Friends of Train Mountain

Railroad Track Standards

These Standards apply to New Construction starting 2009

Operating Standards

1. **Train Length.** No Trains over 140'.

2. **No Insulated Wheels or Axles**. Metal wheels and uninsulated metal axles are required beyond Farmersville and on Caboose Ridge.

3. **No Reversing on Mainline.** Trains may not reverse on Bidirectional track except to back up into a Wye (at the Wye) or to back up into a Siding (at the Siding).

4. **Back into Wyes.** Trains must always back up into Wyes.

5. **Go Forward out of Sidings.** Trains cannot enter a Siding if there is already an opposing train in it…. Go to the far end and back up to get in the Siding.

6. **Emergency Communication.** Cell phones are required north of Farmersville Circle and on Caboose Ridge where FRS radios may not reach in an emergency.

Locating Standards

1. **Fouling Point.** The fouling point on a switch is measured at 34" from the center of the two tracks of a switch and shall be indicated by a two-inch washer in the middle of the 2 tracks. Where a siding length sign is provided, the fouling point is at the top edge of the sign.

2. **Signal Points** – Signal Points mark the location of Signals. On Sidings, Queuing Tracks, and Mainline Meet Tracks, on each track, find the end of the first Track Panel after the tracks begin to run parallel. The Track Panel end that is farthest from the point where the tracks began to run parallel is one Signal Point. The other Signal Point is directly across on the other track. On the legs of a Wye the Signal point is at the first Track Panel end where the centerlines of the tracks are at least 9 feet apart. This allows a signal between the tracks to be 4' from either track. Signal Points are marked with two 2" washers screwed to the middle of the Signal Point Ties on both tracks. On Sidings and Mainline Meet Tracks the distance between Signal Points must be 140' minimum.

Grade Standards :

1. **Right of Way Width.** The main line right of way shall be eight-feet wide for single line track and twelve-feet wide for double track.

2. **Grade Steepness.** Grade for newly constructed right of way shall not exceed 2%. Better is for the grade not to exceed 11/2%. Best is for the grade not to exceed 1%.

3. **Grade Level.** Grade may have slope for drainage, but shall be level from side to side at the point that track will be laid. Grade will be free from longitudinal dips and humps.

4. **Roadbed Drainage.** Roadbed shall either have a minimum of six-inches of fill above the surrounding ground or have ditches on both sides that are a minimum of six-inches deep and twelve-inches wide. The roadbed design shall protect the roadbed from washouts and flooding by providing for culverts, bridges, trestles, French drains, perforated pipe or other means of providing for adequate drainage as required by topography.

5. **Finished Roadbed.** Before track laying, the roadbed shall be finish graded and rolled to provide an absolutely smooth surface that is ready for underlayment and track panels.

6. **Drainage Culverts.** Drainage Culverts will be 12” diameter.

7. **Slope < 30% Fill.** Tracks may be located on fill only where the slope is less than 30%. Fill shall be graded to have a slope of 2H to 1V. (H= Horizontal, V=Vertical) Ground should be scraped free of surface organics to a depth of 6” before placing fill. Slope should be benched as fill is placed to blend fill with native soil. Fill should be applied in layers on < 1’ depth, wetted to within 3% of optimum moisture content and compacted to 95% of the maximum dry density as determined by ASTM D 698.

8. **Slope < 30% Cuts.** The sides of cuts on slopes less than 30% shall be graded to 1.75H to 1V.

9. **Steep Slopes >30% Fill.** Fill should not be placed on slopes greater than 30%.

10. **Steep Slopes >30% Cuts.** Tracks may only be located in the cut on slopes greater than 30%. Dirt shall be removed from the cut. The uphill slope shall be no steeper than 1.75H to 1V.

11. **Sides of Cuts and Fills ReSeeded.** The sides of Cuts Fills should be reseeded as soon as practical.

Rail Standards :

1. **Rail.** Rail shall be steel and shall be rolled or extruded to match the existing Train Mountain rail profile. Rail sections shall be ten feet long.

2. **Ties.** Ties shall be plastic ties. The base shall be an actual 2" x 3" x 16". Ties shall be on four- inch centers, which means a two-inch space between ties and thirty ties to a ten-foot track panel.

