

PART 1 - GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE

- A. The provisions and intent of the Contract, including the General Conditions and General Requirements, apply to this work as if specified in this section.

1.02 DESCRIPTION OF WORK

- A. This Section specifies the material requirements and performance criteria for railroad track materials to be furnished by the Contractor in accordance with the Contract Drawings.
- B. Except as modified herein, materials shall be designed, manufactured, tested, assembled, inspected, handled and shipped in accordance with the current edition of the American Railway Engineering and Maintenance-of-Way Association (AREMA) Portfolio of Trackwork Plans, and the AREMA Manual of Railway Engineering.
- C. The contract includes the requirements for providing railroad track materials including rail, ties and other track materials.
- D. See Section 34 11 23 “Special Trackwork” for additional special trackwork specifications.

1.03 REFERENCED STANDARDS

- A. Comply with all applicable local, State and Federal codes provisions of most recent edition, including all addenda, of following codes, specifications, standards, and recommended practices, except as otherwise indicated:
 1. AREMA MANUAL – American Railway Engineering and Maintenance-of-Way Association, Manual for Railway Engineering
 2. AREMA PORTFOLIO – American Railway Engineering and Maintenance-of-Way Association, Portfolio of Trackwork Plans
 3. FRA-DOT – Federal Railroad Administration, Department of Transportation

1.04 SUBMITTALS

- A. Certification of Rail
 1. Contractor to provide Certifications of compliance from suppliers or manufacturers that rail delivered to the site is in conformance with AREMA Specifications Chapter 4, Part 1 Design of Rail and Part 2 Manufacture of Rail.
 2. The chemical analysis of the rails listed by heat number, and the specified chemical analysis elements.
 3. The Brinell hardness of the rails shipped by heat numbers.
- B. Gage Rods: Provide catalog cut sheet.
- C. Bill of Materials: Submit a complete bill of materials for all supplied railroad materials, including but not limited to, all rail and rods.

1.05 QUALITY ASSURANCE

- A. Testing and inspection shall conform to the AREMA Manual, AREMA Portfolio and these specifications.
- B. The Contractor shall own a copy of the American Railway Engineering and Maintenance-of-Way Association - Manual for Railway Engineering (AREMA); current edition, Chapters 1, 4, 5, and 30.
- C. The Contractor shall notify the Engineer five (5) business days in advance of all material delivery. Upon delivery, any material identified as unsatisfactory, at the discretion of the Engineer, will be loaded back on to the delivery truck and sent back to the Contractor's plant at the Contractor's expense.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Furnish all track materials and products as shown and quantified on the contract documents. Materials shall conform in all regards to the AREMA Manual of Railway Engineering, except as otherwise noted herein and on the contract drawings.
- B. Rail and other track material shall be new, fabricated in the United States or Canada. Rail shall be 115RE as shown on the Drawings. There is not a Buy America contract requirement.

2.02 RAIL

- A. The Contractor shall provide new rail, except as allowed in the bid alternate, see Offer Sheet. All rail shall be 115 RE, as shown on the Drawings, meeting the requirements of AREMA Manual, Chapter 4, Part 2, Specification Section "Specifications for Steel Rails". The Contractor shall provide high strength head hardened rail. High strength head hardened rail shall have a minimum surface Brinell Hardness number of 370.
- B. The rail shall be 80 feet lengths.
- C. Bolt holes within the rail are not acceptable, except at the ends of the rail at locations where joint bars are used.
- D. Rail provided under track pavement shall not be drilled. All other rail shall be end drilled according to the Contract Drawings.
- E. The rail section shall conform to the dimensions shown in AREMA Manual, Chapter 4, Part 1 for 115 RE.

2.02 SECOND HAND (RELAY) RAIL

- A. The Contractor shall provide a bid alternate unit price for 115 RE second hand (relay) rail meeting the following requirements:
 1. Relay rail shall conform to AREMA specifications for Class 1 relay rail or better.
 2. Relay rail shall be appropriately marked so that it is easily distinguished from new rail.
 3. Relay rail shall be 39 feet or 80 feet lengths.

DIVISION 34 – TRANSPORTATION
SECTION 34 05 17 – RAILROAD WORK

2.03 TIE PLATES

See Section 34 11 32 “Timber Ties”

2.04 ELASTIC RAIL CLIPS

See Section 34 11 32 “Timber Ties”

2.05 SCREW SPIKES

See Section 34 11 32 “Timber Ties”

2.06 GAGE RODS

- A. Gage rods shall be manufactured to fit the specified rail, shall be manufactured from 1-1/4-inch diameter steel bar with double adjustable clamps at both ends to grip both sides of the rail, and shall be set for standard gage track.

PART 3 – EXECUTION

NOT USED

END OF SECTION

PART 1 - GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE

- A. The provisions and intent of the Contract, including the General Conditions and General Requirements, apply to this work as if specified in this section.

