UTC
TILITIES AND TRANSPORTATION
COMMISSION

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

US Government – Joint Base Lewis McChord Petitioner, vs. Tacoma Rail Respondent	)	DOCKET NO. TR-111634 PETITION TO CONSTRUCT OR RECONSTRUCT A HIGHWAY-RAIL GRADE CROSSING AND INSTALL AN INTER-TIE BETWEEN A HIGHWAY SIGNAL AND A RAILROAD CROSSING SIGNAL SYSTEM USDOT CROSSING NO.: 396703W

Prior to submitting a Petition to **Construct** a highway-rail grade crossing and install an inter-tie between a Highway Signal and a Railroad Crossing Signal System to the Washington Utilities and Transportation Commission (UTC), State Environmental Protection Act (SEPA) requirements must be met. Washington Administrative Code (WAC) 197-11-865 (2) requires:

> **All actions of the utilities and transportation commission under statutes administered as of December 12, 1975, are exempted, except the following:**
>
> **(2) Authorization of the openings or closing of any highway/railroad grade crossing, or the direction of physical connection of the line of one railroad with that of another;**

Please attach sufficient documentation to demonstrate that the SEPA requirement has been fulfilled. For additional information on SEPA requirements contact the Department of Ecology.

Installation of the signals proposed hereunder is Categorically Exempt under WAC 197-11-800(2)(c).

The Petitioner asks the Washington Utilities and Transportation Commission to approve reconstruction of a highway-rail grade crossing and inter-tie the highway signal with the railroad crossing signal system.

Section 1 – Petitioner's Information

US Government – Joint Base Lewis McChord
Petitioner

Signature

Bldg 02012 Liggett Ave
Street Address

Joint Base Lewis-McChord, WA 98433-9500
City, State and Zip Code

Directorate of Public Works, Bldg 2012 Liggett Ave MS17 Box339500
Mailing Address, if different than the street address Joint Base Lewis-McChord, WA 98433-9500

Steven Perrenot, P.E., Public Works Director
Contact Person Name

Larry Mickel, (253) 966-1887, larry.mickel@us.army.mil
Contact Phone Number and E-mail Address

Section 2 – Respondent's Information

Tacoma Rail
Respondent

2601 SR-509 N. Frontage Road
Street Address

Tacoma, WA 98421
City, State and Zip Code

Mailing Address, if different than the street address

Alan Matheson
Contact Person Name

(253) 502-8934 alan.matheson@cityoftacoma.org
Contact Phone Number and E-mail Address

Section 3 – Proposed Crossing Location

1. Existing highway/roadway East Gate Road

2. Existing railroad Tacoma Rail Mountain Division

3. Location of proposed crossing:
   Located in the SW 1/4 of the SW 1/4 of Sec. 18, Twp. 18N, Range 3E W.M.

4. GPS location, if known _____

5. Railroad mile post (nearest tenth) 20.90

6. City _____ County Pierce County

Section 4 – Proposed Crossing Information

1. Railroad company Tacoma Rail

2. Type of railroad at crossing Common Carrier

3. Type of tracks at crossing **1** Main Line **1** Siding or Spur

4. Number of tracks at crossing 2

5. Average daily train traffic, freight 2/week (may increase to 10/week in 2 years)

   Authorized freight train speed 20 Operated freight train speed 10

6. Average daily train traffic, passenger N/A

7. Will the proposed crossing eliminate the need for one or more existing crossings? No

8. Does the petitioner propose to close any existing crossings? No

Section 5 – Temporary Crossing

1. Is the crossing proposed to be temporary? No

Section 6 – Current Highway Traffic Information

1. Name of roadway/highway East Gate Road

2. Roadway classification Local Access – US Government

3. Road authority US Government – Joint Base Lewis McChord

4. Average annual daily traffic (AADT) 3,500

5. Number of lanes 1 WB, 2 EB

6. Roadway speed 25 MPH

7. Is the crossing part of an established truck route? No

8. If so, trucks are what percent of total daily traffic? N/A

9. Is the crossing part of an established school bus route? No

10. If so, how many school buses travel over the crossing each day? N/A

11. Describe any changes to the information in 1 through 7, above, expected within ten years:
Highway traffic volumes estimated to increase 2.3% annually

Section 7 – Alternatives to the Proposal

1. Does a safer location for a crossing exist within a reasonable distance of the proposed location?
No

2. If a safer location exists, explain why the crossing should not be located at that site. N/A

3. Are there any hillsides, embankments, buildings, trees, railroad loading platforms or other barriers in the vicinity which may obstruct a motorist's view of the crossing?
No

4. If a barrier exists, describe: N/A
- ♦ Whether petitioner can relocate the crossing to avoid the obstruction and if not, why not.
- ♦ How the barrier can be removed.
- ♦ How the petitioner or another party can mitigate the hazard caused by the barrier.

5. Is it feasible to construct an over-crossing or under-crossing at the proposed location as an alternative to an at-grade crossing?
No

6. If an over-crossing or under-crossing is not feasible, explain why.

Proposal seeks to upgrade warning signals due to installation of a highway traffic signal at the adjacent East Gate Road/SR-507 intersection, located 40 feet east of the railroad grade crossing of East Gate. The short distance between the tracks and SR-507 does not allow for grade separation.

7. Does the railway line, at any point in the vicinity of the proposed crossing, pass over a fill area or trestle or through a cut where it is feasible to construct an over-crossing or an under-crossing, even though it may be necessary to relocate a portion of the roadway to reach that point?
No

8. If such a location exists, state: N/A
- ♦ The distance and direction from the proposed crossing.
- ♦ The approximate cost of construction.
- ♦ Any reasons that exist to prevent locating the crossing at this site.

9. Is there an existing public or private crossing in the vicinity of the proposed crossing?
No

10. If a crossing exists, state: N/A
- ♦ The distance and direction from the proposed crossing.
- ♦ Whether it is feasible to divert traffic from the proposed to the existing crossing.