3. **Track Gauge.** The distance between rails shall be seven and five-eighths inches.

4. **Track Panels.** Track panels shall use Spall rail joiners, and Train Mountain plates and track screws. Panels shall have a 12" rail offset, resulting in an actual track panel length of eleven feet. All track panels shall be built to the exact specifications of existing Train Mountain track panels so that all track panels on Train Mountain Railroad and all private track connected to Train Mountain mainline are fully interchangeable.

5. **Curved Track Panels.** Track Panels will be assembled with rail pre-bent to the following radius curves: 75', 90', 105', 135', and 165'.

Track Laying Standards :

1. **Underlayment.** Underlayment shall be plastic that prevents plant growth and shall have a minimum thickness of 12 mil. On Train Mountain mainline, underlayment shall be eight-feet wide on single track and twelve feet wide on double track. On private track connected to Train Mountain mainline, it shall be a minimum of four feet wide for single track and eight-feet wide on double track.

2. **Track Separation.** Parallel tracks shall be five feet apart on the main line and in yards, measured from the track centerline.

3. **Curves.** The minimum curves for mainline track shall be 90’ radius. Sidings and Yard tracks shall be minimum 75' radius.

4. **Sidings.** The distance between sidings shall be approximately 3,000'. The minimum siding length shall be 140' between Switch points. A kick plate operated switch and stub track at least 12' long for storage of bad order equipment shall be provided at one end of each Siding. Mainline Switches will have Switch Stands. On Signaled, Bi-Directional track, Sidings will have a push button labled “Push When Ready to Depart” to alert the Signaling system that the train is ready to leave.

5. **Water Sidings.** Water Sidings are Sidings that provide water. Water sidings should be located approximately every 2 miles. All Water sidings will have Ash Pits for coal burning locomotives.

6. **Queuing Tracks**. Every original entry to Bi-Directional track will have a Queuing Track that breaks groups of trains into aggregate lengths of no more than 140’ which is the length of the Mainline Meet Tracks and Sidings. The Mainline switch on all Queuing Tracks will be spring operated.

7. **Wyes.** Each Wye will have a minimum of 160’ on the tail measured from the switch. This allows 140’ to turn a train around and 20’ to store equipment. At the end of the Tail there will be an End of Track sign. All three switches will have Switch Stands. The Yellow disks on the Bi-Directional Mainline switch stands will display “Back In Only”. On Signaled, Bi-Directional track, Wyes will have a push button labled “Push When Ready to Depart” to alert the Signaling system that the train is ready to leave.

8. **Mainline Meet Tracks.** Mainline Meet Tracks are where trains traveling in opposite directions on Bi-Directional Track can pass each other. Both switches on Mainline Meet Tracks will be spring operated.

Mainline Meet Tracks are always structured as in the above picture. They are part of the Mainline. Trains may not park on the Mainline. Trains are to proceed as soon as the signal allows you to. Mainline Meet Tracks shall be located approximately every 3000ft on Bi-Directional Track. Mainline Meet Tracks will be long enough to at least accommodate 140’ of train(s) between Signal Points.

9. **Circles**. New Circles will have counter clockwise flow unless there is a really good reason why that will not work.

10. **Switches.** Mainline Switches shall have a radius of 100'. Switches to Sidings and yard switches shall have a radius of 75'. All switches shall be built to the exact specifications of existing Train Mountain switches so that all switches on Train Mountain Railroad and all private track connected to Train Mountain mainline are fully interchangeable. Switches installed on Queuing Tracks and Mainline Meet Tracks will be Spring operated. Mainline Switches on Sidings and Wyes will be operated by Switch Stands.

11. **Switch Stands.** Switch stands may be of any design, provided that they do not protrude above tie level, within 24" of the center line of the track, and thereby not impede the operation of oversized snowplow and pine needle blower equipment. Remote switch stands shall be forty feet from the points of the switch that they control and the edge of the remote switch shall be a minimum of 24" from the centerline of the track. If possible, remote switch stands shall be located on the right hand side of the track.

