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Managing Water in the West

Compact Bypass Grading Options

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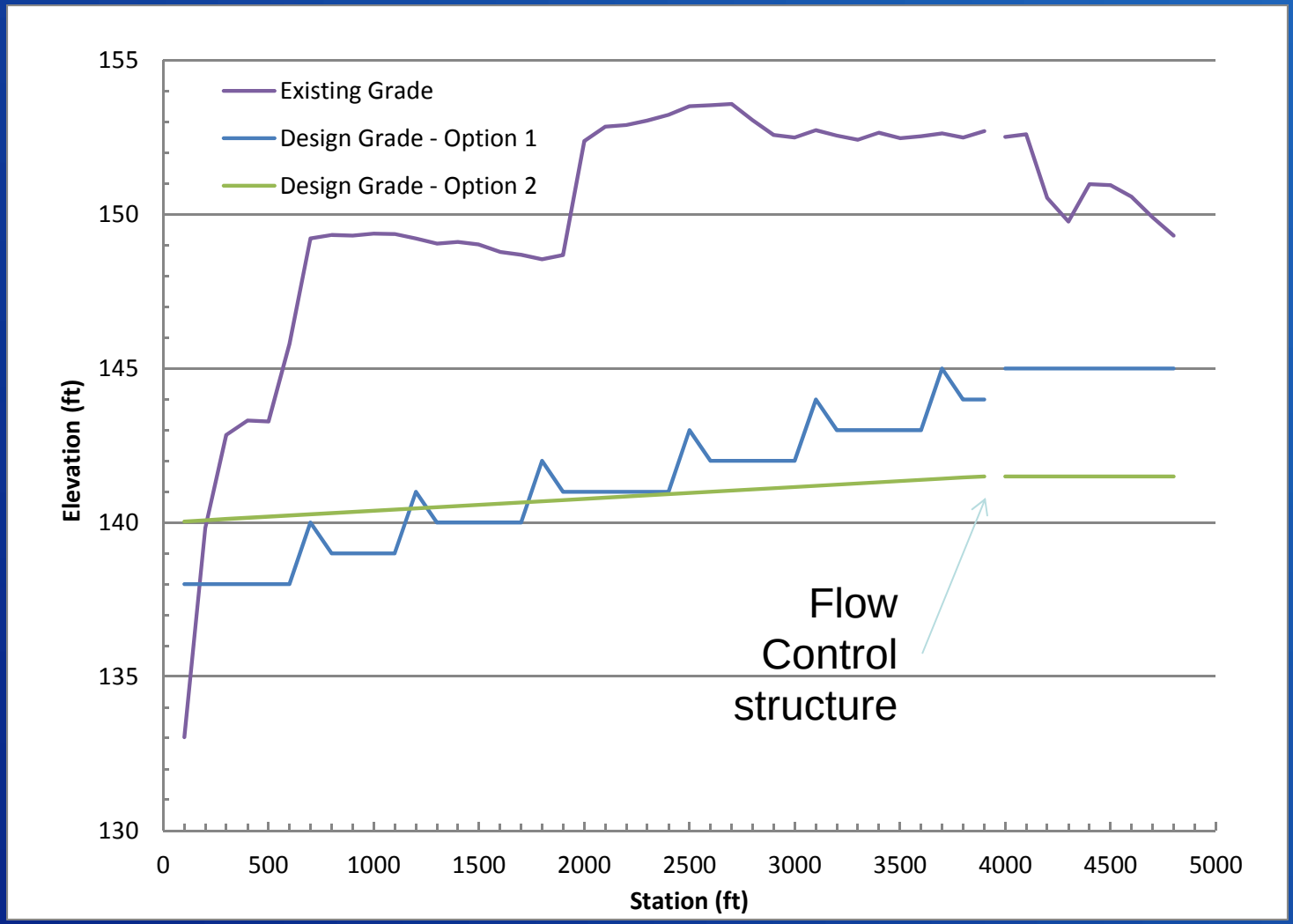
SAN JOAQUIN RIVER RESTORATION PROGRAM

U.S. Department of the Interior
Bureau of Reclamation

Design Options for Grading

- **Option 1: Grade Control Profile**
  - **Stabilization of the Compact Bypass with grade control structures**
- **Option 2: Natural Stream Profile**
  - **Minimizes the use of channel stabilization features and allows for more erosion in Reach 2B and deposition in Reach 3**
- **Both options include a gated flow control structure at upper end of Compact Bypass to divert flows from San Joaquin into Mendota Pool**

