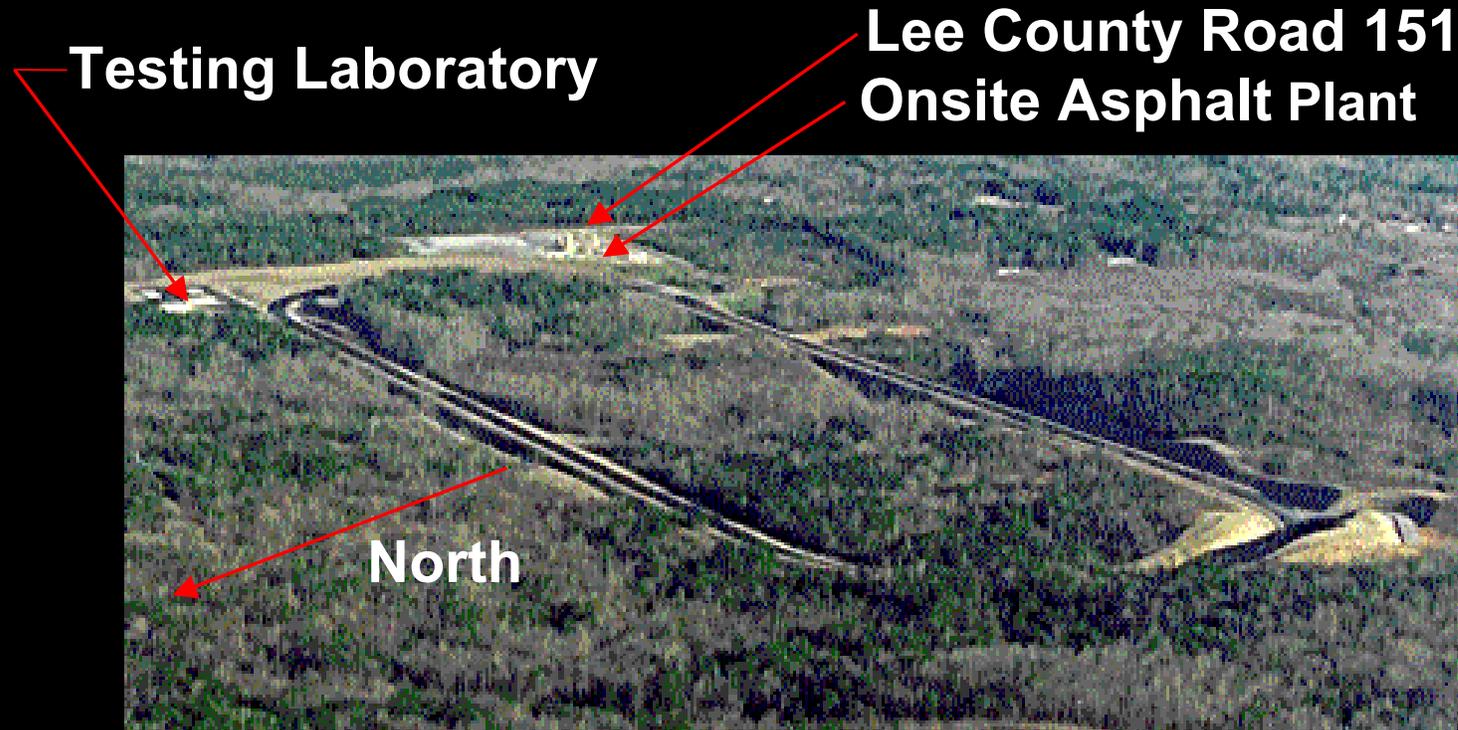


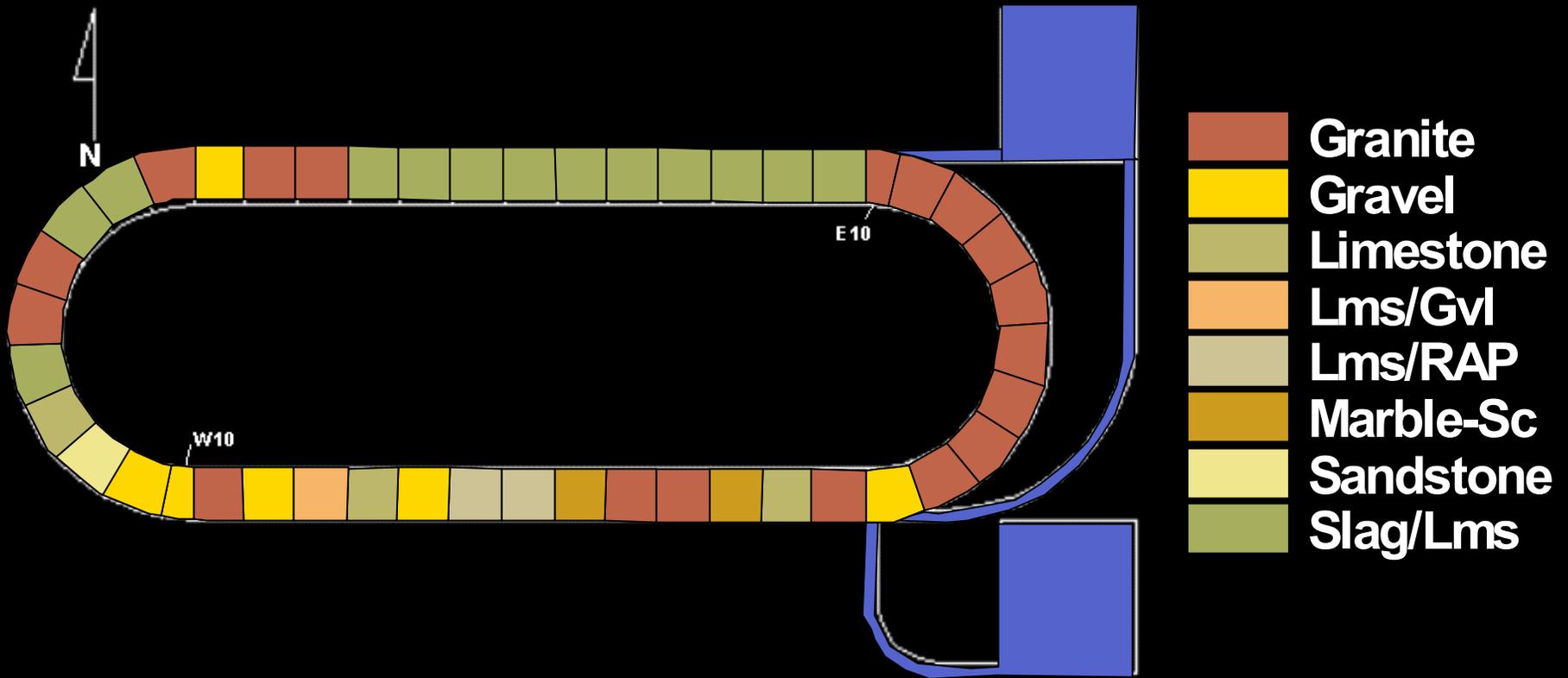
National Center for Asphalt Technology
1600 Lee Road 151
Opelika, AL 36804
(334) 844-6855

PROJECT OVERVIEW



- Materials and Methods (Not Thickness) are Study Variables
- Determine Which Mixes Perform Better Under Actual Traffic
- Identify Laboratory Tests That Best Indicate Field Performance

2000 PAVEMENT TEST TRACK



2000 INSTRUMENTATION PLAN

- Simple Instrumentation System for Construction Quality
- Infrared Vehicle Identification System to Count Trucks
- Digital Weather Station to Capture Environmental Effects
- Multi-Depth Temperature in Each Experimental Section
- Subgrade Moisture Under Every Section
- Sensors on Underdrain Outlets to Capture Flow
- All Data Available Real Time in Onsite Laboratory

VEHICLE ID SYSTEM

Tomar Electronics - Strobecom II OSPsoft version 2.0.1 / Connected to OSP Version 2.0.3

Attached OSP Event Log 3/5/2001 5:29 PM

Start Time - End Time/Date	Event	ID	SG	PR	CH	Pre	Result	Pk
23:17:29 - 23:17:48 on 03/04/2001	Vehicle	40	E15	E15	1	yes	normal completion	218
23:15:06 - 23:15:27 on 03/04/2001	Vehicle	40	E15	E15	1	yes	normal completion	155
23:12:48 - 23:13:06 on 03/04/2001	Vehicle	40	E15	E15	1	yes	normal completion	215
23:10:26 - 23:10:45 on 03/04/2001	Vehicle	40	E15	E15	1	yes	normal completion	216
23:09:33 - 23:09:54 on 03/04/2001	Vehicle	30	E15	E15	1	yes	normal completion	182
23:08:03 - 23:08:24 on 03/04/2001	Vehicle	40	E15	E15	1	yes	normal completion	170
23:07:15 - 23:07:36 on 03/04/2001	Vehicle	30	E15	E15	1	yes	normal completion	168
23:05:45 - 23:06:03 on 03/04/2001	Vehicle	40	E15	E15	1	yes	normal completion	196
23:04:56 - 23:05:18 on 03/04/2001	Vehicle	30	E15	E15	1	yes	normal completion	163
23:03:22 - 23:03:42 on 03/04/2001	Vehicle	40	E15	E15	1	yes	normal completion	154
23:02:39 - 23:03:00 on 03/04/2001	Vehicle	30	E15	E15	1	yes	normal completion	153
23:01:02 - 23:01:21 on 03/04/2001	Vehicle	40	E15	E15	1	yes	normal completion	214
23:00:23 - 23:00:42 on 03/04/2001	Vehicle	30	E15	E15	1	yes	normal completion	224
22:59:26 - 22:59:38 on 03/04/2001	Vehicle	20	E15	E15	1	yes	normal completion	69
22:58:40 - 22:59:01 on 03/04/2001	Vehicle	40	E15	E15	1	yes	normal completion	223
22:58:04 - 22:58:24 on 03/04/2001	Vehicle	30	E15	E15	1	yes	normal completion	205
22:57:08 - 22:57:18 on 03/04/2001	Vehicle	20	E15	E15	1	yes	normal completion	95
22:56:20 - 22:56:40 on 03/04/2001	Vehicle	40	E15	E15	1	yes	normal completion	182
22:55:46 - 22:56:06 on 03/04/2001	Vehicle	30	E15	E15	1	yes	normal completion	208
22:54:49 - 22:54:59 on 03/04/2001	Vehicle	20	E15	E15	1	yes	normal completion	117

