Virginia's Stream Mitigation Monitoring & Success Criteria: Application & Appropriateness

Mid-Atlantic Stream Restoration Conference
November 3 - 5, 2009

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Presentation Outline

- Integration of the critical components for stream mitigation projects in Virginia
  - Unified Stream Methodology
  - Success Criteria
  - Monitoring Criteria
- Preliminary results of Monitoring and Success Criteria application
- Appropriateness of Success Criteria

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Unified Stream Methodology (USM)

- Riparian Buffer Preservation

  0.07-0.14 credit / % area

- Riparian Buffer Enhancement

  0.29-0.4 credit / % area

- Stream Enhancement

  0.09-0.3 credit / ft

- Stream Restoration

  1.0 credit / ft

Success Criteria

- Riparian Buffer Preservation
  - Invasive species (< 5%)
- Riparian Buffer Enhancement
  - Stem counts (400/acre)
  - Canopy coverage (30%)
- Stream Preservation
  - Dimension
    - W/D (0.7 – 1.3)
    - BHR (0.2)

Success Criteria (cont.)

- Stream Enhancement
  - Dimension
  - Stream Reach Stability
    - BEHI
    - Stem counts (1/10ft^2)
    - Canopy coverage (50%)
  - Pattern
    - Sinuosity (0.1)
    - Rc/W ratio
    - Centerline (10%)
  - Structures

Success Criteria (cont.)

- Stream Restoration
  - Dimension
  - Stream Reach Stability
  - Pattern
  - Structures
  - Profile
    - Slope (0.1%)
    - “Significant Changes”
  - Materials
    - D50

Monitoring Criteria

- Riparian Buffer Preservation
- Riparian Buffer Enhancement
- Stream Preservation
- Stream Enhancement
- Stream Restoration

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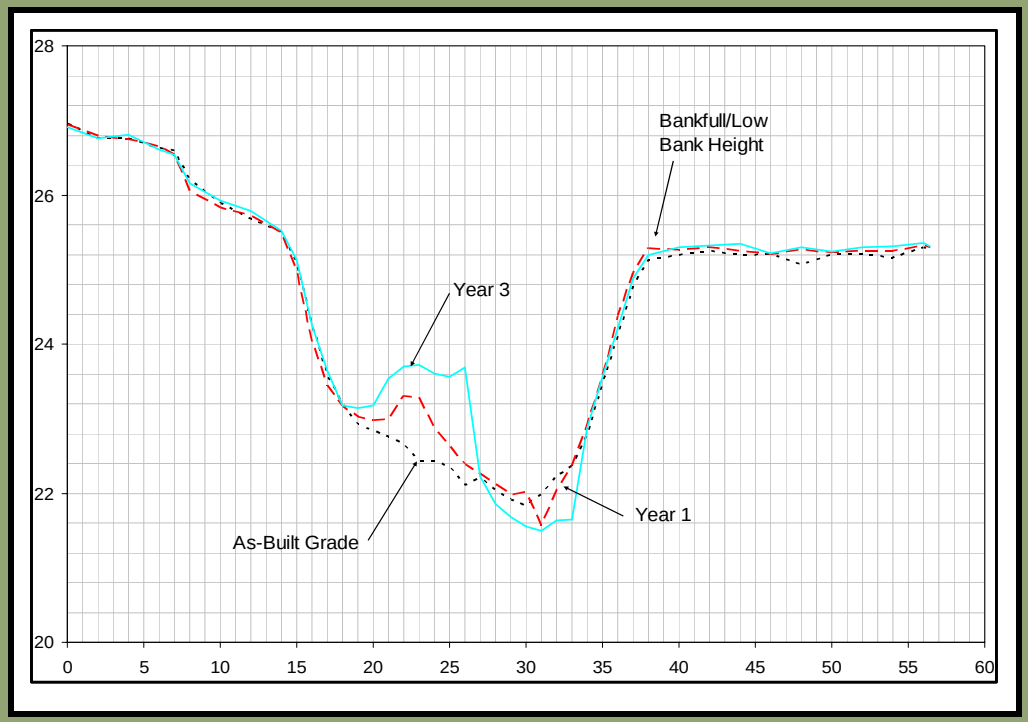
General Success Criteria Statement

- The overall goal for the stream success criteria is to ensure that the dimension, pattern, and profile of the stream enhancement and restoration areas remain within the natural range of variability present in the reference data obtained for the design.

