



**GRADE CROSSING CONSTRUCTION AND MAINTENANCE AGREEMENT**  
**FORM PP-0118**

BNSF File No. BF10018000  
Mile Post 59.46  
Line Segment 7500  
U.S. DOT Number 022677B  
Galveston Subdivision

This Agreement (“**Agreement**”), is executed to be effective as of this 11<sup>th</sup> day of August, 2021 (“**Effective Date**”), by and between BNSF RAILWAY COMPANY, a Delaware corporation (“**BNSF**”), and FORT BEND COUNTY, a political subdivision of the State of Texas (“**Agency**”).

**RECITALS:**

WHEREAS, BNSF owns and operates a line of railroad in and through the City of Rosenberg and Fort Bend County, State of Texas;

WHEREAS, in the interest of aiding vehicular travel and public safety, the Agency is undertaking a project to improve the existing Benton Road at-grade crossing, located at BNSF Line Segment 7500 and Milepost 59.46, and designated by D.O.T. No. 022677B, by constructing asphalt/concrete pavement on the roadway approaches and installing railroad crossing signals and activation equipment within a widened roadway easement across the BNSF right-of-way as indicated on the Exhibit A, attached hereto and incorporated herein; and

WHEREAS, the Agency desires to preempt the highway traffic control signals with the grade crossing warning devices shown on Exhibit A; and

WHEREAS, BNSF agrees to allow the Agency to preempt the highway traffic control signals with the grade crossing warning devices indicated on Exhibit A.

WHEREAS, the parties agree that the RAILROAD will receive no ascertainable benefit from the installation of advance warning signs, pavement marking stop bars or crossing signal equipment (hereinafter collectively called, “Crossing Signal Equipment”); and

WHEREAS, the Agency also desires BNSF to install a new crossing surface at Benton Road with a new concrete and rubber crossing surface;

WHEREAS, the Agency is paying for the acquisition and installation of crossing signal equipment and the new crossing surface at Benton Road.



WHEREAS, the BNSF agrees to purchase and install, at AGENCY'S sole expense, the crossing signal equipment and the new crossing surface described in the scope of work herein, and upon the terms and conditions set forth below.

NOW, THEREFORE, in consideration of the mutual covenants and agreements of the parties contained herein, the receipt and sufficiency of which are hereby acknowledged, the parties agree as follows:

## **ARTICLE I - SCOPE OF WORK**

1. The term "**Project**" as used herein includes any and all work related to the construction of asphalt/concrete pavement and pavement markings on the roadway approaches at Benton Road by Agency and the installation of crossing signals and activation equipment and new crossing surface extension at U.S. D.O.T No. 022677B, (hereinafter referred to as the "**Crossing**") by BNSF, more particularly described on the Exhibit A, including, but not limited to, any and all changes to telephone, telegraph, signal and electrical lines and appurtenances, temporary and permanent track work, fencing, grading, alterations to or new construction of drainage facilities, preliminary and construction engineering and contract preparation.

## **ARTICLE II - BNSF OBLIGATIONS**

In consideration of the covenants of Agency set forth herein and the faithful performance thereof, BNSF agrees as follows:

1. Upon Agency's payment to BNSF of an administrative fee in the sum of Two Thousand Five Hundred and No/100 Dollars (\$2,500), together with the Temporary Construction License Fee in the sum of Thirteen Thousand Four Hundred and No/100 Dollars (\$13,400) for 0.32034 acres, BNSF hereby grants to Agency, its successors and assigns, upon and subject to the terms and conditions set forth in this Agreement, a temporary non-exclusive license (hereinafter called, "Temporary Construction License") to enter upon and use the portion of BNSF's right-of-way as is necessary to construct concrete, asphalt/concrete pavement, and pavement markings on the roadway approaches and thereafter maintain, the Crossing as described further on Exhibit A, excepting and reserving BNSF's rights, and the rights of any others who have obtained, or may obtain, permission or authority from BNSF, to do the following:

- (a) Operate, maintain, renew and/or relocate any and all existing railroad track or tracks, wires, pipelines and other facilities of like character upon, over or under the surface of said right- of-way;
- (b) Construct, operate, maintain, renew and/or relocate upon said right-of-way, without limitation, such facilities as the BNSF may from time to time deem

appropriate;

- (c) Otherwise use or operate the right-of-way as BNSF may from time to time deem appropriate.

The term of the Temporary Construction License begins on the Effective Date and ends on the earlier of (i) substantial completion of the Structure, or (ii) twenty-four (24) months following the Effective Date. The Temporary Construction License and related rights given by BNSF to Agency in this provision are without warranty of title of any kind, express or implied, and no covenant of warranty of title will be implied from the use of any word or words herein contained. The Temporary Construction License is for construction of the Crossing only and shall not be used by Agency for any other purpose. Agency acknowledges and agrees that Agency shall not have the right, under the Temporary Construction License, to use the Structure for any other purpose than construction. In the event Agency is evicted by anyone owning, or claiming title to or any interest in said right-of-way, BNSF will not be liable to Agency for any damages, losses or any expenses of any nature whatsoever. The granting of similar rights to others, subsequent to the date of this Agreement, will not impair or interfere with the rights granted to Agency herein.

Upon Agency's payment to BNSF of the additional sum of Twenty Thousand Five Hundred and No/100 Dollars (\$20,500) for 0.18 acres, such payment to be made within thirty (30) days of issuing the Notice to Proceed pursuant to Article III, Section 16 of this Agreement, and provided further that Agency is in compliance with the term and conditions of this Agreement, BNSF will grant to Agency, its successors and assigns, an easement (hereinafter called, the "Easement") to enter upon and use that portion of BNSF's right-of-way as is necessary to use and maintain the Crossing, substantially in the form of Exhibit B attached to this Agreement. If Agency fails to pay BNSF within the thirty-day time period set forth in the preceding sentence, BNSF may stop construction of the Project until full payment is received by BNSF

2. BNSF will furnish all labor, materials, tools, and equipment for railroad work required for the construction of the Project, such railroad work and the estimated cost thereof being as shown on Exhibit B attached hereto and made a part hereof. In the event construction on the Project has not commenced within six (6) months following the Effective Date, BNSF may, in its sole and absolute discretion, revise the cost estimates set forth in said Exhibit B. In such event, the revised cost estimates will become a part of this Agreement as though originally set forth herein. Any item of work incidental to the items listed on Exhibit B not specifically mentioned therein may be included as a part of this Agreement upon written approval of Agency, which approval will not be unreasonably withheld. Construction of the Project must include the following railroad work by BNSF:

- (a) Procurement of materials, equipment and supplies necessary for the railroad work;
- (b) Preliminary engineering, design, and contract preparation;

- (c) Furnishing of flagging services during construction of the Project as required and set forth in further detail on Exhibit C, attached to this Agreement and made a part hereof;
  - (d) Furnishing engineering and inspection as required in connection with the construction of the Project;
  - (e) Removal and disposal of the existing crossing surfaces from the Crossing;
  - (f) Provide and place asphalt beneath the track(s) to provide further sub-grade stability prior to BNSF installing new concrete crossing surfaces for road crossings;
  - (g) Installation of one 104-foot concrete crossing surfaces for the one track complete with new rail, timber crossties, ballast, fasteners, along with appropriate surfacing, to carry the improved roadway and proposed sidewalk;
  - (h) Installation of Crossing Signal Equipment and Crossing Signal Control House upon completion of the roadway construction as shown on Exhibit A;
  - (i) Provide an interface box, with contact terminals, mounted on side of Crossing Signal Control House; and
  - (j) Make such changes in the alignment, location and elevation of its telephone, telegraph, signal and/or wire lines and appurtenances along, over or under the tracks, both temporary and permanent, as may become necessary by reason of the construction of the Project.
3. BNSF will do all railroad work set forth in Article II, Section 2 above on an actual cost basis, when BNSF, in its sole discretion, determines it is required by its labor agreements to perform such work with its own employees working under applicable collective bargaining agreements.
4. Agency agrees to reimburse BNSF for work of an emergency nature caused by Agency or Agency's contractor in connection with the Project which BNSF deems is reasonably necessary for the immediate restoration of railroad operations, or for the protection of persons or BNSF property. Such work may be performed by BNSF without prior approval of Agency and Agency agrees to fully reimburse BNSF for all such emergency work
5. BNSF may charge Agency for insurance expenses, including self-insurance expenses, when such expenses cover the cost of Employer's Liability (including, without limitation, liability under the Federal Employer's Liability Act) in connection with the construction of the Project. Such charges will be considered part of the actual cost of the Project, regardless of the nature or amount of ultimate liability for injury, loss or death to BNSF's employees, if any.

6. During the construction of the Project, BNSF will send Agency progressive invoices detailing the costs of the railroad work performed by BNSF under this Agreement. Agency must reimburse BNSF for completed force-account work within thirty (30) days of the date of the invoice for such work. Upon completion of the Project, BNSF will send Agency a detailed invoice of final costs, segregated as to labor and materials for each item in the recapitulation shown on Exhibit B. Pursuant to this section and Article IV, Section 7 herein, Agency must pay the final invoice within ninety (90) days of the date of the final invoice. BNSF will assess a finance charge of .033% per day (12% per annum) on any unpaid sums or other charges due under this Agreement which are past its credit terms. The finance charge continues to accrue daily until the date payment is received by BNSF, not the date payment is made or the date postmarked on the payment. Finance charges will be assessed on delinquent sums and other charges as of the end of the month and will be reduced by amounts in dispute and any unposted payments received by the month's end. Finance charges will be noted on invoices sent to Agency under this section.

### **ARTICLE III - AGENCY OBLIGATIONS**

In consideration of the covenants of BNSF set forth herein and the faithful performance thereof, Agency agrees as follows:

1. Agency must furnish to BNSF plans and specifications for the Project. Said plans (reduced size 11" x 17"), showing the plan and profile of the roadway work on BNSF right-of-way and marked as Exhibit A, attached hereto and made a part hereof, must be submitted to BNSF for the development of railroad cost estimates.
2. Agency must make any required application and obtain all required permits and approvals for the construction of the Project.
3. Agency must acquire all rights of way necessary for the construction of the Project.
4. Agency must make any and all arrangements, in compliance with BNSF's Utility Accommodation Manual (<http://www.bnsf.com/communities/faqs/pdf/utility.pdf>), for the installation or relocation of wire lines, pipe lines and other facilities owned by private persons, companies, corporations, political subdivisions or public utilities other than BNSF which may be necessary for the construction of the Project.
5. Agency must construct the Project as shown on the attached Exhibit A and do all work ("Agency's Work") provided for in the plans and specifications for the Project, except railroad work that will be performed by BNSF hereunder. Agency must furnish all labor, materials, tools and equipment for the performance of Agency's Work. The principal elements of Agency's Work are as follows:
  - (a) Design and Reconstruction/Construction of Benton Road. Roadway to be temporarily closed during the installation of the 104-ft concrete crossing panels by BNSF;

- (b) Installation of pavement marking stop bars, double yellow center lines, and white edge lines in accordance with the Manual on Uniform Traffic Control Devices (hereinafter called, "MUTCD");
- (c) Installation of advance warning signs in accordance with the MUTCD;
- (d) Perform all necessary grading and paving, including backfill of excavations and restoration of disturbed vegetation on BNSF's right-of-way;
- (e) Provide suitable drainage, both temporary and permanent;
- (f) Provide all barricades, lights, flagmen or traffic control devices necessary for preventing vehicular traffic from using a portion of the Crossing during the installation of the concrete crossing panels;
- (g) Construct asphalt and/or concrete roadway surface on the approaches to each track. Roadway surface must match elevation of the track crossing surfaces and remain level to a point at least two (2) feet from the outside edge of the railroad concrete crossing panels. Any concrete pavement headers, as part of this Project or future project, must be constructed no closer than 7'-0" from the centerline of each track to provide for a minimum of 14'-0" opening for the track, timber crossties and railroad crossing surfaces;
- (h) Provide and place a 2'-0" minimum width section of asphalt (expansion joint) between any concrete pavement headers, as part of this Project or future project, and the track crossing surfaces, including the portion of roadway surface located between multiple tracks;
- (i) Job site cleanup including removal of all construction materials, concrete debris, surplus soil, refuse, contaminated soils, asphalt debris, litter and other waste materials to the satisfaction of BNSF;
- (j) Provide BNSF in writing with the total time required from start of preempt cycle of highway traffic control signals until arrival of the train at the highway-rail crossing. See the Exhibit E – Preemption Timing Information documents;
- (k) Connect the highway traffic control signals to the contact terminals in the interface box including all necessary cable and conduit; and
- (l) Install the new highway traffic control signals.

6. The Agency will approve the location of the signals and signal bungalow prior to the installation by BNSF.

7. The Agency must have advanced railroad crossing signs and standard pavement markings in place at the crossing shown on Exhibit A (if the same are required by the MUTCD) prior to the acceptance of this Project by the Agency.

8. The Agency must give BNSF's Manager Public Projects written notice to proceed ("**Notice to Proceed**") with the railroad portion of the work after receipt of necessary funds for the Project. BNSF will not begin the railroad work (including, without limitation, procurement of supplies, equipment or materials) until written Notice to Proceed is received from Agency.

9. The Agency's Work must be performed by Agency or Agency's contractor in a manner that will not endanger or interfere with the safe and timely operations of BNSF and its facilities.

10. For any future inspection or maintenance, either routine or otherwise, performed by subcontractors on behalf of the Agency, Agency shall require the subcontractors to comply with the provisions of the attached Exhibit C and execute the agreement attached hereto as Exhibit C-1. Prior to performing any future maintenance with its own personnel, Agency shall: comply with all of BNSF's applicable safety rules and regulations; require any Agency employee performing maintenance to complete the safety training program at the BNSF's Internet Website "[www.BNSFContractor.com](http://www.BNSFContractor.com)"; notify BNSF when, pursuant to the requirements of Exhibit C, a flagger is required to be present; procure, and have approved by BNSF's Risk Management Department, Railroad Protective Liability insurance.

11. Agency must require its contractor(s) to notify BNSF's Roadmaster at least thirty (30) calendar days prior to requesting a BNSF flagman in accordance with the requirements of Exhibit C attached hereto. Additionally, Agency must require its contractor(s) to notify BNSF's Manager of Public Projects thirty (30) calendar days prior to commencing work on BNSF property or near BNSF tracks.

12. Agency must include the following provisions in any contract with its contractor(s) performing work on said Project:

- (a) The Contractor is placed on notice that fiber optic, communication and other cable lines and systems (collectively, the "Lines") owned by various telecommunications companies may be buried on BNSF's property or right-of-way. The locations of these Lines have been included on the plans based on information from the telecommunications companies. The contractor will be responsible for contacting BNSF's Roadmaster (John Reid at mobile # 254-447-1587 or John.Reid@bnsf.com), BNSF's Signal Supervisor (Daniel Cardiff at mobile # 817-964-8741 or Daniel.Cardiff@bnsf.com) and the telecommunications companies and notifying them of any work that may damage these Lines or facilities and/or interfere with their service. The contractor must also mark all Lines shown on the plans or marked in the field in order to verify their locations. The contractor must also use all reasonable methods when working in the BNSF right-of-way or on BNSF property to determine if any other Lines (fiber optic, cable, communication or otherwise) may exist.
- (b) Failure to mark or identify these Lines will be sufficient cause for BNSF's engineering representative to stop construction at no cost to the Agency or BNSF until these items are completed.
- (c) The Contractor will be responsible for the rearrangement of any facilities or Lines determined to interfere with the construction. The Contractor must cooperate fully with any telecommunications company(ies) in performing such rearrangements.

- (d) In addition to the liability terms contained elsewhere in this Agreement, the contractor hereby indemnifies, defends and holds harmless BNSF for, from and against all cost, liability, and expense whatsoever (including, without limitation, attorney's fees and court costs and expenses) arising out of or in any way contributed to by any act or omission of Contractor, its subcontractors, agents and/or employees that cause or in any way or degree contribute to (1) any damage to or destruction of any Lines by Contractor, and/or its subcontractors, agents and/or employees, on BNSF's property or within BNSF's right-of-way, (2) any injury to or death of any person employed by or on behalf of any telecommunications company, and/or its contractor, agents and/or employees, on BNSF's property or within BNSF's right-of-way, and/or (3) any claim or cause of action for alleged loss of profits or revenue by, or loss of service by a customer or user of such telecommunication company(ies). **THE LIABILITY ASSUMED BY CONTRACTOR WILL NOT BE AFFECTED BY THE FACT, IF IT IS A FACT, THAT THE DAMAGE, DESTRUCTION, INJURY, DEATH, CAUSE OF ACTION OR CLAIM WAS OCCASIONED BY OR CONTRIBUTED TO BY THE NEGLIGENCE OF BNSF, ITS AGENTS, SERVANTS, EMPLOYEES OR OTHERWISE, EXCEPT TO THE EXTENT THAT SUCH CLAIMS ARE PROXIMATELY CAUSED BY THE INTENTIONAL MISCONDUCT OR GROSS NEGLIGENCE OF BNSF.**

13. Agency must require compliance with the obligations set forth in this agreement, including Exhibit C and Exhibit C-1, and incorporate in each prime contract for construction of the Project, or the specifications therefor (i) the provisions set forth in Article III and IV; and (ii) the provisions set forth in Exhibit C and Exhibit C-1, attached hereto and by reference made a part hereof.

14. Except as otherwise provided below in this Section 14, all construction work performed hereunder by Agency for the Project will be pursuant to a contract or contracts to be let by Agency, and all such contracts must include the following:

- (a) All work performed under such contract or contracts within the limits of BNSF's right- of-way must be performed in a good and workmanlike manner in accordance with plans and specifications approved by BNSF;
- (b) Changes or modifications during construction that affect safety or BNSF operations must be subject to BNSF's approval;
- (c) No work will be commenced within BNSF's right-of-way until each of the prime contractors employed in connection with said work must have (i) executed and delivered to BNSF an agreement in the form of Exhibit C-1, and (ii) delivered to and secured BNSF's approval of the required insurance; and
- (d) If it is in Agency's best interest, Agency may direct that the construction of the Project be done by day labor under the direction and control of Agency, or if at any time, in the opinion of Agency, the contractor has failed to prosecute with

diligence the work specified in and by the terms of said contract, Agency may terminate its contract with the contractor and take control over the work and proceed to complete the same by day labor or by employing another contractor(s) provided; however, that any contractor(s) replacing the original contractor(s) must comply with the obligations in favor of BNSF set forth above and, provided further, that if such construction is performed by day labor, Agency will, at its expense, procure and maintain on behalf of BNSF the insurance required by Exhibit C-1.

- (e) To facilitate scheduling for the Project, Agency shall have its contractor give BNSF's Roadmaster ninety (90) days advance notice of the proposed times and dates for work windows. BNSF and Agency's contractor will establish mutually agreeable work windows for the Project. BNSF has the right at any time to revise or change the work windows, due to train operations or service obligations. BNSF will not be responsible for any additional costs and expenses resulting from a change in work windows. Additional costs and expenses resulting from a change in work windows shall be accounted for in the contractor's expenses for the Project.

15. Agency must advise the appropriate BNSF Manager Public Projects, in writing, of the completion date of the Project within thirty (30) days after such completion date. Additionally, Agency must notify BNSF's Manager Public Projects, in writing, of the date on which Agency and/or its Contractor will meet with BNSF for the purpose of making final inspection of the Project.

**16. TO THE FULLEST EXTENT PERMITTED BY LAW, AGENCY HEREBY RELEASES, INDEMNIFIES, DEFENDS AND HOLDS HARMLESS BNSF, ITS AFFILIATED COMPANIES, PARTNERS, SUCCESSORS, ASSIGNS, LEGAL REPRESENTATIVES, OFFICERS, DIRECTORS, SHAREHOLDERS, EMPLOYEES AND AGENTS FOR, FROM AND AGAINST ANY AND ALL CLAIMS, LIABILITIES, FINES, PENALTIES, COSTS, DAMAGES, LOSSES, LIENS, CAUSES OF ACTION, SUITS, DEMANDS, JUDGMENTS AND EXPENSES (INCLUDING, WITHOUT LIMITATION, COURT COSTS AND ATTORNEYS' FEES) OF ANY NATURE, KIND OR DESCRIPTION OF ANY PERSON (INCLUDING, WITHOUT LIMITATION, THE EMPLOYEES OF THE PARTIES HERETO) OR ENTITY DIRECTLY OR INDIRECTLY ARISING OUT OF, RESULTING FROM OR RELATED TO (IN WHOLE OR IN PART) (I) THE USE, OCCUPANCY OR PRESENCE OF AGENCY, ITS CONTRACTORS, SUBCONTRACTORS, EMPLOYEES OR AGENTS IN, ON, OR ABOUT THE CONSTRUCTION SITE, (II) THE PERFORMANCE, OR FAILURE TO PERFORM BY THE AGENCY, ITS CONTRACTORS, SUBCONTRACTORS, EMPLOYEES, OR AGENTS, ITS WORK OR ANY OBLIGATION UNDER THIS AGREEMENT, (III) THE SOLE OR CONTRIBUTING ACTS OR OMISSIONS OF AGENCY, ITS CONTRACTORS, SUBCONTRACTORS, EMPLOYEES, OR AGENTS IN, ON, OR ABOUT THE CONSTRUCTION SITE, (IV) AGENCY'S BREACH OF THE TEMPORARY CONSTRUCTION LICENSE OR EASEMENT GRANTED TO AGENCY PURSUANT TO ARTICLE II OF THIS AGREEMENT, (V) ANY RIGHTS OR INTERESTS GRANTED TO**

**AGENCY PURSUANT TO THE TEMPORARY CONSTRUCTION LICENSE OR EASEMENT DISCUSSED IN ARTICLE II OF THIS AGREEMENT, (VI) AGENCY'S OCCUPATION AND USE OF BNSF'S PROPERTY OR RIGHT-OF-WAY, INCLUDING, WITHOUT LIMITATION, SUBSEQUENT MAINTENANCE OF THE STRUCTURE BY AGENCY, OR (VII) AN ACT OR OMISSION OF AGENCY OR ITS OFFICERS, AGENTS, INVITEES, EMPLOYEES OR CONTRACTORS OR ANYONE DIRECTLY OR INDIRECTLY EMPLOYED BY ANY OF THEM, OR ANYONE THEY CONTROL OR EXERCISE CONTROL OVER. THE LIABILITY ASSUMED BY AGENCY WILL NOT BE AFFECTED BY THE FACT, IF IT IS A FACT, THAT THE DAMAGE, DESTRUCTION, INJURY OR DEATH WAS OCCASIONED BY OR CONTRIBUTED TO BY THE NEGLIGENCE OF BNSF, ITS AGENTS, SERVANTS, EMPLOYEES OR OTHERWISE, EXCEPT TO THE EXTENT THAT SUCH CLAIMS ARE PROXIMATELY CAUSED BY THE INTENTIONAL MISCONDUCT OR GROSS NEGLIGENCE OF BNSF.**

#### **ARTICLE IV - JOINT OBLIGATIONS**

IN CONSIDERATION of the premises, the parties hereto mutually agree to the following:

1. All work contemplated in this Agreement must be performed in a good and workmanlike manner and each portion must be promptly commenced by the party obligated hereunder to perform the same and thereafter diligently prosecuted to conclusion in its logical order and sequence. Furthermore, any changes or modifications during construction which affect BNSF will be subject to BNSF's approval prior to the commencement of any such changes or modifications.
2. The work hereunder must be done in accordance with the Exhibit A and the detailed plans and specifications approved by BNSF.
3. Agency must require its contractor(s) to reasonably adhere to the Project's construction schedule for all Project work. The parties hereto mutually agree that BNSF's failure to complete the railroad work in accordance with the construction schedule due to inclement weather or unforeseen railroad emergencies will not constitute a breach of this Agreement by BNSF and will not subject BNSF to any liability. Regardless of the requirements of the construction schedule, BNSF reserves the right to reallocate the labor forces assigned to complete the railroad work in the event of an emergency to provide for the immediate restoration of railroad operations of either BNSF or its related railroads, or to protect persons or property on or near any BNSF owned property. BNSF will not be liable for any additional costs or expenses resulting from any such reallocation of its labor forces. The parties mutually agree that any reallocation of labor forces by BNSF pursuant to this provision and any direct or indirect consequences or costs resulting from any such reallocation will not constitute a breach of this Agreement by BNSF.
4. BNSF will have the right to stop construction work on the Project if any of the following

events take place: (i) Agency (or any of its contractors) performs the Project work in a manner contrary to the plans and specifications approved by BNSF; (ii) Agency (or any of its contractors), in BNSF's opinion, prosecutes the Project work in a manner that is hazardous to BNSF property, facilities or the safe and expeditious movement of railroad traffic; or (iii) the insurance described in the attached Exhibit C-1 is canceled during the course of the Project. The work stoppage will continue until all necessary actions are taken by Agency or its contractor to rectify the situation to the satisfaction of BNSF's engineering representative or until proof of additional insurance has been delivered to and accepted by BNSF. In the event of a breach of (i) this Agreement or (ii) the Temporary Construction License, BNSF may immediately terminate the Temporary Construction License. Any such work stoppage under this provision will not give rise to any liability on the part of BNSF. BNSF's right to stop the work is in addition to any other rights BNSF may have including, but not limited to, actions or suits for damages or lost profits. In the event that BNSF desires to stop construction work on the Project, BNSF agrees to immediately notify the following individual in writing:

Ike Akinwande  
Assistant County Engineer  
Fort Bend County  
William B. Travis Building  
301 Jackson Street  
Richmond, TX 77469  
Office # 281-633-7506  
[ike.akinwande@fortbendcountytexas.gov](mailto:ike.akinwande@fortbendcountytexas.gov)

5. Agency must supervise and inspect the operations of all Agency contractors to ensure compliance with the plans and specifications approved by BNSF, the terms of this Agreement and all safety requirements of BNSF. If BNSF determines that proper supervision and inspection are not being performed by Agency personnel at any time during construction of the Project, BNSF has the right to stop construction (within or adjacent to its operating right-of-way). Construction of the Project will not proceed until Agency corrects the situation to BNSF's reasonable satisfaction. If BNSF feels the situation is not being corrected in an expeditious manner, BNSF will immediately notify Chris Dick for appropriate corrective action.

