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TYPICAL DITCH AND OBSTRUCTION CLEARANCE SECTION

BACKSLOPE RATIO: VERTICAL/HORIZONTAL
ROCK COMMON:

OBSTRUCTION CLEARANCE WIDTH

SHOULDER WIDTH

TREAD WIDTH

TRAILER

FILL SLOPE RATIO: VERTICAL/HORIZONTAL
ROCK COMMON:

TYPICAL DITCH DIMENSIONS

<table>
<thead>
<tr>
<th>TYPICAL ID</th>
<th>D (INCHES)</th>
<th>E (INCHES)</th>
<th>F (INCHES)</th>
<th>G (INCHES)</th>
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<tbody>
<tr>
<td>TDD-1</td>
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OBSTRUCTION CLEARANCE TABLE

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<th>OBSTRUCTION CLEARANCE HEIGHT</th>
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</table>
EXISTING TRAIL RESTORATION

A BROKEN DOWN SECTION

B TRENCHED SECTION

C SLOUGHED SECTION

D WASHED SECTION

NOTES:
1. RE-ESTABLISH ORIGINAL DRAINAGE STRUCTURES TO MATCH NEW TREAD SURFACE.
2. INSTALL CHECK DAMS, DRAINAGE DIPS OR OTHER DRAINAGE STRUCTURES WHEN SPECIFIED.
3. DRAINAGE DIPS WILL BE STAKED IN THE FIELD WHEN REQUIRED AND WILL BE PAID SEPARATELY UNDER SECTION 927.
4. USE ONLY SUITABLE MATERIAL TO CONSTRUCT RESTORED TRAIL PRISMS. DISPOSE OF UNSUITABLE MATERIAL AS SHOWN ON PLANS.
5. SEEDING, FERTILIZING & MULCHING WHEN REQUIRED WILL BE PAID UNDER SECTION 981.
A) CHECK DAM SECTION

B) SCARIFICATION AND SLASH PLACEMENT SECTION

C) RECONTOUR & SLASH PLACEMENT SECTION

D) RESTORE NATURAL DRAINAGE SECTION

CHECK DAM SPACING

<table>
<thead>
<tr>
<th>DRAINAGE GRADE %</th>
<th>DRAINAGE SPACING (FEET)</th>
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<tbody>
<tr>
<td>&lt;3</td>
<td>OCCASIONAL</td>
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<tr>
<td>3-7</td>
<td>50</td>
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<tr>
<td>8-12</td>
<td>25</td>
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<td>&gt;12</td>
<td>15</td>
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TRAIL OBLITERATION

<table>
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<th>LENGTH</th>
<th>COMMENTS</th>
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<td>OBT-1</td>
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<td></td>
</tr>
</tbody>
</table>

N/A WHEN NOT APPLICABLE

**** FOR CHECK DAM SEE SHEET STD-028-01

NOTES:
1. SLASH CONSISTS OF LOGS, LIMBS, BRUSH, AND ROCKS PLACED IN A WAY TO CATCH SEDIMENT MOVEMENT.
2. SLASH TO BE SPREAD RANDOMLY ACROSS TRAIL BED. DO NOT SPREAD PARALLEL TO TRAIL SURFACE.
3. LIMB ALL TREES AND SHRUBS AND TAMPER SLASH INTO GROUND SO THAT 80% OF SLASH IS IN CONTACT WITH THE GROUND.
4. DRAINAGE DIPS WILL BE STAKED IN THE FIELD WHEN REQUIRED AND WILL BE PAID SEPARATELY UNDER SECTION 927.
5. SEEDING, FERTILIZING & MULCHING WHEN REQUIRED WILL BE PAID UNDER SECTION 981.
## Clearing Limits - Trees and Logs

<table>
<thead>
<tr>
<th>Typical ID</th>
<th>Clearing Method</th>
<th>Downhill Width (A)</th>
<th>Uphill Width (B)</th>
<th>Clearing Height (C)</th>
<th>Distance (Feet)</th>
<th>Diameter (Inches)</th>
<th>Downhill Width (D)</th>
<th>Uphill Width (E)</th>
<th>Maximum Height (F)</th>
<th>Stumps (G)</th>
<th>Hazard Trees (H)</th>
<th>Removal Width (I)</th>
<th>Disposal Method (J)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLT-1</td>
<td>C</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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</table>

### Clearing Method

<table>
<thead>
<tr>
<th>Clearing Type</th>
<th>Clearing Method</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>New Construction</td>
<td>Trees, Pruning, &amp; Brush</td>
</tr>
<tr>
<td>C2</td>
<td>Clearing Limit Restoration</td>
<td>Trees, Pruning, Logs, Brush &amp; Maintenance</td>
</tr>
<tr>
<td>C3</td>
<td>Trail Opening</td>
<td>Logging Out, Loose Rock &amp; Drainage Clearing</td>
</tr>
<tr>
<td>C4</td>
<td>Hazard Tree Removal</td>
<td>Along Trail Corridor</td>
</tr>
<tr>
<td>C5</td>
<td>Hazard Tree Removal</td>
<td>Individual (as marked)</td>
</tr>
<tr>
<td>C6</td>
<td>Loose Rock &amp; Root Removal</td>
<td></td>
</tr>
<tr>
<td>C7</td>
<td>Leave Trees</td>
<td>Leave Trees Should be Live, Sound &amp; Undamaged with Uncompromised Root Systems</td>
</tr>
</tbody>
</table>

### Hazard Trees

Hazard trees are trees that are standing or leaning dead trees larger than 8 inches in diameter and greater than 90 feet in height.

### Disposal Method

<table>
<thead>
<tr>
<th>Disposal Type</th>
<th>Disposal Method</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>D1</td>
<td>Lop and Scatter Outside Trailway</td>
<td></td>
</tr>
<tr>
<td>D2</td>
<td>Lop and Scatter on Fill Slope</td>
<td></td>
</tr>
<tr>
<td>D3</td>
<td>Pile and Burn</td>
<td></td>
</tr>
<tr>
<td>D4</td>
<td>CMP</td>
<td></td>
</tr>
<tr>
<td>D5</td>
<td>Haul to Disposal Site</td>
<td></td>
</tr>
<tr>
<td>D6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Clearing Limits - Brushing

<table>
<thead>
<tr>
<th>Typical ID</th>
<th>Clearing Method</th>
<th>Uphill Width</th>
<th>Downhill Width</th>
<th>Clearing Height</th>
<th>Uphill Width</th>
<th>Downhill Width</th>
<th>Disposal Method</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLB-1</td>
<td>C</td>
<td>J</td>
<td>K</td>
<td>L</td>
<td>M</td>
<td>N</td>
<td>D</td>
<td></td>
</tr>
</tbody>
</table>

![Diagram of clearing limits and brush cutting areas]

**Clearing Method**

<table>
<thead>
<tr>
<th>Clearing Type</th>
<th>Clearing Method</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>C9</td>
<td>Brushing</td>
<td></td>
</tr>
<tr>
<td>C10</td>
<td>Mowing</td>
<td></td>
</tr>
<tr>
<td>C11</td>
<td></td>
<td></td>
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</tbody>
</table>

**Disposal Method**

<table>
<thead>
<tr>
<th>Disposal Type</th>
<th>Disposal Method</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>D1</td>
<td>Lop and scatter outside trailway</td>
<td></td>
</tr>
<tr>
<td>D2</td>
<td>Lop and scatter on fill slope</td>
<td></td>
</tr>
<tr>
<td>D3</td>
<td>Pile and burn</td>
<td></td>
</tr>
<tr>
<td>D4</td>
<td>Chip</td>
<td></td>
</tr>
<tr>
<td>D5</td>
<td>Haul to disposal site</td>
<td></td>
</tr>
<tr>
<td>D6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note: See sheet STD_912-01 for clear zone limits*
## SURFACING SECTIONS

<table>
<thead>
<tr>
<th>TYPICAL ID</th>
<th>SECTION TYPE</th>
<th>TREAD WIDTH</th>
<th>SHOULDER WIDTH UPHILL</th>
<th>SHOULDER WIDTH DOWNHILL</th>
<th>GEOTEXTILE TYPE</th>
<th>TYPE</th>
<th>DEPTH</th>
<th>TYPE</th>
<th>DEPTH</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSS-1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>B</td>
<td>S</td>
<td></td>
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N/A WHEN NOT APPLICABLE

### BASE COURSE MATERIAL TYPE

<table>
<thead>
<tr>
<th>TYPE</th>
<th>MATERIAL</th>
<th>GRADATION</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>B1</td>
<td>PIRRUN</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B2</td>
<td>AGGREGATE</td>
<td></td>
<td></td>
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<tr>
<td>B3</td>
<td></td>
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### SURFACE COURSE MATERIAL TYPE

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<th>TYPE</th>
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<th>COMMENTS</th>
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<tbody>
<tr>
<td>S1</td>
<td>PIRRUN</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S2</td>
<td>AGGREGATE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S3</td>
<td>CLAY</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S4</td>
<td>WOODCHIPS</td>
<td></td>
<td></td>
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<tr>
<td>S5</td>
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### DRAWDN BY

[Diagram of outsloped section, excavated section, and raised section]

**A** OUTSLOPED SECTION

**B** EXCAVATED SECTION

**C** RAISED SECTION

**NOTE:**
1. REMOVE AND DISPOSE OF DUFF AND TOP ORGANIC LAYERS DOWN TO MINERAL SOIL.
2. COMPACT BACKFILL IN 6 INCH LIFTS UNTIL NO VISUAL DISPLACEMENT.
### SURFACING SECTIONS

<table>
<thead>
<tr>
<th>TYPICAL ID</th>
<th>SECTION TYPE</th>
<th>TREAD WIDTH</th>
<th>SHOULDER WIDTH</th>
<th>ELEVATION TYPE</th>
<th>TYPE</th>
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<th>SURFACE COURSE</th>
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<tbody>
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<td>TSR-1</td>
<td>R</td>
<td>SB</td>
<td>B</td>
<td>S</td>
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N/A WHEN NOT APPLICABLE
*FOR TYPICAL RETAINERS SEE SHEET STD_911-03*

### SUBBASE MATERIAL TYPE

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<tr>
<td>SB3</td>
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### BASE COURSE MATERIAL TYPE

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<th>TYPE</th>
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<th>GRADATION</th>
<th>COMMENTS</th>
</tr>
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<tbody>
<tr>
<td>B1</td>
<td>PITHRUN</td>
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<td></td>
</tr>
<tr>
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<td>AGGREGATE</td>
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### SURFACE COURSE MATERIAL TYPE

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<tbody>
<tr>
<td>S1</td>
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<td>S3</td>
<td>CLAY</td>
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<td>S4</td>
<td>WOODCHIPS</td>
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<td>S5</td>
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</tbody>
</table>

**NOTE:**
1. REMOVE AND DISPOSE OF DUFF AND TOP ORGANIC LAYERS DOWN TO MINERAL SOIL.
2. COMPACT BACKFILL IN 6 INCH LIFTS UNTIL NO VERTICAL DISPLACEMENT.
### HARDENED SURFACING SECTIONS WITH RETAINERS

<table>
<thead>
<tr>
<th>TYPICAL ID</th>
<th>SECTION TYPE</th>
<th>TREAD WIDTH</th>
<th>SHOULDER WIDTH UPHILL</th>
<th>SHOULDER WIDTH DOWNHILL</th>
<th>GEOTEXTILE TYPE</th>
<th>TYPE</th>
<th>SUBBASE</th>
<th>BASE COURSE</th>
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<td>R</td>
<td>SB</td>
<td>B</td>
<td>HS</td>
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N/A WHEN NOT APPLICABLE
*FOR TYPICAL RETAINERS SEE SHEET STD_911-03*

### SUBBASE MATERIAL TYPE

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<th>TYPE</th>
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<tbody>
<tr>
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<td>PIRUN</td>
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### BASE COURSE MATERIAL TYPE

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### HARDENED SURFACE COURSE MATERIAL TYPE

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<tr>
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<td>COLD ASPHALT</td>
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<td>HS3</td>
<td>WARM ASPHALT</td>
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<td>HS4</td>
<td>RST - CMP SEAL</td>
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<tr>
<td>HS5</td>
<td>STABILIZED AGGREGATE</td>
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</tbody>
</table>

**NOTE:**

1. REMOVE AND DISPOSE OF DUFF AND TOP ORGANIC LAYERS DOWN TO MINERAL SOIL.
2. COMPACT BACKFILL IN 6 INCH LIFTS UNTIL NO VISUAL DEFORMATION.
GRID UNIT SURFACING

NOTE:
1. REMOVE AND DEPOSE OF DUFF AND TOP ORGANIC LAYERS DOWN TO MINERAL SOIL.
2. COMPACT BACKFILL IN 6 INCH LIFTS UNTIL NO VISUAL DISPLACEMENT.

GRID UNIT TYPE

GRID UNIT SURFACING

<table>
<thead>
<tr>
<th>TYPICAL ID</th>
<th>GEOTEXILE TYPE</th>
<th>STRAIGHT SECTION WIDTH</th>
<th>BANK CURVE WIDTH</th>
<th>CURVE WINDING WIDTH</th>
<th>CURVE TRANSITION LENGTH</th>
<th>GRID UNIT TYPE</th>
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<tbody>
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<td>GUS-1</td>
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N/A WHEN NOT APPLICABLE

SECTION A-A

SECTION B-B

SECTION C-C
### Riprap Surfacing

**Minimum Rock Size**

<table>
<thead>
<tr>
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<th>WIDTH</th>
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N/A WHEN NOT SPECIFIED

### Leveling Course Material

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### Plan View

- Shoulder Rock
- Tread Width
- Base Rock
- Shoulder Rock

**Notes:**

1. Remove and dispose of duff and top organic layers down to mineral soil.
2. Provide organic-free backfill material where shown on drawings for leveling and support of base rock.
3. Lay rock with a minimum of 3 points of contact with adjacent rocks.
4. Lay rocks in a random arrangement.
5. Fill voids with broken rock or suitable backfill.

**Section A-A**

- Shoulder Rock (Typ)
- Unsuitable or Waste Material
- Backfill with suitable material
- Geotextile
- Leveling Course
CLIMBING TURN SECTIONS

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N/A WHEN NOT SPECIFIED

PLAN VIEW

RADIUS POINT AND CENTER LINE OF CLIMBING TURN WILL STAY ON THE GROUND.

NOTE:
CONSTRUCT CONSTANT GRADE THROUGH BOTH APPROACH SECTIONS.