1.02 DESCRIPTION OF WORK

- A. This Section specifies the material requirements and performance criteria for complete special trackwork including turnouts to be furnished in accordance with the Contract Drawings.
- B. Except as modified herein, special trackwork shall be designed, manufactured, tested, assembled, inspected, handled and shipped in accordance with the current edition of the American Railway Engineering and Maintenance-of-Way Association (AREMA) Portfolio of Trackwork Plans, and the AREMA Manual of Railway Engineering.

1.03 REFERENCE STANDARDS

- A. Comply with all applicable local, State and Federal codes provisions of most recent edition, including all addenda, of following codes, specifications, standards, and recommended practices, except as otherwise indicated:
 1. AREMA MANUAL – American Railway Engineering and Maintenance-of-Way Association, Manual for Railway Engineering
 2. AREMA PORTFOLIO – American Railway Engineering and Maintenance-of-Way Association, Portfolio of Trackwork Plans
 3. FRA-DOT – Federal Railroad Administration, Department of Transportation

1.04 QUALITY ASSURANCE

- A. All special trackwork specified shall be standardized throughout the project trackage. Mixing and matching of different materials from different suppliers shall not be permitted. All furnished special trackwork assemblies shall be furnish from a single supplier.
- B. Testing and inspection shall conform to the AREMA Manual, AREMA Portfolio and these specifications.
- C. The Contractor shall notify the Engineer five (5) business days in advance of all material delivery.
 1. Upon delivery, any material identified as unsatisfactory or deficient, at the discretion of the Engineer, will be loaded back on to the delivery truck and sent back to the Contractor's plant at the Contractor's expense.
 2. If identified deficiencies require replacement, modification, or repair of special trackwork components, the Engineer and Engineer's representative may perform site inspections at the Contractor's plant prior to any additional trackwork material shipments. Site inspections shall be at the Contractor's expense, and the Contractor shall make available all tools, measuring devices, materials, and personnel typical of material inspection and quality assurance review.

1.05 SUBMITTALS

- A. All special trackwork shall be provided by the Contractor in exact accordance with the Contract Documents. All material provided in this manner will not require a shop drawing submittal or review.
- B. The Contractor shall submit, under the provisions of Section 01 33 00, "SUBMITTALS PROCEDURES", the following information:
 1. Within 14 days of an executed purchase order, the Contractor shall submit shop drawings and certificates for any and all deviations of the special trackwork materials from the Contract Drawings. All special trackwork submittals shall be approved by the Engineer prior to beginning manufacture or fabrication of submitted material or component.
 2. Bill of Materials: Upon delivery, submit a complete bill of materials for all supplied special trackwork materials.

1.06 CORRELATION OF THE CONTRACT DOCUMENTS

- A. In the event of a conflict or discrepancy between or among the Contract Documents with respect to the Special Trackwork, the conflict or discrepancy will be resolved by means of the Contract Drawings taking the highest priority over the specifications herein. This requirement is a variance to the precedence described in Section 00 72 00 General Conditions and applies only to the special trackwork.

PART 2 - PRODUCTS

2.01 GENERAL

- A. The following specifications shall be followed in conjunction with the Contract Drawings for a No 9 Turnout. The Contract Drawings shall be consulted first and take priority over the written specifications for all of the following special trackwork components, see Article 1.06.

2.02 TURNOOTS

- A. Turnouts shall be No. 9 turnouts with rail bound manganese frogs fabricated in accordance with the BNSF/Union Pacific Common Standards except as modified in the Contract Drawings and in the specifications herein. See Article 2.01 for discussion on order of priority.
- B. Rail and frog castings shall be new, fabricated in the United States or Canada. Rail shall be 115RE as shown on the Drawings and conform to Section 34 05 17 "Railroad Work". There is not a Buy America contract requirement.
- C. Turnouts shall have 16'-6" switch points with graduated risers. Turnouts shall be furnished with appurtenant hardware for hand throw switches as indicated in the Contract Drawings and in these specifications and as directed by the Engineer. Switch points shall be Samson undercut type and be manufactured per AREMA Specifications for Special Trackwork and with AREMA Plan No. 221-12 Detail 5100 and modified as required to meet the geometry and accommodate appurtenances shown on Contract Drawings, including drilling for horizontal switch rods with transit style clips. Samson points shall be head hardened and double reinforced with transit style clips. Turnouts shall include curved, straight, closure rails utilizing 115 RE rail

with screw spikes and elastic fasteners. Switches shall have manganese tips per AREMA Plan No. 220-08.

