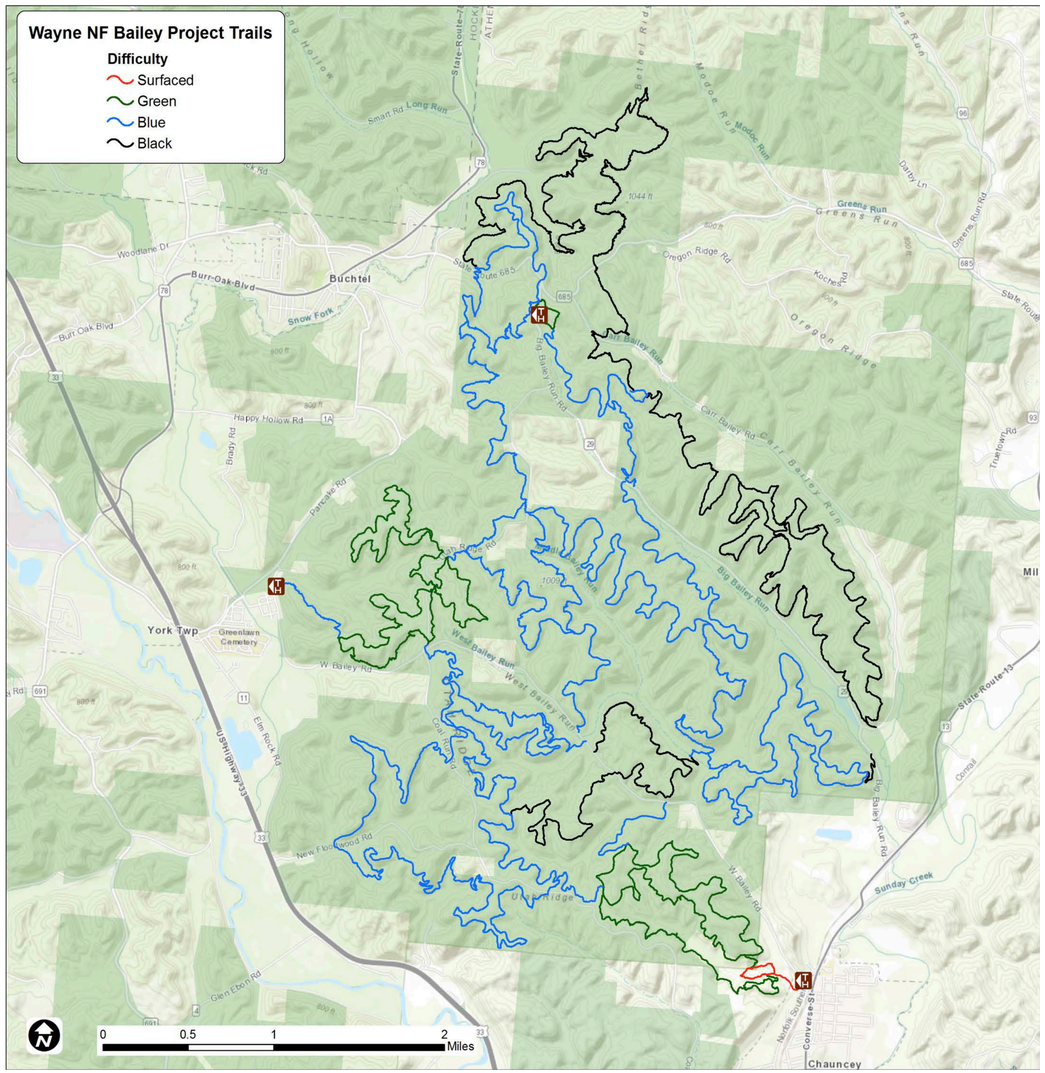
Bailey Tract Trail System
Construction Documents



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Panel Locator Map

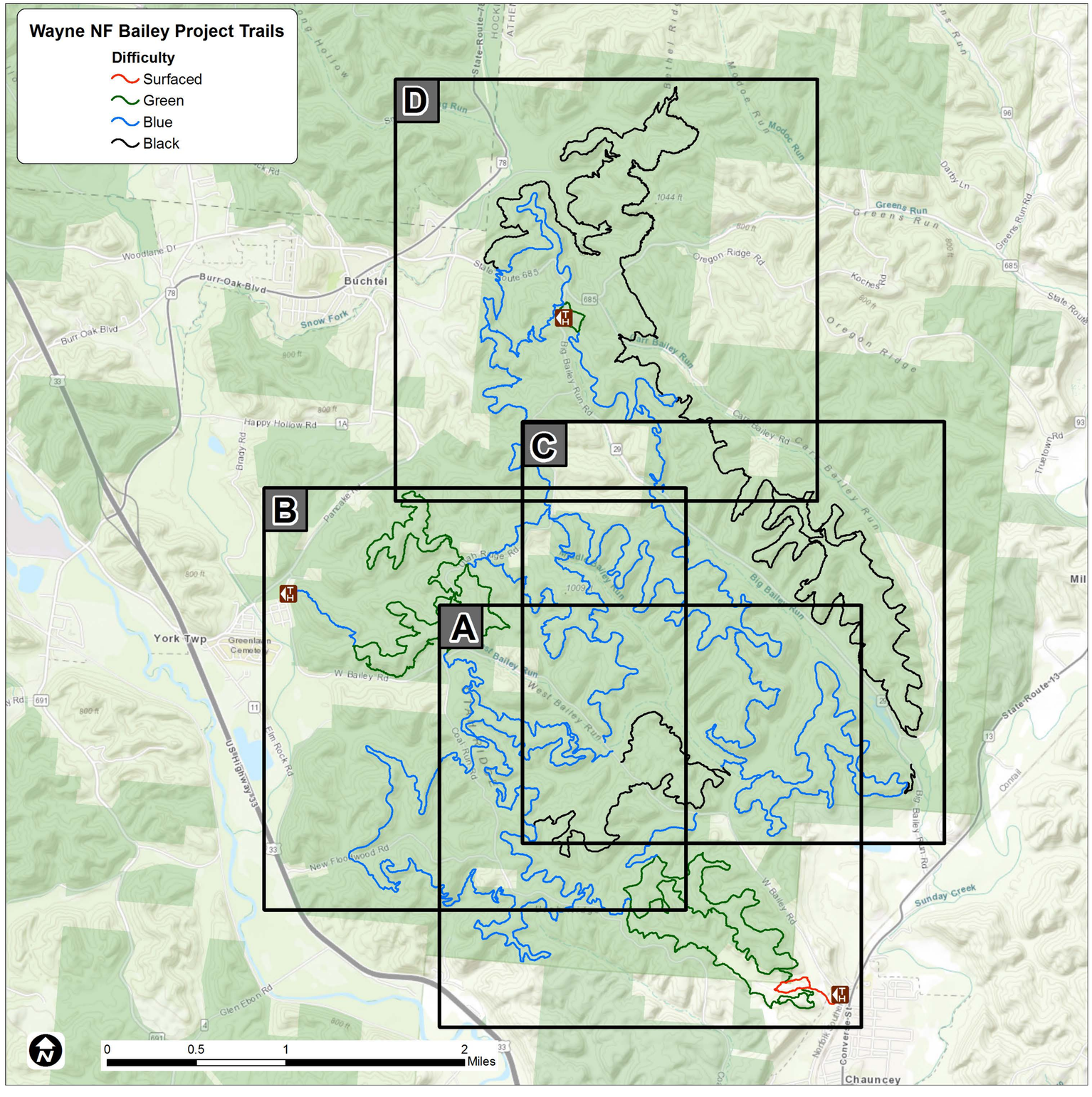
Summary Table

Trail Type

Surfaced	3,839 feet
Less Difficult (green)	79,243 feet
More Difficult (blue)	205,516 feet
More Difficult Directional (blue)	33,471 feet
Most Difficult (black)	92,626 feet
Most Difficult Directional (black)	26,671 feet