- The IRT will use best professional judgment, visual observations, and monitoring reports to evaluate attainment of success criteria, and in determining whether part or all of the site is successful, or whether corrective actions are warranted.

Example 1: Dimension



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Dimension Criteria Comparisons

Table 1. Comparison of Stability Rating for Consecutive Monitoring Years

Monitoring Year	W/D	Stability Rating
As-Built	10.3	
Year 1	10.7	1.04
Year 3	11.3	1.10

Table 2. Comparison of Bank Height Ratio for Consecutive Monitoring Years

Monitoring Year	Bank Height Ratio	Difference
As-Built	1.0	
Year 1	1.0	0.0
Year 3	1.0	0.0

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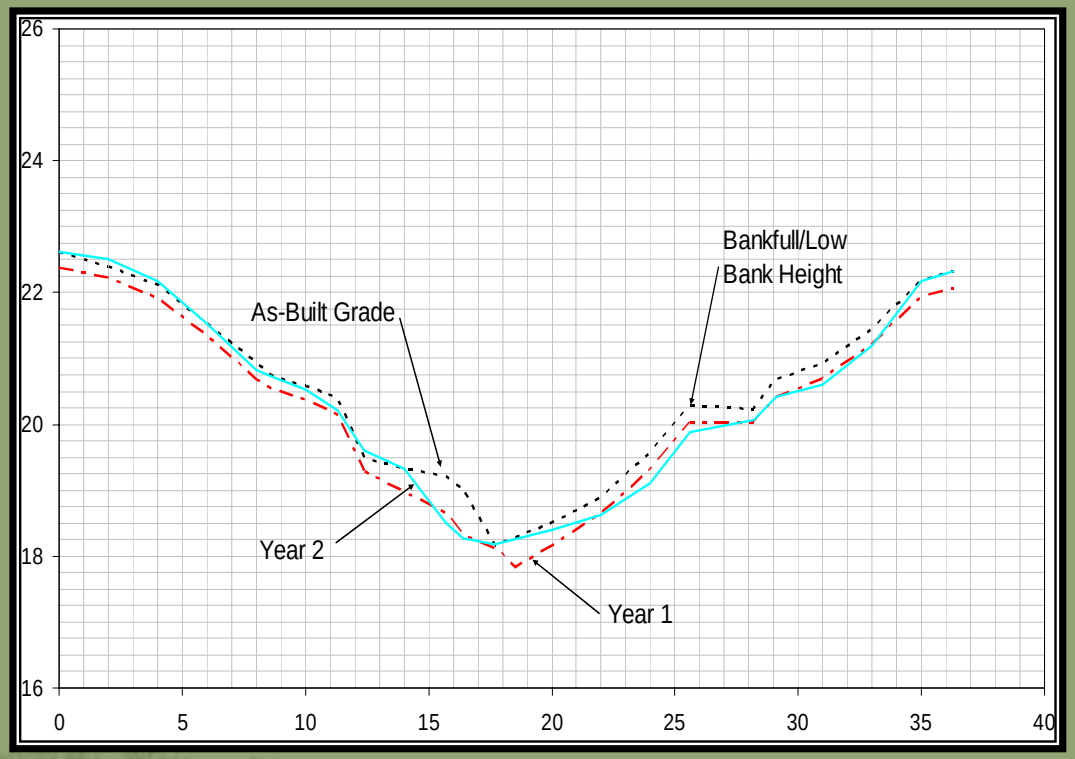
Example 2: Dimension



Dimension Criteria Comparisons

Table 1. Comparison of Stability Rating for Consecutive Monitoring Years

Monitoring Year	W/D	Stability Rating
As-Built	8.4	
Year 1	8.4	1.00
Year 2	8.3	0.99

Table 2. Comparison of Bank Height Ratio for Consecutive Monitoring Years

Monitoring Year	Bank Height Ratio	Difference
As-Built	1.0	
Year 1	1.1	0.1
Year 2	1.0	0.0

