

BNSF Railway

Joint Line Maintenance & Expansion

Robert J. Boileau, P.E.

Assistant Vice President Engineering Services

May 17, 2006



Joint Line Design & Construction

Joint Line (Orin Sub) Mile Post 14.7 to 117.7

- **1979**

Original Construction	103 route miles	\$ 120 Million*
-----------------------	-----------------	-----------------

- **1994-1999**

Double Track	38.7 track miles	
--------------	------------------	--

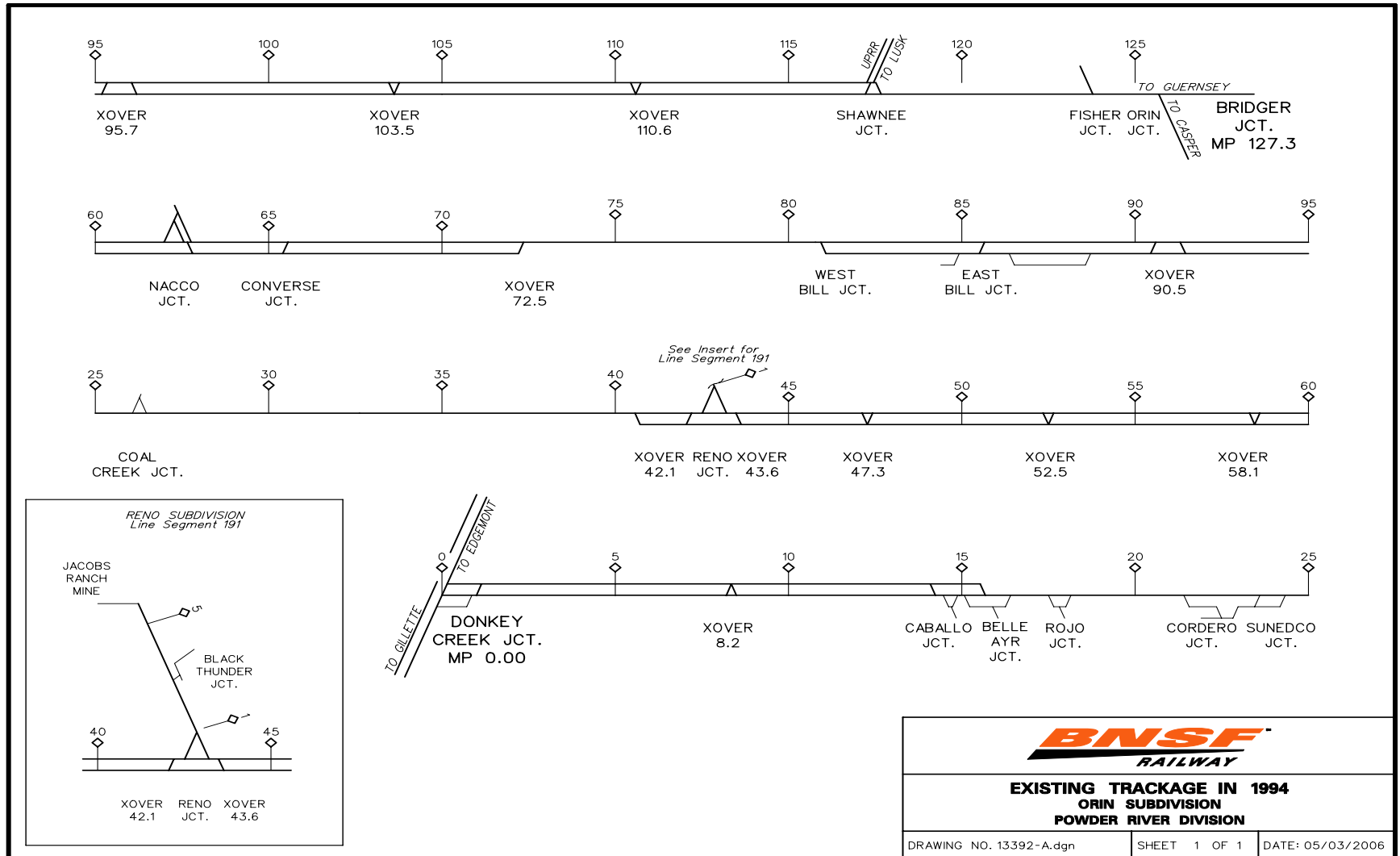
Triple Track	46.0 track miles	\$ 160 Million*
--------------	------------------	-----------------