6. Pursuant to this section and Article II, Section 6 herein, Agency must, out of funds made available to it for the construction of the Project, reimburse BNSF in full for the **actual costs** of all work performed by BNSF under this Agreement (including taxes, such as applicable sales and use taxes, business and occupation taxes, and similar taxes).

7. All expenses detailed in statements sent to Agency pursuant to Article II, Section 6 herein will comply with the terms and provisions of the Title 23 U.S. Code, Title 23 Code of Federal Regulations, and the Federal-Aid Policy Guide, U.S. Department of Transportation, as amended from time to time, which manual is hereby incorporated into and made a part of this Agreement by reference. The parties mutually agree that BNSF's preliminary engineering, design, and contract preparation costs described in Article II, Section 2 herein are part of the costs of the Project even though such work may have preceded the date of this Agreement.

8. The construction of the Project will not commence until Agency gives BNSF's Manager Public Projects thirty (30) days prior written notice of such commencement. The commencement notice will reference BNSF's file number BF10018000 and D.O.T. Crossing No. 022677B and must state the time that construction activities will begin.

9. In addition to the terms and conditions set forth elsewhere in this Agreement, BNSF and the Agency agree to the following terms upon completion of construction of the Project:

- (a) Agency will own and be fully responsible for repairs, maintenance, future construction or reconstruction of the Benton Road roadway up to the end of the timber crossties.
- (b) Agency will maintain the elevation of the Benton Road roadway approaches to match the elevation on the railroad track crossing surfaces.
- (c) Agency will maintain the advanced railroad crossing warning signs and pavement markings and agrees to hold harmless and indemnify BNSF for any claims, damages or losses, in whole or in part, caused by or due to the Agency's failure to maintain the advanced warning signs and markings or other requirements of the MUTCD.
- (d) Agency will do nothing and permit nothing to be done in the maintenance of the Benton Road roadway, which will interfere with or endanger facilities of BNSF.
- (e) It is expressly understood by Agency and BNSF that any right to install utilities will be governed by a separate permit or license agreement between the parties hereto.
- (f) BNSF will, at its sole cost and expense, operate and maintain the Crossing Signal Equipment, Crossing Signal Control House, and the crossing surfaces, from end of timber crosstie to end of timber crosstie, in proper condition.
- (g) Notwithstanding the preceding provision, if any regulations, ordinances, acts, rules or other laws subsequently passed or amended by the Agency or any other governmental or legislative authority increase the Agency's portion of maintenance cost under this Agreement, BNSF will receive the benefit of any such regulations, ordinances, acts, rules or other laws and the Agency's increased portion of maintenance costs will be incorporated into and made a part of this Agreement.
- (h) If a railway or highway improvement project necessitates rearrangement,

relocation, or alteration of the Crossing Signal Equipment, Crossing Signal House, or the crossing surface installed hereunder, the costs for such rearrangement, relocation or alteration will be the responsibility of the party requesting such changes.

- (i) BNSF will operate and maintain, at its expense, the necessary relays and other materials required to preempt the highway traffic control signals with the grade crossing warning devices.
- (j) BNSF will operate and maintain, at its expense, the necessary relays and other materials required to preempt the highway traffic control signals with the grade crossing warning devices.
- (k) Agency will own, operate and maintain, at its expense, the highway traffic control signals up to and including connection to the contact terminals in the interface box including all necessary cable and conduit.

10. Agency must notify and obtain prior authorization from BNSF's Manager of Public Projects before entering BNSF's right-of-way for **Inspection and Maintenance** purposes and the BNSF Manager of Public Projects will determine if flagging is required. If the construction work hereunder is contracted, Agency must require its prime contractor(s) to comply with the obligations set forth in Exhibit C and Exhibit C-1, as the same may be revised from time to time. Agency will be responsible for its contractor(s) compliance with such obligations.

11. Any books, papers, records and accounts of the parties hereto relating to the work hereunder or the costs or expenses for labor and material connected with the construction will at all reasonable times be open to inspection and audit by the agents and authorized representatives of the parties hereto, as well as the State of Texas and the Federal Highway Administration, for a period of one (1) year from the date of the final BNSF invoice under this Agreement.

12. The covenants and provisions of this Agreement are binding upon and inure to the benefit of the successors and assigns of the parties hereto. Notwithstanding the preceding sentence, neither party hereto may assign any of its rights or obligations hereunder without the prior written consent of the other party.

13. In the event construction of the Project does not commence within one (1) year of the Effective Date, this Agreement will become null and void.

14. Neither termination nor expiration of this Agreement will release either party from any liability or obligation under this Agreement, whether of indemnity or otherwise, resulting from any acts, omissions or events happening prior to the date of termination or expiration.



15. To the maximum extent possible, each provision of this Agreement will be interpreted in such a manner as to be effective and valid under applicable law. If any provision of this Agreement is prohibited by, or held to be invalid under, applicable law, such provision will be ineffective solely to the extent of such prohibition or invalidity and the remainder of the provision will be enforceable.

16. This Agreement (including exhibits and other documents, manuals, etc. incorporated herein) is the full and complete agreement between BNSF and Agency with respect to the subject matter herein and supersedes any and all other prior agreements between the parties hereto.

17. Any notice provided for herein or concerning this Agreement must be in writing and will be deemed sufficiently given when sent by certified mail, return receipt requested, to the parties at the following addresses:

BNSF:	<u>Manager Public Projects</u> <u>4200 Deen Road</u> <u>Fort Worth, Texas 76106-3099</u>
Agency:	<u>County Judge</u> <u>401 Jackson Street</u> <u>Richmond, TX 77469</u>



IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed and attested by its duly qualified and authorized officials as of the day and year first above written.

**AGENCY**

**FORT BEND COUNTY, TEXAS**

By: \_\_\_\_\_

Printed Name: K. P. George

Title: County Judge

[REMAINDER OF THIS PAGE LEFT INTENTIONALLY BLANK]

(COUNTY Signature Page for Benton Road Agreement)

**BNSF RAILWAY COMPANY**



By: \_\_\_\_\_

Printed Name: Craig Rasmussen

Title: AVP Engineering Services & Structures

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(BNSF Signature Page for Benton Road Agreement)

Parcel #6  
0.41 Acre

EXHIBIT A-1  
Property Description for  
Permanent Easement at  
Benton Road - DOT No. 022677B

Jane Long League, Abstract 55  
Joseph Kuykendall League, Abstract 49

STATE OF TEXAS §

COUNTY OF FORT BEND §

A **METES & BOUNDS** description of a 0.41 acre tract of land in the Jane Long League, Abstract 55, and the Joseph Kuykendall League, Abstract 49, City of Rosenberg, Fort Bend County, Texas, being over, through and across a portion of the G. C. & S. F. Railroad right-of-way recorded in Volume M, Page 161, Deed Records, Fort Bend County, Texas, with all bearings based upon the Texas Coordinate System of 1983, South Central Zone, based upon GPS observations.

**Beginning** at a 5/8 inch iron rod found at the intersection of the existing westerly right-of-way line of Benton Road (100-feet wide this location) and the southerly line of said G. C. & S. F. Railroad right-of-way, being the northeast corner of Restricted Reserve "A" of the adjoining Rosenberg Self Storage Number One, according to map or plat thereof recorded under County Clerk's File Number 20090085, Plat Records, Fort Bend County, Texas, for a point in the southwest line and **Place of Beginning** of the herein described tract, from which point a 5/8 inch iron rod with cap marked "EHRA" found for the northwest corner of said adjoining Restricted Reserve "A" bears North 83 degrees 12 minutes 59 seconds West, 332.32 feet;

**Thence** North 83 degrees 12 minutes 59 seconds West along the southwest line of the herein described tract and the southwest line of said G. C. & S. F. Railroad right-of-way, same being the northeast line of said adjoining Restricted Reserve "A", 16.65 feet to a 5/8 inch iron rod with cap marked "Jones | Carter" set on said line for the west corner of the herein described tract;

**Thence** North 06 degrees 47 minutes 01 second East establishing the westerly line of the herein described tract, crossing said G. C. & S. F. Railroad right-of-way, 93.91 feet to an angle point;

**Thence** North 38 degrees 38 minutes 24 seconds West continuing along said line, 8.67 feet to a 5/8 inch iron rod with cap marked "Jones | Carter" set for the northwest corner of the herein described tract, said point being in the northerly line of said G. C. & S. F. Railroad right-of-way, same being the southerly right-of-way line of F. M. Highway 762 (100-feet wide);

**Thence** South 83 degrees 12 minutes 59 seconds East along the northerly line of said G. C. & S. F. Railroad right-of-way, same being the southerly right-of-way line of F. M. Highway 762, 208.59 feet to a 5/8 inch iron rod with cap marked "Jones | Carter" set for the northeast corner of the herein described tract;

**Thence** South 58 degrees 15 minutes 38 seconds West establishing the easterly line of the herein described tract, crossing said G. C. & S. F. Railroad right-of-way, 23.43 feet to an angle point;

**Thence** South 19 degrees 45 minutes 12 seconds West continuing along said line, 87.64 feet to a 5/8 inch iron rod with cap marked "Jones | Carter" set for the southeast corner of the herein described tract, said point being in the southerly line of said G. C. & S. F. Railroad right-of-way, same being the northeast line of Restricted Reserve "B-1" of the adjoining Benton Park Reserves "B" & "C" Replat, according to map or plat thereof recorded under Slide Numbers 2082B, 2083A&B, Plat Records, Fort Bend County, Texas, from which point a 5/8 inch iron rod with cap marked "Team" found for the northeast corner of said adjoining Restricted Reserve "B-1" bears South 83 degrees 12 minutes 59 seconds East, 726.32 feet;

Parcel #6  
0.41 Acre

Jane Long League, Abstract 55  
Joseph Kuykendall League, Abstract 49

**Thence** North 83 degrees 12 minutes 59 seconds West along the southerly line of said G. C. & S. F. Railroad right-of-way, crossing Benton Road, 147.76 feet to the **Place of Beginning** and containing 0.41 acre of land, with 0.23 acre within the existing right-of-way of Benton Road, for a net acreage of 0.18 acre of land, more or less.

For reference and further description see Drawing No. 13376 prepared by the undersigned on same date.

October 22, 2018  
Revised: March 26, 2020

Job Number R0090-0004-00

Jones | Carter  
1229 Corporate Drive, Suite 100  
Rosenberg, TX 77471  
(281) 342-2033  
Texas Board of Professional Land  
Surveying Registration No. 10046104



Acting By/Through Chris D. Kalkomey  
Registered Professional Land Surveyor  
No. 5869  
CDKalkomey@jonescarter.com

WILLIAM LUSK SURVEY  
ABSTRACT 276

ROSENBERG  
SELF STORAGE  
NUMBER ONE  
SECTION ONE  
C.C.F. NO.  
20090085  
P.R.F.B.C.T.

BLOCK 1

10' ELECTRIC EASEMENT  
w/ 11.5' AERIAL EASEMENT  
C.C.F. NO. 2016103392  
O.P.R.F.B.C.T.

RESTRICTED RESERVE A  
SUMMER LAKES STORAGE  
PARTNERS, LLLP  
C.C.F. NO. 2014026793  
O.P.R.F.B.C.T.

RIGHT-OF-WAY LINE  
C.C.F. NO. 20090085, P.R.F.B.C.T.  
JANE LONG LEAGUE  
ABSTRACT 55 100'

JOSEPH  
KUYKENDALL  
LEAGUE  
ABSTRACT 49

RIGHT-OF-WAY LINE SLIDE NOS. 1985B, 1986A&B, P.R.F.B.C.T.

RESTRICTED RESERVE "B-2"  
BENTON REALTY LLC  
CALLED 6.00 AC.  
C.C.F. NO. 2008010873  
O.P.R.F.B.C.T.

RESTRICTED RESERVE "B-1"  
BENTON REALTY LLC.  
CALLED 6.56 AC.  
C.C.F. NO. 2008010872  
O.P.R.F.B.C.T.

BENTON PARK  
RESERVES "B" & "C"  
REPLAT  
SLIDE NOS. 2082B, 2083A & B  
P.R.F.B.C.T.

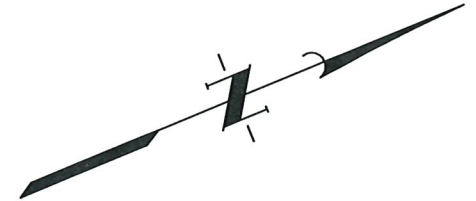
WILEY MARTIN LEAGUE  
ABSTRACT 58

16' UTILITY EASEMENT  
w/ AERIAL EASEMENT  
SLIDE NOS.  
2082B & 2083A&B  
P.R.F.B.C.T.

FND 5/8" IR w/CAP  
MK. "TEAM"

LINE	BEARING	DISTANCE
L1	N 83°12'59" W	16.65'
L2	N 06°47'01" E	93.91'
L3	N 38°38'24" W	8.67'
L4	S 83°12'59" E	208.59'
L5	S 58°15'38" W	23.43'
L6	S 19°45'12" W	87.64'
L7	N 83°12'59" W	147.76'
L8	N 83°12'59" W	315.67'
L9	S 83°12'59" E	726.32'

PARCEL #6  
0.41 ACRE  
-0.23 AC. IN EXISTING ROAD  
0.18 AC. NET



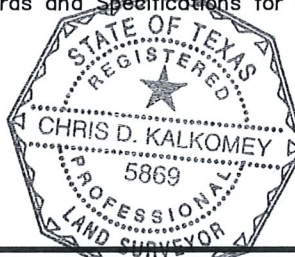
NORTH  
SCALE: 1" = 100'

SURVEY  
OF  
PROPOSED BENTON ROAD  
RIGHT-OF-WAY  
BEING  
0.41 ACRE  
OUT OF THE  
JANE LONG LEAGUE  
ABSTRACT 55  
AND THE  
JOSEPH KUYKENDALL LEAGUE  
ABSTRACT 49  
CITY OF ROSENBERG  
FORT BEND COUNTY, TEXAS  
JULY 2019

Subject to the General Notes shown:

We, Jones|Carter, acting by and through Chris D. Kalkomey, a Registered Professional Land Surveyor, hereby certify that this survey substantially complies with the current Texas Society of Professional Surveyors Standards and Specifications for a Category 1A, Condition III Survey.

Surveyed: July 19, 2019  
Revised: March 26, 2020



*Chris D. Kalkomey*

Chris D. Kalkomey  
Registered Professional Land Surveyor  
No. 5869  
cdkalkomey@jonescarter.com

J|C JONES|CARTER

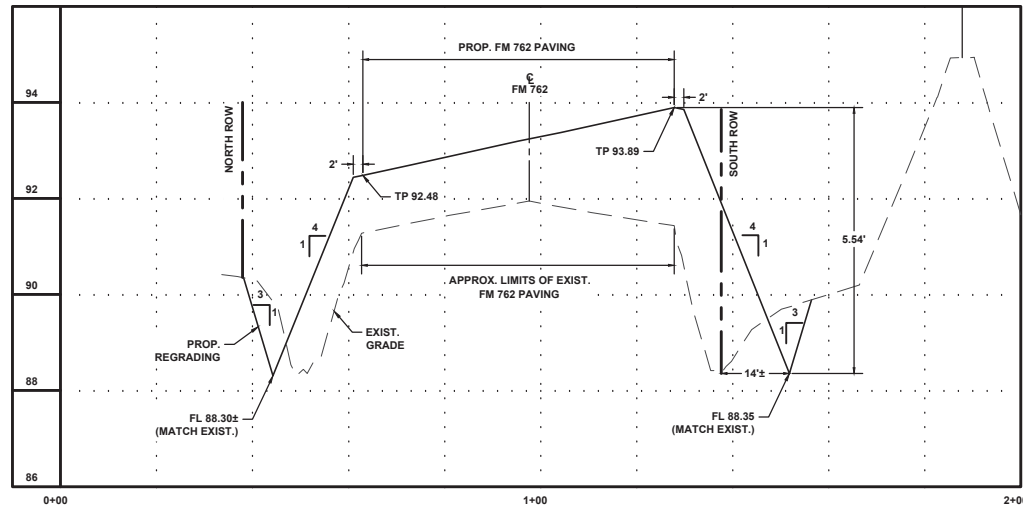
Texas Board of Professional Land Surveying Registration No. 10046104  
1229 Corporate Drive, Ste 100 • Rosenberg, Texas 77471 • 281.342.2033

"S" - SET 5/8" IR W/CAP  
"JONES|CARTER"

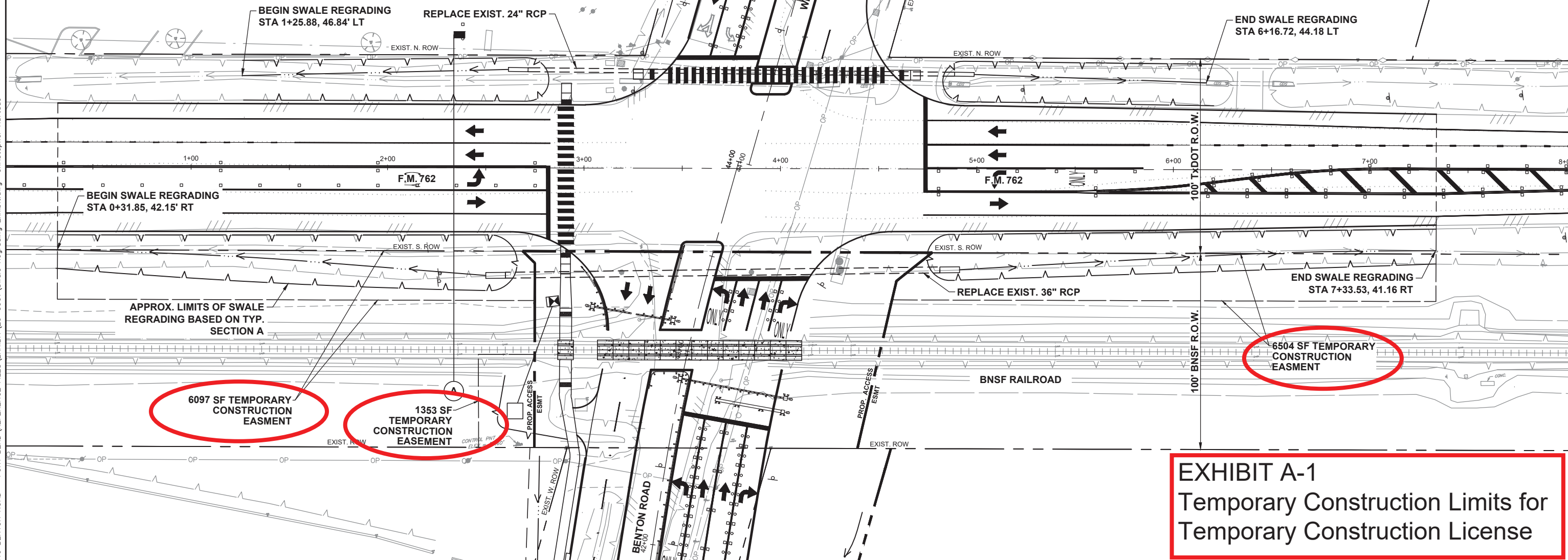
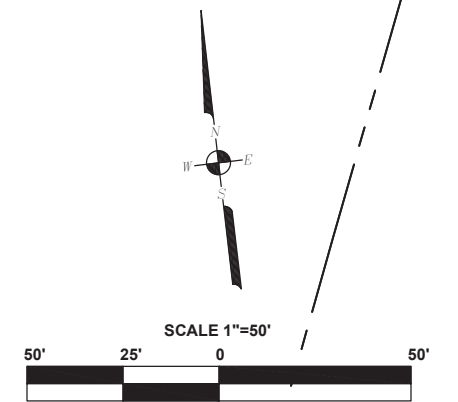
GENERAL NOTES:

- Bearings are based upon the Texas Coordinate System of 1983, South Central Zone, based upon GPS observations.
- For reference and further description, see metes and bounds description, job number R0090-0004-00, prepared by Jones|Carter, Inc. on same date.

X:\Engineering\2018\18110 BENTON ROAD - FORT BEND\REFERENCE FILES\EXHIBIT\20-0901\Swale Regrading Exhibit.dwg Christopher Hurtado



**A FM 762 CROSS SECTION**  
**STA 2+42.82**  
 N.T.S.



**6097 SF TEMPORARY CONSTRUCTION EASEMENT**

**1353 SF TEMPORARY CONSTRUCTION EASEMENT**

**6504 SF TEMPORARY CONSTRUCTION EASEMENT**

**EXHIBIT A-1**  
**Temporary Construction Limits for**  
**Temporary Construction License**

NO.	REVISIONS	DATE	NAME

FORT BEND COUNTY  
 TEXAS



**MCDONOUGH**  
 Civil Engineers & Project Managers  
 TBPLS Firm Registration No. 10103900  
 TBPE Registration No. F-000340  
 5625 Schumacher Lane (713) 975-9990  
 Houston, Texas 77057 www.mectx.com  
 PROJ. 18110

**INTERIM REVIEW ONLY**  
 This document is **INCOMPLETE** and is released for the purpose of **INTERIM REVIEW ONLY**. It is not to be used for **BIDDING, PERMIT or CONSTRUCTION**.  
 Engineer: Connor McBride, P.E.  
 License No. 122323  
 TX Firm Registration No. F-000340

PROJECT TITLE: BENTON ROAD		SHEET NO: 4 / 11
DRAWN BY: CAH	FM 762 TO 300' SOUTH OF READING ROAD	
CK'D BY: CM	SHEET DESCRIPTION: SWALE REGRADING	DATE: 9/2/20
SCALE: 1" = 50'	F.M. 762 AND BENTON ROAD	
DATE: 9/2/20	APPROVED BY:	

**EXHIBIT B (to C&M Agreement – BF10018000)**

**EASEMENT AGREEMENT  
FOR BENTON ROAD WIDENING  
(C&M Agreement)**

**THIS EASEMENT AGREEMENT FOR CONSTRUCTING A NEW AT GRADE CROSSING AT** Benton Road – DOT No. 022677B in Richmond, Fort Bend County, Texas ("**Easement Agreement**") is made and entered into as of the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_ ("**Effective Date**"), by and between **BNSF RAILWAY COMPANY**, a Delaware corporation ("**Grantor**"), and \_\_\_\_\_, a \_\_\_\_\_ ("**Grantee**").

A. Grantor owns or controls certain real property situated at or near the vicinity of Richmond, County of Fort Bend, State of Texas, at Railroad Line Segment 7500 Mile Post 59.46, Agency Project # [ \_\_\_\_\_ ], as described or depicted on **Exhibit "A-1"** attached hereto and made a part hereof (the "**Premises**").

B. Grantor and Grantee have entered into that certain Construction and Maintenance Agreement (BNSF Contract No. BF10018000) dated as of \_\_\_\_\_ concerning improvements on or near the Premises (the "**C&M Agreement**").

C. Grantee has requested that Grantor grant to Grantee an easement over the Premises for the Easement Purpose (as defined below).

D. Grantor has agreed to grant Grantee such easement, subject to the terms and conditions set forth in this Easement and in the C&M Agreement incorporated herein as if fully set forth in this instrument which terms shall be in full force and effect for purposes of this Easement even if the C&M Agreement is, for whatever reason, no longer in effect.

**NOW, THEREFORE**, for and in consideration of the foregoing recitals which are incorporated herein, the mutual promises contained herein, and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties agree as follows:

**Section 1     Granting of Easement.**

1.1 Easement Purpose. The "**Easement Purpose**" shall be for the purposes set forth in the C&M Agreement. Any improvements to be constructed in connection with the Easement Purpose are referred to herein as "**Improvements**" and shall be constructed, located, configured and maintained by Grantee in strict accordance with the terms of this Easement Agreement and the C&M Agreement.

1.2 Grant. Grantor does hereby grant unto Grantee a non-exclusive easement ("**Easement**") over the Premises for the Easement Purpose and for no other purpose. The Easement is granted subject to any and all restrictions, covenants, easements, licenses, permits, leases and other encumbrances of whatsoever nature whether or not of record, if any, relating to the Premises and subject to all with all applicable federal, state and local laws, regulations, ordinances, restrictions, covenants and court or administrative decisions and orders, including Environmental Laws (defined below) and zoning laws (collectively, "**Laws**"). Grantor may not make any alterations or improvements or perform any maintenance or repair activities within the Premises except in accordance with the terms and conditions of the C&M Agreement.