Section 8 – Sight Distance

1. Complete the following table, describing the sight distance for motorists when approaching the tracks from either direction.

a. Approaching the crossing from West (North, South, East, West), the current approach provides an unobstructed view as follows:

Direction of sight (left or right)	Number of feet from proposed crossing	Provides an unobstructed view for how many feet
Right	300	0
Right	200	40
Right	100	65
Right	50	75
Right	25	90
Left	300	110
Left	200	120
Left	100	130
Left	50	150
Left	25	220

b. Approaching the crossing from East (Opposite direction-North, South, East, West), the current approach provides an unobstructed view as follows:

	Number of feet from	Provides an unobstructed

Direction of sight (left or right)	proposed crossing	view for how many feet
Right	300	225
Right	200	230
Right	100	235
Right	50	250
Right	25	275
Left	300	190
Left	200	190
Left	100	200
Left	50	220
Left	25	235

2. Will the new crossing provide a level approach measuring 25 feet from the center of the railway on both approaches to the crossing?

Yes

3. If not, state in feet the length of level grade from the center of the railway on both approaches to the crossing. N/A

4. Will the new crossing provide an approach grade of not more than five percent prior to the level grade?

Yes

5. If not, state the percentage of grade prior to the level grade and explain why the grade exceeds five percent. N/A

Section 9 – Illustration of Proposed Crossing Configuration

Attach a detailed diagram, drawing, map or other illustration showing the following:

- ♦ The vicinity of the proposed crossing.
- ♦ Layout of the railway and highway 500 feet adjacent to the crossing in all directions.
- ♦ Percent of grade.
- ♦ Obstructions of view as described in Section 7 or identified in Section 8.
- ♦ Traffic control layout showing the location of the existing and proposed signage.

Section 10 – Sidewalks

1. Provide the following information: Sidewalks are not proposed to be added
   a. Provide a description of the type of sidewalks proposed.
   b. Describe who will maintain the sidewalks.
   c. Attach a proposed diagram or design of the crossing including the sidewalks.

Section 11 – Proposed Warning Signals or Devices

1. Explain in detail the number and type of automatic signals or other warning devices planned at the proposed crossing, including a cost estimate for each. If requesting pre-emption include the type of train detection circuitry, sequencing and advanced preemption time, justification for the changes and its effects on current warning devices and warning times for drivers.

The westbound shoulder mounted signal will be replaced with a new shoulder mounted signal with a gate, and the eastbound cantilever-mounted signal will be replaced with a new* cantilever-mounted signal with a gate. The railroad warning signal will be interconnected with a new highway traffic signal, to be installed at the intersection of East Gate Road and SR-507. The existing AC/DC train detection circuitry will be upgraded with constant warning circuitry.

*It may be possible to utilize and retrofit the existing cantilever on the eastbound approach. WSDOT and Tacoma Rail will determine this installation per a construction and maintenance agreement for the upgrades. In any case, a cantilever-mounted signal with gate is proposed for this approach.

2. Provide an estimate for maintaining the signals for 12 months. _____

3. Is the petitioner prepared to pay to the respondent railroad company its share of installing the warning devices as provided by law?

Yes

Section 12 – Traffic Signal Preemption

Complete the attached Guide for Determining Time Requirements for Traffic Signal Preemption at Highway-Rail Grade Crossings.

1. Specify simultaneous or advance preemption requested. See attached worksheet

If advance preemption, what is the preemption time. 32 Seconds

Section 13 – Additional Information

Provide any additional information supporting the proposal, including information such as the public benefits that would be derived from constructing a new crossing as proposed.

This proposal is necessitated by a WSDOT project to install a highway traffic signal at the intersection of East Gate Road and SR-507. Installation of the highway traffic signals and interconnection with the highway-rail grade crossing warning signals will improve efficiency and safety at both the highway and rail intersections of East Gate Road.

For more information on WSDOT's project, please contact Ahmer Nizam: nizama@wsdot.wa.gov or (360) 705-7271.

Section 14 – Waiver of Hearing by Respondent

Waiver of Hearing

The undersigned represents the Respondent in the petition to construct or reconstruct a highway-railroad grade crossing and inter-tie the highway signal with the railroad crossing signal system.

USDOT Crossing No.: 396703W

We have investigated the conditions at the proposed or existing crossing site. We are satisfied the conditions are the same as described by the Petitioner in this docket. We agree that a crossing be installed or reconstructed and the highway signals inter-tied with the railroad crossing signal system and consent to a decision by the commission without a hearing.

Dated at Tacoma, Washington, on the 3rd day of June, 20 11.

Tacoma Rail

Printed name of Respondent

Alan Matheson

Signature of Respondent's Representative

Roadmaster

Title

(253) 502-8934 alan.matheson@cityoftacoma.org

Phone number and e-mail address

2601 SR-509 N. Frontage Road

Tacoma, WA 98421

Mailing address

Washington State Department of Transportation

Memorandum

February 22, 2011

TO: Ahmer Nizam, Utilities, Railroad, and Agreements Manager
MS 47329

FROM: Michael Villnave MRV, Olympic Region Traffic Design Engineer
MS 47440

SUBJECT: SR 507 / XL1589
SR 507 / East Gate Rd – Install Signal
Request for Revisions at Tacoma Rail Railroad Crossing,
USDOT #396703W