Crossing Type

Bridges	10 total
Puncheon	1500 feet
Rock Armor	120 feet
At Grade/Culvert	115 total (75% at grade, 25% culvert desired)



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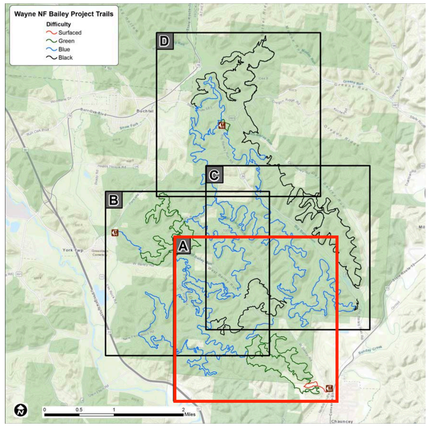
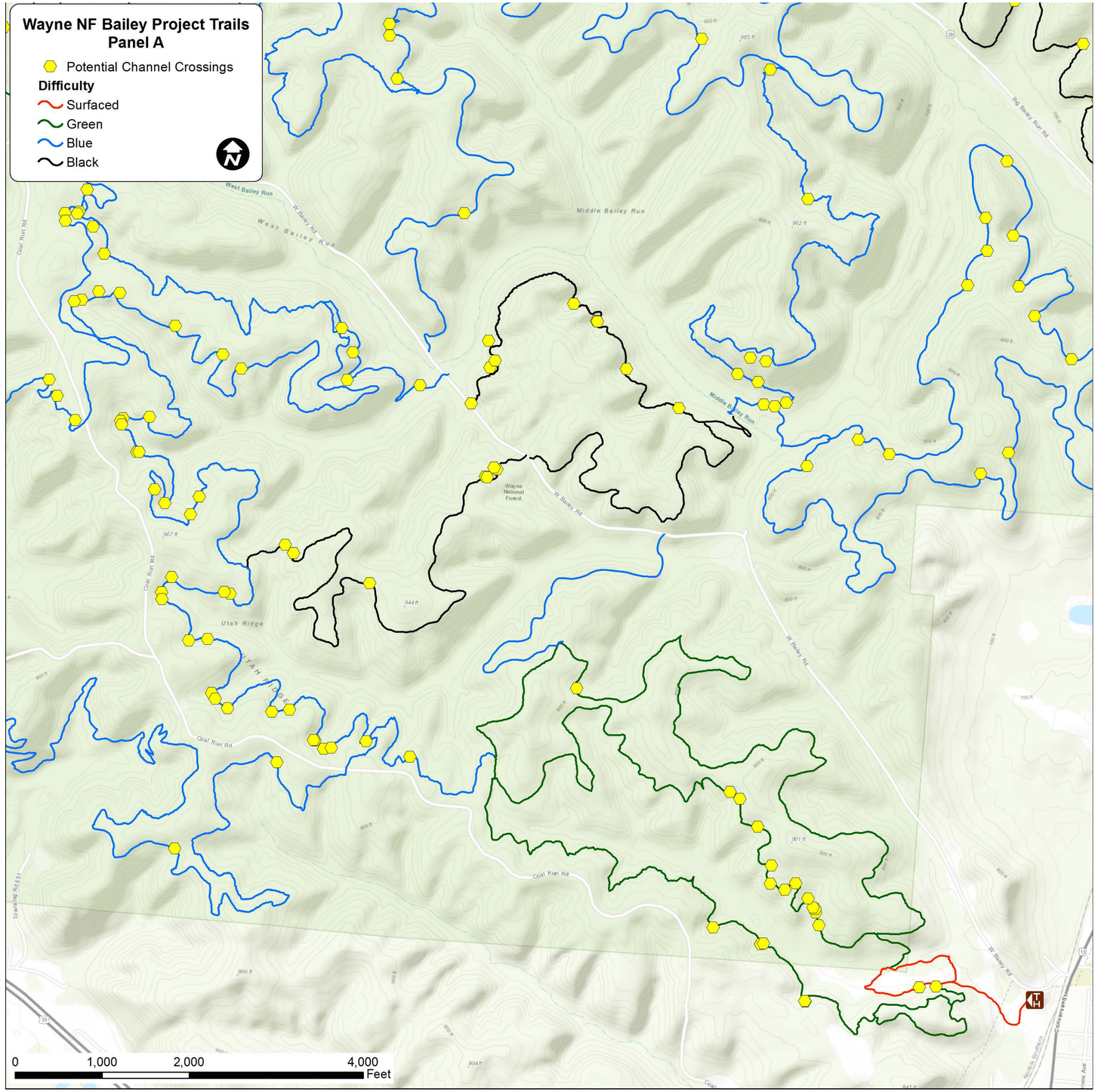
Panel A





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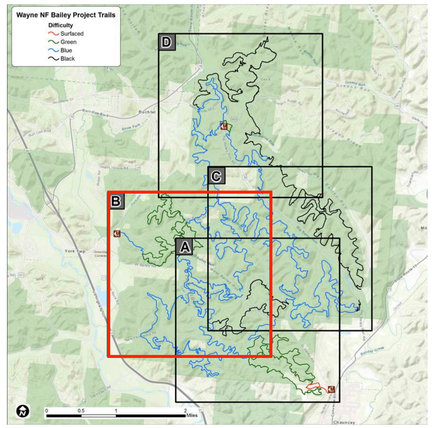
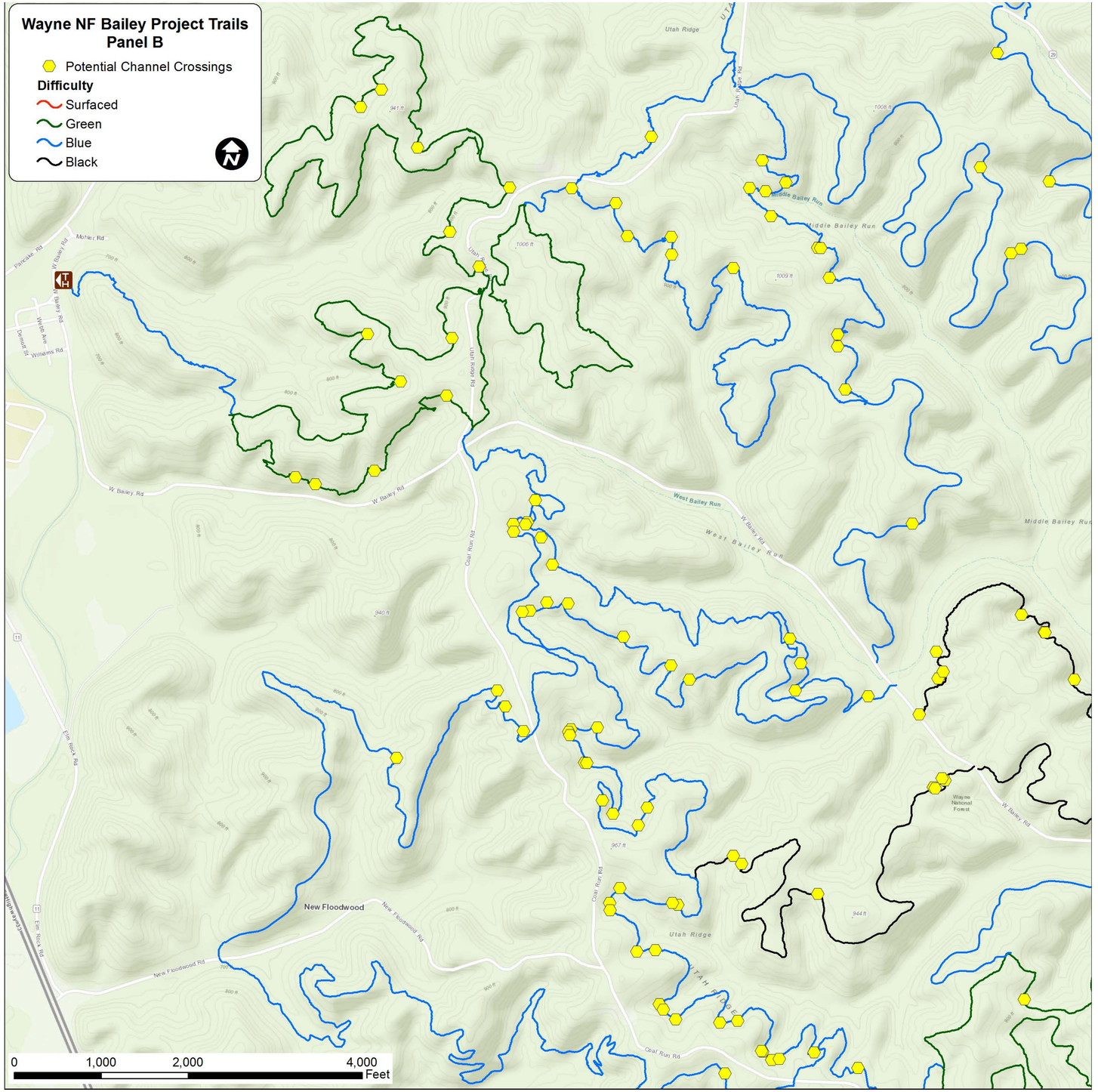
Panel B





