



Accelerated Pavement Testing with the HVS

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Base Course Layer Construction Using Marginal Materials

CONCERN: Need guidance for the use of marginal materials in base course construction for airfield pavements.

OBJECTIVES:

- Assess **performance** of marginal aggregate-soil base course mixtures
- Develop guidance for the use of **marginal materials** in base course construction for airfield pavements

Test Items

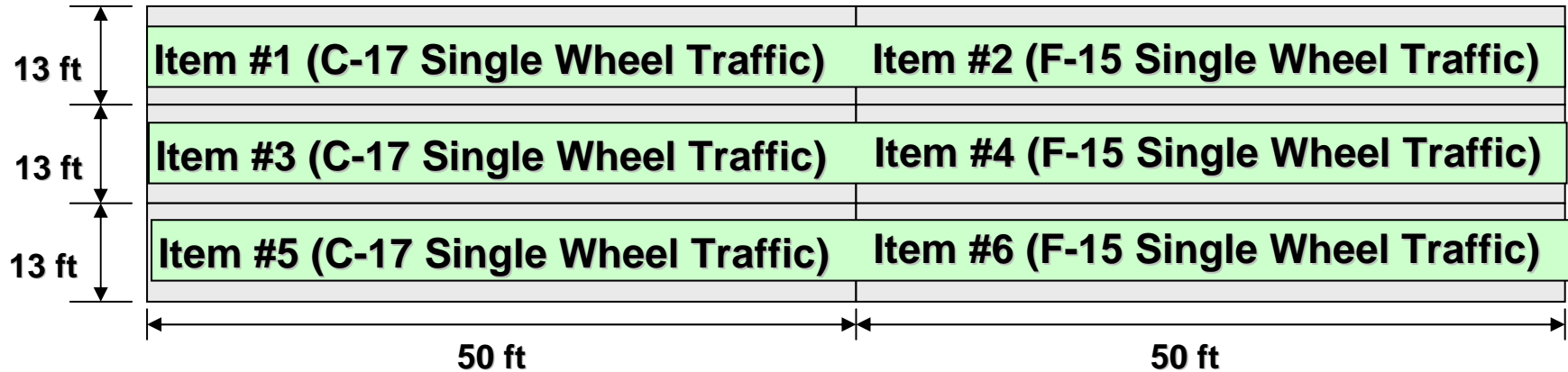


Table 1. Marginal Materials Evaluation Matrix

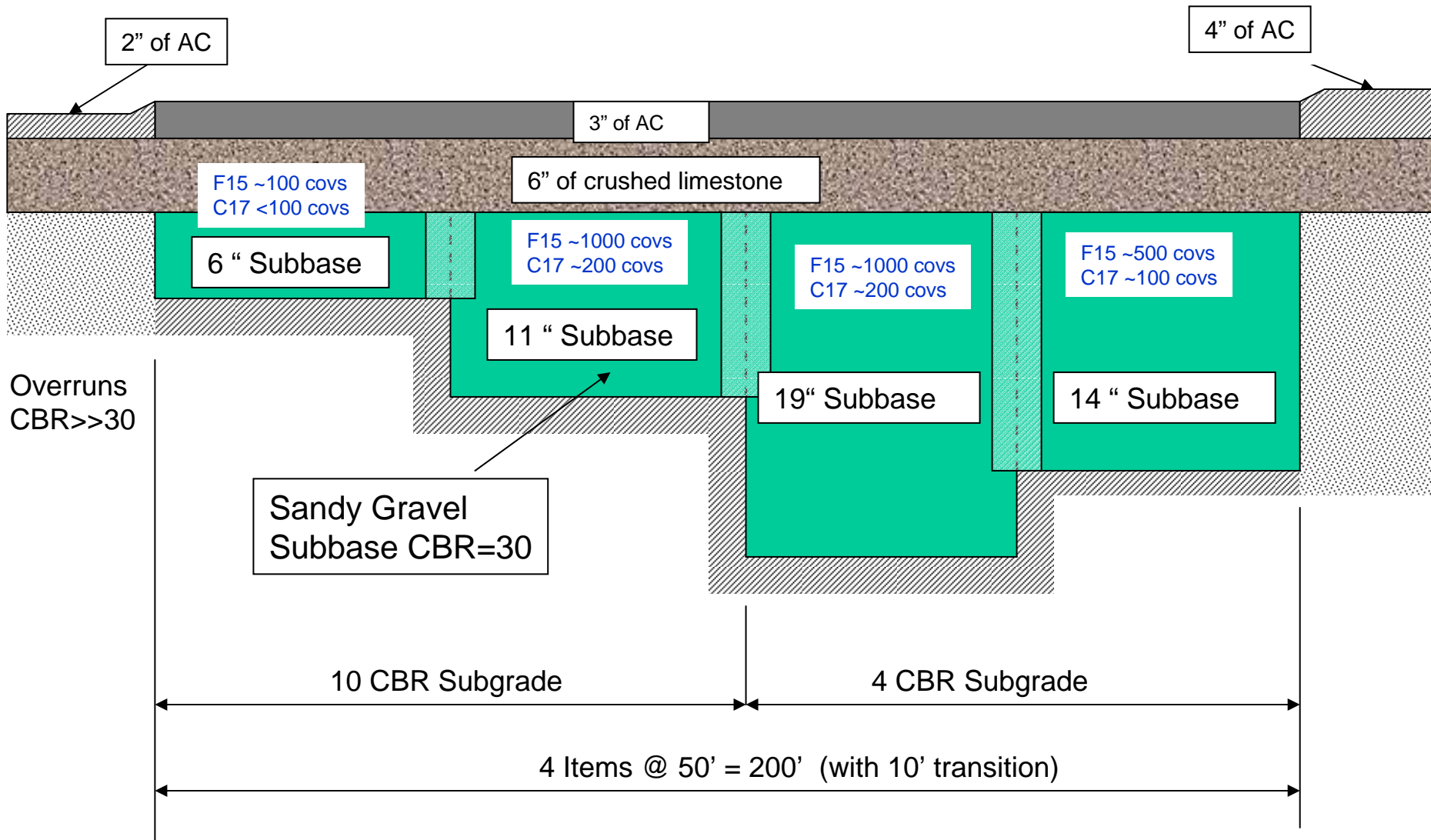
Pavement Type	Asphalt Concrete Thickness (in.)	Base Strength CBR (%)	Base Thickness (in.)	Aircraft Tire Pressure (psi)
Item #1	5	40	6	142
Item #3	5	50	6	142
Item #5	5	60	6	142
Item #2	5	40	6	325
Item #4	5	50	6	325
Item #6	5	60	6	325