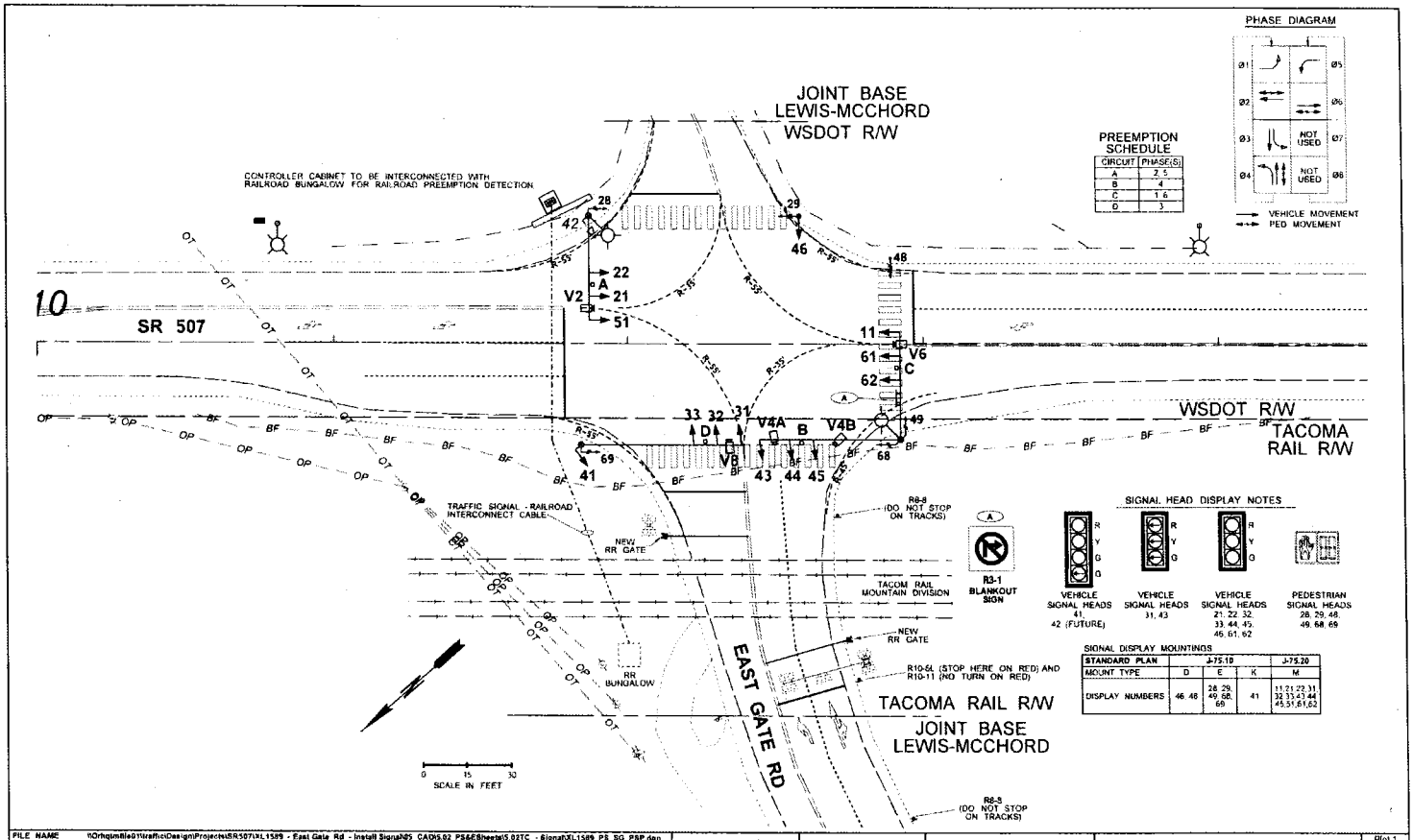
This is a request for assistance in obtaining revisions to the Railroad Crossing at East Gate Road at SR 507 in Pierce County. The following revisions to the crossing are needed to support installation of a traffic signal at the intersection of SR 507 and East Gate Road:

- Increase advance train detection time to a total of 62 seconds. Detection should be located to provide this advance detection time for the fastest train speed to use the crossing.
- Installation of crossing gates at the railroad crossing
- Revisions as needed to equipment in the crossing equipment bungalow to accommodate the installation of an 8 wire, supervised preemption interconnect circuit between the railroad bungalow and the traffic signal controller cabinet.

A set of plans and a copy of the railroad preemption time worksheet are included for reference. If there are any questions, please contact Flint Jackson at jacksfl@wsdot.wa.gov or 360-704-3236.

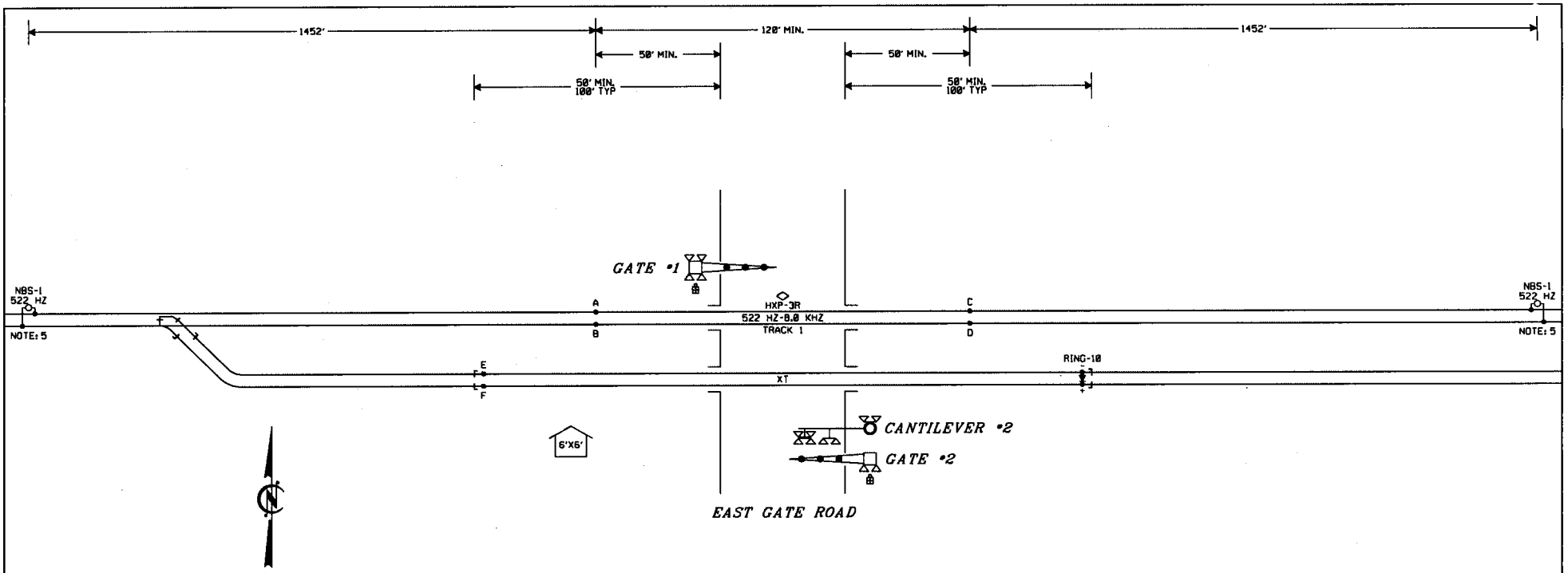
MV:fj
Attachments: Traffic Signal Plan Sheet (1)
TxDOT Railroad Preemption Worksheet (3 pages)