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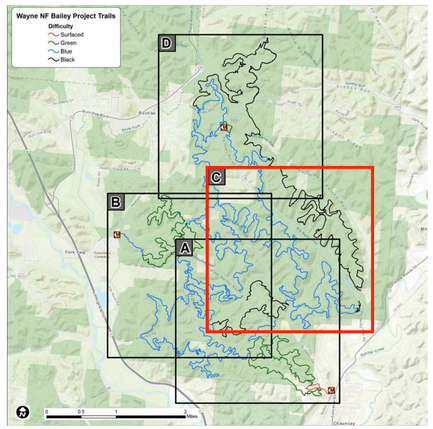
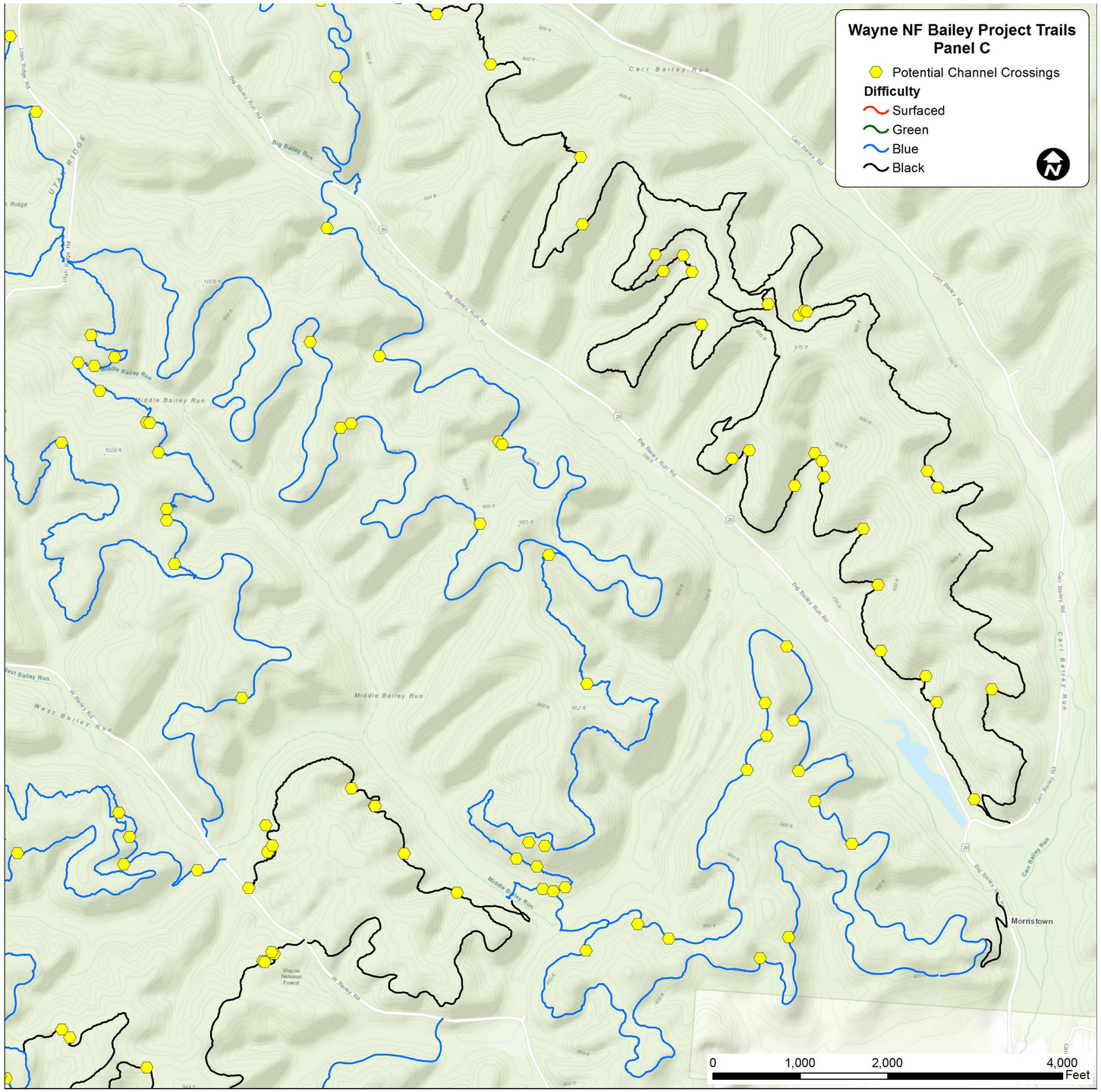
Panel C