SECTION A-A

EXISTING GROUND
TALUS OR ROCK SECTION

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N/A WHEN NOT APPLICABLE

GEOTEXTILE TYPE

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BASE COURSE MATERIAL TYPE

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SURFACE COURSE MATERIAL TYPE

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NOTE:
1. REMOVE AND DEPOSE OF DUFF AND TOP ORGANIC LAYERS DOWN TO MINERAL SOIL.
2. COMPACT BACKFILL IN 6 INCH LIFTS UNTIL NO VISUAL DISPLACEMENT.

TYPICAL CROSS SECTION
PASSING SECTION
FULL PITCH CONSTRUCTION AS STAKED IN THE FIELD

TURNOUT SECTION

NOTE:
PASSING SECTIONS AND TURNOUTS SHALL BE CONSTRUCTED TO THE SAME STANDARD AS THE MAIN TRAIL UNLESS NOTED IN THE COMMENTS.
NATURAL FORD STRUCTURE

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<tr>
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*FOR TYPICAL RETAINERS SEE SHEET STD-911-03
***FOR CHECK DAM SEE SHEET STD-628-01

SURFACE COURSE MATERIAL TYPE

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<tr>
<td>S4</td>
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SECTION A-A

PLAN VIEW

BEGIN/END FORD WIDTH TO DAILY LIGHT

RETAINER TYPE AS SPECIFIED

INSTALL STEPPING ROCKS ON UPSTREAM EDGE OF TREAD WHEN SPECIFIED

12 INCHES TYPICAL SPACING

BURY SIDE RETAIKER PERPENDICULAR TO TREAD SURFACE

CHECK DAM TYPE AS SPECIFIED

BEGIN/END FORD WIDTH TO DAILY LIGHT

STEPPING ROCK DETAIL

MATERIAL TYPE

BEGIN/END FORD WIDTH TO DAILY LIGHT

RETAINER TYPE AS SPECIFIED

INSTALL STEPPING ROCKS, EMDED 1/3 OF ROCK DEPTH

STREAM

TREAD

BACKFILL WITH SUITABLE MATERIAL

HIGH WATER MARK
### CONSTRUCTED FORD - ROCK STRUCTURE

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N/A WHEN NOT REQUIRED

*FOR TYPICAL RETAINERS SEE SHEET STD_911-03
**FOR FOUNDATIONS SEE SECTION STD_918

### GEOTEXTILE TYPE

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### FOUNDATION MATERIAL TYPE

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### SURFACE COURSE MATERIAL TYPE

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**NOTES:**
1. THE TRANSITION AND GRADE SHALL BE THE AVERAGE OF THE APPROACH GRADE AND THE TRAIL GRADE TO CREATE A SMOOTH TRANSITION.
2. TRANSITION TREAD WIDTH FROM FORD WIDTH TO TYPICAL TREAD WIDTH TO ACCOMMODATE GRADE TRANSITION.
## CONSTRUCTED FORD - LOG STRUCTURE

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N/A WHEN NOT APPLICABLE
*FOR TYPICAL RETAINERS SEE SHEET STD-911-03
**FOR FOUNDATIONS SEE SECTION STD-918

**NOTCHED LOG**

MANOPLACED ROCKS ACROSS FULL WIDTH. KEY IN SMALLER ROCKS. 100 Lb MINIMUM NEAR LOG.

EMBED LOG DAM INTO BANK A MINIMUM DEPTH OF 12 INCHES. SEE SECTION 911 TYPICAL SECTIONS.

PLAN VIEW

HIGH WATER MARK

STREAM BANK

12 INCHES SPACING (TYPICAL)

INSTALL STEPPING ROCKS ON UPSTREAM EDGE OF TREAD.

NOTES:
1. THE TRANSITION AND GRADE SHALL BE THE AVERAGE OF THE APPROACH GRADE AND THE TRAIL GRADE TO CREATE A SMOOTH TRANSITION.
2. TRANSITION TREAD WIDTH FROM FORD WIDTH TO TYPICAL TREAD WIDTH TO ACCOMMODATE GRADE TRANSITION.

**GEOTEXTILE TYPE**

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**FOUNDATION MATERIAL TYPE**

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ROCK FOUNDATIONS

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N/A WHEN NOT APPLICABLE
*FOR TYPICAL RETAINERS SEE SHEET STD-911-03

NOTE:
1. REMOVE AND DISPOSE OF DUFF AND TOP ORGANIC LAYERS DOWN TO MINERAL SOIL.
2. COMPACT BACKFILL IN 6 INCH LIFTS UNTIL NO VISUAL DISPLACEMENT.
3. OVERLAP GEOTEXTILE A MINIMUM OF 12 INCHES AT CENTER AND AT ENDS.
4. A 6 INCH MINIMUM COVER IS REQUIRED OVER ALL GEOTEXTILE AND GEOCELL FOUNDATIONS.

GEOTEXTILE TYPE

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GEOTEXTILE MATERIAL

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<td>FM5</td>
<td>8 INCH PLUS</td>
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GABION BASKET FOUNDATIONS

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N/A WHEN NOT APPLICABLE
* FOR TYPICAL RETAINERS SEE SHEET STD.911-03

A EXCAVATED SECTION
B RAISED SECTION
C RETAINER SECTION

NOTE:
1. REMOVE AND DEPOSE OF DUFF AND TOP ORGANIC LAYERS DOWN TO MINERAL SOIL
2. COMPACT BACKFILL IN 6 INCH LiftS UNtIL NO VISUAL DISPLACEMENT
3. OVERLAP GEOTEXTILE A MINIMUM OF 12 INCHES AT CENTER AND AT ENDS
4. INSTALL GABION BASKETS ACCORDING TO MANUFACTURERS INSTRUCTIONS
5. A 6 INCH MINIMUM COVER IS REQUIRED OVER ALL GEOTEXTILE

IN-FILL MATERIAL TYPE

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GEOTEXTILE TYPE

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## CRIB FOUNDATIONS

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### CRIB LOG SECTION

- **Foundation Depth**: 24 inch maximum
- **Sill Log**: 8 inch minimum
- **No. 4 Rebar to Penetrate All Logs**
- **Foundation Width**: 6 inch minimum
- **Stringer Log**: 8 inch minimum
- **Backfill with Suitable Material**: Geotextile

### CRIB LOG W/RETAINERS SECTION

- **Foundation Depth**: 24 inch maximum
- **Sill Log**: 8 inch minimum
- **No. 4 Rebar to Penetrate All Logs**
- **Foundation Width**: 6 inch minimum
- **Stringer Log**: 8 inch minimum
- **Backfill with Suitable Material**: Geotextile

#### NOTCHING DETAIL

Provide a notch depth between 1/4 and 1/3 the log diameter. Notch depth and width as required to obtain safe fit. Do not exceed 1/2 inch space between logs. Logs to be installed with notch facing down.

#### GEOTEXTILE TYPE

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#### IN-FILL MATERIAL TYPE

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<th>Type</th>
<th>Material Type</th>
<th>Rock Size</th>
<th>Gradation %</th>
<th>Comments</th>
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</thead>
<tbody>
<tr>
<td>FM1</td>
<td>Aggregate</td>
<td>1 inch minus</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FM2</td>
<td>Coarse Aggregate</td>
<td>3 inch minus</td>
<td></td>
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</tr>
<tr>
<td>FM3</td>
<td>Rock</td>
<td>3 to 6 inch</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FM4</td>
<td>Rock</td>
<td>4 to 8 inch</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FM5</td>
<td>Heavy Rock</td>
<td>8 inch plus</td>
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#### PRESERVATIVE TREATMENT

<table>
<thead>
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<th>Preservative</th>
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<th>Use Category</th>
<th>Comments</th>
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<tr>
<td>P1</td>
<td>WB</td>
<td>UC4A</td>
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<tr>
<td>P2</td>
<td>WB</td>
<td>UC38</td>
<td></td>
</tr>
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### NOTES:

1. Straightness requirements: the true center of each log deviates no more than 2 inches from a straight line between the centers of the ends of the log.
2. Pre-drill holes for rebar to prevent splitting of logs or sawn timbers.
3. Rebar end of rebar 1/2 inch below top of timber header log. Place rebar a minimum of 10 inches from each end of timber with maximum rebar spacing as shown on the drawings.
4. Compact backfill in 6 inch lifts until no visual displacement.
5. All field-drilled holes and cuts shall be field treated.

---

**U.S. DEPARTMENT OF AGRICULTURE**
**FOREST SERVICE**

**STANDARD TRAIL PLAN**

**CRIB FOUNDATIONS**

**SECTION**: 918 - FOUNDATIONS

**Typical B**: CBF

**NO SCALE**

**DRAWING NO.**: STD_918-30-01

**DRAWING DATE**: XX/XX/XX

**REVISION DATE**: XX/XX/XX

**PROJECT NAME & LOCATION**: CRIB FOUNDATIONS

---

**DRAWING NAME**: CRIB FOUNDATIONS

**CRIB FOUNDATIONS**

**SECTION**: 918 - FOUNDATIONS

**Typical B**: CBF

**NO SCALE**

**DRAWING NO.**: STD_918-30-01

**DRAWING DATE**: XX/XX/XX

**REVISION DATE**: XX/XX/XX

**PROJECT NAME & LOCATION**: CRIB FOUNDATIONS

---

**DIAGRAM**: CRIB FOUNDATIONS

**SECTION**: 918 - FOUNDATIONS

**Typical B**: CBF

**NO SCALE**

**DRAWING NO.**: STD_918-30-01

**DRAWING DATE**: XX/XX/XX

**REVISION DATE**: XX/XX/XX

**PROJECT NAME & LOCATION**: CRIB FOUNDATIONS
## Corduroy Foundation

### Typical Foundation Details

<table>
<thead>
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<th>Typical ID</th>
<th>Section Type</th>
<th>Geotextile</th>
<th>Foundation</th>
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</thead>
<tbody>
<tr>
<td>CDF-1</td>
<td>G</td>
<td>G</td>
<td></td>
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</tbody>
</table>

### Diagrams

**A. Corduroy Section**
- Geotextile placement
- Retaining log details
- Foundation width

**B. Corduroy with Retainers Section**
- Geotextile placement
- No. 4 rebar at 6 inches from ends, every 3 feet

**C. Excavated Corduroy Section**
- Geotextile placement

### Geotextile Type

<table>
<thead>
<tr>
<th>Type</th>
<th>Material</th>
<th>Comments</th>
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<td>G1</td>
<td>Non-Woven</td>
<td></td>
</tr>
<tr>
<td>G2</td>
<td>Woven</td>
<td></td>
</tr>
<tr>
<td>G3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Notes
1. Overlap geotextile a minimum of 12 inches at ends.
2. A 6 inch minimum cover is required over geotextile foundations.
3. Adjacent logs shall not have an elevation difference of more than 1 inch.
### STANDARD CULVERT

#### BEDDING

<table>
<thead>
<tr>
<th>TYPICAL ID</th>
<th>GEOTEXTILE TYPE</th>
<th>TYPE</th>
<th>TYPE</th>
<th>MATERIING</th>
<th>TYPE</th>
<th>COMMENTS</th>
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</thead>
<tbody>
<tr>
<td>SCV-1</td>
<td>B</td>
<td>C</td>
<td>R</td>
<td>R</td>
<td>A</td>
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N/A WHEN NOT APPLICABLE
*FOR TYPICAL RETAINERS SEE SHEET STD_911-03

#### CULVERT TYPE

<table>
<thead>
<tr>
<th>TYPE</th>
<th>MATERIAL</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>CMF - GALV</td>
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<tr>
<td>C2</td>
<td>MORTICE</td>
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<tr>
<td>C3</td>
<td>PLASTIC</td>
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<tr>
<td>C4</td>
<td>ALUMINUM</td>
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<tr>
<td>C5</td>
<td>CONCRETE</td>
<td></td>
</tr>
<tr>
<td>C6</td>
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</table>

#### RETAINER TYPE

1. COMPACT BACKFILL IN 6 INCH LIFTS UNTIL NO VISUAL DISPLACEMENT.
2. NO ROCKS LARGER THAN 1 1/2 INCHES WITHIN 12 INCHES OF PIPE

#### BEDDING MATERIAL TYPE

<table>
<thead>
<tr>
<th>TYPE</th>
<th>MATERIAL</th>
<th>GRADATION</th>
<th>COMMENTS</th>
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<tbody>
<tr>
<td>B1</td>
<td>BRICK</td>
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<td></td>
</tr>
<tr>
<td>B2</td>
<td>AGGREGATE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### DIAGRAM

- TREAD
- 12 INCH MINIMUM
- PIPE BEDDING 6 INCH MINIMUM WHEN SPECIFIED
- MINIMUM BEDDING WIDTH EQUALS 1.5X DIAMETER OF PIPE
- BACKFILL WITH SUITABLE MATERIAL
- GEOTEXTILE WHEN SPECIFIED
- RETAINER TYPE AS SPECIFIED
- BUSINESS LOCATION WHERE STARED
- END VIEW
- ELEVATION VIEW
- TREAD WIDTH
- SHOULDER WIDTH
- SEE SECTION 913 TYPICAL SECTIONS
- 6 INCHES MINIMUM
Rock Culvert

<table>
<thead>
<tr>
<th>Typical ID</th>
<th>Rock Culvert</th>
<th>Rock Sidewall</th>
<th>Cover Rock (Flat)</th>
<th>Retainer Rock*</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>RCV-1</td>
<td></td>
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<td></td>
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</tr>
</tbody>
</table>

N/A when not applicable.
*For typical retainer SEE SHEET STD_911-03

Plan View

Elevation View

End View

Note:
1. Compact backfill in 6 inch lifts until no visual displacement.
## TREATED TIMEBER BOX CULVERT & CURB

<table>
<thead>
<tr>
<th>ID</th>
<th>CURB-CURB WIDTH</th>
<th>OVERALL WIDTH</th>
<th>LENGTH</th>
<th>SPECIES</th>
<th>DECK WIDTH</th>
<th>DECK MATERIAL</th>
<th>PRESERV. TYPE</th>
<th>PRESSURE TREATED</th>
<th>CURVE/SCUPPER BLOCKS</th>
<th>PRESSURE TREATED</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>TCV-1</td>
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<td>P</td>
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<td>P</td>
<td>P</td>
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</tr>
</tbody>
</table>