cc: Keith Calais, HQ Traffic
Hai Tran, Lakewood PEO
Project File



FILE NAME	\\Orhqtumfile01\TrafficDesignProjects\SR507\XL1589 - East Gate Rd - Install Signal\05 CADD\5.02 PS&E Sheets\5.02TC - Signal\XL1589_PS_SG_PSP.dgn			REGION NO. 10	STATE WASH	FED.AID PROJ.NO.		Washington State Department of Transportation
TIME	10:57:52 AM							
DATE	2/23/2011							
PLOTTED BY	Jackaff							
DESIGNED BY	F. JACKSON							
ENTERED BY	F. JACKSON							
CHECKED BY	M. VILLNAVE							
PROJ. ENGR.	J. DEFFENBACHER							
REGIONAL ADM.	K. DAYTON	REVISION	DATE	BY		XL1589		

SR 507
EAST GATE RD - INSTALL SIGNAL
PSP1
PRELIMINARY SIGNAL PLAN



APPROACH CIRCUIT DISTANCE CALCULATION

	TRACK 1	XT
BASE WARNING TIME	30 SEC	ISLAND ONLY
PLUS TIME FOR CLEARANCE DISTANCE > 35'	0 SEC	
EQUALS PLANNED WARNING TIME	30 SEC	
PLUS TIME FOR EQUIPMENT RESPONSE	4 SEC	
PLUS TIME FOR TRAFFIC PRE-EMPTION	32 SEC	
EQUALS CIRCUIT APPROACH TIME	66 SEC	
TIMES MAXIMUM PLANNED TRAIN SPEED PLUS 5 MPH OVERSPEED	15 MPH	
TIMES RATIO OF FEET PER SECOND TO MILE PER HOUR	22/15	
EQUALS APPROACH CIRCUIT DISTANCE WITH ANY FRACTIONAL VALUE INCREASED TO FULL UNIT	1452 FT	

NOTES:

1. ALL WIRING IN THE BUNGALOW IS #16 AWG FLEX UNLESS OTHERWISE NOTED.
2. SEE APPROACH CIRCUIT DISTANCE CALCULATION TABLE FOR PLANNED WARNING TIME AND TRAIN SPEED PER TRACK.
3. TRANSMITTER WIRE T1 AND T2 MUST BE RUN TO THE TRACK BUNGALOW SIDE OF CROSSING.
4. APPROACH DISTANCES ARE TO BE MEASURED FROM THE CIRCUIT FEED POINTS.
5. WHEN TERMINATING WITH NARROW BAND SHUNTS, BONDING SHOULD BE EXTENDED AN ADDITIONAL 20% BEYOND THE TERMINATIONS.

LEGEND:

- -TEST TERMINAL
- -EQUALIZER
- -ARRESTER TO GROUND
- -TWISTED WIRE 2 TURNS PER FOOT
- -INSULATED NUT

REVISIONS

THE OPERATION OF THE CIRCUITS AND EQUIPMENT REPRESENTED HEREIN CANNOT BE FULLY CHECKED UNTIL ALL CIRCUITS AND DEVICES ARE CONNECTED TO FORM A COMPLETE SYSTEM, OR AN EFFECTIVE SUBSYSTEM. SUCH SYSTEM OR SUBSYSTEM MUST BE GIVEN COMPLETE CIRCUIT AND OPERATIONAL TESTS BEFORE BEING PLACED IN REGULAR OPERATION.

