

# Construction Control / Assurance

## Compaction Control Report XYZ Engineering Consultants, Inc. Los Angeles, CA 90017

**Report Produced By**  
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Project Number: CE00127-17  
Project Name: Springfield Creek Spillway  
Project Phase: Construction Quality Assurance (CQA)  
Project Owner: USACE  
Fill: Bank Section 1  
Work Segment: Station 2+30  
Lift: 4A  
Contractor:

### Control Specifications and References

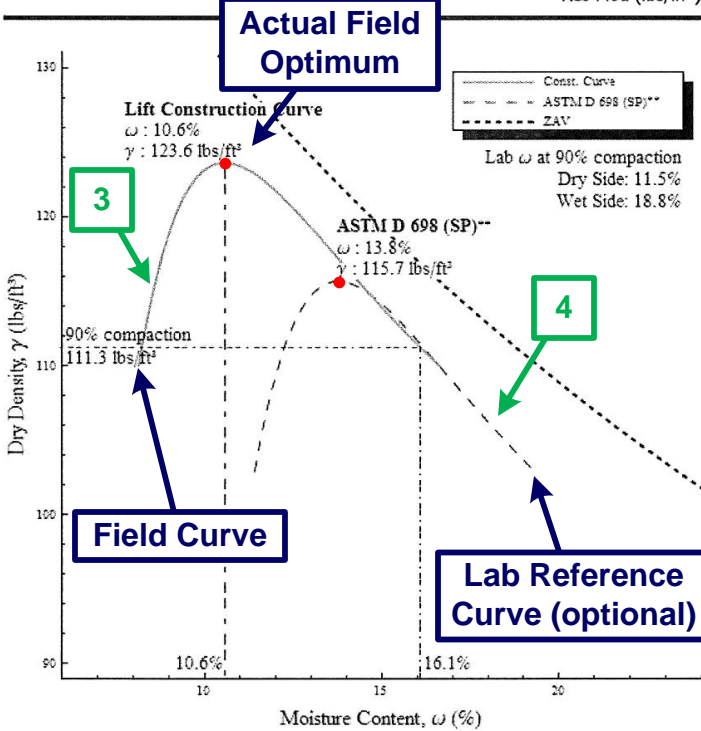
Min % of Max Dry Density 90%  
Lab Reference Standard ASTM D 698 (SP)  
Resilient Modulus Method AASHTO

### Lift Properties at 90% Compaction on Construction Curve †

	Dry Side <sup>1</sup>	Wet Side <sup>1</sup>	Tolerance
$\omega$ (%)	8.3	16.1	±1% MC
$\gamma$ (lbs/ft <sup>3</sup> )	111.3	111.3	±1.8%
S (%)	44.0	85.6	±3%
e	0.50	0.50	±3%
Na (%)	18.8	4.8	±3%
$\omega$ Potential (%)	+10.5	+2.7	±3%
UCS (lbs/ft <sup>2</sup> )	ASTM D 2166	x	±20%
c (lbs/ft <sup>2</sup> )	ASTM D 2850	x	±10%
$\phi$ (°)	ASTM D 2850	x	±10%
Free Swell (%)	ASTM D 4546	7.7	±10%
CBR* (%)	Soaked	1.0	±10%
CBR* (%)	Unsoaked	32.2	±10%
Res Mod (lbs/in <sup>2</sup> )	Soaked	1,500	±10%
Res Mod (lbs/in <sup>2</sup> )	Unsoaked	23,573	±10%

### Compaction Conditions of Lift: 4A

Loose Lift Thickness (in) 10  
Compactor CAT 815  
USCS Classification CL  
Specific Gravity 2.68  
Liquid Limit (%) 34  
Plasticity Index (%) 19  
Plastic Limit (%) 15  
% Fines (Passing #200) 77  
% Gravel (Retained #4) 1  
% Sand (Passing #4) 22



### Construction Controls/CQA

**Minimum % of Maximum Dry Density**  
Construction Curve 90%  
ASTM D 698 (SP) 96%

**Wet-of-Optimum Moisture Range for 90%**  
10.6% - 16.1% (±1% MC)

**Minimum # of Roller Passes**  
11 (Equiv. 6 roundtrip passes, full lift coverage required)

Compaction curves should be obtained regularly with changes in material index properties and upon change in color or texture for effective construction control.

M-D probe depths should be centered on the center of the compacted lift.

† c and  $\phi$  - Unsaturated triaxial test, total soil parameter.  
UCS - Unconfined Compressive Strength.  
Measured values include  $\omega$ ,  $\gamma$ , UCS, c,  $\phi$ , Free Swell, and CBR (soaked and unsoaked). Calculated values include S, e, Na,  $\omega$  Potential, and Resilient Modulus (soaked and unsoaked).  
Wet side permeability in field not factored in Free Swell test condition.  
\* CBR based on field compacted state.  
1 Properties represent average values.  
x Strength property values available upon request.

**Soil Sample** Date: 12/20/2017  
Loc: Fosters Field  
Desc: Reddish Brown Lean Clay

Authorization By: \_\_\_\_\_  
Print Name: \_\_\_\_\_  
Date: \_\_\_\_\_ Firm Reg. #: \_\_\_\_\_

\*\* ASTM D 698 (SP) equivalent, corrected to control relative moisture standard in construction. Graphics powered by Mathematica

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Version: 2.30 - 7.11

1 → [Control Specifications and References]

2 → [Compaction Conditions of Lift: 4A]

3 → [Lift Construction Curve]

4 → [Lab Reference Curve (optional)]

5 → [Lift Properties at 90% Compaction on Construction Curve †]

6 → [Construction Controls/CQA]

1. Input: Required min. % density compaction standard for selected compactor + optional lab curve reference standard (corrected)
2. Input: Known compactor - soil - lift combination
3. Output: Site-Specific Compaction Curve® (SSCC®) in construction, on the site-specific field line-of-optimums, with minimum % density intercepts
4. Output: Soil-specific lab curve reference, corrected according to standard dry-unit weight relations and the corresponding lab line-of-optimums (close to line-of-opts in construction, as verified on report)
5. Output: Compacted lift properties at minimum % density intercepts
6. Output: Lift-specific compaction controls for full compaction