Log Viewer

Auto Refresh Refresh Attached OSP

PREEMPTS ENABLED Maximum Codes Capacity: 9999
Maximum Log Capacity: 1390

AUTOMATED WEATHER STATION

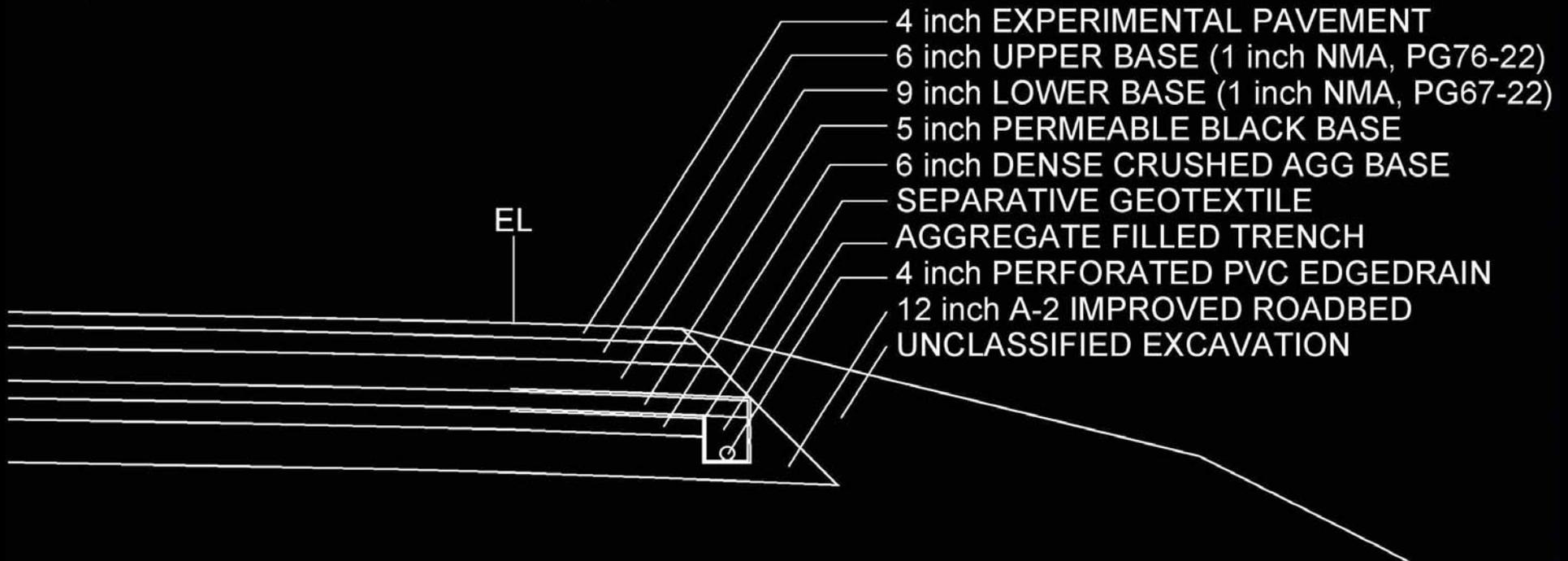


UNDERDRAIN INSTALLATION



TRACK BUILDUP

OUTSIDE RESEARCH LANE
(inside lane has same buildup)