- D. Guardrails shall be new, 13'-0" long, conform to AREMA Plan No. 504-03, shall be set according to AREMA Plan No. 502 and fastened with screw spike plates and elastic fasteners.
- E. The special trackwork components shall be designed to be hand thrown capable of providing 300 pounds of force at mid-stroke and 500 pounds of force at the end of the throw.
- F. Frogs shall be one piece, rail-bound manganese, and heavy walled. Contractor shall use resilient fastening system for all frog base plates and gage plates.
- G. Frogs shall conform to AREMA Portfolio of Trackwork Plans, Plan No. 623-03, 16' rail bound manganese steel frog for 115 RE rail with screw spike plates and elastic fasteners. Frogs shall be drilled for three (3) bolts to match the specified rail.
- H. The arm ends of the frogs shall be beveled as per AREMA Portfolio Plan No. 1005-03 "Beveling of Rail Ends for Special Trackwork". Rail bending shall be done with great care to avoid stress build up and injury to the rails. Rail shall be bent cold whenever possible. If heating the rail should be necessary, the surface temperature of the rail shall not exceed 800° F and the surface of the remainder of the rail section shall not exceed 1100° F. Heating shall be done in a manner so as to have a minimal adverse effect on the metal.
- I. All switch ties shall be provided by the Contractor and shall conform to Section 34 11 32 "Timber Ties".
- J. Switch point guards shall be furnished for all switches. Switch point guards shall be boltless adjustable switch point guard Model U69 as manufactured by A&K Railroad Materials, or approved equal. Switch point guards shall be furnished with appropriate switch plates and mounting hardware.
- K. Switch stands shall be Racor Model 22-E trailable, adjustable switch stands with low banner, "Backsaver" handle, adjustable connecting rod and bolts with lock washers and cotter pins. The bolt hole in the switch stands, connecting rods and switch rods (42-inches) shall all be the same matching diameter with matching size bolts. Mismatch of bolts and bolt holes will be cause for rejection.
- L. Turnouts shall be of bolted design. All switch bolts shall be designed for use with cotter pins and shall be installed with lock washers for cotter pins.
- M. Switch rods and clips shall be insulated. Switch rods shall be horizontal and conform to AREMA Plan No. 222-03. Switch rods shall conform to AREMA Specification Section M6. The Contractor shall furnish switch rods with all associated slide and runoff plates.
- N. Switch rods shall conform to the AAR Signal Manual, Part 14.5.3, Signal Specifications, "Recommended Developmental Criteria for Insulating Material".
 - 1. Fiber angles, plates and end posts shall be fabricated of fiberglass mat reinforced polyester, 3/16-inch thick, GPO- I sheet stock, NEMA Class B.
 - 2. Fiber bushings shall be fabricated of NEMA Grade 10 epoxy glass fabric.
 - 3. All cut edges of fiberglass shall be sealed with Sherwin Williams Polane, 2-part coatings or an accepted equal.

4. Prior to assembly, all contact metal surfaces shall be painted with General Electric Insulating Enamel, Red Glyptol No. 1202 or equal.
- O. Gage Plates
 1. Plates shall conform to the AREMA "Specifications for Special Trackwork", Section M7, rolled "Mild Steel".
 2. Insulation shall conform to the AAR Signal Manual, Part 116, Signal Specifications, "Assembly and Test of Insulated Track Fittings".
 3. Insulated gage plates shall be provided for all turnouts.

2.03 RAIL

- A. Rail shall be new 115 RE as shown on the Drawings, head hardened rail for turnouts and conform to Section 34 05 17 "Railroad Work". Bid Alternate relay rail shall not be used in the turnouts.

2.04 JOINT BARS:

- A. Joint bars shall conform to the AREMA Manual, Chapter 4, Part 3 "Joining of Rail", Section 3.1 and 3.2. Joint Bars shall be 6-hole, 36 inches long, conforming to the AREMA Manual for Railway Engineering, Section 3.2 "Joint Bars and Assemblies."
- B. The bars shall be smoothly rolled, or forged, true to template and shall accurately fit the rails for which they are intended and shall provide a true alignment of the gage and running surfaces of the two rails being connected. A variation of $\pm 1/32$ inch from the specified size of holes, or $\pm 1/16$ inch from the specified location of holes, and of $\pm 1/8$ inch from the specified length of joint bar will be permitted.
- C. Joint Bars shall be provided with the full number of bolts, nuts and lockwashers.
- D. The Contractor shall provide joint bars for all joints internal to the turnout.

2.05 TRACK BOLTS, NUTS, AND SPRING WASHERS

- A. Track bolts and square nuts shall be new, conforming to the current AREMA Manual, Chapter 4, Part 3, "Specifications for Heated Treated Carbon Steel Track Bolts and Carbon Steel Nuts". Spring washers shall be new conforming to the current AREMA manual Chapter 4, Part 2, "Specification for Spring Washers". For each track bolt, provide a square nut and spring washer of proper size for each bolt.
- B. The Contractor shall provide all track bolts, nuts and washers necessary to build a complete turnout with all appurtenances identified in the Contract Documents.

2.06 SWITCH TIES

- A. Switch ties shall conform to Section 34 11 32, "Timber Ties".

2.07 OTHER TRACK MATERIAL

- A. Other track material, including, but not limited to, tie plates, elastic clips and screw spikes, shall conform to Sections 34 05 17 "Railroad Work" and 34 11 32, "Timber Ties".

PART 3 – EXECUTION

NOT USED

END OF SECTION

PART 1 - GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE

- A. The provisions and intent of the Contract, including the General Conditions and General Requirements, apply to this work as if specified in this section.