N/A WHEN NOT APPLICABLE

---

**SECTION 921 - CULVERTS**

**PLAN VIEW**

- **48 INCHES (TYP)**
- **7 INCH (TYP)**
- **45° (TYP)**

**PROFILE VIEW**

- **3 INCH EMBEDMENT DEPTH**
- **1 INCH (TYP)**

**END VIEW**

- **3 INCH (TYP)**
- **6 INCH (TYP)**
- **2 X 4 X 16 INCHES LG (TYP)**
- **SCUPPER BLOCK**

**NOTES**

1. COMPACT BACKFILL IN 6 INCH LIFTS UNTIL NO VISUAL DISPLACEMENT.
**SKEW**

<table>
<thead>
<tr>
<th>Trail Grade</th>
<th>Skew Angle</th>
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<tbody>
<tr>
<td>&lt;5%</td>
<td>45° MAX</td>
</tr>
<tr>
<td>&gt;5%</td>
<td>30° MIN</td>
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</table>

**TYPICAL ID**

<table>
<thead>
<tr>
<th>ID</th>
<th>Species</th>
<th>Preservative Type</th>
<th>Rock Spillway</th>
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<tbody>
<tr>
<td>OTD-1</td>
<td>P</td>
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</tbody>
</table>

**COMMENTS**

N/A WHEN NOT APPLICABLE

**FOR ROCK SPILLWAY SEE SHEET STD_923-10-01**

**PERSPECTIVE VIEW**

- Embed 12 inches minimum
- Skew 30°-45°
- Extend 12 inches minimum
- See Sheet STD_923-10-51 (Rock Spillway When Specified)

**TYPICAL SECTION**

- 2 1/2 inches
- 4 inches
- 3 x 8 treated timber
- 3 x 12 treated timber
- 3/4 diameter pipe spacer at each bolt
- 60d ring shank spikes
- 11/16 dia holes at 5 foot maximum C to C

**PLAN VIEW**

- 6 inch (Typ)
- Ring Shank Spikes at 24 inches C to C

**ELEVATION VIEW**

- 6 inch (Typ)
- 11/16 dia holes at 5 foot maximum C to C

**NOTES:**
1. Compact backfill in 6 inch lifts until no visual displacement.

**TREATMENT TYPE**

<table>
<thead>
<tr>
<th>Treatment Type</th>
<th>Use Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>WB = WATERBORNE</td>
<td>UC4A = ABOVE GROUND - GENERAL USE</td>
</tr>
<tr>
<td>OT = OIL-BORNE</td>
<td>UC4B = GROUND CONTACT - HEAVY DUTY</td>
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</table>

**TREATMENT CATEGORY**

<table>
<thead>
<tr>
<th>Treatment Type</th>
<th>Use Category</th>
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</thead>
<tbody>
<tr>
<td>WB = WATERBORNE</td>
<td>UC3B = ABOVE GROUND - EXPOSED</td>
</tr>
<tr>
<td>OT = OIL-BORNE</td>
<td>UC4C = GROUND CONTACT - GENERAL USE</td>
</tr>
</tbody>
</table>

**PREVENTATIVE TREATMENT = (REFER TO AWWA USE CATEGORY SYSTEM)**

<table>
<thead>
<tr>
<th>Treatment Type</th>
<th>Use Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>UC4A</td>
</tr>
<tr>
<td>P2</td>
<td>UC4B</td>
</tr>
<tr>
<td>P3</td>
<td>UC3B</td>
</tr>
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**DRAWING NAME**

OPEN TOP DRAIN

**SECTION**

921 - CULVERTS

**TYPICAL ID**

OTD

**REVISION DATE**

XX/XX/XX

**DRAWING NO.**

STD_921-50-01

**NO SCALE**

**U.S. DEPARTMENT OF AGRICULTURE**

**FOREST SERVICE**

**STANDARD TRAIL PLAN**
BOTTOMLESS ARCH CULVERT

<table>
<thead>
<tr>
<th>TYPICAL ID</th>
<th>GEOTEXTILE TYPE</th>
<th>SIZE</th>
<th>ASSEMBLY TYPE</th>
<th>MINIMUM ROCK SIZE</th>
<th>MAXIMUM ROCK SIZE</th>
<th>COMMENTS</th>
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<tbody>
<tr>
<td>ACV-1</td>
<td>AP</td>
<td></td>
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</tbody>
</table>

N/4 WHEN NOT APPLICABLE

A LAG BOLT ASSEMBLY

1/2 FLAT WASHER

6 X 6 TREATED TIMBER

NO. 5 REBAR

12 INCH MINIMUM FROM ENDS WITH 36 INCH MAXIMUM SPACING

B REBAR ASSEMBLY

C WELDED ASSEMBLY

TACK WELD ANGLE ACROSS PIPE RIBS EVERY 12 INCHES MINIMUM

D BOLTED ASSEMBLY

END VIEW GALVANIZED ARCH

NOTES:
1. PRE-DRILL HOLES FOR REBAR TO PREVENT SPLITTING OF TREATED TIMBERS.
2. COMPACT BACKFILL IN 6 INCH LIFTS UNTIL NO VISUAL DISPLACEMENT.
3. REMOVE AND Dispose OF DUFF AND TOP ORGANIC LAYERS DOWN TO MINERAL SOIL.
4. LAY ROCK WITH A MINIMUM OF 3 POINTS OF CONTACT WITH ADJACENT ROCKS.
5. LAY ROCKS IN A RANDOM ARRANGEMENT.
6. FILL Voids WITH BROKEN ROCK OR SUITABLE BACKFILL.
7. NO ROCKS LARGER THAN 1 1/2 INCHES WITHIN 12 INCHES OF PIPE.
<table>
<thead>
<tr>
<th>TYPICAL ID</th>
<th>LENGTH</th>
<th>SECTION TYPE</th>
<th>OPENING WIDTH</th>
<th>OPENING HEIGHT</th>
<th>MATERIAL TYPE</th>
<th>PRESERVATIVE TYPE</th>
<th>MATERIAL TYPE</th>
<th>SIZE</th>
<th>PRESERVATIVE TYPE</th>
<th>TYPE</th>
<th>COMMENTS</th>
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<tbody>
<tr>
<td>LCV-1</td>
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</tbody>
</table>

**LOG CULVERT**

**A** SINGLE SPLIT/ROUND LOG CULVERT  
RETAINER NOT SHOWN FOR CLARITY

**B** SOLID MULTI-LOG CULVERT  
RETAINER NOT SHOWN FOR CLARITY

**C** PLANK  
RETAINER NOT SHOWN FOR CLARITY

**D** ROCK-LOG/TIMBER CULVERT  
RETAINER NOT SHOWN FOR CLARITY

**E** SPLIT MULTI-LOG CULVERT  
RETAINER NOT SHOWN FOR CLARITY

---

**Preservative Treatment**

<table>
<thead>
<tr>
<th>Preservative Type</th>
<th>Treatment Type</th>
<th>Use Category</th>
<th>Comments</th>
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<tbody>
<tr>
<td>P1</td>
<td>WB</td>
<td>UC4A</td>
<td></td>
</tr>
<tr>
<td>P2</td>
<td>WB</td>
<td>UC3B</td>
<td></td>
</tr>
<tr>
<td>P3</td>
<td></td>
<td>UC4B</td>
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</table>

**TREATMENT TYPE**

- **WB** = WATERBORNE  
- **OT** = OIL-BORNE  
- **UC3B = ABOVE GROUND**  
- **UC4A = GROUND CONTACT - GENERAL USE**  
- **UC4B = GROUND CONTACT - HEAVY DUTY**

---

**U.S. DEPARTMENT OF AGRICULTURE**  
**FOREST SERVICE**  
**STANDARD TRAIL PLAN**
ROCK WATERBAR

<table>
<thead>
<tr>
<th>ID</th>
<th>ROCK SIZE</th>
<th>OUTSLOPE</th>
<th>LENGTH</th>
<th>SPILLWAY</th>
<th>COMMENTS</th>
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</tbody>
</table>

N/A WHEN NOT APPLICABLE
***FOR ROCK SPILLWAY SEE SHEET STD_923-10-01

NOTE:
1. COMPACT BACKFILL IN 6 INCH LIFTS UNTIL NO VISUAL DISPLACEMENT.
2. ALL EXCAVATED SECTIONS FOR WATERBARS SHALL BE OUTSLOPED TO DAYLIGHT.

SECTION A-A

SECTION B-B
ROCK SPILLWAY

<table>
<thead>
<tr>
<th>TYPICAL ID</th>
<th>SPILLWAY WIDTH</th>
<th>SPILLWAY LENGTH</th>
<th>GEOTEXTILE TYPE</th>
<th>MINIMUM ROCK SIZE (LBS)</th>
<th>MAXIMUM ROCK SIZE (LBS)</th>
<th>RETAINER TYPE</th>
<th>COMMENTS</th>
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<tr>
<td>RSP-1</td>
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<td>R</td>
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N/A WHEN NOT APPLICABLE
*FOR TYPICAL RETAINERS SEE SHEET STD-911-03

NOTES:
1. COMPACT BACKFILL IN 6 INCH LIFTS UNTIL NO VISUAL DISPLACEMENT.
2. UNLESS OTHERWISE SPECIFIED, WHEN ROCK SPILLWAY IS REQUIRED, DIMENSION SHALL BE 36 INCHES WIDE X 12 INCHES DEEP X 48 INCHES LONG. THE AS BUILT SLOPE SHALL BE SUBEXCAVATED 12 INCHES PRIOR TO PLACEMENT OF THE SPILLWAY. THE FINISHED SURFACE OF THE RIPRAP WILL BE AT THE SAME ELEVATION AS THE ADJACENT SLOPE.
NOTE:
1. REMOVE AND DISPOSE OF DUFF AND TOP ORGANIC LAYERS DOWN TO MINERAL SOIL.
2. COMPACT BACKFILL IN 6 INCH LIFTS UNTIL NO VISUAL DISPLACEMENT.
3. A 6 INCH MINIMUM COVER IS REQUIRED OVER ALL GEOTEXTILE AND GEOCELL FOUNDATIONS.
## Sheet Drain with Outlet Pipe

### Typical ID | Type | Size | Collector Pipe Type | Outlet Pipe Type | Retainer Type | Rock | Comments
--- | --- | --- | --- | --- | --- | --- | ---
SDP-1 | G | CP | CP | R | |

N/A WHEN NOT APPLICABLE
*FOR TYPICAL RETAINERS SEE SHEET STD_911-03*

---

### Collector Pipe Type

<table>
<thead>
<tr>
<th>Type</th>
<th>Material</th>
<th>Comments</th>
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</thead>
<tbody>
<tr>
<td>CP1</td>
<td>SOD</td>
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<td>CP2</td>
<td>PERFORATED</td>
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<td>CP3</td>
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---

### Geosynthetic Type

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<th>Type</th>
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<td>NON-WOVEN</td>
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</tr>
<tr>
<td>G2</td>
<td>WOVEN</td>
<td></td>
</tr>
<tr>
<td>G3</td>
<td>GEOCELL</td>
<td></td>
</tr>
<tr>
<td>G4</td>
<td>GEOGRID</td>
<td></td>
</tr>
<tr>
<td>G5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

### Sheet Drain with Outlet Pipe

- **Direction of Travel:**
- **Retainer Type:** AS SPECIFIED
- **Sheet Drain Width:**
- **Collector Pipe:**
- **Outlet Pipe or Sheet Drain:**
- **4 Inch Minimum Retainer:**
- **Log Rests Against 1 X 2 X 12 Log Stakes:**
- **With a Maximum Spacing of 36 Inches:**
- **Outlet Pipe:**
- **As Required:**

---

**NOTES:**

1. **Compact Backfill in 6 Inch Lifts Until No Visual Displacement.**
2. **Remove and Dispose of Duff and Top Organic Layers Down to Mineral Soil.**

---

**U.S. DEPARTMENT OF AGRICULTURE**
**FOREST SERVICE**
**STANDARD TRAIL PLAN**

**PROJECT NAME & LOCATION**

**DRAWING NO:** STD_924-20-02
**SECTION:** 924 - UNDERDRAINS
**NO SCALE**
**REVISION DATE:** XX/XX/XX
BERMS

<table>
<thead>
<tr>
<th>TYPICAL ID</th>
<th>MATERIAL TYPE</th>
<th>OUTSIDE SHOULDER WIDTH</th>
<th>HEIGHT</th>
<th>TOP WIDTH</th>
<th>BOTTOM WIDTH</th>
<th>ROCK SPILLWAY</th>
<th>COMMENTS</th>
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<tbody>
<tr>
<td>BRM-1</td>
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</tbody>
</table>

N/A WHEN NOT APPLICABLE

***FOR ROCK SPILLWAY SEE SHEET STD-923-10-01

HOE MATERIAL

SEE SECTION 913 TYPICAL SECTIONS

TYPICAL BERM SECTION

BERM MATERIAL TYPE

<table>
<thead>
<tr>
<th>TYPE</th>
<th>MATERIAL</th>
<th>SIZE</th>
<th>GRADATION %</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>B1</td>
<td>AGGREGATE</td>
<td>1 INCH MINUS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B2</td>
<td>COARSE AGGREGATE</td>
<td>3 INCH MINUS</td>
<td></td>
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<tr>
<td>B3</td>
<td>ROCK</td>
<td>2 TO 6 INCH</td>
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</tr>
<tr>
<td>B4</td>
<td>ROCK</td>
<td>4 TO 8 INCH</td>
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<tr>
<td>B5</td>
<td>HEAVY ROCK</td>
<td>8 INCH PLUS</td>
<td></td>
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</tr>
<tr>
<td>B6</td>
<td></td>
<td></td>
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<tr>
<td>B7</td>
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</tbody>
</table>

NOTES:
1. REMOVE AND DISPOSE OF SOIL AND TOP ORGANIC LAYERS DOWN TO MINERAL SOIL.
2. COMPACT BACKFILL IN 6 INCH LIFTS UNTIL NO VISUAL DISPLACEMENT.
DRAIN DIP SECTION

**SURFACE COURSE**

<table>
<thead>
<tr>
<th>TYPICAL ID</th>
<th>DRAIN DIP TYPE</th>
<th>GEOTEXTILE TYPE</th>
<th>SKEW</th>
<th>TYPE</th>
<th>DEPTH</th>
<th>ROCK SPILLWAY</th>
<th>COMMENTS</th>
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<tbody>
<tr>
<td>DD1-1</td>
<td>DD</td>
<td>G</td>
<td>S</td>
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</tbody>
</table>

N/A WHEN NOT APPLICABLE

***FOR ROCK SPILLWAY SEE SHEET STD_923-10-01***

NOTES:
1. DRAIN DIPS WILL BE STAKED IN THE FIELD.
2. ROCK SPILLWAY SLOPE SHALL BE THE SAME AS THE CONSTRUCTED FILL SLOPE.

