

Vermont Agency of Transportation

Mark Woolaver

VAOT Construction Paving Engineer

Off = 802-828-1475

Cell = 802-522-6951

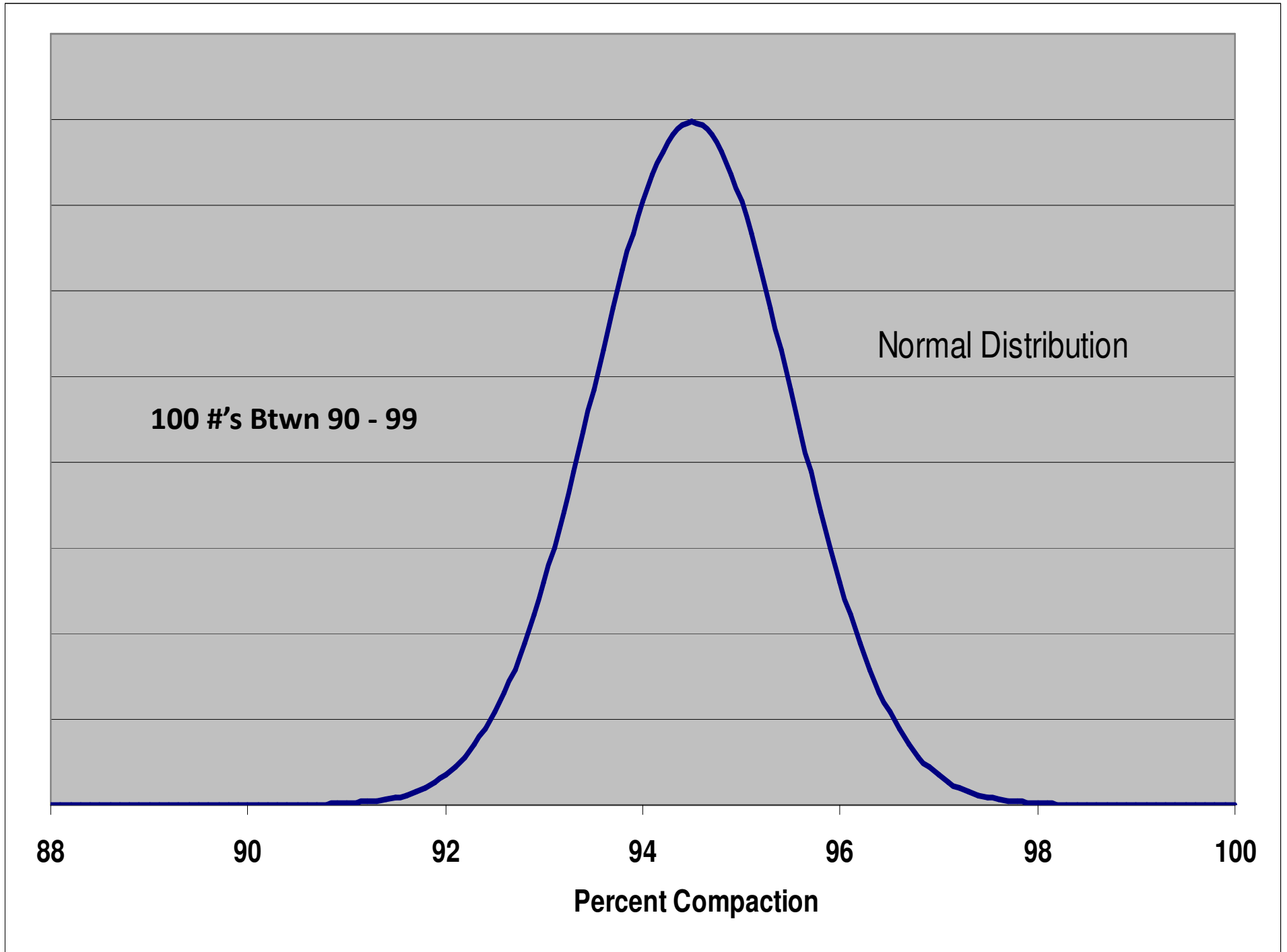
mark.woolaver@state.vt.us

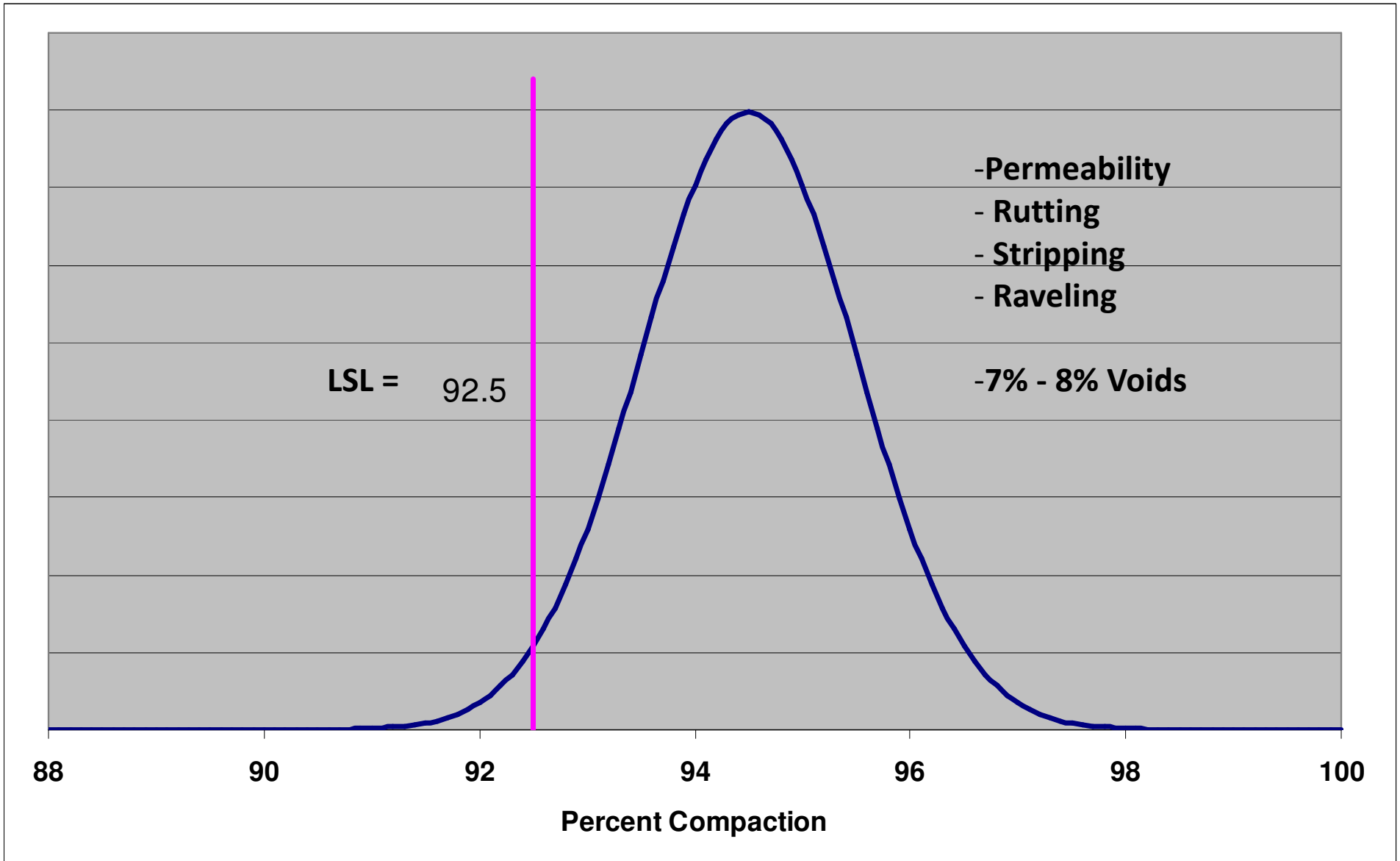


