

MIX DESIGN PROTOCOL

FIELD SAMPLE

**DETERMINING STABILIZER BY
No. 200 SIEVE / PLASTIC INDEX**

**Determine In-Situ Moisture
Content and Record
ASTM D2216**

**Soil Classification
ASTM D2487**

>25 Percent passing No. 200

<25 Percent passing No. 200

**Perform Atterberg Limit
ASTM D4318**

**Perform Atterberg Limit
ASTM D4318**

PI > 25

**PI
10 to 25**

**PI
10 to 25**

PI <10

**QUICKLIME
(+ 90% CaO)
or
(55-60%CaO
/35-40%MgO)**

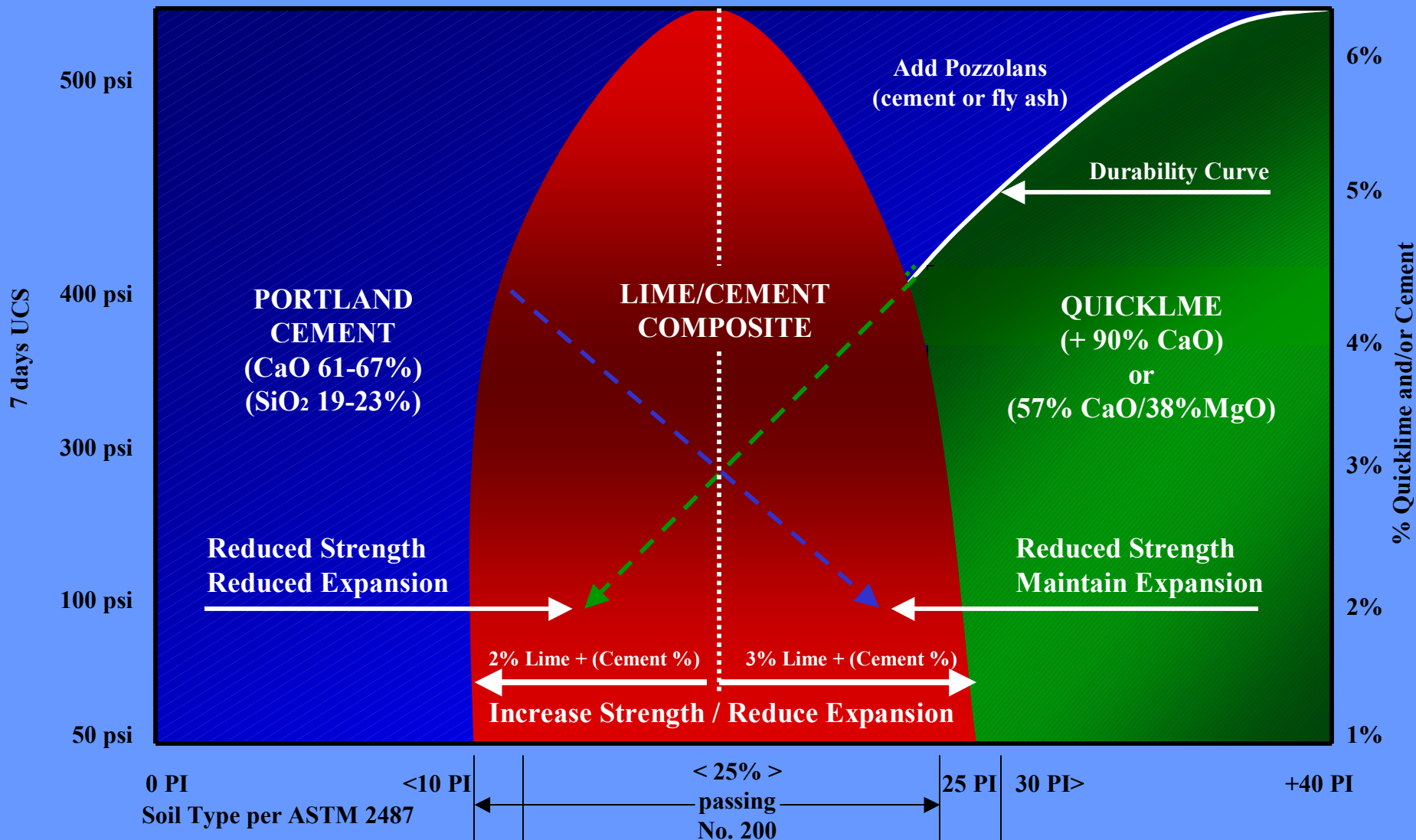
**Quicklime
/Cement or
Pozzolan Blends**