**GEOTEXTILE TYPE**

<table>
<thead>
<tr>
<th>TYPE</th>
<th>MATERIAL</th>
<th>COMMENTS</th>
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<tbody>
<tr>
<td>G1</td>
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<td>G3</td>
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**SURFACE COURSE MATERIAL TYPE**

<table>
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<th>TYPE</th>
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<th>GRADATION</th>
<th>COMMENTS</th>
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<tr>
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<td>PERMIX</td>
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<td>S2</td>
<td>AGGREGATE</td>
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<td>S3</td>
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**DRAIN DIP CONSTRUCTION DIMENSIONS**

- ROCK SPILLWAY
- SPILLWAY HOME OF TREAD
- TOE SPILLWAY NOT RECOMMENDED

<table>
<thead>
<tr>
<th>DRAIN DIP TYPE</th>
<th>N</th>
<th>PROFILE GRADE</th>
<th>L1</th>
<th>L2</th>
<th>L3</th>
<th>(H)</th>
<th>(E)</th>
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<tbody>
<tr>
<td>DD1</td>
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<td>TO 4</td>
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<td>DD2</td>
<td>5</td>
<td>TO 6</td>
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<tr>
<td>DD3</td>
<td>7</td>
<td>TO 8</td>
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<td></td>
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<tr>
<td>DD4</td>
<td>9</td>
<td>TO 10</td>
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<tr>
<td>DD5</td>
<td>1</td>
<td>TO 2</td>
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**CHECK DAM**

<table>
<thead>
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<th>NO. OF CHECK DAMS</th>
<th>COMMENTS</th>
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<tr>
<td>CKD-1</td>
<td>C</td>
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</table>

**NOTES:**
1. PRE-DRILL HOLES FOR REBAR TO PREVENT SPLITTING OF LOGS OR SAWN TIMBERS.
2. RECESS END OF REBAR 1/2 INCH BELOW TOP OF TIMBER. PLACE REBAR 6 INCHES FROM EACH END OF TIMBER WITH MAXIMUM REBAR SPACING OF 36 INCHES.
3. PLACE STAKES 6 INCHES FROM EACH END OF TIMBER WITH MAXIMUM SPACING OF 36 INCHES.
4. COMPACT BACKFILL IN 6 INCH LIFTS UNTIL NO VISUAL DISPLACEMENT.

**CHECK DAM TYPE**

<table>
<thead>
<tr>
<th>CHECK DAM TYPE</th>
<th>MATERIAL</th>
<th>SIZE</th>
<th>SPECIES/ GRADE</th>
<th>PRESERV TYPE</th>
<th>COMMENTS</th>
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<tbody>
<tr>
<td>C1 ROCK</td>
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<tr>
<td>C2a LOG</td>
<td></td>
<td></td>
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<tr>
<td>C2b LOG</td>
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<td></td>
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<tr>
<td>C3a SAWN TIMBER</td>
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<td></td>
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</tr>
<tr>
<td>C3b SAWN TIMBER</td>
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</tr>
<tr>
<td>C4 RAIL ROAD TIE</td>
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<td>C5</td>
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</table>

**CHECK DAM SPACING**

<table>
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<th>DRAINAGE GRADE (%)</th>
<th>DRAINAGE SPACING (FEET)</th>
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<tr>
<td>&lt;3</td>
<td>OCCASIONAL</td>
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<td>3-7</td>
<td>60</td>
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<td>8-12</td>
<td>30</td>
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<td>&gt;12</td>
<td>18</td>
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</table>

**PRESCRIBED TREATMENT - REFER TO AHPA USE CATEGORY SYSTEM**

<table>
<thead>
<tr>
<th>PRESCRIBED TYPE</th>
<th>TREATMENT TYPE</th>
<th>USE CATEGORY</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>WB</td>
<td>UC4A</td>
<td></td>
</tr>
<tr>
<td>P2</td>
<td>WB</td>
<td>UC3B</td>
<td></td>
</tr>
<tr>
<td>P3</td>
<td>OT</td>
<td>UC4A</td>
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</table>

**PROJECT NAME & LOCATION**

**DEPARTMENT OF AGRICULTURE**

**FOREST SERVICE**

**STANDARD TRAIL PLAN**

**DRAWING NAME**

**DRAWING NO.**

**SECTION**

**REVISION DATE**

**NO SCALE**

**DRAWING NO.**

**INDEX SHEET**
NOTES:
1. CONSTRUCT CONSTANT GRACE THROUGH BOTH APPROACH SECTIONS AND TURN SECTION.
2. RADIUS POINT AND CENTERLINE OF SWITCHBACK AS STATED ON THE GROUND.
TYPE 3 RETANGULAR LANDING SWITCHBACK SECTIONS

<table>
<thead>
<tr>
<th>TYPICAL ID</th>
<th>LANDING LENGTH (FEET)</th>
<th>LANDING WIDTH (FEET)</th>
<th>BARRIER TYPE</th>
<th>RETAINING WALL TYPE</th>
<th>CROSS DRAINS</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>SW3-1</td>
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</tr>
</tbody>
</table>

N/A WHEN NOT SPECIFIED

NOTE:
TRANSITION POINT OF SWITCHBACK AS STARED ON THE GROUND.

PLAN VIEW

SECTION A-A

INCHES

INCHES
**Geotextile Type**

<table>
<thead>
<tr>
<th>Type</th>
<th>Material</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>G1</td>
<td>Non-Woven</td>
<td></td>
</tr>
<tr>
<td>G2</td>
<td>Woven</td>
<td></td>
</tr>
<tr>
<td>G3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
1. Compact backfill in 6 inch lifts until no visual displacement.
2. Remove and dispose of cull and top organic layers down to mineral soil.
3. Leaderoff ditch to be constructed the same as side ditches.
4. Lead-off ditch to drain to daylight.
### Type 2 - Standard Turnpike with Foundation

#### Typical Retainer

<table>
<thead>
<tr>
<th>Typical ID</th>
<th>Geotextile Type</th>
<th>Geotextile Type</th>
<th>Location</th>
<th>Dimensions (Inches)</th>
<th>Foundation Type</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>TPF-1</td>
<td>G</td>
<td>N</td>
<td>LT</td>
<td>RT</td>
<td>D</td>
<td>FD</td>
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</tbody>
</table>

N/A When not applicable.

*For typical retainers see Sheet STD_011-03

*For foundations see Section STD_018

#### Notes:

1. Compact backfill in 6 inch lifts until no visual displacement.
2. Remove and dispose ofuff and top organic layers down to mineral soil.
3. Lead-off ditch to be constructed the same as side ditches.
4. Lead-off ditch to drain to daylight.

#### Geotextile Type

<table>
<thead>
<tr>
<th>Type</th>
<th>Material</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>G1</td>
<td>Non-Woven</td>
<td></td>
</tr>
<tr>
<td>G2</td>
<td>Woven</td>
<td></td>
</tr>
<tr>
<td>G3</td>
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</tbody>
</table>

#### In-Fill Material Type

<table>
<thead>
<tr>
<th>Type</th>
<th>Material</th>
<th>Rock Size</th>
<th>Gradation %</th>
<th>Comments</th>
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</thead>
<tbody>
<tr>
<td>F01</td>
<td>Aggregate</td>
<td>1 Inch Minus</td>
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</tr>
<tr>
<td>F02</td>
<td>Coarse Rock</td>
<td>4 to 6 Inch</td>
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<td></td>
</tr>
<tr>
<td>F03</td>
<td>Heavy Rock</td>
<td>8 Inch Plus</td>
<td></td>
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</tr>
<tr>
<td>F04</td>
<td></td>
<td></td>
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<td></td>
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</tbody>
</table>

#### Typical Cross Section

- **Plan View:**
  - Retainer type as specified
  - Foundation type as specified
  - Geotextile
  - Backfill with suitable material
  - Side ditch

- **Typical Cross Section**
  - V ditch section
  - Flat bottom ditch section
  - Shoulder width
  - Tread width
  - See Section 9:3 Typical Sections

- **Typical Cross Section Details**
  - 12 inch minimum (typ)
  - Depth
  - 10 inch minimum (typ)
  - Backfill

#### Drawing Information:

- Organization: U.S. Department of Agriculture Forest Service
- Project: Standard Trail Plan
- Section: 932 - Turnpikes
- Type: TPF
- Revision Date: XX/XX/XX
- Drawing No: STD_932-20-01
- No Scale
TABLE: STACKED ROCK BARRIER

<table>
<thead>
<tr>
<th>TYPICAL ID</th>
<th>CLEAR WIDTH</th>
<th>GEOTEXILE TYPE</th>
<th>LEVELING COURSE TYPE</th>
<th>HEIGHT</th>
<th>WIDTH</th>
<th>COMMENTS</th>
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</thead>
<tbody>
<tr>
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</tbody>
</table>

N/A WHEN NOT APPLICABLE

END VIEW

1. USE ROCKS OF GENERAL RECTANGULAR SHAPE BETWEEN 45 AND 120 LBS. PLACE LARGER ROCKS ON BOTTOM.
2. USE ROCK CHIPS TO WEDGE LARGER ROCKS IN PLACE TO FORM A STABLE WALL.
3. LEAVE A 4 INCH GAP EVERY 8 TO 10 FEET OR USE FLEXIBLE PIPE ON BOTTOM COURSE FOR DRAINAGE.
4. PROVIDE ORGANIC-FREE BACKFILL MATERIAL WHERE SHOWN ON DRAWINGS FOR LEVELING AND SUPPORT OF BASE ROCK.
5. REMOVE AND DISPOSE OF DUFF AND TOP ORGANIC LAYERS DOWN TO MINERAL SOIL.
6. CLEAR WIDTH IS GREATER OR EQUAL TO THE TREAD AND SHOULDER WIDTHS DEFINED IN SECTION 011.

LEVELING COURSE MATERIAL

<table>
<thead>
<tr>
<th>TYPE</th>
<th>MATERIAL</th>
<th>GRADATION</th>
<th>COMMENTS</th>
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</thead>
<tbody>
<tr>
<td>L1</td>
<td>FINERUN</td>
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<td></td>
</tr>
<tr>
<td>L2</td>
<td>AGGREGATE</td>
<td></td>
<td></td>
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<tr>
<td>L3</td>
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</table>
# Masonry Rock Barrier

## Typical ID: MRB-1

<table>
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<tr>
<th>Geotextile Type</th>
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<tbody>
<tr>
<td>G1</td>
<td>Non-Woven</td>
</tr>
<tr>
<td>G2</td>
<td>Woven</td>
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<tr>
<td>G3</td>
<td>Geotextile when specified</td>
</tr>
<tr>
<td>G4</td>
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## Leveling Course Material

<table>
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<th>Material</th>
<th>Gradation</th>
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<tbody>
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</tr>
<tr>
<td>L3</td>
<td>G4</td>
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</tbody>
</table>

## Footing Material

<table>
<thead>
<tr>
<th>Type</th>
<th>Material</th>
<th>Gradation</th>
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<tbody>
<tr>
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<td>Concrete</td>
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<tr>
<td>FT2</td>
<td>Aggregate</td>
<td></td>
</tr>
<tr>
<td>FT3</td>
<td>G4</td>
<td></td>
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</tbody>
</table>

## Notes:
1. Use large stones to build base.
2. Set 2 inch minimum diameter drain pipe 1 inch below tread and outside drain pipe at 2 to 3 ft.
3. Compact backfill, leveling course and foundation in 6 inch lifts until no visual displacement.
4. Remove and dispose of duff and top organic layers down to mineral soil.
5. Clear width is greater or equal to the tread and shoulder widths defined in Section 911.

## Dimensions:
- **Clear Width**
- **Leveling Course Depth**
- **Footing Width**
- **Leveling Course Depth & Width**
- **Mortar**
- **WALL LENGTH**
- **MORTAR TYPE**

---

**U.S. Department of Agriculture**
**Forest Service**

**Standard Trail Plan**

---

**Revision Date:** XX/XX/XX
**Drawing No.:** STD_933-20-01
**Section:** 933 - Side Barriers
**Typical ID:** MRB
**No Scale:**
BARRIER RAIL ON GRADE

<table>
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<th>SPECIES</th>
<th>PRESERV. TYPE</th>
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</table>

N/A WHEN NOT APPLICABLE

A. TYPICAL ONE LOG SECTION

B. TYPICAL TWO LOG SECTION

C. TYPICAL ONE TIMBER SECTION

D. TYPICAL TWO TIMBER SECTION

ELEVATION VIEW

PRESERVATIVE TREATMENT – (REFER TO AMPLA USE CATEGORY SYSTEM)

<table>
<thead>
<tr>
<th>PRESERVATIVE TYPE</th>
<th>TREATMENT TYPE</th>
<th>USE CATEGORY</th>
<th>COMMENTS</th>
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</thead>
<tbody>
<tr>
<td>P1</td>
<td>WB</td>
<td>UC4A</td>
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</tr>
<tr>
<td>P2</td>
<td>WB</td>
<td>UC3B</td>
<td></td>
</tr>
<tr>
<td>P3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

TREATMENT TYPE

| WB – WATERBORNE | OT – OIL-BORNE |
| UC3B – ABOVE GROUND | UC4A – GROUND CONTACT |
| UC4B – GROUND CONTACT |        |

NOTES:
1. PRE-DRILL HOLES FOR REBAR TO PREVENT SPLITTING OF LOGS OR SAWN TIMBERS. REDUCE END OF REBAR 1/2 INCH BELOW TOP OF TIMBER.
2. PLACE REBAR 6 INCHES FROM EACH END OF TIMBER WITH MAXIMUM SPACING OF 36 INCHES. FOR STACKED RETAINERS STAGGER JOINTS 24 INCHES MINIMUM.
3. COMPACT BACKFILL IN 6 INCH LIFTS UNTIL NO VISUAL DISPLACEMENT.
4. FIELD TREAT ALL FIELD CUTS AND PRE-DRILLED HOLES.
5. REMOVE AND DISPOSE OF DUFF AND TOP ORGANIC LAYERS DOWN TO MINERAL SOIL.

EMBED 1/3 MINIMUM
NO. 5 REBAR MINIMUM
12 INCH MINIMUM (TYP)
OPENING BETWEEN ADJACENT BARRIERS 3 TO 4 INCHES (TYP)
18 INCHES MINIMUM
18 INCHES MINIMUM
4 INCHES MINIMUM
8 X 8 INCH MINIMUM
BACKFILL WITH SUITABLE MATERIAL
<table>
<thead>
<tr>
<th>Typical Rail</th>
<th>Clear Width</th>
<th>Section Type</th>
<th>Size</th>
<th>Height</th>
<th>Embedment Depth</th>
<th>Species</th>
<th>Preserv. Type</th>
<th>Size</th>
<th>Species</th>
<th>Preserv. Type</th>
<th>Connection Detail Type</th>
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</tr>
</tbody>
</table>

**Typical Log Barrier Section**

- **Clear Width:**
  - Width to be determined.