12. **Rail Joints.** All rail shall be connected with Spall Rail Joiners between rails at joints. The gaps in rail joints shall not exceed three-sixteenths of an inch at eighty degrees Fahrenheit

Ballast Standards :

1. **Pre-Ballast Checklist.** No ballast shall be laid until all the tasks on the Pre-Ballast checklist(s) for the area to be ballasted have been completed and the Checklist signed off.

2. **Ballast.** Ballast shall be 3/4" clean crushed rock that is three inches deep. Neither 3/4" minus rock nor round river rock are acceptable. Ballast on Train Mountain mainline shall be eight-feet wide for single track and twelve-feet wide for double track. Ballast on private track connected to Train Mountain mainline shall be a minimum of four feet wide for single track and eight-feet wide for double track.

Grade Crossings :

1. **Grade Crossings.** Grade crossings are constructed of track welded to the top of two steel i-beams, 3", 5.7 lb per foot. For automobile and truck traffic the i-beams are set in concrete that is 24" inches wide, 12" deep and that extends at least 12" past the edge of the roadway being crossed, examples of which are found on the three existing grade crossings on Hidden Valley Road. For Gator and light duty use, the i-beams may be set in Ballast.

2. **Grade Crossing Signs.** All grade crossings shall be protected by crossbucks. Crossing lights shall be installed at all steel beam crossings set in concrete. Both the crossbucks and the crossing lights shall meet the crossing light specifications set forth in the Train Mountain Encyclopedia.

Signal Standards :

1. **Entry to Bi-Directional Track**. Every original entry to Bi-Directional track will have a Queuing Track that breaks groups of trains into aggregate lengths of no more than 140' which is the length of the Mainline Meet Tracks and Sidings.

2. **Signals, Sidings & Wyes.** Every Re-Entry to Bi-Directional Mainline will be controlled by a signal to the right of the track. In Sidings that signal may be Left of the siding track, away from the Mainline. (New Standard)

3. **Signals, Ready to Leave Button.** A Push Button will alert the signal system that the train is ready to depart a Siding or Wye and ReEnter the Bi-Directional Mainline. The Push Button Stands may be of any design, provided that they do not protrude above tie level, within 24" of the center line of the track, and thereby not impede the operation of oversized snowplow and pine needle blower equipment. Push Button stands shall be forty feet from the Re-Entry Signal. If possible, Push Buttons shall be located on the right hand side of the track, but may be Left of a Siding, away from the Mainline. (New Standard)

4. **Signals, Intermediate.** Intermediate Signals are located at Block Boundaries. Bi-Directional track is broken into Track segments of approximately 3000’ by Mainline Meet Tracks. Track segments are broken into a maximum of 6 Blocks, approximately 600’ long, by Intermediate Signals. Signal Points mark Block Boundaries with two 2” washers in the center of the top of a tie.

5. **Signals, Lamp Colors.** The following 6 Lamp Colors will be used :

    - **Green** – Proceed the track ahead is clear

    - **Flashing** Yellow – Proceed. There is a reason to stop about 1200-1800’ ahead. The next signal is solid yellow.

    - **Solid Yellow** – Proceed Cautiously. There is a reason to stop about 600-1200’ ahead. The next signal is Solid Red, Flashing Red or a Yard entry with a Lunar White.

    - **Flashing Red** -- Proceed “on-your-own”. There is a reason to stop ahead. Be prepared to stop.

    - **Solid Red – STOP – Do not pass this signal.**

    - **Lunar White** – Proceed “on-your-own”, used for entering a yard.

Structures :

1. **Bridges & Trestles.** Bridges may be of any design as long as they meet the following specifications. Bridges over other tracks, roads or walking paths shall have a minimum clearance above the track, road or path below of 83". Single-track bridges shall be a minimum of 64" wide, double-track bridges shall be minimum of 112" wide and all bridges shall have a minimum internal vertical clearance of 84". Bridges more than 30" above the ground shall have a railing 42" above the deck surface and no opening below the top railing larger than a 4" sphere.

2. **Tunnels.** Tunnel portals shall have a minimum portal width of 48" for single track and 96" inches for double track and a minimum portal height of 75". The minimum inside tunnel width for single track shall be 72" and the minimum inside tunnel height shall be 84".