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/Cement or
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**PORTLAND
CEMENT
(CaO 61-67%)
(SiO₂ 19-23%)**

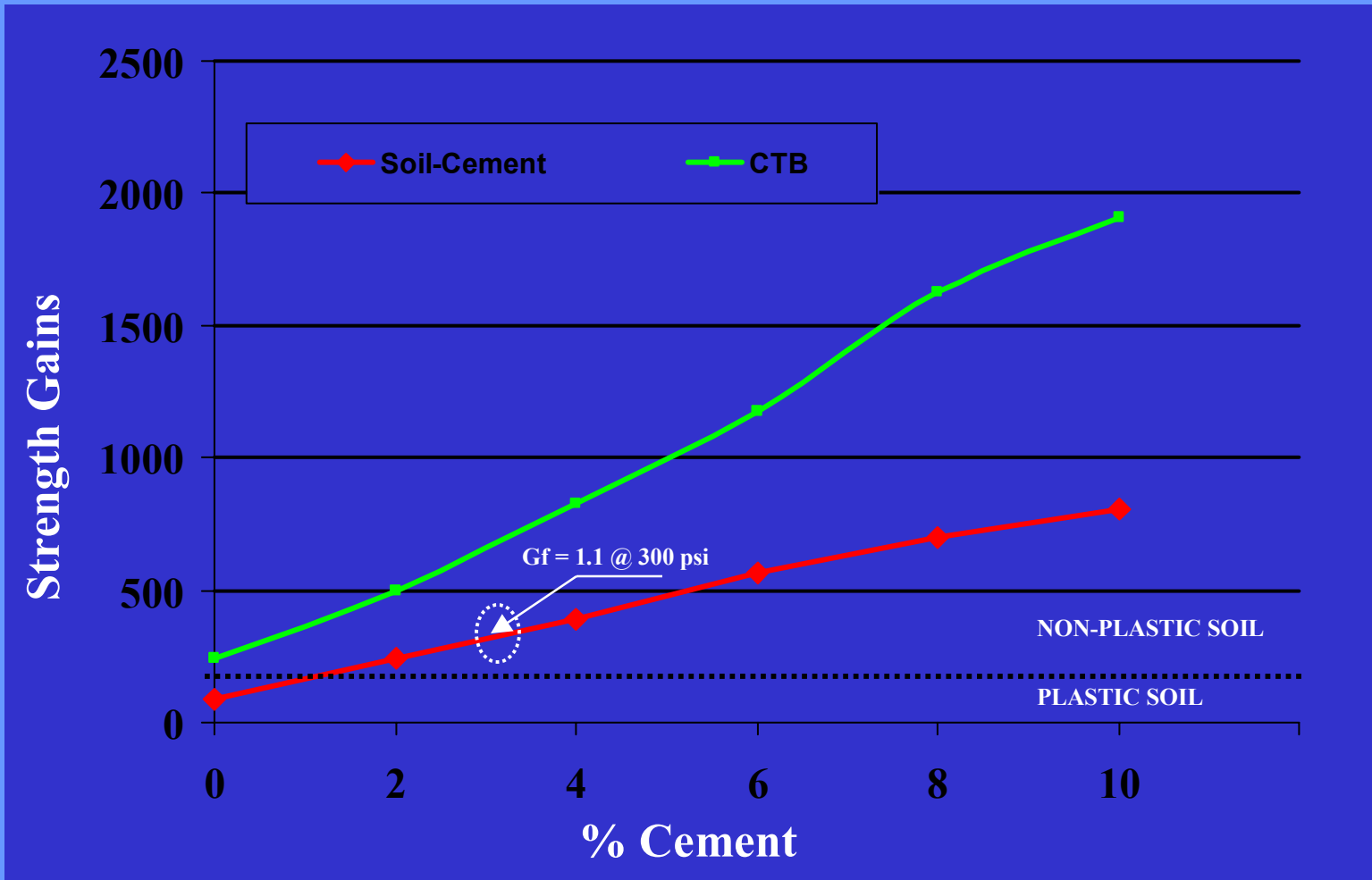
CHEMICAL SOIL STABILIZATION

A BALANCE APPROACH



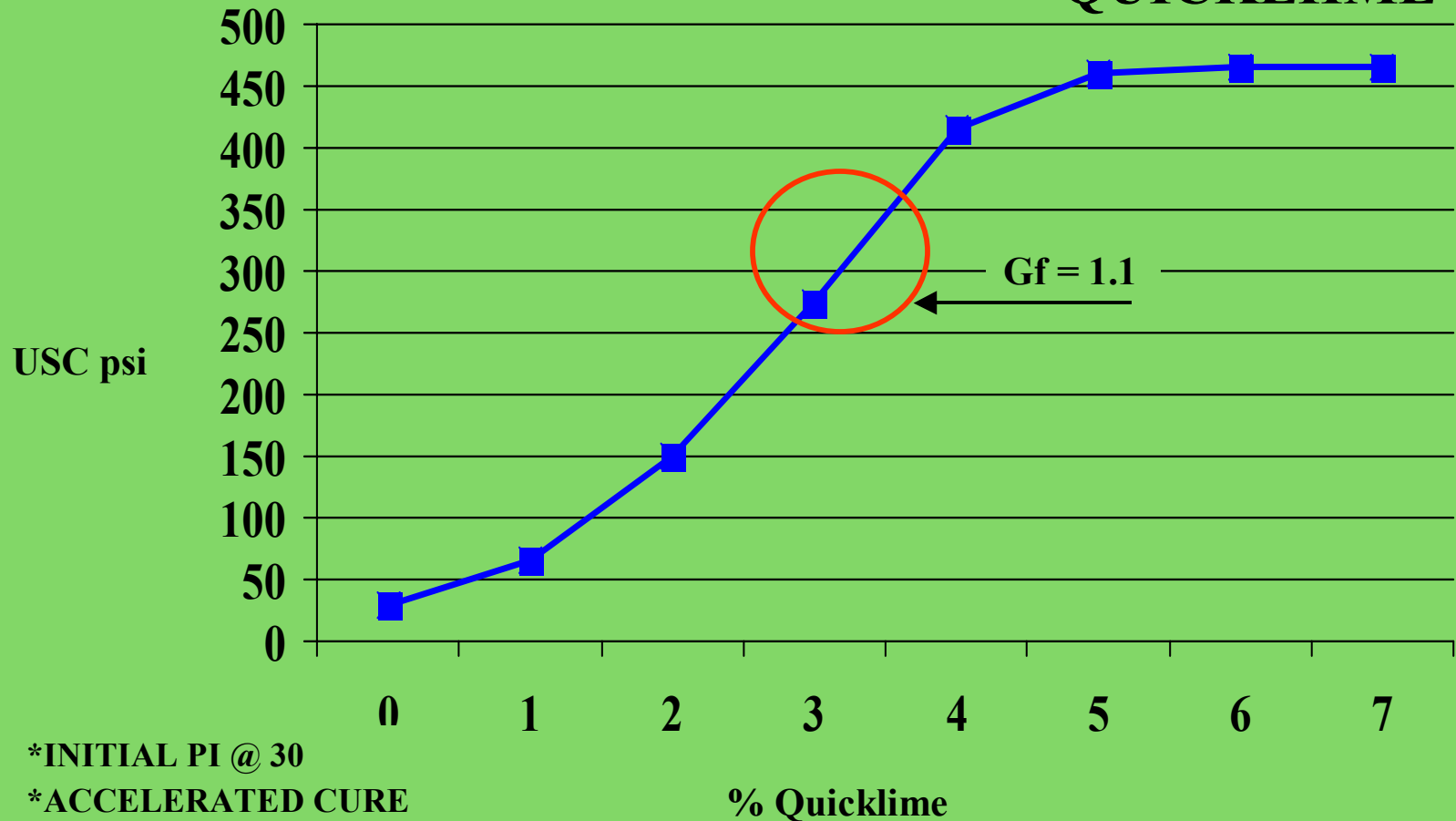
Typical Strength Curves for Treated Bases and Soils

