

NOTIFICATION OF ADDENDUM

ADDENDUM NO. 2

DATED 10/05/2007

Control	0320-01-059
Project	STP 2005(463)RGS
Highway	US 190
County	BELL

Ladies/Gentlemen:

Attached please find an addendum on the above captioned project. Included in the attachment is an addendum notification which details the changes and the respective proposal pages which were added and/or changed.

Except for new bid insert pages, it is unnecessary to return any of the pages attached.

Bid insert pages must be returned with the bid proposal submitted to the Department, unless your firm is submitting a bid using a computer print out. The computer print out must be changed to reflect the new bid item information.

Contractors and material suppliers, etc. who have previously been furnished informational proposals are not being furnished a copy of the addendum. If you have a subcontractor on the above project, please advise them of this addendum. Acknowledgment of this addendum is not requested if your company has been issued a proposal stamped "This Proposal Issued for Informational Purposes."

You are required to acknowledge receipt of this addendum on the Addendum Acknowledgement form contained in your bid proposal by placing a mark in the box next to the respective addendum.

Failure to Acknowledge receipt of this addendum in your bid proposal will result in your bid not being read.

SUBJECT: PLANS AND PROPOSAL ADDENDUMS
PROJECT: STP 2005(463)RGS CONTROL: 0320-01-059
COUNTY: BELL
LETTING: 10/10/2007
REFERENCE NO: 1005

PROPOSAL ADDENDUMS

- _ PROPOSAL COVER
X BID INSERTS (SH. NO.: 8-8)
_ GENERAL NOTES (SH. NO.:)
X SPEC LIST (SH. NO.: 3-3)
_ SPECIAL PROVISIONS:
_ ADDED:

DELETED:

X SPECIAL SPECIFICATIONS:
ADDED: 4320

DELETED: 4076

X OTHER: PLAN SHEETS

DESCRIPTION OF ABOVE CHANGES
(INCLUDING PLANS SHEET CHANGES)

BID INSERTS: SHEET 8-8: THE FOLLOWING ITEMS WERE DELETED: 4076-2001,
4076-2002, 4076-2003, 4076-2004, AND 4076-2005

ITEM 4320-2001 WAS ADDED WITH A QUANTITY OF
7,161.0 CY
ITEM 4320-2002 WAS ADDED WITH A QUANTITY OF
3,851.0 LF
ITEM 4320-2003 WAS ADDED WITH A QUANTITY OF
3,851.0 LF
ITEM 4320-2004 WAS ADDED WITH A QUANTITY OF 2.0 EA
ITEM 4320-2005 WAS ADDED WITH A QUANTITY OF 2.0 EA

SPEC LIST: SHEET 3-3: SPECIAL SPEC 4076 WAS REMOVED
SPECIAL SPEC 4320 WAS ADDED

PLAN SHEETS: THE FOLLOWING PLAN SHEETS WERE REVISED: 4A AND 6

ALT	ITEM-CODE			UNIT BID PRICE ONLY. WRITTEN IN WORDS	UNIT	APPROX QUANTITIES	DEPT USE ONLY
	ITEM NO	DESC CODE	S.P. NO.				
	100	2001	001	PREPARING ROW DOLLARS and CENTS	AC	4.600	1
	100	2002	001	PREPARING ROW DOLLARS and CENTS	STA	9.000	2
	104	2021		REMOVING CONC (CURB) DOLLARS and CENTS	LF	251.000	3
	110	2001		EXCAVATION (ROADWAY) DOLLARS and CENTS	CY	11,130.000	4
	110	2003		EXCAVATION (SPECIAL) DOLLARS and CENTS	CY	3,009.000	5
	132	2006		EMBANKMENT (FINAL)(DENS CONT)(TY C) DOLLARS and CENTS	CY	3,535.000	6
	160	2004		FURNISHING AND PLACING TOPSOIL (6") DOLLARS and CENTS	SY	6,404.000	7
	160	2006		FURNISHING AND PLACING TOPSOIL (3") DOLLARS and CENTS	SY	10,202.000	8
	164	2035		DRILL SEEDING (PERM) (RURAL) (CLAY) DOLLARS and CENTS	SY	18,071.000	9
	164	2041		DRILL SEEDING (TEMP) (WARM) DOLLARS and CENTS	SY	9,036.000	10
	164	2043		DRILL SEEDING (TEMP) (COOL) DOLLARS and CENTS	SY	9,036.000	11

ALT	ITEM-CODE			UNIT BID PRICE ONLY. WRITTEN IN WORDS	UNIT	APPROX QUANTITIES	DEPT USE ONLY
	ITEM NO	DESC CODE	S.P. NO.				
	168	2001		VEGETATIVE WATERING DOLLARS and CENTS	MG	539.000	12
	169	2003		SOIL RETENTION BLANKETS (CL 1) (TY C) DOLLARS and CENTS	SY	8,309.000	13
	316	2006		ASPH (AC-20-5TR) DOLLARS and CENTS	GAL	9,800.000	14
	316	2363		AGGR (TY-PD GR-4 OR TY-PL GR-4)(SAC-B) DOLLARS and CENTS	CY	224.000	15
	403	2001		TEMPORARY SPL SHORING DOLLARS and CENTS	SF	1,772.000	16
	416	2002		DRILL SHAFT (24 IN) DOLLARS and CENTS	LF	424.000	17
	416	2007		DRILL SHAFT (54 IN) DOLLARS and CENTS	LF	566.000	18
	420	2003	003	CL C CONC (ABUT) DOLLARS and CENTS	CY	101.800	19
	420	2006	003	CL C CONC (RAIL FOUNDATION) DOLLARS and CENTS	CY	19.400	20
	420	2017	003	CL C CONC (BENT)(MASS PLACEMENT) DOLLARS and CENTS	CY	96.300	21
	432	2001		RIPRAP (CONC)(4 IN) DOLLARS and CENTS	CY	9.000	22

ALT	ITEM-CODE			UNIT BID PRICE ONLY. WRITTEN IN WORDS	UNIT	APPROX QUANTITIES	DEPT USE ONLY
	ITEM NO	DESC CODE	S.P. NO.				
	432	2011		RIPRAP (STONE TY F)(GROUT)(6 IN) DOLLARS and CENTS	CY	56.000	23
	432	2043		BEDDING MATERIAL (3 IN) DOLLARS and CENTS	CY	27.000	24
	442	2005	005	STR STL (MISCELLANEOUS) DOLLARS and CENTS	LB	1,165.000	25
	442	2007	005	STR STL (RAILROAD THROUGH-GIRDER) DOLLARS and CENTS	LB	1,477,920.00	26
	450	2013		RAIL (TY SSTR) DOLLARS and CENTS	LF	250.500	27
	458	2001		WATRPf (TY 1) DOLLARS and CENTS	SY	52.000	28
	458	2008		WATRPf (TY RR-1) DOLLARS and CENTS	SY	881.000	29
	462	2007		CONC BOX CULV (5 FT X 3 FT) DOLLARS and CENTS	LF	36.500	30
	466	2004		WINGWALL (PW) DOLLARS and CENTS	SF	347.790	31
	481	2012		PVC PIPE (SCH 40)(6 IN) DOLLARS and CENTS	LF	84.000	32
	481	2013		PVC PIPE (SCH 40)(8 IN) DOLLARS and CENTS	LF	18.000	33

ALT	ITEM-CODE			UNIT BID PRICE ONLY. WRITTEN IN WORDS	UNIT	APPROX QUANTITIES	DEPT USE ONLY
	ITEM NO	DESC CODE	S.P. NO.				
	496	2010	013	REMOV STR (BRIDGE 100-499 FT LENGTH) DOLLARS and CENTS	EA	2.000	34
	497	2001	003	SALV MATRL (CREDIT ITEM) DOLLARS and CENTS	LS	1.000	35
	500	2001	002	MOBILIZATION DOLLARS and CENTS	LS	1.000	36
	502	2001	022	BARRICADES, SIGNS AND TRAFFIC HAN- DLING DOLLARS and CENTS	MO	14.000	37
	506	2002	011	ROCK FILTER DAMS (INSTALL) (TY 2) DOLLARS and CENTS	LF	30.000	38
	506	2009	011	ROCK FILTER DAMS (REMOVE) DOLLARS and CENTS	LF	30.000	39
	506	2016	011	CONSTRUCTION EXITS (INSTALL) (TY 1) DOLLARS and CENTS	SY	300.000	40
	506	2019	011	CONSTRUCTION EXITS (REMOVE) DOLLARS and CENTS	SY	300.000	41
	506	2034	011	TEMPORARY SEDIMENT CONTROL FENCE DOLLARS and CENTS	LF	4,173.000	42
	508	2002		CONSTRUCTING DETOURS DOLLARS and CENTS	SY	2,225.000	43

ALT	ITEM-CODE			UNIT BID PRICE ONLY. WRITTEN IN WORDS	UNIT	APPROX QUANTITIES	DEPT USE ONLY
	ITEM NO	DESC CODE	S.P. NO.				
	529	2003		CONC CURB & GUTTER (TY I) DOLLARS and CENTS	LF	425.000	44
	540	2002		MTL W-BEAM GD FEN (STEEL POST) DOLLARS and CENTS	LF	399.000	45
	540	2011		MTL BEAM GD FEN TRANS (THRIE-BEAM) DOLLARS and CENTS	EA	8.000	46
	544	2001		GUARDRAIL END TREATMENT (INSTALL) DOLLARS and CENTS	EA	8.000	47
	556	2008		PIPE UNDERDRAINS (TY 8) (6") DOLLARS and CENTS	LF	58.000	48
	556	2012		PIPE UNDERDRAINS (TY 8) (4 IN) DOLLARS and CENTS	LF	790.000	49
	636	2001		ALUMINUM SIGNS (TY A) DOLLARS and CENTS	SF	56.000	50
	662	2075		WK ZN PAV MRK REMOV (W) 8" (SLD) DOLLARS and CENTS	LF	280.000	51
	662	2099		WK ZN PAV MRK REMOV (Y) 4" (SLD) DOLLARS and CENTS	LF	600.000	52
	662	2113		WK ZN PAV MRK SHT TERM (TAB) TY W DOLLARS and CENTS	EA	438.000	53
	662	2115		WK ZN PAV MRK SHT TERM (TAB) TY Y-2 DOLLARS and CENTS	EA	25.000	54