Design Option Profiles



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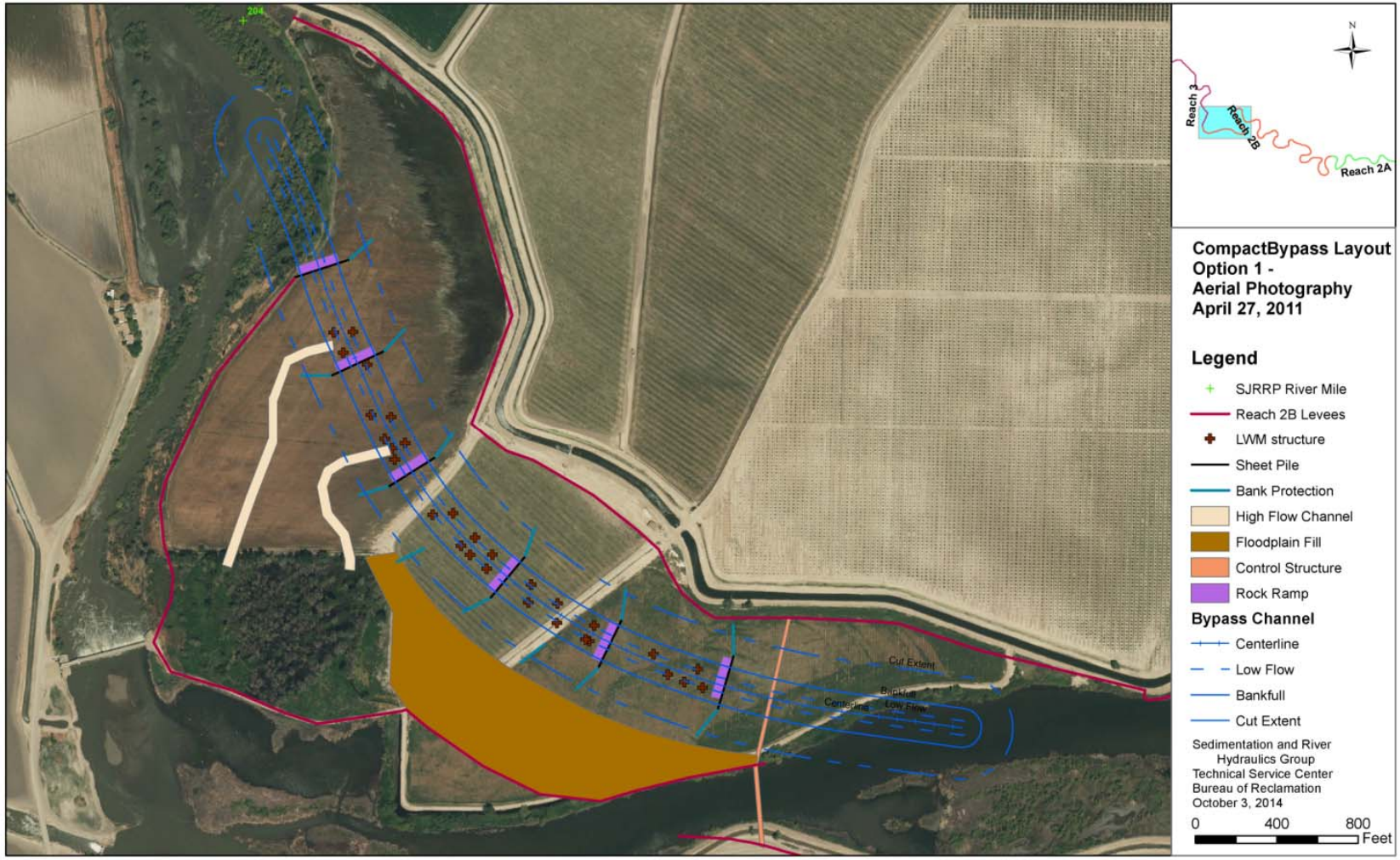
Option 1



