

ALASKA STATE PARKS

TRAIL MANAGEMENT HANDBOOK

MAY 2015

APPENDIX A: STANDARD TRAIL STRUCTURES



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Appendix A: Standard Trail Structures

This section contains technical drawings, illustrations, and guidelines for common structures that are used in trail construction. Figures A.1-A.20 have been adopted from the U.S. Forest Service standard trail drawing catalogue, and have been adapted by Ted Kincaid to meet the needs of Alaska State Parks. Figures A.21-A.34 are original artwork by Ted Kincaid.

CLEARING LIMITS

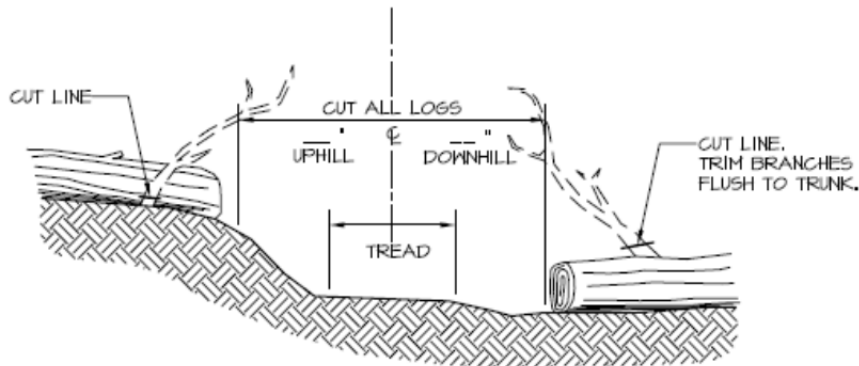
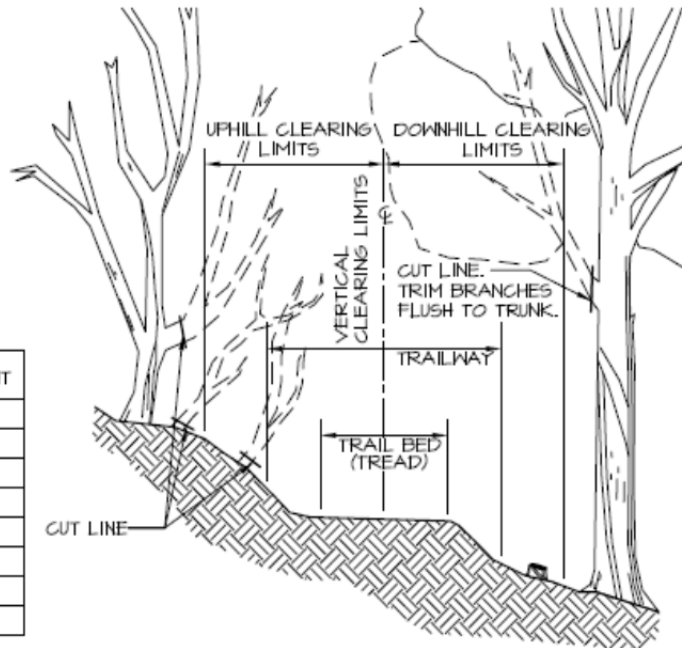
NOTES:

DO NOT REMOVE TREES OVER ___ " DIAMETER IF THEY ARE OVER ___ ' FROM THE CENTERLINE.

REMOVE ALL TREES ___ " OR LESS IN DIAMETER IF THEY ARE WITHIN ___ ' OF THE CENTERLINE.

CLEARING LIMITS (FT)

BEGINNING STATION	ENDING STATION	UPHILL	DOWNHILL	HEIGHT



STUMP HEIGHT REQUIREMENTS* (IN)

STUMP LOCATION	SIDE SLOPE	UPHILL	DOWNHILL
STUMPS BETWEEN THE TRAILWAY AND CLEARING LIMITS.	SIDE SLOPE 10% OR LESS		
	SIDE SLOPE OVER 10%		
STUMPS OUTSIDE THE CLEARING LIMITS.	SIDE SLOPE 10% OR LESS		
	SIDE SLOPE OVER 10%		

*ALL HEIGHTS ARE TO BE MEASURED ON THE UPHILL SIDE OF STUMPS.

NOTE:
DRAWINGS NOT TO SCALE

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BASE DATA MAY HAVE BEEN SLIGHTLY ALTERED

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CLEARING LIMITS



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Figure A.1 – Clearing Limits

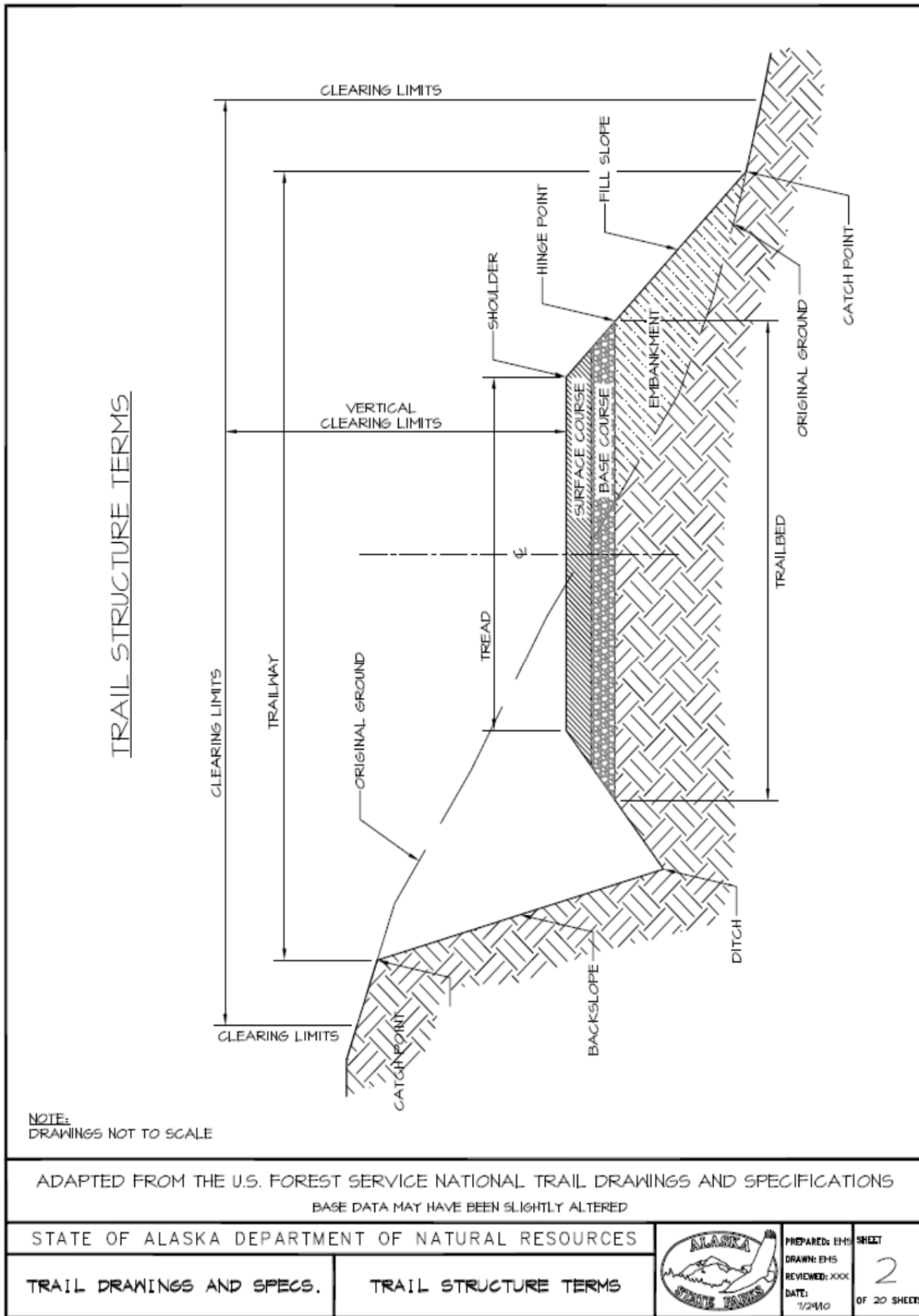
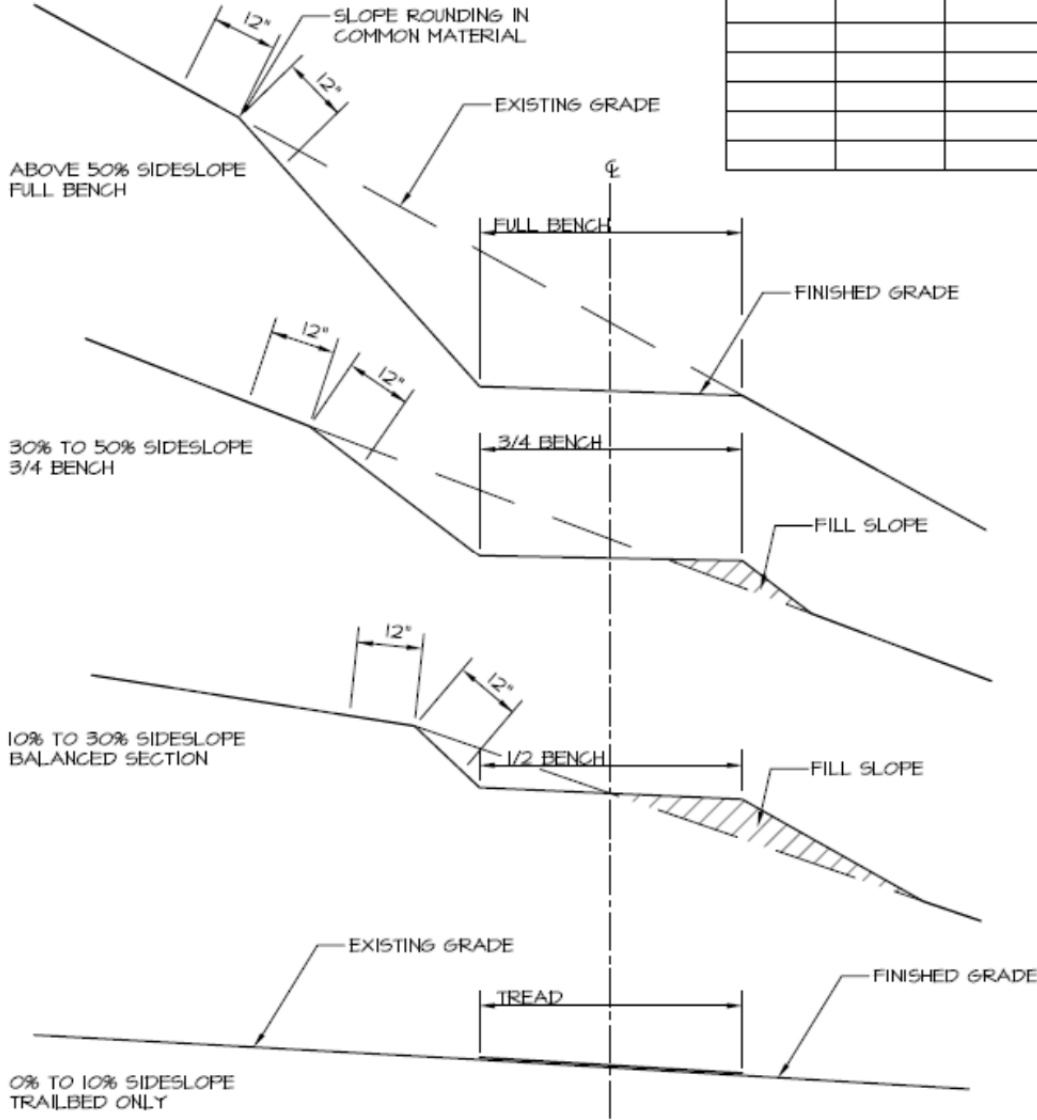


Figure A.2 – Trail Structure Terms

TYPICAL TRAIL CROSS SECTIONS

NOTE:
AMOUNT OF BENCH VARIES WITH % OF SIDESLOPE. OUTSLOPE TRAILBED 6-10%.