EDGEDRAIN OUTLET



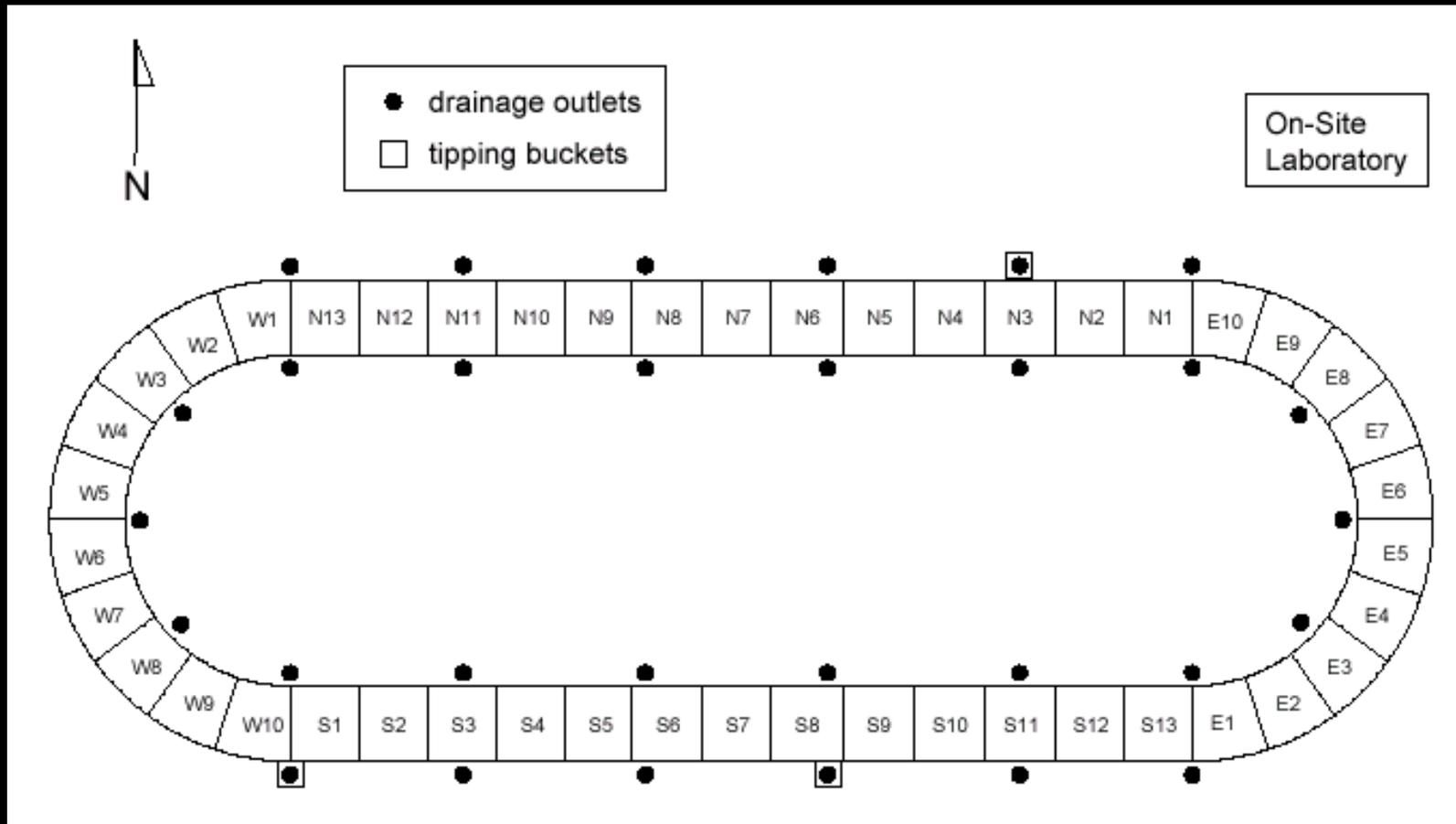
EDGEDRAIN OUTFLOW



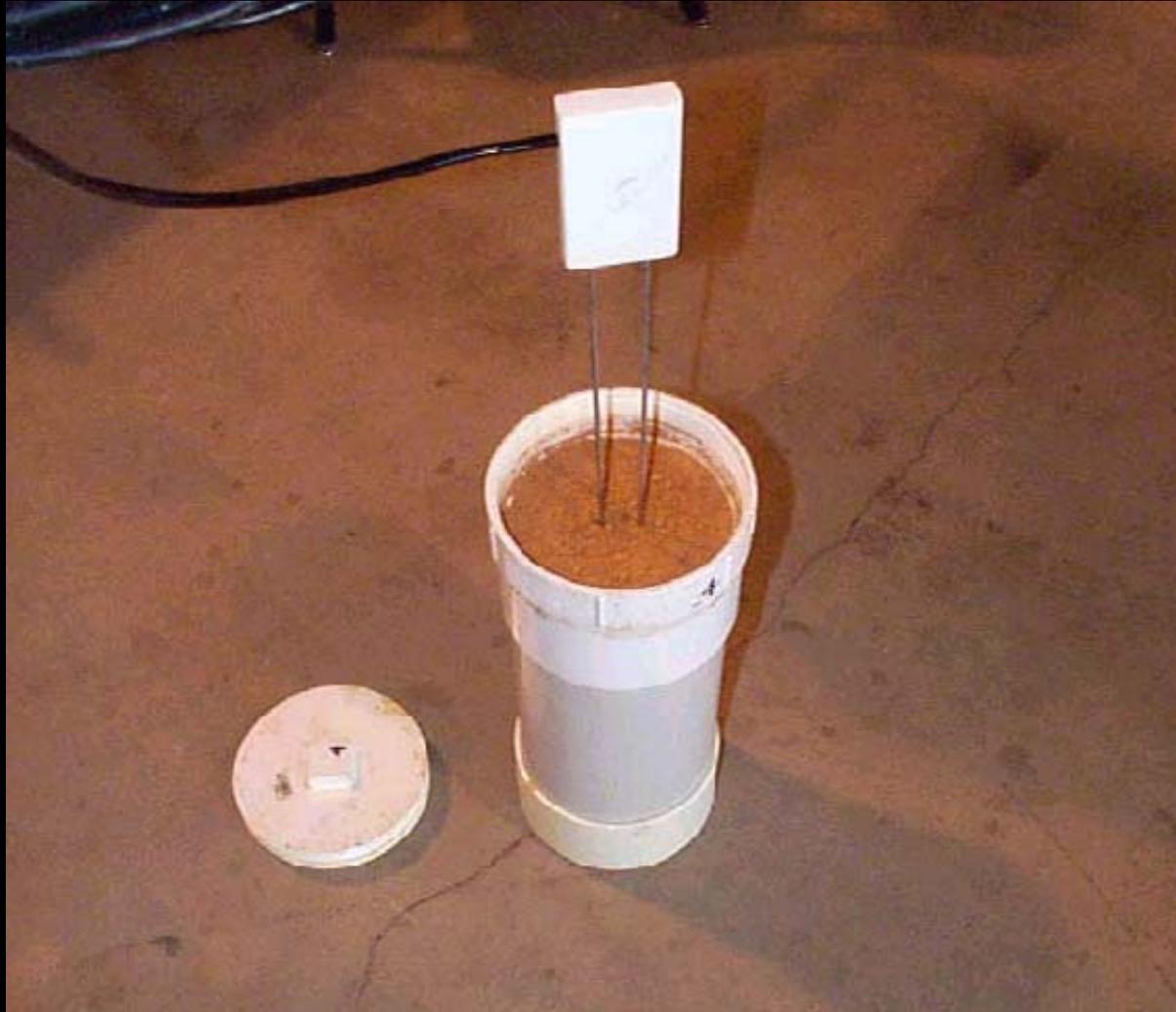
TIPPING BUCKET ENCLOSURE



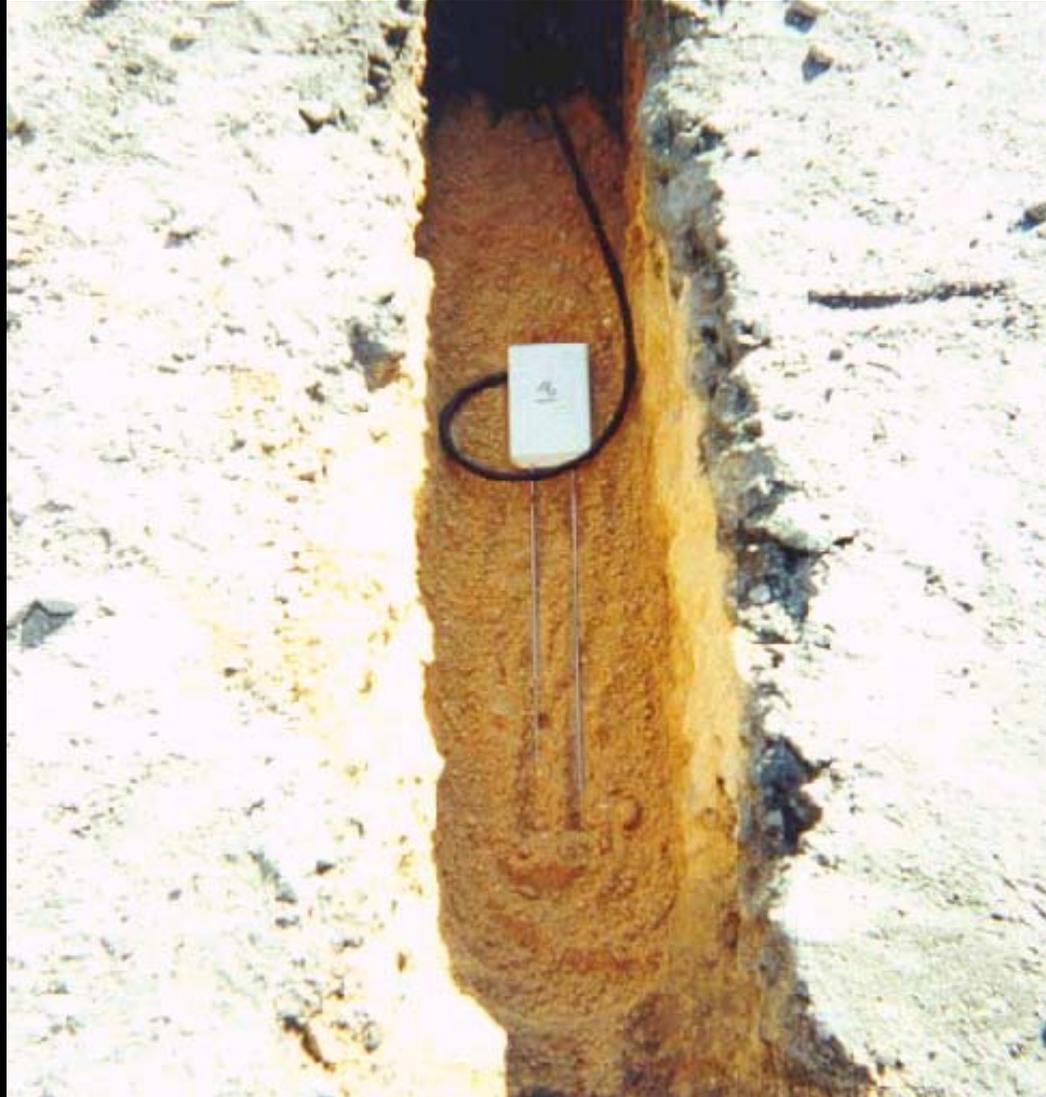
TIPPING BUCKET LOCATIONS



TIME DOMAIN REFLECTOMETRY



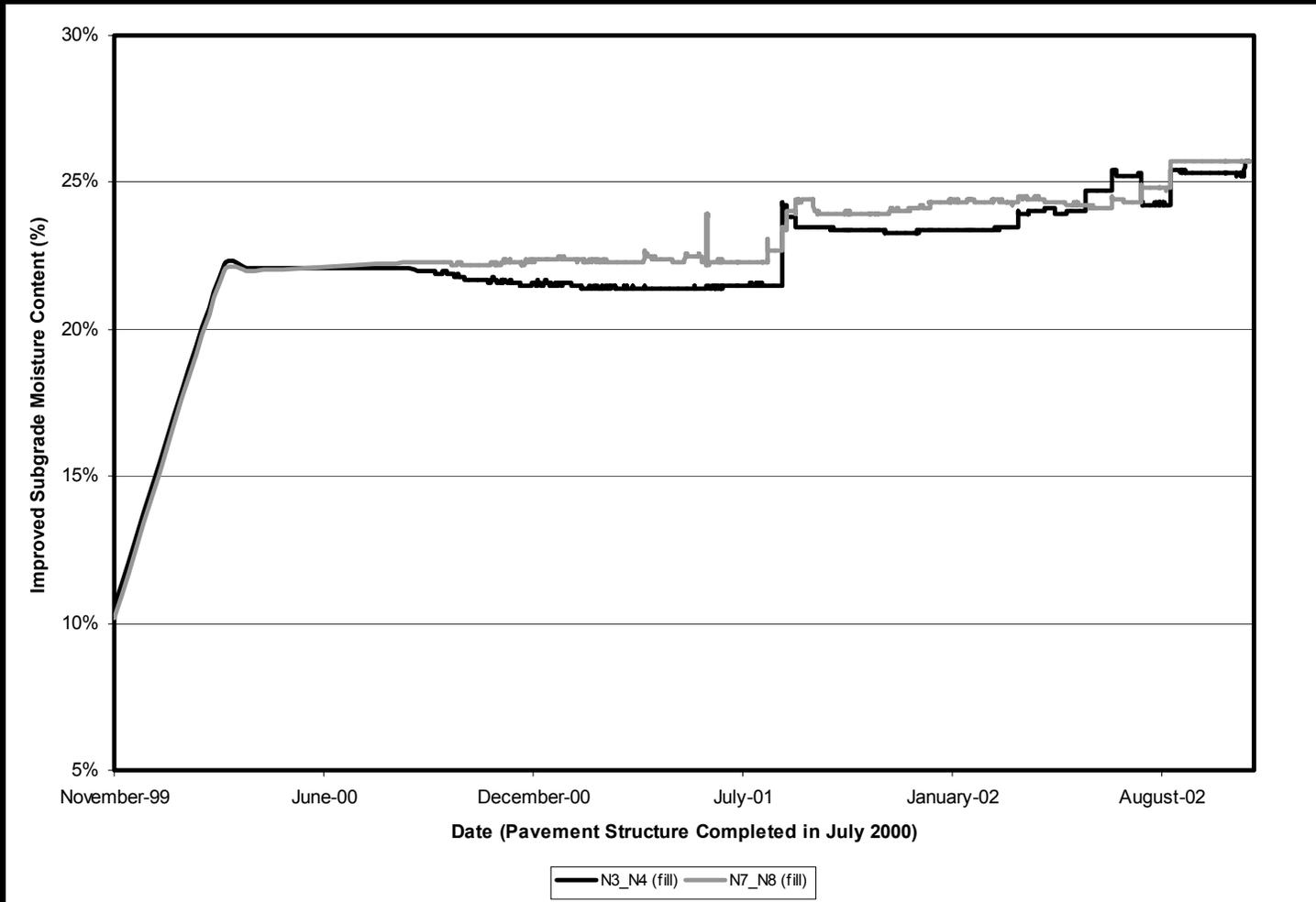
MOISTURE PROBE INSTALLATION



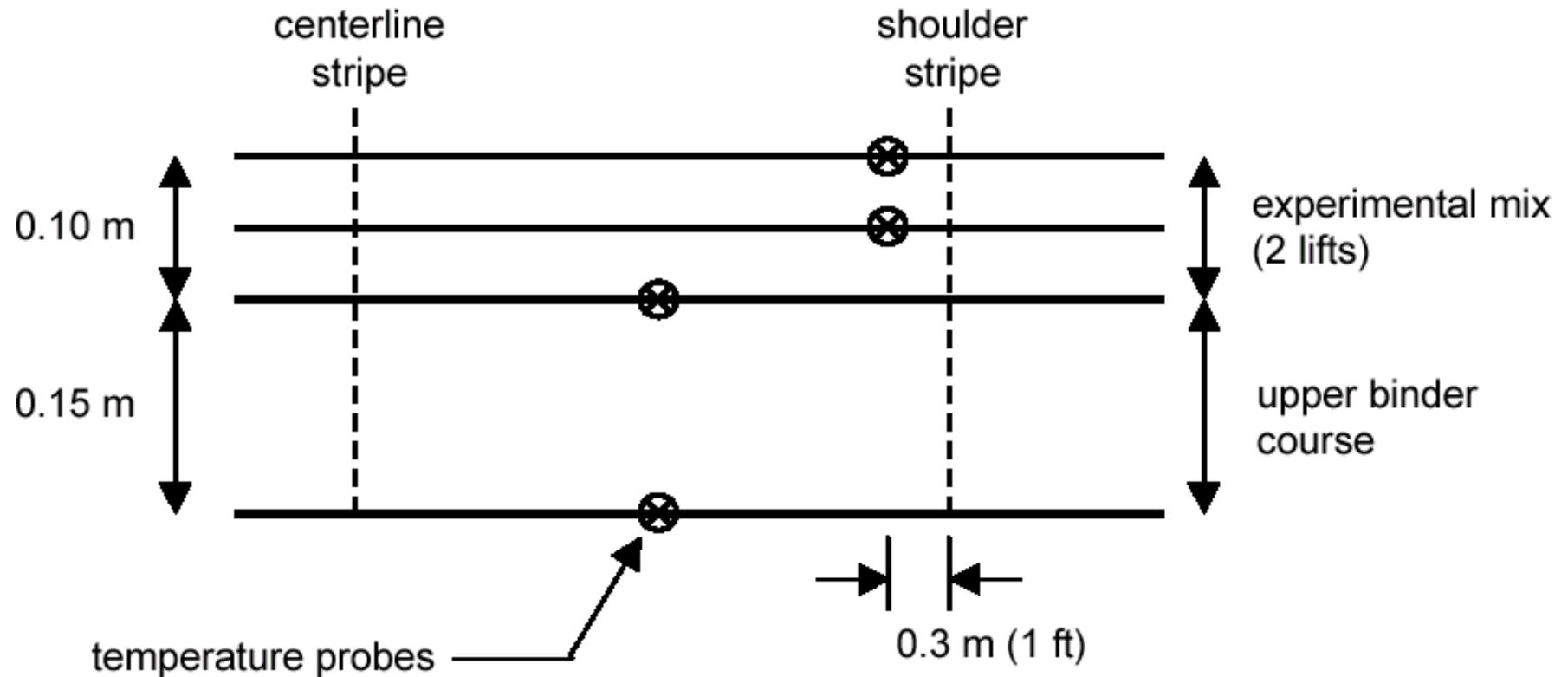
MOISTURE PROBE INSTALLATION