- **2000-2006**

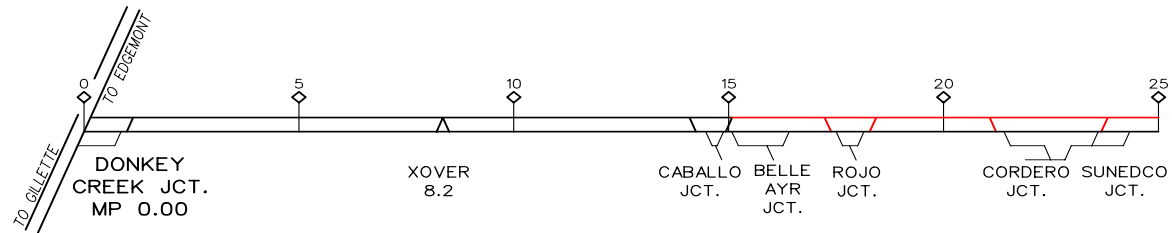
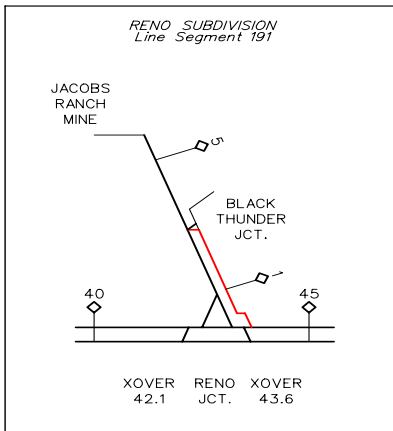
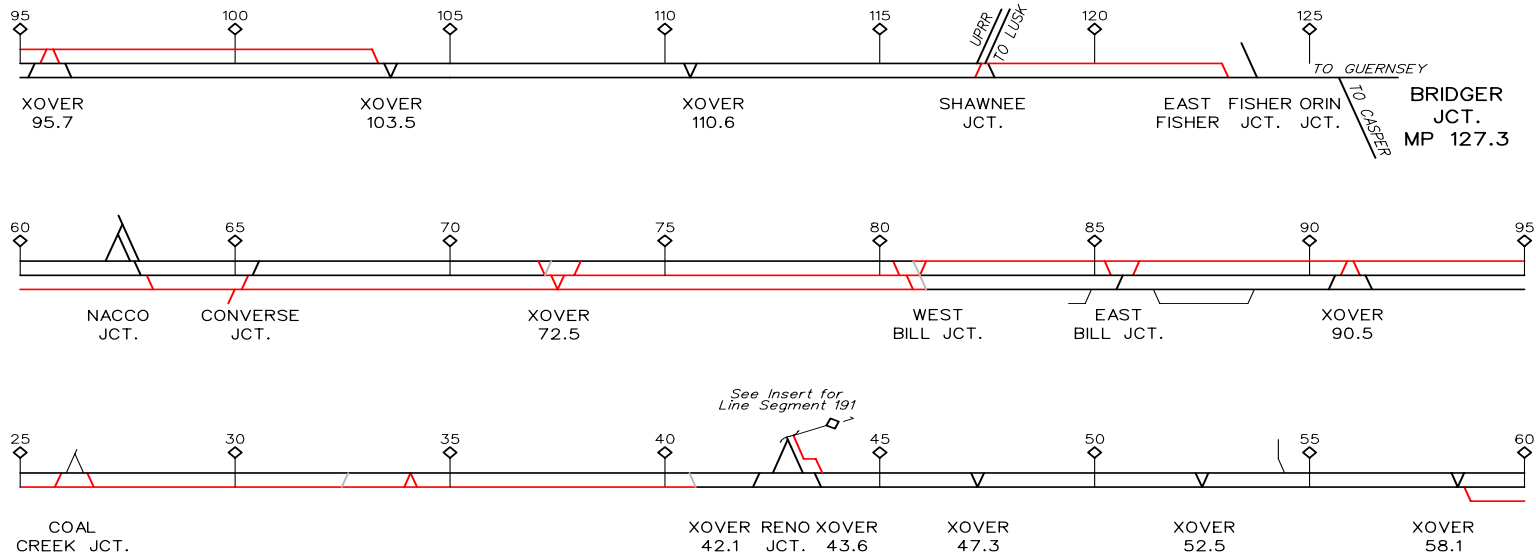
Triple Track	32.5 track miles	\$ 94 Million*
--------------	------------------	----------------