- **4 Inch Minimum:**
  - Minimum width for standard log barriers.

- **8 Inch Dia Minimum:**
  - Minimum diameter for the barrier post.

- **Barrier Post shall be the same Dia. or Larger than the Rail Post:**
  - The barrier post should be at least as large as the rail post to ensure stability.

- **Widen Trailered 16 to 18 Inches:**
  - Widening the trailered section to provide additional stability.

**Typical Timber Barrier Section**

- **Clear Width:**
  - Width to be determined.

- **4 Inch Minimum:**
  - Minimum width for standard timber barriers.

- **8 X 8 Inch Minimum (Nominal):**
  - Minimum nominal size for the barrier post.

- **Barrier Post shall be the same Dimension as Barrier Rail:**
  - Ensure the barrier post matches the dimensions of the rail for uniformity.

- **Widen Trailered 16 to 18 Inches:**
  - Widening the trailered section to provide additional stability.

**Preservative Treatment - Refer to AWA (Use Category System)**

<table>
<thead>
<tr>
<th>Preservative Type</th>
<th>Treatment Type</th>
<th>Use Category</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>WB</td>
<td>UC4A</td>
<td></td>
</tr>
<tr>
<td>P2</td>
<td>WB</td>
<td>UC3B</td>
<td></td>
</tr>
<tr>
<td>P3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**

1. **Pre-Drill Holes for Fasteners to Prevent Splitting of Logs or Sawn Timbers.**
2. **Rebar Length shall be 0.5 the Depth of the Rail with a Minimum of 18 Inches Long.**
3. **Compact and Backfill Post Holes in 6 Inch Lifts Until No Visual Displacement.**
4. **Field Treat all Field Cuts and Pre-Drilled Holes.**
5. **Clear Width is Greater or Equal to the Tread and Shoulder Widths Defined in Section 911.**

**Recessed Rebar Detail**

- **Drill 9/16 Dia. Hole for No. 5 Rebar in Post and Rail Recess 1/2 Inch from Top of Barrier.**

**Embedded Rebar Detail**

- **Drill 9/16 Dia. Hole for 5/8 Dia. Carriage Bolt in Post and Rail.**

**Carriage Bolt Detail**

- **Elevation View:**
  - View from above showing the barrier post and rail alignment.
  - **12 Inches Minimum:**
    - Minimum height to ensure stability.
  - **36 Inches Minimum Embedment Depth:**
    - Minimum embedment depth for stability.

**Section:**

- **933 - Side Barriers**

**Drawing Name:**

- **Standard Trail Plan**

**Revision Date:**

- **XX/XX/XX**

**Drawing Number:**

- **STD_933-40-01**

**Scale:**

- **NO SCALE**
## Timber Barrier on Post

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<thead>
<tr>
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<th>Section Type</th>
<th>SEE</th>
<th>LENGTH</th>
<th>Embedment Depth</th>
<th>Species</th>
<th>Preserv. Type</th>
<th>SEE</th>
<th>Overhang</th>
<th>Species</th>
<th>Preserv. Type</th>
<th>Comments</th>
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</tr>
</tbody>
</table>

### A - Single Guardrail Section

- **Notes:**
  1. Pre-drill holes for fasteners to prevent splitting of logs or sawn timbers.
  2. Compact backfill in 6-inch lifts until no visual displacement.
  3. Field treat all field cuts and pre-drilled holes.
  4. All hardware shall be galvanized or stainless steel.

### B - Continuous Guardrail Section

The table below shows the preservative treatment and use category system:

<table>
<thead>
<tr>
<th>Preservative Type</th>
<th>Treatment Type</th>
<th>Use Category</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>WB</td>
<td>UC4A</td>
<td></td>
</tr>
<tr>
<td>P2</td>
<td>WB</td>
<td>UC3B</td>
<td></td>
</tr>
</tbody>
</table>

**Preservative Treatment:**
- **WB = Waterborne**
- **OT = Oil-Borne**

**Use Category:**
- **UC3B = Above Ground**
- **UC4A = Ground Contact**
- **UC4B = Ground Contact**
- **Exposed**
- **General Use**
- **Heavy Duty**

---

**U.S. Department of Agriculture**

**Forest Service**

**Standard Trail Plan**

**Project Name & Location**

**Drawing Name**

**Revision Date**

**Drawing No.**

**Scale**

**Sheet**
### CURB TABLE

<table>
<thead>
<tr>
<th>CURB TYPE</th>
<th>MATERIAL</th>
<th>COMMENTS</th>
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<td>CB1</td>
<td>CONCRETE</td>
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</tr>
<tr>
<td>CB2</td>
<td>PLASTIC</td>
<td></td>
</tr>
<tr>
<td>CB3</td>
<td>LOG</td>
<td></td>
</tr>
<tr>
<td>CB4</td>
<td>SAWN TIMBER</td>
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<tr>
<td>CB5</td>
<td>RAIL ROAD TIES</td>
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<tr>
<td>CB6</td>
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</table>

### CURBS

**SECTION:** 933 - SIDE BARRIERS

**Typical ID:** CRB

**Drawing No.:** STD_933-50-01

**Revision Date:** XX/XX/XX

**NO SCALE**
GUARDRAIL

<table>
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<tr>
<th>TYPICAL ID</th>
<th>SECTION TYPE</th>
<th>SIZE</th>
<th>LENGTH</th>
<th>EMBREIDMENT DEPTH</th>
<th>SPECIES</th>
<th>PRESERV. TYPE</th>
<th>SIZE</th>
<th>END</th>
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<td>p</td>
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</tbody>
</table>

6 INCH DIA. MINIMUM POST

4 X 6 MINIMUM SWAIN TIMBER

N/A WHEN NOT APPLICABLE

4 FOOT MAXIMUM

HEIGHT 29 INCHES (TYP)

EMBREIDMENT DEPTH 36 INCH MINIMUM

BACKFILL WITH SUITABLE MATERIAL

A SINGLE GUARDRAIL SECTION

NOTES:
1. PRE-DRILL HOLES FOR FASTENERS TO PREVENT SPLITTING OF LOGS OR SWAIN TIMBERS.
2. COMPACT BACKFILL IN 6 INCH LiftS UNTIL NO VISUAL DISPLACEMENT.
3. ALL FIELD DRILLED HOLES AND CMENTS SHALL BE FIELD TREATED.
4. ALL HARDWARE SHALL BE GALVANIZED OR STAINLESS STEEL.
5. USE ONLY HARDWARE MANUFACTURED FOR GUARDRAILS.

B CONTINUOUS GUARDRAIL SECTION

PRESERVATIVE TREATMENT - (REF TO AWPA USE CATEGORY SYSTEM)

<table>
<thead>
<tr>
<th>PRESERVATIVE TYPE</th>
<th>TREATMENT TYPE</th>
<th>USE CATEGORY</th>
<th>COMMENTS</th>
</tr>
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<tbody>
<tr>
<td>WB = WATERBORNE</td>
<td>UC4A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OT = OIL-BORNE</td>
<td>UC4A</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>UC4B</td>
<td></td>
<td></td>
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</tbody>
</table>

TREATMENT TYPE

WB = WATERBORNE
OT = OIL-BORNE
}

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
STANDARD TRAIL PLAN

GUARDRAIL

SECTION 933 - SIDE BARRIERS

PROJECT NAME & LOCATION

DRAWING NAME

REVISION DATE XX/XX/XX

DRAWING NO. STD_933-60-01

NO SCALE
LOG CRIB

NOTES:
1. STRAIGHTNESS REQUIREMENTS: THE TRUE CENTER OF EACH LOG DEVIATES NO MORE THAN 2 INCHES FROM A STRAIGHT LINE BETWEEN THE CENTERS OF THE ENDS OF THE LOG.
2. PRE-DRILL HOLES FOR DRIFT PINS AND OTHER FASTENERS TO PREVENT SPLITTING OF LOGS ON DRAIN TIMBERS.
3. RECESS END OF REBAR 1/2 INCH BELLOW TOP OF TIMBER TOP HEADER LOG. PLACE REBAR A MINIMUM OF 12 INCHES FROM EACH END OF TIMBER WITH MAXIMUM REBAR SPACING AS SHOWN ON THE DRAWINGS.
4. COMPACT BACKFILL AND FOUNDATION IN 6 INCH LIFTS UNTIL, NO VISUAL DISPLACEMENT.
5. FIELD TREAT ALL FIELD CUTS AND PRE-DRILLED HOLES.
6. REMOVE AND DISPOSE OF DUFF AND TOP ORGANIC LAYERS DOWN TO MINERAL SOIL.

PRESEVERATIVE TREATMENT - REFERS TO AWPA USE CATEGORY SYSTEM

<table>
<thead>
<tr>
<th>PRESEVERATIVE TYPE</th>
<th>TREATMENT TYPE</th>
<th>USE CATEGORY</th>
<th>COMMENTS</th>
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</thead>
<tbody>
<tr>
<td>P1</td>
<td>WB</td>
<td>UC4A</td>
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</tr>
<tr>
<td>P2</td>
<td>WB</td>
<td>UC3B</td>
<td></td>
</tr>
<tr>
<td>P3</td>
<td></td>
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</tr>
</tbody>
</table>

TREATMENT TYPE:
- WB = WATERBORNE
- OT = OIL-BORNE

Use Category:
- UC3B = ABOVE GROUND - EXPOSED
- UC4A = GROUND CONTACT - GENERAL USE
- UC4B = GROUND CONTACT - HEAVY DUTY
STACKED ROCK RETAINING WALL

### Table: Embedment Depth

<table>
<thead>
<tr>
<th>Typical ID</th>
<th>Geotextile Type</th>
<th>Foundation</th>
<th>Side</th>
<th>Height</th>
<th>Comments</th>
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<tbody>
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</table>

N/A WHEN NOT APPLICABLE

---

### Diagram:

**A** UPHILL RETAINING WALL SECTION
SLOPE JOINTS INTO HILL

**B** UNDERTREAD RETAINING WALL SECTION
WALL WIDTH SHALL BE 2 FEET WIDE ON 1/2 THE WALL HEIGHT, WHENEVER IS GREATER.

---

NOTES:

1. REMOVE AND DEPOSE OF DUFF AND TOP ORGANIC LAYERS DOWN TO MINERAL SOIL.
2. COMPACT BACKFILL AND FOUNDATION IN 6 INCH LIFTS UNTIL NO VISUAL DISPLACEMENT.
3. CLEAR WIDTH IS GREATER OR EQUAL TO THE THREAD AND SHOULDER WIDTHS DEFINED IN SECTION 911.
**GABION BASKET RETAINING WALL**

<table>
<thead>
<tr>
<th>TYPICAL ID</th>
<th>SECTION TYPE</th>
<th>GABION TYPE</th>
<th>HEIGHT</th>
<th>WIDTH</th>
<th>EMERGENCE DEPTH</th>
<th>NUMBER OF ROWS</th>
<th>SEE</th>
<th>SIDE EMBELEM DEPTH</th>
<th>INFILL MATERIAL TYPE</th>
<th>COMMENTS</th>
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<tbody>
<tr>
<td>BRW-1</td>
<td>G</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>x</td>
<td></td>
<td>FM</td>
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</table>

N/A WHEN NOT APPLICABLE

**UPHILL RETAINING WALL SECTION**

1. GABION BASKETS SHALL BE ASSEMBLED ACCORDING TO MANUFACTURER'S INSTRUCTIONS.
2. COMPACT BACKFILL AND FOUNDATION IN 6 INCH LIFTS UNTIL NO VISUAL DISPLACEMENT.
3. REMOVE AND DISPOSE OF DUFF AND TOP ORGANIC LAYERS DOWN TO MINERAL SOIL.
4. CLEAR WIDTH IS GREATER OR EQUAL TO THE TREAD AND SHOULDER WIDTHS DEFINED IN SECTION 911.

**UNDERTREAD RETAINING WALL SECTION**

**IN-FILL MATERIAL TYPE**

<table>
<thead>
<tr>
<th>TYPE</th>
<th>MATERIAL</th>
<th>ROCK SIZE</th>
<th>GRADATION %</th>
<th>COMMENTS</th>
</tr>
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<tbody>
<tr>
<td>FM1</td>
<td>aggregate</td>
<td>1 inch minus</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FM2</td>
<td>coarse aggregate</td>
<td>2 inch minus</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FM3</td>
<td>rock</td>
<td>3 to 6 inch</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FM4</td>
<td>rock</td>
<td>4 to 8 inch</td>
<td></td>
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</tr>
<tr>
<td>FM5</td>
<td>heavy rock</td>
<td>8 inch plus</td>
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**ANCHOR BOLT AND STRAP DETAIL**

**STANDARD TRAIL PLAN**

**ORGANIC NAME**

**REVISION DATE**

**DRAWING NO**

**NO SCALE**
### Cast in Place Concrete Retaining Wall

#### Leveling Course

<table>
<thead>
<tr>
<th>Typical ID</th>
<th>Clear Width</th>
<th>Geotextile Type</th>
<th>Leveling Course</th>
<th>Precast Wall</th>
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<tbody>
<tr>
<td>CCW-1</td>
<td>G</td>
<td>L</td>
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<td></td>
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</tbody>
</table>

**NOTES:**
1. 2 INCH MINIMUM DIAMETER PIPE DRAIN REQUIRED AT LOW POINTS.
2. SET PIPE DRAIN 1 INCH BELOW TREAD AND OUTSIDE PIPE AT 2 TO 3%.
3. COMPACT BACKFILL IN 6 INCH LIFTS UNTIL NO VISUAL DISPLACEMENT.
4. REMOVE AND DISPOSE OF DUFF AND TOP ORGANIC LAYERS DOWN TO MINERAL SOIL.
5. CLEAR WIDTH IS GREATER OR EQUAL TO THE TREAD AND SHOULDER WIDTHS DEFINED IN SECTION 9.11.