1.3 Reservations by Grantor. Grantor excepts and reserves the right, to be exercised by Grantor and any other parties who may obtain written permission or authority from Grantor:

- (a) to install, construct, maintain, renew, repair, replace, use, operate, change, modify and relocate any existing pipe, power, communication, cable, or utility lines and appurtenances and other facilities or structures of like character (collectively, "**Lines**") upon, over, under or across the Premises;

- (b) to install, construct, maintain, renew, repair, replace, use, operate, change, modify and relocate any tracks or additional facilities or structures upon, over, under or across the Premises; and
- (c) to use the Premises in any manner as the Grantor in its sole discretion deems appropriate, provided Grantor uses all commercially reasonable efforts to avoid material interference with the use of the Premises by Grantee for the Easement Purpose.

**Section 2** **Term of Easement.** The term of the Permanent Easement, unless sooner terminated under provisions of this Easement Agreement, shall be perpetual. The term of the Temporary Construction Easement, unless sooner terminated under provisions of this Easement Agreement, shall expire one year from the Effective Date or completion of the project, whichever occurs first.

**Section 3** **No Warranty of Any Conditions of the Premises.** Grantee acknowledges that Grantor has made no representation whatsoever to Grantee concerning the state or condition of the Premises, or any personal property located thereon, or the nature or extent of Grantor's ownership interest in the Premises. Grantee has not relied on any statement or declaration of Grantor, oral or in writing, as an inducement to entering into this Easement Agreement, other than as set forth herein. GRANTOR HEREBY DISCLAIMS ANY REPRESENTATION OR WARRANTY, WHETHER EXPRESS OR IMPLIED, AS TO THE DESIGN OR CONDITION OF ANY PROPERTY PRESENT ON OR CONSTITUTING THE PREMISES, ITS MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE, THE QUALITY OF THE MATERIAL OR WORKMANSHIP OF ANY SUCH PROPERTY, OR THE CONFORMITY OF ANY SUCH PROPERTY TO ITS INTENDED USES. GRANTOR SHALL NOT BE RESPONSIBLE TO GRANTEE OR ANY OF GRANTEE'S CONTRACTORS FOR ANY DAMAGES RELATING TO THE DESIGN, CONDITION, QUALITY, SAFETY, MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE OF ANY PROPERTY PRESENT ON OR CONSTITUTING THE PREMISES, OR THE CONFORMITY OF ANY SUCH PROPERTY TO ITS INTENDED USES. GRANTEE ACCEPTS ALL RIGHTS GRANTED UNDER THIS EASEMENT AGREEMENT IN THE PREMISES IN AN "AS IS, WHERE IS" AND "WITH ALL FAULTS" CONDITION, AND SUBJECT TO ALL LIMITATIONS ON GRANTOR'S RIGHTS, INTERESTS AND TITLE TO THE PREMISES. Grantee has inspected or will inspect the Premises, and enters upon Grantor's rail corridor and property with knowledge of its physical condition and the danger inherent in Grantor's rail operations on or near the Premises. Grantee acknowledges that this Easement Agreement does not contain any implied warranties that Grantee or Grantee's Contractors (as hereinafter defined) can successfully construct or operate the Improvements.

**Section 4** **Nature of Grantor's Interest in the Premises.** GRANTOR DOES NOT WARRANT ITS TITLE TO THE PREMISES NOR UNDERTAKE TO DEFEND GRANTEE IN THE PEACEABLE POSSESSION OR USE THEREOF. NO COVENANT OF QUIET ENJOYMENT IS MADE. In case of the eviction of Grantee by anyone owning or claiming title to or any interest in the Premises, or by the abandonment by Grantor of the affected rail corridor, Grantor shall not be liable to refund Grantee any compensation paid hereunder.

**Section 5** **Improvements.** Grantee shall take, in a timely manner, all actions necessary and proper to the lawful establishment, construction, operation, and maintenance of the Improvements, including such actions as may be necessary to obtain any required permits, approvals or authorizations from applicable governmental authorities. Any and all cuts and fills, excavations or embankments necessary in the construction, maintenance, or future alteration of the Improvements shall be made and maintained in such manner, form and extent as will provide adequate drainage of and from the adjoining lands and premises of the Grantor; and wherever any such fill or embankment shall or may obstruct the natural and pre-existing drainage from such lands and premises of the Grantor, the Grantee shall construct and maintain such culverts or drains as may be requisite to preserve such natural and pre-existing drainage, and shall also wherever necessary, construct extensions of existing drains, culverts or ditches through or along the premises of the Grantor, such extensions to be of adequate sectional dimensions to preserve the present flowage of drainage or other waters, and of materials and workmanship equally as good as those now existing. In the event any construction, repair, maintenance, work or other use of the Premises by Grantee will affect any Lines, fences, buildings, improvements or other facilities (collectively, "**Other Improvements**"), Grantee will be responsible at Grantee's sole risk to locate and make any adjustments necessary to such Other Improvements. Grantee must contact the owner(s) of the Other Improvements notifying them of any work that may damage these Other Improvements and/or interfere with their service and obtain the owner's written approval prior to so affecting the Other Improvements. Grantee must mark all Other Improvements

on the Plans and Specifications and mark such Other Improvements in the field in order to verify their locations. Grantee must also use all reasonable methods when working on or near Grantor property to determine if any Other Improvements (fiber optic, cable, communication or otherwise) may exist. The Grantee agrees to keep the above-described premises free and clear from combustible materials and to cut and remove or cause to be cut and removed at its sole expense all weeds and vegetation on said premises, said work of cutting and removal to be done at such times and with such frequency as to comply with Grantee and local laws and regulations and abate any and all hazard of fire.

**Section 6**     **Taxes and Recording Fees.** Grantee shall pay when due any taxes, assessments or other charges (collectively, "**Taxes**") levied or assessed upon the Improvements by any governmental or quasi-governmental body or any Taxes levied or assessed against Grantor or the Premises that are attributable to the Improvements. Grantee agrees to purchase, affix and cancel any and all documentary stamps in the amount prescribed by statute, and to pay any and all required transfer taxes, excise taxes and any and all fees incidental to recordation of the Memorandum of Easement. In the event of Grantee's failure to do so, if Grantor shall become obligated to do so, Grantee shall be liable for all costs, expenses and judgments to or against Grantor, including all of Grantor's legal fees and expenses.

**Section 7**     **Environmental.**

7.1     Compliance with Environmental Laws. Grantee shall strictly comply with all federal, state and local environmental Laws in its use of the Premises, including, but not limited to, the Resource Conservation and Recovery Act, as amended (RCRA), the Clean Water Act, the Oil Pollution Act, the Hazardous Materials Transportation Act, the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and the Toxic Substances Control Act (collectively referred to as the "**Environmental Laws**"). Grantee shall not maintain a "treatment," "storage," "transfer" or "disposal" facility, or "underground storage tank," as those terms are defined by Environmental Laws, on the Premises. Grantee shall not handle, transport, release or suffer the release of "hazardous waste" or "hazardous substances", as "hazardous waste" and "hazardous substances" may now or in the future be defined by any Environmental Laws.

7.2     Notice of Release. Grantee shall give Grantor immediate notice to Grantor's Resource Operations Center at (800) 832-5452 of any release of hazardous substances on or from the Premises, violation of Environmental Laws, or inspection or inquiry by governmental authorities charged with enforcing Environmental Laws with respect to Grantee's use of the Premises. Grantee shall use its best efforts to promptly respond to any release on or from the Premises. Grantee also shall give Grantor immediate notice of all measures undertaken on behalf of Grantee to investigate, remediate, respond to or otherwise cure such release or violation.

7.3     Remediation of Release. In the event that Grantor has notice from Grantee or otherwise of a release or violation of Environmental Laws which occurred or may occur during the term of this Easement Agreement, Grantor may require Grantee, at Grantee's sole risk and expense, to take timely measures to investigate, remediate, respond to or otherwise cure such release or violation affecting the Premises. If during the construction or subsequent maintenance of the Improvements, soils or other materials considered to be environmentally contaminated are exposed, Grantee will remove and safely dispose of said contaminated soils. Determination of soils contamination and applicable disposal procedures thereof, will be made only by an agency having the capacity and authority to make such a determination.

7.4     Preventative Measures. Grantee shall promptly report to Grantor in writing any conditions or activities upon the Premises known to Grantee which create a risk of harm to persons, property or the environment and shall take whatever action is necessary to prevent injury to persons or property arising out of such conditions or activities; provided, however, that Grantee's reporting to Grantor shall not relieve Grantee of any obligation whatsoever imposed on it by this Easement Agreement. Grantee shall promptly respond to Grantor's request for information regarding said conditions or activities.

7.5     Evidence of Compliance. Grantee agrees periodically to furnish Grantor with proof satisfactory to Grantor that Grantee is in compliance with this **Section 7**. Should Grantee not comply fully with the above-stated obligations of this **Section 7**, notwithstanding anything contained in any other provision hereof, Grantor may, at its option, terminate this Easement Agreement by serving five (5) days' notice of termination upon Grantee. Upon termination, Grantee shall remove the Improvements and restore the Premises as provided in **Section 9**.

**Section 8**      **Default and Termination.**

8.1      Grantor's Performance Rights. If at any time Grantee, or Grantee's Contractors, fails to properly perform its obligations under this Easement Agreement, Grantor, in its sole discretion, may: (i) seek specific performance of the unperformed obligations, or (ii) at Grantee's sole cost, may arrange for the performance of such work as Grantor deems necessary for the safety of its rail operations, activities and property, or to avoid or remove any interference with the activities or property of Grantor, or anyone or anything present on the rail corridor or property with the authority or permission of Grantor. Grantee shall promptly reimburse Grantor for all costs of work performed on Grantee's behalf upon receipt of an invoice for such costs. Grantor's failure to perform any obligations of Grantee or Grantee's Contractors shall not alter the liability allocation set forth in this Easement Agreement.

8.2      Abandonment. Grantor may, at its option, terminate this Easement Agreement by serving five (5) days' notice in writing upon Grantee if Grantee should abandon or cease to use the Premises for the Easement Purpose. Any waiver by Grantor of any default or defaults shall not constitute a waiver of the right to terminate this Easement Agreement for any subsequent default or defaults, nor shall any such waiver in any way affect Grantor's ability to enforce any section of this Easement Agreement.

8.3      Effect of Termination or Expiration. Neither termination nor expiration will release Grantee from any liability or obligation under this Easement, whether of indemnity or otherwise, resulting from any acts, omissions or events happening prior to the date of termination or expiration, or, if later, the date the Premises are restored as required by **Section 9**.

8.4      Non-exclusive Remedies. The remedies set forth in this **Section 8** shall be in addition to, and not in limitation of, any other remedies that Grantor may have under the C&M Agreement, at law or in equity.

**Section 9**      **Surrender of Premises.**

9.1      Removal of Improvements and Restoration. Upon termination of this Easement Agreement, whether by abandonment of the Easement or by the exercise of Grantor's termination rights hereunder, Grantee shall, at its sole cost and expense, immediately perform the following:

- (a)      remove all or such portion of Grantee's Improvements and all appurtenances thereto from the Premises, as Grantor directs at Grantor's sole discretion;
- (b)      repair and restore any damage to the Premises arising from, growing out of, or connected with Grantee's use of the Premises;
- (c)      remedy any unsafe conditions on the Premises created or aggravated by Grantee; and
- (d)      leave the Premises in the condition which existed as of the Effective Date.

9.2      Limited License for Entry. If this Easement Agreement is terminated, Grantor may direct Grantee to undertake one or more of the actions set forth above, at Grantee's sole cost, in which case Grantee shall have a limited license to enter upon the Premises to the extent necessary to undertake the actions directed by Grantor. The terms of this limited license include all of Grantee's obligations under this Easement Agreement. Termination will not release Grantee from any liability or obligation under this Easement Agreement, whether of indemnity or otherwise, resulting from any acts, omissions or events happening prior to the date of termination, or, if later, the date when Grantee's Improvements are removed and the Premises are restored to the condition that existed as of the Effective Date. If Grantee fails to surrender the Premises to Grantor upon any termination of the Easement, all liabilities and obligations of Grantee hereunder shall continue in effect until the Premises are surrendered.

**Section 10**      **Liens.** Grantee shall promptly pay and discharge any and all liens arising out of any construction,

alterations or repairs done, suffered or permitted to be done by Grantee on the Premises or attributable to Taxes that are the responsibility of Grantee pursuant to **Section 6**. Grantor is hereby authorized to post any notices or take any other action upon or with respect to the Premises that is or may be permitted by Law to prevent the attachment of any such liens to any portion of the Premises; provided, however, that failure of Grantor to take any such action shall not relieve Grantee of any obligation or liability under this **Section 10** or any other section of this Easement Agreement.

**Section 11** **Tax Exchange**. Grantor may assign its rights (but not its obligations) under this Easement Agreement to Goldfinch Exchange Company LLC, an exchange intermediary, in order for Grantor to effect an exchange under Section 1031 of the Internal Revenue Code. In such event, Grantor shall provide Grantee with a Notice of Assignment, attached as Exhibit C, and Grantee shall execute an acknowledgement of receipt of such notice.

**Section 12** **Notices**. Any notice required or permitted to be given hereunder by one party to the other shall be delivered in the manner set forth in the C&M Agreement. Notices to Grantor under this Easement shall be delivered to the following address: BNSF Railway Company, Real Estate Department, 2501 Lou Menk Drive, Ft. Worth, TX 76131, Attn: Real Estate, or such other address as Grantor may from time to time direct by notice to Grantee.

**Section 13** **Recordation**. It is understood and agreed that this Easement Agreement shall not be in recordable form and shall not be placed on public record and any such recording shall be a breach of this Easement Agreement. Grantor and Grantee shall execute a Memorandum of Easement in the form attached hereto as Exhibit "B-1" (the "**Memorandum of Easement**") subject to changes required, if any, to conform such form to local recording requirements. The Memorandum of Easement shall be recorded in the real estate records in the county where the Premises are located. If a Memorandum of Easement is not executed by the parties and recorded as described above within 30 days of the Effective Date, Grantor shall have the right to terminate this Easement Agreement upon notice to Grantee.

**Section 14** **Miscellaneous**.

14.1 All questions concerning the interpretation or application of provisions of this Easement Agreement shall be decided according to the substantive Laws of the State of **[Texas]** without regard to conflicts of law provisions.

14.2 In the event that Grantee consists of two or more parties, all the covenants and agreements of Grantee herein contained shall be the joint and several covenants and agreements of such parties. This instrument and all of the terms, covenants and provisions hereof shall inure to the benefit of and be binding upon each of the parties hereto and their respective legal representatives, successors and assigns and shall run with and be binding upon the Premises.

14.3 If any action at law or in equity is necessary to enforce or interpret the terms of this Easement Agreement, the prevailing party or parties shall be entitled to reasonable attorneys' fees, costs and necessary disbursements in addition to any other relief to which such party or parties may be entitled.

14.4 If any provision of this Easement Agreement is held to be illegal, invalid or unenforceable under present or future Laws, such provision will be fully severable and this Easement Agreement will be construed and enforced as if such illegal, invalid or unenforceable provision is not a part hereof, and the remaining provisions hereof will remain in full force and effect. In lieu of any illegal, invalid or unenforceable provision herein, there will be added automatically as a part of this Easement Agreement a provision as similar in its terms to such illegal, invalid or unenforceable provision as may be possible and be legal, valid and enforceable.

14.5 This Easement Agreement is the full and complete agreement between Grantor and Grantee with respect to all matters relating to Grantee's use of the Premises and supersedes any and all other agreements between the parties hereto relating to Grantee's use of the Premises as described herein. However, nothing herein is intended to terminate any surviving obligation of Grantee or Grantee's obligation to defend and hold Grantor harmless in any prior written agreement between the parties.

14.6 Time is of the essence for the performance of this Easement Agreement.

**ADMINISTRATIVE FEE**

15. Grantee acknowledges that a material consideration for this agreement, without which it would not be made, is the agreement between Grantee and Grantor, that the Grantee shall pay upon return of this Agreement signed by Grantee to Grantor's Broker a processing fee in the amount of **\$2,500.00** over and above the agreed upon Acquisition Price. Said fee shall be made payable to BNSF Railway Company by a separate check.

Witness the execution of this Easement Agreement as of the date first set forth above.

**GRANTOR:**

**BNSF RAILWAY COMPANY**, a Delaware corporation

By: \_\_\_\_\_  
Name: \_\_\_\_\_  
Title: \_\_\_\_\_

**GRANTEE:**

\_\_\_\_\_,  
a \_\_\_\_\_

By: \_\_\_\_\_  
Name: \_\_\_\_\_  
Title: \_\_\_\_\_

**EXHIBIT "A-1"**

**Premises**

**EXHIBIT "B-1"**

**MEMORANDUM OF EASEMENT**

## MEMORANDUM OF EASEMENT

**THIS MEMORANDUM OF EASEMENT** is hereby executed this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_, by and between **BNSF RAILWAY COMPANY**, a Delaware corporation ("**Grantor**"), whose address for purposes of this instrument is 2500 Lou Menk Drive, Fort Worth, Texas 76131, and \_\_\_\_\_, a \_\_\_\_\_ ("**Grantee**"), whose address for purposes of this instrument is \_\_\_\_\_, which terms "Grantor" and "Grantee" shall include, wherever the context permits or requires, singular or plural, and the heirs, legal representatives, successors and assigns of the respective parties:

### **WITNESSETH:**

**WHEREAS**, Grantor owns or controls certain real property situated in Fort Bend County, Texas as described on **Exhibit "A-1"** attached hereto and incorporated herein by reference (the "**Premises**");

**WHEREAS**, Grantor and Grantee entered into an Easement Agreement, dated \_\_\_\_\_, 20\_\_ (the "**Easement Agreement**") which set forth, among other things, the terms of an easement granted by Grantor to Grantee over and across the Premises (the "**Easement**"); and

**WHEREAS**, Grantor and Grantee desire to memorialize the terms and conditions of the Easement Agreement of record.

For valuable consideration the receipt and sufficiency of which are hereby acknowledged, Grantor does grant unto Grantee and Grantee does hereby accept from Grantor the Easement over and across the Premises.

The term of the Easement, unless sooner terminated under provisions of the Easement Agreement, shall be perpetual.

All the terms, conditions, provisions and covenants of the Easement Agreement are incorporated herein by this reference for all purposes as though written out at length herein, and both the Easement Agreement and this Memorandum of Easement shall be deemed to constitute a single instrument or document. This Memorandum of Easement is not intended to amend, modify, supplement, or supersede any of the provisions of the Easement Agreement and, to the extent there may be any conflict or inconsistency between the Easement Agreement or this Memorandum of Easement, the Easement Agreement shall control.

**IN WITNESS WHEREOF**, Grantor and Grantee have executed this Memorandum of Easement to as of the date and year first above written.

**GRANTOR:**

**BNSF RAILWAY COMPANY**, a Delaware corporation

By: \_\_\_\_\_  
Name: \_\_\_\_\_  
Title: \_\_\_\_\_

**STATE OF TEXAS**           §  
  §  
**COUNTY OF TARRANT**   §

This instrument was acknowledged before me on the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_, by \_\_\_\_\_ (name) as \_\_\_\_\_ (title) of **BNSF RAILWAY COMPANY**, a Delaware corporation.

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

My appointment expires: \_\_\_\_\_

(Seal)

**GRANTEE:**

\_\_\_\_\_  
\_\_\_\_\_

By: \_\_\_\_\_  
Name: \_\_\_\_\_  
Title: \_\_\_\_\_

STATE OF \_\_\_\_\_ §  
  §  
COUNTY OF \_\_\_\_\_ §

This instrument was acknowledged before me on the \_\_\_\_\_ day of \_\_\_\_\_,  
20\_\_, by \_\_\_\_\_ (name) as  
\_\_\_\_\_ (title) of \_\_\_\_\_, a  
\_\_\_\_\_.

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

My appointment expires: \_\_\_\_\_

(Seal)

## **EXHIBIT "C"**

### **CONTRACTOR REQUIREMENTS**

#### **1.01 General:**

- **1.01.01** The Contractor must cooperate with **BNSF RAILWAY COMPANY**, hereinafter referred to as "**Railway**" where work is over or under on or adjacent to Railway property and/or right-of-way, hereafter referred to as "Railway Property", during the **construction and widening of the roadway approaches on Benton Road – DOT No. 022677B, located at railroad milepost 59.46 on Railway's Red River (South) Division, Galveston Subdivision, Line Segment 7500 in Rosenberg, Texas in Fort Bend County.**
- **1.01.02** The Contractor must execute and deliver to the Railway duplicate copies of the Exhibit "C-1" Agreement, in the form attached hereto, obligating the Contractor to provide and maintain in full force and effect the insurance called for under Section 3 of said Exhibit "C-1". Questions regarding procurement of the Railroad Protective Liability Insurance should be directed to Rosa Martinez at Marsh, USA, 214-303-8519.
- **1.01.03** The Contractor must plan, schedule and conduct all work activities so as not to interfere with the movement of any trains on Railway Property.
- **1.01.04** The Contractor's right to enter Railway's Property is subject to the absolute right of Railway to cause the Contractor's work on Railway's Property to cease if, in the opinion of Railway, Contractor's activities create a hazard to Railway's Property, employees, and/or operations. Railway will have the right to stop construction work on the Project if any of the following events take place: (i) Contractor (or any of its subcontractors) performs the Project work in a manner contrary to the plans and specifications approved by Railway; (ii) Contractor (or any of its subcontractors), in Railway's opinion, prosecutes the Project work in a manner which is hazardous to Railway property, facilities or the safe and expeditious movement of railroad traffic; (iii) the insurance described in the attached Exhibit C-1 is canceled during the course of the Project; or (iv) Contractor fails to pay Railway for the Temporary Construction License or the Easement. The work stoppage will continue until all necessary actions are taken by Contractor or its subcontractor to rectify the situation to the satisfaction of Railway's Division Engineer or until additional insurance has been delivered to and accepted by Railway. In the event of a breach of (i) this Agreement, (ii) the Temporary Construction License, or (iii) the Easement, Railway may immediately terminate the Temporary Construction License or the Easement. Any such work stoppage under this provision will not give rise to any liability on the part of Railway. Railway's right to stop the work is in addition to any other rights Railway may have including, but not

limited to, actions or suits for damages or lost profits. In the event that Railway desires to stop construction work on the Project, Railway agrees to immediately notify the following individuals in writing:

Ike Akinwande  
Assistant County Engineer  
Fort Bend County  
William B. Travis Building  
301 Jackson Street  
Richmond, TX 77469  
Email: ike.akinwande@fortbendcountytexas.gov

- **1.01.05** The Contractor is responsible for determining and complying with all Federal, State and Local Governmental laws and regulations, including, but not limited to environmental laws and regulations (including but not limited to the Resource Conservation and Recovery Act, as amended; the Clean Water Act, the Oil Pollution Act, the Hazardous Materials Transportation Act, CERCLA), and health and safety laws and regulations. The Contractor hereby indemnifies, defends and holds harmless Railway for, from and against all fines or penalties imposed or assessed by Federal, State and Local Governmental Agencies against the Railway which arise out of Contractor's work under this Agreement.
- **1.01.06** The Contractor must notify Ike Akinwande (Fort Bend County) at 281-633-7506 and Railway's Manager Public Projects, telephone number 817-352-2902 at least thirty (30) calendar days before commencing any work on Railway Property. Contractor's notification to Railway must refer to Railway's file: 022677B – Benton Road (BNSF Contract No. \_\_\_\_\_).
- **1.01.07** For any bridge demolition and/or falsework above any tracks or any excavations located with any part of the excavations located within, whichever is greater, twenty-five (25) feet of the nearest track or intersecting a slope from the plane of the top of rail on a 2 horizontal to 1 vertical slope beginning at eleven (11) feet from centerline of the nearest track, both measured perpendicular to center line of track, the Contractor must furnish the Railway five sets of working drawings showing details of construction affecting Railway Property and tracks. The working drawing must include the proposed method of installation and removal of falsework, shoring or cribbing, not included in the contract plans and two sets of structural calculations of any falsework, shoring or cribbing. For all excavation and shoring submittal plans, the current "BNSF-UPRR Guidelines for Temporary Shoring" must be used for determining the design loading conditions to be used in shoring design, and all calculations and submittals must be in accordance with the current "BNSF-UPRR Guidelines for Temporary Shoring". All submittal drawings and calculations must be stamped by a registered professional engineer licensed to practice in the state the

project is located. All calculations must take into consideration railway surcharge loading and must be designed to meet American Railway Engineering and Maintenance-of-Way Association (previously known as American Railway Engineering Association) Coopers E-80 live loading standard. All drawings and calculations must be stamped by a registered professional engineer licensed to practice in the state the project is located. The Contractor must not begin work until notified by the Railway that plans have been approved. The Contractor will be required to use lifting devices such as, cranes and/or winches to place or to remove any falsework over Railway's tracks. In no case will the Contractor be relieved of responsibility for results obtained by the implementation of said approved plans.

- **1.01.08** Subject to the movement of Railway's trains, Railway will cooperate with the Contractor such that the work may be handled and performed in an efficient manner. The Contractor will have no claim whatsoever for any type of damages or for extra or additional compensation in the event his work is delayed by the Railway.

