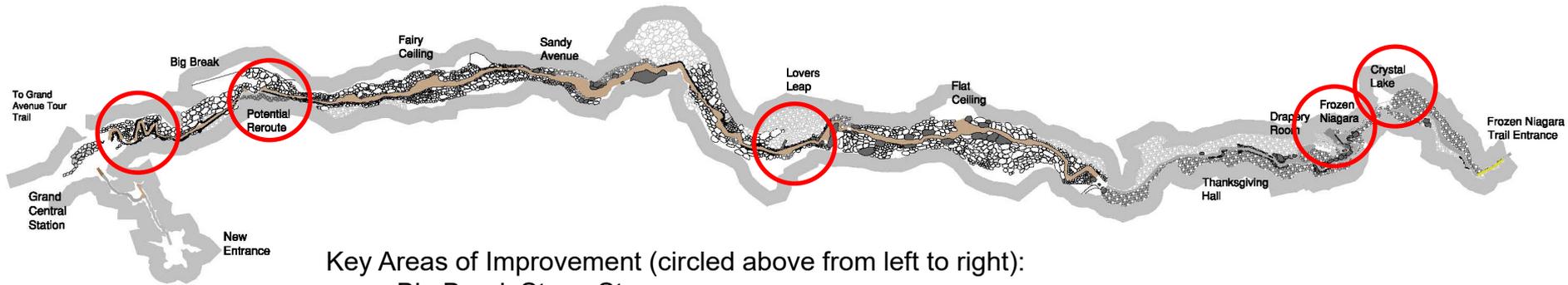


Mammoth Cave National Park

Rehabilitate Cave Trails: Frozen Niagara



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Key Areas of Improvement (circled above from left to right):

- Big Break Stone Steps
- Metal Stairs Trail Reroute
- Lover's Leap Trail Reroute
- Frozen Niagara Overlook
- Crystal Lake Overlook

Frozen Niagara Trail Overview

Cave Trails Rehabilitation: Frozen Niagara



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Big Break Steps - Overall



Big Break Steps - Lower Steps



Big Break Steps - Landing

Issues at Big Break Steps:

- Steep slopes
- Historic limestone steps
- Historic stacked stone walls
- Uneven trail surfaces

Big Break Steps – Existing Conditions

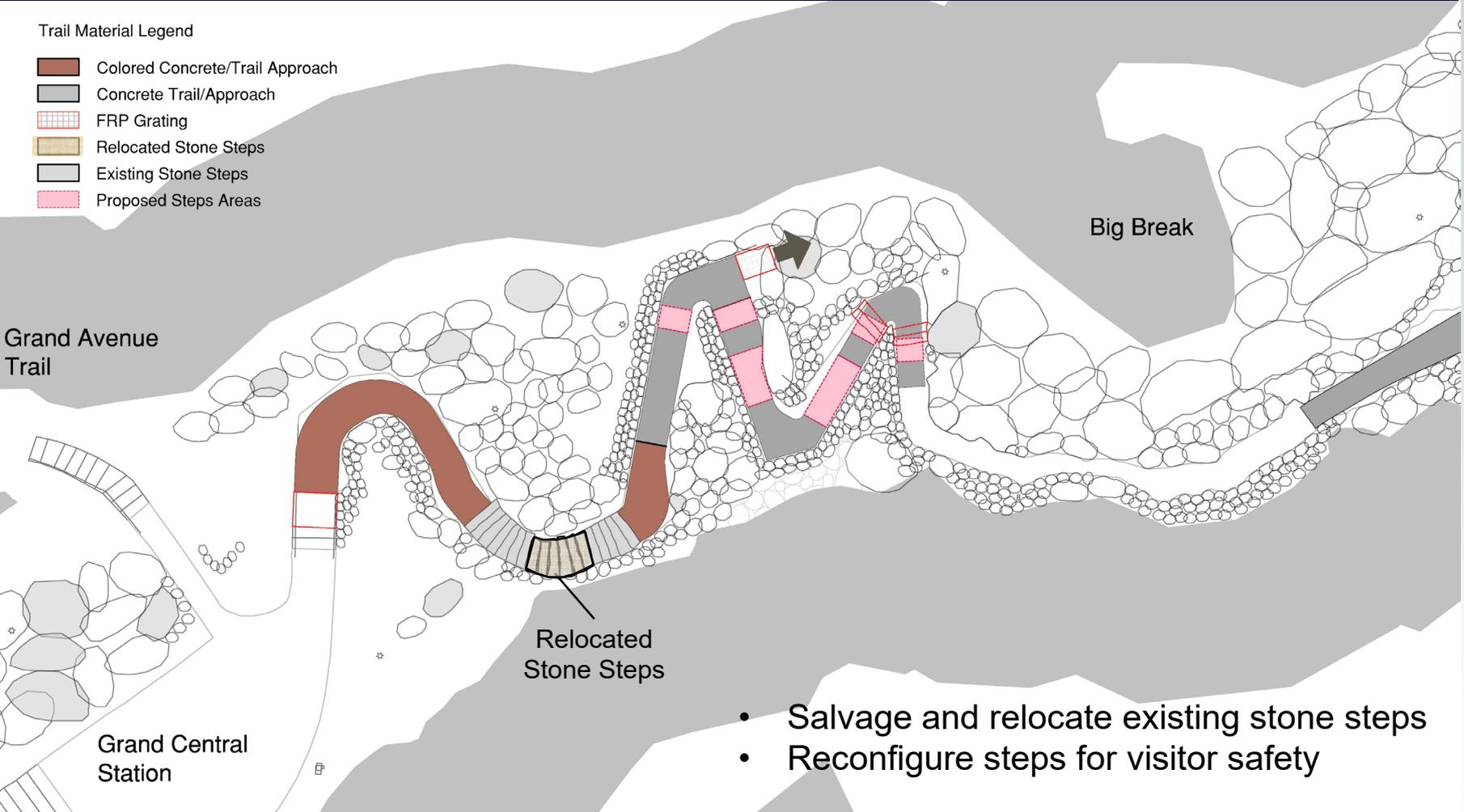
Cave Trails Rehabilitation: Frozen Niagara