#### Geotextile Type

<table>
<thead>
<tr>
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<td>Non-Woven</td>
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<td>Woven</td>
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<td>L2</td>
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<td>06</td>
<td>L3</td>
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#### Leveling Course Material

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<td>Aggregate</td>
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INDIVIDUAL TIMBER PINNED STEP

<table>
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<tr>
<th>TYPICAL ID</th>
<th>MORTAR/ RESISTANT MATERIAL</th>
<th>STEP WIDTH</th>
<th>STEP RISE</th>
<th>STEP RUN</th>
<th>MATERIAL TYPE</th>
<th>SPECIES</th>
<th>EPOXY TYPE</th>
<th>PRESERV TYPE</th>
<th>COMMENTS</th>
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<tr>
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<td>P</td>
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</tr>
</tbody>
</table>

N/A WHEN NOT APPLICABLE

2 HOLES
1 INCH DIAMETER BORING 6 INCHES DEEP 16 INCHES C TO C

HOLE FILLED WITH EPOXY ADHESIVE AS PER MANUFACTURER'S RECOMMENDATIONS

TILT TREAD FRONT TO BACK 4%}

LOSS SURFACES OF STEP TO CONFORM TO ROCK SURFACE PLACE OVER REBAR TO PROVIDE A STRONG, SOLID CONTACT WITH ROCK.

PERSPECTIVE VIEW

NOTES:
1. PRE-DRILL HOLES FOR REBAR TO PREVENT SPLITTING OF TIMBER.
2. REMOVE AND DISPOSE OF DUFF AND TOP ORGANIC LAYERS DOWN TO MINERAL SOIL.

STEP

STEP RUN 10 INCH MINIMUM

STEP RISE 10 INCH MAXIMUM

2 INCHES

STEP WIDTH

STEP TOP

STEP BOTTOM

PRESERVATIVE TREATMENT - (REFERS TO AWPA USE CATEGORY SYSTEM)

<table>
<thead>
<tr>
<th>PRESERVATIVE TYPE</th>
<th>TREATMENT TYPE</th>
<th>USE CATEGORY</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>WB</td>
<td>UC4A</td>
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</tr>
<tr>
<td>P2</td>
<td>WB</td>
<td>UC3B</td>
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</tbody>
</table>

TREATMENT TYPE

WB = WATERBORNE
OT = OIL-BORNE

USE CATEGORY

UC3B = ABOVE GROUND - EXPOSED
UC4A = GROUND CONTACT - GENERAL USE
UC4B = GROUND CONTACT - HEAVY DUTY

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
STANDARD TRAIL PLAN

PROJECT NAME & LOCATION

ORGANIC NAME

SECTION

936 - STAIRWAYS

REVISION DATE

XX/XX/XX

DRAWING NO

STD_936-10-01

NO SCALE
INDIVIDUAL ROCK STEP

<table>
<thead>
<tr>
<th>TYPICAL ID</th>
<th>STEP WIDTH</th>
<th>STEP RUN</th>
<th>STEP RISE</th>
<th>MINIMUM ROCK WEIGHT</th>
<th>COMMENTS</th>
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</table>

NOTE:
1. COMPACT BACKFILL IN 6 INCH LIFTS UNTIL NO VISUAL DISPLACEMENT.
2. REMOVE AND DISPOSE OF DUFF AND TOP ORGANIC LAYERS DOWN TO MINERAL SOIL.
OVERLAPPING ROCK STEP

<table>
<thead>
<tr>
<th>TYPICAL ID</th>
<th>STEP WIDTH</th>
<th>STEP RUN</th>
<th>STEP RISE</th>
<th>STEP OVERLAP</th>
<th>MINIMUM ROCK WEIGHT</th>
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</tbody>
</table>

NOTES:
1. CONTACT BACKFILL IN 6 INCH LIFTS UNTIL NO VISUAL DISPLACEMENT.
2. REMOVE AND DISPOSE OF DUFF AND TOP ORGANIC LAYERS DOWN TO MINERAL SOIL.

OVERLAPPING ROCK STAIRWAY

ELEVATION VIEW

PERSPECTIVE VIEW

TREAD

TILT FRONT TO BACK 2%

10 INCH MINIMUM STEP RUN

10 INCH MAXIMUM STEP RISE

TREAD

BACKFILL WITH SUITABLE MATERIAL

8 INCH MINIMUM OVERLAP

OVERLAPPING ROCK STEPS

SECTION 936 - STAIRWAYS

TOOLKIT

100% SCALE
OVERLAPPING TIMBER STEP

<table>
<thead>
<tr>
<th>TYPICAL ID</th>
<th>MATERIAL TYPE</th>
<th>OVERALL LENGTH</th>
<th>OVERALL WIDTH</th>
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<td>M</td>
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</table>

N/A WHEN NOT APPLICABLE

NOTES:
1. PRE-DRILL HOLES FOR REBAR AND PINS TO PREVENT SPLITTING OF LOGS OR SAWN TIMBERS.
2. REDUCE END OF REBAR 1/2 INCH BELOW TOP OF TIMBER.
3. COMPACT BACKFILL IN 6 INCH LIFTS UNTIL NO VISUAL DISPLACEMENT.
4. ALL FIELD DRILLED HOLES AND CUTS SHALL BE FIELD TREATED.
5. REMOVE AND DEPOSE OF DUFF AND TOP ORGANIC LAYERS DOWN TO MINERAL SOIL.
6. MINIMUM OVERLAP OF BOTTOM CARRIAGE IS THE SAME AS THE STEP RUN LENGTH.
7. RIDERS AND CARRIAGES SHALL BE THE SAME DIMENSIONS.

MATERIAL TYPE

<table>
<thead>
<tr>
<th>TYPE</th>
<th>MATERIAL</th>
<th>SIZE</th>
<th>SPECIES/ GRADE</th>
<th>PRESERV. TYPE</th>
<th>COMMENTS</th>
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<tbody>
<tr>
<td>M1</td>
<td>LOG</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>M2</td>
<td>SAWN TIMBER</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M3</td>
<td>RAIL ROAD TIES</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>M4</td>
<td></td>
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PRESERVATIVE TREATMENT - (REFERS TO AWPA USE CATEGORY SYSTEM)

<table>
<thead>
<tr>
<th>PRESERVATIVE TYPE</th>
<th>TREATMENT TYPE</th>
<th>USE CATEGORY</th>
<th>COMMENTS</th>
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<tbody>
<tr>
<td>P1</td>
<td>WB</td>
<td>UC4A</td>
<td></td>
</tr>
<tr>
<td>P2</td>
<td>WB</td>
<td>UC3B</td>
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</table>

TREATMENT TYPE

<table>
<thead>
<tr>
<th>TREATMENT TYPE</th>
<th>USE CATEGORY</th>
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<tbody>
<tr>
<td>WB = WATERBORNE</td>
<td>UC4A = GROUND CONTACT</td>
</tr>
<tr>
<td>OT = OIL-BORNE</td>
<td>UC3B = ABOVE GROUND</td>
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<td>UC4B = GROUND CONTACT</td>
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### CRIB LADDER

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<th>Overall Length</th>
<th>Step Run</th>
<th>Lumber Species</th>
<th>Preserv. Type</th>
<th>Type</th>
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N/A WHEN NOT APPLICABLE

### SURFACE COURSE MATERIAL TYPE

<table>
<thead>
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<td>PB RUN</td>
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<tr>
<td>S2</td>
<td>AGGREGATE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S3</td>
<td>CLAY</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S4</td>
<td>WOODCHIPS</td>
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<tr>
<td>S5</td>
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</tbody>
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NOTES:
1. COMPACT BACKFILL IN 6 INCH LIFTS UNTIL NO VISUAL DISPLACEMENT.
2. REMOVE AND DISPOSE OF DUFF AND TOP ORGANIC LAYERS DOWN TO MINERAL SOIL
3. ALL FIELD DRILLED HOLES AND CUTS SHALL BE FIELD TREATED.

### PRESERVATIVE TREATMENT
- P1: WB, UC4A
- P2: WB, UC3B
- P3: WB, UC3B

GAZENIZED NAILS PER CARRIAGE

SIDE VIEW

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
STANDARD TRAIL PLAN

CRIB LADDER
TYPICAL ID: CRL
936 - STAIRWAYS

NO SCALE
RAILING SYSTEM

<table>
<thead>
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<th>HEIGHT</th>
<th>EMERGENCY DEPTH</th>
<th>SIZE</th>
<th>TYPE</th>
<th>COMMENTS</th>
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N/A WHEN NOT APPLICABLE

A. IBC (HIGH USE) HELD CONSTRUCTION

B. AASTO (MEDIUM USE) HELD CONSTRUCTION

C. OSHA (LOW USE) HELD CONSTRUCTION

NOTES:
1. REMOVE AND DISPOSE OF DUFF AND TOP ORGANIC LAYERS DOWN TO MINERAL SOIL.
2. COMPACT BACKFILL IN 6 INCH LIFTS UNTIL NO VISUAL DISPLACEMENT.
3. 1/4 INCH WEEP HOLES ARE REQUIRED AT BOTTOMS AND LOW POINTS OF RAILS AND POSTS.
4. ALL ENDS TO BE CAPPED.
5. ALL SHARP EDGES TO BE GROUND SMOOTH.
6. CLEAR WIDTH IS GREATER OR EQUAL TO THE TREAD AND SHOULDER WIDTHS DEFINED IN SECTION 911.

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

STANDARD TRAIL PLAN

PROJECT NAME & LOCATION

DRAWING NAME

SECTION

937 - RAILING SYSTEM

TYPICAL ID

RLS

REVISION DATE

XX/XX/XX

DRAWING NO.

STD_937-10-01

NO SCALE
# STANDARD BOARDWALK

## Footing Material

<table>
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<tr>
<th>TYPE</th>
<th>MATERIAL</th>
<th>GRADEATION</th>
<th>COMMENTS</th>
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<tbody>
<tr>
<td>FT1</td>
<td>CONCRETE</td>
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<tr>
<td>FT2</td>
<td>AGGREGATE</td>
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</tr>
<tr>
<td>FT3</td>
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## Post/Sills/Backwalls

<table>
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<th>OVERALL WIDTH</th>
<th>SURFACE WIDTH</th>
<th>TYPE</th>
<th>DEPTH</th>
<th>WIDTH</th>
<th>POST EMERGENT DEPTH</th>
<th>SPECIES</th>
<th>PRESERV TYPE</th>
<th>DECK SIDE</th>
<th>SPECIES</th>
<th>PRESERV TYPE</th>
<th>COMMENTS</th>
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<tr>
<td>SB1-1</td>
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N/A WHEN NOT APPLICABLE

## Header Beam/Stringers/Deck/Curb/Railing System

<table>
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<tr>
<th>NOTES</th>
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<tbody>
<tr>
<td>1. DESIGN LOAD: 100 PSF PEDESTRIAN LOAD.</td>
</tr>
<tr>
<td>2. ALL MATERIAL TYPE SHALL BE DOUGLAS FIR OR SOUTHERN PINE NO. 2 OR BETTER AS SPECIFIED IN THE ABOVE TABLE.</td>
</tr>
<tr>
<td>3. ALL FASTENERS SHALL BE GALVANIZED.</td>
</tr>
<tr>
<td>4. FASTENERS: DECKING: BOLTS 6 INCH RING SHANK NAILS OR DECK SCREWS 2 PER DECK STRINGER CONNECTION.</td>
</tr>
<tr>
<td>RAILING: NO. 13 X 4 INCH LONG WOOD SCREWS 2 PER RAIL POST CONNECTION.</td>
</tr>
<tr>
<td>STRINGERS &amp; 40D 5 INCH LONG RING SHANK BACKWALLS: NAILS.</td>
</tr>
<tr>
<td>5. ALTERNATIVE FOR 7/8 BOLTS FOR HEADER BEAM IS BRACKET WITH AN ALLOWABLE LOAD OF 1100 LBS EACH SIDE.</td>
</tr>
</tbody>
</table>

## Rails System Detail

### Footing Material

<table>
<thead>
<tr>
<th>TYPE</th>
<th>MATERIAL</th>
<th>GRADEATION</th>
<th>COMMENTS</th>
</tr>
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<tbody>
<tr>
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</tr>
<tr>
<td>FT2</td>
<td>AGGREGATE</td>
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<td></td>
</tr>
<tr>
<td>FT3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Curbing Details

- **Continuous Curb**
- **3 x 6 x 24 Inch Scupper Block**
- **2 x 4 Curb Retainer**
- **Stringer Lag Bolts**
- **Backwall Not Shown for Clarity**

## Bracket Detail

- **Continuous Curb**
- **2 x 4 INCH (Typ) Continuous Curb**
- **CURB SPACING DETAIL**
- **PREVENTIVE TREATMENT - (REFERS TO AWPA USE CATEGORY SYSTEM)**

<table>
<thead>
<tr>
<th>TREATMENT TYPE</th>
<th>USE CATEGORY</th>
</tr>
</thead>
<tbody>
<tr>
<td>WB = WATERBORNE</td>
<td>UC4A = ABOVE GROUND - GENERAL USE</td>
</tr>
<tr>
<td>OT = OIL-BORNE</td>
<td>UC4B = GROUND CONTACT - HEAVY DUTY</td>
</tr>
</tbody>
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*U.S. DEPARTMENT OF AGRICULTURE*  
*FOREST SERVICE*  
*STANDARD TRAIL PLAN*  

*DRAWING NAME*  
*SECTION*  
*REVISION DATE*  
*DRAWING NO.*  
*STANDARD BOARDWALK*  
*938 - BOARDWALKS*  
*TYPICAL ID*  
*SB1*  
*NO SCALE*
ELEVATED BOARDWALK

FOOTING MATERIAL

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<td>AGGREGATE</td>
</tr>
<tr>
<td>FT3</td>
<td>AGGREGATE</td>
</tr>
</tbody>
</table>

POST/SELS/BACKWALLS

<table>
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<tr>
<th>TYPE</th>
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<td>4</td>
<td>24</td>
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<tr>
<td>P3</td>
<td>4</td>
<td>24</td>
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</table>

HEADER BEAM/STRINGERS/DECK/CURB/RAILING SYSTEM

<table>
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<tr>
<th>DECK</th>
<th>SPECIES</th>
<th>PRESERV TYPE</th>
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</table>

NOTES:
1. DESIGN LOAD: 100 PSF PEDESTRIAN LOAD.
2. ALL MATERIAL TYPE SHALL BE DOUGLAS FIR OR SOUTHERN PINE NO. 2 OR BETTER AS SPECIFIED IN THE ABOVE TABLE.
3. ALL FASTENERS SHALL BE GALVANIZED.
4. FASTENERS:
   - DECKING: 80d 6 INCH RING SHANK NAILS OR DECK SCREWS 2 PER DECK STRINGER CONNECTION.
   - RAILING: NO. 13 X 4 INCH LONG WOOD SCREWS 2 PER RAIL POST CONNECTION.
   - STRINGERS & 40d 5 INCH LONG RING SHANK BACKWALLS: NAILS.
5. ALTERNATIVE FOR 7/8 BOLTS FOR HEADER BEAM IS BRACKET WITH AN ALLOWABLE LOAD OF 1100 LBS EACH SIDE.

