



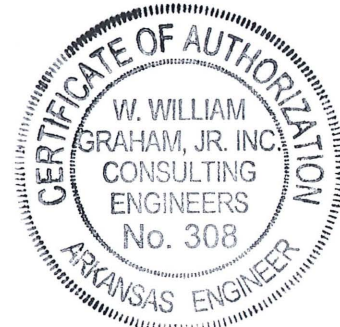
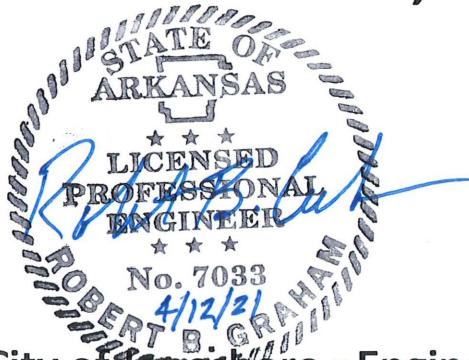
# Specifications

For

## *Craighead Technology Park* *Industrial Lead Rail Expansion* *Project-Section II*

(Bid #2021:21)

Jonesboro, Arkansas



City of Jonesboro ■ Engineering Department

## **ADDENDUM No. 1**

### **Craighead Technology Park Industrial Lead Rail Expansion Project City of Jonesboro, Arkansas (BID 2021:21)**

April 9, 2021

#### **1. Section II – Track Construction: Schedule of Work**

The existing #9 main turnout for the Post Foods Lead (0+00) shall not be removed and have tracks realigned until at least one of the new proposed double-ended sidings is in service. Once the Post Foods rail service is switched to the East side, the Railroad will need the double-ended siding for a runaround in order to serve the Post Foods Facility.

#### **2. Contract Clarification**

It is not necessary to bid on both Section I & II of the Bid Proposal to be considered for the Project. A bidder can choose to submit bids for only Section I, only Section II, or both Section I & II. The City will award separate contracts for the lowest bidders for Section I and for Section II.

#### **3. Questions from Bidders**

Any prospective bidders that have questions about the Project shall submit the questions to Robert Graham at the following email: [wwg\\_eng@swbell.net](mailto:wwg_eng@swbell.net)

All questions shall be submitted up to 48 hours from the bid opening event.

#### **4. Section II – Alternate Rail Sections**

For any Alternate Rail Sections to be considered, the bidders must have written approval from the Project Engineer. There will be no approvals granted within 48 hours of the bid opening event. Any Alternate Rail Sections to be considered must be certified New Condition, or No.1 Relay (min.), and be a common rail section to the region.

## **ADDENDUM No. 2**

### **Craighead Technology Park Industrial Lead Rail Expansion Project City of Jonesboro, Arkansas (BID 2021:21)**

April 26, 2021

#### **1. General Information**

The successful Contractors for Section I and Section II will be required to supply the Owner with Insurance Certificates for the related Contracts. The Contractors will be required to show Post Foods, Inc. as an “also insured” on all Insurance Certificates.

### **ADDENDUM No. 3**

**Craighead Technology Park Industrial Lead Rail Expansion Project  
City of Jonesboro, Arkansas  
(BID 2021:21)**

April 27, 2021

#### **1. II – INSTRUCTION TO BIDDERS: 1. Preparation of Bid**

The following sentence “*The Bid Form and Unit Price Schedule shall not be detached, but shall be submitted in the original binding as furnished by the Engineer.*” (3<sup>rd</sup> paragraph, 1<sup>st</sup> sentence) shall be revised to read as follows:

“The bid forms from Section III (Bid Proposal for Unit Price), Section IV (Bid Bond, Buy America Certification, Suspension and Debarment), and Section V (Statement of Bidder’s Qualifications) shall be filled out completely by the Contractor. These completed forms shall be included in the sealed bid submittal.”



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## I. ADVERTISEMENT FOR BIDS

Sealed bids for the Craighead Technology Park Industrial Lead Rail Expansion Project will be received at the Purchasing Department, Room 421, of the City of Jonesboro City Hall, 300 South Church, Jonesboro, Arkansas until 2:00 P.M. (Local Time) on Thursday, May 6 and then publicly opened and read in the First Floor Conference Room for furnishing all labor, material, and equipment, and all work required to furnish and construct the industrial rail spur expansion complete. All Submissions shall be annotated on the outside of the envelope with the bid number 2021:21.

The Project consists of the site preparation, drainage, excavation (approximately 16,500 CY) and construction of subgrade for the railroad expansion, and the railroad track materials and construction (approximately 7,200 TF).

Proposals shall be accompanied by a cashier's or certified check upon a national or state bank in an amount not less than five percent (5%) of the total maximum bid price payable without recourse to the City of Jonesboro or a bid bond in the same amount from a reliable surety company, as a guarantee that the Bidder will enter into a contract and execute performance and payment bonds within ten (10) days after notice of award of Contract to him. The notice of award of Contract shall be given by the Owner within sixty (60) days following the opening of bids.

The successful Bidder must furnish a performance and payment bond upon the form provided in the amount of one hundred percent (100%) of the contract price from an approved surety company holding a permit from the State of Arkansas to act as surety, or other surety or sureties acceptable to the Owner.

The attention of bidders is called to the fact that no contractor's license is required to submit a bid, but successful bidder must be licensed prior to entering into a contract with the City for the project.

Plans, specifications, proposal forms and other contract documents may be examined at City of Jonesboro Engineering Department, 300 South Church Street, Jonesboro, Arkansas 72401 and may be secured at the cost of printing per set from the Jonesboro Blueprint, 222 Madison Street, Jonesboro, Arkansas 72401, ph. (870)932-4349. No partial sets will be issued. No refunds will be made. Any addendum to this bid will be posted no later than 7 days before bid opening by clicking on "Purchasing" at [www.jonesboro.org](http://www.jonesboro.org).

Proposals will be considered on the basis of cost, the bidder's financial responsibility, his equipment, and his past performance in completing similar work. The City of Jonesboro reserves the right to reject any or all bids, to waive any informalities, and to accept the proposal deemed to be for their best interest.

The City of Jonesboro hereby notifies all bidders that this contract is subject to applicable labor laws, non-discrimination provisions, wage rate laws and other federal laws including the Fair Labor Standards Acts of 1938. The Work Hours Act of 1962 and Title VI of the Civil Rights Act of 1964 also apply.

The City of Jonesboro encourages participation of small, minority, and woman owned business enterprises in the procurement of goods, services, and construction, either as a general contractor or subcontractor. It is further requested that whenever possible, majority contractors who require sub-contractors seek qualified small, minority, and women owned businesses to partner with them.

## II. INSTRUCTION TO BIDDERS

### **1. PREPARATION OF BID**

Each bid must be submitted on the prescribed form (Proposal) and Unit Price Schedule. All blank spaces must be filled in legibly with ink or typed. All blank spaces for bid prices on the Unit Price Schedule must be filled in with figures; the extended total for each item shall be entered. If the unit price and the extended total of any item are not in agreement, the unit price shall govern and the extended total be corrected to conform thereto. Erasures or other corrections on the Proposal form or Unit Price Schedule shall be initialed by the signer of the bid. All bids must be signed in ink by an individual authorized to bind the Bidder. All bids must be regular in every respect and no interlineations, excisions or special conditions shall be made or included in the Proposal by the Bidder. Total Base Bid will equal Invoice Price.

There must be a bid on all items which may appear on the Unit Price Schedule. No bid will be considered which covers only a part of the work. A conditional bid will not be considered.

The bid form and Unit Price Schedule shall not be detached, but shall be **submitted in the original binding** as furnished by the Engineer. Submission must be at the place, and at or prior to the time specified in the Advertisement for Bids.

The Anti-Collusion and Debarment Certification in Section IV must be executed and submitted with the bids at the time proposals are submitted.

"Buy America" provisions apply to this project in accordance with standard provisions of the F.R.A. Buy America requirements of 49 U.S.C. Section 22905(a) and associated sections (see Sec IV).

Each bid must be submitted in a sealed envelope clearly marked on the outside that it contains a bid for the Craighead Technology Park Industrial Lead Rail Expansion Project, Bid Number 2021:21 and with the hour and date of bid opening shown thereon. The name and address of the Bidder shall appear in the upper left hand corner of the envelope. If forwarded by mail, the sealed envelope containing the bid must be enclosed in another envelope properly addressed as noted in the NOTICE TO CONTRACTORS.

A bid which obviously is unbalanced may be rejected.

### **2. INTERPRETATIONS AND ADDENDA**

No oral interpretation will be made to any Bidder as to the meaning of the Contract Documents or any part thereof. Every request for such an interpretation shall be made in writing to the City of Jonesboro Engineering Department. Any inquiry received up to seven (7) days prior to the opening of bids will be given consideration. Every interpretation made to a Bidder will be in the form of an Addendum to the contract Documents. All such Addenda shall become part of the Contract and all Bidders shall be bound by such Addenda, whether or not received by the Bidders.

### **3. INSPECTION OF SITE**

Each Bidder shall visit the site of the proposed work and fully acquaint himself with the existing conditions there relating to construction and labor, and shall fully inform himself as to the facilities involved, and the difficulties and restrictions attending the performance of the Contract. The Bidder shall thoroughly examine and familiarize himself with the Plans, Technical Specifications, and other Contract Documents. The Contractor by the execution of the Contract shall not be relieved of any obligation under it due to his failure to receive or examine any form or legal instrument or to visit the site and acquaint himself with the conditions there existing. The Owner will be justified in rejecting any claim based on facts regarding which the contractor should have been on notice as a result thereof.

### **4. BID GUARANTY**

The bids must be accompanied by a Bid Guaranty which shall not be less than five percent (5%) of the amount of the bid. At the option of the Bidder, the guaranty may be a certified check, or may be a bid bond (substantially in the form attached). No bid will be considered unless it is accompanied by the required guaranty. Certified check must be payable to the City of Jonesboro, Arkansas. Cash deposits will not be accepted. The Bid Guaranty shall insure the execution of the Contract and the furnishing of the surety bond or bonds by the successful Bidder, all as required by the Contract Documents.

Certified checks, or bid bonds, of unsuccessful Bidders, will be returned upon request as soon as feasible after the opening of the bids.

### **5. COLLUSION; SUBCONTRACTS**

A Bidder submitting a Proposal to the Owner for the work contemplated by the Documents on which bidding is based shall not collude with any other person, firm, or corporation in regard to any bid submitted.

Before executing any subcontract, the successful Bidder shall submit the name of any proposed Subcontractor for prior approval of the Owner.

### **6. STATEMENT OF BIDDER'S QUALIFICATIONS**

Each Bidder shall submit on the form furnished for that purpose (a copy of which is included in the Contract Documents), a statement of the Bidder's qualifications, his experience record in construction of work similar to that which here is involved, and his organization and equipment available for the work contemplated; and when specifically requested by the Owner, the Bidder shall provide a detailed financial statement. The Owner shall have the right to take such steps as it deems necessary to determine the ability of the Bidder to perform his obligations under the Contract, and the Bidder shall furnish the Owner all such information and data for this purpose as it may request. The right is reserved to reject any bid where an investigation of the available evidence or information does not satisfy the Owner that the Bidder is qualified to carry out properly the terms of the Contract.

## **7. BALANCED BIDS; VARIATIONS IN QUANTITIES**

The lump sum price and unit price for each of the several items in the Proposal of each Bidder shall be balanced and shall include its pro rata share of overhead.

The Owner shall have the right to increase or decrease the extent of the work or to change the location, gradient, or the dimensions of any part of the work, provided that the length of the improvement is not increased or decreased in excess of 25% of the contract length, or that the quantities of work to be done or the materials to be furnished are not increased or decreased in money value in excess of 25% of the total Contract. Such changes shall not be considered as a waiver of any conditions of the Contract nor invalidate any of the provisions thereof. The Contractor shall perform the work as increased or decreased within the qualifying limits named and no allowance will be made for anticipated profits on increases or decreases so incurred.

Increases or decreases in items of work, and the cost thereof, shall be done in accordance with the Section entitled, CHANGES IN THE WORK under GENERAL CONDITIONS.

## **8. TIME FOR RECEIVING BIDS**

A bid received prior to the advertised time of opening will be kept securely, and will remain sealed until the time of opening. The officer whose duty it is to open them will decide when the specified time has arrived, and any bid received subsequent to that time will be returned unopened.

## **9. OPENING OF BIDS**

At the time and place fixed for the opening of bids, the Owner first will cause the bid guarantees to be checked as stipulated above. The Owner then will cause the qualified bids to be opened and publicly read aloud, irrespective of any irregularities therein. Bidders and other persons properly interested may be present, in person or by representative.

## **10. WITHDRAWAL OF BIDS**

Bids may be withdrawn on written request if the request is received prior to the time fixed for the opening of bids.

## **11. AWARD OF CONTRACT; REJECTION OF BIDS**

The Contract will be awarded to the responsible Bidder submitting the lowest total bid complying with the conditions of the Notice to Contractors and other parts of these Contract Documents. The Bidder to whom the award is made will be notified at the earliest possible date. The Owner, however, reserves the right to reject any or all bids and to waive any informality in bids received whenever such rejection or waiver is in its interests.

The Owner reserves the right to consider as unqualified to do the work any Bidder who does not habitually perform with his own forces the major portions of such work as is involved in construction of these improvements.

## **12. EXECUTION OF AGREEMENT; PERFORMANCE AND PAYMENT BOND**

Subsequent to the award and within ten (10) days after the prescribed forms are presented for signature, the successful Bidder shall execute and deliver to the Owner a Contract in the form included in the Contract Documents in such number of copies as the Owner may require.

Having satisfied all conditions of award as set forth elsewhere in these Documents, the successful Bidder shall, within the period specified above, furnish a surety bond in a penal sum not less than the amount of the Contract as awarded, as security for the faithful performance of the Contract, and for the payment of all persons, firms or corporations to whom the Contractor may become legally indebted for labor, materials, tools, equipment, or services of any nature, including utility and transportation services employed or used by him in performing the work. Such bond shall be as included in the Contract Documents and shall bear the same date as, or a date subsequent to, that of the Contract. The current power of attorney for the person who signs for any surety company shall be attached to such bond.

The failure of the successful Bidder to execute such Contract and to supply the required bond or bonds within ten (10) days after the prescribed forms are presented for signature, or within such extended period as the Owner may grant, based upon reasons determined insufficient by the Owner, shall constitute a default, and the Owner may either award the Contract to the next lowest responsible Bidder or re-advertise for bids.

## **13. BONDS AND INSURANCE**

Attention of Bidders is called to Act 82 of the 1935 Acts of the Arkansas General Assembly, which has certain requirements pertaining to performance bonds, labor bonds, employer's liability insurance, public liability insurance, workmen's collective insurance, and property damage insurance.

All companies furnishing bid bonds and performance bonds shall furnish evidence of being on the U.S. Treasury Department's most current list (Circular 570, as amended) and be authorized to transact business in the State of Arkansas.

## **14. LEGAL QUALIFICATIONS**

The successful Bidder, if a corporation created under the laws of a state other than the State of Arkansas, will be required to qualify, or to have qualified, with the Secretary of State of Arkansas to do business in the State of Arkansas.

## **15. MODIFICATION OF BID**

No modification of any bid already submitted will be considered unless such modification is received prior to the time set for opening of bids.

## **16. SURVEY CONSTRUCTION CONTROLS**

CONSTRUCTION SURVEY STAKING TO BE PROVIDED BY CONTRACTORS.

### III. BID PROPOSAL FOR UNIT PRICES

#### Bid Proposal for Unit Price "Line Item" Contract

City of Jonesboro, Arkansas (City/County), Arkansas

Proposed Industrial Park Rail Spur Expansion Type of Project

Craighead Technology Park in the City of Jonesboro, Arkansas Location of Project

Bid # 2021:21 F.R.A. Project Number

As bidder, Trac-Work, Inc. (Insert name of corporation, partnership or individual), in accordance with your invitation for bids for the construction of the above-identified project, having examined all contract documents and the site of the proposed work, and being familiar with all of the conditions surrounding the construction of the proposed project including the availability of materials and labor, hereby proposes to furnish all labor, materials, and supplies, and to construct the project in accordance with the contract documents, within the time set forth therein, and at the prices as stated below. These prices are to cover all expenses incurred in performing the work required under the contract documents, of which this proposal is a part.

**TO: CITY OF JONESBORO**  
**Attn: Mayor Harold Copenhaver**  
**c/o City of Jonesboro**  
**300 S. Church Street**  
**Jonesboro, AR 72401**

Gentlemen:

The undersigned do hereby declare:

1. That they have been regularly engaged in contract work of the class required by the drawings, specifications, and contract for 53 years, and respectfully invites your attention to the following similar improvements that have been constructed by them.



Place

Character of Work

Year

Owner

See Attachments

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2. That they have carefully examined the nature and the location of the work, the contract and specifications governing the same and hereby agree to complete the work covered in this proposal in strict conformity with all documents appended.

3. That they understand that a bid can be placed on an individual Section, or on both Sections. A low bidder will be chosen for each Section I and Section II, which could be the same bidder or two separate bidders.

4. That they have examined and familiarized themselves with the laws of Arkansas governing work of this class and safeguarding the public construction will conform to such laws.

5. That if awarded a contract, to commence the work within 10 days of receipt of the Notice to Proceed from the Owner and to fully complete it on or before the expiration of \_\_\_\_\*\_\_\_\_ days after the date of the Notice to Proceed. The bidder further agrees to pay as liquidated damaged, the sum of \$\_\_\_\_\*\*\_\_\_\_ for each consecutive calendar day thereafter as provided in the General Conditions.

\*Section I - 110 Days; \*\*\$ 300.00/day

\*Section II - 90 Days; \*\*\$ 500.00/day

6. That if awarded a contract, to furnish the Owner within ten days of the date of the award, an approved Performance Bond and Payment Bond in the amount of 100% of the contract with an approved surety company authorized to do business in Arkansas, which bonds shall particularly provide for the performance of the contractor and payment of all material and labor claims arising from the work. In addition, that in order to comply fully with the statutes of the State of Arkansas, the originals of the Performance Bond and Payment Bond will be filed with the Circuit Clerk of Craighead County by the Owner.

7. That the undersigned also acknowledges receipt and inclusion in this proposal of the following addendum or addenda:

#1, #2 & #3

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8. That the undersigned does hereby offer to perform the whole of the work and to furnish all appurtenances, labor tools, machinery and equipment necessary for the work contemplated under these contracts in accordance with the specifications for roadbed and industrial spur tracks contained herein, as applicable, for the following unit prices and lump sum prices:

**INDUSTRIAL PARK RAIL EXPANSION (Post Foods Area) – SECTION I/SUBGRADE WORK**

<u>Item No.</u>	<u>Description of Item</u>	<u>Approx. Quantity</u>	<u>Unit</u>	<u>Unit Price</u>	<u>Amount</u>
1.	Clearing and Grubbing	2.25	Ac.		
			Dollars	(\$ 0 )	\$ 0
2.	Erosion & Sediment Control	100%	LS		
			Dollars	(\$ 0 )	\$ 0
3.	Unclassified Excavation	1,950	CY		
			Dollars	(\$ 0 )	\$ 0
4.	Compacted Embankment	750	CY		
			Dollars	(\$ 0 )	\$ 0
5.	Geo-Tech Fabric/Geo-Grid System	7,125	SY		
			Dollars	(\$ 0 )	\$ 0
6.	Compacted Sub-ballast	2,375	CY		
			Dollars	(\$ 0 )	\$ 0
7.	Drainage Structures				
	a.) Relocate Existing (2)-12" RCP Pipes w/ Rip-Rap Protection	100%	LS		
			Dollars	(\$ 0 )	\$ 0
8.	Project Signs	100%	LS		
			Dollars	(\$ 0 )	\$ 0
9.	Payment & Performance Bond	100%	LS		
			Dollars	(\$ 0 )	\$ 0

**SECTION I SUB-GRADE WORK (Post Foods Area)      SUBTOTAL \$ 0**

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**INDUSTRIAL PARK RAIL EXPANSION (Post Foods Area) – SECTION II/TRACK CONSTRUCTION**

<u>Item No.</u>	<u>Description of Item</u>	<u>Approx. Quantity</u>	<u>Unit</u>	<u>Unit Price</u>	<u>Amount</u>
1.	115# No.1 Relay (min.) Rail, Ties, Ballast & Incidentals	2,795	LF		
			Dollars	(\$ 121.11 )	\$ 338,502.45 ✓
2.	Salvage/Reinstall Ex. Rail, Ties, inc. w/ 25% Tie Replacement, complete	730	LF		
			Dollars	(\$ 30.15 )	\$ 22,009.50 ✓
3.	Realign Ex. Rail, Ties, inc.. w/ 25% Tie Replacement, complete	250	LF		
			Dollars	(\$ 30.15 )	\$ 7,537.50 ✓
4.	Turnouts				
	a.) #11 Mainline T.O. (136#, HT) BNSF Rails, Ties, Ballasts & Inc. complete	1	Ea.		
			Dollars	(\$65,649.98 )	\$ 65,649.98 ✓
	b.) #11 Industrial Grade T.O. (115#, HT) Rails, Ties, Ballasts & Incidentals	1	Ea.		
			Dollars	(\$ 61,918.38 )	\$ 61,918.38 ✓
	c.) #9 Industrial Grade T.O. (115#, HT) Rails, Ties, Ballasts & Incidentals	1	Ea.		
			Dollars	(\$ 49,533.24 )	\$ 49,533.24 ✓
	d.) #7 Industrial Grade T.O. (115#, HT) Rails, Ties, Ballasts & Incidentals	2	Ea.		
			Dollars	(\$ 49,533.24 )	\$ 99,066.48 ✓
	e.) Salvage Existing #9 Ind Grade T.O. Incl. Rails, Ties, & Incidentals	2	Ea.		
			Dollars	(\$ 5,449.51 )	\$ 10,899.02 ✓
5.	Single Switch Point Derail complete (BNSF Specs)	1	Ea.		
			Dollars	(\$ 12,867.21 )	\$ 12,867.21 ✓

6.	EOT Device (Steel Bumping Post w/ Shockfree Head)	100%	LS		
				Dollars	(\$ 7,124.68 )\$ 7,124.68 ✓
7.	Payment & Performance Bond	100%	LS		
				Dollars	(\$ 7,500.00 )\$ 7,500.00 ✓
8	In-plant Grade Crossing (ASPHALT)	120	LF		
				Dollars	(\$ 97.95 )\$ 11,754.00 ✓

**SECTION II TRACK CONSTRUCTION (Post Foods Area) SUBTOTAL \$ 694,362.44 ✓**

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**INDUSTRIAL PARK RAIL EXPANSION (Nestle Rd. Area) – SECTION I/SUBGRADE WORK**

<u>Item No.</u>	<u>Description of Item</u>	<u>Approx. Quantity</u>	<u>Unit</u>	<u>Unit Price</u>	<u>Amount</u>
1.	Clearing and Grubbing	6.1	Ac.		
			Dollars	(\$ 0 )	\$ 0
2.	Erosion & Sediment Control	100%	LS		
			Dollars	(\$ 0 )	\$ 0
3.	Unclassified Excavation (Incl. Entrance drive & West Ditch)	10,745	CY		
			Dollars	(\$ 0 )	\$ 0
4.	Compacted Embankment (Incl. Entrance & Access drives)	2,845	CY		
			Dollars	(\$ 0 )	\$ 0
5.	Geo-Tech Fabric/Geo-Grid System (Incl. Entrance & Access drives)	20,800	SY		
			Dollars	(\$ 0 )	\$ 0
6.	Compacted Sub-ballast (Incl. Entrance & Access drives)	7,310	CY		
			Dollars	(\$ 0 )	\$ 0
7.	Drainage Structures				
	a.) 15" CMP Pipe w/ Rip-Rap End Protection	35	LF		
			Dollars	(\$ 0 )	\$ 0
	b.) 18" CMP Pipe w/ Rip-Rap End Protection	167	LF		
			Dollars	(\$ 0 )	\$ 0
	a.) 24" CMP Pipe (Extend Ex.) w/ Rip-Rap End Protection	28	LF		
			Dollars	(\$ 0 )	\$ 0

8. Project Signs 100% LS  
Dollars (\$ 0 )\$ 0

9. Payment & Performance Bond 100% LS  
Dollars (\$ 0 )\$ 0

**SECTION I SUB-GRADE WORK (Nestle Rd. Area) SUBTOTAL \$ 0**

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**INDUSTRIAL PARK RAIL EXPANSION (Nestle Rd. Area) – SECTION II/TRACK CONSTRUCTION**

<u>Item No.</u>	<u>Description of Item</u>	<u>Approx. Quantity</u>	<u>Unit</u>	<u>Unit Price</u>	<u>Amount</u>
1.	115# No.1 Relay (min.) Rail, Ties, Ballast & Incidentals	4,402	LF		
			Dollars	(\$ 121.11 )	\$ 533,126.22 ✓
2.	Remove, Salvage Ex. Rail, Ties, etc. Industrial Lead Mainline	250	LF		
			Dollars	(\$ 30.15 )	\$ 7,537.50 ✓
3.	Regrade Ex. Industrial Lead Rail, Ties, Ballast & Inc. complete	448	LF		
			Dollars	(\$ 13.98 )	\$ 6,263.04 ✓
4.	Turnouts				
	a.) #11 Mainline T.O. (136#, HT) Rails, Ties, Ballasts & Inc complete	2	Ea.		
			Dollars	(\$ 65,649.98 )	\$ 131,299.96 ✓
	b.) #9 Industrial Grade (115#, HT) Rails, Ties, Ballasts & Inc complete	2	Ea.		
			Dollars	(\$ 49,533.24 )	\$ 99,066.48 ✓
5.	Single Switch Point Derail Complete (BNSF Specs)	2	Ea.		
			Dollars	(\$ 12,867.21 )	\$ 25,734.42 ✓
6.	EOT Device (2 Track Earthen bumper)	1	Ea.		
			Dollars	(\$ 440.69 )	\$ 440.69 ✓
7.	Payment & Performance Bond	100%	LS		
			Dollars	(\$ 7,500.00 )	\$ 7,500.00 ✓

**SECTION II TRACK CONSTRUCTION (Nestle Rd. Area) SUBTOTAL \$ 810,968.31 ✓**

\* \* \* \* \*

**TOTAL: SECTION I (Post Foods & Nestle Rd Areas) \$** 694,362.44

**TOTAL: SECTION II(Post Foods & Nestle Rd. Areas) \$** 810,968.31  
1,505,330.75

9. The bidder proposes to use the following equipment or material on the construction of TRACK:

A. RAIL  
Supplier's Name: Omaha Track

B. BALLAST  
Supplier's Name: Bradley Contracting

C. SWITCHES  
Manufacturer's or Supplier's Name: Birmingham Rail

D. TIES  
Supplier's Name: Stella Jones

10. The bidder, at his expense, will supply the Owner with Certification of Authenticity certificates that all rails will be Number One relay (min.) according to BNSF RR Standards. The rail may be measured again once shipped to the site. Rail not meeting the standards will be rejected.

11. The bidder proposes to use the following subcontractors to construct a portion of the project:

A. Name: None  
Address: \_\_\_\_\_  
Brief List of Work: \_\_\_\_\_  
Approximate Amount of Subcontract: \$ \_\_\_\_\_

B. Name: None  
Address: \_\_\_\_\_  
Brief List of Work: \_\_\_\_\_  
Approximate Amount of Subcontract \$ \_\_\_\_\_

C. Name: None  
Address: \_\_\_\_\_  
Brief List of Work: \_\_\_\_\_  
Approximate Amount of Subcontract \$ \_\_\_\_\_



12. The contractor receiving the award of contract shall post a Performance and Payment Bonds in the amount of the contract for the Section being bid on.

13. Bidder understands that the Owner reserves the right to reject any or all bids and to waive any informalities in the bidding. The Owner reserves the right to award the contract to the bidder that is deemed to have presented the proposal that is in the best interest of the Owner.

14. The bidder agrees that this bid shall be good and may not be withdrawn for a period of 30 calendar days after the scheduled closing time for receiving bids.

RESPECTFULLY SUBMITTED

Trac-Work, Inc.

By 

Title President

Address 3801 North I-45

Ennis, TX 75119

Arkansas License Number 003507

**IV. BID BOND**

KNOW ALL MEN BY THESE PRESENTS:

THAT we the undersigned, Trac-Work, Inc., as PRINCIPAL, and  
**Fidelity and Deposit Company**  
of Maryland, as SURETY, are held and firmly bound unto the

City of Jonesboro, hereinafter called the OWNER in the penal sum of \_\_\_\_\_

**5% of the Greatest Amount Bid**

(\$5% GAB), lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these Presents.

THE CONDITION OF THIS OBLIGATION IS SUCH THAT WHEREAS, the Principal has submitted the accompanying Proposal, dated May 6, 2021, for the Craighead Technology Park Industrial Lead Rail Expansion Project

NOW, THEREFORE, if the Principal shall not withdraw said Proposal within sixty (60) days after the opening of same, and shall within ten (10) days after the prescribed forms are presented to him for signature, enter into a written Contract with the Owner in accordance with the Proposal as accepted, and give bond with good and sufficient surety or sureties, as may be required, for the faithful performance and proper fulfillment of such Contract, then the above obligation shall be void and of no effect, otherwise to remain in full force and virtue.

IN WITNESS WHEREOF, the above bounded parties have executed this instrument, under their several seals this 6th day of May, 2021, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representatives, pursuant to authority of its governing body.

Trac-Work, Inc.

(Principal)

By Robert m. Favors  
President  
(Title)

Ericka Allen

(Witness)

3801 N. I-45, Ennis, TX 75119

3801 N. I-45, Ennis, TX 75119

(Address)

SEAL

Fidelity and Deposit Company of Maryland

(Corporate Surety)

By \_\_\_\_\_

Debra Lee Moon, Attorney-in-Fact

1299 Zurich Way, 5th Floor  
Schaumburg, IL 60196

(Address)

NOTE: Power-of-attorney for person signing  
for surety company must be attached  
to bond.

**ZURICH AMERICAN INSURANCE COMPANY  
COLONIAL AMERICAN CASUALTY AND SURETY COMPANY  
FIDELITY AND DEPOSIT COMPANY OF MARYLAND  
POWER OF ATTORNEY**

KNOW ALL MEN BY THESE PRESENTS: That the ZURICH AMERICAN INSURANCE COMPANY, a corporation of the State of New York, the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY, a corporation of the State of Illinois, and the FIDELITY AND DEPOSIT COMPANY OF MARYLAND a corporation of the State of Illinois (herein collectively called the "Companies"), by **Robert D. Murray, Vice President**, in pursuance of authority granted by Article V, Section 8, of the By-Laws of said Companies, which are set forth on the reverse side hereof and are hereby certified to be in full force and effect on the date hereof, do hereby nominate, constitute, and appoint **Sammy Joe MULLIS, JR., Suzanne Elizabeth NIEDZWIEDZ, John William NEWBY, Joshua D. TRITT, Sandra Lee RONEY, Debra Lee MOON, Andrea Rose CRAWFORD, Troy Russell KEY, Cheri Lynn IRBY of Addison, Texas, EACH**, its true and lawful agent and Attorney-in-Fact, to make, execute, seal and deliver, for, and on its behalf as surety, and as its act and deed: **any and all bonds and undertakings**, and the execution of such bonds or undertakings in pursuance of these presents, shall be as binding upon said Companies, as fully and amply, to all intents and purposes, as if they had been duly executed and acknowledged by the regularly elected officers of the ZURICH AMERICAN INSURANCE COMPANY at its office in New York, New York., the regularly elected officers of the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY at its office in Owings Mills, Maryland., and the regularly elected officers of the FIDELITY AND DEPOSIT COMPANY OF MARYLAND at its office in Owings Mills, Maryland., in their own proper persons.

The said Vice President does hereby certify that the extract set forth on the reverse side hereof is a true copy of Article V, Section 8, of the By-Laws of said Companies, and is now in force.

IN WITNESS WHEREOF, the said Vice-President has hereunto subscribed his/her names and affixed the Corporate Seals of the said **ZURICH AMERICAN INSURANCE COMPANY, COLONIAL AMERICAN CASUALTY AND SURETY COMPANY, and FIDELITY AND DEPOSIT COMPANY OF MARYLAND**, this 19th day of February, A.D. 2021.



**ATTEST:**  
**ZURICH AMERICAN INSURANCE COMPANY  
COLONIAL AMERICAN CASUALTY AND SURETY COMPANY  
FIDELITY AND DEPOSIT COMPANY OF MARYLAND**

By: *Robert D. Murray*  
Vice President

By: *Dawn E. Brown*  
Secretary

**State of Maryland  
County of Baltimore**

On this 19th day of February, A.D. 2021, before the subscriber, a Notary Public of the State of Maryland, duly commissioned and qualified, **Robert D. Murray, Vice President and Dawn E. Brown, Secretary** of the Companies, to me personally known to be the individuals and officers described in and who executed the preceding instrument, and acknowledged the execution of same, and being by me duly sworn, depose and saith, that he/she is the said officer of the Company aforesaid, and that the seals affixed to the preceding instrument are the Corporate Seals of said Companies, and that the said Corporate Seals and the signature as such officer were duly affixed and subscribed to the said instrument by the authority and direction of the said Corporations.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my Official Seal the day and year first above written.



Constance A. Dunn, Notary Public  
My Commission Expires: July 9, 2023

**Authenticity of this bond can be confirmed at [bondvalidator.zurichna.com](http://bondvalidator.zurichna.com) or 410-559-8790**

## EXTRACT FROM BY-LAWS OF THE COMPANIES

"Article V, Section 8, Attorneys-in-Fact. The Chief Executive Officer, the President, or any Executive Vice President or Vice President may, by written instrument under the attested corporate seal, appoint attorneys-in-fact with authority to execute bonds, policies, recognizances, stipulations, undertakings, or other like instruments on behalf of the Company, and may authorize any officer or any such attorney-in-fact to affix the corporate seal thereto; and may with or without cause modify or revoke any such appointment or authority at any time."

### CERTIFICATE

I, the undersigned, Vice President of the ZURICH AMERICAN INSURANCE COMPANY, the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY, and the FIDELITY AND DEPOSIT COMPANY OF MARYLAND, do hereby certify that the foregoing Power of Attorney is still in full force and effect on the date of this certificate; and I do further certify that Article V, Section 8, of the By- Laws of the Companies is still in force.

This Power of Attorney and Certificate may be signed by facsimile under and by authority of the following resolution of the Board of Directors of the ZURICH AMERICAN INSURANCE COMPANY at a meeting duly called and held on the 15th day of December 1998.

RESOLVED: "That the signature of the President or a Vice President and the attesting signature of a Secretary or an Assistant Secretary and the Seal of the Company may be affixed by facsimile on any Power of Attorney...Any such Power or any certificate thereof bearing such facsimile signature and seal shall be valid and binding on the Company."

This Power of Attorney and Certificate may be signed by facsimile under and by authority of the following resolution of the Board of Directors of the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY at a meeting duly called and held on the 5th day of May, 1994, and the following resolution of the Board of Directors of the FIDELITY AND DEPOSIT COMPANY OF MARYLAND at a meeting duly called and held on the 10th day of May, 1990.

RESOLVED: "That the facsimile or mechanically reproduced seal of the company and facsimile or mechanically reproduced signature of any Vice-President, Secretary, or Assistant Secretary of the Company, whether made heretofore or hereafter, wherever appearing upon a certified copy of any power of attorney issued by the Company, shall be valid and binding upon the Company with the same force and effect as though manually affixed.

IN TESTIMONY WHEREOF, I have hereunto subscribed my name and affixed the corporate seals of the said Companies,  
this 6th day of May, 2021.



*Brian M. Hodges*

By: Brian M. Hodges  
Vice President

**TO REPORT A CLAIM WITH REGARD TO A SURETY BOND, PLEASE SUBMIT A COMPLETE DESCRIPTION OF THE CLAIM INCLUDING THE PRINCIPAL ON THE BOND, THE BOND NUMBER, AND YOUR CONTACT INFORMATION TO:**

Zurich Surety Claims  
1299 Zurich Way  
Schaumburg, IL 60196-1056  
[www.reportsfclaims@zurichna.com](mailto:www.reportsfclaims@zurichna.com)  
800-626-4577



## Texas Important Notice

### IMPORTANT NOTICE

To obtain information or make a complaint:

You may call Zurich North America's toll-free telephone number for information or to make a complaint at:

**1-800-382-2150**

You may contact the Texas Department of Insurance to obtain information on companies, coverages, rights, or complaints at:

**1-800-252-3439**

You may write the Texas Department of Insurance:

P.O. Box 149104

Austin, TX 78714-9104

Fax: (512) 490-1007

Web: [www.tdi.texas.gov](http://www.tdi.texas.gov)

E-mail: [ConsumerProtection@tdi.texas.gov](mailto:ConsumerProtection@tdi.texas.gov)

### PREMIUM OR CLAIM DISPUTES:

Should you have a dispute concerning your premium or about a claim, you should contact the company first. If the dispute is not resolved, you may contact the Texas Department of Insurance.

### ATTACH THIS NOTICE TO YOUR POLICY:

This notice is for information only and does not become a part or condition of the attached document.

### AVISO IMPORTANTE

Para obtener información o para presentar una queja:

Usted puede llamar al número de teléfono gratuito de Zurich North America's para obtener información o para presentar una queja al:

**1-800-382-2150**

Usted puede comunicarse con el Departamento de Seguros de Texas para obtener información sobre compañías, coberturas, derechos, o quejas al:

**1-800-252-3439**

Usted puede escribir al Departamento de Seguros de Texas a:

P.O. Box 149104

Austin, TX 78714-9104

Fax: (512) 490-1007

Sitio web: [www.tdi.texas.gov](http://www.tdi.texas.gov)

E-mail: [ConsumerProtection@tdi.texas.gov](mailto:ConsumerProtection@tdi.texas.gov)

### DISPUTAS POR PRIMAS DE SEGUROS O RECLAMACIONES:

Si tiene una disputa relacionada con su prima de seguro o con una reclamación, usted debe comunicarse con la compañía primero. Si la disputa no es resuelta, usted puede comunicarse con el Departamento de Seguros de Texas.

**ADJUNTE ESTE AVISO A SU PÓLIZA:** Este aviso es solamente para propósitos informativos y no se convierte en parte o en condición del documento adjunto.

### Buy America Requirements

49 U.S.C. 5323(j)

49 CFR Part 661

**Buy America** - The contractor agrees to comply with 49 U.S.C. 5323(j) and 49 C.F.R. Part 661, which provide that Federal funds may not be obligated unless steel, iron, and manufactured products used in FTA-funded projects are produced in the United States, unless a waiver has been granted by FTA or the product is subject to a general waiver. General waivers are listed in 49 C.F.R. 661.7, and include final assembly in the United States for 15 passenger vans and 15 passenger wagons produced by Chrysler Corporation, and microcomputer equipment and software. Separate requirements for rolling stock are set out at 49 U.S.C. 5323(j)(2)(C) and 49 C.F.R. 661.11. Rolling stock must be assembled in the United States and have a 60 percent domestic content. A bidder must submit to the FTA recipient the appropriate Buy America certification (below) with all bids or offers on FTA-funded contracts, except those subject to a general waiver. Bids or offers that are not accompanied by a completed Buy America certification must be rejected as nonresponsive. This requirement does not apply to lower tier subcontractors.

#### **Certification requirement for procurement of steel, iron, or manufactured products.**

##### *- Certificate of Compliance with 49 U.S.C. 5323(j)(1)*

The bidder or offeror hereby certifies that it will meet the requirements of 49 U.S.C. 5323(j)(1) and the applicable regulations in 49 CFR Part 661.5.

Date 5-6-21

Signature [Signature]

Company Name Trac-Work, Inc

Title Area Manager

##### *- Certificate of Non-Compliance with 49 U.S.C. 5323(j)(1)*

The bidder or offeror hereby certifies that it cannot comply with the requirements of 49 U.S.C. 5323(j)(1) and 49 C.F.R. 661.5, but it may qualify for an exception pursuant to 49 U.S.C. 5323(j)(2)(A), 5323(j)(2)(B), or 5323(j)(2)(D), and 49 C.F.R. 661.7.

Date \_\_\_\_\_

Signature \_\_\_\_\_

Company Name \_\_\_\_\_

Title \_\_\_\_\_

#### **Certification requirement for procurement of buses, other rolling stock and associated equipment.**

##### *- Certificate of Compliance with 49 U.S.C. 5323(j)(2)(C).*

The bidder or offeror hereby certifies that it will comply with the requirements of 49 U.S.C. 5323(j)(2)(C) and the regulations at 49 C.F.R. Part 661.11.

Date \_\_\_\_\_

Signature \_\_\_\_\_

Company Name \_\_\_\_\_

Title \_\_\_\_\_

##### *- Certificate of Non-Compliance with 49 U.S.C. 5323(j)(2)(C)*

The bidder or offeror hereby certifies that it cannot comply with the requirements of 49 U.S.C. 5323(j)(2)(C) and 49 C.F.R. 661.11, but may qualify for an exception pursuant to 49 U.S.C. 5323(j)(2)(A), 5323(j)(2)(B), or 5323(j)(2)(D), and 49 C.F.R. 661.7.

Date \_\_\_\_\_

Signature \_\_\_\_\_

Company Name \_\_\_\_\_

Title \_\_\_\_\_

Suspension and Debarment

This contract with the **City of Jonesboro** is a covered transaction for purposes of 49 CFR Part 29. As such, the contractor is required to verify that none of the contractor, its principals, as defined at 49 CFR 29.995, or affiliates, as defined at 49 CFR 29.905, are excluded or disqualified as defined at 49 CFR 29.940 and 29.945.

The contractor is required to comply with 49 CFR 29, Subpart C and must include the requirement to comply with 49 CFR 29, Subpart C in any lower tier covered transaction it enters into.

By signing and submitting its bid or proposal, the bidder or proposer certifies as follows:


The certification in this clause is a material representation of fact relied upon by **the City of Jonesboro**. If it is later determined that the bidder or proposer knowingly rendered an erroneous certification, in addition to remedies available to **the City of Jonesboro**, the Federal Government may pursue available remedies, including but not limited to suspension and/or debarment. The bidder or proposer agrees to comply with the requirements of 49 CFR 29, Subpart C while this offer is valid and throughout the period of any contract that may arise from this offer. The bidder or proposer further agrees to include a provision requiring such compliance in its lower tier covered transactions.

Trac-Work, Inc.

\_\_\_\_\_  
(Name of Bidder/Proposer)

Robert Favors

\_\_\_\_\_  
(Printed Name of Bidder's Agent)

  
\_\_\_\_\_  
(Signature of Bidder's Agent)

President

\_\_\_\_\_  
(Printed Title of Bidder's Agent)

04/28/2021

\_\_\_\_\_  
(Date Executed)



## **V. STATEMENT OF BIDDER'S QUALIFICATIONS**

All questions must be answered and the data given must be clear and comprehensive. This statement must be notarized. If necessary, questions may be answered on separate attached sheets. The Bidder may submit any additional information he desires.

1. Name of Bidder. Trac-Work, Inc.
2. Permanent main office address. 3801 North I-45 Ennis, TX 75119
3. When organized. 08/22/1968
4. If a corporation, where incorporated. Texas
5. How many years have been engaged in the contracting business under your present firm or trade name? 53 years
6. Arkansas Contractor's License Number # 003507
7. DUNS # 04-462-9020
8. System of Award Management (SAM) expiration date 06/25/2021
9. Contracts on hand: (Schedule these, showing amount of each contract and the appropriate anticipated dates of completion). See attached
10. General character of work performed by your company. Railroad track construction
11. Have you ever failed to complete any work awarded to you? No
12. Have you ever defaulted on a Contract? No.  
If so, where and why?
13. Have you ever been fined or had your license suspended by a Contractor's Licensing Board? No.  
If so, where and why?
14. List the more important projects recently completed by your company, stating the approximate cost for each, and the month and year completed. See attached.
15. List your major equipment available for this Contract. See attached.
16. Experience in construction work similar in importance to this project.  
See attached.

17. Background and experience of the principal members of your organization, including the officers.
18. Credit available: \$ 500,000.
19. Give Bank reference: Ennis State Bank.
20. Will you, upon request, fill out a detailed financial statement and furnish any other information that may be required by the Owner? yes
21. The undersigned hereby authorizes and requests any person, firm, or corporation to furnish any information requested by the Owner, in verification of the recitals comprising this statement of Bidder's Qualifications.

Dated at Trac-Work, Inc. this 28th  
day of April, 20 21.

Trac-Work, Inc.  
(Name of Bidder)  
By [Signature]  
Title President

STATE OF Texas )  
 ) SS.  
COUNTY OF Ellis )

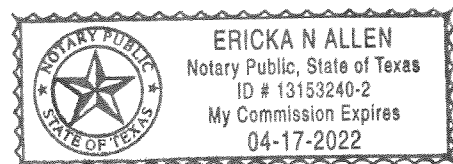
Robert Favors being duly sworn deposes and says that  
he is President of Trac-Work, Inc.  
(Name of Organization)

and that the answers to the foregoing questions and all statements therein contained are true and correct.

SUBSCRIBED AND SWORN TO BEFORE ME this 28th day of April, 20 21.

Ericka N. Allen  
(Notary Public)

My Commission Expires:  
4-17-2022



EQUIPMENT LIST – TRAC-WORK, INC.

6700 TAMPER – 3  
900 TAMPER - 13  
AIR COMPRESSOR – 11  
BACKHOE – 7  
BALLAST REGULATOR – 4  
BOLT MACHINE – 1  
FORKLIFT – 14  
GENERATOR – 10  
HAND TAMPER – 12  
RAIL DRILL – 47  
RAIL GRINDER – 6  
RAIL SAW – 42  
RAIL STRETCHER/PULLER – 9  
SPIKE PULLER – 5  
SPIKE DRIVER – 41  
TIE CRANE – 1  
WELDER – 11  
IMPACT TOOL – 4

## VII. CONTRACT

THIS AGREEMENT made this \_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, by and  
between Trac-Work, Inc.

(a Corporation organized and existing under the laws of the State of Texas)

Hereinafter called the "Contractor" and the City of Jonesboro, Arkansas, hereinafter called the "Owner".

### WITNESSETH:

That the Contractor and the Owner for the consideration stated herein mutually agree as follows:

ARTICLE 1. Statement of Work. The Contractor shall furnish all supervision, technical personnel, labor, materials, machinery, tools, equipment, incidentals and services, including utility and transportation services and perform and complete all work required for the Craighead Technology Park Industrial Lead Rail Expansion Project – Section II Track Construction, in strict accordance with the Contract Documents, including all Addenda thereto

Addendum 1 dated April 9, 2021

Addendum 2 dated April 26, 2021

Addendum 3 dated April 27, 2021

as prepared by the Engineer.

ARTICLE 2. The Contract Price. The Owner will pay the Contractor, because of his performance of the Contract, for the total quantities of work performed at the lump sum and unit prices stipulated in the Proposal, subject to additions and deductions as provided in the Section entitled "CHANGES IN THE WORK" under the GENERAL CONDITIONS.

ARTICLE 3. Contract Time. The Contractor agrees to begin work within ten (10) calendar days after issuance by the Owner of a "Work Order" or "Notice to Proceed" and to complete the work within the time specified in the BID PROPOSAL FOR UNIT PRICES (except as modified in the GENERAL CONDITIONS of these Contract Documents). If the Contractor shall fail to complete the work within the time specified, he and his Surety shall be liable for payment to the Owner, as liquidated damages ascertained and agreed, and not in the nature of a penalty, the amount specified in the SPECIAL CONDITIONS of these Contract Documents for each day of delay. To the extent sufficient in amount, liquidated damages shall be deducted from the payments to be made under this Contract.

ARTICLE 4. Contract. The executed Contract Documents shall consist of the following:

- |                              |                                       |
|------------------------------|---------------------------------------|
| a. This Agreement (Contract) | f. General Conditions                 |
| b. Addenda                   | g. Supplemental General Conditions    |
| c. Advertisement for Bids    | h. Special Conditions                 |
| d. Instructions to Bidders   | i. Technical Specifications including |
| e. Proposal                  | Special Provisions                    |
|                              | j. Drawings (Plans)                   |
|                              | k. Performance-Payment Bond           |

This Contract, together with other Documents enumerated in this Article 4, which said other Documents are as fully a part of the Contract as if hereto attached or herein repeated, form the Contract between the parties hereto. In the event that any provisions in any component part of this Contract conflicts with any provision of any other component part, the conflict shall be resolved by the Engineer whose decision shall be final.

ARTICLE 5. Surety. The Surety on the Performance-Payment Bond shall be a surety company of financial resources satisfactory to the Owner, authorized to do business in the State of Arkansas, and shall comply with applicable Arkansas laws.

IN WITNESS WHEREOF, the parties hereto have caused this CONTRACT to be executed in four (4) counterparts, each of which shall be considered an original on the day and year first above written.

ATTEST:

\_\_\_\_\_  
(Contractor)

\_\_\_\_\_ By \_\_\_\_\_

\_\_\_\_\_ Title \_\_\_\_\_

\_\_\_\_\_  
(Street)

\_\_\_\_\_  
(City)

\_\_\_\_\_  
City of Jonesboro  
(Owner)

\_\_\_\_\_ By \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**VIII. ARKANSAS PERFORMANCE-PAYMENT BOND**

KNOW ALL MEN BY THESE PRESENTS:

THAT WE, \_\_\_\_\_

as Principal, hereinafter called Principal, and \_\_\_\_\_

of \_\_\_\_\_ State of \_\_\_\_\_  
as Surety, hereinafter called the Surety, are held and firmly bound unto the City of Jonesboro as Obligee, hereinafter called Owner, in the amount \_\_\_\_\_  
\_\_\_\_\_ Dollars (\$ \_\_\_\_\_) in lawful money of the United States of America,  
for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, and successors, jointly, severally, and firmly by these presents.

**THE CONDITION OF THIS OBLIGATION IS SUCH THAT:**

WHEREAS, The Principal entered into a Contract with the Owner by written Agreement dated the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, a copy of which is attached hereto and made a part hereof, hereinafter referred to as the Contract, for the Craighead Technology Park Industrial Rail Expansion Project – Section II Track Construction.

NOW THEREFORE, if the Principal shall well and truly perform and complete in good, sufficient, and workmanlike manner all of the work required by said Contract and within the time called for thereby to the satisfaction of the Owner, and shall pay all persons for labor, materials, equipment, and supplies furnished by said Principal in accordance with said Contract (failing which such persons shall have a direct right to action against the Principal and Surety under this obligation, but subject to the Owner's priority) and shall hold and save harmless the Owner from any and all claims, loss, and expense of every kind and nature arising because of or resulting from the Principal's operation under said Contract, except payments to the Principal rightly due the Principal for work under said Contract, then this obligation shall be null and void; otherwise to remain in full force and effect.

Any alterations which may be made in the terms of the Contract, or in the work to be done under it, or the giving by the Owner of an extension of time for the performance of the Contract, or any other forbearance on the part either of the Owner or Principal to the other shall not release in any way the Principal and Surety, or either of them, their heirs, personal representatives, successors, or assigns from their liability hereunder, notice to the Surety of any alteration, extension, or forbearance hereby being waived.

In no event shall the aggregate liability of the Surety exceed the sum set herein.

No suit, action, or proceeding shall be brought on this bond outside the State of Arkansas. No

suit, action, or proceeding shall be brought on this bond, except by the Owner, after six (6) months from the date on which final payment to the Contractor falls due. No suit, action, or proceeding shall be brought by the Owner after two (2) years from the date on which final payment to the Contractor falls due.

This bond is executed pursuant to the terms of Arkansas Code Ann. §§ 18-44-501 et. seq.

Executed on this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

\_\_\_\_\_  
(Principal)

By \_\_\_\_\_

Title \_\_\_\_\_

SEAL

\_\_\_\_\_  
(Surety)

By \_\_\_\_\_  
(Attorney-in-Fact)

NOTES:

1. This bond form is mandatory. No other forms will be acceptable.
2. The date of the Bond must not be prior to the date of the Contract.
3. Any surety executing this Bond must appear on the U.S. Treasury Department's most current list (Circular 570, as amended) and be authorized to transact business in the State of Arkansas.
4. Attach Power of Attorney.



## **VIII. GENERAL CONDITIONS**

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Wherever used in any of the Contract Documents, the following meanings shall be given to the terms herein defined:

(1) The term "Addendum" means any change, revision, or clarification of the Contract Documents which has been duly issued by the Local Public Agency, or the Engineer, to prospective Bidders prior to the time of receiving bids.

(2) The term "Award" means the acceptance by the owner of the successful bidder's proposal.

(3) The term "Bidder" means any individual, partnership, firm, or corporation, acting directly or through a duly authorized representative, who submits a proposal for the work contemplated.

(4) The term "Calendar Day" means every day shown on the calendar.

(5) The term "Change Order" means a written order to the contractor covering changes in the plans, specifications, or proposal quantities and establishing the basis of payment and contract time adjustment, if any, for the scope of work affected by the change. The work covered by the change order shall be within the scope of the contract.

(6) The term "Contract" means the Contract executed by the Local Public Agency and the Contractor of which these GENERAL CONDITIONS form a part.

(7) The term "Contract Documents" means and shall include the following: Executed Contract, Addenda (if any), Advertisement For Bids, Instructions to Bidders, Proposal, Performance-Payment Bond, General Conditions, Supplemental General Conditions, Special Conditions, Supplemental Special Conditions, Technical Specifications, and Drawings.

(8) The term "Contractor" means the person, firm, or corporation entering into the Contract with the Local Public Agency to construct and install the improvements embraced in this project.

(9) The term "Engineer" means the City of Jonesboro Engineering Department, serving the Local Public Agency with engineering services, its successor, or any other person or persons employed by said Local Public Agency to furnish engineering services in connection with the construction embraced in the Contract.

(10) The term "Local Government" means the City of Jonesboro, Arkansas, within which the Project is situated.

(11) The term "Local Public Agency" or "Owner" means the City of Jonesboro, which is authorized to undertake this Contract.

(12) The term "Plans" or "Drawings" means the official drawings or exact reproductions which show the location, character, and details of the work contemplated, and which are to be considered part of the contract, supplementary to the specifications.

(13) The term "Proposal" means the written offer of the Bidder (when submitted on the approved proposal form) to perform the contemplated work and furnish the necessary materials in accordance with the provisions of the Plans and Specifications.

(14) The term "Specifications" means a part of the contract containing the written directions and requirements for completing the contract work. Standards for specifying materials, or testing, which are cited in the specifications by reference shall have the same force and effect as if included in the contract physically.

(15) The term "Subcontractors" shall mean the individual, partnership or corporation entering into an agreement with the Contractor to perform any portion of the work covered by the Plans and Specifications.

(16) The term "Surety" shall mean any person, firm, or corporation that has executed, as Surety, the Contractor's Performance Bond securing the performance of the Contract.

(17) The term "Technical Specifications" means that part of the Contract documents which describes, outlines and stipulates the quality of the materials to be furnished; the quality of workmanship required; and the controlling requirements to be met in carrying out the construction work to be performed under this Contract. This also includes Special Provisions.

(18) The term "Work" shall mean the furnishing of all necessary labor, tools, equipment, appliances, supplies, and material other than materials furnished by the Owner as specified to complete the construction covered by the Plans and Specifications.

## **GC.2 SUPERINTENDENCE BY CONTRACTORS**

Except where the Contractor is an individual and gives his personal superintendence to the work, the Contractor shall provide a competent superintendent, satisfactory to the Local Public Agency and the Engineer, on the work at all times during working hours with full authority to supervise and direct the work and who shall be the Contractor's agent responsible for the faithful discharge of the Contractor's obligations under the Contract.

The Owner shall have the authority to require the Contractor to remove from the work any incompetent or insubordinate superintendent.

### **GC.3 CONTRACTOR'S EMPLOYEES**

The Contractor shall employ only competent skillful workers and shall at all times enforce strict discipline and good order among the employees.

The Contractor shall neither permit nor suffer the introduction or use of alcoholic beverages or controlled substances upon or about the work embraced in this Contract.

The Owner may require the Contractor to dismiss from the work such employee or employees as the Owner or the Engineer may deem incompetent, or careless, or insubordinate.

### **GC.4 SAFETY OF CONTRACTOR'S EMPLOYEES**

The Contractor shall be responsible for the safety of his employees during the progress of the work as well as the safety, efficiency, and adequacy of his plant, appliances, and methods, and for any damage which may result from their failure or their improper construction, maintenance or operation.

### **GC.5 SUBCONTRACTS**

The Contractor is responsible to the Owner for the acts and omissions of his subcontractors and of persons either directly or indirectly employed by the subcontractors and is aware that nothing contained in the Contract Documents shall create any contractual relation between any subcontractor and the Owner.

### **GC.6 OTHER CONTRACTS**

The Local Public Agency may award, or may have awarded other Contracts for additional work, and the Contractor shall cooperate fully with such other Contractors, by scheduling his own work with that to be performed under other Contracts as may be directed by the Local Public Agency. The Contractor shall not commit or permit any act which will interfere with the performance of work by any other Contractor as scheduled.

### **GC.7 CONTRACTOR'S INSURANCE**

Before any work is commenced, the Contractor shall furnish an approved certificate of insurance addressed to the Owner, showing that he carries the following insurance which shall be maintained throughout the term of the Contract.

- |   |                   |
|---|-------------------|
| (1) Workmen's Compensation                  | - Statutory Limit |
| (2) Employer's Liability for Hazardous Work | - If Needed       |

(3) Public Liability (Bodily Injury and Property Damage	- \$1,000,000/occurrence - \$2,000,000/aggregate
(4) Builder's Risk	- Insurable Portion

The Contractor shall carry or require that there be carried the insurance listed in (1) through (3) above for the protection of all his employees and those of his Subcontractors engaged in work under this Contract, and for the protection of the public.

If the work includes pipelines or other underground structures, the Property Damage Liability shall include explosion, collapse, and underground coverage.

The premiums for all insurance and the bond required herein shall be paid by the Contractor.

It shall be the obligation of the Contractor to complete and deliver to the Owner the structure required by these Contract Documents regardless of any loss, damage to, or destruction of the structure prior to delivery.

#### **GC.8 OWNER'S AND ENGINEER'S PROTECTIVE LIABILITY INSURANCE**

The Owner requires the Contractor to name the City of Jonesboro and the Engineer as an additional insured on their Protective Liability insurance, which shall be in force for the entire project period. Limits of liability shall be the following:

Bodily Injury Liability (Including Death) and Physical Damage Liability (Damage to or Destruction of Property)	- \$1,000,000/occurrence - \$2,000,000/aggregate
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#### **GC.9 FITTING AND COORDINATION OF THE WORK**

The Contractor shall be responsible for the proper fitting of all work and for the coordination of the operations of all trades, Subcontractors, or material men engaged upon this Contract. He shall be prepared to guarantee to each of his Subcontractors the locations and measurements which they may require for the fitting of their work to all surrounding work.

