Railroad Design and Coordination Guide

Division of Right of Way and Utilities

Revised 11/12/2024

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Overview

The following guidelines have been compiled based on published guidance documents as well as common review comments from past projects over several years. This is intended to be a live document and is the best information available as of the revision date. Please check for newer editions when starting any project.

The following guidance applies only to projects on or adjacent to Railroad ROW and bridges over the Railroad. Rail carrying bridges over the highway are unique and have many different requirements and aspects. For those, please reach out to the Rail Coordinator for current guidance.

When dealing with the Railroad, the biggest items they are most concerned with are clearances and drainage. The Railroads do not like ANY drainage being directed onto their ROW. Some may allow drainage if calculations show no changes. Scupper drains are not typically allowed on bridges and should be avoided. Minimum vertical and horizontal clearance should be shown on both the structure and roadway plans. The Railroad Centerline and ROW lines should be shown on all applicable sheets in both roadway and structure plans. Temporary crossings are very difficult to obtain and should be left up to contractor if they so choose.

Timing

Railroad coordination is a lengthy process. At minimum, 6 months to a year should be expected but may run longer depending on how involved the project is. It is imperative to involve the Railroad early on and continuously throughout the design process as their requirements can have a snowball effect on the design. Project managers should expect a minimum of 3 rounds of review comments with the Railroad, with each review taking approximately 30-60 days plus additional time for drafting and executing agreements. Depending on the comments, it may take several rounds of reviews to fully satisfy the Railroad.

The first step in Railroad Coordination is to initiate the project and execute a Preliminary Engineering (PE) Agreement. This allows the Railroad to bring their consultants onboard and to begin reviewing plans and submittals. This should be done as soon as funding is in place and a project scope is defined. Typically, this occurs around the start of Phase II design but can also be accelerated in Phase I if early guidance from the RR is required. Utility or Design funding may be used for PE Agreements, with a preference to Utility funds if they are authorized.

Once a PE Agreement is executed and in place plan reviews may begin. Initial plan submittals should include, at minimum, the proposed alignment, structure locations, and minimum clearances as these need to be approved by the Railroad and locked in for further design. A sheet with the plan view and profile of bridges over the Railroad is the most useful. As plans progress more detail will be required and data such as drainage calculations may be requested. Once all Railroad comments and concerns are addressed to their satisfaction a Construction Agreement will be executed and the Rail Coordination will be clear for letting.

Funding

Utility phase funding is preferred and is usually used for all Railroad agreements. However, if early Railroad involvement is required and Utility funds are a long way from being authorized Design funds may be used for PE agreements. Construction Agreements can use either Utility or Construction funding, however Construction funds are not typically authorized until after letting so this requires careful coordination. Design and Construction funds both present their own challenges with the Railroad agreements needing to remain open longer than other contracts and complications with requesting more funding if needed. For these reasons, Utility funds are greatly preferred.

Comment Spreadsheets

When the Railroad returns comments from plan reviews, a comment spreadsheet is typically employed to track the comments and responses. KYTC and/or the design consultant will fill in the response column for each column and return the sheet along with the revised plans. The Railroad will then either mark the comment as closed or provide further comments and leave it open. Once all comments are marked as closed the Railroad will send notification that the plans are acceptable and will typically move on to providing a force account estimate for the Construction Agreement. Example comments sheets may be found in the Exhibits.

Variance Requests

When the Railroad's requirements are not able to be met or would be prohibitively expensive to meet, a variance may be requested. Variances should be a last resort and are not guaranteed to be granted. When a variance request is required please provide as much background information and supporting data as possible to make the best case. Variance requests can typically take up to 3 months for review as they often require going through several layers of management at the Railroad.

Diagnostic Reviews

If there is a public at-grade Railroad crossing within the vicinity of a Federally funded project Federal rules require the crossing to be brought up to current standards (i.e. automatic flashing lights, gates, and bell) unless an engineering study, known as a Diagnostic Review, determines that such features are not warranted. In this case, the word "vicinity" is not strictly defined but is generally interpreted to mean within the distance prescribed by MUTCD for the advance warning signs of the crossing. The crossing does not need to be within the project limits for this to apply, only within the "vicinity" as described previously. The Diagnostic Review will take into account attributes like vehicular and train traffic counts and speed, geometry, sight distance, etc. If the Diagnostic Review finds that gates or other upgrades are warranted these will be recommended to be constructed at the project's expense.