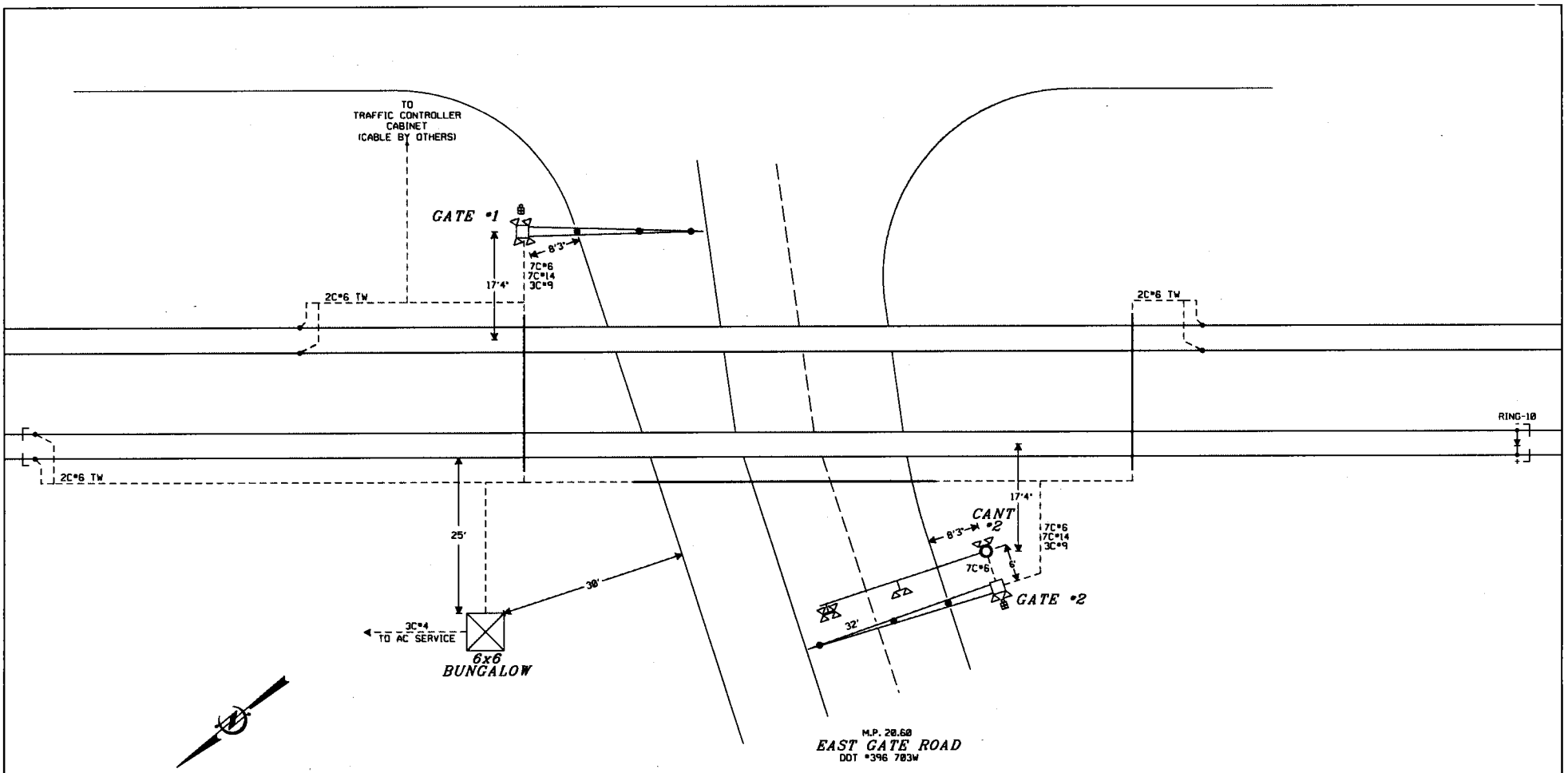
MIDVALE ELECTRIC INC.

TACOMA RAIL

DRAWN: A.P.D.
DESIGNED: A.P.D.
CHECKED: ---
DATE: 05-19-11

CROSSING TRACK PLAN
EAST GATE ROAD
ROY, WASHINGTON
OOT# 396 703W MILEPOST #20.60

DRAWING NO.
EAST GATE
SHEET 1 OF 2



UNDERGROUND UTILITIES
CALL BEFORE YOU DIG

LEGEND:

——— - RIGID CONDUIT

- - - - - - UNDERGROUND CABLE

REVISIONS

THE OPERATION OF THE CIRCUITS AND EQUIPMENT REPRESENTED HEREIN CANNOT BE FULLY CHECKED UNTIL ALL CIRCUITS AND DEVICES ARE CONNECTED TO FORM A COMPLETE SYSTEM, OR AN EFFECTIVE SUBSYSTEM. SUCH SYSTEM OR SUBSYSTEM MUST BE GIVEN COMPLETE CIRCUIT AND OPERATIONAL TESTS BEFORE BEING PLACED IN REGULAR OPERATION.

MIDVALE ELECTRIC INC.

TACOMA RAIL

DRAWN: A.P.D.
DESIGNED: A.P.D.
CHECKED: ---
DATE: 05-19-11

CABLE & FOUNDATION PLAN
EAST GATE ROAD
ROY, WASHINGTON
DOT# 396 703W MILEPOST #20.60

DRAWING NO.
EAST GATE
SHEET 2 OF 2

GE Transportation

Gary L. Young, P.E., MIRSE
Manager
Quotes and Proposals

GE Transportation Systems Global Signaling, LLC
2712 South Dillingham Road
Grain Valley, MO. 64029-7200

T 800 825-7090 ext. 4570
T 816 650-4570
F 816 817-2634
Gary.Young@trans.ge.com
http://www.getransportation.com/

Mr. Greg Van de Graaf
MidVale Electric Inc.
1661 Bishop Rd.
Sunnyside, WA 98944

e-mail: gregvdg@att.net

January 18, 2011

REF: MidVale/Tacoma Rail - East Gate Rd. Spanaway, WA

QN: 2011-001600

Dear Mr. Greg Van de Graaf:

GE Transportation Systems Global Signaling, LLC (GETSGS) is pleased to provide a proposal regarding the MidVale/Tacoma Rail - East Gate Rd. Spanaway, WA Highway Crossing as set out in the MidVale Electric Inc. request of January 2011.

The proposed equipment, services and application engineering are described below.

East Gate Road: A pre-wired and tested 6' x 6' Bungalow containing a HXP-3R Unit, Hawk Recorder, XLCs, MDSA-1, ACG-2T, TD-1A, Relays, Chargers, surge protection and other miscellaneous materials required to complete the bungalow. Field Material includes two LED flashing light gate signals, one bell, NBS-1s, Ring-10, foundations, field cable, batteries, and other miscellaneous materials.

GETSGS Total Quoted Price is: **$104,951**

GETSGS' total quoted price for your solution is set out herein in U.S. Dollars, F.O.B. Spanaway, WA, and is exclusive of all taxes, tariffs, licenses, bonds, and permits. This proposal will remain valid for sixty (60) days from the date of this letter.

Delivery is estimated to be 60 to 90 days after receipt of a purchase order and the finalization of engineering details, but actual delivery times may vary. Payment terms are net thirty (30) days.

Please reference Quote Number 2011-001600 when ordering this equipment.