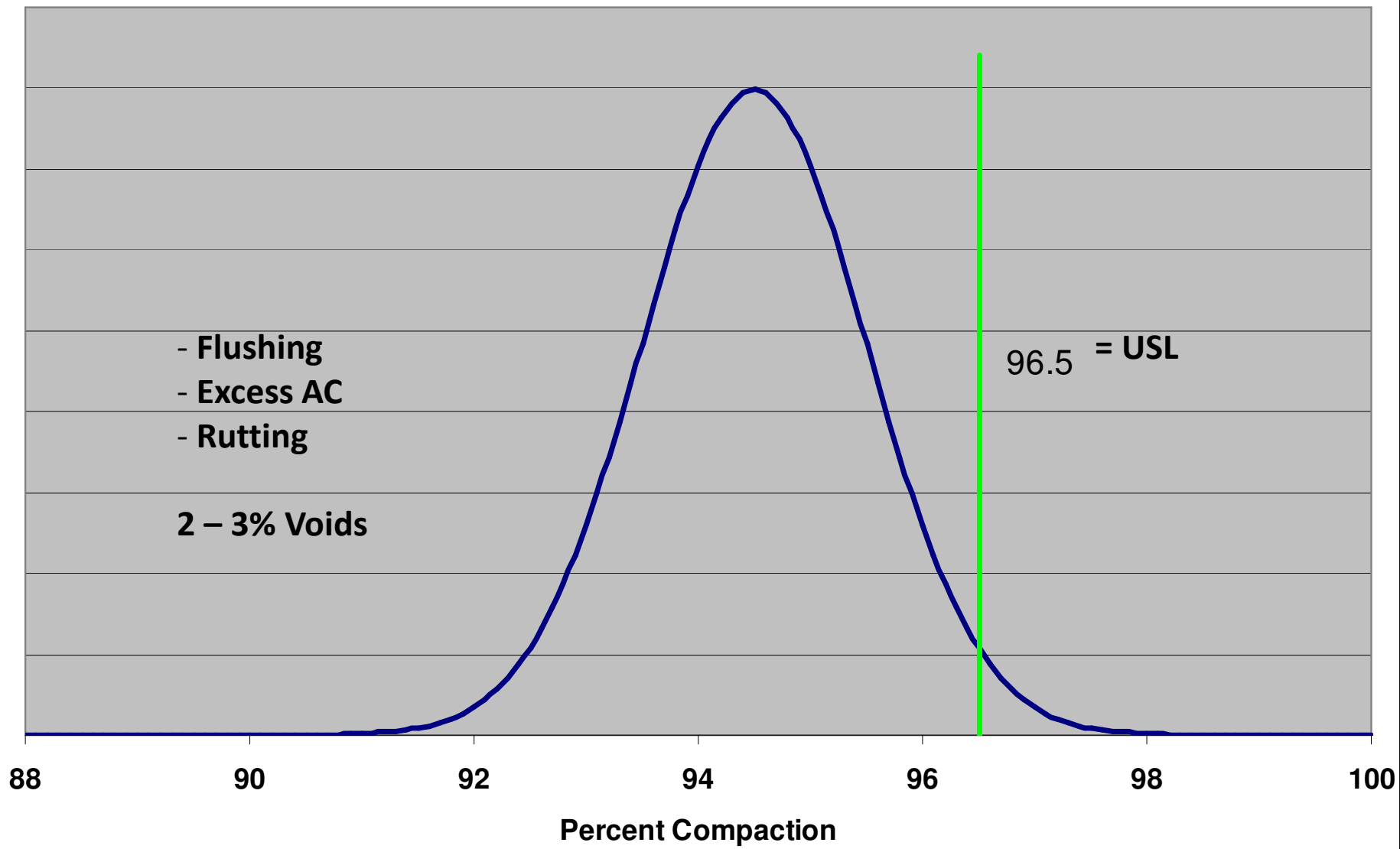
VAOT PWL Compaction Specification

An Illustrative Example

Mark Woolaver
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mark.woolaver@state.vt.us
802-522-6951