1.02 DESCRIPTION OF WORK

- A. The Work of this Section consists of the furnishing, handling, and installation of timber cross ties and switch ties for use in railroad track construction.

1.03 REFERENCED STANDARDS:

- A. Comply with all applicable local, State and Federal codes provisions of most recent edition, including all addenda, of following codes, specifications, standards, and recommended practices, except as otherwise indicated:
 1. AREMA MANUAL – American Railway Engineering and Maintenance-of-Way Association, Manual for Railway Engineering
- B. AMERICAN WOOD-PRESERVERS' ASSOCIATION (AWPA)
 1. A1 - Analysis of Creosote and Oil-Type Preservatives
 2. M2 - Standard for Inspection of Treated Timber Products

1.04 SUBMITTALS:

- A. Submit the name, address and phone number of the timber tie supplier.
- B. Submit the completed inspectors report form as described by AWPA M2 Standard for Inspection of Treated Timber Products, including step by step work sheets of preservative analysis and retention analysis. Submit to the Engineer prior to shipment of the ties from the treatment plant.
- C. Submit Certificates of Compliance that ties comply with these specifications, AREMA specifications and AWPA standards prior to shipping timber ties.
- D. Certification of Tie Plates
 1. Contractor to provide Certifications of compliance from suppliers or manufacturers that Tie Plates delivered to the site are in conformance with AREMA Specifications Chapter 5, Part 1 Tie Plates and these specifications.
 2. Contractor to provide shop drawing detailing all tie plates using elastic fasteners.
- E. Certification of Elastic Fasteners on Timber Ties
 1. Contractor to provide Certifications of compliance from suppliers or manufacturers that Elastic Fasteners delivered to the site are in conformance with AREMA Specifications Chapter 5, Part 9, Design Qualification Specifications for Elastic Fasteners of Timber Cross Ties.
 2. Contractor to provide shop drawing detailing elastic fasteners and clamping force.
- F. Certification of Screw Spikes

1. Contractor to provide Certifications of compliance from suppliers or manufacturers that Screw Spikes delivered to the site are in conformance with AREMA Specifications Chapter 5, Part 10, Section 10.1 Steel Screw Spikes.
- G. Submit a complete bill of ties for all supplied crossties and switch ties.
- H. Bill of Materials: Submit a complete bill of materials for all supplied railroad materials, including but not limited to, all fasteners and plates.

1.05 QUALITY ASSURANCE

- A. The Contractor shall notify the Engineer five (5) business days in advance of all material delivery. Upon delivery, any material identified as unsatisfactory, at the discretion of the Engineer, will be loaded back on to the delivery truck and sent back to the Contractor's plant at the Contractor's expense.

PART 2 - PRODUCTS

2.01 TIMBER TIES:

- A. General:
 1. Crossties and switch ties shall meet the requirements of AREMA Chapter 30 Part 3.
 2. All crossties shall be pre-plated, except for the quantities listed on the Offer Sheet.
- B. Material:
 1. The following woods can be used for crossties and switch ties:
 - a. Mixed hardwood consisting of black or honey locust, red or white oak.
- C. Physical Requirements:
 1. Except as hereinafter provided, all ties shall be free from any defects that may impair their strength or durability as crossties or switch ties, such as decay, large splits, large shakes, slanting grain, or large or numerous holes or knots.
- D. Design:
 1. Standard crossties shall be 7" x 9" x 8'-6". Crossties under pavement shall be 7" x 9" x 10'-0". Thickness, width, and length specified are minimum dimensions for green ties. Dry or treated ties may be 1/4 inch thinner or narrower than the specified sizes. Ties exceeding these dimensions by more than 1 inch shall be rejected. The grade of each tie shall be determined at the point of most wane on the top face of the tie within the rail-bearing areas. The rail-bearing areas are those sections between 20 inches and 40 inches from the center of the tie. The top of the tie shall be the narrowest face and/or the horizontal face farthest from the heart or pith center.
 2. Switch ties shall be sized as shown on the Contract Drawings.
 3. All rail-bearing areas shall measure as follows: 7-inch grade crossties shall be 7" x 9" in cross section with a maximum of 1 inch of wane (uncut edge) in the top rail-bearing areas. A maximum of 20% of the ties in any given quantity may be square-sawn 7" x 8" in cross section with no wane in the rail-bearing areas. Wane shall be

permitted on the bottom face so long as it does not exceed 1 inch at any given point.