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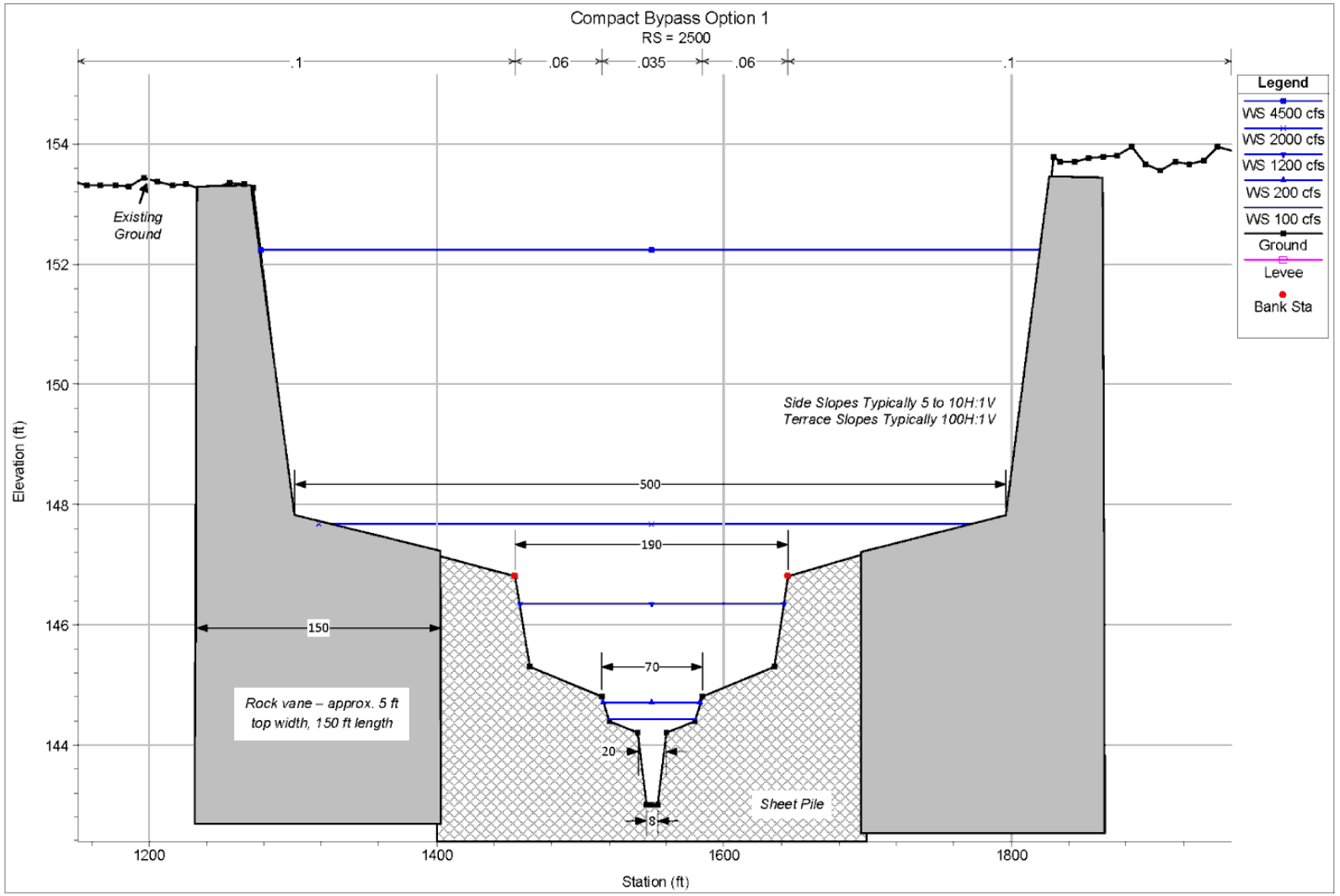
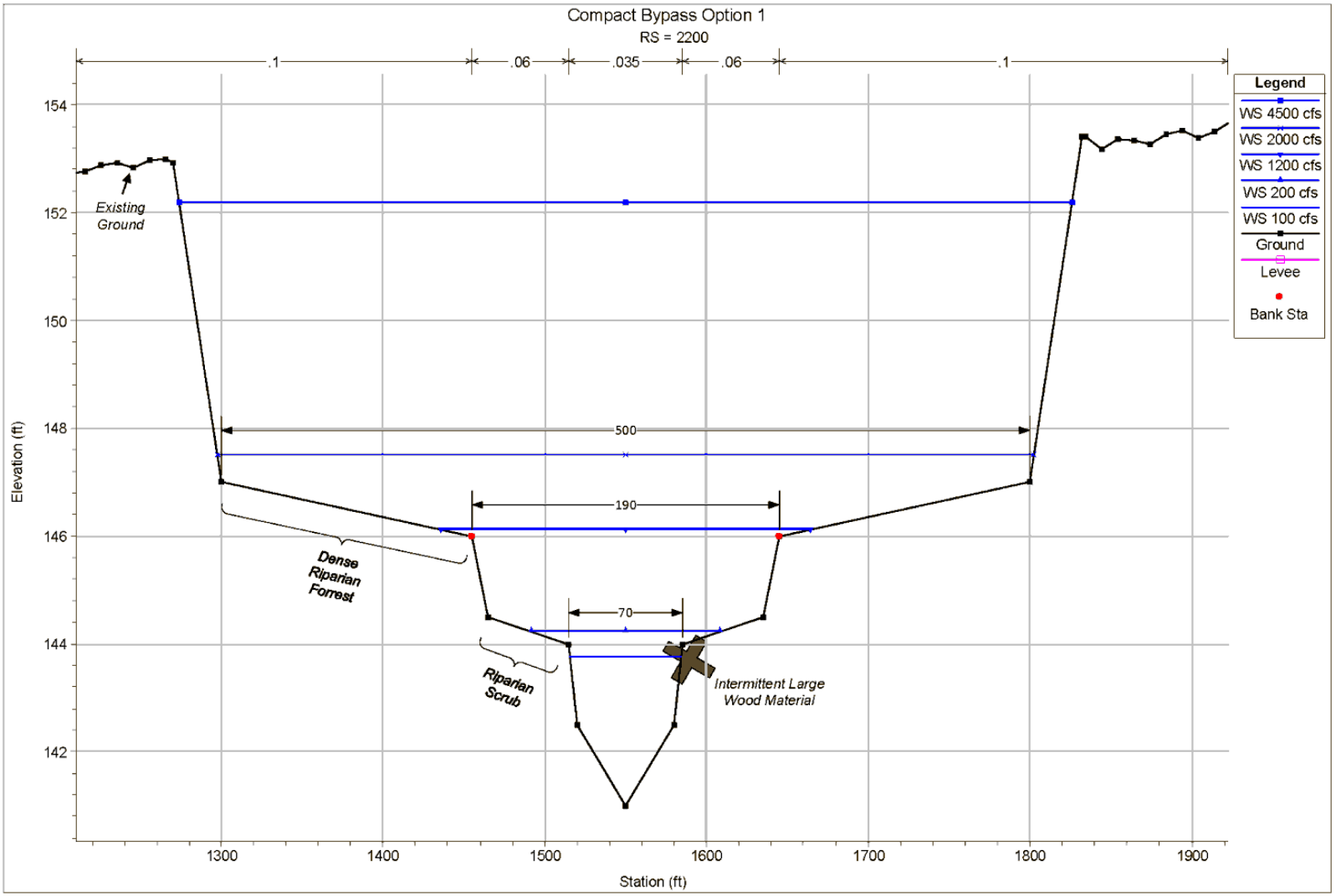
Example Riffle Section at Upstream end of each Rock Ramp