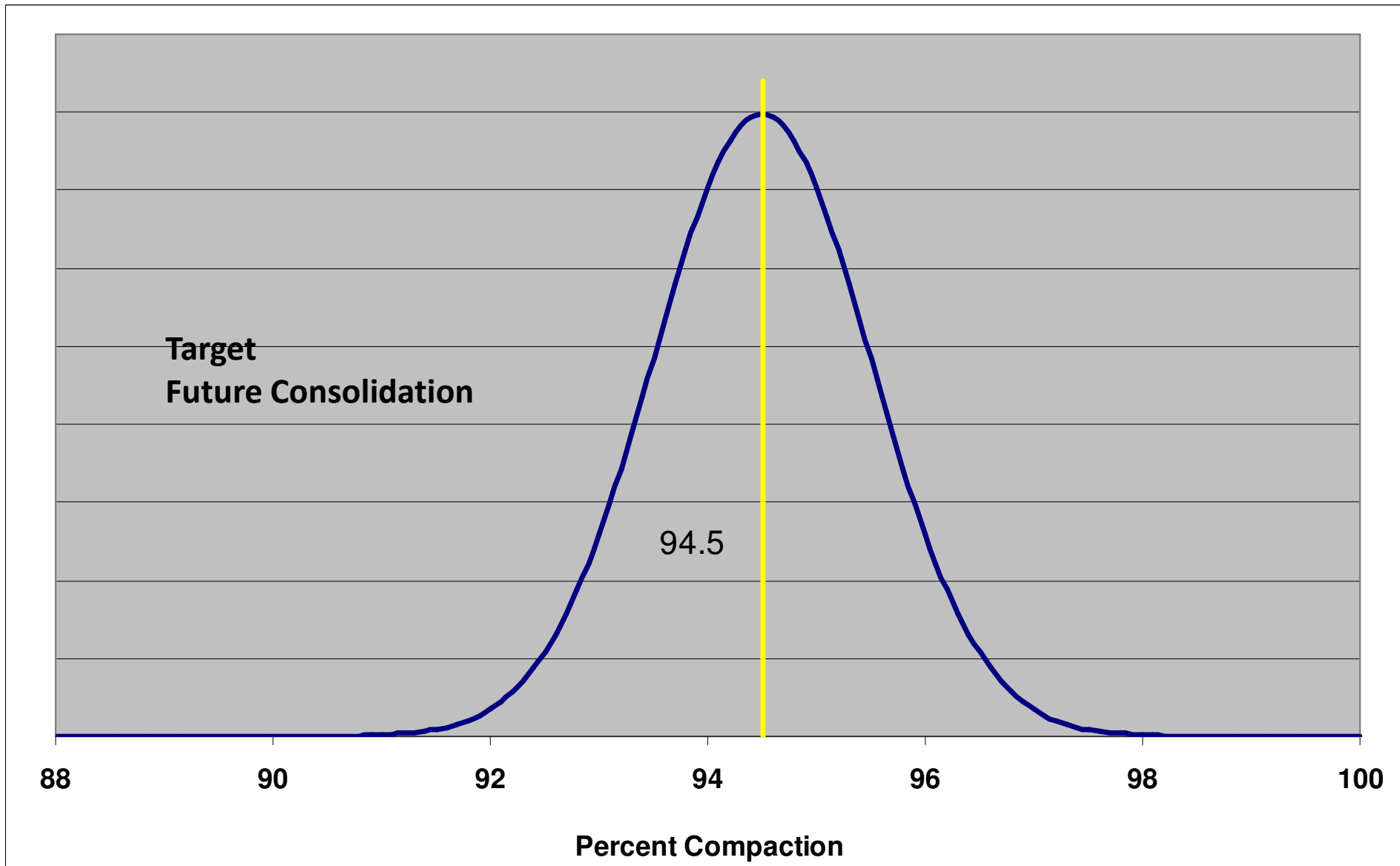




- Flushing
- Excess AC
- Rutting

2 - 3% Voids

96.5 = USL



Specification Target

LSL =

92.5

= USL

96.5

94.5

88

90

92

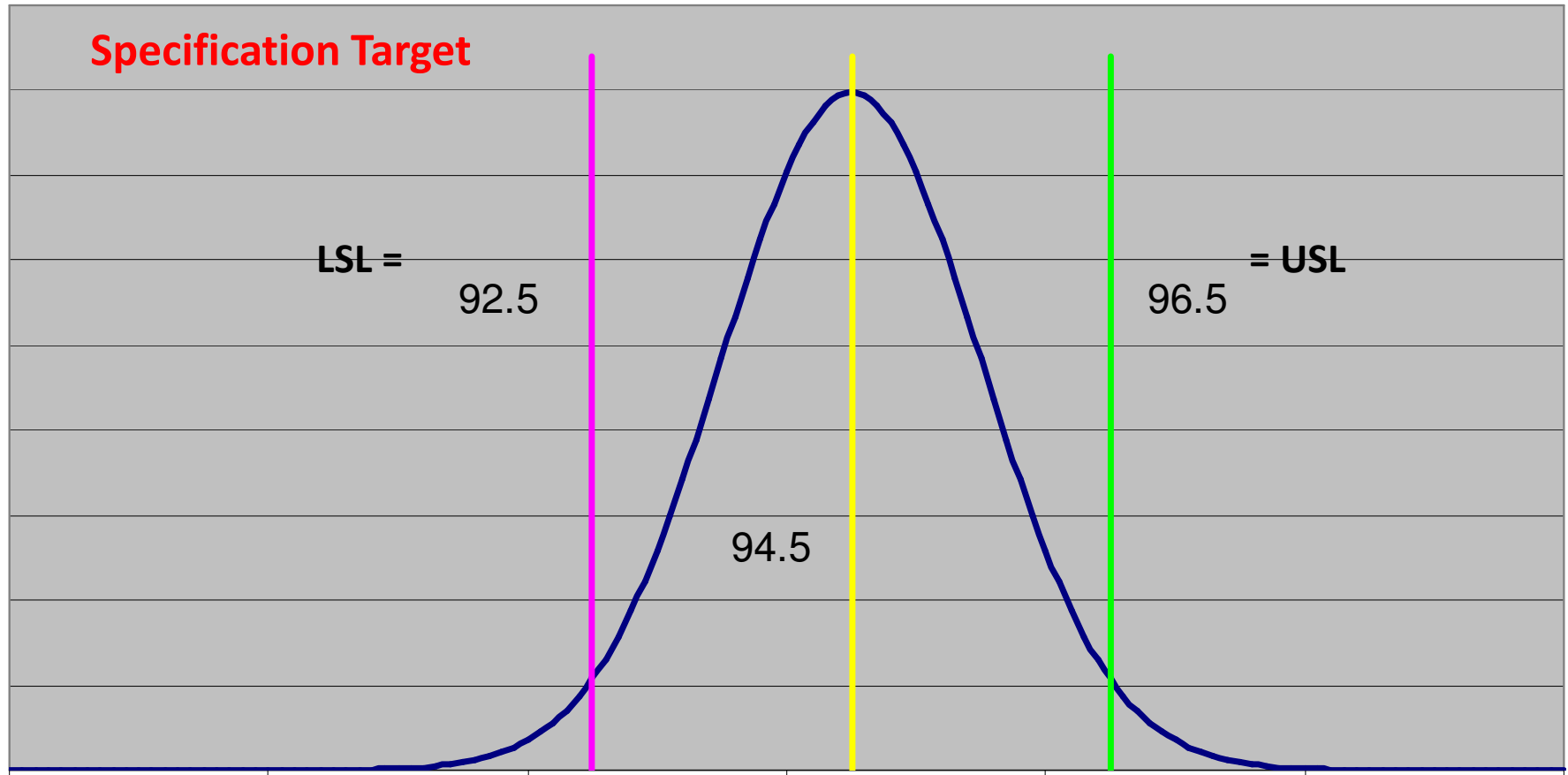