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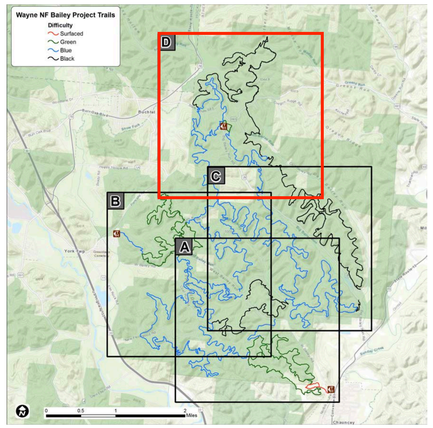
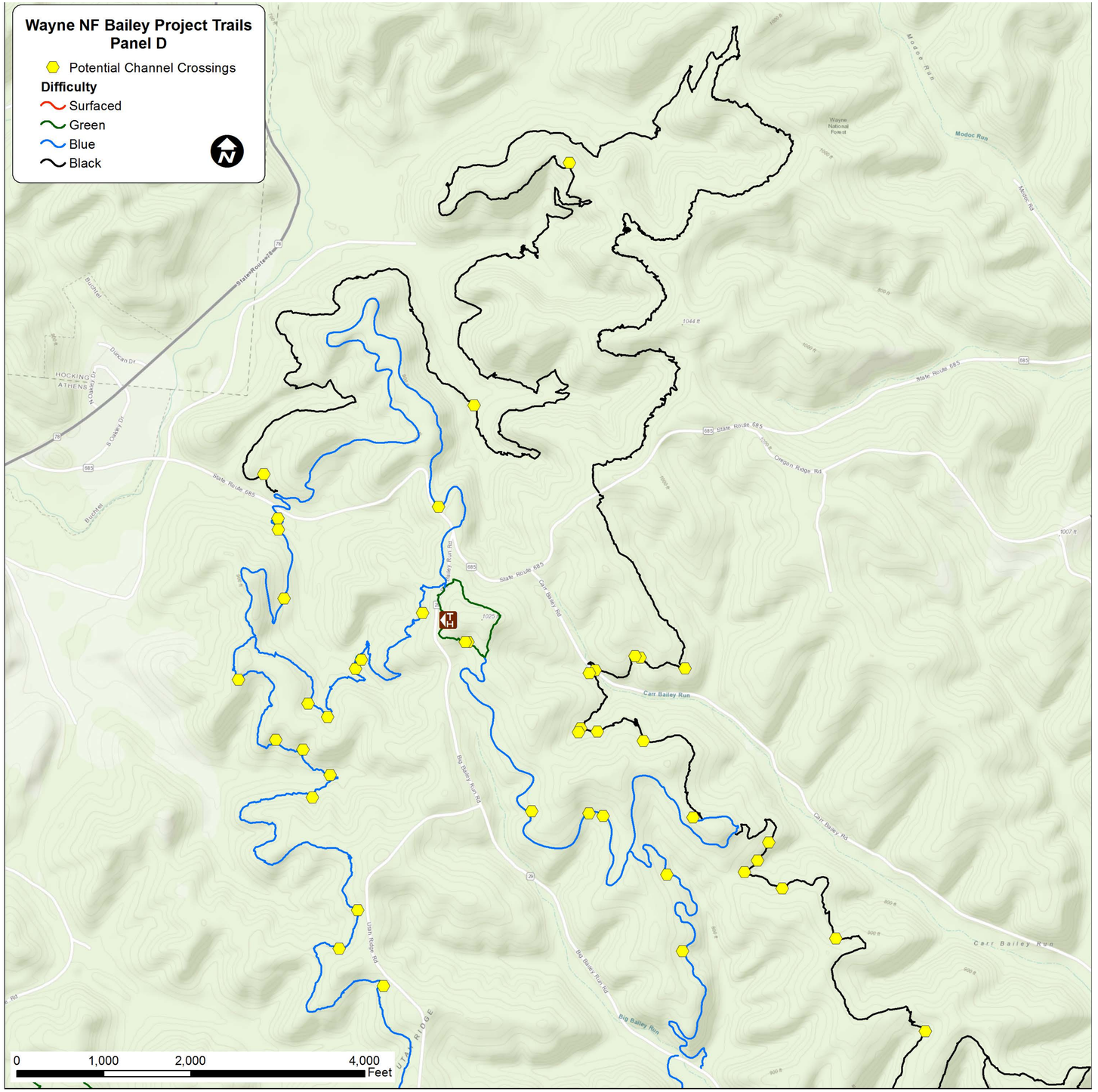
Panel D





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Construction Notes

SEQUENCE OF CONSTRUCTION:

General Notes

1. At least 7 days prior to initiating any earth disturbance (corridor and/or tread development), the owner and/or construction manager shall invite contractors, the USFS, appropriate officials to an on-site preconstruction meeting.
2. All earth disturbance activities shall proceed in accordance with the sequence provided on the plan drawings and construction notes. Deviation from that sequence must be approved in writing from USFS to implementation.
3. Contractor will perform controls necessary for the execution of the work (even if not specifically mentioned) and provide additional controls as required by unforeseen conditions. Any additional controls will be submitted in writing to USFS via the owner/construction manager.

TRAIL CONSTRUCTION NOTES

1. Trail construction will be conducted by a professional firm that can demonstrate significant and successful experience in the field of mountain bike-optimized natural surface trail development.
2. Construction of trail tread and attendant features (i.e. puncheon, bridge, culvert, and rock armored segments) will be in accordance with the general specifications presented within this document and fundamentally based on sustainable trail design principles promulgated by credible, recognized printed source material, including the International Mountain Bicycling Association's handbooks, *Trail Solutions* and *Managing Mountain Biking*, and the USDA Forest Service's *Trail Construction and Maintenance Notebook*.
3. Trail corridor will be cleared to a width in accordance with the specifications. Stems larger than 6" dbh will not be removed until approved by the construction manager or USFS. All cut materials longer than 5' in length will be bucked to less than 5' and utilized with nearby native materials to stabilize excavated spoils. All vegetative materials will be removed from the trail tread. Any stumps developed in the corridor development will be excavated and removed from the corridor.
4. Trail tread development will consist of full bench trail construction, devoid of fill material for use in the tread surface (berms and roller features excepted), and mechanically compacted following construction. Acceptable protrusion height above the trail tread for natural features such as rocks or roots will be in accordance with the specifications of the particular trail type (i.e. least difficult, more difficult, most difficult) being constructed. Tread will be constructed with a 3-10% cross slope, except where features are constructed for the purpose of keeping riders on the trail (i.e. berms, insloped corners, and constructed features).
5. Grade reversals will be located at less than 100' intervals and should have broad drains (6-10') with cross slopes of 10-15%. Subsequent reversals in grade should also be broad (10-25') and compacted with leading face and transition field-fit to match the desired trail experience (i.e. low and rolling on least difficult trails, rollable with the ability to jump on more difficult trails, and jump-optimized on most difficult trails).
6. Backslopes should blend with surrounding hillslope gradient and finished to tread specifications. In the case of inside turns, backslope should be optimized for utility as a riding/tread surface and blended with trail tread to provide smooth transitions.
7. Excavated spoils shall be distributed such that no berm is present on the downslope edge of the trail tread unless it is created for the purpose of a trail feature, in which case it will be preceded upslope by a grade reversal and compacted as trail tread.
8. Spoils will be sufficiently distributed downslope a.) with a depth not greater than 4" and b.) shall not be deposited in active drainages (i.e. stream bed and bank structure or incised linear flow pattern) or locations demonstrating characteristics of standing water (i.e. presence of standing water during construction, darkened leaves or water lines on trees indicating standing water for significant portions of time). If situation cannot be attained, spoil materials will be bucketed and dispersed in a nearby location that meets these conditions.
9. Following spoils dispersal, downslope and backslope areas will be immediately covered with native seed and mulch materials stockpiled during trail corridor clearing activities.
10. For hard armoring techniques, rock will be collected by hand within 50' of the trail centerline.
11. Turns in the trail tread that result in crossing the fall-line of the hillslope will be constructed according to the trail tread specifications with the addition of a grade reversal upslope and prior to the turn, all fill and/or retaining walls necessary to stabilize the turn, drainage features necessary to remove water from the turn area (i.e. insloped drain or crowned turn platform), and a grade reversal downslope/following the turn. Insloped and/or super-elevated turns shall be field-fit and constructed, where necessary, to assist riders in remaining in the center of the trail tread and maintaining momentum.
12. Alternative riding lines and/or technical trail features, if developed, will be designed in a collaborative manner with approval necessary from the construction manager and USFS, and will be developed based on available time and funds. All features will adhere to standard construction best practices for dry stack masonry. Approaches to and exits from features will be field-fit to minimize vegetation and hydrologic impacts. Fall zones for features higher than 12" above the surrounding topography will be cleared of loose, sharp rocks or other materials that could focus rider impacts for a lateral distance of 10' from the feature.