Validation of CBR Stress-Based Design Procedure

OBJECTIVES:

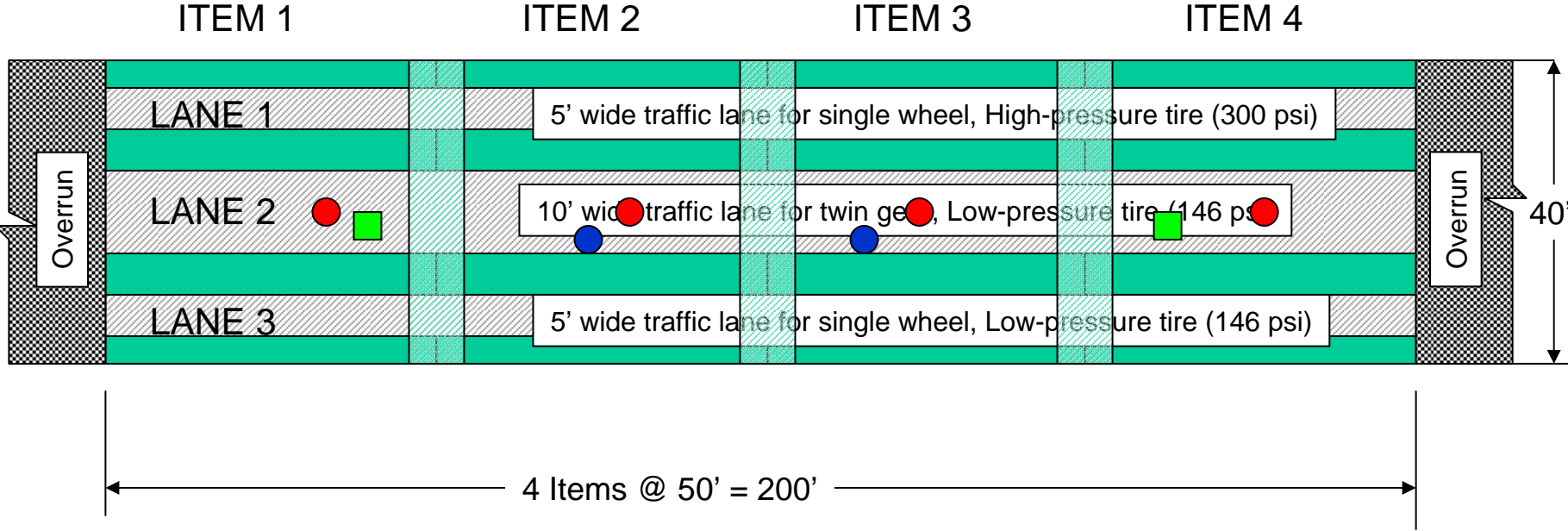
- Verify modeling stress distribution using **Frohlich's stress concentration factor**
- Verify that **superposition** can be used to compute the vertical stress due to multi-wheel loading
- Verify **Beta criteria** for single wheel and multi-wheel traffic
- Investigate the benefits for considering a more sophisticated method for computing **repetitions of stress** at the top of the subgrade
- Develop a methodology for handling **mixed traffic**
- Add a method for computing **design reliability**

Test Items



Elevation

Traffic Lanes



Plan View

- SDD SURF-SUBG
- SDD SUBG-NATURAL SOIL
- SDD SURF-NATURAL SOIL

Evaluation of Minimum AC Thickness Criteria

CONCERN: There is a need to validate current minimum AC thickness requirements and to quantify the effect of operating on thin AC pavements within the theater of operations.

OBJECTIVES:

- Verify **minimum thickness** requirements used in current AC pavement design
- Evaluate the **constructability** of thin AC
- Identify principle failure mechanisms of **premature deterioration** of thin AC in theater of operations
- Quantify the **service life** of thin AC pavements

APPROACH

➤ Full-Scale Test Section

- 100' x 39'
- 6 items
 - 50' x 13'

Pavement Type	AC Thickness (in.)	Base Thickness (in.)	Base Strength CBR (%)	Subbase Thickness (in.)	Subbase Strength CBR (%)	Aircraft Tire Pressure (psi)
Contingency Cargo A	2.5	8	80	17	30	142
Contingency Cargo B	3.5	7	80	17	30	142
Short Field Cargo A	4	6	100	16	30	142
Short Field Cargo B	5	6	80	15	30	142
Light Load A	4	6	100	14	30	325
Light Load B	5	6	80	12	30	325

➤ Instrumentation

- Strain Gauges
- EPC
- SDD



TRAFFICKING

- HVS-A
 - ~10,000 passes per item
 - Single-Wheel Load
 - C-17 @ 142 psi
 - F-15 @ 325 psi





Questions?