Company Specific Details

The following sections contain details for each Railroad company. If the company isn't listed, it's best to follow CSX standards with the exception of spanning the ROW and easement types. Please reach out to the Rail Coordinator for any projects on other Railroads.

Norfolk Southern

1. Public Projects Manual: https://www.norfolksouthern.com/content/dam/nscorp/pdf/public-projects/Public%20Projects%20Manual.pdf
2. Clearances
    a. Vertical clearance 23.5'
    b. Horizontal clearance 25' or 13' with crash wall
    c. Temporary clearances 22' vertical, 13' horizontal from tangent or 14' from curve
    d. Notes: *vertical measured from a point offset 6'-0" from the centerline of existing and future tracks. For concrete superstructures, the minimum vertical clearance shall not incorporate beam camber.*
3. Drainage
    a. *When the proposed construction will increase the quantity and/or character of flow for drainage on the right-of-way, drainage plans and calculations showing the change in drainage flowing into the Norfolk Southern ditches and on the right-of-way should be provided for review. The calculations should be based on a 100-year storm event in accordance with the Norfolk Southern Public Projects Manual. Any increase in quantity or rate of flow should be mitigated either by improvements to the Norfolk Southern ditches and under track drainage structures, or by directing the flow away from the Railway's right-of-way. If the proposed project will not change the quantity and/or character of flow on the Railway's right-of-way or in the ditches and drainage structures, the plans shall include a general note stating this.*
4. Fencing
    a. Curved fence when sidewalk present
    b. Straight fence when no sidewalk
    c. Minimum height 10' from deck
    d. Notes: *A protective fence shall be installed extending to the NS right-of-way lines, the entire length of the span over the tracks or 25 feet beyond the centerline of the outermost track, whichever is greater. For further details, refer to Typical Drawing No. 3 – Overhead Bridge Details – Bridge Fencing, in the Public Project Manual.*
5. Right of Way
    a. Permanent Aerial Easements 5' outside bridge
    b. Permanent Easements only where structures or features touch ground
    c. Temporary Easement outside permanent easements
    d. Construction Agreement includes a right of entry. NS will not begin ROW process until after Construction Agreement is executed.

e. Notes: *Show coordinate values either as notes or in a table on the exhibit and label the POB. Add state plane coordinate in the surveyed description to aid in describing the POB.*

6. Surveying Requirements
    a. A profile of the existing top of rail for 500 feet either side of the overhead bridge should be plotted on the plans.
7. Closed Crossings
    a. If an at-grade crossing is closed and removed as part of the project then:
        i. Positive blockage must be installed, typically guardrail
        ii. RR ditches shall be restored for drainage
        iii. Notes: Include note "Grade/Restore RR Ditches for Positive Drainage (Both Sides)."
8. Flagging
    a. Flagging will be acquired by the contractor and included in their contract using Construction Funds. A "Railroad Coordination" bid item should be included for these costs.
9. Notes in Plans
    a. The following notes should be included on either the roadway or structure plans:
        i. "All work on, over, under, or adjacent to Norfolk Southern right-of-way shall be done in accordance with the Norfolk Southern "Special Provisions for the Protection of Railway Interests" (NS Special Provisions)."
        ii. "PRIOR TO COMMENCING WORK, THE CONTRACTOR MUST REQUEST FROM THE RAILROAD AND FOLLOW THE LATEST VERSION OF THE "SPECIAL PROVISIONS FOR PROTECTION OF RAILWAY INTERESTS""
        iii. "All utility installations or relocations that are required in conjunction with this project can be installed or relocated as part of the project provided the construction is performed by the project contractor or project contractor's sub-contractor. However, the utility must submit an application for the installation or relocation for appropriate handling for license agreement and applicable fees. For utility applications go to: www.nscorp.com > Real estate > NS Services > Wire, Pipeline, and Fiber Optics Projects. Note: License agreement must be executed prior to utility being installed or relocated."
        iv. "'One Call' services do not locate buried railroad signal and communications lines. The contractor shall contact the railroad's representative seven (7) days in advance of those places where excavation, pile driving, or heavy loads may damage railroad underground lines on railroad property. Upon request from the contractor or agency, railroad signal forces will locate and paint mark or flag railroad underground signal, communication, and power lines in the area to be disturbed for the contractor. The contractor shall avoid excavation or

other disturbance of these lines which are critical to the safety of the railroad and the public. If disturbance or excavation is required near a buried railroad signal, communication, or power line, the line shall be potholed manually with careful hand excavation by the contractor and protected by the contractor during the course of the disturbance under the supervision and direction of a railroad signal representative"

v. "If NS personnel is flagging (contractor is not directly hiring protective services) and projects will exceed 30 days of construction, Contractor shall provide the flagman a small work area with a desk/counter and chair within the field/site trailer, including the use of bathroom facilities, where the flagman can check in/out with the Project, as well as to the flagman's home terminal. The work area should provide access to two (2) electrical outlets for recharging radio(s), and a laptop computer; and have the ability to print off needed documentation and orders as needed at the field/site trailer. This should aid in maximizing the flagman's time and efficiency on the Project."