TRAILBED SPECIFICATIONS

BEGINNING STATION	ENDING STATION	WIDTH	BENCH TYPE

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TYPICAL TRAIL
CROSS SECTIONS



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Figure A.3 – Typical Trail Cross Sections

TRAILBED AND SLOPE FINISH

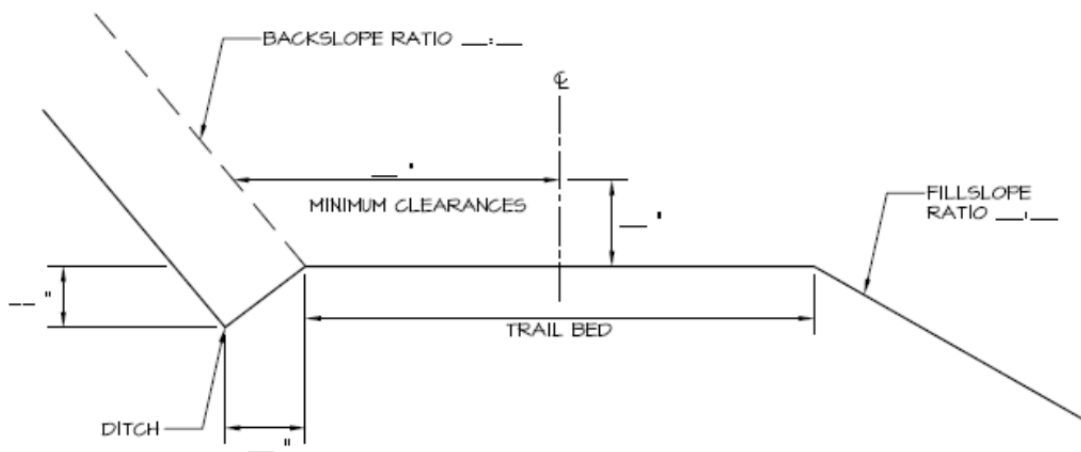
SLOPE FINISH

REMOVE ROOTS OVER ___ " IN DIAMETER THAT PROTRUDE FROM THE BACKSLOPE.

TRAILBED FINISH

REMOVE LOOSE ROCK ON THE TRAILBED SURFACE OVER ___ " IN THE SMALLEST DIMENSION.

REMOVE OR REDUCE EMBEDDED ROCK THAT PROTRUDES MORE THAN ___ " ABOVE THE TRAILBED.



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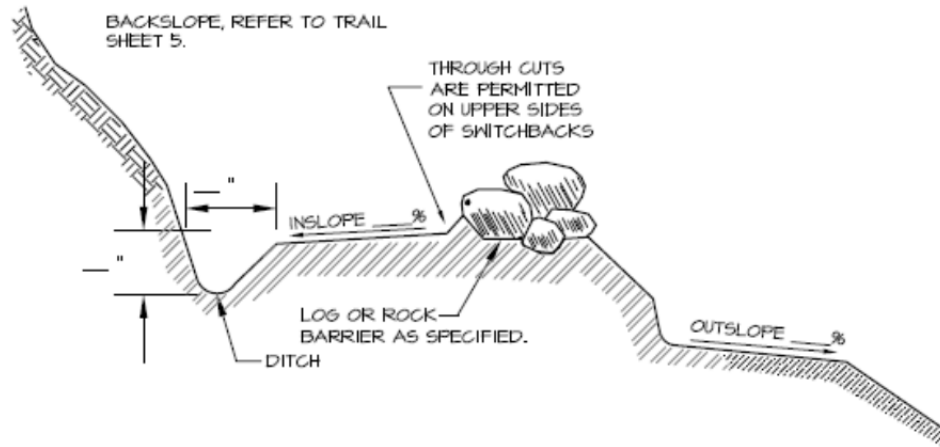
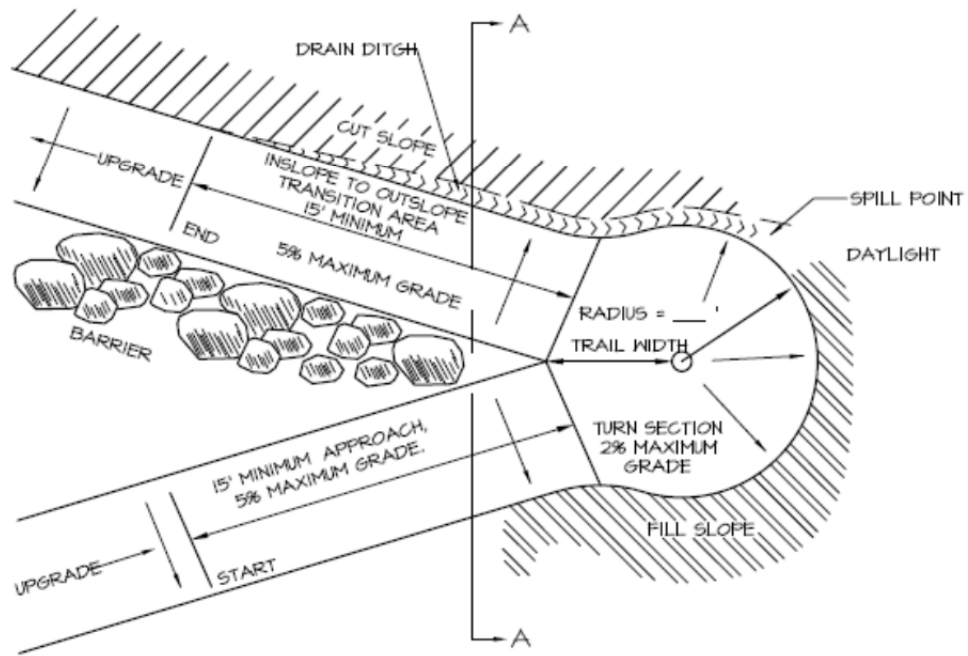
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			REVIEWED: XXX	OF 20 SHEETS
			DATE: 7/24/10	

Figure A.4 – Trailbed and Slope Finish

SWITCHBACK SPECIFICATIONS



SECTION A-A



RADIUS POINT IS STAKED AT EACH INDIVIDUAL SITE.

PLAN VIEW

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SWITCHBACK SPECIFICATIONS



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Figure A.5 – Switchback Specifications