EROSION AND SEDIMENTATION POLLUTION CONTROL NOTES

1. At least 7 days prior to initiating any earth disturbance activities (trail corridor clearing and grubbing and trail tread excavation), the owner and/or construction manager shall invite all contractors, USFS, appropriate municipal and county officials, including County Conservation District officer, to an on-site preconstruction meeting.
4. All earth disturbance activities shall proceed in accordance with the sequence provided in the General and Trail Construction Notes and accompanying specifications. Deviation from that sequence must be approved in writing from the construction manager or USFS prior to implementation.
5. Clearing, grubbing, and topsoil stripping shall be limited to the trail corridor.
6. Borrow pit development shall take place within 50' of the trail centerline with all borrow pits and access routes stabilized and naturalized (see Trail Construction Notes) following use.
7. Immediately upon discovering unforeseen circumstances posing the potential for accelerated erosion and/or sediment pollution, the contractor shall implement appropriate BMPs to minimize the potential for erosion and sediment pollution and notify the construction manager or USFS.
8. All building materials and wastes must be removed from the site and recycled or disposed of in accordance with local regulations. No building materials, wastes, or unused building materials shall be burned, buried, dumped, or discharged at the site.
9. **Trail tread construction disturbances shall be permanently stabilized on a daily basis**, as prescribed in the Construction Notes and specifications, Trail corridor clearing and grubbing may take place without additional stabilization activities.
10. Sediment tracked onto any public roadway or parking area shall be returned to the construction site by the end of each work day and disposed in the manner presented for spoils stabilization in the Trail Construction Notes. In no case shall the sediment be washed, shoveled, or swept into any roadside ditch, storm sewer, or surface water.
11. Upon completion of all earth disturbance activities and permanent stabilization of all disturbed areas, the contractor shall contact the the construction manager or USFS to schedule a final inspection.

RECYCLING AND DISPOSAL OF CONSTRUCTION WASTE

1. Recycling and disposal of materials associated with this project shall be undertaken in accordance with local rules and regulations.
2. Except for items indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain on the property, demolished or excavated materials shall be removed from the site.
3. Materials slated for removal from the site shall be disposed of in accordance with any and all applicable municipal or other government agency current regulations.
4. Debris shall not be permitted to accumulate on the job site. Dust and dirt shall be held to a minimum during construction.
5. At the completion of work, the entire work area shall be clean and left in a neat condition, free of waste and debris.

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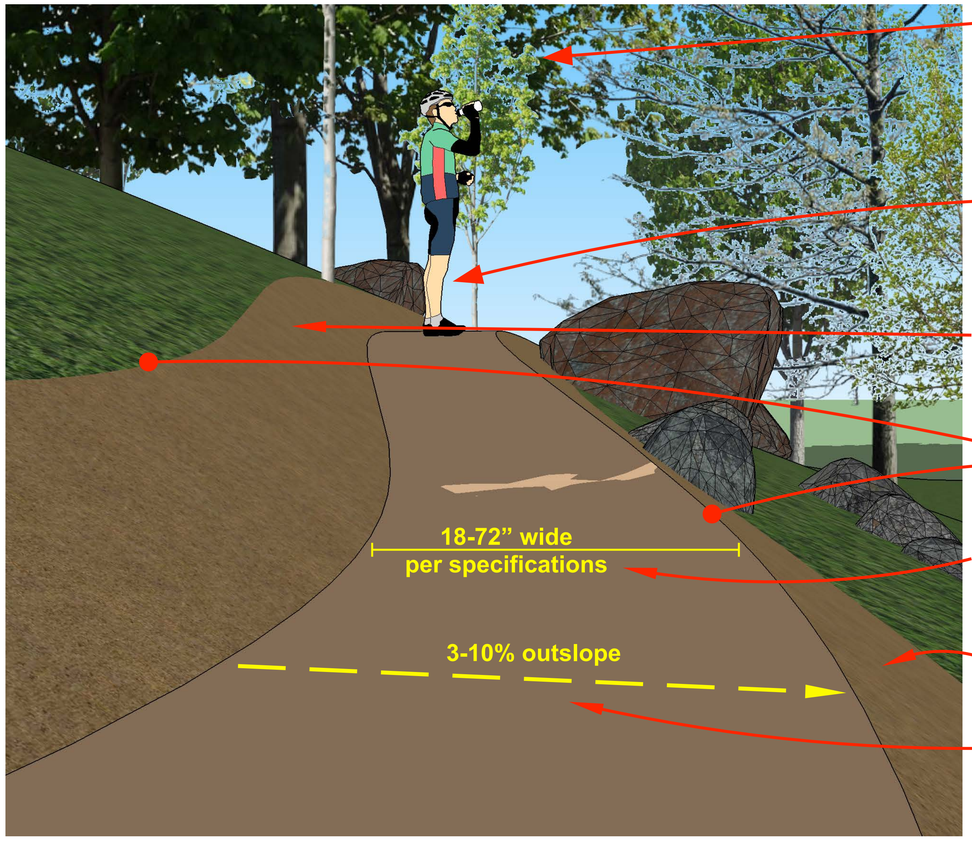
Details 1. Rolling Contour Trail



Retain entire forest canopy/riparian buffer, no tree greater than 6" DBH to be removed

Rocks and trees used as trail anchors

Backslope blended into hillside, covered with leaf litter, native seed bank following construction

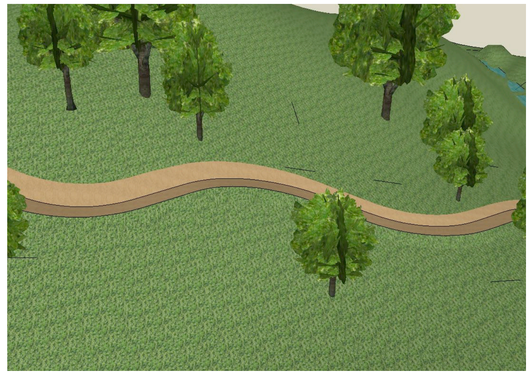
Critical point is rounded

Trail tread has gentle gradient (2-15%, not more than half prevailing hillslope grade), 18-72” wide (per specifications) with minimal compaction

Spoils dispersed evenly, less than 4" deep, covered with leaf litter, native seed bank

Trail tread is outsloped 3-10%

Rolling Contour - Outsloped Tread with frequent grade reversals to force water to drain off the trail, maintaining natural hydrologic flow patterns and watersheds.



Rolling Contour - Insloped Turn with Outsloped Grade Reversal to keep riders on trail and reduce lateral displacement of soil. Drains in grade reversals need to be 10-15% outsloped.