#### **GC.10 MUTUAL RESPONSIBILITY OF CONTRACTORS**

If, through acts of neglect or through failure to comply with any applicable Government regulations by the Contractor, any other Contractor or any Subcontractor shall suffer loss or damage on the work, the Contractor shall settle with such other Contractor or Subcontractor by agreement or arbitration, if such other Contractor or Subcontractor will so settle. If such other Contractor or Subcontractor shall assert any claim against the Local Public Agency on account of any damage alleged to have been so sustained,

the Local Public Agency will notify this Contractor, who shall defend at his own expense any suit based upon such claim, and, if any judgments or claims against the Local Public Agency shall be allowed, the Contractor shall pay or satisfy such judgments or claim and pay all costs and expenses in connection therewith.

#### **GC.11 PAYMENT TO CONTRACTOR**

Payment may be made to the Contractor once a month in accordance with the Payment to Contractors Schedule provided at the end of this section. The Engineer will prepare (with the required assistance from the Contractor) the application for partial payment. If the bid contains lump sum prices, the Contractor shall furnish to the Engineer, upon request, a detailed cost breakdown of the several items of work involved in the lump sum prices. The Engineer will use this cost breakdown to determine the amount due the Contractor as progress payment.

The amount of the payment due to the Contractor shall be determined by the total value of work completed to date, deducting five percent (5%) for retainage, adding the value of submitted paid invoices covering construction materials, properly stored on the site, and deducting the amount of all previous payments. The total value of work completed to date shall be based on the estimated quantities of work completed and on the unit and lump sum prices contained in the Proposal. The value of materials properly stored on the site shall be based upon the estimated quantities of such materials and the invoice prices. Copies of paid invoices, covering construction materials for which material payments are made, shall be furnished to the Engineer before such material payments are made.

NOTE: It has been the policy of the Owner to make payments for properly stored materials/equipment based upon invoice price and allow the Contractor to submit paid invoices within 30 days (or the next partial payment period). If paid invoices are not provided within the time allowed, then the materials/equipment so paid for will be removed from the next partial payment.

Monthly or partial payments made by the Owner to the Contractor are monies advanced for the purpose of assisting the Contractor to expedite the work of construction. All material and complete work covered by such monthly or partial payments shall remain the property of the Contractor, and he shall be responsible for the care and protection of all materials and work upon which payments have been made. Such payments shall not constitute a waiver of the right of the Owner to require the fulfillment of all terms of the Contract and the delivery of all improvements embraced in this Contract complete and satisfactory to the Owner in all details.

**GC.11.1 Withholding Payments:** The Local Public Agency may withhold from any payment otherwise due the Contractor so much as may be necessary to protect the Local Public Agency and if it so elects may also withhold any amounts due from the Contractor to any Subcontractors or material dealers, for work performed or material furnished by them. The foregoing provisions shall be construed solely for the benefit of the Local Public Agency and will not require the Local Public Agency to determine or adjust any claims or disputes between the Contractor and his Subcontractors or material dealers, or to

withhold any monies for their protection unless the Local Public Agency elects to do so. The failure or refusal of the Local Public Agency to withhold any monies from the Contractor shall not impair the obligations of any Surety or Sureties under any bond or bonds furnished under this Contract. Such withholding may also occur as a result of the Contractor's failure or refusal to prosecute the work with such diligence as will insure its completion within the time specified in these Contract Documents, or as modified as provided in these Contract Documents, or if the Contractor fails to comply with any applicable regulations promulgated by the U.S. Government or any other Government agencies.

GC.11.2 Final Payment: After final inspection and acceptance by the Local Public Agency of all work under the Contract, the application for final payment shall be prepared which shall be based upon the carefully measured or computed quantity of each item of work at the applicable unit and lump sum prices stipulated in the Unit Price Schedule. The total number of the final payment due the Contractor under this Contract shall be the amount computed as described above less all previous payments. All prior payments shall be subject to correction in the final payment. Final payment to the Contractor shall be made subject to his furnishing the Local Public Agency with a release in satisfactory form of all claims against the Local Public Agency arising under and by virtue of his Contract, other than such claims, if any, as may be specifically excepted by the Contractor from the operation and the release as provided under the section entitled DISPUTES under GENERAL CONDITIONS.

The Local Public Agency, before paying the final estimate, may require the Contractor to furnish releases or receipts from all Subcontractors having performed any work and all persons having supplied materials, equipment (installed on the Project), and services to the Contractor, if the Local Public Agency deems the same necessary in order to protect its interest. The Local Public Agency, however, may, if it deems such action advisable, make payment in part or in full to the Contractor without requiring the furnishing of such releases or receipts and any payments so made shall not impair the obligations of any Surety or Sureties furnished under this Contract.

Withholding of any amount due the Local Public Agency under the section entitled LIQUIDATED DAMAGES FOR DELAY under SPECIAL CONDITIONS, shall be deducted from the payments due the Contractor.

All equipment warranties and general guarantee and maintenance bond provisions shall become effective for one year upon date of final acceptance of the completed, project by the Local Public Agency.

GC.11.3 Payments Subject to Submission of Certificates: Each payment to the Contractor by the Local Public Agency shall be made subject to submission by the Contractor of all written certifications required of him.

<b>PAYMENT TO CONTRACTORS</b> <b>2021 SCHEDULE - CONTRACTED PROJECTS</b>	
<b>City of Jonesboro Payment Schedule</b>	<b>Deadline for Invoice Submittal to Engineering</b>
Friday, January 8, 2021	Tuesday, December 29, 2020
Monday, February 8, 2021	Friday, January 29, 2021
Monday, March 8, 2021	Friday, February 26, 2021
Thursday, April 8, 2021	Monday, March 29, 2021
Monday, May 10, 2021	Friday, April 30, 2021
Tuesday, June 8, 2021	Friday, May 28, 2021
Thursday, July 8, 2021	Monday, June 28, 2021
Monday, August 9, 2021	Friday, July 30, 2021
Wednesday, September 8, 2021	Monday, August 30, 2021
Friday, October 8, 2021	Tuesday, September 28, 2021
Monday, November 8, 2021	Friday, October 29, 2021
Wednesday, December 8, 2021	Monday, November 29, 2021



## **GC.12      USE OF COMPLETED PORTIONS**

The Owner shall have the right to use any completed or partially completed portion of the work and such use shall not be considered as an acceptance of any work.

## **GC.13      CHANGES IN THE WORK**

The Local Public Agency may make changes in the scope of the work required to be performed by the Contractor under the Contract or make additions thereto, or omit work therefrom without invalidating the Contract, and without relieving or releasing the Contractor from any of his obligations under the Contract or any guarantee given by him pursuant to the Contract provisions, and without affecting the validity of the Guaranty Bonds, and without relieving or releasing the Surety or Sureties of said bonds. All such work shall be executed under the terms of the original Contract unless it is expressly provided otherwise.

Except for the purpose of affording protection against any emergency endangering life or property, the Contractor shall make no change in the materials used or in the specified manner of constructing and/or installing the improvements, or supply additional labor, services or materials beyond that actually required for the execution of the Contract, unless in pursuance of a written order from the Local Public Agency authorizing the Contractor to proceed with the change. No claim for an adjustment of the Contract price will be valid unless so ordered.

After the work is complete, a final change order may be prepared to be accepted by the Owner and Contractor to adjust final payment as required to cover the actual units of work acceptably completed.

If the applicable unit prices are contained in the Proposal (established as a result of either a unit price or a Supplemental Schedule of Unit Prices) the Local Public Agency may order the Contractor to proceed with desired changes in the work, the value of such changes to be determined by the measured quantities involved and the applicable unit and lump sum prices specified in the Contract; provided that in case of a unit price Contract the net value of all changes does not increase or decrease the original total amount shown in the Agreement by more than twenty-five (25) percent in accordance with the section entitled BALANCED BID; VARIATION IN QUANTITIES under INSTRUCTIONS TO BIDDERS.

If applicable unit prices are not contained in the Unit Price Schedule as described above or if the total net change increases or decreases the total Contract price more than twenty-five (25) percent, the Local Public Agency shall, before ordering the Contractor to proceed with a desired change, request an itemized Proposal from him covering the work involved in the change after which the procedure shall be as follows:

- (1) If the Proposal is acceptable the Local Public Agency will prepare the Change Order in accordance therewith for acceptance by the Contractor and

(2) If the Proposal is not acceptable and prompt agreement between the two (2) parties cannot be reached, the Local Public Agency may order the Contractor to proceed with the work on a Force Account basis, under which the net cost shall be the sum of the actual costs that follow:

- (A) Labor, including foremen;
- (B) Materials entering permanently into the work;
- (C) The ownership or rental cost of construction plant and equipment during the time of use on the extra work;
- (D) Power and consumable supplies for the operation of power equipment;
- (E) Insurance;
- (F) Social Security and old age and unemployment contributions.

To the net cost shall be added a fixed fee agreed upon, but not to exceed fifteen (15) percent of the net cost, to cover supervision, overhead, bond, and any other general expense, and profit.

Each Change Order shall include in its final form:

- (1) A detailed description of the change in the work.
- (2) The Contractor's Proposal (if any) or a conformed copy thereof.
- (3) A definite statement as to the resulting change in the Contract price and/or time.
- (4) The statement that all work involved in the change shall be performed in accordance with Contract requirements except as modified by the Change Order.

#### **GC.14 CLAIMS FOR EXTRA COST**

If the Contractor claims that any instructions by Drawings or otherwise involve extra cost or extension of time, he shall, within ten (10) days after the receipt of such instructions, and in any event before proceeding to execute the work, submit his protest thereto in writing to the Local Public Agency, stating clearly and in detail the basis of his objections. No such claim will be considered unless so made.

Claims for additional compensation for extra work, due to alleged errors in ground elevations, contour lines, or bench marks, will not be recognized unless accompanied by certified survey data made prior to the time the original ground was disturbed, clearly showing that errors exist which resulted or would

result in handling more material, or performing more work, than would be reasonably estimated from the Drawings and maps issued.

Any discrepancies which may be discovered between actual conditions and those represented by the Drawings and maps shall at once be reported to the Local Public Agency, and work shall not proceed except at the Contractor's risk, until written instructions have been received by him from the Local Public Agency.

If, on the basis of the available evidence, the Local Public Agency determines that an adjustment of the Contract Price and/or Time is justifiable, the procedure shall then be as provided in the Section entitled CHANGES IN THE WORK under GENERAL CONDITIONS.

#### **GC.15      OWNER'S RIGHT TO TERMINATE CONTRACT**

##### Termination for Cause

If the Contractor shall be adjudged as bankrupt or shall file a petition for an arrangement or reorganization under the Bankruptcy Act, or if he should make a general assignment for the benefit of his creditors, or if a receiver should be appointed on account of his insolvency, or if he should persistently or repeatedly refuse or should fail, except under conditions where extension of time is approved, to supply adequate workmen, equipment and material, or disregard laws, ordinances, or the instructions of the Engineer, or otherwise be guilty of a violation of any provisions of the Contract; provided further that if the Contractor at any time fails to comply with any applicable Federal or State regulation which prevents either the Local Public Agency or the Contractor from fulfilling its obligations under these Contract Documents, then the Owner upon certification of the Engineer that sufficient cause exists to justify such action may, without prejudice to any other right or remedy, and after giving the Contractor ten (10) days' written notice, terminate the employment of the Contractor.

At the expiration of the said ten (10) days, the Owner may immediately serve notice upon the Surety to complete the work.

In the case the Surety fails to comply with the notice within thirty (30) days after service of such notice, the Owner may complete the work and charge the expense of the completion, including labor, materials, tools, implements, machinery, or apparatus, to said Contractor; and the expense so charged shall be deducted and paid by the Owner out of such monies as may be due, or that may thereafter at any time become due to the Contractor under and by virtue of this Contract. And in case such expense is less than the sum which would have been payable under this Contract if the same had been completed by the Contractor, then said Contractor shall be entitled to receive the difference. And in case such expense is greater than the sum which would have been payable under this Contract if the same had been completed by said Contractor, then the Contractor and his Surety shall pay the amount of such excess to the Owner, on demand from said Owner or Engineer of the amount so due.

### Termination for Convenience

The City of Jonesboro may, by written notice to the Contractor, terminate this contract without cause. The City must give notice of termination to the Contractor at least ten (10) days prior to the effective date of termination.

Upon receipt of written notice from the Owner of such termination for the Owner's convenience, the Contractor shall:

- (1) cease operations as directed by the Owner in the notice;
- (2) take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and
- (3) except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing Subcontracts and purchase orders and enter into no further Subcontracts and purchase orders.

In case of such termination for the Owner's convenience, the Contractor shall be entitled to receive payment for Work executed, and actual costs incurred directly as a result of such termination, and there will be no compensation for overhead and profit on work not executed.

### **GC.16      SUSPENSION OF WORK**

Should contingencies arise to make such action necessary, the Owner shall have the right to suspend the whole or any part of the work for a period not to exceed sixty (60) days by giving the Contractor notice in writing three (3) days prior to the suspension.

The Contractor after written notice to resume work shall begin within ten (10) days from the date of such notice.

If the work or any part thereof shall be stopped by the Owner's notice and the Owner fails to notify the Contractor to resume work within sixty (60) days, the Contractor may abandon that portion of the work so suspended and the Contractor shall be paid for all work performed on the portion so suspended at unit prices quoted in the Unit Price Schedule for completed work involved, at agreed prices on any extra work involved, and at a fair and equitable price for partially completed work involved.

The Engineer may suspend work pending the settlement of any controversy. The Contractor shall not be entitled to any claim for loss or damage by reason of such delay, nor shall he be entitled to any extension of time; but an extension may be granted by the Owner at his discretion.

### **GC.17      DELAYS - EXTENSION OF TIME - LIQUIDATED DAMAGES**

If the Contractor is delayed at any time in the progress of the work by any act or neglect of the Owner, the Owner's Engineer or employees, or by any separate contractor employed by the Owner, or by

changes ordered in the work, or by strikes, lock-outs, fire, unusual delay in transportation, unavoidable casualty, or any other cause beyond the Contractor's control, then the time of completion shall be extended for such reasonable time as the Owner may decide; provided, however, said time of completion shall be extended upon the following conditions and no other.

- 1) Requests for extension of time shall be in writing. No extension of time shall be granted automatically.
- 2) The Contractor claiming an extension of time because of any of the contingencies hereinabove mentioned, shall, within ten (10) days of the occurrence of the contingency which justifies the delay, notify the Owner in writing of his claim and the reasons therefore.
- 3) In event of a continuing cause of delay, only one claim is necessary.

GC.17.1 Excusable Delays: The right of the Contractor to proceed shall not be terminated nor shall the Contractor be charged with liquidated damages for any delays in the completion of the work due:

- (1) To any acts of the Government, including controls or restrictions upon requisitioning of materials, equipment, tools, or labor by reason of war, National Defense, or any other national emergency;
- (2) To any acts of the Owner;
- (3) To causes not reasonable foreseeable by the parties of this Contract which are beyond the control and without the fault or negligence of the Contractor, including, but not restricted to, acts of God or of the public enemy, acts of another Contractor in the performance of some other Contract with the Owner, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and weather of unusual severity such as hurricanes, tornadoes, cyclones, and other extreme weather conditions.
- (4) To any delay of any subcontractor occasioned by any of the causes specified in subparagraphs (1), (2), and (3) of this paragraph.

It is acknowledged between the parties to this Contract that the work to be performed by the Contractor will result in a benefit to the Owner and that a delay in completion of the work will be detrimental to the Owner. It is further acknowledged that, while work is in progress, the Owner shall incur an indeterminable amount of expense as a result of necessary supervision of the work and other overhead and administrative expenses.

It is, therefore, agreed that if there is a delay in the completion of the work beyond the period elsewhere herein specified which has not been authorized by the Owner as set forth above, then the Owner may

deduct from the Contract price the amount stated in the Special Conditions, bound herewith, as liquidated damages.

#### **GC.18 DISPUTES**

All disputes arising under this Contract or its interpretation, whether involving law or fact or both, or extra work, and all claims for alleged breach of Contract shall within ten (10) days of commencement of the dispute be presented by the Contractor to the Local Public Agency for decision. All papers pertaining to claims shall be filed in quadruplicate. Such notice need not detail the amount of the claim, but shall state the facts surrounding the claim in sufficient detail to identify the claim, together with its character and scope. In the meantime, the Contractor shall proceed with the work as directed. Any claim not presented within the time limit specified within this paragraph shall be deemed to have been waived, except that if the claim is of a continuing character and notice of the claim is not given within ten (10) days of its commencement, the claim will be considered only for a period commencing ten (10) days prior to the receipt by the Local Public Agency of notice thereof.

The Contractor shall submit in detail his claim and his proof thereof. Each decision by the governing body of the Local Public Agency will be in writing and will be mailed to the Contractor by registered mail, with return of receipt requested.

If the Contractor does not agree with any decision of the Local Public Agency, he shall in no case allow the dispute to delay the work, but shall notify the Local Public Agency promptly that he is proceeding with the work under protest, and he may then except the matter in question from the final release.

#### **GC.19 ASSIGNMENT OR NOVATION**

The Contractor shall not assign or transfer, whether by an assignment or novation, any of its rights, duties, benefits, obligations, liabilities, or responsibilities under this Contract without the written consent of the local Public Agency; provided, however, that assignments to banks, trust companies, or other financial institutions may be made without the consent of the Local Public Agency. No assignment or novation of this Contract shall be valid unless the assignment or novation expressly provides that the assignment of any of the Contractor's rights or benefits under the Contract is subject to a prior lien for labor performed, services rendered, and materials, tools, and equipment, supplied for the performance of the work under this Contract in favor of all persons, firms, or corporations rendering such labor or services or supplying such materials, tools, or equipment.

#### **GC.20 TECHNICAL SPECIFICATIONS AND DRAWINGS**

The Drawings and this Specification are to be considered cooperative. All work necessary for the completion of the facility shown on the Drawings, but not described in this Specification, or described in this Specification but not shown on the Drawings, OR REASONABLY IMPLIED BY EITHER OR BOTH, shall be executed in the best manner, the same as if fully shown and specified. When no figures or memoranda are given, the Drawings shall be accurately followed, according to their scale, but in all cases

of discrepancy in figures or details, the decision of the Engineer shall be obtained before proceeding with the Work. If the Contractor adjusts any such discrepancy without first having obtained the approval of the Engineer, it shall be at his own risk, and he shall bear any extra expense resulting therefrom.

#### **GC.21 SHOP DRAWINGS**

Shop Drawings shall be required for all equipment, materials, and as required by the Engineer. All Shop Drawings, Machinery Details, Layout Drawings, etc., shall be submitted to the Engineer in four (4) copies for review (unless otherwise specified) sufficiently in advance of requirements to afford ample time for checking, including time for correcting, resubmitting, and rechecking if necessary. The Contractor may proceed, only at his own risk, with manufacture or installation of any equipment or work covered by said Shop Drawings, etc. until they are reviewed, and approved; and no claim, by the Contractor, for extension of the Contract time will be granted by reason of his failure in this respect.

Any Drawings submitted without the Contractor's stamp of approval will not be considered and will be returned to him for proper resubmission. If any Drawings show variations from the requirements of the Contract because of standard shop practice or other reason, the Contractor shall make specific mention of such variation in his letter of transmittal in order that, if acceptable, suitable action may be taken for proper adjustment of Contract price and/or time; otherwise, the Contractor will not be relieved of the responsibility for executing the work in accordance with the Contract even though the Drawings have been reviewed.

The review of Shop Drawings by the Engineer shall be considered an accommodation to the Contractor to assist him in the execution of the Contract. The Engineer's review of such Drawings shall not relieve the Contractor of his responsibility to perform the work in strict accordance with the Plans and Specifications, and approved changes.

If the Shop Drawing is in accordance with the Contract or involves only a minor adjustment in the interest of the Local Public Agency not involving a change in Contract price or time, the Engineer shall so stamp the Drawing and shall contain in substance the following:

"Corrections or comments made on the shop drawings during this review do not relieve contractor from compliance with requirements of the drawings and specifications. This check is only for review of general conformance with the design concept of the project and general compliance with the information given in the contract documents. The contractor is responsible for: confirming and correlating all quantities and dimensions; selecting fabrication processes and techniques of construction; coordinating his work with that of all other trades; and performing his work in a safe and satisfactory manner".

#### **GC.22 REQUESTS FOR SUPPLEMENTARY INFORMATION**

It shall be the responsibility of the Contractor to make timely requests of the Local Public Agency for any

additional information not already in his possession which should be furnished by the Local Public Agency under the terms of this Contract, and which he will require in the planning and execution of the work. Such requests may be submitted from time to time as the need is approached, but each shall be filed in ample time to permit appropriate action to be taken by all parties involved so as to avoid delay. Each request shall be in writing, and shall list the various items and the latest date by which each will be required by the Contractor. The first list shall be submitted within two (2) weeks after the Contract award and shall be as complete as possible at that time. The Contractor shall, if requested, furnish promptly any assistance and information the Engineer may require in responding to these requests of the Contractor. The Contractor shall be fully responsible for any delay in his work or to others arising from his failure to comply fully with the provisions of this Section.

#### **GC.23      REFERENCE TO MANUFACTURER OR TRADE NAME - "OR EQUAL CLAUSE"**

If the Plans, Specifications, or Contract Documents, laws, ordinances or applicable rules and regulations permit the Contractor to furnish or use a substitute that is equal to any material or equipment specified, and if the Contractor wishes to furnish or use a proposed substitute, he shall make written application to the Engineer for approval of such a substitute certifying in writing that the proposed substitute will perform adequately the functions called for in the general design, be similar and of equal substance to that specified, and be suited to the same use and capable of performing the same functions as that specified; the use of such substitute will not require revisions of related work. No substitute shall be ordered or installed without the written approval of the Engineer who will be the judge of equality and may require the Contractor to furnish such other data regarding the proposed substitute as he considers pertinent. No substitute shall be ordered or installed without such performance guarantee and bonds as the Owner may require which shall be furnished at Contractor's expense.

Where such substitutions alter the design or space requirements indicated on the Contract Drawings, detailed drawings shall be prepared and submitted by the Contractor delineating any changes in, or additions to, the work shown on the Contract Drawings, and such drawings and changes or additions to the work shall be made by the Contractor at no additional expense to the City. In all cases, the burden of proof that the material or equipment offered for substitution is equal in construction, efficiency, and service to that named on the Contract Drawings and in these Contract Documents shall rest on the Contractor, and unless the proof is satisfactory to the Engineer, the substitution will not be approved.

#### **GC.24      SAMPLES, CERTIFICATES, AND TESTS**

The Contractor shall submit all material, product, or equipment samples, descriptions, certificates, affidavits, etc., as called for in the Contract Documents or required by the Engineer, promptly after award of the Contract and acceptance of the Contractor's bond. No such material or equipment shall be manufactured or delivered to the site, except at the Contractor's own risk, until the required samples or certificates have been approved in writing by the Engineer. Any delay in the work caused by late or improper submission of samples or certificates for approval shall not be considered just cause for an extension of the Contract time. Submit four (4) copies of data for Engineer's review.



Each sample submitted by the Contractor shall carry a label giving the name of the Contractor, the project for which it is intended, and the name of the producer. The accompanying certificate or letter from the Contractor shall state that the sample complies with Contract requirements, shall give the name and brand of the product, its place of origin, the name and address of the producer, and all specifications or other detailed information which will assist the Engineer in passing upon the acceptability of the sample promptly. It shall also include the statement that all materials or equipment furnished for use in the project will comply with the samples and/or certified statements.

Approval of any materials shall be general only and shall not constitute a waiver of the Local Public Agency's right to demand full compliance with Contract requirements. After actual deliveries, the Engineer will have such check tests made as he deems necessary in each instance and may reject materials and equipment and accessories for cause, even though such materials and articles have been given general approval. If materials, equipment or accessories which fail to meet check tests have been incorporated in the work, the Engineer will have the right to cause their removal and replacement by proper materials or to demand and secure such reparation by the Contractor as is equitable, at the Contractor's expense.

Except as otherwise specifically stated in the Contract, the costs of sampling and testing will be divided as follows:

- (1) The Contractor shall furnish without extra cost, including packing and delivery charges, all samples required for testing purposes, except those samples taken on the project by the Engineer;
- (2) The Contractor shall assume all costs of re-testing materials which fail to meet Contract requirements;
- (3) The Contractor shall assume all costs of testing materials offered in substitution for those found deficient; and
- (4) All Construction materials shall be tested in accordance with AHTD Specifications and at the contractor's expense.

## **GC.25 PERMITS AND CODES**

The Contractor shall give all notices required by and comply with all applicable laws, ordinances, and codes of the Local Government. All construction work and/or utility installations shall comply with all applicable ordinances, and codes including all written waivers.

Should the Contractor fail to observe the foregoing provisions and proceed with the construction and/or install any utility at variance with any applicable ordinance or code, including any written waivers, the Contractor shall remove such work without cost to the Local Public Agency.

The Contractor shall at his own expense, secure and pay to the appropriate department of the Local Government the fees or charges for all permits for street pavements, sidewalks, sheds, removal of abandoned water taps, sealing of house connection drains, pavement cuts, building, electrical, plumbing, water, gas, and sewer permits required by the local regulatory body or any of its agencies.

The Contractor shall comply with applicable local laws and ordinances governing the disposal of surplus excavation, materials, debris, and rubbish on or off the site of the work, and commit no trespass on any public or private property in any operation due to or connected with the Improvements embraced in this Contract.

## **GC.26 CARE OF WORK**

The Contractor alone shall be responsible for the safety, efficiency, and adequacy of his plant, appliances, and methods, and for any injury, including death, to any person, and for any damage to property which may result from their failure, or from their improper construction, maintenance, or operation. He shall indemnify and save harmless the Local Public Agency and the Engineer and their employees and agents, against any judgement with costs, which may be obtained as a result of such injury or property damage, because of the alleged liability of the Local Public Agency or of the Engineer.

The Contractor shall be responsible for the proper care and protection of all materials delivered and work performed until completion and final acceptance, whether or not the same has been covered in whole or in part by payments made by the Local Public Agency.

The Contractor shall provide sufficient competent watchmen, as required to protect the work both day and night, including Saturdays, Sundays, and holidays, from the time the work is commenced until final completion and acceptance.

In an emergency affecting the safety of life or property, including adjoining property, the Contractor, without special instructions or authorization from the Local Public Agency, is authorized to act at his discretion to prevent such threatened loss or injury, and he shall so act. He shall likewise act if instructed to do so by the Local Public Agency. Any compensation claimed by the Contractor on account of such emergency work will be determined by the Local Public Agency as provided in the Section entitled CHANGES IN THE WORK under GENERAL CONDITIONS.

The Contractor shall avoid damage, as a result of his operations, to existing sidewalks, streets, curbs, pavements, utilities (except those which are to be replaced or removed), adjoining property, etc., and he shall at his own expense completely repair any damage thereto caused by his operations, to the satisfaction of the Owner.

The Contractor shall shore up, brace, underpin, secure, and protect as may be necessary, all foundations and other parts of existing structures adjacent to, adjoining, and in the vicinity of the site, which may be in any way affected by the excavations or other operations connected with the construction of the Improvements embraced in this Contract. The Contractor shall be responsible for the giving of any and

all required notices to any adjoining or adjacent property owner or other party before the commencement of any work. The Contractor shall indemnify and save harmless the Local Public Agency, and the Engineer, from any damages on account of settlements or the loss of lateral support of adjoining property and from all loss or expense and all damages for which it may be claimed that the Local Public Agency, or the Engineer, is liable in consequence of such injury or damage to adjoining and adjacent structures and their premises.

#### **GC.27      QUALITY OF WORK AND PROPERTY**

All property, materials, and equipment shall be new and free of defects upon completion of the Contractor's performance and, unless different standards are specified elsewhere in the Contract Documents, shall be of the best type and quality available for the purpose. All of the Contractor's work shall be performed with the highest degree of skill and completed free of defects and in accordance with the Contract Documents. Any work, property, materials, or equipment not in conformance with these standards shall be considered defective. If any work, property, materials or equipment is discovered to have been defective or not in conformance with the Contract Documents, whether said discovery is made before or after completion of performance, the Contractor, at his expense, after written notice from the Owner or Engineer, shall promptly replace or correct the deficiency and pay any engineering costs and consequential expense or damage incurred by the Owner in connection therewith. If the Contractor fails to promptly correct all deficiencies, the Owner shall have the option of remedying the defects at the Contractor's cost. If the Contractor is required to furnish shop drawings or designs, the above provisions shall apply to such drawings or designs.

Neither the Owner's payment, acceptance, inspection or use of the work, property, materials, or equipment, nor any other provision of the Contract Documents shall constitute acceptance of work, property, materials, or equipment which are defective or not in accordance with the Contract Documents. If the Contractor breaches any provision of the Contract Documents with respect to the quality of the work, property, materials, equipment or performance, whether initial or corrective, his liability to the Owner shall continue until the statute of limitations with respect to such breach of contract has expired following discovery of the defect. All parts of this section are cumulative to any other provisions of the Contract Documents and not in derogation thereof. If it is customary for a warranty to be issued for any of the property to be furnished hereunder, such warranty shall be furnished, but no limitations in any such warranty shall reduce the obligations imposed under the Contractor in the Contract Documents or by Arkansas Law; but if any greater obligations than imposed in this Contract are specified in any such warranty or by Arkansas Law, those greater obligations shall be deemed a part of this Contract and enforceable by the Owner.

#### **GC.28      ACCIDENT PREVENTION**

The Contractor shall exercise proper precaution at all times for the protection of persons and property and shall be responsible for all damages to persons or property, either on or off the site, which occur as a result of his prosecution of the work. The safety provisions of applicable laws and building and

construction codes, including applicable parts of the Arkansas Department of Labor Safety Code, shall be observed. The Contractor shall take or cause to be taken such safety and health measures, additional to those herein required, as he may deem necessary or desirable. Machinery, equipment, and all hazards shall be guarded in accordance with the safety provisions of the "Manual of Accident Prevention in Construction" published by the Associated General Contractors of America, Inc., to the extent that such provisions are not in conflict with applicable local laws.

The Contractor shall maintain an accurate record of all cases of death, occupational disease, and injury requiring medical attention or causing loss of time from work, arising out of and in the course of employment on work under the Contract. The Contractor shall promptly furnish the Local Public Agency with reports concerning these matters.

The Contractor shall indemnify and save harmless the Local Public Agency, and the Engineer, from any claims for damages resulting from personal injury and/or death suffered or alleged to have been suffered by any person as a result of any work conducted under this Contract.

#### **GC.29      SANITARY FACILITIES**

The Contractor shall furnish, install, and maintain ample sanitary facilities for the workers. As the needs arise, a sufficient number of enclosed temporary toilets shall be conveniently placed as required by the sanitary codes of the State and Local Government. Drinking water shall be provided from an approved source, so piped or transported as to keep it safe and fresh and served from single service containers or satisfactory types of sanitary drinking stands or fountains. All such facilities and services shall be furnished in strict accordance with existing and governing health regulations.

#### **GC.30      USE OF PREMISES**

The Contractor shall confine his equipment, storage of materials, and construction operations to the Rights-of-Way to accommodate the permanent construction furnished by the Local Public Agency, or as may be directed otherwise by the Local Public Agency, and shall not unreasonably encumber the site of other public Rights-of-Way with his materials and construction equipment. In case such Rights-of-Way furnished by the Local Public Agency are not sufficient to accommodate the Contractor's operations, he shall arrange with the Local Government, or with the owner or owners of private property for additional area or areas, and without involving the Local Public Agency in any manner whatsoever.

The Contractor shall comply with all reasonable instructions of the Local Public Agency and the ordinances and codes of the Local Government (including but not limited to those) regarding signs, advertising, traffic, fires, explosives, danger signals, and barricades.

#### **GC.31      REMOVAL OF DEBRIS, CLEANING, ETC.**

The Contractor shall periodically or as directed during the progress of the work, remove and legally

dispose of all surplus excavated material and debris, and keep the project site and public Rights-of-Way reasonably clear. Upon completion of the work, he shall remove all temporary construction facilities, debris, and unused materials provided for the work, thoroughly clean all drainage pipes, structures, ditches, and other features, and put the whole site of the work and public Rights-of-Way in a neat and "broom" clean condition. Trash burning on the site of the work will be subject to prior approval of the Jonesboro Fire Department.

#### **GC.32      RETURN OF OWNER'S MATERIALS, EQUIPMENT OR PROPERTY**

Any materials, equipment or other property which belongs to the Owner, removed by the Contractor, shall be delivered to the Owner's designated warehouse unless its re-use is specified in the Plans and Specifications. If the Contractor fails to deliver the materials, equipment, or other property, the value, as determined by the Engineer, shall be deducted from amounts due the Contractor.

#### **GC.33      OBSERVATION OF WORK**

The Engineer, his authorized representative, and any Federal, State, County, or local authority representative having jurisdiction over any part of the work, or area through which the work is located, shall at all times have access to the work in progress.

The detailed manner and method of performing the work shall be under the direction and control of the Contractor, but all work performed shall at all times be subject to the observation of the Engineer or his authorized representative to ascertain its conformance with the Contract Documents. The Contractor shall furnish all reasonable aid and assistance required by the Engineer for the proper observation and examination of the work and all parts thereof.

The Engineer is not responsible for the Contractor's means, methods, techniques, sequences, or procedures of construction, or safety precautions and programs incident thereto.

Observers may be appointed by the Engineer or Owner. Observers shall have no authority to permit any deviation from the Plans and Specifications except on written order from the Engineer and the Contractor will be liable for any deviation except on such written order. Observers shall have authority, subject to the final decision of the Engineer, to condemn and reject any defective work and to suspend the work when it is not being performed properly.

The observer shall in no case act as superintendent or foreman or perform other duties for the Contractor, nor interfere with the management of the work by the latter. Any advice which the observer may give the Contractor shall in no way be construed as binding to the Engineer in any way or releasing the Contractor from fulfilling all of the terms of the Contract.

Any defective work may be rejected by the Engineer at any time before final acceptance of the work, even though the same may have been previously overlooked and estimated for payment and payment therefore made by the Owner.

The Contractor shall notify the Engineer sufficiently in advance of backfilling or concealing any facilities to permit proper observation. If the facilities are concealed without approval or consent of the Engineer, the Contractor shall uncover for observation and recover such facilities all at his own expense, when so requested by the Engineer.

Should it be considered necessary or advisable by the Engineer at any time before final acceptance of the entire work to make an examination of work already completed, by uncovering the same, the Contractor shall on request promptly furnish all necessary facilities, labor, and material. If such work is found to be defective in any important or essential respect, due to fault of the Contractor or his Subcontractors, he shall defray all the expenses of such examination and of satisfactory reconstruction. If, however, such work is found to meet the requirements of the Contract, the actual cost of labor and material necessarily involved in the examination and replacement, plus fifteen (15) percent of such costs to cover superintendence, general expenses and profit, shall be allowed the Contractor and he shall, in addition, if completion of the work of the entire Contract has been delayed thereby, be granted a suitable extension of time on account of the additional work involved.

Observation of materials and appurtenances to be incorporated in the Improvements embraced in this Contract may be made at the place of production, manufacture or shipment, whenever the quantity justifies it, and such observation and acceptance, unless otherwise stated in the Technical Specifications, shall be final, except as regards (1) latent defects, (2) departures from specific requirements of the Contract, (3) damage or loss in transit, or (4) fraud or such gross mistakes as amount to fraud. Subject to the requirements contained in the preceding sentence, the observation of materials as a whole or in part will be made at the project site.

All condemned or rejected work shall be promptly taken out and replaced by satisfactory work. Should the Contractor fail or refuse to comply with the instructions in this respect, the Owner may, upon certification by the Engineer, withhold payment, proceed to terminate the Contract, or perform work as provided herein.

#### **GC.34 REVIEW BY LOCAL PUBLIC AGENCY OR OWNER**

The Local Public Agency, its authorized representatives and agents, shall at all times during work hours have access to and be permitted to observe and review all work, materials, equipment, payrolls, and personnel records pertaining to this Contract, provided, however, that all instructions and approval with respect to the work will be given to the Contractor only by the Local Public Agency through its authorized representatives or agents. Representatives of Federal, State, and local government agencies also have the right of physical inspection of the work during work hours.

#### **GC.35 PROHIBITED INTERESTS**

No official of the Owner who is authorized in such capacity and on behalf of the Owner to negotiate, make, accept or approve, or to take part in negotiating, making, accepting, or approving any

architectural, engineering, inspection, construction or material supply contract or any subcontract in connection with the construction of the project, shall become directly or indirectly interested personally in this Contract or in any part thereof. No officer, employee, architect, attorney, engineer, or inspector of or for the Owner who is authorized in such capacity and on behalf of the Owner to exercise any executive, supervisory, or other similar functions in connection with the construction of the project, shall become directly or indirectly interested personally in this Contract or in any part thereof.

#### **GC.36 FINAL INSPECTION**

When the Improvements embraced in this Contract are substantially completed, the Contractor shall notify the Local Public Agency in writing that the work will be ready for final inspection on a definite date which shall be stated in the notice. The notice will be given at least ten (10) days prior to the date stated for final inspection, and bear the signed concurrence of the representative of the Local Public Agency having charge of observation. If the Local Public Agency determines that the status of the Improvements is as represented, it will make the arrangements necessary to have final inspection commenced on the date stated in the notice, or as soon thereafter as practicable. The inspection party will also include the representatives of each Department of the Local Government and any other involved government agencies when such improvements are later to be accepted by the Local Government and/or other government agencies.

#### **GC.37 PATENTS**

The Contractor shall hold and save harmless the Local Public Agency, its officers, employees, and the Engineer, from liability of any nature or kind, including costs and expenses, for, or on account of, any patented or unpatented invention, process, article, or appliance manufactured or used in the performance of the Contract, including its use by the Local Public Agency, unless otherwise specifically stipulated in the Technical Specifications.

#### **GC.38 WARRANTY OF TITLE**

No material, supplies, or equipment for the work shall be purchased subject to any chattel mortgage or under a conditional sale or other agreement by which an interest therein or in any part thereof is retained by the seller or supplier. The Contractor shall warrant good title to all materials, supplies, and equipment installed or incorporated in the work and upon completion of all work, shall deliver the same together with all improvements and appurtenances constructed or placed thereon by him to the Local Public Agency free from any claims, liens, or charges. Neither the Contractor nor any person, firm or corporation furnishing any material or labor for any work covered by this Contract, shall have any right to a lien upon any improvement or appurtenance thereon. Nothing contained in this paragraph, however, shall defeat or impair the right of persons furnishing materials or labor to recover under any bond given by the Contractor for their protection or any rights under any law permitting such persons to look to funds due the Contractor in the hands of the Local Public Agency. The provisions of this paragraph shall be inserted in all subcontracts and material Contracts and notice of its provisions shall

be given to all persons furnishing materials for the work when no formal Contract is entered into for such materials.

**GC.39      GENERAL GUARANTY**

Neither the final certificate of payment nor any provision in the Contract nor partial or entire use of the Improvements embraced in this Contract by the Local Public Agency or the public shall constitute an acceptance of work not done in accordance with the Contract or relieve the Contractor of liability in respect to any express warranties or responsibility for faulty materials or workmanship. The Contractor shall promptly remedy any defects in the work and pay for any damage to other work resulting therefrom which shall appear within a period of twelve (12) months from the agreed upon day of final acceptance of the work. The Local Public Agency will give notice of defective materials and work with reasonable promptness.



## **IX. SUPPLEMENTAL GENERAL CONDITIONS**

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SGC.1	PROGRESS SCHEDULE
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SGC.6	MINIMUM WAGE (DAVIS BACON)

## **SGC.1      PROGRESS SCHEDULE**

The Contractor shall submit a construction contract schedule of the bar graph (or other approved) type seven (7) calendar days prior to the preconstruction conference showing the following information as a minimum:

- (1) Actual date construction is scheduled to start if different from the date of notice to proceed.
- (2) Planned contract completion date.
- (3) Beginning and completion dates for each phase of work.
- (4) Respective dates for submission of shop drawings and the beginning of manufacture, the testing of, and the installation of materials, supplies, and equipment.
- (5) All construction milestone dates.
- (6) A separate graph showing work placement in dollars versus contract time. The schedule shall incorporate contract changes as they occur. The schedule shall be maintained in an up-to-date condition and shall be available for inspection at the construction site at all times.

The construction contract schedule shall be submitted in conjunction with and/or in addition to any other specification requirements concerning schedules.

## **SGC.2      DRAWINGS**

One (1) set of Plans and Specifications shall be furnished to the Contractor, at no charge, for construction purposes. Additional copies may be obtained at cost of reproduction upon request.

The Contractor shall keep one (1) copy of all drawings and Contract Documents in good condition readily accessible at the site of the work available to the Engineer and his authorized representatives.

## **SGC.3      ADDITIONAL INSURANCE (i.e. Railroad Insurance)**

\*NOT APPLICABLE FOR THIS PROJECT

## **SGC.4      RECORD DRAWINGS**

Before any work is started, the Contractor shall obtain at his own expense one set of Plans to be used for Record Drawings. The Engineer will supply the Plans at printing cost to the Contractor. Record Drawings will be kept on full-size plan sheets; no half-size sheets will be permitted. The Record Drawings shall be stored and maintained in good condition at all times by the Contractor and shall be made available to the Engineer at the work site immediately at the Engineer's request. All writing, notes,

comments, dimensions, etc. shall be legible. The Record Drawings shall be stored flat and shall not be rolled. The Record Drawings shall be submitted to the Engineer before the project can be accepted.

The Contractor shall accurately identify and document the locations of all underground and/or concealed work that he has performed and/or has been affected by his work. This shall include all equipment, conduits, pipe lines, valves, fittings and other appurtenances and underground structures that are part of the Contractor's work and their proximity to existing underground structures and utilities to the extent known. The Contractor will certify accuracy of the Record Drawings by endorsement.

The Contractor's work shall be documented on the Record Drawings in an on-going manner. Distances, offsets, depths, etc. shall be accurately measured from permanent fixed objects so that the Owner can expose any item of the work in the future with a minimum of effort. All such measurements shall be made before the items of work are covered or backfilled. The Contractor shall be required to expose and recover/backfill the work at his own expense if, in the Engineer's opinion, the measurements need to be verified.

#### **SGC.5      TRENCH AND EXCAVATION SAFETY SYSTEM**

This section covers trench and excavation safety system required for constructing improvements that necessitate open excavations on the project. All work under this item shall be in accordance with the current edition of the "Occupational Safety and Health Administration Standard for Excavation and Trenches Safety System, 29 CFR 1926, Subpart P.

The Contractor, prior to beginning any excavation, shall notify the State Department of Labor (Safety Division) that work is commencing on a project with excavations greater than five feet.

The Contractor shall notify all Utility Companies and Owners in accordance with OSHA Administration 29 CFR 1926.651(b) (2) for the purpose of locating utilities and underground installations.

Where the trench or excavation endangers the stability of a building, wall, street, highway, utilities, or other installation, the Contractor shall provide support systems such as shoring, bracing, or underpinning to ensure the stability of such structure or utility.

The Contractor may elect to remove and replace or relocate such structures or utilities with the written approval of the Owner of the structure or utility and the Project Owner.

The work required by this item will not be measured for separate payment, but will be considered subsidiary to other items of the contract. If a Trench and Excavation Safety System is needed, the Contractor shall submit to the Engineer a certification by the Contractor's "competent person" as defined in Subpart "P" 1926.650(b) that the Contractor has complied with the provisions of "Occupational Safety and Health Administration Standard for Excavation and Trenches Safety System", 29 CFR 1926 Subpart P for work for which payment is requested.

## **SGC.6      MINIMUM WAGES      (DAVIS BACON)**

The Contractor shall comply with the wage provisions of the Davis Bacon Act and the administrative regulations promulgated thereunder, as they apply under this Contract.

It shall be the responsibility of each Bidder to determine the consequences of the applicable wage provisions of the Davis Bacon Act, and include in his bid any costs made necessary because of them. No additional payment will be made, and no extension of Contract time will be allowed because of the provisions of the Act.

The Contractor shall comply with all applicable wage provisions of the Davis Bacon Act including the following:

- (1) Pay wage rates not less than the prevailing hourly wage for each craft or type of workman needed to execute the Contract, as determined by the United States Department of Labor. Such determination covering rates for regular hours, fringe benefits, and rates for holidays and overtime are listed on the following page.
- (2) Post on the site of the work, in a conspicuous and accessible place, a copy of the prevailing wage rates as determined by the United States Department of labor.
- (3) Keep an accurate record of workman employed by him, and by each subcontractor, if any, including the wage payments made. Such record, or records, shall be available for inspection by the United States Department of Labor, and the Owner, during reasonable hours.
- (4) The Contractor's bond shall guarantee the payment of wages as herein specified.

Wage rates as established by the United States Department of Labor are minimums for wage payments under this Contract.

There is no assurance on the part of the Owner that mechanics and laborers can be obtained for the rates herein bound. Each Bidder shall determine for himself the availability of laborers and mechanics, and the rates he must pay to obtain employees. Such rates of pay may be greater than, but cannot be less than, the wage rates bound herein.

"General Decision Number: AR20210160 01/01/2021

Superseded General Decision Number: AR20200160

State: Arkansas

Construction Type: Highway

County: Craighead County in Arkansas.

HIGHWAY CONSTRUCTION PROJECTS

Note: Under Executive Order (EO) 13658, an hourly minimum wage of \$10.95 for calendar year 2021 applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least \$10.95 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2021. If this contract is covered by the EO and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must pay workers in that classification at least the wage rate determined through the conformance process set forth in 29 CFR 5.5(a)(1)(ii) (or the EO minimum wage rate, if it is higher than the conformed wage rate). The EO minimum wage rate will be adjusted annually. Please note that this EO applies to the above-mentioned types of contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but it does not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60). Additional information on contractor requirements and worker protections under the EO is available at [www.dol.gov/whd/govcontracts](http://www.dol.gov/whd/govcontracts).

Modification Number	Publication Date
0	01/01/2021

\* SUAR2014-032 07/21/2014

	Rates	Fringes
CARPENTER, Includes Form Work....	\$ 20.23	0.00
CEMENT MASON/CONCRETE FINISHER...	\$ 15.32	0.00
HIGHWAY/PARKING LOT STRIPING: Operator (Striping Machine).....	\$ 13.74	0.00
HIGHWAY/PARKING LOT STRIPING: Painter.....	\$ 21.75	0.00
IRONWORKER, REINFORCING.....	\$ 14.22	0.00
IRONWORKER, STRUCTURAL.....	\$ 22.00	0.00
LABORER: Asphalt, Includes Raker, Shoveler, Spreader and Distributor.....	\$ 14.68	0.00

LABORER: Common or General.....	\$ 12.99	0.00
LABORER: Mason Tender - Cement/Concrete.....	\$ 12.38	0.00
LABORER: Pipelayer.....	\$ 14.56	0.00
OPERATOR: Asphalt Spreader.....	\$ 15.80	0.00
OPERATOR: Backhoe/Excavator/Trackhoe.....	\$ 21.64	0.00
OPERATOR: Bobcat/Skid Steer/Skid Loader.....	\$ 16.06	0.00
OPERATOR: Broom/Sweeper.....	\$ 12.00	0.00
OPERATOR: Bulldozer.....	\$ 19.29	0.00
OPERATOR: Crane.....	\$ 22.84	0.00
OPERATOR: Drill.....	\$ 14.85	0.00
OPERATOR: Grader/Blade.....	\$ 15.00	0.00
OPERATOR: Hydroseeder.....	\$ 10.79	0.00
OPERATOR: Loader.....	\$ 16.85	0.00
OPERATOR: Mechanic.....	\$ 18.83	0.00
OPERATOR: Milling Machine.....	\$ 17.52	0.00
OPERATOR: Oiler.....	\$ 19.29	0.00
OPERATOR: Paver (Asphalt, Aggregate, and Concrete).....	\$ 15.05	0.00
OPERATOR: Post Driver (Guardrail/Fences).....	\$ 16.97	0.00
OPERATOR: Roller.....	\$ 12.50	0.00
OPERATOR: Scraper.....	\$ 19.31	0.00
OPERATOR: Screed.....	\$ 16.54	0.00
PILEDRIVERMAN.....	\$ 24.70	0.00
TRAFFIC CONTROL: Flagger.....	\$ 9.88	0.00
TRAFFIC CONTROL: Laborer-Cones/ Barricades/Barrels - Setter/Mover/Sweeper.....	\$ 10.00	0.00
TRUCK DRIVER: Dump Truck.....	\$ 12.00	0.00
TRUCK DRIVER: Flatbed Truck.....	\$ 21.03	0.00
TRUCK DRIVER: Lowboy Truck.....	\$ 17.67	0.00
TRUCK DRIVER: Water Truck.....	\$ 16.00	0.00

TRUCK DRIVER: Semi/Trailer

Truck.....\$ 12.50                      0.00

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WELDERS - Receive rate prescribed for craft performing  
operation to which welding is incidental.

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Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at [www.dol.gov/whd/govcontracts](http://www.dol.gov/whd/govcontracts).

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

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The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

#### Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than "SU" or "UAVG" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

## Survey Rate Identifiers

Classifications listed under the "SU" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

## Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

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## WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- \* an existing published wage determination
- \* a survey underlying a wage determination
- \* a Wage and Hour Division letter setting forth a position on a wage determination matter
- \* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations



Wage and Hour Division  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

=====

END OF GENERAL DECISION

"

## **X. SPECIAL CONDITIONS**

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## **SC.1      GENERAL**

The provisions of this section of the Specifications shall govern in the event of any conflict between them and the "General Conditions".

## **SC.2      LOCATION OF PROJECT**

The project is located within the Craighead Technology Park on the CTP Industrial Lead Railroad. A map showing the general location is included in the plan sets.

## **SC.3      SCOPE OF WORK**

The work to be performed under this Contract consists of furnishing all materials, labor, supervision, tools and equipment necessary to complete site preparation, drainage, excavation (approximately 16,500 CY) and construction of subgrade for the railroad expansion, and the railroad track materials and construction (approximately 7,200 TF).

## **SC.4      TIME ALLOTTED FOR COMPLETION**

The time allotted for completion of the work shall be the time as specified in the BID PROPOSAL FOR UNIT PRICES, which time shall begin within ten (10) days of the work order or notice to proceed. After award of the Contract is made and the Contract Documents are completed, the Engineer shall issue a Notice to Proceed, notifying the Contractor to proceed with the construction of the project, subject to the provisions of this paragraph.

## **SC.5      FORMS, PLANS AND SPECIFICATIONS**

Forms of Plans, Specifications, Proposal forms and other contract documents may be examined at City of Jonesboro Engineering Department, 300 South Church Street, Jonesboro, Arkansas 72401 and may be secured at the cost of printing per set from the Jonesboro Blueprint, 222 Madison Street, Jonesboro, Arkansas 72401, ph. (870)932-4349. No partial sets will be issued. No refunds will be made.

## **SC.6      LIQUIDATED DAMAGES FOR DELAY**

The number of calendar days allowed for completion of the project is stipulated in the Proposal and in the Contract and shall be known as the Contract Time.

1. It is understood and agreed by and between the Owner and the Contractor that the time of completion herein set out is a reasonable time. The Contractor shall perform fully, entirely, and in an acceptable manner, the work contracted for within the contract time stated in the Contract. The contract time shall be counted from ten days after the effective date of the "Notice to Proceed"; and shall include all Sundays, holidays, and non-work days. All calendar days elapsing between the effective dates of any orders of the Engineer for suspension of the prosecution of the work, due to the fault of the Contractor, shall be counted as elapsed contract

time, and shall not be considered for an extension of time.

2. Extensions of time for completion, under the condition of 2(a) next below, will be granted; extensions may be granted under other stated conditions:
  - a. If the satisfactory execution and completion of the Contract shall require work or material in greater amounts or quantities than those set forth in the Contract, then the Contract time shall be increased in the same proportion as the additional work bears to the original work contracted for.
  - b. An average or usual number of inclement weather days, when work cannot proceed, is to be anticipated during the construction period and is not to be considered as warranting extension of time. If, however, it appears that the Contractor is delayed by conditions of weather, so unusual as not to be reasonably anticipated, extensions of time may be granted.
  - c. Should the work under the Contract be delayed by other causes which could not have been prevented or contemplated by the Contractor, and which are beyond the Contractor's power to prevent or remedy, an extension of time may be granted. Such causes of delay shall include but not necessarily be limited to the following:
    - (1) Acts of God, acts of the public enemy, acts of the Owner except as provided in these Specifications, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and unusually severe weather.
    - (2) Any delays of Subcontractors or suppliers occasioned by any of the causes specified above.
3. The Resident Project Representative or other authorized representative of the City shall keep a written record sufficient for determination as to the inclusion of that day in the computation of Contract time. This record shall be available for examination by the Contractor during normal hours of work as soon as feasible after the first of each construction month. In case of disagreement between the representative of the City and the Contractor, as to the classification of any day, the matter shall be referred to the City whose decision shall be final.
4. The amount of all extensions of time for whatever reason granted shall be determined by the Owner. In general, only actual and not hypothetical days of delay will be considered. The Owner shall have authority to grant additional extensions of time as the Owner may deem justifiable.

The amount of Liquidated Damages to be assessed shall be in accordance with the schedule that follows:

<u>Amount of Contract</u>	<u>Liquidated Damages</u> <u>Per Day</u>
Less than \$25,000.00	\$100.00
Not less than \$ 25,000.00 but less than \$ 50,000.00	\$150.00
Not less than \$ 50,000.00 but less than \$ 100,000.00	\$200.00

Not less than \$100,000.00 but less than \$ 500,000.00	\$250.00
Not less than \$500,000.00 but less than \$1,000,000.00	\$350.00
Over \$1,000,000.00	\$500.00

1. Time is an essential element of the Contract and it is important that the work be pressed vigorously to completion. Loss will accrue to the public due to delayed completion of the facility; and the cost to the Owner of the administration of the Contract, including engineering, inspection and supervision, will be increased as the time occupied in the work is lengthened.
2. Should the Contractor fail to complete the work as set forth in the Specifications and within the time stipulated in the Contract, there shall be deducted the amount shown in the schedule above, for each day of delay, from any monies due or which may thereafter become due him, not as a penalty, but as ascertained and liquidated damages.
3. Should the amount otherwise due the Contractor be less than the amount of such ascertained and liquidated damages, the Contractor and his Surety shall be liable to the Owner for such deficiency.

If the Contractor finds it impossible for reasons beyond his control to complete the work within the Contract time as specified, or as extended in accordance with the provisions of this subsection, he may, at any time prior to the expiration of the Contract time as extended, make a written request to the Engineer for an extension of time setting forth the reasons which he believes will justify the granting of his request. The Contractor's plea that insufficient time was specified is not a valid reason for extension of time. If the Engineer finds that the work was delayed because of conditions beyond the control and without the fault of the Contractor, he may recommend to the Owner that the contract time be extended as conditions justify. If the Owner extends the contract, the extended time for completion shall then be in full force and effect, the same as though it were the original time for completion.

#### **SC.7 KNOWLEDGE OF CONDITIONS**

The Contractor states that he has examined all the available records and has made a field examination of the site and right-of-way and that he has informed himself about the character, quality, and quantity of surface and subsurface materials and other conditions to be encountered; the quantities in various sections of the work; the character of equipment and facilities needed for the prosecution of the work; the location and suitability of all construction materials; the local labor conditions; and all other matters in connection with the work and services to be performed under this contract.

#### **SC.8 PERMITS AND RIGHTS-OF-WAY**

The Owner will secure easements across public or private property permanently required for the pipelines at no cost to the Contractor.

The Contractor shall lease, buy, or otherwise make satisfactory provision, without obligating the Owner in any manner, for any land required outside the land provided by the Owner.

State Highway and Railroad Crossing Permits will be secured by the Owner. All other permits and licenses necessary for the prosecution of the work shall be secured and paid for by the Contractor.

#### **SC.9 REFERENCE SPECIFICATIONS**

Where reference is made in these Specifications to the Standard Specifications of the Arkansas State Highway and Transportation Department, such reference is made for expediency and standardization, and such specifications (latest edition thereof) referred to are hereby made a part of these Specifications.

More specifically, if any items or materials required for completion of the work required for this project are not specified in these Contract Documents, such items or materials and requirements for installation shall conform to the latest edition of the Arkansas State Highway and Transportation Department Standard Specifications for Highway Construction.

#### **SC.10 PUBLIC UTILITIES AND OTHER PROPERTY TO BE CHANGED**

In case it is necessary to change or move the property of any owner or of a public utility, such property shall not be moved or interfered with until ordered to do so by the Engineer. The right is reserved to the owner of public utilities to enter upon the limits of the project for the purpose of making such changes or repairs of their property that may be made necessary by performance of this Contract.

#### **SC.11 USED MATERIALS**

No material which has been used by the Contractor for any temporary purpose whatever is to be incorporated in the permanent structure without written consent of the Engineer.

#### **SC.12 EXISTING STRUCTURES**

The Plans show the locations of all known surface and subsurface structures. However, the Owner assumes no responsibility for failure to show any or all of these structures on the Plans, or to show them in their exact location. It is mutually agreed that such failure shall not be considered sufficient basis for claims for additional compensation for extra work or for increasing the pay quantities in any manner whatsoever, unless the obstruction encountered is such as to necessitate changes in the lines or grades, or requires the building of special work, provisions for which are not made in the Plans and Proposal, in which case the provisions in these Specifications for Extra Work shall apply.

The Contractor shall be responsible for protection of all existing structures, and any damage caused by his operations shall be repaired immediately without cost to the Owner. It shall be the responsibility of the prospective Contractor to examine the site completely before submitting his bid.

#### **SC.13 USE OF EXPLOSIVES**

Any use of explosives or blasting shall be as outlined in these Specifications.

#### **SC.14      BARRICADES, LIGHTS, AND WATCHMEN**

Where the work is performed on or adjacent to any street, alley, or public place, the Contractor shall, at his own expense, furnish and erect such barricades, fences, lights, and danger signals, shall provide such watchmen, and shall provide such other precautionary measures for the protection of persons or property and of the work as are necessary.

Barricades shall be painted in a color that will be visible at night. From sunset to sunrise the Contractor shall furnish and maintain at least one light at each barricade and a sufficient number of barricades shall be erected to keep vehicles from being driven on or into any work under construction. The Contractor shall furnish watchmen in sufficient numbers to protect the work.

The Contractor will be held responsible for all damage to the work due to failure to provide barricades, signs, lights, and watchmen to protect it. Whenever evidence is found of such damage, the Engineer may order the damaged portion immediately removed and replaced by the Contractor at his expense. The Contractor's responsibility for the maintenance of barricades, signs, and lights, and for providing watchmen, shall not cease until the project shall have been accepted by the Owner.

#### **SC.15      FENCES AND DRAINAGE CHANNELS**

Boundary fences or other improvements removed to permit the installation of the work shall be replaced in the same location and left in a condition as good, or better than that in which they were found except as indicated on the Drawings.

Where surface drainage channels are disturbed or blocked during construction, they shall be restored to their original condition of grade and cross section after the work of construction is completed.