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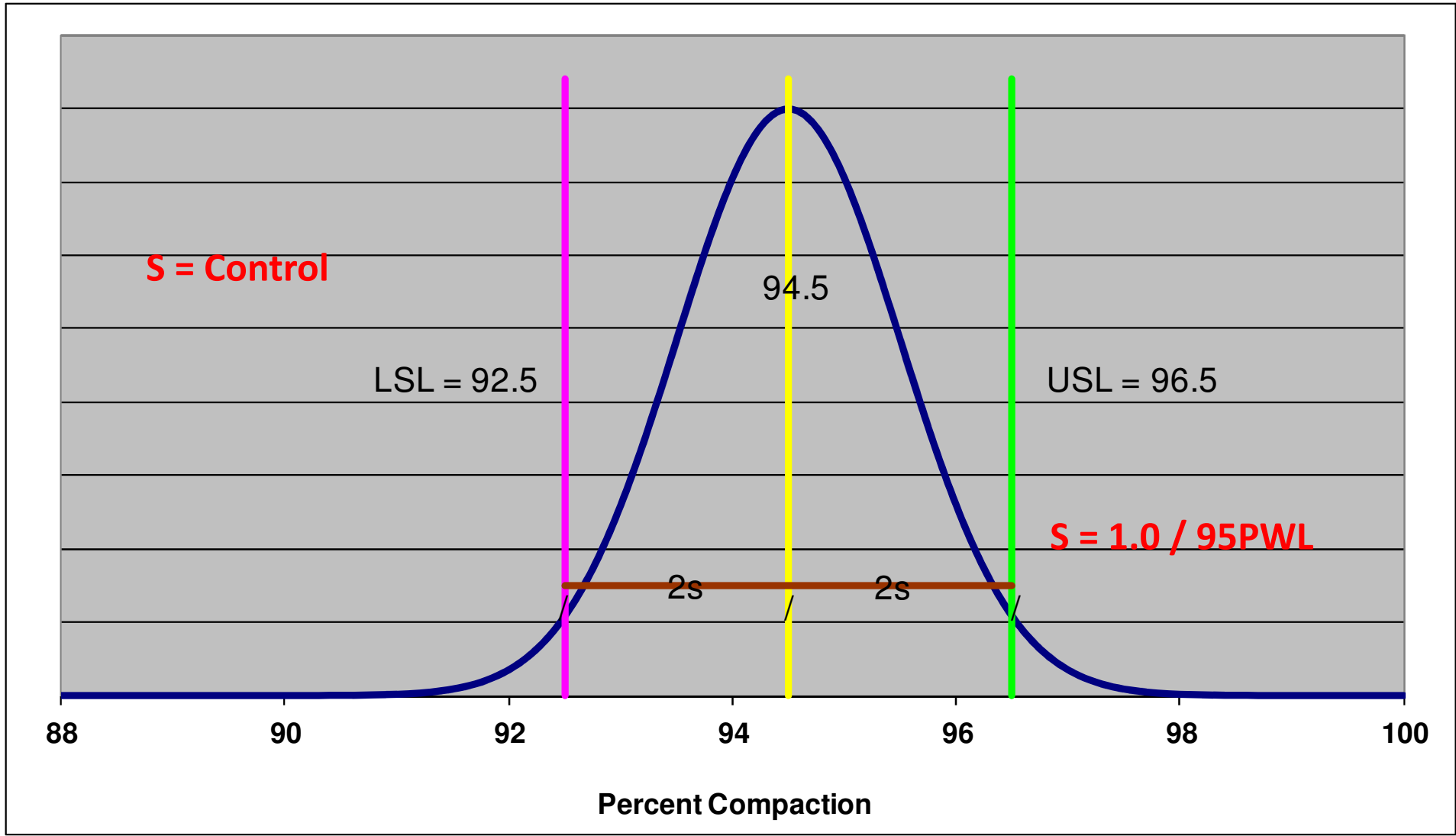
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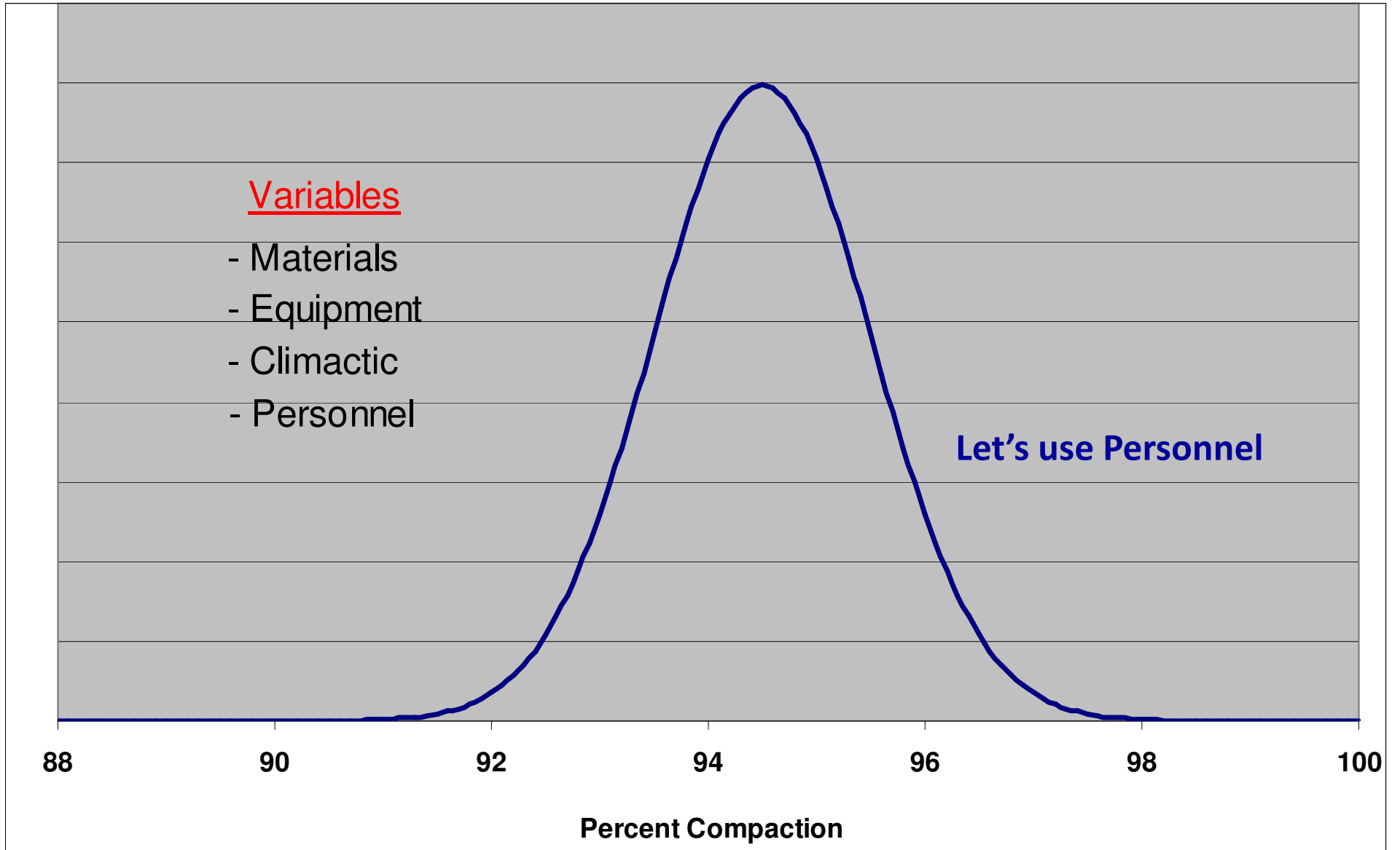
