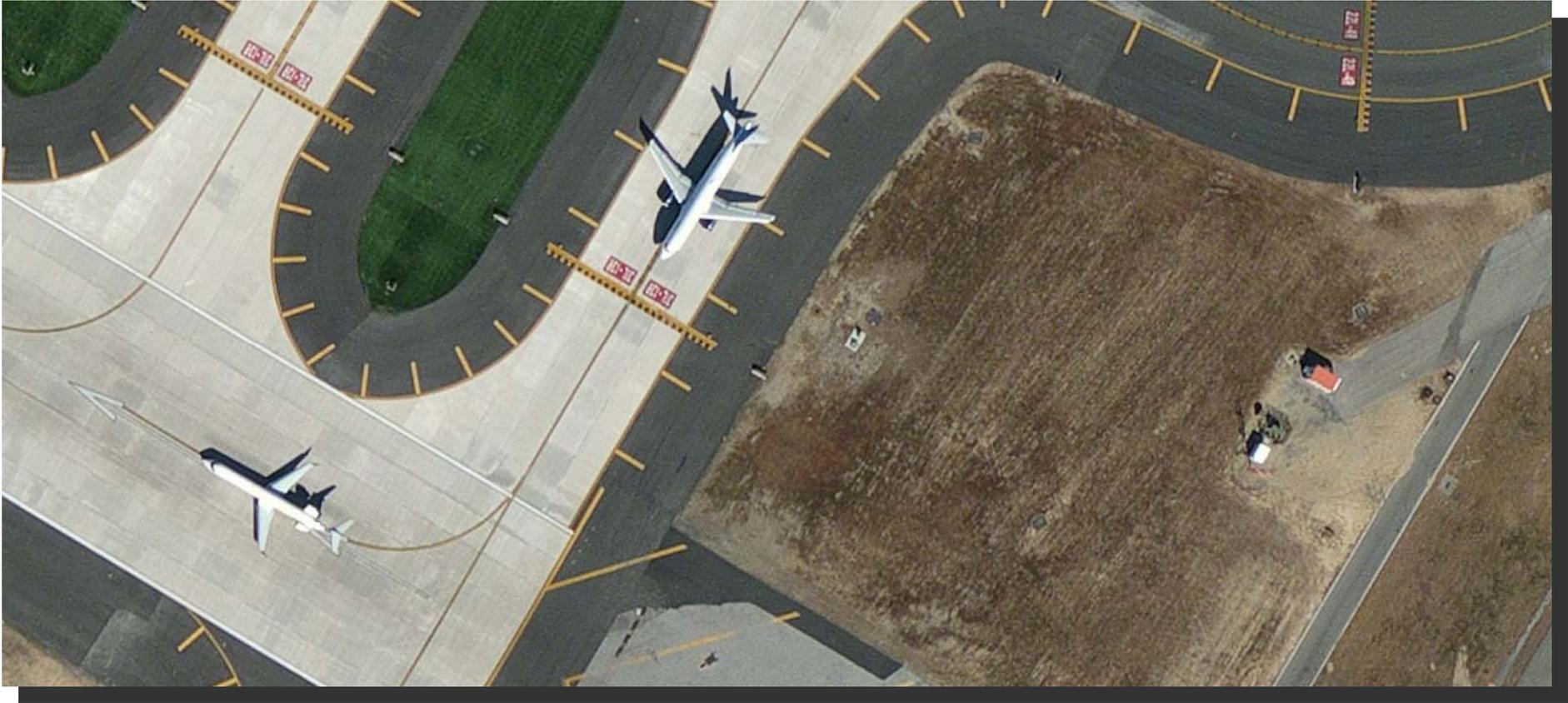
DIA – Restoration Effort

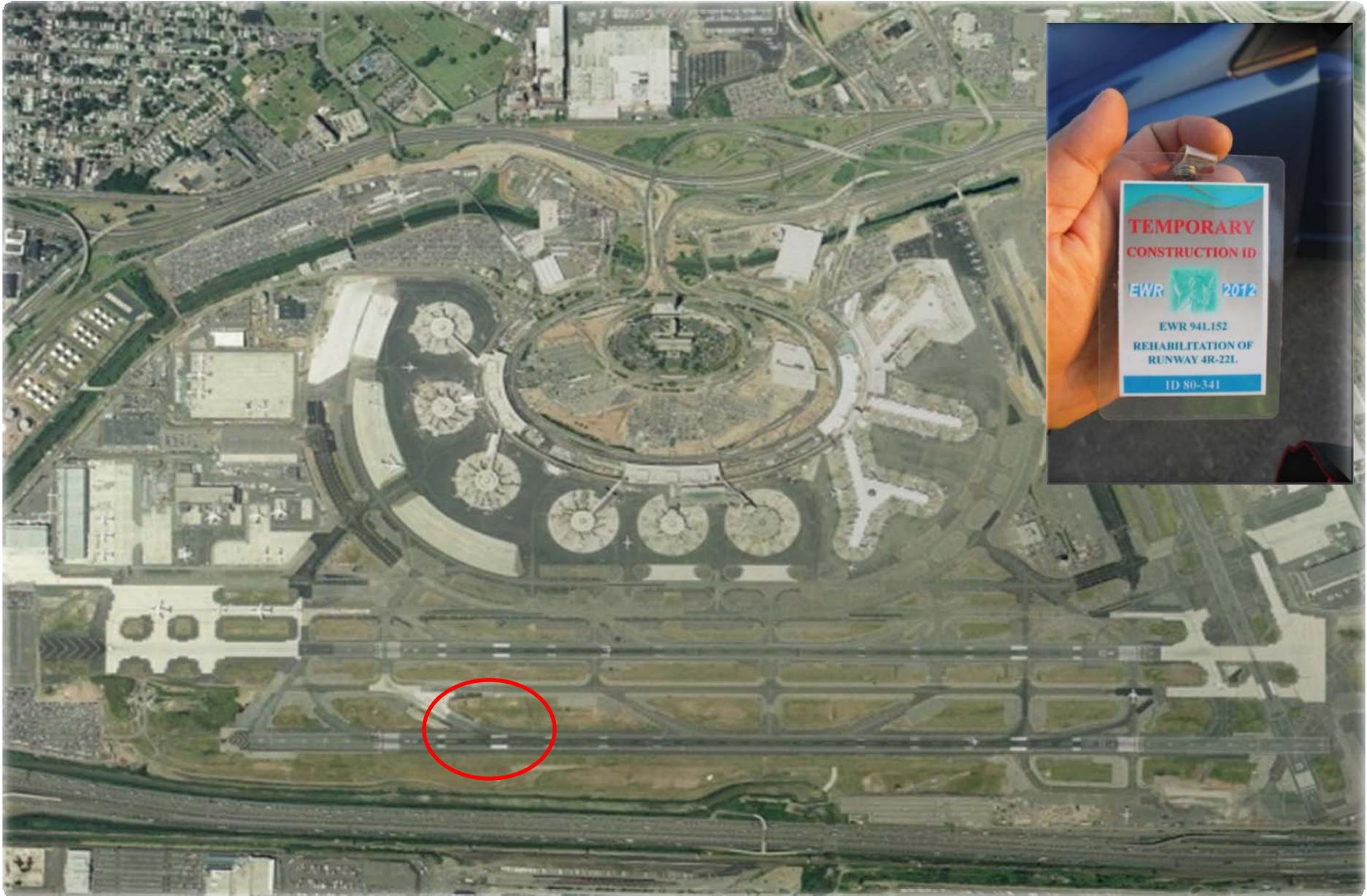
- Sensor cables identified.
- Campbell Scientific Data Logger connected to group of sensors.
- Data collected for sensors in groups.
- Data collected by SRA subcontractor and sent to FAA/SRA for analysis.
- Readings showed that none of the sensors were collecting any meaningful data.
- DIA project was closed.
- Possibility of instrumenting pavement (new runway) in future.