#### **SC.16      WATER FOR CONSTRUCTION**

Water used for the mixing of concrete, testing, or any other purpose incidental to this project, shall be furnished by the Contractor. The Contractor shall make the necessary arrangements for securing and transporting such water and shall take such water in a manner and at such times that will not produce a harmful drain or decrease of pressure in the Owners' water system. No separate payment will be made for water used but the cost thereof shall be included in the Unit Price Schedule.

#### **SC.17      MATERIAL STORAGE**

Materials delivered to the site of the work in advance of their use shall be stored so as to cause the least inconvenience and in a manner satisfactory to the Engineer.

#### **SC.18      EXISTING UTILITIES AND SERVICE LINES**

The Contractor shall be responsible for the protection of all existing utilities or improvements crossed by or adjacent to his construction operations. Where existing utilities or service lines are cut, broken,

or damaged, the Contractor shall replace or repair immediately the utilities or service lines with the same type of original material and construction or better, at his own expense.

#### **SC.19        TESTING, INSPECTION AND CONTROL**

Testing and control of all materials used in the work shall be done by an approved commercial laboratory employed and paid directly by the Contractor. The Contractor shall furnish, at his own expense, all necessary specimens for testing of the materials, as required by the Engineer.

Testing and control of all materials used for this project shall be done in accordance with the Standard Specifications and The Arkansas State Highway and Transportation Department Field Sampling manual.

Only Technicians certified by the Center for Training Transportation Professionals, University of Arkansas Department of Civil Engineering, Fayetteville, Arkansas (CTTP) shall perform quality control and acceptance testing on this project. Testing Laboratories shall be CTTP certified also. The Contractor shall furnish, at his own expense, all necessary specimens for testing of the materials, as required by the Engineer.

**Materials testing for this project will be at the Contractor's expense with the exception of verification testing by an independent, approved Testing Laboratory, furnished by the City of Jonesboro.** The City of Jonesboro reserves the right to employ a certified lab to perform verification and acceptance testing normally performed by the Arkansas State Highway and Transportation Department. The Contractor shall cooperate fully with the testing firm so employed by the City of Jonesboro

#### **SC.20        BOND**

Coincident with the execution of the Contract, the Contractor shall furnish a good and sufficient surety bond, in the full amount of the Contract sum, guaranteeing the faithful performance of all covenants, stipulations, and agreements of the Contract, the payment of all bills and obligations arising from the execution of the Contract, (which bills or obligations might or will in any manner become a claim against the Owner), and guaranteeing the work included in this Contract against faulty materials and/or poor workmanship for one (1) year after the date of completion of Contract.

All provisions of the bond shall be complete and in full accordance with Statutory requirements. The bond shall be executed with the proper sureties through a company licensed and qualified to operate in the state and approved by the Owner. The issuing agent's power of attorney shall be attached to the bond and the bond shall be signed by an agent resident in the state and date of bond shall be the date of execution of the Contract. If at any time during the continuance of the Contract the surety on the Contractor's bond becomes irresponsible, the Owner shall have the right to require additional and sufficient sureties which the Contractor shall furnish to the satisfaction of the Owner within ten (10) days after notice to do so. In default thereof, the Contract may be suspended and all payments or money due the Contractor withheld.



## **SC.21 LIGHT AND POWER**

The Contractor shall provide, at his own expense, temporary lighting and facilities required for the proper prosecution and inspection of the work. At the time the Owner obtains beneficial occupancy of any of the facilities placed in satisfactory service, charges for power and light for regular operation of those involved facilities will become the responsibility of the Owner.

## **SC.22 LINES AND GRADES**

The Contractor will be furnished baselines and benchmarks to control the work. The Contractor shall be responsible for the additional instrument control necessary to layout and construct the improvements. The Contractor's instrument control of the work shall not be measured for separate payment.

As a minimum, the Contractor shall provide the following instrument control for the work:

- a. For the full length and width of all areas within the limits of paving, the finished grade of the concrete surface course shall be controlled by grade wires or forms set by the Contractor to control the final surface, in accordance with the plans.
- b. For the full length and width of all areas within the limits of paving, the initial courses of bituminous pavement will be controlled by uniform thickness. The course under the final surface course shall be controlled by grade wire, and the final surface course shall be controlled by uniform thickness. The bituminous pavement shall be constructed with a lay down machine with automatic controls and a forty (40) foot ski.
- c. For the full length and width of all areas within the limits of paving, the crushed aggregate base course and the sub base course will be controlled with intermediate and final surface stakes, "blue tops". Stakes shall be set as required or as directed by the Engineer to control the construction.
- d. The Contractor shall set intermediate line and grade stakes and final grade stakes, "blue tops," as required to control the construction of shoulders.

## **SC.23 LEGAL HOLIDAYS**

January 1, Martin Luther King, Jr. Day, President's Day, Memorial Day, July 4, Labor Day, Veteran's Day, Thanksgiving, Day after Thanksgiving, December 24, and December 25 will be considered as being legal holidays; no other days will be so considered. Should any holiday fall on Sunday, the holiday shall be observed on the following Monday. No engineering observation will be furnished on legal holidays or Sundays, except in an emergency. The Contractor shall observe the legal holidays and Sundays, and no work shall be performed on these days except in an emergency. However, these days shall not be excluded from Contract time.

## **SC.24 SEQUENCE OF CONSTRUCTION**

Sequence of all phases of work shall be such as to provide for the least possible inconvenience to the Owner. Scheduling of work which would interfere with normal traffic operation shall be coordinated with the Owner. Material and equipment received on the project prior to time of installation shall be stored at such locations designated by the Owner.

The Contractor shall furnish a proposed work schedule to the Engineer for review and approval as soon as possible after award of the Contract. This schedule shall show anticipated equipment delivery schedules and times of beginning and completing of the several work tasks.

## **SC.25 TEST BORINGS**

The Contractor may rely upon the general accuracy of the test pit or soil boring data contained in reports or drawings, but such reports and drawings are not Contract Documents. The Contractor may not rely upon or make any claim against Owner, Engineer, or Engineer's Consultants with respect to (1) the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by the Contractor and safety precautions and programs incident thereto, (2) other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings, (3) any Contractor interpretation of or conclusion drawn from any data, interpretations, opinions, or information.

## **SC.26 TEMPORARY FIELD OFFICE**

\*NOT APPLICABLE THIS PROJECT

## **SC.27 RELEASE AND CONTRACTOR'S AFFIDAVIT**

At the project's completion, the Contractor shall execute the attached Release and Lien Waiver to release all claims against the Owner arising under and by virtue of his Contract. The date of the Release shall be that agreed to for the final acceptance of the project with the Owner.

## **SC.28 MAINTENANCE BOND**

The Contractor shall execute the attached Maintenance Bond guaranteeing the work included in the Contract against faulty materials and/or prior workmanship for one year after completion of the Contract. The date of the Maintenance Bond shall be that agreed to for the final acceptance of the project with the Owner. The Maintenance Bond shall be for 100% of the final contract amount.

At the end of the applicable maintenance period, the Owner and/or the Engineer, with the Contractor, shall make an inspection of the work. The Contractor immediately shall repair and correct any and all defects which have resulted from faulty workmanship, equipment, or materials, following which repair and correction the Local Public Agency will accept full maintenance of the work.

RELEASE

FROM: Contractor's Name \_\_\_\_\_  
Address \_\_\_\_\_  
\_\_\_\_\_

TO: City of Jonesboro

DATE OF CONTRACT: \_\_\_\_\_

Upon receipt of the final payment and in consideration of that amount, the undersigned does hereby release the Owner and its agents from any and all claims arising under or by virtue of this Contract or modification thereof occurring from the undersigned's performance in connection with the construction of the **Craighead Technology Park Industrial Lead Rail Expansion Project Section II Track Construction**.

\_\_\_\_\_  
Contractor's Signature

\_\_\_\_\_  
Title

Subscribed and sworn to before me this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

\_\_\_\_\_  
Notary Public

My Commission Expires:

\_\_\_\_\_

**CONTRACTOR'S AFFIDAVIT**

FROM: Contractor's Name\_\_\_\_\_

Address\_\_\_\_\_

\_\_\_\_\_

TO: City of Jonesboro

DATE OF CONTRACT: \_\_\_\_\_

I hereby certify that all claims for material, labor, and supplies entered into contingent and incident to the construction or used in the course of the performance of the work on the construction of the **Craighead Technology Park Industrial Lead Rail Expansion Project Section II Track Construction** have been fully satisfied.

\_\_\_\_\_  
Contractor's Signature

\_\_\_\_\_  
Title

Subscribed and sworn to before me this \_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

\_\_\_\_\_  
Notary Public

My Commission Expires:

\_\_\_\_\_

The Surety Company consents to the release of the retained percentage on this project with the understanding that should any unforeseen contingencies arise having a right of action on the bond that the Surety Company will not waive liability through the consent to the release of the retained percentage.

Dated \_\_\_\_\_

\_\_\_\_\_  
Surety Company

By\_\_\_\_\_  
Resident Agent, State of Arkansas

\_\_\_\_\_

**MAINTENANCE BOND**

KNOW ALL MEN BY THESE PRESENTS:

That we, \_\_\_\_\_,

as Principal, and \_\_\_\_\_,

as Surety, are held and firmly bound unto the City of Jonesboro, as Obligee, in the full and

just sum of \_\_\_\_\_  
(\$ \_\_\_\_\_) DOLLARS, lawful money of the United States of America, to be paid to the said Obligee, its successors or assigns, for the payment of which, well and truly to be made, we and each of us, bind ourselves, our heirs, executors and assigns, themselves, and their successors and assigns, jointly and severally, firmly by these presents.

Dated this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_.

The conditions of this obligation are such, that whereas, said Principal, has by a certain contract with the City of Jonesboro dated the \_\_\_\_ day of \_\_\_\_\_, 20 \_\_\_\_, agreed to construct the **Craighead Technology Park Industrial Lead Rail Expansion Project Section II Track Construction** and to maintain the said Improvement in good condition for a period of one (1) year from the date of acceptance of the improvements.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH, that if the said Principal shall indemnify and hold harmless the said Obligee from and against all loss, costs, damages, and expenses whatsoever which it may suffer or be compelled to pay by reason of failure of the said Principal to keep said work in repair for a one year period beginning \_\_\_\_\_ against any and all defects of faulty workmanship or inferior material, then this obligation shall be void; otherwise to remain in full force and effect.

It is further agreed that if the said Principal or Surety herein shall fail to maintain said improvements in good condition for the said period of 1 year, and at any time repairs shall be necessary, that the cost of making said repairs shall be determined by the Owner, or some person or persons designated by the Owner to ascertain the same, and if, upon thirty (30) days notice, the said amount ascertained shall not be paid by the Principal or Surety herein, or if the necessary repairs are not made, that said amount shall become due upon the expiration of thirty (30) days, and suit may be maintained to recover the amount so determined in any Court of competent jurisdiction; and that the amount so determined shall be conclusive upon the parties as to the amount due on this bond for the repair or repairs included therein; and that the cost of all repairs shall be so determined from time to time during the life of this bond, as the condition of the improvements may require.

Signed, sealed and delivered the day and year first above written.

\_\_\_\_\_  
Principal

ATTEST:

\_\_\_\_\_  
BY: \_\_\_\_\_

\_\_\_\_\_  
SEAL

\_\_\_\_\_  
Surety

ATTEST:

\_\_\_\_\_  
BY: \_\_\_\_\_

\_\_\_\_\_  
Attorney in Fact

## **XI. DIVISION 1 – GENERAL REQUIREMENTS**

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#### **TITLE**

01150

MEASUREMENT AND PAYMENT

## **MEASUREMENT AND PAYMENT**

### **1. GENERAL**

- 1.01 Measurement of and payment for all new materials, supplies, services, equipment, tools, plant, and labor furnished and all work completed in accordance with these Contract Documents shall be as shown on the drawings and adhere to the Burlington Northern Santa Fe Railroad Technical specifications for Industrial Tracks.
- 1.02 The prices herein agreed to for the performance of the work shown and as specified shall be inclusive, that is, the said prices shall include not only the doing of the work; but also, all costs in connection with the work and payment therefore; including the furnishing of all materials, equipment, supplies, and appurtenances; all construction plant, tools, and other equipment; services; and the performance of all necessary labor, superintendence, and administration required to fully complete the work. No item of work that is required for the proper and successful completion of the work, whether shown or not, shall be paid for outside of or in addition to the prices submitted in the Proposal except as specifically provided for in the Contract Documents.
- 1.03 All incidental work required by the Contract Documents, for which no payment is specifically provided, and any work or materials not therein specified which are required to complete the work, and which may fairly be implied as included in the contract, and which the Engineer shall judge to be so included, shall be done or furnished by the contractor without extra compensation.

### **2. MEASUREMENTS**

- 2.01 Measurement of all quantities shall be by the utilization of conventional methods and the standard units described.

### **3. PAYMENT**

- 3.01 Payment to the Contractor of the prices bid in the Proposal shall be full compensation for the furnishing or the furnishing and installing of all materials, labor, tools, equipment, water, light, power, transportation, supervision, temporary construction of any nature, and all other services and facilities of any nature necessary to execute, complete and deliver the work.

### **4. MEASUREMENT AND PAYMENT ITEMS**

- 4.01 The items of work for which actual measurement and payment will be made are listed hereinafter by actual Proposal Item Number and general Proposal Item Description. Each item of work for measurement and payment shall define the method of measurement, the method of payment, and the general scope of work to be included.



4.02a **SECTION I (Post Foods Area) – RAILROAD SUBGRADE CONSTRUCTION**

A. Item No. 1 – Clearing and Grubbing

This item will be paid for to the nearest tenth of an acre at the unit price listed in the Proposal. The unit price shall include all labor, materials, tools, equipment, and incidentals necessary to clear and grub the designated areas complete. The clearing and grubbing will consist of the stripping of all topsoil, vegetation and root balls along with any existing structures for the top 12" of natural ground where required in the work area. This material is to be removed from the work site at the Contractor's expense.

B. Item No. 2 – Erosion and Sediment Control

This item will be paid for on a lump sum basis. The lump sum price shall include all labor, materials, tools, equipment and incidentals necessary to furnish all silt fences at the toes of new excavation, hay-bale or rip rap check dams, diversion ditches and other items needed to prevent the erosion of sediment. The price will also include the removal/replacement of erosion and sediment control where needed during the project. All new ditches shall contain rip-rap check dams at 100' intervals. All disturbed ground shall be seeded, fertilized, and mulched after final grading is complete. This item shall also include the SWPPP from the initial permitting through the completion of the project. The Contractor shall be responsible for the SWPPP reports and associated duties.

C. Item No. 3 – Unclassified Excavation

The excavation will be measured by the in-place cubic yard and will not include the stripping of topsoil in areas where excavation is required. Payment will be made at the unit price per cubic yard as listed in the Proposal and shall include all labor, materials, tools, equipment, and incidentals necessary to complete the excavation to the grades as shown in the plans. The Contractor shall be responsible for offsite disposal of all excavated material unsuitable for embankment construction on other areas of the project. Once the design elevation has been obtained, the sub-grade must be compacted to 95% modified density prior to placing geotech materials layer.

D. Item No. 4 – Compacted Embankment

The compacted embankment will be measured on a cubic yard basis of in-place material. Payment will be made at the unit price per in place cubic yard as listed in the Proposal. Measurement will be made from the grade on plans and prior to the spreading of any topsoil on side slopes. This item will include all labor, materials, tools, equipment, and incidentals necessary to furnish, haul, place, construct and compact the fill material meeting Burlington Northern Santa Fe Railroad standards and placed as per specifications. The embankment work must pass density tests before final acceptance is received. The densities must meet or exceed a 95% modified test. All embankment material placed shall meet ArDOT Class 5 material specifications.

E. Item No. 5 – Geo-tech Fabric (Non-woven)/Geo-grid System

The geo-tech fabric/geo-grid system for the track bed shall be measured on a square yard basis of in-place material. Payment will be made at the unit price per square yard as listed in the Proposal. Additional material needed to account for the manufacturer's recommendations for overlap will not be measured or paid for, but is to be installed at the Contractor's expense. The fabric shall be installed on properly prepared and compacted, finished sub-grade. The fabric will be placed down first and the geo-grid on top of the fabric in direct contact with the sub-ballast. The fabric shall be Contech C60 or an approved equal and the geo-grid shall be a Tensar TX 160 or approved equal.

F. Item No. 6 – Compacted Sub-ballast

The sub-ballast shall be measured on a cubic yard basis of in-place material and paid at the unit price as shown in the Proposal. The 10" section of compacted sub-ballast material must meet Burlington Northern Santa Fe Standards and be placed per specifications. This item will include all labor, materials, tools, transportation, equipment, and incidentals necessary to furnish, haul, place and compact the sub-ballast complete to the grade as shown on the plans. All compacted sub-ballast shall pass density tests before final acceptance is received.

G. Item No. 7a – Drainage Structures

The drainage pipes shall be measured on a lump sum basis of installed pipe with the riprap and fabric as shown in the specification. Payment will be made at the lump sum price as listed in the Proposal. This item will include all materials, labor, tools, equipment, and incidentals necessary to excavate, relocate & install the 12" RCP pipe complete with compacted backfill to the lines and grades shown on the drawings. Contractor shall be responsible for any pipe damaged during completion of this item.

H. Item No. 8 – Project Sign

This item will be measured on a lump sum basis and paid for at the lump sum price as listed in the Proposal. The lump sum price shall include the cost of preparing the sign as shown in the specifications and mounting the sign at a location to be determined by the Owner. There is a sign for FRA and EDA both in the specifications.

I. Item No. 9 – Payment and Performance Bonds

This item will be measured as a lump sum item and paid for at the lump sum price as listed in the proposal. The lump sum price shall include the cost of obtaining a surety bond for 100% of the contract price from an insurance company that is licensed to do business in the state of Arkansas and is able to cover 100% of the bid price.

**4.02b SECTION I (Nestle Rd. Area) – RAILROAD SUBGRADE CONSTRUCTION**

A. Item No. 1 – Clearing and Grubbing

This item will be paid for to the nearest tenth of an acre at the unit price listed in the Proposal. The unit price shall include all labor, materials, tools, equipment, and incidentals necessary to clear and grub the designated areas complete. The clearing and grubbing will consist of the stripping of all topsoil, vegetation and root balls along with any existing structures for the top 12" of natural ground where required in the work area. This material is to be removed from the work site at the Contractor's expense.

B. Item No. 2 – Erosion and Sediment Control

This item will be paid for on a lump sum basis. The lump sum price shall include all labor, materials, tools, equipment and incidentals necessary to furnish all silt fences at the toes of new excavation, hay-bale or rip rap check dams, diversion ditches and other items needed to prevent the erosion of sediment. The price will also include the removal/replacement of erosion and sediment control where needed during the project. All new ditches shall contain rip-rap check dams at 100' intervals. All disturbed ground shall be seeded, fertilized, and mulched after final grading is complete. This item shall also include the SWPPP from the initial permitting through the completion of the project. The Contractor shall be responsible for the SWPPP reports and associated duties.

C. Item No. 3 – Unclassified Excavation

The excavation will be measured by the in-place cubic yard and will not include the stripping of topsoil in areas where excavation is required. Payment will be made at the unit price per cubic yard as listed in the Proposal and shall include all labor, materials, tools, equipment, and incidentals necessary to complete the excavation to the grades as shown in the plans, including ditches and entrance drive. The Contractor shall be responsible for offsite disposal of all excavated material unsuitable for embankment construction on other areas of the project. Once the design elevation has been obtained, the sub-grade must be compacted to 95% modified density prior to placing geotech materials layer.

D. Item No. 4 – Compacted Embankment

The compacted embankment will be measured on a cubic yard basis of in-place material. Payment will be made at the unit price per in place cubic yard as listed in the Proposal. Measurement will be made from the grade on plans and prior to the spreading of any topsoil on side slopes. This item will include all labor, materials, tools, equipment, and incidentals necessary to furnish, haul, place, construct and compact the fill material meeting Burlington Northern Santa Fe Railroad standards and placed as per specifications. The embankment work must pass density tests before final acceptance is received. The densities must meet or exceed a 95% modified test. All embankment material placed shall meet ArDOT Class 5 material specifications.

E. Item No. 5 – Geo-tech Fabric (Non-woven)/Geo-grid System

The geo-tech fabric/geo-grid system for the track bed shall be measured on a square yard basis of in-place material. Payment will be made at the unit price per square yard as listed in the Proposal. Additional material needed to account for the manufacturer's recommendations for overlap will not be measured or paid for, but is to be installed at the Contractor's expense. The fabric shall be installed on properly prepared and compacted, finished sub-grade. The fabric will be placed down first and the geo-grid on top of the fabric in direct contact with the sub-ballast. The fabric shall be Contech C60 or an approved equal and the geo-grid shall be a Tensar TX 160 or approved equal.

F. Item No. 6 – Compacted Sub-ballast

The sub-ballast shall be measured on a cubic yard basis of in-place material and paid at the unit price as shown in the Proposal. The 10" section of sub-ballast material must meet Burlington Northern Santa Fe Standards and be placed per specifications. This item will include all labor, materials, tools, transportation, equipment, and incidentals necessary to furnish, haul, place and compact the sub-ballast complete to the grade as shown on the plans, including the access and entrance drives. All compacted sub-ballast shall pass density tests before final acceptance is received.

G. Item No. 7a, 7b, 7c – Drainage Structures

The drainage pipes shall be measured on a lineal foot basis of installed pipe with the riprap and fabric as shown in the specification. Payment will be made at the lineal foot price as listed in the Proposal. This item will include all materials, labor, tools, equipment, and incidentals necessary to furnish, excavate, and install the drainage pipe complete with compacted backfill to the lines and grades shown on the drawings.

H. Item No. 8 – Project Sign

This item will be measured on a lump sum basis and paid for at the lump sum price as listed in the Proposal. The lump sum price shall include the cost of preparing the sign as shown in the specifications and mounting the sign at a location to be determined by the Owner. There is a sign for FRA and EDA both in the specifications.

I. Item No. 9 – Payment and Performance Bonds

This item will be measured as a lump sum item and paid for at the lump sum price as listed in the proposal. The lump sum price shall include the cost of obtaining a surety bond for 100% of the contract price from an insurance company that is licensed to do business in the state of Arkansas and is able to cover 100% of the bid price.

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4.03a **SECTION II (Post Foods Area) – RAIL SPUR CONSTRUCTION**

A. Item No.1–Furnish & Install 115# New or No. 1 Relay (min.) Rail, Ties, Ballast, & Inc.

This item will be measured on a lineal foot basis along the surveyed centerline. Payment will be made at the unit price per lineal foot as listed in the Proposal. The unit price will include all labor, materials, tools, equipment, and incidentals necessary to furnish and construct the track complete from the top of the compacted sub-ballast to the finished industrial rail spur. The unit price will be based on 115 pound new, or No.1 relay (min.) rail and will include all requirements of the construction such as 7"x9"x8.5' ties on 19'5" centers, 8" ballast section, tie plates, bolts, anchors, angle bars, spikes, and any other items of work required by Burlington Northern Santa Fe Railroad for the construction. All final work must be tamped with a tamper equivalent in size to a 6700 tamper.

B. Item No. 2 – Salvage/Reinstall Ex. Rail, Ties & Incidentals w/ 25% Tie Replacement

This item shall be measured on a lineal foot basis along the surveyed centerline. Payment will be made at the unit price per lineal foot as listed in the Proposal. The unit price will include all labor, materials, tools, equipment, and incidentals necessary to salvage and reinstall the existing rail, ties, ballast and incidentals. The panels shall have 25% of ties replaced prior to reinstallation. Any additional ballast required shall be included in the cost. Any material damaged during the removal and reinstallation shall be replaced at the Contractor's expense. Any material damage prior to the removal should be pointed out to the Engineer before performing the work. All finished work shall be tamped with a tamper equivalent in size to a 6700 tamper.

C. Item No. 3 – Realignment Ex. Rail, Ties & Incidentals w/ 25% Tie Replacement

This item shall be measured on a lineal foot basis along the surveyed centerline. Payment will be made at the unit price per lineal foot as listed in the Proposal. The unit price will include all labor, materials, tools, equipment, and incidentals necessary to realign the existing rail, ties, ballast and incidentals complete. The panels shall have 25% of ties replaced prior to reinstallation. Any additional ballast required shall be included in the cost. Any material damaged during the removal and reinstallation shall be replaced at the Contractor's expense. Any material damage prior to the removal should be pointed out to the Engineer before performing the work. All finished work shall be tamped with a tamper equivalent in size to a 6700 tamper.

D. Item No. 4a, 4b, 4c & 4d – Furnish and Install Turnouts (Style Varies as Shown)

This item will be measured on a unit basis and paid for at the unit price as listed in the Proposal. The unit price shall include all labor, material, tools, equipment, and incidentals necessary to furnish and install the Turnouts complete from the point of switch to the last switch tie as shown in Division 18. Each unit price shall include all switch ties, rail, points, frogs, switch stand (36EH) and any other incidentals necessary to build the switch complete. The unit price shall also include any comp bars if required. All switch ties shall be new and meet Burlington Northern Santa Fe standards. All mainline turnouts shall be

new, BNSF packaged turnouts. All other turnouts shall be Industrial Grade (115#), at a minimum.

E. Item No. 4e – Salvage and Stockpile Existing #9 Turnouts

This item will be measured on a unit basis and paid for at the unit price as listed in the Proposal. The unit price shall include all labor, material, tools, equipment, and incidentals necessary to salvage and stockpile the existing #9 Turnouts complete from the point of switch to the last switch tie as shown in Division 18. Each unit price shall include all switch ties, rail, points, frogs, switch stand (36EH) and any other incidentals necessary to salvage the turnout complete.

F. Item No. 5 – Single Switch Point Derail

This item will be measured on a unit basis and paid for at the unit price as listed in the Proposal. The unit price shall include all labor, material, tools, equipment, and incidentals necessary to furnish and install the Single Switch Point Derail complete from the point of switch to the last switch tie as shown in Division 18. Each unit price shall include any switch ties, rail, points, frogs, switch stand (36EH) and any other incidentals necessary to install the derail complete according to BNSF Specifications.

G. Item No. 6 – EOT Device (Steel Bumping Post w/ Shockfree Head)

This item will be measured on a lump sum basis and paid for at the lump sum price as listed in the Proposal. The lump sum price shall include all labor, material, tools, equipment, and incidentals necessary to furnish and install the Steel Bumping Post w/ Shockfree Head (Hayes), complete as shown in Division 18. Each unit price shall include any cross ties, rail, bolts, steel cross-members, bumper and any other incidentals necessary to build the bumping post complete to meet Burlington Northern Santa Fe Specifications.

H. Item No. 7 – Payment and Performance Bonds

This item will be measured as a lump sum item and paid for at the lump sum price as listed in the Proposal. The lump sum price shall include the cost of obtaining a surety bond for 100% of the contract price from an insurance company that is licensed to do business in the state of Arkansas and is able to cover 100% of the bid price.

I. Item No. 86 – In-plant Grade Crossing (Asphalt)

This item will be measured on a lump sum basis and paid for at the lump sum price as listed in the Proposal. The lump sum price shall include all labor, material, tools, equipment, and incidentals necessary to furnish and install the Asphalt In-plant Grade Crossing complete. The price shall include all asphalt and any additional ballast/subballast required to construct the crossing complete to grade.

4.03b **SECTION II (Nestle Rd. Area) – RAIL SPUR CONSTRUCTION**

A. Item No.1–Furnish & Install 115# New or No. 1 Relay (min.) Rail, Ties, Ballast, & Inc.

This item will be measured on a lineal foot basis along the surveyed centerline. Payment will be made at the unit price per lineal foot as listed in the Proposal. The unit price will include all labor, materials, tools, equipment, and incidentals necessary to furnish and construct the track complete from the top of the compacted sub-ballast to the finished industrial rail spur. The unit price will be based on 115 pound new, or No.1 relay (min.) rail and will include all requirements of the construction such as 7"x9"x8.5' ties on 19'5" centers, 8" ballast section, tie plates, bolts, anchors, angle bars, spikes, and any other items of work required by Burlington Northern Santa Fe Railroad for the construction. All final work must be tamped with a tamper equivalent in size to a 6700 tamper.

B. Item No. 2 – Remove/Salvage/Stockpile Existing Industrial Lead Rail

This item shall be measured on a lineal foot basis along the surveyed centerline. Payment will be made at the unit price per lineal foot as listed in the Proposal. The unit price will include all labor, materials, tools, equipment, and incidentals necessary to remove, salvage, stockpile the existing rail and incidentals for Turnout installation. Any material damaged during the process shall be replaced at the Contractor's expense. Any material damage prior to the removal should be pointed out to the Engineer before performing the work.

C. Item No. 3 – Regrade Existing Industrial Lead Rail, Ties, Ballast

This item shall be measured on a lineal foot basis along the surveyed centerline. Payment will be made at the unit price per lineal foot as listed in the Proposal. The unit price will include all labor, materials, tools, equipment, and incidentals necessary to regrade the existing Industrial Lead rail, ties, ballast and incidentals complete to the grade as shown. Any additional ballast required shall be included in the cost. Any material damaged during the regrade process shall be replaced at the Contractor's expense. Any material damage prior to the removal should be pointed out to the Engineer before performing the work. All finished work shall be tamped with a tamper equivalent in size to a 6700 tamper.

D. Item No. 4a & 4b – Furnish and Install Turnouts (Style Varies as Shown)

This item will be measured on a unit basis and paid for at the unit price as listed in the Proposal. The unit price shall include all labor, material, tools, equipment, and incidentals necessary to furnish and install the Turnouts complete from the point of switch to the last switch tie as shown in Division 18. Each unit price shall include all switch ties, rail, points, frogs, switch stand (36EH) and any other incidentals necessary to build the switch complete. The unit price shall also include any comp bars if required. All switch ties shall be new and meet Burlington Northern Santa Fe standards. All mainline turnouts shall be new, BNSF packaged turnouts. All other turnouts shall be Industrial Grade (115#), at a minimum.

E. Item No. 5 – Single Switch Point Derail

This item will be measured on a unit basis and paid for at the unit price as listed in the Proposal. The unit price shall include all labor, material, tools, equipment, and incidentals necessary to furnish and install the Single Switch Point Derail complete from the point of switch to the last switch tie as shown in Division 18. Each unit price shall include any switch ties, rail, points, frogs, switch stand (36EH) and any other incidentals necessary to install the derail complete according to BNSF Specifications.

F. Item No. 6 – EOT Device ( 2-Track Earthen Bumper)

This item will be measured on a unit basis and paid for at the unit price as listed in the Proposal. The unit price shall include all labor, materials, tools, equipment and incidentals necessary to furnish and construct the dirt bumper end of track safety device according to Burlington Northern Santa Fe specifications and details.

L. Item No. 7 – Payment and Performance Bonds

This item will be measured as a lump sum item and paid for at the lump sum price as listed in the Proposal. The lump sum price shall include the cost of obtaining a surety bond for 100% of the contract price from an insurance company that is licensed to do business in the state of Arkansas and is able to cover 100% of the bid price.

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## **XII. TECHNICAL SPECIFICATIONS**

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#### **TITLE**

SP-1	Standard Specifications for Highway Construction Arkansas State Highway and Transportation Department, Latest Edition (including all Errata for the Book of Standard Specifications) if specified
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DIV 18	BNSF Railway – Guidelines for Industry Track Projects
DIV 19	Geotechnical Investigation Report

## **SP-1 - SPECIFICATIONS, ARKANSAS STATE HIGHWAY COMMISSION**

### General

The standard specifications of the Arkansas State Highway and Transportation are bound in a book titled Standard Specifications for Highway Construction. These specifications are referred to herein as "Standard Specifications." The latest edition shall apply.

A copy of these "Standard Specifications" may be obtained from the Arkansas State Highway and Transportation Department, Little Rock, Arkansas, at their customary charge.

DIVISION 17  
RAILROAD ROADBED CONSTRUCTION

## 1. CLEARING AND GRUBBING

### 1.01 DESCRIPTION

This item shall consist of clearing and grubbing, including the disposal of materials, for all areas within the limits designated on the plans or as required by the Engineer.

Clearing and grubbing shall consist of clearing the surface of the ground of the designated areas of all trees, stumps, down timber, logs, snags, brush, undergrowth, hedges, heavy growth of weeds, fences, structures, old railroad including ties and rail, debris and rubbish of any nature, natural obstruction or such material which in the opinion of the Engineer is unsuitable for the foundation of strips or other requirements, including the grubbing of stumps, roots, matted roots, foundations and the disposal from the project of all spoil materials resulting from clearing and grubbing by burning.

## 2. CONSTRUCTIONS METHODS

### 2.01 GENERAL

The areas denoted on the drawings to be cleared shall be flagged on the ground by the Engineer. The clearing and grubbing shall be done at a satisfactory distance in advance of the removal of top soil operations.

All spoil materials removed by clearing and grubbing shall be disposed of by burning, when permitted by local laws. When burning of material is permitted, it shall be burned under the constant care of competent watchmen so that the surrounding vegetation and other adjacent property will not be jeopardized. Burning shall be done in accordance with all applicable laws, ordinances and regulations. Before starting any burning operations, the Contractor shall notify the agency having jurisdiction and acquire any necessary permits.

As far as practicable, waste concrete and masonry shall be placed on slopes of embankments. When embankments are constructed of such material, this material shall be placed in accordance with requirements for formation of embankments. Any broken concrete or masonry which cannot be used in construction and all other materials not considered suitable for use elsewhere, shall be disposed of by the Contractor. In no case shall any discarded materials be left in windrows or piles adjacent to or within the construction limits. The manner and location of disposal of materials shall be subject to the approval of the Engineer and shall not create an unsightly or objectionable view.

No blasting shall be permitted in the clearing and grubbing operation.

### 2.02 CLEARING AND GRUBBING

In areas designated to be cleared and grubbed, all stumps, roots, buried lots, brush, weeds and other unsatisfactory shall be removed. Where embankments are to be made, all unsatisfactory materials shall be removed.

Fences shall be removed and disposed of when directed by the Engineer. Fence wire shall be neatly rolled and wire and posts stored on the site and to remain the property of the Owner.

Any building and miscellaneous structures within the cleared and grubbed area shall be demolished or removed, and all materials there from shall be disposed of either by burning or removed from the site. The remaining or existing foundations, wells, cesspools, and all like structures shall be destroyed by breaking out or breaking down of at least 2 feet below the existing surrounding ground. Any broken concrete, blocks or other objectionable material which cannot be used in backfill shall be removed and disposed of. The holes or openings shall be backfilled with acceptable material and property compacted.

All holes remaining after the grubbing operation in embankment areas shall have the sides broken down to flatten out the slopes and shall be filled with acceptable material, moistened and properly compacted in layers to the density required in Section 17050. The same construction procedure shall be applied to all holes remaining after grubbing in excavation areas where the depth of holes exceeds the depth of the proposed excavation.

\* \* \* \* \*

## 1. DESCRIPTION

### 1.01 GENERAL

This item covers excavation, disposal, placement and compaction of all materials within the limits of the work required to construct railroad roadbed, other areas for drainage or other purposes in accordance with these specifications and in conformity to the dimensions and typical section shown on the drawings.

A. Classification – All material excavated shall be unclassified. The excavation shall be used as a part of the embankment or removed from the site and disposed of at the Contractor's option. The excavation placed in the embankments shall be accomplished only with materials that are suitable and meet the requirements of these specifications.

### 1.02 STRIPPING

Any material containing vegetable or organic matter, organic silt or sod shall be considered unsuitable for use in embankment construction. A minimum of the top 6 inches of existing ground in both cut and embankment areas shall be stripped. Material, when approved by the Engineer as suitable to support vegetation, may be used on the embankment slopes and seed bed for side slopes.

## 2. CONSTRUCTION METHODS

### 2.01 GENERAL

Before beginning excavation, grading and embankment operations in any area, the area shall be completely cleared and grubbed in accordance with Section 17000.

The suitability of material to be placed in embankments shall be subject to approval by the Engineer. All unsuitable material shall be disposed of in waste areas shown on the drawings. All waste areas shall be graded to allow positive drainage of the area and of adjacent areas. The surface elevation of waste areas shall not extend above the surface elevation of adjacent usable areas of the roadbed, unless specified on the drawings or approved by the Engineer.

When the Contractor's excavation operations encounter artifacts of historical or archaeological significance, the operations shall excavate the site in such a manner as to preserve the artifacts encountered and allow for their removal. Such excavation will be paid for as extra work.

Those areas outside of the roadbed areas in which the top layer of soil material has become compacted, by hauling or other activities or the Contractor, shall be scarified and disked to a depth of 4 inches in order to loosen and pulverize the soil. These areas shall then have seeding and fertilization applied.

### 2.02 EXCAVATION

No excavation shall be started until the work has been staked out by the Contractor, and the Engineer has obtained elevations and measurements of the ground surface. All suitable

excavated material shall be used in the formation of embankment, subgrade or for other purposes shown on the drawings. All unsuitable material shall be disposed of as shown on the drawings.

When the volume of the excavation exceeds that required to construct the embankments to the grades indicated, the excess shall be used to grade the areas of ultimate development or disposed of as directed. When the volume of excavation is not sufficient for constructing the embankments to the grades indicated, the deficiency shall be obtained from off-site borrow pits of materials that are suitable and acceptable to the Engineer.

A. Undercutting – Rock, shale, hardpan, loose rock, boulders or other materials unsatisfactory for the roadbed shall be excavated to a minimum depth of 8 inches, or to the depth specified by the Engineer, below the subgrade. Muck, matted roots or other yielding material, unsatisfactory for subgrade foundation, shall be removed to the depth specified. Unsuitable materials shall be disposed of at locations shown on the drawings.

The excavated area shall be refilled with suitable material, obtained from the grading operations or borrow areas and thoroughly compacted by rolling. The necessary refilling will constitute a part of the embankment. Where rock cuts are made and refilled with selected material, any pockets created in the cuts are made and refilled with selected material, any pockets created in the rock surface shall be drained in accordance with the details shown on the drawings. Geo-grid use shall be determined in a case-by-case inspection.

B. Overbreak – Overbreak, including slides, is that portion of any material displaced or loosened beyond the finished work as planned or authorized by the Engineer. The Engineer shall determine if the displacement of such material was unavoidable and his decisions shall be final. All overbreak shall be graded or removed by the Contractor and disposed of as directed; however, payment will not be made for the removal and disposal of overbreak which the Engineer determines as avoidable. Unavoidable overbreak will be classified as “Unclassified Excavation”.

C. Compaction Requirements – the finished grades shall be compacted to a depth of 6 inches and to a density of not less than 95 percent of the maximum density and determined by ASTM D 1557 (Modified Proctor Test).

No payment will be made for suitable materials removed, manipulated and replaced in order to obtain the required depth of density.

The in-place field density shall be determined in accordance with ASTM D-2922 (Nuclear Method). Stones or rock fragments larger than 4 inches in their greatest dimension will not be permitted in the top 6 inches of the subgrade.

## 2.03 DRAINAGE EXCAVATION

Drainage excavation shall consist of excavating for drainage ditches along the roadbed, and as shown on the drawings. The work shall be performed in the proper sequence with the other construction. All satisfactory material shall be placed in fills; unsuitable material shall be placed in waste areas or as directed. Intercepting ditches shall be constructed prior to starting

adjacent excavation operations. All necessary work shall be performed to secure a finish true to line, elevation and cross section.

The Contractor shall maintain ditches constructed on the project to the required cross section and shall keep them free of debris or obstructions until the project is accepted.

#### 2.04 SURPLUS EXCAVATION

The material excavated and not required by the construction of the embankments shall be stockpiled separately from the top soil. The surplus matter shall be stockpiled at the locations shown on the drawings. The stockpile shall be such that rain water will not pocket on the surface. The crown of the stockpile shall be sloped to provide drainage.

#### 2.05 PREPARATION OF EMBANKMENT AREA

Where an embankment is to be constructed, all sod and vegetable matter shall be removed from the surface upon which the embankment is to be placed, and the cleared surface shall be completely broken up by plowing or scarifying to a minimum depth of 6 inches. This area shall then be compacted as indicated in paragraph 2.06.

No direct payment shall be made for the work performed under this paragraph.

#### 2.06 FORMATION OF EMBANKMENTS

Embankments shall be formed in successive horizontal layers of not more than 8 inches in loose depth for the full width of the cross section, unless otherwise approved by the Engineer.

The grading operations shall be conducted, and the various soil strata shall be placed, to produce a soil structure as shown on the typical cross section or as directed. Materials such as brush, hedge, roots, stumps, grass and other organic matter, shall not be incorporated or buried in the embankment.

Operations on earthwork shall be suspended at any time when satisfactory results cannot be obtained because of rain, freezing or other unsatisfactory conditions of the field. The Contractor shall drag, blade or slope the embankment to provide proper surface drainage.

The material in the layer shall be within  $\pm 2$  percent of optimum moisture content before rolling to obtain the prescribed compaction. In order to achieve uniform moisture content throughout the layer, wetting or drying of the material and manipulation shall be required when necessary. Should the material be too wet to permit proper compaction or rolling, all work on all of the affected portions of the embankment shall be delayed until the material has dried to the required moisture content. Sprinkling of dry material to obtain the proper moisture content shall be done with approved equipment that will sufficiently distribute the water. Sufficient equipment to furnish the required water shall be available at all times. Samples of all embankment materials for testing, both before and after placement and compaction, will be taken for each 100 cubic yards. Based on these tests, the Contractor shall make the necessary corrections and adjustments in methods, materials or moisture content in order to achieve the correct embankment density.



Rolling operations shall be continued until the embankment is compacted to not less than 95 percent of maximum density as determined by ASTM D 1557 (Modified Proctor Test).

On all areas outside of the roadbed areas, no compaction will be required on the top 4 inches.

The in-place field density shall be determined in accordance with ASTM D 1556 or ASTM D 2922.

Compaction areas shall be kept separate and no layer shall be covered by another until proper density is obtained.

During construction of the embankment, the Contractor shall route his equipment at all times, both when loaded and when empty, over the layers as they are placed and shall distribute the travel evenly over the entire width of the embankment. The equipment shall be operated in such a manner that hardpan, cemented gravel, clay or other chunky soil material will be broken up into small particles and become incorporated with other materials in the layer.

In the construction of embankments, layer placement shall begin in the deepest portion of the fill; as placement progresses, layers shall be constructed approximately parallel to the finished grade line.

When rock and other embankment material are excavated at approximately the same time, the rock shall be incorporated into the outer portion of the embankment and other material shall be incorporated under the roadbed areas. Stones or fragmentary rock larger than 4 inches in their greatest dimension will not be allowed in the top 6 inches of the subgrade. Rock fill shall be brought up in layers as specified or as directed and every effort shall be exerted to fill the voids with the finer material forming a dense, compact mass. Rock boulders shall not be disposed of outside the excavation or embankment areas, except at places and the manner designated by the Engineer.

When the excavated material consists predominately of rock fragments of such size that the material cannot be placed in layers of the prescribed thickness without crushing, pulverizing or further breaking down the pieces, such material may be placed in the embankment as directed in layers not exceeding 2 feet in thickness. Each layer shall be leveled and smoothed with suitable leveling equipment and by distribution of spalls and finer fragments of rock. These type lifts shall not be constructed above an elevation 4 feet below the finished subgrade. Density requirements will not apply to portions of embankments constructed of materials which cannot be tested in accordance with specified methods.

Frozen material shall not be placed in the embankment nor shall embankment be placed upon frozen material.

Separate measurement of payment for compacted embankment and all costs incidental to placing in layers, compacting, diskings, watering, mixing, sloping and other necessary operations for construction of embankments will be included in the unit price bid for the compacted embankment.

## 2.07 FINISHING AND PROTECTION OF SUBGRADE

After the subgrade has been substantially completed, the full width shall be conditioned by removing any soft or other unstable material which will not compact properly. The resulting areas and all other low areas, holes or depressions shall be brought to grade with suitable select material. Scarifying, blading, rolling and other methods shall be performed to provide a thoroughly compacted subgrade shaped to the lines and grades shown on the drawings.

Grading of the subgrade shall be performed so that it will drain readily. The Contractor shall take all precautions necessary to protect the subgrade from damage. He shall limit hauling over the finished subgrade to that which is essential for construction purposes.

All ruts or rough places that develop in a completed subgrade shall be smoothed and recompact.

No top soil shall be placed on the subgrade side slopes until the subgrade has been accepted by the Engineer.

## 2.08 HAUL

All hauling will be considered a necessary and incidental part of the work. Its cost shall be considered by the Contractor and included in the contract lump sum price. No payment will be made separately or directly for hauling of any part of the work.

## 2.09 TOLERANCES

In those areas upon which a top soil is to be placed, the top of the subgrade shall be of such smoothness that when tested with a 16-foot straightedge applied parallel and at right angles to the centerline, it shall not show any deviation in excess of 1 inch, or shall not be more than 0.08-foot from the true grade as established by grade hubs or pins. Any deviation in excess of these amounts shall be corrected by loosening, adding or removing materials; reshaping; and recompact by sprinkling and rolling.

## 2.10 TOP SOIL

The top soil shall be salvaged from stripping or other grading operations. The top soil is the surface soil containing grass and organic type materials. At the time of excavation or stripping, the top soil cannot be placed in its proper and final section or finished construction, the materials shall be stockpiled at designated locations. Stockpiles shall not be placed within the improvements area and shall not be placed on areas which subsequently will require any excavation or embankment. If, in the judgment of the Engineer, it is practical to place the salvaged top soil at the time of excavation or stripping, the material shall be placed in its final position without stockpiling or further rehandling. Upon completion of grading operations, stockpiled top soil shall be placed as required on the fore and back slopes of the roadbed.

No direct payment will be made for top soil as such under this Section. The quantity removed and placed directly or stockpiled shall be included in the unit price bid for the "Compacted Embankment".

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1. DESCRIPTION

A. General

This item shall consist of reinforced concrete drainage pipe to be located as shown on the drawings. All concrete culverts shall be in accordance with the American Railway Engineering and Maintenance of Way Association (AREMA) specifications chapter 1, part 4, Culverts.

B. Materials

a. Pipe – pipe shall be of the type, size, and class as shown on the plans.

b. Reinforced Concrete Culvert Pipe – reinforced concrete culvert pipe shall conform to the requirements of the specifications for reinforced concrete culvert pipe, ASTM C-76. Installation shall be made with circular pipe conforming to the requirements for class III, class IV, class V, R-wall or C-wall of the ASTM C-76 specification. All wall thickness to be used shall meet AREMA specifications.

c. All precast flared end sections shall conform to ASTM C-76. Toe walls required shall conform to AASHTO M-170.

1) All precast Bends, Wyess, and Tees shall comply with ASTM C-76, AASHTO M-170 or Federal Specification SS-P-375.

d. Fine and coarse aggregates for the concrete mixture shall comply with the requirements of ASTM specifications.

1) Cement shall comply with the requirements of ASTM C-150.

2) Steel shall comply with the requirements ASTM C-185.

3) Joint sealing material, plastic type, shall comply with ASTM C-990, AASHTO M-198, or Federal Specification SS-S-210A.

e. D-load design pipe shall conform to ASTM C-655.

f. Preform tape-type plastic compound shall be applied in accordance with the manufacturer's recommendations.

\* \* \* \* \*

1. DESCRIPTION

GENERAL

This item shall consist of temporary control measured as shown on the drawings or as ordered by the Engineer during the life of a contract to control water pollution, soil erosion, and siltation through the use of berms, dikes, dams, sediment basins, gravel, mulches grasses, slope drains and other erosion control devices or methods.

The temporary erosion control measures contained herein shall be coordinated with the permanent erosion control measured for the Site to the extent practical to assure economical, effective and continuous erosion control throughout the construction period.

Temporary control may include work outside the construction limits such as equipment and material storage sites and waste areas.

The project will require a Construction Storm Water Permit from the Oklahoma Department of Pollution Control and Ecology. The permit will be secured by the Owner. The permit shall include the Contractor's methods of controlling the storm water discharges.

2. MATERIALS

2.01 GRASS

Grass which will not compete with the grasses sown later for permanent cover shall be a quick-growing species such as ryegrass, Italian ryegrass, or cereal grasses suitable to the area providing a temporary cover. The application method shall be by hydro-seeding.

2.02 MULCHES

Mulches may be hay, straw, netting, bark, wood chips or other suitable material reasonable clean and free of noxious weeds and deleterious materials.

2.03 FERTILIZER

Fertilizer shall be a standard commercial grade and shall conform to all Federal and State regulations and to the standards of the Association of Official Agricultural Chemists.

2.04 SLOPE DRAINS

Slope drains may be constructed of pipe, rubble or other materials that will adequately control erosion.

2.05 OTHER

All other materials shall meet commercial grade standards and shall be approved by the Engineer before incorporated into the project.

### 3. CONSTRUCTION REQUIREMENTS

#### 3.01 GENERAL

In the event of conflict between these requirements and pollution control laws, rules or regulations of other Federal, State or local agencies, the more restrictive laws, rules or regulations shall apply.

The Engineer shall be responsible for assuring compliance to the extent that construction practices, construction operations and construction work are involved.

#### 3.02 SCHEDULE

Prior to start of construction, the Contractor shall submit schedules for accomplishment of temporary and permanent erosion control work, as are applicable for clearing and grubbing; grading; construction; and ditches excavation/ The Contractor shall also submit a proposed method of erosion and dust control on haul roads and a plan for disposal of waste materials. Work shall not be started until the erosion control schedules and methods of operation for the applicable construction have been accepted by the Engineer.

#### 3.03 AUTHORITY OF ENGINEER

The Engineer has the authority to limit the surface area of erodible earth material exposed by clearing and grubbing, to limit the surface area of erodible earth material exposed by excavation and fill operations, and to direct the Contractor to provide immediate permanent or temporary pollution control measures to minimize containment or adjacent streams or other water courses, lakes and ponds.

#### 3.04 CONSTRUCTION DETAILS

The Contractor will be required to incorporate all permanent erosion control features into the project at the earliest practicable time as outlined in the accepted schedule. Except where future construction operations will damage slopes, the protection work in stages, as soon as substantial areas of exposed slopes can be made available. Temporary erosion and pollution control measures will be used to correct conditions that develop during construction that are needed prior to installation of permanent control features or that are needed temporarily to control erosion that develops during normal construction practices but are not associated with permanent control features on the project.

Where erosion is likely to be a problem, clearing and grubbing operations should be scheduled and performed so that grading operations and permanent erosion control features can follow immediately thereafter if the project conditions permit; otherwise, temporary erosion control measures may be required between successive construction stages.

The Engineer may limit the area of clearing and grubbing, excavation, borrow and embankment operations in progress, commensurate with the Contractor's capability and progress in keeping the finish grading, mulching, seeding and other such permanent control measures current in

accordance with the accepted schedule. Should seasonal limitations make such coordination unrealistic, temporary erosion control measures shall be taken immediately to the extent feasible and justified.

In the event that temporary erosion and pollution control measures are required due to the Contractor's negligence, carelessness or failure to install permanent controls as a part of the work as scheduled or are ordered by the Engineer, such work shall be performed by the Contractor.

The Engineer may increase or decrease the area of erodible earth material to be exposed at one time as determined by analysis of project conditions.

The erosion control features installed by the Contractor shall be acceptable maintained by the Contractor during the construction period.

Whatever construction equipment must cross water courses at frequent intervals, and such crossings will adversely affect the sediment levels, temporary structures should be provided.

Pollutants such as fuels, lubricants, bitumen, raw sewage, wash water from concrete mixing operations and other harmful materials shall not be discharged into or near rivers, streams and impoundments or into natural or manmade channels leading thereto.

\* \* \* \* \*

1. INDUSTRY SUB-BALLAST

1.01 DESCRIPTION

Sub-ballast – This item shall consist of a foundation course for a typical railroad roadbed and shall be composed of either caliche, argillaceous limestone, granite, conglomerate, gravel, crushed slag or other granular materials.

1.02 MATERIAL REQUIREMENTS

The materials shall meet the requirements herein after specified. Aggregate retained on a No. 10 sieve shall consist of hard, durable particles or fragments of stone, gravel, sand or slag. Materials that break up when alternately frozen and thawed or soaked and dried shall not be used. Allowable wear, based on the Los Angeles abrasion test, shall not be greater than 50%. A higher or lower percentage of wear may be specified by the Engineer.

1.03 GRADATIONS

It is the intent of this specification that the sub-ballast shall consist of gradation as set forth in the following table:

SIEVE SIZE	2"	1"	¾"	No. 10	No. 40	No. 200
% Pass (optimum)	-100	95	67	38	21	7
% Pass (permitted)	-100	90-100	50-84	26-50	12-30	0-10

1.04 DESIGN REQUIREMENTS

Sub-ballast will be used as indicated by the following charts or as directed by the Engineer. The Contractor will furnish the Engineer with sieve results for the material to be used.

SUB-BALLAST WILL NOT BE REQUIRED WHERE SUBGRADE MATERIAL SIZES ARE NOT SMALLER THAN THE FOLLOWING GRADATIONS.

PERCENT PASSING (BY WEIGHT)	SIEVE SIZE NO. OF MESH PER/IN.	GRAIN SIZE IN MM
0 -----	200 -----	.08
20 -----	100 -----	.16
38 -----	60 -----	.26
64 -----	40 -----	.42
89 -----	20 -----	.85
100 -----	10 -----	1.08

8" OF SUB-BALLAST SHALL BE REQUIRED WHEN SUBGRADE MATERIAL SIZES ARE SMALLER THAN LISTED ABOVE, BUT NO FINER THAN THE GRADATIONS LISTED BELOW.

PERCENT PASSING (BY WEIGHT)	SIEVE SIZE NO. OF MESH PER/IN.	GRAIN SIZE IN MM
19 -----	200 -----	.08
74 -----	100 -----	.16
92 -----	60 -----	.26
100 -----	40 -----	.42

12" OF SUB-BALLAST SHALL BE REQUIRED WHEN SUBGRADE MATERIALS HAVE A GRADATION SMALLER THAN LISTED ABOVE.

#### 1.05 CONSTRUCTION METHODS

A. Preparation of Subgrade – The roadbed shall be shaped in conformity with the typical sections shown on drawings and to the line and grades provided by the Engineer. All unstable or otherwise objectionable material shall be in an acceptable condition to receive sub-ballast material. A minimum of 6" shall be stabilized and compacted prior to placing sub-ballast.

B. Lift Thickness – The sub-ballast shall be constructed in two or more lifts of approximate equal thickness. The maximum compacted thickness of any one lift shall not exceed 6 inches and shall be compacted to not less than 95% of the maximum density and to within  $\pm 2\%$  of the optimum moisture content as determined by ASTM D 1557.

C. Compaction – If the material is laid and compacted in more than one lift, the Contractor shall plan and coordinate his work in such a manner that the previously placed and compacted lifts be allowed ample time for curing and development of sufficient stability before vehicles hauling materials for the succeeding lifts or other heavy equipment are permitted on the sub-ballast. Prior to placing the succeeding lifts of materials, the surface of the lower lift shall be sufficiently moist to ensure a strong bond between the lifts. The edges and/or edge slopes of the sub-ballast shall be bladed or otherwise dressed to conform to the lines, grades and dimensions shown on the drawings.

\* \* \* \* \*



1. DESCRIPTION

## 1.01 GENERAL

This item shall consist of a woven (or non-woven as required), highly durable construction fabric installed on top of the compacted subgrade for track-bed stabilization, including the functions of separation, confinement, drainage and load distribution for the sub-ballast section.

## 1.02 MATERIALS

The stabilization fabric shall be a woven (or non-woven as required) fabric consisting only of long chain polymeric filaments such as polypropylene, polyethylene, polyester, polyamide or polyvinylidene-chloride formed into a stable weave such that the filaments retain their relative position to each other. The fabric shall be inert to commonly encountered chemicals in the environment. The fabric shall also be stabilized against sunlight deterioration and protected against raveling by mechanically sealed edges.

A. Fabric Properties – The fabric shall conform to the properties shown below:

	<u>Fabric Property</u>	<u>Test Method</u>	<u>Fabric Requirements</u> <u>(Min. Shpt. Avgs.)</u>
I.	Resistance to Installation Stresses		
a.	Grab Tensile Strength, lbs.	ASTM-D-1682-64	300
b.	Grab Tensile Elongation, %	ASTM-D-1682-64	15
c.	Burst Strength, psi	ASTM-D-751-68 (Diaphragm Method)	650
d.	Trapezoid Tear Strength, lbs.	ASTM-D-2263-68	120
II.	Performance Criteria During Service Life		
a.	Equivalent Opening Size, U.S. Standard Sieve	CW-02215-77*	30-60
b.	Water Permeability, k, cm/sec	H, 20 cm to 10 CM*	0.01
c.	Modulus (Load at 10% Elongation), lbs.	ASTM-D-1682-64	150
d.	Abrasion Resistance, lbs.	CW-02215-77*	130
e.	U.V. Resistance, %	ASTM D4355 @ 500 hrs.	90
	*Corps of Engineers Methods		
III.	Resistance to Environmental		
a.	Mildew, Rot Resistance, % Strength Retention	AATCC-30-74	100
b.	Insect, Rodent Resistance, % Strength Retention	AATCC-24-74	100

Geotextile woven fabric shall be CONTECH 300C, MIRAFI 600X, or an approved equal. Non-woven shall be CONTECH C60 or approved equal. Contractor shall supply the Engineer with the appropriate submittals prior to placing final bid. Any material that failed to be received prior acceptance by the Engineer shall not be usable on the project.

## 2.02 Grid Material

The geo-grid material shall be punched from polypropylene sheets. The pattern shall be such as to create three equilateral directions across the material. The material shall be resistant to chemical degradation, ultra-violet light, and weathering. The apertures shall be triangular.

The geo-grid shall be a Tensar Tri-Ax TX 160 geo-grid or an approved equal.

\* \* \* \* \*

# ***BNSF RAILWAY COMPANY***

## **GUIDELINES FOR INDUSTRY TRACK PROJECTS**



### **Engineering Services**

#### **System Design & Construction**

**4515 Kansas Avenue Kansas  
City, KS 66106**

**August 2018**

# **BNSF RAILWAY COMPANY**

## **Design Guidelines for Industry Track Projects**

**August 2018**

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# 1. General Procedure for Industrial Track Projects

The purpose of this chapter is to guide the process for the development of industry tracks and facilities. Build-ins and tracks other than industrial need to follow BNSF's Main Line Design Guidelines for Track Projects.

- 1.1. Customer will contact BNSF's Economic Development (ED) representative. Contact information and a questionnaire can be found at <http://www.bnsf.com/customers/support-services/>.
- 1.2. After completing the questionnaire the customer will be asked to provide a conceptual layout for the project. This layout should include property boundaries, existing buildings and roads, and a general location of where the proposed tracks will be located.