## **1.02 Contractor Safety Orientation**

- **1.02.01** No employee of the Contractor, its subcontractors, agents or invitees may enter Railway Property without first having completed Railway's Engineering Contractor Safety Orientation, found on the web site [www.BNSFContractor.com](http://www.BNSFContractor.com). The Contractor must ensure that each of its employees, subcontractors, agents or invitees completes Railway's Engineering Contractor Safety Orientation through internet sessions before any work is performed on the Project. Additionally, the Contractor must ensure that each and every one of its employees, subcontractors, agents or invitees possesses a card certifying completion of the Railway Contractor Safety Orientation before entering Railway Property. The Contractor is responsible for the cost of the Railway Contractor Safety Orientation. The Contractor must renew the Railway Contractor Safety Orientation annually. Further clarification can be found on the web site or from the Railway's Representative.

## **1.03 Railway Requirements**

- **1.03.01** The Contractor must take protective measures as are necessary to keep railway facilities, including track ballast, free of sand, debris, and other foreign objects and materials resulting from his operations. Any damage to railway facilities resulting from Contractor's operations will be repaired or replaced by Railway and the cost of such repairs or replacement must be paid for by the Agency.
- **1.03.02 INTENTIONALL LEFT BLANK**

- **1.03.03** The Contractor must abide by the following temporary clearances during construction:
  - 15'-0" Horizontally from centerline of nearest track
  - 21'-6" Vertically above top of rail
  - 27'-0" Vertically above top of rail for electric wires carrying less than 750 volts
  - 28'-0" Vertically above top of rail for electric wires carrying 750 volts to 15,000 volts
  - 30'-0" Vertically above top of rail for electric wires carrying 15,000 volts to 20,000 volts
  - 34'-0" Vertically above top of rail for electric wires carrying more than 20,000 volts
  
- **1.03.04** Upon completion of construction, the following clearances shall be maintained:
  - 25' Horizontally from centerline of nearest track
  - 23' 6" Vertically above top of rail
  
- **1.03.05** Any infringement within State statutory clearances due to the Contractor's operations must be submitted to the Railway and to **Fort Bend County** and must not be undertaken until approved in writing by the Railway, and until **Fort Bend County** has obtained any necessary authorization from the State Regulatory Authority for the infringement. No extra compensation will be allowed in the event the Contractor's work is delayed pending Railway approval, and/or the State Regulatory Authority's approval.
  
- **1.03.06** In the case of impaired vertical clearance above top of rail, Railway will have the option of installing tell-tales or other protective devices Railway deems necessary for protection of Railway operations. The cost of tell-tales or protective devices will be borne by the Agency.
  
- **1.03.07** The details of construction affecting the Railway's Property and tracks not included in the contract plans must be submitted to the Railway by **Fort Bend County** for approval before work is undertaken and this work must not be undertaken until approved by the Railway.
  
- **1.03.08** At other than public road crossings, the Contractor must not move any equipment or materials across Railway's tracks until permission has been obtained from the Railway. The Contractor must obtain a "Temporary Construction Crossing Agreement" from the Railway prior to moving his equipment or materials across the Railways tracks. The temporary crossing must be gated and locked at all times when

not required for use by the Contractor. The temporary crossing for use of the Contractor will be constructed and, at the completion of the project, removed at the expense of the Contractor.

- **1.03.09** Discharge, release or spill on the Railway Property of any hazardous substances, oil, petroleum, constituents, pollutants, contaminants, or any hazardous waste is prohibited and Contractor must immediately notify the **Railway's Resource Operations Center at 1(800) 832-5452**, of any discharge, release or spills in excess of a reportable quantity. Contractor must not allow Railway Property to become a treatment, storage or transfer facility as those terms are defined in the Resource Conservation and Recovery Act or any state analogue.
- **1.03.10** The Contractor upon completion of the work covered by this contract, must promptly remove from the Railway's Property all of Contractor's tools, equipment, implements and other materials, whether brought upon said property by said Contractor or any Subcontractor, employee or agent of Contractor or of any Subcontractor, and must cause Railway's Property to be left in a condition acceptable to the Railway's representative.

#### **1.04 Contractor Roadway Worker on Track Safety Program and Safety Action Plan:**

- **1.04.01** Each Contractor that will perform work within 25 feet of the centerline of a track must develop and implement a Roadway Worker Protection/On Track Safety Program and work with Railway Project Representative to develop an on track safety strategy as described in the guidelines listed in the on track safety portion of the Safety Orientation. This Program must provide Roadway Worker protection/on track training for all employees of the Contractor, its subcontractors, agents or invitees. This training is reinforced at the job site through job safety briefings. Additionally, each Contractor must develop and implement the Safety Action Plan, as provided for on the web site **www.BNSFContractor.com**, which will be made available to Railway prior to commencement of any work on Railway Property. During the performance of work, the Contractor must audit its work activities. The Contractor must designate an on-site Project Supervisor who will serve as the contact person for the Railway and who will maintain a copy of the Safety Action Plan, safety audits, and Material Safety Datasheets (MSDS), at the job site.
- **1.04.02** Contractor shall have a background investigation performed on all of its employees, subcontractors and agents who will be performing any services for Railroad under this Agreement which are determined by Railroad in its sole discretion **a)** to be on Railroad's property, or **b)** that require access to Railroad Critical Infrastructure, Railroad Critical Information Systems, Railroad's Employees,



Hazardous Materials on Railroad's property or is being transported by or otherwise in the custody of Railroad, or Freight in Transit involving Railroad.

The required background screening shall at a minimum meet the rail industry background screening criteria defined by the e-RAILSAFE Program as outlined at [www.eVerifile.com](http://www.eVerifile.com), in addition to any other applicable regulatory requirements.

Contractor shall obtain written consent from all its employees, subcontractors or agents screened in compliance with the e-RAILSAFE Program to participate in the Program on their behalf and to release completed background information to Railroad's designee. Contractor shall be subject to periodic audit to ensure compliance.

Contractor subject to the e-RAILSAFE Program hereunder shall not permit any of its employees, subcontractors or agents to perform services hereunder who are not first approved under e-RAILSAFE Program standards. Railroad shall have the right to deny entry onto its premises or access as described in this section above to any of Contractor's employees, subcontractors or agents who do not display the authorized identification badge issued by a background screening service meeting the standards set forth in the e-RAILSAFE Program, or who in Railroad's opinion, which may not be unreasonable, may pose a threat to the safety or security of Railroad's operations, assets or personnel.

Contractors shall be responsible for ensuring that its employees, subcontractors and agents are United States citizens or legally working in the United States under a lawful and appropriate work VISA or other work authorization.

## 1.05 Railway Flagger Services:

- **1.05.01** The Contractor must give Railway's **Roadmaster** (John Reid at mobile # 254-447-1587 or John.Reid@bnsf.com) a minimum of thirty (30) calendar days advance notice when flagging services will be required so that the Roadmaster can make appropriate arrangements (i.e., bulletin the flagger's position). If flagging services are scheduled in advance by the Contractor and it is subsequently determined by the parties hereto that such services are no longer necessary, the Contractor must give the Roadmaster five (5) working days advance notice so that appropriate arrangements can be made to abolish the position pursuant to union requirements.
- **FOR THIS PROJECT, RAILROAD FLAGGING SERVICES WILL BE PROVIDED BY RAILPROS (NOT A BNSF EMPLOYEE). The Contractor must**

contact Railpros directly at Office # 877-315-0513 or e-mail: [BNSFinfo@railprosfs.com](mailto:BNSFinfo@railprosfs.com) to enter into a reimbursement agreement for flagging services and to request and schedule a railroad flagger. The Railpros flagger(s), the Contractor, and the BNSF Roadmaster must participate in a job safety briefing PRIOR TO the start of any work on/over/under Railway's right of way. The Railway reserves the right to utilize its employees to provide railroad flagging services when those resources become available. In this event, the Railpros flagger and the Contractor will be notified by the Railway.

- **1.05.02** Unless determined otherwise by Railway's Project Representative, Railway flagger will be required and furnished when Contractor's work activities are located over, under and/or within twenty-five (25) feet measured horizontally from centerline of the nearest track and when cranes or similar equipment positioned beyond 25-feet from the track centerline could foul the track in the event of tip over or other catastrophic occurrence, but not limited thereto for the following conditions:
  - **1.05.02a** When, upon inspection by Railway's Representative, other conditions warrant.
  - **1.05.02b** When any excavation is performed below the bottom of tie elevation, if, in the opinion of Railway's representative, track or other Railway facilities may be subject to movement or settlement.
  - **1.05.02c** When work in any way interferes with the safe operation of trains at timetable speeds.
  - **1.05.02d** When any hazard is presented to Railway track, communications, signal, electrical, or other facilities either due to persons, material, equipment or blasting in the vicinity.
  - **1.05.02e** Special permission must be obtained from the Railway before moving heavy or cumbersome objects or equipment which might result in making the track impassable.
- **1.05.03** Flagging services will be performed by qualified Railway flaggers.
  - **1.05.03a** Flagging crew generally consists of one employee. However, additional personnel may be required to protect Railway Property and operations, if deemed necessary by the Railways Representative.
  - **1.05.03b** Each time a flagger is called, the minimum period for billing will be the eight (8) hour basic day.

- **1.05.03c** The cost of flagger services provided by the Railway will be borne by **CONTRACTOR**. The estimated cost for one (1) flagger is approximately between \$800.00-\$1,600.00 for an eight (8) hour basic day with time and one-half or double time for overtime, rest days and holidays. The estimated cost for each flagger includes vacation allowance, paid holidays, Railway and unemployment insurance, public liability and property damage insurance, health and welfare benefits, vehicle, transportation, meals, lodging, radio, equipment, supervision and other costs incidental to performing flagging services. Negotiations for Railway labor or collective bargaining agreements and rate changes authorized by appropriate Federal authorities may increase actual or estimated flagging rates. **THE FLAGGING RATE IN EFFECT AT THE TIME OF PERFORMANCE BY THE CONTRACTOR HEREUNDER WILL BE USED TO CALCULATE THE ACTUAL COSTS OF FLAGGING PURSUANT TO THIS PARAGRAPH.**
- **1.05.03d** The average train traffic on this route is **30** freight trains per 24-hour period at a timetable speed **55** MPH and **0** passenger trains at a timetable speed of **n/a** MPH.

## **1.06 Contractor General Safety Requirements**

- **1.06.01** Work in the proximity of railway track(s) is potentially hazardous where movement of trains and equipment can occur at any time and in any direction. All work performed by contractors within 25 feet of any track must be in compliance with FRA Roadway Worker Protection Regulations.
- **1.06.02** Before beginning any task on Railway Property, a thorough job safety briefing must be conducted with all personnel involved with the task and repeated when the personnel or task changes. If the task is within 25 feet of any track, the job briefing must include the Railway's flagger, as applicable, and include the procedures the Contractor will use to protect its employees, subcontractors, agents or invitees from moving any equipment adjacent to or across any Railway track(s).
- **1.06.03** Workers must not work within 25 feet of the centerline of any track without an on track safety strategy approved by the Railway's Project Representative. When authority is provided, every contractor employee must know: (1) who the Railway flagger is, and how to contact the flagger, (2) limits of the authority, (3) the method of communication to stop and resume work, and (4) location of the designated places of safety. Persons or equipment entering flag/work limits that were not previously job briefed, must notify the flagger immediately, and be given a job briefing when working

within 25 feet of the center line of track.

- **1.06.04** When Contractor employees are required to work on the Railway Property after normal working hours or on weekends, the Railway's representative in charge of the project must be notified. A minimum of two employees must be present at all times.
- **1.06.05** Any employees, agents or invitees of Contractor or its subcontractors under suspicion of being under the influence of drugs or alcohol, or in the possession of same, will be removed from the Railway's Property and subsequently released to the custody of a representative of Contractor management. Future access to the Railway's Property by that employee will be denied.
- **1.06.06** Any damage to Railway Property, or any hazard noticed on passing trains must be reported immediately to the Railway's representative in charge of the project. Any vehicle or machine which may come in contact with track, signal equipment, or structure (bridge) and could result in a train derailment must be reported immediately to the Railway representative in charge of the project and to the Railway's Resource Operations Center at 1(800) 832-5452. Local emergency numbers are to be obtained from the Railway representative in charge of the project prior to the start of any work and must be posted at the job site.
- **1.06.07** For safety reasons, all persons are prohibited from having pocket knives, firearms or other deadly weapons in their possession while working on Railway's Property.
- **1.06.08** All personnel protective equipment (PPE) used on Railway Property must meet applicable OSHA and ANSI specifications. Current Railway personnel protective equipment requirements are listed on the web site, [www.BNSFContractor.com](http://www.BNSFContractor.com), however, a partial list of the requirements include: a) safety glasses with permanently affixed side shields (no yellow lenses); b) hard hats; c) safety shoe with: hardened toes, above-the-ankle lace-up and a defined heel; and d) high visibility retro-reflective work wear. The Railway's representative in charge of the project is to be contacted regarding local specifications for meeting requirements relating to hi-visibility work wear. Hearing protection, fall protection, gloves, and respirators must be worn as required by State and Federal regulations. **(NOTE – Should there be a discrepancy between the information contained on the web site and the information in this paragraph, the web site will govern.)**
- **1.06.09 THE CONTRACTOR MUST NOT PILE OR STORE ANY MATERIALS, MACHINERY OR EQUIPMENT CLOSER THAN 25'-0" TO THE CENTER LINE OF THE NEAREST RAILWAY TRACK. MATERIALS, MACHINERY OR EQUIPMENT MUST NOT BE STORED OR LEFT WITHIN 250 FEET OF ANY HIGHWAY/RAIL AT-GRADE CROSSINGS OR TEMPORARY CONSTRUCTION CROSSING,**

**WHERE STORAGE OF THE SAME WILL OBSTRUCT THE VIEW OF A TRAIN APPROACHING THE CROSSING. PRIOR TO BEGINNING WORK, THE CONTRACTOR MUST ESTABLISH A STORAGE AREA WITH CONCURRENCE OF THE RAILWAY'S REPRESENTATIVE.**

- **1.06.10** Machines or vehicles must not be left unattended with the engine running. Parked machines or equipment must be in gear with brakes set and if equipped with blade, pan or bucket, they must be lowered to the ground. All machinery and equipment left unattended on Railway's Property must be left inoperable and secured against movement. (See internet Engineering Contractor Safety Orientation program for more detailed specifications)
- **1.06.11** Workers must not create and leave any conditions at the work site that would interfere with water drainage. Any work performed over water must meet all Federal, State and Local regulations.
- **1.06.12** All power line wires must be considered dangerous and of high voltage unless informed to the contrary by proper authority. For all power lines the minimum clearance between the lines and any part of the equipment or load must be; 200 KV or below - 15 feet; 200 to 350 KV - 20 feet; 350 to 500 KV - 25 feet; 500 to 750 KV - 35 feet; and 750 to 1000 KV - 45 feet. If capacity of the line is not known, a minimum clearance of 45 feet must be maintained. A person must be designated to observe clearance of the equipment and give a timely warning for all operations where it is difficult for an operator to maintain the desired clearance by visual means.

### **1.07 Excavation:**

- **1.07.01** Before excavating, the Contractor must determine whether any underground pipe lines, electric wires, or cables, including fiber optic cable systems are present and located within the Project work area. The Contractor must determine whether excavation on Railway's Property could cause damage to buried cables resulting in delay to Railway traffic and disruption of service to users. Delays and disruptions to service may cause business interruptions involving loss of revenue and profits. Before commencing excavation, the Contractor must contact BNSF's Roadmaster (John Reid at mobile # 254-447-1587) and BNSF's Signal Supervisor (Daniel Cardiff at mobile # 817-964-8741). All underground and overhead wires will be considered HIGH VOLTAGE and dangerous until verified with the company having ownership of the line. **It is the Contractor's responsibility to notify any other companies that have underground utilities in the area and arrange for the location of all underground utilities before excavating.**
- **1.07.02** The Contractor must cease all work and notify the Railway immediately

before continuing excavation in the area if obstructions are encountered which do not appear on drawings. If the obstruction is a utility and the owner of the utility can be identified, then the Contractor must also notify the owner immediately. If there is any doubt about the location of underground cables or lines of any kind, no work must be performed until the exact location has been determined. There will be no exceptions to these instructions.

- **1.07.03** All excavations must be conducted in compliance with applicable OSHA regulations and, regardless of depth, must be shored where there is any danger to tracks, structures or personnel.
- **1.07.04** Any excavations, holes or trenches on the Railway's Property must be covered, guarded and/or protected when not being worked on. When leaving work site areas at night and over weekends, the areas must be secured and left in a condition that will ensure that Railway employees and other personnel who may be working or passing through the area are protected from all hazards. All excavations must be back filled as soon as possible.

### **1.08 Hazardous Waste, Substances and Material Reporting:**

- **1.08.01** If Contractor discovers any hazardous waste, hazardous substance, petroleum or other deleterious material, including but not limited to any non-containerized commodity or material, on or adjacent to Railway's Property, in or near any surface water, swamp, wetlands or waterways, while performing any work under this Agreement, Contractor must immediately: (a) notify the Railway's Resource Operations Center at 1(800) 832-5452, of such discovery: (b) take safeguards necessary to protect its employees, subcontractors, agents and/or third parties: and (c) exercise due care with respect to the release, including the taking of any appropriate measure to minimize the impact of such release.

### **1.09 Personal Injury Reporting**

- **1.09.01** The Railway is required to report certain injuries as a part of compliance with Federal Railroad Administration (FRA) reporting requirements. Any personal injury sustained by an employee of the Contractor, subcontractor or Contractor's invitees while on the Railway's Property must be reported immediately (by phone mail if unable to contact in person) to the Railway's representative in charge of the project. The Non-Employee Personal Injury Data Collection Form contained herein is to be completed and sent by Fax to the Railway at 1(817) 352-7595 and to the Railway's Project Representative no later than the close of shift on the date of the injury.



## NON-EMPLOYEE PERSONAL INJURY DATA COLLECTION

(If injuries are in connection with rail equipment accident/incident, highway rail grade crossing accident or automobile accident, ensure that appropriate information is obtained, forms completed and that data entry personnel are aware that injuries relate to that specific event.)

Injured Person Type:

- Passenger on train (C)       Non-employee (N)  
*(i.e., emp of another railroad, or, non-BNSF emp involved in vehicle accident, including company vehicles)*
- Contractor/safety sensitive (F)     Contractor/non-safety sensitive (G)
- Volunteer/safety sensitive (H)     Volunteer/other non-safety sensitive (I)
- Non-trespasser (D) - to include highway users involved in highway rail grade crossing accidents who did not go around or through gates
- Trespasser (E) - to include highway users involved in highway rail grade crossing accidents who went around or through gates
- Non-trespasser (J) - Off railroad property

If train involved, Train ID:

\_\_\_\_\_

Transmit attached information to Accident/Incident Reporting Center by:

Fax 1-817-352-7595      or by Phone 1-800-697-6736      or email to: [Accident-Reporting.Center@BNSF.com](mailto:Accident-Reporting.Center@BNSF.com)  
AND COPY TO: ROADMASTER [John.Reid@BNSF.com](mailto:John.Reid@BNSF.com) & MANAGER PUBLIC PROJECTS [Tim.Huya@BNSF.com](mailto:Tim.Huya@BNSF.com)

Officer Providing Information:

\_\_\_\_\_  
(Name)

\_\_\_\_\_  
(Employee No.)

\_\_\_\_\_  
(Phone #)

**REPORT PREPARED TO COMPLY WITH FEDERAL ACCIDENT REPORTING REQUIREMENTS AND PROTECTED FROM DISCLOSURE PURSUANT TO 49 U.S.C. 20903 AND 83 U.S.C. 490**



### NON-EMPLOYEE PERSONAL INJURY DATA COLLECTION

INFORMATION REQUIRED TO BE COLLECTED PURSUANT TO FEDERAL REGULATION. IT SHOULD BE USED FOR COMPLIANCE WITH FEDERAL REGULATIONS ONLY AND IT IS NOT INTENDED TO PRESUME ACCEPTANCE OF RESPONSIBILITY OR LIABILITY.

1. Accident City/St: \_\_\_\_\_ 2. Date: \_\_\_\_\_ Time: \_\_\_\_\_  
County: \_\_\_\_\_ 3. Temperature: \_\_\_\_\_ 4. Weather: \_\_\_\_\_  
(if non BNSF location)

Mile Post / Line Segment: \_\_\_\_\_

5. Driver's License No (and state) or other ID: \_\_\_\_\_ **SSN (required):** \_\_\_\_\_

6. Name (last, first, mi): \_\_\_\_\_

7. Address: \_\_\_\_\_ City: \_\_\_\_\_ St: \_\_\_\_\_ Zip: \_\_\_\_\_

8. Date of Birth: \_\_\_\_\_ and/or Age: \_\_\_\_\_ Gender: \_\_\_\_\_  
(if available)

Phone Number: \_\_\_\_\_ Employer: \_\_\_\_\_

9. Injury: \_\_\_\_\_ 10. Body Part: \_\_\_\_\_  
(i.e., Laceration, etc.) (i.e., Hand, etc.)

11. Description of Accident (To include location, action, result, etc.): \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

12. Treatment:  
 First Aid Only \_\_\_\_\_  
 Required Medical Treatment \_\_\_\_\_  
 Other Medical Treatment \_\_\_\_\_

13. Dr. Name: \_\_\_\_\_ Date: \_\_\_\_\_

14. Dr. Address:  
Street: \_\_\_\_\_ City: \_\_\_\_\_ St: \_\_\_\_\_ Zip: \_\_\_\_\_

15. Hospital Name: \_\_\_\_\_

16. Hospital Address:  
Street: \_\_\_\_\_ City: \_\_\_\_\_ St: \_\_\_\_\_ Zip: \_\_\_\_\_

17. Diagnosis: \_\_\_\_\_

**REPORT PREPARED TO COMPLY WITH FEDERAL ACCIDENT REPORTING REQUIREMENTS AND PROTECTED FROM DISCLOSURE PURSUANT TO 49 U.S.C. 20903 AND 83 U.S.C. 490**



## EXHIBIT "C-1"

### Agreement Between BNSF RAILWAY COMPANY and the CONTRACTOR

Railway Files: DOT No. 022677B

Agency Project: construct and widen Benton Road in Rosenberg, TX

\_\_\_\_\_ (hereinafter called "**Contractor**"), has entered into an agreement (hereinafter called "Agreement") with **Fort Bend County (COUNTY)** for the performance of certain work in connection with the following project: construction and widening of the roadway approaches on Benton Road – DOT No. 022677B, located at railroad milepost 59.46 on Railway's Red River (South) Division, Galveston Subdivision, Line Segment 7500 in Rosenberg, Texas in Fort Bend County.

Performance of such work will necessarily require Contractor to enter **BNSF RAILWAY COMPANY** (hereinafter called "Railway") right of way and property (hereinafter called "Railway Property"). The Agreement provides that no work will be commenced within Railway Property until the Contractor employed in connection with said work for **COUNTY** (i) executes and delivers to Railway an Agreement in the form hereof, and (ii) provides insurance of the coverage and limits specified in such Agreement and Section 3 herein. If this Agreement is executed by a party who is not the Owner, General Partner, President or Vice President of Contractor, Contractor must furnish evidence to Railway certifying that the signatory is empowered to execute this Agreement on behalf of Contractor.

Accordingly, in consideration of Railway granting permission to Contractor to enter upon Railway Property and as an inducement for such entry, Contractor, effective on the date of the Agreement, has agreed and does hereby agree with Railway as follows:

#### 1) RELEASE OF LIABILITY AND INDEMNITY

Contractor hereby waives, releases, indemnifies, defends and holds harmless Railway for all judgments, awards, claims, demands, and expenses (including attorneys' fees), for injury or death to all persons, including Railway's and Contractor's officers and employees, and for loss and damage to property belonging to any person, arising in any manner from Contractor's or any of Contractor's subcontractors' acts or omissions or any work performed on or about Railway's property or right-of-way. **THE LIABILITY ASSUMED BY CONTRACTOR WILL NOT BE AFFECTED BY THE FACT, IF IT IS A FACT, THAT THE DESTRUCTION, DAMAGE, DEATH,**

**OR INJURY WAS OCCASIONED BY OR CONTRIBUTED TO BY THE NEGLIGENCE OF RAILWAY, ITS AGENTS, SERVANTS, EMPLOYEES OR OTHERWISE, EXCEPT TO THE EXTENT THAT SUCH CLAIMS ARE PROXIMATELY CAUSED BY THE INTENSIONAL MISCONDUCT OR GROSS NEGLIGENCE OF RAILWAY.**

**THE INDEMNIFICATION OBLIGATION ASSUMED BY CONTRACTOR INCLUDES ANY CLAIMS, SUITS OR JUDGMENTS BROUGHT AGAINST RAILWAY UNDER THE FEDERAL EMPLOYEE'S LIABILITY ACT, INCLUDING CLAIMS FOR STRICT LIABILITY UNDER THE SAFETY APPLIANCE ACT OR THE LOCOMOTIVE INSPECTION ACT, WHENEVER SO CLAIMED.**

Contractor further agrees, at its expense, in the name and on behalf of Railway, that it will adjust and settle all claims made against Railway, and will, at Railway's discretion, appear and defend any suits or actions of law or in equity brought against Railway on any claim or cause of action arising or growing out of or in any manner connected with any liability assumed by Contractor under this Agreement for which Railway is liable or is alleged to be liable. Railway will give notice to Contractor, in writing, of the receipt or dependency of such claims and thereupon Contractor must proceed to adjust and handle to a conclusion such claims, and in the event of a suit being brought against Railway, Railway may forward summons and complaint or other process in connection therewith to Contractor, and Contractor, at Railway's discretion, must defend, adjust, or settle such suits and protect, indemnify, and save harmless Railway from and against all damages, judgments, decrees, attorney's fees, costs, and expenses growing out of or resulting from or incident to any such claims or suits.