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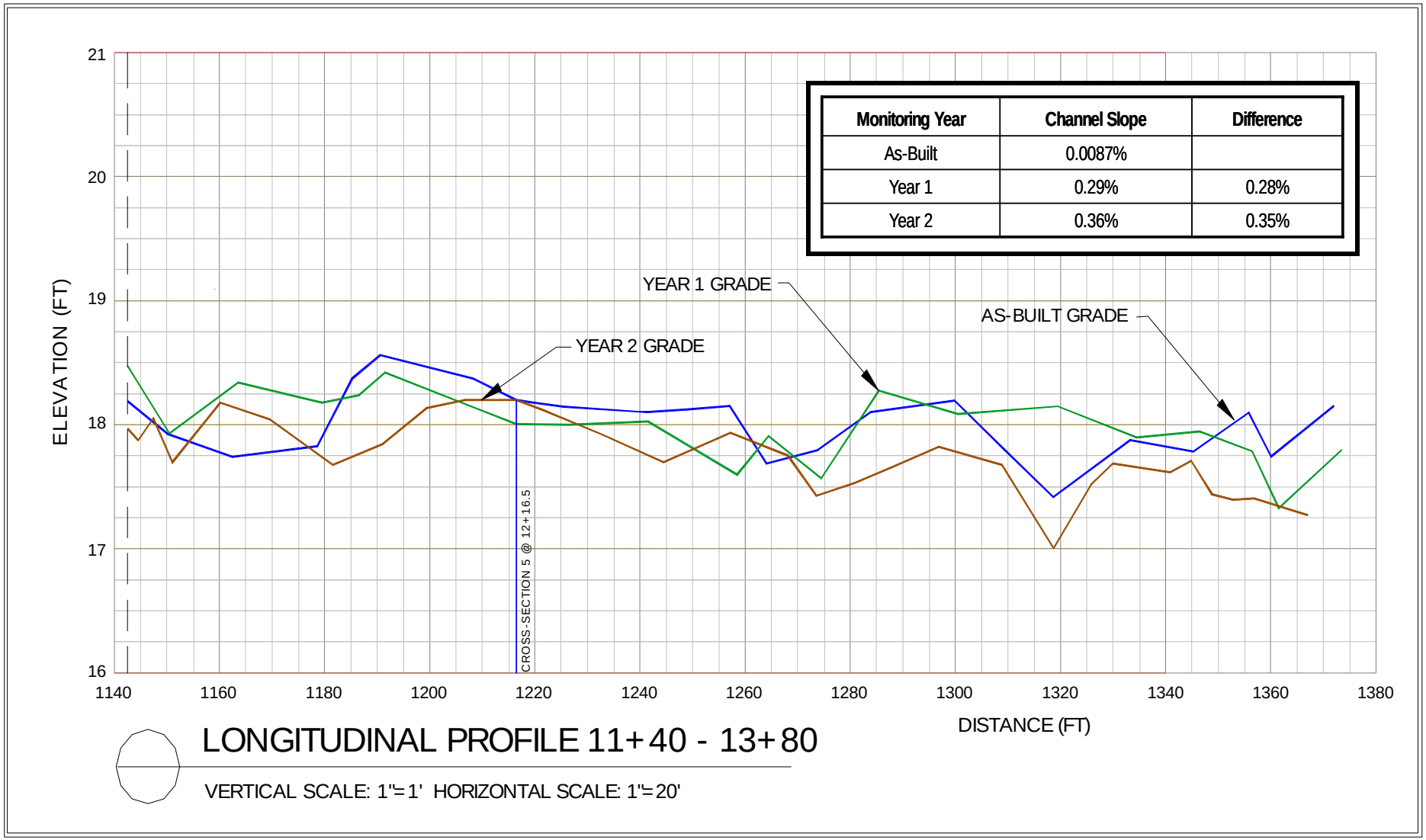
Example 1: Profile