BNSF will consider the feasibility of constructing the project at the desired location along with operating issues related to product origins and destinations. BNSF will prepare a scaled track layout (project schematic) based on the customer's concept to ensure the desired operation meets design standards. The project schematic will identify both BNSF's and the customer's scopes of work, and then be shared with the Customer (see appendix, page A-10 for an example). After BNSF approval of the opportunity (New Business Review) the customer will be provided a cost estimate for BNSF's track and signal work.

- 1.3. The Customer may use a designer or contractor of its choice to prepare the track plans. Survey on BNSF right-of-way will require the application of a temporary occupancy permit (see "Requirements for Working on BNSF Right of Way"). The project schematic should be used as a guide for preparing the industrial track plan. Plans should be complete with all the items in the "Final Track Plan Checklist" included. Questions concerning these guidelines should be directed to the BNSF Engineering representative. Customers are encouraged to reference this document, including standard plan drawings, in the construction specifications. BNSF Engineering will review and approve the track design, and if there are significant changes from the original project schematic, the plan may need to be reviewed by other BNSF departments.
- 1.4. BNSF Engineering will communicate directly with the Customer regarding any plan revisions. Any revisions will be documented on the prints and communicated in writing to the Customer. BNSF Engineering will notify ED when the industrial track plan has been reviewed and approved.
- 1.5. BNSF Engineering will prepare a cost estimate, chargeable to the Customer, which includes ***BNSF's portion of track and signal construction, as well as an appropriated amount for an Inspector/Coordinator for construction monitoring purposes.*** The cost estimate does not include flagging charges as they can vary significantly based on the approach adopted by the customer's contractor. In general, BNSF will construct from point of switch to the 14-ft clearance point for manual switches, and from the point of switch to just beyond the power derail and the approach signal for powered switches. The Inspector/Coordinator will serve as a BNSF representative related to grading on BNSF R/W, utility drops, turnout installation schedules and customer track construction inspection.
- 1.6. Upon receiving the Firm Bid Cost Estimate, ED will present the formal industrial track package, including all agreements and cost proposal, to the Customer for consideration.
- 1.7. Upon Customer's acceptance of the proposal (check, fully executed agreements, and submittal of the final plans) ED will notify all concerned the project has been approved and funded.
- 1.8. The final plans must be approved by BNSF Engineering prior to the execution of the contractor's right of entry, which limits when work can start on BNSF property. Materials for BNSF's portion of the project are then ordered, work scheduled and construction completed, which can take up to 27 weeks. Customers should note that turnout construction pads must be completed 6 weeks or more

(dependent on territorial restrictions) before the target construction completion timeline to allow time to deliver, assemble, and install the turnout at the designed location.

Following is the timeline for a typical industry track project

STAGE	ACTIVITY	START	END	TIMELINE
1	New opportunity conceptual layout request	Conceptual layout request received	Conceptual layout delivered to ED Mgr.	1 week
2	New Business Review (internal BNSF assessment)	NBR created	NBR completed	2 weeks
3	Project schematic approval & cost estimate preparation	NBR completed notification	BNSF cost estimates completed	9 weeks
4	Customer acceptance & payment	Proposal letter sent	Check deposited	9 weeks
5	Request for capital	Check deposited / CPAR approved	AFE approved	3 weeks
6	Track & signal materials ordered and delivered	AFE approved	Track and signal material delivered	13 weeks
7	Track & signal construction	Customer agreements & contracts executed	Track and signal construction complete	13 weeks
8	Engineering & Construction complete	Final customer track inspection completed	Actual project in service date entered in ESI	1 week
9	Customer moves cars into facility Project Closeout	Actual project in service date entered in ESI	CDI, CRF & Credit complete	1 week
	Total Engineering and Construction timeline			52 weeks

## 2. Standards for Industrial Trackage (Carload, or Non-Unit Facilities)

**2.1 Roadbed:** Roadbed and ballast section for industrial trackage shall conform to the special roadbed section (see appendix, page A-11), and to the ballast material requirements on page 24.

**2.2 Curvature:** Maximum degree of curve shall not exceed 9°30' (603.80' radius). All curves are defined using the chord definition. A minimum tangent length of 50 feet must be placed between reversing curves. No turnouts (switches) can be placed in a curve. Mainline turnouts must be placed at least 200 feet from the end of a mainline curve. Industry turnouts within the facility must be placed at least 50 feet from the end of any curve.

**2.3 Profile Grade:** Track profile grades shall be limited to a maximum of 1.5%.

**2.4 Vertical Curves:** Vertical curves must be provided at break points in profile grade. The rate of change shall not exceed 2.0 in summits or sags. Vertical curves shall not extend into limits of turnout switch ties. See appendix, pages A-43 and A-44 for BNSF's standard for vertical curves.

**2.5 Track:** Recommended rail section is 115-lb. or greater. Hardwood ties shall be new 7" X 8" (No. 4) or 7" X 9" (No. 5), 8'-6" long, placed on 21.5" centers with a 6" ballast section. Rail anchorage shall be provided at a minimum rate of 16 anchors per 39' panel. Continuous welded rail (CWR) shall be box-anchored every other tie. Concrete ties can be spaced at 28" center to center with an 8" ballast section. CWR is recommended when using concrete ties. M-8 steel ties (8mm or 5/16" section) can be used in non-unit facility tracks and are spaced at 24" centers with 8" ballast section.

**2.6 Turnouts:** All main line, controlled siding and passing track turnouts will be a minimum new No. 11-141 lb. and include either a spring-rail frog or a rigid, railbound manganese frog, as specified by BNSF Engineering. For other turnouts maintained by BNSF, the size and weight will be determined dependent upon the transportation commodity, with a No. 11-141 lb. recommended, and a No. 9 - 115 lb. as the minimum (see appendix, pages A-16 to A-33). Main line turnout switch ties shall be new and hardwood. All mainline, controlled siding and passing track turnouts and trackage are to be placed by BNSF personnel out to the 14' clearance point.

Mainline, controlled siding and passing track turnouts will require the placement of a construction pad alongside the track to allow assembly of the turnout, with no disruption to traffic. After the turnout is assembled, a track window is obtained to remove the trackage and insert the turnout. An example of a construction pad is shown in the appendix on page A-14. For turnouts placed off of BNSF property and/or maintained by the Customer, and operated by BNSF, the recommended minimum is a No. 9 - 115 lb. All switch stands need to include a "30 Degree" handle (see appendix, page A-35), and a target with alternating green and yellow colors indicating switch position (page A-36).

Switch heaters are required for mainline turnouts where snow and ice present operational challenges. If a power turnout requires a switch heater, the power derail will require one also. The cost estimate will include installation of the switch heaters when required.

**2.7 Derails:** A derail shall be placed on all tracks connecting with a main line, siding, or industrial lead. Derails protecting mainline tracks and controlled sidings shall be double switch point (see appendix, page A-34) and installed so that the derailed car is directed away from BNSF trackage. A power derail is required when the mainline turnout is powered, and BNSF will install track and signal from the point of switch to the insulated joints just beyond the power derail. Derails protecting mainline tracks shall be placed a minimum of 100 feet behind the 14' clearance point, and placed on tangent track where possible. Derails protecting other-than-mainline tracks shall be placed a minimum of 50 feet behind the 14' clearance point, and placed on tangent track where possible. The type of derail and actual location may be determined by BNSF Operating Department requirements. A "Derail" sign needs to be placed next to the derail.



**2.8 Structures:** Bridges, drainage structures, track hoppers, retaining walls, etc. shall be designed to carry Cooper E-80 live load with diesel impact. Structures shall be designed per American Railway Engineering and Maintenance of Way Association (AREMA) Manual chapters 1, 7, 8, or 15 as applicable, and designed by a licensed engineer. See AREMA standards for unloading pits (Chapter 15, Section 8.4). All structural plans will need to be reviewed and accepted by BNSF Engineering. Gratings covering open pits must be bolted in place.

If a project creates the need for existing structures (including BNSF's structures) to be modified, the modifications shall be accounted into the customer's scope of work of the project, subjected to BNSF's review and approval. For drainage related structures, additional information is included in "Culverts" section within the "Specifications for Construction of Industry Trackage by Private Contractor" chapter.

**2.9 Road Crossings:** The standard for a road crossing surface installed and maintained by the BNSF is concrete plank (for 141-lb. rail) placed on 10-ft. switch ties. Also, ten each 10-ft. switch ties are placed on both ends of the crossing, replacing any standard cross-ties. For crossings installed and maintained by the Customer, a concrete plank is recommended, with a wood plank surface as acceptable (see appendix, pages A-37 to A-39).

**2.10 Clearances:** BNSF will adhere to the "Clearance Requirements By State," BNSF Dwg. No. 2509, Sheet No. 2 (see appendix, page A-40) for each state. If a state does not have its own clearances, the "BNSF Minimum Clearances Diagram," BNSF Dwg. No. 2509, Sheet No. 1 (see appendix, page A-41) will apply. Side clearances for curves should have an additional 1-1/2" per degree of curvature. All effort should be made to provide adequate clearances. In the event clearances cannot be provided for as prescribed, warning signs will be installed and they must be illuminated at night (see appendix, page A-42).

All loading/unloading equipment that fouls the clearance envelope during operation must positively lock in a non-fouling position when not in use.

All new tracks constructed will maintain a minimum distance of 25 feet for track centers from any main track, controlled siding or passing track. New tracks adjacent to other tracks will maintain a minimum distance of 14 feet for track centers.

At road crossings the set-back distance for storing rail cars on multiple adjacent tracks (track centers less than 25') is 250 feet from the edge of roadway. For single tracks, the setback distance varies for each state and is regulated by the states' appropriate agencies, **but 150 feet from the edge of roadway is the minimum.** However, operating conditions may require greater distances.

**2.11 Walkways:** Walkways on bridges and adjacent to switches and trackage are governed by the appropriate State Public Service Commission, Railway Commission or other State and/or Federal agencies. However, the example on page A-11 depicts requirements for most states. Walkway ballast shall be Class 2 and no larger than 1" in size (ballast gradation shown on page 24).

**2.12 Signals and Utility Service:** **Customer shall provide electrical service to BNSF property should the proposed trackwork require power for the signal facilities.** The requirement and locations will be identified by BNSF Engineering and communicated to the customer. If the service will include providing power to one or more switch heaters, a minimum of 200 Amp, Single Phase, 120/240 volt service, with meter socket and service disconnect is required. The service disconnect shall be a minimum of 200 amp, 2 pole breaker by either Cutler Hammer or Square D (QO style), with the meter socket requirement as per the power company specifications. No additional electrical panels are necessary as BNSF will take a feeder from the load side of the 200 amp service disconnect switch. The service may be either overhead or underground. All electrical installations will be made in accordance with the prevailing State/local electrical code(s), or if there is none, the current edition of the National Electrical Code will govern the installation. If an electric switch heater is not involved, 100 Amp service will be sufficient.

**Customer shall also provide natural gas service to BNSF property should the proposed**

**trackwork require the installation of one or more switch heaters.** The requirement and locations will be identified by the BNSF project representative. The service shall be capable of delivering 600-900 thousand BTUs per heater per location required. The actual pressure shall be requested from BNSF for each project specifically (typical pressure should be around 6 psi).

**2.13 Inspection of Materials and Track:** BNSF's Engineering representative should inspect all track materials prior to placement to avoid subsequent removal of sub-standard material. BNSF personnel will inspect the completed track before placing it into service.

**2.14 General:**

- 2.14.1** Loading and unloading tracks must be designed so that they are completely independent of railroad operating lines and passing tracks such that loading and unloading operations in no way interfere with train operations. Design of trackage must be approved by BNSF Engineering.
- 2.14.2** Utility installations may require a permit. Pipelines under track are to be encased per BNSF requirements. Wirelines are to be installed per BNSF requirements. Refer to "BNSF Utility Accommodation Policy" booklet <http://bnsf.com/communities/faqs/pdf/utility.pdf>. Utilities within 50 feet beyond the end of track must be underground, and protected as if they were under the track.
- 2.14.3** The effect on sight distance must be considered when planning construction of trackage in the vicinity of any grade crossings. The required sight distance should be determined and preserved when performing and designing for construction near any grade crossing. Less than the required sight distance will be the liability of the Customer.
- 2.14.4** Maintenance of Way Operating Rule No. 6.32.4: "Leave cars, engines, or equipment clear of road crossings and crossing signal circuits. If possible, avoid leaving cars, engines, or equipment standing closer than 250 feet from the road crossing when there is an adjacent track (<25' track centers)."
- 2.14.5** The effect on queuing distance of a crossing must be considered when planning the extension of a track across a grade crossing. The proposed plans shall not cause vehicles to be trapped in between tracks, cause vehicles to have to stop on a track while waiting in queue for a crossing to clear, or to cause excessive highway congestion by reducing the queuing distance of an existing crossing. Adding new public crossings or adding more tracks to an existing public crossing will be reviewed by BNSF Engineering and the appropriate entity with jurisdiction over the crossing (Typically the State's Department of Transportation).
- 2.14.6** An earthen berm (see appendix, page A-15) or suitable bumping post shall be installed at the end of track. Also, a red retro-reflective marker shall be placed at the end of track.
- 2.14.7** Customer is responsible for all grading including placing all subballast up to BNSF ballast and the placement of a construction pad.
- 2.14.8** Customer is to acquire any additional property required to construct grade and drainage. If the proposed trackage or facility will increase runoff onto BNSF property, a detailed drainage plan needs to be submitted for review prior to construction. Drainage should be handled in a manner as not to increase current drainage structures on BNSF property.

**2.14.9** Contractor must not at any time foul the main line tracks. A BNSF flagman will be required, at the Contractor's expense, when working within 25 feet from centerline of the track, which would include, but not limited to, work that could foul a track, such as with a large crane, excavation activities that could undermine a track, and overhead wire work which could potentially fall onto the track. Billing for the flagman is separate from the cost for BNSF portion of the track work. Current cost for BNSF flagging is approximately \$1,800 per day with billing based on actual charges.

**2.14.10** Appropriate access must be provided for BNSF to drive an SU-40 maintenance truck (See AASHTO's "A Policy on Geometric Design of Highways and Streets", a.k.a. the "AASHTO Green Book") to the proposed installations to be installed and/or maintained by BNSF or other existing BNSF infrastructure. If switch heaters are required at locations where the installation of a natural gas supply is infeasible, the access must be sufficient for refueling trucks to access the switch heater area. Depending on the location and the fuel providers of the region, refueling trucks may exceed the size of a SU-40 vehicle. Additional requirements related to the backing up of vehicles may be active in certain operating regions, which affects turnaround designs. Consult your project representative for additional region specific requirements.

### 3. Standards for Unit Train/Loop Facilities

- 3.1 Roadbed:** Roadbed and ballast section for industrial trackage shall conform to the special roadbed section (see appendix, page A-11), and to the ballast material requirements on page 24.
- 3.2 Curvature:** Maximum degree of curve shall not exceed  $7^{\circ}30'$  (764.49' radius). All curves are defined using the chord definition method. A minimum tangent length of 100 feet must be placed between reversing curves. No turnouts (switches) can be placed in a curve. Mainline turnouts must be placed at least 200 feet from the end of a mainline curve. Industry turnouts within the facility must be placed at least 100 feet from the end of any curve.
- 3.3 Profile Grade:** Track profile grades shall be limited to a maximum of 1.5%. For loop tracks, the maximum grade will be 0.5%. Other restrictions may be defined for individual projects. A flat grade (0.0%) must be maintained through loading/unloading areas.
- 3.4 Vertical Curves:** Vertical curves must be provided at break points in profile grade. The rate of change shall not exceed 1.0 in summits or 0.5 in sags. Vertical curves shall not extend into limits of turnout switch ties. See appendix, pages A-43 and A-44 for BNSF's standard for vertical curves.
- 3.5 Track:** For New Unit Train Facilities minimum rail section is 115-lb and continuous welded rail (CWR) is recommended. Hardwood ties shall be new 7" X 8" (No. 4) or 7" X 9" (No. 5), 8'-6" long, placed on 21.5" centers with a 6" ballast section. Rail anchorage shall be provided at a minimum rate of 16 anchors per 39' panel. Continuous welded rail (CWR) shall be box-anchored every other tie. Concrete ties can be spaced at 28" center to center with an 8" ballast section. CWR is recommended when using concrete ties. M-10 steel ties (10mm or 13/32" section) can be used in unit facility tracks and are spaced at 24" centers with 8" ballast section.
- 3.6 Turnouts:** All main line, controlled siding and passing track turnouts will be a minimum new No. 11-141 lb. and include either a spring-rail frog or a rigid, railbound manganese frog, as specified by BNSF Engineering. For other turnouts maintained by BNSF, a No. 11-115 lb. is the minimum (see appendix, pages A-22 to A-33). Main line turnout switch ties shall be new and hardwood. All mainline, controlled siding and passing track turnouts and trackage are to be placed by BNSF personnel out to the 14' clearance point. All joints on the side of turnout receiving majority of traffic will be thermite welded.
- Mainline, controlled siding and passing track turnouts will require the placement of a construction pad alongside the track to allow assembly of the turnout, with no disruption to traffic. After the turnout is assembled, a track window is obtained to remove the trackage and insert the turnout. An example of a construction pad is shown in the appendix on page A-14.
- For turnouts placed off of BNSF property and/or maintained by the Customer, and operated by BNSF, a No. 11 - 115 lb. turnout will be the minimum. All switch stands need to include a "30 Degree" handle (see appendix, page A-35), and a target with alternating green and yellow colors indicating switch position (page A-36).
- Switch heaters are required for mainline turnouts where snow and ice present operational challenges. If a power turnout requires a switch heater, the power derail will require one also. The cost estimate will include installation of the switch heaters when required.
- 3.7 Derails:** A derail shall be placed on all tracks connecting with a main line, siding, or industrial lead. Derails protecting mainline tracks and controlled sidings shall be double switch point (see appendix, page A-34) and installed so that the derailed car is directed away from BNSF trackage. A power derail is required when the mainline turnout is powered, and BNSF will install track and signal from the point of switch to the insulated joints just beyond the power derail. Derails protecting mainline tracks shall be placed a minimum of 100 feet behind the 14' clearance point, and placed on tangent track where possible. Derails protecting other-than-mainline tracks shall be

placed a minimum of 50 feet behind the 14' clearance point, and placed on tangent track where possible. The type of derail and actual location may be determined by BNSF Operating Department requirements. A "Derail" sign needs to be placed next to the derail.

**3.8 Structures:** Bridges, drainage structures, track hoppers, retaining walls, etc. shall be designed to carry Cooper E-80 live load with diesel impact. Structures shall be designed per American Railway Engineering and Maintenance of Way Association (AREMA) Manual chapters 1, 7, 8, or 15 as applicable, and designed by a licensed engineer. See AREMA standards for unloading pits (Chapter 15, Section 8.4). All structural plans will need to be reviewed and accepted by BNSF Engineering. Gratings covering open pits must be bolted in place.

If a project creates the need for existing structures (including BNSF's structures) to be modified, the modifications shall be accounted into the customer's scope of work of the project, subjected to BNSF's review and approval. For drainage related structures, additional information is included in "Culverts" section within the "Specifications for Construction of Industry Trackage by Private Contractor" chapter.

**3.9 Road Crossings:** The standard for a road crossing surface installed and maintained by the BNSF is concrete plank (for 141-lb. rail) placed on 10-ft. switch ties. Also, ten each 10-ft. switch ties are placed on both ends of the crossing, replacing any standard cross-ties. For crossings installed and maintained by the Customer, a concrete plank is recommended, with a wood plank surface as acceptable (see appendix, pages A-37 to A-39).

**3.10 Clearances:** BNSF will adhere to the "Clearance Requirements By State," BNSF Dwg. No. 2509, Sheet No. 2 (see appendix, page A-40) for each state. If a state does not have its own clearances, the "BNSF Minimum Clearances Diagram," BNSF Dwg. No. 2509, Sheet No. 1 (see appendix, page A-41) will apply. Side clearances for curves should have an additional 1-1/2" per degree of curvature. All effort should be made to provide adequate clearances. In the event clearances cannot be provided for as prescribed, warning signs will be installed and they must be illuminated at night (see appendix, page A-42).

All loading/unloading equipment that fouls the clearance envelope during operation must positively lock in a non-fouling position when not in use.

All new tracks constructed will maintain a minimum distance of 25 feet for track centers from any main track, controlled siding or passing track. New tracks adjacent to other tracks will maintain a minimum distance of 14 feet for track centers.

At road crossings the set-back distance for storing rail cars on multiple adjacent tracks (track centers less than 25') is 250 feet from the edge of roadway. For single tracks, the setback distance varies for each state and is regulated by the states' appropriate agencies, **but 150 feet from the edge of roadway is the minimum.** However, operating conditions may require greater distances.

**3.11 Walkways:** Walkways on bridges and adjacent to switches and trackage are governed by the appropriate State Public Service Commission, Railway Commission or other State and/or Federal agencies. Due to revised FRA Airbrake and Train Handling Rules, outbound trains are required to have an airbrake inspection on both sides of the train. New shuttle projects will be required to have a minimum 13' inspection road on one side and a minimum 8.5' walkway on the other. See appendix pages A-11 and A-12 for typical sections of roads and walkways. Walkway ballast shall be Class 2 and no larger than 1" in size (ballast gradation shown on page 24).

- 3.12 Signals and Utility Service:** Customer shall provide electrical service to BNSF property should the proposed trackwork require power for the signal facilities. The requirement and locations will be identified by BNSF Engineering and communicated to the customer. If the service is for an electric switch heater, a 200 Amp, Single Phase, 120/240 volt service, with meter socket and service disconnect is required. The service disconnect shall be a 200 amp, 2 pole breaker by either Cutler Hammer or Square D (QO style), with the meter socket requirement as per the power company specifications. No additional electrical panels are necessary as BNSF will take a feeder from the load side of the 200 amp service disconnect switch. The service may be either overhead or underground. All electrical installations will be made in accordance with the prevailing State/local electrical code(s), or if there is none, the current edition of the National Electrical Code will govern the installation. If an electric switch heater is not involved, 100 Amp service will be sufficient. Customer shall also provide natural gas service to BNSF property should the proposed trackwork require the installation of one or more switch heaters. The requirement and locations will be identified by the BNSF project representative. The service shall be capable of delivering 600-900 thousand BTUs per heater per location required. The actual pressure shall be requested from BNSF for each project specifically (typical pressure should be around 6 psi).
- 3.13 Access Road:** Unless otherwise directed a road will be required that will provide access to inspect the entire train prior to movement from the facility. Due to revised FRA Airbrake and Train Handling Rules, outbound trains are required to have an airbrake inspection on both sides of the train. New shuttle projects will be required to have a minimum 13' inspection road on one side and a minimum 8.5' walkway on the other. See appendix pages A-12 and A-13 for typical sections of roads and walkways. A standard section with a 13-ft wide roadway is shown in the appendix, page A-13. The roadway can be constructed using subballast materials as specified in the Grading & Embankment section of this document, page 20.
- 3.14 Inspection of Materials and Track:** BNSF's Engineering representative should inspect all track materials prior to placement to avoid subsequent removal of sub-standard material. BNSF personnel will inspect the completed track before placing it into service.
- 3.15 General:**
- 3.15.1** Loading and unloading tracks should be designed so that they are completely independent of railroad operating lines and passing tracks such that loading and unloading operations in no way interfere with train operations. Design of trackage must be approved by BNSF Engineering.
- 3.15.2** Utility installations may require a permit. Pipelines under track are to be encased per BNSF requirements. Wirelines are to be installed per BNSF requirements. Refer to "BNSF Utility Accommodation Policy" booklet <http://bnsf.com/communities/faqs/pdf/utility.pdf>. Utilities within 50 feet beyond the end of track must be underground, and protected as if they were under the track.
- 3.15.3** The effect on sight distance must be considered when planning construction of trackage in the vicinity of any grade crossings. The required sight distance should be determined and preserved when performing and designing for construction near any grade crossing. Less than the required sight distance will be the liability of the Customer.
- Maintenance of Way Operating Rule No. 6.32.4:  
"Leave cars, engines, or equipment clear of road crossings and crossing signal circuits. If possible, avoid leaving cars, engines, or equipment standing closer than 250 feet from the road crossing when there is an adjacent track (<25' track centers)."

- 3.15.4** The effect on queuing distance of a crossing must be considered when planning the extension of a track across a grade crossing. The proposed plans shall not cause vehicles to be trapped in between tracks, cause vehicles to have to stop on a track while waiting in queue for a crossing to clear, or to cause excessive highway congestion by reducing the queuing distance of an existing crossing. Adding new public crossings or adding more tracks to an existing public crossing will be reviewed by BNSF Engineering and the appropriate entity with jurisdiction over the crossing (Typically the State's Department of Transportation).
- 3.15.5** An earthen berm (see appendix, page A-15) or suitable bumping post shall be installed at the end of track. Also, a red retro-reflective marker shall be placed at the end of track.
- 3.15.6** Customer is responsible for all grading including placing all subballast up to BNSF ballast and the placement of a construction pad, if required.
- 3.15.7** Customer is to acquire any additional property required to construct grade and drainage. If the proposed trackage or facility will increase runoff onto BNSF property, a detailed drainage plan needs to be submitted for review prior to construction. Drainage should be handled in a manner as not to overload current drainage structures on BNSF property.
- 3.15.8** Contractor must not at any time foul the main line tracks. A BNSF flagman will be required, at the Contractor's expense, when working within 25 feet from centerline of the track, which would include, but not limited to, work that could foul a track, such as with a large crane, excavation activities that could undermine a track, and overhead wire work which could potentially fall onto the track. Billing for the flagman is separate from the cost for BNSF portion of the track work. Current cost for BNSF flagging is approximately \$1,000 per day with billing based on actual charges.
- 3.15.9** Adequate lighting must be provided for train crews working at night. Work areas near switches, gates, doors, pits and buildings should be illuminated to prevent walking/tripping hazards and allow crewmen riding rail cars to see without reliance upon a flashlight.
- 3.15.10** A track to set out bad order cars unsuitable for loading or unloading needs to be added to the overall design. Set out track should be long enough to place at least 5 rail cars and be accessible to a repair crew. A locomotive tie-up track may also need to be incorporated into the design. This need will be determined at the on-site meeting.
- 3.15.11** Appropriate access must be provided for BNSF to drive an SU-40 maintenance truck (See AASHTO's "A Policy on Geometric Design of Highways and Streets", a.k.a. the "AASHTO Green Book") to the proposed installations to be installed and/or maintained by BNSF or other existing BNSF infrastructure. If switch heaters are required at locations where the installation of a natural gas supply is infeasible, the access must be sufficient for refueling trucks to access the switch heater area. Depending on the location and the fuel providers of the region, refueling trucks may exceed the size of a SU-40 vehicle. Additional requirements related to the backing up of vehicles may be active in certain operating regions, which affects turnaround designs. Consult your project representative for additional region specific requirements.

## 4. Survey and Plan Requirements

**4.1 Surveying on BNSF Right of Way:** In order to protect BNSF's investment of its Right of Way (ROW) and for the safety of persons coming onto BNSF property, BNSF requires all parties entering or performing work on the right-of-way to secure appropriate agreement and insurance before beginning any type of work. Please consult the BNSF project representative and the section "Requirements for Working on BNSF Right of Way" before proceeding.

**4.1.1** Grading and alignment stake out and re-staking is the responsibility of the customer, including the portions to be installed by BNSF forces. **BNSF project stake out shall not include the point of intersection (PI).** All stake out locations shall be documented by photographs. We encourage marking up photographs to demonstrate the stakes' corresponding feature to minimize misunderstanding. They shall be sent to the BNSF project representative (the BNSF inspector coordinator) when completed. The stakeout guidelines listed below illustrate the various responsibilities of the customer relative to the stage of the project:

Project Stage	Pt. of Switch (PSw)	Power Switch Projects Only	
		Pt. of Derail (Derail)	Alignment
<b>Conceptual:</b> Allows for proper visualization of preliminary site visit.	✓		
<b>Pad Completion:</b> Enables crews to unload and assemble the switch at the correct locations.	✓	✓	
<b>Pre-Install Stake Out:</b> These staked items will be communicated to the BNSF during the pre-install meeting.	✓	✓	✓

**4.1.1.1 Point of Switch:** A one page document has been included in A-51 of the appendix. This stake out shall include rail markings and center of track markings at a minimum. An offset stake is encouraged after the pad is completed. A flagger will be needed for this stake out due to the need to foul the track.

**4.1.1.2 Point of Derail:** BNSF will construct and install up to the entering signal for the power switch's control point for projects involving power switches. The power derail shall be marked with both a centerline feather and an offset stake. The stake out shall follow the format included in the point of switch stake out document on A-51 of the appendix with the only difference being replacing "PSw" by the word "Derail".

**4.1.1.3 Alignment:** BNSF will construct and install up to the entering signal for the power switch's control point for projects involving power switches. The alignment stake out shall start from the last long tie to the entering signal's location. Stakes should be in intervals of 100' or less, and should include centerline feathers and offset stakes at the edge of the pad or a location that will not be easily damaged by construction equipment.



**4.2 Plan Requirements: All plans and drawings need to be prepared electronically in a CADD format.** This allows for updates to BNSF's maps and records to be done electronically. All information is to be in English units. Plan submittals should be in Adobe's Acrobat pdf format, with 11" x 17" sheet size. Upon approval, BNSF Engineering will revise the project schematic, if necessary.

Plan View Scale: 1" = 50'

Profile View Scale: 1" = 50' horizontal and 1" = 5' vertical

Cross Sections Scale: 1"=10' horizontal and vertical

#### **4.2.1 BNSF Engineering Plan Submittals - Definitions**

**Conceptual** – An alignment plan showing existing track and features along with proposed changes, and the official operating plan. This will be used for the New Business Review (NBR).

**30% Design** - All items from the conceptual submittal plus plan/profile sheets, cross-sections, typical sections, xing plans, drainage plans, revisions from changes due to land and utility negotiations, and 30% structure plans. This plan will be used for the walk-thru inspection and schematic approval.

**90% Design** - All items from the 30% submittal plus revisions from the walk-thru inspection, culvert extensions, road xing plans, and 60% structure plans (e.g. pit plans, catwalks, and sheds).

**Final Track Plan** – All items in 30% and 90% with all relevant details and revisions incorporated from previous comments. Specifications and details included.

**As-Built Submittal** – The plan/profile sheets updated with post-construction locations as surveyed.

#### **4.2.2 Provide an Operating Plan**

Prepare a sketch (does not have to be to-scale) showing in-bound and out-bound switching plans and lengths of tracks to be used. Prepare multiple sketches to show the position of cars and locomotives at different stages of switching/loading/unloading together with a narrative describing the movements depicted by the multiple sketches.

In developing track lengths for operating plans, designers shall be aware that:

- Switches cannot be thrown unless the closest on track equipment is at least 50' from the point of switch
- Cars shall not come within 25' of the end of track bumper at any time
- Parked cars shall be at least 50' or more from the clearance point of a turnout if the other side of the turnout is to be safely used by BNSF crews.
- If a power turnout is required, industry switching cannot come within 50' of the proposed entering signal location of the control point
- If a manual turnout and derail is used, industry switching cannot come within 50' of the proposed point of derail location

Customers are encouraged to reference this document, including standard plan drawings, in the construction specifications.

### **Conceptual Plan Submittal Checklist:**

- ☐ Furnish Milepost and Line Segment in the Title Block, along with name of Industry and date of plan preparation. Contact information for engineering firm should also be included on plans.
- ☐ BNSF Milepost location and BNSF stationing information for switches on proposed on BNSF tracks (Lat/Long information for power switch projects)
- ☐ Curvatures not exceeding 7-30 (unit train) or 9-30 (manifest)
- ☐ Grades not exceeding 0.5% on receiving/departure tracks
- ☐ Grades not exceeding 1.5% on any tracks
- ☐ Track centerline distances from BNSF mainline and for inspection roads & ATV inspection paths
- ☐ Switch sizes for all switches
- ☐ Culverts to be abandoned/extended/replaced for those under BNSF tracks
- ☐ Designated unit train receiving/departure tracks and/or manifest tracks
- ☐ Added tracks across existing BNSF at grade crossings, or additional crossings proposed across public roadways
- ☐ Additional bridges next to existing BNSF infrastructure
- ☐ Distances from proposed turnouts to existing critical BNSF infrastructure
  - ☐ To abutments of BNSF bridges
  - ☐ To the edge of BNSF crossings
  - ☐ To the closest start of BNSF curve (i.e. the distance from the spiral to the PSw/last long tie)
- ☐ Basic property limits & railroad Right of Way lines
- ☐ Graphical operating plan
- ☐ Include a description of work to be performed by BNSF. Example: “Construct 185 track feet including a #11-141 lb. turnout from point of switch to clearance point, raise railroad pole line, adjust signals.”
- ☐ Include a description of work to be performed by the contractor. Example: “Construct remaining trackage from clearance point to end, place wheel stops, install plank crossing and signs, perform all grading, install all drainage structures, install double switch point derail, provide electrical service to a point opposite the proposed switch locations.”
- ☐ Include a list of track materials to be used by the contractor. Example: “115-lb continuous welded rail (CWR) on #4 new cross-ties, #11-115lb BNSF standard turnouts, 32-ft full depth timber crossing planks to be placed in new construction.
- ☐ Effective track capacities of proposed/modified tracks

### **30% Design Drawings Submittal Checklist:**

- ☐ 30% checklist with conceptual checklist included
- ☐ Track Plan alignment included
  - ☐ Dimension from proposed BNSF switch locations to an identifiable fix object in the field (For practicality, shall be in the direction of the track)
  - ☐ Derail location stationing and derail type included
  - ☐ Crossing location(s) with stationing and width included
  - ☐ PC/PT stationing on all curves included
  - ☐ Curvature information on all curves included
  - ☐ 14.21' clearance point stationing included
  - ☐ Point of switch stationing included (PSw)
  - ☐ End of track stationing and structures included
  - ☐ Culvert/other pipe crossings included
  - ☐ Location of connection structures to existing drainage systems
- ☐ Access roadway information called out
  - ☐ Turnout pad sizes called out
  - ☐ Turnarounds/Access at turnout pad determined
- ☐ Track profile plan included
  - ☐ Vertical curves included
  - ☐ Vertical curves' lengths included
  - ☐ Culvert/other pipe structures included on profile
  - ☐ Cover information on culvert/other pipe structures to top of subgrade & base of rail
- ☐ BNSF construction coordination sheet for power turnout projects (One page blow up sheet of pad size, signal house locations, key asset locations such as the derail and the signal locations)
- ☐ Cross section drawings with typical sections included
- ☐ Grading limits plan
- ☐ Survey monuments/control point locations
- ☐ Utility relocates on the BNSF right-of-way with owner information
- ☐ Separate sheet for each public crossing proposed / modified including information
  - ☐ Distance from turnouts to nearest crossings
  - ☐ Cross bucks locations / Lights & gates locations
  - ☐ Access roadway locations
  - ☐ Signal house locations (if applicable)
  - ☐ Distance between multiple track crossings (if applicable)

- ☐ DOT # (if crossing is existing)
- ☐ Queuing distance from adjacent roadways (if applicable)
- ☐ Contour information of surrounding terrain (use light gray lines for contours)
  - At least 300' on each side parallel to the direction of the track
  - At least 100' on each side parallel to the direction of the roadway
- ☐ City, county, and governing roadway authority information

**90% Design Drawings Submittal Checklist:**

- ☐ 90% checklist with 30% checklist included
- ☐ Clearance submittal for all structures coming within 15' of the centerline of the closest track
- ☐ Clearance submittal for all structures crossing above any track in the facility
- ☐ Finalized drainage plan
  - ☐ Culvert extensions finalized
  - ☐ Culvert locations finalized with cover information requested in 30%
  - ☐ Line drawings for all pipe crossings/drainage structures under existing or proposed tracks that will be impacted by the project
  - ☐ Pre-project drainage pattern with pre-project terrain contours
  - ☐ Post-project drainage pattern with (if available, include post-project terrain contours)
- ☐ Finalized access roadway plan
  - ☐ Final turnout pad access routes
  - ☐ Final crossing locations internal to facility
- ☐ Structure locations included (i.e. building sheds, catwalks, etc.)
- ☐ H&H studies included in submittal (if required)
- ☐ 100% signed and sealed plans for structures included (Only structures that affects track stability or track clearance will require reviews. E.g. pit plans, shed plans, catwalks, etc.)

**Final Track Plan / 100% Design Plan Submittal Checklist:**

- ☐ 100% checklist with 90% checklist included
  - ☐ Signage plans included
  - ☐ Sign locations included
  - ☐ Lighting plan included
  - ☐ Details included
    - ☐ Switch geometry details
    - ☐ Stand details
    - ☐ Crossing details
    - ☐ Bumper details
    - ☐ Rail weights and tie specifications
    - ☐ Reference to the specifications within the BNSF design guidelines and applicable AREMA guidelines
    - ☐ Culvert specifications
- 

**As-Built Record Drawing Submittal Checklist:**

- ☐ Lat/Lon of actual installed BNSF switch location
- ☐ Actual installed location from an identifiable permanent structure in the field
- ☐ Alignment deviations of actual installed track
- ☐ Actual lengths of tracks and effective lengths of tracks

## 5. Specifications for Construction of Industrial Trackage by Private Contractor

**5.1 Contractor's Responsibility:** By acceptance of the contract the contractor assumes complete responsibility for construction of the work. The Contractor should understand that any work not specifically mentioned in the written specifications, but which is necessary, either directly or indirectly, for the proper carrying out of the intent thereof, shall be required and applied, and will perform all such work just as though it were particularly delineated or described. Contractor should also understand that final approval of the track for service is the prerogative of BNSF and close contact with BNSF's Engineering Representative is required. No work is to be performed on BNSF's right-of-way, or in such proximity as to interfere with BNSF's tracks or roadbed, without advance permission by BNSF, including insurance and if necessary, flagging protection.

**5.2 Insurance Requirements:** Contained within the Contract for Industrial Track Agreement to be executed prior to construction.

**5.3 Grading & Embankment:** The work covered by this section of the specifications consists of furnishing all plant, labor, material and equipment and performing all operations in connection with construction of track roadbed, including clearing and grubbing, excavation, construction of embankments and incidental items, all in accordance with the contract drawings and specifications.

The Contractor shall load, haul, spread, place and compact suitable materials in embankments and shall finish the embankments to the grade, slope and alignment as shown in the plans. Suitable materials shall consist of mineral soils free from organics, debris, and frozen materials. Embankment slopes shall be compacted and dressed to provide a uniform and dense slope. Embankments shall be built with approved materials from excavation of cuts or from borrow unless otherwise shown on the plans.

If materials unsuitable for embankments (organics, debris, brush and trees, etc.) are encountered within the areas to be excavated, or material existing below the designated subgrade in cuts or within areas on which embankments are to be placed are of such nature that stability of the roadbed will be impaired, such materials shall be removed and wasted or stockpiled for other use. Topsoil removed from embankment areas shall be spread uniformly over the embankment slopes.

Unsuitable material removed from embankment foundations or below subgrade elevation in excavation areas shall be replaced to grade with suitable material compacted as specified for embankments in these specifications.

Wherever an embankment is to be placed on or against an existing slope steeper than four horizontal to one vertical, such slope shall be cut into steps as the construction of the new embankment progresses. Such steps shall each have a horizontal dimension of not less than three feet and a vertical rise of one foot.

At all times, the Contractor shall operate sufficient equipment to compact the embankment at the rate at which it is being placed. Compaction shall be accomplished by sheep's foot rollers, pneumatic-tired rollers, steel-wheeled rollers, vibratory compactors, or other approved equipment. Use construction procedures and drainage design that will provide a stable roadbed.

Each layer in embankments made up primarily of materials other than rock shall not exceed 6" in loose depth and shall be compacted to the dry density as specified hereinafter before additional layers are placed. All embankments shall be compacted to a density of not less than 95% of the maximum standard laboratory density, and not more than +4 percentage points above the optimum moisture content, unless otherwise specified on the drawings. The standard laboratory density and optimum moisture content shall be the maximum density and optimum moisture as determined in accordance with ASTM Designation: D 698 (Standard Proctor Test). Copies of soil test results shall be furnished to owner.

On top of the embankment fill, the Contractor shall place a minimum of 6 inches of granular sub-ballast which meets the above criteria and contains no material larger than that which will pass through a (3) inch square sieve. Sub-ballast shall be crushed gravel or crushed stone with a minimum 75% of the material having two fractured faces. Sub-ballast must meet the quality requirements of ASTM Designation: D 1241 and be approved by the Engineer. Additional sub-ballast may be required as determined from an engineering soil analysis.

**5.4 Culverts:** The minimum diameter for all culverts installed under main tracks or tracks maintained by BNSF is 36 inches. This is to accommodate regular inspection and cleaning. Culverts maintained by the Customer should be 24 inches or larger. Impacts to existing culverts shall be included in the customer's scope of the project.

Culvert extensions with a change in direction or a change in pipe section (including size) is generally not permitted. If the project involves removing/abandoning existing culverts under BNSF tracks, adding additional culverts under BNSF tracks or extending an existing culvert under BNSF tracks, a hydraulic study shall be provided to demonstrate that the post project condition will meet or exceed the existing hydraulic capacity. Projects adjacent to BNSF right-of-way with potential hydraulic impacts to BNSF will also require a hydraulic study. The hydraulic study can be waived if the project area is less than 1.0 Ac and does not have any hydraulic impact to an existing BNSF bridge/drainage structure.

Existing pipes that have to be extended will become the responsibility of the customer in installation, ownership and maintenance. If it is determined by BNSF Structures that an existing pipe cannot be extended in an acceptable manner, the cost of installing an acceptable replacement pipe shall be the responsibility of the customer. Additional guidelines related to pipe installations can be requested from your BNSF engineering project representative.

**5.5 Corrugated Metal Culverts:** These instructions cover the selection, installation, and fabrication of circular type zinc coated (galvanized) corrugated steel culverts for nominal diameters of 36-inch to 96-inch, inclusive. Additional protective coatings may be specified or allowed by BNSF Engineering.

Galvanized corrugated steel pipe shall be manufactured in accordance with AASHTO Specifications M 36 and M 218. All areas of surface rust on re-corrugated ends or lock seams shall be painted using the hot-dip or metallizing process.

Design, installation, and fabrication shall be in accordance with current American Railway Engineering and Maintenance of Way Association (AREMA) Specifications Chapter 1, Part 4, Culverts. Additionally, all culvert pipes shall meet the requirements shown in Table 1.

**TABLE 1**

<u>Nominal Diameter (Inches)</u>	<u>Nominal* Corrugation (Inches)</u>	<u>Minimum** Width of Lap (Inches)</u>	<u>Nominal Thickness (Inches)</u>	<u>Thickness U.S. Std. Gage</u>	<u>Rivet** Diameter (Inches)</u>	<u>Max. Cover</u>	<u>Min. Cover</u>
36	2-2/3 x 1/2	2	0.109	12	3/8	40'	***
42	2-2/3 X 1/2	3	0.138	10	3/8	70'	***
42	3 x 1 & 5 x 1	3	0.109	12	7/16	70'	***
48	2-2/3 x 1/2	3	0.138	10	3/8	65'	***
48	3 x 1 & 5 x 1	3	0.109	12	7/16	70'	***
54	2-2/3 x 1/2	3	0.168	8	3/8	60'	***
54	3 x 1 & 5 x 1	3	0.138	10	7/16	75'	***
60	2-2/3 x 1/2	3	0.168	8	3/8	55'	***
60	3 x 1 & 5 x 1	3	0.138	10	7/16	70'	***
66	3 X 1 & 5 X 1	3	0.138	10	7/16	60'	***
72	3 X 1 & 5 X 1	3	0.168	10	7/16	65'	***
84	3 X 1 & 5 X 1	3	0.168	8	7/16	55'	***
96	3 X 1 & 5 X 1	3	0.168	8	7/16	45'	***

\* Where two types of corrugation are acceptable, the use of standard 2-2/3" x 1/2" material is preferred, if available. 5 x 1 corrugations to be used only on helical pipe.

\*\* For riveted pipe.  
Pipes 48 inches or greater in diameter shall be shop-elongated 5 percent of their diameter in a vertical direction and have lifting lugs.

\*\*\* Minimum cover to be one-half diameter of culvert pipe from top of subgrade to top of pipe.

Due to settlement of culvert pipes, cambering longitudinally is recommended to improve the flow line profile after settlement. This is accomplished by laying the upstream half of the pipe on a flatter grade than the downstream half. Riveted pipe shall be placed with the inside circumferential laps pointing downstream and with the longitudinal laps at the side. Pipes shall be installed with a camber suitable to the height of the cover over the pipe and bearing capacity of the supporting soil.

Firm support must be provided to obtain a satisfactory installation. The filling material adjacent to pipes shall be loose granular material, free from large stones, frozen lumps, cinders, or rubbish. The filling shall be deposited alternately on opposite sides of the pipe in layers not exceeding 6 inches in depth, and each layer shall be thoroughly tamped before placing the next layer. Special care shall be taken in tamping under the lower part of the pipe. For a trench installation, the backfill shall be tamped the entire width of the trench, and for surface installation it shall be tamped not less than one half the pipe diameter out from the sides of the pipe. The density of the backfill after tamping must be at least 95% of its maximum density, as determined by ASTM D 698.

Any other type or size drainage structure shall have approval of BNSF Engineering prior to installation under track locations.

**5.6 Utility Crossings:** Utility crossings and relocations shall conform to BNSF standards as outlined in the "BNSF Utility Accommodation Policy" <http://bnsf.com/communities/faqs/pdf/utility.pdf> Applications for utility crossings and relocations are handled by Jones, Lang, LaSalle (JLL), phone number 1- 866-498-6647. Any questions regarding utilities can be directed to the BNSF Engineering representative.



- 5.7 Curvature and Grades:** Tracks will be staked by the customer's surveyor (under flag protection if necessary) and constructed as shown on the approved plans. Any changes to the approved design need to be reviewed by BNSF Engineering or appointed representative.
- 5.8 Clearances:** BNSF will adhere to the "Clearance Requirements By State," BNSF Dwg. No. 2509, Sheet No. 2 (see appendix, page A-38) for each state. If a state does not have its own clearances, the "BNSF Minimum Clearances Diagram," BNSF Dwg. No. 2509, Sheet No. 1 (see appendix, page A-41) will apply. Side clearances for curves should have an additional 1-1/2" per degree of curvature. Warning signs will be installed for all close clearances less than standard (see appendix, page A-42). All loading/unloading equipment that fouls the clearance envelope during operation must positively lock in a non-fouling position when not in use.
- 5.9 Material:** BNSF's Division Engineer representative should inspect all track materials prior to placement to avoid removal of sub-standard material. BNSF personnel will also inspect the track before placing it into service.
- 5.9.1 **Rail:** For trackage maintained by the Customer the minimum acceptable rail shall be 112# section (5-1/2" base) and shall be compatible with BNSF standard rail section. For locations where trackage will be maintained by BNSF rail and fastenings shall conform to the BNSF standard rail section in use in that area. Contractor shall contact BNSF Engineering for approved section. Transition rails or compromise joints at the BNSF-Customer interface are the responsibility of the customer. Minimum length shall not be less than 39 feet except in turnouts and shall be free from defects. Rail should be minimum full ball relay rail, not exceeding 3/16 inch wear on any surface. Continuous welded rail (CWR) will need to be de-stressed as soon as possible after laying (see "Procedures for the Installation, Adjustment, Maintenance, and Inspection of CWR in Industry Tracks" appendix, page A-1 thru A-9). CWR is recommended when using concrete ties. Thermite and flash-butt welds must be placed in crib area between ties. An abrasive rail saw will be used to cut rail—no torch-cutting.
- 5.9.2 **Anchors:** Rail anchors shall be new or reconditioned, sized to fit the rail section, and shall be provided per industrial track design criteria on pages 3 and 6. High traffic volumes or unusual grade or alignment problems may require additional anchors as determined by BNSF Engineering. Turnouts shall also be anchored.
- 5.9.3 **Ties:** Hardwood ties shall be new 7" X 8" (AREMA No. 4) or 7" X 9" (No. 5), 8'-6" long, placed on 21.5" centers. Switch ties shall have a minimum cross section of 7" x 9" and minimum lengths shall conform to applicable BNSF Standard plans. Concrete ties shall be pre-stressed, measure 11" wide at the bottom and 9" high with a length of 8' 3" and weight of 630 pounds. Concrete ties can be placed on 28" centers provided there is a minimum ballast section of 8" below the tie. Second-hand, or "3/4" concrete ties can be used after inspection and approval from the BNSF Roadmaster. When placing 3/4 ties, the damaged shoulders should be alternated from left to right sides so that they are not on the same side. Steel ties are spaced at 24" centers with 8" ballast section and can be used with timber or concrete ties. Steel ties should not be used within 200 feet of a signal circuit identified by insulated joints.
- 5.9.4 **Turnouts (Switches, Frogs & Guardrails):** All parts shall be new or good secondhand, with secondhand parts being free of injurious defects.
- 5.9.5 **Tie Plates:** Tie plates may be new or secondhand, free of injurious defects and foreign material, conforming to AREMA Specifications, and shall fit rail being used. For rail 110# section and greater, all plates will be double-shouldered.

- 5.9.6 **Joints:** New or secondhand joints, free of foreign material and without injurious defects, and with 4 or 6 bolt holes, conforming to AREMA requirements, may be furnished to fit rail section for which they are designed. Bolt holes must be drilled with proper equipment. Torch-cutting of bolt holes is not allowed. New or secondhand compromise joints of manufactured type (welded or homemade are not acceptable), free of foreign material and without injurious defects, shall be furnished and used where rail section (weight or design) changes. Rail section by weight shall not be compromised where difference in weight is in excess of 25 lbs. When this becomes necessary, a rail of some weight between the two different rail sections, in excess of 25 lbs., shall be used and the compromise made in two steps. The length of the medium-weight rail should be 39 feet where practical.
- 5.9.7 **Spikes:** 5/8" x 6" cut track spikes shall be installed. All spikes shall conform to AREMA requirements.
- 5.9.8 **Track Bolts & Nuts:** Track bolts and nuts shall be installed conforming to AREMA Specifications. Bolts will be correct size and length to fit rail.
- 5.9.9 **Lock Washers:** One lock washer conforming to AREMA Specifications shall be installed on each track bolt.
- 5.9.10 **Ballast:** Track ballast shall be Class 2 (1" - 3/8"). Ballast shall be free from loam, dust, and other foreign particles and shall not have less than 75% crushed particles with two or more fractured faces, unless otherwise approved by BNSF. Processed ballast shall be hard, dense, of angular particle structure, providing sharp corners and cubicle fragments and free of deleterious materials. Ballast materials shall provide high resistance to temperature changes, chemical attack, have high electrical resistance, low absorption properties and free of cementing characteristics. Materials shall have sufficient unit weight (measured in pounds per cubic foot) and have a limited amount of flat and elongated particles. Unless it meets or exceeds BNSF requirements, slag is not an approved ballast material. Walkway ballast shall be Class 2 (1" - 3/8").

NOMINAL BALLAST SIZE		PERCENT PASSING (BY WEIGHT)										
SIZE NO.	SQ. OPENING	2 1/2"	2"	1 3/4"	1 1/2"	1 1/4"	1"	3/4"	1/2"	3/8"	No. 4	
Class 2	1" – 3/8"				100		90-100	40-75	15-35	0-15	0-5	

- 5.9.11 **Bumping Post:** An earthen berm (see appendix, page A-15) or suitable bumping post, approved by the Railroad, shall be installed at the ends of tracks. Also, a red retro-reflective marker shall be placed at the end of track. Cars shall not be parked or spotted closer than 25 feet to the end of the track.
- 5.9.12 **Derails:** A derail shall be placed on all tracks connecting with a main line, siding, or industrial lead. Derails protecting mainline tracks and controlled sidings shall be double switch point (see appendix, page A-34) and installed so that the derailed car is directed away from BNSF trackage. A power derail is required when the mainline turnout is powered, and BNSF will install track and signal from the point of switch to the insulated joints just beyond the power derail. Derails protecting mainline tracks shall be placed a minimum of 100 feet behind the 14' clearance point, and placed on tangent track where possible. Derails protecting other-than-mainline tracks shall be placed a minimum of 50 feet behind the 14' clearance point, and placed on tangent track where possible. The type of derail and actual location may be determined by BNSF Operating Department requirements. A "Derail" sign

needs to be placed next to the derail. Timber ties are recommended within 50 feet of a derail.

A second derail may be required where BNSF locomotives are parked during unit train loading operations. BNSF's Operating department will determine the necessity and type. If required, placement will be 275 feet from first derail. A "Derail" sign needs to be placed next to the derail.

- 5.9.13 **Highway Crossings:** All crossings shall be approved by BNSF Engineering and local governments as to type and design, in advance of placing order. Effect on sight distance of crossings must be considered when planning construction of trackage in vicinity of public grade crossings not equipped with automatic signals.
- 5.9.14 **Under Track Hoppers or Pits:** Plans shall be approved by BNSF Engineering or authorized representative. Specifications for unloading pits are covered in the "AREMA Manual for Railway Engineering," (Chapter 15, Section 8.4). Gratings covering open pits must be bolted in place.

## 5.10 Track Construction

- 5.10.1 **General:** All work shall be of good quality in materials, equipment and workmanship and shall conform in every respect with the specifications and instructions.
- 5.10.2 **Ties:** Ties will be unloaded and handled in such a manner as not to damage ties, using approved handling equipment. Ties to be placed at design spacing of 21.5-inch center to center (22 ties/39 feet) for wood, and 28-inch centers for concrete, on the finished subgrade, perpendicular to center line of track with the right hand ends of ties being parallel. Exception: On curves, align the ties to the inside of the curve. All joints are to be suspended between ties. Top surface of ties shall be clean and smooth to provide full bearing for tie plates. Lay wood ties with heartwood face down, and if not possible to determine position of the heartwood, lay the widest surface of the tie down. If spikes are pulled from any tie, hole shall be filled by driving in a treated wood tie plug the full depth of the hole. Boring or adzing of ties shall be kept to a minimum.
- 5.10.3 **Tie Plates:** Double-shouldered tie plates will be used on all ties and set in position with cant surface sloping inward, making sure they are firmly seated and have full bearing. After rails are in place, shoulder of plates shall be in full contact with outside edge of rail base.
- 5.10.4 **Rails:** Assemble joints before fastening rails to ties, using joint bars with full number of track bolts and spring washer for each bolt, first removing loose mill scale and rust from contact surfaces or joint bars and rails. In laying secondhand rail, care must be taken to rail end mismatch at the joints. Under no circumstances must rail be struck in web with tool or any metal object. The right-hand rail facing in direction of increasing construction shall be spiked to ties, and the opposite rail shall be brought to gage of 4' 8-1/2", measured at right angles between the rails, in a place 5/8" below top of rail. A track gauge manufactured for the purpose of measuring gage should be used rather than a tape measure. Gage is to be checked at every third tie. Do not strike rail directly with a maul, either on top when driving spikes, or on side to obtain track gage. Rail shall be laid with staggered joints. Joints shall be located as nearly as possible to the middle of the opposite rails with the following variation: (a) except through turnouts, the staggering of the joints on one side shall not vary more than 6' in either direction from the center of the opposite rail.

Continuous welded rail (CWR) will need to be de-stressed as soon as possible after laying (see "Procedures for the Installation, Adjustment, Maintenance, and Inspection of CWR in

Industry Tracks” appendix, pages A-1 thru A-9). The completed “Record of Neutral Temperature of Welded Rail as Laid” form will be completed and presented to the BNSF Engineering representative at time of final track inspection.

- 5.10.5 **Joints:** If necessary to force joint bar into position, strike lower edge of bar lightly with 4-lb. maul. Do not drive bolts in place. Tighten bolts in sequence, beginning at joint center and working out to ends. Bolts are to be tightened to a range of 20,000 to 30,000 ft.-lbs. tension. If a bolt tightening machine is not used, a standard track wrench with a 42" long handle may be used. At the time of installation, rail expansion shims of softwood not over 1" width shall be placed between the ends of adjacent rails to insure proper space allowance for expansion required by the rail temperatures in the following table, and shall be left in place:

**39-ft Rail**

<b>Temperature</b>	
<b><u>Deg. F</u></b>	<b><u>Expansion</u></b>
Over 85	None
66 to 85	1/16
46 to 65	1/8
26 to 45	3/16
6 to 25	1/4
Below 6	5/16

- 5.10.6 **Bending Stock Rails:** Use approved rail bending equipment. Make bends uniform and accurate for all stock rails.
- 5.10.7 **Spiking to Wood Ties:** Rails shall be spiked to every tie, using not less than 2 spikes for each rail at each tie. Drive spikes through tie plate holes into ties, located diagonally opposite each other but not less than 2" from edge of tie. Start and drive spikes vertically and square with rail. Take care to avoid slanting, bending, or causing sideways movement of spike. Each rail will be spiked with two spikes per tie plate on tangent track staggered with inside spikes to the east or north and outside spikes to the west or south. On curves a third spike is required on the gage side of the rail. Spikes should not be placed in the slots on skirted joint bars when such practice can be avoided by providing other plates with a hole pattern that will clear the skirts. When spikes are driven by machine, work shall be closely supervised to see that they are driven with hammer centered exactly over each spike head and drive spike vertically. Set stop bolt on the machine to prevent over-driving. Withdraw spikes that are incorrectly driven and fill hole by driving a tie plug to full depth of hole. Locate replacement spike at another hole in tie plate and tie.
- 5.10.8 **Ballast and Surfacing:** Raise track by means of jacks placed close enough together to prevent excessive bending of rails or strain on joint. Lift both rails simultaneously and as uniformly as possible. Power jack may also be used. Each track raise shall not exceed 4" with ties tamped prior to additional raise.
- 5.10.9 **Unloading and Tamping Ballast:** Unload and level down ballast by most practical means, taking care not to disturb grade stakes. Perform tamping, using power tamping machines wherever possible, or manually, using approved AREMA tamping tools appropriate for type of ballast being placed. Tamp each layer of ballast from a line 15" inside each rail, on both sides of and to the ends of ties. Center area between these limits shall be filled lightly with ballast but not tamped. At turnouts and crossovers, tamp ballast uniformly for full length of ties. Tamping shall proceed simultaneously at both ends of same tie, making sure ballast is forced directly under the ties and against sides and ends of ties.

5.10.10 **Finishing and Dressing:** Dress ballast in conformance with dimensions shown on drawings, placing additional ballast material as necessary. When placing pavement up to the track and flush with top of rail it is important to make sure water drains away from the track. This will prevent pooling and freezing which create hazardous walking conditions. Lines should be painted 10 feet parallel to the centerline of track on both sides to serve as visual reminder of the track's foul zone. Crushed rock or fabric should be placed over the ties to keep the pavement from adhering to them. Flange ways need to be kept clean to allow wheels to contact top of rail at all times.