ALT	ITEM-CODE			UNIT BID PRICE ONLY. WRITTEN IN WORDS	UNIT	APPROX QUANTITIES	DEPT USE ONLY
	ITEM NO	DESC CODE	S.P. NO.				
	666	2003		REFL PAV MRK TY I (W) 4" (BRK)(100MIL) DOLLARS and CENTS	LF	950.000	55
	666	2012		REFL PAV MRK TY I (W) 4" (SLD)(100MIL) DOLLARS and CENTS	LF	5,980.000	56
	666	2036		REFL PAV MRK TY I (W) 8" (SLD)(100MIL) DOLLARS and CENTS	LF	1,308.000	57
	666	2048		REFL PAV MRK TY I (W) 24"(SLD)(100MIL) DOLLARS and CENTS	LF	1,969.000	58
	666	2111		REFL PAV MRK TY I (Y) 4" (SLD)(100MIL) DOLLARS and CENTS	LF	6,042.000	59
	666	2132		REFL PAV MRK TY I (Y) 24"(SLD)(100MIL) DOLLARS and CENTS	LF	730.000	60
	666	2142		REF PAV MRK TY II (W) 4" (BRK) DOLLARS and CENTS	LF	950.000	61
	666	2145		REF PAV MRK TY II (W) 4" (SLD) DOLLARS and CENTS	LF	5,980.000	62
	666	2153		REF PAV MRK TY II (W) 8" (SLD) DOLLARS and CENTS	LF	1,308.000	63
	666	2157		REF PAV MRK TY II (W) 24" (SLD) DOLLARS and CENTS	LF	1,942.000	64
	666	2178		REF PAV MRK TY II (Y) 4" (SLD) DOLLARS and CENTS	LF	6,042.000	65

ALT	ITEM-CODE			UNIT BID PRICE ONLY. WRITTEN IN WORDS	UNIT	APPROX QUANTITIES	DEPT USE ONLY
	ITEM NO	DESC CODE	S.P. NO.				
	666	2185		REF PAV MRK TY II (Y) 24" (SLD) DOLLARS and CENTS	LF	730.000	66
	672	2012		REFL PAV MRKR TY I-C DOLLARS and CENTS	EA	39.000	67
	672	2017		REFL PAV MRKR TY II-C-R DOLLARS and CENTS	EA	80.000	68
	677	2001		ELIM EXT PAV MRK & MRKS (4") DOLLARS and CENTS	LF	600.000	69
	677	2003		ELIM EXT PAV MRK & MRKS (8") DOLLARS and CENTS	LF	280.000	70
	677	2007		ELIM EXT PAV MRK & MRKS (24") DOLLARS and CENTS	LF	867.000	71
	738	2094		CLEAN/SWEEP-CENTER MEDIAN-AREA (1) DOLLARS and CENTS	CYC	14.000	72
	738	2114		CLEAN/SWEEP-OUTSIDE MAIN LANE-AREA (1) DOLLARS and CENTS	CYC	14.000	73
	740	2005		ANTI-GRAFFITI COATING (PERMANENT) DOLLARS and CENTS	SF	12,732.000	74
	4025	2001		DECK DRAIN (HALF ROUND)(8 IN) DOLLARS and CENTS	LF	797.000	75

ALT	ITEM-CODE			UNIT BID PRICE ONLY. WRITTEN IN WORDS	UNIT	APPROX QUANTITIES	DEPT USE ONLY
	ITEM NO	DESC CODE	S.P. NO.				
	4026	2001		CONSTR, MAINTAIN, & REMOVE SHOOFLY BR DOLLARS and CENTS	EA	2.000	76
	4044	2001		NATURAL STONE VENEER DOLLARS and CENTS	SF	2,700.000	77
	4320	2001		SUBBALLAST DOLLARS and CENTS	CY	7,161.000	78
	4320	2002		BALLASSTED TRACK CONSTR (TRACK) DOLLARS and CENTS	LF	3,851.000	79
	4320	2003		BALLASSTED TRACK CONSTR (TRACK REMOV) DOLLARS and CENTS	LF	3,851.000	80
	4320	2004		BALLASSTED TRACK CONSTR (TURNOUT) DOLLARS and CENTS	EA	2.000	81
	4320	2005		BALLASSTED TRACK CONSTR (TURNOUT REMOV) DOLLARS and CENTS	EA	2.000	82
	6834	2001		PORTABLE CHANGEABLE MESSAGE SIGN DOLLARS and CENTS	DAY	58.000	83

CONTROL : 0320-01-059
PROJECT : STP 2005(463)RGS
HIGHWAY : US 190
COUNTY : BELL

TEXAS DEPARTMENT OF TRANSPORTATION

GOVERNING SPECIFICATIONS AND SPECIAL PROVISIONS

ALL SPECIFICATIONS AND SPECIAL PROVISIONS APPLICABLE TO THIS PROJECT ARE IDENTIFIED AS FOLLOWS:

STANDARD SPECIFICATIONS: ADOPTED BY THE TEXAS DEPARTMENT OF
----- TRANSPORTATION JUNE 1, 2004.
STANDARD SPECIFICATIONS ARE INCORPORATED
INTO THE CONTRACT BY REFERENCE.

ITEMS 1 TO 9 INCL., GENERAL REQUIREMENTS AND COVENANTS
ITEM 100 PREPARING RIGHT OF WAY (103)
ITEM 104 REMOVING CONCRETE
ITEM 110 EXCAVATION (132)
ITEM 132 EMBANKMENT (100) (204) (210) (216) (400)
ITEM 160 TOPSOIL
ITEM 164 SEEDING FOR EROSION CONTROL (162) (166) (168)
ITEM 168 VEGETATIVE WATERING
ITEM 169 SOIL RETENTION BLANKETS
ITEM 316 SURFACE TREATMENTS (210) (300) (302) (520)
ITEM 403 TEMPORARY SPECIAL SHORING (423)
ITEM 416 DRILLED SHAFT FOUNDATIONS (420) (421) (440) (448)
ITEM 420 CONCRETE STRUCTURES (400) (404) (421) (426) (427) (438) (440)
(441) (448)
ITEM 432 RIPRAP (247) (420) (421) (427) (431) (440)
ITEM 442 METAL FOR STRUCTURES (441) (445) (446) (447) (448) (449)
ITEM 450 RAILING (420) (421) (440)
ITEM 458 WATERPROOFING MEMBRANES FOR STRUCTURES
ITEM 462 CONCRETE BOX CULVERTS AND STORM DRAINS (400) (420) (421)
(424) (440) (464) (476)
ITEM 466 HEADWALLS AND WINGWALLS (400) (420) (421) (430) (440) (464)
ITEM 481 PVC PIPE FOR DRAINS (400)
ITEM 496 REMOVING STRUCTURES (430)
ITEM 497 SALE OF SALVAGEABLE MATERIAL
ITEM 500 MOBILIZATION (5010)
ITEM 502 BARRICADES, SIGNS, AND TRAFFIC HANDLING
ITEM 504 FIELD OFFICE AND LABORATORY
ITEM 506 TEMPORARY EROSION, SEDIMENTATION, AND ENVIRONMENTAL
CONTROLS (432) (556)
ITEM 508 CONSTRUCTING DETOURS

ITEM 529 CONCRETE CURB, GUTTER, AND COMBINED CURB AND GUTTER (360)
(420) (421) (440)
ITEM 540 METAL BEAM GUARD FENCE (421) (445) (529) (542) (544)
ITEM 544 GUARDRAIL END TREATMENTS
ITEM 556 PIPE UNDERDRAINS (402) (432)
ITEM 636 ALUMINUM SIGNS (643)
ITEM 662 WORK ZONE PAVEMENT MARKINGS (666) (668) (672) (677)
ITEM 666 REFLECTORIZED PAVEMENT MARKINGS (316) (318) (662) (677) (678)
ITEM 672 RAISED PAVEMENT MARKERS (677) (678)
ITEM 677 ELIMINATING EXISTING PAVEMENT MARKINGS AND MARKERS (300)
(302) (316)
ITEM 738 CLEANING AND SWEEPING HIGHWAYS
ITEM 740 GRAFFITI REMOVAL AND ANTI-GRAFFITI COATING (427) (446)

SPECIAL PROVISIONS: SPECIAL PROVISIONS WILL GOVERN AND TAKE
----- PRECEDENCE OVER THE SPECIFICATIONS ENUMERATED
HEREON WHEREVER IN CONFLICT THEREWITH.

REQUIRED CONTRACT PROVISIONS, FEDERAL-AID CONSTRUCTION CONTRACTS
(FORM FHWA 1273, MARCH, 1994)

WAGE RATES

SPECIAL PROVISION "SCHEDULE OF LIQUIDATED DAMAGES" (000--1002)
SPECIAL PROVISION "PARTNERING" (000---002)
SPECIAL PROVISION "NOTICE TO ALL BIDDERS" (000---003)
SPECIAL PROVISION "NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION TO
ENSURE EQUAL EMPLOYMENT OPPORTUNITY" (000---004)
SPECIAL PROVISION "DISADVANTAGED BUSINESS ENTERPRISE IN FEDERAL-AID
CONSTRUCTION" (000---461)
SPECIAL PROVISION "STANDARD FEDERAL EQUAL EMPLOYMENT OPPORTUNITY
CONSTRUCTION CONTRACT SPECIFICATIONS" (000---006)
SPECIAL PROVISION "ON-THE-JOB TRAINING PROGRAM" (000--1001)
SPECIAL PROVISION "CERTIFICATION OF NONDISCRIMINATION IN EMPLOYMENT"
(000---009)
SPECIAL PROVISION "DEPARTMENT DIVISION MAILING AND PHYSICAL ADDRESS"
(000---011)
SPECIAL PROVISION TO ITEM 1 (001---005)
SPECIAL PROVISION TO ITEM 3 (003---020)
SPECIAL PROVISION TO ITEM 4 (004---008)
SPECIAL PROVISION TO ITEM 5 (005---004)
SPECIAL PROVISION TO ITEM 6 (006---030)
SPECIAL PROVISIONS TO ITEM 7 (007---001) (007---213) (007---297)
ADDENDUM I TO SPECIAL PROVISION TO ITEM 7 (007---087)
SPECIAL PROVISION TO ITEM 8 (008---049)
SPECIAL PROVISION TO ITEM 9 (009---009)
SPECIAL PROVISION TO ITEM 100 (100---001)
SPECIAL PROVISION TO ITEM 247 (247---020)
SPECIAL PROVISION TO ITEM 360 (360---003)
SPECIAL PROVISION TO ITEM 420 (420---003)
SPECIAL PROVISION TO ITEM 421 (421---024)
SPECIAL PROVISION TO ITEM 440 (440---001)
SPECIAL PROVISION TO ITEM 441 (441---002)
SPECIAL PROVISION TO ITEM 442 (442---005)

SPECIAL PROVISION TO ITEM 447 (447---002)
SPECIAL PROVISION TO ITEM 496 (496---013)
SPECIAL PROVISION TO ITEM 497 (497---003)
SPECIAL PROVISION TO ITEM 500 (500---002)
SPECIAL PROVISION TO ITEM 502 (502---022)
SPECIAL PROVISION TO ITEM 506 (506---011)

SPECIAL SPECIFICATIONS:

ITEM 4025 DECK DRAINS
ITEM 4026 CONSTRUCT, MAINTAIN AND REMOVE SHOOFLY BRIDGE (416) (420)
(421) (432) (440) (441) (442) (448) (490) (491)
ITEM 4044 NATURAL STONE VENEER (401)
ITEM 4320 BALLASTED TRACK CONSTRUCTION (247) (441) (448) (556)
ITEM 5010 TRANSPORTABLE CELLULAR TELEPHONES
ITEM 6834 PORTABLE CHANGEABLE MESSAGE SIGN

GENERAL: THE ABOVE-LISTED SPECIFICATION ITEMS ARE THOSE UNDER WHICH
----- PAYMENT IS TO BE MADE. THESE, TOGETHER WITH SUCH OTHER
PERTINENT ITEMS, IF ANY, AS MAY BE REFERRED TO IN THE ABOVE-
LISTED SPECIFICATION ITEMS, AND INCLUDING THE SPECIAL
PROVISIONS LISTED ABOVE, CONSTITUTE THE COMPLETE SPECIFI-
CATIONS FOR THIS PROJECT.