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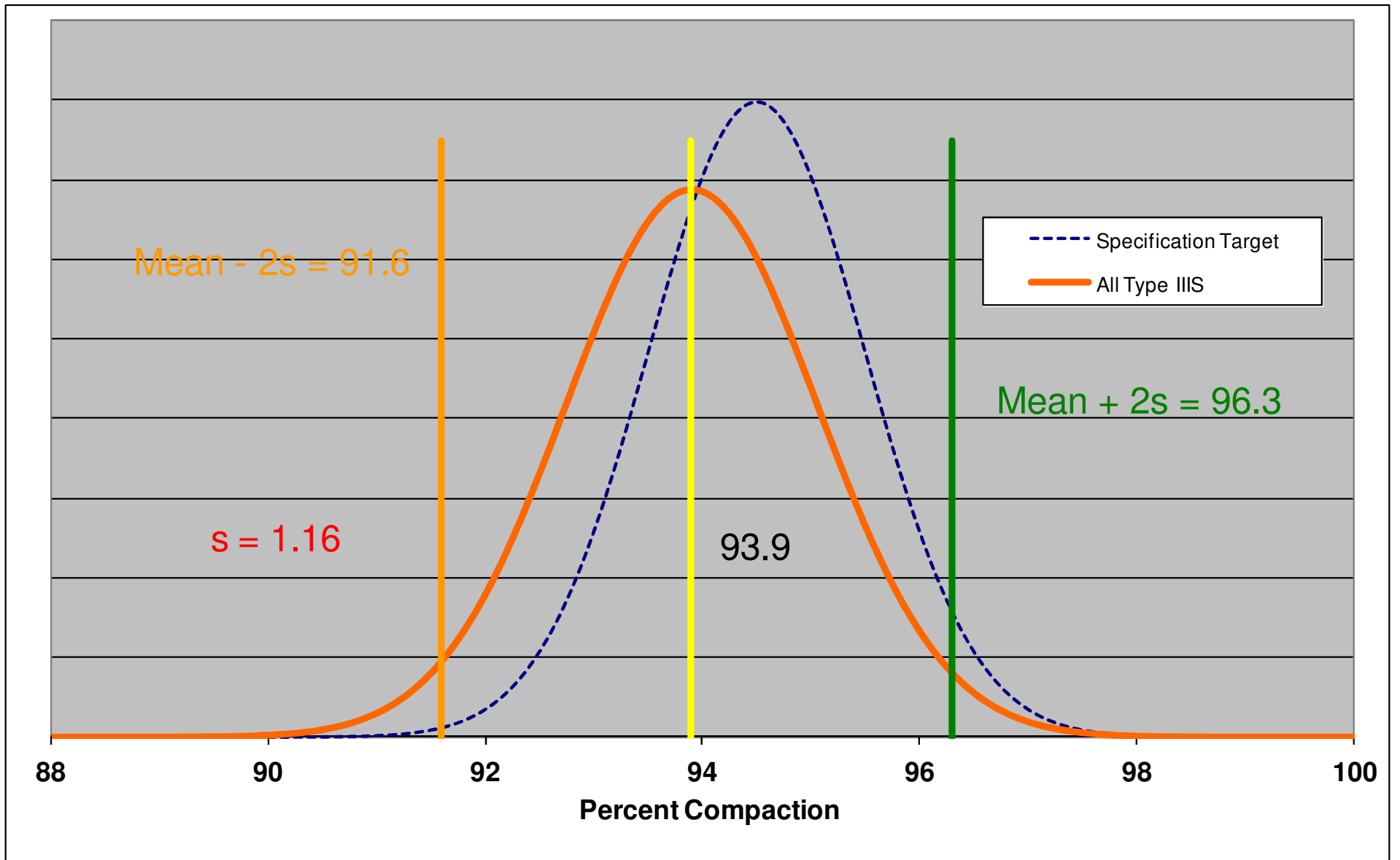
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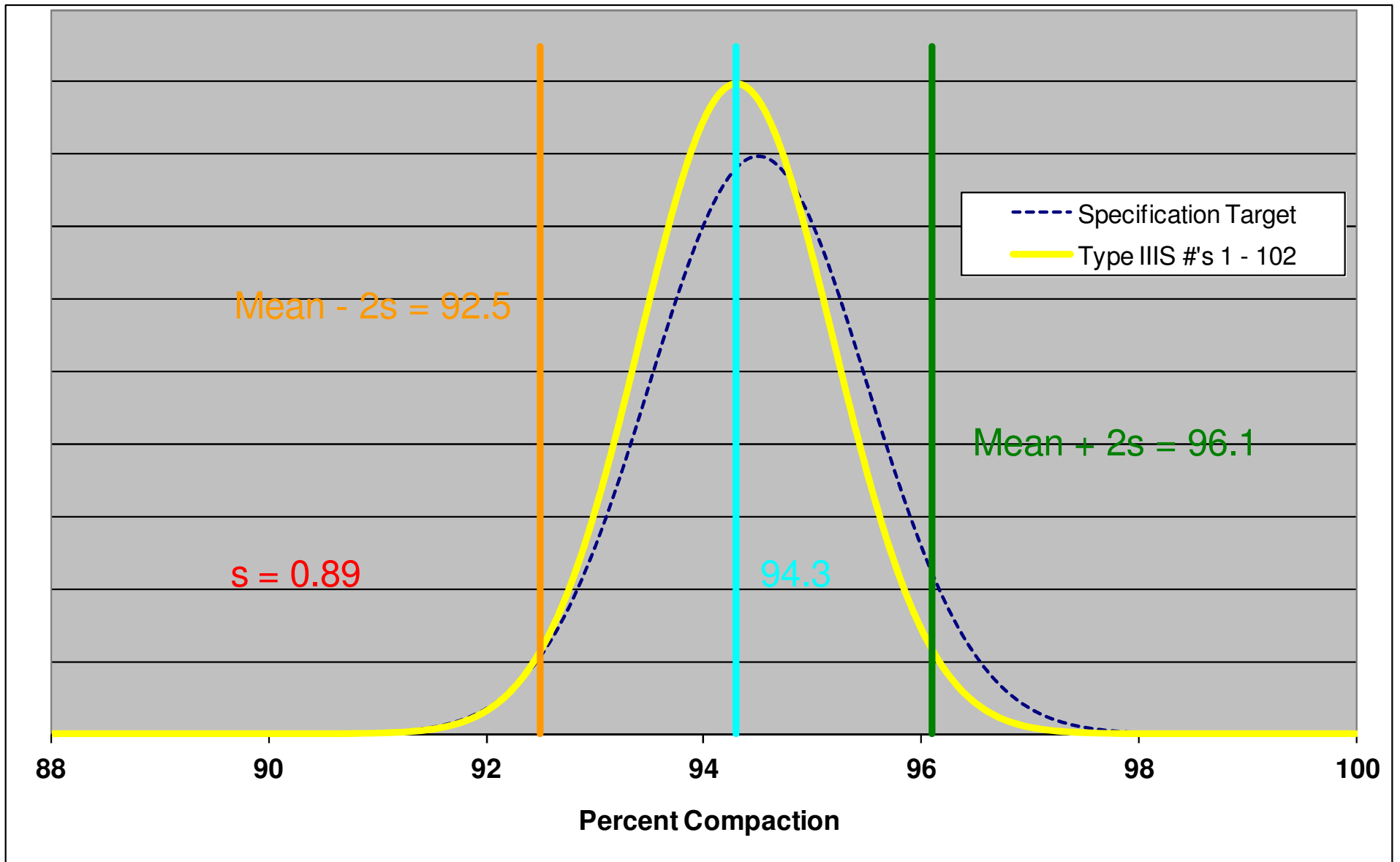
Percent Compaction