5.10.11 **Final Inspection:** After ballasting and surfacing are completed, inspect track to see that joints are tight and rail attachments to ties are secure. Customer will notify the BNSF Engineering Representative that the track work is complete and ready for inspection. The BNSF Engineering Representative will inspect the finished track work and complete the Project Closeout Checklist (not included in this document). Civil and Track items to be inspected are included in a list in the next section. The Contractor will provide a copy of the "Record of Neutral Temp of Welded Rail as Laid" form to the BNSF Engineering Representative prior to or during inspection. After the BNSF Engineering Representative's approval, the track will be placed in service by the Division's General Manager and can then accept rail cars. Rail cars delivered to site before the track is in service will be stored at another location at an additional cost to the customer, or returned to origination point.

## 5.11 Miscellaneous

5.11.1 **Fencing and Gates:** Gates and fences must be grounded in accordance with National Electric Safety Code requirements to prevent an injury resulting from an electrical charge. Gates crossing tracks must have the ability to lock in the open position during train operations. If a fence parallel to a track has an angled piece at the top with security wire it must not foul the clearance envelope of the track.

## 6. Acceptance

<b>CIVIL</b>
All slopes meet design plans
Drainage ditches drain properly
All access roads and Inspection Paths completed
All drainage devices (Culverts, Catch Basins, etc.) Installed as per the plans
All abandoned culverts properly sealed, filled, and communicated to Structures and RIS
Gates/fences installed per plans and are appropriately locked
Paving and grading for disturbed crossings completed per plan
Grade crossing roadway markings established per crossing agreement
Temporary road crossings removed and proper drainage established
Temporary traffic controls removed
All structures placed according to the design plans
All clearances meet the design plans
Full and proper seeding completed

<b>TRACK</b>
All rail joints identified as part of the project scope are welded
Record of target neutral temperature recorded for CWR as laid
Destressing completed
Site cleaned and scrap rail and ties stockpiled
Track surfaced to design plans
Placed ballast meets design standards
Switch stands dressed properly with walkway ballast
All turnouts installed as per the plans
Targets installed and properly oriented
Derails installed in proper locations and positions with appropriate locks
Insulated Joints installed per plan (with 10ft ties and correct plates installed)
All retired insulated joints identified by project scope have been removed (OS, Intermediates, and Turnouts)
All crossings installed according to plans
Crossing approaches paved/graded to provide a smooth transition (if performed by track)
All signage has been installed per plan (Track, road crossings, etc.)
All track work completed to plan

## **7. Requirements for Working on BNSF Right of Way**

In order to protect BNSF's investment in its right-of-way and for the safety of persons coming onto BNSF property, BNSF has established certain requirements. The following constitute minimum requirements for Contractors, Consultants and Surveyors coming on or near BNSF right-of-way. Contractors are encouraged to develop their own safety rules that meet or exceed the following requirements. A web site has been set up to assist in preparation of a safety plan <http://www.bnsfcontractor.com/> (or [contractororientation.com](http://contractororientation.com)). Registering on the web site and completing the course is a requirement prior to occupying or working on BNSF right-of-way.

The orientation does not relieve the contractor from the need to secure appropriate flagging protection when working close to BNSF tracks. Flaggers are required whenever there is a potential for men, structures, materials or equipment to enter within 25' of BNSF tracks. See the list below for additional guidance. If in doubt, take the safe course and request a flagger.

It shall be noted that these requirements are complementary to the contractor's right of entry agreement to be executed by the contractor prior to starting work on BNSF right-of-way and is not intended to waive any terms within the right of entry agreement. The permission to work and enter the BNSF right-of-way can be taken away at any time if BNSF deems the contractor's behavior not meeting or exceeding the safety vision of how BNSF intends to have work performed on its right-of-way.

- 7.1** All permits and agreements must be in effect, required payments made, and insurance certificates received and approved prior to Contractor entering BNSF right-of-way. All of these documents are included in the packet containing the cost proposal. Prior to performing the preliminary survey, the consultant/surveyor will obtain a "Temporary Occupancy Permit". To obtain a permit contact Jones, Lang, LaSalle (JLL), phone number 1-866-498-6647, or follow the relevant instructions online (<http://www.bnsf.com/communities/faqs/permits-real-estate/>). The permit requires a preparation fee and some lead time. Copies of all documents should be kept on the job site.
- 7.2** Flagging requests shall be made at least 30 days prior to the start of flagging.
- 7.3** Flagging requests cancelled less than 2 days in advance may still be charged to the customer.
- 7.4** Any de-watering utilizing drains or ditches on BNSF property must be approved by BNSF Engineering.
- 7.5** Contractor must have BNSF-approved "Final Construction Plans" prior to commencing work on a project, or will be proceeding work at their own risk. No change will be made to "Final Construction Plans" without approval by all parties involved. Approved revised plan will be furnished to all parties prior to implementation of changes.
- 7.6** Road Authority or Contractor will be responsible for all costs for track work, including flagging, etc., made necessary due to their construction operation.
- 7.7** Pursuant to BNSF safety rules, flagging protection is always required when equipment crosses or is working within 25 feet of center of any track. When deemed necessary by BNSF, a flagman may be required at all times while working on BNSF right-of-way.
- 7.8** Crossing of any railroad tracks must be done at approved locations and must be over full depth timbers, rubber, etc. Any equipment with steel wheels, lugs, or tracks must not cross steel rails without aid of rubber tires or other approved protection and proper flagging will be required.
- 7.9** All temporary construction crossings must be covered by a "Private Roadway & Crossing Agreement," and must be barricaded when not in use.

- 7.10** Contractor must furnish details on how work will be performed that may affect existing drainage and/or possible fouling of track ballast as well as removal of overhead bridges/structures. (Structures and bridge spans over tracks must be removed intact.)
- 7.11** Absolutely no piling of construction materials or any other material, including dirt, sand, etc., within 25 feet of any track or on property of BNSF not covered by construction easement, permit, lease or agreement.
- 7.12** Storage of materials, temporary structures, equipment and etc. shall not be within 250 feet of a public grade crossing. If material haul routes involve crossing a BNSF crossing or traversing a considerable distance parallel to a BNSF track, a trucking coordinator provided by the contractor will be required. Contractors shall supply a radio for communications between the railroad flagger and the roadway flagger/coordinator to ensure activities such as dumping/unloading/other activities that can foul the main will stop until the train has completely passed.
- 7.13** A 10-foot clear area on both sides of a main track must remain unobstructed at all times to allow for stopped train inspection.
- 7.14** No construction will be allowed within 25 feet of center of any track unless authorized by BNSF and as shown on Final Plan approved by the Railroad. This includes any excavation, slope encroachment and driving of sheet piles.
- 7.15** No vehicles or machines should remain unattended within 25 feet of any track. All machines will be disabled with as much potential energy released as practicable, and locked out when not in use to prevent unauthorized operation. (e.g. A mobile crane that has to be left on the BNSF right-of-way will have to be boomed down, with outriggers disengaged.)
- 7.16** IMPORTANT: Non-compliance to any of these items and requirements within the right-of-entry agreement could result in the job being shut down. The contractor/consultant/surveyor will then be prohibited from working on BNSF right-of-way while the infraction is investigated. Based on findings of the investigation, BNSF will determine whether the non-compliant entity/entities will be allowed to continue its work on BNSF rights-of-way in the future.
- 7.17** Contractor safety rules, including rules regarding Personal Safety Equipment, must not conflict with BNSF safety policies. Contractor's personnel will complete BNSF's safety orientation prior to entering BNSF property. A job safety briefing will be held prior to beginning work each day and any time work conditions change. All personnel will wear proper personal protective equipment (PPE) while on BNSF property. Any person working on BNSF property may be subjected to a safety audit by BNSF personnel, and is required to comply with the audit. The results of the audit will be presented to the contractor's supervisor immediately upon completion. Any questions regarding safety should be directed to the BNSF project representative.





# **Procedures for the Installation, Adjustment, Maintenance, and Inspection of CWR as Required by CFR 213.118**

**February 22, 2016**

Materials contained within this documents are excerpts from BNSF's Engineering Instructions, and the EI chapter numbers and references are retained. Sections unrelated to construction of industry tracks have been removed.

This document details the Railroad's policy on installing, adjusting, maintaining, and inspecting Continuous Welded Rail (CWR) track. Each chapter details how the Railroad applies its standards and procedures to comply with FRA standards. The procedures listed in this document apply to CWR on all main tracks, sidings, and other tracks over which trains operate at speeds above Class 1.

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### 1.3 Installing CWR

Follow these general requirements when laying CWR:

- Refer to Figure 6-1 for the target rail laying temperature for your area.
- Take the rail temperature and calculate the expansion required before making adjustments.
- Record the rail laying temperature, location, and date on approved forms. These records may be retained in an electronic format per FRA 213.241.
- Rail does not need to be adjusted when the actual rail temperature exceeds the target neutral temperature.
- Use rail heaters or rail expanders to adjust the rail to the correct length when the actual rail temperature is less than the target neutral temperature. Heat the rail evenly and uniformly so that the rail expansion occurs evenly and uniformly throughout its length. If rail is laid at a rail temperature cooler than 40 F degrees below the target neutral temperature, it must be adjusted or protected with a 40 mph restriction. When tight rail conditions exist excess rail must be adjusted using Figure 6-4 as a guide.

## Chapter 2 Rail Anchoring Requirements

Where the anchoring function is otherwise provided by Pandrol clips or concrete ties, rail anchors may be omitted. Anchors should not be applied where they will interfere with signal or other track appliances, where they are inaccessible for adjustment or inspection, or on rail opposite a joint. Anchor pattern may be varied as reasonable to avoid placing anchors against deteriorated ties.

### Installation

The following anchoring requirements apply to CWR installations on all main tracks, sidings, and other tracks over which trains operate at speeds above Class 1.

#### 2.1 Standard Box Pattern

When installing CWR, box anchor every other tie except as outlined in Section 2.2 of these CWR Procedures.

#### 2.2 Solid Box Pattern

When installing CWR, box anchor every sound (effective) tie at specific locations listed below to provide additional restraint against rail movement.

Condition	Action
Turnouts*, Crossing Frogs, Joints, Open-Deck Bridges, and where CWR abuts bolted	Anchor every tie for 195 feet in each direction
Bolted joint created during CWR installation/construction when using heater, rail expander, or at or above Target Neutral Temperature	<b>Within 60 days from date of creation:</b> Weld joint, <b>OR</b> Install joint with 6 bolts, <b>OR</b> Anchor every tie for 195' in both directions

\*For turnouts connected to Class 1 yard or back tracks, it is only necessary to anchor every tie to the first transition rails/joints of the diverging route.

## 2.3 Bridge Pattern

When installing CWR, follow these bridge anchoring requirements:

1. Ballast deck bridges should be anchored with the same pattern as in section 2.1 and 2.2 of these CWR Procedures.
2. Open-deck bridges should be anchored according to Engineering Instruction 6.4.5:
  - On open-deck timber bridges, apply anchors to all ties fastened to the stringers.
  - On open-deck steel bridges 150 feet long or less, apply anchors to all ties fastened to the steel structure.
  - On all other structures, apply anchors as directed by the Director Bridge Engineering

## Maintenance or Rail Repair

### 2.4 Legacy Patterns

On CWR installations completed before September 21, 1998, existing anchoring may remain if rail is restrained to prevent track buckles. Rail must be adjusted (by increasing or decreasing the length of rail or by lining curves) or anchors added to rail, if restraint is not sufficient.

### 2.5 Anchor Requirements after Rail Repair

When rail repairs result in a joint added to CWR, the anchor pattern shall match the existing pattern in track. At least every other tie will be box anchored for a distance of 195 feet in each direction unless anchoring is otherwise provided. When repairs are made to a stripped joint or failed joint bar, the adjustment or addition of anchors will be as prescribed in the following table.

Condition	Action
Bolted joint in CWR experiencing service failure (stripped joint) or failed bar(s) with gap* present. *gap exists if it cannot be closed by drift pin.	<ol style="list-style-type: none"><li>1. Weld joint, <b>OR</b></li><li>2. Remediate joint conditions (per Chapter 6.5 CWR) <b>and</b> replace bolts (new, in-kind or stronger), <b>and</b> weld joint within 30 days, <b>OR</b></li><li>3. Replace failed bar(s), install 2 additional bolts <b>and</b> adjust anchors <b>OR</b></li><li>4. Replace bars, bolts (if failed or missing) <b>and</b> anchor every tie for 195' in both directions <b>OR</b></li><li>5. Add rail (with provisions for adjusting later, if necessary)</li></ol>

## Chapter 3 Preventive Maintenance on Existing CWR Track

Performing track buckling preventive maintenance can reduce the risk of buckles. When tight rail conditions exist excess rail must be adjusted using Figure 6-4 as a guide.

RAIL ADJUSTMENT RECORD		<b>BNSF</b> RAILWAY
Division	Line Segment	Date:
Adjusted by (Signature)		
A. Reason for adjustment: _____		
1) Service failure, broken rail _____		
2) Detector Car defect _____		
3) Open joint _____		
4) Adjustment due to heat _____		
5) Other (explain) _____		
B. Mile Post where adjustment occurred _____		
C. Curve or tangent _____		
D. Weight of rail _____		
E. Adjustment made to which rail _____		
F. Rail temperature at time of adjustment _____		
G. GAP (inches) _____		
H. PULL (inches) _____		
I. Rail was cut in, out, or welded _____		
J. Show specific data recorded on rail _____		
If rail was added, indicate date		
follow up rail adjustment is made _____		
FORM 16430-N 4-89	Original-Roadmaster	Copy-Retain
Printed in U.S.A.		

**Figure 6-4. Rail Adjustment Record**

### 3.1 Maintaining Desired Rail Installation Temperature Range

A record of rail neutral temperature will be maintained where rail has pulled apart, broken, or been cut for defect removal. Record the length of the rail-end gap and rail temperature in addition to the other required information on the Rail Adjustment Record, figure 6-4.

Rail that has pulled apart, broken, or has been cut for defect removal must be readjusted into a safe zone defined as the Target Neutral Temperature minus 20 F degrees or higher for that location.

If the rail has not been readjusted prior to the rail temperature exceeding the values in the TABLE below, a speed restriction not to exceed 25 mph will be placed. A speed restriction of 40 mph can be placed in lieu of the 25 mph but the track must be inspected daily during the heat of the day.

As you can see from the table below, if the rail temperature at the time of break or pull-apart exceeded 60°F, no slow order is necessary.

<b>Rail Temperature Recorded at Time of Break or Pull-Apart (°F)</b>	<b>Readjust or Place Slow Order Before Rail Temperature Reaches (°F)</b>
60	135
50	130
40	125
30	120
20	115
10	110
0	105
-10	100
-20	95
-30	90
-40	85

Effective January 1, 2010, locations where the neutral temperature has been lowered below the safe zone by adding rail must be adjusted to TNT-20 F degrees or higher within 365 days of the date of the addition (broken rail/pull apart).

When rail is added for any reason, measure and record the Gap, Pull, and Rail Temperature at the time of repair. Where rail has been added to re-establish the TNT this requirement need not apply. This measurement will be made by the use of match marks.

- Prior to cutting rail, make match marks outside of the rail section to be repaired or removed. Match marks should be made:
  - On the field side of the rail using a ball-point paint marker
  - At least 4 feet from any planned cuts or drilled holes in the rail
  - A whole number of feet apart
- Write the match mark measurement on the web of the rail next to both of the match marks. The markings should not be between the match marks.
- If there is a gap due to broken rail or a pulled-apart joint, consider the gap when making match marks.
- Install the rail.
- Record and document the information on the rail.
- Take Gap, Pull, and Rail Temperature at each repair.

When welding rail ends together, the required weld gap or rail consumption must be taken into consideration when determining the amount of rail adjustment.

## 3.2 De-Stressing Rail

Rail can be de-stressed by cutting rail out or by re-aligning a curve. When cutting rail out, use this procedure:

1. Cut rail to be de-stressed.
2. Remove or reposition anchors or clips for a minimum of 200 feet in both directions from the cut or up to a restriction that prevents rail movement.
3. Wait until the rails stop moving. The rail ends may need to be trimmed more than one time to allow for expansion.
4. Make match marks on either side of the cut after the unrestrained rail is relaxed.
5. Take the rail temperature (far enough away from the cut so that the reading is not affected by the cutting procedure).
6. Use Figure 6-1 in Engineering Instruction 6.2.3 A to compare the rail temperature with the target neutral temperature for the territory. This is known as the temperature differential.
7. If the actual rail temperature is lower than the target neutral temperature for the territory, use Table 6-3, *Change in Length of Welded Rail to Change Neutral Temperature*, located in Engineering Instruction 6.2.3 B, to determine the rail length to be removed based on the total distance the anchors or clips have been removed.
8. If the rail temperature is at or above the Target Neutral Temperature, no additional adjustments are needed. When destressing rail near fixed objects, de-stress each rail to a temperature that is 10 degrees higher than the TNT.
9. Weld the joint or apply joint bars.
10. Replace the rail anchors or clips.
11. Document match marks, employee name, date work performed, rail temperature at time of adjustment, amount of rail added or removed (PULL) per Table 6-3 on Page 9, and feet of rail adjusted.

Chapter 9 Recordkeeping

9.1 Report of CWR Installations

Rail temperature, location, and date of CWR installations must be recorded on the prescribed form ,”Record of Neutral Temperature of Welded Rail as Laid”, can be found as Figure 6-2 in the appendix of this document.

9.2 Report Maintenance Work in CWR

Because track maintenance can disturb the lateral and longitudinal resistance of the track, records of the following must be kept until corrections or adjustments are made:

- Rail that is cut, broken, or added for any reason, including repair of broken or defective rail, pull-aparts, and welding of rail joints.
- A curve that has been staked and inward lateral curve movement exceeds 3”. Record offset measurements on BNSF form ENG00018 “Curve Offset Measurements Record.” Check them again after the curve has been surfaced. Hand deliver the completed form to the Track Inspector, who, in turn, will copy the Territory Roadmaster so that the curve can be monitored.
- CWR installation or maintenance work that does not conform to these written procedures. A record of rail neutral temperature will be maintained where rail has pulled apart, broken or been cut for defect removal.

Record of Neutral Temperature  
of Welded Rail as Laid

Division \_\_\_\_\_ Subdivn \_\_\_\_\_ Line Segment \_\_\_\_\_

Relay Between \_\_\_\_\_ and \_\_\_\_\_ Recorded by \_\_\_\_\_

Target Neutral Temperature = \_\_\_\_°F (see figure 6-1.)

Date Rail Laid	Curve No and/or MP Loca	Position		Trk No	Actual Rail Temp.	Temp Diff	Distance to Match mark	Expansion at Matchmark		Length of String	Remarks
		N/W Rail	S/E Rail					Required	Actual		

3-part form to be distributed as follows: White - Division Engineer,  
Canary - Roadmaster, and Pink - Foreman.

Figure 6-2. Record of Neutral Temperature of Welded Rail as Laid



Table 6-3. Change in Length of Welded Rail to Change Neutral Temperature.

Temp. Diff. (°F)	Length of Unrestrained Rail							
	200'	400'	600'	800'	1,000'	1,200'	1,400'	1,600'
5°	1/8"	1/4"	1/4"	1/4"	1/2"	1/2"	1/2"	1/2"
10°	1/8"	1/4"	1/2"	1/2"	3/4"	1"	1"	1-1/4"
15°	1/4"	1/2"	3/4"	1"	1-1/4"	1-1/2"	1-3/4"	1-3/4"
20°	1/4"	1/2"	1"	1-1/4"	1-1/2"	1-3/4"	2-1/4"	2-1/2"
25°	3/8"	3/4"	1-1/4"	1-1/2"	2"	2-1/4"	2-3/4"	3"
30°	1/2"	1"	1-1/2"	1-3/4"	2-1/4"	2-3/4"	3-1/4"	3-3/4"
35°	1/2"	1"	1-3/4"	2-1/4"	2-3/4"	3-1/4"	3-3/4"	4-1/4"
40°	5/8"	1-1/4"	1-3/4"	2-1/2"	3"	3-3/4"	4-1/4"	5"
45°	3/4"	1-1/2"	2"	2-3/4"	3-1/2"	4-1/4"	5"	5-1/2"
50°	3/4"	1-1/2"	2-1/4"	3"	4"	4-3/4"	5-1/2"	6-1/4"
55°	7/8"	1-3/4"	2-1/2"	3-1/2"	4-1/4"	5-1/4"	6"	6-3/4"
60°	7/8"	1-3/4"	2-3/4"	3-3/4"	4-3/4"	5-1/2"	6-1/2"	7-1/2"
65°	1"	2"	3"	4"	5"	6"	7"	8"
70°	1-1/8"	2-1/4"	3-1/4"	4-1/4"	5-1/2"	6-1/2"	7-3/4"	8-3/4"
75°	1-1/8"	2-1/4"	3-1/2"	4-3/4"	5-3/4"	7"	8-1/4"	9-1/4"
80°	1-1/4"	2-1/2"	3-3/4"	5"	6-1/4"	7-1/2"	8-3/4"	10"
85°	1-3/8"	2-3/4"	4"	5-1/4"	6-3/4"	8"	9-1/4"	10-1/2"
90°	1-3/8"	2-3/4"	4-1/4"	5-1/2"	7"	8-1/2"	9-3/4"	11-1/4"
95°	1-1/2"	3"	4-1/2"	6"	7-1/2"	9"	10-1/4"	11-3/4"
100°	1-1/2"	3"	4-3/4"	6-1/4"	7-3/4"	9-1/4"	11"	12-1/2"

**Note:** The above amounts do not allow for rail added during thermite welding nor rail removed in upset during flash-butt welding.

LEGEND:

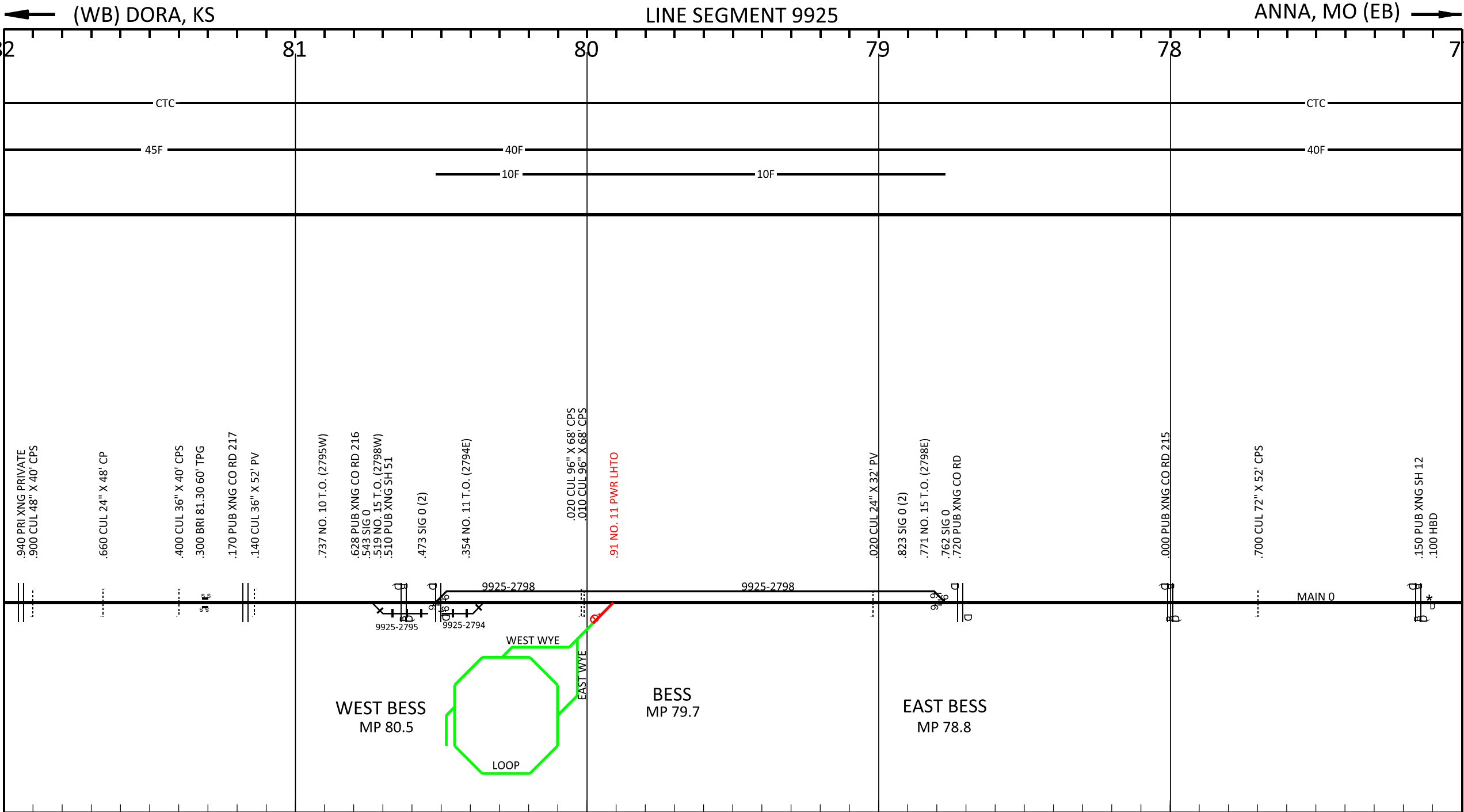
- EXISTING TRACK
- CONSTRUCT - BNSF
- CONSTRUCT - INDUSTRY
- REMOVE
- UPGRADE TRACK
- FOREIGN RAILROAD
- NEW ACCESS ROAD
- POTENTIAL ADDITIONAL ROW
- SOLD ROW
- CTC REVISED OPERATION
- P79 F50 REVISED SPEED


CUSTOMER WORK:  
INSTALL 2 NO. 11 RHTO  
INSTALL 2 NO. 11 LHTO  
CONSTRUCT 10,919 TF

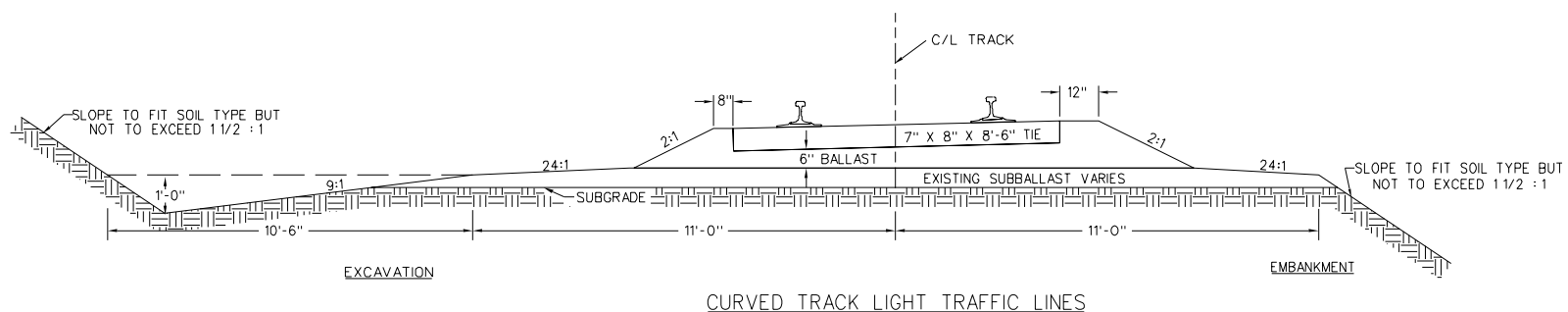
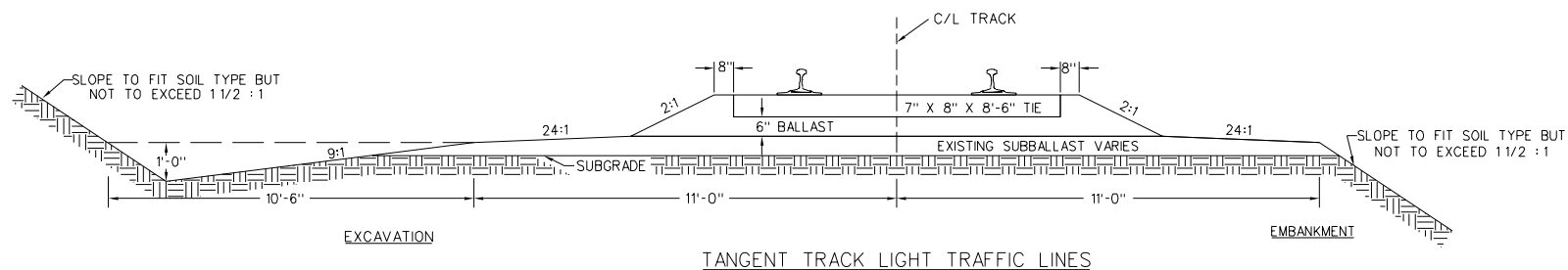
BNSF WORK:  
INSTALL 1 NO. 11 PWR LHTO  
INSTALL 1 PWR DSPD  
CONSTRUCT 285 TF

CLEAR LENGTHS:  
WEST WYE TRACK - 1,490'  
EAST WYE TRACK - 1,197'  
LOOP TRACK - 6,002'  
BAD ORDER TRACK - 300'

CONCEPTUAL DRAWING ONLY!  
THIS LAYOUT HAS NOT BEEN  
ENGINEERED AND NEEDS TO BE  
VERIFIED BY FIELD SURVEY

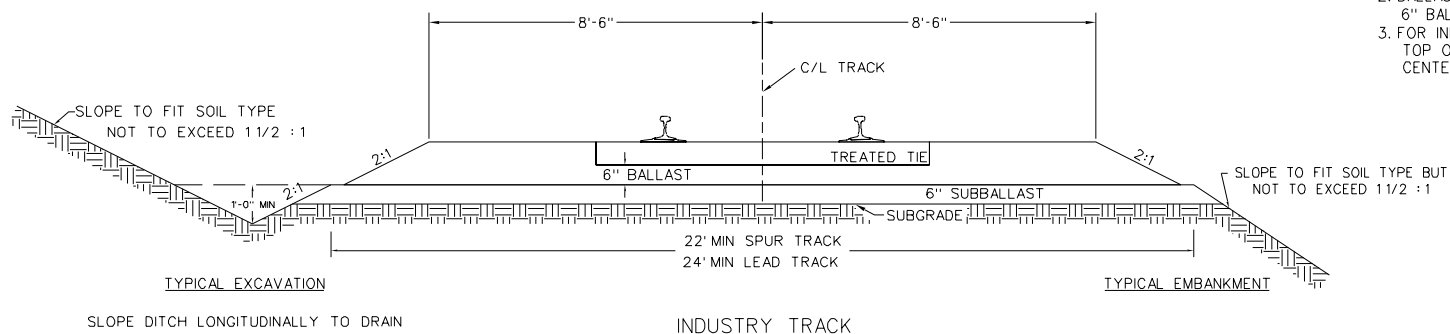


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								REVISIONS				NEW AG LOOP FACILITY BESS,KS				
								NO.	DESCRIPTION		DATE					BY
DRN	CHECKED	BNSF RAILWAY COMPANY - ENGINEERING SERVICES					SF NO.	CS NO.	STATUS PRELIMINARY					FILE:	SHEET 1 OF 1	DATE: 4/04/2017

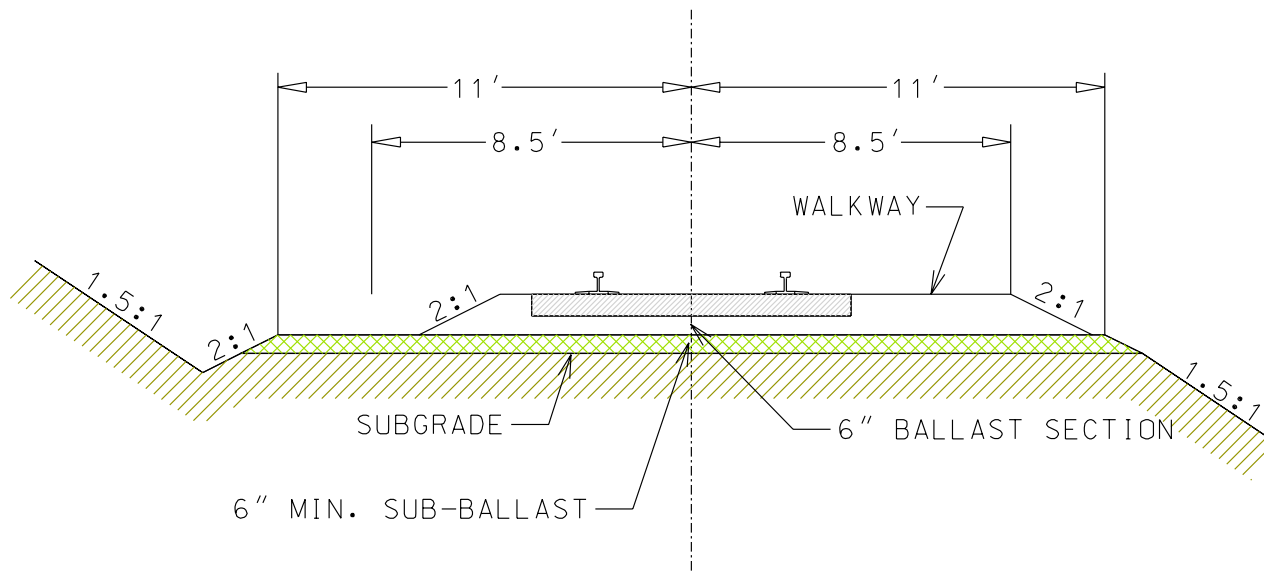
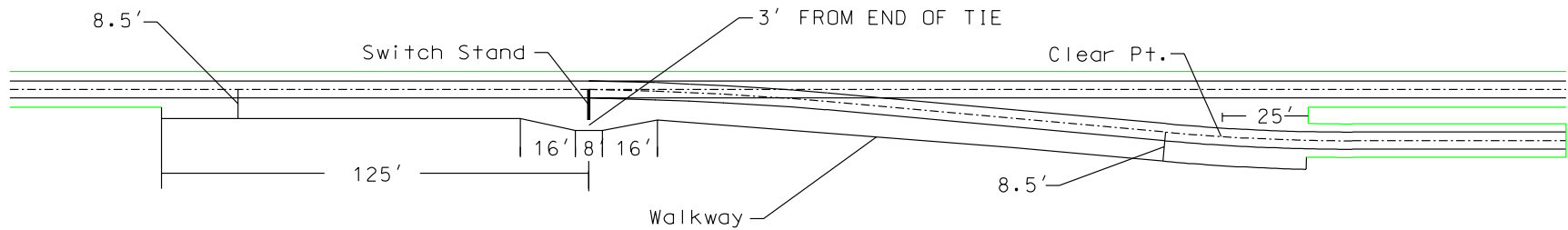


**NOTE:**

1. 6" MIN. GRANULAR SUBBALLAST OR AS REQUIRED PER LOCAL SUBGRADE CONDITION.
2. BALLAST PER MILE OF TRACK:  
6" BALLAST 2,435 CU. YARDS TANGENT
3. FOR INDUSTRY TRACK BALLAST SECTION TO BE LEVEL WITH TOP OF TIE WHERE WALKING REQUIRED, 8'-6" MIN FROM CENTER LINE.

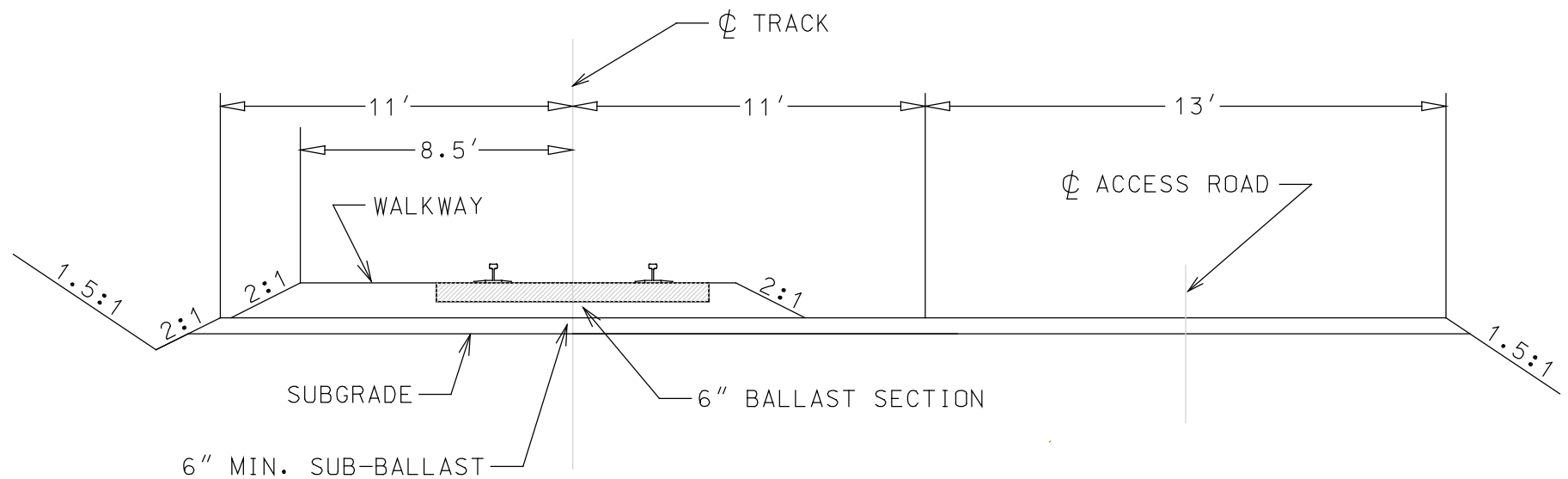
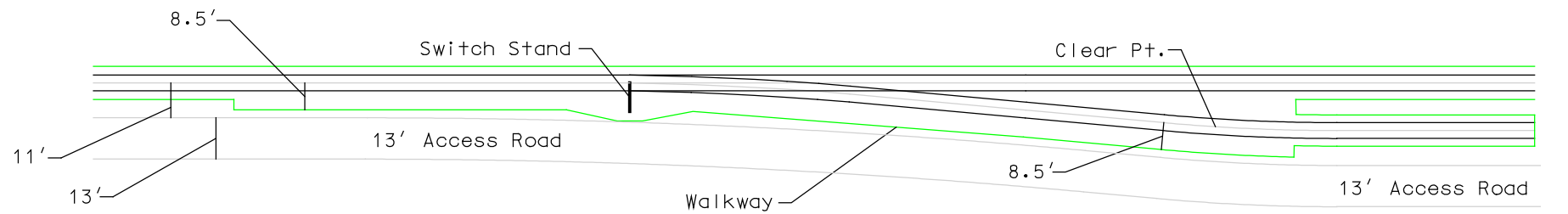


BURLINGTON NORTHERN SANTA FE STANDARD PLAN ENGINEERING DEPT., FORT WORTH, TEXAS		
LIGHT TRAFFIC LINES AND INDUSTRY TRACK		
RAIL:		
DATE: 10/29/97	SCALE: NONE	
DWG. NO. 1000	SHEET NO. 03	REV. NO. 01
USE OF THIS DRAWING IS LIMITED TO BURLINGTON NORTHERN SANTA FE AND THE PARTY DESIGNATED ON THE ATTACHED E-SHEET "A". USE MAY NOT BE MADE BY ANY THIRD PARTY WITHOUT THE WRITTEN CONSENT OF BURLINGTON NORTHERN SANTA FE.		



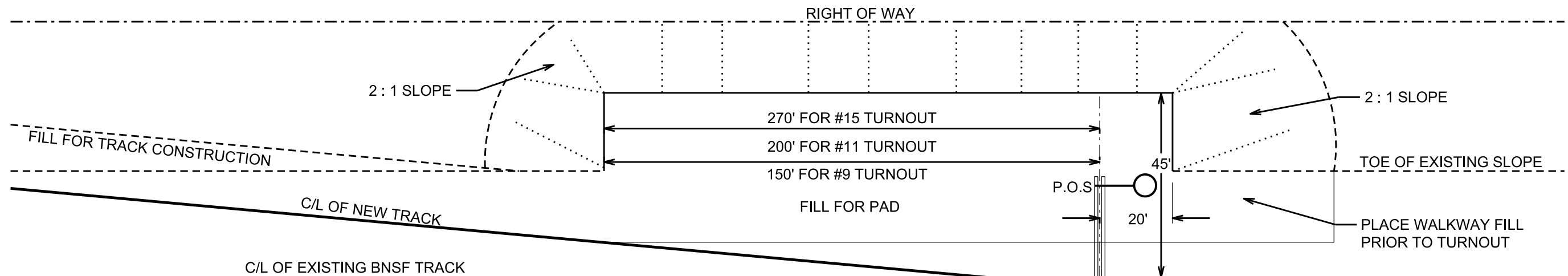
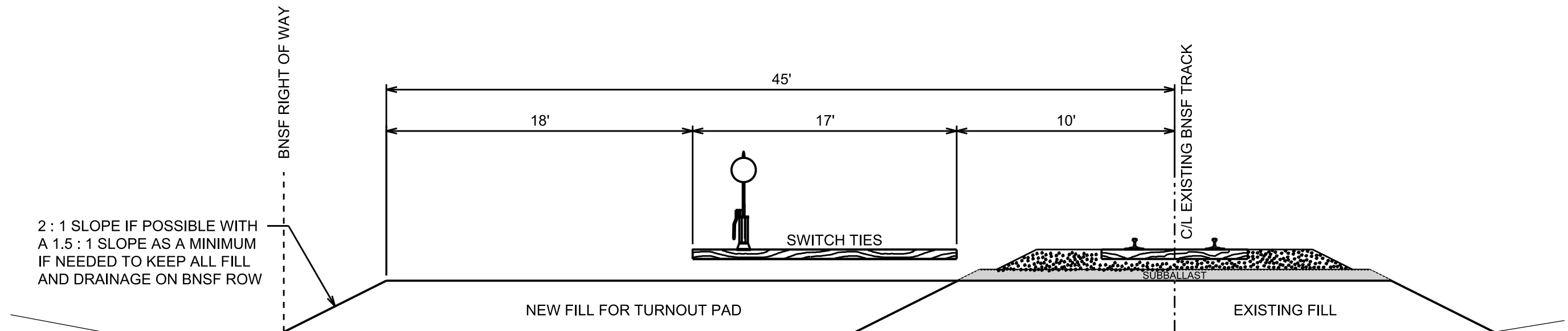
INDUSTRY TRACK STD SECTION  
WITH 8.5' WALKWAY

BNSF ENG SVCS - 10/12/01



INDUSTRY TRACK STD SECTION  
WITH 13' ACCESS ROAD

BNSF ENG SVCS - 04/02/04



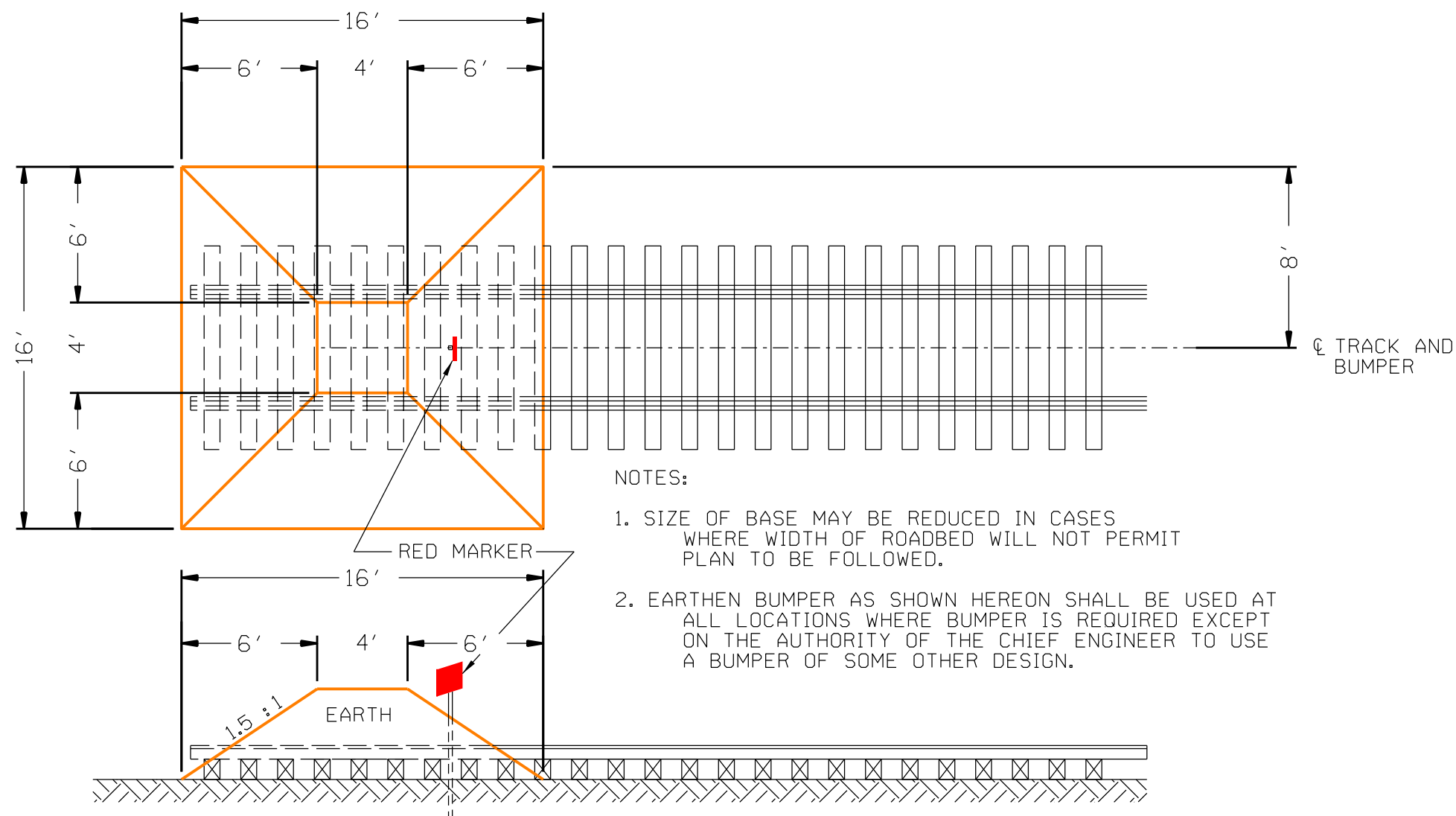
NOTE: CONSTRUCTION OF INDUSTRY TURNOUT PAD IS FOR THE PLACEMENT OF THE PROPOSED PACKAGE TURNOUT FOR ASSEMBLY AND INSTALLATION. TURNOUT PAD IS ALSO TO PROVIDE FOUNDATION FOR ANY REQUIRED SIGNAL EQUIPMENT

TURNOUT PAD FILL MATERIAL SHALL BE PLACED BY THE INDUSTRY AS PART OF THE GRADING FOR THE NEW INDUSTRY SPUR. PAD IS TO BE CONSTRUCTED USING STANDARD COMPACTION AND FILL PLACEMENT PROCESSES AS PER THE BNSF INDUSTRY TRACK GUIDELINES. TOP OF PAD IS TO BE 2' BELOW THE EXISTING TOP OF RAIL.


CONTRACTOR SHALL COORDINATE WITH THE ROADMASTER AND ASSOCIATED PROJECT ENGINEER FOR ANY DEVIATION OF FILL AND FOR FLAGMAN PROTECTION.

APPROVALS - (NAME - TITLE)		DATE	APPROVALS - (NAME - TITLE)		DATE				
						<b>BNSF STANDARD TURNOUT PAD FOR INDUSTRY TRACKS NOT TO SCALE</b>			
						FILE: turnoutpad.dgn    SHEET 1 OF 1    DATE: 9/23/2005			

DRAWN: GLE		CHECKED:	BNSF RAILWAY COMPANY - ENGINEERING SERVICES		CS/SCO NO	STATUS: A-14
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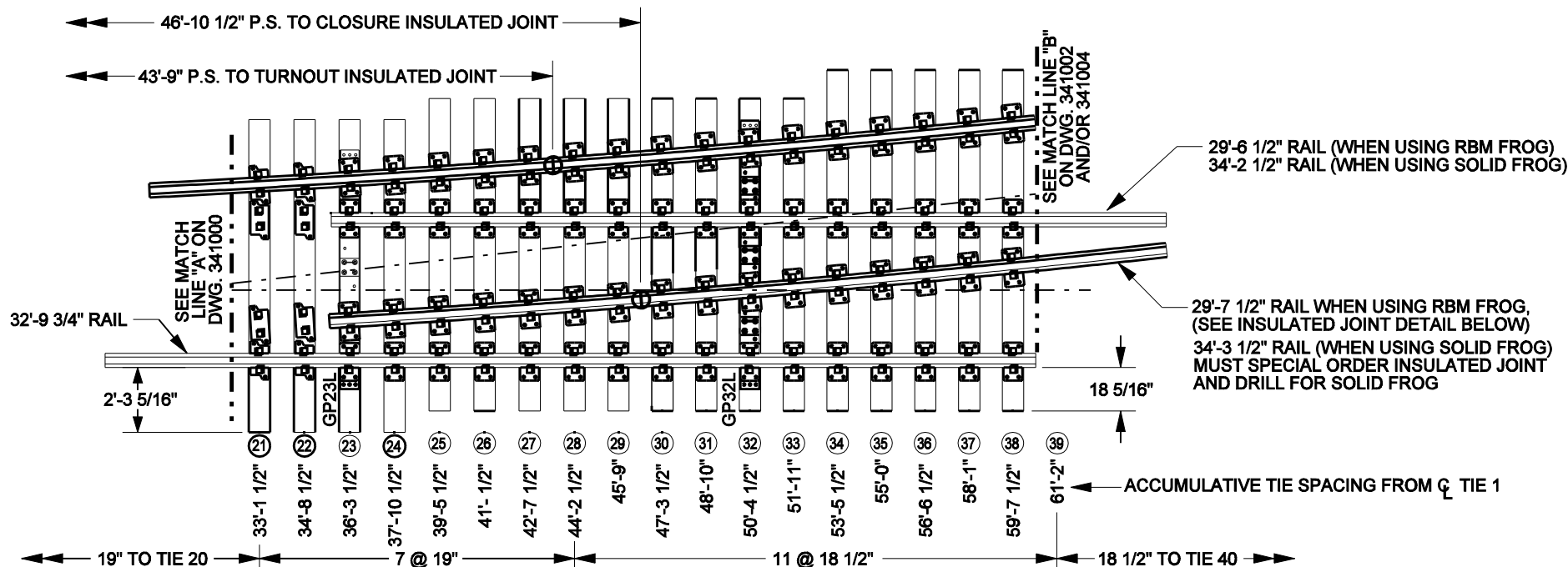


TYPICAL PLAN & SECTION FOR  
EARTHEN BUMPER FOR END OF TRACK  
SCALE: N.T.S.

APPROVALS - (NAME - TITLE)		DATE	APPROVALS - (NAME - TITLE)		DATE	<div></div>																							
						<div>REVISIONS</div> <table><thead><tr><th>NO.</th><th>DESCRIPTION</th><th>DATE</th><th>BY</th></tr></thead><tbody><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr></tbody></table>				NO.	DESCRIPTION	DATE	BY																
NO.	DESCRIPTION	DATE	BY																										
DRAWN	CHECKED	BNSF RAILWAY COMPANY - ENGINEERING SERVICES		PROJECT SCO NO	STATUS	FILE: earthen bumper.dgn		DATE: 04/05/2017																					

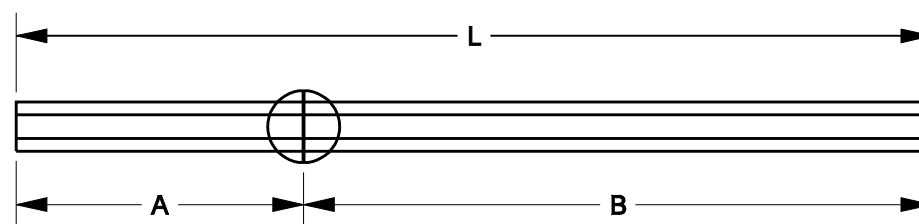






# NOTES:

1. WHEN INSULATED JOINTS ARE REQUIRED, THE LOCATION OF THE JOINTS SHOULD BE STAGGERED NO CLOSER THAN 6" AND NOT MORE THAN 4'-6" APART, MEASURED ALONG THE TURNOUT.
2. SEE DWGS 341000, 341002, 341003, AND 341004 FOR THE BALANCE OF LAYOUT PLANS.
3. ALL TIES 7" X 9" BODY UNLESS OTHERWISE SHOWN.
4. SEE DWG 341100 FOR TURNOUT GEOMETRY.
5. SEE DWG 341200 FOR TURNOUT BILL OF MATERIAL.
6. PANEL WEIGHT = 14,500 LBS.



	A	B	L	BNSF ITEM NO.
TURNOUT INSULATED JOINT RAIL	14'-3 1/4"	17'-0 3/4"	31'-4"	524400027
CLOSURE INSULATED JOINT RAIL	11'-0 1/2"	18'-7"	29'-7 1/2"	524400030

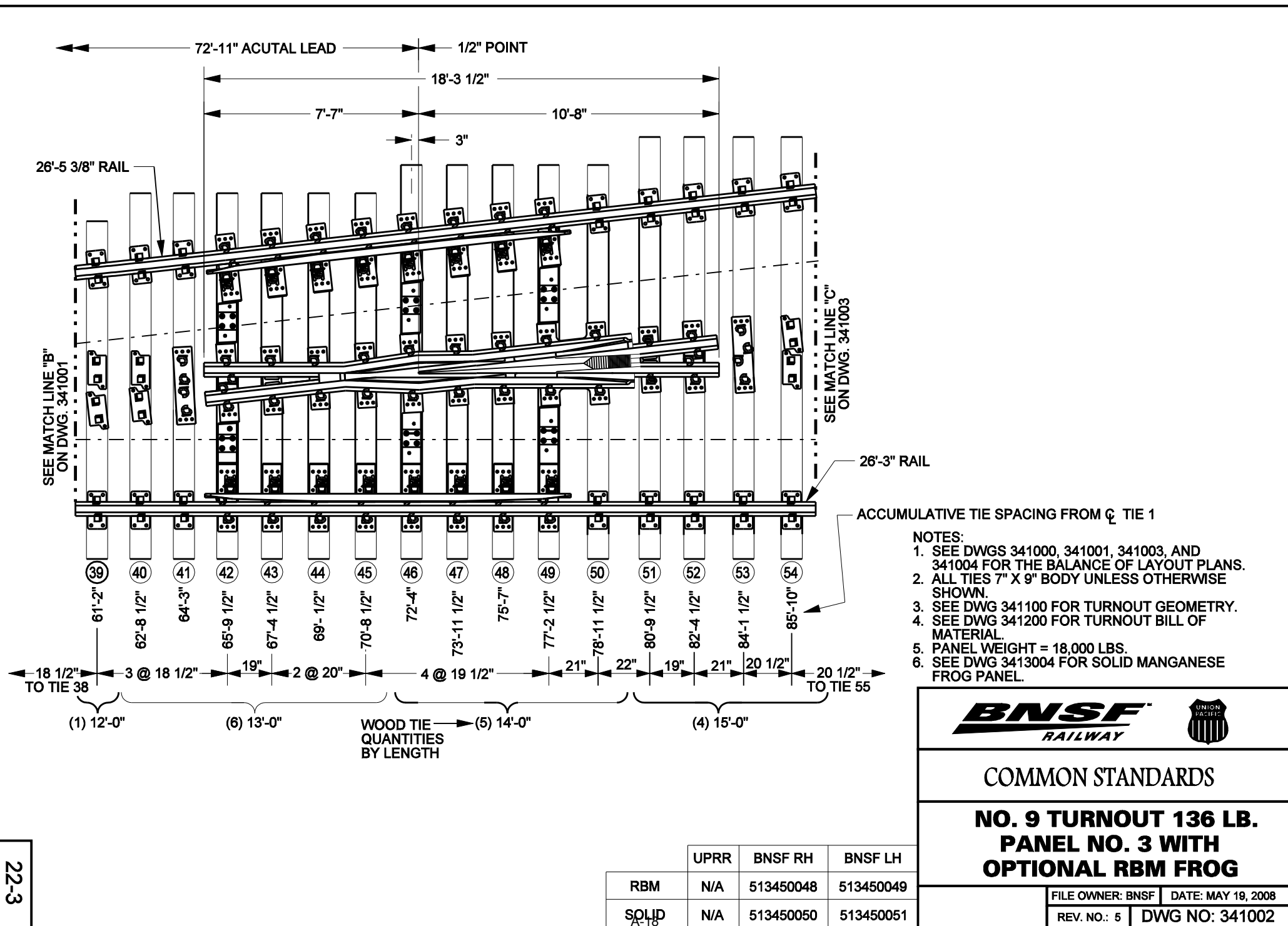
## INSULATED JOINT DETAIL (FOR USE WITH RBM FROG ONLY)

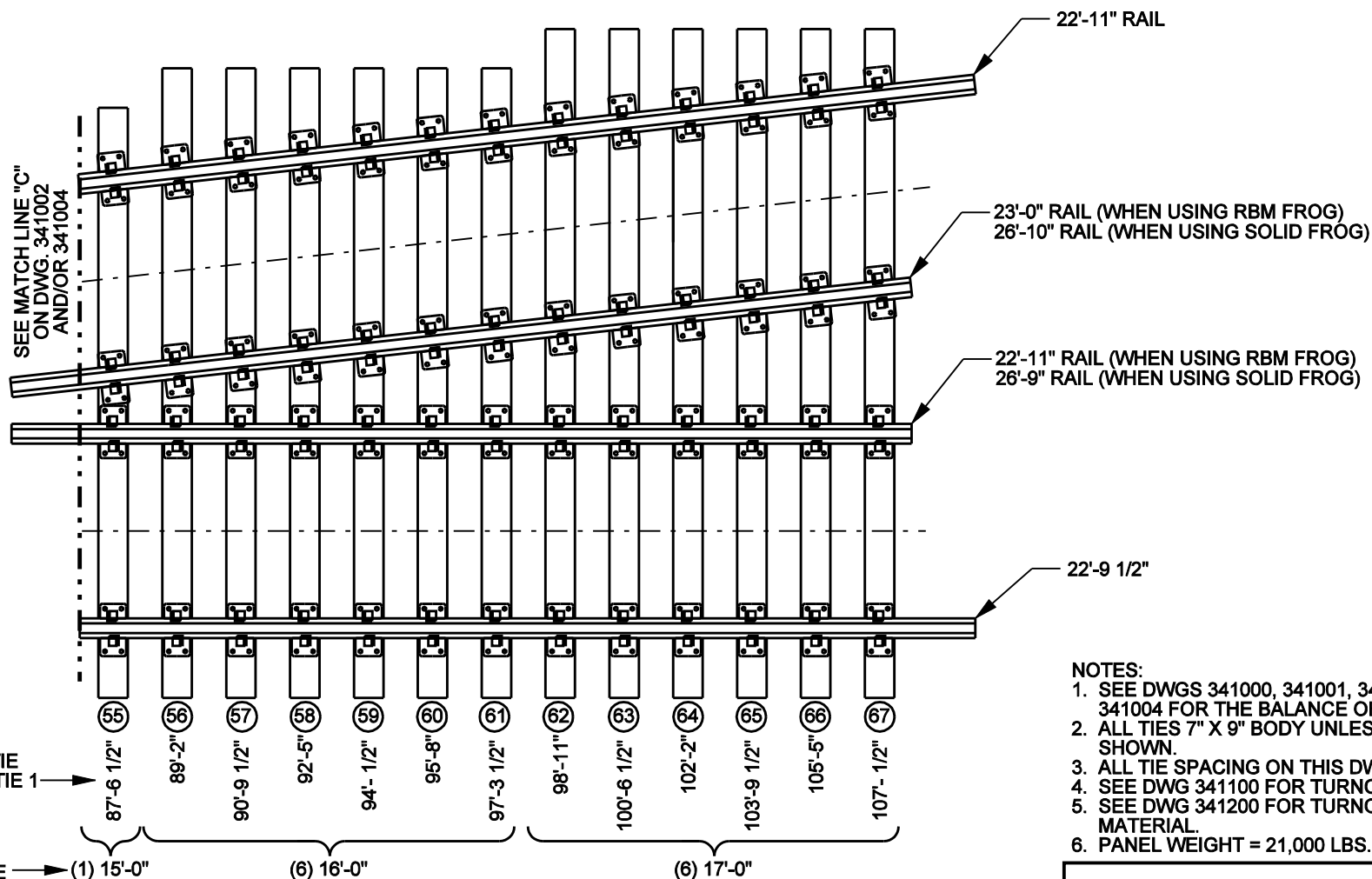


## COMMON STANDARDS

## NO. 9 TURNOUT 136 LB. PANEL NO. 2

FILE OWNER: BNSF	DATE: MAR. 1, 2007
REV. NO.: 4	DWG NO: 341001





- NOTES:
1. SEE DWGS 341000, 341001, 341002, AND 341004 FOR THE BALANCE OF LAYOUT PLANS.
  2. ALL TIES 7" X 9" BODY UNLESS OTHERWISE SHOWN.
  3. ALL TIE SPACING ON THIS DWG IS 19 1/2".
  4. SEE DWG 341100 FOR TURNOUT GEOMETRY.
  5. SEE DWG 341200 FOR TURNOUT BILL OF MATERIAL.
  6. PANEL WEIGHT = 21,000 LBS.