CEMENT

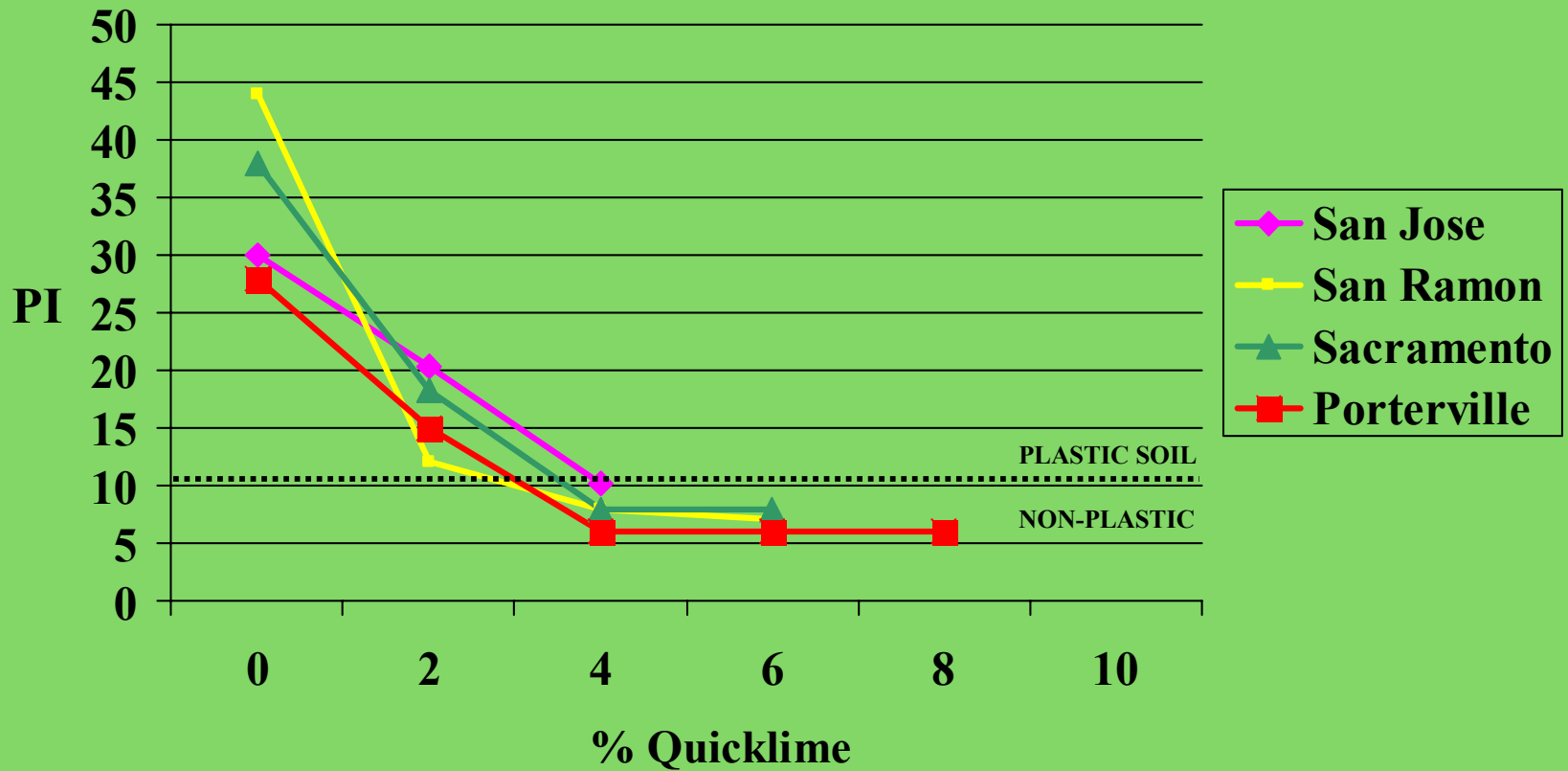


Typical Strength Increase of Lime Stabilized Soil at 7 Days

QUICKLIIME



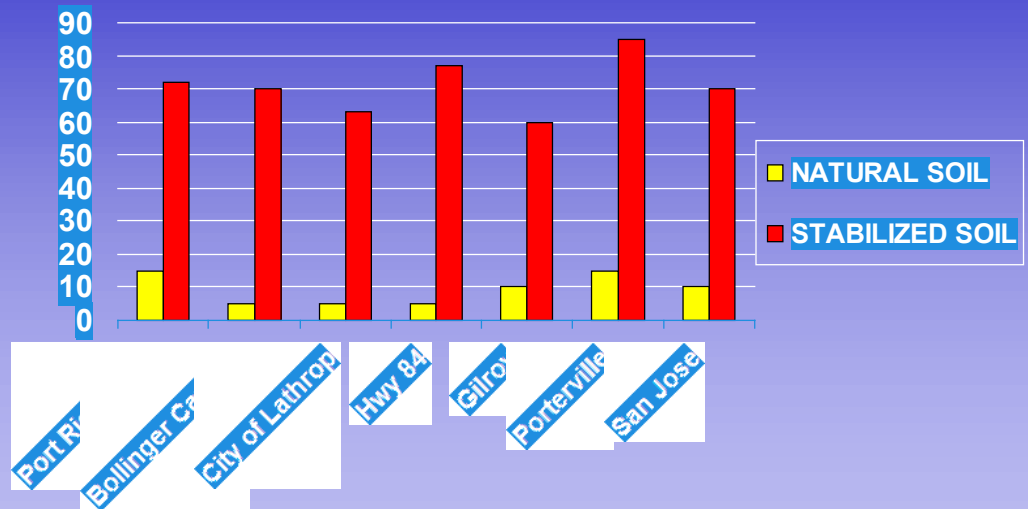