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Trail Material Legend

- Colored Concrete/Trail Approach
- Concrete Trail/Approach
- FRP Grating
- Relocated Stone Steps
- Existing Stone Steps
- Proposed Steps Areas



Big Break Steps – Proposed Concept

Cave Trails Rehabilitation: Frozen Niagara



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Metal Stairs - Bottom Landing



Metal Stairs - Looking Up



Metal Stairs - Looking Down

Issues at Trail Reroute Area:

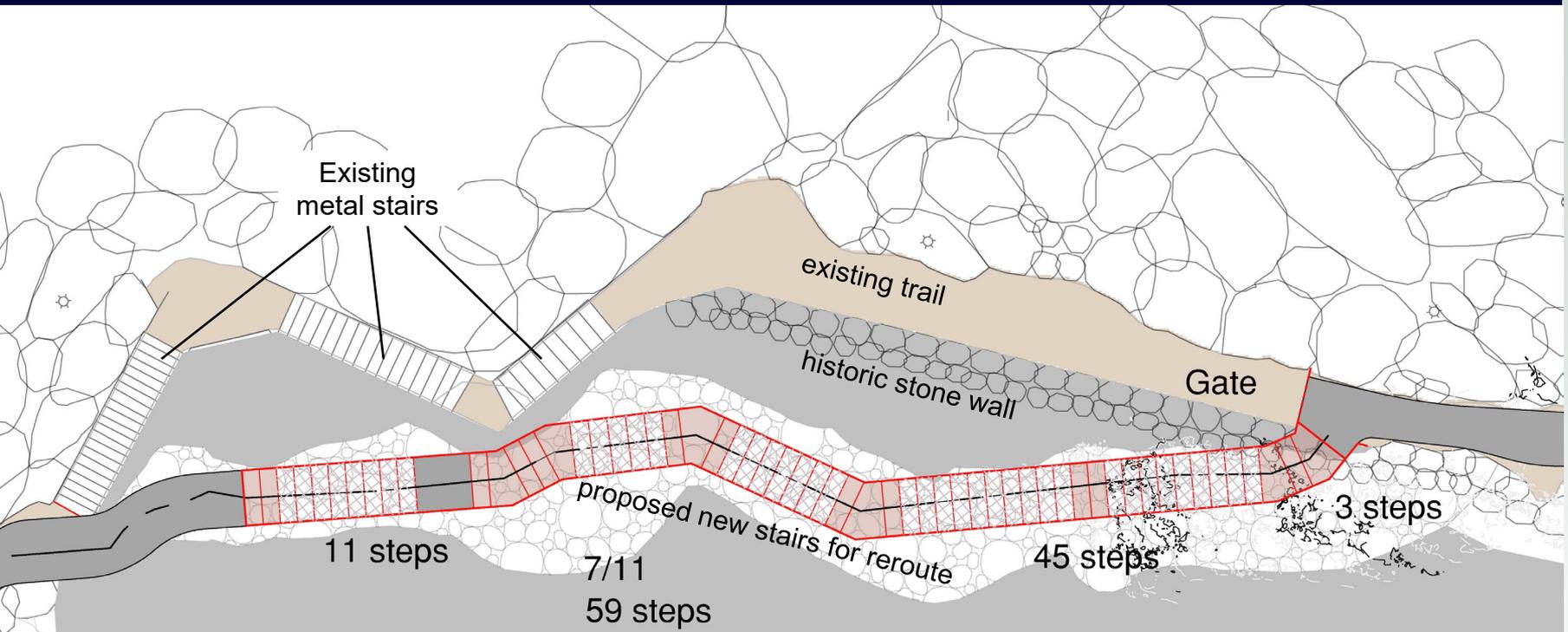
- Three sets of very steep, ladder-like stairs
- Low head clearance
- Very narrow
- Historic stone retaining wall adjacent to trail
- Understructure encased in lead paint