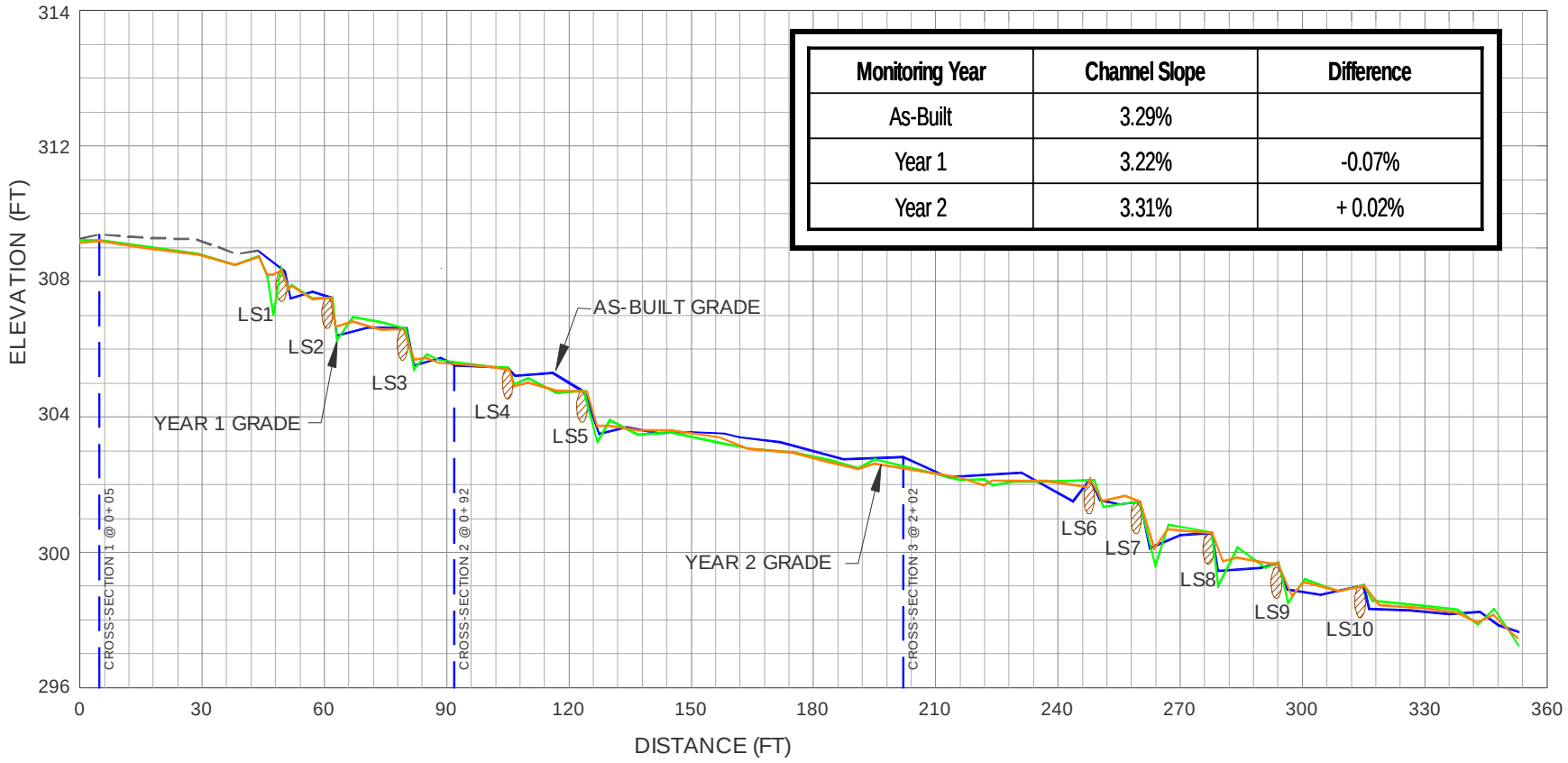


Monitoring Year	Channel Slope	Difference
As-Built	0.0087%	
Year 1	0.29%	0.28%
Year 2	0.36%	0.35%

LONGITUDINAL PROFILE 11+40 - 13+80

VERTICAL SCALE: 1"=1' HORIZONTAL SCALE: 1"=20'