Effects of Quicklime on Plasticity



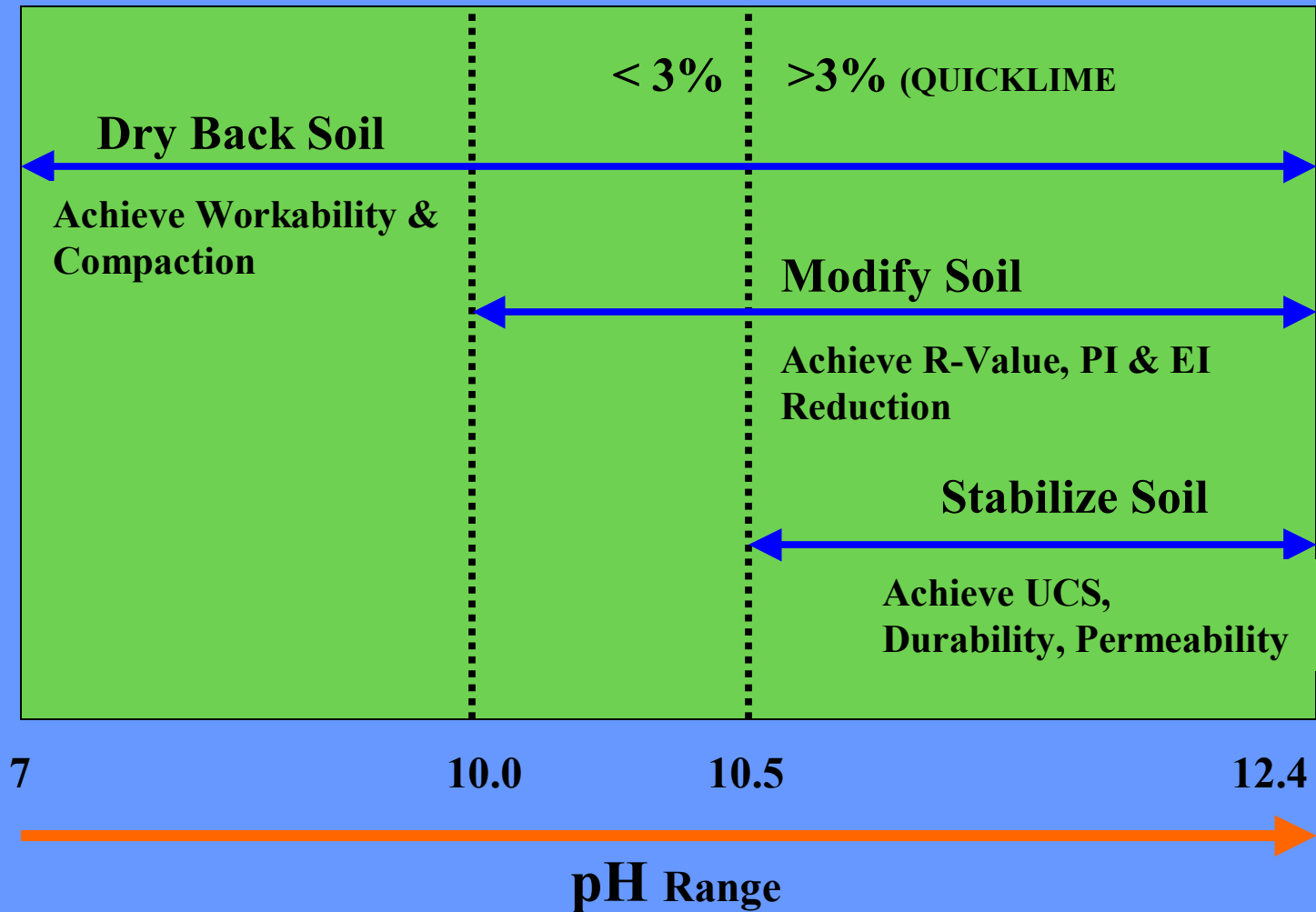
Substantial increases in R-Value can be achieved by treating with 3 to 5 percent Quicklime.