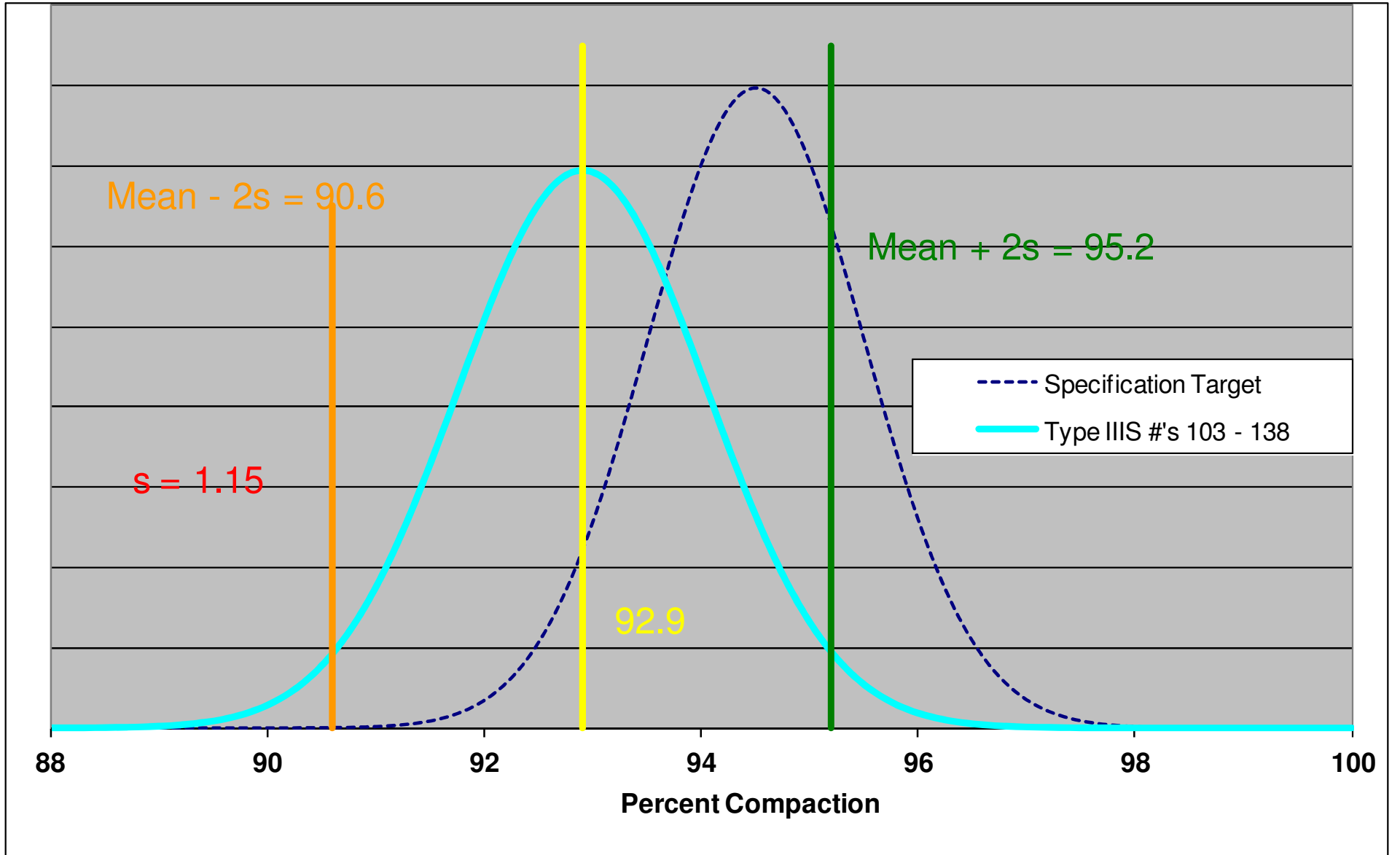


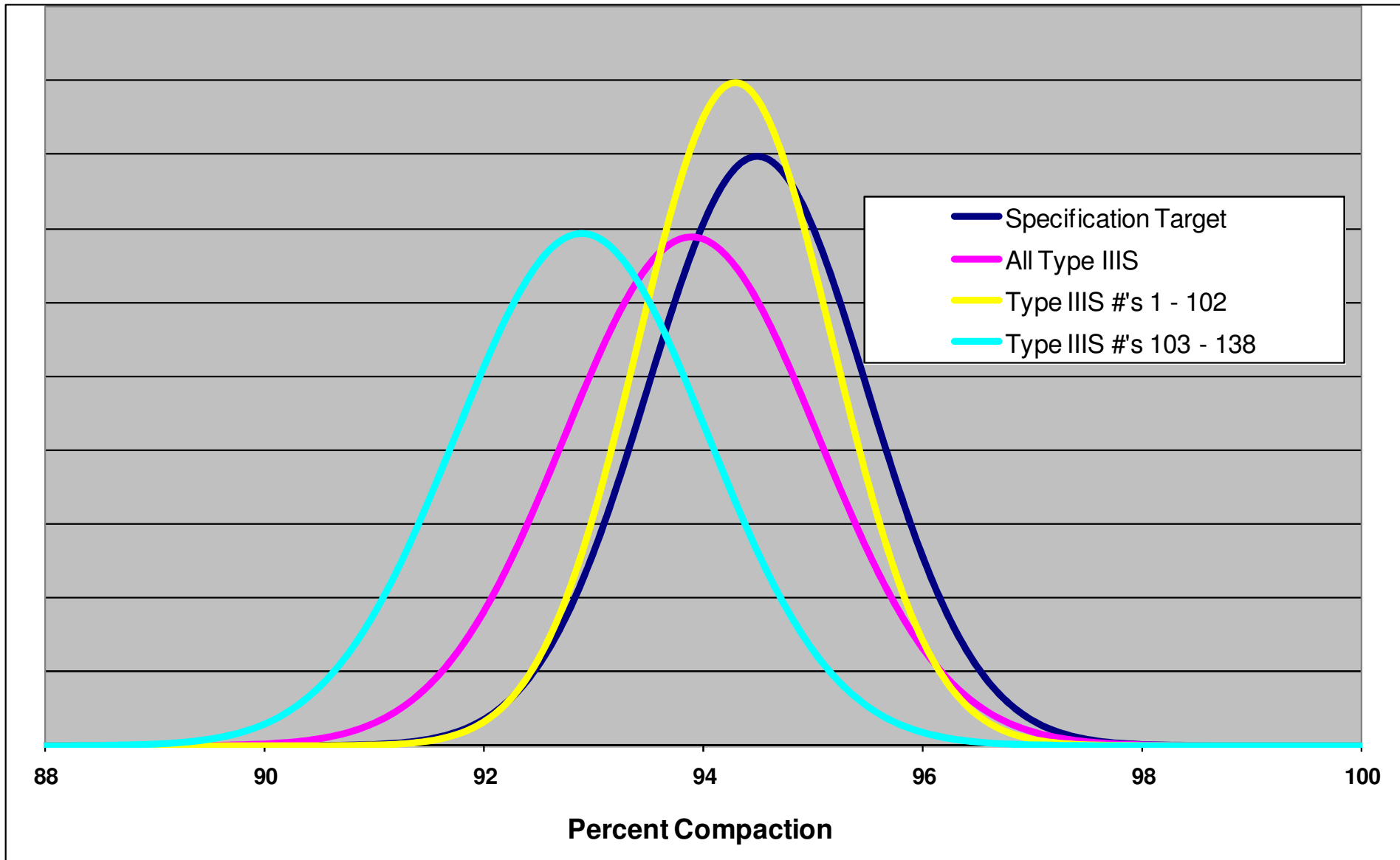












The End Result Summary?