vi. "Norfolk Southern will be provided as-built drawings of the bridges showing the actual clearances as constructed. Depth, size, and location of all foundation components shall be shown on the drawings."

10. Examples

a. Exhibit A: Example NS bridge layout sheet

CSX

1. Public Projects Manual: https://www.csx.com/index.cfm/library/files/about-us/property/public-project-manual
2. Clearances
    a. Vertical clearance 23.0'
    b. Horizontal clearance: **all bridges must clear span entire CSX ROW, including slopes**
        i. If spanning ROW is not feasible, a variance may be requested, in which case minimum horizontal clearance is 25' or 18' with crash wall. This would require a very compelling case to be approved.
    c. Notes: *vertical measured from a point offset 6'-0" from the centerline of existing and future tracks.*
3. Drainage
    a. No additional drainage onto RR ROW
4. Fencing
    a. Curved fence when sidewalk present
    b. Straight fence when no sidewalk
    c. Minimum height 8' from deck
    d. Notes: Should extend the length of the span over the tracks
5. Right of Way
    a. Permanent Aerial Easements 5' outside bridge
    b. Permanent Easements only where structures or features touch ground
    c. Temporary Easement outside permanent easements
    d. CSX will begin ROW negotiations while in design but will not sign the deeds until the construction agreement is executed
    e. Provide a CAD file of the easements along with the offer to purchase to speed up the process
6. Surveying Requirements
    a. CSX's valuation station and distance from the nearest milepost at the intersection of the centerline of track and centerline of bridge shall be shown on the general plan sheet
7. Closed Crossings
    a. If an at-grade crossing is closed and removed as part of the project then:
        i. Positive blockage must be installed, typically guardrail
        ii. RR ditches shall be restored for drainage
        iii. Notes: Include note "Grade/Restore RR Ditches for Positive Drainage (Both Sides)."

8. Flagging
    a. Flagging is included in the Construction Agreement and paid out of Utility funds, typically. Design will need to provide an estimated number of days of flagging so that CSX can include it in their estimate.
9. Notes in Plans
    a. "Temporary construction Clearance - Ensure all falsework, bracing or forms have a minimum horizontal clearance of 12 feet measured perpendicular to the centerline of the nearest track."
    b. "Means and Methods – The Contractor shall develop a detailed submission indicating the progression of work with specific times when tasks will be performed for work activities that are on or in the vicinity of the CSXT property. This submission may require a walkthrough at which time CSXT and/or the Representative will be present. Work will not be permitted to commence until the Contractor has provided CSXT with a satisfactory plan that the project will be undertaken without scheduling, performance or safety related issues. Provide a listing of the anticipated equipment to be used, the location of all equipment to be used and ensure a contingency plan of action is in place should a primary piece of equipment malfunction. All work in the vicinity of CSXT property that has the potential of affecting CSXT train operations must be submitted and approved by CSXT prior to work being performed. This submission will also include a detailed narrative discussing the coordination of project safety issues between Contractor, CSXT and the Representative. The narrative shall address project level coordination and day to day, specific work operations including crane and equipment operations, erection plans and temporary works."
    c. "Emergency Action Plan – Submit an emergency action plan indicating the location of the site, contact numbers, access to the site, instructions for emergency response and location of the nearest hospitals. This plan should cover all items required in the event of an emergency at the site including fire suppression. Coordinate the Emergency Action Plan with the safety related discussion of the Means and Methods submission discussed above. The plan should also include a method to provide this information to each project worker for each day on site."
    d. "Demolition Procedures are required to be submitted to CSXT, or the Representative, in accordance with the CSXT Construction Submission Criteria, last revised July 2017. The CSXT Construction Submission Criteria should be referred to and complied with prior to the preparation of submissions, as it contains specific requirements that could impact the Contractor's material selection and methods or operations for work near the railroad. Revisions to Contractor submissions may not be field approved. Any deviation(s) from a previously accepted plan including equipment substitutions will require a formal resubmission of the procedure for review and acceptance prior to performing

any work. A Professional Engineer in the State of Kentucky must sign and seal the plans. Up to thirty (30) days will be required to review all construction submissions. Up to an additional thirty (30) days will be required to review any subsequent submissions returned not approved."