Increasing R-Value will significantly reduce pavement base section design

Recent California Projects R-Value Test Results

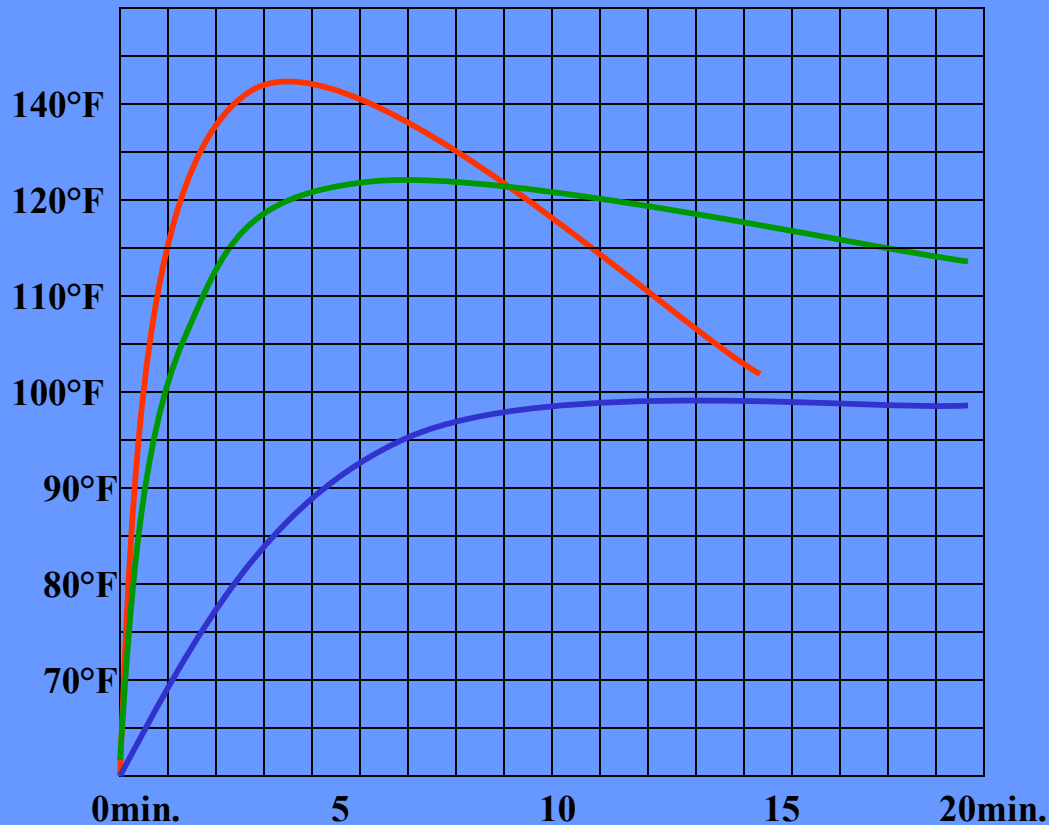


Elevated pH = Permanent Reaction



****ALWAYS USE FRESH SAMPLES WHEN CONDUCTING MIX DESIGN***

REACTIVITY CURVE