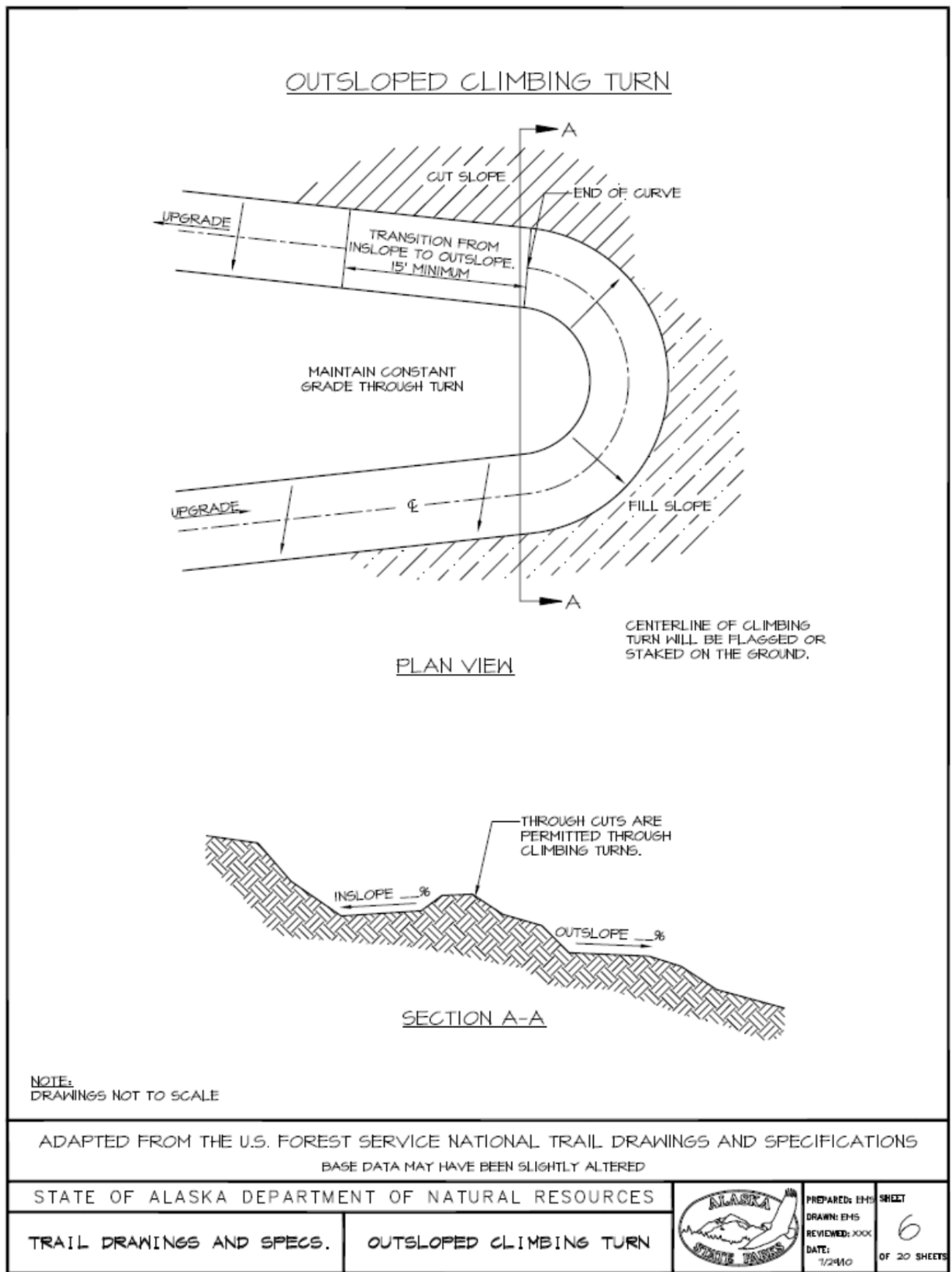


Figure A.6 – Outsloped Climbing Turn

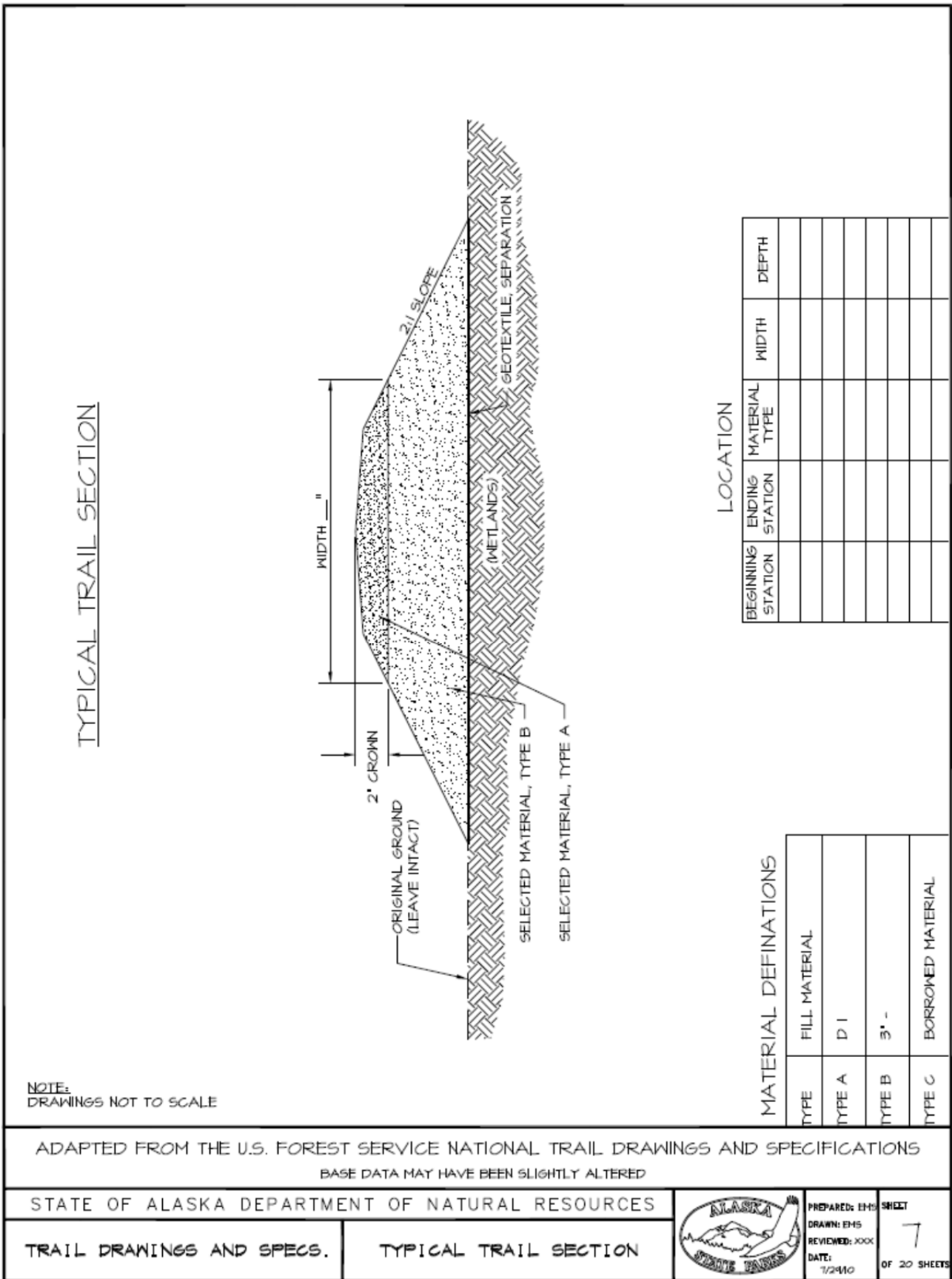


Figure A.7 – Typical Trail Section

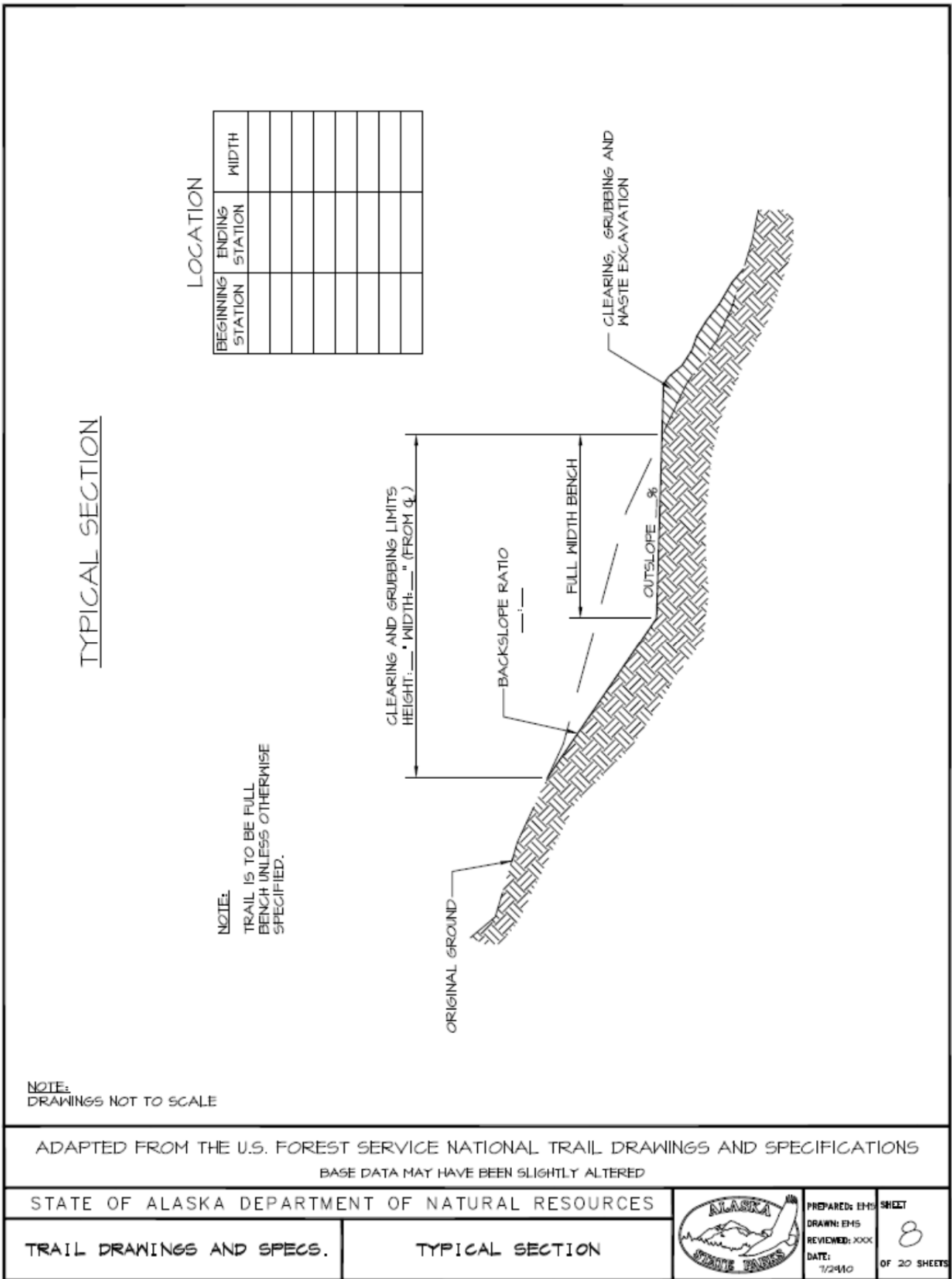


Figure A.8 – Typical Section

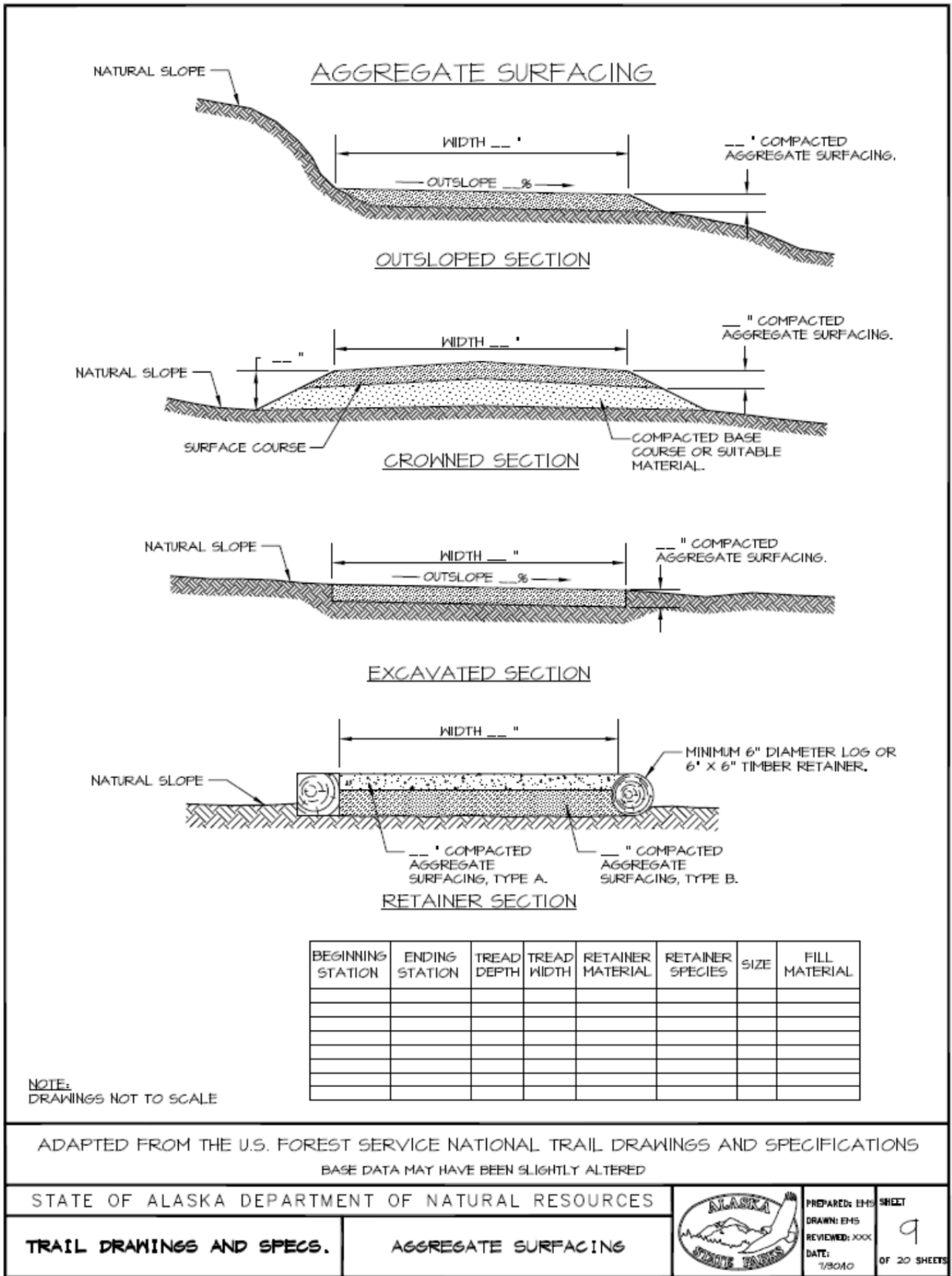
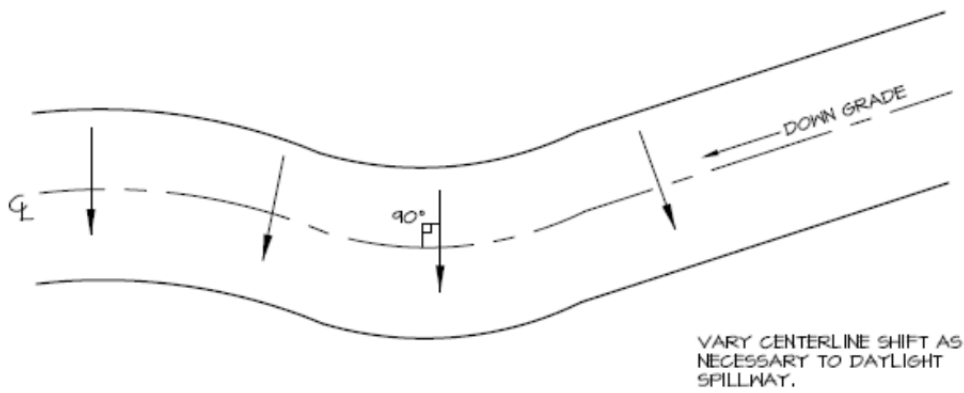