SPECIAL SPECIFICATION

4320

Ballasted Track Construction

1. **Description.** This Item shall govern for the construction of ballasted track on constructed trackbed. Ballasted track construction includes, but is not limited to, placing ballast, distributing and lining ties, installing and field welding running rail, raising and lining track, installing vehicular grade crossings and other incidentals as specified herein. Track on ballasted deck bridges is also included.
2. **Materials.**
 - (1) **Rail.** Rail for the main line must be new. Rail for the shoofly may be Class 1 second hand per Union Pacific Railroad Engineering Track Maintenance Field Manual, Section 4.3 (See Appendix). Use Type RE 136 lb Standard Strength Continuous Welded Rail meeting the requirements of Union Pacific Standard Drawing 176000, "136 Lb. Rail Section" and conforming to the requirements of American Railway Engineering and Maintenance of Way Association (AREMA) Chapter 4 "Rail". Rail on tangent track and on curves of 1 degree 30 minutes or less shall be new 136 RE standard carbon. Rail on curves greater than 1 degree 30 minutes shall be 136 RE head hardened rail. All rail, excluding rail for industry leads, shall be continuously shop welded and transported in 400 feet or longer sections to the project site or 39 feet pieces trucked in and welded into the track using the flash butt weld process, unless shorter sections are required due to curve length, or fit between switches.
 - (2) **Track Crossties.** Track crossties shall conform to the current AREMA Specifications, Chapter 30, "Ties". The track crossties shall be new Oak or Douglas Fir Wood ties, 7 inches x 9 inches x 9 feet minimum AREMA-7 inch Grade. Crossties shall be treated according to the American Wood Preservers Association Standards, based on 50 percent creosote and 50 percent coal tar solution with a minimum preservative retention of 8 pounds per cubic foot of Wood. Crossties shall be seasoned, dimensioned and prebored prior to treatment and treated in accordance with AWP Standard C6 "Crossties and Switch Ties - Preservative Treatment by Pressure Processes", or ASTM D 1760 "Standard Specification for Pressure Treatment of Timber Products". All ties shall be fitted with anti-splitting devices, regardless of their tendency to split.

Ties shall be fabricated and preplated in accordance with Union Pacific Standard Drawing 0211G, "Preplating Dimensions for Wood Ties". Ties shall be inspected and certified by an approved commercial testing laboratory stating that the ties to be used meet the specifications in accordance with AWP Standard M2 "Standard for Inspection of Treated Wood Products". Results of test and inspections shall be furnished to the Engineer.

- (3) **Tie Plates.** Hot worked, high carbon, double shoulder, flat bottom tie plates shall conform to the AREMA specifications, Chapter 5, "Track", and Union Pacific Standard Drawing 0442C, "Double Shoulder Tie Plate for 6" Base Rail 1:40 Cant", with punched A-6 square spike holes. Where necessary on curves, use Curve Block Assemblies in accordance with Union Pacific Railroad Standard Drawing 262000, "Curve Block Assembly".
- (4) **Track Spikes and Coach Screws.** Supply new high carbon steel track spikes conforming to the requirements of Union Pacific Standard Drawing 0451A, "Cut Spike for Wood Ties" and coach screws conforming to the requirements of Union Pacific Standard Drawing 130800, "Rectangular Head Timber Coach Screw". Track spikes and coach screws must meet the requirements of AREMA Chapter 5 "Track". Deliver track spikes to the Job Site in Engineer-approved containers (kegs). Install in accordance with Federal Railroad Administration (FRA) Standards.
- (5) **Joint Bars, Compromise Joint Bars and Track Bolts.** Use joint bars, compromise joint bars and track bolts conforming to the requirements of Union Pacific Standard Drawings 180100, "36", 6-Hole 136 Lb Joint Bar", 0904E, "Miscellaneous Joint Bars", 0948B, "Compromise Joints", and/or 0950G, "Track Bolt" and the requirements of AREMA Chapter 4, Part 2, Section 2.8, "Specifications for Quenched Carbon-Steel Joint Bars, Microalloyed Joint Bars, and Forged Compromise Joint Bars". Compromise joint bars must be new and of the size, shape, and punch necessary to fit the rail sizes and sections being joined. Only factory designed and produced (forged or cast) compromise joint bars may be used to join rails of different sizes and/or sections.
- (6) **Rail Anchors.** Use Grip type rail anchors conforming to the requirements of Union Pacific Standard Drawing 0457A, "Heavy Duty Rail Anchor". Provide and Install in accordance with AREMA Chapter 5, Section 7 "Rail Anchors"
- (7) **Guard Rail.** Use guard rails as specified in the plans meeting the requirements of Union Pacific Standard Drawing 4015E, "Double Inside Guardrail for Ballast Deck Bridges".
- (8) **Pipe Underdrains.** Pipe underdrains shall be minimum 8 inch Class 1 corrugated steel pipe conforming to the provisions of AREMA Chapter 1, Section 4.3.
- (9) **Subballast.** Subballast shall consist of a foundation coarse for a typical railroad roadbed and shall be composed of crushed limestone or crushed concrete materials meeting Union Pacific Railroad Requirements and as approved by the Engineer. However, only 100% crushed material from oversized quarried rock or crushed concrete as the source will be accepted. Aggregate retained on a No. 10 sieve must consist of hard, durable particles or fragments of stone, gravel, sand or slag. Materials that break up when alternately frozen and thawed or wetted and dried are not permitted. Aggregate must not have a percentage of wear of more than 50 percent, by the Los Angeles abrasion test. A higher or lower percentage of wear may be specified by the Engineer, depending on the material available.

Subballast shall be in accordance with Item 247 "Flexible Base", Type A, Grade 1 except as follows:

Gradations. Unless otherwise indicated on the plans, provide subballast consisting of gradations as set forth in Table 1.

Table 1
Subballast Gradations

Sieve Size	2"	1"	3/4"	No. 10	No. 40	No. 200
% Passing (optimum)	100	95	67	38	21	7
% Passing (permissible.)	100	90-100	50-84	26-50	12-30	0-10

(10) Ballast. Railroad ballast material shall be crushed granite stone in conformance with AREMA Chapter 1, Part 2. Ballast gradation shall conform to AREMA Number 4.

3. Property Requirements.

(1) Physical Analysis.

- (a) **Method of Sampling.** Secure field samples in accordance with ASTM D-75. Reduce test samples from field samples in accordance with ASTM C 702.
- (b) **Sieve Analysis.** Perform sieve analysis in accordance with ASTM C 136. All sieve analyses require wet sieving.
- (c) **Material Finer than No. 200 Sieve.** Test material finer than a No. 200 Sieve in accordance with ASTM C 117.
- (d) **Bulk Specific Gravity and Absorption.** Determine bulk specific gravity and percentage of absorption in accordance with ASTM C 127.
- (e) **Percentage of Clay Lumps and Friable Particles.** Determine percentage of clay lumps and friable particles in accordance with ASTM C 142.
- (f) **Resistance to Degradation.** Determine the resistance to degradation in accordance with ASTM C 131 or C 535 as follows: test materials having gradations containing particles retained on the 1" sieve by ASTM C 535, test materials having gradations of 100 percent passing the 1" sieve by ASTM C 131.
- (g) **Sodium Sulfate Soundness.** Sodium sulfate soundness tests shall be made in accordance with ASTM C 88.
- (h) **Unit Weight.** The weight per cubic foot shall be determined in accordance with ASTM C 29.
- (i) **Percentage of Flat and/or Elongated Particles.** Percent of flat and/or elongated particles shall be determined in accordance with U.S. Army Corps of Engineers Test CRD-C-119.
- (j) **Plasticity Index.** The plastic limit, liquid limit and plasticity index shall be determined in accordance with ASTM D 423 and D 424. Each sample shall be tested in two ways; one test shall test the fines generated by the Los Angeles Machine, and the other test shall test the fines contained in the total sample. The portions of these samples generated by the Los Angeles Machine, and passing the

#40 sieve shall be non-plastic (NP). The portion of the total sample passing the #40 sieve shall have a liquid limit of not more than 25, and plasticity index of not more than 6.

- (2) **Chemical Analysis.** No specific chemical analysis is considered essential for the evaluation of granite, trap rocks, or quartzite type materials, provided the materials are defined by applicable method. For carbonate materials, dolomitic limestone is defined as having a magnesium carbonate content of 28 to 36 percent. Those carbonate materials indicating magnesium carbonate values above 36 percent shall be defined dolomite. Carbonate material indicating magnesium carbonate values below 28 percent shall be defined as limestone. Chemical analysis will be used in selecting or evaluating plant sites. Magnesium carbonate content of carbonate materials shall be tested and defined in accordance with ASTM C 25.

The blending, stockpiling and other production handling operations shall be managed by the producer to minimize segregation of the finished product. Stockpiling operations shall minimize, as practical, breakage or excessive fall in stockpiling operations and movement of wheeled or tracked machines over stockpile material shall be limited. Processed ballast shall be washed and/or rescreened as necessary to remove fine particle contamination as defined by the specification.

- (a) **Loading.** The manufacturer shall ensure the fitness of the cars for loading of prepared materials, arranging to clean cars of deleterious materials, plug leaks, close doors, and other like operations as necessary.
- (b) **Inspection.** TxDOT or its representative reserve the right to visit the producers facility during usual business hours unscheduled for the following purposes:

Prior to installation, the supplier should provide the Engineer with certified results of ballast quality and gradation as conducted by a testing laboratory acceptable to the Engineer. The supplier shall receive approval from the Engineer for the testing laboratory prior to performing tests.

4. **General Requirements.** Before starting work, the Contractor shall fully inform the Engineer of the construction methods he proposes to use, the adequacy of which shall be subject to the approval of the Engineer.

Concurrence on the part of the Engineer of any proposed construction methods or approval of equipment does not relieve the Contractor of the responsibility for the safety or correctness of the methods, the adequacy of his equipment or from carrying out the work in full accordance with the contract.