Example Pool Section at between Rock Ramps



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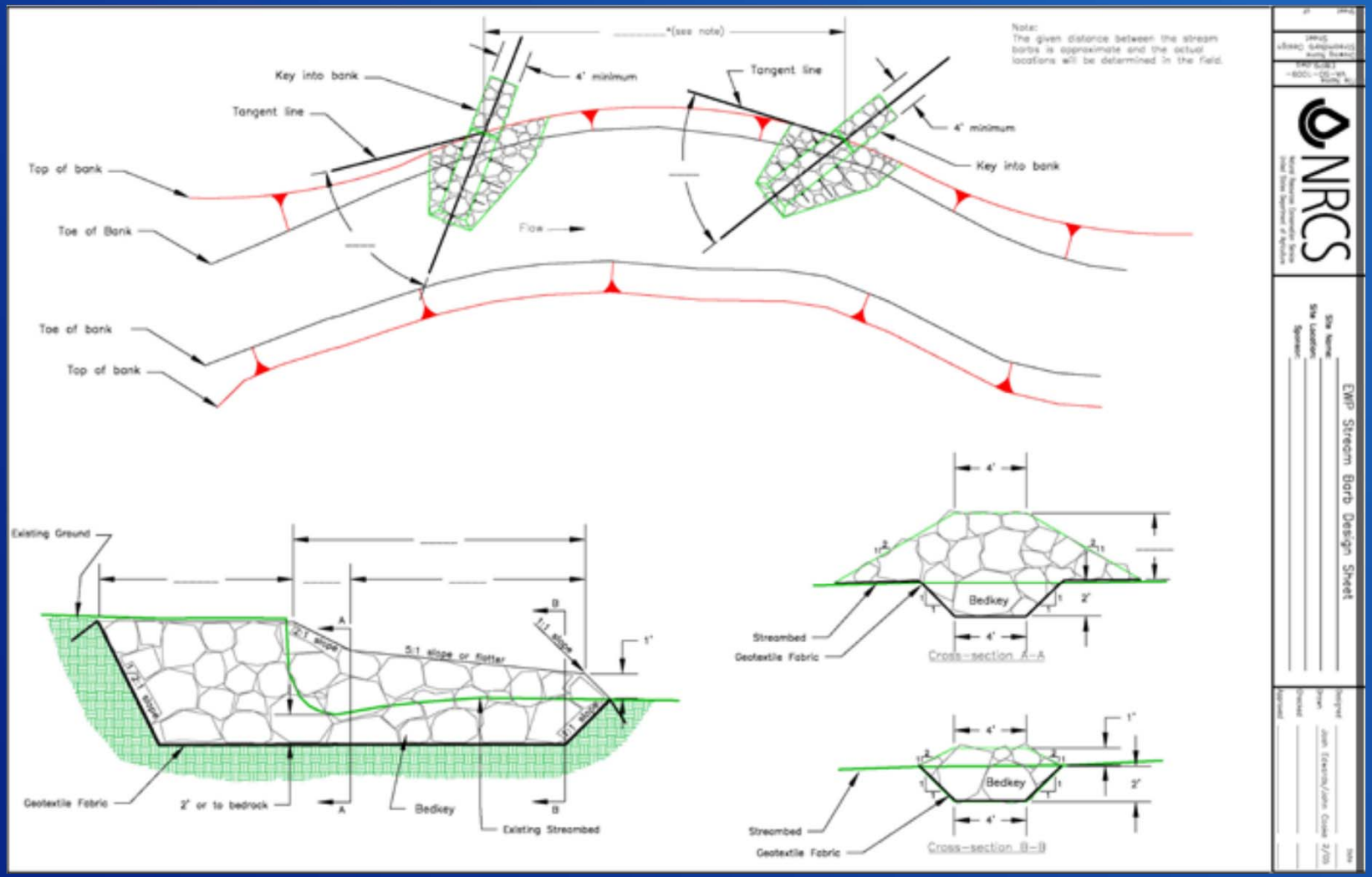
Option1: Rock Vanes for Bank Protection