Faxed purchase orders should be sent to Kim Mobley at (866) 548-3793. Mailed purchase orders should be sent to:

GE Transportation Systems Global Signaling, LLC
Attention: Kim Mobley
2712 S. Dillingham Rd.
Grain Valley, MO 64029

GETSGS welcomes the opportunity to provide a solution to your transportation needs. If you have any questions or require any further assistance, please feel free to contact us.

Thank you,

Gary L. Young

Gary L. Young, P.E., MIRSE
Manager
Quotes & Proposals

EMF/emf

Enc. Material List

cc: Melissa Weiler
Paul Kleinhenz

General Proposal Terms:

1. This quotation is a financial proposal only and does not contain language suitable for a legal offer or a contract. Any eventual contract based on this proposal shall be pursuant to GETSGS' current Conditions of Sale or as mutually agreed to in separate writing between the parties.
2. Equipment will be invoiced at the quoted price when shipped, and/or Services will be invoiced at the quoted price when delivered.
3. GETSGS reserves the right to subject orders to a credit limit or other approved terms of payment.
4. In the event there are any discrepancies between your specification and the proposed solution, GETSGS agrees to work with you in an effort to find a mutually satisfactory solution to your transportation needs.
5. GETSGS sales are pursuant to GETSGS standard terms and conditions which are available for download at the following link: https://customer.getransportation.com/public/signaling/GS_Sales_Terms.pdf

Location/Description	QTY		GETSGS-PN
East Gate Road - Spanaway, WA			
House Material			
HSE 6X6 AL S/L SKR101 L/KEY SW	1	EA	028633-003
ASSY HXP-3R W/IDK/AXD/RMM 8KHZ	1	EA	250811-2221
ASSY MDSA-1	1	EA	250204-001C
ASSY HAWK REC CDU 2M	1	EA	251210-00001
ASSY XLC TOP LEVEL	2	EA	250991-000
ASSY PLUGBOARD XLC	2	EA	251071-100
CHARGER 10-20VDC 20A NRS 10'TC	1	EA	017191-000
CHARGER 10-20VDC 40A NRS 10'TC	1	EA	017191-001
XFMR 115-230VPRI/16VCT 5A 80VA	1	EA	016206-105
ASSEMBLY, 4 POST TERMINALBLOCK	48	EA	203032-000
ASSY AGA-1	52	EA	202216-001
ASSY AGE-1	3	EA	202217-000
RLY B 194 OHM 2.8 SR 4FB-2F-1B	1	EA	007062-358
RLY B 500 OHM NEUT 4FB-2F-1B	5	EA	007062-277
RLY B 4 OHM NEUT 4FB-2F-1B	1	EA	007062-276
RLY B1 PLBD KIT NO FLAG CONT	7	EA	007062-003
KIT RLY FL E-POST MOD W/S STUD	7	EA	005634-000
RES ADJ WW 15W 8 OHM 5% PNLMT	1	EA	002014-011
RES ADJ WW 15W 16 OHM 5% PNLMT	1	EA	002014-018
NUT INSULATED HARMON	24	EA	013986-000
TEST LINK W/PLT & INSUL	96	EA	032257-002
TEST LINK 2.375" CNTR FL INSUL	1	EA	032258-003
LABEL RK PNL-MAINTAINER TST SW	1	EA	125372-000
WIRE 16AWG/19 TC EPR/PVC BLU	750	FT	012092-002
WIRE 10AWG/19 TC EPR/PVC BLU	800	FT	012092-000
WIRE 6AWG/19THHN BLK	100	FT	012253-000
WIRE 6AWG/19 THHN RED	100	FT	012253-003
WIRE 6AWG/19 THHN GRN	30	FT	012253-002
CABLE RAW 3/14AWG PWR 300V	10	FT	012690-010
CONN PLUG L6-15 250V 15A 2P3W	2	EA	132286-001
ASSY 2WAY TERM BLK W/AAR HARD	7	EA	202810-000
ASSY TERM STRIP DBL POST 12	8	EA	250094-300
GROUND POST P5-162	4	EA	113047-000
ASSY LIGHT PO EXT-GEMS	1	EA	201744-001
WRENCH AAR TERMINAL	1	EA	095905-000
WRENCH RLY TST E-POST	1	EA	095605-000
KIT SM PRTS GENERIC	1	EA	180394-XXX
House RR ID/Call Sign, Adhesive	1	EA	N/A
LABEL, DANGER 240 V, 1.75 X 2.	1	EA	SQS109
THERMOSTAT SPDT REMOTE BULB 8A	1	EA	009186-004
ASSY ACG-2T	1	EA	800-003564-000