The following codes, regulations, reference standards, and specifications apply to work included in this section:

- (a) AREMA, Manual for Railway Engineering, Chapter 1 “Roadway and Ballast”, Chapter 4 “Rail” and Chapter 5 “Track”.
- (b) American Welding Society (AWS): D1.1
- (c) Applicable referenced ASTM Specifications

- (d) Track Safety Standards of the Federal Railroad Administration (FRA).
- (e) Union Pacific Railroad Company (UPRR) Technical Specifications for the Construction of Industrial Tracks and Track Standard Drawings.

Any Items not covered specifically herein shall be in accordance with AREMA Standards and recommended practices subject to the approval of the Engineer. Construction must adhere to all UPRR Standard Plans and FRA requirements.

The following review/approval milestones will be monitored during the project:

- (a) **Grading.** Reviewed and approved prior to placement of subballast.
- (b) **Ballasted Trackwork.** Review, approve and coordinate the track construction to assure compliance with UPRR requirements.
- (c) **Welding.** All welds, including compromise welds shall be done in accordance with Union Pacific Railroad Company Requirements Governing the Inspection, Grinding, and Heat Treating of Track Components.

5. Construction. All trackwork shall be constructed in accordance with the following:

(1) Subgrade.

Railroad subgrade shall be constructed in a firm and unyielding manner and compacted to a minimum density of 95% modified proctor, regardless of the depth, except that all fill within 100 feet of bridge ends and 20 feet of outer edges of culverts shall be compacted to 100%. Moisture content of fill material shall be adjusted to within -3% and +3% of optimum moisture content prior to compaction. Subgrade stabilization shall be in accordance with TxDOT's Standard Specification Item 260, "Lime Treatment (Road-Mixed)", to the lines, grades, and thickness as shown on the plans. If geotechnical report suggests other stabilization methods, the alternative method will be considered.

(2) Trackwork

All ties shall be spaced uniformly at 19.5 inches center-to-center of ties (24 crossties per 39 feet of rail), and laid with heart side down, except when ties are not true, the bow side shall be laid upward.

Ties shall be placed and maintained square to the line of rail on straight track and radially on curves. The right-hand end of ties (direction determined by facing away from initial point of the line) shall be lined parallel with the rail.

Tie hooks, tongs or tie crane shall be used in handling ties, to avoid damage to the ties. New treated ties must not be adzed without authority from the Engineer. If adzing is authorized, an approved preservative shall be applied to the adzed surface.

Tie plates must set squarely on the tie and shall be of the dimensions to fit the base of rail used. All track shall be fully tie plated and spiked in accordance with proper criteria. Tie plates shall be centered and have full bearing on ties. Rail shall be properly seated in the tie plates and not riding on the shoulder of the tie plate. Tie

plates and rail shall be cleaned before being laid. Tie plates must be placed with slope of plate towards center of track.

All rail shall be gauged when laid. The standard gauge is 4 feet 8-1/2 inches between points 5/8 inch below the top of rail on the two inside edges of the rail. All gauges used by the Contractor will be checked by the Engineer. If found to be more than 1/16 inch in variance from the master gauge, those gauges shall immediately be removed from the job.

Track bolts, with nuts, which have wrench turn fittings, shall be used where required. Spring washers shall be the correct size to fit the bolt. All bolts will be tightened with an approved bolt machine or torque wrench to a torque of 650 foot-pounds. Bolting shall be started with the center bolts working toward the ends and all nuts shall be turned up tight with bolt heads staggered inside and outside of the rail alternately.

All track spikes are to be the proper size. Tie plates shall be adjusted as necessary so that the spikes can be driven into the spike holes drilled in the ties. Care shall be taken to make sure that the base of rail is not riding on the shoulder of the tie plate when spikes are driven. Spikes shall be started, driven vertically, and square when driven into the spike holes of the tie plate. Crooked or bent spikes shall be removed and replaced. Straightening with maul of spikes started crooked will not be permitted. When spikes are pulled, the hole shall be plugged with a standard treated tie plug. In driving the spikes, the last few blows of the hammers shall be such that the spike head will not be bent or broken, and the hammer shall not be permitted to strike directly upon the rail. All rail shall be spiked to ties with not less than four spikes per tie, one spike in contact with gauge side and one in contact with field side of each rail.

Spikes shall be staggered so that the outside spikes shall be on the same side of the tie and the inside spikes on the opposite side.

Rail shall not be struck with maul or heavy tool when spiking, gauging or lining.

Immediately after completion of track surfacing, spikes shall be settled in place with the underside of the head of the spike contacting the top of base of rail with a minimum of pressure.

Tie plugs, where required, shall fill holes from which spikes are drawn. The plugs shall conform to the current AREMA Specifications for Tie Plugs, and are to be treated with a Creosote oil solution.

Grip type rail anchors shall be applied by an approved rail anchor applicator machine and in the approved manner for the particular type of anchor furnished. Rail anchors shall be installed after the ballast operation and the track is raised, lined and ties re-spaced. Under no circumstances shall rail anchors be installed on ties under or immediately adjacent to rail joints, nor shall anchors be installed on one side of the tie under one rail and on the opposite side of the tie under the other rail. Care shall be taken to avoid overdriving or damaging anchors. Anchors shall not be driven along the rail.

Sufficient rail anchors shall be applied and maintained to effectively control longitudinal rail movement. Anchors shall be installed on the same side(s) of the tie on both rails. Anchors must not be applied to one rail only, but must be applied to both rails in a uniform pattern. For continuously welded rail (CWR), anchors must not be applied on the opposite rail directly across from the joints or straps.

Track shall be box anchored every other tie. Box anchoring is defined as installing opposing anchors to bear against each side of the tie on each rail for a total of four anchors per cross tie.

When laying rail in tangent track, the right-hand rail (direction determined by facing away from initial point of line), shall be laid first and lined to the staked track alignment. After each right-hand rail is lined and spiked, the left-hand rail shall be laid to accurate gauge and spiked to gauge every third tie with gauge spikes fully driven (except through joint areas) before the track gauges are removed. The left hand rail shall be laid into the track, and rail joint bolts installed (if used) before spiking to gauge, and before gauge spikes are driven. The left-hand rail shall be held in place snugly against the track gauges with lining bars.

When laying up to existing track tie-in locations, a combination of rails less than standard length may be used to avoid cutting, if practicable. Rail saws shall be used when necessary to cut rail. The use of a torch or track chisel will not be permitted. All necessary new bolt holes shall be marked, using an approved rail drilling template and the drilling operation shall be carefully performed. Both cutting and drilling shall utilize proper lubrication. Cut rails shall be drilled and fully bolted. There shall be no extra holes in the rail. The burred edges on bolt holes drilled in the field shall be carefully removed by grinding. When necessary to cut secondhand rail, the cut end shall be beveled. When necessary to cut new standard carbon rail, the cut end shall be end hardened and beveled in accordance with Railroad Specifications.

The Contractor is responsible for rail delivery to the site. If the Contractor plans to deliver by rail, delivery shall be coordinated with UPRR and TxDOT. The Contractor shall unload the CWR trains as directed by the Engineer. The Contractor shall provide for the handling and laying of welded rail strings in such a manner as to avoid damage to the roadbed, sub-ballast and rail strings. Care must be taken to avoid twisting or damaging the welded rail strings. The speed of unloading welded rail strings shall not exceed 4 MPH. Guide rollers shall be placed in pairs about every 39 feet for the entire length of each string at the unloading end of the rail train. This will carry the welded strings from the cars in a gradual manner, not deforming the rail. In areas where new construction is adjacent to existing track, continuous welded rail may be unloaded using a threader car, pulling away from the rail. The Contractor shall provide such equipment, tools and materials as necessary and in common practice for welded rail track construction. It may be necessary for the Contractor to move the welded rail strings to the exact location of installation. The Contractor shall furnish such additional equipment and supplies as may be required to handle and place the CWR strings and the cost thereof included in the unit price for track construction.

When unloading CWR, joint straps shall be removed, rail ends by-passed when necessary and wooden blocks or shims shall be placed between rail ends to

accommodate thermal expansion of rail. CWR must not be unloaded where it would obstruct a grade crossing and must either be cut or buried through it.

The desired laying temperature of the rail is 115 degrees Fahrenheit. The Contractor shall record the temperature of each rail laid. Rail temperature measurements shall be taken on the base of rail on the side away from the sun.

When it is not possible to lay rail at the desired laying temperature, the Contractor shall make the necessary adjustment at a later date. The exact procedure used to adjust the rail temperature must be approved by the Engineer.

The Contractor should apply all rail anchors immediately behind the laying of CWR. Ballast must be unloaded and all cribs filled as soon as rail anchors have been applied. The track should be surfaced and tamped as soon as possible after the laying of the CWR.

De-stressing rail must conform with UPRR's Engineering Track Maintenance Field Manual, Sections 4.5.1, 4.5.5, 4.13, 7.8.1 and 7.8.2 (See Appendix). The Contractor shall supply all field weld kit, molds, bentonite, sand, paste, etc for UPRR crews to use for cutovers. Welds will be Boue one-shot.

- (3) **Joint Bars.** At the time rail is being laid, joint bars shall be applied, placing one bolt at each end of rail in the joint bar. Before the bolts are tightened, and after the track has been surfaced and lined, the joint bars shall be removed and the joint bars as well as the rail ends within the limits of the joint bar area shall be thoroughly cleaned with a wire brush to remove all rust, dirt and mill scale. The contact surface of the joint bars shall then be lubricated using a liberal amount of lubricant as approved by the Engineer. After application of lubricant, the joint bars are to be reapplied; taking care to see that no dirt, gravel or other foreign material is permitted to get into the lubricated area.
- (4) **Staggering of Rail Joints.** Rail not in CWR locations shall be staggered according to the Union Pacific Maintenance of Way Rules or at the direction of the Engineer, except when balancing the joints for switch leads, road crossings, bridge ends and signal circuits, as well as in secondary tracks where use of prefabricated track panels is authorized. To reduce the resonant reaction, rail joints shall be staggered at 12 feet from the nearest joint on the opposite rail. To avoid unnecessary rail cutting in providing staggered joints, a two-foot tolerance will be permitted in either direction. When laying rail, joints must not be located in road crossings, bridge decks, or on ends of bridges.
- (5) **Rail Expansion Shims.** Expansion shims must be used to establish the proper opening between rails. At joints, the opening between rail ends must be as shown in the following table:

For 39 ft Rail:

Rail Temperature	Opening
Below 25° F	1/2"
51° F to 75° F	1/8"

Above 75° F	1/8" every other joint
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For 78 ft Rail:

Rail Temperature	Opening
Below 25° F	1/2"
25° F to 50° F	3/8"
51° F to 75° F	1/4"
75° F to 100° F	1/8"
Above 100° F	1/8" every other joint

Rail thermometers of the approved type must be used to determine the rail temperature.

Exception: Expansion shims must not be used at the ends of strings when laying CWR.

- (6) **Joint Bar Lubrication.** The application of lubricants and general maintenance of rail joints in jointed-rail territory are necessary to ensure that the rail is working properly to accommodate rail expansion and contraction resulting from temperature variations, and prevent the occurrence of track buckles or sun kinks and pull-aparts. Joint bars and rail ends must be cleaned and lubricated with an approved joint lubricant when installing joint bars. Joints must be installed with the full number of bolts and the nuts tightened to the proper tension.