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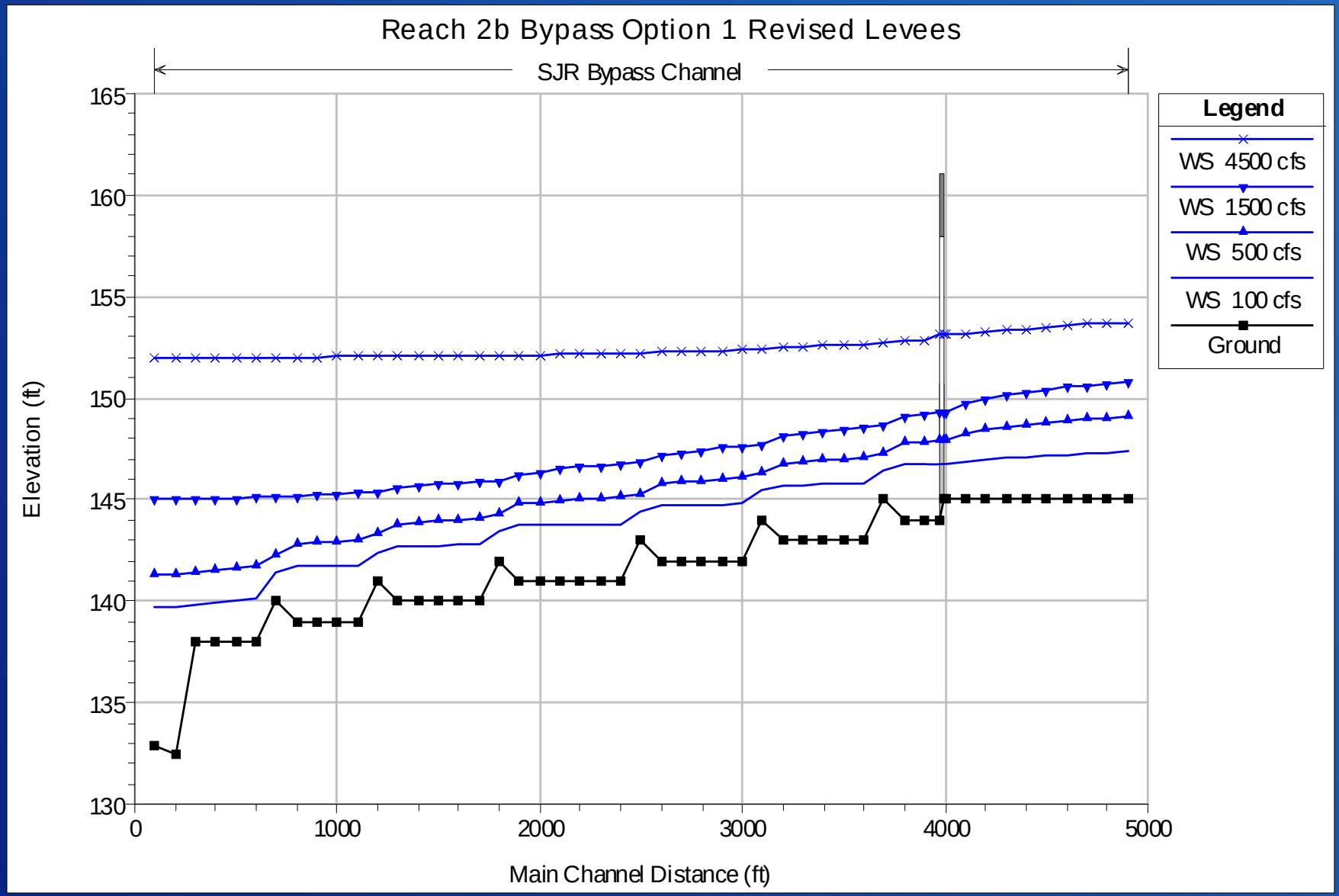
Option1: Rock Ramps for Grade Control - example