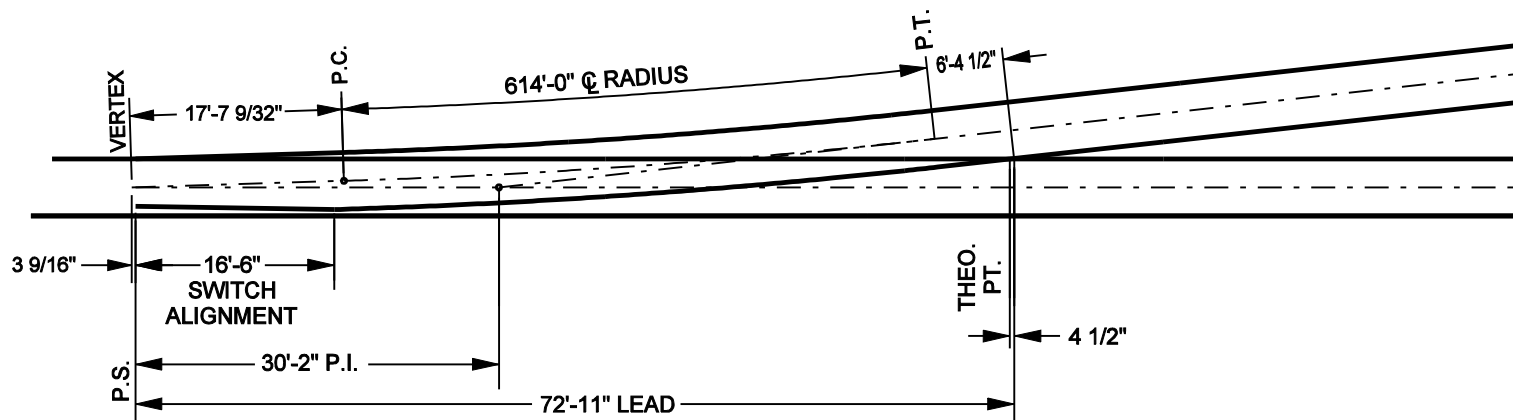
**BNSF**  
RAILWAY



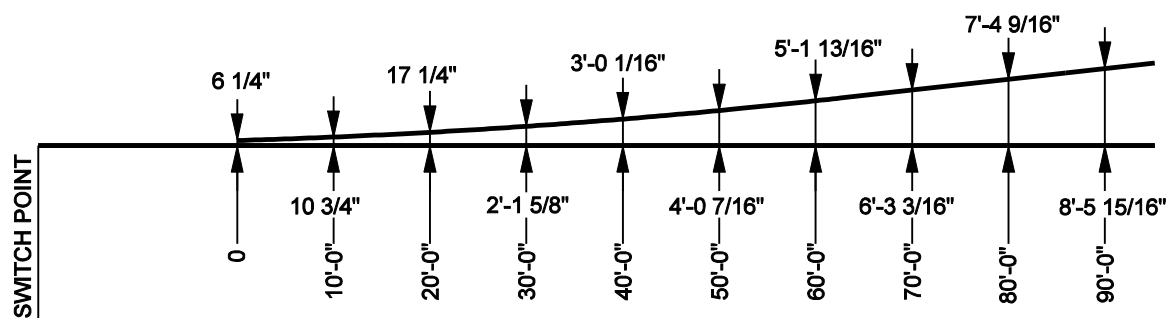
COMMON STANDARDS

**NO. 9 TURNOUT 136 LB.  
PANEL NO. 4**

FILE OWNER: BNSF	DATE: FEB 28, 2007
REV. NO.: 2	DWG NO: 341003



GENERAL LAYOUT



SPREAD LAYOUT

SWITCH DATA	
SWITCH LENGTH	16'-6"
HEEL SPREAD	6 1/4"
HEEL ANGLE	1°-46'-22"
SWITCH ANGLE	1°-46'-22"
THROW AT ROD #1	4 3/4"
THICKNESS AT POINT	0"
RADIUS (CLOSURE CURVE)	616.3542'
VERTEX DISTANCE	7 1/16"

FROG DATA	
ANGLE	6°-21'-35"
LENGTH	VARIES

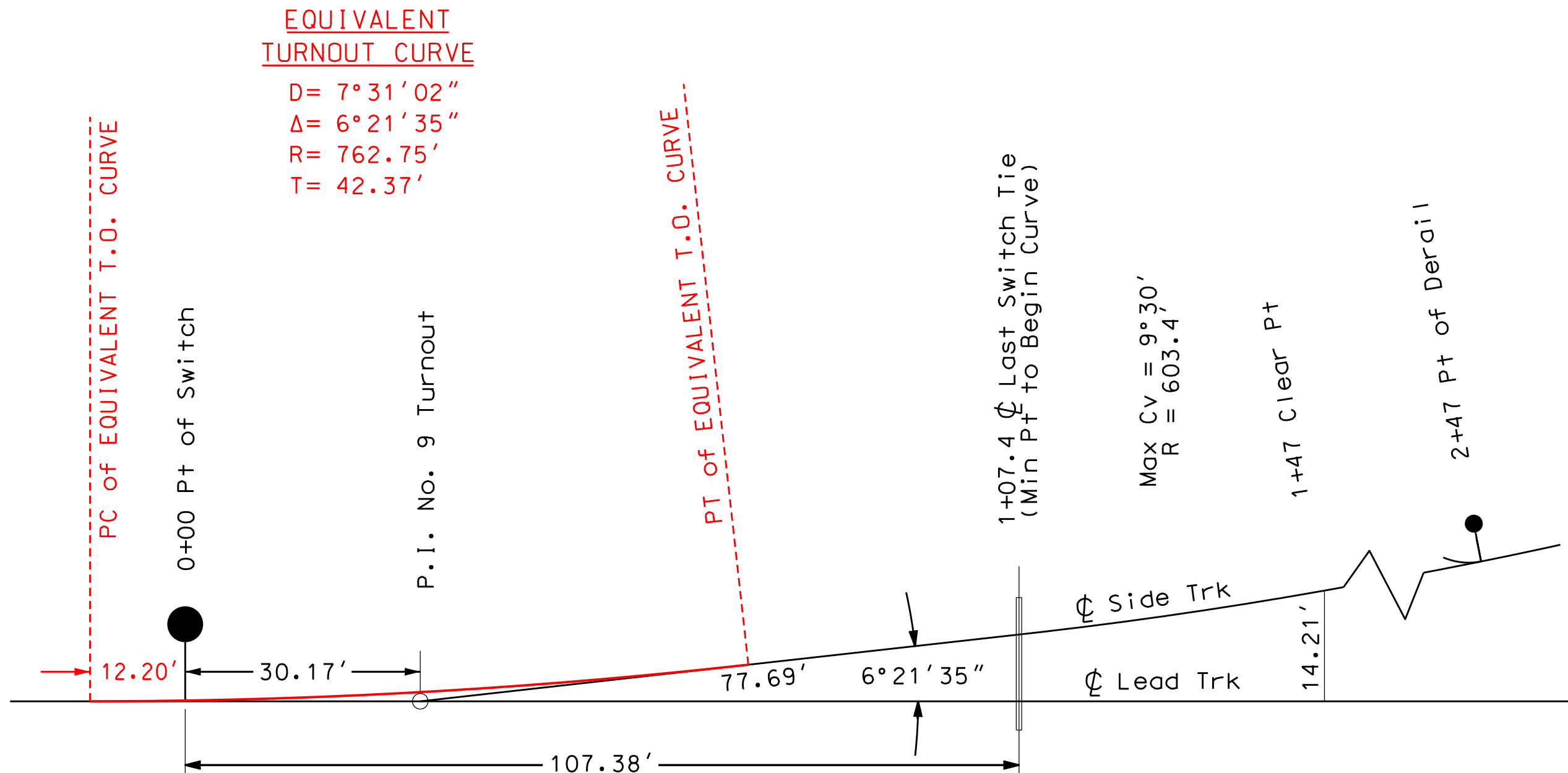
TURNOUT DATA	
RADIUS OF CENTER LINE	614'
T =	24.59'
CENTRAL ANGLE - CLOSURE CURVE	4°35'13"
DEGREE OF CURVE	9°20'31"



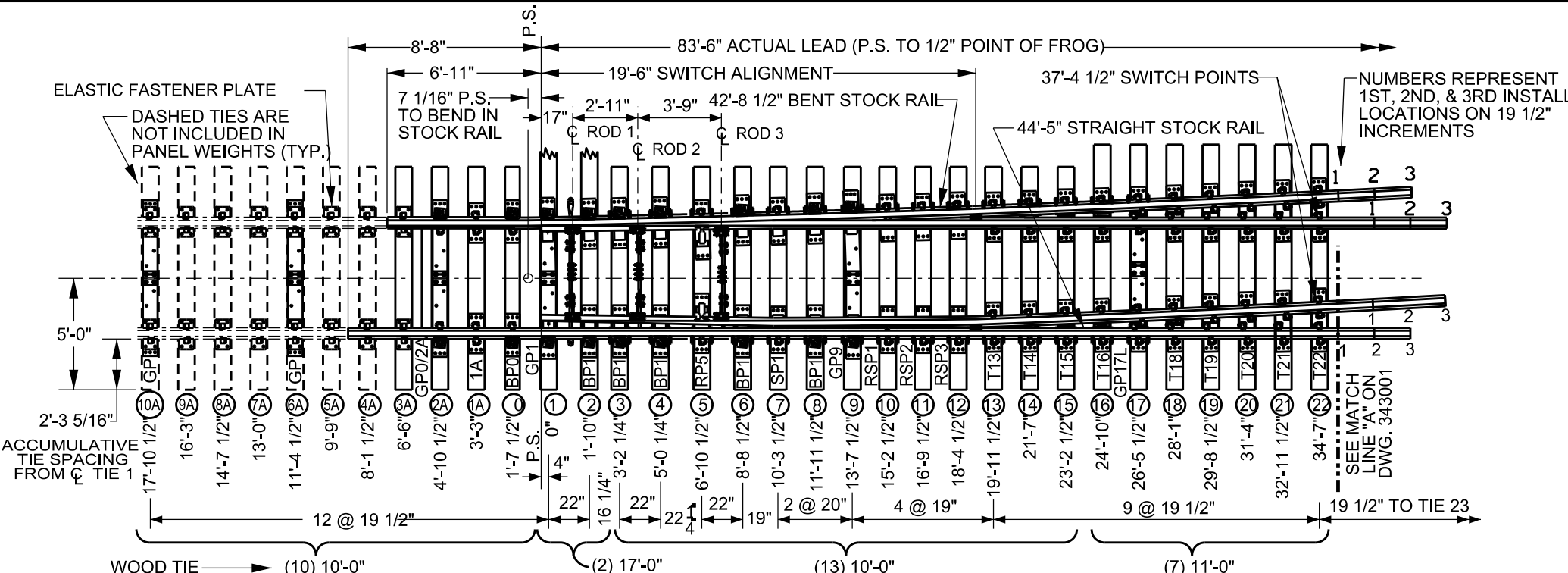
## COMMON STANDARDS

## NO. 9 TURNOUT 16-6" STRAIGHT SWITCH TURNOUT GEOMETRY

FILE OWNER: BNSF	DATE: JAN. 8, 2003
REV. NO.: 0	DWG NO: 341100

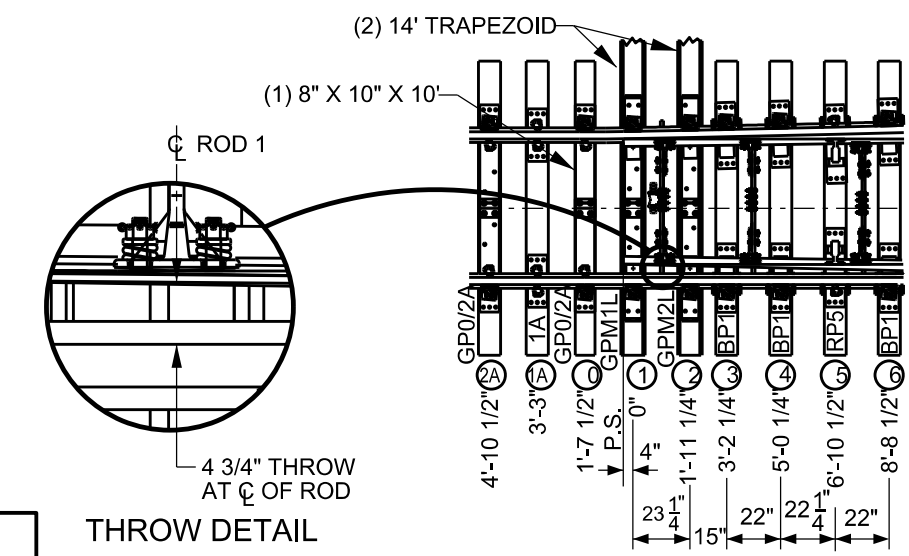


APPROVALS - (NAME - TITLE)		DATE	APPROVALS - (NAME - TITLE)		DATE	<div><div><div>BNSF<sup>SM</sup></div><div>RAILWAY</div></div></div>			
						<div>NUMBER 9 TURNOUT TRACK ALIGNMENT GEOMETRY</div>			
REVISIONS									
NO.	DESCRIPTION				DATE				BY
1	Added CP and Derail info				4/5/17				JRG





**MANUAL OPERATED**  
PANEL WEIGHT: 20,000 LBS.

- NOTES:
1. SEE DWGS 343001 THRU 343005 FOR THE BALANCE OF LAYOUT PLANS.
  2. ALL TIES 7" X 9" BODY UNLESS OTHERWISE SHOWN.
  3. SEE DWG 343100 FOR TURNOUT GEOMETRY.
  4. SEE DWG 343200 FOR TURNOUT BILL OF MATERIAL.
  5. FULLY BOX ANCHOR STOCK RAILS, TIES 3-15 FOR SHIPPING OF PANELS ONLY.
  6. APPLY 5" SAFE BOND WIRES ONE CRIB AHEAD OF HEEL OF SWITCH ON STOCK AND SWITCH POINT RAILS.
  7. ALL SWITCH POINT AND STOCKRAIL DIMENSIONS ARE TO FIRST INSTALL, SEE PLAN 241500 FOR FULL LENGTH.




**POWER OPERATED**  
PANEL WEIGHT: 20,000 LBS.

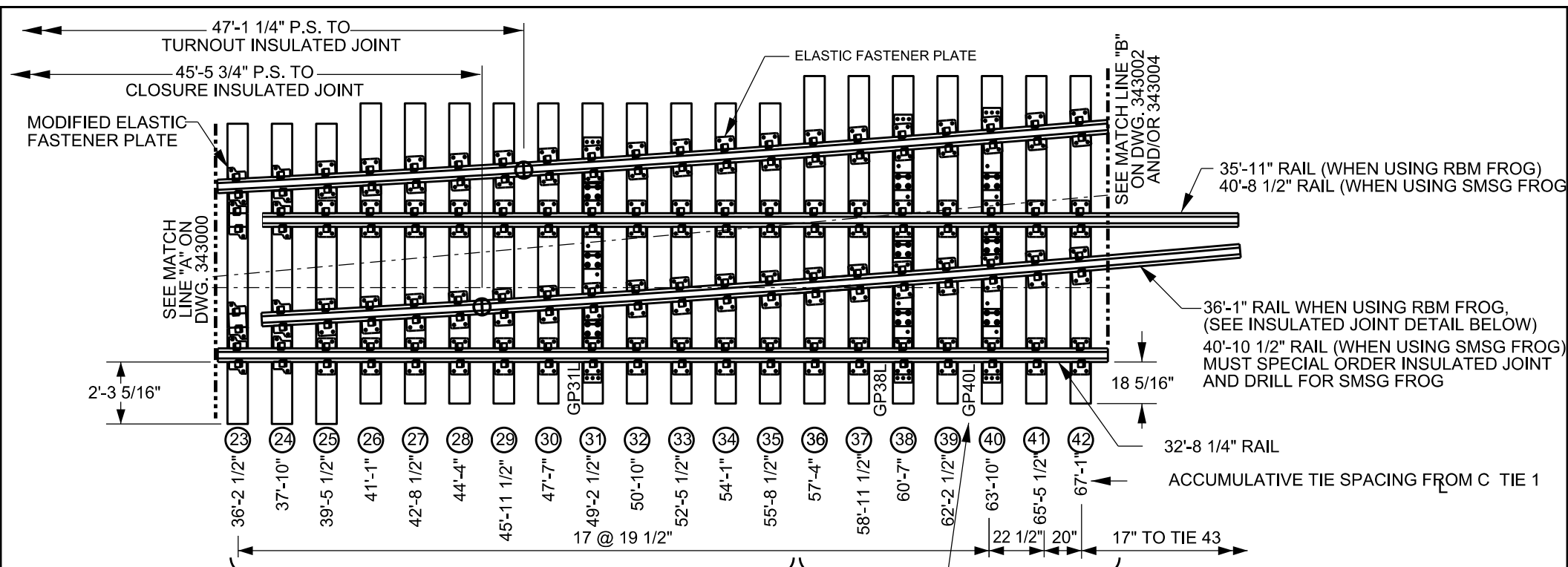
	UPRR	BNSF RH	BNSF LH
136LB. POWER	N/A	004734653	004734810
136LB. MANUAL	N/A	004734828	004734836
136LB. MAN. SPR. SW.	N/A	004734869	004734877
141LB. POWER	N/A	005253505	005253497
141LB. MANUAL	N/A	005253521	005253513
141LB. MAN. SPR. SW.	N/A	005253547	005253539

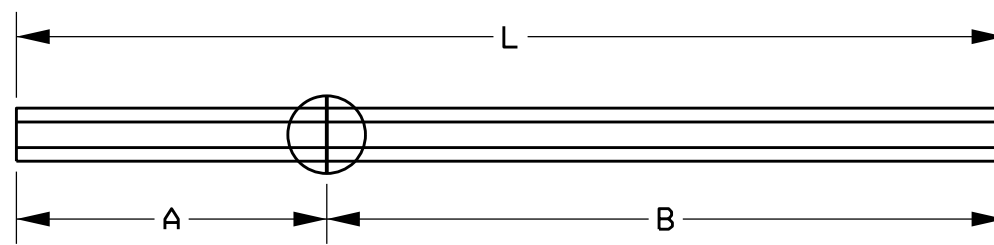
**COMMON STANDARDS**

**NO. 11 TURNOUT 136/141 LB. PANEL NO. 1**

 UPRR VP ENGINEERING BNSF VP ENGINEERING	FILE OWNER: BNSF	DATE: OCT. 5, 2010
	REV. NO.: 6	DWG NO: 343000



- NOTES:
1. WHEN INSULATED JOINTS ARE REQUIRED, THE LOCATION OF THE JOINTS SHOULD BE STAGGERED NO CLOSER THAN 6" AND NOT MORE THAN 4'-6" APART, MEASURED ALONG THE TURNOUT.
  2. SEE DWGS 343000, 343002, 343003, 343004, AND 343005 FOR THE BALANCE OF LAYOUT PLANS.
  3. ALL TIES 7" X 9" BODY UNLESS OTHERWISE SHOWN.
  4. SEE DWG 343100 FOR TURNOUT GEOMETRY.
  5. SEE DWG 343200 FOR TURNOUT BILL OF MATERIAL.
  6. PANEL WEIGHT = 17,000 LBS.



INSULATED JOINT DETAIL  
(FOR USE WITH RBM FROG ONLY)

	A	B	L
TURNOUT INSULATED JOINT RAIL	11'-4"	21'-5"	32'-9"
CLOSURE INSULATED JOINT RAIL	8'-2"	27'-11"	36'-1"

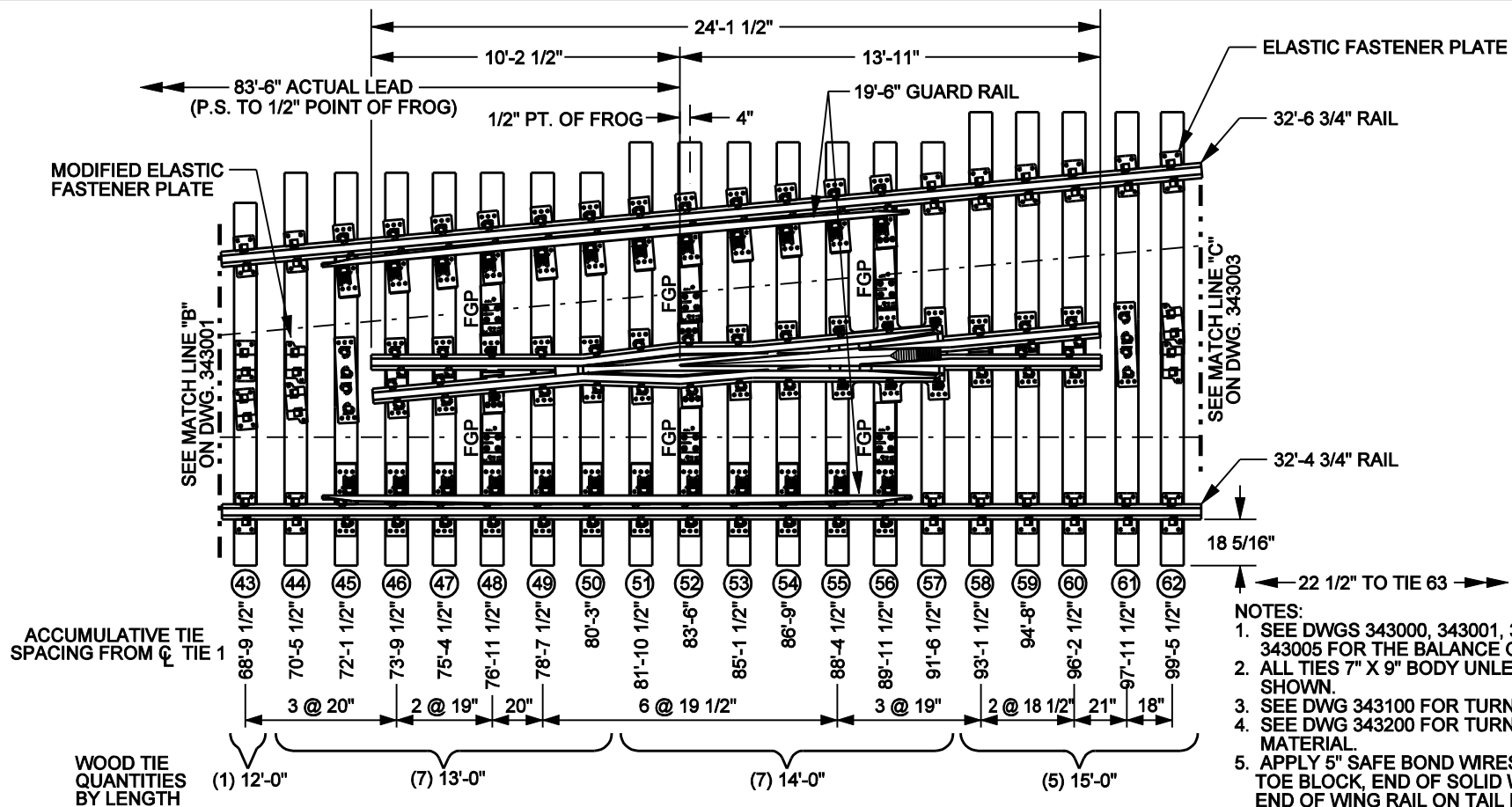
	BNSF STOCK CODE	
	136LB.	141LB.
LH TURNOUT INSULATED JOINT RAIL	005253760	005253554
LH CLOSURE INSULATED JOINT RAIL	005253778	005253562
RH TURNOUT INSULATED JOINT RAIL	005253786	005253570
RH CLOSURE INSULATED JOINT RAIL	005253794	005253588



COMMON STANDARDS

NO. 11 TURNOUT 136/141 LB.  
PANEL NO. 2

FILE OWNER: BNSF	DATE: MAY 6, 2011
REV. NO.: 7	DWG NO: 343001



## NOTES:

1. SEE DWGS 343000, 343001, 343003, 343004, AND 343005 FOR THE BALANCE OF LAYOUT PLANS.
2. ALL TIES 7" X 9" BODY UNLESS OTHERWISE SHOWN.
3. SEE DWG 343100 FOR TURNOUT GEOMETRY.
4. SEE DWG 343200 FOR TURNOUT BILL OF MATERIAL.
5. APPLY 5" SAFE BOND WIRES ONE CRIB AHEAD OF TOE BLOCK, END OF SOLID WING RAIL, BEHIND END OF WING RAIL ON TAIL RAIL AND ONE CRIB BEHIND HEEL BLOCK OF FROG.
6. PANEL WEIGHT = 22,000 LBS.
7. SEE DWGS 343004 AND 343005 FOR SMSG AND LIFT FROG PANELS.

**BNSF**  
RAILWAY


## COMMON STANDARDS

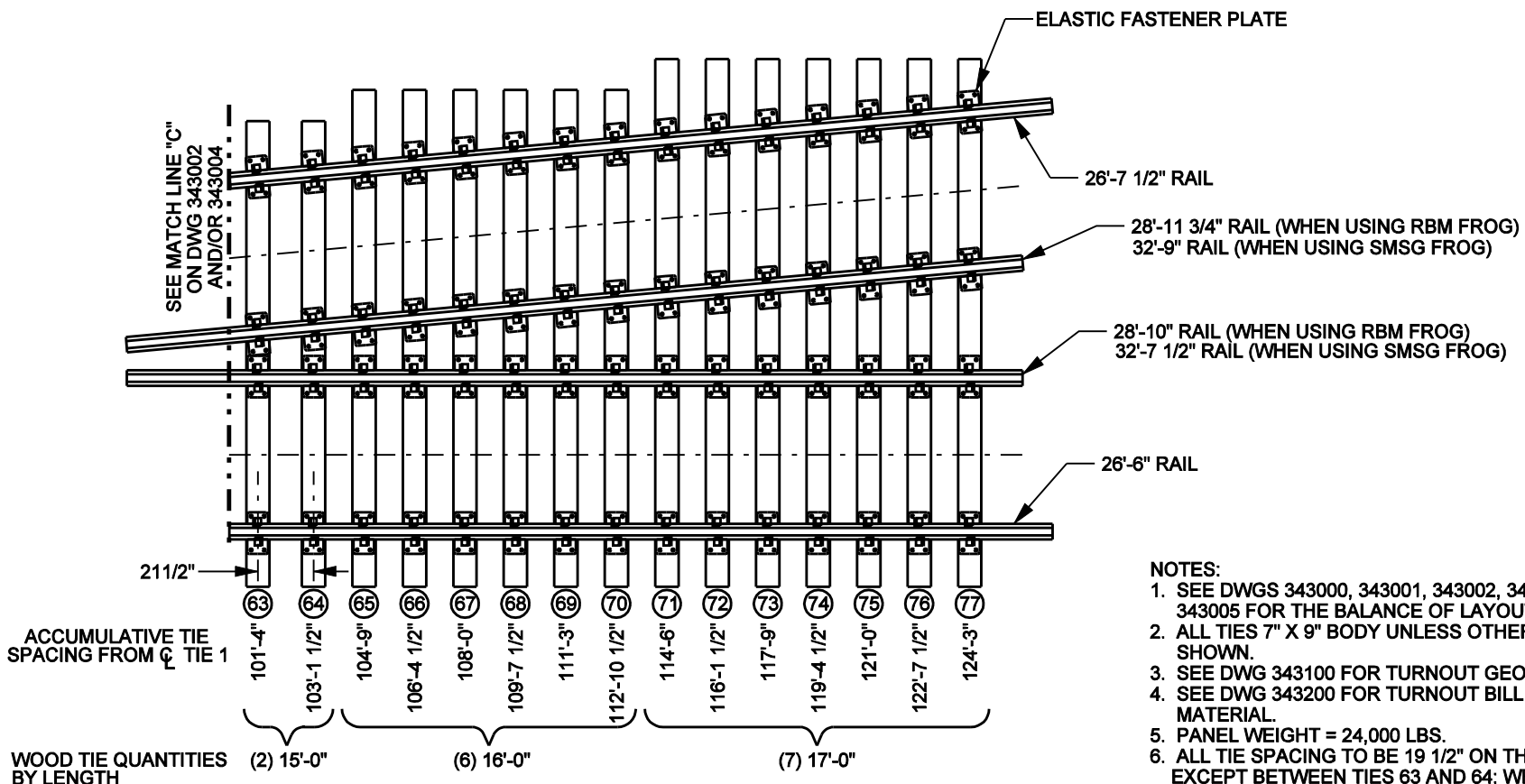
**NO. 11 TURNOUT 136/141 LB.  
PANEL NO. 3 WITH  
OPTIONAL RBM FROG**

	UPRR	BNSF RH	BNSF LH
136LB. RBM	N/A	004710299	004710307
136LB. SPR	N/A	004710315	004710323
136LB. SOLID	N/A	004710331	004710349
141LB. RBM	N/A	005252739	005252721
141LB. SPR	N/A	005252754	005252747
141LB. SOLID	N/A	N/A	N/A

FILE OWNER: BNSF DATE: AUG. 26, 2009

REV. NO.: 5 DWG NO: 343002





**NOTES:**

1. SEE DWGS 343000, 343001, 343002, 343004, AND 343005 FOR THE BALANCE OF LAYOUT PLANS.
2. ALL TIES 7" X 9" BODY UNLESS OTHERWISE SHOWN.
3. SEE DWG 343100 FOR TURNOUT GEOMETRY.
4. SEE DWG 343200 FOR TURNOUT BILL OF MATERIAL.
5. PANEL WEIGHT = 24,000 LBS.
6. ALL TIE SPACING TO BE 19 1/2" ON THIS DWG. EXCEPT BETWEEN TIES 63 AND 64; WHICH ARE SHOWN AT 21 1/2".

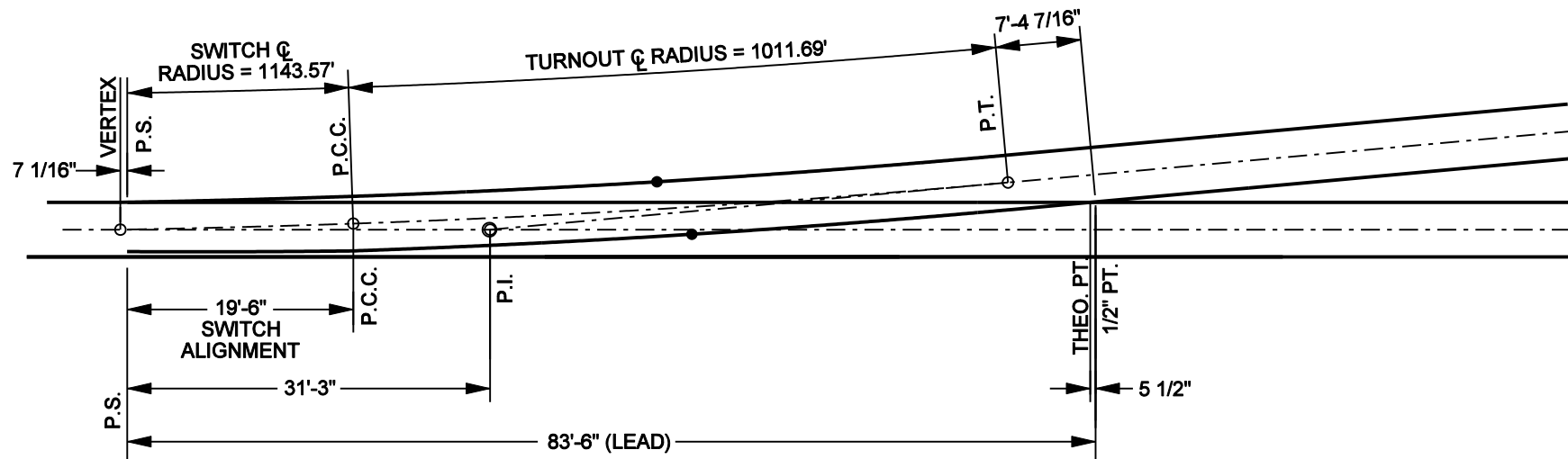


**COMMON STANDARDS**

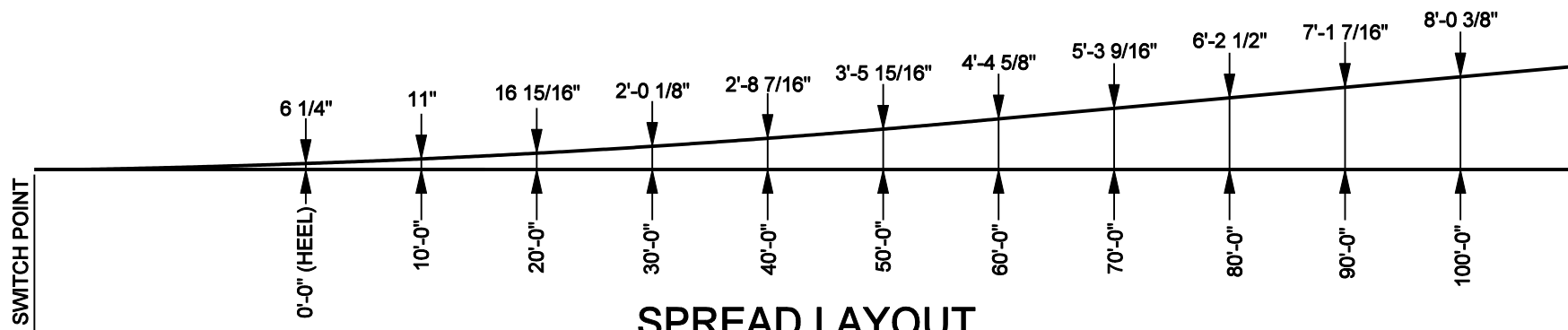
**NO. 11 TURNOUT 136/141 LB.  
PANEL NO. 4**

FILE OWNER: BNSF DATE: AUG. 26, 2009

REV. NO.: 3 DWG NO: 343003



## GENERAL LAYOUT



## SPREAD LAYOUT

### SWITCH DATA

SWITCH LENGTH	19'-6"
HEEL SPREAD	6 1/4"
HEEL ANGLE	1°-59'-16"
SWITCH ANGLE	1°-00'-40"
THROW AT ROD #1	4 3/4"
RADIUS (CENTER LINE)	1143.57'
T =	9.69'
CENTRAL ANGLE - CLOSURE CURVE	0°58'16"
DEGREE OF CURVE	5°00'06"
THICKNESS AT POINT	1/8"
RADIUS (CLOSURE CURVE)	1145.92'
VERTEX DISTANCE	7 1/16"

### FROG DATA

ANGLE	5°-12'-18"
LENGTH	VARIES

### TURNOUT DATA

RADIUS OF CENTER LINE	1011.69'
T =	28.35'
CENTRAL ANGLE - CLOSURE CURVE	3°13'02"
DEGREE OF CURVE	5°40'44"

### NOTES:



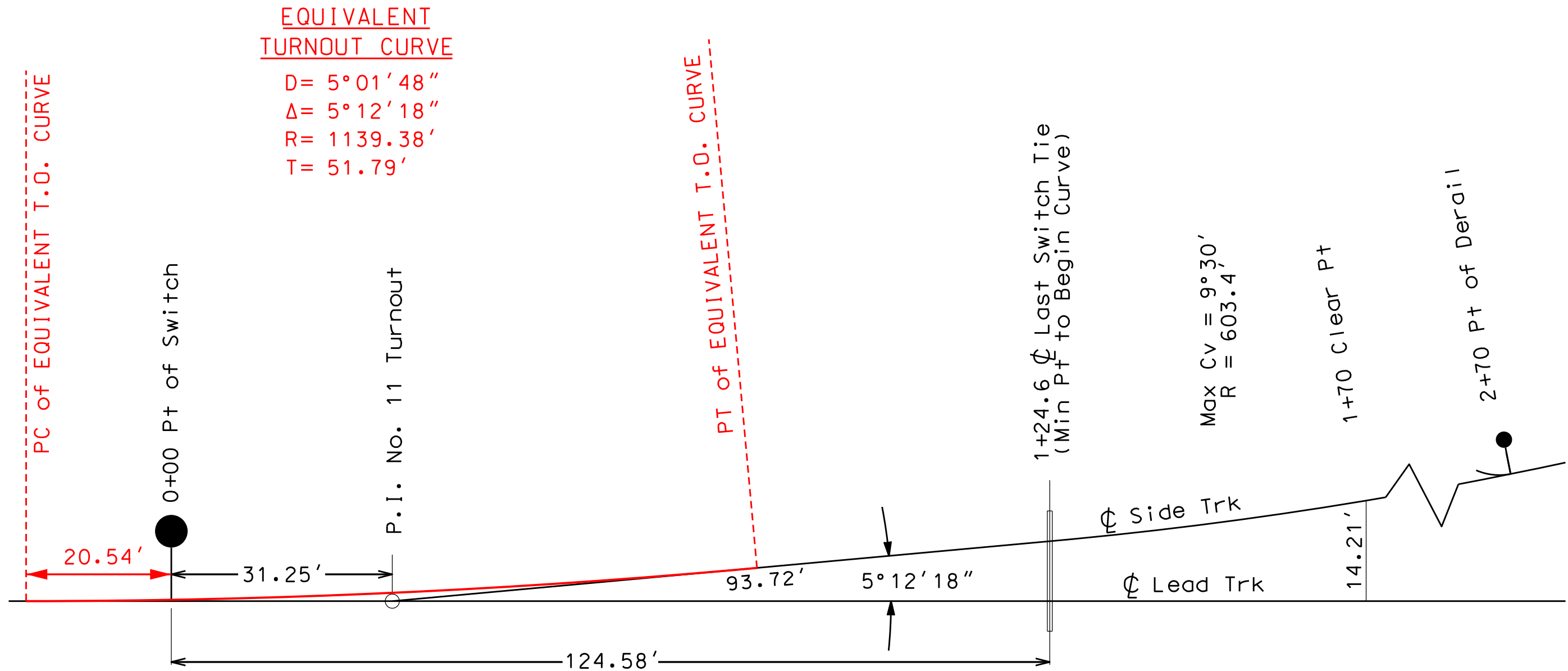
COMMON STANDARDS




## NO. 11 TURNOUT 19'-6" CURVED SWITCH TURNOUT GEOMETRY

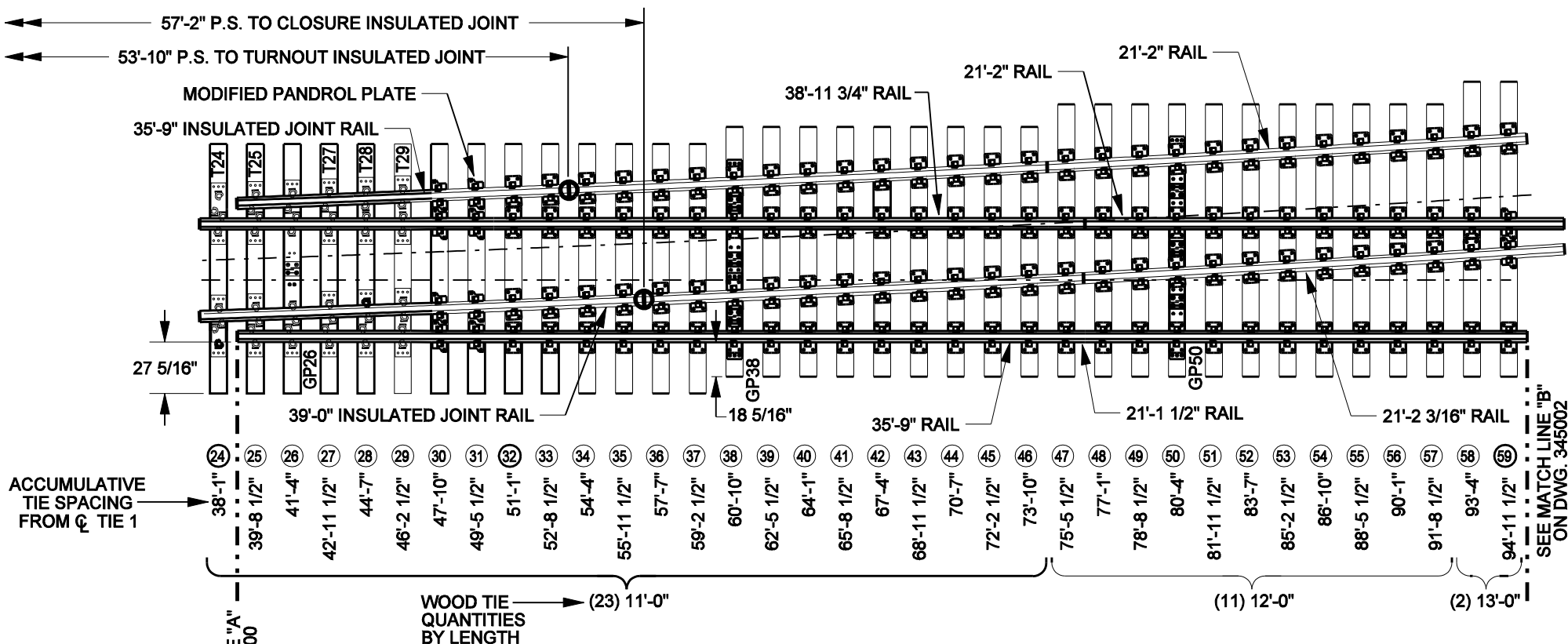
FILE OWNER: BNSF DATE: JAN. 9, 2003

REV. NO.: 0 DWG NO: 343100



APPROVALS - (NAME - TITLE)			DATE	APPROVALS - (NAME - TITLE)			DATE	<div></div>									
								REVISIONS				<div>NUMBER 11 TURNOUT TRACK ALIGNMENT GEOMETRY</div>					
								NO.	DESCRIPTION		DATE					BY	
								1	Added CP and Derail info		4/5/17					JRG	
DRAWN	CHECKED		BNSF RAILWAY COMPANY - ENGINEERING SERVICES					PROJ/SEC NO		STATUS PRELIMINARY							
												FILE: TURNOUTS.DGN		SHEET 1 OF 1		DATE: 05/06/2011	





- NOTES:
1. SEE DWGS 345000, 345002, AND 345003 FOR THE BALANCE OF LAYOUT PLANS.
  2. ALL TIE SPACING IS 19 1/2" ON THIS PANEL.
  3. ALL TIES 7" X 9" BODY UNLESS OTHERWISE SHOWN.
  4. SEE DWG 345100 FOR TURNOUT GEOMETRY.
  5. SEE DWG 345200 FOR TURNOUT BILL OF MATERIAL.
  6. PANEL WEIGHTS = APPROXIMATELY 19,500 LBS. AND 11,800 LBS.



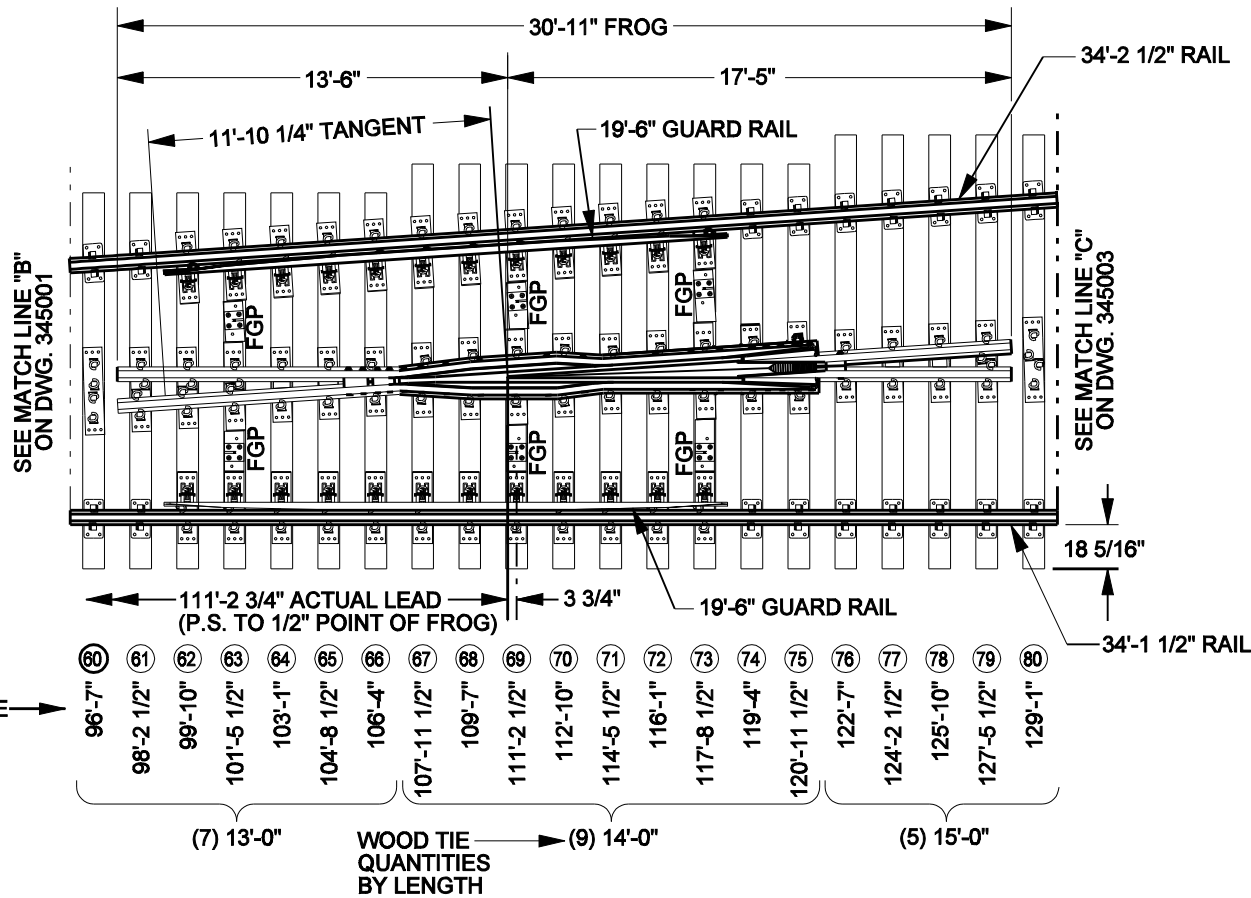
## COMMON STANDARDS

## NO. 15 TURNOUT 136/141 LB. PANELS NO. 2 AND NO. 3

FILE OWNER: UPRR DATE: MAY 19, 2008  
REV. NO.: 3 DWG NO: 345001

	A	B	L
TURNOUT INSULATED JOINT RAIL	14'-8"	21'-1"	35'-9"
CLOSURE INSULATED JOINT RAIL	19'-7"	19'-5"	39'-0"

	BNSF ITEM NUMBER	
	136LB.	141LB.
LH TURNOUT INSULATED JOINT RAIL	518030155	518030140
LH CLOSURE INSULATED JOINT RAIL	518030156	518030141
RH TURNOUT INSULATED JOINT RAIL	518030157	518030142
RH CLOSURE INSULATED JOINT RAIL	518030158	518030143



- NOTES:
1. SEE DWGS 345000, 345001, AND 345003 FOR THE BALANCE OF LAYOUT PLANS.
  2. ALL TIE SPACING IS 19 1/2" ON THIS PANEL.
  3. ALL TIES 7" X 9" BODY UNLESS OTHERWISE SHOWN.
  4. SEE DWG 345100 FOR TURNOUT GEOMETRY.
  5. SEE DWG 345200 FOR TURNOUT BILL OF MATERIAL.
  6. PANEL WEIGHT = APPROXIMATELY 28,800 LBS.

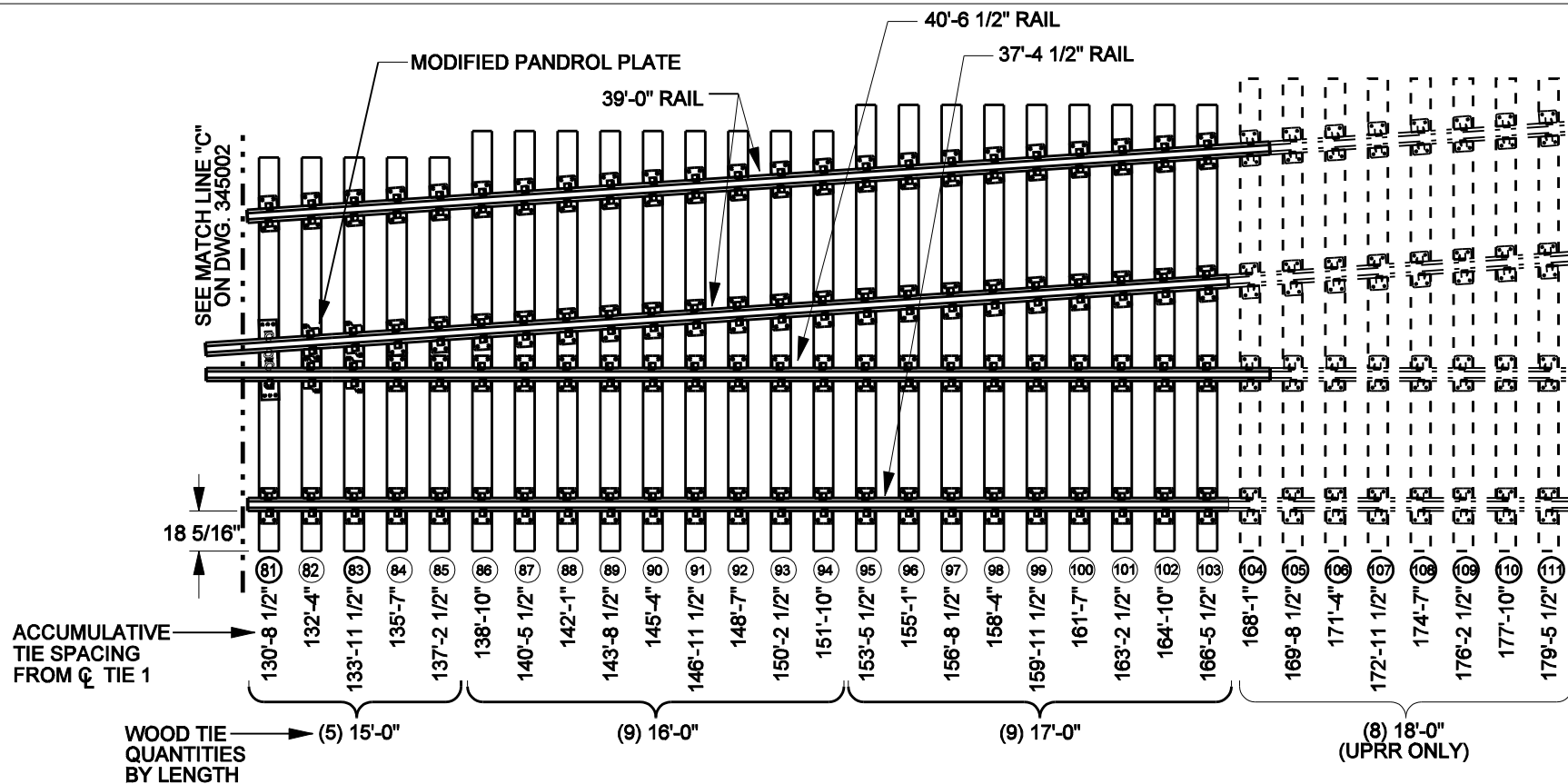


## COMMON STANDARDS

### NO. 15 TURNOUT 136/141 LB. PANEL NO. 4

	UPRR	BNSF LH	BNSF RH
136LB. RBM	N/A	513450060	513450059
136 LB. SPRING	N/A	513450063	513450061
141 LB. RBM	N/A	513450232	513450233
141 LB. SPRING	N/A	513450234	513450235

FILE OWNER: UPRR	DATE: MAY 16, 2008
REV. NO.: 3	DWG NO: 345002



**NOTES:**

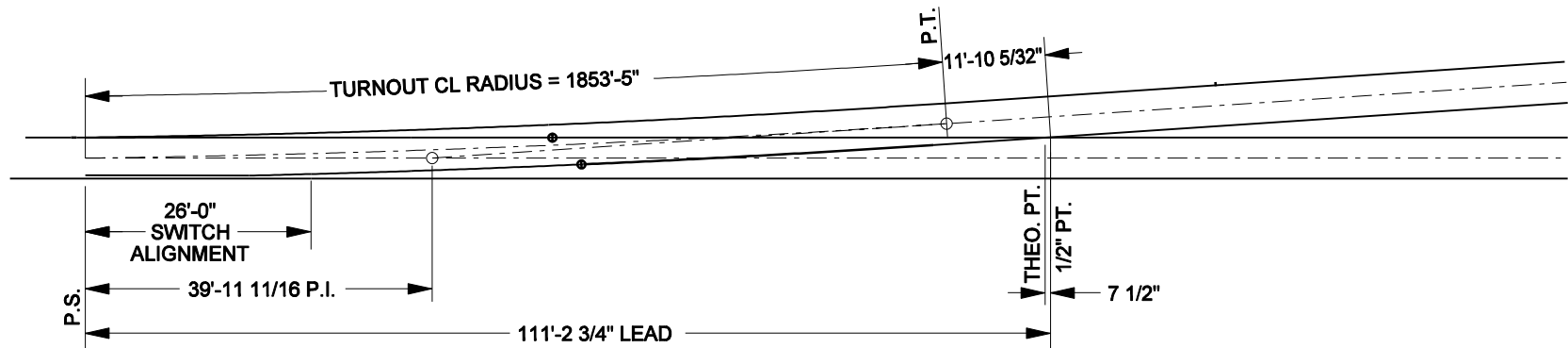
1. SEE DWGS 345000, 345001, AND 345002 FOR THE BALANCE OF LAYOUT PLANS.
2. ALL TIE SPACING IS 19 1/2" ON THIS PANEL.
3. ALL TIES 7" X 9" BODY UNLESS OTHERWISE SHOWN.
4. SEE DWG 345100 FOR TURNOUT GEOMETRY.
5. SEE DWG 345200 FOR TURNOUT BILL OF MATERIAL.
6. PANEL WEIGHT = APPROXIMATELY 23,650 LBS.