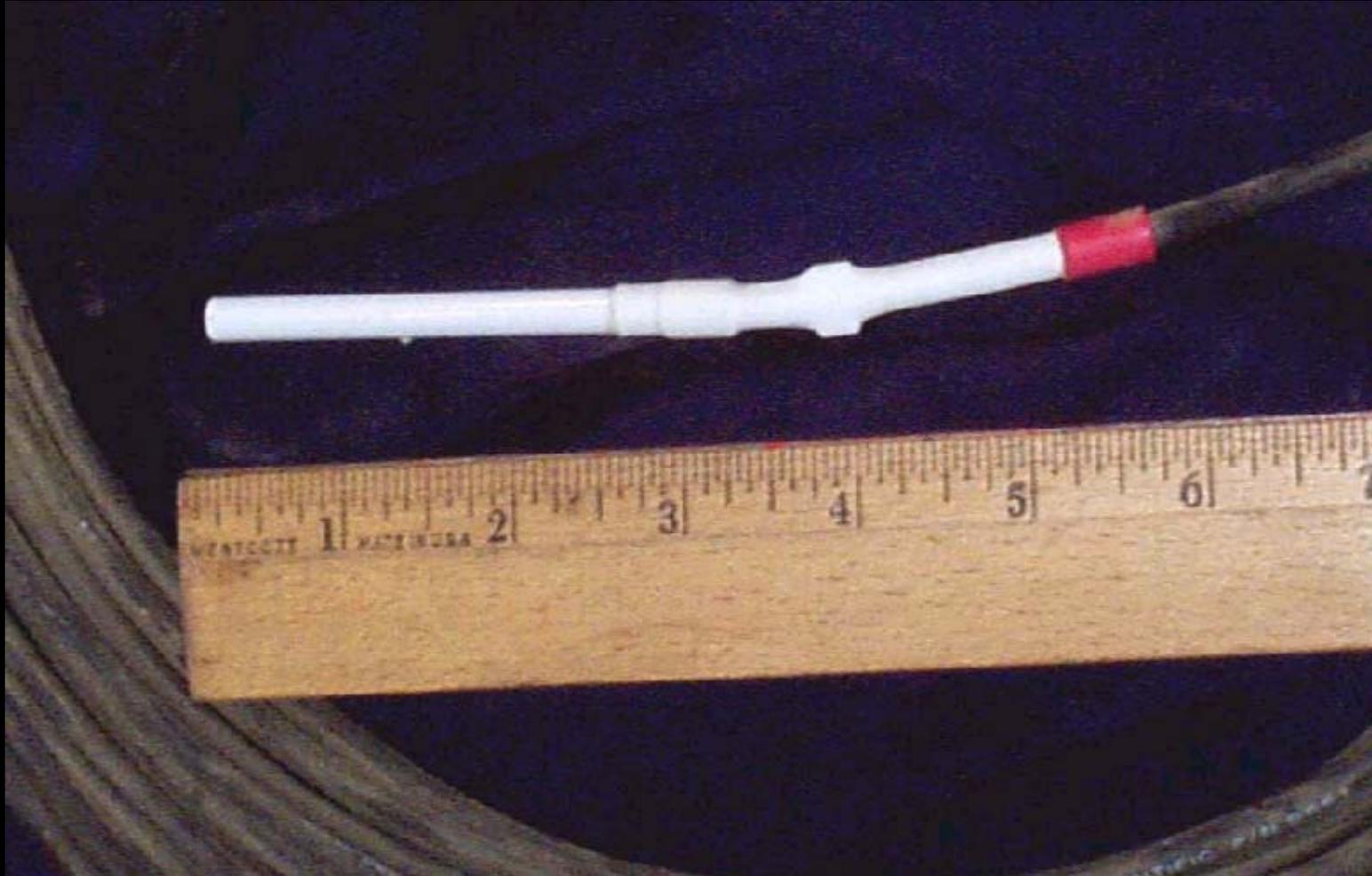
SUBGRADE MOISTURE



MULTIDEPTH TEMPERATURES



TEMPERATURE PROBE



PROBE INSTALLATION



PROBE INSTALLATION



PROBE INSTALLATION



PROBE INSTALLATION



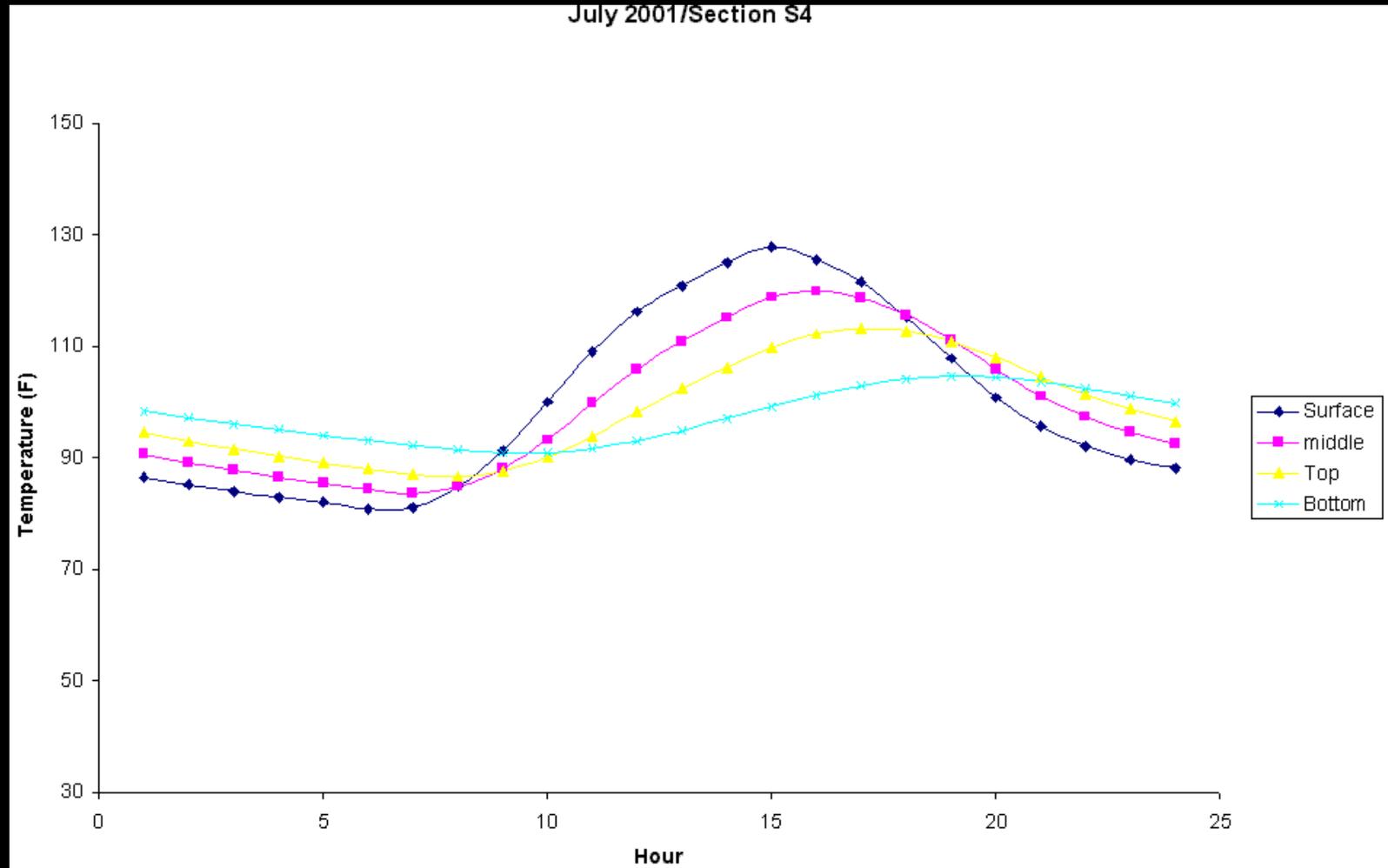
PROBE INSTALLATION



PROBE INSTALLATION



MULTIDDEPTH TEMPERATURES



EXPOSED PROBE LEADS



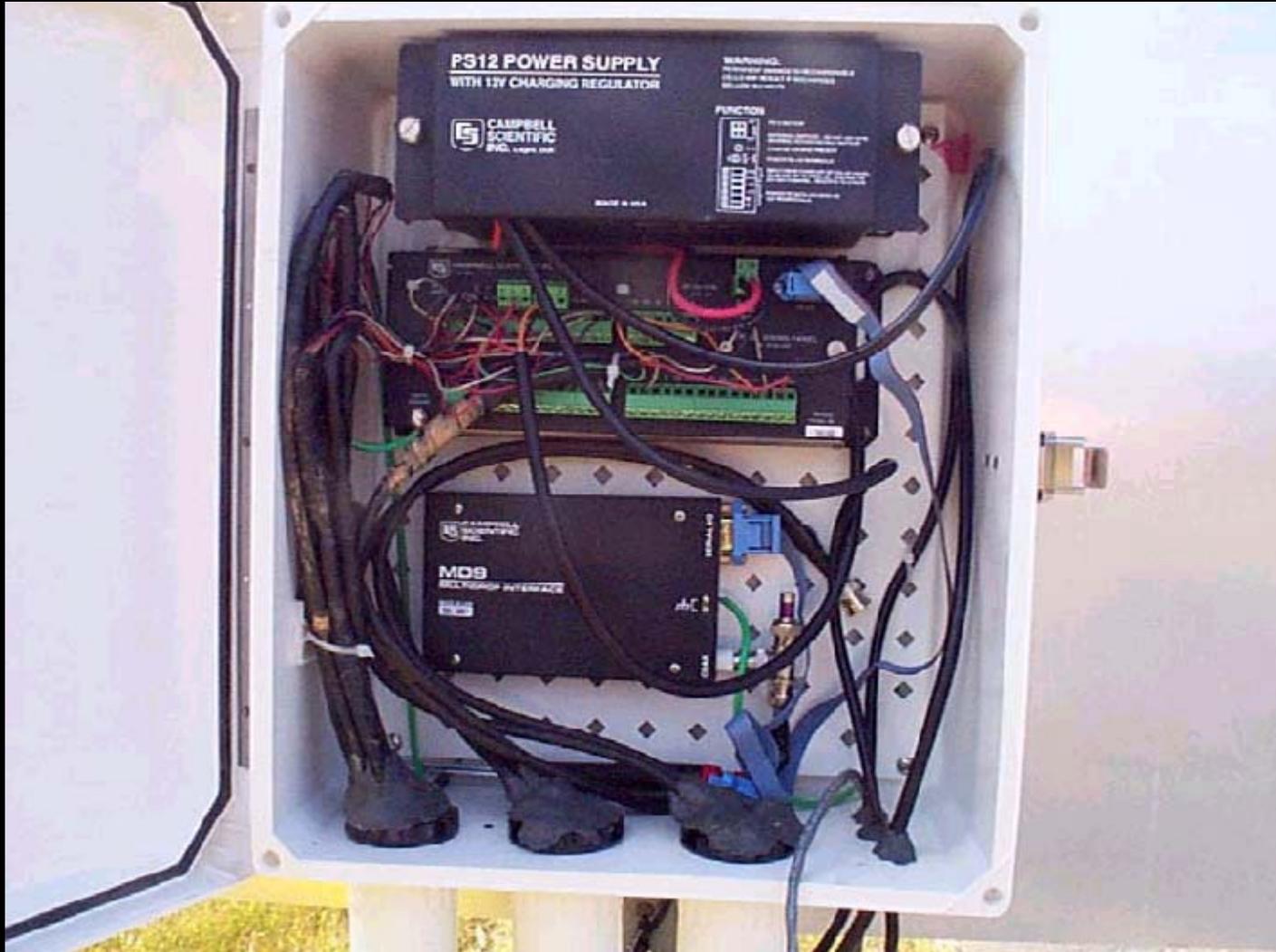
CABLE MANAGEMENT