In addition to any other provision of this Agreement, in the event that all or any portion of this Article shall be deemed to be inapplicable for any reason, including without limitation as a result of a decision of an applicable court, legislative enactment or regulatory order, the parties agree that this Article shall be interpreted as requiring Contractor to indemnify Railway to the fullest extent permitted by applicable law. **THROUGH THIS AGREEMENT THE PARTIES EXPRESSLY INTEND FOR CONTRACTOR TO INDEMNIFY RAILWAY FOR RAILWAY'S ACTS OF NEGLIGENCE.**

It is mutually understood and agreed that the assumption of liabilities and indemnification provided for in this Agreement survive any termination of this Agreement.

## **2) TERM**

This Agreement is effective from the date of the Agreement until (i) the completion of the project set forth herein, and (ii) full and complete payment to Railway of any and all sums or other amounts owing and due hereunder.

### 3) INSURANCE

Contractor shall, at its sole cost and expense, procure and maintain during the life of this Agreement the following insurance coverage:

A. Commercial General Liability insurance. This insurance shall contain broad form contractual liability with a combined single limit of a minimum of \$2,000,000 each occurrence and an aggregate limit of at least \$4,000,000 but in no event less than the amount otherwise carried by the Contractor. Coverage must be purchased on a post 2004 ISO occurrence form or equivalent and include coverage for, but not limit to the following:

- ◆ Bodily Injury and Property Damage
- ◆ Personal Injury and Advertising Injury
- ◆ Fire legal liability
- ◆ Products and completed operations

This policy shall also contain the following endorsements, which shall be indicated on the certificate of insurance:

- ◆ The definition of insured contract shall be amended to remove any exclusion or other limitation for any work being done within 50 feet of railroad property.
- ◆ Waiver of subrogation in favor of and acceptable to Railway.
- ◆ Additional insured endorsement in favor of and acceptable to Railway.
- ◆ Separation of insureds.
- ◆ The policy shall be primary and non-contributing with respect to any insurance carried by Railway.

It is agreed that the workers' compensation and employers' liability related exclusions in the Commercial General Liability insurance policy(s) required herein are intended to apply to employees of the policy holder and shall not apply to **Railway** employees.

No other endorsements limiting coverage as respects obligations under this Agreement may be included on the policy with regard to the work being performed under this agreement.

B. Business Automobile Insurance. This insurance shall contain a combined single limit of at least \$1,000,000 per occurrence, and include coverage for, but not limited to the following:

- ◆ Bodily injury and property damage
- ◆ Any and all vehicles owned, used or hired

The policy shall also contain the following endorsements or language, which shall be indicated on the certificate of insurance:

- ◆ Waiver of subrogation in favor of and acceptable to Railway.
- ◆ Additional insured endorsement in favor of and acceptable to Railway.
- ◆ Separation of insureds.
- ◆ The policy shall be primary and non-contributing with respect to any insurance carried by Railway.

C. Workers Compensation and Employers Liability insurance including coverage for, but not limited to:

- ◆ Contractor's statutory liability under the worker's compensation laws of the state(s) in which the work is to be performed. If optional under State law, the insurance must cover all employees anyway.
- ◆ Employers' Liability (Part B) with limits of at least \$500,000 each accident, \$500,000 by disease policy limit, \$500,000 by disease each employee.

This policy shall also contain the following endorsements or language, which shall be indicated on the certificate of insurance:

- ◆ Waiver of subrogation in favor of and acceptable to Railway.

D. Railroad Protective Liability insurance naming only the **Railway** as the Insured with coverage of at least \$2,000,000 per occurrence and \$6,000,000 in the aggregate. The policy Must be issued on a standard ISO form CG 00 35 12 04 and include the following:

- ◆ Endorsed to include the Pollution Exclusion Amendment
- ◆ Endorsed to include the Limited Seepage and Pollution Endorsement.
- ◆ Endorsed to remove any exclusion for punitive damages.
- ◆ No other endorsements restricting coverage may be added.
- ◆ The original policy must be provided to the **Railway** prior to performing any work or services under this Agreement
- ◆ Definition of "Physical Damage to Property" shall be endorsed to read: "means direct and accidental loss of or damage to all property owned by any named insured and all property in any named insured' care, custody, and control arising out of the acts or omissions of the contractor named on the Declarations.

In lieu of providing a Railroad Protective Liability Policy, Licensee may participate (if available) in Railway's Blanket Railroad Protective Liability Insurance Policy.



**Other Requirements:**

Where allowable by law, all policies (applying to coverage listed above) shall contain no exclusion for punitive damages.

Contractor agrees to waive its right of recovery against **Railway** for all claims and suits against **Railway**. In addition, its insurers, through the terms of the policy or policy endorsement, waive their right of subrogation against **Railway** for all claims and suits. Contractor further waives its right of recovery, and its insurers also waive their right of subrogation against **Railway** for loss of its owned or leased property or property under Contractor's care, custody or control.

Allocated Loss Expense shall be in addition to all policy limits for coverages referenced above.

Contractor is not allowed to self-insure without the prior written consent of **Railway**. If granted by **Railway**, any self-insured retention or other financial responsibility for claims shall be covered directly by Contractor in lieu of insurance. Any and all **Railway** liabilities that would otherwise, in accordance with the provisions of this Agreement, be covered by Contractor's insurance will be covered as if Contractor elected not to include a deductible, self-insured retention or other financial responsibility for claims.

Prior to commencing services, Contractor shall furnish to **Railway** an acceptable certificate(s) of insurance from an authorized representative evidencing the required coverage(s), endorsements, and amendments. The certificate should be faxed or emailed to the following:

BNSF Railway Company  
c/o CertFocus  
Toll Free: 877-576-2378  
Fax number: 817-840-7487  
Email: [BNSF@certfocus.com](mailto:BNSF@certfocus.com)

Contractor shall notify **Railway** in writing at least 30 days prior to any cancellation, non-renewal, substitution or material alteration.

Any insurance policy shall be written by a reputable insurance company acceptable to **Railway** or with a current Best's Guide Rating of A- and Class VII or better, and authorized to do business in the state(s) in which the service is to be provided.

If coverage is purchased on a "claims made" basis, Contractor hereby agrees to maintain coverage in force for a minimum of three years after expiration, cancellation or termination of this Agreement. Annually Contractor agrees to provide evidence of such coverage as required hereunder.

Contractor represents that this Agreement has been thoroughly reviewed by Contractor's insurance agent(s)/broker(s), who have been instructed by Contractor to procure the insurance coverage required by this Agreement.

Not more frequently than once every five years, **Railway** may reasonably modify the required insurance coverage to reflect then-current risk management practices in the railroad industry and underwriting practices in the insurance industry.

If any portion of the operation is to be subcontracted by Contractor, Contractor shall require that the subcontractor shall provide and maintain insurance coverage(s) as set forth herein, naming **Railway** as an additional insured, and shall require that the subcontractor shall release, defend and indemnify **Railway** to the same extent and under the same terms and conditions as Contractor is required to release, defend and indemnify **Railway** herein.

Failure to provide evidence as required by this section shall entitle, but not require, **Railway** to terminate this Agreement immediately. Acceptance of a certificate that does not comply with this section shall not operate as a waiver of Contractor's obligations hereunder.

The fact that insurance (including, without limitation, self-insurance) is obtained by Contractor shall not be deemed to release or diminish the liability of Contractor including, without limitation, liability under the indemnity provisions of this Agreement. Damages recoverable by **Railway** shall not be limited by the amount of the required insurance coverage.

In the event of a claim or lawsuit involving **Railway** arising out of this agreement, Contractor will make available any required policy covering such claim or lawsuit.

These insurance provisions are intended to be a separate and distinct obligation on the part of the Contractor. Therefore, these provisions shall be enforceable and Contractor shall be bound thereby regardless of whether or not indemnity provisions are determined to be enforceable in the jurisdiction in which the work covered hereunder is performed.

For purposes of this section, **Railway** shall mean "Burlington Northern Santa Fe LLC", "BNSF Railway Company" and the subsidiaries, successors, assigns and affiliates of each.

#### **4) SALES AND OTHER TAXES**

In the event applicable sales taxes of a state or political subdivision of a state of the United States are levied or assessed in connection with and directly related to any amounts invoiced by Contractor to Railway ("Sales Taxes"), Railway shall be responsible for paying only the Sales

Taxes that Contractor separately states on the invoice or other billing documents provided to Railway; *provided, however,* that (i) nothing herein shall preclude Railway from claiming whatever Sales Tax exemptions are applicable to amounts Contractor bills Railway, (ii) Contractor shall be responsible for all sales, use, excise, consumption, services and other taxes which may accrue on all services, materials, equipment, supplies or fixtures that Contractor and its subcontractors use or consume in the performance of this Agreement, (iii) Contractor shall be responsible for Sales Taxes (together with any penalties, fines or interest thereon) that Contractor fails to separately state on the invoice or other billing documents provided to Railway or fails to collect at the time of payment by Railway of invoiced amounts (except where Railway claims a Sales Tax exemption), and (iv) Contractor shall be responsible for Sales Taxes (together with any penalties, fines or interest thereon) if Contractor fails to issue separate invoices for each state in which Contractor delivers goods, provides services or, if applicable, transfers intangible rights to Railway.

Upon request, Contractor shall provide Railway satisfactory evidence that all taxes (together with any penalties, fines or interest thereon) that Contractor is responsible to pay under this Agreement have been paid. If a written claim is made against Contractor for Sales Taxes with respect to which Railway may be liable for under this Agreement, Contractor shall promptly notify Railway of such claim and provide Railway copies of all correspondence received from the taxing authority. Railway shall have the right to contest, protest, or claim a refund, in Railway's own name, any Sales Taxes paid by Railway to Contractor or for which Railway might otherwise be responsible for under this Agreement; *provided, however,* that if Railway is not permitted by law to contest any such Sales Tax in its own name, Contractor shall, if requested by Railway at Railway's sole cost and expense, contest in Contractor's own name the validity, applicability or amount of such Sales Tax and allow Railway to control and conduct such contest.

Railway retains the right to withhold from payments made under this Agreement amounts required to be withheld under tax laws of any jurisdiction. If Contractor is claiming a withholding exemption or a reduction in the withholding rate of any jurisdiction on any payments under this Agreement, before any payments are made (and in each succeeding period or year as required by law), Contractor agrees to furnish to Railway a properly completed exemption form prescribed by such jurisdiction. Contractor shall be responsible for any taxes, interest or penalties assessed against Railway with respect to withholding taxes that Railway does not withhold from payments to Contractor.

## **5) EXHIBIT "C" CONTRACTOR REQUIREMENTS**

The Contractor must observe and comply with all provisions, obligations, requirements and limitations contained in the Agreement, and the Contractor Requirements set forth on Exhibit "C" attached to the Agreement and this Agreement, including, but not be limited to, payment of all costs incurred for any damages to Railway roadbed, tracks, and/or appurtenances thereto, resulting from use, occupancy, or presence of its employees, representatives, or agents or

subcontractors on or about the construction site. Contractor shall execute a Temporary Construction Crossing Agreement or Private Crossing Agreement (<http://www.bnsf.com/communities/faqs/permits-real-estate/>), for any temporary crossing requested to aid in the construction of this Project, if approved by BNSF.

## 6) TRAIN DELAY

Contractor is responsible for and hereby indemnifies and holds harmless Railway (including its affiliated railway companies, and its tenants) for, from and against all damages arising from any unscheduled delay to a freight or passenger train which affects Railway's ability to fully utilize its equipment and to meet customer service and contract obligations. Contractor will be billed, as further provided below, for the economic losses arising from loss of use of equipment, contractual loss of incentive pay and bonuses and contractual penalties resulting from train delays, whether caused by Contractor, or subcontractors, or by the Railway performing work under this Agreement. Railway agrees that it will not perform any act to unnecessarily cause train delay.

For loss of use of equipment, Contractor will be billed the current freight train hour rate per train as determined from Railway's records. Any disruption to train traffic may cause delays to multiple trains at the same time for the same period.

Additionally, the parties acknowledge that passenger, U.S. mail trains and certain other grain, intermodal, coal and freight trains operate under incentive/penalty contracts between Railway and its customer(s). Under these arrangements, if Railway does not meet its contract service commitments, Railway may suffer loss of performance or incentive pay and/or be subject to penalty payments. Contractor is responsible for any train performance and incentive penalties or other contractual economic losses actually incurred by Railway which are attributable to a train delay caused by Contractor or its subcontractors.

The contractual relationship between Railway and its customers is proprietary and confidential. In the event of a train delay covered by this Agreement, Railway will share information relevant to any train delay to the extent consistent with Railway confidentiality obligations. The rate then in effect at the time of performance by the Contractor hereunder will be used to calculate the actual costs of train delay pursuant to this agreement.

Contractor and its subcontractors must give Railway's representative Roadmaster John Reid at mobile # 254-447-1587 or [John.Reid@bnsf.com](mailto:John.Reid@bnsf.com) four (4) weeks advance notice of the times and dates for proposed work windows. Railway and Contractor will establish mutually agreeable work windows for the project. Railway has the right at any time to revise or change the work windows due to train operations or service obligations. Railway will not be responsible for any additional costs or expenses resulting from a change in work windows. Additional costs or



expenses resulting from a change in work windows shall be accounted for in Contractor's expenses for the project.

Contractor and subcontractors must plan, schedule, coordinate and conduct all Contractor's work so as to not cause any delays to any trains.



IN WITNESS WHEREOF, each of the parties hereto has caused this Agreement to be executed by its duly authorized officer the day and year first above written.

---

**Contractor**

By: \_\_\_\_\_

Printed Name: \_\_\_\_\_

Title: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_

State: \_\_\_\_\_ Zip: \_\_\_\_\_

Office #: \_\_\_\_\_

Fax #: \_\_\_\_\_

On-site Project  
Contact Person: \_\_\_\_\_

E-mail: \_\_\_\_\_

Phone #: \_\_\_\_\_



**BNSF Railway Company**

By: \_\_\_\_\_

Name: \_\_\_\_\_  
Manager Public Projects

Accepted and effective this \_\_\_\_\_ day

of \_\_\_\_\_, 20\_\_.



EXHIBIT E  
PREEMPTION TIMING INFORMATION for  
Benton Road - DOT No. 022677B

Version 06/2020

**HIGHWAY-RAIL GRADE CROSSING  
TRAFFIC SIGNAL PREEMPTION REQUEST FORM**

The Road Authority traffic controller circuitry requires railroad preemption contacts to initiate the preemption sequence. Per BNSF standard, we will provide normally closed “dry” preemption relay contacts to interconnect the railroad active warning system to the Road Authority traffic signal controller assembly. These contacts are rated at 4 amps, and the source voltage from the traffic signal controller should not exceed 30 volts DC or AC. With no trains in the area, these contacts remain closed. The Road Authority Traffic Department will be responsible for installing the interconnection cable between the traffic signal controller and the crossing warning signal control housing. If exit gates are utilized with presence detection loops as the vehicle detection method, the Road Authority Traffic Department will be responsible for installing and maintaining the “in pavement” vehicle detection loops from the street to the cable junction box.

To estimate and or design the crossing warning system, BNSF needs to know certain timing parameters.

**Definitions:**

**“Advance Preemption”** – The system will be designed to open the preemption contacts for a predetermined amount of time (Advance Preemption Time) prior to activation of the warning devices (flashing lights).

**“Advance Pedestrian Preemption”** – The system will be designed to open the pedestrian preemption contacts for a predetermined amount of time (Advance Pedestrian Preemption Time) prior to opening of preemption contacts (advance preemption), where advance preemption is used.

**“Simultaneous Preemption”** – The system will be designed to open the preemption contact at the same time the warning devices (flashing lights) are activated. Additional warning time may be requested.

**“Gate Down Logic”** – Per BNSF standard, we will provide normally open “dry” gate down relay contacts to interconnect the crossing warning system to the Road Authority traffic signal controller assembly. These contacts are rated at 4 amps, and the source voltage from the traffic signal controller should not exceed 30 volts DC or AC. The system will be designed to close the gate down contacts upon the gates arrival in the down position. This logic is normally utilized to hold track clearance green until the gates are down since the time from preemption to gate down will vary depending upon the traffic signal cycle. In the event the gate does not descend; BNSF provides a parallel island circuit that provides input to terminate track clearance green once track occupies the crossing (island). This circuit will reduce parallel street delays by allowing the traffic signal to exit the track clearance phase after railroad gate is horizontal and providing a green indication for parallel street.

**“Minimum Warning Time”** – Per the MUTCD and FRA regulations, BNSF must provide at least 20 seconds of warning time for through trains (typically main track applications). However, per BNSF standards for constant warning time train detection equipment, the system will be designed to provide a “nominal” warning time of 30 seconds to ensure MUTCD/FRA minimums are met and to compensate for accelerating trains and ballast conditions.

**“Minimum Track Clearance Distance”** – For standard two-quadrant railroad warning devices, the minimum track clearance distance is the length along a highway at one or more railroad tracks, measured either from the railroad stop line, warning device or 12 ft. perpendicular to the far rail, along the centerline or edge line of the highway, as appropriate, to obtain the longer distance. For locations with exit gate warning devices, the minimum track clearance distance is the length along a highway at one or more railroad tracks, measured either from the railroad stop line or entrance warning device to the point clear of the exit gate. Note that in cases where the exit gate arm is parallel to the track(s) and/or not perpendicular to the roadway, clearance will be either along the centerline or edge line of the highway, as appropriate, to obtain the longer distance.

When (entrance) gates are used they are typically designed to start their decent within 3 to 5 seconds of the warning lights flashing, descend in an additional 10 to 15 seconds, and reach horizontal at least 5 seconds prior to train arrival per FRA regulations.

The length of the railroad’s control circuit approach distance is directly related to the amount of requested “Advanced Preemption Time” (APT). Typically, the longer the APT requirement is, the longer the approach distance, and thus the more control equipment that will be required.

**Please provide the following information in order to process your request:**

Date of Request:  
Requesting Agency: TXDOT

Requested by: Maurice Johnson, PE  
Title: Transportation Engineer

E-mail: maurice.johnson@txdot.gov  
Phone: 713-802-5739

**Grade Crossing Information:**

State: TX  
City: Richmond  
County: Fort Bend  
Crossing Street Name: Benton Road  
Parallel Street Name: Farm-to-Market 762

DOT #: 022677B  
District: Houston  
RR Subdivision: Galveston  
Mile Post: 59.46

**Signalized Intersection Information:**

1) Provide interconnection configuration:  Single break circuit  Double break circuit

2) Is a Supervised circuit being requested?  Yes  No

3) Is this request for Simultaneous Preemption Operation?  Yes  No

If "Yes", what is your requested Additional Warning Time? (if needed)  Seconds

4) Is this request for Advance Preemption Operation?  Yes  No

If "Yes", what is your requested Vehicle Advance Preemption Time (APT)?  Seconds

If "Yes", is a Gate Down circuit being requested?  Yes  No

\* The purpose of the gate-down circuit is to comply with the Institute of Traffic Engineers (ITE) recommended practice to ensure that the Track Clearance Green interval remains on until gates are fully lowered to prevent a "preempt trap". Railroad will provide relay contacts for the gate down circuit.

5) Is this request for additional time for Advance Pedestrian Preemption Operation?  Yes  No

If "Yes", what is your requested additional time for Advance Pedestrian Preemption Time (APPT)?  Seconds

\* Note: The time listed above is the requested time **above** the requested APT time (where APT is requested).

\* Note: Double-break with supervision is not an option when using Advance Pedestrian Preemption Operation.

\* Note: Pedestrian Detection is required when using Advance Pedestrian Preemption Operation.

6) Is a Crossing Active (XC) circuit required to activate blank-out signs or another traffic control device?  Yes  No

7) Is a Traffic Signal Health circuit being requested?  Yes  No

\* Note: A Traffic Signal Health circuit is required when requesting new Advance Preemption Operation.

\* Note: A Traffic Signal Health circuit is not required when requesting changes to existing advanced preemption Operation.

**Comments / Additional Info:**

\*\* The BNSF signal design department approved the deviation from the AREMA System Design Time (AREMA Part 3.10 (C)(1)) to remain at the existing time at the grade crossing.

The above information has been completed by the undersigned representative of the public agency responsible for the traffic signal. The public agency agrees to have all work related to the preemption of the traffic signal complete and operational prior to the activation of the railroad signal system. The public agency further agrees to not change any traffic signal design or timing parameters which may affect the preemption operation without coordinating said change with Railroad.



Signature of public agency representative

Maurice Johnson, P.E

Print or type name of public agency representative

7/30/20

Date

Please sign, scan this page, and submit electronically along with support documentation to appropriate Manager of Industry and Public Projects.

**RESET**



**Texas Department of Transportation**  
**GUIDE FOR DETERMINING TIME REQUIREMENTS FOR**  
**TRAFFIC SIGNAL PREEMPTION AT HIGHWAY-RAIL GRADE CROSSINGS**

Form 2304  
(Rev. 7/17)

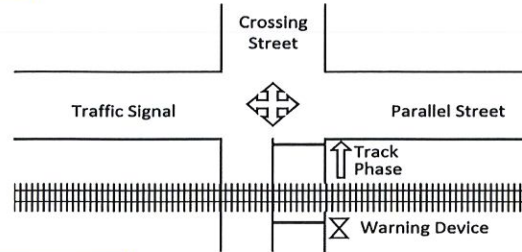
City   
 County   
 District

CSJ

Date

Completed by

District Approval



Parallel Street Name

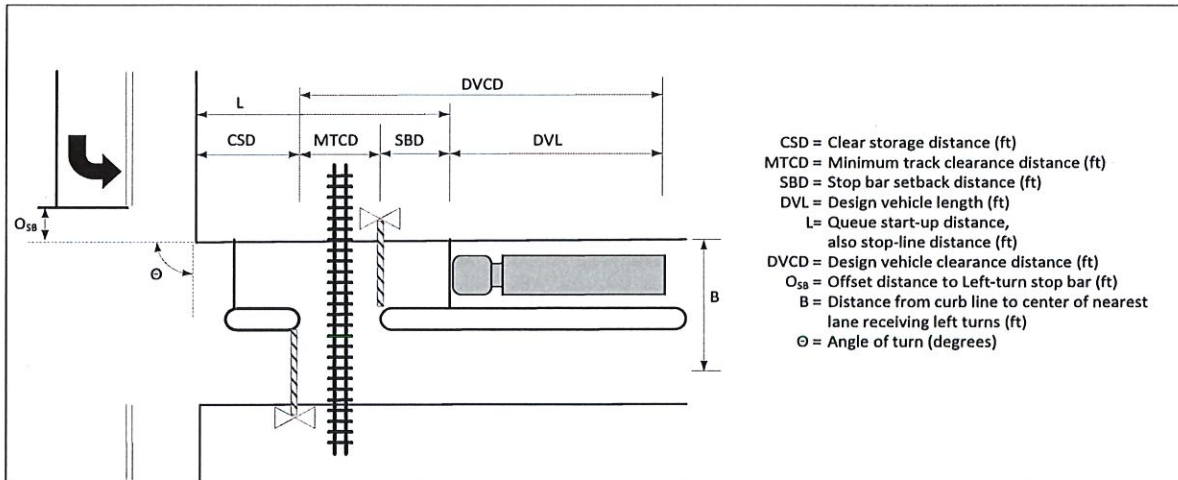
Crossing Street Name

Railroad   
 Crossing DOT#

Railroad Contact   
 Phone

**NOTE: After approval by the District, a copy of this form, along with the traffic signal design sheets and the phasing diagrams for normal and preempted operation, shall be placed in the traffic signal cabinet. See Section 7 for traffic signal timings.**

**SECTION 1: GEOMETRY DATA & DEFAULTS**



**GEOMETRIC DATA FOR CROSSING**

1. Clear storage distance (CSD, feet) .....	1.	<input type="text" value="53"/>
2. Minimum track clearance distance (MTCD, feet) .....	2.	<input type="text" value="33"/>
3. Stop bar setback distance (SBD, feet) .....	3.	<input type="text" value="16"/>
4. Width of receiving approach (B, feet).....	4.	<input type="text" value="71"/>
5. Offset distance of left turn stop bar (O <sub>sb</sub> , feet).....	5.	<input type="text" value="41"/>
6. Approach grade. % ( 0 if approach is on downgrade) .....	6.	<input type="text" value="3.0"/>
7. Angle of turn at Intersection (Θ, degrees).....	7.	<input type="text" value="105"/>

**Remarks**

Enter "0" if no stop bar is present

**DESIGN VEHICLE DATA**

8. Select Design Vehicle

School Bus       Intermediate Truck       Interstate Semi-Truck       Other

9. Default design vehicle length (feet) .....	9.	<input type="text" value="75"/>	Based on selected Design Vehicle
a. Additional vehicle length, if needed (feet) .....	9a.	<input type="text" value="0"/>	Use only if "Other" selected as Design Vehicle
10. Total design vehicle length (DVL, feet) .....	10.	<input type="text" value="75"/>	Sum of line 9 and 9a
11. Centerline turning radius of design vehicle (R, feet).....	11.	<input type="text" value="41"/>	Based on selected Design Vehicle
12. Passenger car vehicle length (LV, feet).....	12.	<input type="text" value="19"/>	Default value

**SECTION 2: RIGHT-OF-WAY TRANSFER TIME CALCULATION**

**Preempt verification and response time**

- 13. Preempt delay time (seconds) ..... 13. 