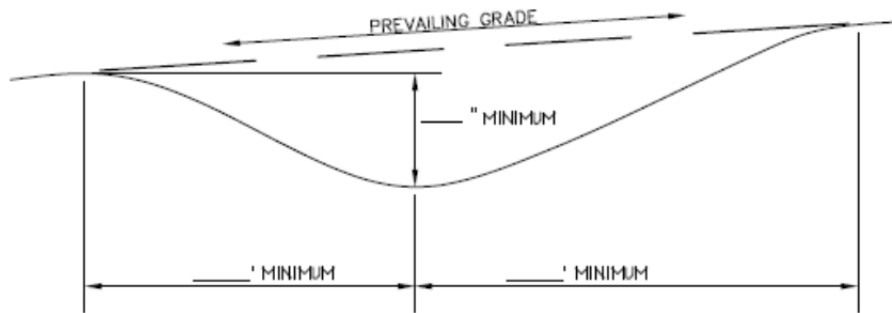
Figure A.9 – Aggregate Surfacing

GRADE DIP



MAINTAIN OUTSLOPE AND TRAILBED WIDTH.

PLAN VIEW



PROFILE

NOTE:
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GRADE DIP

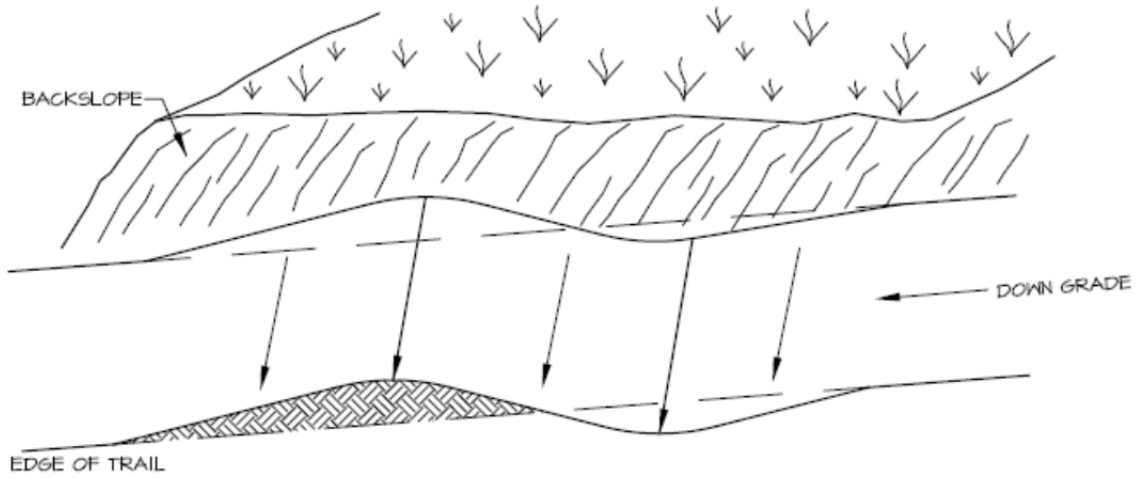


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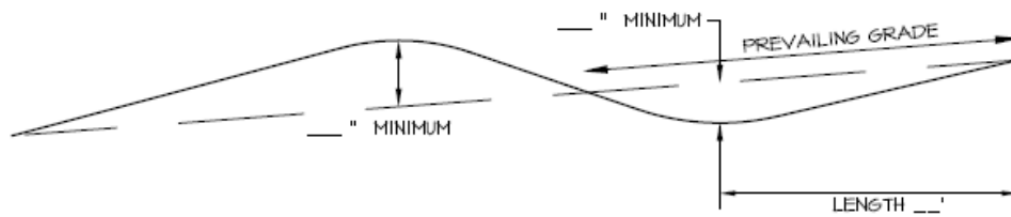
Figure A.10 – Grade Dip

ROLLING DIP



OUTSLOPE RANGE 6%-10%.

PLAN VIEW



NOTE:
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PROFILE

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ROLLING DIP

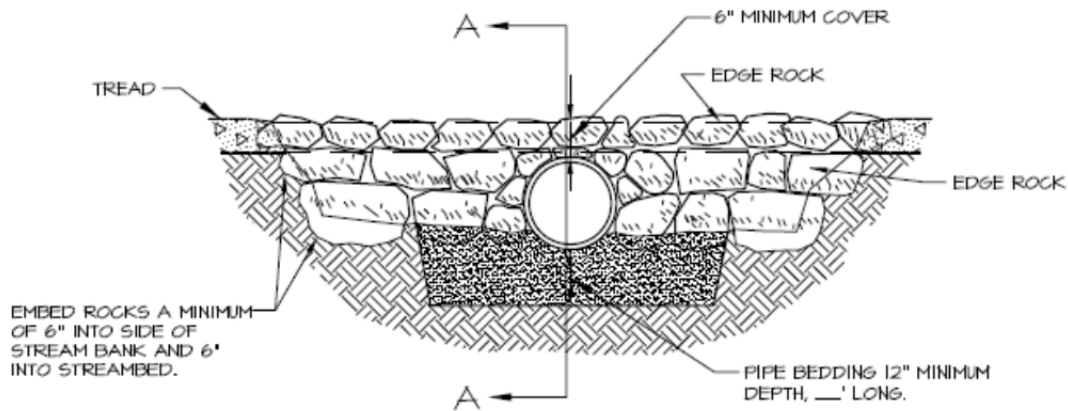


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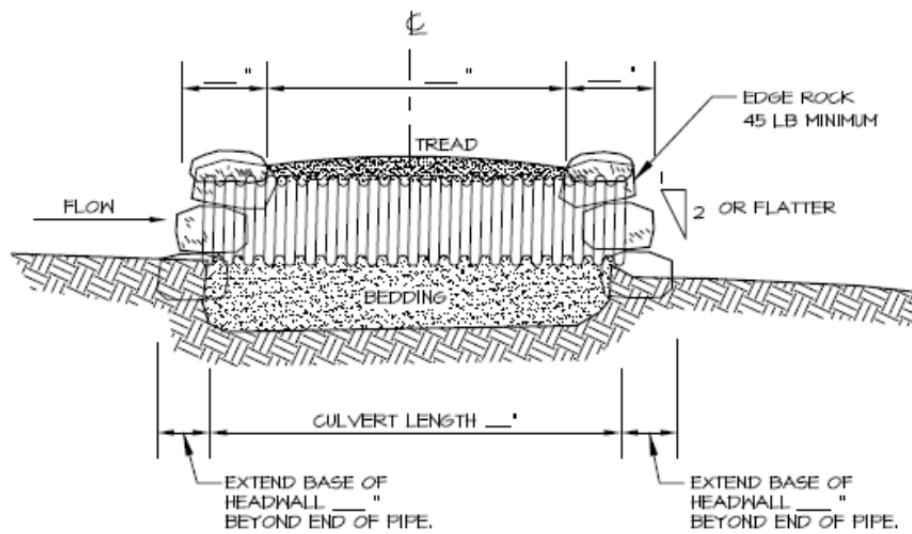
Figure A.11 – Rolling Dip

CULVERT WITH HEADWALLS



HEADWALL ROCKS: 45 LB
MINIMUM, 50% LARGER
THAN 65 LB.