When laying new or second hand jointed rail, or constructing new track using jointed rail, the contact surface of the rail ends and joint bars shall be lubricated using a liberal amount of approved lubricant.

To maintain free rail movement in existing joint rail territory, joint area must be thoroughly lubricated along all marring surfaces and into the interior of the bars, using a Hudson sprayer or equivalent. Frozen joint conditions shall be corrected by loosening the bolts and breaking the bars free from the rail to permit proper oiling and ensure free rail movement within the joint.

- (7) **Mismatched Rail.** Where the running surface of rails at joints are mismatched by more than one eighth (1/8) inch, the Contractor shall build up, grind and profile the rail per Union Pacific Railroad Company Instructions Governing the Inspection, Welding and Heat Treating of Track Components. A rail of more section shall not be ground down to match the lesser, but the lesser built up.
- (8) **Compromised Joints.** At permanent connections of different rail sections, compromise joints or compromise welds shall be installed in accordance with Union Pacific Railroad Track Standard Drawings, and where practicable they shall not be located in crossings, main track curves, on open deck bridges, or in turnouts.

Compromise Joints are required at all locations between the ends of rail of different weights or cross section. The Contractor shall install all compromise joints as directed by the Engineer. Installation of compromise joints shall be considered incidental to track laying and no separate payment made therefore. Compromise joints shall not be placed within the limits of turnouts.

(9) Appendix Information. See Appendix, at the end of this specification, for additional requirements concerning UPRR's Fire Prevention Plan and Minimum Safety Requirements.

6. Ballasting and Surfacing. Furnishing, delivery and unloading of ballast to project site is the Contractor's responsibility. Care must be taken to insure that track and walkways are safe for movement.

Haul and place ballast material in such a way that damage to adjacent areas is avoided.

Ballast shall be uniformly distributed and the track raised, lined, surfaced, and tamped, with the finished surface of the ballast dressed in accordance with the approved drawings.

The track shall be laid and connected before ballast is spread and raised. It will not be permissible to operate over long stretches of track before it has been raised and surfaced unless approved by the Engineer. Immediately prior to unloading ballast for the final 4 inch raise, the track shall be lined as close as practical to the stakes and all ties straightened and respaced as necessary. Ballast shall then be spread evenly and leveled to the required section, taking care to assure that subgrade material is not intermixed with the ballast.

Ballast shall be spread and the track raised in a series of lifts to the approved elevation. No single lift shall be higher than 4 inches. In raising track, if jacks or mechanical tampers are used they shall be so regulated as to avoid the binding or straining of joints. Sufficient sets of track jacks, if used, shall be simultaneously used and properly spaced to avoid sharp breaks or bends in the rail when the track is raised. Both rails shall be raised simultaneously and to proper cross level by utilizing standard track level boards with each set of track raising jacks (minimum three insertions). Tamping is to be done by a Jackson 6700 or approved equivalent in a manner that will produce uniform compaction. Tamping must not disturb subgrade/subballast. Thorough tamping under the rail set is required, and joint ties shall be tamped especially firm. Tamping will not be permitted at the middle of a tie. Both ends of a tie shall be tamped simultaneously and tamping inside and outside the rail shall be done at the same time. All ties that are pulled loose in the track raising operation shall be placed in their proper position and properly tie-plated and fully spiked before tamping. The track shall be true to line and grade as staked with tangent track level transversely. During each track raise, the track is to be tamped in such a manner that it will be uniform. During the raising and tamping operations, sufficient spot boards, track level boards or other approved surfacing devices shall be constantly used to insure the correct surface and cross level in the track after tamping work is completed. After ballasting is completed and the track is in correct gauge, surfaced and lined according to the stakes, the ballast shall be trimmed neatly to the section shown on the drawings, and any surplus material shall be spread evenly along the slopes of the ballast section. Dressing of the ballast by placing earth higher than the ballast toe and thus preventing proper drainage will not be permitted.

Bring the initial layer of compacted ballast to an elevation that will establish the track surface no higher than 2 inches below final base of rail grade. Refer to plans and cross sections for ballast depth and base of rail grades.

Ballast shall be inserted under ties in minimum 2-1/2 inch, maximum 4 inch lifts. Cribs shall be filled with ballast to the top of tie.

Do not perform track surfacing unless the cribs are filled with ballast.

Special care must be taken when surfacing during hot weather in order to avoid track buckles.

Perform track surfacing by an approved method which prevents undue bending of the rail or straining of the joints.

Both rails shall be raised at one time and as uniformly as possible.

Ties that have been pulled loose shall be replaced to proper position and shall be fully tamped to proper elevation.

Ballast shall be kept clean and free of segregation during handling and placing operations.

Ballast to be thoroughly tamped from each tie end to 15 inches outside and inside of rail. Centers are to be filled but not tamped.

Tamping tools shall be inserted simultaneously on opposite sides of the same tie to prevent the tie from cocking, to insure that the ballast under the tie is completely compacted and that the rail is firmly seated on the tie plate.

When using power tampers in tandem, the machines should be of the same type and have identical tamping heads to produce uniform compaction.

Track shall be constructed to the alignment and grade prescribed by the plans. Deviation from established gauge and cross level shall not exceed 1/4 inch; deviation from profile grade and horizontal alignment shall not exceed 1/4 inch in 50 feet. All work shall be acceptable to the Engineer.

Tangent track shall be cross level.

No humps or sags will be accepted nor will irregularities in alignment, either on tangent or curved track, that exceed previously defined deviations.

Maximum allowable adjustment in line after final resurfacing is 2 inches.

Top of track ballast shall be dressed parallel with top of ties, extending 12 inches beyond the end of tie, then on three to one slope to subballast. Not less than three insertions of tamping tools shall be made.

Before final acceptance, all track shall be surfaced and accurately lined to remove all irregularities of cross level, surface or line caused by settlement or compaction of ballast following traffic loading. Any ties not giving full support to rails shall be retamped. Bolts

shall be retightened, if necessary, to bring to full tension and spikes set down to full rail contact.

The UPRR's acceptance of trackage and its appurtenances which have been built shall be based on the UPRR's Representative's written statement that construction and construction materials have met UPRR standards.

7. Field Rail Welding. All field welding shall be performed in accordance with the following:

Clean the rails to be free of grease, oil, dirt, loose scale, and moisture to a minimum of six inches back from the rail ends, including the rail end surfaces, by use of a wire brush. Align the faces of the rail ends. Rail ends to show no steel defects, dents, or porosity before welding. If rail must be cut to length for any reason, cut it square and clean by means of rail saws or abrasive cutting wheels in accordance with AREMA, "Specifications for Steel Rails." Straighten rail not meeting the requirements of AREMA, "Specifications For Fabrication of Continuous Welded Rail", to be within the specified tolerance. If any rail cannot be straightened, cut it back a sufficient distance to achieve the required alignment. Perform all straightening or cutting prior to welding. Align and properly gap the ends of the rails to be welded to produce a weld which conforms to the alignment tolerances specified. Hold the rail gap and alignment during field welding without change during the complete welding cycle. Align rail on the head of the rail. Vertical alignment shall provide for a flat running surface. Horizontal alignment shall be in such a manner that any difference in the width of heads of rails occurs on the field side. Horizontal offsets shall not exceed 0.040 inch in the head and 0.125 inch in the base. Surface misalignment tolerance shall conform to the following:

- (a) **Combined Vertical Offset and Crown Camber.** Not to exceed 0.080 inch per foot at 600 degrees Fahrenheit or less. No dip camber shall be allowed.
- (b) **Gauge Misalignment Tolerance.** Combined horizontal offset and horizontal kink camber not to exceed 0.080 inch per foot at 600 degrees Fahrenheit or less.

All rails for electric-flash butt welds shall have the scale removed down to the bright metal in those end zones, top and bottom of the rails where the welding current-carrying electrodes contact on head and base of rail. All electric-flash butt welds shall be forged to point of refusal to further plastic deformation and have a minimum upset of 1/2 inch, with 5/8 inch as standard. If flashing on electric-flash butt welds is interrupted because of malfunction or external reason, with less than 1/2 inch of flashing distance remaining before upsetting, rails shall be reclamped in the machine and flashing initiated again. Rails for preheated rail welds shall be cleaned 2 inches on each side of the weld, to remove scale and rust using a power actuated grinder, with abrasive wheel. Rail ends shall be preheated prior to welding to at least the temperature designed by the welding manufacturer and for a sufficient time to ensure full fusion of the weld metal to the rail ends without cracking of the rail or weld.

Inspect each weld using a 3 foot straightedge along the centerline of the rail and 0.625 inch below top of rail on the gauge side of the rail head. Center the straightedge over the weld. The gap between the straightedge and the rail to comply with the requirements of AREMA, Chapter 4 and the Union Pacific Railroad Company Instructions Governing the Inspection, Grinding and Heat Treating of Track Components.

Bring rails and joints in the finished track to a true surface and alignment by means of an approved grinding machine.

If end bolt hole is drilled in rail to be welded, the minimum allowable distance from end of rail to edge of end bolt hole is 6”.

Finish the completed weld by grinding to conform with the following requirements:

- (a) Rail head surface and sides shall be finished ground to a smooth and uniform surface.
- (b) The web zone (underside of head, web, top of base, both fillets each side) shall be finished to not greater than 1/8 inch of parent contour or closer, but shall not be deeper than parent section. Finishing shall eliminate all cracks.
- (c) All notches created by offset conditions or twisted rails shall be eliminated by grinding to blend the variations.
- (d) All fins on the weld due to shearing drag shall be removed prior to final inspection.
- (e) All heavy grinding shall be performed on the hot metal, immediately following welding, by an approved rail grinder, to prevent metallurgical damage. Finish grinding shall be carried out in a cooled down condition. Use a straightedge frequently while grinding to make sure that a good straight surface is produced. If a hard grinder must be used, extra care must be taken to insure a smooth running surface without low spots. Any grinding of the web and base of the weld should be done while the web is at least 450 degrees Fahrenheit.
- (f) Jagged, notched or badly mismatched end faces shall be preflashed to an even or mated condition before setting up rails for preheating and final flashing to assure that the entire surfaces of the rail ends are uniformly flashing immediately preceding upsetting.

Test all welds at the time of welding and ultrasonically test both the welds and the rail once the rails have been laid in final position. Ultrasonically inspect welds in accordance with ASTM E164 and the AWS D1.1. Use ultrasonic test equipment capable of detecting a 3/64 inch discontinuity, 6-1/2 inches below the top of rail. At a minimum, scan the weld from the top and both sides of the rail head and the base. Scan the weld from both sides on the face for longitudinal and transverse discontinuities using the applicable scanning pattern or patterns. Use equipment which has a distance amplitude correction feature. Calibrate the equipment daily using an 11 W calibration block, also made of rail steel. Inspection Personnel: Qualify all inspection personnel in accordance with AWS D1.1. Cut out and re-weld all welds giving fault indication in ultrasonic inspection.