E. Inspection:

1. Place: Ties will be inspected when delivered on site, see Article 1.05.
2. Decay: Decay is the disintegration of the wood substance due to the action of wood destroying fungi. "Blue stain" is not decay and is permissible in any wood.
3. Holes: A large hole is one more than 1/2 inch in diameter and 3 inches deep within, or more than one-fourth the width of the surface on which it appears and 3 inches deep outside, the sections of the tie between 20 inches and 40 inches from its middle. Numerous holes are any number equaling a large hole in damaging effect. Such holes may be caused in manufacture or otherwise.
4. Knots: Within the rail bearing areas, a large knot is one having an average diameter more than 1/3 the width of the surface on which it appears; but such a knot will be allowed if it is located outside the rail bearing areas. Numerous knots are any number equaling a large knot in damaging effect.
5. Shake: A shake is a separation along the grain, most of which occurs between the rings of annual growth. One which is not more than 1/3 the width of the tie will be allowed, provided it does not extend nearer than 1 inch to any surface.
6. Split: A split is a separation of the wood extending from one surface to an opposite or adjacent surface. Do not count the end as a surface when measuring the length of a split. In unseasoned cross ties, a split no more than 1/8 inch wide and/or 4 inches long is acceptable. In a seasoned cross tie, a split no more than 1/4 inch wide and/or longer than the width of the face across which it occurs is acceptable. In seasoned cross ties, a split exceeding the limit is acceptable, provided split limitations and anti-splitting devices are approved by the buyer and properly applied.
7. Checks: A check is a separation of the wood due to seasoning which appears on one surface only. Do not count the end as a surface. Ties with continuous checks whose depth in a fully seasoned and/or treated tie is greater than 1/4 the thickness and longer than 1/2 the length of the tie will be rejected.
8. Slope of Grain: Except in woods with interlocking grain a slope in grain in excess of 1 in 15 will not be permitted.
9. Bark Seams: A bark seam or pocket is a patch of bark partially or wholly enclosed in the wood. Bark seams will be allowed provided they are not more than 2 inches below the surface and/or 10 inches long.
10. Manufacturing Defects: All ties must be straight, square-sawn, cut square at the ends, have top and bottom parallel, and have bark entirely removed. Any ties which do not meet the following characteristics of good manufacture will be rejected:
 - a. A tie will be considered straight when a straight line from a point on one end to a corresponding point on the other end is no more than 1-1/2 inches from the surface at all points.

- b. A tie is not well-sawn when its surfaces are cut into with scoremarks more than 1/2 inch deep, or when its surfaces are not even.
- c. The top and bottom of a tie will be considered parallel if any difference at the sides or ends does not exceed 1/2 inch.
- d. For proper seating of nail plates, tie ends must be flat, and will be considered square with a sloped end of up to 1/2 inch, which equals a 1 in 20 cant.

2.02 ANTI-SPLITTING DEVICES:

- A. Timber crossties and switch ties shall be equipped with anti-splitting devices of the type specified regardless of whether or not the wood has shown any tendency to split. Products used shall conform to the AREMA Manual, Chapter 30, Part 1, Section 3.1.6, "Specifications for Devices to Control the Splitting of Wood Ties".
- B. Timber crossties and switch ties shall be equipped on each end with gang nails (steel nail plates).
- C. Anti-splitting devices shall be applied in accordance with the AREMA Manual, Chapter 30, Part 3, Section 3.1.7, "Application of Anti-splitting Devices".

2.03 INCISING:

- A. Timber crossties and switch ties shall be incised on all four sides in the pattern specified in the AREMA Manual, Chapter 3, Part 6, "Wood Preserving".

2.04 TIE PRESERVATIVE TREATMENT:

- A. Timber crossties and switch ties shall be pressure treated in accordance with AREMA Chapter 30 Part 3 Section 3.7.2 "Treatment" by the empty cell process. Process and preservative to be used on material and retention required shall be as follows:
 1. Wood 50% Creosote / 50% Oil Process
 2. Doug Fir 8 lb. or Refusal L&R
 3. Hardwood (non oak) 7-1/2 lb. or Refusal L&R
 4. Oak 7-1/2 lb. or Refusal Bethel or L&R
- B. Ties will be accepted by the Engineer based on the Manufacturer's Certification of Compliance and Treatment Inspection Reports.
- C. Ties shall be free of excess preservative. Ties exuding a minor amount of preservative will be permitted.

2.05 TIE PLATES

- A. Tie plates shall conform to AREMA Manual Chapter 5, Part 1, "Specifications for Steel Tie Plates".
- B. Either low carbon or high carbon steel tie plates may be furnished.
- C. Tie plates shall accommodate two elastic spring clips and at least four screw spikes to secure the plates to the timber ties. Tie plates to have a minimum length of 15". Tie

plates shall have minimum width of 7-3/4" and minimum thickness of 1/2" under the rail in base section.

- D. Tie plates to have 1" diameter holes to accommodate 15/16" diameter screw spikes.
- E. Tie plate section to be canted 1:40, +/-5, toward the center line of track.
- F. Tie plates shall have smooth flat bases with no ridges or indentations.
- G. One tie plate shall be placed under each rail at each tie.

2.06 ELASTIC RAIL CLIPS

- A. The elastic rail clips to be used shall be one piece, threadless fasteners of spring steel Pandrol e-2055 Rail or approved equal, which must meet all the following requirements:
 - 1. An easy to install one piece elastic spring steel rail clip without threaded elements which can be easily removed from its housing without any possible damage to or the loss of the lateral support provided by the shoulder.
 - 2. The design and configuration of the clips, their housing and their area in contact with the rail should be such that a nominal rail seat clamping force of 2500 pounds per clip is provided and frequent rail slippage can be allowed without stressing, bending, twisting or damaging the clips or their housing.