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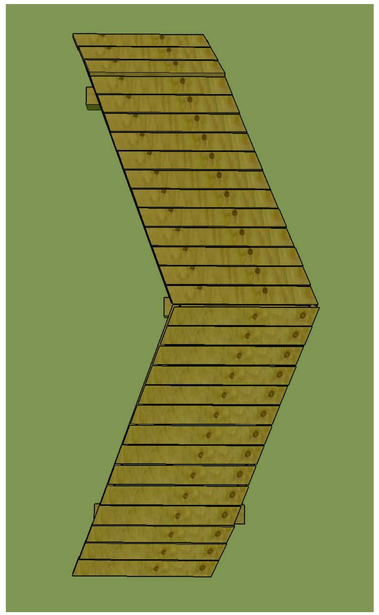
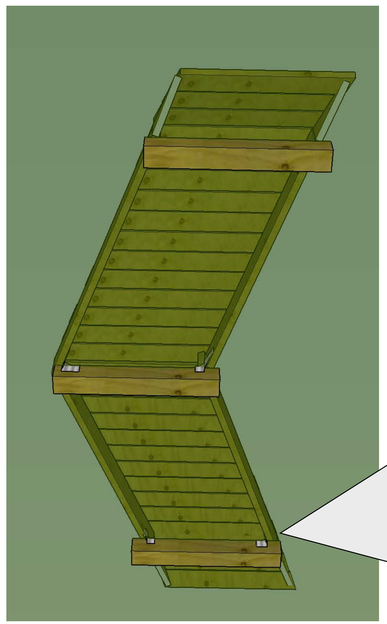
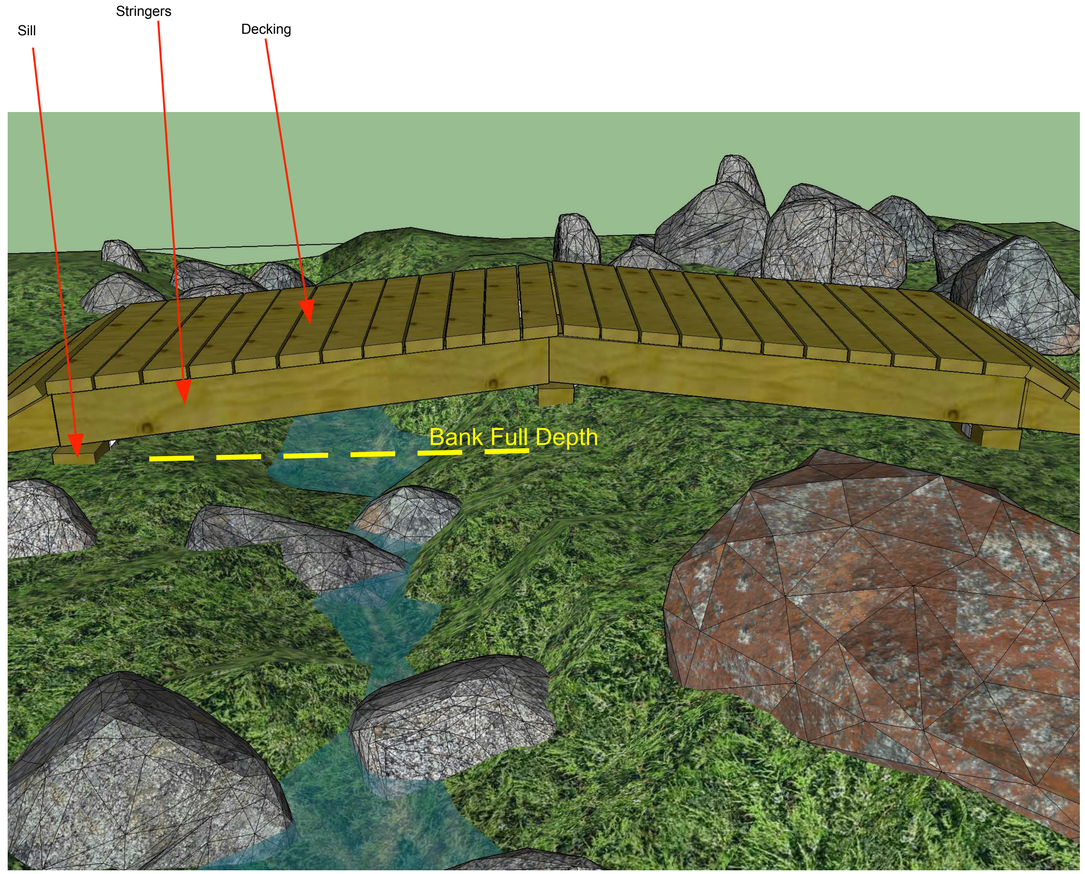
Details 2. Puncheon and Bridge

Top View



Bottom View





Notes:

1. Bridges are specified for perennial streams with bed and bank structure equal to or deeper to 3 feet. Puncheons are specified for intermittent or lesser flowing streams. Construction process for bridges and puncheons are identical except for stringer size and footers. See notes 2, 4 and 5.

2. 6X6 ground contact sills, 1-2" above surrounding grade/height of potential flowing channel. 6" diameter 18" depth concrete footers for bridges greater than 18'.

3. 6x6 mud sills secured with 36" #5 rebar (~6" in from outside edge) and placed at locations above and lateral to channels or depressions.

4. Stringers will be set on 12” centers.

5. Stringers will be 2X10 for bridges less than 12'; 2X12 for bridges 12'-17'; Gluelam 2X16 for bridges 18'-23'. All pressure treated. For bridges, cross-bracing on 6' centers.

6. Hardware to connect stringers to mud sills: Simpson Strong Tie Hurricane Clips (H2.5 AZ) (Figure 1.), Tie Plates (TP47), and #9 1.5" hex drive screws (SD9112MB) (Figure 2).

7. Decking is 2x6 rough cut durable hardwood or marine grade pressure treated, fastened with 3.5" decking screws and 30-degree 3" ring shank framing nails.

8. Edges of deck materials should not extend more than 3" from edge of stringers.

9. Fall zones cleared of woody and sharp debris 8' to all lateral surfaces of bridge.

10. Curvilinear construction of puncheon to blend with surrounding topography when possible.

Figure 1.

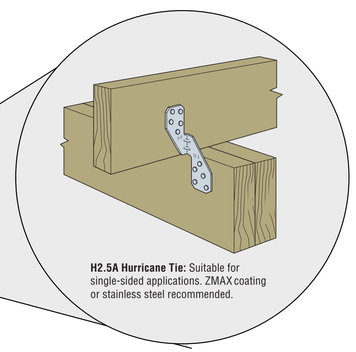
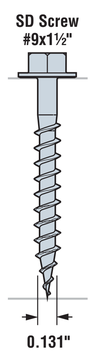
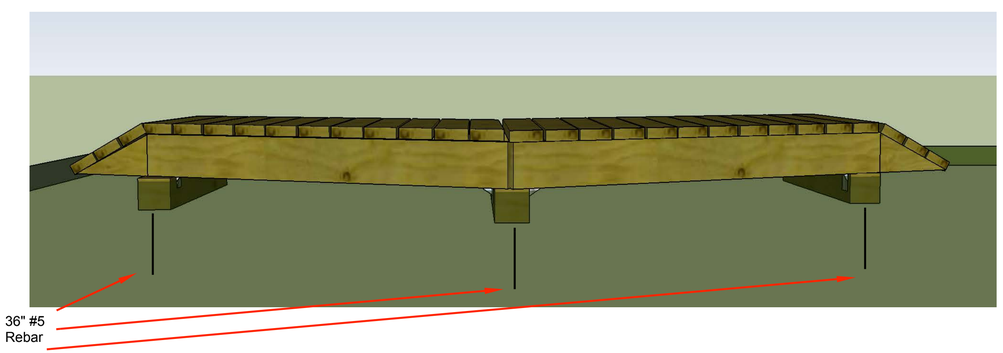


Figure 2.