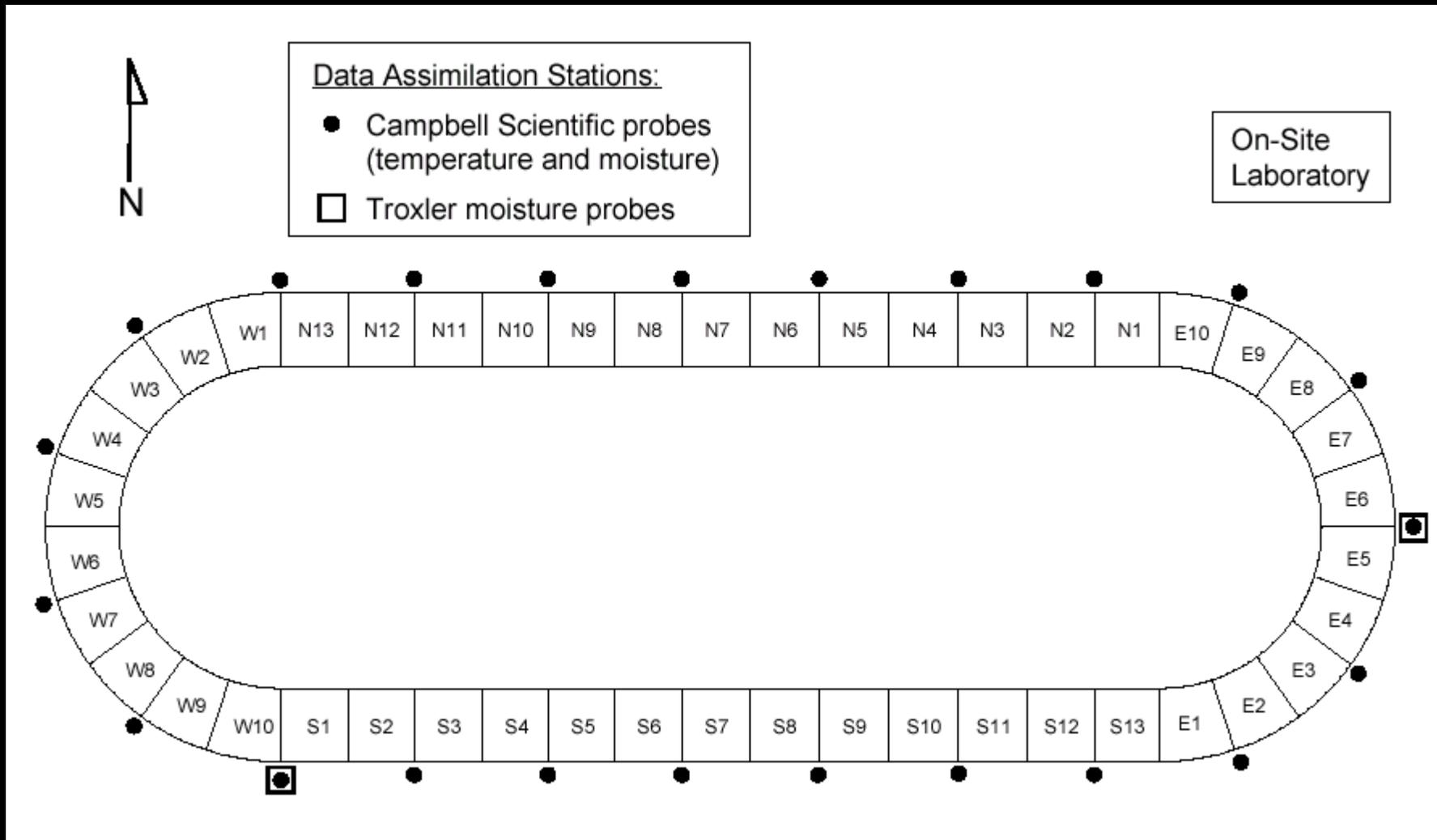
DATA COLLECTION



DATALOGGER



DATALOGGER LOOP

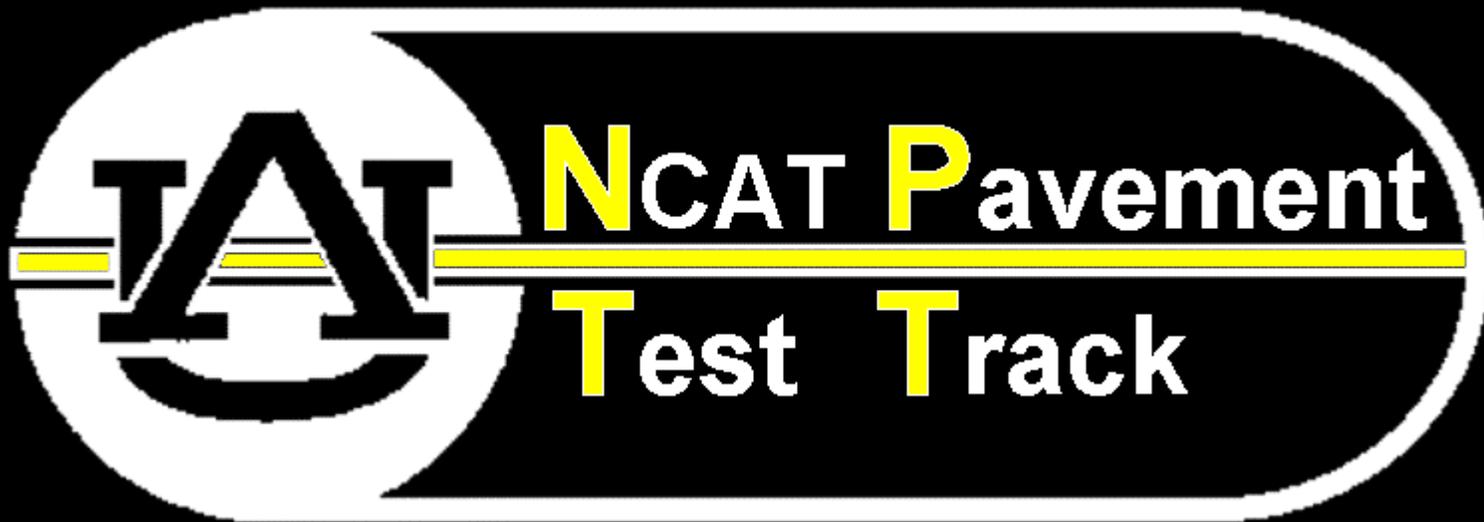


ROAD HAZARD



2000 EXPERIENCES

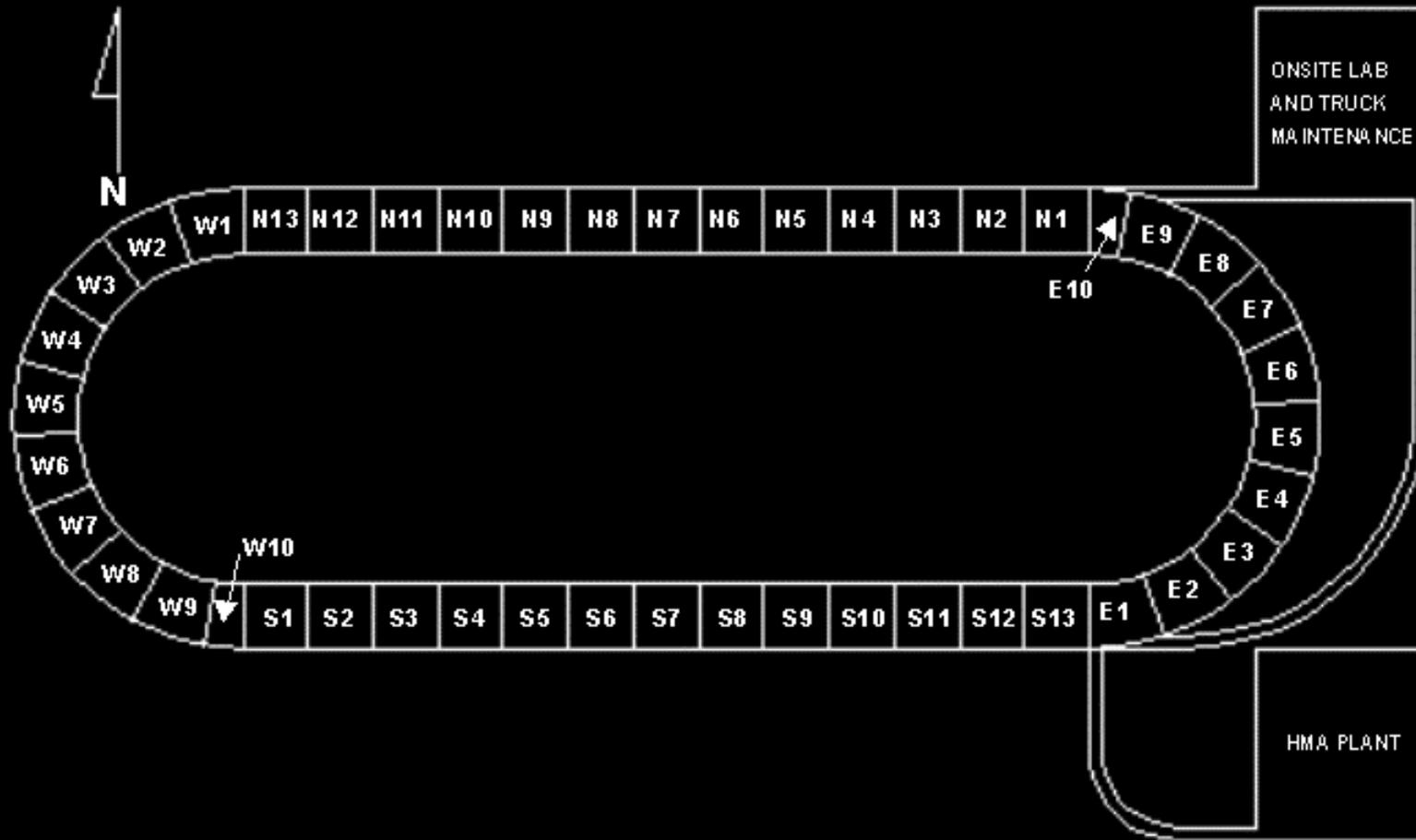
- Infrared VID System Not Reliable
- Weather Station Maintenance Free
- 1/3 TDR Gages Lost to Lightening
- 85% Thermistors Surviving
- Tipping Bucket Maintenance
- CR10X Units are Extremely Robust