e. "Contractor shall install a non-woven geotextile fabric ballast protection system to prevent construction/demolition debris and fines from fouling the ballast. The geotextile ballast protection shall be installed and maintained by the Contractor to the satisfaction of CSX's Construction Representative. Fabric should extend at least 15' past the construction limits in both directions of the track and cover all railroad ballast stone (from fence to fence, including the areas between the track)."

10. Examples
    a. Exhibit B: Example CSX bridge layout sheet

Paducah and Louisville

Note: Paducah and Louisville does not have its own Public Projects Manual but generally follows most of the same requirements as CSX.

1. Public Projects Manual: https://www.csx.com/index.cfm/library/files/about-us/property/public-project-manual
2. Clearances
    a. Vertical clearance 23.0'
    b. Horizontal clearance 25' or 18' with crash wall.
    c. Notes: *vertical measured from a point offset 6'-0" from the centerline of existing and future tracks.*
3. Drainage
    a. No additional drainage onto RR ROW
4. Fencing
    a. Partially curved fence regardless of sidewalk
    b. Minimum height 8' from deck
    c. Notes: Should extend the length of the span over the tracks
5. Right of Way
    a. Permanent Easements for the width of the ROW
    b. Temporary Easement outside permanent easements
    c. P&L may begin ROW negotiations while in design but will not sign the deeds until the construction agreement is executed
6. Surveying Requirements
    a. P&L's valuation station and distance from the nearest milepost at the intersection of the centerline of track and centerline of bridge shall be shown on the general plan sheet
7. Closed Crossings
    a. If an at-grade crossing is closed and removed as part of the project then:
        i. Positive blockage must be installed, typically guardrail
        ii. RR ditches shall be restored for drainage
        iii. Notes: Include note "Grade/Restore RR Ditches for Positive Drainage (Both Sides)."
8. Flagging
    a. Flagging is included in the Construction Agreement and paid out of Utility funds, typically. Design will need to provide an estimated number of days of flagging so that P&L can include it in their estimate.

9. Notes in Plans
    a. “Temporary construction Clearance - Ensure all falsework, bracing or forms have a minimum horizontal clearance of 12 feet measured perpendicular to the centerline of the nearest track.”
    b. “Means and Methods – The Contractor shall develop a detailed submission indicating the progression of work with specific times when tasks will be performed for work activities that are on or in the vicinity of the PAL property. This submission may require a walkthrough at which time PAL and/or the Representative will be present. Work will not be permitted to commence until the Contractor has provided PAL with a satisfactory plan that the project will be undertaken without scheduling, performance or safety related issues. Provide a listing of the anticipated equipment to be used, the location of all equipment to be used and ensure a contingency plan of action is in place should a primary piece of equipment malfunction. All work in the vicinity of PAL property that has the potential of affecting PAL train operations must be submitted and approved by PAL prior to work being performed. This submission will also include a detailed narrative discussing the coordination of project safety issues between Contractor, PAL and the Representative. The narrative shall address project level coordination and day to day, specific work operations including crane and equipment operations, erection plans and temporary works.”
    c. “Emergency Action Plan – Submit an emergency action plan indicating the location of the site, contact numbers, access to the site, instructions for emergency response and location of the nearest hospitals. This plan should cover all items required in the event of an emergency at the site including fire suppression. Coordinate the Emergency Action Plan with the safety related discussion of the Means and Methods submission discussed above. The plan should also include a method to provide this information to each project worker for each day on site.”
    d. “Demolition Procedures are required to be submitted to PAL, or the Representative, in accordance with the CSXT Construction Submission Criteria, last revised July 2017. The CSXT Construction Submission Criteria should be referred to and complied with prior to the preparation of submissions, as it contains specific requirements that could impact the Contractor’s material selection and methods or operations for work near the railroad. Revisions to Contractor submissions may not be field approved. Any deviation(s) from a previously accepted plan including equipment substitutions will require a formal resubmission of the procedure for review and acceptance prior to performing any work. A Professional Engineer in the State of Kentucky must sign and seal the plans. Up to thirty (30) days will be required to review all construction submissions. Up to an additional thirty (30) days will be required to review any subsequent submissions returned not approved.”

e. “Contractor shall install a non-woven geotextile fabric ballast protection system to prevent construction/demolition debris and fines from fouling the ballast. The geotextile ballast protection shall be installed and maintained by the Contractor to the satisfaction of PAL's Construction Representative. Fabric should extend at least 15' past the construction limits in both directions of the track and cover all railroad ballast stone (from fence to fence, including the areas between the track).”