* above costs are in actual dollars in the year the projects were constructed

Joint Line, 1994



Joint Line Expansion, 1994 - 1999

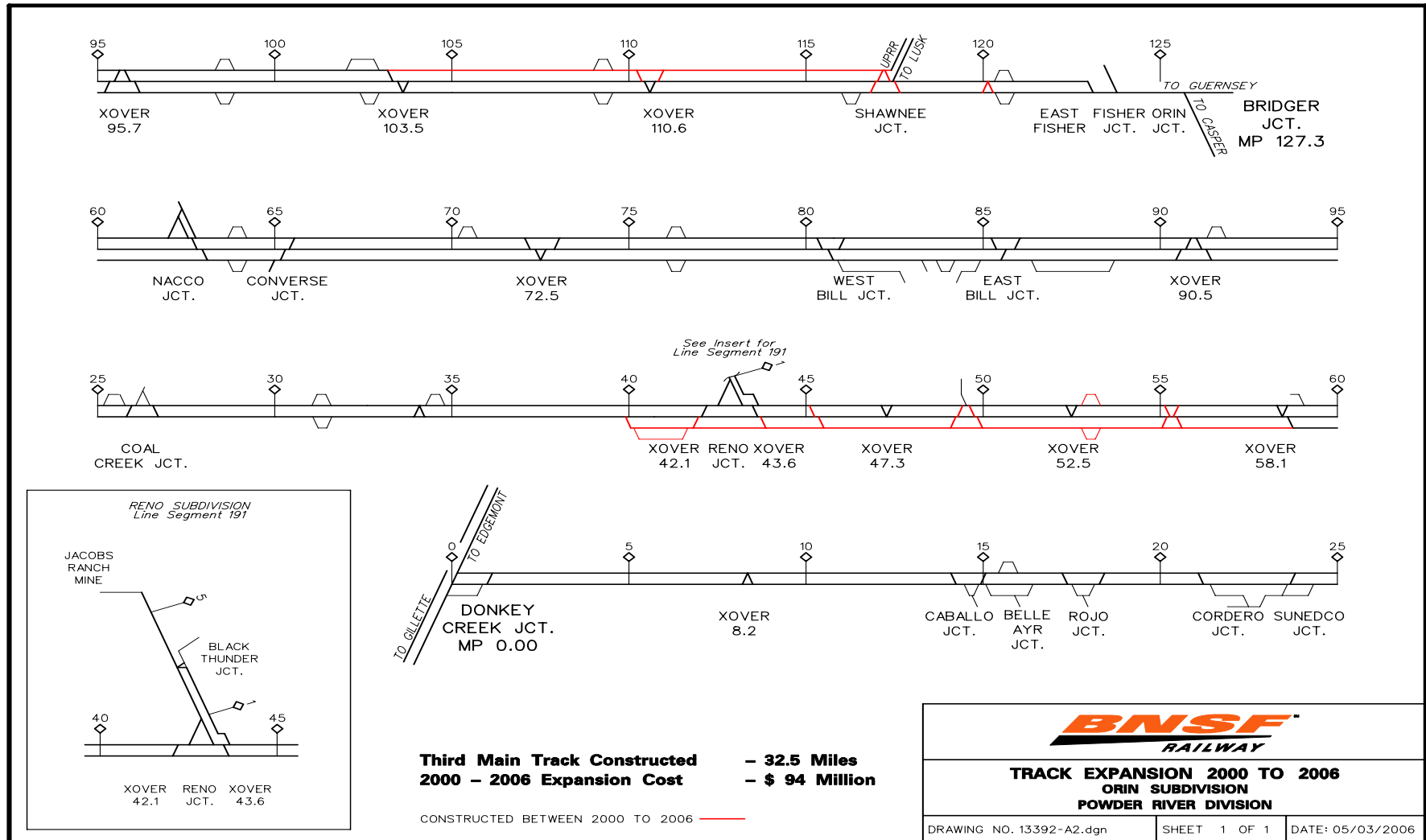


Second Main Track Constructed - 38.7 Miles
Third Main Track Constructed - 46.0 Miles
1994 - 1999 Expansion Cost - \$ 160 Million

CONSTRUCTED BETWEEN 1994 TO 1999

BNSF RAILWAY		
TRACK EXPANSION 1994 TO 1999 ORIN SUBDIVISION POWDER RIVER DIVISION		
DRAWING NO. 13392-A.dgn	SHEET 1 OF 1	DATE: 05/03/2006

Joint Line Expansion, 2000-2006



Design & Construction

- **Design – Construction Management**
- **Permitting - Mitigation**
- **Property Acquisition**
- **Grading**
 - Maintenance Road/Access
 - Sub-ballast
- **Track Work**
 - Concrete Ties
 - Premium Track Work
 - 25' Track Centers
- **Signals**
 - Independent Crossover Switch
- **Structures**
 - Box Culvert Extensions
 - Bridges and County Road Overpasses