END VIEW



SECTION A-A

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CULVERT WITH HEADWALLS



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DATE: 7/30/00	

Figure A.12 – Culvert with Headwalls

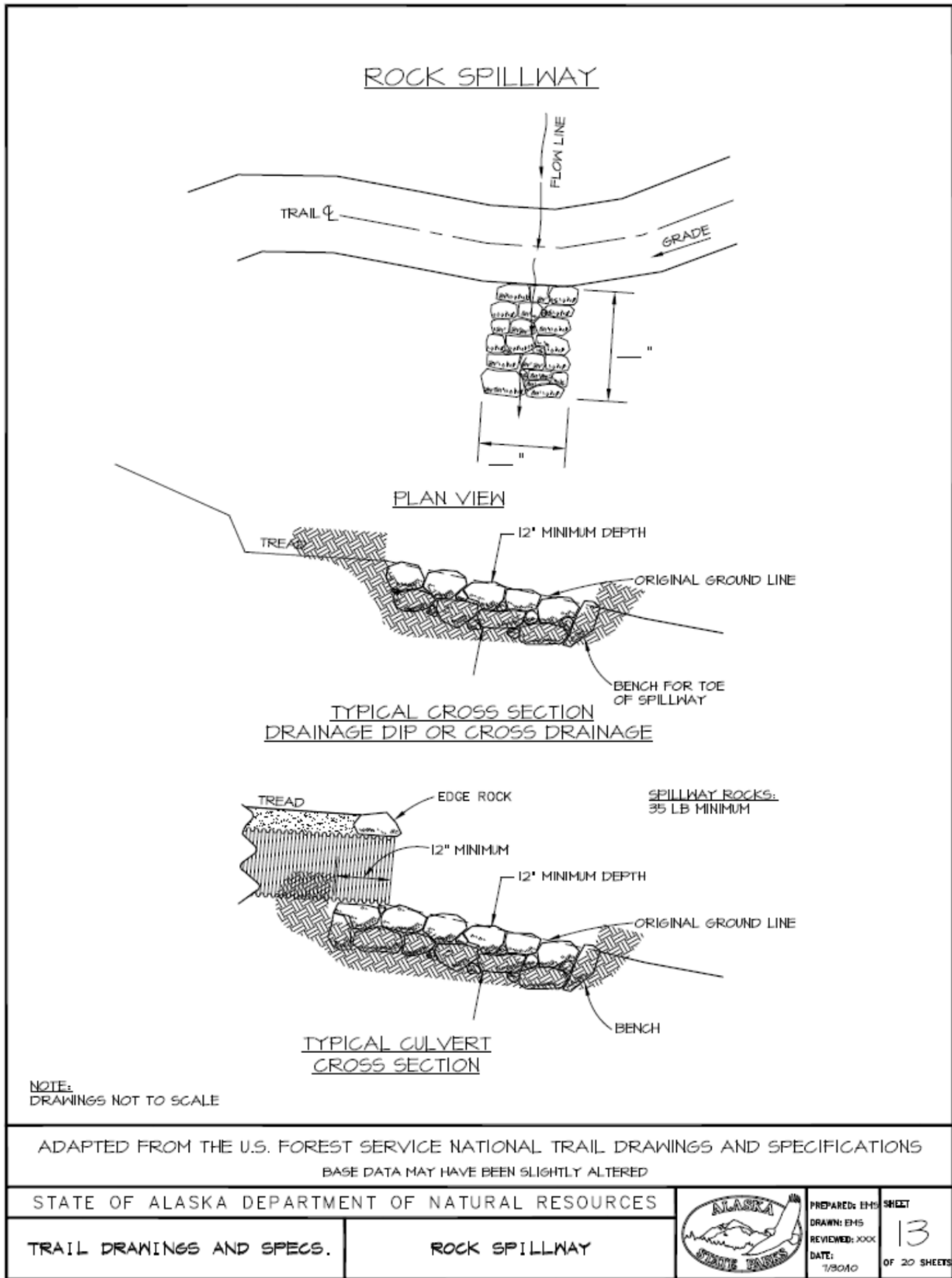


Figure A.13 – Rock Spillway

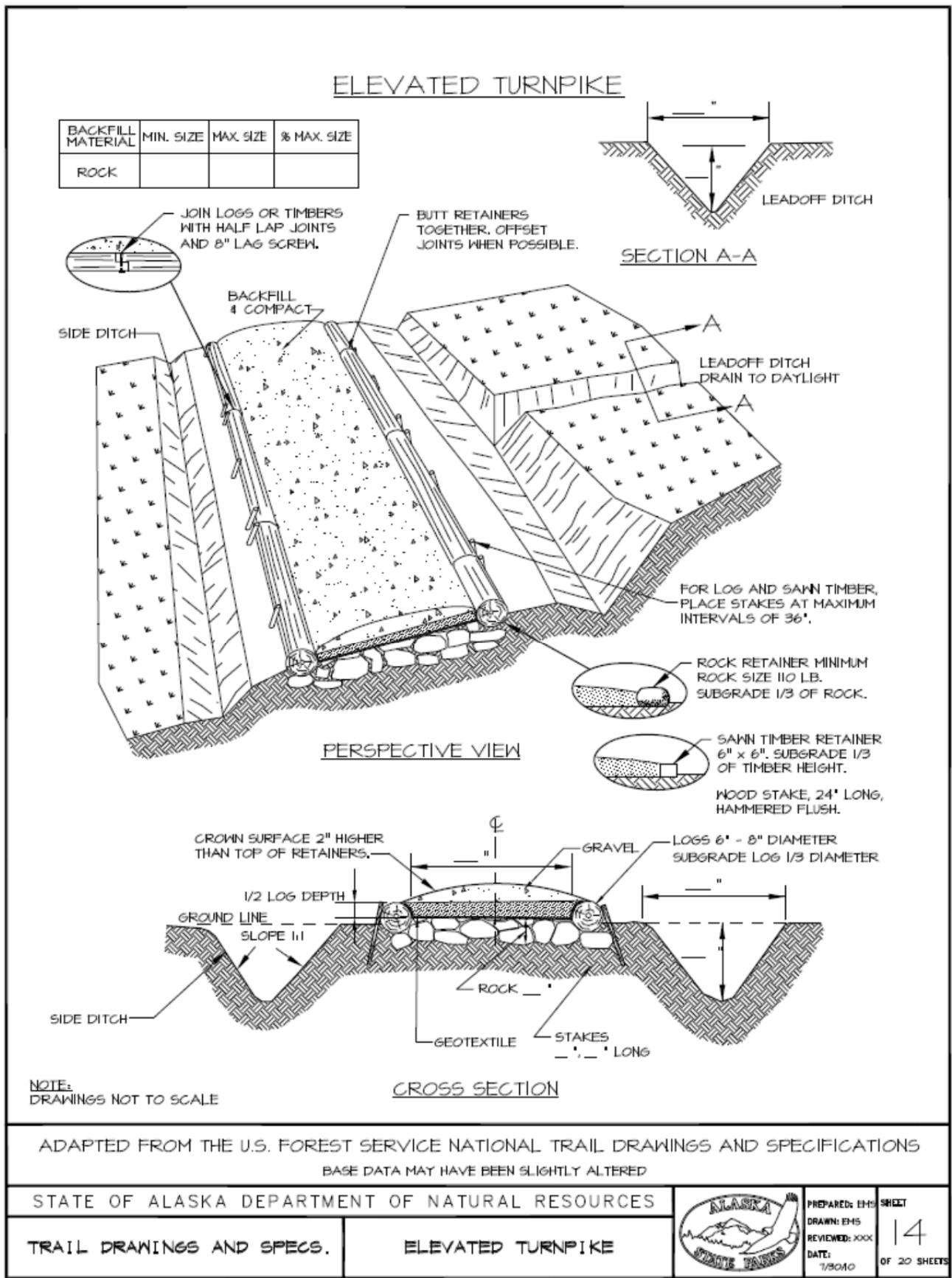
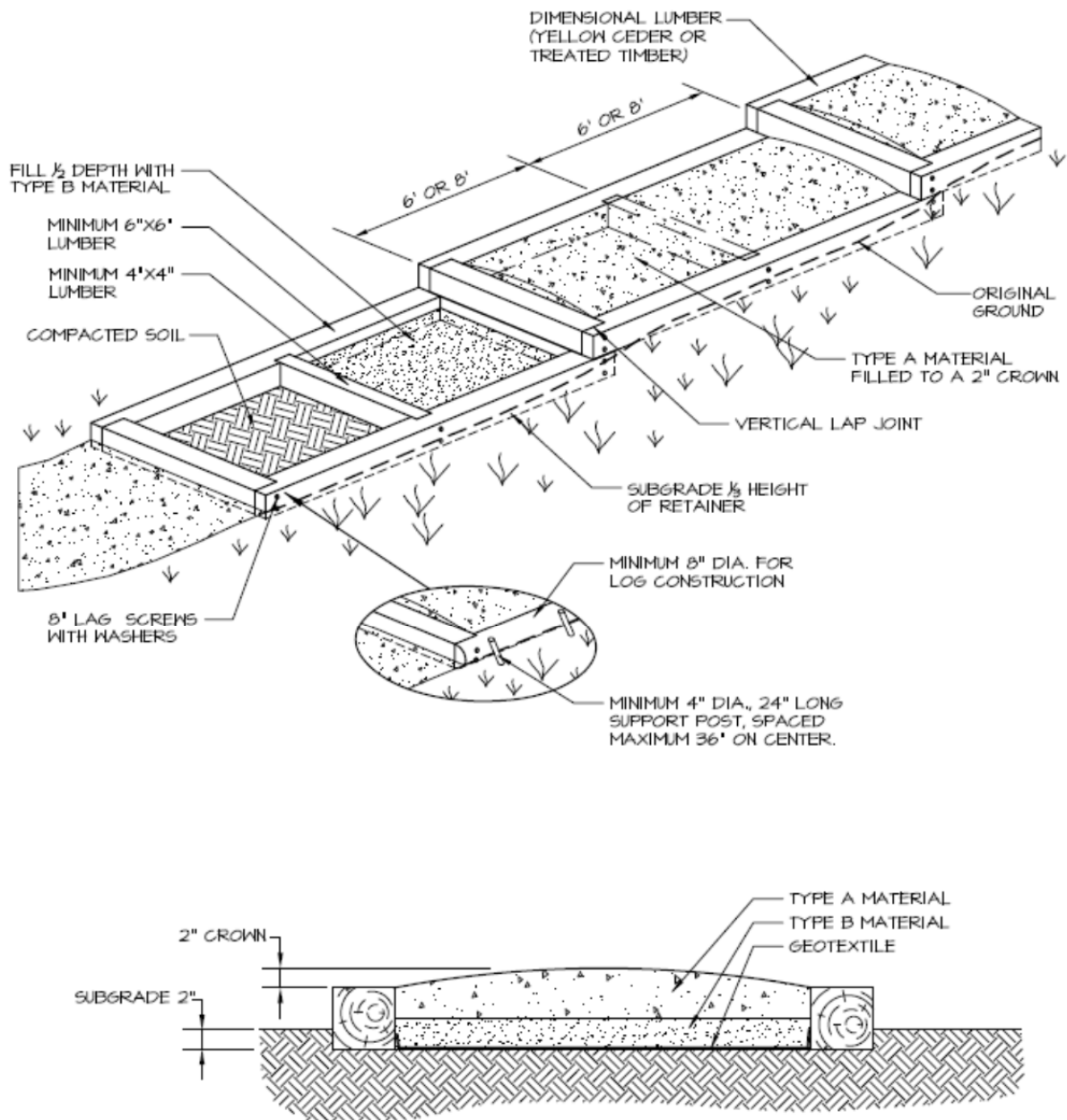