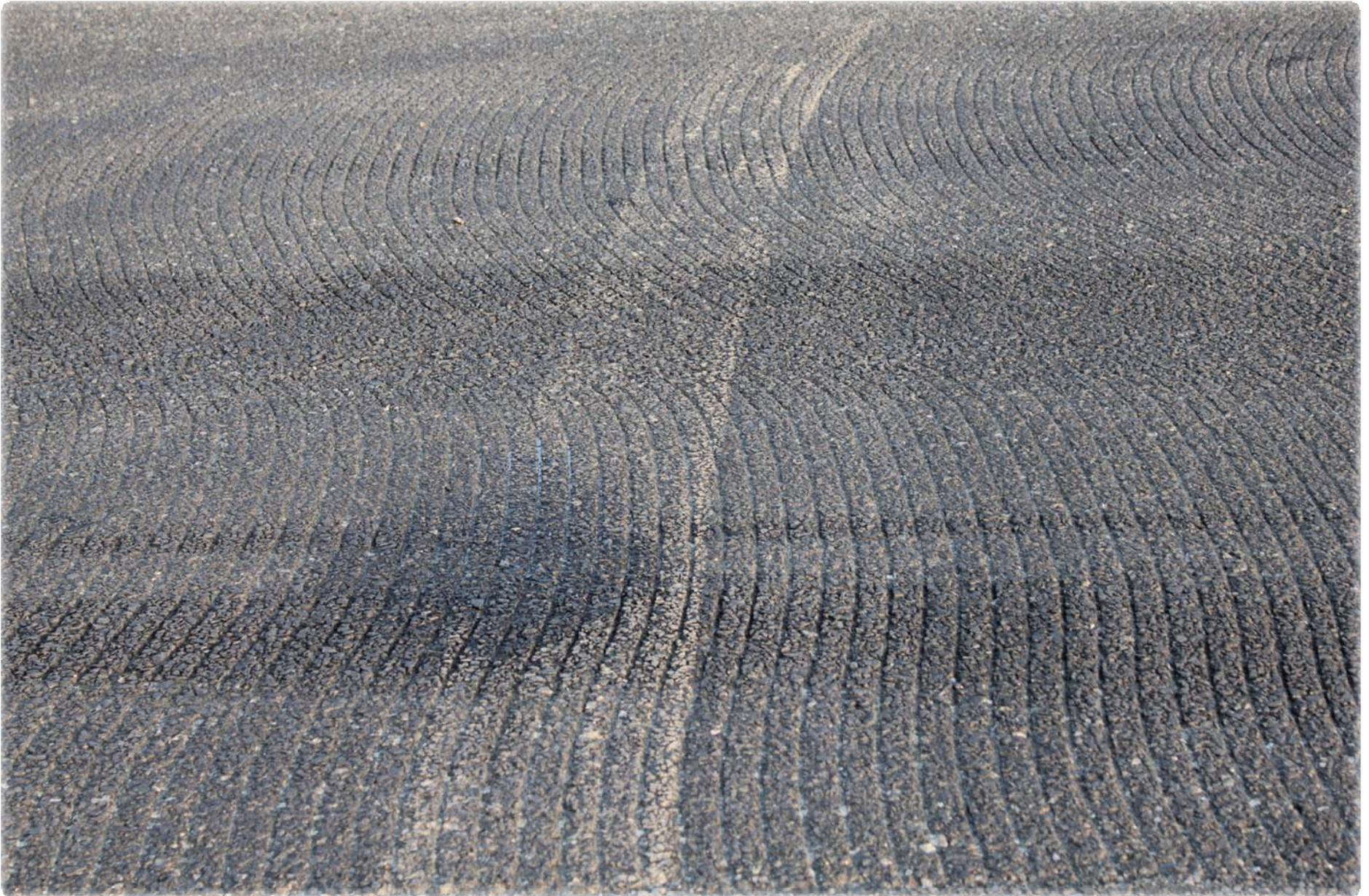
JFK Runway 13R-31L Reconstruction Project