2.07 SCREW SPIKES

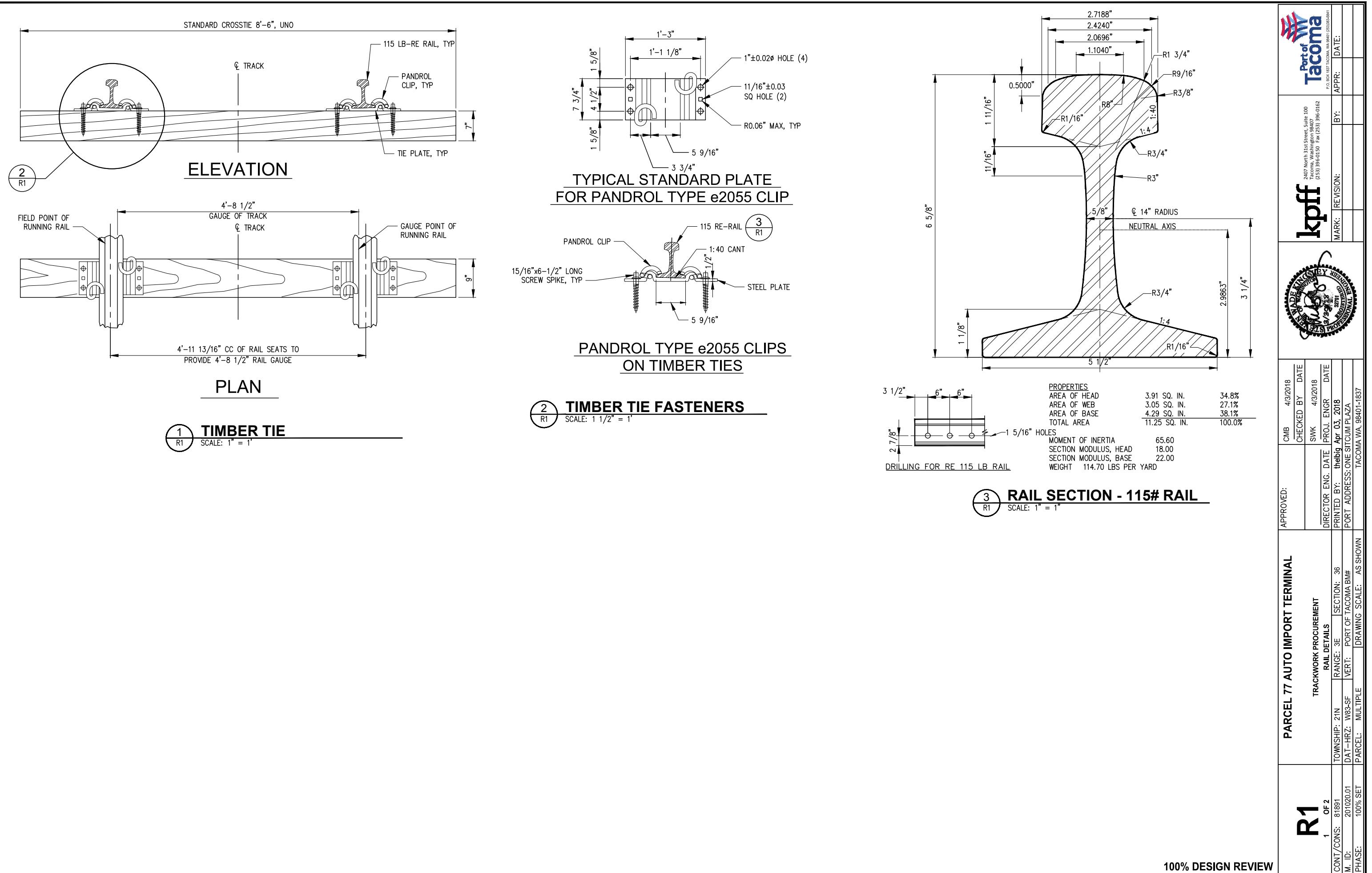
- A. Screw spikes shall be new, conforming to the current AREMA Manual, Chapter 5, Part 10, Section 10.1.
- B. Screw spikes used to fasten the plates to the timber ties shall be one piece with reinforced throat, 27/32-inch by 1-1/8-inches rectangular head, 15/16-inch diameter, 6-1/2-inches long per BNSF/UP Common Standards Drawing No. 130800.
- C. The head shall be concentric with and firmly joined to the body of the screw. The material shall be free from injurious defects and shall have a workmanlike finish. Screws shall be provided with plain finish.
- D. Finished screws shall conform to the following minimum requirements:
 - 1. High Strength
 - a. Tensile Strength, psi 120,000 Min
 - b. Yield Strength, psi 80,000 Min
 - c. Elongation, % 18 Min
- E. Except for heat-treated screws, steel mill cert data may be used for tensile strength with approval of the Port.
- F. A letter or brand indicating the manufacturer shall be located on the top of the washer of each screw.
- G. Two screw spikes to be provided each side of rail for a total of four screw spikes per tie plate.