Side View



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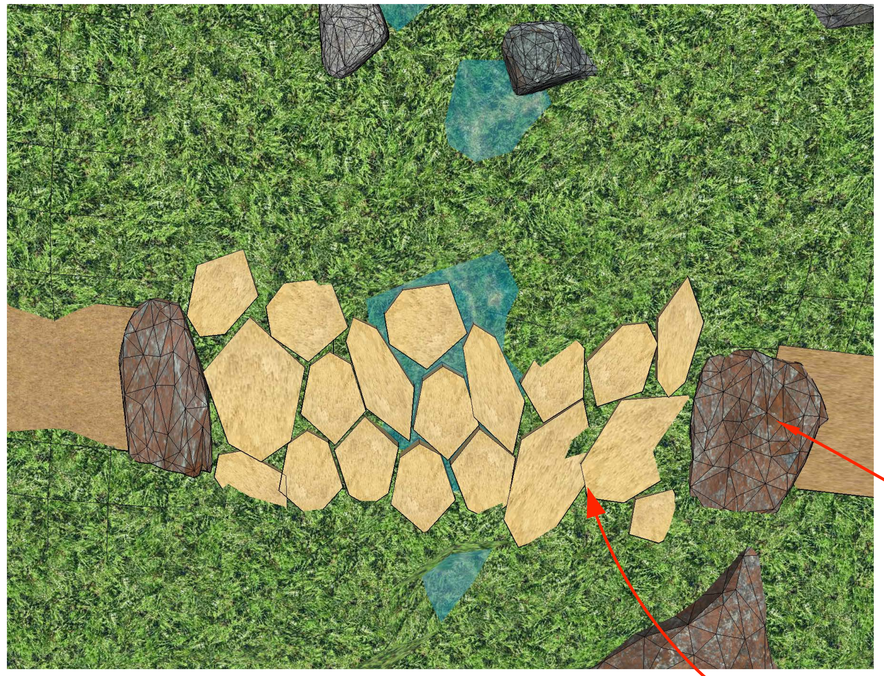
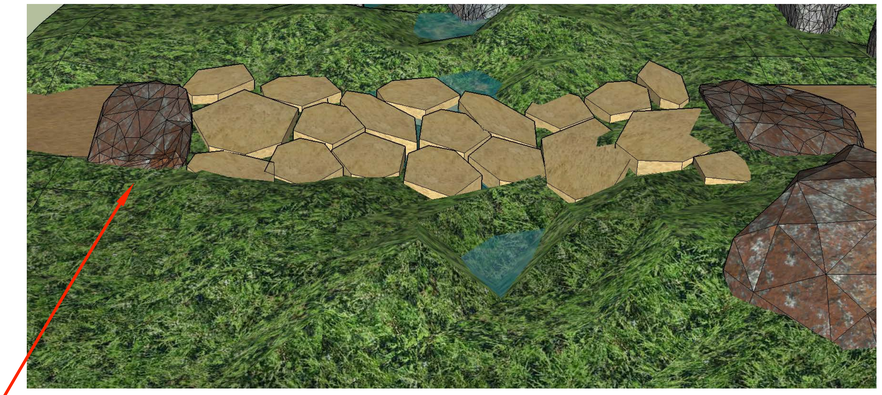
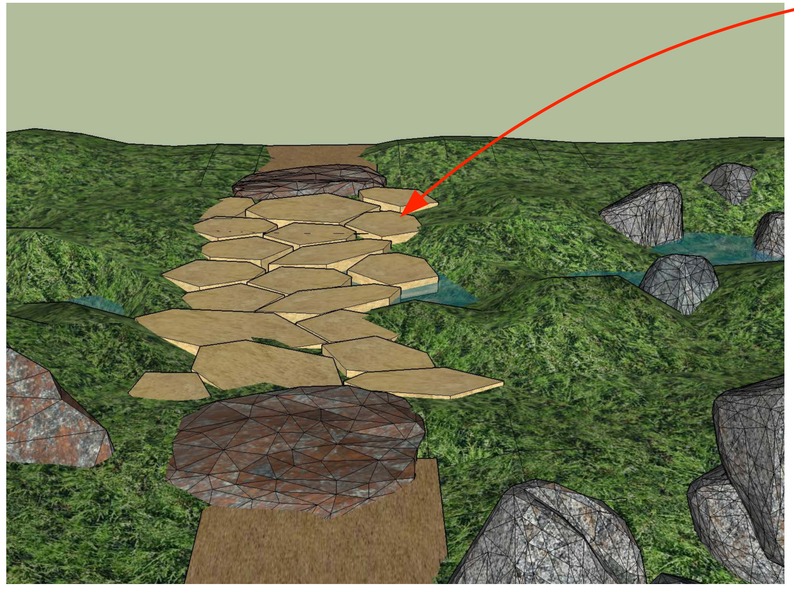
Details 3. Flagstone Armored Crossing





Anchor Stones

At Grade



Notes:

1. Remove all organic matter from area of armoring to a depth of thickest rocks

2. Armoring to extend at least 6' beyond indications of surface flow or to extent of saturated soils.

3. Anchor Stones are placed at each terminus, span the entire trail tread and extend deep into the mineral soil (2/3 of rock must be buried).

4. Flagstones, large flat stones, are placed directly on mineral soil (or an aggregate foundation).

5. Flagstones are set at-grade to eliminate any potential obstruction to normal water flow.

6. Each stone must have 3 points of contact with other rocks and be locked into place.

7. Pore spaces between stones will be filled with smaller chock stones or crushed rock.

8. When complete, no rock in structure should move in any direction when significant pressure is applied.

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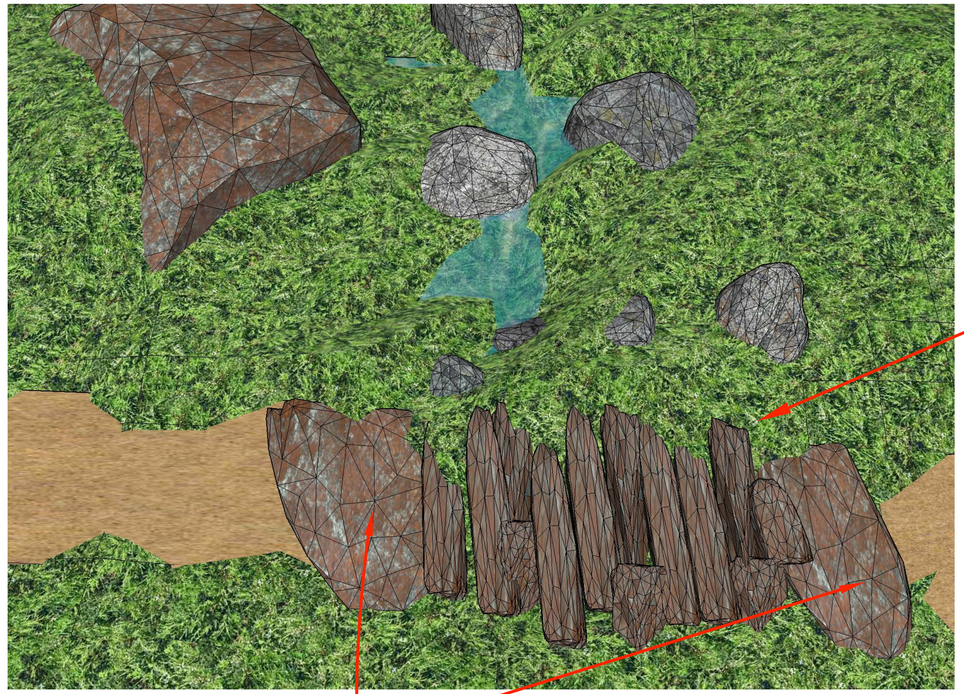
Details 4. Stone Pitched Armored Crossing



Notes:

1. Remove all organic matter from area of armoring to a depth of thickest rocks.

2. Armoring should extend to a minimum of 6' past each edge normal high water surface or to extent of saturated soils.

3. Anchor Stones are placed at each terminus, span the entire trail tread and extend deep into the mineral soil (2/3 of rock must be buried).

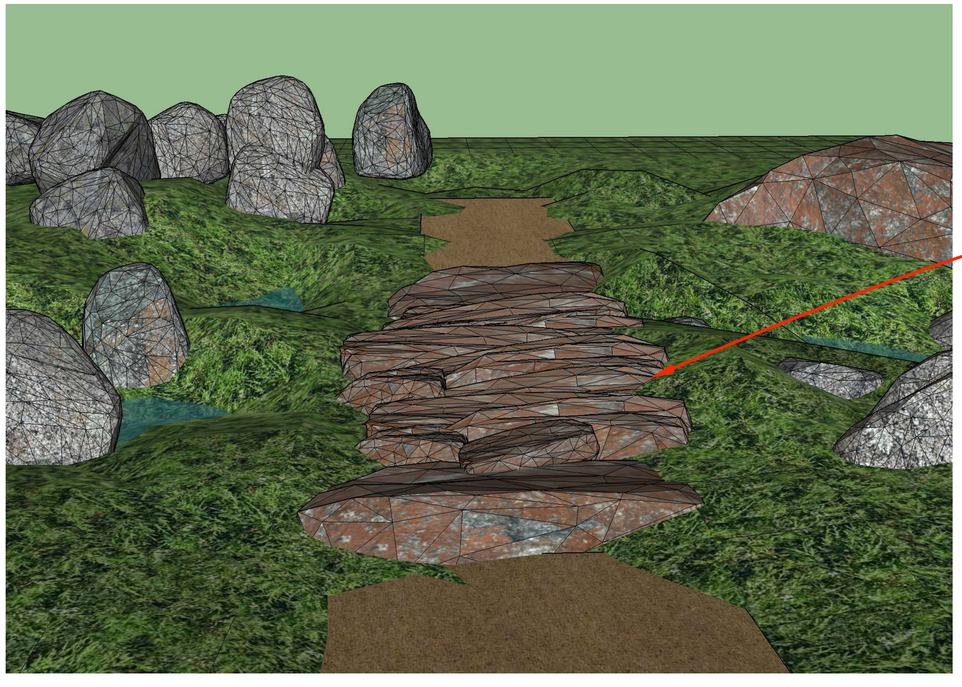
3. Stones are placed at grade to eliminate any potential obstruction to normal water flow.