Trail Reroute – Existing Conditions

Cave Trails Rehabilitation: Frozen Niagara



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- Reroute existing trail to improve head clearance issues, width constraints, and steep steps
- Minimize disturbance to existing stone/rubble
- Minimize impacts to existing stone wall built by the Civilian Conservation Corps

Trail Reroute – Proposed Concept

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Lover's Leap Trail - Overview



Lover's Leap Trail - Switchback



Lover's Leap Trail - Steps

Issues at Lover's Leap Trail:

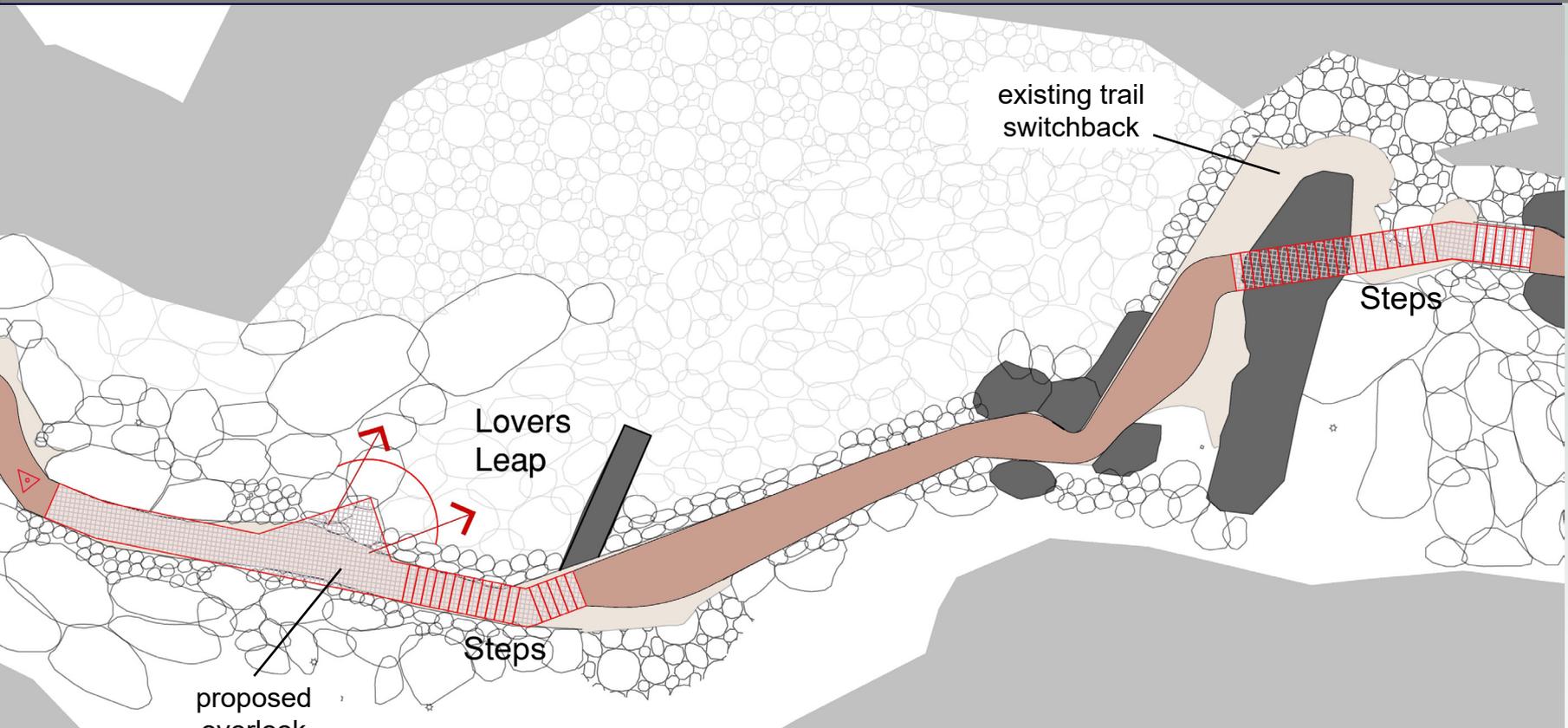
- Steep, narrow trail
- Switchback with low head clearance
- Non-compliant handrails
- Uneven trail surfaces
- Historic stacked stone wall