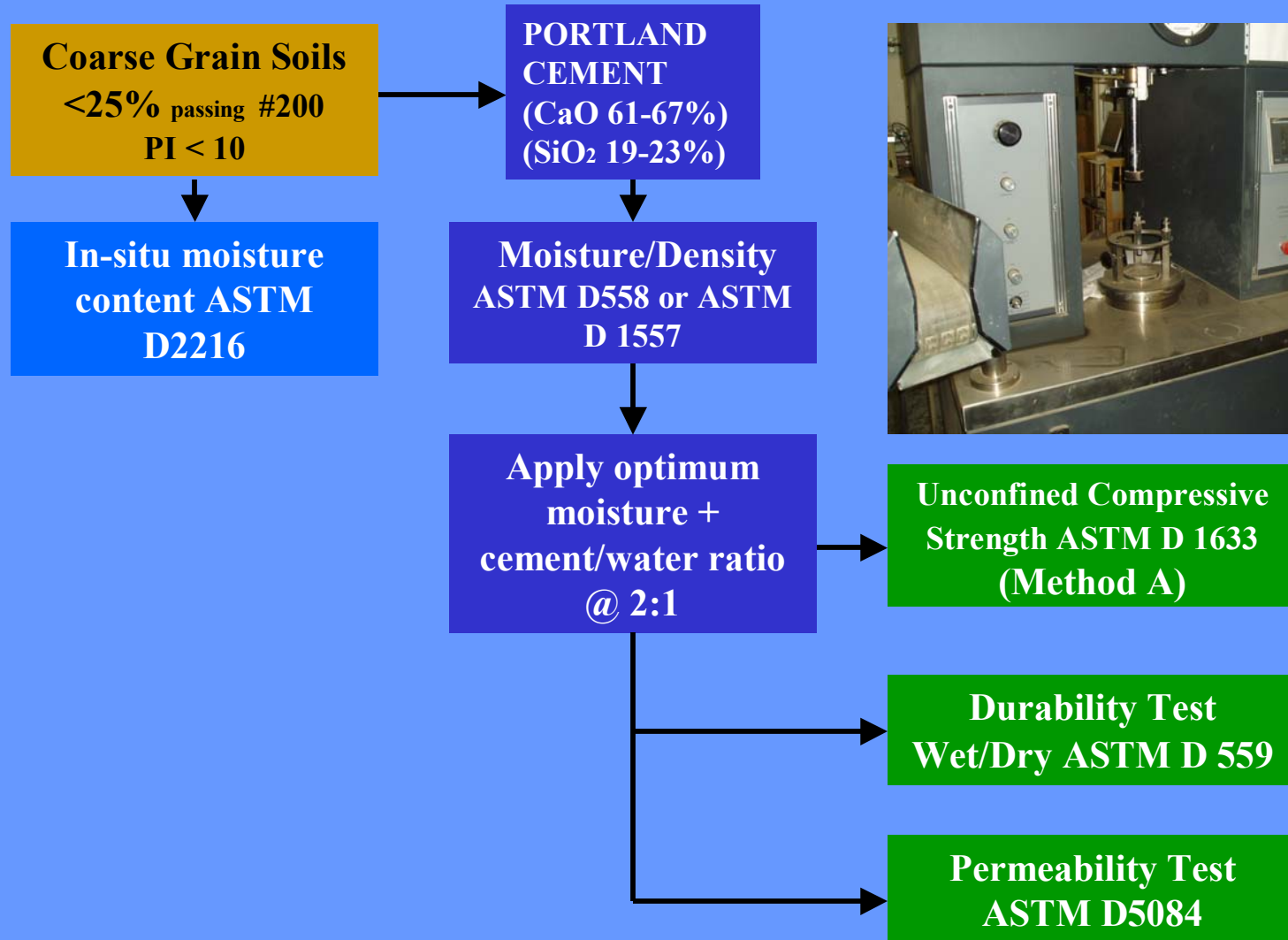
CONFIRM THAT REAGENT USED FOR MIX DESIGN IS REACTIVE (ASTM C110.12)

- **High-Calcium Quicklime**
30 sec @ 85°F / 180 sec @ 125°F
- **Dolomitic Quicklime**
Within 20 min @ 130°F
- **Portland Cement**