PREVENTATIVE TREATMENT - (REFER TO AWPA USE CATEGORY SYSTEM)

<table>
<thead>
<tr>
<th>PRESERVATIVE TYPE</th>
<th>TREATMENT TYPE</th>
<th>USE CATEGORY</th>
<th>COMMENTS</th>
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<tbody>
<tr>
<td>P1</td>
<td>WB</td>
<td>UC4A</td>
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<tr>
<td>P2</td>
<td>WB</td>
<td>UC3B</td>
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</tr>
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U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
STANDARD TRAIL PLAN

PROJECT NAME & LOCATION

DRAWING NAME

ELEVATED BOARDWALK

938 - BOARDWALKS

REVISION DATE: XX/XX/XX
DRAWING NO: STD_938-20-01
SHEET 1 OF 4
A TYPICAL GROUND SECTION

Blocking required at every support not shown for clarity.

B TYPICAL ELEVATED SECTION

Less than 3 feet with curb blocking required at every support not shown for clarity.

C TYPICAL ELEVATED SECTION

Less than 3 feet with curb blocking required at every support not shown for clarity.
### STEP AND RUN

#### SILL

<table>
<thead>
<tr>
<th>TYPICAL ID</th>
<th>TYPE</th>
<th>SIZE</th>
<th>SPECIES</th>
<th>PRESERV. TYPE</th>
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<td>p</td>
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<td></td>
<td>p</td>
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<td></td>
</tr>
</tbody>
</table>

**NOTES:**

1. **KEEP PLANKS LOW TO THE GROUND.**
   - **FOLLOW TOPOGRAPHY THROUGH SMALL DIPS.**
2. **AVOID STACKING PLANKS FOR SILL ON SIDE HILLS.**
   - **DIG THE SILL INTO THE BANK.**

#### PLANK

- **NOTCH SILL LOG 1 INCH MINIMUM TO PROVIDE A 4 INCH WIDE BEARING SURFACE**
- **4 INCH MINIMUM**
- **2 X 14 MINIMUM PLANK**
- **ANCHOR STAKES 2 X 16 INCHES LONG WITH 16D RING SHANK OR BARRIED NAILS**
- **ANCHORS 2 X 14 MINIMUM (SAME SIZE AS RUNNING PLANK)**
- **LEVELING PAD**
- **6 INCH MINIMUM 8 INCH MAXIMUM**
- **SHIM TO SEAT PLANK**
- **5% MAXIMUM GRADE**
- **6 FOOT MINIMUM 8 FOOT MAXIMUM SILL SPACING**
- **2 X 14 MINIMUM PLANK**
- **16D GALV. NAIL (TYP)**
- **24 INCH MINIMUM (TYP)**

#### PRESERVATIVE TREATMENT - REFERS TO AWPA USE CATEGORY SYSTEM

<table>
<thead>
<tr>
<th>PRESERVATIVE TYPE</th>
<th>TREATMENT TYPE</th>
<th>USE CATEGORY</th>
<th>COMMENTS</th>
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<tbody>
<tr>
<td>P1</td>
<td>WB</td>
<td>UC4A</td>
<td></td>
</tr>
<tr>
<td>P2</td>
<td>WB</td>
<td>UC3B</td>
<td></td>
</tr>
<tr>
<td>P3</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

**TREATMENT TYPE:**

- **WB = WATERBORNE**
- **OT = OIL-BORNE**

**USE CATEGORY:**

- **UC4B = ABOVE GROUND - EXPOSED**
- **UC4A = GROUND CONTACT - GENERAL USE**
- **UC4B = GROUND CONTACT - HEAVY DUTY**

---

**U.S. DEPARTMENT OF AGRICULTURE**

**FOREST SERVICE**

**STANDARD TRAIL PLAN**

**STEP AND RUN**

**938 - BOARDWALKS**

**NO SCALE**

**DRAWING NO.**

**STD_938-30-01**
POST AND RAIL FENCE

<table>
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<tr>
<th>FENCE</th>
<th>POST</th>
<th>RAIL</th>
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N/A WHEN NOT APPLICABLE

NOTES:
1. REFER TO THE PUBLICATION "FENCES" PREPARED BY THE MISSOULA TECHNOLOGY AND DEVELOPMENT CENTER FOR ADDITIONAL CONSTRUCTION DETAILS AND INSTALLATION PROCEDURES.
2. FENCE AND GATE LOCATIONS AS STAKED IN THE FIELD.
3. PRE-DRILL HOLES FOR FASTENERS TO PREVENT SPLITTING OF BRACING OR POSTS.
4. COMPACT AND BACKFILL POST HOLES IN 6 INCH LIFTS UNTIL NO VISUAL DISPLACEMENT.

PRE-SHORTENED TREATMENT - REFER TO AWPA USE CATEGORY SYSTEM

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<th>PRE-SHORTENED TYPE</th>
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<td>P1</td>
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</tr>
<tr>
<td>P2</td>
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<td>UC3B</td>
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</tr>
<tr>
<td>P3</td>
<td>OT</td>
<td>UC4A</td>
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</tbody>
</table>

TREATMENT TYPE:
- WB = WATERBORNE
- OT = OIL-BORNE
- UC3B = ABOVE GROUND - EXPOSED
- UC4A = GROUND CONTACT - GENERAL USE
- UC4B = GROUND CONTACT - HEAVY DUTY

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
STANDARD TRAIL PLAN

PROJECT NAME & LOCATION

DRAWING NAME
SECTION
941 - FENCES

REVISION DATE
XX/XX/XX

DRAWING NO.
STD_941-20-01
NOT TO SCALE
STACKED RAIL (WORM) FENCE

<table>
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<th>TYPICAL ID</th>
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</table>

N/A WHEN NOT APPLICABLE

NOTE:
1. REMOVE AND DISPOSE OF CLIFF AND TOP ORGANIC LAYERS DOWN TO MINERAL SOIL.
2. REFER TO THE PUBLICATION "FENCES" PREPARED BY THE MISSOULA TECHNOLOGY AND DEVELOPMENT CENTER FOR ADDITIONAL CONSTRUCTION DETAILS AND INSTALLATION PROCEDURES.
3. GATE LOCATIONS AS STATED IN THE FIELD.

20 FOOT MAXIMUM RAIL LENGTH

NOTCHING DETAIL

TYPICAL SPLIT RAIL SECTION

TYPICAL LOG SECTION

PRESEVATIVE TREATMENT - (REFER TO AWPA USE CATEGORY SYSTEM)

<table>
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<tr>
<th>PRESEVATIVE TYPE</th>
<th>TREATMENT TYPE</th>
<th>USE CATEGORY</th>
<th>COMMENTS</th>
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<tbody>
<tr>
<td>P1</td>
<td>WB</td>
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</tr>
<tr>
<td>P2</td>
<td>WB</td>
<td>UC3B</td>
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</tr>
</tbody>
</table>

TREATMENT TYPE
- WB = WATERBORNE
- OT = OIL-BORNE
- UC4A = GROUND CONTACT - GENERAL USE
- UC3B = GROUND CONTACT - HEAVY DUTY

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
STANDARD TRAIL PLAN

MODEL NAME

SECTION 941 - FENCES

REVISED DATE XX/XX/XX
DRAFTING NO. STP-941-50-01
NOT TO SCALE
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<th>WIRE TYPE</th>
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<th>LENGTH</th>
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<th>LATCH CLOSURE TYPE</th>
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</table>

N/A WHEN NOT APPLICABLE

---

### Typical Wire Gate for Trails

**Notes:**
1. Refer to the publication "Fences" prepared by the Missoula Technology and Development Center for additional construction details and installation procedures.
2. Gate locations as staked in the field.
3. Wire type and spacing shall be the same as adjoining fencing section unless otherwise specified.

---

### Typical Wire Gate for Roads

<table>
<thead>
<tr>
<th>Preservative Type</th>
<th>Treatment Type</th>
<th>Use Category</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>WB</td>
<td>UC4A</td>
<td></td>
</tr>
<tr>
<td>P2</td>
<td>WB</td>
<td>UC3B</td>
<td></td>
</tr>
</tbody>
</table>

**Treatment Type**
- **WB** = Waterborne
- **OT** = Oil-Borne

**Use Category**
- **UC3B** = Above Ground - Exposed
- **UC4A** = Ground Contact - General Use
- **UC4B** = Ground Contact - Heavy Duty
## Woven Wire Gate

<table>
<thead>
<tr>
<th>Typical ID</th>
<th>Opening Width</th>
<th>Type</th>
<th>Width</th>
<th>Wire Type</th>
<th>Type</th>
<th>Size</th>
<th>Length</th>
<th>No. of Stays</th>
<th>Preserv. Type</th>
<th>Latch Closure Type</th>
<th>Hinge Type</th>
<th>Comments</th>
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<tbody>
<tr>
<td>WWG-1</td>
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N/A WHEN NOT APPLICABLE

### Typical Woven Wire Gate for Trails

**NOTES:**

1. REFER TO THE PUBLICATION "FENCES" PREPARED BY THE MISSOULA TECHNOLOGY AND DEVELOPMENT CENTER FOR ADDITIONAL CONSTRUCTION DETAILS AND INSTALLATION PROCEDURES.

2. GATE LOCATIONS AS STATED IN THE FIELD.

3. WIRE TYPE AND SPACING SHALL BE THE SAME AS ADJOINING FENCING SECTION UNLESS OTHERWISE SPECIFIED.

### Typical Woven Wire Gate for Roads

**Preservative Treatment - (Refers to AWPA USE CATEGORY SYSTEM):**

<table>
<thead>
<tr>
<th>Preservative Type</th>
<th>Treatment Type</th>
<th>Use Category</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>WB</td>
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<td>P2</td>
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<tr>
<td>P3</td>
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</tr>
</tbody>
</table>

TREATMENT TYPE

- WB = WATERBORNE
- OT = OIL-BORNE

USE CATEGORY

- UC3B = ABOVE GROUND - EXPOSED
- UC4A = GROUND CONTACT - GENERAL USE
- UC4B = GROUND CONTACT - HEAVY DUTY

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

STANDARD TRAIL PLAN

PROJECT NAME & LOCATION

DRAWING NAME

REVISION DATE

SECTION

942 - GATES

NOT TO SCALE
<table>
<thead>
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<th>ID</th>
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<th>Size</th>
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</tbody>
</table>

N/A WHEN NOT APPLICABLE

**G1** TYPICAL METAL SWING GATE FOR TRAILS

**G2** TYPICAL METAL SWING GATE FOR ROADS

**NOTES:**

1. REFER TO THE PUBLICATION "FENCES" PREPARED BY THE MISSOULA TECHNOLOGY AND DEVELOPMENT CENTER FOR ADDITIONAL CONSTRUCTION DETAILS AND INSTALLATION PROCEDURES.
2. GATE LOCATIONS AS STATED IN THE FIELD.
3. PRE-DRILL HOLES FOR FASTENERS TO PREVENT SPLITTING OF POSTS.
4. COMPACT BACKFILL IN 6 INCH LIFTS UNTIL NO VISUAL DISPLACEMENT.
5. GATE DIMENSIONS AS PER MANUFACTURER OR APPROVED EQUAL.
### TYPICAL WOOD SWING GATE FOR TRAILS

#### NOTES:
1. REFER TO THE PUBLICATION "FENCES" PREPARED BY THE MISSOULA TECHNOLOGY AND DEVELOPMENT CENTER FOR ADDITIONAL CONSTRUCTION DETAILS AND INSTALLATION PROCEDURES.
2. FENCE AND GATE LOCATIONS AS STAKED IN THE FIELD.
3. PRE-DRILL HOLES FOR FASTENERS TO PREVENT SPLITTING OF LOGS OR SAWN TIMBERS.
4. BLOCKING SHALL BE REQUIRED ON GATES AT HINGE LOCATIONS FOR STABILITY.

### WOOD SWING GATE

<table>
<thead>
<tr>
<th>TYPICAL ID</th>
<th>OPENING WIDTH</th>
<th>TYPE</th>
<th>SIZE</th>
<th>PRESERV. TYPE</th>
<th>LATCH CLOSURE TYPE</th>
<th>HINGE TYPE</th>
<th>COMMENTS</th>
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</tbody>
</table>

N/A WHEN NOT APPLICABLE

[Diagram of Wood Swing Gate for Trails]

### TYPICAL WOOD SWING GATE FOR ROADS

#### PRESERVATIVE TREATMENT - (REFER TO AWA USE CATEGORY SYSTEM)

<table>
<thead>
<tr>
<th>TREATMENT TYPE</th>
<th>USE CATEGORY</th>
</tr>
</thead>
<tbody>
<tr>
<td>WB = WATERBORNE</td>
<td>UC4A</td>
</tr>
<tr>
<td>OT = OIL-BORNE</td>
<td>UC4B</td>
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#### TREATMENT TYPE

<table>
<thead>
<tr>
<th>TREATMENT TYPE</th>
<th>USE CATEGORY</th>
</tr>
</thead>
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<td>UC4B</td>
</tr>
<tr>
<td>OT = OIL-BORNE</td>
<td>UC4B</td>
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</tbody>
</table>

#### USE CATEGORY

<table>
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<tr>
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[Diagram of Wood Swing Gate for Roads]
WOOD SWING GATE

NOTES:
1. REFER TO THE PUBLICATION "FENCES" PREPARED BY THE MISSOULA TECHNOLOGY AND DEVELOPMENT CENTER FOR ADDITIONAL CONSTRUCTION DETAILS AND INSTALLATION PROCEDURES.
2. FENCE AND GATE LOCATIONS AS STATED IN THE FIELD.
3. PRE-DRILL HOLES FOR FASTENERS TO PREVENT Splitting OF SAWN TIMBERS.
4. BLOCKING SHALL BE REQUIRED ON GATES AT HINGE LOCATIONS FOR STABILITY.
5. ALL FASTENERS SHALL BE GALVANIZED SCREWS.