ASSY TD-1A	1	EA	800-003565-001
Relay Snub assembly	1	EA	250612-XXX
Field Material			
FOUND SIGNAL 60"DEPTH 11 11/16	2	EA	1322-01
BASE 5" SPLIT JCT BOX DBL	2	EA	022603-008
MAST AL 5"X16' BO M90R	2	EA	076069-202
GATE ASSY 3597-131R CTWT 16-32	2	EA	076037-030
HEATER GATE MECH 115VAC WCH	2	EA	017155-006
BRACKET CONVERSION W/CAST ADPT	2	EA	1082-01
BRACKET HI WIND NEG WIG191036	2	EA	10018-01
GATE ARM 16-32' UHI LED LGHTS	2	EA	076045-014
DIODE GATEARM TIP LIGHT REC	2	EA	0760456-300
LIGHT ASSY 2W LED 24"H/B -06	2	EA	076048-111
LIGHT ASSY 1W LED 24"H/B -05	1	EA	076048-113
BRKT EXT F/SIDE LIGHT 5" MTG	1	EA	52001-01
MOUNTING 4" F/ LIGHT ASSY	1	EA	076048-102
MOUNTING 5" F/ LIGHT ASSY	2	EA	076048-103
SIGN SF-XING CANT BKT HI W/HDW	2	EA	60007-01-2EA
BELL ELECTRONIC CROSSING 4/5"	1	EA	6147-01
PINNACLE 5" MACHINED W/SETSCRW	1	EA	021978-101
CABLE UG 3 COND #4 AWG	75	EA	5192-02
CABLE UG 7 COND #6 AWG SOLID	450	FT	1077-02
CABLE UG 7 COND #14 AWG SOLID	400	FT	1023-02
CABLE UG 3 COND #9 AWG SOLID	400	FT	1078-02
WIRE UG TRK #6 AWG DUPLEX	450	FT	1094-02
TAPE MARKER BURIED RR CABLE	1	FT	029989-000
BATT NICAD 340AH 1 CELL SPL340	9	EA	017064-206
BATT NICAD 250AH 1CELL SPL250	10	EA	017064-210
WIRE #6 SOFT BARE COPPER	50	FT	1436-01
ROD 3/4 X 8 NON-SECT COP GRD	7	EA	1132-01
CONNECTION SBNT1-181G ONE-SHOT	4	EA	2531-01
CADWELD ONESHOT 3/4" GR 1 WIRE	3	EA	005755-011
CLAMP ASSY GRND/MAST 3 1/2-8"	3	EA	4098-01
BOND STRAND 8-STR 3/16" TINNED	100	FT	4133-01
BOOTLEG BOND W/COUPLER KIT	18	EA	3522-01
ASSY NBS-1 W/10' LEADS PLAN	2	EA	250250-XXX
PLATE SHUNT 22"X26"X1/4" GAL	2	EA	6193-01
SCREW LAG 1/2X4 JOSLYN J8754P	8	EA	14512-01
TAPE ELECTRICAL 3M #33+ 3/4"	3	RL	1190-01
TAPE ELECTRICAL 3M #130-C	3	RL	1321-01
COMPOUND INSULATING ELECTRICAL	1	EA	4123-01
HOSE RUBBER 3/4"	90	EA	005360-015
STAPLE GROUND WIRE 1-1/16"X3"	18	EA	113005-000
TIE CABLE .184 X 7.31" HIG TEM	20	EA	4125-01
CABLE TIE 14-1/2L NAT	20	EA	005019-022

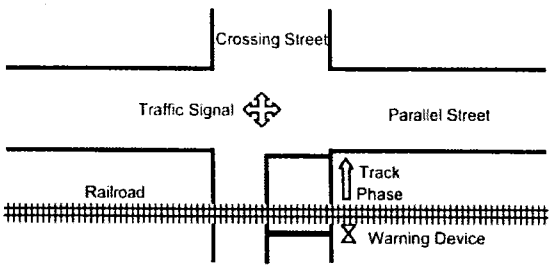
LUG RNG 1/4" 12-10AWG INS BLK	85	EA	032114-008
WIRE DIESEL 10AWG 2000 VOLTS	375	FT	2125-01
STAPLE COPPERWELD 3/8 X 1-3/4	50	EA	1148-01
GREASE RUST PREVENTIVE NO OXID	1	EA	1906-01
SLEEVE NICO 3/16"-#6 AWG REDUC	6	EA	1145-01
CLIP TRACK WIRE RETAINER	16	EA	1118-01
COMPOUND DUCT SEAL 5 LB PLUG	3	PK	1179-01
PADLOCK SIGNAL CASE	5	EA	013043-000
Sign, DOT #	2	EA	N/A
TRAY BATT 12X24 POLYETHYLENE	4	EA	040231-000
ASSY RING-10	1	EA	800-004080-000
LENS LED FLASHING 12" RED	8	EA	180572-006

GUIDE FOR DETERMINING TIME REQUIREMENTS FOR TRAFFIC SIGNAL PREEMPTION AT HIGHWAY RAIL GRADE CROSSINGS

City N/A
County Pierce
District 3 - Olympic

Date 02/07/11
Completed by F. Jackson
District Approval

Show North Arrow



Parallel Street Name: SR 507

Crossing Street Name: East Gate RD

Railroad Tacoma Rail (Mountain Div)
Crossing DOT# 396703W

Railroad Contact Alan Matheson (Roadmaster)
Phone (253) 502-8934

SECTION 1: RIGHT-OF-WAY TRANSFER TIME CALCULATION

Preempt verification and response time

			Remarks
1. Preempt delay time (seconds)	1.	0.0	Delay is in microseconds
2. Controller response time to preempt (seconds)	2.	0.0	Controller type: 2070
3. Preempt verification and response time (seconds): add lines 1 and 2	3.	0.0	

Worst-case conflicting vehicle time

			Remarks
4. Worst-case conflicting vehicle phase number	4.	2	
5. Minimum green time during right-of-way transfer (seconds)	5.	0.00	
6. Other green time during right-of-way transfer (seconds)	6.	0.00	
7. Yellow change time (seconds)	7.	4.70	
8. Red clearance time (seconds)	8.	2.00	
9. Worst-case conflicting vehicle time (seconds): add lines 5 through 8	9.	6.7	

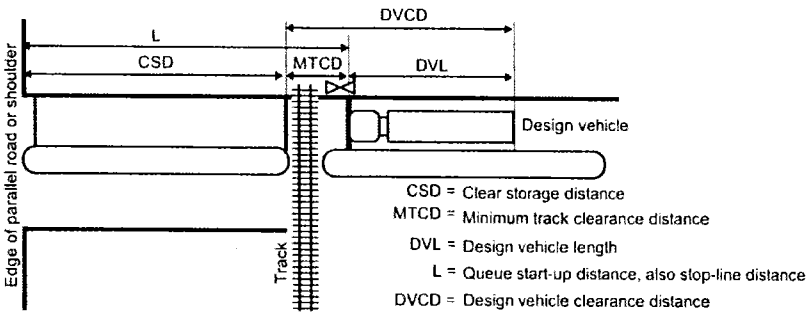
Worst-case conflicting pedestrian time

			Remarks
10. Worst-case conflicting pedestrian phase number	10.	6	
11. Minimum walk time during right-of-way transfer (seconds)	11.	0.0	
12. Pedestrian clearance time during right-of-way transfer (seconds)	12.	24.6	
13. Vehicle yellow change time, if not included on line 12 (seconds)	13.	4.7	
14. Vehicle red clearance time, if not included on line 12 (seconds)	14.	2.0	
15. Worst-case conflicting pedestrian time (seconds): add lines 11 through 14	15.	31.3	