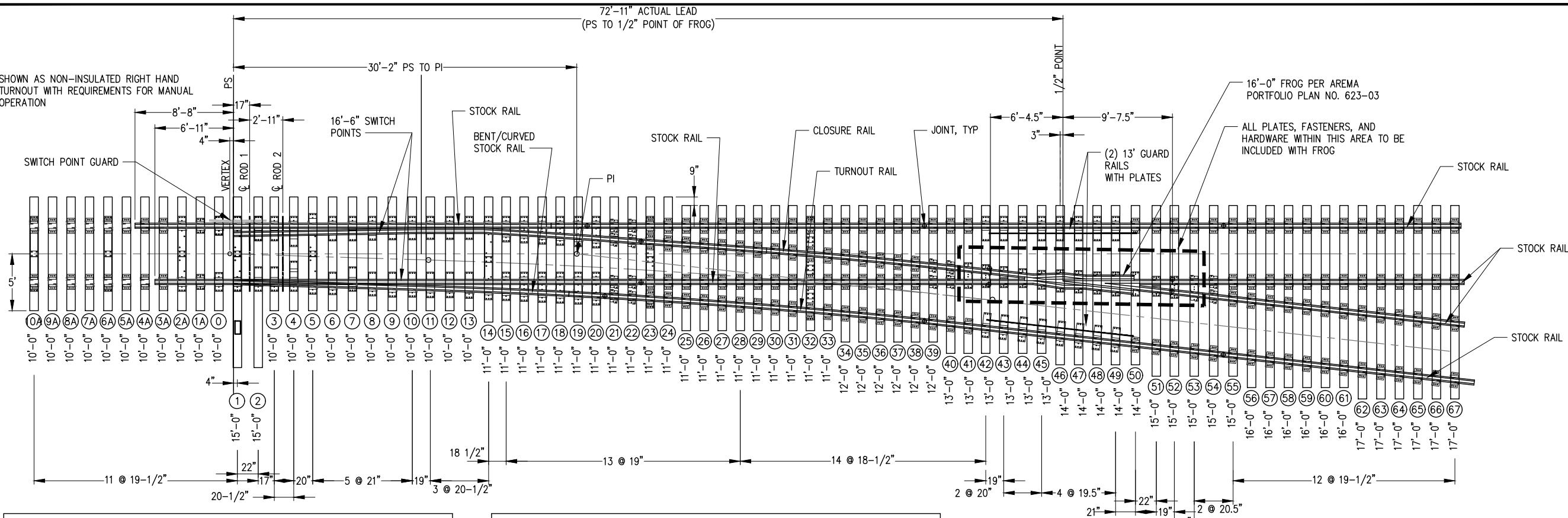
DIVISION 34 – TRANSPORTATION
SECTION 34 11 32 – TIMBER TIES

PART 3 - EXECUTION

NOT USED

END OF SECTION





STANDARD BILL OF MATERIALS			
QTY	DESCRIPTION	LOCATION	BNSF/UP COM STANDARDS D NUMBER
2	16'-6" STRAIGHT SAMSON SWITCH POINTS		
1	36'-7" STRAIGHT SAMSON STOCK RAIL		
1	36'-5" BENT/CURVED SAMSON STOCK RAIL		
1	SWITCH ROD #1		
1	SWITCH ROD #2		
2	GAGE PLATE AHEAD OF POINT	TIES 6A & 10A	241304
1	ADJUSTABLE BRACE GAGE PLATE	TIE 2A	241301
2	TIE PLATE	TIE 1A	241307
1	ADJUSTABLE BRACE GAGE PLATE	TIE 1	241300
1	ADJUSTABLE BRACE GAGE PLATE	TIE 5	241305
2	PLATE	TIE 0	241306
6	ADJUSTABLE BRACE SLIDE PLATE	TIES 2, 3, & 7	241306
4	SLIDE PLATE	TIES 4 & 6	241306
6	RISER SLIDE PLATE	TIES 8, 9 & 10	241306
18	TURNOUT PLATE	TIES 11, 12, 13, 15, 16, 17, 18, 19, & 20	241307
1	GAGE PLATE	TIE 14	241311
1	GAGE PLATE	TIE 23	241312
1	GAGE PLATE	TIE 32	241313
1	CLOSURE RAIL		341001
1	TURNOUT RAIL		341001
A/R	115 RE RAIL		N/A
A/R	PANDROL TIE PLATES	SEE NOTE 1	