RJ Corman

Note: RJ Corman does not have its own Public Projects Manual but generally follows most of the same requirements as CSX.

1. Public Projects Manual: https://www.csx.com/index.cfm/library/files/about-us/property/public-project-manual
2. Clearances
    a. Vertical clearance 23.0'
    b. Horizontal clearance 25' or 18' with crash wall.
    c. Notes: *vertical measured from a point offset 6'-0" from the centerline of existing and future tracks.*
3. Drainage
    a. No additional drainage onto RR ROW
4. Fencing
    a. Partially curved fence regardless of sidewalk
    b. Minimum height 8' from deck
    c. Notes: Should extend the length of the span over the tracks
5. Right of Way
    a. Permanent Aerial Easements 5' outside bridge
    b. Permanent Easements only where structures or features touch ground
    c. Temporary Easement outside permanent easements
    d. RJ Corman/CSX will begin ROW negotiations while in design but will not sign the deeds until the construction agreement is executed
    e. Provide a CAD file of the easements along with the offer to purchase to speed up the process
    f. On the line from Louisville to Winchester (through Frankfort and Lexington), CSX owns the ROW while RJC owns the tracks. For projects on this line, the engineering is coordinated through RJC but the ROW offer is made to CSX.
6. Surveying Requirements
    a. RJC/CSX's valuation station and distance from the nearest milepost at the intersection of the centerline of track and centerline of bridge shall be shown on the general plan sheet
7. Closed Crossings
    a. If an at-grade crossing is closed and removed as part of the project then:
        i. Positive blockage must be installed, typically guardrail
        ii. RR ditches shall be restored for drainage
        iii. Notes: Include note "Grade/Restore RR Ditches for Positive Drainage (Both Sides)."

8. Flagging
    a. Flagging is included in the Construction Agreement and paid out of Utility funds, typically. Design will need to provide an estimated number of days of flagging so that RJC can include it in their estimate.
9. Notes in Plans
    a. "Temporary construction Clearance - Ensure all falsework, bracing or forms have a minimum horizontal clearance of 12 feet measured perpendicular to the centerline of the nearest track."
    b. "Means and Methods – The Contractor shall develop a detailed submission indicating the progression of work with specific times when tasks will be performed for work activities that are on or in the vicinity of the RJC property. This submission may require a walkthrough at which time RJC and/or the Representative will be present. Work will not be permitted to commence until the Contractor has provided RJC with a satisfactory plan that the project will be undertaken without scheduling, performance or safety related issues. Provide a listing of the anticipated equipment to be used, the location of all equipment to be used and ensure a contingency plan of action is in place should a primary piece of equipment malfunction. All work in the vicinity of RJC property that has the potential of affecting RJC train operations must be submitted and approved by RJC prior to work being performed. This submission will also include a detailed narrative discussing the coordination of project safety issues between Contractor, RJC and the Representative. The narrative shall address project level coordination and day to day, specific work operations including crane and equipment operations, erection plans and temporary works."
    c. "Emergency Action Plan – Submit an emergency action plan indicating the location of the site, contact numbers, access to the site, instructions for emergency response and location of the nearest hospitals. This plan should cover all items required in the event of an emergency at the site including fire suppression. Coordinate the Emergency Action Plan with the safety related discussion of the Means and Methods submission discussed above. The plan should also include a method to provide this information to each project worker for each day on site."
    d. "Demolition Procedures are required to be submitted to RJC, or the Representative, in accordance with the CSXT Construction Submission Criteria, last revised July 2017. The CSXT Construction Submission Criteria should be referred to and complied with prior to the preparation of submissions, as it contains specific requirements that could impact the Contractor's material selection and methods or operations for work near the railroad. Revisions to Contractor submissions may not be field approved. Any deviation(s) from a previously accepted plan including equipment substitutions will require a formal resubmission of the procedure for review and acceptance prior to performing

any work. A Professional Engineer in the State of Kentucky must sign and seal the plans. Up to thirty (30) days will be required to review all construction submissions. Up to an additional thirty (30) days will be required to review any subsequent submissions returned not approved."