Example 2: Profile

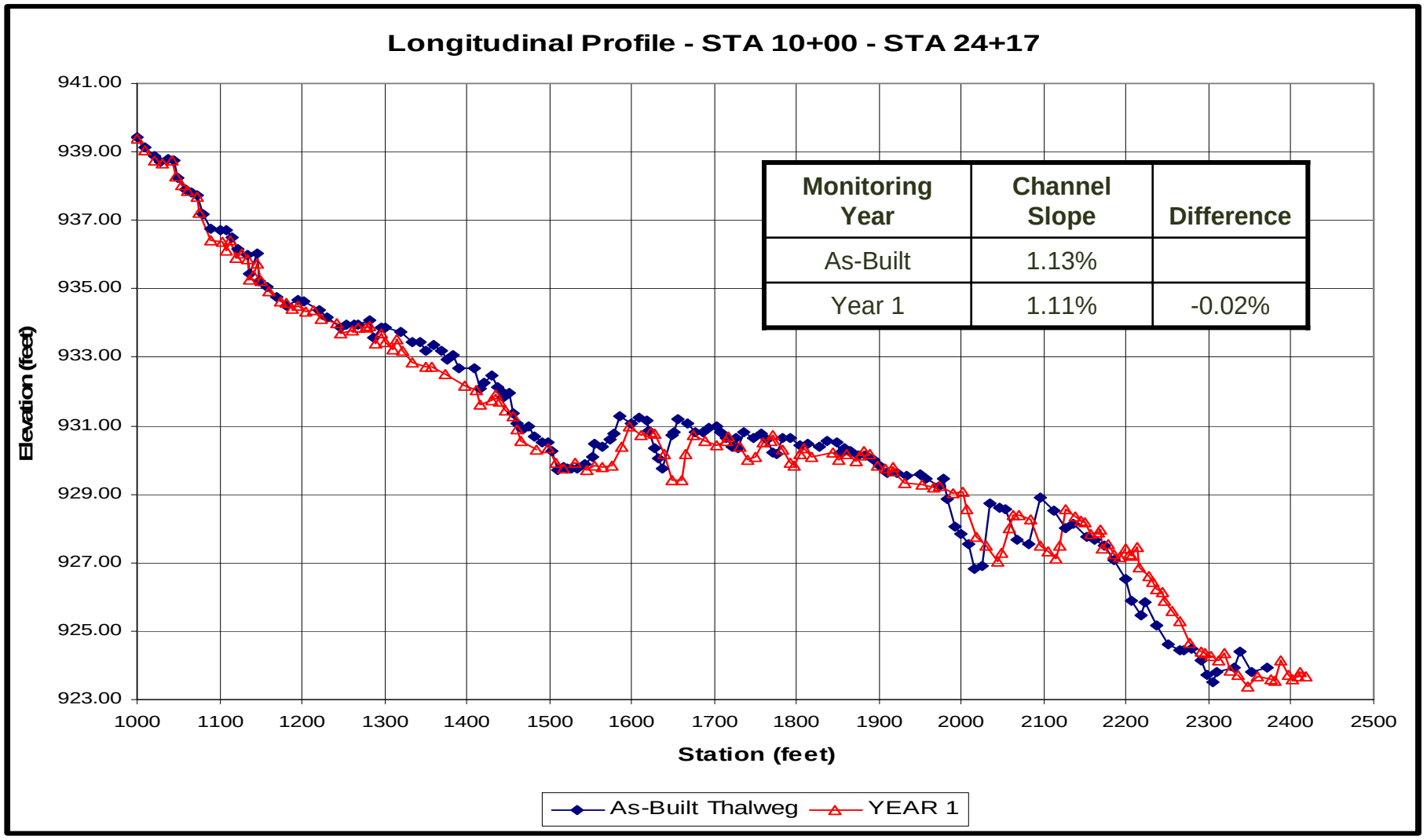


Monitoring Year	Channel Slope	Difference
As-Built	3.29%	
Year 1	3.22%	-0.07%
Year 2	3.31%	+ 0.02%

LONGITUDINAL PROFILE 0+00 - 3+53

VERTICAL SCALE: 1"= 4' HORIZONTAL SCALE: 1"= 30'

Example 3: Profile



Monitoring Year	Channel Slope	Difference
As-Built	1.13%	
Year 1	1.11%	-0.02%

Appropriateness of Success Criteria

- Are Virginia's Success Criteria…
  - Comprehensive enough to analyze the departure from the as-built condition?
  - Repeatable and reproducible to allow year-to-year comparisons to show departure and problems, and enable analysis of data?
  - Enforceable?
  - Appropriate for determining ecological success?

Questions?

Thank you

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