1
---
- 14. Controller response time to preempt (seconds) ..... 14. 

0.0
-----
- 15. Preempt verification and response time (seconds): add lines 13 and 14 ..... 15. 

1.0
-----

**Remarks**

Manufacturer: \_\_\_\_\_  
Firmware Version: \_\_\_\_\_

**Worst-case conflicting vehicle time**

- 16. Minimum green time during right-of-way transfer (seconds) ..... 16. 

5
---
- 17. Other green time during right-of-way transfer (seconds) ..... 17. 

0
---
- 18. Yellow change time (seconds) ..... 18. 

4.5
-----
- 19. Red clearance time (seconds) ..... 19. 

1.5
-----
- 20. Worst-case conflicting vehicle time (seconds): add lines 16 through 19 ..... 20. 

11.0
------

**Remarks**

Value may be adjusted to meet local conditions  
\_\_\_\_\_  
\_\_\_\_\_

**Worst-case conflicting pedestrian time**

- 21. Minimum walk time during right-of-way transfer (seconds) ..... 21. 

0
---
- 22. Pedestrian clearance time during right-of-way transfer (seconds) ..... 22. 

0
---
- 23. Vehicle yellow change time, if not included on line 22 (seconds) ..... 23. 

0.0
-----
- 24. Vehicle red clearance time, if not included on line 22 (seconds) ..... 24. 

0.0
-----
- 25. Worst-case conflicting pedestrian time (seconds): add lines 21 through 24 ..... 25. 

0.0
-----

**Remarks**

Value may be adjusted to meet local conditions  
\_\_\_\_\_  
Refer to instructions for pedestrian truncation guidance  
Full truncation of pedestrian clearance  
\_\_\_\_\_

**Worst-case conflicting vehicle or conflicting pedestrian time**

- 26. Worst-case conflicting vehicle or conflicting pedestrian time (seconds): maximum of lines 20 and 25 ..... 26. 

11.0
------
- 27. Right-of-way transfer time (seconds): add lines 15 and 26 ..... 27. 

12.0
------

**SECTION 3: QUEUE CLEARANCE TIME CALCULATION**

- 28. Are there left-turns towards the tracks?  Yes  No
- 29. Distance traveled by truck during left-turn (LTL, feet): ..... 29. 

0
---
- 30. Travel speed of left-turning truck (S<sub>LTT</sub>, mph): ..... 30. 

10
----
- 31. Distance required to clear left-turning truck from travel lanes on track clearance approach (feet): ..... 31. 

0
---
- 32. Additional time required to clear left-turning truck from travel lanes on track clearance approach (seconds): ..... 32. 

0.0
-----
- 33. Worst-case Left Turning Truck time (seconds): if Line 28 = 'Yes', use line 32; otherwise Use 0 ..... 33. 

0.0
-----
- 34. Queue start-up distance, L (feet): add lines 1 through 3 ..... 34. 

102
-----
- 35. Time required for design vehicle to start moving (seconds): calculate as 2+(L÷20) ..... 35. 

7.1
-----
- 36. Design vehicle clearance distance, DVCD (feet): add lines 2, 3 and 10..... 36. 

124
-----
- 37. Time for design vehicle to accelerate through the DVCD (seconds), level terrain ..... 37. 

14.9
------
- 38. Factor to account for slower acceleration on uphill grade ..... 38. 

1.22
------
- 39. Time for design vehicle to accelerate through DVCD (seconds), adjusted for grade: multiply lines 37 and 38 ..... 39. 

18.2
------
- 40. Queue clearance time (seconds): add lines 33, 35 and 39 ..... 40. 

25.3
------

**Remarks**

LTL =  $\lceil \lceil R0 / 180 \rceil \rceil$   
Default value  
Equation: (line 4 + line 5 + line 12 - line 11 ) + line 29 + line 10  
Equation:  $[(\text{line } 31 * 3600) / (\text{line } 30 * 5280) - \text{line } 18 - \text{line } 19]$

**SECTION 4: MAXIMUM PREEMPTION TIME CALCULATION**

- 41. Right-of-way transfer time (seconds): line 27 ..... 41. 

12.0
------
- 42. Queue clearance time (seconds): line 40 ..... 42. 

25.3
------
- 43. Desired minimum separation time (seconds) ..... 43. 

5.0
-----
- 44. Maximum preemption time for Queue Clearance (seconds): add lines 41 through 43 ..... 44. 

42.3
------

**Remarks**

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**SECTION 5: SUFFICIENT WARNING TIME CHECK**

		Remarks
45. Required minimum time, MT (seconds): per regulations .....	45. 20	
46. Clearance time, CT (seconds): (line 2 -35) / 10 (rounded up to nearest second).....	46. 0	
47. Total minimum warning time, MWT, needed (seconds): add lines 45 and 46 (excludes buffer time and equipment response time).....	47. 20	
48. Required advance preemption time (APT) from railroad (seconds): subtract line 47 from line 44, round up to nearest full second, enter 0 if less than 0 .....	48. 23	
49. APT currently provided by railroad (seconds): Enter "0" if new crossing or signal .....	49. 23	

**If the required advance preemption time (line 48) is greater than the amount of advance preemption time currently provided by the railroad (line 49), additional warning time must be requested from the railroad. Alternatively, the maximum preemption time (line 48) may be decreased after performing an engineering study to investigate the possibility of reducing the values on lines 13, 16, 17, 21, 22 and 43.**

Remarks:

**SECTION 6: TRACK CLEARANCE GREEN TIME CALCULATION (IF NO GATE DOWN CIRCUIT PROVIDED)**

**Preempt Trap Check**

		Remarks
50. Warning Time Variability (Select One) <input type="checkbox"/> Consistent Warning Times <input checked="" type="checkbox"/> Low Warning Time Variability <input type="checkbox"/> High Warning Time Variability		
51. APT required or provided (seconds): maximum of Line 48 or Line 49.....	51. 23	See Instructions for details.
52. Multiplier for maximum APT due to train handling .....	52. 1.25	
53. Maximum APT (seconds): multiply line 51 and 52 .....	53. 28.8	
54. Minimum duration for the track clearance green interval (seconds) .....	54. 15	
55. Track Clearance Green Time to avoid Preempt Trap (seconds): add lines 53 and 54 .....	55. 43.8	

**Clearing of Clear Storage Distance**

56. Time waiting on left-turn truck (seconds): line 33 .....	56. 0.0
57. Time required for design vehicle to start moving (seconds): line 35 .....	57. 7.1
58. Design vehicle clearance distance (DVCD, feet): line 36 .....	58. 124

*If CSD ≤ DVL, you must clear the design vehicle through the entire CSD during the traffic clearance phase; however, if CSD > DVL, you should consider providing enough time to clear the design vehicle from the crossing.*

Is the clear storage distance (CSD) less than or equal to the design vehicle length (DVL)?

- YES. The design vehicle MUST clear through the entire CSD. (CSD will be entered in Line 59).  
 NO. The design vehicle may clear through a portion of the CSD.

Do you want to clear the design vehicle through the entire CSD?

- YES. Clear the entire CSD. (CSD will be entered in Line 59).  
 NO. Clear the crossing ONLY. (DVL will be entered in Line 59).

59. Portion of CSD to clear during track clearance phase (feet)	59. 53
60. Design vehicle relocation distance (DVRD, feet): add lines 58 and 59 .....	60. 177
61. Time required to accelerate design vehicle through DVRD (seconds), level terrain: .....	61. 18.2
62. Factor to account for slower acceleration on uphill grade .....	62. 1.23
63. Time required to accelerate design vehicle through DVRD (seconds), adjusted for grade: multiply lines 61 and 62 .....	63. 22.3
64. Time to clear portion of clear storage distance (seconds): add lines 56, 57 and 63 .....	64. 29.4
65. Track clearance green interval (seconds): maximum of lines 55 or 64, round up to nearest full second .....	65. 44

**Maximum Duration of Track Clearance Green after gates are down (in absence of a gate down circuit)**

66. Total time to complete track clearance green (seconds): line 27 + line 65 .....	66. 56.0
67. Total time before gates are down (seconds): subtract 5 seconds from line 44 (per AREMA Manual) .....	67. 37.3
68. Maximum Duration of Track Clearance Green after gates are down (seconds): Line 66 - Line 67 .....	68. 19

**SECTION 7: SUMMARY OF CONTROLLER PREEMPTION SETTINGS**

69. Duration Time (seconds) .....	69.	0	Remarks
70. Preempt Delay Time (seconds) .....	70.	1	Default Value
			From Line 13

Right of Way Transfer Phase

71. Minimum Green Interval (seconds) .....	71.	5	Remarks
72. Pedestrian Walk Interval (seconds) .....	72.	0	From Line 16
73. Pedestrian Clearance Interval (Flashing "DON'T WALK", seconds) .....	73.	0	From Line 21
74. Yellow Change Interval (seconds) .....	74.	4.5	From Line 22
75. All Red Vehicle Clearance (seconds) .....	75.	1.5	From Line 18
			From Line 19

Track Clearance Phase

76. Green Interval (seconds) (in the absence of gate down circuit) .....	76.	44	Remarks
77. Green Interval (seconds) <u>with</u> gate down circuit .....	77.	25	From Line 65
78. Yellow Change Interval (seconds) .....	78.	4.5	From Line 40
79. All Red Vehicle Clearance (seconds) .....	79.	1.5	From Line 18
			From Line 19

Exit Phase

80. Dwell/Cycle Minimum Green Time (seconds) .....	80.	0	Remarks
81. Yellow Change Interval (seconds) .....	81.	4.5	Default Value
82. All Red Vehicle Clearance (seconds) .....	82.	1.5	From Line 18
			From Line 19

Remarks:

# Review of Interconnected Highway-Rail Grade Crossing

**DOT# 022677B**

Benton Road

Richmond, TX

BNSF Railway

MP 59.46, Galveston Subdivision, LS 7500

**Prepared by Alfred Benesch & Company for  
McDonough Engineering Corporation**

June 3, 2020



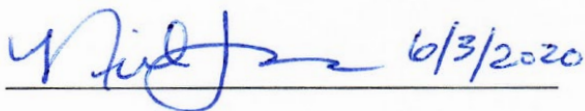
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Review of Interconnected  
Highway-Rail Grade Crossing

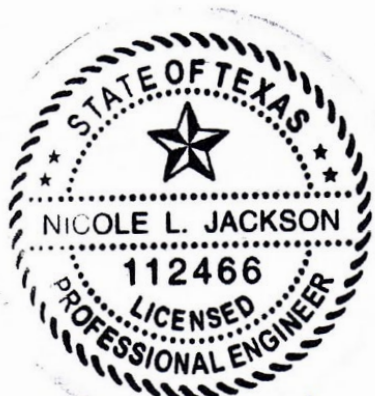
Benton Road  
Richmond, Texas  
BNSF Railway  
DOT# 022677B, MP 59.46  
Galveston Subdivision, LS 7500

Prepared by:

I hereby certify that this report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Texas. This report represents an electronic version of the original hard copy report, sealed, signed and dated by Nicole L. Jackson, PE, PTOE. The content of the electronically transmitted report can be confirmed by referring to the original hard copy that will be kept on file with Alfred Benesch & Company.



Nicole L. Jackson, PE, PTOE  
Texas License No. 112466



Alfred Benesch &  
Company F-9404

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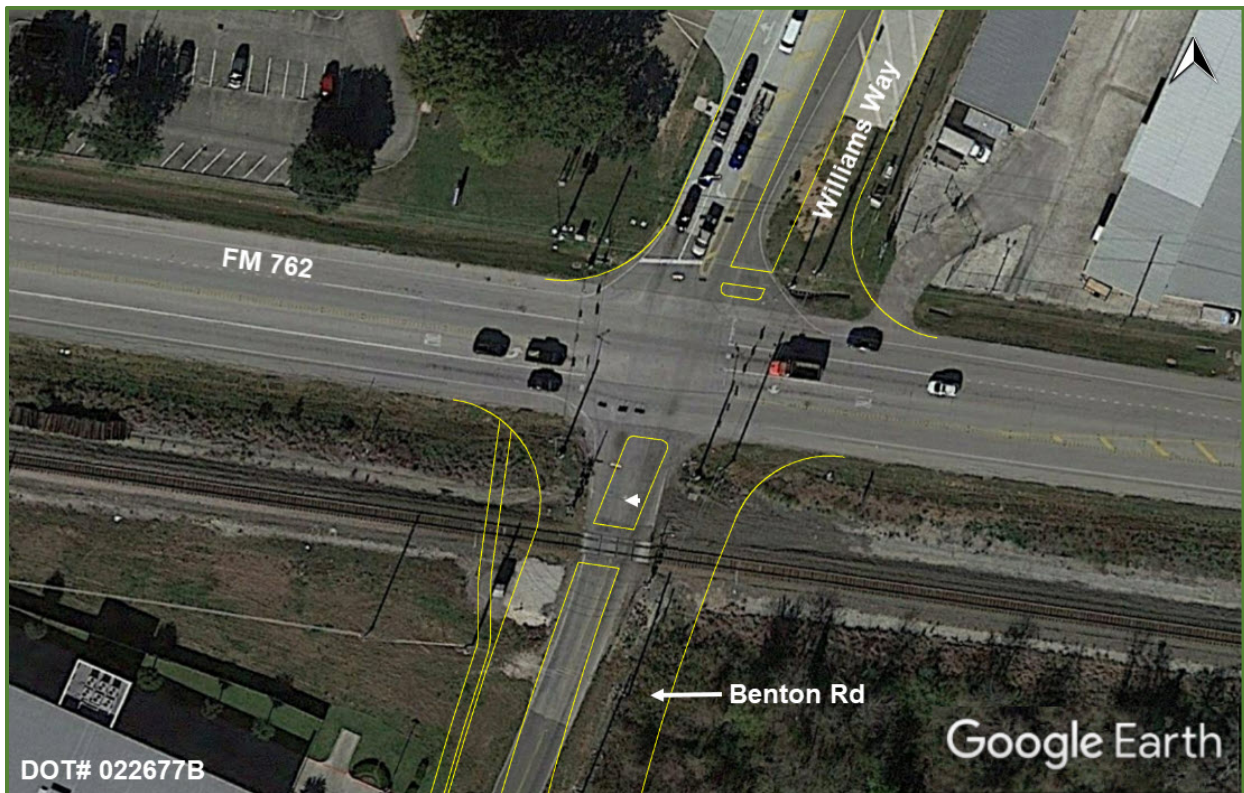
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# 1 INTRODUCTION

## 1.1 Project Information

Alfred Benesch & Company (Benesch) conducted a review of the highway-rail grade crossing (DOT# 022677B) on the BNSF Railway (Railroad), Galveston Subdivision, Line Segment 7500 located near the intersection of Benton Road / Williams Way Boulevard and Farm-to-Market 762 in Richmond, Texas. The review incorporates an analysis of the preemption calculations and additional design documents provided by Fort Bend County (Agency), McDonough Engineering Corporation (Agency Consultant) and the Railroad.

FIGURE 1 – PROPOSED ALIGNMENT - BENTON RD / WILLIAMS WAY BLVD @ FM 762, DOT# 022677B



The Agency requested advance preemption time<sup>1</sup> for this highway-rail grade crossing. This report expands on the proposed preemption time requirements and provides recommendations to improve the preemption operations in accordance with the referenced material, MUTCD and industry best practices.

---

<sup>1</sup> **Advance Preemption Time (APT)** – The period of time that is the difference between the required Maximum Highway Traffic Signal Preemption Time and the Prescribed Warning Time (AREMA Part 3.1.10, D. 2.).

Benesch and the Railroad recognize that the decision to incorporate any recommendations made within this report is determined by the authority with jurisdiction and the statutory authority (where applicable) in accordance with requirements set forth in MUTCD. The actions of the Railroad are limited.

## 1.2 References

The following documents were submitted by the Agency, Agency Consultant and Railroad to assist in the review:

- ❖ TXDOT Preemption Calculation Form dated May 15, 2020
- ❖ Email from BNSF Signal Design titled “Benesch Comments – BNSF Railway -TX, Richmond – Benton Rd – DOT# 022677B” - dated May 1, 2020
- ❖ Benton Road from FM 762 to 300 South of Reading Road – 95% Plan Set dated March 10, 2020

Appendix A contains additional documents, reference material and manuals on recommended practices which were utilized to further evaluate the interconnection design and operation of the highway-rail grade crossing.

## 2 PARTIES OF INTEREST

The main contact information for each entity during the preemption review process is outlined below:

TABLE 1 - CONTACT INFORMATION

<b>Agency:</b>	Ike Akinwande, PE, SE, MLSE	Fort Bend County 301 Jackson Street Richmond, TX 77469	281-633-7506 ike.akinwande@fortbendcountytexas.gov
<b>Agency Consultant:</b>	Connor McBride, PE Project Manager	McDonough Engineering Corporation 5625 Schumacher Lane Houston, TX 77057	732-606-2101 connorm@mectx.com
<b>TXDOT:</b>	Sam Walden Railroad Project Coordinator	TXDOT – Houston District 7600 Washington Avenue Houston, TX 77007	713-802-5632 sam.walden@txdot.gov
<b>Railroad:</b>	Tim Huya Manager Public Projects	BNSF Railway 5800 North Main Street Ft Worth, TX 76179	817-352-2902 tim.huya@bnsf.com

### 3 RAILROAD PREEMPTION DESIGN ELEMENTS

The Agency must take into account a number of design elements when providing preemption control<sup>2</sup> by interconnecting the railroad active warning system with the traffic signal equipment at a nearby highway-highway intersection. The grade crossing circuit design, roadway layout and traffic signal design all provide information on the existing and any proposed characteristics for the grade crossing and adjacent intersection. The following sections outline the railroad and traffic characteristics that were identified during the review.

**NOTE:** Benesch has not field verified the values presented on the preemption calculation form. However, an overview of the grade crossing through Google Earth and the plans provided was conducted to review the measurements and values.

#### 3.1 Railroad Characteristics

- ❖ The Railroad operates on one main line track through the grade crossing.
- ❖ Flashing-light signals with automatic gates are provided at the grade crossing.
- ❖ Overhead flashing-light signals are proposed for the northbound approach on Benton Road.
- ❖ Additional flashing-light signals are provided for Farm-to-Market 762 facing eastbound and westbound traffic.

#### 3.2 Traffic Characteristics

- ❖ The roadway consists of four lanes proposed over the tracks approaching the intersection with Farm-to-Market 762.
- ❖ The proposed traffic signal controller is not specified.
- ❖ The proposed traffic signal controller firmware is not specified.
- ❖ The clear storage distance<sup>3</sup> (CSD) is 53 feet.
- ❖ The minimum track clearance distance<sup>4</sup> (MTCD) is 33 feet.
- ❖ The design vehicle<sup>5</sup> is a 75-foot interstate semi-truck.
- ❖ The approach grade is indicated to be 3.0% in the preemption calculations.

---

<sup>2</sup> **Preemption Control** – A special sequence of signal phases and timing to expedite and/or provide additional clearance time for vehicles to clear the tracks prior to the arrival of rail traffic (MUTCD, Chapter 4D, Section 4D.03).

<sup>3</sup> **Clear Storage Distance** – The distance available for vehicle storage measured between 6 feet from the rail nearest the intersection to the intersection stop line or the normal stopping point on the highway (MUTCD, Chapter 1A, Section 1A.13).

<sup>4</sup> **Minimum Track Clearance Distance** – For standard two-quadrant warning devices, the minimum track clearance distance is the length along a highway at one or more railroad or light rail transit tracks, measured from the highway stop line, warning device, or 12 feet perpendicular to the track center line, to 6 feet beyond the furthest track(s) measured perpendicular to the far rail, along the center line or edge line of the highway, as appropriate, to obtain the longest distance (MUTCD, Chapter 1A, Section 1A.13).

<sup>5</sup> **Design Vehicle** – The longest vehicle permitted by statute of the road authority (State or other) on that roadway (AREMA, Part 3.3.10, D. 4.).

❖ The proposed right-of-way transfer time<sup>6</sup> (RWTT) for APT is as follows:

TABLE 2 - RIGHT OF WAY TRANSFER TIME

		Traffic Signal Preemption Timing Values
Preempt Delay Time <sup>7</sup>		1
Controller Response Time to Preempt <sup>8</sup>		0
	Minimum Green Time	5
	Other Green Time	0
	Yellow Change Time	4.5
	Red Clearance Time	+ 1.5
<i>Total Vehicle Interval Time</i>		<i>11</i>
	Minimum Walk Time	0
	Pedestrian Change (PC) Time	0
	Yellow Change Time	0
	Red Clearance Time	+ 0
<i>Total Pedestrian Interval Time</i>		<i>0</i>
Max: <i>Total Vehicle or Total Pedestrian Interval Time</i>		11
Additional RWTT		+ 0
Maximum RWTT		12.0

#### 4 REQUESTED RAILROAD PREEMPTION TIME

The Agency requests that the existing Railroad design of 23 seconds of APT remain in service (see Appendix C for more information on the preemption values). The Railroad signal design department has approved the deviation from the AREMA Programmed System Designed Time (AREMA Part 3.10(C)(1)) since the time is already existing at the crossing.

<sup>6</sup> **Right-of-Way Transfer Time** – The maximum amount of time needed for the worst-case condition, prior to the display of the track clearance green interval. This includes any railroad or light rail transit or highway traffic signal control equipment time to react to the preemption call, and any traffic control signal green, pedestrian walk and clearance, yellow change, and red clearance intervals for conflicting traffic (MUTCD, Chapter 1A, Section 1A.13).

<sup>7</sup> **Preempt Delay Time** – The amount of time, in seconds, that the traffic signal controller is programmed to wait from the initial receipt of a preempt call until the call is “verified” and considered a viable request for transfer into preemption mode. Preempt delay time should be a whole number value entered into the controller unit for purposes of preempt call validation, and may not be available on all manufacturer’s controllers (TXDOT, July 2017, *Form 2304 Instructions*).

<sup>8</sup> **Controller Response Time to Preempt** – The time that elapses while the controller unit electronically registers the preempt call. The controller manufacturer should be consulted to find the correct value (in seconds) for use (TXDOT, July 2017, *Form 2304 Instructions*).

## 5 RECOMMENDATIONS

The following recommendations have been proposed to improve the railroad preemption operations and overall safety of the grade crossing in accordance with any applicable federal, state or local regulations/guidelines and industry best or recommended practice. The MUTCD provides that the Agency has sole responsibility in determining the operational design and any time required for railroad preemption operations at an interconnected grade crossing. The Agency should carefully review each recommendation, as numerous solutions may exist for any problem identified.

### 2009 MUTCD Chapter 8C, Section 8C.09, Paragraph 6:

*“The highway agency or authority with jurisdiction and the regulatory agency with statutory authority, if applicable, should jointly determine the preemption operation and the timing of traffic control signals interconnected with highway-rail grade crossings adjacent to signalized highway intersections.”*

### 5.1 Design Recommendations

- ❖ **Review the traffic signal and railroad warning system to determine which interconnection circuits<sup>A</sup> and configuration should be included in the design and requested from the Railroad (ITE 2019).** Interconnection circuits have been developed alongside the technological advancements in the railroad and traffic industry. These circuits work to improve communication between the railroad warning system for the grade crossing and traffic signal controller present at an adjacent intersection. In addition to circuitry to initiate the preemption call in the traffic signal controller, these circuits have the capabilities of performing duties such as notifying the traffic signal controller of the start of the warning devices at the grade crossing or alerting the railroad warning system in the event the traffic signal experiences operational failure. The selection of interconnection circuits below is dependent on such factors, but are not limited to, the roadway geometry, traffic signal design, pedestrian volume, vehicle and pedestrian phasing during preemption, train counts, as well as other traffic and grade crossing design characteristics:
  - **Advance Preemption Circuit<sup>B</sup>**
  - **Supervised Circuit<sup>C</sup>**
  - **Crossing Active Circuit<sup>D</sup>**
  - **Gate Down Circuit<sup>E</sup>**
  - **Traffic Signal Health Circuit<sup>F</sup>**

When a train enters the approach of a grade crossing, it either de-energizes the appropriate interconnection circuits or sends notification through a safety-critical data communications protocol using one of the following connection designs to initiate the preemption operation:

- **Single Break**
- **Double Break<sup>G</sup>**

- **Data Communication (IEEE 1570)<sup>H</sup>**

Once the appropriate interconnection circuit is activated, the traffic signal controller preemption plan begins. Railroad preemption should be implemented by an interconnection system using fail-safe design principles (single break with supervision, double break with or without supervision, or a fail-safe data communications protocol).