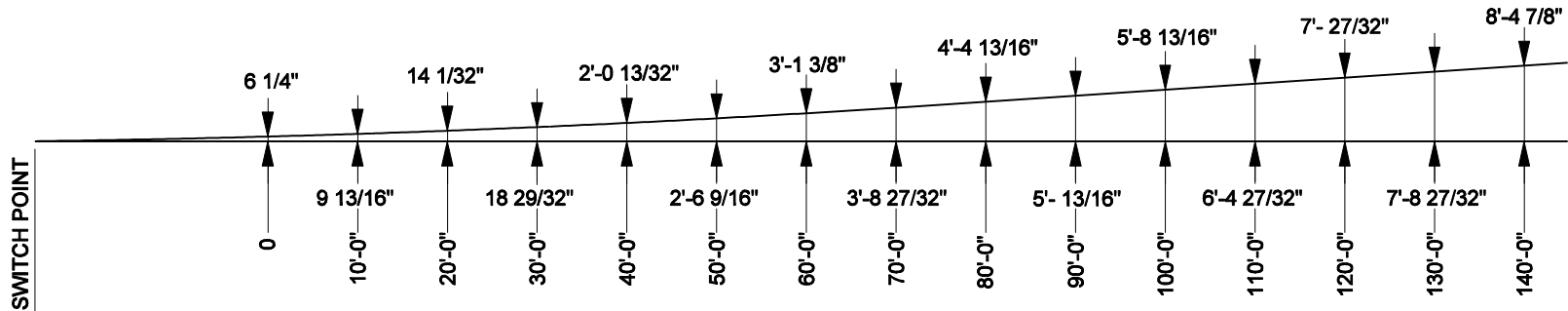
**COMMON STANDARDS**

**NO. 15 TURNOUT 136/141 LB.  
PANEL NO. 5**

FILE OWNER: UPRR	DATE: MAY 2, 2008
REV. NO.: 1	DWG NO: 345003



## GENERAL LAYOUT



## SPREAD LAYOUT

SWITCH DATA	
SWITCH LENGTH	26'-0"
HEEL SPREAD	6 1/4"
HEEL ANGLE	1°-33'-2"
SWITCH ANGLE	0°-44'-47"
THROW AT ROD #1	4 3/4"
RADIUS (CENTER LINE)	1853.42'
T =	49.68'
CENTRAL ANGLE - CLOSURE CURVE	3°-04'-16"
DEGREE OF CURVE	3°-05'-30"
THICKNESS AT POINT	1/4"
RADIUS (CLOSURE CURVE)	1855.77'
VERTEX DISTANCE	0"

FROG DATA	
ANGLE	3°-49'-06"
LENGTH	VARIES

TURNOUT DATA	
RADIUS OF CENTER LINE	1853.42'
T =	49.68'
CENTRAL ANGLE - CLOSURE CURVE	3°-04'-16"
DEGREE OF CURVE	3°-05'-30"

### NOTES:



COMMON STANDARDS

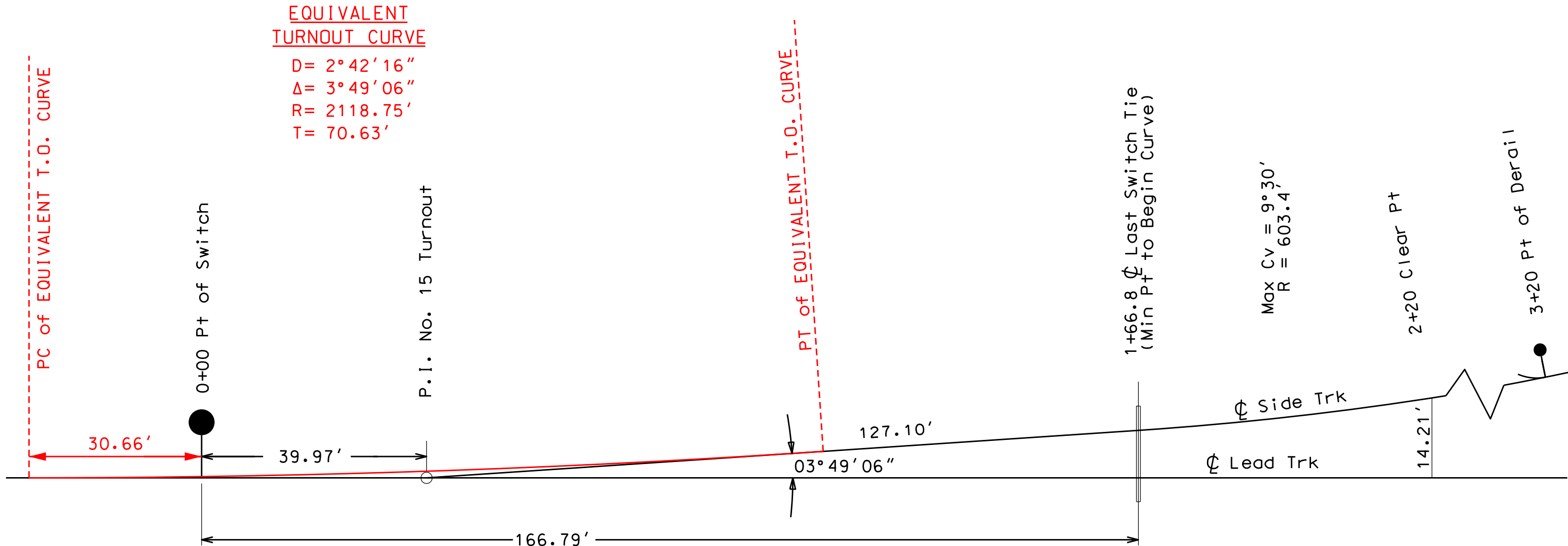


## NO. 15 TURNOUT 26'-0" CURVED SWITCH, TURNOUT GEOMETRY

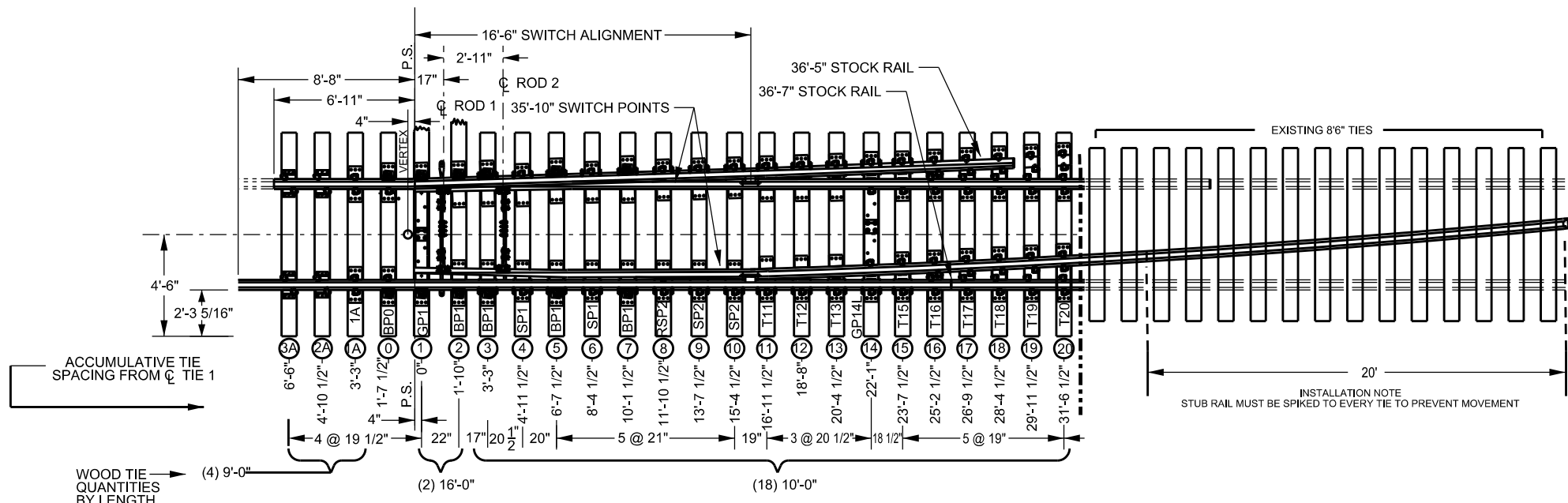
FILE OWNER: UPRR	DATE: JAN. 14, 2003
REV. NO.: 0	DWG NO: 345100

345100



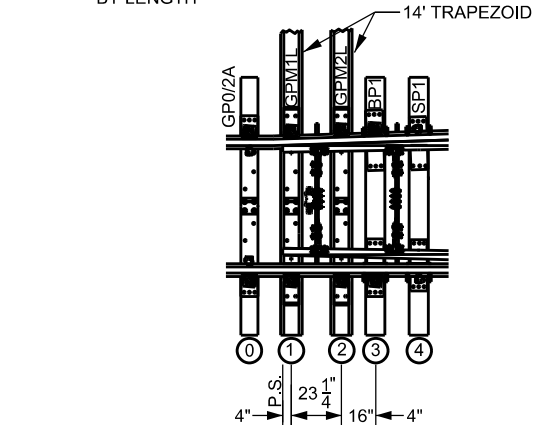


APPROVALS - (NAME - TITLE)		DATE	APPROVALS - (NAME - TITLE)		DATE	<div><div><div></div></div><div><div></div></div><div><div></div></div></div> <div><div></div></div> <div><div></div></div>
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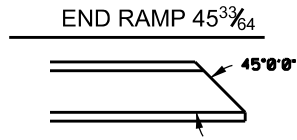
ACCUMULATIVE TIE SPACING FROM C TIE 1

WOOD TIE QUANTITIES BY LENGTH



**POWER OPERATED**  
PANEL WEIGHT: 20,000 LBS.

**MANUAL OPERATED**  
PANEL WEIGHT: 20,000 LBS.  
Panel Length 44' 6"



- NOTES:
1. ALL TIES 7" X 9" BODY UNLESS OTHERWISE SHOWN ABOVE.
  2. SEE DWG 341100 FOR TRACK GEOMETRY.
  3. FULLY BOX ANCHOR STOCK RAILS, TIES 3-15 FOR SHIPPING OF PANELS ONLY.
  4. SWITCH POINT DERAIL FURNISHED AS A COMPLETE PANEL.
  5. WHEN ORDERING SPECIFY LEFT OR RIGHT HAND AND POWER OR MANUAL OPERATION. SUPPLIER TO PROVIDE CORRECT PLATING AND TIES FOR POWER APPLICATIONS.
  6. FOR OPERATING STANDS SEE STANDARD PLANS 2501.02 & 2153.01.
  7. FOR ROD PLAN SEE DRAWING 2156.01 AND DERAIL SIGN ON PLAN 3020.01.
  8. SEE STANDARD PLAN 24000202 FOR DOUBLE SWITCH POINT DERAIL REQUIREMENTS.
  9. SEE LATEST REVISED ENGINEERING INSTRUCTIONS 9.3.3 FOR INSTALLATION AND USE.
  10. MANUFACTURER WILL PROVIDE A DRILLED 20' STUB RAIL, A DRILLED TURNOUT SWITCH POINT AND ANGLE BARS FOR HOOK UP.
  11. END RAMP REQUIRED ON STUB RAIL AND TURNOUT STOCK RAIL.

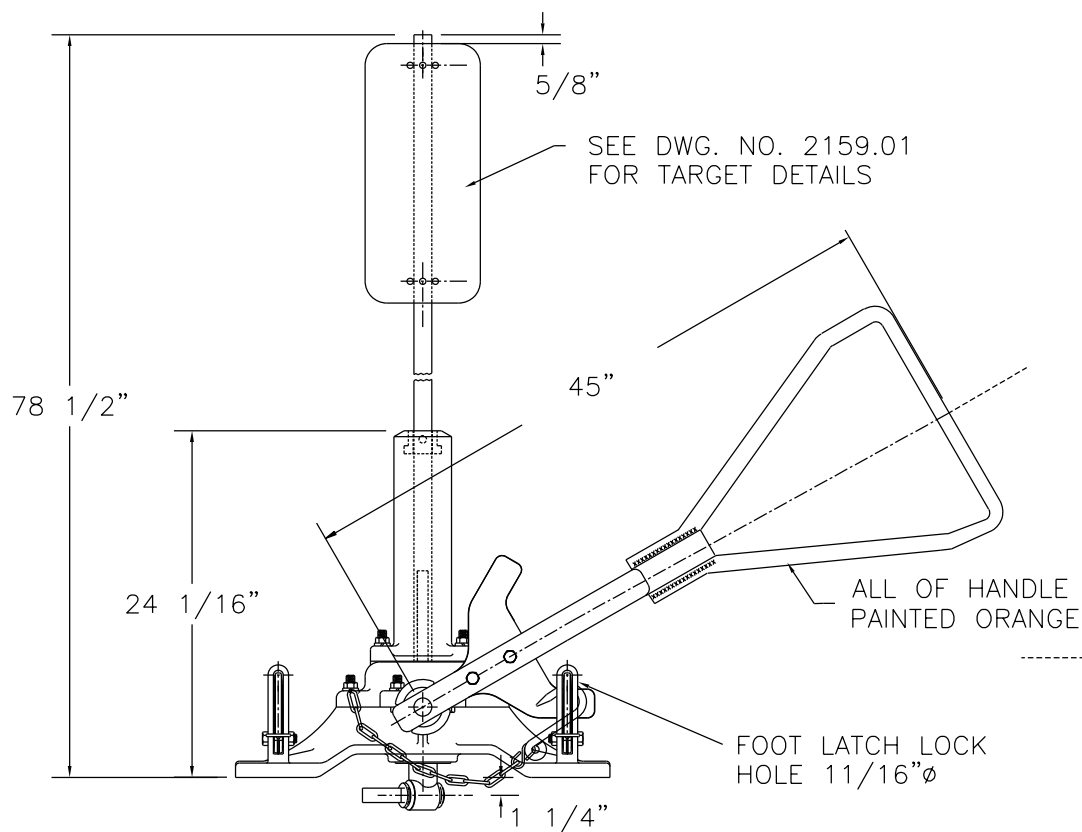
	LH	RH
POWER 141	054333703	054333711
POWER 136	054333646	054333653
POWER 115	054333687	054333695
MANUAL 141	054333661	054333679
MANUAL 136	54590633	54590641
MANUAL 115	054333638	54590658

STANDARD PLAN

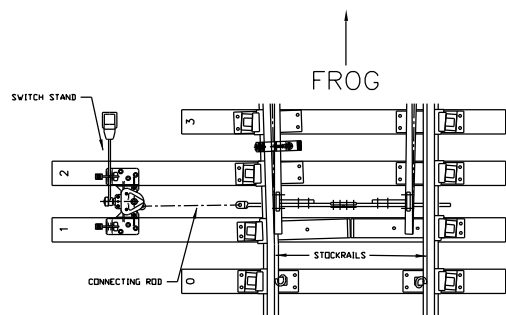
DOUBLE SWITCH POINT DERAIL

16' 6" POINTS 136 LB

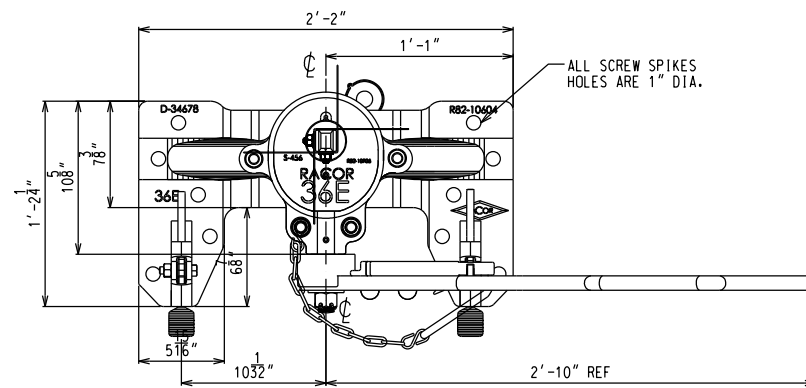
DATE: SEPTEMBER 8, 2011	FILE OWNER: BNSF	
DWG NO: 2400	SHEET NO: 04	REV NO: 00



**ELEVATION VIEW**  
36 EH STANDS,  
SHOWN WITH HIGH STAFF  
AND TRI-HANDLE.



**INSTALLATION VIEW**



**PLAN VIEW**

**PLAN VIEW**  
36 E STANDS,  
SHOWN WITH LOW STAFF  
AND TRI-HANDLE.

## BILL OF MATERIALS

QUANTITY	SWITCH STAND DESCRIPTION	ITEM NO.
1 EA.	36E LOW TARGET WITH TRI-HANDLE @ 30°	517740985N
1 EA.	36EH HIGH TARGET WITH TRI-HANDLE @ 30°	517740995N
1 EA.	36D RETRO-FIT KIT WITH TRI-HANDLE @ 30°	513960006N

### NOTES:

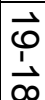
- SEE DWG. 2156 & 2160 FOR SPINDLE AND CRANK EYE DETAILS.
- HANDLE KITS (STRAIGHT OR TRI-HANDLE) ARE AVAILABLE FOR FIELD RETRO FIT OF EXISTING 36 STYLE SWITCH STANDS.
- STAND 36EH IS FOR MAIN LINE USE ONLY. FURNISHED WITH NO. 1.2 STAFF, SEE DWG. 2160.01.
- STAND 36E IS FOR MAIN LINE OR YARD USE, FURNISHED WITH NO. 2 STAFF, SEE DWG. 2160.01.
- 16:1 MECHANICAL ADVANTAGE.
- SWITCH STANDS ARE TO BE INSTALLED WITH HANDLE DIRECTED TOWARDS FROG WHEN LINED TO THE STRAIGHT SIDE OF SWITCH.
- STAND INCLUDES 1/2" DIAMETER HOOK ON 19" CHAIN

**BNSF**  
RAILWAY

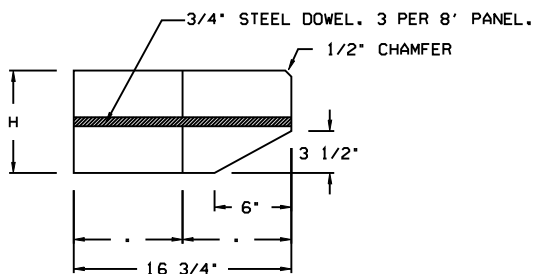
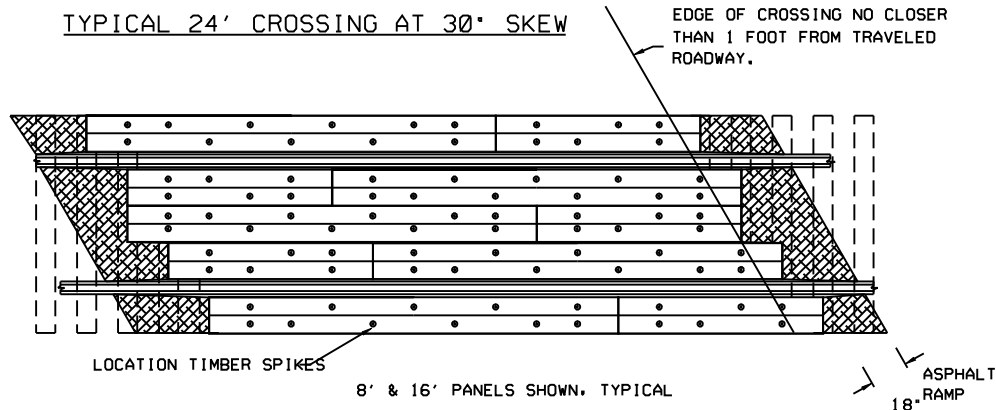
### STANDARD PLAN

**RACOR STYLE 36E & 36EH  
SWITCH STAND  
WITH 45" TRI-HANDLE**

FILE OWNER BNSF | DATE: DECEMBER 10, 2010  
REV. NO.: 13 | DWG NO: 215301

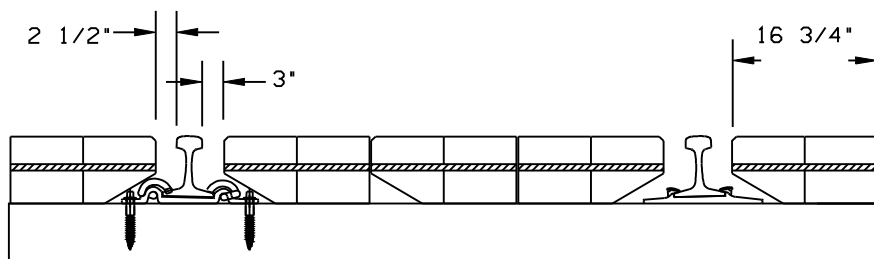


# TYPICAL 24' CROSSING AT 30° SKEW



## TWO PIECE PANEL

H = 7' FOR 100 LB RAIL  
H = 7 1/2' FOR 115 LB RAIL  
H = 8' FOR 136 LB. RAIL



## 8'6\"/>

## MATERIAL & FABRICATION

1. HARDWOOD PANELS TO BE TREATED (BNSF SPECIFICATIONS) MIXED HARDWOOD, FREE OF WANE.
2. BRANDING: EACH CROSSING PANEL SHALL BE IDENTIFIED ON THE END WITH MANUFACTURER ID, MO/YR MANUFACTURED, WEIGHT RAIL.

## INSTALLATION

1. BALLAST THROUGH CROSSING AREA SHALL BE CLEAN CRUSHED ROCK BALLAST, 12\"/>

BILL OF MATERIAL		
WT. RAIL	DESCRIPTION	STOCK CODE
100 LB	8' FULL DEPTH PANEL (2 PCS. DOWELED)	004938916
115 LB	8' FULL DEPTH PANEL (2 PCS. DOWELED)	004938940
115 LB	16' FULL DEPTH PANEL (2 PCS. DOWELED)	004938932
136 LB	8' FULL DEPTH PANEL (2 PCS. DOWELED)	004938866
136 LB	16' FULL DEPTH PANEL (2 PCS. DOWELED)	004938957
	3/4" x 12" TWIN LEAD TIMBER SPIKE	004744074
	3/4" x 13" TWIN LEAD TIMBER SPIKE	004743985

**BNSF**  
RAILWAY

## STANDARD PLAN

## TIMBER CROSSING PANELS FOR LOW DENSITY RAIL TRAFFIC ON 8'6\"/>

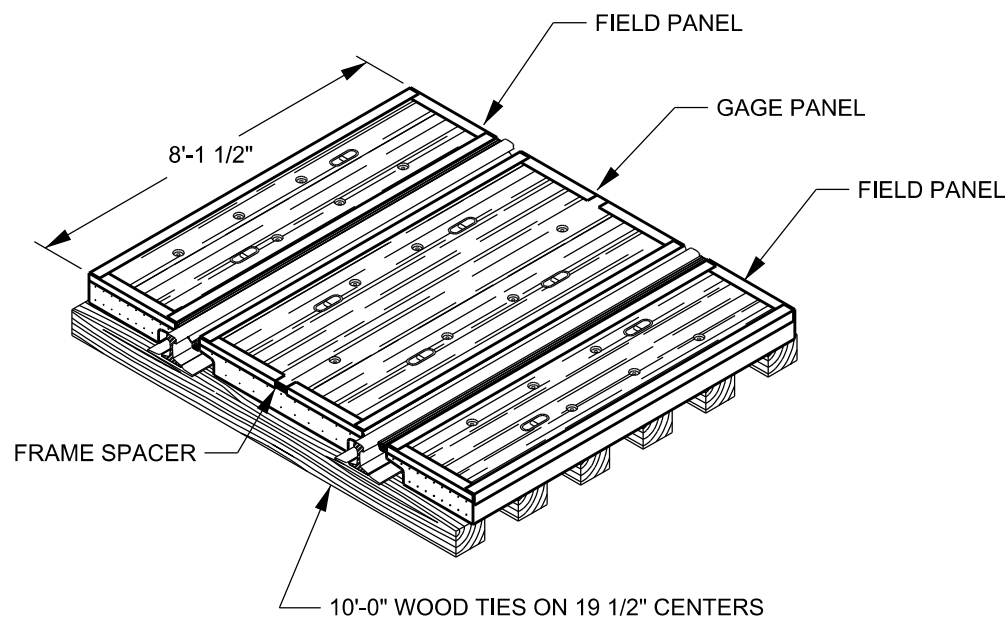
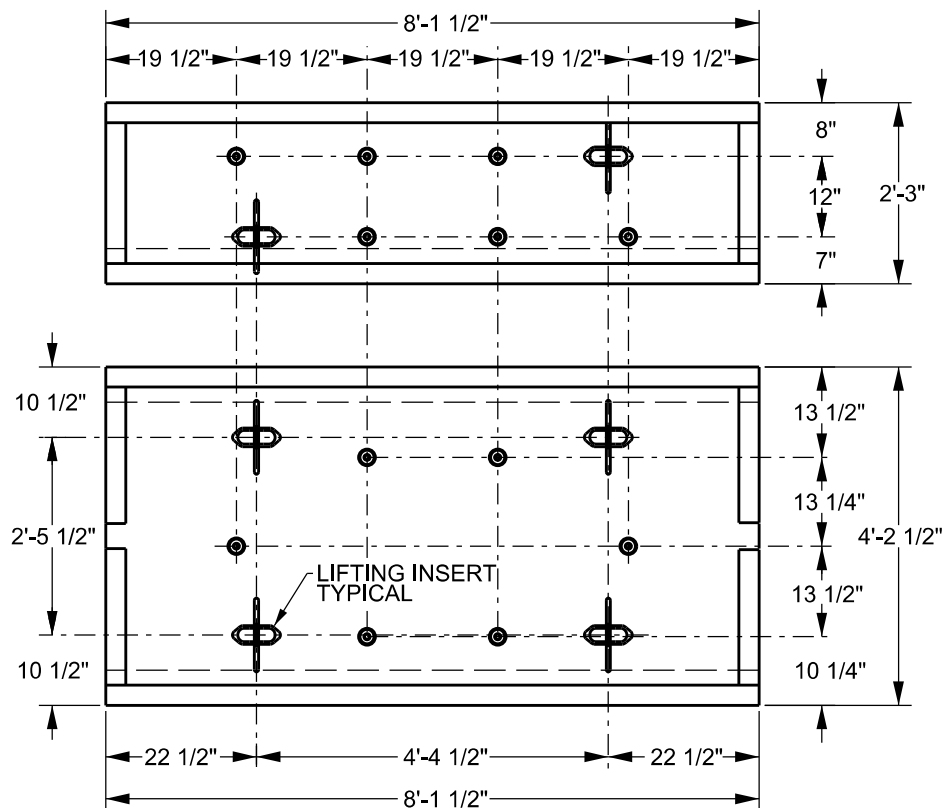
SCALE: NONE

FILE OWNER BNSF

DATE: MAY 11, 2010

REV. NO.: 07



DWG NO: 225302



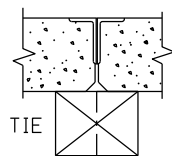
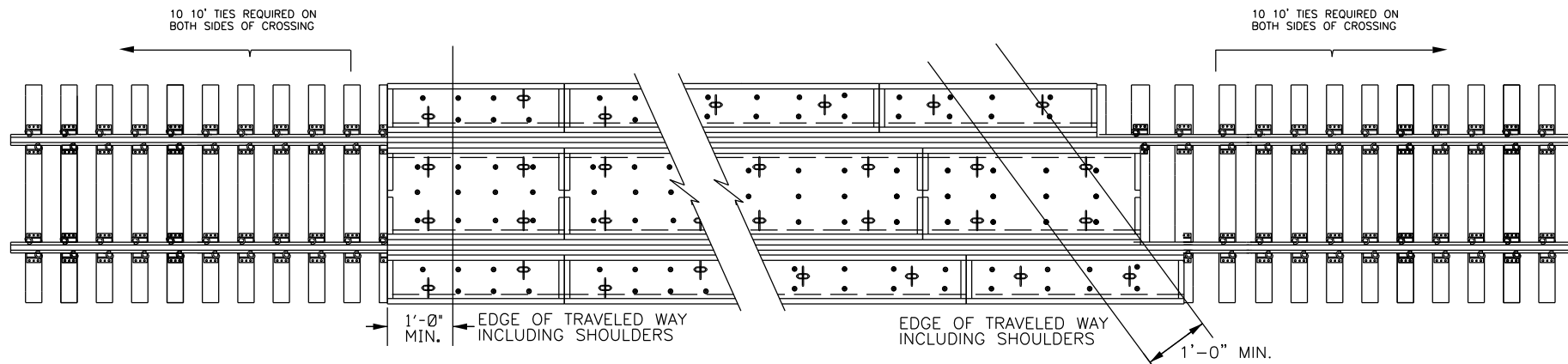
NOTES:  
1/4" RUBBER INTERFACE PAD TO BE PLACED BETWEEN PANEL AND TIES FOR 141 LB. RAIL SECTION. PAD TO BE NAILED TO TIES,

CROSSING TYPE - 10W

RAIL SIZE	PANEL HEIGHT	GAGE PANEL WEIGHT	FIELD PANEL WEIGHT
115	7 1/8"	2850 LBS.	1550 LBS.
132-141	7 7/8"	3125 LBS.	1675 LBS.

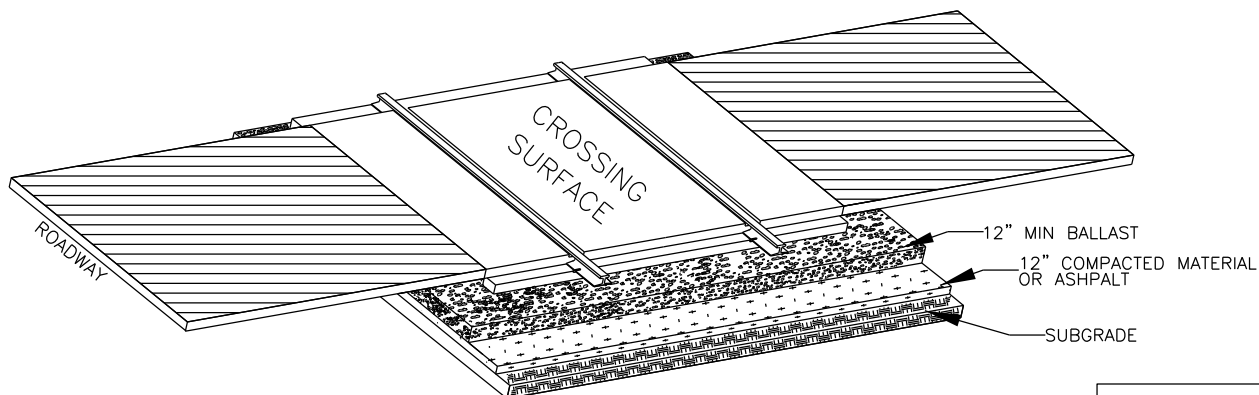
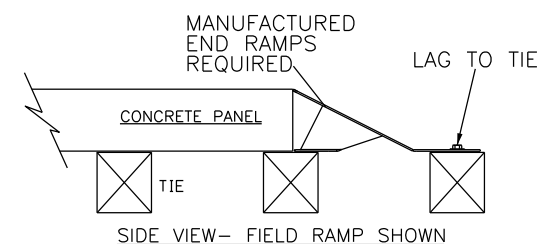
		
COMMON STANDARDS		
LAYOUT FOR CONCRETE PANELS ON 10'-0" LONG WOOD TIES ( 10W)		
FILE OWNER: UPRR		DATE: DEC. 6, 2010
REV. NO.: 2	DWG NO: 200100	

ITEM NUMBERS				
141 LB. BNSF	133-141 LB. UPRR	132-136 LB. BNSF	115 LB. UPRR	115 LB. BNSF
054374616	540-1301	004935722	540-0202	004935706



CONCRETE PANELS MUST BE SUPPORTED BY TIE AS SHOWN

## CONCRETE CROSSING ON WOOD TIES



## BALLAST SECTION

### NOTES:

SEE E.I. 10 FOR ROAD CROSSING REQUIREMENTS

1. DIRECT DRAINAGE AWAY FROM THE TRACK
2. PREVENT MATERIAL FROM FOULING THE ROAD CROSSING BALLAST SECTION
3. DIVERT SURFACE WATER FLOWING ALONG THE ROADWAY OR APPROACHES AWAY FROM THE TRACK
4. SEE BNSF STANDARD PLANS 2258.03, 2258.04 AND 2258.05 FOR END RAMP SYSTEM

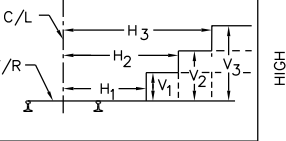
A-39

**BNSF**  
RAILWAY

## ROAD CROSSING LAYOUT

DRAWING: 2259 SHEET: 01 REVISION: 07

DATE: OCTOBER 29, 2013 OWNER: BNSF

STATE	REGULATION REFERENCE	TRACK CENTERS										VERTICAL						HORIZONTAL																			
		YEAR OF LATEST AMENDMENT	MAIN TRACKS	ANY TWO SUBSIDIARY TRACKS	ADJACENT SUBSIDIARY TRACK TO ANY MAIN TRACKS	LADDER TRACK ADJACENT TO ANY PARALLEL TRACK	TWO ADJACENT PARALLEL LADDER TRACKS	LEAD, REPAIR AND CABOOSE TRACKS	TEAM TRACKS IN PAIRS	UNLOADING TRACKS AT PLATFORMS	GENERAL	THRU BRIDGES	HIGHWAY BRIDGES	TUNNELS	BUILDING DOORS	IN BUILDINGS	GENERAL	THRU BRIDGES	HIGHWAY BRIDGES	TUNNELS	BUILDING DOORS	IN BUILDINGS	PLATFORMS						SIGNALS				POLES	ORE AND COAL DOCKS	CATTLE CHUTES		
																							<div>H=HORIZONTAL CLEARANCE (MIN) V=VERTICAL CLEARANCE (MAX)</div> 						HIGH	LOW BETWEEN TRACKS		SWITCH BOXES, ETC.					
																														HEIGHT (MAX)	CLEARANCE	HEIGHT (MAX)				CLEARANCE	
																																					V1
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	
ALABAMA	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	
ARIZONA	CHPTR. 5, ART. 1	1987	14-0	14-0	15-0	20-0	20-0	NR	13-0	13-6	22-0	22-0	23-0	22-0	18 <sup>2</sup> -0	18 <sup>3</sup> -0	8-6	8-0	8-6	8-0	7 <sup>2</sup> -8	8-6	0-8	4-8			4-6	8-0	8-6	3-0	6-0	0-5	3-0	8-6	8-6	8-6	
ARKANSAS	CASE R-1012	1956	14-0	14-0	14-0	17-0	20-0	14-0	13-0	13-0	22-0	22-0	22-0	23-0	17 <sup>2</sup> -0	18 <sup>3</sup> -0	8-6	8-0	8-6	8-0	7 <sup>4</sup> -0 <sup>2</sup>	7 <sup>5</sup> -0	0-8	5-0	4-0	8-0	8-6	3-0	6-0	0-4	3-0	8-6	8-6	8-6	8-6		
CALIFORNIA	G.O. 26-D	1988	14-0	14-0	15-0	20-0	20-0	14-0	13-0	13-0	22-6	22-6	22-6	22-6	18-0	18 <sup>3</sup> -0	8-6	8-0	8-6	8-0	8-6	8-6	0-8	4-8	NR	NR	4-0	7 <sup>8</sup> -6	8-6	3-0	6-0	0-4	3-0	8-6	8-6	8-6	
CANADA	CHPTR. 1189	1983	13-0	13-6	14-0	15-0	18-0	13-6	12-0	12-0	22-6	22-6	22-6	22-6	22-6	22-6	8-4 1/4	8-0	8-4 1/4	8-0	8-4 1/4	8-4 1/4	12	12	12	12	4-0	12	8-4 1/4	3-0	8-4 1/4	NR	NR	8-4 1/4	8-4 1/4	8-4 1/4	
COLORADO	DEC. 55621	1987	14-0	14-0	15-0	17-0	20-0	14-0	13-0	13-6	22-6	22-0	22-6	23-0	17 <sup>2</sup> -0	18 <sup>3</sup> -0	8-6	8-0	8-6	8-0	7-0	8 <sup>5</sup> -0	0-8	5-0	4-0	5 <sup>6</sup> -9	4-0	8-6	8-6	3-0	6-0	0-4	3-0	8-6	8-6	8-6	
IDAHO	G.O. NO. 158	1980	14-0	14-0	15-0	20-0	20-0	14-0	13-0	13-0	23-6	22-6	22-6	22-6	18 <sup>2</sup> -0	18 <sup>3</sup> -0	8-6	8-0	8-6	8-0	8 <sup>2</sup> -6	8 <sup>2</sup> -6	0-8	4-8	4-0	7-3	4-0	8 <sup>8</sup> -6	8-0	3-0	6-0	0-4	3-0	8-6	8-6	8-6	
ILLINOIS	TITLE 92 I.A.C.	1986	13 <sup>11</sup> -6	13-6	15-0	17 <sup>15</sup> -0	19 <sup>16</sup> -0	NR	13-6	13-6	21-6	21-3	21-6	21-6	H	21-6	8-0	8-0	8-0	8-0	8 <sup>1</sup> -0	7 <sup>2</sup> -0	8-0	0-4	4-6	0-8	5 <sup>7</sup> -1	CFH	6-2	8-6	NR	NR	NR	NR	9-0	8-0	8-0
IOWA	NR	1982	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	
KANSAS	ART. 5 -RSR	1987	14-0	14-0	14-0	17-0	20-0	14-0	13-0	13-6	22-6	22-6	22-6	23-0	17-0	18-0	8-6	8-6	8-6	8-0	7 <sup>13</sup> -0	7 <sup>14</sup> -0	0-8	5-0	4-0	6 <sup>6</sup> -2	4-0	8-6	8-6	3-0	6-0	0-4	3-0	8-6	8-6	8-6	
KENTUCKY	277.240	1942	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	22-0	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	
MINNESOTA	219.47	1980	14-0	14-0	14-0	17-0	19-0	14-0	14-0	14-0	22-0	22-0	22-0	22-0	22 <sup>2</sup> -0	22-0	8-6	8-6	8-6	8-6	8 <sup>2</sup> -6	8-6	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	
MISSISSIPPI	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	
MISSOURI	TTL 4 CSR 265-8.060	1987	14-0	14-0	14-0	17-0	19-0	14-0	13-6	14-0	22-0	22-0	22-0	22-0	22-0	22-0	8-6	8-0	8-0	8-6	8 <sup>2</sup> -6	8-6	0-4	4-6	0-8	5 <sup>7</sup> -1	CFH	8-6	8-6	4-0	5 <sup>8</sup> -0 <sup>10</sup>	0-3	4-2	8-6	8-6	8-6	
MONTANA	ADM. RULES	1980	14-0	14-0	15-0	20-0	20-0	14-0	13-0	13-0	22-6	22-6	22-6	22-6	18 <sup>2</sup> -0	18 <sup>3</sup> -0	8-6	8-0	8-6	8-0	8 <sup>2</sup> -6	8-6	0-8	4-8	4-0	5 <sup>9</sup> -9	4-0	8 <sup>8</sup> -6	8-0	3-0	6-0	0-4	3-0	8-6	8-6	8-6	
NEBRASKA	ORD 16, CHPT 5, ART 4	1987	14-0	14-0	15-0	17-0	20-0	14-0	13-0	13-6	22-6	22-0	23-0	23-0	17 <sup>2</sup> -0	18 <sup>3</sup> -0	8-6	8-0	8-6	8-0	7 <sup>2</sup> -0	8 <sup>5</sup> -6	0-8	5-0	4-0	5 <sup>6</sup> -9	4-0	8-6	8-6	3-0	6-0	0-4	3-0	8-6	8-6	8-6	
NEW MEXICO	NMAC 18.14.2.9(B)	2011	14-0	14-0	15-0	17-0	20-0	14-0	13-0	13-0	22-6	22-0	22-6	23-0	17 <sup>2</sup> -0	18 <sup>3</sup> -0	8-6	8-0	8-6	8-0	7 <sup>4</sup> -0	7 <sup>5</sup> -0	0-8	4-8	4-0	5 <sup>9</sup> -9	4-0	8-0	8-6	3-0	6-0	0-4	3-0	8-6	8-6	8-6	
NORTH DAKOTA	SEC.49.10.1-13	1981	NR	NR	NR	NR	NR	NR	NR	NR	21-0	21 <sup>1</sup> -0	21-0	21 <sup>1</sup> -0	21-0	21-0	8-0	8 <sup>1</sup> -0	8-0	8-0	8 <sup>1</sup> -0	8-0	NR	NR	NR	NR	4-0	8-0	8-0	NR	NR	NR	NR	NR	8-0	8-0	8-0
OKLAHOMA	ORDER 33847	1987	14-0	14-0	14-0	17-0	20-0	14-0	13-0	13-6	22-0	22-0	22-0	23-0	17 <sup>2</sup> -0	18 <sup>3</sup> -0	8-6	8-0	8-6	8-0	7 <sup>2</sup> -0 <sup>4</sup>	7 <sup>5</sup> -0	0-8	4-8	4-0	5 <sup>9</sup> -9	4-0	8-6	8-6	3-0	6-0	0-4	3-0	8-6	8-6	8-6	
OREGON	ORDER 83-313	1983	15-0	14-0	15-0	20-0	20-0	14-0	14-0	13-0	20-9	20-9	20-9	20-9	18 <sup>2</sup> -0	18 <sup>3</sup> -0	8-6	8-0	8-6	8-0	8-6	8-6	0-8	4-8	NR	NR	4-0	7 <sup>8</sup> -3	8-6	3-0	6-0	0-4	3-0	8-6	8-6	8-6	
SOUTH DAKOTA	ORDER F2465	1957	NR	NR	NR	NR	NR	NR	NR	NR	22-6	22-6	22 <sup>1</sup> -6	22-6	17-0	22-6	8-6	8-0	8 <sup>1</sup> -0	8-6	7-0	8-6	0-8	4-8	CFH	5 <sup>9</sup> -9	NR	NR	8-0	NR	NR	0-4	3-0	8-6	8-6	8-6	
TENNESSEE	RULE 1220-3-1-.12	1970	14-0	13-0	14-0	18-0	18-0	14-0	13-0	13-0	22-0	22-0	22-0	22-0	17-0	17 <sup>3</sup> -0	8-0	8-0	8-0	8-0	8-0	8-0	0-8	4-8	4-0	5-9	4-0	7-6	8-0	NR	6-6	0-4	3-0	8-0	8-0	8-0	
TEXAS	SEC. 5, CHPT 11	1988	NR	NR	NR	NR	NR	NR	NR	NR	22-0	22-0	22-0	NR	22 <sup>2</sup> -0	22-0	8-6	7-6	8-6	NR	8 <sup>2</sup> -6	8-6	1-0	4-6	NR	NR	4-0	8-6	8-6	2-6	5-6	0-6	4-0	8-6	8-6	8-6	
WASHINGTON	CHPTR. 480-60	1969	14-0	14-0	15-0	20-0	20-0	14-0	13-0	13-0	22-6	22-6	22-6	22-6	18 <sup>2</sup> -0	18 <sup>3</sup> -0	8-6	8-0	8-6	8-0	8 <sup>2</sup> -6	8-6	0-8	4-8	4-0	7 <sup>5</sup> -3	4-0	8 <sup>8</sup> -6	8-0	3-0	6-0	0-4	3-0	8-6	8-6	8-6	
WISCONSIN	CHPTR. TC-3	1982	14-0	14-0	14-0	14-0	14-0	14-0	14-0	14-0	22-0	22 <sup>1</sup> -0	22-0	22 <sup>1</sup> -0	22-0	22-0	8-6	E	8-6	8 <sup>1</sup> -6	8-6	8-6	0 <sup>4</sup> -8	4 <sup>6</sup> -1	1-9	6 <sup>2</sup> -0	5-0	6-4	8-6	E	E	E	E	12-0	8-6	8-6	
WYOMING	CHPTR. XIII	1979	14-0	14-0	15-0	17-0	20-0	14-0	13-0	13-0	22-6	22-0	23-6	23-0	17 <sup>2</sup> -0	18 <sup>3</sup> -0	8-6	8-0	8-6	8-0	7 <sup>2</sup> -0 <sup>4</sup>	7 <sup>3</sup> -0	0-8	5-0	4-0	5 <sup>9</sup> -9	4-0	8-6	8-6	3-0	6-0	0-4	3-0	8-6	8-6	8-6	
BNSF RY. CO.	18	1997	25 <sup>19</sup> -0	14-0	25-0	20-0	20-0	14-0	14-0	20	23-0	23-0	23-6	23-0	H	20	8 <sup>17</sup> -6	8-6	21	8-6	20	20	20	20	20	20	20	20	20	20	20	20	20	8-6	8-6	8-6	

THIS CHART FOR INFORMATION ONLY - NO LIABILITY CAN BE ASSUMED  
ARCHITECTS, CONTRACTORS, ETC., SHOULD CHECK WITH STATE INVOLVED.

#### DIMENSIONS:

SHOWN IN FEET AND INCHES.  
ARE FOR TANGENT TRACK - MOST LAWS SPECIFY INCREASES FOR CURVED AND SUPERELEVATED TRACK.  
VERTICAL - MEASURED FROM TOP OF RAIL, EXCEPT CANADA BASE OF RAIL FOR OTHER THAN PLATFORMS.  
HORIZONTAL - MEASURED FROM CENTER LINE OF TRACK.  
APPLY TO NEW CONSTRUCTION, SOME RECONSTRUCTION AND SOME EXTENSIONS SOME CAN BE VARIED UPON APPROVAL OF APPLICATION BY GOVERNING BODY.  
ARE BASED ON MAXIMUM CAR SIZE FOR CALIFORNIA, IDAHO, MINNESOTA, MONTANA, NORTH DAKOTA, OREGON AND WASHINGTON.  
ALL ARE MINIMUM EXCEPT COLUMNS 24, 26, 28, 31 AND 33 WHICH ARE MAXIMUM.

#### ABBREVIATIONS

CFH - CAR FLOOR HEIGHT  
E - EXEMPT  
H - HEIGHT OF CAR GOVERNS  
NR - NO CURRENT REGULATION TO COVER

#### COLUMN HEADINGS

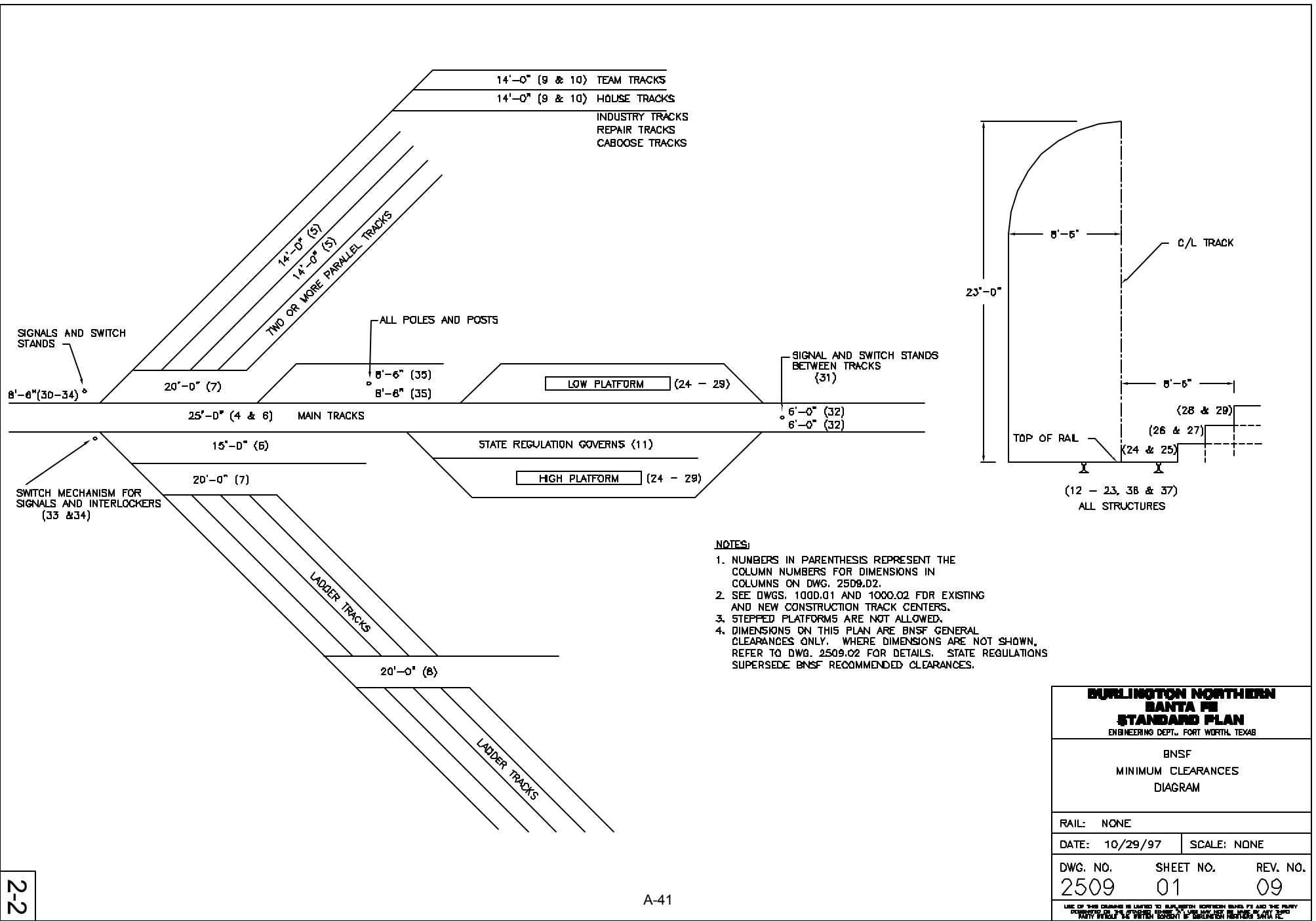
2 SHOWS BASIC REGULATION  
3 SHOWS EFFECTIVE YEAR OR YEAR OF LATEST AMENDMENT  
7 & 8 APPLY TO HAND AND MECHANICALLY OPERATED SWITCHES EXCEPT AS NOTED  
12 & 18 PREVAILS FOR ALL ITEMS NOT OTHERWISE PROVIDED FOR  
13 & 19 BRIDGES SUPPORTING TRACKS  
14 & 20 BRIDGES SPANNING TRACKS  
24 & 25 PASSENGER PLATFORMS  
26 & 27 PASSENGER/FREIGHT PLATFORMS ON SIDE TRACKS EXCEPT AS NOTED.  
28 & 29 FREIGHT PLATFORMS ON SIDE TRACKS  
STEPPED PLATFORMS ARE NOT ALLOWED.  
35 OTHER THAN TROLLEY CONTACT POLES.  
36 TO CENTER OF STAND EXCEPT AS NOTED.  
37 APPLIES TO BOTH SUPPORTS AND PLATFORMS EXCEPT AS NOTED.

#### FOOTNOTES:

1 LESSER CLEARANCES NOT PERMITTED IN QUADRANTS  
2 ENGINE HOUSES AND SHOP BUILDINGS EXEMPT OR PERMITTED LESSER DIMENSIONS  
3 ONLY IF TRACKS END WITHIN BUILDINGS.  
4 MAY BE REDUCED TO 5-9 IF 8-3 (8-6 FOR WY) PROVIDED ON OPPOSITE SIDE  
5 MAY BE REDUCED TO 5-9 IF 8-0 (8-6 FOR NE, MO & WY) PROVIDED ON OPPOSITE SIDE  
6 ONLY IF 8-0 (7-3 FOR MT & WY; 8-6 FOR WA & SD) PROVIDED ON OPP. SIDE  
7 PASSENGER PLATFORMS ONLY  
8 MAY BE 8-0 AT 4-6 FOR REFRIGERATOR CAR PLATFORMS ONLY.  
9 TO ENDS OF ARMS IN OPERATING POSITION.  
10 FOR PLATFORMS AT CAR EAVE HEIGHT - SUPPORTS TO BE 8-0 (8-6 FOR TEXAS).  
11 FOR FREIGHT TRACKS - CAN BE 13-0 FOR PASSENGER TRACKS.  
12 REGARDING CANADA - CHECK STANDARD CLEARANCE DIAGRAM APPROVED BY BOARD OF TRANSPORT COMMISSIONERS FOR CANADA FOR RAILWAY INVOLVED.  
13 MAY BE REDUCED TO 6-2 IF 8-3 PROVIDED ON OPPOSITE SIDE.  
14 MAY BE REDUCED TO 6-2 IF 8-0 PROVIDED ON OPPOSITE SIDE.  
15 FOR HAND OPERATED SWITCHES - MAY BE 15-0 FOR MECHANICALLY OPERATED SWITCHES.  
16 FOR HAND OPERATED SWITCHES - MAY BE 17-0 FOR MECHANICALLY OPERATED SWITCHES.  
17 MUST HAVE ADDITIONAL SIDE CLEARANCE OF 1 1/2 INCH PER DEGREE OF CURVATURE.  
18 IF NO FIGURE IS GIVEN USE STATUTORY CLEARANCE.  
19 NEW CONSTRUCTION 25-0 CENTER TO CENTER MAIN TRACK/CONTROL SIDING.  
20 STATE REGULATION GOVERNS.  
21 CENTER LINE OF TRACK TO CLOSEST EDGE OF PIER: MAIN LINE-25'0", OTHERS-18'-0".

2-3	BURLINGTON NORTHERN SANTA FE STANDARD PLAN ENGINEERING DEPT., FORT WORTH, TEXAS		CLEARANCE REQUIREMENTS BY STATE AND RECOMMENDED BNSF CLEARANCE	





**NOTES:**

1. NUMBERS IN PARENTHESIS REPRESENT THE COLUMN NUMBERS FOR DIMENSIONS IN COLUMNS ON DWG. 2509.02.
2. SEE DWGS. 1000.01 AND 1000.02 FOR EXISTING AND NEW CONSTRUCTION TRACK CENTERS.
3. STEPPED PLATFORMS ARE NOT ALLOWED.
4. DIMENSIONS ON THIS PLAN ARE BNSF GENERAL CLEARANCES ONLY. WHERE DIMENSIONS ARE NOT SHOWN, REFER TO DWG. 2509.02 FOR DETAILS. STATE REGULATIONS SUPERSEDE BNSF RECOMMENDED CLEARANCES.

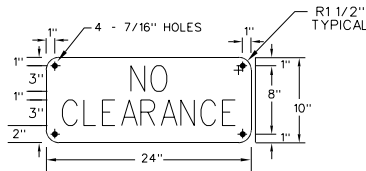
**BURLINGTON NORTHERN  
SANTA FE  
STANDARD PLAN**  
ENGINEERING DEPT., FORT WORTH, TEXAS

BNSF  
MINIMUM CLEARANCES  
DIAGRAM

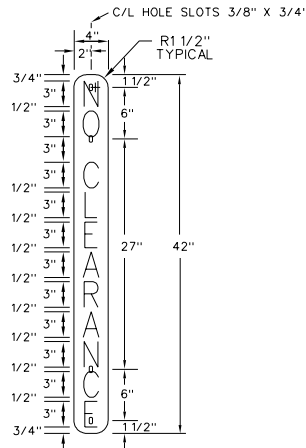
RAIL: NONE		
DATE: 10/29/97	SCALE: NONE	
DWG. NO. 2509	SHEET NO. 01	REV. NO. 09

USE OF THIS DRAWING IS LIMITED TO BURLINGTON NORTHERN SANTA FE AND THE RAILWAY COMPANIES OF THE UNITED STATES. NO PART MAY BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, WITHOUT PERMISSION OF BURLINGTON NORTHERN SANTA FE.

## EXAMPLE 1



## EXAMPLE 2



## SIGNS:

### NO. 44 - "NO CLEARANCE"

PLACE NO CLEARANCE SIGN ON BUILDING STRUCTURE OVER C/L TRACK WHERE VERTICAL CLEARANCE IS LESS THAN REQUIRED. LETTERED AND MOUNTED AS SHOWN IN EXAMPLE 1.

### NO. 44A - "NO CLEARANCE"

PLACE NO CLEARANCE SIGN ON BUILDING STRUCTURE OR POST WHERE HORIZONTAL CLEARANCE IS LESS THAN REQUIRED. LETTERED AND MOUNTED AS SHOWN IN EXAMPLE 2.

## NOTES:

1. THE SIGNS LISTED IN THIS PLAN ARE 10" X 24" AND 4" X 42" SIZED WITH WHITE BACKGROUND AND BLACK LETTERS, ONE SIDE ONLY, AS SHOWN IN EXAMPLES 1 AND 2.
2. SEE PLAN 3000.01 FOR ADDITIONAL SPECIFICATIONS AND INFORMATION CONCERNING THE REFLECTIVE AND PANEL MATERIAL.
3. FOR USE IN THE STATE OF MINNESOTA AS ORDERED BY THE PUB. SERV. COMM. AT POINTS WHERE CLEARANCE IS LESS THAN THE LEGAL REQUIREMENT.

## BILL OF MATERIALS

QUANTITY	SIGN PANEL
1 EA.	SIGN NO. 44-NO CLEARANCE ITEM NO. 047220983
1 EA.	SIGN NO. 44A-NO CLEARANCE ITEM NO. 047220984
OPTIONAL HARDWARE	
1 EA.	2 LB. PER LIN. FT. GALVANIZED FLANGED CHANNEL STEEL POST, 8'-0" LONG WITH 3/8"Ø MONTING HOLES, 1" CENTERS, WITH POINTED END.
2 EA.	5/16" DIA. X 2" GALVANIZED ROUND HEAD SQUARE NECK MACHINE BOLT, ALL THREAD, WITH LOCK NUT AND WASHER.

BURLINGTON NORTHERN  
SANTA FE  
STANDARD PLAN  
ENGINEERING DEPT., FORT WORTH, TEXAS

CLEARANCE  
SIGNS

RAIL:

DATE: 06/10/96

SCALE:

DWG. NO.  
3044

SHEET NO.  
01

REV. NO.  
04

USE OF THIS DRAWING IS LIMITED TO BURLINGTON NORTHERN SANTA FE AND THE PARTY DESIGNATED ON THE ATTACHED ORDER. IT IS NOT TO BE USED BY ANY THIRD PARTY WITHOUT THE WRITTEN CONSENT OF BURLINGTON NORTHERN SANTA FE.

## VERTICAL CURVES

Vertical curves should be used to round off all intersecting grades.

The length of a vertical curve is determined by the grades to be connected and the speed of the traffic.

The rate of change for tracks with a vertical curve concave upwards (sag) should be one-half the rate of change of a vertical curve concave downward (summit).

**The rate of change for high-speed main tracks (> 50 MPH) should not be more than 0.05 feet per station (of 100 feet) in sags, and not more than 0.10 feet per station on summits.**

**For secondary main tracks (speed < 50 MPH), the rate of change should not be more than 0.10 feet per station in sags, and not more than 0.20 feet per station on summits.**

**For industry tracks and non-main tracks with speeds not greater than 20 MPH, the rate of change should not be more than 2.0 feet per station for both sags and summits.**

The rate of change per station is calculated as follows:  $R = D/L$  Where:

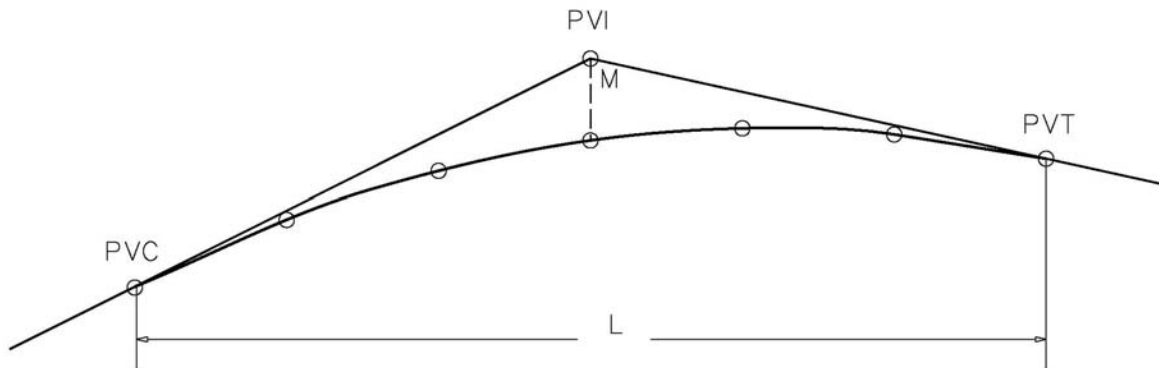
R = Rate of change per station

D = Algebraic difference of the two intercepting grades

L = Length of vertical curve in 100-ft. stations

M = Correction from the straight grade to the vertical curve

A parabola is used for the vertical curve in which the correction from the straight grade for the first station is one half the rate of change, and the others vary as the square of the distance from the point of tangency. Where points fall on full stations, it will be necessary to figure these for only one half the vertical curve, as they are the same for corresponding points each side of the vertex. Corrections are (-) when the vertical curve is concave downwards (summit), and (+) when the vertical curve is concave upwards (sag). The rate of change may be assumed and the length of vertical curve computed, or preferable the length assumed and the rate computed.