Lover's Leap Trail – Existing Conditions

Cave Trails Rehabilitation: Frozen Niagara



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- Elevated deck to create an overlook at Lovers Leap
- Steps at grade to the concrete trail
- Steps or elevated walkway to bypass switchback

Lover's Leap Trail – Proposed Concept

Cave Trails Rehabilitation: Frozen Niagara



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Frozen Niagara Overlook from Trail



View of Rock Wall and Pillar over Fence



Frozen Niagara Overlook from Below

Issues at Frozen Niagara Overlook:

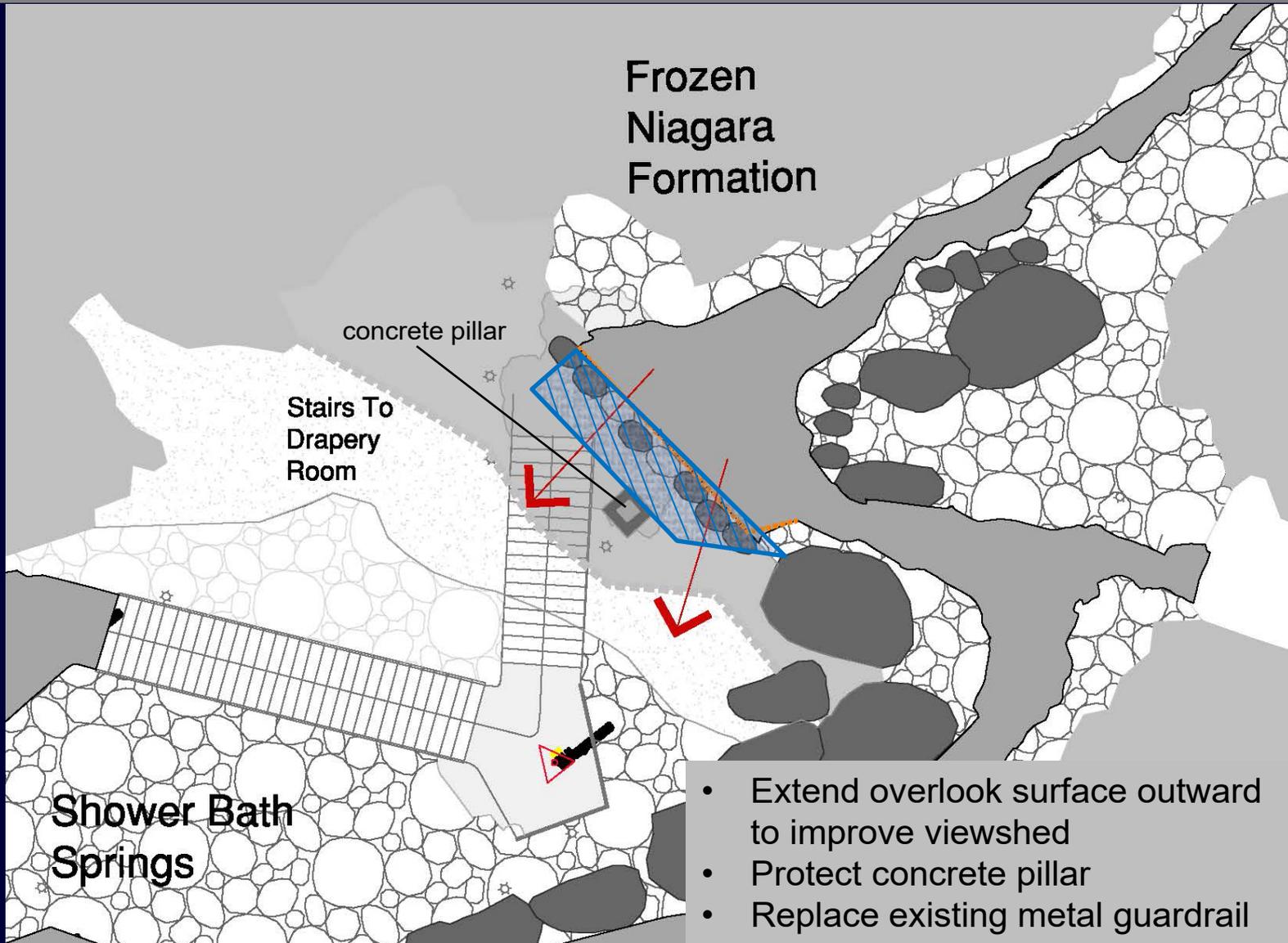
- Concrete pillar partially blocks view
- Metal handrail is set back from overlook
- Uneven trail surfaces