Figure A.14 – Elevated Turnpike

STEPPED TURNPIKE



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STEPPED TURNPIKE



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DATE: 7/30/10

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OF 20 SHEETS

Figure A.15 – Stepped Turnpike

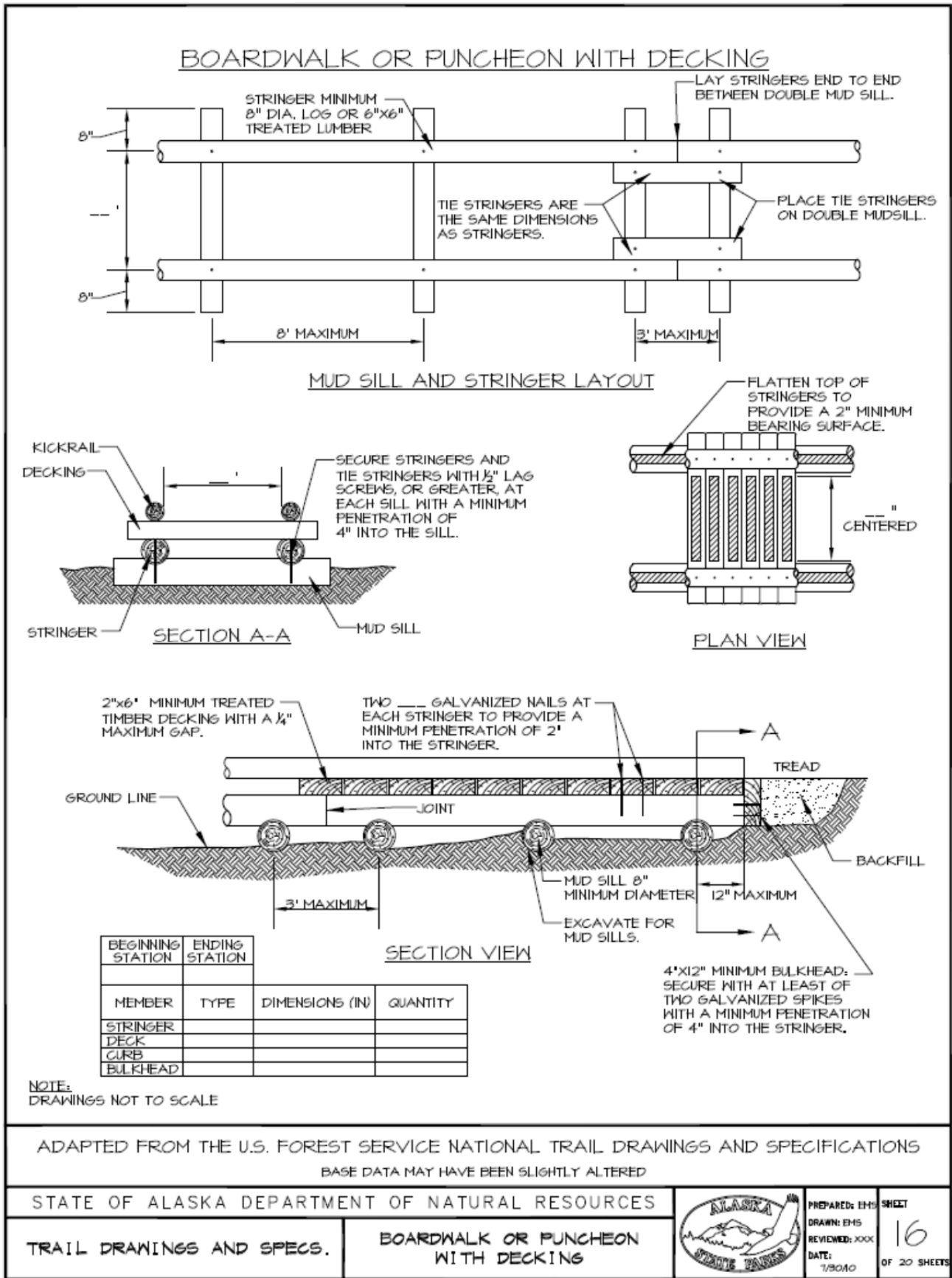
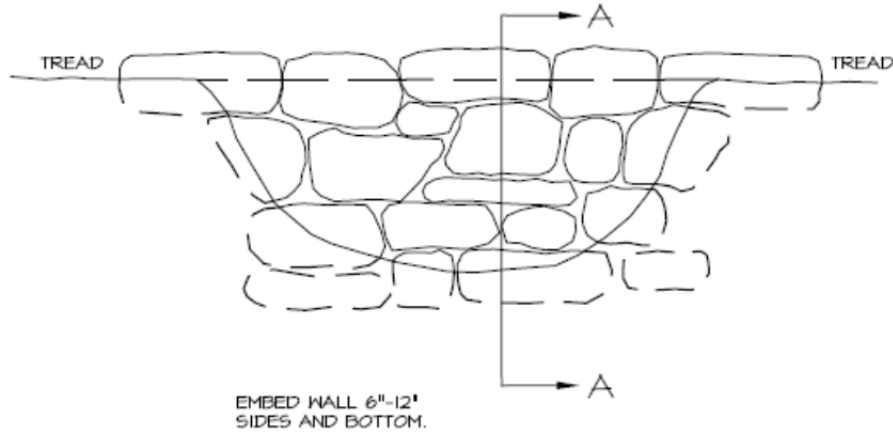
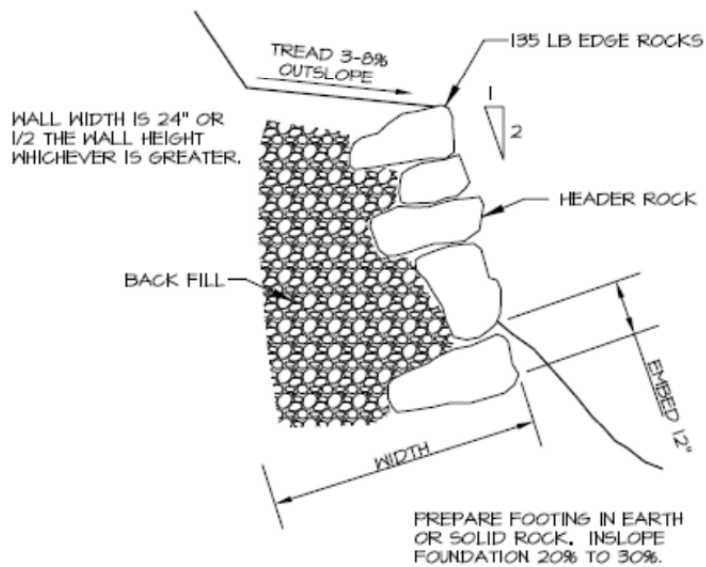


Figure A.16 – Boardwalk or Puncheon with Decking

ROCK RETAINING WALL



FRONT VIEW



SECTION A-A

NOTES:

1. USE HIGH AND OUTSIDE CONTACT
2. ALWAYS INSLOPE WALL
3. ALWAYS CROSS JOINTS WITH NEXT LAYER
4. ALWAYS SUBGRADE FIRST LAYER AND SIDES
5. NO OVERHANGS

WALL SPECIFICATIONS

BEGINNING STATION	ENDING STATION	HEIGHT	WIDTH

NOTE:
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TRAIL DRAWINGS AND SPECS.	ROCK RETAINING WALL		DRAWN: EHS	17
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			DATE: 7/30/10	

Figure A.17 – Rock Retaining Wall

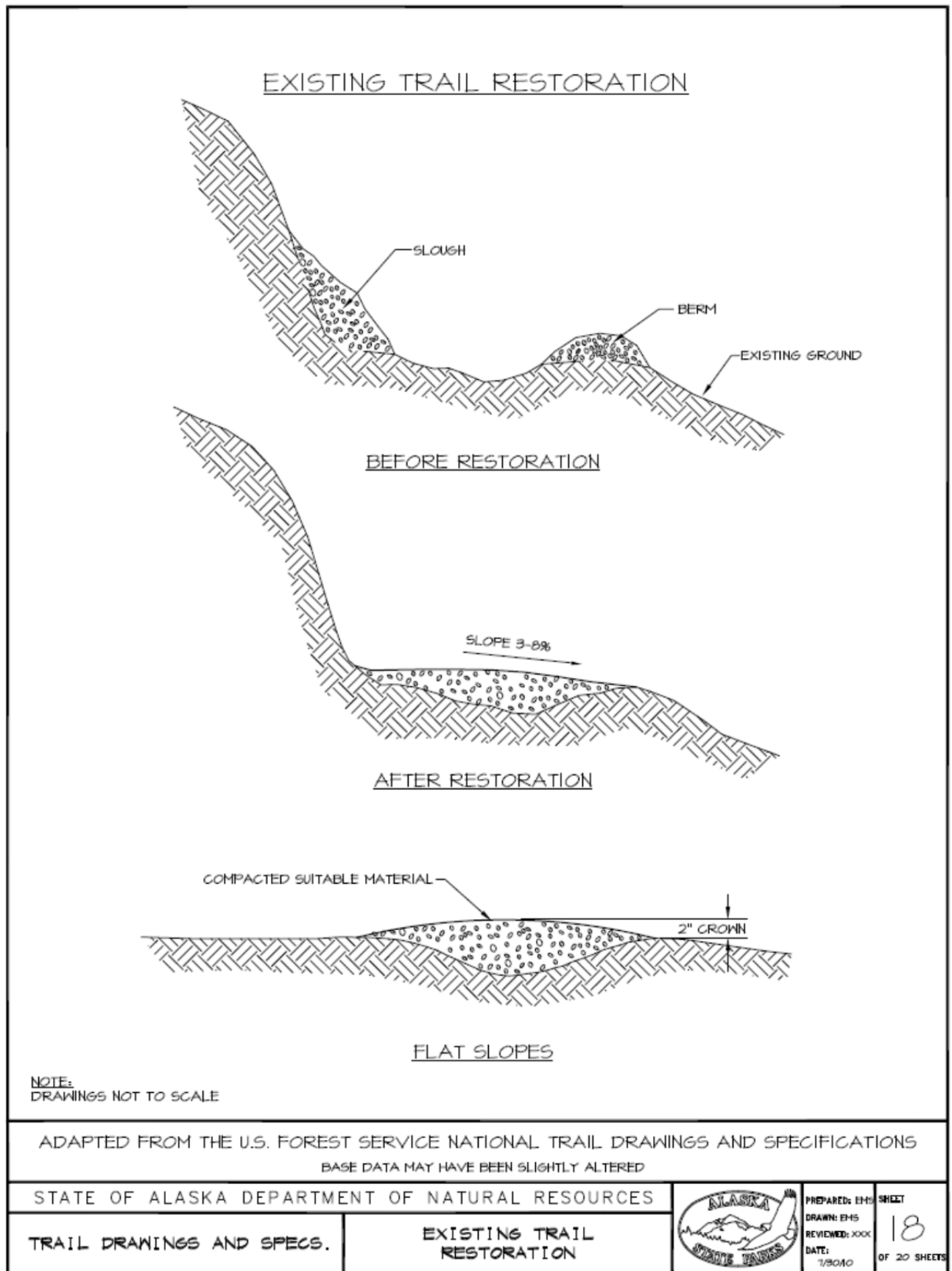
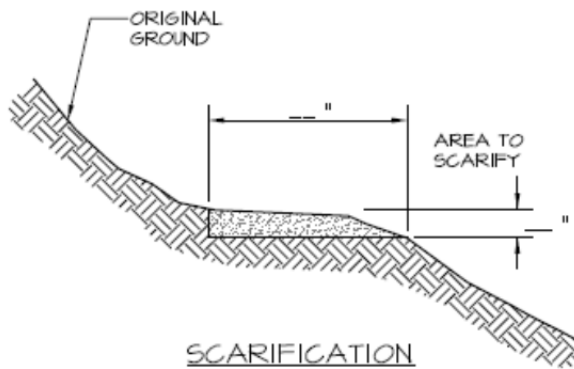
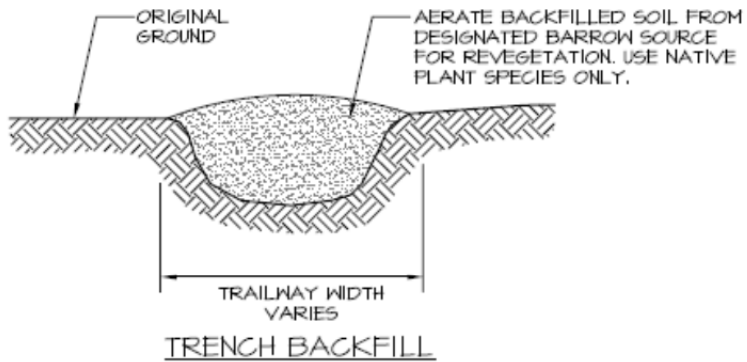
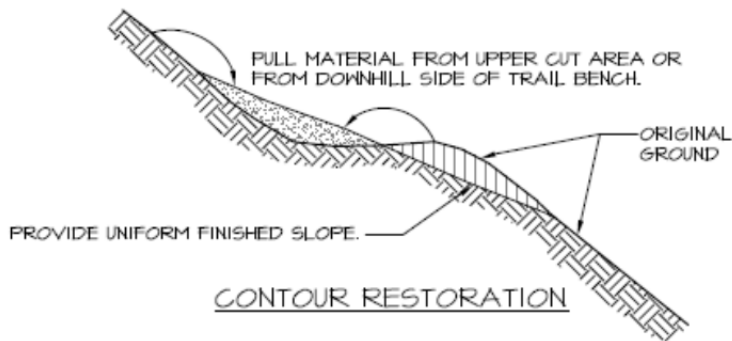