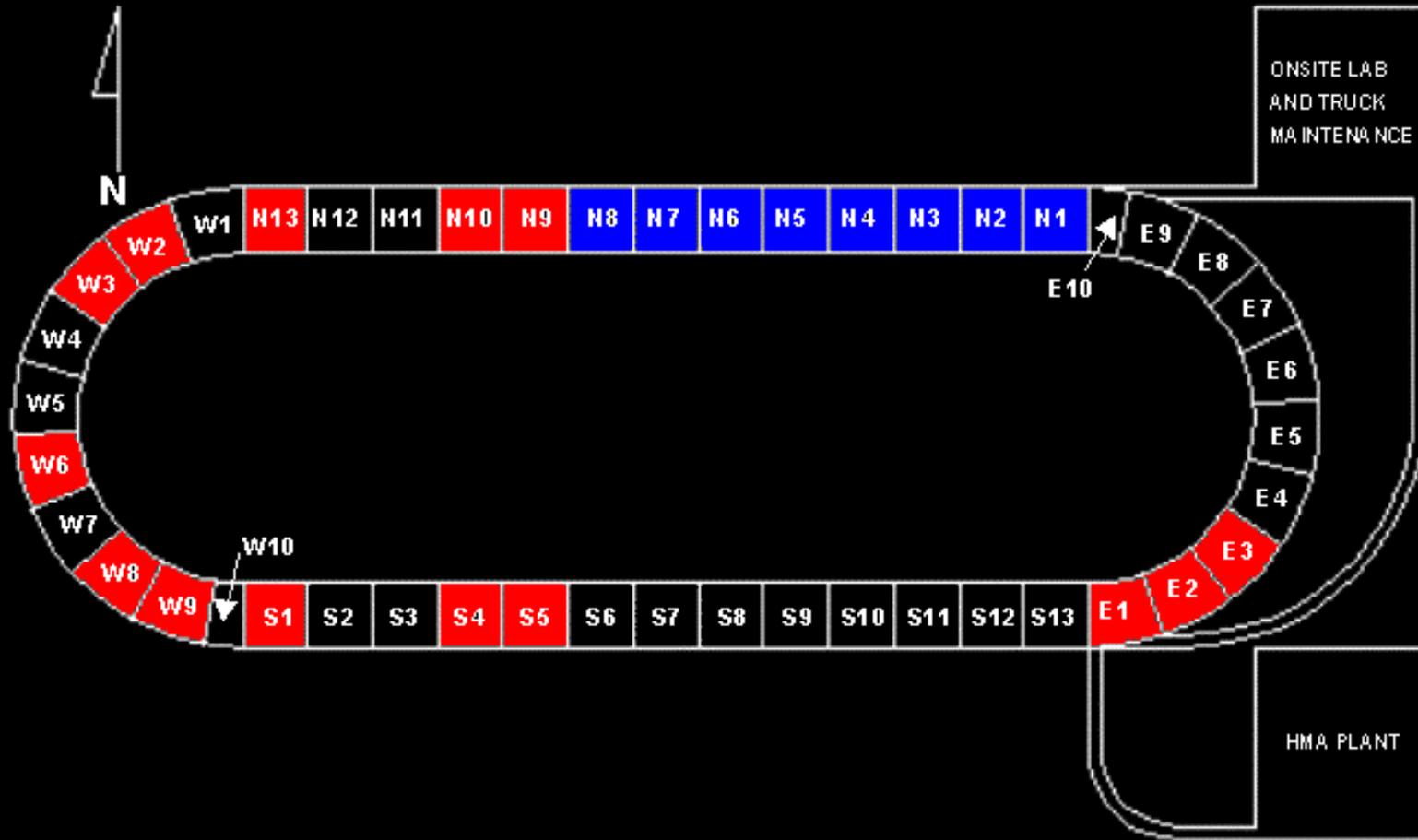
2003

- **Continue Traffic**
- **Mill and Inlay**
- **Structural Study**

TRACK LAYOUT



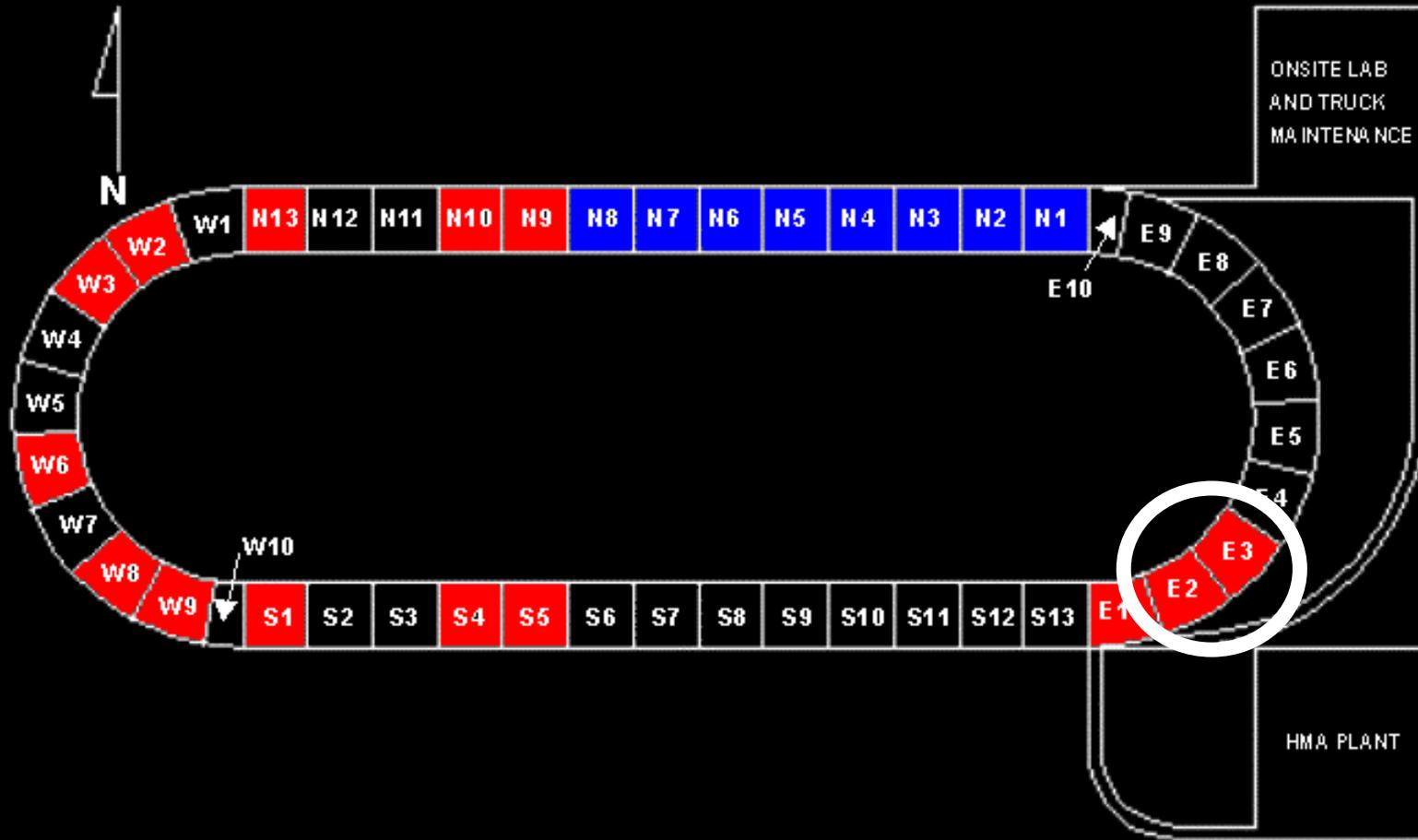
2003 EXPERIMENT



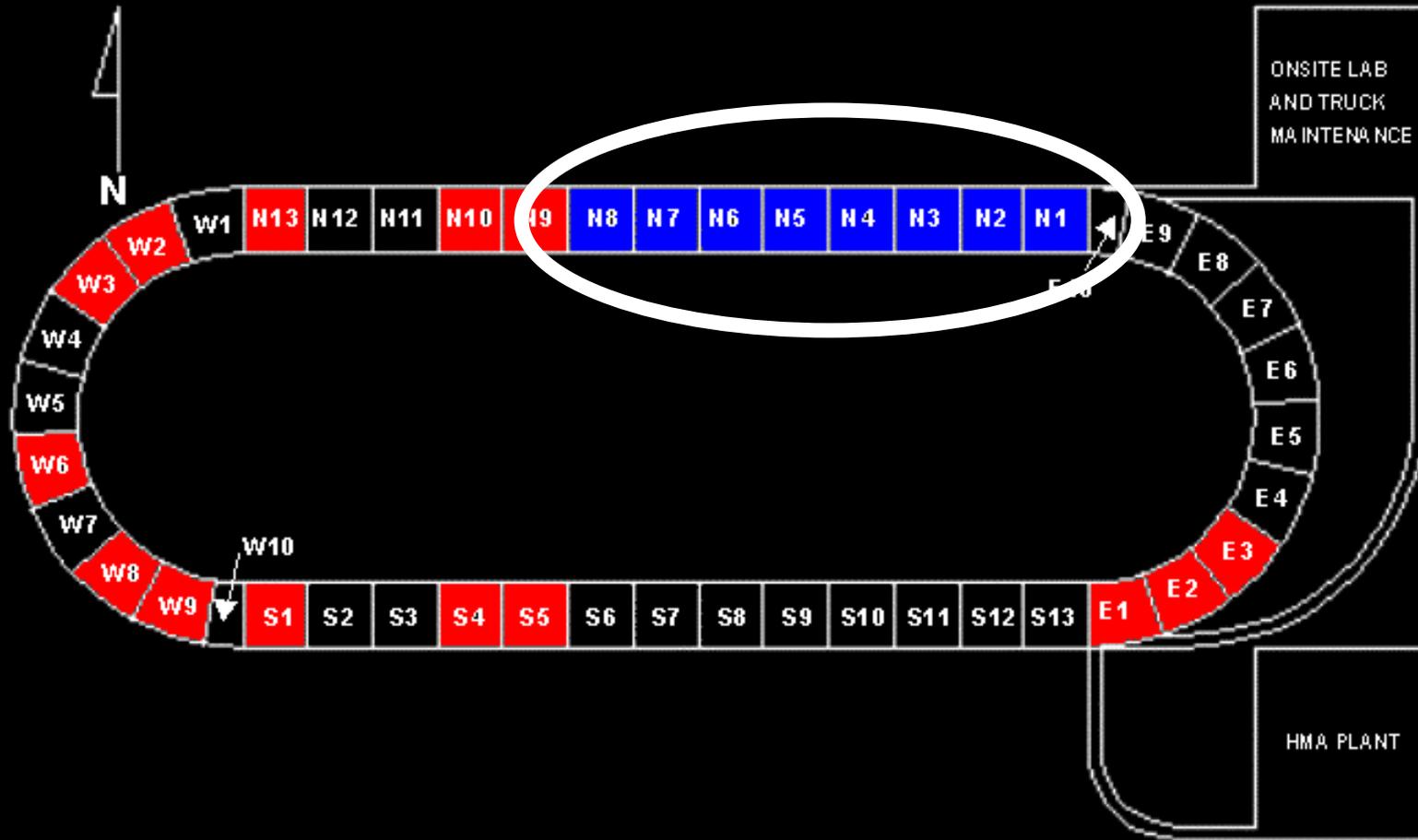
2003 INSTRUMENTATION PLAN

- Continue 2000 Environmental Monitoring
- Vertical Probe for Multi-Depth Temperatures
- Post Construction Temperature Instrumentation
- Focus on Mechanistic Gages During Construction
- High Speed Dataloggers Will Be Required
- Gages by Campbell, CTL, Geokon & Dynatest
- Learn for Larger Structural Project in 2006