Frozen Niagara Overlook – Existing Conditions

Cave Trails Rehabilitation: Frozen Niagara



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Frozen Niagara Overlook – Proposed Concept

Cave Trails Rehabilitation: Frozen Niagara



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Crystal Lake Overlook Decking



Partially-Obstructed View Below



Crystal Lake Overlook Guardrail

Issues at Crystal Lake Overlook:

- Concrete decking and metal guardrail partially obstruct the view to the lake below
- Water management issues
- Age of existing infrastructure

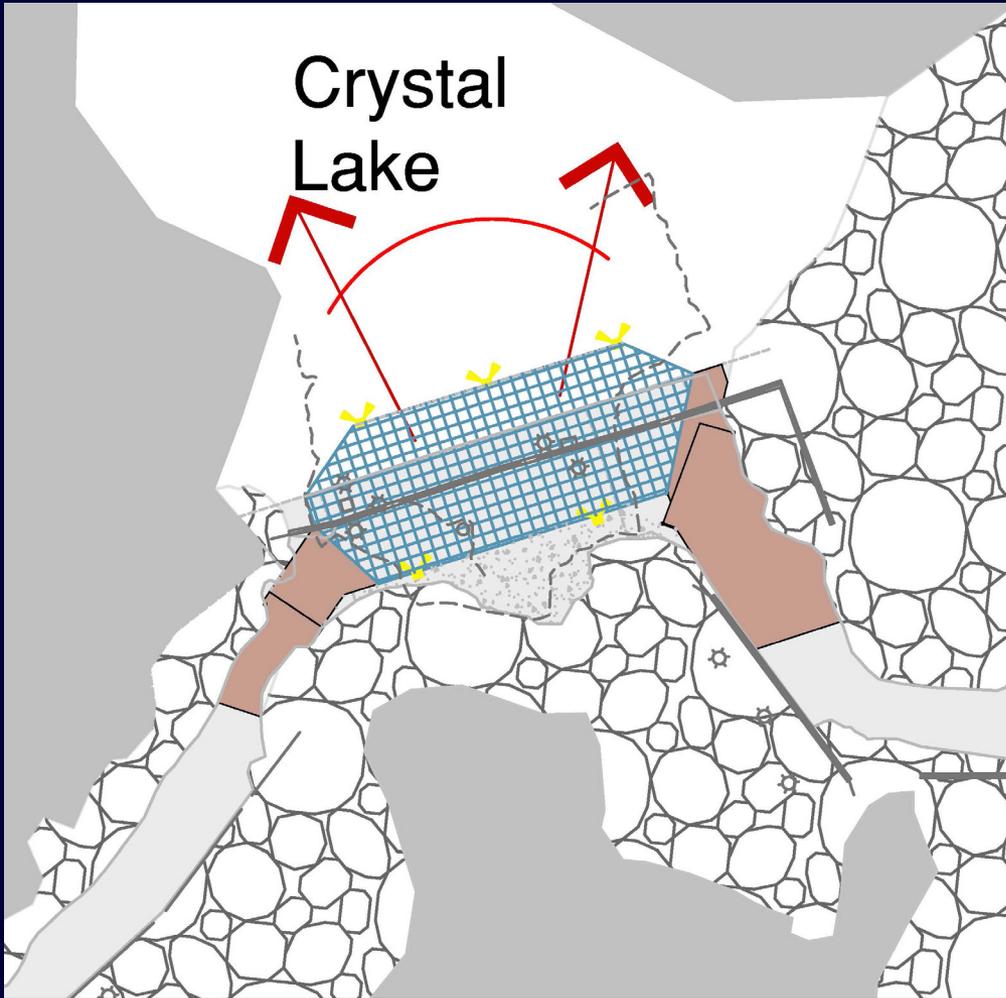
Crystal Lake Overlook – Existing Conditions