Crew #1: - 17 Paving Days
- 1 Deduct PF Overall (99%)
- 41 500 Ton Placed
- \$12K Bonus

Crew #2: - 6 Paving Days
- 6 Deduct PF's
- 11 700 Ton Placed
- \$53K Deduct

Overall Project Result = \$41k Deduct

Thoughts?



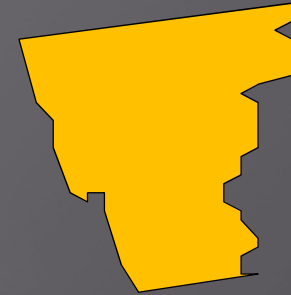
Intelligent Compaction The State of Vermont Perspective

Mark Woolaver
VAOT Construction Paving Engineer
mark.woolaver@state.vt.us

How Did VT Implement IC?

- ▣ FHWA 1st National IC Workshop @ SE Region
- ▣ Agency, Industry, and Vendor Participation
- ▣ Obstacles/Successes ?
- ▣ Specifications / What Has VT Done ?
- ▣ VT Contractor Implementation

VT's Experience



- One Project : VT CY2012 Project
- \$4M Contract
- \$25k Expended on IC Bid
- Part of FHWA HfL Program
- Lets Look at Results



Castleton
A VERMONT STATE COLLEGE

Campus
Entrance



South Street Entrance
Welcome







HAMM Double Drum IC System





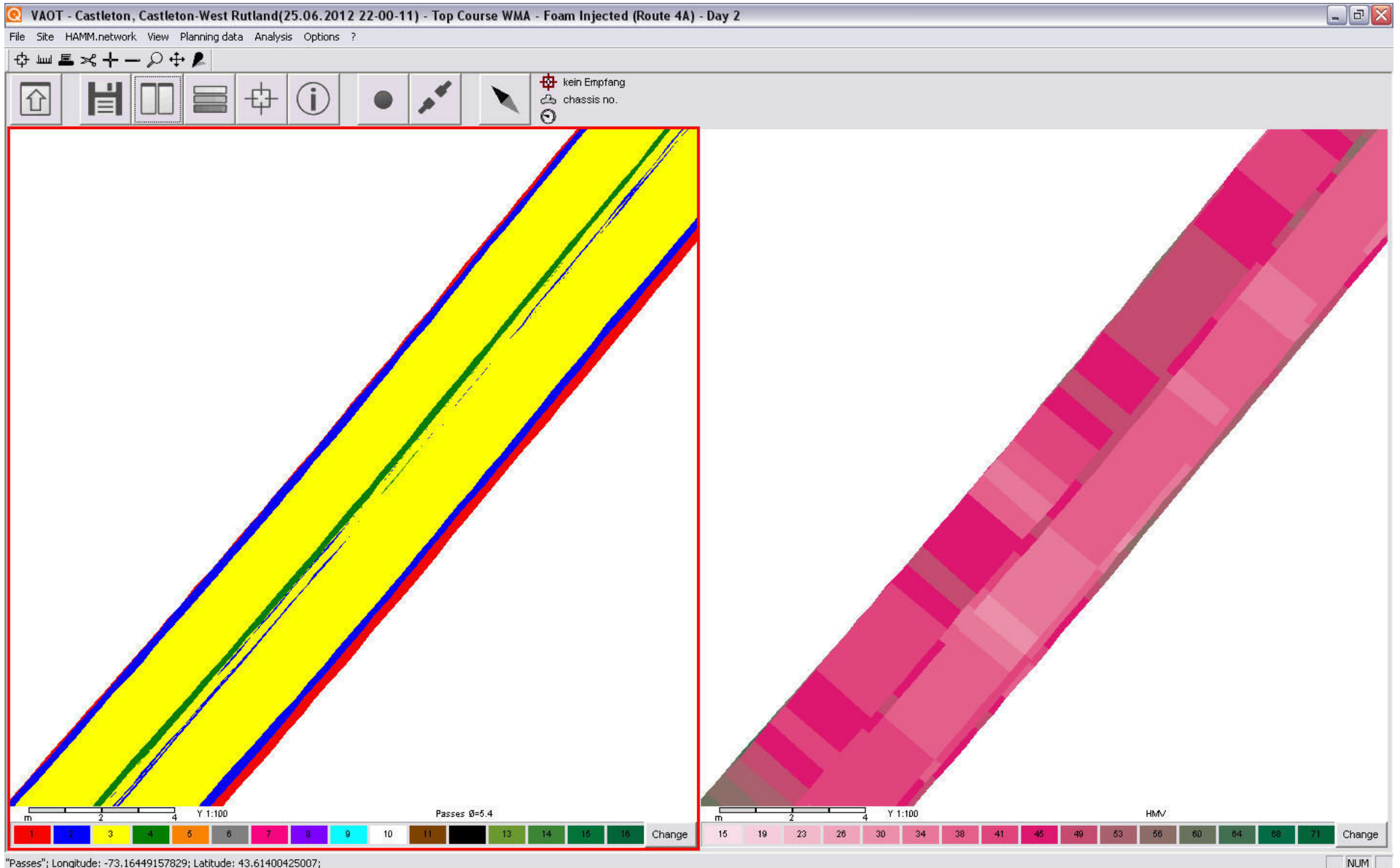
IC System 

- Definition of IC
- Why do we need IC?
- IC Equipment used
- In-situ Tests
- Project Pictures





HCQ Screen Shot



"Passes"; Longitude: -73.16449157829; Latitude: 43.61400425007;

ThermaCAM™

+ 1 124 °F

□ 1 ▲ 234

241

1

1



73

Tatm=68.1 Rh=30 % Dst=2.0 FOV 24

6/20/12 09:58:52 -40 - +250 e=0.96 Trefl=68.0

Thoughts on IC Experience

- Incorporated Into FHWA HfL Program
- Increased Attention ?
- “Intelligent” vs “Smart”
- Night Work?
- Compaction Improved ?
- Efficiency Improved? (\$)
- Consistency Improved ?
- QC Information Improved ?

Why Did VT Go With IC?

- Was It Beneficial?
- Can It Be Beneficial ?
- Takeaway : IC = IP
- 5% Reduction in Performance @ Each 1% Reduction in Optimum Compaction