De-stressing rail must conform with UPRR’s Engineering Track Maintenance Field Manual, Sections 4.5.1, 4.5.5, 4.13, 7.8.1 and 7.8.2 (See Appendix). The Contractor shall supply all field weld kit, molds, bentonite, sand, paste, etc for UPRR crews to use for cutovers. Welds will be Boue one-shot.

- 8. Vehicular Grade Crossing.** All vehicular grade crossings shall be constructed in accordance with the following:

Construct grade crossings to the lines and grades indicated in the plans and as shown on UPRR Engineering Track Standard Drawings.

Verify that the track has been installed in accordance with the specifications and approved for alignment and profile by the Engineer.

Verify that cross-ties are of correct length, position and spacing to satisfy the requirements of the concrete crossing panels and fasteners. Correct any deficiencies prior to proceeding with grade crossing installation.

When required by the plans, install filter fabric and perforated pipe extending to the indicated limits shown in accordance with the manufacturer's instructions and UPRR Track Standard Drawings. Filter fabric shall meet the requirements of Departmental Material Specification DMS-6200 "Filter Fabric".

Protect filter fabrics from puncture throughout construction.

The approaches for private roadways shall be supplied with stop signs and installed as directed by the Engineer.

All welds within the crossing surface shall be ground flush on all sides of the rail except on the bottom of the base. The track must be properly lined, tamped, compacted, spiked, broomed and anchored before any crossing material is installed.

9. Turnouts.

- (1) **Turnouts.** Shall be constructed in strict conformity with the Union Pacific Railroad Track Standard Drawings. The switch stands shall be fastened securely to headblocks and shall be square with the track. The targets shall be lined parallel with the rails of the major track when the switch is lined for the major track. All switch ties shall be fully tie plated. Stock rails for turnouts shall be bent accurately and shall not be sprung into place. All frogs, with the exception of self-guarded frogs, shall be protected by guardrails installed in accordance with the standard plans before any train is allowed to pass over them. Turnouts shall also include switchman walkways.
- (2) **Spiking.** Turnouts shall have all special switch plates, frog and guard rail plates fully spiked. Spiking standards shall be per Union Pacific Railroad Track Standard Drawings and Maintenance of Way Rules 52.0 through 52.4.
- (3) **Panel Turnouts.** Shall be constructed in strict conformity with the Union Pacific Railroad Track Standard Drawings and these specifications. Care shall be taken in unloading or moving the panel sections so as not to skew or bend the sections or cause damage to the prepared subgrade. The Contractor shall adjust anchors, ties, spikes, switch plates, braces, etc., as necessary to conform to the standard plan.
- (4) **Derails and Bumpers.** Where required, derails and bumpers shall be installed in conformity with the Union Pacific Railroad Track Standard Drawings and/or instructions, and shall be inspected and approved by the Engineer before final acceptance and operation over the track.
- (5) Anchors are to be place on both sides of every tie 200' in each direction of the turnout.

10. Removing Ballasted Track, Turnouts and Vehicular Grade Crossings. After designated sections of ballasted track, turnouts and grade crossings are no longer needed to carry traffic they shall be disconnected from the rail line and all salvageable materials shall be removed. Remove all abandoned structures. Fill in ditches, except as needed for drainage and scarify abandoned trackbed and/or plow so as to mix it with soil to the satisfaction of the Engineer. The entire area of the removed ballasted track and turnouts shall be smoothed by blading or other methods. Pave over abandoned grade crossings as shown in the plans and directed by the engineer.

11. Salvaging. Unless otherwise specified, all removed materials shall become the property of the contractor.

12. Measurement.

Ballasted track will be measured by the track foot for construction and removal.

Vehicular grade crossing will be measured by the foot for installation and removal.

Ballasted Track Turnout installation and removal will be measured by each.

Subballast will be measured by the cubic yard, complete in place.

13. Payment. The work performed and material furnished by this Item and measured as provided under "Measurement", will be paid for as follows:

Payment for ballasted track will be made at the unit price bid for "Ballasted Track Construction (Track)" and "Ballasted Track Construction (Track Removal)". This price shall be full compensation for transportation; storage; installation of materials including all welding, track work on bridges, track work at vehicular grade crossings; placing ballast; for raising track to final grade and alignment; for the removal of all materials used in Ballasted Track Construction and for all other materials, tools, equipment and incidentals necessary to complete the work.

Payment for vehicular Grade crossing will be made at the unit price bid for "Vehicular Grade Crossing" and "Vehicular Grade Crossing (Removal)". This price shall be full compensation for all crossing materials, filter fabric, underdrains, fasteners; for the removal of the crossing materials, filter fabric, underdrains, fasteners and for all other materials, tools, equipment, labor and incidentals necessary to complete the work.

Payment for turnouts will be at the unit price bid for "Ballasted Track Construction (Turnout)" and "Ballasted Track Construction (Turnout Removal)". This price shall be full compensation for all furnishing, installing and removing turnouts and for all materials, tools, equipment and incidentals necessary to complete the work.

Payment for subballast will be at the unit price bid for "Subballast". This price shall be full compensation for furnishing, hauling, placing, sprinkling, rolling the subballast and for all other materials, tools, equipment and incidentals necessary to complete the work.

APPENDIX

Table 4-B

Alloy Rail		
Manufacturer Branding	Stamping	Chemistry/Type
CF&I	CROMO	Chrome/Molybdenum
CF&I	HI SI	High Silicon
WHEELING PITT	WR	Chrome/Silicon
KLOCKNER-AL	Blank	Chrome/Vanadium
KRUPP-AL	Blank	Chrome/Vanadium
THYSSEN-AL	Blank	Chrome/Vanadium
ATH	Blank	Chrome/Vanadium

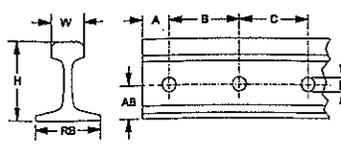
Table 4-C

Non-Alloy Rail		
Manufacturer Branding	Stamping	Chemistry/Type
BETHLEHEM STEEL	FT	Fully Heat Treated
BETHLEHEM STEEL	HH	Head Hardened
BETHLEHEM STEEL	MH	Standard Strength
BRITISH STEEL	FT	Head Hardened
CF&I	IS	Head Hardened
CF&I	HH	Head Hardened
CF&I	DH390	Head Hardened
CF&I	IS	Standard Strength
CF&I	SS	Standard Strength
COLORADO	Blank	Standard Strength
HAYANGE	Blank	Standard Strength
ILLINOIS	Blank	Standard Strength
INLAND	Blank	Standard Strength
KLOCKNER	Blank	Standard Strength
KRUPP	Blank	Standard Strength
MMRA	Blank	Standard Strength
MMRA HH	Blank	Head Hardened
NIPPON	DH340	Head Hardened
NIPPON	DH370	Head Hardened
NIPPON	HE370	Head Hardened
NIPPON	HE400	Head Hardened
NKK	NHH	Head Hardened
NKK	SP	Head Hardened
NKK HH	Blank	Head Hardened
RMSM	DH 390	Head Hardened
RMSM	SS	Standard Strength
RMSM	HCP	Head Hardened
RMSM	Blank	Standard Strength
TENNESSEE	Blank	Standard Strength
THYSSEN	HH	Head Hardened
THYSSEN	Blank	Standard Strength
WHEELING PITT	MH	Standard Strength

4.2.5 Rail Sections

The following table 4-D lists some of the more common rail sections used in the construction of the railroads throughout their history. Though most of the sections are no longer used, the table can be used as a reference for rail identification and a guide for rail end drilling in repair situations:

Table 4-D



Common Rail Section Information							
Rail Weight (lbs/yd)	Rail Section Type	"H" Rail Height (inches)	"RB" Rail Base (inches)	"W" Head Width (inches)	Rail End Drilling "A-B-C" (inches)	"D" Hole Dia. (inches)	"AB" Above Base (inches)
75	40 (ASCI)	4 1/16	5	2 15/32	2 1/16 - 5 (RP) 3 - 6 (MP) 2 29/32 - 4 (RP) 2 29/32 - 5 (MP, MA)	1 1/8	2 15/16
	CS	5	5	2 9/16	2 11/16 - 5 (RP & SP) 2 5/8 - 5 1/2 (RP)	1 1/32	2 1/4
85	48 (ACSI)	5 3/16	5 3/16	2 9/16	2 29/32 - 6 (CRH) 2 13/16 - 5 (MP) 2 15/16 - 6 (MP)	1 1/8	2 17/64
	50	5 7/32	5 1/4	2 15/32	2 13/32 - 5 (MP) 2 5/8 - 5 1/2 (RP)	1 1/8	2 21/32
90	RA (APA-N)	5 5/8	5 1/8	2 9/16	2 13/32 - 5 (MP, SP) 2 29/32 - 6 (MP, CRH)	1 1/16	2 19/32
	CS	5 3/4	5 3/8	2 3/4	2 5/8 - 5 1/2	1 1/8	2 3/16
100	RA Headline	2 25/32	5 1/8	2 3/16	2 29/32 - 6 2 5/8 - 5 1/2 (RP) 2 11/16 - 5 1/2 (MP)	1 1/4	2 1/2
	25 RE 28 RA	6 6	5 3/8 5 1/2	2 11/16 2 3/4	2 13/32 - 5 (MP) 2 1/2 - 6 1/2 (CRH)	1 1/8 1 3/16	2 3/4
110	RE	6 1/4	5 1/2	2 25/32	2 11/16 - 5 1/2 (RP, SP) 2 29/32 - 6 (MP) 2 23/32 - 5 1/2 (CRH)	1 1/4	2 5/8
	RE Headline	6 3/16	5 1/2	2 11/16	2 29/32 - 6 (MP) 2 1/2 - 6 1/2	1 1/8	2 13/16
112	28 RE	6 5/8	5 1/2	2 23/32	2 1/2 - 6 1/2 2 1/2 - 6 1/2 (MP)	1 1/4	2 7/8
	RE Headline	6 3/4	5 1/2	2 11/16	2 1/2 - 6 1/2 (MP) 2 1/2 - 6 1/2 (SP)	1 1/8	2 7/8
113	Headline	6 13/16	5 1/2	2 11/16	2 1/2 - 6 1/2 (SP) 3 1/2 - 6 - 6	1 1/4	2 7/8
116	25 RE	6 5/8	5 1/2	2 23/32	2 1/2 - 6 1/2 - 6 1/2 (MP, SP) 3 1/2 - 6 - 6	1 1/4	2 7/8
	RE	6 13/16	5 1/2	2 21/32	2 1/2 - 6 1/2 - 6 1/2 (MP, SP)	1 1/4	2 7/8
130	PS	6 5/8	5 1/2	3	2 11/16 - 5 1/2 - 5 1/2 (SP) 2 11/16 - 5 1/2 (RP)	1 1/4	2 3/4
	RE	6 3/4	6	2 15/16	2 11/16 - 5 1/2 (RP)	1 1/4	2 3/4
131	RE	7 1/8	6	3	2 1/2 - 6 1/2 - 6 1/2 (MP) 2 15/16 - 6 1/2 - 6 1/2 (RP)	1 1/8	2 23/32
	28 RE	7 1/8	6	3	2 23/32 - 6 - 7 2 1/2 - 6 - 6 (MP) 2 1/2 - 6 - 6 (RP)	1 1/8	3 1/4
132	25 RE	7 1/8	6	3	2 15/16 - 6 - 6 (MP) 2 15/16 - 6 - 6 (RP)	1 1/8	3 3/32
	Headline	7 3/16	6	2 31/32	2 1/2 - 6 1/2 - 6 1/2 (SP)	1 1/8	3 3/32
133	0 RE	7 1/16	6	3	3 1/2 - 6 - 6 3 1/2 - 6 - 6 2 15/16 - 6 - 6 (MP)	1 1/8	3
136	0 RE	7 5/16	6	2 15/16	2 11/16 - 5 1/2 - 5 1/2 (SP) 2 1/2 - 6 1/2 - 6 1/2 (SP)	1 1/8	3 3/32
	CF&I	7 5/16	6	2 15/16	2 1/2 - 6 1/2 - 6 1/2 (SP)	1 1/8	3 3/32
140	31 RE	7 3/16	6	3	6 - 3 - 2 23/32	1 1/8	3
141	AB	7 7/16	6	3 1/16	3 1/2 - 6 - 6	1 1/4	3 3/32