Option 1: Initial Water Surface Profile



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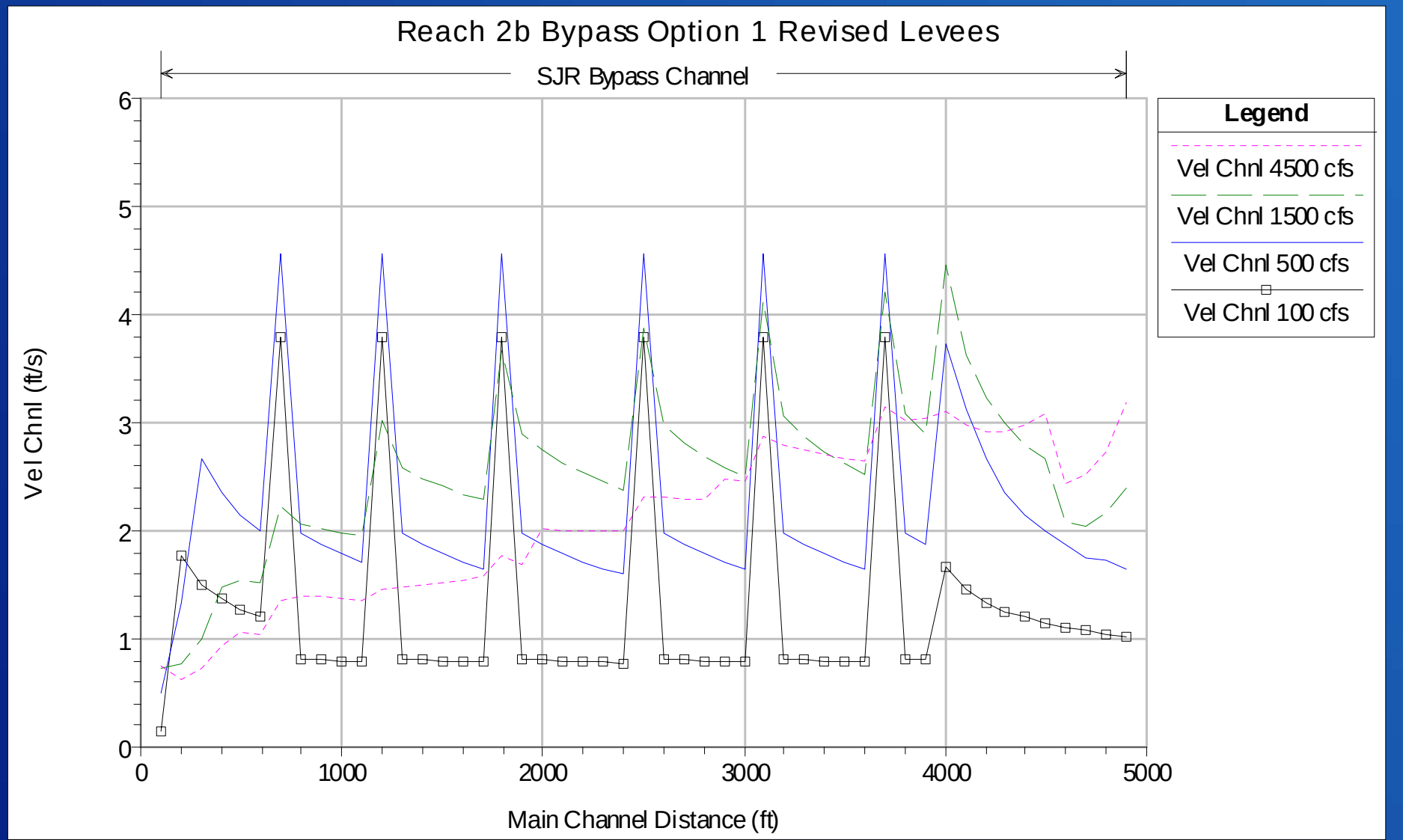
Option 1: Initial Channel Velocities



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Option 2

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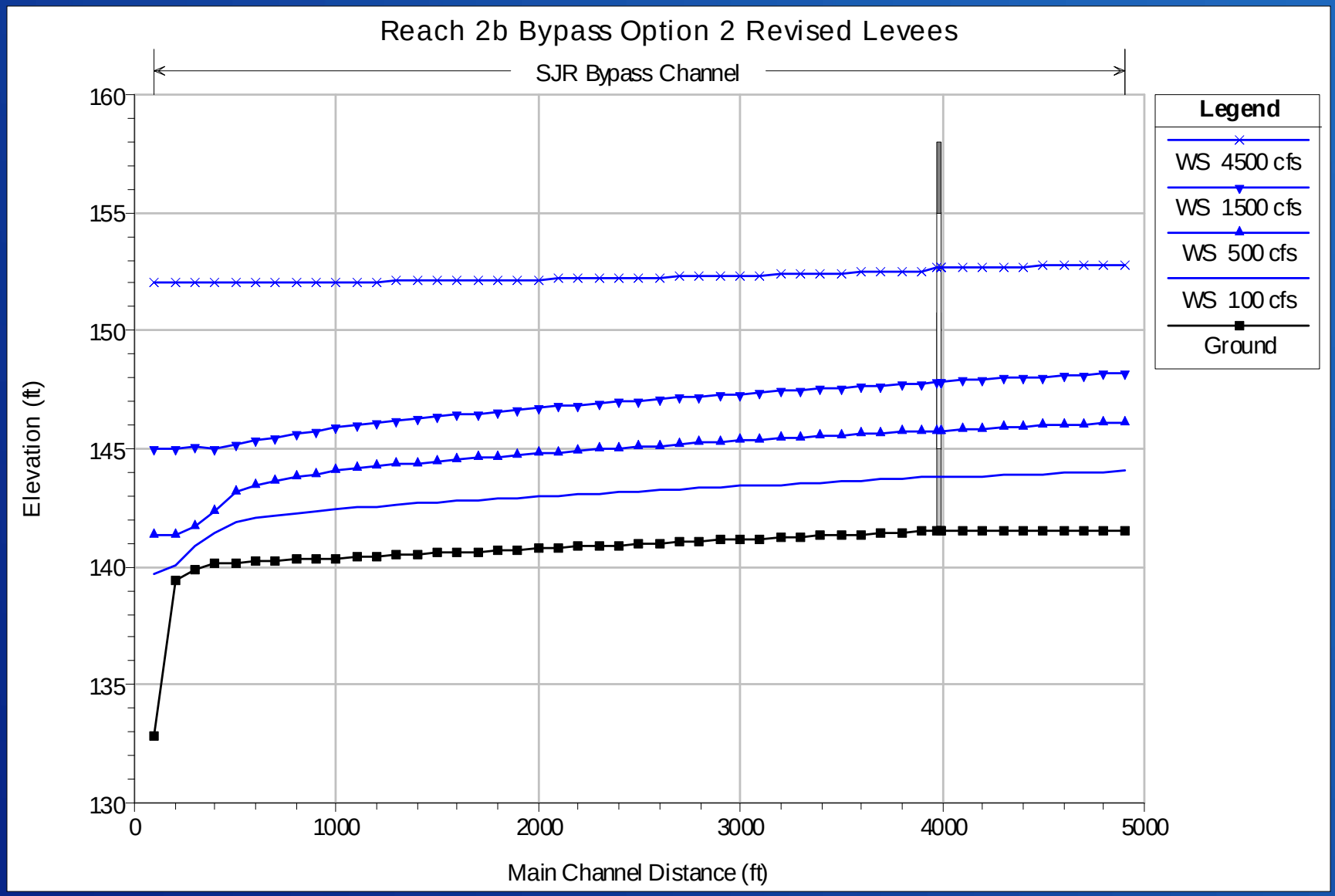
Option 2: Initial Water Surface Profile