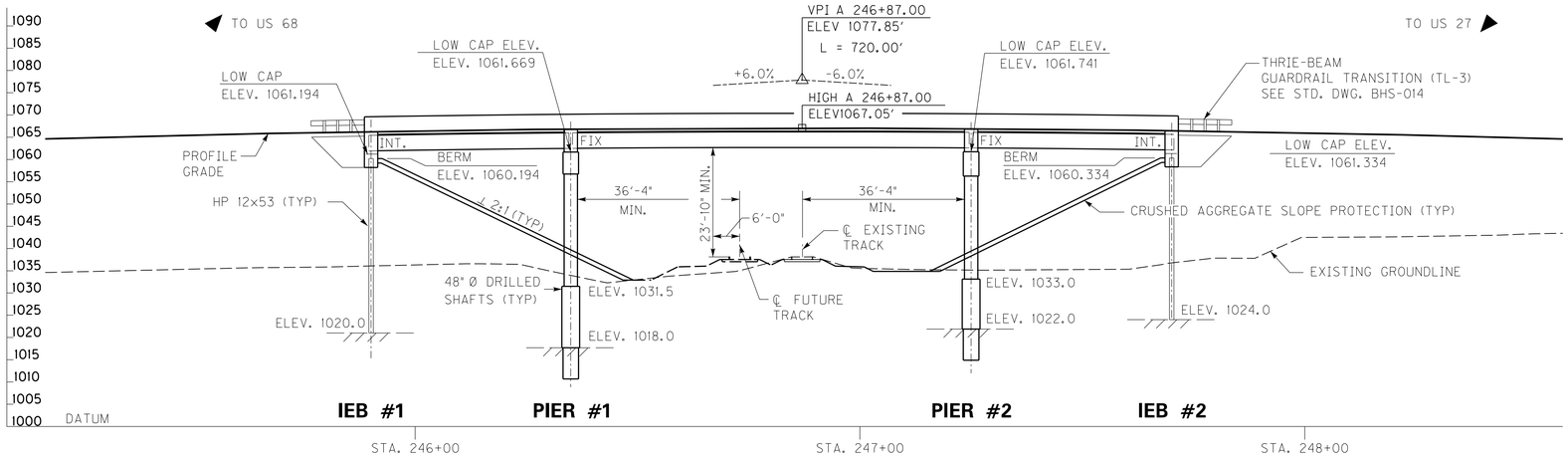
e. "Contractor shall install a non-woven geotextile fabric ballast protection system to prevent construction/demolition debris and fines from fouling the ballast. The geotextile ballast protection shall be installed and maintained by the Contractor to the satisfaction of RJC's Construction Representative. Fabric should extend at least 15' past the construction limits in both directions of the track and cover all railroad ballast stone (from fence to fence, including the areas between the track)."

Illinois Central

Note: Illinois Central (Canadian National) does not have a Public Projects Manual. Following most of CSX's guidelines is a safe assumption.