**NOTE:** *Descriptions for each interconnection circuits and configuration along with some example interface methods<sup>I</sup> can be found in Appendix B.*

- ❖ **Ensure the interconnection cable is of adequate size and contains a sufficient number of conductors to accommodate the requested interconnection circuits and configuration (ITE 2019).** The Agency is responsible for providing and maintaining the interconnection cable, pull boxes and conduit needed for the requested preemption operations from the traffic signal equipment to the Railroad equipment house. All equipment must be installed prior to the Railroad construction phase. For safety purposes, it is recommended that the interconnection power provided by the Agency for the interconnection be limited to a maximum of 28 Vac or Vdc.
- ❖ **Determine an adequate preemption clearance interval minimum time<sup>J</sup> that allows sufficient opportunity for a design vehicle to clear the grade crossing (TRB 2017).** The preemption clearance interval is the programmed minimum time and phases in the preemption plan settings of the traffic signal controller that are displayed for highway users which may be stopped in the MTCD and CSD. While normally displayed as green indications and frequently referred to as track clearance green, the preemption clearance interval may be displayed as all-red indications or some combination of flashing and steady indications based on site specific needs. The amount of traffic clearance green time for this grade crossing is dependent on the interconnect circuits chosen for the grade crossing:
  - **A gate down circuit is not proposed according to the documents provided.** If the Agency does not request a gate down circuit from the Railroad, they must consider an alternative method (timing correction) to prevent the APT from exceeding the requested amount of time due to train speed variability (AREMA Part 3.1.10). The Agency should request a not-to-exceed advance preemption timer from the Railroad be installed in the grade crossing warning system.

If the not-to-exceed advance preemption timer is requested, the track clearance green should be programmed a minimum of 43 seconds. If the Agency opts for the gate down circuit request, the track clearance green should be programmed a minimum of 26 seconds which is the queue clearance time<sup>9</sup> determined by the preemption calculations.

---

<sup>9</sup> **Queue Clearance Time** – The time required for the design vehicle of maximum length stopped just inside the MTCD to start up and move through and clear the entire MTCD. If pre-signals are present, this time shall be long enough to allow the vehicle to move through the intersection, or to clear the tracks if there is sufficient CSD. If a four-quadrant gate system is

Due to the length of the CSD, the Agency should consider extending the track clearance green by a minimum of 3 seconds after receipt of the gate down indication from the grade crossing warning system.

- ❖ **Implement a maximum preemption timer<sup>k</sup> (ITE 2019).** If, for any reason, the traffic signal controller preemption remains active for an extended period of time, this timer allows the controller to exit the preemption plan and enter an all-red flash mode.
- ❖ **Review the traffic signal design and ensure emergency, malfunction, conflict and maintenance flash modes are configured to provide all-red flash operations (NTSB 2003).** These flash modes should be configured to an all-red flash operation to allow an opportunity for drivers to clear the CSD and MTCD when the traffic signal is not displaying a green indication and the space between the grade crossing and the downstream intersection is limited. A yellow-red flash operation may cause vehicles to queue over the grade crossing with no opportunity to clear the tracks since the parallel street has priority and they may not get a gap to proceed.
- ❖ **Consider providing vehicle phases that do not conflict with the grade crossing during the preemption dwell operation (limited service) (NTSB 2003).** By implementing a limited service operation, the traffic signal controller can be programmed to include only movements that do not conflict with the grade crossing.
- ❖ **Review proposed preemption dwell operation and consider prohibiting the right turn movement toward the grade crossing (MUTCD 2009, Second Edition).** Allowing the right turn movement toward the grade crossing during railroad preemption can have some potential negative impacts on the preemption operation, such as, drivers turning inside lowered automatic gates, vehicles queued into the intersection blocking a clearance movement, or drivers running into a lowered automatic gate. Turning movements toward the grade crossing should be prohibited during the railroad preemption plan in accordance with the MUTCD.

Some of the methods available to prohibit these turning movements include:

- Blank-out signs or changeable message signs (CMS) displaying the word or symbol prohibiting the turn
- A separate turn signal face providing a protected only mode for the movement conflicting with the grade crossing

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present, this time shall be long enough to permit the exit gate arm to lower after the design vehicle is clear of the MTCD (MUTCD, Chapter 1A, Section 1A. 13).

- ❖ **Ensure scheduled flashing operation<sup>10</sup> is not programmed in the traffic signal controller (NTSB 2003).** Under scheduled flashing operations, the traffic signal controller is not capable of providing a steady green signal indication for the track clearance movement. With a train on the approach, the vehicles would only be allowed to stop and proceed with caution under the scheduled flashing operation, potentially resulting in vehicles stopped on the tracks upon a train's arrival at the grade crossing. Since the signalized intersection is in close proximity to the adjacent grade crossing and the CSD is significantly less than a design vehicle length, the probability of this occurrence increases.
- ❖ **Consider installation of vehicle detection on the upstream side of the grade crossing (TRB 2015).** Most commercial vehicles and school buses are required to stop prior to all grade crossings before proceeding. By providing vehicle detection upstream of the grade crossing, the traffic signal controller can be notified to provide service to these mandatory stop vehicles in the event they cannot pull up to the intersection detection zone without fouling the tracks.
- ❖ **Consider relocating the proposed through, left and right and turn arrow pavement markings a minimum of 100 feet in advance of the grade crossing (FHWA 2019).** Drivers may interpret the highway-rail grade crossing as a highway-highway intersection in certain situations if the arrow pavement markings are installed too close to the grade crossing (low light, poor visibility due to fog or other) and can increase the potential for drivers to turn onto the tracks. These arrow markings should be placed further away from the grade crossing so that drivers do not associate the arrow markings with the highway-rail grade crossing.
- ❖ **Consider installing intersection grade crossing advance warning (W10-2) signs for the eastbound and westbound approaches to the intersection on Farm-to-Market 762 in accordance with the MUTCD.** The intersection of Benton Road/Williams Way Boulevard and Farm-to-Market 762 is less than 100 feet from the near track at the grade crossing. Therefore, the grade crossing advance warning signs are required to warn the left and right turning drivers as they approach the grade crossing from the parallel roadway.
- ❖ **Consider relocation of the proposed "DO NOT STOP ON TRACKS" (R8-8) signs downstream of the grade crossing (MUTCD 2009 Second Edition).** These signs should be installed when the potential for vehicles to stop on the grade crossing is significant. The signs provide warning to the drivers that they must not stop on the grade crossing and remind them that it is prohibited to do so.
- ❖ **Consider installation of a warning label for the traffic signal cabinet to notify personnel that the traffic signal is interconnected with the grade crossing warning system (US DOT TWG 1997).**

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<sup>10</sup> **Scheduled Flashing Operation** – Based on engineering study or engineering judgement, traffic control signals may be operated in the flashing mode on a scheduled basis during one or more periods of the day rather than operated continuously in the steady (stop-and-go) mode (MUTCD, Chapter 4D, Section 4D.28).

- ❖ **Develop and follow a preemption operation and maintenance program<sup>4</sup>.** The railroad preemption system should be tested on an annual basis and an inspection should be conducted jointly by the Agency and the Railroad (FRA Safety Advisory 2010-02 and FRA Technical Bulletin S-12-01). The Agency should develop a special preemption operation program in the event of operational failure of traffic signals or other events that may affect the operation of the interconnected highway by causing extended queues across the tracks. The events that could require use of this plan are emergency or planned construction and special events. The plan should include notifying the railroad and proceeding forward with a traffic management plan to mitigate the possible traffic queues across the tracks.

## 5.2 Implementation Recommendations

The Agency and Railroad should perform thorough joint testing upon changes to the preemption timing and operation to confirm that the traffic signal controller hardware and firmware is operating according to the design. Some of the testing that should be conducted are outlined below.

- ❖ **Thoroughly test the programming of the traffic signal controller during advance preemption to ensure the total right-of-way transfer time does not exceed 12.0 seconds (see preemption calculation form in appendix C).** If the Agency elects to make timing adjustments to the programmed minimum green time, yellow change time or red clearance time, the combined sum must not exceed the maximum right-of-way transfer time established on the preemption calculation form in Appendix C of this report. If it is determined that additional right-of-way transfer time is needed, the Agency must request an increase in APT from the Railroad.
- ❖ **Thoroughly test the programming of the traffic signal controller during railroad preemption to ensure the preemption clearance interval minimum time is in accordance with the design plans.** The preemption clearance interval is the programmed minimum time and phases in the preemption plan settings of the traffic signal controller that are displayed for highway users which may be stopped in the MTCD and CSD. While normally displayed as green indications and frequently referred to as track clearance green, the preemption clearance interval may be displayed as all-red indications, or some combination of flashing and steady indications based on site specific needs.
- ❖ **Confirm traffic signal controller can respond in a train restart event.** A train has the potential of stopping and restarting within the grade crossing circuitry approach. After receiving the preemption call from the first train event, the traffic signal controller must be able to return to the track clearance interval and provide an opportunity to clear a design vehicle from the MTCD during any subsequent train event. Additional logic may be required depending on the traffic signal controller hardware and firmware.
- ❖ **Thoroughly test the traffic signal controller programmed delay time.** Upon receipt of the preemption notification, the traffic signal controller will delay progression to the track clearance interval by this programmed time. This additional time will result in further delay or possibly omit the track clearance

interval during a preemption call reactivation. Thorough testing should be conducted to evaluate the operations of the traffic signal controller during a preemption activation and ensure that the programmed delay time does not negatively impact the traffic signal from proceeding to the track clearance interval upon reactivation of the preemption.

- ❖ **Thoroughly test all interconnection circuits to ensure the circuitry involving both the traffic signal and railroad are fully operational at the time of implementation.** Testing should be conducted to evaluate communications between the traffic signal and railroad circuitry and ensure the requested circuits operate as designed.

## 6 CONCLUSION

Benesch is providing this report as recommendations for improvements to the traffic signal and railroad operations at this grade crossing location in regard to railroad preemption. Further discussion and collaboration should take place between the Agency and Railroad in order to address the concerns discussed in this report. Future changes in design outside the scope of this report or upgrades after implementation of the recommendations put forth in this report will require further collaborative work and review by the Agency and Railroad.

## APPENDIX A – REFERENCES

- ❖ 23 CFR 646, Subpart B, Railroad-Highway Projects. Code of Federal Regulations (CFR)
- ❖ 49 CFR 392.10, Railroad Grade crossings; Stopping Required. Code of Federal Regulations (CFR)
- ❖ 17 USC, Copyright. United States Code (USC)
- ❖ 23 USC 409, Discovery and admission as evidence of certain reports and surveys. United States Code (USC)
- ❖ AREMA (2019). *Manual for Communications and Signals, Volume 1, Section 3 (C&S Manual)*. Landover, MD: American Railway Engineering and Maintenance-of-Way Association (AREMA).
- ❖ FHWA (May 2012). *2009 Manual on Uniform Traffic Control Devices (MUTCD) - Revision 2*. Federal Highway Administration (FHWA).
- ❖ FHWA (2019). *Highway-Rail Crossing Handbook – 3rd Edition*. Federal Highway Administration (FHWA).
- ❖ FRA (July 25, 2012). *Technical Bulletin S-12-0, Guidance Regarding the Appropriate Processes for the Inspection of Highway-Rail Grade Crossing Warning System Pre-emption Interconnections with Highway Traffic Signals*. Federal Railroad Administration (FRA).
- ❖ FRA (October 1, 2010). *Federal Register Volume 75, Issue 190 - Safety Advisory 2010-02, Signal Recording Devices for Highway-Rail Grade Crossing Active Warning Systems that are Interconnected with Highway Traffic Signal Systems*. Federal Railroad Administration (FRA).
- ❖ ITE (April 2019). *Preemption of Traffic Signals Near Railroad Crossings*. Washington, DC. Institute of Transportation Engineers (ITE).
- ❖ NTSB (2003). *Collision Between Metrolink Train 210 and Ford Crew Cab, Stake Bed Truck at Highway-Rail Grade Crossing in Burbank, California, on January 6, 2003, Highway Accident Report NTSB/HAR-03/04*. Washington, DC: National Transportation Safety Board (NTSB).
- ❖ TCC (October 2014). *2011 Texas Manual on Uniform Traffic Control Devices – Revision 2 (TXMUTCD)*. Texas Transportation Commission (TTC)
- ❖ TRB (2015). *National Cooperative Highway Research Program (NCHRP), Report 812, Signal Timing Manual, Section 6.1.3.2 - Minimum Green Based on Driver Expectancy*. Transportation Research Board (TRB)
- ❖ TRB (2003). *National Cooperative Highway Research Program (NCHRP), Report 493, Evaluation of Traffic Signal Displays for Protected/Permissive Left-Turn Control*. Transportation Research Board (TRB).
- ❖ TRB (2017). *National Cooperative Highway Research Program (NCHRP), Synthesis 507, Traffic Signal Operations near Highway-Rail Grade Crossings*. Transportation Research Board (TRB).
- ❖ TTI (March 2002). *Report 1752-9, The Preempt Trap: How to Make Sure You Do Not Have One*. Texas A&M Transportation Institute (TTI).
- ❖ TXDOT (July 2017). *Form 2304 Instructions, Instructions for the Guide for Determining Time Requirements for Traffic Signal Preemption at Highway Grade Crossings*. Texas Department of Transportation (TXDOT).
- ❖ TXDOT (July 2017). *Form 2304, Guide for Determining Time Requirements for Traffic Signal Preemption at Highway Grade Crossings*. Texas Department of Transportation (TXDOT).
- ❖ TXDOT (March 2017). *2012 Standard Highway Sign Designs for Texas – Revision 2*. Texas Department of Transportation (TXDOT).
- ❖ TXDOT (December 2016). *Railroad Crossing Design Guidelines*. Texas Department of Transportation (TXDOT).
- ❖ TXDOT (August 2015). *Rail-Highway Operations Manual*. Texas Department of Transportation (TXDOT).
- ❖ USDOT–TWG (June 1, 1997). *Implementation Report of the USDOT Grade Crossing Safety Task Force*. Department of Transportation – Technical Work Group (DOT-TWG).

## APPENDIX B – END NOTES

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### <sup>A</sup> **Interconnection Circuits:**

The interconnection is the means by which information is shared between a grade crossing warning system and a traffic control device. While the most frequent use of an interconnection is for preemption of a traffic signal controller, other uses involve train activated advance warning beacons, illumination of blank-out signs, remote notification of a crossing occupied by a train or activation of a wayside horn.

Interconnection circuits are most commonly found as a combination of various individual control functions necessary to implement the desired preemption operation. They typically use one or more conductors in a cable to deliver the required function. However, some agencies utilize safety-critical data circuits to provide the interconnection. In some cases, these data circuits contain the vehicle and pedestrian signal status as a part of the message. This type of circuit is more commonly found where advanced monitoring or automated testing of the preemption operation is desired.

Excluding the data circuits, discrete interconnection circuits require a source of power from the traffic signal controller to operate. The power for the interconnection circuits should meet the following criteria:

- Applied energy should not exceed 28 Vac or Vdc. While many interconnection circuits have historically used 120 Vac, this presents a potential safety hazard to maintenance personnel in the railroad warning system enclosure.
- Applied energy should be from an isolated (non-grounded) source.
- Applied energy should be over-current protected, especially if a potential greater than 28 V is used.

The use of a simple 120 Vac to 24 Vac transformer or a DC power supply that incorporates a step-down transformer will satisfy the first two bullet points listed above.

The following is a listing of the most commonly encountered interconnection circuits in use. Because each grade crossing has preemption needs based on site-specific conditions, not all the circuits are used at every location. It is also possible that based on a specific need, an interconnection circuit other than those identified here may be implemented. Regardless, every circuit should be evaluated for necessity and where a special circuit is implemented, a hazard analysis should be performed to assess the failure modes and effects.

In reviewing the advance preemption circuits, three circuit types are identified, APP, AVP and AP. The actual usage is typically AP alone or AVP and APP together. Generally, the time provided by the grade crossing warning system where an AP circuit is used equals the sum of the time where an APP and AVP circuit are used. In many cases, where the preemption operation necessitates that additional time be provided for pedestrian change interval, separating the APP from AVP provides a means to maintain the AVP preemption time under the AREMA 50 second time limit for SDT – ERT.

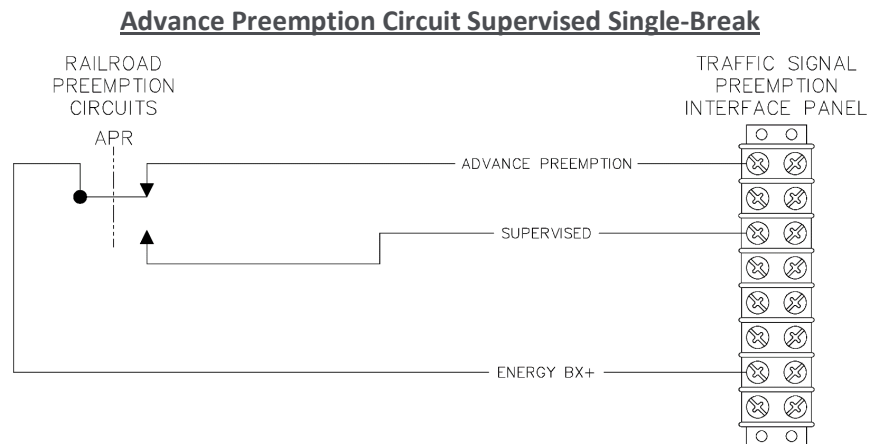
### <sup>B</sup> **Advance Preemption Circuit:**

The Advance Preemption (AP) circuit provides an input to the traffic signal controller to initiate preemption operation a calculated amount of time before activation of the grade crossing warning devices. The time between when the preempt call is made to the traffic signal controller and when the warning devices become

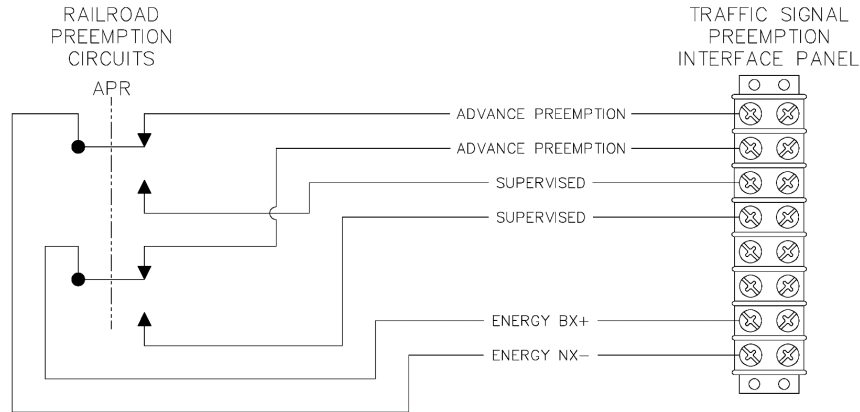
active is known as Advance Preemption Time (APT). The AP circuit is used to terminate any active non-PCI intervals and transition to the programmed PCI.

**<sup>c</sup> Supervised Circuit:**

The supervised circuit is used to safeguard the reliability of railroad preemption activations by monitoring the integrity of the interconnection cable between the grade crossing warning system and the traffic signal system. While any interconnection circuit can include a Supervised Circuit, it is typically only implemented with the highest priority preemption interconnection circuit. The supervised circuit does not provide any operational control functions in the normal preemption sequence or timing. During railroad preemption activations, the Advance Preemption (AP) circuit or Advance Vehicle Preemption (AVP) circuit (advance preemption operation to PCI) or the crossing active circuit (simultaneous preemption operation to PCI) opens upon notification of a train approaching the crossing, while the corresponding supervised circuit closes. Under normal conditions, the supervised circuit is out-of-correspondence with its associated preemption circuit. In other words, one circuit is closed and the other is open. In the event of a failure of the interconnection cable or system, the supervised circuit will be in-correspondence with the associated preemption circuit, where both circuits are either open or both circuits are closed. The in-correspondence condition indicates that an interconnection fault has occurred to the traffic signal controller. These types of system failures can be caused by a number of differing conditions, including but not limited to, underground excavation work exposing the cable and cutting the railroad interconnect cable, loose connections in either the traffic signal cabinet interconnection system or the railroad cabinet, and potential shorted or open circuits between conductors in the interconnection cable. When a failure is indicated by the supervised circuit, the traffic signal controller must be capable of acknowledging the fault and the Agency must program the necessary response in the traffic signal controller. The programming should provide for appropriate preemption operations while also considering the need for a system inspection with the information provided by the supervised circuit. For example, with an interconnection fault indicated by the Supervised Circuit, consider serving the programmed PCI and then proceeding to an all-red flashing condition. This setting will provide a gradual transition by allowing vehicle movements to clear the tracks prior to proceeding to a state in which the Agency can be notified of a malfunction that must be addressed and repaired before the traffic signal can be restored to normal operation. The supervised circuit maybe used in both single-break and double-break configurations.



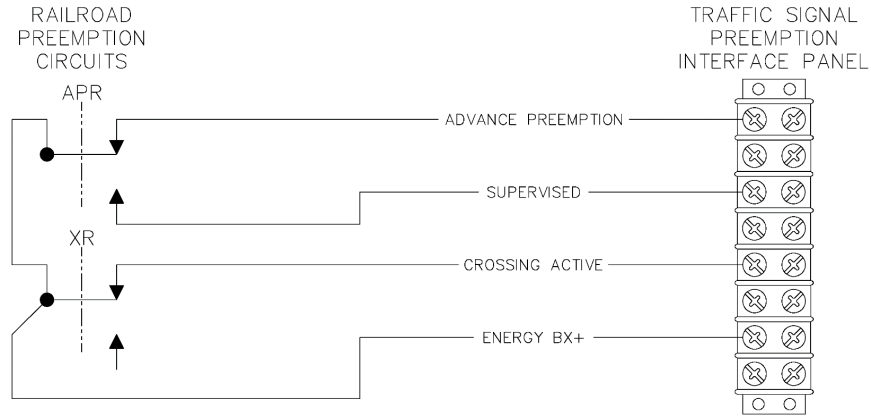
### Advance Preemption Circuit Supervised Double-Break



#### <sup>D</sup> Crossing Active Circuit:

The crossing active circuit, commonly referred to as the “XR” or “XC” circuit, will notify the traffic signal controller at the start of the railroad active warning system operation. The crossing active circuit is used to initiate preemption where simultaneous preemption is used. In advance preemption operation, the crossing active circuit is used to address conditions where the railroad, by nature of its operations, provides less than the calculated preemption time. Various train moves in the vicinity of the crossing may require a different preemption plan in the traffic signal controller that demands a truncated or eliminated minimum green, walk and/or pedestrian clearance time where the preemption time is shortened. The crossing active circuit can be beneficial in accommodating a train restart move or second train event if the crossing has more than one track. For example, if an approaching train stops before reaching the crossing where motion sensing circuits are in place and the train has remained stopped for approximately 20 seconds, the active warning system will recover as long as the train stops short of the island circuit. When this occurs, the gates will ascend, and the preemption call ceases in the traffic signal controller. Once the train resumes movement towards the crossing, the APT can be reduced or even eliminated since the train has already entered the approach and the warning devices will reactivate. In this situation, the traffic signal should attempt to reach the PCI in a safe but also prompt manner. Under these circumstances, the railroad operating rules regulate train movements through the crossing which commonly involves the train crew procedure of guaranteeing that the crossing is clear of vehicles and the gates are fully descended before proceeding over the crossing. The crossing active circuit is also commonly used to active blank-out signs used to restrict turns toward the grade crossing.

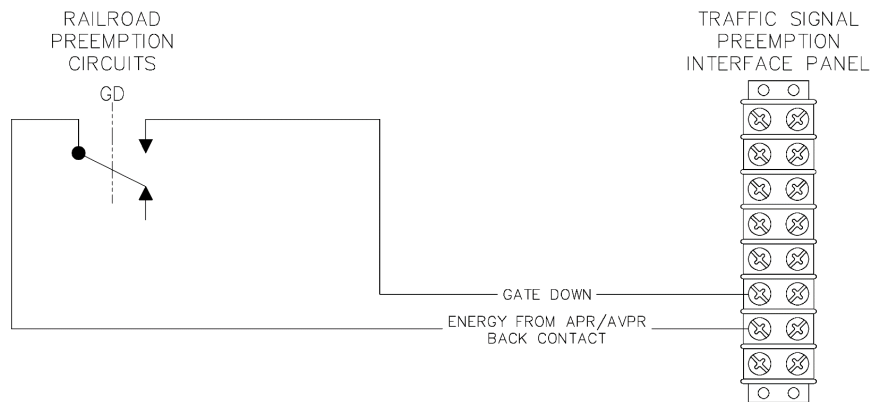
**Advance Preemption Circuit Supervised Single-Break with Crossing Active Circuit**



**Gate Down Circuit:**

The Gate Down (GD) circuit allows the traffic signal controller to know when the automatic gates are within approximately five (5) degrees of horizontal. This will keep the PCI from terminating prior to activation of the warning system and lowering of the automatic gates. The GD circuit plays a vital role in preventing a preempt trap, which may occur following the advance preemption operations due to warning time variabilities that ultimately result in drivers queued onto the tracks (see TTI Report 1752-9). Implementing a GD circuit not only improves grade crossing safety, it also removes the need for excessive PCI and furthermore reduces delays for the non-conflicting directions of traffic. Without a GD circuit, the PCI time can be significantly longer to account for varying conditions. This could result in the PCI holding longer than expected after the gates are horizontal, frustrating drivers on all approaches to the traffic intersection.