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N/A WHEN NOT APPLICABLE

---

**Diagram:**

- 2 x 4 (typ)
- 1 x 4 minimum
- 1 x 6 maximum

---

**Preservative Treatment - (Refer to AWPA Use Category System):**

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<tr>
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<th>TREATMENT TYPE</th>
<th>USE CATEGORY</th>
<th>COMMENTS</th>
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**Legend:**
- WB = WATERBORNE
- OT = OIL-BORNE
- UC3B = ABOVE GROUND - EXPOSED
- UC4A = GROUND CONTACT - GENERAL USE
- UC4B = GROUND CONTACT - HEAVY DUTY
**LOOSE RAIL GATE**

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N/A WHEN NOT APPLICABLE

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**G1 TYPICAL LOOSE RAIL GATE FOR TRAILS**

**G2 TYPICAL LOOSE RAIL GATE FOR ROADS**

**NOTES:**

1. REFER TO THE PUBLICATION "FENCES" PREPARED BY THE MISSOULA TECHNOLOGY AND DEVELOPMENT CENTER FOR ADDITIONAL CONSTRUCTION DETAILS AND INSTALLATION PROCEDURES.

2. FENCE AND GATE LOCATIONS AS STAKED IN THE FIELD.

3. PRE-DRILL HOLES FOR FASTENERS TO PREVENT SPLITTING OF LOGS OR SAWN TIMBERS.

---

**PRESEVATIVE TREATMENT - REFER TO AWPA USE CATEGORY SYSTEM**

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**TREATMENT TYPE**

- **WB** = WATERBORNE
- **OT** = OIL-BORNE

**USE CATEGORY**

- **UC4A** = GROUND CONTACT - GENERAL USE
- **UC4B** = GROUND CONTACT - HEAVY DUTY
- **UC3B** = ABOVE GROUND - EXPOSED

---

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

STANDARD TRAIL PLAN

PROJECT NAME & LOCATION

DRAWING NAME

SECTION

REVISION DATE

DRAWING NO.

942 - GATES

STD_942-30-01

NOT TO SCALE
# Accessible Kissing Gate

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N/A when not applicable

See Sheet Std. 942-20-03

Wood Swing Gate

(for kissing gate)

**Existing Fence**

4 x 4 or 5 inch dia. Minimum Fence Post

6 x 6 or 8 inch dia. Minimum Gate Post

61 1/2 inches for 2x Material

43 1/2 inches

63 inches for 2x Material

**Elevation View**

**Fence Material Type**

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<tr>
<td>M4</td>
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**Notes:**

1. Remove and dispose of duff and top organic layers down to mineral soil.
2. Compact backfill in 6 inch lifts until no visual displacement.

**Plan View**

**Preservative Treatment** — (Refer to AWPA use category system)

<table>
<thead>
<tr>
<th>PRESERVATIVE TYPE</th>
<th>TREATMENT TYPE</th>
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TREATMENT TYPE

- WB = Waterborne
- OT = Oil-Borne

USE CATEGORY

- UC3B = Above Ground - Exposed
- UC4A = Ground Contact - General Use
- UC4B = Ground Contact - Heavy Duty

---

**U.S. Department of Agriculture**

**Forest Service**

**Standard Trail Plan**

**Drawing Name:** ACCESSIBLE KISSING GATE

**Section:** 942 - Gates

**Typical ID:** KG1

**Revision Date:** 11/17/14

**Drawing No.:** STD_942-40-01

**No Scale**
ACCESSIBLE KISSING GATE

FENCE

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<th>POST SIZE</th>
<th>POST EMERGENCE DEPTH</th>
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N/A WHEN NOT APPLICABLE

4 X 4 OR 5 INCH DIA. MINIMUM FENCE POST

EXISTING FENCE

2 X 4 MINIMUM RAILS

19 INCH MAXIMUM (TYP)

30 INCH MINIMUM EMBRacement DEPTH (TYP)

3 INCH MINIMUM

48 INCHES FOR 2X MATERIAL

44 INCHES

4 INCHES

45 INCHES

6 INCHES

63 INCHES REQUIRED FOR 2X MATERIAL

36 INCH MINIMUM EMBRacement DEPTH (TYP)

60 INCHES

30 INCHES

18 INCHES

90 INCHES

ELEVATION VIEW

NOTES:
1. REMOVE AND DISPOSE OF DUFF AND TOP ORGANIC LAYERS DOWN TO MINERAL SOIL
2. COMPACT BACKFILL IN 6 INCH LIFTS UNTIL NO VISUAL DISPLACEMENT.

PLAN VIEW

FOREST SERVICE

U.S. DEPARTMENT OF AGRICULTURE

STANDARD TRAIL PLAN

PROJECT NAME & LOCATION

DRAWING NAME

ACCESSIBLE KISSING GATE

SECTION

942 - GATES

TYPICAL ID

KG2

REVISION DATE

11/17/14

DRAWING NO

STD_942-40-02

NO SCALE
**ACCESSIBLE GATES CHICANES**

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**FENCE MATERIAL TYPE**

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<th>TYPE</th>
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<tbody>
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**NOTES:**
1. REMOVE AND DISPOSE OF DUFF AND TOP ORGANIC LAYERS DOWN TO MINERAL SOIL.
2. COMPACT BACKFILL IN 6 INCH LIFTS UNTIL NO VISUAL DISPLACEMENT.

**PRESERVATIVE TREATMENT**

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<th>PRESERVATIVE TYPE</th>
<th>TREATMENT TYPE</th>
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**TREATMENT TYPE**

- **WD** = WATERBORNE
- **OT** = OIL-BORNE

**USE CATEGORY**

- **UC3B** = ABOVE GROUND - EXPOSED
- **UC4A** = GROUND CONTACT - GENERAL USE
- **UC4B** = GROUND CONTACT - HEAVY DUTY
### STILES

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</tbody>
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N/A WHEN NOT APPLICABLE

---

#### WALK OVER

- 2 x 4 minimum carriage
- 2 x 6 minimum riser
- 2 x 8 minimum step
- 6 x 6 minimum post
- Existing fence
- 2 x 4 minimum cross brace
- 8 inch rise (typ)
- 9 inch run (typ)
- 12 inches
- 18 inch minimum carriage
- 2 x 4 construction
- 36 inch minimum embedment depth
- Width
- Length

**NOTE:**
1. Compact backfill in 6 inch lifts until no visual displacement.

#### PLATFORM STEP OVER

- Existing post
- Up to 48 inches
- 18 inch maximum
- Or straight down embedded 12 inches

#### STEP OVER

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**TREATMENT TYPE**
- WB = WATERBORNE
- OT = OIL-BORNE

**USE CATEGORY**
- UC3B = ABOVE GROUND - EXPOSED
- UC4A = GROUND CONTACT - GENERAL USE
- UC4B = GROUND CONTACT - HEAVY DUTY
BOLLARDS

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N/A WHEN NOT APPLICABLE

A. PERMANENT INSTALLATION SECTION

B. REMOVABLE INSTALLATION SECTION

C. DROP-DOWN INSTALLATION SECTION

BOLLARD MATERIAL

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NOTES:
1. REMOVE AND DISPOSE OF DUFF AND TOP ORGANIC LAYERS DOWN TO MINERAL SOIL.
2. COMPACT BACKFILL IN 6 INCH LIFTS UNTIL NO VISUAL DISPLACEMENT.
3. WHEN SPECIFIED INSTALL PER MANUFACTURERS INSTRUCTION.
4. OBJECT MARKERS REQUIRED ON MOTORIZED TRAILS.

PREVIAN TREATMENT – (REFERS TO AWPA USE CATEGORY SYSTEM)

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U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
STANDARD TRAIL PLAN

PROJECT NAME & LOCATION

DRAWING NAME

SECTION

945 - BOLLARDS

TYPICAL ID

BLD

REVISION DATE

STD_945-10-01

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</table>

**SUPPORT TYPE**

- TR: TREE
- WP: WOOD POST
- SP: STEEL POST
- FP: FLEXIBLE POST

**POST INSTALLATION TOLERANCE**

Post placement tolerance is within shaded area for avoiding obstacles affecting post hole installation.

**NOTE:**

WOOD SIGN POST SPACING AND SIZE REQUIREMENTS

<table>
<thead>
<tr>
<th>POST SIZE (IN)</th>
<th>MAX SIGN WIDTH (IN)</th>
<th>MAX SIGN AREA (SQ.FT)</th>
<th>MAX SIGN SIZE</th>
<th>MAX SIGN AREA (SQ.FT)</th>
<th>MINIMUM EMERGENCE DEPTH (FT)</th>
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<tbody>
<tr>
<td>4 X 4</td>
<td>48</td>
<td>10</td>
<td>72</td>
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<tr>
<td>4 X 6</td>
<td>48</td>
<td>20</td>
<td>72</td>
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<td>6 X 6</td>
<td>48</td>
<td>20</td>
<td>96</td>
<td>95</td>
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</tr>
</tbody>
</table>

*The maximum width is 36 inches for diamond-shaped signs.

GUIDELINES FOR WOOD SIGN POSTS

SIGN AND POST INSTALLATION

NOTES:
1. REFER TO "EM-7100-15 SIGN AND POSTER GUIDELINES FOR THE FS" FOR SIGN SPECIFICATIONS, MATERIALS, AND PLACEMENT.
2. POST SPACING APPLIES TO BOTH WOOD AND STEEL POSTS.
3. FOR SIZES OF STEEL POSTS, REFER TO EM 7100-15.
4. ALL HARDWARE SHALL BE ALUMINUM OR GALVANIZED.
5. LAG SCREW FASTENERS REQUIRE GROOVE HOLES IN POSTS AND SHALL BE TAPPED PRIOR TO INSTALLATION.
6. BOLT HOLES IN POSTS TO BE 1/16 INCH LARGER (MAXIMUM) LARGER THAN THE BOLT HOLE REQUIREMENT.
7. SIGN AND MARKER POSTS ONLY SHALL BE TREATED WITH CCA (COPPER CHLORIDE) FOR GROUND CONTACT FOR GENERAL USE.
8. COMPACT BACKFILL IN 6 INCH LIFTS UNTIL NO VISUAL DISPLACEMENT.
ROUTE MARKER INFORMATION ORDER

<table>
<thead>
<tr>
<th>NO.</th>
<th>DESCRIPTION</th>
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<tbody>
<tr>
<td>1</td>
<td>TRAIL IDENTIFICATION</td>
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<tr>
<td>2</td>
<td>ARROW</td>
</tr>
<tr>
<td>3</td>
<td>SPECIAL TRAIL DESIGNATION</td>
</tr>
<tr>
<td>4</td>
<td>BLAZE(R)</td>
</tr>
<tr>
<td>5</td>
<td>OTHER</td>
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</table>

ROUTE MARKER

<table>
<thead>
<tr>
<th>TYPICAL ID</th>
<th>ROUTE MARKER INFORMATION</th>
<th>SUPPORT</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>TYPE</td>
<td>LOCATION</td>
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<td></td>
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</tbody>
</table>

ROUTE MARKER LOCATION ON TRAIL

| L | LEFT SIDE |
| R | RIGHT SIDE |
| O | BOTH |

INFORMATION LOCATION ON SUPPORT

| FR | FRONT SIDE |
| BA | BACK SIDE  |
| O  | BOTH |

SUPPORT TYPE

| TR | TREE               |
| WP | WOOD POST          |
| SP | STEEL POST         |
| FP | FLEXIBLE POST      |

NOTES:
1. REFER TO "EM-7100-15 SIGN AND POSTER GUIDELINES, FOR THE FIRST SPECIFICATIONS, MATERIALS, AND PLACEMENT.
2. CUT BLAZE NO DEEPER THAN NECESSARY FOR CLEAR VISIBILITY, CUT ON BOTH SIDES, VISIBLE FROM BOTH DIRECTIONS.
3. REFER TO EM-7100-15 FOR BLAZER COLOR.
Typical Cut Blaze

Typical Manufactured Blazer

Painted and scribed blazes not shown for clarity.

Minimum mounting height for hiker/pedestrian, pack and saddle, bicycle and.

Notes:
1. Refer to EM 7100-15 for sign specifications, materials, and placement.
2. Cut blaze no deeper than necessary for clear visibility.
3. Refer to EM 7100-15 for blaze color.
ROCK CAIRN CONSTRUCTION

<table>
<thead>
<tr>
<th>TYPICAL ID</th>
<th>CAIRN TYPE</th>
<th>CAIRN INTERVAL</th>
<th>MINIMUM ROCK SIZE</th>
<th>MAXIMUM ROCK SIZE</th>
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<tbody>
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</tbody>
</table>

OVERLAP ALL JOINTS
PACK THE CENTER WITH RUBBLE

TOP VIEW
SECOND LAYER OF ROCK CAIRN

TOP VIEW
FIRST LAYER OF ROCK CAIRN
OR TYPICAL SECTION OF SHEEPHERDERS CAIRN

EXISTING GROUND

T SIMPLE ROCK CAIRN

NOTES:
1. REFER TO "EM-7100-15 SIGN AND POSTER GUIDELINES FOR THE FS" FOR SIGN SPECIFICATIONS, MATERIALS, AND PLACEMENT.
2. USE LARGE STONES TO BUILD BASE.
3. USE FLAT STONES AND OVERLAP JOINTS.
4. SLOPE STONES INWARD.
5. DO NOT WEDGE SMALL ROCKS INTO CRACKS BETWEEN LARGE ROCKS TO STABILIZE THE LARGE ROCKS.
6. JOINTS OF FIRST LAYER ARE BRIDGED BY THE SECOND LAYER.

36 INCHES MINIMUM

SIDE VIEW

ROCK CAIRN

30 INCHES MINIMUM

EXISTING GROUND

EMBED ROCKS 2 TO 4 INCHES INTO MINERAL SOIL

5 TO 6 FOOT (TYP)

SHEEPHERDERS CAIRN

24 INCHES (TYP)

EXISTING GROUND

EMBED ROCKS 2 TO 4 INCHES INTO MINERAL SOIL

U ROCK CAIRN

V SHEEPHERDERS CAIRN

U ROCK CAIRN

V SHEEPHERDERS CAIRN

STANDARD TRAIL PLAN
CONSTRUCTION LIMITS

SEEDING FERTILIZING & MULCHING LIMITS

TREAD

SEEDING FERTILIZING & MULCHING LIMITS

HINGE POINT

FILL SLOPE

EXISTING GROUND

CATCHPOINT

BACKSLOPE

CATCH

APPLICATION TYPE

A. SEEDING
B. SEEDING & MULCHING
C. SEEDING, FERTILIZING AND MULCHING
D. SEEDING AND FERTILIZING
E. MULCHING
F. EROSION CONTROL BLANKET

NOTE: CONTRACTOR SHALL SEED, FERTILIZE AND MULCH ANY DISTURBED AREA THAT WAS CAUSED BY CONTRACTORS OPERATION. OUTSIDE OF SEEDING, FERTILIZING AND MULCHING LIMITS, THIS WORK SHALL BE INCIDENTAL TO SEEDING, FERTILIZING AND MULCHING.