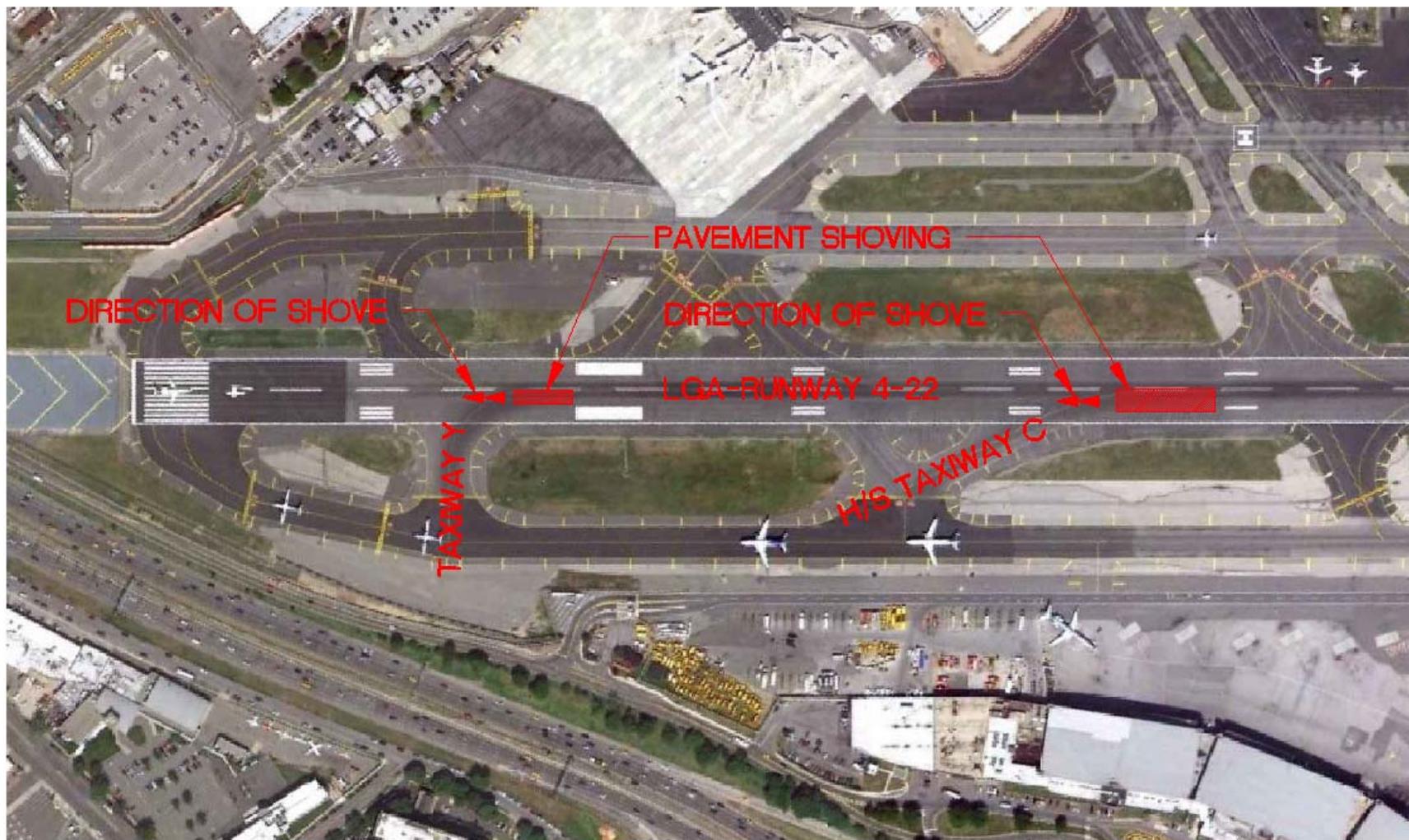












OBJECTIVE

Study slippage failures on Runway 4R-22L at EWR.



APPROACH

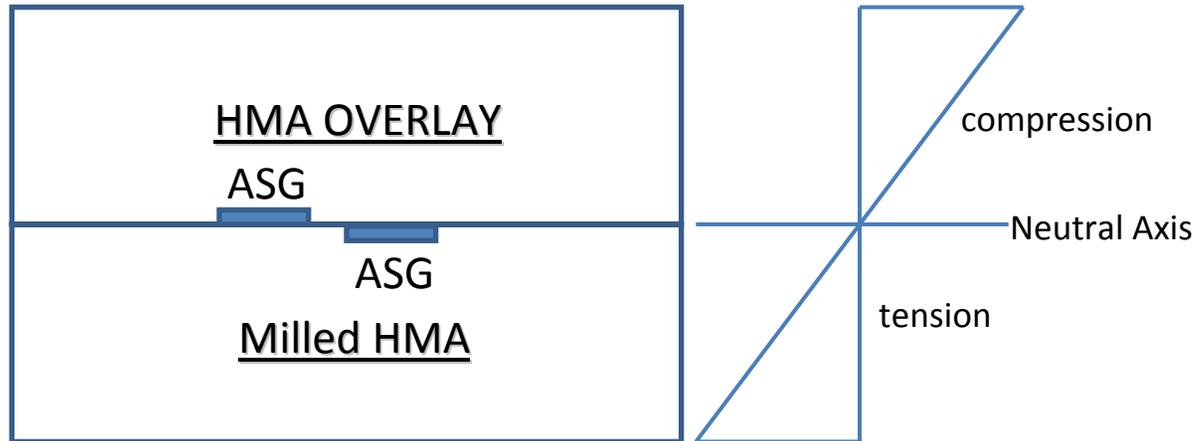
- Pavement Response
 - Instrumentation
 - In-situ tests (non-destructive)
- Material evaluation
 - Laboratory Tests