Figure A.18 – Existing Trail Restoration

TRAIL OBLITERATION



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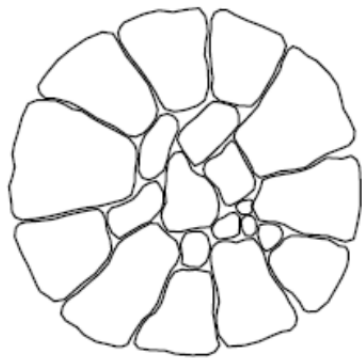
TRAIL OBLITERATION



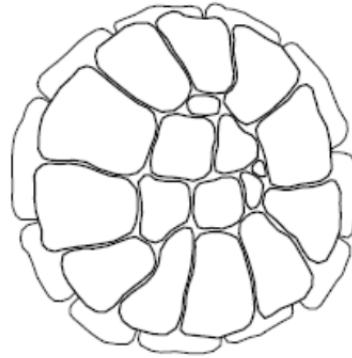
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Figure A.19 – Trail Obliteration

ROCK CAIRN CONSTRUCTION



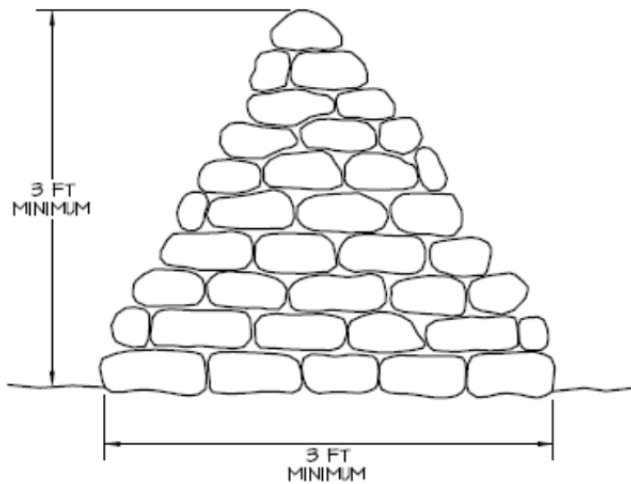
FIRST LAYER



SECOND LAYER

NOTE:

JOINTS OF THE PREVIOUS LAYER ARE TO BE BRIDGED BY THE NEXT.



STATION

NOTE:
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ROCK CAIRN CONSTRUCTION