Cave Trails Rehabilitation: Frozen Niagara

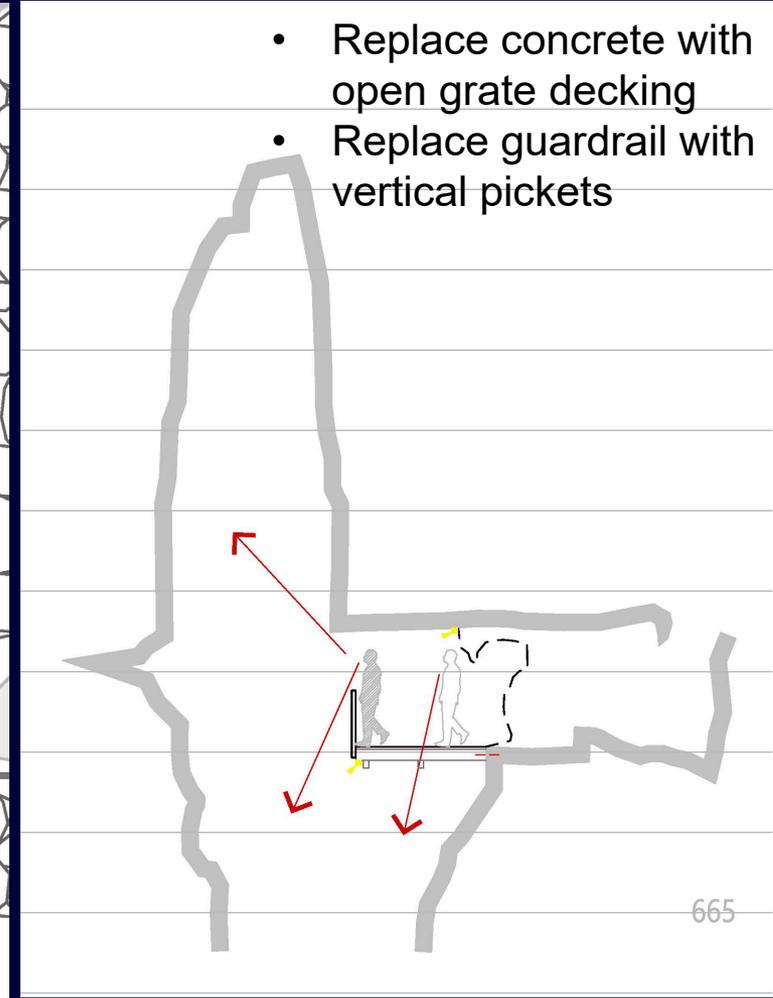


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Crystal
Lake



- Replace concrete with open grate decking
- Replace guardrail with vertical pickets



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Crystal Lake Overlook – Proposed Concept