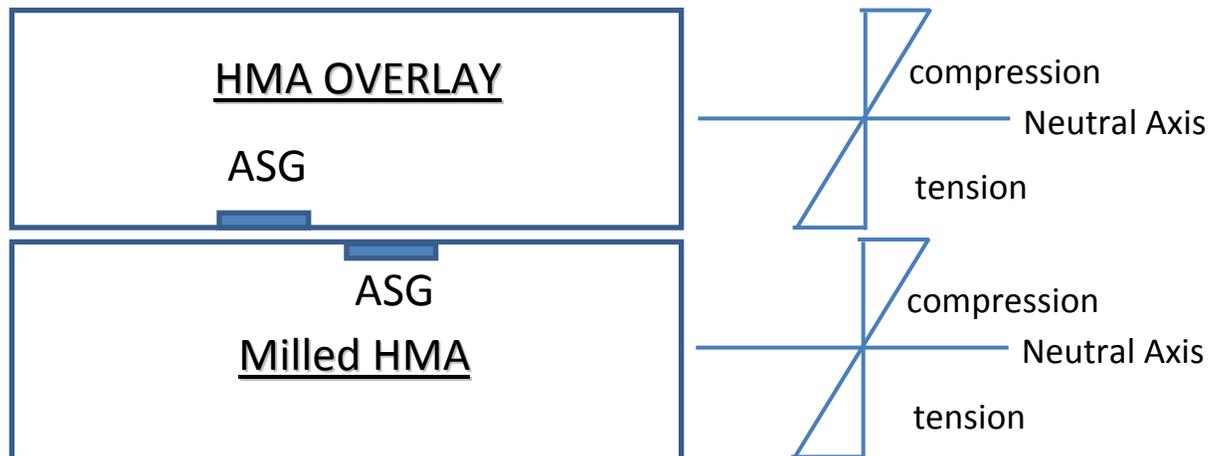
FIELD INSTRUMENTATION

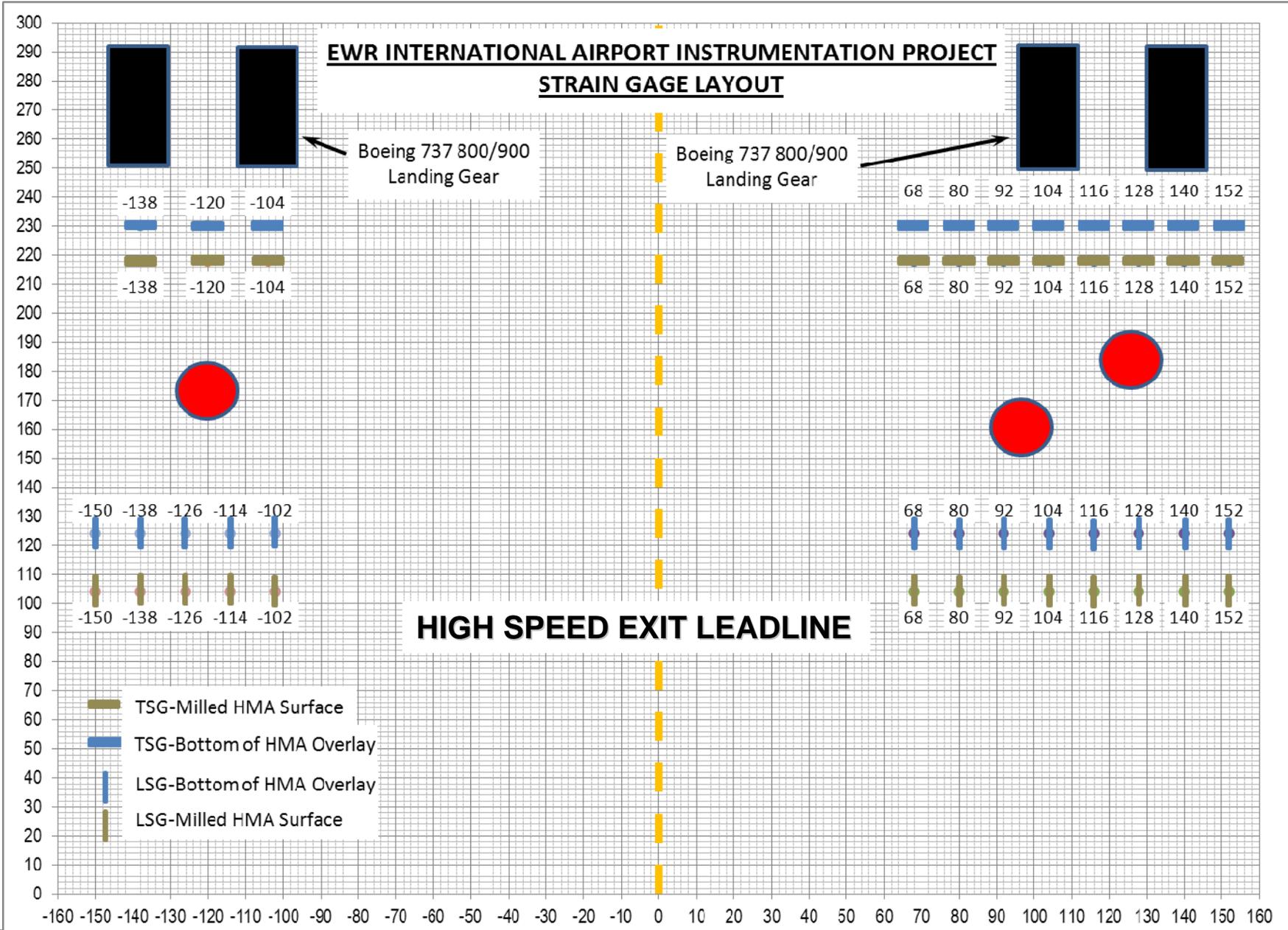
- Type of data collected:
 - Pavement & air temperatures.
 - HMA strains
 - Top of milled surface
 - Bottom of HMA Overlay
 - Transverse and Longitudinal