4.3 Rail Relays and Wear Limits

Out-of-face rail and curve relay programs are based on accumulated gross tonnage, defect rates, and rail head wear.

4.3.1 Classification and Use of Second Hand Rail

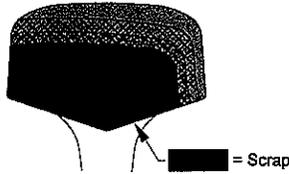
The specification and inspection parameters below detail the guidelines for the secondhand rail standards. These are the standards that secondhand rail be recovered for re-use or purchased from outside sources. The instructions outlined below are designed to provide consistent evaluation of secondhand rail throughout the system so that each rail is properly marked for its identity and usage.

Class 1-Principal utilization is for main line replacement rails, rail relays of lines carrying between 5 and 20 MGT per year and other areas requiring long term serviceable secondhand rail.

Class 2-Principal utilization is for secondary main line or siding replacement rails, rail relays of lines carrying less than 5 MGT per year, yard or industry tracks and other areas of low track speeds or demands on serviceable secondhand rail.

Class 3-Principal utilization is for yard or industry tracks and other areas of temporary service or low demands on quantity of secondhand rail.





133 WEAR COMPARISON BETWEEN CLASS 1, 2, AND 3

	Allowable Top Wear	Allowable Side Wear
CLASS 1	1/4"	1/8"
CLASS 2	7/16"	1/4"
CLASS 3	5/8"	3/8"

Figure 4-C

Class 1		
Rail Weight	Max. Vert. Wear	Max. Hor. Wear
141	5/16"	1/8"
133-136	1/4"	1/8"
131-132	3/16"	1/8"
119	5/32"	1/16"
112-115	1/8"	1/16"
Corrugation up to .010 allowed		
Class 2		
Rail Weight	Max. Vert. Wear	Max. Hor. Wear
141	7/16"	1/4"
133-136	3/8"	1/4"
131-132	1/4"	1/4"
119	1/4"	1/8"
112-115	3/16"	1/8"
Two dime sized engine burns per 39' corrugation up to .020 1/4" field size lip allowed		
Class 3		
Rail Weight	Max. Vert. Wear	Max. Hor. Wear
141	11/16"	3/8"
133-136	5/8"	3/8"
131-132	3/8"	3/8"
119	3/8"	5/16"
112-115	1/4"	5/16"
Three quarter sized engine burns per 39', corrugations and light spalling up to .030, pitting and oxidation up to .060 and 1/4" field side lip allowed.		

Table 4-D-1

A. Manufacturing Process Restrictions

A-rails and non-controlled cooled rails are to be utilized in yard, back or industry tracks only. These rails must be separated in inventory upon inspection and identification. Non controlled cooled rails (pre 1937) are not to be utilized in welded strings. If rail cannot be identified because of corrosion, rust scaling or otherwise, assume that the rail is an "A-rail" and inventory as such. Under current policy, no A-rails or non-controlled cooled rails can be purchased.

A-rail - Rails rolled from the top or "first rail" of the ingot casting process (past technology). This rail is identified with an "A" stamped on the heat number side between the heat and ingot/boom numbers. This rail is prone to have the majority of defects in rails manufactured by the ingot process. A-rail is limited to Class 3 usage.

The following rail chemistries must not be reinstalled on any track unless directed by the Chief Engineer:

"Algoma, British, Workington, Vilru, Bethlehem FHT" manufactured rails.

"Klockner, Thyssen, Krupp and CFI" manufactured chrome rails.

Any other manufactured chrome alloy rails

B. Acceptable Lengths

The minimum acceptable length for secondhand rail classified at the weld plant is 25 feet. Minimum length for plug rail is 15 feet.

C. Wear Measurement References

Vertical head measurement will be taken from the center of the rail's head (+/- 3/8") to its base plane (excluding base pitting). Determine gauge face wear loss by measuring the width of the railhead at a point 5/8" below the top surface of the railhead.

D. Weld Plant Classification Parameters

After cropping, no bolt holes can remain, no bond wires or bond pin holes are allowed within 18" from ends of the rails. Rail ends must be inspected for injurious pipe or segregation. No negative camber in the rails is allowed, a maximum of 3/4" uniform side sweep in 39 ft. is permissible. Twisted rails (>0.060" on ends), or bent rails will be scrapped. Rail ends will be straight with a maximum 0.030" concave hook and no droop allowed, as measured with a 36" straight edge and taper gage.

E. Internal Defects

Rail subject to these specifications shall be free of known internal defects. All SH rails not generated by UP will be ultrasonically tested and free of any defects in excess of the following reflector set up criterion. Head - 1/16" flat bottom hole, Web - 3/32" flat bottom hole, Base - 1/16" deep by 1/4" long by 1/16" wide slot.

F. Drilled Stick Rail

When secondhand drilled rails are retained or purchased, the above requirements and parameters apply with the following additions. No extra bolt holes are allowed and end batter shall not exceed 1/16" on Class 1 or 1/8" on Classes 2 and 3. Bolt holes shall be free of defects and fins and shall not be elongated in excess of 1/16".

G. Marking of Classified Rails

After cropping and classification, rails will be center marked to facilitate handling. Class number and weight of rail will be marked on top of the head on one end. In addition, A-rails and non-control-cooled rails will be marked with an A (ie. #3 115RE A) and non-control-cooled rails marked NC. Marking will be done with high quality white paint or other approved method, with the objective of long term legibility. Drilled rails will have their pattern identified such as (#2 133RE 6H UP). This example is a Class 2 133RE rail drilled 3 holes both ends at 3 1/2 x 6 x 6.

H. Shipment Requirements of Stick Rail

All carloads of rail received at UP facilities, must be loaded per 'AAR Section 2, Rules Governing Loading of Steel Products Including Pipe on Open Top Cars' or per individual special agreements. Under no circumstances will rail be received loaded "loose fill", rail must be loaded on its base (head up) on spaced wood slates to prevent shifting, damage, etc.

4.3.2 Out-of-Face Rail Relays

For a list of guidelines of approved rail sections for out-of-face rail relay programs.

4.0 RAIL & JOINTS



Minimum Safety Requirements for Engineering Department Contractors

The safety of personnel, property, rail operations, and the public is of paramount importance in the prosecution of the work pursuant to this agreement. As reinforcement and in furtherance of overall safety measures to be observed by the Contractor (and not by way of limitation), the following special safety rules shall be followed. The terms “Contractor” and “Employees” as used in this document refers to all employees of the contractor as well as all employees of any subcontractor.

Clothing

All employees of the Contractor will be suitably dressed to perform their duties safely and in a manner that will not interfere with their vision, hearing, or free use of their hands or feet.

Specifically, the Contractor’s employees must wear:

Waist-length shirts with sleeves.

Trousers that cover the entire leg. If flare-legged trousers are worn, the trouser bottoms must be tied to prevent catching.

Footwear that covers their ankles and has a defined heel. Employees working on bridges are required to wear safety-toed footwear that conforms to the American National Standards Institute (ANSI) and FRA footwear requirements. Employees shall not wear boots (other than work boots), sandals, canvas-type shoes, or other shoes that have thin soles or heels that are higher than normal.

Employees must not wear loose or ragged clothing, neckties, finger rings, or other loose jewelry while operating or working on machinery.

Personal Protective Equipment

The Contractor shall require its employees to wear personal protective equipment as specified by Railroad rules, regulations, or the railroad’s employee in charge. In particular, the protective equipment to be worn shall be:

Hard hat that meets the American National Standard (ANSI) Z89.1 – latest revision. Hard hats should be affixed with the contractor’s or subcontractor’s company logo or name.

Eye protection that meets American National Standard (ANSI) for occupational and educational eye and face protection, Z87.1 – latest revision. Additional eye protection must be provided to meet specific job situations such as welding, grinding, etc.

Hearing protection, which affords enough attenuation to give protection from noise levels that will be occurring on the job site. Hearing protection, in the form of plugs or muffs, must be worn when employees are within:

- 100 feet of a locomotive or roadway/work equipment

- 15 feet of power operated tools

- 150 feet of jet blowers or pile drivers

- 150 feet of retarders in use (when within 10 feet, employees must wear dual ear protection – plugs and muffs)

Other types of personal protective equipment, such as respirators, fall protection equipment, and face shields, must be worn as directed by the employee in charge.

On Track Safety

The Contractor is responsible for compliance with the Federal Railroad Administration's Roadway Worker Protection regulations – 49CFR214, Subpart C and UPRR's On-Track Safety rules. Under 49CFR214, Subpart C, railroad contractors are responsible for the training of their employees on these regulations. In addition to the instructions contained in Roadway Worker Protection regulations, all contractor employees must:

Maintain a distance of 25 feet to any track unless a railroad representative is present to authorize movements.

Wear an orange, reflectorized workwear approved by the employee in charge.

Participate in a job briefing that will specify the type of On-Track Safety for the type of work being performed. Contractors must take special note of limits of track authority, which tracks may or may not be fouled, and clearing the track. They will also receive special instructions relating to the work zone around machines and minimum distances between machines while working or traveling.

Equipment

It is the responsibility of the Contractor to ensure that all equipment is in a safe condition to operate. If, in the opinion of the railroad representative, any of the Contractor's equipment is unsafe for use, the Contractor shall remove such equipment from the railroad's property. In addition, the Contractor must ensure that:

The operators of all equipment are properly trained and competent in the safe operation of the equipment. In addition, operators must be:

- Familiar and comply with UPRR's rules on lockout/tagout of equipment.