— **High-Calcium Quicklime**
— **Dolomitic Quicklime**
— **Portland Cement**

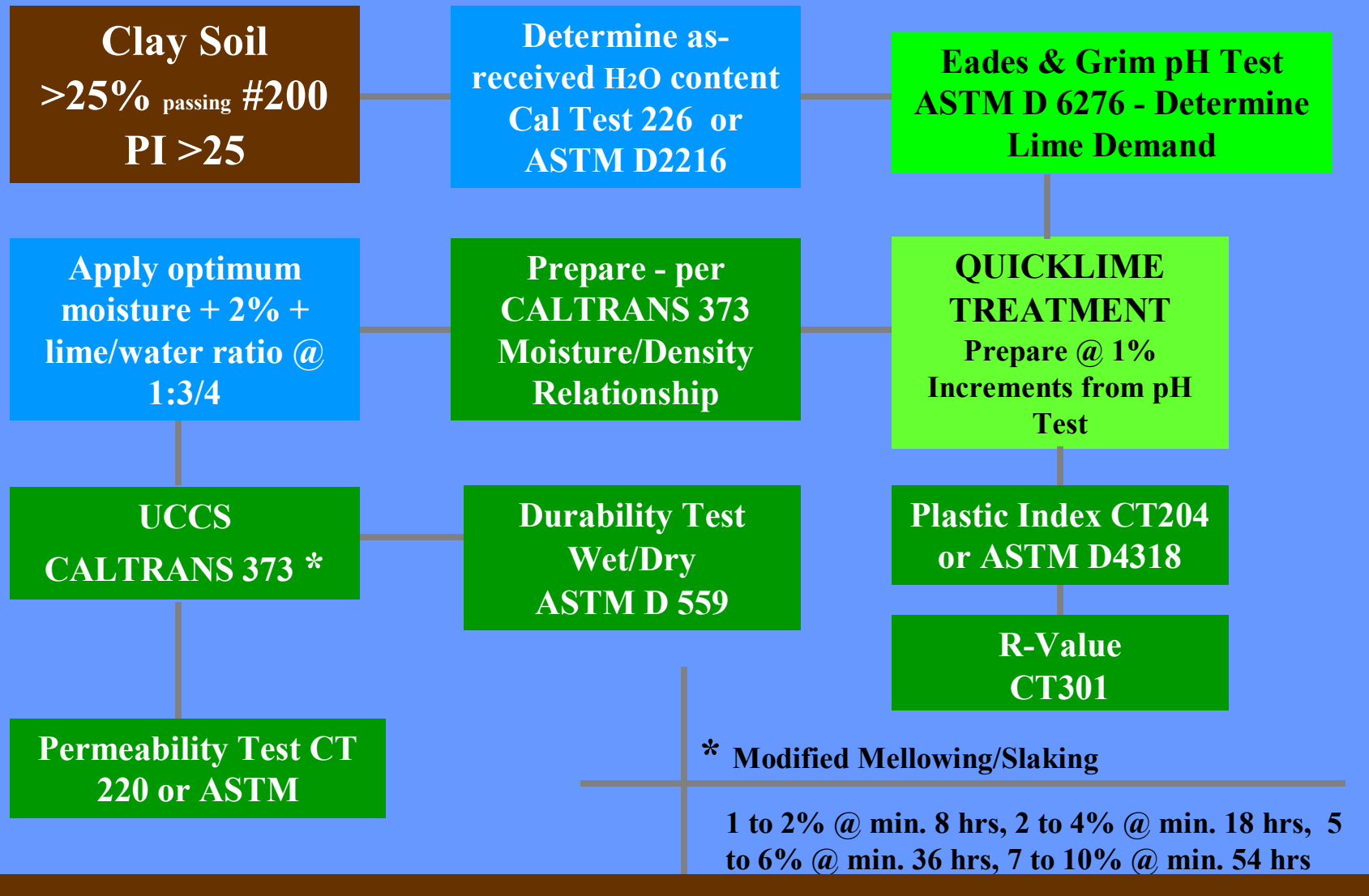
LAB TESTING

CEMENT



LAB TESTING

QUICKLIME



LAB TESTING

LIME/CEMENT BLEND