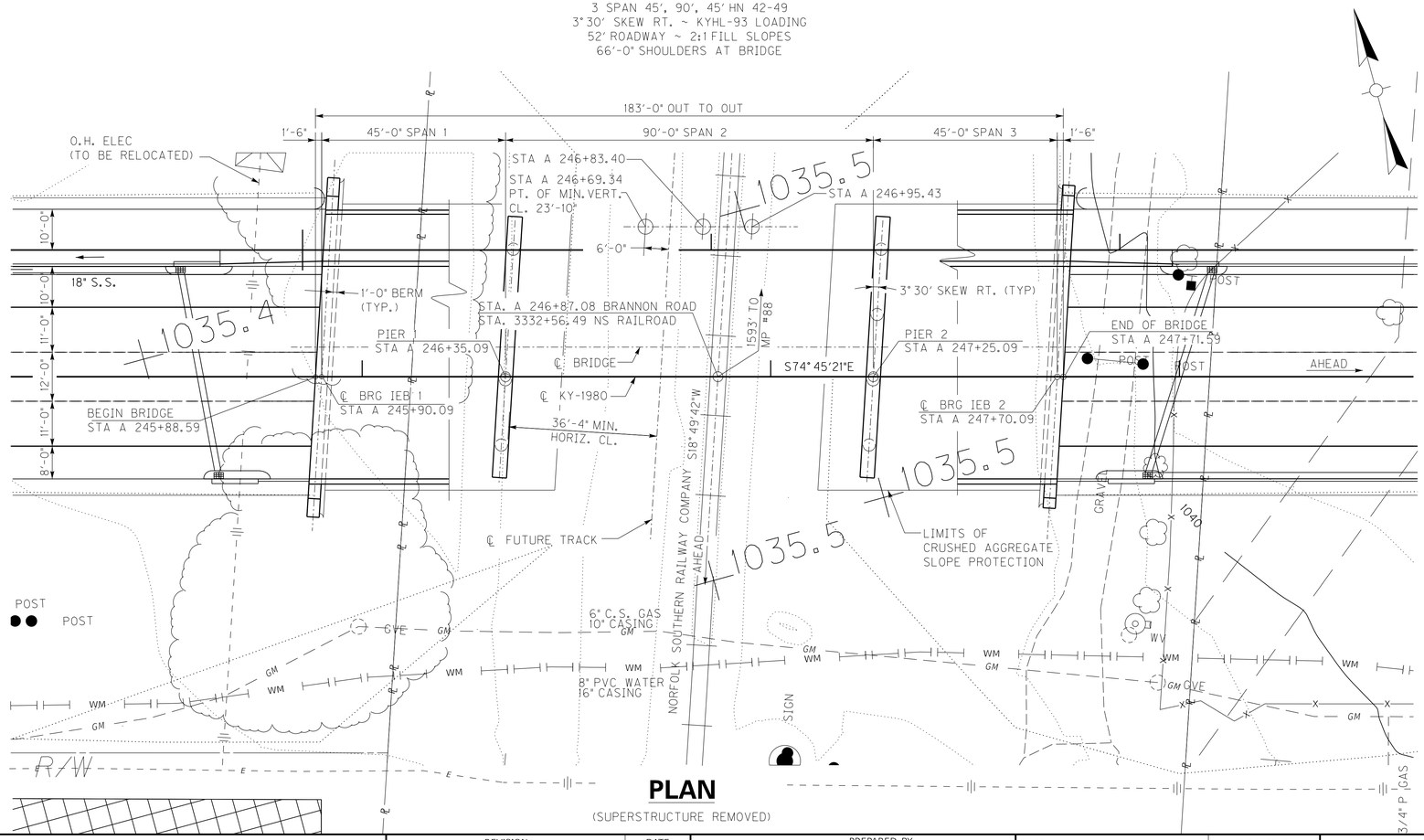
1. Public Projects Manual
    a. Not available
2. Clearances
    a. Vertical clearance 23.0'
    b. Horizontal clearance 25' or 18' with crash wall.
    c. Notes: *vertical measured from a point offset 6'-0" from the centerline of existing and future tracks.*
3. Drainage
    a. No additional drainage onto RR ROW
4. Fencing
    a. Partially curved fence regardless of sidewalk
    b. Minimum height 8' from deck
    c. Notes: Should extend the length of the span over the tracks
5. Right of Way
    a. Permanent Easements for the width of the ROW
    b. Temporary Easement outside permanent easements
    c. IC may begin ROW negotiations while in design but will not sign the deeds until the construction agreement is executed
6. Surveying Requirements
    a. IC's valuation station and distance from the nearest milepost at the intersection of the centerline of track and centerline of bridge shall be shown on the general plan sheet
7. Closed Crossings
    a. If an at-grade crossing is closed and removed as part of the project then:
        i. Positive blockage must be installed, typically guardrail
        ii. RR ditches shall be restored for drainage
        iii. Notes: Include note "Grade/Restore RR Ditches for Positive Drainage (Both Sides)."
8. Flagging
    a. Flagging is included in the Construction Agreement and paid out of Utility funds, typically. Design will need to provide an estimated number of days of flagging so that IC can include it in their estimate.
9. Notes in Plans
    a. No standard notes have been requested at this time