Signs :

1. **W signs.** A sign indicating that the engineer shall blow his/her locomotive's whistle shall be placed 60' before the beginning of each steel in concrete grade crossing and 60' before any diamonds where two main line tracks cross. The specifications for these "W' signs are set forth in the Train Mountain Encyclopedia.

2. **Y signs.** Signs indication that the engineer shall yield to cross traffic at a diamond shall be placed 60' before each diamond where the approaching track is a siding, spur or connector track and the crossing track in a main line track with mileposts. The specifications for these "Y" signs are set forth in the Train Mountain Encyclopedia.

3. **Informational Brochures.** Information on Signals shall be available before entering signal controlled Bi-Directional Track. On the Farmersville Queuing Track at first Signal there will be a Box for Information Flyers for Northbound Track and a recycling box for Southbound Track.

4. **Wye Signs.** On signaled Bi-Directional track there will be a sign on the Yellow Disk of the mainline Wye Switch Stands saying “Back In Only”.

5. **Push Button Signs**. On signaled Bi-Directional track there will be a sign “Push When Ready to Depart” on Push Button Posts on Sidings and Wyes.

6. **End of Track Signs.** There will be an “End of Track” indicator at the end of Siding storage tracks and on the blind tails of wyes.

Wildlife Protection :

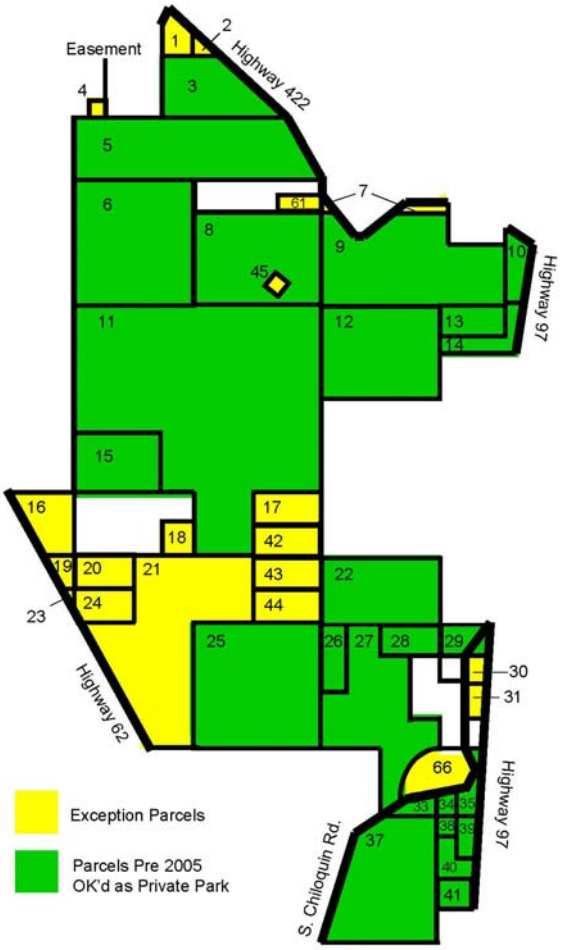
1. Silent Operation Zones. Silent Operation Zones will be established within 1320’ of any Bald Eagle’s nest.

2. Restricted Construction Zones. No construction and no track will be allowed within 660’ of a Bald Eagle’s nest. Construction shall only be allowed within 1320’ of a Bald Eagle’s nest in September, October, November, and December.

Zoning :

1. **No track on Exception Parcels.** Klamath County allows one northbound track and one southbound track to directly connect together the North and South private park areas of the Train Mountain, pictured in green below. No other Track, Sidings, Wyes, Mainline Meet Tracks, Queuing Tracks, or other railroad improvements on the Exception Parcels pictured in yellow below.

2. **Track on Private Park Parcels require County Approval.** Track on the Private Park parcels pictured in green must be approved by Klamath County pursuant to a Conditional Use Permit such as the Train Mountain Master Conditional Use Permit and as part of the annual work program which is submitted to the county.



FTM Track Standards.doc