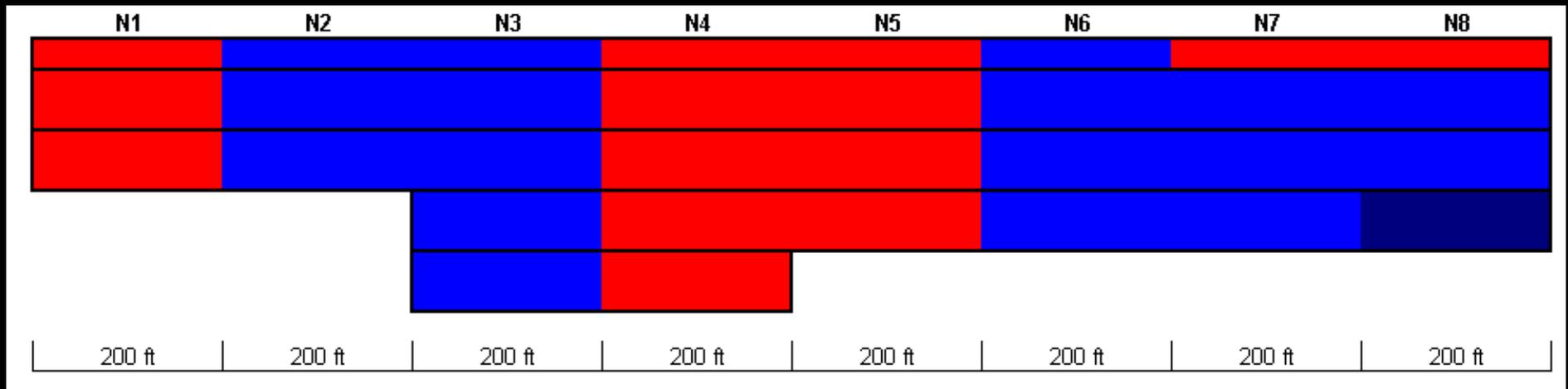
FLORIDA RUTTING SECTIONS



ALABAMA STRUCTURAL SECTIONS



ALDOT STRUCTURAL STUDY

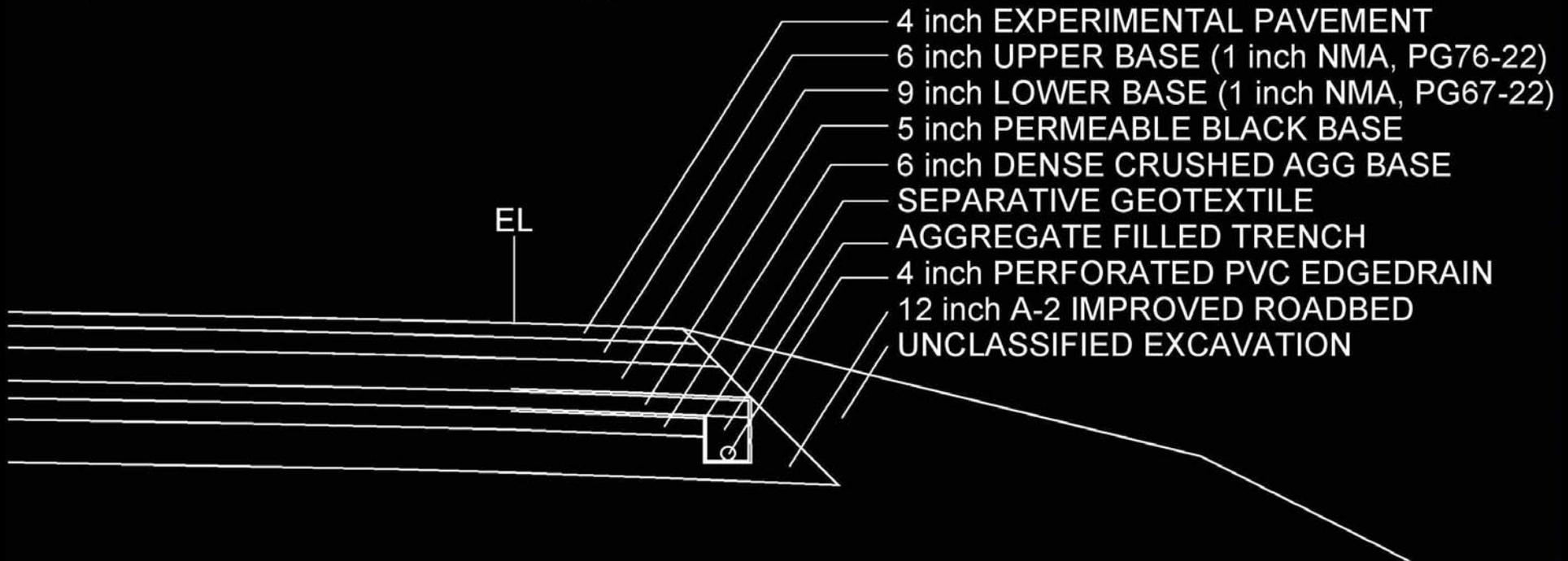


UNIFORM SUBGRADE @ $\approx 30''$



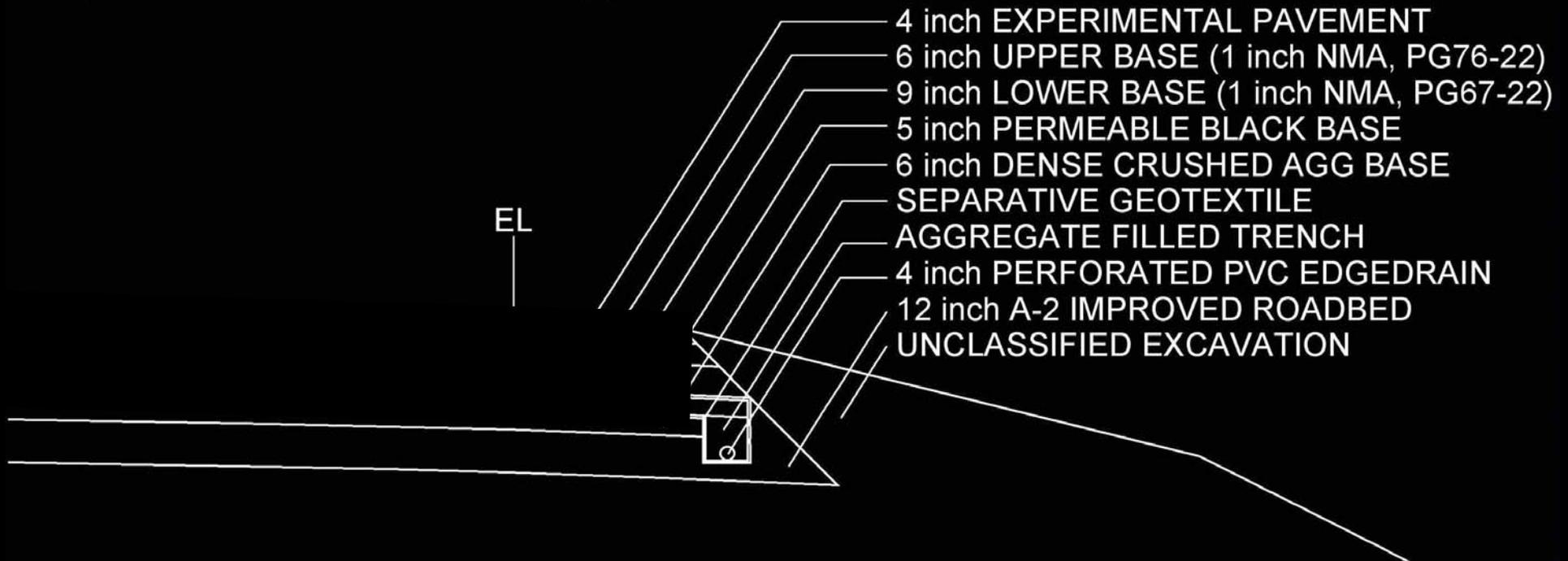
TRACK BUILDUP

OUTSIDE RESEARCH LANE
(inside lane has same buildup)



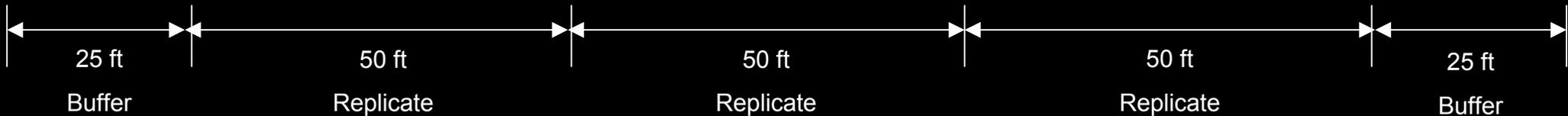
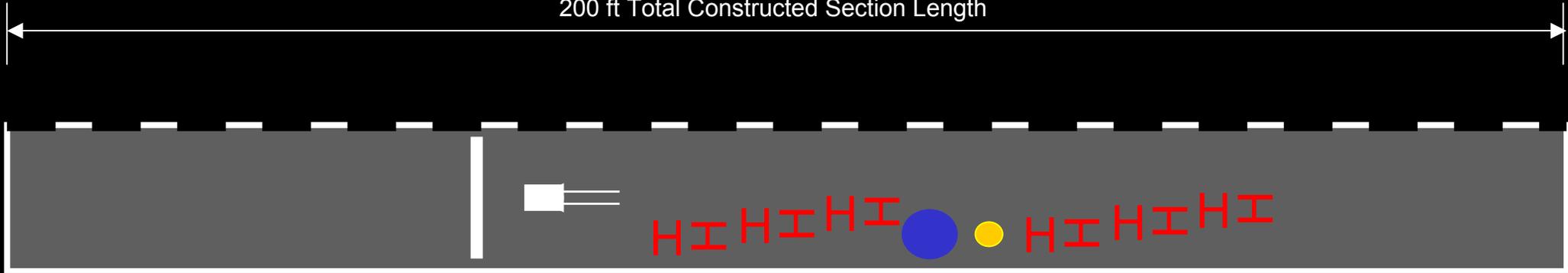
TRACK BUILDUP

OUTSIDE RESEARCH LANE
(inside lane has same buildup)



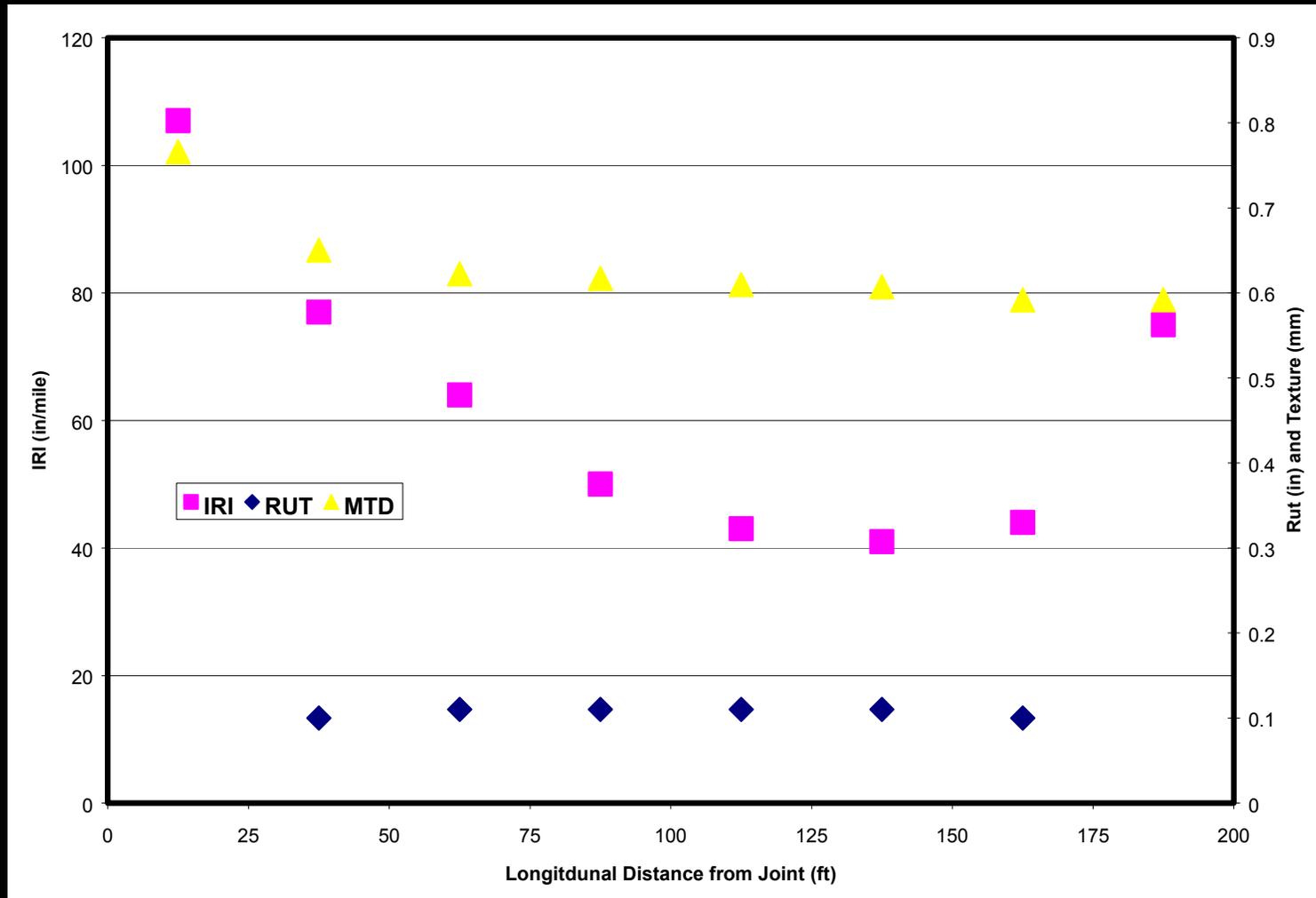
STRUCTURAL INSTRUMENTATION LAYOUT

200 ft Total Constructed Section Length



-  - Stack of Two 9”D Pressure Cells (Top of Subgrade & Base)
-  - Bridge Type Strain Gage in the Longitudinal Direction Under HMA
-  - Bridge Type Strain Gage in the Transverse Direction Under HMA
-  - Stack of Two Inductive Coils (Small Diameter) for Vertical Strain
-  Time Domain Reflectometry Moisture Gage in Subgrade
-  Piezoelectric Pressure Sensitive Trigger Switch (& “Z”)