Joint Line Maintenance

- **2006 Program**

- **Capital Maintenance**

- New rail, 12 lineal miles
 - Undercut 91 track miles
 - Shoulder ballast cleaning 76 miles
 - High speed surfacing 270 miles
 - Rail grinding 550 pass miles
 - Spot surfacing (2 gangs) 360 days
 - Other work activities

- **Night Gangs**

- 24x7 coverage- maintenance and rapid response

Joint Line Expansion Shawnee Triple Track

- **Shawnee-Walker Triple Track Project**

(14.1 miles of 3rd main track)

- **Engineering, CM** **\$ 3 Million**
- **Grading** **\$ 6 Million**
 - 1.3 million cubic yards embankment and excavation including access roads
- **Structures** **\$ 1 Million**
 - Box culvert extensions, 5 each
- **Track** **\$ 15 Million**
 - Construct 14.1 miles with 3 crossover plants
 - Includes 7- #20 crossovers
- **Signal** **\$ 11 Million**
 - CTC 3rd main; control points at MP 103, 110 & Shawnee Jct.
- **PROJECT TOTAL** **\$ 36 MILLION**

Joint Line Expansion Reno Triple Track

- **Reno (MP 58) Triple Track Project**

(18.4 miles of 3rd main track)

- **Engineering, CM** **\$ 3 Million**

- **Grading** **\$ 9 Million**

1.9 million cubic yards embankment and excavation
including access roads, clearing, grubbing & seeding

- **Structures** **\$ 2 Million**

Construct 2 crash & retaining walls and 3 box culverts

- **Track** **\$ 24 Million**

Construct 18.4 miles with 7 crossover plants;
Includes 24 - #20, 5 - #24, and 4 - #11 turnouts

- **Signal** **\$ 18 Million**

CTC 3rd main; control points at MP 55.9, 48.8, 45.6, 43.5,
42.1 and 40.0

- **PROJECT TOTAL** **\$ 56 MILLION**

Joint Line Expansion Bill Yard

- **Bill Yard Lead Project**

(0.39 miles of yard lead)

- **Engineering, CM** **\$ 0.1 Million**
- **Grading** **\$ 0.6 Million**
7,000 cubic yards embankment and excavation;
including access road
- **Track** **\$ 0.7 Million**
Construct 0.39 miles; includes 1- #20 crossover
- **Signal** **\$ 1.0 Million**
Power up both ends of lead
- **PROJECT TOTAL** **\$ 2.4 MILLION**

Joint Line Expansion

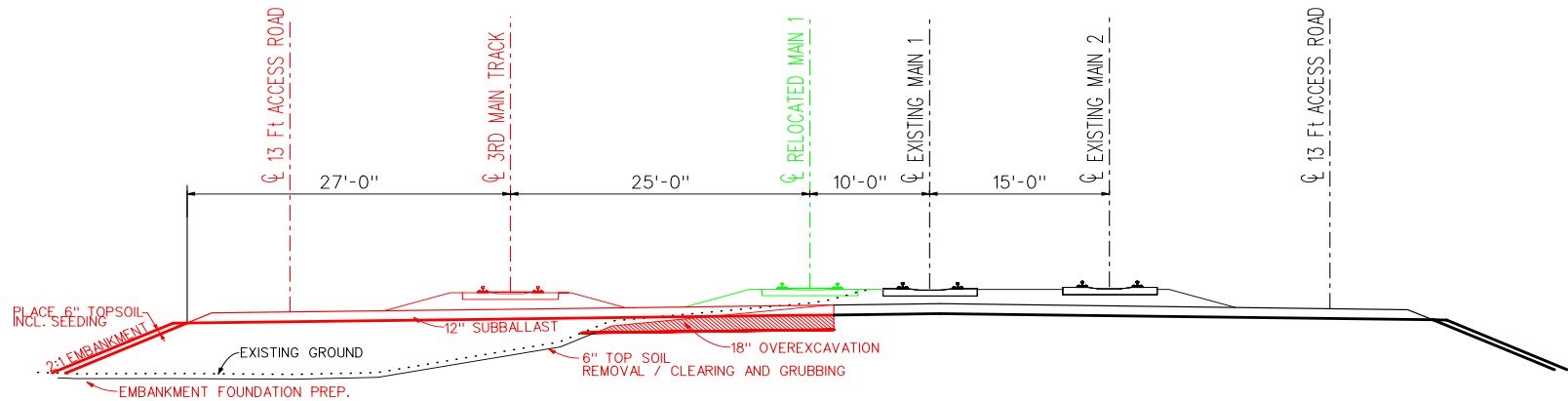
Donkey Creek Yard (Phase I)