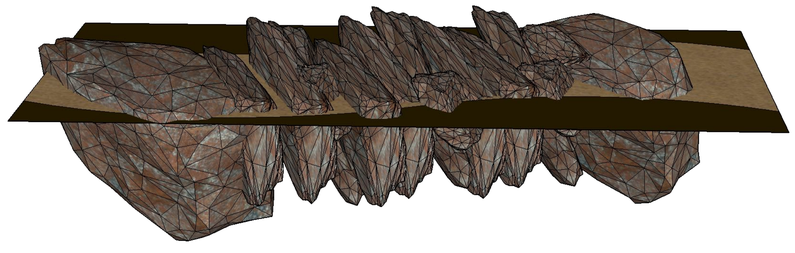
4. Stones pitched on end with majority of stone underground, placed directly on mineral soil (or an aggregate foundation).

7. Each stone must have three points of contact with other rocks to "lock" into place.

8. Chock Stones added last to increase structural stability.Pore spaces between stones will be filled with smaller chock stones or crushed rock.

9. When complete, structure should not move in any direction when significant pressure is applied.





Majority of Rock Underground

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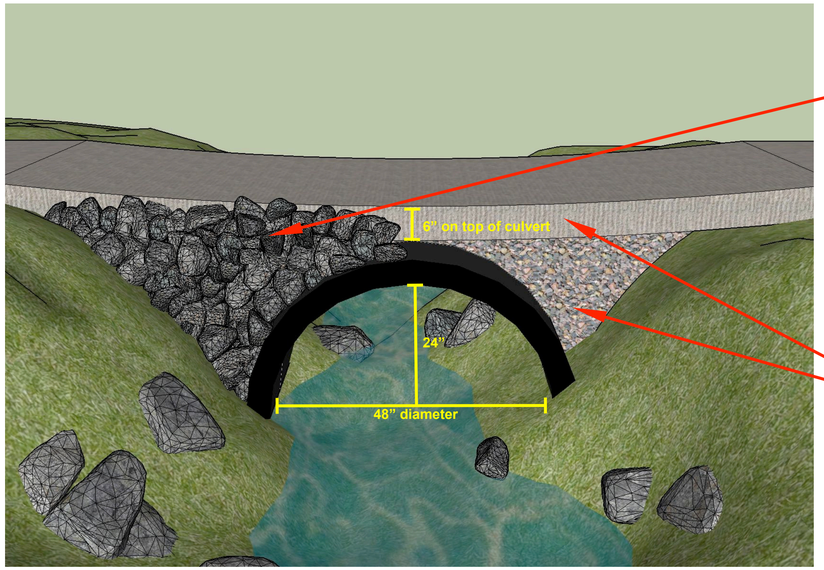
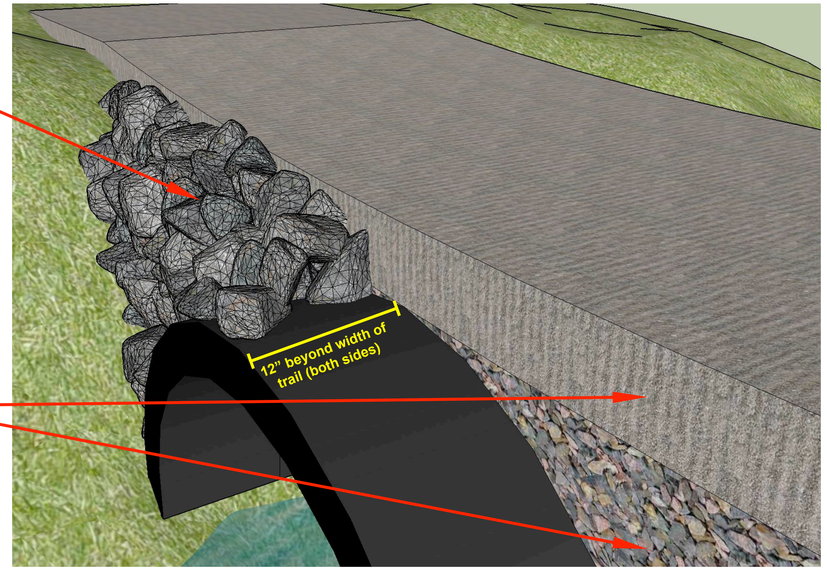
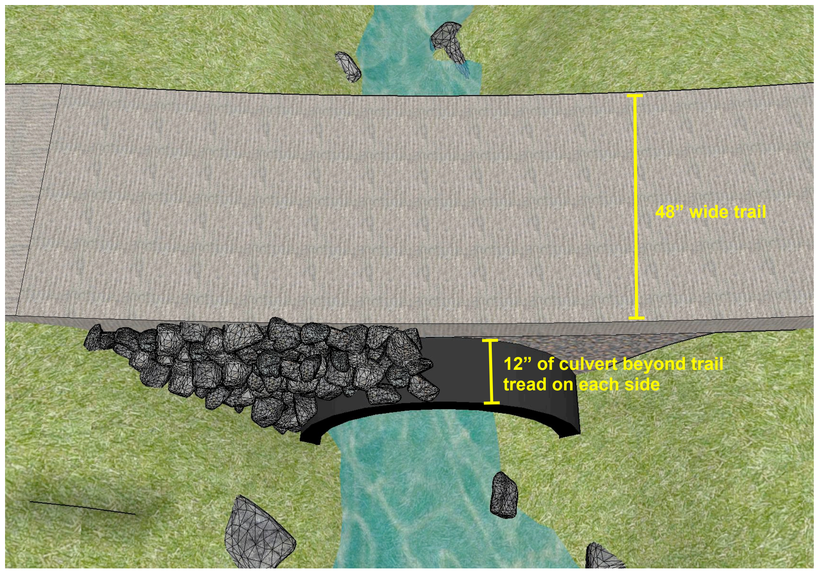
Details 5. Arched Half Culvert



Rocks (or 1/2"-minus aggregate, if rock is not available) placed on exposed culvert inlet/outlet and blended from exposed edge of culvert to top of compacted fill material. Treatment should cover the entire culvert (only half treatment shown in diagrams).

Compacted dry mineral soil (or 1/2"-minus aggregate if suitable, dry mineral soil is not available)





NOTES:
1. Ensure grade reversal within 25' of each side of culvert location.

2. Install any sediment and erosion control, as directed by permitting or local code, on each side of culvert location.

3. Final culvert location will be determined in the field, in association with construction manager.

4. Excavate stormwater conveyance channel to a width of 48" (or appropriate culvert diameter), if necessary, but do not excavate the active bed of the channel.

5. Cut full, HDPE, double walled, plastic culvert in half and to a length of 2' longer than the width of the trail, as described in the specifications.

6. Install culvert directly in line with channel flow and assure full ground contact along the entire length of the culvert on both sides.

7. Place and compact 6" of dry mineral soil (or 1/2"-minus aggregate if suitable, when dry mineral soil is not available) on top of the culvert and to the width of the trail, as described in the specifications, leaving 1' of exposed culvert on each side of the fill.

8. Place rock (or 1/2"-minus aggregate, if rock is not available) on exposed culvert inlet and outlet and blend from plastic edge of the culvert to the top of compacted fill material.

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