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OF 20 SHEETS

Figure A.20 – Rock Cairn Construction

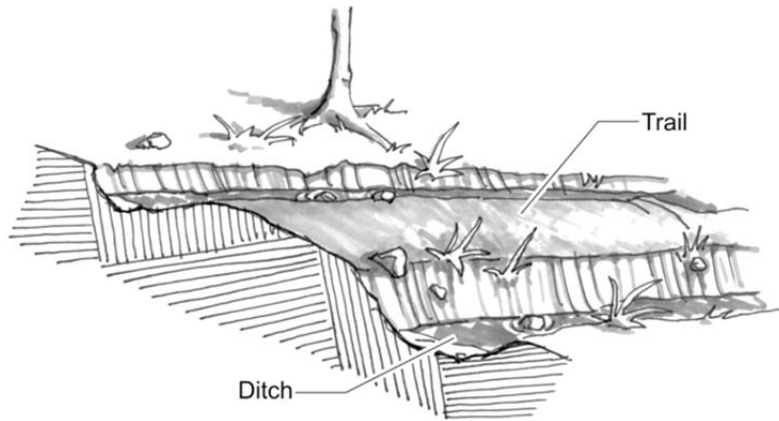


Figure A.21 - Slot Trench Drains and Elevated Trail Tread

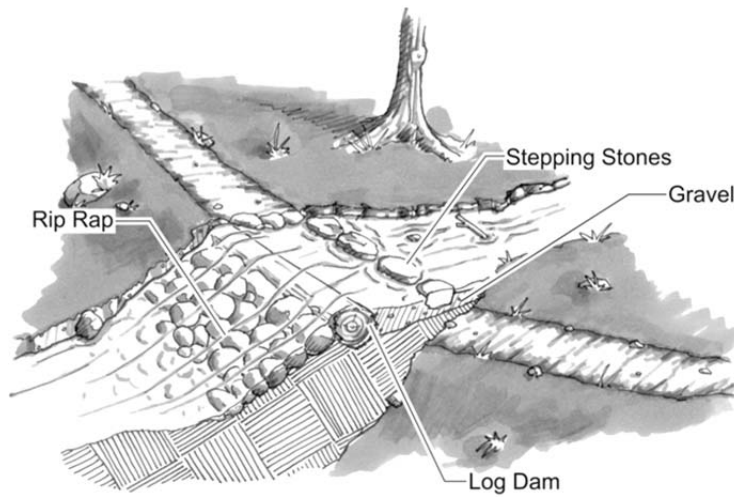


Figure A.22 - Stream Crossings and Stepping Stone Construction

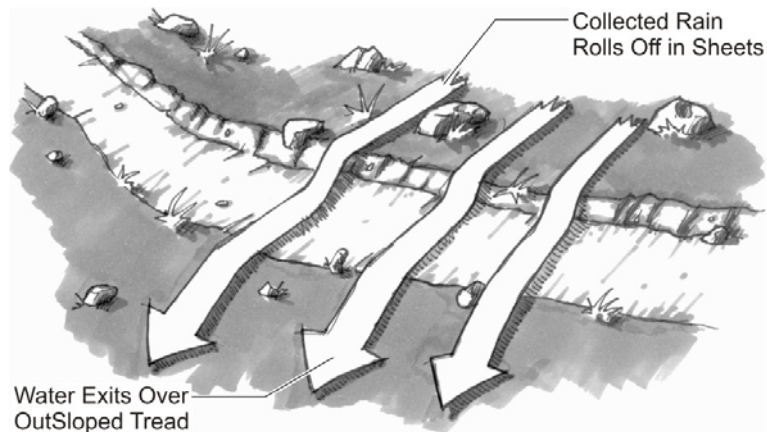


Figure A.23 - Outslope, Grade Dips, and Grade Reversals

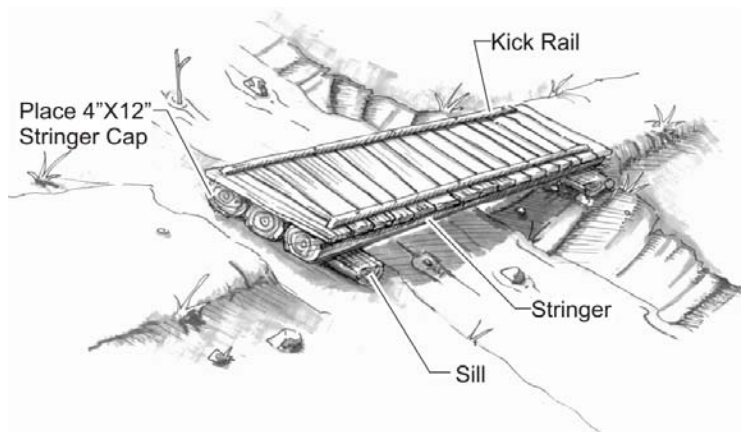


Figure A.24 – Puncheon

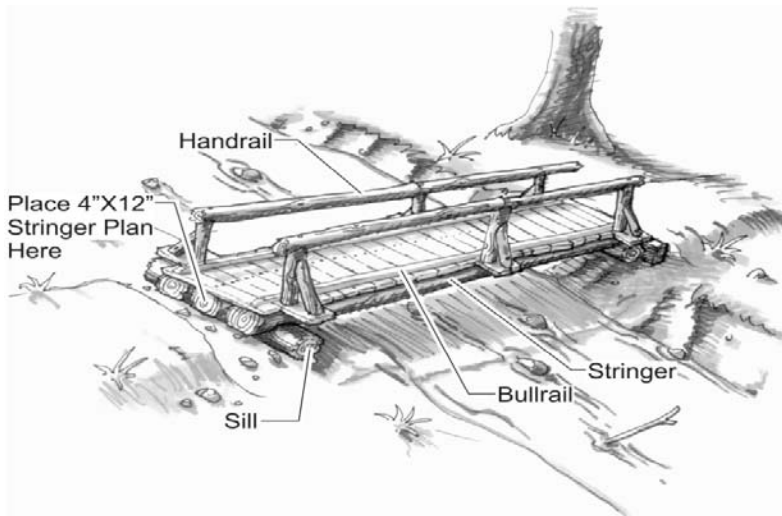


Figure A.25 - Basic Bridge Design Concepts

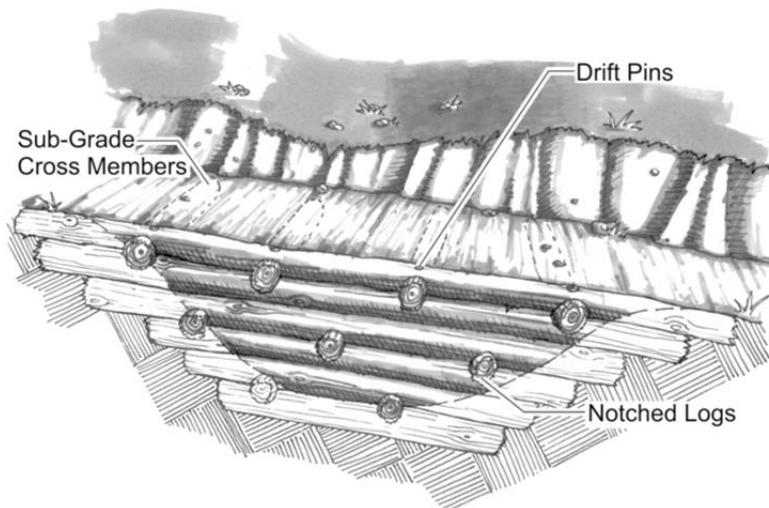


Figure A.26 - Log Crib Walls

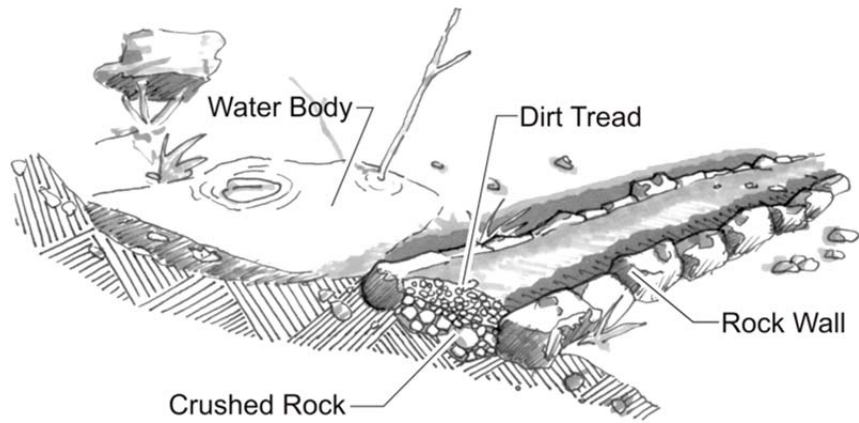


Figure A.27 - Stone Causeway

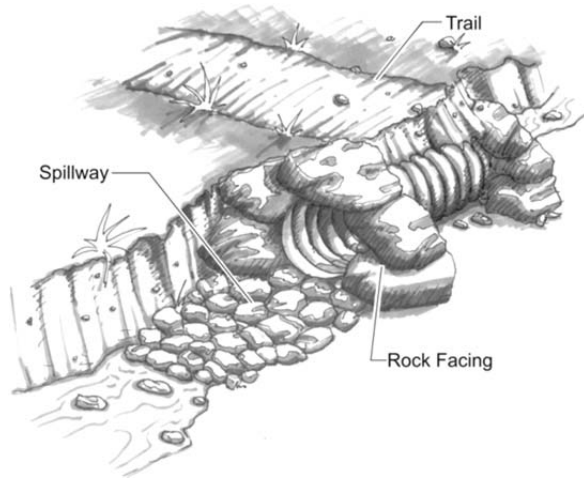


Figure A.28 - Armored Culverts

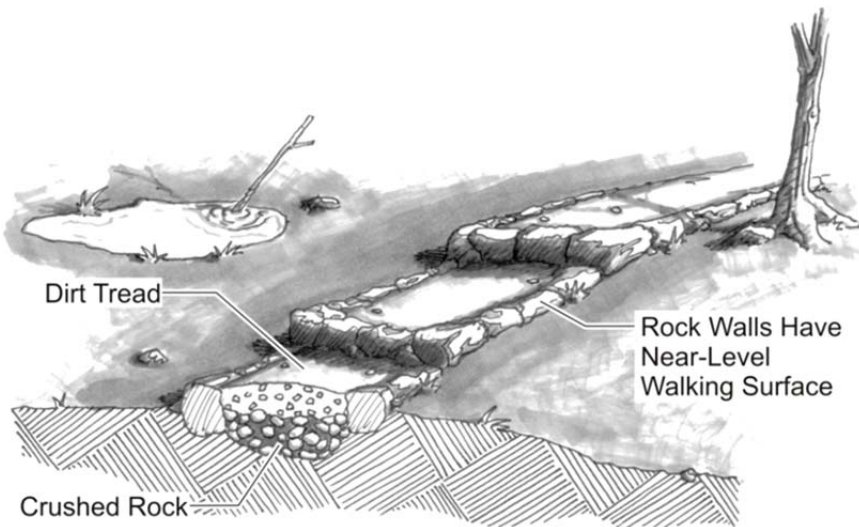


Figure A.29 - Stepped Causeway

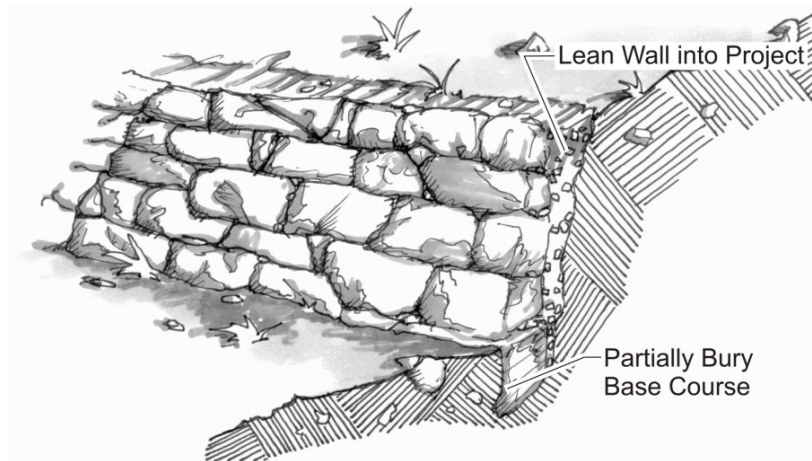


Figure A.30 - Dry Laid Rock Wall

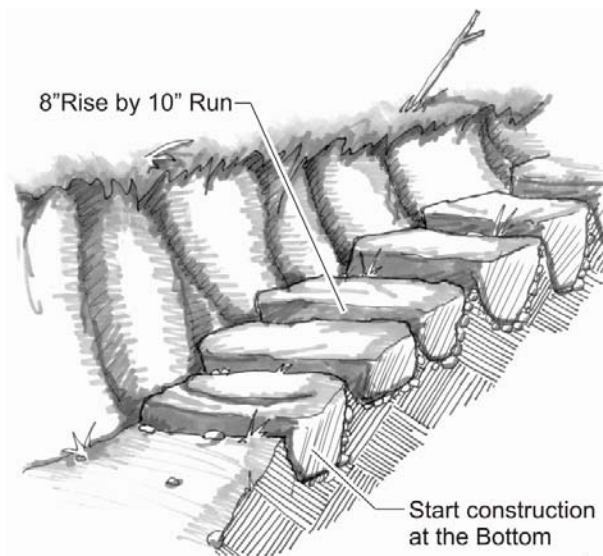


Figure A.31 - Stone Steps

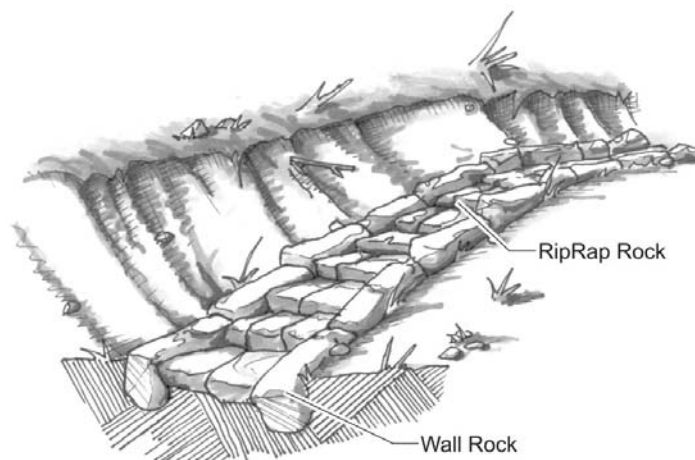


Figure A.32 - Riprap

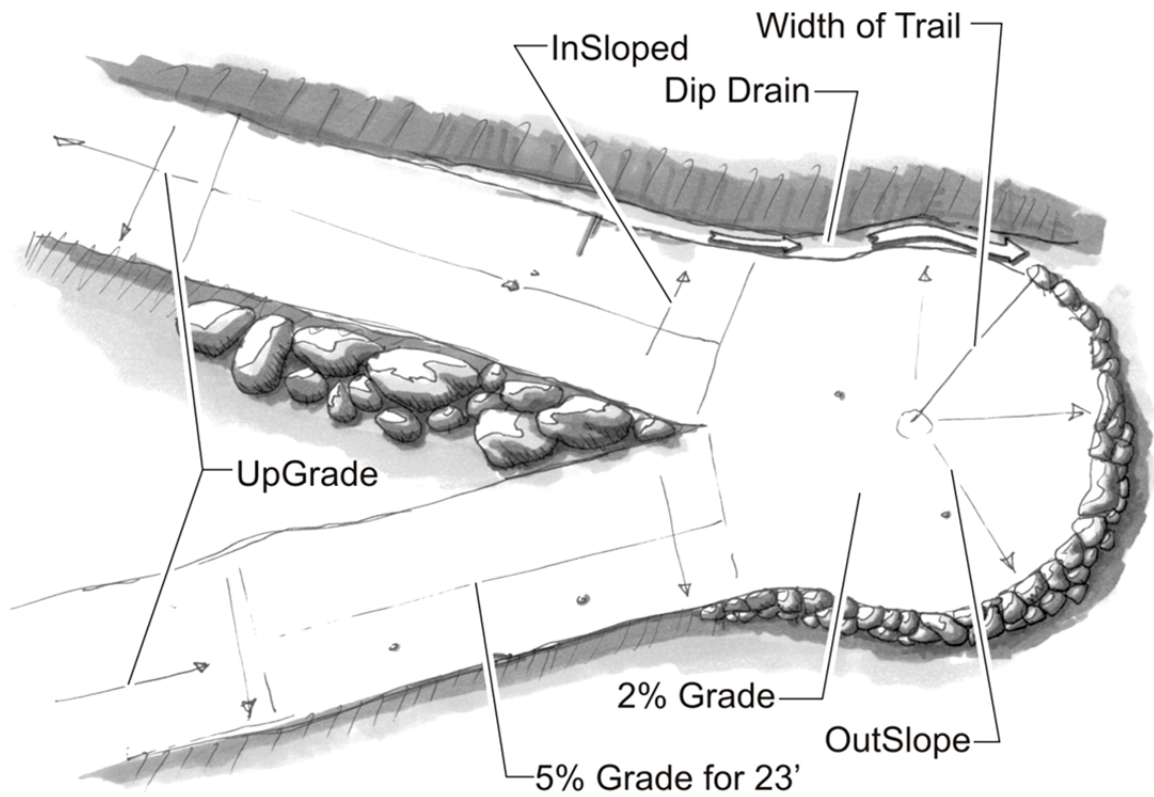


Figure A.33 - Switchback Layout and Design

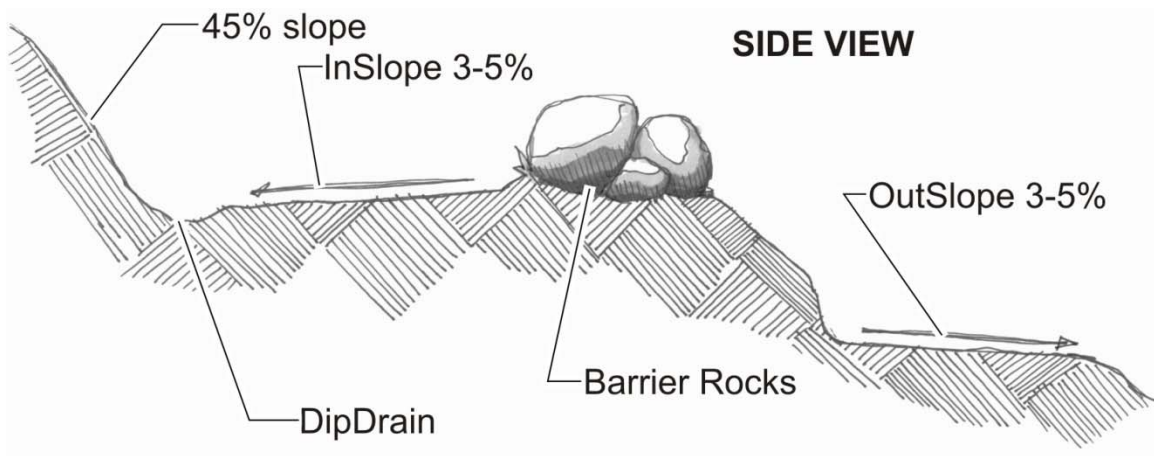


Figure A.34 - Switchback Horizontal View