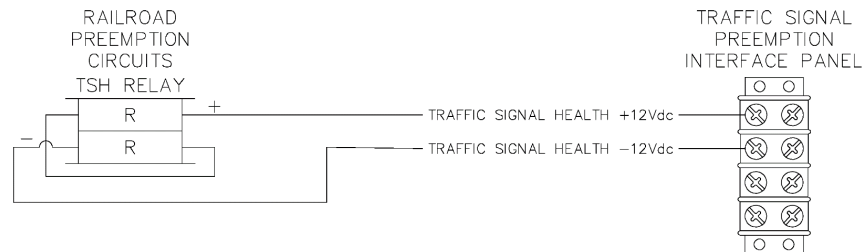
**Gate Down Circuit:**



**F Traffic Signal Health Circuit:**

A Traffic Signal Health (TSH) circuit notifies the railroad equipment of a failure in the traffic signal control equipment. This is a 12 V dc circuit which is normally energized and fused for 500 mA. In the event the traffic signal enters a flashing state, or the signals are dark (commercial power failure, signals off manually, backup battery system depleted, etc.), this will de-energize the TSH circuit.

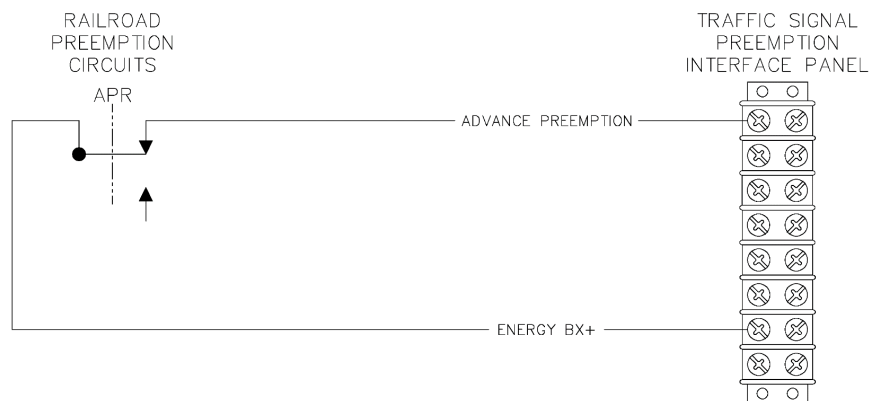
**Traffic Signal Health Circuit:**



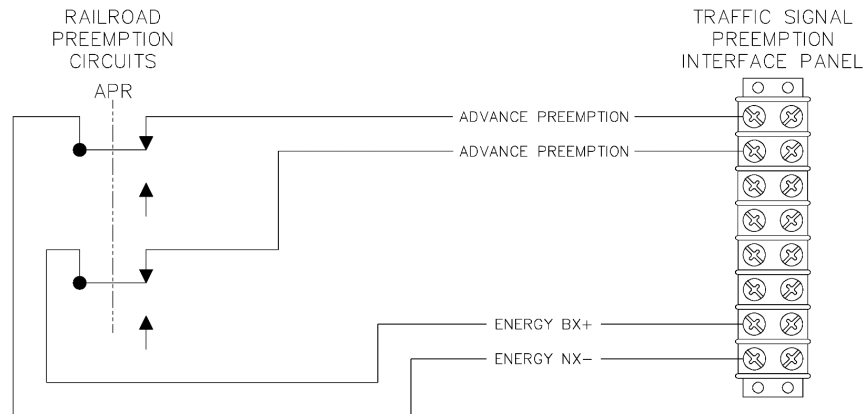
**G Single-break and Double-break Circuits:**

Interconnection circuit design consist of two (2) techniques, single-break and double-break circuits. With a single break electrical design, one of the two conductors in an electrical circuit is opened or closed to activate or deactivate a connected device while a double break electrical design has both conductors opened or closed in its technique. A single-break circuit only breaks or closes the positive OR negative for DC systems, or line OR neutral for AC systems through relays or system control circuits. A double-break circuit breaks or closes both positive AND negative for DC systems, or line AND neutral for AC systems through relays or system control circuits. Both single-break and double-break designs can be utilized for all interconnection circuits except for the Traffic Signal Health circuit which is always double-break. The railroad industry considers the double-break circuit to be a functionally equal method of interconnection to activate or deactivate circuits due to its redundancy and enhanced reliability if a supervised single-break circuit is not utilized.

**Advance Preemption Single-Break Circuit:**



### **Advance Preemption Double-Break Circuit:**



#### **H Data Communication Circuit:**

In lieu of a multi-conductor cable to send the various functions identified above, a safety-critical data circuit may be used. For the purpose of preemption, a MUTCD and ITS accepted safety-critical protocol may be used to provide the interconnection between the traffic signal controller and a grade crossing warning system. The IEEE 1570 protocol may be used over serial or ethernet data with links via copper wire, fiber or radio based on the application.

#### **I Interface Methods:**

When using railroad preemption interconnect circuits, additional equipment is normally required in the traffic signal cabinets. Most traffic signal cabinet manufacturers, equipment manufacturers, and/or dealers can deliver different interconnection methods dependent on the traffic signal cabinet type, controller type/brand, and requested circuits. These methods include relay panels, solid state systems, or isolator cards. The Agency should seek guidance on the types of interconnection systems and components that are available if they are not familiar with current technology.

#### **J Preemption Clearance Interval Minimum Time:**

The Preemption Clearance (PCI) Interval is the programmed minimum time and phase(s) in the preempt plan settings of the traffic signal controller that are displayed for highway users which may be stopped in the Minimum Track Clearance Distance (MTCD) and the Clear Storage Distance (CSD). While normally displayed as green indications and frequently referred to as track clearance green, the PCI may be displayed as all-red indications, or some combination of flashing and steady indications based on site specific needs.

Based on the preemption system design, the minimum time required for the PCI must be adequate for the Design Vehicle (DV) of maximum length to start in motion and clear the Minimum Track Clearance Distance (MTCD). This period of time is known as the Queue Clearance Time (QCT). In addition, the PCI time must include any Separation Time (ST) required. ST is additional time added to the QCT to permit the DV to travel beyond the MTCD before an approaching train enters the roadway.

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Two different methods are used to determine the PCI based on the interconnect circuits that are installed:

Method 1 – The PCI is the calculated period of time required for the Design Vehicle of maximum length to start in motion and move clear of the Minimum Track Clearance Distance (QCT). The QCT is added to the ST and the sum of the two is the minimum PCI time. When used with Advance Preemption, a Gate Down circuit must be provided to overcome timing variability resulting from decelerating train moves approaching the grade crossing or Right-of-Way Transfer Time variability known as a preempt trap. This is the most efficient method of implementing the PCI minimum time.

Method 2 - The PCI is based on a combination of fixed time events. This method is also known as Timing Correction. To determine the amount of time necessary, use the GREATER of two options: the QCT which is the calculated time for the design vehicle to start in motion and clear the MTCD **OR** the APT plus an additional 15 seconds (APT + 15). Any desired Separation Time should be added to the result. Timing Correction requires the use of a not-to-exceed advance preempt timer in the railroad warning system control circuits. A Gate Down circuit is not required with Timing Correction. Using Method 2, the APT plus an additional 15 seconds (APT + 15), is approximated based on the operation of the railroad warning system during a train movement. During advance preemption operations, the completion of APT is immediately followed by the activation of the railroad warning devices. From the initiation of the active warning system, it takes approximately 15 seconds from the start of the flashing-lights to the complete descent of the automatic gate arms to a horizontal position. Timing Correction shall not be used if the railroad circuitry does not include a not-to-exceed timer and the RWTT time is not considered to be the maximum value. Timing Correction is only used with Advance Preemption operation. When advance preemption operation is utilized, the recommended best practice method is to use gate down circuitry to terminate the track clearance green interval, since the APT+15 or the queue clearance time methods do not account for variations in the APT because of decelerating or accelerating trains.

#### **K Maximum Preemption Timer:**

The maximum preemption timer operates by timing out a preemption call if in excess to the expected or calculated time and allows the traffic signal controller to exit the preemption plan. Since railroad active warning systems are designed to "fail-safe", this timer can help improve traffic signal operations under these conditions. For example, if a railroad warning system fails, the flashing light signals will stay active and the gates will remain lowered indicating to the highway users that it is not safe to use the crossing. In addition, the traffic signal continues to stay in the railroad preemption plan. By implementing a maximum preemption timer, this allows the traffic signal to exit the existing preemption plan and proceed to an all-red flash mode allowing non-conflicting traffic to move thru the intersection. It should be noted that not all traffic signal controllers have the capability to transition to an all-red flashing mode at the expiration of the built-in maximum preemption timer. Various traffic signal controllers will release the preemption call and return to normal operation which is not recommended. Some controllers are limited to a maximum preemption timer value of 255 seconds which could be short of the needed value. Internal controller logic or an external device will be needed to permit these controllers to exit to a "fail-safe" mode. Engineering judgment should be exercised when deciding the appropriate time for the maximum preemption timer. If the timer is programmed too short, the traffic signal could exit preemption to all-red flash while the train is occupying the crossing. It is recommended that the maximum preemption timer be programmed to a value greater than to two times the longest average train movement, including any switching movements.

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### **Preemption Operation and Maintenance Program:**

To conform with the FRA Safety Advisory 2010-02, the Agency and the Railroad should establish a joint program to annually perform an operational test of the preemption system.

At a minimum the program should:

1. Ensure that no changes have been made to the traffic signal, grade crossing, active warning system, or roadway that would alter operations of the highway grade crossing system or traffic signal from the approved and agreed upon design.
2. Review any recorder logs (where available) to ensure correct operation.
3. Perform a test of the system when undergoing the maximum right-of-way transfer time.
4. Representatives from the both traffic agency and railroad should be accounted for at the joint inspection and test.

During traffic signal failure, the Agency should establish a plan of interim procedures until system issues can be addressed:

1. If the traffic signal is dark due to power loss/manual operation or in a flashing mode, notify the Railroad and provide flagger and/or law enforcement to monitor the grade crossing and ensure that highway users safely travel over the tracks.
2. The Agency should inform the Railroad when the traffic signal has been returned to normal operation.

Contact the Railroad when any changes are made to the traffic signal, roadway geometry, or preemption system. (See MUTCD Section 8A.02 Paragraph 6)

The Railroad must be notified by the Agency if a joint test will be conducted on the railroad preemption system. If traffic density changes occur downstream of the crossing due to a lane closure or a high traffic volume event which could cause queueing onto the crossing, the railroad should be contacted, and the Agency should provide flagging or a temporary traffic control plan. (See MUTCD Section 8A.08 for additional Information.)

# APPENDIX C – PREEMPTION CALCULATION FORM

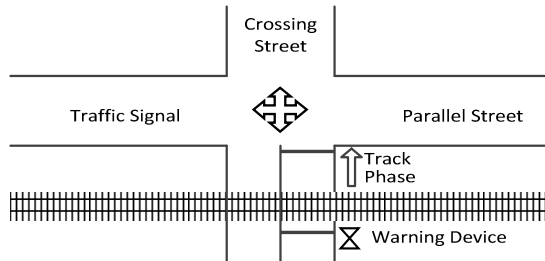
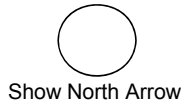




**Texas Department of Transportation**  
**GUIDE FOR DETERMINING TIME REQUIREMENTS FOR**  
**TRAFFIC SIGNAL PREEMPTION AT HIGHWAY-RAIL GRADE CROSSINGS**

Form 2304  
(Rev. 7/17)

City \_\_\_\_\_ CSJ \_\_\_\_\_ Date \_\_\_\_\_  
 County \_\_\_\_\_ Completed by \_\_\_\_\_  
 District \_\_\_\_\_ District Approval \_\_\_\_\_

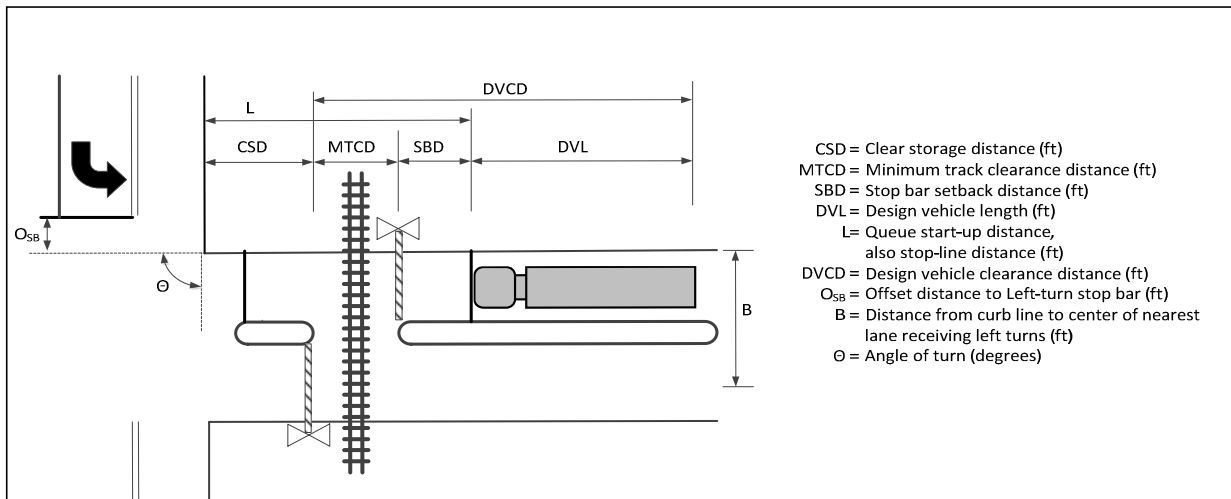


Parallel Street Name \_\_\_\_\_  
 Crossing Street Name \_\_\_\_\_

Railroad \_\_\_\_\_ Railroad Contact \_\_\_\_\_  
 Crossing DOT# \_\_\_\_\_ Phone \_\_\_\_\_

**NOTE: After approval by the District, a copy of this form, along with the traffic signal design sheets and the phasing diagrams for normal and preempted operation, shall be placed in the traffic signal cabinet. See Section 7 for traffic signal timings.**

**SECTION 1: GEOMETRY DATA & DEFAULTS**



**GEOMETRIC DATA FOR CROSSING**

1. Clear storage distance (CSD, feet) .....	1.	<input style="width: 50px; height: 20px;" type="text"/>
2. Minimum track clearance distance (MTCD, feet) .....	2.	<input style="width: 50px; height: 20px;" type="text"/>
3. Stop bar setback distance (SBD, feet) .....	3.	<input style="width: 50px; height: 20px;" type="text"/>
4. Width of receiving approach (B, feet).....	4.	<input style="width: 50px; height: 20px;" type="text"/>
5. Offset distance of left turn stop bar (O <sub>SB</sub> , feet).....	5.	<input style="width: 50px; height: 20px;" type="text"/>
6. Approach grade. % ( 0 if approach is on downgrade) .....	6.	<input style="width: 50px; height: 20px;" type="text"/>
7. Angle of turn at Intersection (θ, degrees).....	7.	<input style="width: 50px; height: 20px;" type="text"/>

**Remarks**

\_\_\_\_\_  
 \_\_\_\_\_  
 Enter "0" if no stop bar is present  
 \_\_\_\_\_  
 \_\_\_\_\_

**DESIGN VEHICLE DATA**

8. Select Design Vehicle

School Bus	Intermediate Truck	Interstate Semi-Truck	Other
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9. Default design vehicle length (feet) .....	9.	<input style="width: 50px; height: 20px;" type="text"/>
a. Additional vehicle length, if needed (feet) .....	9a.	<input style="width: 50px; height: 20px;" type="text"/>
10. Total design vehicle length (DVL, feet) .....	10.	<input style="width: 50px; height: 20px;" type="text"/>
11. Centerline turning radius of design vehicle (R, feet).....	11.	<input style="width: 50px; height: 20px;" type="text"/>
12. Passenger car vehicle length (LV, feet).....	12.	<input style="width: 50px; height: 20px;" type="text"/>

Based on selected Design Vehicle  
 Use only if "Other" selected as Design Vehicle  
 Sum of line 9 and 9a  
 Based on selected Design Vehicle  
 Default value

**SECTION 2: RIGHT-OF-WAY TRANSFER TIME CALCULATION**

**Preempt verification and response time**

- 13. Preempt delay time (seconds) ..... 13.
- 14. Controller response time to preempt (seconds) ..... 14.
  
- 15. Preempt verification and response time (seconds): add lines 13 and 14 ..... 15.

**Remarks**

Manufacturer: \_\_\_\_\_  
 Firmware Version: \_\_\_\_\_

**Worst-case conflicting vehicle time**

- 16. Minimum green time during right-of-way transfer (seconds) ..... 16.
- 17. Other green time during right-of-way transfer (seconds) ..... 17.
- 18. Yellow change time (seconds) ..... 18.
- 19. Red clearance time (seconds) ..... 19.
  
- 20. Worst-case conflicting vehicle time (seconds): add lines 16 through 19 ..... 20.

**Remarks**

Value may be adjusted to meet local conditions  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**Worst-case conflicting pedestrian time**

- 21. Minimum walk time during right-of-way transfer (seconds) ..... 21.
- 22. Pedestrian clearance time during right-of-way transfer (seconds) ..... 22.
- 23. Vehicle yellow change time, if not included on line 22 (seconds) ..... 23.
- 24. Vehicle red clearance time, if not included on line 22 (seconds) ..... 24.
  
- 25. Worst-case conflicting pedestrian time (seconds): add lines 21 through 24 ..... 25.

**Remarks**

Value may be adjusted to meet local conditions  
 \_\_\_\_\_  
 Refer to instructions for pedestrian truncation guidance  
 \_\_\_\_\_  
 \_\_\_\_\_

**Worst-case conflicting vehicle or conflicting pedestrian time**

- 26. Worst-case conflicting vehicle or conflicting pedestrian time (seconds): maximum of lines 20 and 25 ..... 26.
  
- 27. Right-of-way transfer time (seconds): add lines 15 and 26 ..... 27.

**SECTION 3: QUEUE CLEARANCE TIME CALCULATION**

- 28. Are there left-turns towards the tracks? Yes No
- 29. Distance traveled by truck during left-turn (LTL, feet): ..... 29.
- 30. Travel speed of left-turning truck ( $S_{LTT}$ , mph): ..... 30.
- 31. Distance required to clear left-turning truck from travel lanes on track clearance approach (feet): ..... 31.
- 32. Additional time required to clear left-turning truck from travel lanes on track clearance approach (seconds): ..... 32.
  
- 33. Worst-case Left Turning Truck time (seconds): if Line 28 = 'Yes', use line 32; otherwise Use 0 ..... 33.
- 34. Queue start-up distance, L (feet): add lines 1 through 3 ..... 34.
- 35. Time required for design vehicle to start moving (seconds): calculate as  $2+(L+20)$  ..... 35.
- 36. Design vehicle clearance distance, DVCD (feet): add lines 2, 3 and 10..... 36.
- 37. Time for design vehicle to accelerate through the DVCD (seconds), level terrain ..... 37.
- 38. Factor to account for slower acceleration on uphill grade ..... 38.
- 39. Time for design vehicle to accelerate through DVCD (seconds), adjusted for grade: multiply lines 37 and 38 ..... 39.
  
- 40. Queue clearance time (seconds): add lines 33, 35 and 39 ..... 40.

**Remarks**

LTL =  $TTR\theta/180$   
 \_\_\_\_\_  
 Default value  
 Equation: (line 4 + line 5 + line 12 - line 11 ) + line 29 + line 10  
 \_\_\_\_\_  
 Equation:  $[(\text{line } 31 * 3600) / (\text{line } 30 * 5280)] - \text{line } 18 - \text{line } 19]$   
 \_\_\_\_\_

**SECTION 4: MAXIMUM PREEMPTION TIME CALCULATION**

- 41. Right-of-way transfer time (seconds): line 27 ..... 41.
- 42. Queue clearance time (seconds): line 40 ..... 42.
- 43. Desired minimum separation time (seconds) ..... 43.
  
- 44. Maximum preemption time for Queue Clearance (seconds): add lines 41 through 43 ..... 44.

**Remarks**

Typical Value  
 \_\_\_\_\_

**SECTION 5: SUFFICIENT WARNING TIME CHECK**

Remarks

- 45. Required minimum time, MT (seconds): per regulations ..... 45.
- 46. Clearance time, CT (seconds): (line 2 -35) / 10  
(rounded up to nearest second)..... 46.
- 47. Total minimum warning time, MWT, needed (seconds):  
add lines 45 and 46 (excludes buffer time and equipment response time)..... 47.
- 48. Required advance preemption time (APT) from railroad (seconds):  
subtract line 47 from line 44, round up to nearest full second, enter 0 if less than 0 ..... 48.
- 49. APT currently provided by railroad (seconds): Enter "0" if new crossing or signal ..... 49.

**If the required advance preemption time (line 48) is greater than the amount of advance preemption time currently provided by the railroad (line 49), additional warning time must be requested from the railroad. Alternatively, the maximum preemption time (line 48) may be decreased after performing an engineering study to investigate the possibility of reducing the values on lines 13, 16, 17, 21, 22 and 43.**

Remarks:

**SECTION 6: TRACK CLEARANCE GREEN TIME CALCULATION (IF NO GATE DOWN CIRCUIT PROVIDED)**

**Preempt Trap Check**

Remarks

- 50. Warning Time Variability (Select One)  

Consistent Warning Times
Low Warning Time Variability
High Warning Time Variability
- 51. APT required or provided (seconds): maximum of Line 48 or Line 49..... 51.  See Instructions for details.
- 52. Multiplier for maximum APT due to train handling ..... 52.
- 53. Maximum APT (seconds): multiply line 51 and 52 ..... 53.
- 54. Minimum duration for the track clearance green interval (seconds) ..... 54.
- 55. Track Clearance Green Time to avoid Preempt Trap (seconds): add lines 53 and 54 ..... 55.

**Clearing of Clear Storage Distance**

- 56. Time waiting on left-turn truck (seconds): line 33 ..... 56.
- 57. Time required for design vehicle to start moving (seconds): line 35 ..... 57.
- 58. Design vehicle clearance distance (DVCD, feet): line 36 ..... 58.

*If  $CSD \leq DVL$ , you must clear the design vehicle through the entire CSD during the traffic clearance phase; however, if  $CSD > DVL$ , you should consider providing enough time to clear the design vehicle from the crossing.*

Is the clear storage distance (CSD) less than or equal to the design vehicle length (DVL)?

YES. The design vehicle MUST clear through the entire CSD. (CSD will be entered in Line 59).

NO. The design vehicle may clear through a portion of the CSD.

Do you want to clear the design vehicle through the entire CSD?

YES. Clear the entire CSD. (CSD will be entered in Line 59).

NO. Clear the crossing ONLY. (DVL will be entered in Line 59).

- 59. Portion of CSD to clear during track clearance phase (feet) ..... 59.
- 60. Design vehicle relocation distance (DVRD, feet): add lines 58 and 59 ..... 60.
- 61. Time required to accelerate design vehicle through DVRD (seconds), level terrain: ..... 61.
- 62. Factor to account for slower acceleration on uphill grade ..... 62.
- 63. Time required to accelerate design vehicle through DVRD (seconds), adjusted for  
grade: multiply lines 61 and 62 ..... 63.
- 64. Time to clear portion of clear storage distance (seconds): add lines 56, 57 and 63 ..... 64.
- 65. Track clearance green interval (seconds): maximum of lines 55 or 64, round up to nearest full second ..... 65.

**Maximum Duration of Track Clearance Green after gates are down (in absence of a gate down circuit)**

- 66. Total time to complete track clearance green (seconds): line 27 + line 65 ..... 66.
- 67. Total time before gates are down (seconds): subtract 5 seconds from line 44  
(per AREMA Manual) ..... 67.
- 68. Maximum Duration of Track Clearance Green after gates are down (seconds): Line 66 - Line 67 ..... 68.

**SECTION 7: SUMMARY OF CONTROLLER PREEMPTION SETTINGS**

- 69. Duration Time (seconds) ..... 69.
- 70. Preempt Delay Time (seconds) ..... 70.

**Remarks**

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Right of Way Transfer Phase

- 71. Minimum Green Interval (seconds) ..... 71.
- 72. Pedestrian Walk Interval (seconds) ..... 72.
- 73. Pedestrian Clearance Interval (Flashing "DON'T WALK", seconds) ..... 73.
- 74. Yellow Change Interval (seconds) ..... 74.
- 75. All Red Vehicle Clearance (seconds) ..... 75.

**Remarks**

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Track Clearance Phase

- 76. Green Interval (seconds) (in the absence of gate down circuit) ..... 76.
- 77. Green Interval (seconds) with gate down circuit ..... 77.
- 78. Yellow Change Interval (seconds) ..... 78.
- 79. All Red Vehicle Clearance (seconds) ..... 79.

**Remarks**

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Exit Phase

- 80. Dwell/Cycle Minimum Green Time (seconds) ..... 80.
- 81. Yellow Change Interval (seconds) ..... 81.
- 82. All Red Vehicle Clearance (seconds) ..... 82.

**Remarks**

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**Remarks:**