CONCEPT



Delamination





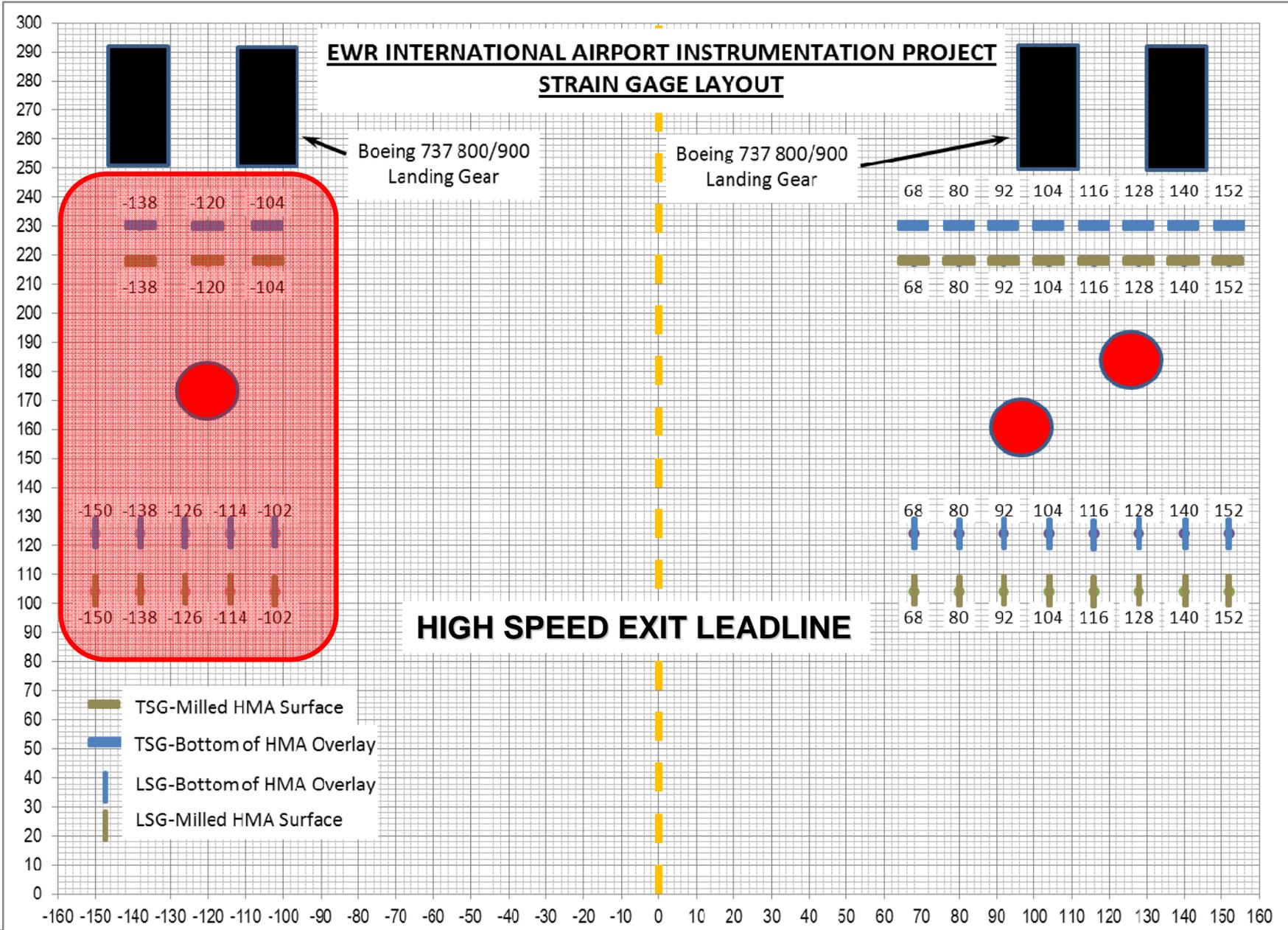


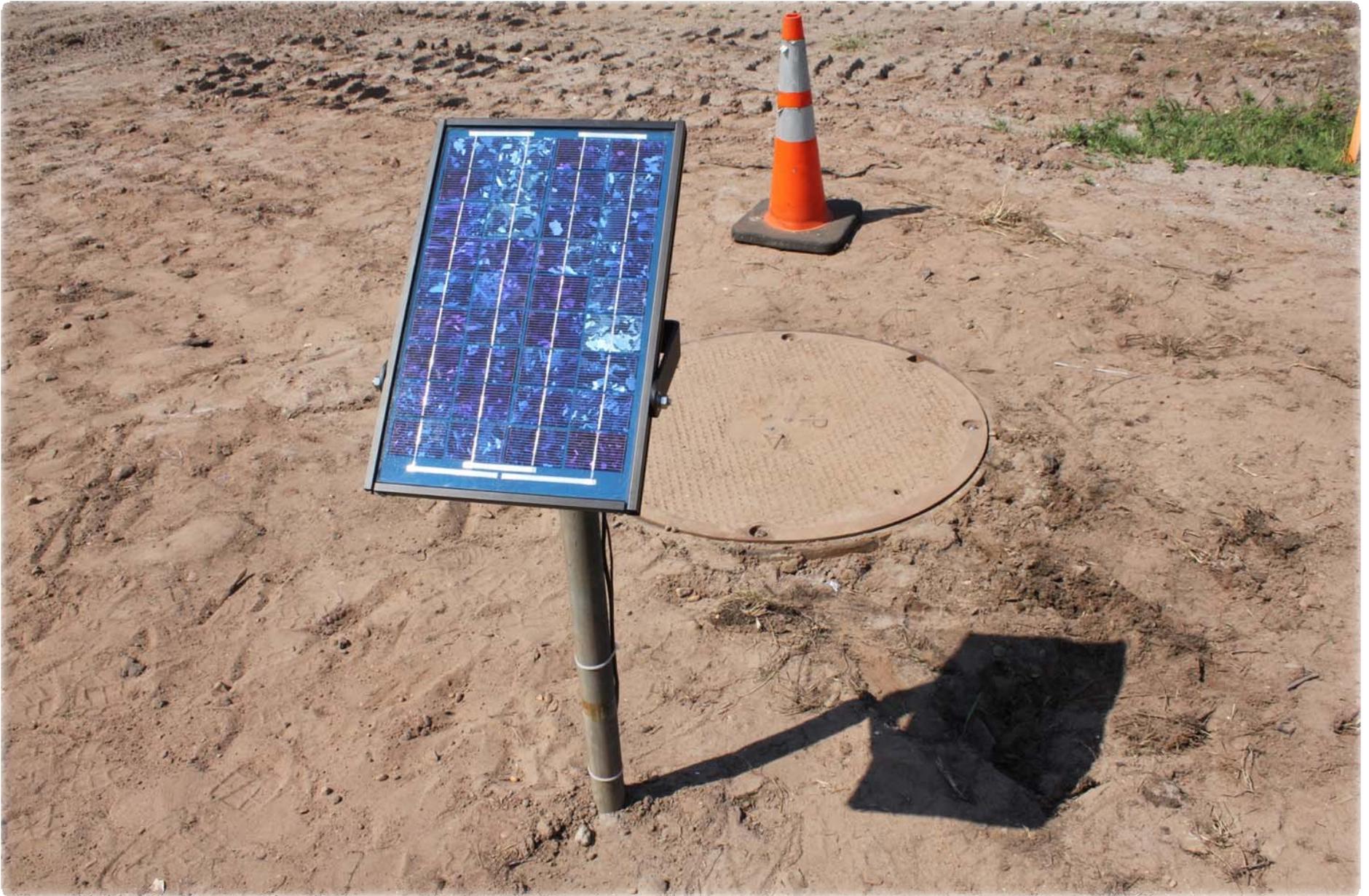