STANDARD BILL OF MATERIALS			
QTY	DESCRIPTION	LOCATION	BNSF/UP COMMON STANDARDS DWG NUMBER
14	MODIFIED PANDROL TIE PLATE	TIES 21, 22, 39, 40, & 54	263001
A/R	PANDROL ECLIP E-2055		
A/R	15/16" DIA. X 6 1/2" LG. SCREW SPIKES		130800
2	FIXED HEEL BLOCKS		
1	NO. 9 16'-0" AREMA RBM FROG PER AREMA PORTFOLIO PLAN NO. 623-03 WITH SCREW SPIKE PLATES AND ELASTIC FASTENERS		N/A
2	GUARD RAILS PER AREMA PORTFOLIO PLAN NO. 504-03 (13') WITH SCREW PLATES AND ELASTIC FASTENERS		N/A
1	SWITCH POINT GUARD, A&K RAILROAD MATERIALS MODEL U69, OR APPROVED EQUAL		N/A
1	SWITCH STAND, RACOR MODEL 22-E TRAILABLE		N/A
A/R	115RE 36" JOINT BARS		
22	7" X 9" X 10'-0" TIE	TIES 0-10A & 3-13	
20	7" X 9" X 11'-0" TIE	TIES 14-33	
6	7" X 9" X 12'-0" TIE	TIES 34-39	
6	7" X 9" X 13'-0" TIE	TIES 40-45	
5	7" X 9" X 14'-0" TIE	TIES 46-50	
7	7" X 9" X 15'-0" TIE	TIES 1-2 & 51-55	
6	7" X 9" X 16'-0" TIE	TIES 56-61	
6	7" X 9" X 17'-0" TIE	TIES 62-67	

A/R = AS REQUIRED

FROG DATA	
ANGLE	6°-21'-35"
TURNOUT DATA	
RADIUS OF CENTERLINE	614'
T =	24.59'
CENTRAL ANGLE - CLOSURE CURVE	4°-35'-13"
DEGREE OF CURVE	9°-20'-31"
DIMENSIONS ALONG TURNOUT	
VERTEX TO PC	17'-7 9/32"
PC TO PT	614'-0" C RADIUS
PT TO FROG POINT	6'-4 1/2"

SWITCH DATA		
TURNOUT POINT	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"
TURNOUT POINT	THICKNESS AT POINT	0"
	RADIUS (CLOSURE CURVE)	616.3542'
	VERTEX DISTANCE	4"

NOTES :

1. PANDROL TIE PLATES AND RESILIENT FASTENERS SHALL BE USED AT ALL LOCATIONS UNLESS OTHERWISE NOTED, SEE DETAIL 2 ON SHEET R1.
2. SWITCH POINTS SHALL HAVE MANGANESE TIPS (AREA 220).
3. SWITCH POINTS SHALL BE HEAD HARDENED AND DOUBLE REINFORCED PER AREMA PLAN NO. 221 DETAIL 5100 WITH TRANSIT STYLE CLIPS.
4. TURNOUTS SHALL HAVE HORIZONTAL SWITCH RODS.
5. FROG SHALL BE HIGH INTEGRITY, RAIL BOUND MANGANESE STEEL CASTING WITH MITERED HEEL AND EXTENDED HEEL AND WING RAILS.
6. THE GUARD RAIL IS TO BE 54-5/8" FROM THE GAUGE SIDE OF THE FROG POINT TO THE STRAIGHT GUARDING FACE OF THE GUARD RAIL.
7. NO ALLOWANCE HAS BEEN MADE FOR EXPANSION GAPS IN COMPUTING RAIL LENGTHS SHOWN.
8. FRACTIONAL RAIL LENGTH CUTTINGS SHOWN ARE THEORETICAL AND ARE SUBJECT TO MINOR ADJUSTMENT TO MEET ACTUAL CLOSURE REQUIREMENTS IN THE FIELD.
9. STOCK RAILS ARE TO BE BENT IN THE MILL OR IN THE SHOP.
10. CHORD METHOD IS USED TO CALCULATE TURNOUT CURVE DATA AND OFFSETS.



1
R2 **NO. 9 TURNOUT**
SCALE: 1" = 5'

100% DESIGN REVIEW

R2		PARCEL 77 AUTO IMPORT TERMINAL	
2 OF 2		TRACKWORK PROCUREMENT	
CONT/CONS: 81891 M. M. ID: 201020.01 PHASE: 100% SET		RAIL DETAILS: NO 9 TURNOUT TOWNSHIP: 21N DAT-HRZ: W83-SF PARCEL: MULTIPLE	
21N SECTION: 36 VERT: PORT OF TACOMA BM#		RANGE: 3E SECTION: 36 DRAWING SCALE: AS SHOWN	
		PRINTED BY: <i>thelbig</i> Apr 03, 2018 PORT ADDRESS: ONE SITCUM PLAZA TACOMA WA. 98401-1837	
		CMB 4/3/2018 CHECKED BY DATE SWK 4/3/2018 DIRECTOR ENG. DATE PROJ. ENGR. DATE	
		MARK: REVISION: BY: APPR: DATE: 2407 North 31st Street, Suite 100 Tacoma, Washington 98407 (253) 396-0150 Fax (253) 396-0152 P.O. Box 1107 Tacoma WA 98441 (253) 398-54941	
		kpff	