Worst-case conflicting vehicle or pedestrian time

16. Worst-case conflicting vehicle or pedestrian time (seconds): maximum of lines 9 and 15	16.	31.3
17. Right-of-way transfer time (seconds): add lines 3 and 16	17.	31.3

SECTION 2: QUEUE CLEARANCE TIME CALCULATION



			Remarks
18. Clear storage distance (CSD, feet)	18.	18	
19. Minimum track clearance distance (MTCD, feet)	19.	60	Two tracks plus gate
20. Design vehicle length (DVL, feet)	20.	74	Design vehicle type: WB-67
21. Queue start-up distance, L (feet): add lines 18 and 19	21.	78	
22. Time required for design vehicle to start moving (seconds): calculate as 2+(L÷20)	22.	5.9	Remarks
23. Design vehicle clearance distance, DVCD (feet): add lines 19 and 20	23.	134	
24. Time for design vehicle to accelerate through the DVCD (seconds)	24.	20.2	Read from Figure 2 in Instructions.
25. Queue clearance time (seconds): add lines 22 and 24	**25.**	26.1	

SECTION 3: MAXIMUM PREEMPTION TIME CALCULATION

			Remarks
26. Right-of-way transfer time (seconds): line 17	26.	31.3	
27. Queue clearance time (seconds): line 25	27.	26.1	
28. Desired minimum separation time (seconds)	28.	4.0	
29. Maximum preemption time (seconds): add lines 26 through 28	**29.**	61.4	

SECTION 4: SUFFICIENT WARNING TIME CHECK

				Remarks
30. Required minimum time, MT (seconds): per regulations	30.	20.0		
31. Clearance time, CT (seconds): get from railroad	31.	3.0		
32. Minimum warning time, MWT (seconds): add lines	32.		23.0	Excludes buffer time (BT)
33. Advance preemption time, APT, if provided (seconds): get from railroad	33.		7.0	For current 30 seconds warning
34. Warning time provided by the railroad (seconds): add lines 32 and 33	34.	30.0		
35. Additional warning time required from railroad (seconds): subtract line 34 from line 29, round up to nearest full second, enter 0 if less than 0	**35.**	32		

If the additional warning time required (line 35) is greater than zero, additional warning time has to be requested from the railroad. Alternatively, the maximum preemption time (line 29) may be decreased after performing an engineering study to investigate the possibility of reducing the values on lines 1, 5, 6, 7, 8, 11, 12, 13 and 14.

Remarks: Total required railroad preemption warning time is 62 seconds in advance of crossing (Sum of lines 34 and 35). Railroad will need to extend detection circuits as needed to provide 62 seconds advance warning at the fastest train speed that will use the line.

SECTION 5: TRACK CLEARANCE GREEN TIME CALCULATION (OPTIONAL)

Preempt Trap Check

36. Advance preemption time (APT) provided (seconds): ..... **36.** 36.0 Line 33 only valid if line 35 is zero.

37. Multiplier for maximum APT due to train handling ..... **37.** 1.60 See Instructions for details.

38. Maximum APT (seconds): multiply line 36 and 37 ..... **38.** 57.6

39. Minimum duration for the track clearance green interval (seconds) **39.** 15.0

Remarks

For zero advance preemption time

40. Gates down after start of preemption (seconds): add lines 38 and 39 ..... **40.** 72.6

41. Preempt verification and response time (seconds): line 3 ..... **41.** 0.0

42. Best-case conflicting vehicle or pedestrian time (seconds): usually 0..... **42.** 0.0

Remarks

43. Minimum right-of-way transfer time (seconds): add lines 41 and 42 ..... **43.** 0.0

44. Minimum track clearance green time (seconds): subtract line 43 from line 40 ..... **44.** 72.6

Clearing of Clear Storage Distance

45. Time required for design vehicle to start moving (seconds), line 22 ..... **45.** 5.9

46. Design vehicle clearance distance (DVCD, feet), line 23 ..... **46.** 134

47. Portion of CSD to clear during track clearance phase (feet) .. **47.** 18

Remarks

CSD* in Figure 3 in Instructions.

48. Design vehicle relocation distance (DVRD, feet): add lines 46 and 47 ..... **48.** 152

49. Time required for design vehicle to accelerate through DVRD (seconds) ..... **49.** 22.0 Read from Figure 2 in Instructions.

50. Time to clear portion of clear storage distance (seconds): add lines 45 and 49 ..... **50.** 27.9

51. **Track clearance green interval (seconds): maximum of lines 44 and 50, round up to nearest full second ....** **51.** 73

SECTION 6: VEHICLE-GATE INTERACTION CHECK (OPTIONAL)

52. Right-of-way transfer time (seconds): line 17 ..... **52.** 31.3

53. Time required for design vehicle to start moving (seconds), line 22 ..... **53.** 5.9

54. Time required for design vehicle to accelerate through DVL (on line 20, seconds) ..... **54.** 15.0 Read from Table 3 in Instructions.

55. Time required for design vehicle to clear descending gate (seconds): add lines 52 though 54 ..... **55.** 52.2

Remarks

56. Duration of flashing lights before gate descent start (seconds): get from railroad **56.** 5.0

Remarks

57. Full gate descent time (seconds): get from railroad **57.** 15.0

58. Proportion of non-interaction gate descent time ..... **58.** 0.20 Read from Figure 5 in Instructions.

59. Non-interaction gate descent time (seconds): multiply lines 57 and 58 ..... **59.** 3.0

60. Time available for design vehicle to clear descending gate (seconds): add lines 56 and 59 ..... **60.** 8.0

61. **Advance preemption time (APT) required to avoid design vehicle-gate interaction (seconds): subtract line 60 from line 55, round up to nearest full second, enter 0 if less than 0 ..... 61.** 45