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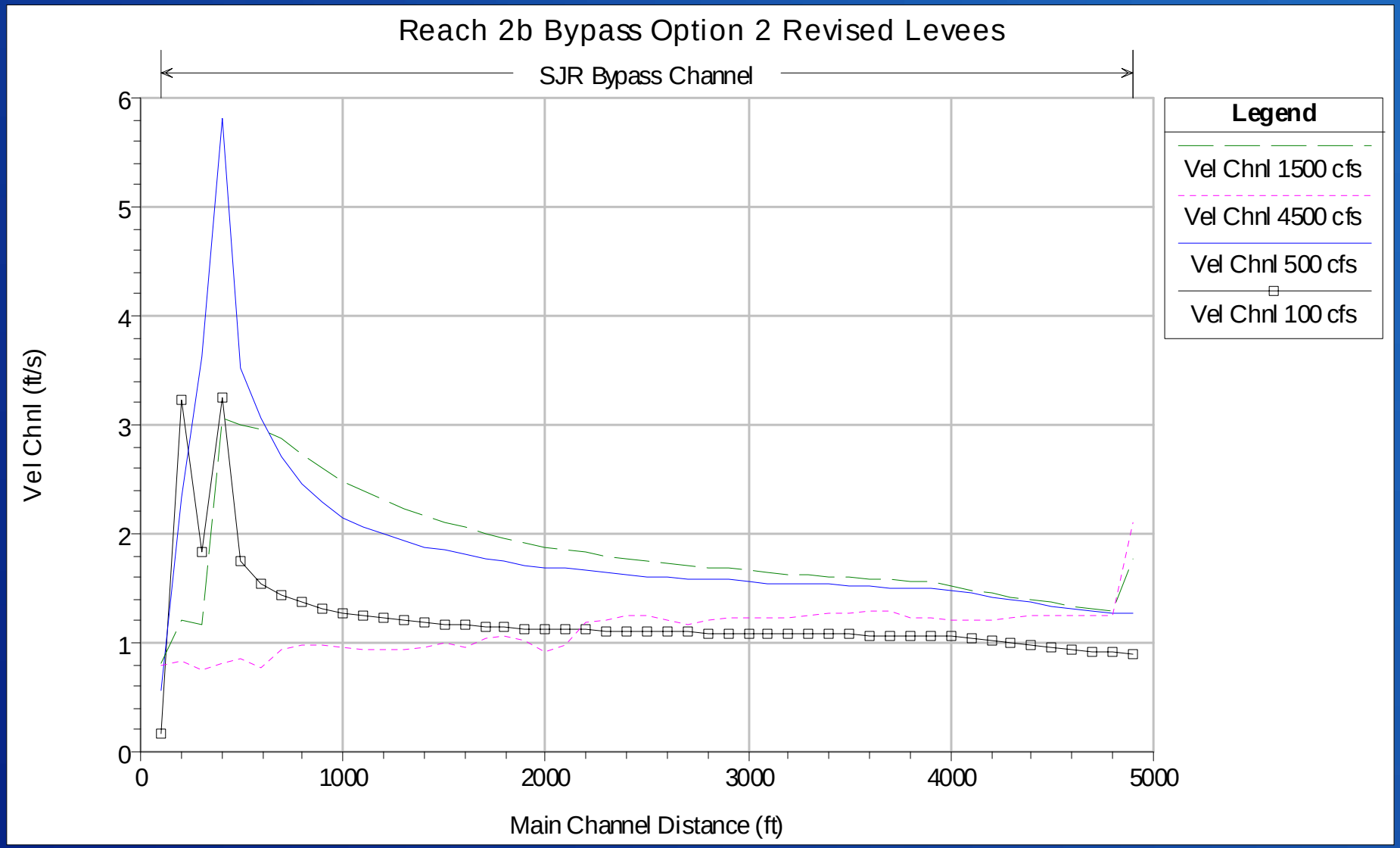
Option 2: Initial Channel Velocities