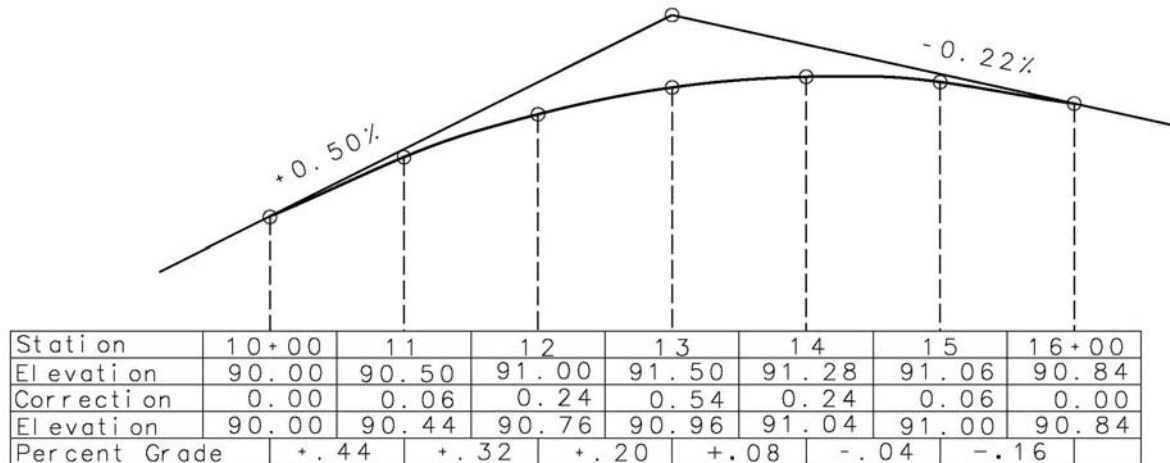
## VERTICAL CURVES

For example:

Assume length = 600 feet (6 stations)

$D = 0.50 \text{ minus } -0.22 = 0.72$

$R = 0.72/6 = 0.12$



Calculate the straight-grade elevations for each station.

The correction for the first station is one-half the rate of change (R). So, the correction for station 11 is 0.06 (minus since it concaves downwards).

The correction for the Station 12 is  $4(0.06) = 0.24$ . This is the correction to the first station (one-half the rate of change) multiplied by the square of the length, in stations, from the PVC. At Station 13 (the PVI), the correction is  $9(0.06) = 0.54$ . Notice the corrections for Stations 11 and 15 are the same. Likewise, for 12 and 14, since they are the same distance from the PVC and PVT. So, only one-half of the curve's corrections need to be calculated.

Next, apply the correction at each station to the straight-grade elevation to obtain the elevation on the vertical curve.

A simpler method of computing this and one that furnishes check throughout is the following:

Sta. 10	90.00	
	<u>+0.44</u>	(% grade sta. 9 to 10) minus one half rate = $0.50 - 0.06$
Sta. 11	90.44	
	<u>+0.32</u>	(% grade sta. 10 to 11) minus rate = $0.44 - 0.12$
Sta. 12	90.76	
	<u>+0.20</u>	(% grade sta. 11 to 12) minus rate = $0.32 - 0.12$
Sta. 13	90.96	
	<u>+0.08</u>	(% grade sta. 12 to 13) minus rate = $0.20 - 0.12$
Sta. 14	91.04	
	<u>-0.04</u>	(% grade sta. 13 to 14) minus rate = $0.08 - 0.12$
Sta. 15	91.00	
	<u>-0.16</u>	(% grade sta. 14 to 15) minus rate = $-0.04 - 0.12$
Sta. 16	90.84	

**BNSF Railway****Underground Cable Location and Acknowledgement**

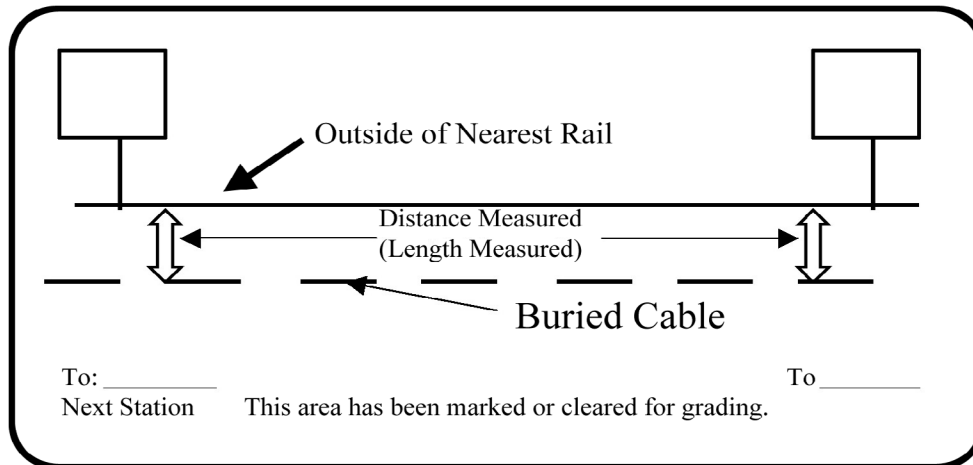
Date: \_\_\_\_\_ Project: \_\_\_\_\_

Meeting Location: \_\_\_\_\_ Time: \_\_\_\_\_

Attendees at proposed work site (Signature of representative)

☐ BNSF Telecom \_\_\_\_\_☐ BNSF Signal \_\_\_\_\_ ☐ Grading Contractor \_\_\_\_\_☐ Project Inspector \_\_\_\_\_ ☐ Flag Person on Duty \_\_\_\_\_

No grading will be permitted in this area without this completed form in the possession of the above.



## Notes:

All signal cables must be marked with paint and flags (as ground conditions permit) prior to any grading.

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Revision: October 15, 2004

**Figure 26-1. Underground Cable Location and Acknowledgement**

STAKING OUT REQUIRES A  
RAILROAD QUALIFIED LOOKOUT  
FLAGGER TO PROVIDE  
AUTHORITY TO WORK WITHIN 25'  
OF THE TRACKS



Stake additional offset stake at around the edge  
of the turnout pad (~45'-56'+) and write on the stake:

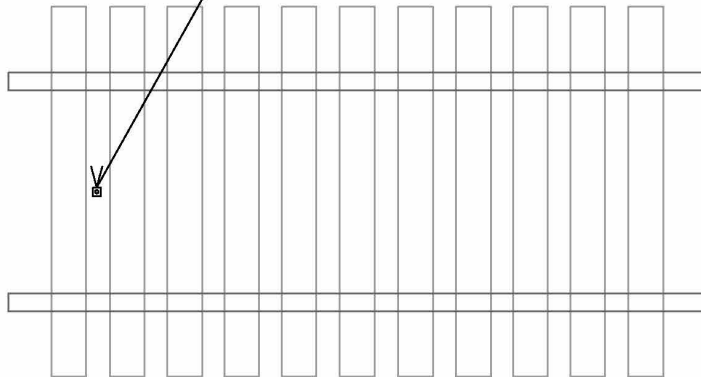
(PSw - mm/dd/yy location type - project description)

Example:

PSw - 1/1/15 E WILLISTON ED - NFC/EVR

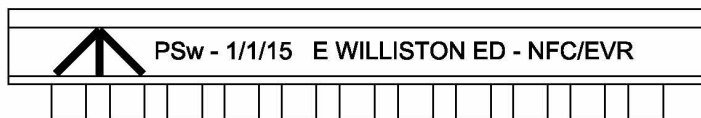
Insert stake/pin with a highly visible ribbon  
Write information on ribbon or spray on ground

Stake must be completely hammered into the ground  
and shall not pose a tripping hazard for crews



PLAN VIEW

(PSw - mm/dd/yy location type - project description)



SIDE VIEW



STAKE OUT GUIDELINES  
BNSF RAILWAY SWITCH INSTALLS

FILE: RAIL MARKUP.DGN SHEET 1 OF 1 DATE: 06/10/2015

DIVISION  
SUBDIVISION  
LINE SEGMENT

REVISIONS

DATE

BY

DATE

APPROVALS - NAME - TITLE

DATE

APPROVALS - NAME - TITLE

NAME

PREPARED BY

DATE

APPROVALS - NAME - TITLE

DATE

APPROVALS - NAME - TITLE

DATE

APPROVALS - NAME - TITLE

DATE

APPROVALS - NAME - TITLE

DATE

BNSF RAILWAY COMPANY - ENGINEERING SERVICES

I acknowledge that I have received the internet link and/or hard copy of BNSF's "Guidelines for Industry Track Projects" dated August 2018. I understand that the design and construction of this facility will follow the Guidelines. Questions concerning the Guidelines are to be directed to the BNSF Project Engineer listed below.

<http://www.bnsf.com/customers/pdf/indytrkstds.pdf> <<Industrial Track Guidelines

<http://www.bnsf.com/communities/faqs/pdf/utility.pdf> << Utility Specs

Owner Representative

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Printed

\_\_\_\_\_  
Company Name

\_\_\_\_\_  
BNSF Project Engineer



# ANDERSON ENGINEERING CONSULTANTS, INC.

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3217 NEIL CIRCLE – JONESBORO, AR 72401  
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March 8, 2021

Job No. 16374

Mr. Robert Graham, P. E.  
W. Willam Graham Jr., Inc.  
100 North Rodney Parham Road, Suite 2B  
Little Rock, Arkansas 72205

Re: Addendum to Geotechnical Investigation  
Proposed Jonesboro Lead Rail Expansion  
Jonesboro, Arkansas

Dear Mr. Graham:

This letter is provided to formalize our conversations regarding the rail section for the above referenced project. The recommendations contained in our geotechnical report, dated January 27, 2020, include a layer of Tensar TX160 and Contech C40 geofabric above a prepared subgrade. A minimum of 12.0 inches of sub-ballast (ARDOT Class 7) was recommended above the fabric and grid and followed with 8 inches of ballast and timber.

Based on our conversations, the grades will not allow the thicknesses indicated to be provided. Thus, some improvement of the subgrade above that recommended in our report will be required. Utilizing a higher quality of fill material in the subgrade preparation will enable the thickness of sub-ballast to be reduced. Once the areas are stripped a minimum of 12.0 inches and the underlying subgrade is prepared adequately, a clay gravel material, similar to ARDOT Class 5 should be used in the top 12.0 inches of subgrade (beneath the fabric and grid). The increased strength provided by the clay gravel will enable the thickness of the sub-ballast to be reduced to 10.0 inches and ballast to 6.0 inches without sacrificing strength of the section.

It has been a pleasure to provide this information to you. Please do not hesitate to contact us with any questions.

Very truly yours,

ANDERSON ENGINEERING CONSULTANTS, INC.

Stuart M. Scheiderer, R.E.P., P.E.  
Senior Geotechnical Engineer



SMS/msk  
16374.Addendum







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**GEOTECHNICAL INVESTIGATION  
FOR  
PROPOSED JONESBORO LEAD RAIL EXPANSION  
JONESBORO, ARKANSAS**

\* \* \* \* \*

**W. WILLIAM GRAHAM JR., INC.  
CONSULTING ENGINEERS  
100 NORTH RODNEY PARHAM ROAD, SUITE 2B  
JONESBORO, ARKANSAS 72205**

\* \* \* \* \*

**JANUARY 27, 2020**

**JOB NO. 16374**





# ANDERSON ENGINEERING CONSULTANTS, INC.

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January 27, 2020

Job No. 16374

Mr. Robert Graham, P.E.  
W. William Graham Jr., Inc.  
100 North Rodney Parham Road, Suite 2B  
Little Rock, Arkansas 72205

Re: Geotechnical Investigation  
Proposed Jonesboro Lead Rail Expansion  
Jonesboro, Arkansas

Dear Mr. Graham:

It is our pleasure to submit this report on the soil investigation for the proposed Jonesboro Lead Rail Expansion in Jonesboro, Arkansas. The investigation consisted of field test borings, soils laboratory analyses, and recommendations.

Soft to marginal soils were encountered across a majority of the areas investigated at the surface. Undercut or stabilization will be required to facilitate construction and support the anticipated loads. We recommend that the subgrade preparation be verified by our geotechnical representative during the earthwork construction phase of the project for this is the most feasible means of assuring the owners, designers, and builders that the geotechnical design intent is being achieved. In the event adverse geotechnical conditions are encountered during excavation, they can be identified and evaluated so that adequate remedial measures can be implemented during construction.

We wish to express our appreciation for the opportunity of serving you and other members of your design team. We are available for further consultation during the design and construction at any time, should you desire further consultation.

Very truly yours,

ANDERSON ENGINEERING CONSULTANTS, INC.



Stuart M. Scheiderer, R.E.P., P.E.  
Senior Geotechnical Engineer

Scott W. Anderson, R.E.P., P.E.  
Principal Engineer



SMS/SWA/llb  
16374.GEO

GEOTECHNICAL INVESTIGATION  
FOR  
PROPOSED JONESBORO LEAD RAIL EXPANSION  
JONESBORO, ARKANSAS

\* \* \* \* \*

W. WILLIAM GRAHAM JR., INC.  
CONSULTING ENGINEERS  
100 NORTH RODNEY PARHAM ROAD, SUITE 2B  
JONESBORO, ARKANSAS 72205

\* \* \* \* \*

BY  
ANDERSON ENGINEERING CONSULTANTS, INC.  
GEOTECHNICAL CONSULTANTS  
3217 NEIL CIRCLE  
LITTLE ROCK, ARKANSAS 72401

JANUARY 27, 2020

JOB NO. 16374

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# Important Information about Your Geotechnical Engineering Report

*Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.*

*While you cannot eliminate all such risks, you can manage them. The following information is provided to help.*

## Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you — should apply the report for any purpose or project except the one originally contemplated.*

## Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

## A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,

- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

## Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

## Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

## A Report's Recommendations Are Not Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final*, because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual

subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

### **A Geotechnical Engineering Report Is Subject to Misinterpretation**

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

### **Do Not Redraw the Engineer's Logs**

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

### **Give Contractors a Complete Report and Guidance**

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time* to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

### **Read Responsibility Provisions Closely**

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that

have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

### **Geoenvironmental Concerns Are Not Covered**

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

### **Obtain Professional Assistance To Deal with Mold**

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

### **Rely on Your ASFE-Member Geotechnical Engineer for Additional Assistance**

Membership in ASFE/THE BEST PEOPLE ON EARTH exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your ASFE-member geotechnical engineer for more information.



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## **PURPOSE**

The primary purposes of this geotechnical investigation were:

- a. To determine the physical and engineering properties of the soils within the anticipated railroad sections with respect to their suitability for support of the proposed expansion.
- b. To make recommendations for the earthwork and the type of support required for construction best suited for the prevailing soil conditions within the proposed construction area.
- c. To evaluate and recommend the design procedures for the various soil items in accordance with current engineering practices.

## **SCOPE**

- a. The geological features of the area consist primarily of alluvial deposits of sands, silts, and clays. It was concluded that six test borings for the proposed rail sections would be required to obtain the geotechnical engineering data. A vicinity map of the project area is given on Plate 1.
- b. The site stratigraphy was defined by utilizing six test borings within the construction area. The borings were placed strategically across the site as shown on the Plan of Borings, Plate 2.
- c. Field tests consist of Standard Penetration test (ASTM D 1586) samples taken in all of the borings. Logs of these borings are shown on Plates 3 through 8. The Field Classification System for Soil Exploration and Key to Soil Classifications and Symbols used on the logs are shown on Plates 9 and 10.
- d. The soils analyses were based on N-values obtained from the Standard Penetration tests, visual observations, results of laboratory tests, and other routine inspection and classification methods. The soils were classified basically in accordance with the Unified Soil Classification System (ASTM D 2487) shown on Plate 11; however, visual classifications may be given on the logs.
- e. Laboratory tests were performed on select soil samples taken during the drilling program. Laboratory tests consisted of moisture content, Atterberg limits and mechanical grain size. The individual test calculations are provided in Appendix B.
- f. Engineering analyses of the field and laboratory investigations was performed to develop recommendations for subgrade preparation and rail construction.

## **AUTHORITY**

This geotechnical investigation was authorized by a subcontract agreement with Mr. Robert Graham, P.E., of W. William Graham Jr., Inc., the owner's representative for the proposed project. The scope of services and fees included therein were outlined in AECI Proposal No. 19312.



## **PROJECT DESCRIPTION**

The project is understood to consist of an extension to the Jonesboro Industrial Lead Rail line. The proposed extension north of CW Post Road as shown on the Vicinity Map, Plate 1. The location of the borings was designated by the client. Site No. 1 (borings B1 through B3) exist within a line approximately 0.5 mile long west of Nestle Way. Site No. 2 is approximately the same distance between Commerce Drive and Moore Road. Though existing and proposed grades were not provided, it is assumed varying amounts of fill will be required to obtain proposed grades. The proposed construction areas were soft and unstable at the surface, requiring the use of an ATV mounted drill rig to access the boring locations.

## **GENERAL GEOLOGY**

The Jonesboro, Arkansas, area lies within the Mississippi Embayment Physiographic region of eastern Arkansas. This area consists of a complex layering of alluvial and terrace deposits of silts, clays, and sands with lenses of clay and gravel from the Quaternary Period. The soils range, in general, from clays to sands. The site soils were found to be consistent with the area geology and consisted primarily of silty clay overlying silty sand in the areas investigated. Previous experience in the area indicate the basal units to be dense sands and gravels.

## **FIELD INVESTIGATION**

The field investigation consisted of drilling and sampling of six test borings placed as indicated on Plate 2. The boreholes were advanced flight auger drilling methods. Due to soft soil conditions, an ATV mounted drilling rig was required to access boring locations. Soil sampling consisted of performing the Standard Penetration test (ASTM D 1586) at intervals selected by the geotechnical engineer. Soil samples obtained from the sampler were visually classified and placed in appropriate containers for transport to the laboratory. The results of the field investigation are given on the logs of borings, Plates 3 through 8. The Field Classification System for Soil Exploration and Key to Soil Classifications and Symbols used on the logs are shown on Plates 9 and 10 with the Unified Soil Classification System shown on Plate 11.

The N-values shown on the logs were determined from the number of blows (N) of the 140.0-pound hammer required to drive the 1-3/8-inch I.D. split spoon the last 12.0 inches of the total 18.0-inch drive or portions thereof as may be indicated on the boring logs. These values are used to correlate strength and settlement characteristics of the soils.



## **GROUNDWATER CONDITIONS**

The groundwater level was not encountered in the areas and depths investigated. The water level is seasonal in nature and will rise and fall with fluctuations in rainfall and seasonal variations. Some groundwater can be expected below these depths and should be considered in design and construction of deep utilities and excavations. Temporary rerouting of ditches and dewatering of these types of excavations by sump/pump may be required.

Perched water, however, was observed and should be expected in the near surface soils above the less permeable clays. This latent water condition is typically due to storage of recent rainfall or by a barrier to capillary evaporation. Perched water could be significant in wet periods. Areas likely to contain perched water include old drainage swales, rubble fills, existing utility trenches, and within organic laden soils.

## **LABORATORY TESTING**

Samples obtained from the borings were visually classified in the field and returned to the laboratory for further evaluation by the engineer and laboratory testing. The moisture content of samples tested was found to be a minimum of 25.7% near the surface (<4.0 feet), which is considered excessive and correlated with the lower N-values of these materials. The soils tested were found to be slightly to moderately plastic. Soils tested near the surface (<1.5 feet) were found to have a maximum liquid limit of 32 and maximum plasticity index of 8. These values increased in some of the underlying soils to a minimum of 45 and 27, respectively. Deeper soils were also found to be slightly plastic. Mechanical grain size analyses performed on samples indicate shallow soils contained between 79.0% and 93.9% fines (passing the No. 200 sieve), resulting in a classification of silty to sandy clay (CL) or silt (ML) based on the Atterberg limit values. Based on the results obtained, the shallow soils are not considered critical with respect to shrink/swell potential, assuming fill will be required to obtain proposed grades. Individual test results are provided in Appendix B.

## **EARTHWORK**

The following sections are intended to provide the designer and contractor with guidelines for construction of the project. They are not intended to be used as a specification for construction procedures or methods. It is strongly recommended that any desired modification be reviewed by the soils engineer prior to implementation into the project specifications. Site conditions different from those indicated herein may result in alteration of these recommendations, but should be verified by the soils engineer, or his representative.

### **Pre-Construction Considerations:**

The condition of the subgrade materials should be considered a significant factor in the early stages of project planning and construction. The conditions reflected herein are based on the data obtained from the borings and the soil condition at the time of drilling. Data obtained from the borings can be effected by seasonal fluctuations in rainfall and temperatures. Some improvement in the condition of the materials should be expected in the summer months. Construction planning and sequencing will likely be a crucial factor on the amount of undercut required for soft soil conditions.

Though efforts have been made to outline climatic factors and their potential impact on construction, some factors also will have a significant impact. Time constraints (proposed schedule) may restrict the contractor's ability to process wet soils. The means and methods of the contractor are not necessarily considered in the recommendations contained herein. The recommendations for site preparation are intended for a normal construction sequence. Prepared subgrade or compacted fill should not be subjected to prolonged periods of weather or construction traffic. Areas intended to be used as staging by the contractor will likely require additional processing and compaction due to distress caused by construction traffic.

It is highly recommended that the geotechnical engineer be included in pre-construction meetings. It would be prudent to perform a limited investigation (probing or test pits) to verify the soil conditions immediately prior to site work and determine if the recommendations contained herein warrant modification.

### **Site Preparation:**

It is assumed that varying amounts of fill will be required to obtain the proposed grades. The owner and contractor should anticipate difficulty with site access and mobility as soils within  $\pm 3.0$  feet of the surface were soft and unstable in addition to standing water in some areas. These conditions will be worse in wet and winter seasons. In any case, vegetation and topsoil should be removed within the proposed rail line. Though a stripping depth of 12.0 inches should suffice in most areas, deeper depths could be required in low lying areas, within ditches, swales, etc. Upon completion of clearing and grubbing, the exposed subgrade should be proof rolled.

Proof rolling should consist of a loaded, tandem axle dump truck or similar equipment passing across the subgrade to identify soft, unstable soils. Data obtained from the borings indicates soft soils are present at the surface. Firmer, more stable soils were encountered within  $\pm 3.0$  feet in most areas. For an estimation on the extent and depth of soft soils, the N-values provided on the borings logs should be reviewed. Previous experience with similar soil types indicate those with an N-value exceeding 10 typically perform adequately for proof rolling with minor re-working and

recompaction. Soils with lower values often require stabilization or undercut to be considered adequate. Upon completion of stabilization/undercut adequately to perform satisfactory for a proof roll, placement of fill should begin.

**Fill Placement:**

Ideal fill materials for the project would consist of granular, non-expansive type soils with a plasticity index (PI) between 5 and 20 per Section 3.7 of ACI 360R. A minimum approximate dry density of 110.0 to 115.0 pcf is typical for soils meeting this criteria. Amendment of on-site soils can be evaluated if needed. Other locally available soils may be suitable, but must be approved by the soils engineer prior to their use. Fill soils should be placed in maximum 8.0-inch loose lifts, moisture conditioned to within two percentage points of optimum moisture content, and be compacted to a minimum of 95% Modified compaction per AREMA guidelines.

The compaction and moisture content of fill materials should be verified through field density tests per ASTM D 6938. One test per lift should be performed for every 5000 to 10,000 square feet for rail bed or drive areas. It would be prudent to require in the specifications the performance of Atterberg limits and mechanical grain size analyses of fill materials during placement to ensure compliance with the criteria outlined herein as borrow pit soils may vary significantly across the pit.

**Shallow Excavation Criteria:**

The soils encountered should be excavated with normal tracked excavators. Trench excavations for utilities should be completed with normal excavation equipment. The site soils are cohesive and could be prone to sloughing or cave-ins. The presence of shallow water will hinder backfill of such excavations and also saturate bearing soils. Especially if these materials are allowed to saturate, some cave-ins are probable. Based on OSHA regulations (29 CFR 1926, Subpart P) regarding soil classification for trench excavations, the shallow soils encountered would best classify as Type C. In any case, OSHA regulations regarding shoring or benching of excavations should be considered during construction. Backfilling trench excavations should satisfy the criteria given previously, though ARDOT approved flowable fill may be used as an alternative for confined spaces (utility trenches) provided it is allowed to properly cure.

**Adverse Weather Conditions:**

Site grading and earthwork operations will be more difficult in wet or winter months. Should earthwork operations for the project begin in the time period of November through April, the owner should anticipate and budget for additional expenses for earthwork. The anticipated runoff from the surrounding area will likely require diverting of the existing ditches. Not only will more frequent and saturating rains be prevalent during these months, ambient air conditions

are not conducive to drying of site soils. Potential fill materials with excessive moisture may also require aeration/drying. Efficient aeration and drying of soils is dependant upon high temperatures, low humidity, and the contractor's ability to disc or scarify the soils. Aeration and drying of on site soils will require additional effort by the contractor and should be considered during budgeting or planning.

### **RAILROAD CONSTRUCTION**

The following recommendations are based on criteria outlined by the American Railway Engineering and Maintenance-of-Way Association (AREMA), which should be reviewed by the designer. The level of traffic of the rail is unknown, but should be considered in design. The following thicknesses should be considered a minimum, but may require additional amounts depending on traffic levels or requirements dictated by others. Preparation of the subgrade materials should conform to criteria outlined in the **EARTHWORK** section. A layer of Contech C40 geofabric and Tensar TX160 should be placed above the finished subgrade. A minimum of 12.0 inches of sub-ballast (ARDOT Class 7) should be placed above the grid and fabric. The minimum thickness of ballast should be 15.0 inches from the top of the timber to the top of sub-ballast, which can be accomplished with 8.0 inches of ballast and standard 7.0-inch by 9.0-inch ties. The gradation should be a minimum of AREMA Standard 4A for light duty traffic. Heavy duty traffic would require a gradation of Standard 5. The thicknesses of the materials might require modification based on thicknesses indicated herein to ensure they are adequate.

### **QUALITY CONTROL**

Quality control testing should be utilized in all phases of the construction. To verify that the proper performance of the proposed structures, all fill required should be compacted to a minimum of 95% Modified compaction, in accordance with ASTM D 1557. The excavations should be evaluated to verify the conditions reflected herein and ensure adequacy of subgrade preparation. The compaction of the materials should be verified by tests after the earthwork is completed, so as not to invalidate the design criteria. Our recommendations are based upon adequate quality control testing being utilized and further evaluations and reviews during the construction phase of the project.

## **CONCLUSIONS AND RECOMMENDATIONS**

As a result of this geotechnical investigation, the following recommendations are offered for consideration:

1. All fill required should consist of low PI non-expansive fill and should be placed in 8.0-inch thick lifts and be compacted within two percentage points of optimum moisture content to 95% of Modified Proctor density as per ASTM D 1557. The select fill shall have a PI between 5 and 20 per Section 3.7 of ACI 360R.
2. Undercutting of soft, wet, or unstable soils may be required in supporting areas. The contractor may replace the undercut areas with suitable backfill (PI = 5 to 20) if it is compacted to 95% of Modified Proctor.
3. As an additional temporary measure, rerouting of existing ditches and subsurface drainage should be assured around the planned areas of construction to intercept and drain surface runoff. It would also be a prudent measure to slope backfill soils away from planned construction areas and install all site drainage features as soon as it is practical.
4. Quality control testing should be utilized in construction, undercutting and fill placement phases of construction with adequate testing to verify that the design requirements have been achieved.
5. Geotechnical engineering and testing services are recommended during the earthwork construction phase so that adequate compensation can be made for conditions that may occur which differ significantly from those assumed as a result of this investigation.
6. Other recommendations are given throughout the text of this report.

## **LIMITATIONS**

The boring logs shown in this report contain information related to the types of soil or rock encountered at specific locations and times and show lines delineating the interface between these materials, as well as results of tests performed in the laboratory on representative samples. The logs also contain our field geologist's interpretation of conditions that are believed to exist in those depth intervals between the actual samples taken. Therefore, these boring logs contain both factual and interpretative information. It is not warranted that these logs are representative of subsurface conditions at other locations and times.

The analyses, conclusions, and recommendations contained in this report are based on site conditions as they existed at the time of our field investigation and further on the assumption that the exploratory borings are representative of the subsurface conditions throughout the site. If, during construction, different subsurface conditions from those encountered in our borings are observed, or appear to be present beneath excavations, we must be advised promptly so that we can review these conditions and provide new recommendations as becomes necessary.

Recognize that both natural and manmade events may have changed site conditions since issuance of this report and further review may result. If after submission of this report structural loads or finished grades are changed from those that were assumed, we urge that we be promptly informed, and retained to review our report to determine the applicability of the conclusions and recommendations, considering the changed conditions and/or time lapse. Further, we request that our firm be retained to review those portions of the plans and specifications for this particular project that pertain to earthwork and foundations as a means to determine whether the plans and specifications are consistent with the recommendations contained in the report.

It should be understood that there is the possibility that even with the proper application of current engineering principles, conditions may exist on the site that could not be identified within the scope of this investigation or which were not reasonably identifiable from the available information. The conclusions and recommendations in this report contain all the limitations inherent to the principles and practice of geotechnical engineering. AECI has not performed any observations, investigation, study, or testing that is not specifically listed in the scope of services. Thus, AECI shall not be liable for failing to discover any condition whose discovery required the performance of services outside of the scope of services provided in our proposal.

The conclusions and recommendations contained herein are based on several assumptions regarding grades, anticipated loads, and location of the structure. It is understood that specific information was unavailable at this early stage of planning. It is strongly recommended that this firm be provided a copy of the plans for review upon completion. An in-depth review is considered necessary to verify the recommendations included in the text and their suitability in the final design.

\* \* \* \* \*

**APPENDIX A**  
**PLATES**





## VICINITY MAP

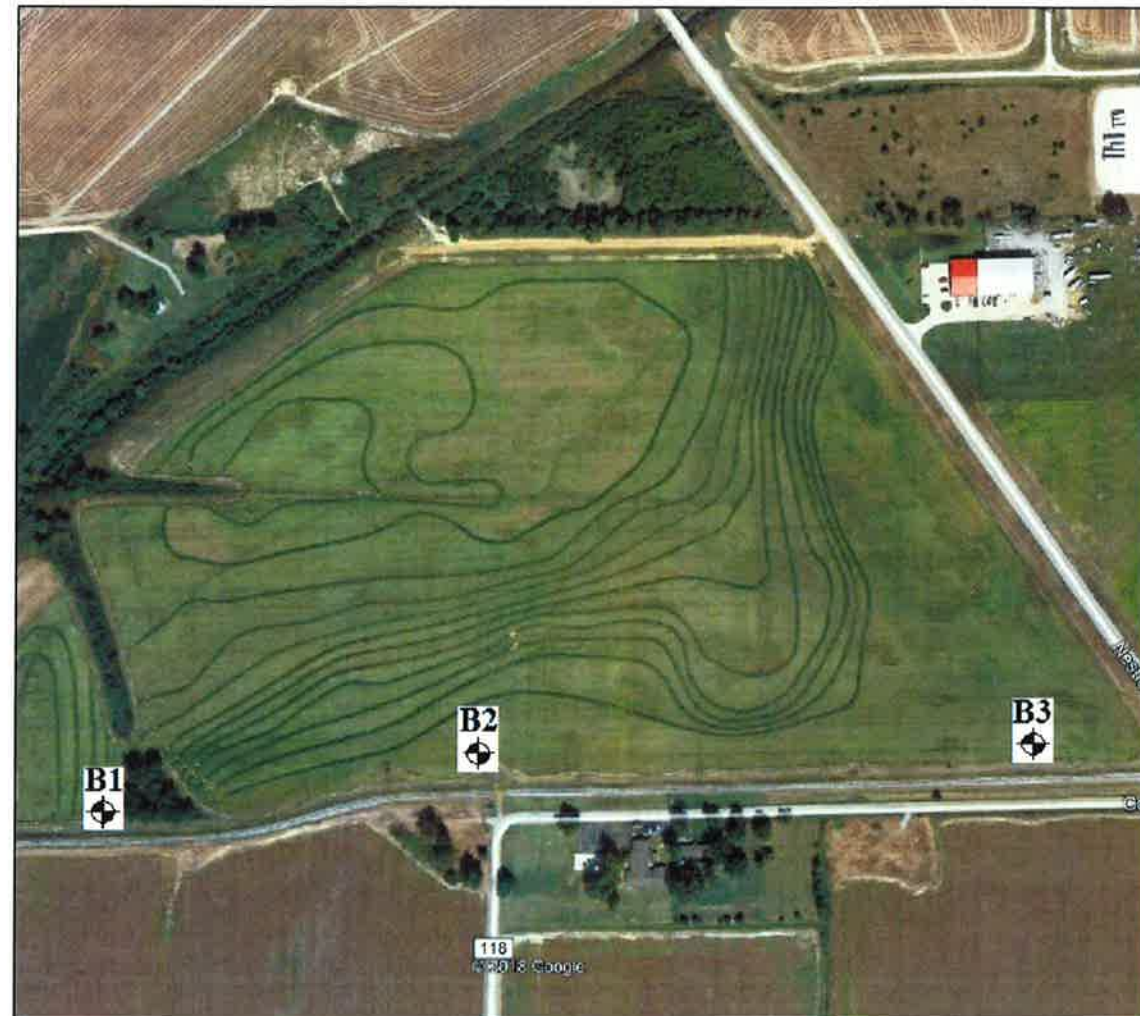
## JONESBORO, ARKANSAS

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NOT DRAWN TO SCALE.



**BORINGS B1 THROUGH B3  
SITE 1**



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Geotechnical Engineering - Environmental Assessments - Quality Control Of Construction Materials



**BORINGS B4 THROUGH B6  
SITE 2**









## PLAN OF BORINGS

**PROPOSED JONESBORO INDUSTRIAL  
LEAD RAIL EXPANSION  
JONESBORO, ARKANSAS**

December 18, 2019

## LOG OF BORING

**PROJECT:** JONESBORO INDUSTRIAL LEAD RAIL EXPANSION **BORING NO:** B1  
**FOR:** JONESBORO, ARKANSAS  
**W. WILLIAM GRAHAM JR., INC**  
**LOCATION:** SEE PLAN OF BORINGS  
**DATE:** 11/21/19 **JOB NO:** 16374 **BORING TYPE:** AUGER W/SPT  
**DRILLER:** BRADBURY **GEOTECHNICIAN:** BRADBURY **GROUND ELEVATION:** NOT FURNISHED  
**SIMCO 2400**

Depth In Feet	Sample Type & No	N-Blows Per Foot	Graphic Symbol	LEGEND		
				S Shelby Tube	NV Diamond Core	P Penetration Test
				Core	Standard Penetration	J - Jar
			Static Water Table	Hydrostatic Water Table	No Recovery	
VISUAL DESCRIPTION OF STRATUM						
0	P1	6		MEDIUM STIFF MOIST BROWN SANDY CLAY (CL) PP = 0.75 KSF		
	P2	17		STIFF TO VERY STIFF MOIST LIGHT GRAY FAT CLAY (CH) PP = 1.75 KSF		
5	P3	11		CONTINUES (CH) PP = 1.25 KSF		
	P4	16		CONTINUES (CH) PP = 1.75 KSF		
10	P5	16		MEDIUM DENSE MOIST BROWN CLAYEY SILTY SAND (SC/SM)		
15	P6	13		MEDIUM DENSE MOIST BROWN SAND (SP)		
20				BOTTOM OF HOLE AT 16.5 FEET. BORING REMAINED OPEN. NO WATER WAS ENCOUNTERED IN THIS BORING.		
25						

# LOG OF BORING

**PROJECT:** JONESBORO INDUSTRIAL LEAD RAIL EXPANSION **BORING NO:** B2  
**FOR:** JONESBORO, ARKANSAS  
W. WILLIAM GRAHAM JR., INC **LOCATION:** SEE PLAN OF BORINGS  
**DATE:** 11/21/19 **JOB NO:** 16374 **BORING TYPE:** AUGER W/SPT  
**DRILLER:** BRADBURY **GEOTECHNICIAN:** BRADBURY **GROUND ELEVATION:** NOT FURNISHED  
SIMCO 2400

Depth In Feet	Sample Type & No	N-Blows Per Foot	Graphic Symbol	LEGEND
				S Shelby Tube NV Diamond Core P Penetration Test Core Standard Penetration J - Jar Static Water Table Hydrostatic Water Table No Recovery
				VISUAL DESCRIPTION OF STRATUM
0	P1	7		MEDIUM STIFF MOIST BROWN SANDY CLAY (CL) PP = 0.75 KSF
	P2	27		VERY STIFF MOIST BROWN FAT CLAY (CH) PP = 2.75 KSF
5	P3	29		MEDIUM DENSE MOIST BROWN CLAYEY SILTY SAND (SC/SM)
	P4	15		MEDIUM DENSE MOIST BROWN SAND (SP)
10	P5	11		CONTINUES (SP)
15	P6	19		CONTINUES (SP)
20				BOTTOM OF HOLE AT 16.5 FEET. BORING REMAINED OPEN. NO WATER WAS ENCOUNTERED IN THIS BORING.
25				

# LOG OF BORING

**PROJECT:** JONESBORO INDUSTRIAL LEAD RAIL EXPANSION **BORING NO:** B3  
**FOR:** JONESBORO, ARKANSAS  
W. WILLIAM GRAHAM JR., INC **LOCATION:** SEE PLAN OF BORINGS  
**DATE:** 11/21/19 **JOB NO:** 16374 **BORING TYPE:** AUGER W/SPT  
**DRILLER:** BRADBURY **GEOTECHNICIAN:** BRADBURY **GROUND ELEVATION:** NOT FURNISHED  
SIMCO 2400

Depth In Feet	Sample Type & No	N-Blows Per Foot	Graphic Symbol	LEGEND
				S Shelby Tube NV Diamond Core P Penetration Test Core Standard Penetration J - Jar Static Water Table Hydrostatic Water Table No Recovery
				VISUAL DESCRIPTION OF STRATUM
0	P1	9		STIFF MOIST BROWN SANDY CLAY (CL) PP = 1.00 KSF
	P2	15		CONTINUES (CL) PP = 1.50 KSF
5	P3	15		CONTINUES (CL) PP = 1.50 KSF
	P4	20		MEDIUM DENSE MOIST BROWN CLAYEY SILTY SAND (SC/SM)
10	P5	21		CONTINUES (SC/SM)
	P6	32		DENSE MOIST BROWN SAND (SP)
15				
20				
25				
				BOTTOM OF HOLE AT 16.5 FEET. BORING REMAINED OPEN. NO WATER WAS ENCOUNTERED IN THIS BORING.





## LOG OF BORING

**PROJECT:** JONESBORO INDUSTRIAL LEAD RAIL EXPANSION **BORING NO:** B4  
 JONESBORO, ARKANSAS  
**FOR:** W. WILLIAM GRAHAM JR., INC **LOCATION:** SEE PLAN OF BORINGS  
**DATE:** 11/21/19 **JOB NO:** 16374 **BORING TYPE:** AUGER W/SPT  
**DRILLER:** BRADBURY **GEOTECHNICIAN:** BRADBURY **GROUND ELEVATION:** NOT FURNISHED  
 SIMCO 2400

Depth In Feet	Sample Type & No	N-Blows Per Foot	Graphic Symbol	LEGEND
				S Shelby Tube NV Diamond Core P Penetration Test Core Standard Penetration J - Jar Static Water Table Hydrostatic Water Table No Recovery
				VISUAL DESCRIPTION OF STRATUM
0	P1	11		STIFF MOIST BROWN SANDY CLAY (CL) PP = 1.25 KSF
	P2	24		VERY STIFF MOIST BROWN CLAY (CL/CH) PP = 2.50 KSF
5	P3	27		CONTINUES (CL/CH) PP = 2.75 KSF
	P4	12		MEDIUM DENSE MOIST BROWN CLAYEY SILTY SAND (SC/SM)
10	P5	13		MEDIUM DENSE MOIST BROWN SAND (SP)
15	P6	16		CONTINUES (SP)
20				BOTTOM OF HOLE AT 16.5 FEET. BORING REMAINED OPEN. NO WATER WAS ENCOUNTERED IN THIS BORING.
25				







## LOG OF BORING

**PROJECT:** JONESBORO INDUSTRIAL LEAD RAIL EXPANSION **BORING NO:** B5  
 JONESBORO, ARKANSAS  
**FOR:** W. WILLIAM GRAHAM JR., INC **LOCATION:** SEE PLAN OF BORINGS  
**DATE:** 11/21/19 **JOB NO:** 16374 **BORING TYPE:** AUGER W/SPT  
**DRILLER:** BRADBURY **GEOTECHNICIAN:** BRADBURY **GROUND ELEVATION:** NOT FURNISHED  
 SIMCO 2400

Depth In Feet	Sample Type & No	N-Blows Per Foot	Graphic Symbol	LEGEND
				S Shelby Tube NV Diamond Core P Penetration Test ■ Core ▣ Standard Penetration ▾ Static Water Table ▿ Hydrostatic Water Table ▮ J - Jar ▯ No Recovery
				VISUAL DESCRIPTION OF STRATUM
0	P1	11		STIFF TO MEDIUM STIFF MOIST BROWN SANDY CLAY (CL) PP = 1.25 KSF
	P2	20		CONTINUES (CL) PP = 2.25 KSF
5	P3	16		CONTINUES (CL) PP = 1.75 KSF
	P4	10		MEDIUM DENSE MOIST BROWN SAND (SP)
10	P5	13		CONTINUES (SP)
15	P6	15		CONTINUES (SP)
20				BOTTOM OF HOLE AT 16.5 FEET. BORING REMAINED OPEN. NO WATER WAS ENCOUNTERED IN THIS BORING.
25				

# LOG OF BORING

**PROJECT:** JONESBORO INDUSTRIAL LEAD RAIL EXPANSION **BORING NO:** B6  
 JONESBORO, ARKANSAS  
**FOR:** W. WILLIAM GRAHAM JR., INC **LOCATION:** SEE PLAN OF BORINGS  
**DATE:** 11/21/19 **JOB NO:** 16374 **BORING TYPE:** AUGER W/SPT  
**DRILLER:** BRADBURY **GEOTECHNICIAN:** BRADBURY **GROUND ELEVATION:** NOT FURNISHED  
 SIMCO 2400

Depth In Feet	Sample Type & No	N-Blows Per Foot	Graphic Symbol	LEGEND		
				S Shelby Tube Core Static Water Table	NV Diamond Core Standard Penetration Hydrostatic Water Table	P Penetration Test J - Jar No Recovery
				VISUAL DESCRIPTION OF STRATUM		
0						
	P1	6		MEDIUM STIFF TO STIFF MOIST BROWN SANDY CLAY (CL) PP = 0.75 KSF		
	P2	11		CONTINUES (CL) PP = 1.25 KSF		
5						
	P3	21		MEDIUM DENSE MOIST BROWN CLAYEY SILTY SAND (SC/SM)		
	P4	18		CONTINUES (SC/SM)		
10						
	P5	11		MEDIUM DENSE MOIST BROWN SAND (SP)		
15						
	P6	12		CONTINUES (SP)		
				BOTTOM OF HOLE AT 16.5 FEET. BORING REMAINED OPEN. NO WATER WAS ENCOUNTERED IN THIS BORING.		
20						
25						

## FIELD CLASSIFICATION SYSTEM FOR SOIL EXPLORATION

### NON COHESIVE SOILS

(Silt, Sand, Gravel and Combinations)

#### Density

Very Loose	- 0 - 4 blows/ft.
Loose	- 4 to 10 blows/ft.
Medium Dense	- 10 to 30 blows/ft.
Dense	- 30 to 50 blows/ft.
Very Dense	- over 50

#### Particle Size Identification

Boulders	- 8-inch diameter or more
Cobbles	- 3 to 8-inch diameter
Gravel	- Coarse - 1 to 3-inch
	Medium - ½ to 1-inch
	Fine - ¼ to ½-inch
Sand	- Coarse - 0.6 mm to ¼-inch (dia. of pencil lead)
	Medium - 0.2 mm to 0.6 mm (dia. of broom straw)
	Fine - 0.05 mm to 0.2 mm (dia. of human hair)
Silt	- 0.06 mm to 0.002 mm (Cannot see particles)

#### Relative Proportions

Descriptive Term	Percent
Trace	1 - 10
Little	11 - 20
Some	21 - 35
And	36 - 50

### COHESIVE SOILS

(Clay, Silt and Combinations)

#### Consistency

Very Soft	- < 2 blows/ft.
Soft	- 2 to 4 blows/ft.
Medium Stiff	- 4 to 8 blows/ft.
Stiff	- 8 to 15 blows/ft.
Very Stiff	- 15 to 30 blows/ft.
Hard	- over 30

#### Plasticity

Degree of Plasticity	Plasticity Index
None to slight	0 - 4
Slight	5 - 7
Medium	8 - 22
High to Very High	over 22

### NOTES

Classification on logs are made by visual inspection.

Standard Penetration Test - Driving a 2.0-inch O.D., 1⅝-inch I.D., sampler a distance of 1.0 foot into undisturbed soil with a 140-pound hammer free falling a distance of 30.0 inches. It is customary for AECI to drive the spoon 6.0 inches to seat into undisturbed soil, then perform the test. The number of hammer blows for seating the spoon and making the tests are recorded for each 6.0 inches of penetration on the drill log (Example: 6/8/9). The standard penetration test results can be obtained by adding the last two figures (i.e., 8 + 9 = 17 blows/ft.).

Strata Changes - In the column "Soil Descriptions" on the drill log the horizontal lines represent strata changes. A solid line (-----) represents an actually observed change, a dashed line (- - -) represents an estimated change.

Groundwater observations were made at the times indicated. Porosity of soil strata, weather conditions, site topography, etc., may cause changes in the water levels indicated on the logs.



## KEY TO SOIL CLASSIFICATIONS AND SYMBOLS

UNIFIED SOIL CLASSIFICATION SYSTEM(1)					TERMS CHARACTERIZING SOIL STRUCTURE(2)	
Major Divisions		Letter	Symbol	Name		
			Hatching	Color		
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	GW		RED	Well-graded gravels or gravel-sand mixtures, little or no fines	SLICKENSIDED - having inclined planes of weakness that are slick and glossy in appearance.
		GP			Poorly-graded gravels or gravel-sand mixtures, little or no fines	
		GM		YELLOW	Silty gravels, gravel-sand-silt mixtures	LAMINATED (VARVED) - composed of thin layers of varying color and texture, usually grading from sand or silt at the bottom to clay at the top.
		GC			Clayey gravels, gravel-sand-clay mixtures	
	SAND AND SANDY SOILS	SW		RED	Well-graded sands or gravelly sands, little or no fines	CRUMBLY - cohesive soils which break into small blocks or crumbs on drying.
		SP			Poorly-graded sands or gravelly sands, little or no fines	
		SM		YELLOW	Silty sands, sand-silt mixtures	WELL GRADED - having wide range in grain sizes and substantial amounts of all intermediate particle sizes.
		SC			Clayey sands, sand-clay mixtures	
FINE GRAINED SOILS	SILTS AND CLAYS LL<50	ML		GREEN	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity	SYMBOLS FOR TEST DATA
		CL			Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays	
		OL			Organic silts and organic silt-clays of low plasticity	
	SILTS AND CLAYS LL>50	MH		BLUE	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts	
		CH			Inorganic clays of high plasticity, fat clays	
		OH			Organic clays of medium to high plasticity, organic silts	
HIGHLY ORGANIC SOILS	Pt		ORANGE	Peat and other highly organic soils		
TERMS DESCRIBING CONSISTENCY OF SOILS(2)						
COARSE GRAINED SOILS			FINE GRAINED SOILS			
DESCRIPTIVE TERM	NO. BLOWS/FOOT STANDARD PEN. TEST		DESCRIPTIVE TERM	NO. BLOWS/FOOT STANDARD PEN. TEST	UNCONFINED COMPRESSION TONS PER SQ. FT.	
Very Loose	0 - 4		Very Soft	<2	<0.25	
Loose	4 - 10		Soft	2 - 4	0.25 - 0.50	
Firm (medium dense)	10 - 30		Plastic (medium stiff)	4 - 8	0.50 - 1.00	
Dense	30 - 50		Stiff	8 - 15	1.00 - 2.00	
Very Dense	over 50		Very Stiff	15 - 30	2.00 - 4.00	
			Hard	over 30	over 4.00	
Field classification for "Consistency" is determined with a 0.25-inch diameter penetrometer.						
(1) - From Waterways Experiment Station Technical Memorandum No. 3-357						
(2) - From "Soil Mechanics in Engineering Practice" by Terzaghi and Peck						

## UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D 2487)

Major divisions			Group Symbols	Typical Names	Laboratory Classifications Criteria							
<div>Coarse-grained soils (More than half of material is larger than No. 200 sieve size)</div> <div>Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows: Less than 5 percent ..... GW, GP, SW, SP More than 12 percent ..... GM, GC, SM, SC 5 to 12 percent ..... Borderline cases requiring dual symbols **</div>					$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3							
					Not meeting all gradation requirements for GW							
					Atterberg limits below "A" line or P.I. less than 4		Above "A" line with P.I. Between 4 and 7 are borderline cases requiring use of dual symbols					
					Atterberg limits above "A" line with P.I. greater than 7							
					$C_u = \frac{D_{60}}{D_{10}}$ greater than 6; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3							
					Not meeting all gradation requirements for SW							
					Atterberg limits below "A" line or P.I. less than 4		Limits plotting in hatched zone with P.I. between 4 and 7 are borderline cases requiring use of dual symbols					
					Atterberg limits above "A" line with P.I. greater than 7							
					<div>Fine-grained soils (More than half of material is smaller than No. 200 sieve)</div> <div>Plasticity Index</div> <div><div>Plasticity Chart</div></div>							

\*Division of GM and SM groups into subdivisions of d and u are for roads and airfield only. Subdivision is based on Atterberg limits; suffix d used when L.L. is 28 or less and the P.I. is 6 or less; u used when L.L. is greater than 24.

\*\*Borderline classifications, used for soils possessing characteristics of two groups, are designated by combinations of group symbols. For example GW-GC, well-graded gravel-sand mixture with clay binder.

**APPENDIX B**  
**SUPPORTING LABORATORY DATA**

**MOISTURE CONTENT DETERMINATION**  
**ASTM D 2216**

**Project:** JONESBORO INDUSTRIAL LEAD RAIL

**Project No.:** 16374

**Location:** JONESBORO, ARKANSAS

**Date:** 12/09/19

MOISTURE CONTENT			
Sample Number	B3;P1	B3;P2	B3;P3
Tare Number	FM	F	III
Tare + Wet Soil (g)	180.75	163.21	173.32
Tare + Dry Soil (g)	149.77	132.14	146.23
Tare (g)	11.80	11.14	11.75
Water (g)	30.98	31.07	27.09
Dry Soil (g)	137.97	121.00	134.48
Water Content (%)	<b>22.45</b>	<b>25.68</b>	<b>20.14</b>

## ATTERBERG LIMIT DETERMINATION ASTM D 4318

**Project:** JONESBORO INDUSTRIAL LEAD RAIL

**Project No.:** 16374

**Location:** JONESBORO, ARKANSAS

**Date:** 12/10/19

### LIQUID LIMIT

Sample Number	B1;P2	B2;P2	B3;P1	B3;P3	B4;P2	B6;P1	B6;P3
Tare Number	R	71A	B44	1	71	MC	G20
Number of Blows	28	28	23	27	22	23	23
Tare + Wet Soil (g)	32.63	18.54	29.71	33.37	33.69	21.79	33.34
Tare + Dry Soil (g)	25.32	15.01	24.93	27.65	25.81	18.61	28.43
Tare (g)	11.73	7.87	10.25	10.51	8.45	7.85	11.30
Water (g)	7.31	3.53	4.78	5.72	7.88	3.18	4.91
Dry Soil (g)	13.59	7.14	14.68	17.14	17.36	10.76	17.13
Water Content (%)	53.79	49.44	32.56	33.37	45.39	29.55	28.66
Liquid Limit	55	50	32	34	45	29	28

### PLASTIC LIMIT

Sample Number	B1;P2	B2;P2	B3;P1	B3;P3	B4;P2	B6;P1	B6;P3
Tare Number	BC	LP	E20	E4	63	18	NP
Tare + Wet Soil (g)	19.83	17.93	21.62	19.08	18.67	17.23	22.35
Tare + Dry Soil (g)	17.81	16.36	19.58	17.82	17.11	15.42	20.39
Tare (g)	7.94	8.05	11.17	9.83	8.27	8.17	11.65
Water (g)	2.02	1.57	2.04	1.26	1.56	1.81	1.96
Dry Soil (g)	9.87	8.31	8.41	7.99	8.84	7.25	8.74
Water Content (%)	20.47	18.89	24.26	15.77	17.65	24.97	22.43
Plastic Limit	20	19	24	16	18	25	22
Plasticity Index	35	31	8	18	27	4	6
Classification (#40)	CH	CH	ML	CL	CL	ML	CL-ML

**MECHANICAL GRAIN SIZE ANALYSES**  
**ASTM D 1140**

**Project:** JONESBORO INDUSTRIAL LEAD RAIL **Project No.:** 16374  
**Location:** JONESBORO, ARKANSAS **Date:** 12/10/19  
**Sample No.:** B1;P1 **Sample Depth:** 0'-1.5'  
**Soil Description:** GRAY & BROWN LEAN CLAY W/ SAND

Sieve or Screen	Weight Retained (grams)	Cumulative Weight Retained (grams)	Percent Retained	Percent Passing
#200	77.1	77.1	21.0	79.0
PAN	289.8	366.9	100.0	0.0
<b>Percent Sample Gravel/Sand:</b>		21.0	<b>Sample Weight:</b> 366.9	
<b>Percent Sample Silt/Clay:</b>		79.0	<b>Washing Loss:</b> 289.8g	

**Project:** JONESBORO INDUSTRIAL LEAD RAIL **Project No.:** 16374  
**Location:** JONESBORO, ARKANSAS **Date:** 12/10/19  
**Sample No.:** B1;P3 **Sample Depth:** 5'-6.5'  
**Soil Description:** GRAY FAT CLAY

Sieve or Screen	Weight Retained (grams)	Cumulative Weight Retained (grams)	Percent Retained	Percent Passing
#200	61.6	61.6	13.1	86.9
PAN	409.9	471.5	100.0	0.0
<b>Percent Sample Gravel/Sand:</b>		13.1	<b>Sample Weight:</b> 471.5	
<b>Percent Sample Silt/Clay:</b>		86.9	<b>Washing Loss:</b> 409.9g	

## MECHANICAL GRAIN SIZE ANALYSES ASTM D 1140

**Project:** JONESBORO INDUSTRIAL LEAD RAIL **Project No.:** 16374  
**Location:** JONESBORO, ARKANSAS **Date:** 12/10/19  
**Sample No.:** B3;P2 **Sample Depth:** 2.5'-4'  
**Soil Description:** LIGHT GRAY & LIGHT BROWN LEAN CLAY

Sieve or Screen	Weight Retained (grams)	Cumulative Weight Retained (grams)	Percent Retained	Percent Passing
#200	34.8	34.8	6.1	93.9
PAN	535.0	569.8	100.0	0.0
<b>Percent Sample Gravel/Sand:</b>		6.1	<b>Sample Weight:</b> 569.8	
<b>Percent Sample Silt/Clay:</b>		93.9	<b>Washing Loss:</b> 535.0g	

**Project:** JONESBORO INDUSTRIAL LEAD RAIL **Project No.:** 16374  
**Location:** JONESBORO, ARKANSAS **Date:** 12/10/19  
**Sample No.:** B3;P4 **Sample Depth:** 7.5'-9'  
**Soil Description:** LIGHT BROWN & LIGHT GRAY SAND W/ SILT

Sieve or Screen	Weight Retained (grams)	Cumulative Weight Retained (grams)	Percent Retained	Percent Passing
#200	335.6	335.6	91.2	8.8
PAN	32.4	368.0	100.0	0.0
<b>Percent Sample Gravel/Sand:</b>		91.2	<b>Sample Weight:</b> 368	
<b>Percent Sample Silt/Clay:</b>		8.8	<b>Washing Loss:</b> 32.4g	

**MECHANICAL GRAIN SIZE ANALYSES**  
**ASTM D 1140**

**Project:** JONESBORO INDUSTRIAL LEAD RAIL **Project No.:** 16374  
**Location:** JONESBORO, ARKANSAS **Date:** 12/10/19  
**Sample No.:** B4;P1 **Sample Depth:** 0'-1.5'  
**Soil Description:** GRAY & BROWN SANDY LEAN CLAY

Sieve or Screen	Weight Retained (grams)	Cumulative Weight Retained (grams)	Percent Retained	Percent Passing
#200	151.3	151.3	31.8	68.2
PAN	324.7	476.0	100.0	0.0
<b>Percent Sample Gravel/Sand:</b>		31.8	<b>Sample Weight:</b> 476	
<b>Percent Sample Silt/Clay:</b>		68.2	<b>Washing Loss:</b> 324.7g	

**Project:** JONESBORO INDUSTRIAL LEAD RAIL **Project No.:** 16374  
**Location:** JONESBORO, ARKANSAS **Date:** 12/10/19  
**Sample No.:** B4;P3 **Sample Depth:** 5'-6.5'  
**Soil Description:** GRAY & REDDISH BROWN LEAN CLAY

Sieve or Screen	Weight Retained (grams)	Cumulative Weight Retained (grams)	Percent Retained	Percent Passing
#200	42.5	42.5	9.7	90.3
PAN	397.1	439.6	100.0	0.0
<b>Percent Sample Gravel/Sand:</b>		9.7	<b>Sample Weight:</b> 439.6	
<b>Percent Sample Silt/Clay:</b>		90.3	<b>Washing Loss:</b> 397.1g	



**MECHANICAL GRAIN SIZE ANALYSES**  
**ASTM D 1140**

**Project:** JONESBORO INDUSTRIAL LEAD RAIL **Project No.:** 16374  
**Location:** JONESBORO, ARKANSAS **Date:** 12/10/19  
**Sample No.:** B6;P2 **Sample Depth:** 2.5'-4'  
**Soil Description:** GRAY & REDDISH BROWN LEAN CLAY

Sieve or Screen	Weight Retained (grams)	Cumulative Weight Retained (grams)	Percent Retained	Percent Passing
#200	40.9	40.9	9.4	90.6
PAN	393.0	433.9	100.0	0.0
<b>Percent Sample Gravel/Sand:</b>		9.4	<b>Sample Weight:</b> 433.9	
<b>Percent Sample Silt/Clay:</b>		90.6	<b>Washing Loss:</b> 393.0g	

<b>Project:</b>	JONESBORO INDUSTRIAL LEAD RAIL	<b>Project No.:</b>	16374	
<b>Location:</b>	JONESBORO, ARKANSAS	<b>Date:</b>	12/10/19	
<b>Sample No.:</b>	B6;P4	<b>Sample Depth:</b>	7.5'-9'	
<b>Soil Description:</b>	LIGHT BROWNISH GRAY SILT			
Sieve or Screen	Weight Retained (grams)	Cumulative Weight Retained (grams)	Percent Retained	Percent Passing
#200	31.4	31.4	10.1	89.9
PAN	280.1	311.5	100.0	0.0
<b>Percent Sample Gravel/Sand:</b>		10.1	<b>Sample Weight:</b> 311.5	
<b>Percent Sample Silt/Clay:</b>		89.9	<b>Washing Loss:</b> 280.1g	