- **Donkey Creek Yard Project (Phase I)**

(17.07 miles of new yard track)

- **Engineering, CM** **\$ 2 Million**
- **Grading** **\$ 5 Million**
602,000 cubic yards embankment and excavation
including access roads
- **Structures** **\$ 2 Million**
Construct 5 bridges
- **Track** **\$ 17 Million**
Construct 17.07 miles with 23 turnouts
- **Signal** **\$ 6 Million**
Control points at MP 581.7, 584.0, 586.3 and 587.5
- **PROJECT TOTAL** **\$ 32 MILLION**

Joint Line Expansion Reno Triple Track (Cross Section)



BNSF RAILWAY		
SHAWNEE TO WALKER THIRD MAIN SECTION DETAIL		
ORIN SUBDIVISION		POWDER RIVER DIVISION
DRAWING NO. 13392-sect.dgn	SHEET 1 OF 1	DATE: 05/03/2006

Ballast Sampling

**Fouled
Ballast
Main Track
#1 MP 47.3**



Ballast Sampling

- Study results indicate that coal accumulations in the ballast at select switches range from 0.5% to 30%. The lower percentage coal values came from previously cleaned switches
- These study results also demonstrated that the ballast/coal mixture has the capacity to retain water, lose compressive strength, and ultimately cause track surface irregularities



Current Committee Initiatives

- **Testing Low Water Topper Agents**
- **Improved Railcar Coal Top Profiles**
- **Address Low Cube Capacity (<4,000 Cu Ft)**
- **Improve Railcar Inspection & Maintenance**
- **Improve Railcar Design**
- **Systematic Elimination of Older Style Railcars**
- **3-inch vs. 2-inch or Less Crushing Size**

Impact of Modified Chutes



BEFORE

Note Peaked Loads, Sharp Lines, Steep Angle of Repose and other irregular surfaces which are susceptible to erosion



AFTER

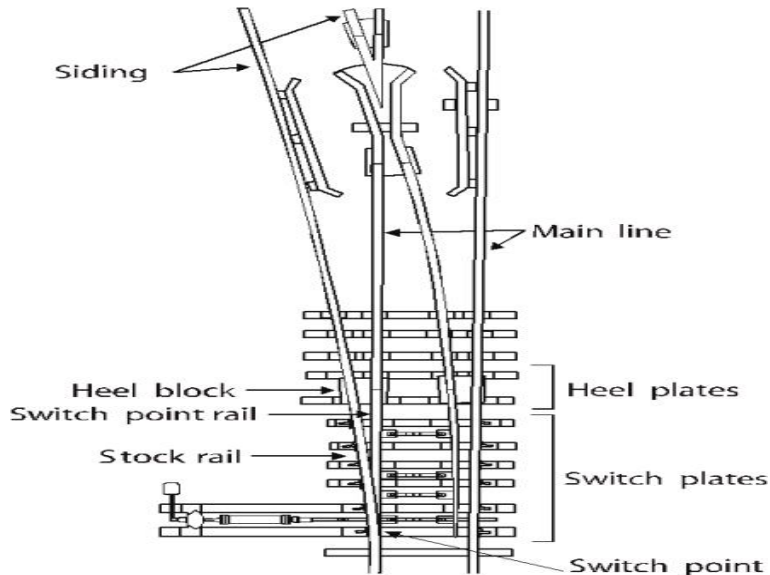
Note Rounded Contour, No Sharp Angles, Flatter Angle of Repose and few irregular surfaces which are susceptible to erosion

Ballast Maintenance: Undercutting

- **2005: Late August – November**
 - 72 track miles of undercutting
 - 11 Bridges Rehabilitated
- **2006:**
 - Undercut 91 track miles
 - Surface 270 miles (Orin & Reno)
 - Shoulder Ballast Clean – 76 Track Miles
 - 3 Bridges Rehabilitated



Turnout Rehabilitation



Existing turnout rehab

2005: 56 turnouts rehabilitated

2006: 28 turnouts rehabilitated

ICS Technology at 2 locations

Process

Turnout removed from track in one piece

Defective ties & Switch components replaced if needed

Fouled ballast removed from location

Fresh ballast placed

Turnout moved back to original location

Additional ballast placed, turnout surfaced

Duration: 12 hours (maximum)



Next Steps

- **Continue with Committee Action Items**
- **Measure Benefits from Modified Chutes**
- **Analyze Results from Topper Agent Stress Testing**
- **Elimination of Older Steel, Bottom Dump Rail Cars**
- **Continue Updates to NCTA Membership, Mines, Utilities & Railroads**