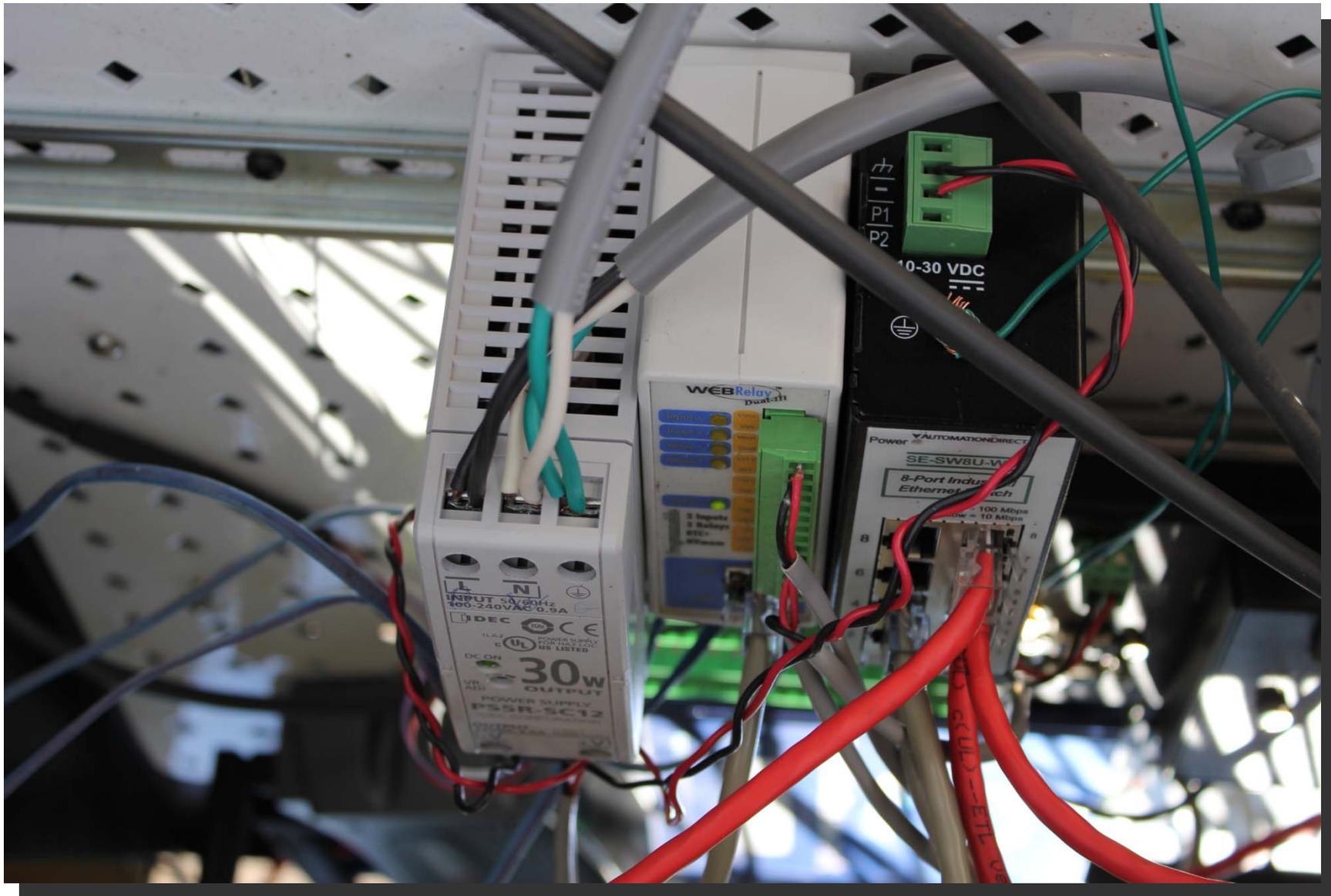






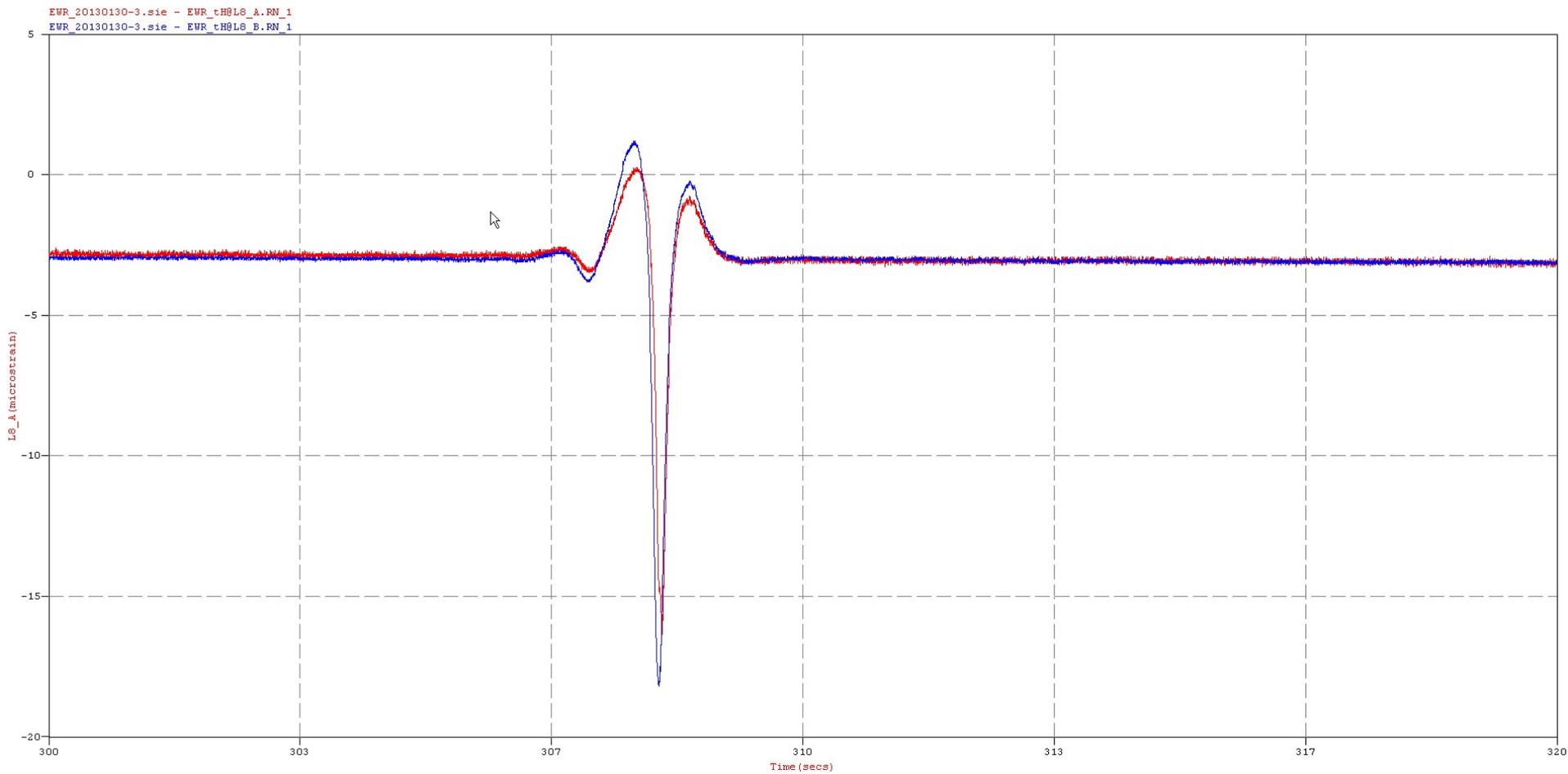