- Trained in and comply with the applicable operating rules if operating any hy-rail equipment on-track.

- Trained in and comply with the applicable air brake rules if operating any equipment that moves rail cars or any other railbound equipment.

All self-propelled equipment is equipped with a first-aid kit, fire extinguisher, and audible back-up warning device.

Unless otherwise authorized by the employee in charge, all equipment is parked a minimum of 25 feet from any track. Before leaving any equipment unattended, the operator must stop the engine and properly secure the equipment against movement.

Cranes are equipped with three orange cones that will be used to mark the working area of the crane and the minimum clearances to overhead powerlines.

General Safety Requirements

The Contractor shall keep the job site free from safety and health hazards and ensure that its employees are competent and properly trained in all safety and health aspects of the job.

Specifically, the Contractor must ensure that:

The railroad is promptly notified of any reportable injury (as defined by the U. S. Occupational Safety and Health Administration) to an employee that occurs during the performance of work at the job site.

Employees do not use, be under the influence of, or have in their possession any alcoholic beverage or illegally obtained drug, narcotic, or other substance while on railroad property.

All waste is properly disposed of in accordance with applicable federal and state regulations

All employees participate in and comply the Job Briefing conducted by the employee in charge.

During this briefing, the employee in charge will specify safe work procedures, (including On-Track Safety) and the potential hazards of the job. If any participant has any questions or concerns about the work, he/she must voice them during the job briefing. Additional job briefings will be conducted during the work as conditions, work procedures, or personnel change.

All track work performed by the Contractor meets the minimum safety requirements established by the Federal Railroad Administration's Track Safety Standards 49CFR213.

All employees comply with the following safety procedures when working around any railroad track:

- Always be on the alert for moving equipment. Employees must always expect movement on any track, at any time, in either direction.

- Do not step or walk on the top of the rail, frog, switches, guard rails, or other track components.

- In passing around the ends of standing cars, engines, roadway machines or work equipment, leave at least 20 feet between yourself and the end of the equipment. Do not go between pieces of equipment if the opening is less than one car length (50 feet).

- Avoid walking or standing on a track unless so authorized by the employee in charge.

- Before stepping over or crossing tracks, look in both directions first.

- Do not sit on, lie under, or cross between cars except as required in the performance of your duties and only when track and equipment have been protected against movement.

All employees comply with all federal and state regulations concerning workplace safety.

Union Pacific is committed to providing the safest workplace possible for, not only our own employees but also, the Contractor's employees. Adherence to these minimum safety requirements, plus additional instructions at the job site, will help to ensure an injury-free project. The railroad employee in charge is authorized to take any actions necessary to prevent injuries to any person, damage to railroad property, disruption of railroad operation, and the safety of the public.



Union Pacific Railroad Engineering Department



Fire Prevention Plan

August 1, 2003

Engineering Department's Fire Prevention Plan

General Statement of Fire Safety

Job Briefings

Fire Control Measures

Fire Danger Class

Production Rail Grinders

In-Track Welders

Open-Flame Rail Heaters

Welding, Grinding or Cutting Operations

Other Work Activities

Track Inspectors

Rule References

GENERAL STATEMENT OF FIRE SAFETY

The purpose of this plan is to prevent loss of life, property and natural resources and to prevent disruption of train operations as a result of fires caused by the work activities of Union Pacific's engineering employees.

All engineering personnel and contractors must be familiar and comply with the instructions contained in this plan. They must also be familiar and comply with state and local fire control regulations where they are working. State and local regulations may require dedicated fire-fighting equipment or other restrictions in addition to what is required in this instruction.

JOB BRIEFINGS

Before beginning any work that could cause a fire, a job briefing must be conducted to discuss the fire preventive measures to be taken in accordance with these instructions and the fire suppression methods to be utilized in case of a fire.

The job briefing must also include a review of the Emergency Response Plan in effect for the specific work location. The Emergency Response Plan must detail the method of contacting local fire/emergency personnel, the train dispatcher and Risk Management Control Center (RMCC). The Emergency Response Plan must also include the evacuation route to be followed in case of a wildfire.

FIRE CONTROL MEASURES

All employees will respond to a fire without endangering their own safety. If a fire gets out of control:

1. Contact local fire/emergency personnel, train dispatcher and RMCC, if possible.
2. Evacuate the area using the route detailed in the job briefing.
3. Contact others in the immediate area to alert them to the fire danger.

FIRE DANGER CLASS

The National Interagency Fire Center provides a Fire Danger Class map on their website at http://www.fs.fed.us/land/wfas/fd_class.gif. For purposes of these instructions, Fire Danger Class HIGH includes classes "high", "very high" and "extreme". Fire Danger Class LOW includes classes "low" and "moderate". The employee in charge of each work activity specified in these instructions must know the Fire Danger Class for the area they are working each day.

PRODUCTION RAIL GRINDERS

Employees and contractors operating or working with production rail grinders will be governed by the following instructions. The supervisor must determine the Fire Danger Class for the area they will be working each day.

1. Grinders must be equipped with spark guards.
2. Fire suppression systems on grinders will have the capability to inject Class A foam into the water supply.
3. Each grinder will carry a minimum of 500 feet of 1½" fire hose along with hand tools for fire fighting.

4. At least one railroad supervisor or contractor supervisor must have received training on wildland fire fighting. This trained supervisor must accompany the rail grinder at all times when grinding rail.
5. When Fire Danger Class is HIGH, a hyrail water truck must follow the grinder. A second off-track, fire-fighting vehicle may also be required to follow the grinding operation.
6. Grinding will cease when the grinder's water reserve falls below 5,000 gallons.
7. Manager of Rail Grinding will be responsible for notifying state and federal agencies of the grinding schedule prior to beginning work.
8. Grinding supervisor or service unit manager will notify the local bridge or track forces prior to grinding the rail on timber bridges. Bridge or track personnel must be on site during the grinding operations and protect the bridge for 4 hours after the last grinding pass has been made.
9. Grinders equipped with thermal imaging equipment must use them to ensure no danger of fire exists before leaving.
- 10. Grinding supervisor will determine additional measures to be taken during periods of extreme dryness or high winds. These additional measures may include shutting down the rail grinding operations.**

IN-TRACK WELDERS

Employees or contractors involved with in-track welding operations are governed by the following instructions. Support gangs with the in-track welders must comply with the instructions specific to their work activities (e.g. rail cutting). When Fire Danger Class is HIGH:

1. In-track welders must have available a minimum of 50 gallons of water with at least 2 pump sprayers. They must also carry six round-nose shovels with an overall length of 46 inches or longer. When temperatures are below freezing, chemical fire extinguishers may be used in lieu of water.
2. Consideration must be given to wetting down or clearing flammable vegetation around the work area.
3. One person will be assigned as a Fire Spotter during the welding process. This person will carry a long-handled round-nose shovel and will be responsible for ensuring that no danger of fire exists before leaving the area.
- 4. Welding supervisor will determine additional measures to be taken during periods of extreme dryness or high winds. These additional measures may include shutting down the welding operations.**

OPEN-FLAME RAIL HEATERS

Rail and curve gang employees are governed by the following instructions when operating an open-flame rail heater. When Fire Danger Class is HIGH:

1. Each rail gang must have available a minimum of 200 gallons of water with at least 4 pump sprayers. Each curve gang must have available a minimum of 100 gallons of water with at least 4 pump sprayers. They must also carry at least 10 round-nose shovels with an overall length of 46 inches or longer. When temperatures are below freezing, chemical fire extinguishers may be used in lieu of water.
2. One water tank will be positioned directly behind the rail heater to douse all ties with water. On rail gangs, a second water tank will be positioned at the rear of the gang to ensure that any smoldering ties are again doused.

- 3. Rail or curve gang supervisor will determine additional measures to be taken during periods of extreme dryness or high winds. These additional measures may include shutting down the rail heater operations.**

WELDING, GRINDING OR CUTTING OPERATIONS

Employees or contractors involved in welding, grinding or cutting operations are governed by the following instructions. When Fire Danger Class is HIGH:

- 1. Track welders and switch grinders** must have available a minimum of 20 gallons of water with at least 2 pump sprayers and 2 round-nose shovels with an overall length of 46 inches or longer.
Track gangs must have available a minimum of 5 gallons of water with at least 1 pump sprayer and enough round-nose shovels with an overall length of 46 inches or longer for every member of the gang.
Bridge welders working over timber bridges or flammable vegetation must have available a minimum of 20 gallons of water with at least 2 pump sprayers and enough round-nose shovels with an overall length of 46 inches or longer for every member of the gang.
Signalmen involved in welding electrical connections (i.e. cadweld) or grinding must have available at least 5 gallons of water with at least 1 pump sprayer and enough round-nose shovels with an overall length of 46 inches or longer for every member of the gang.
Brushcutter operators must have at least 20 gallons of water with at least one pump sprayer and at least one round-nose shovel with an overall length of 46 inches or longer.
Note: When temperatures are below freezing, chemical fire extinguishers may be used in lieu of water.
- 2.** A spark shield will be used when sparks will not be confined to the ballast section and when working over or near timber bridges or structures.
- 3.** Consideration must be given to wetting down or clearing flammable vegetation around the work area.
- 4.** The employee in charge is responsible to ensure that no danger of fire exists before leaving the area.
- 5. The employee in charge will determine additional measures to be taken during periods of extreme dryness or high winds. These additional measures may include shutting down rail welding, grinding or cutting operations.**

OTHER WORK ACTIVITIES

Employees must take all precautions necessary to prevent fires from other work activities not specifically mentioned in these instructions. Even when Fire Danger Class is LOW, adequate fire prevention measures must be taken for the work to be performed. In addition, employees must:

- 1.** Use caution when parking a vehicle so that heat from the exhaust system does not ignite the vegetation.
- 2.** Fuel equipment away from any sources of heat and at least 10 feet from any flammable vegetation. Engine must be stopped while refueling. Restart portable equipment away from the fueling site.
- 3.** Conduct thorough roll-by inspections of trains, watching closely for exhaust sparks from the locomotives, smoke or sparks from brake shoes and hot journals.

TRACK INSPECTORS

Track inspectors must keep a lookout for right-of-way fires. When Fire Danger Class is HIGH, each track inspector must carry a minimum of 5 gallons of water with a pump sprayer and 1 round-nose shovel with an overall length of 46 inches or longer.

RULE REFERENCES

These instructions complement the current rules in effect:

General Code of Operating Rules

1.28 Fire

Safety Rules

72.1 Sounding Alarm

72.7.2 Mobile Equipment

79.3 Fire Protection

79.3.1 Protecting Area

79.11 Hot Metal Precautions

Welding Rules

101.3.2 Shield Welds from Materials

Environmental Laws, Policies and Procedures

Section D-5 - Fire Protection