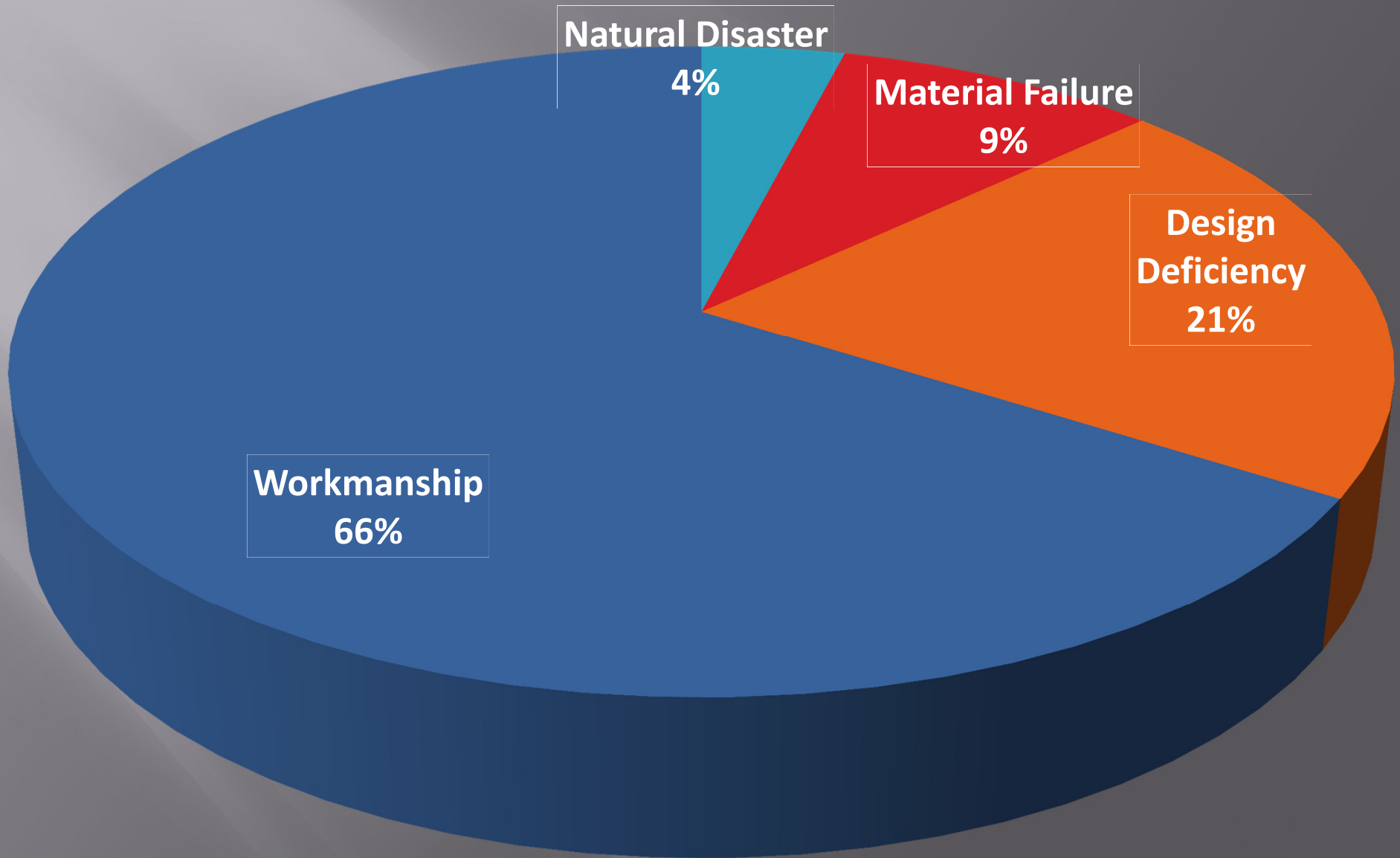
Slide 30

m1

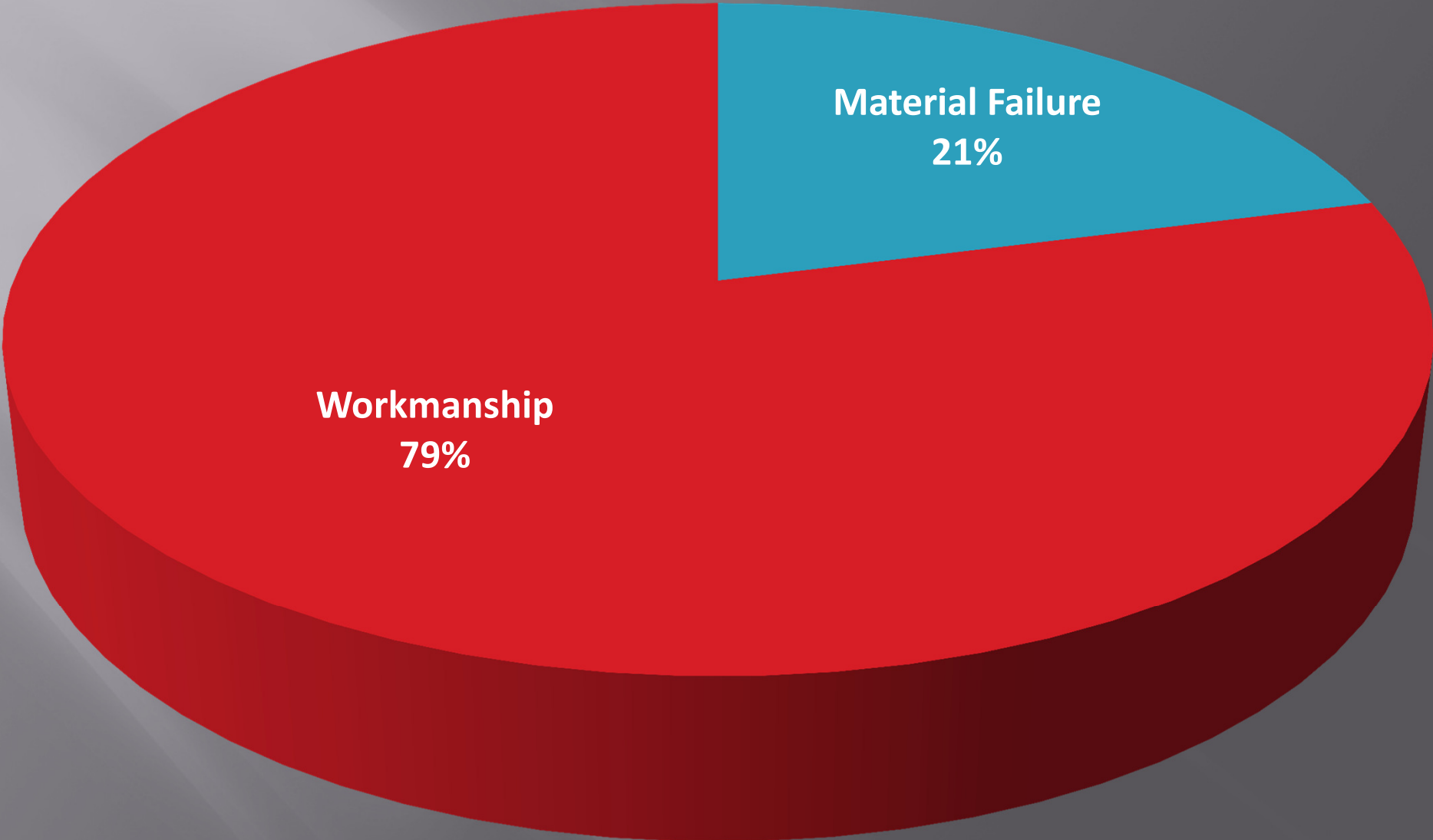
mwoolaver, 11/24/2012

Construction Causes of Failure

Source : IBA Consultants, Inc.



VT Paving Construction Causes of Failure



Final Thoughts

- **Expectations on Any Continued Implementation ?**
- **Have Executive Support (Required)**
- **Have Educated Staff Through Regional Meetings (Buy In)**
- **Realistic in our Expectations**
- **Belay Pessimism (Etch –a – Sketch)**
- **Communication, Communication ,
Communication**

Thank You!