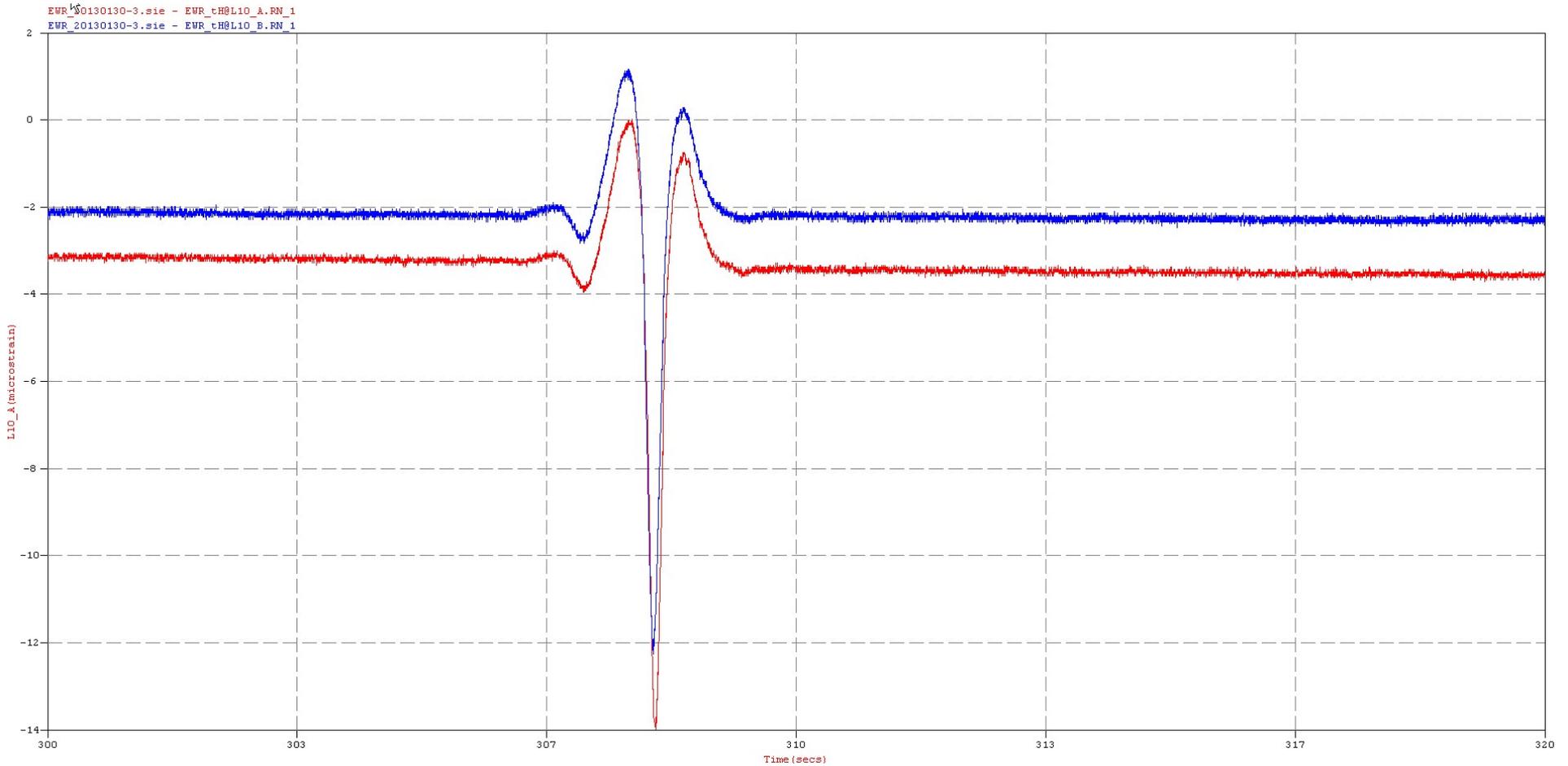


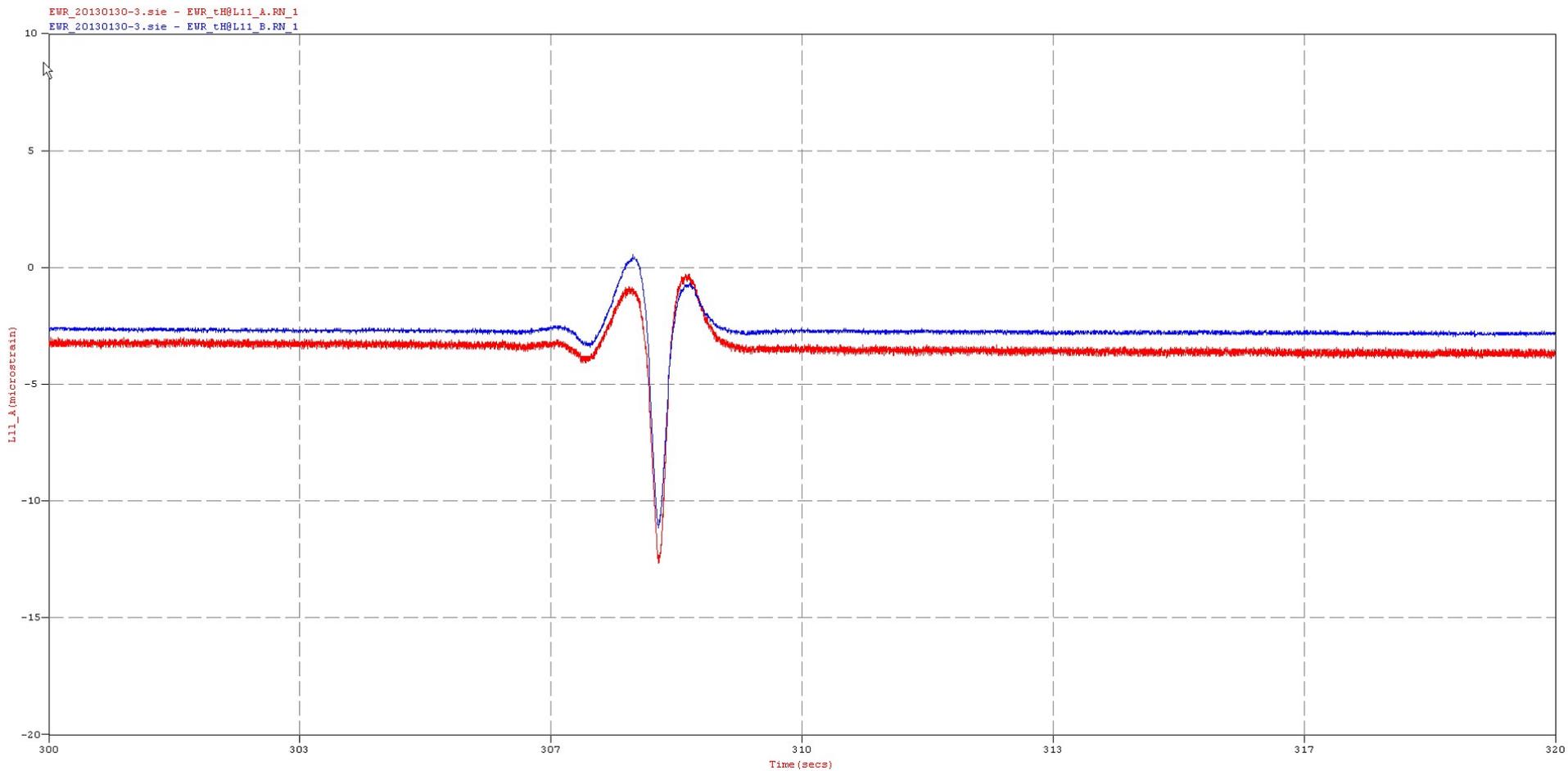


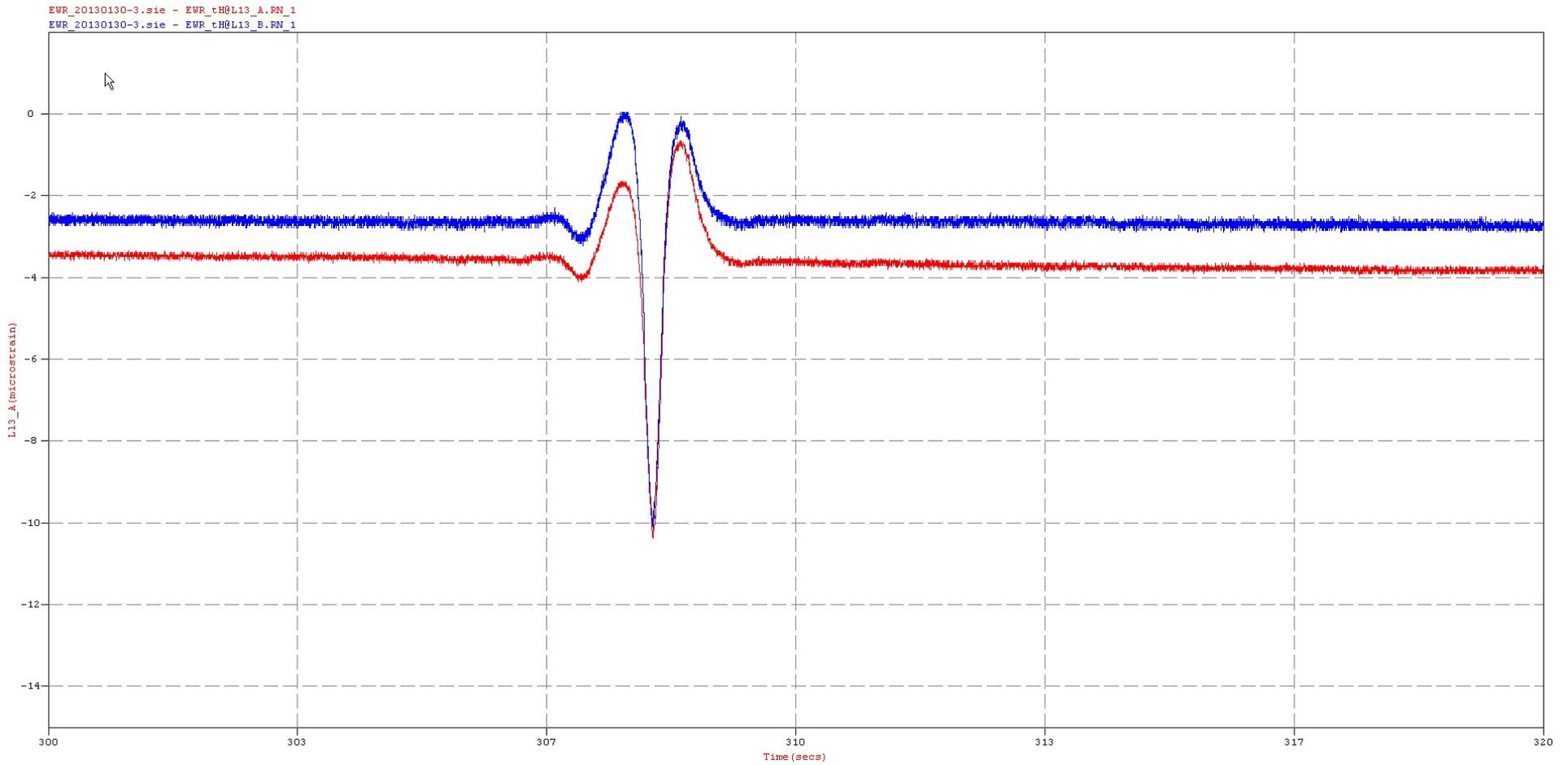












ACKNOWLEDGEMENTS

PANYNJ STAFF

Scott Murrel

Ernesto Larrazabal

Peter Rozpedowski

Emad Qadi





THANK YOU