ARAN GENERATED DATA



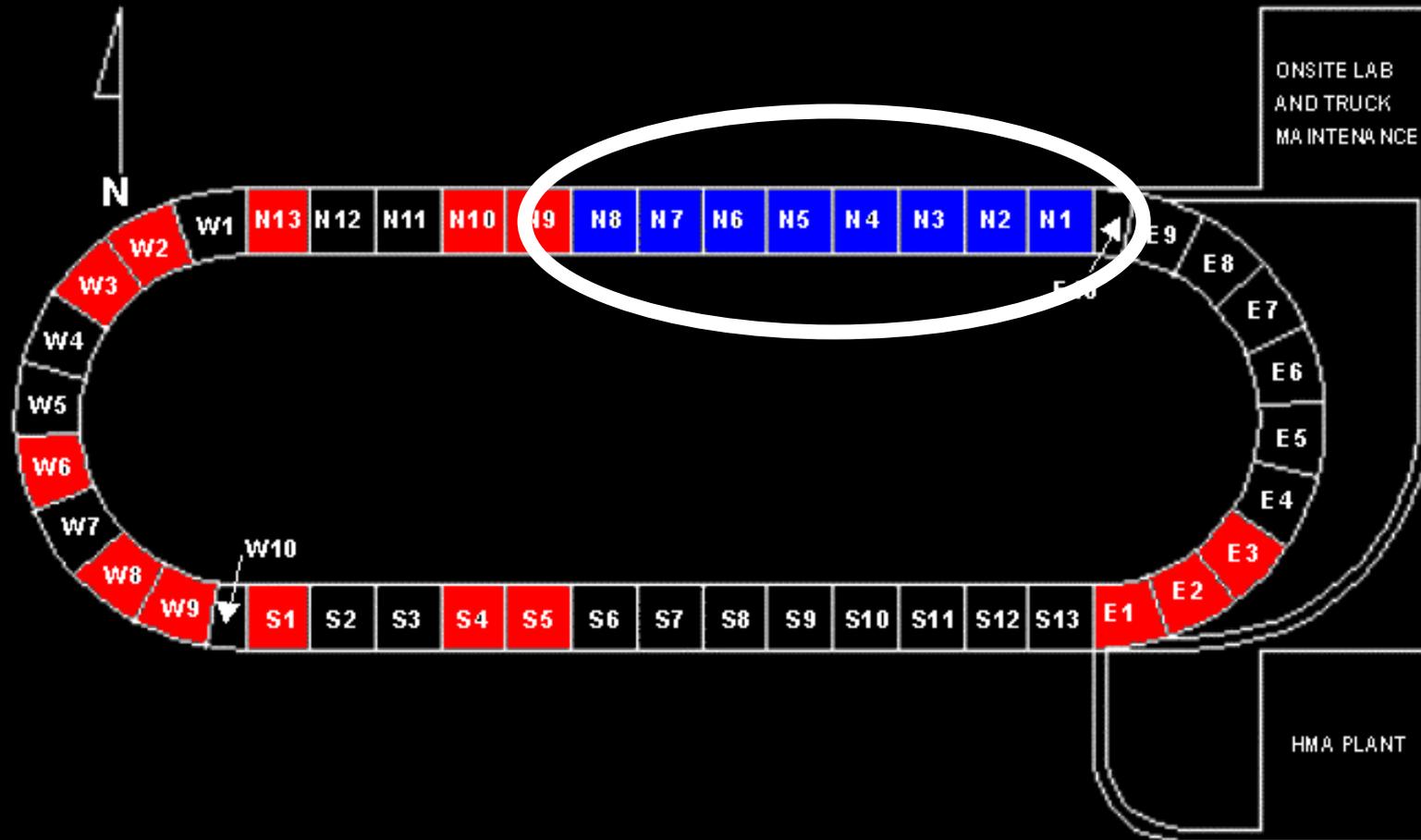
CONSTRUCTION HINDERANCES



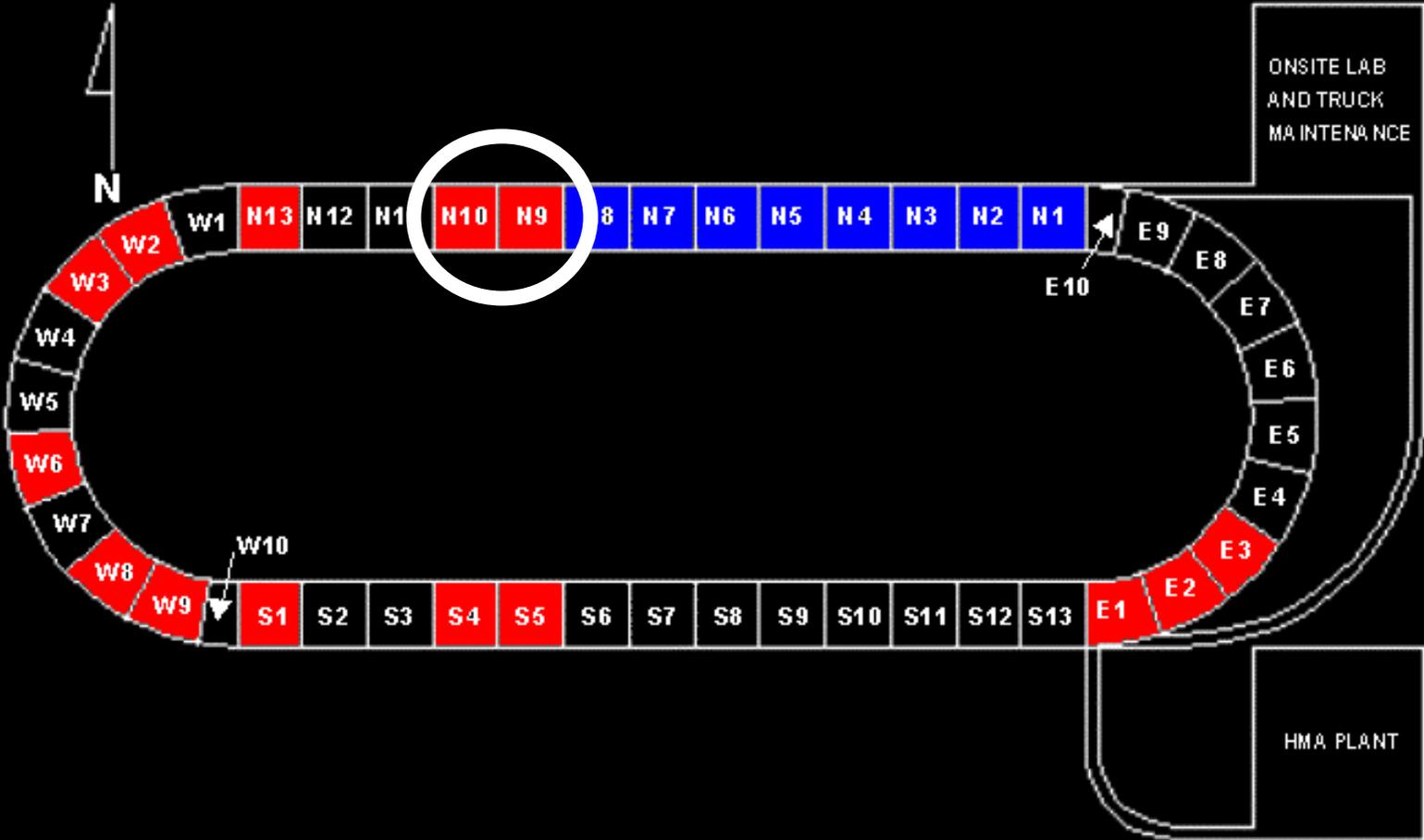
CONSTRUCTION HINDERANCES



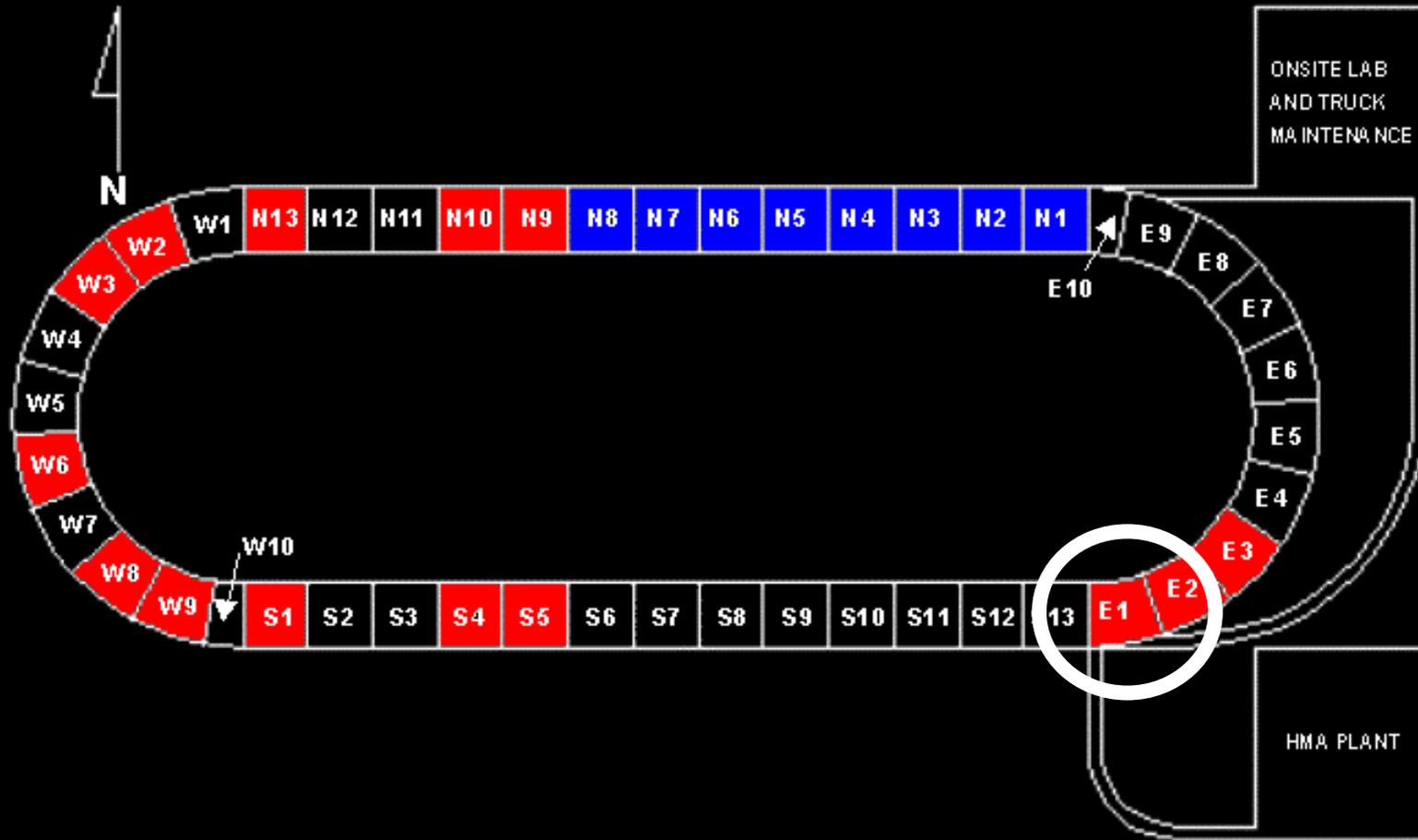
AL STRUCTURAL SECTIONS



MO RUTTING SECTIONS



TN RUTTING SECTIONS



ACKNOWLEDGEMENTS

- Instrumentation Consultants – Tom and Fiesta McEwen
- WES Expertise - Reed Freeman and Tommy Carr