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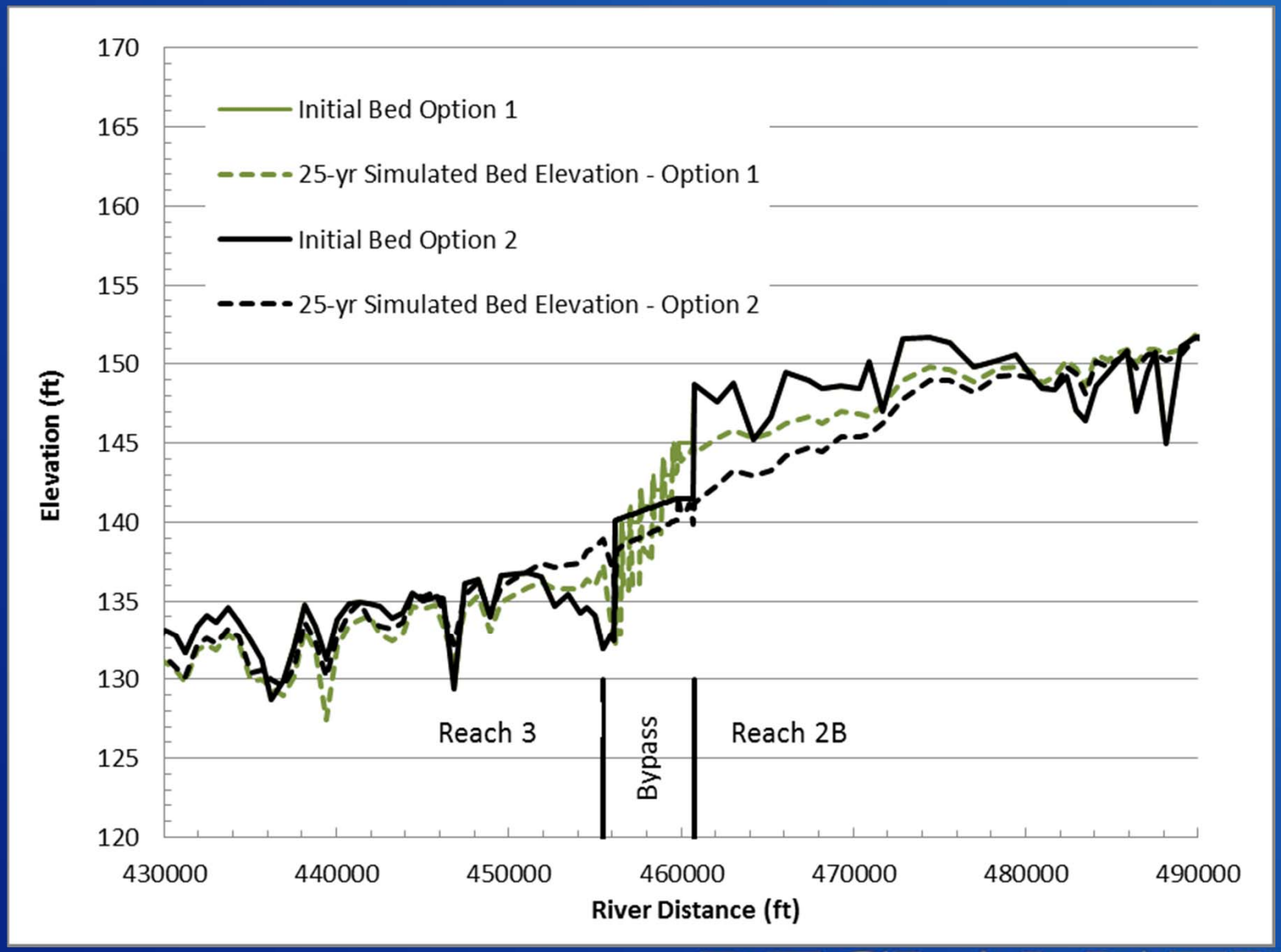
Future Bed Elevations Changes



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Comparison

- Option 1
  - More certainty in channel geometry
  - Less erosion of bed in Reach 2B
  - Higher construction costs and maintenance of grade control structures will be necessary
  - Higher channel velocities
    - More bank erosion, bank protection necessary
    - Reduced fish passage

Comparison

- Option 2
  - Reduced construction and maintenance cost of grade control structures
  - Lower channel velocities
    - Less bank erosion, reduced need for bank protection
    - Better fish passage
  - Additional erosion of channel in Reach 2B lowering water surface elevations and reducing floodplain inundation
  - May eventually still require one or two small grade control structures
  - Uncertainty in initial channel transition period after initial excavation