Exhibit A: Example NS Layout Sheet



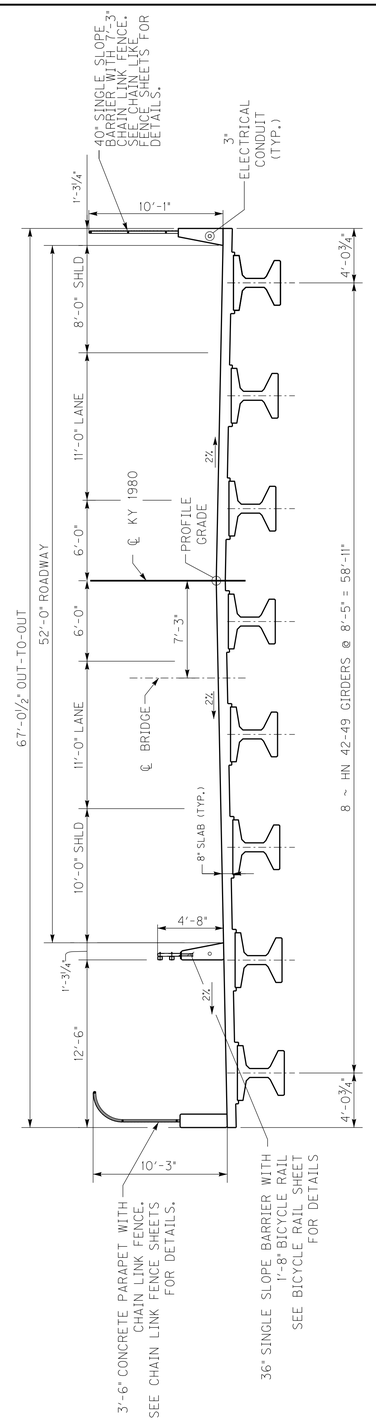
ELEVATION

3 SPAN 45', 90', 45' HN 42-49
3°30' SKEW RT. ~ KYHL-93 LOADING
52' ROADWAY ~ 2:1 FILL SLOPES
66'-0" SHOULDERS AT BRIDGE



PLAN

(SUPERSTRUCTURE REMOVED)



TYPICAL SECTION

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY. TRANSPORTATION CABINET

REVISION	DATE

PREPARED BY

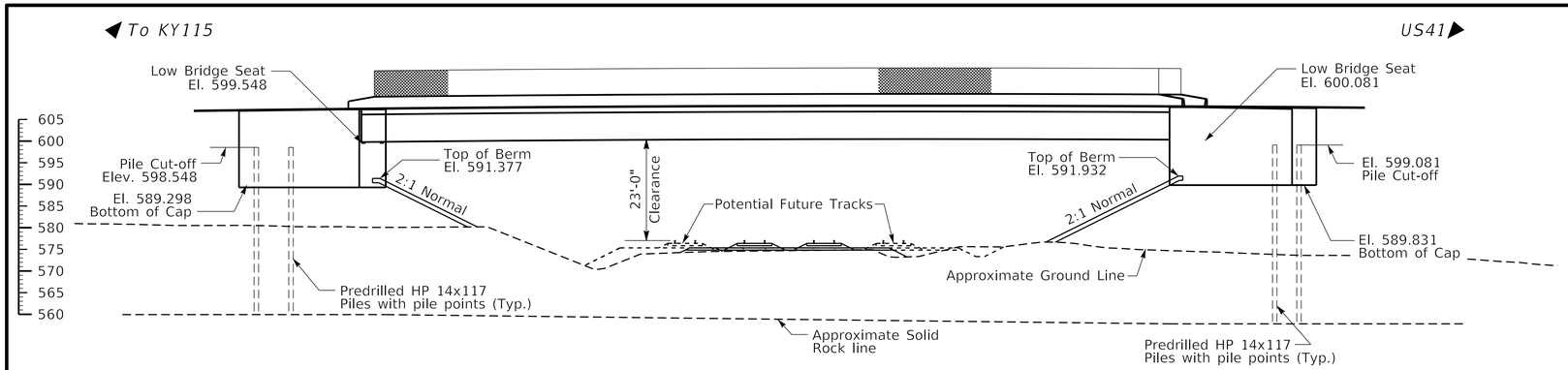
DATE:	CHECKED BY
DESIGNED BY:	
DETAILED BY:	

LAYOUT
CROSSING
NORFOLK SOUTHERN RAILROAD

ROUTE	ITEM NO.	COUNTY OF
KY-1980	7-414.00	JESSAMINE
	SHEET NO.	DRAWING NUMBER
	S3	-----

OpenRoads Designer v10.12.03.2
DATE PLOTTED: $DATE$ $TIME$
FILE: $FILE$

Exhibit B: Example CSX Layout Sheet

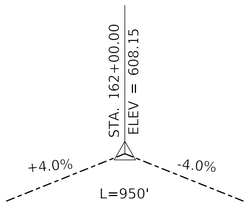


End Bent #1 fixed

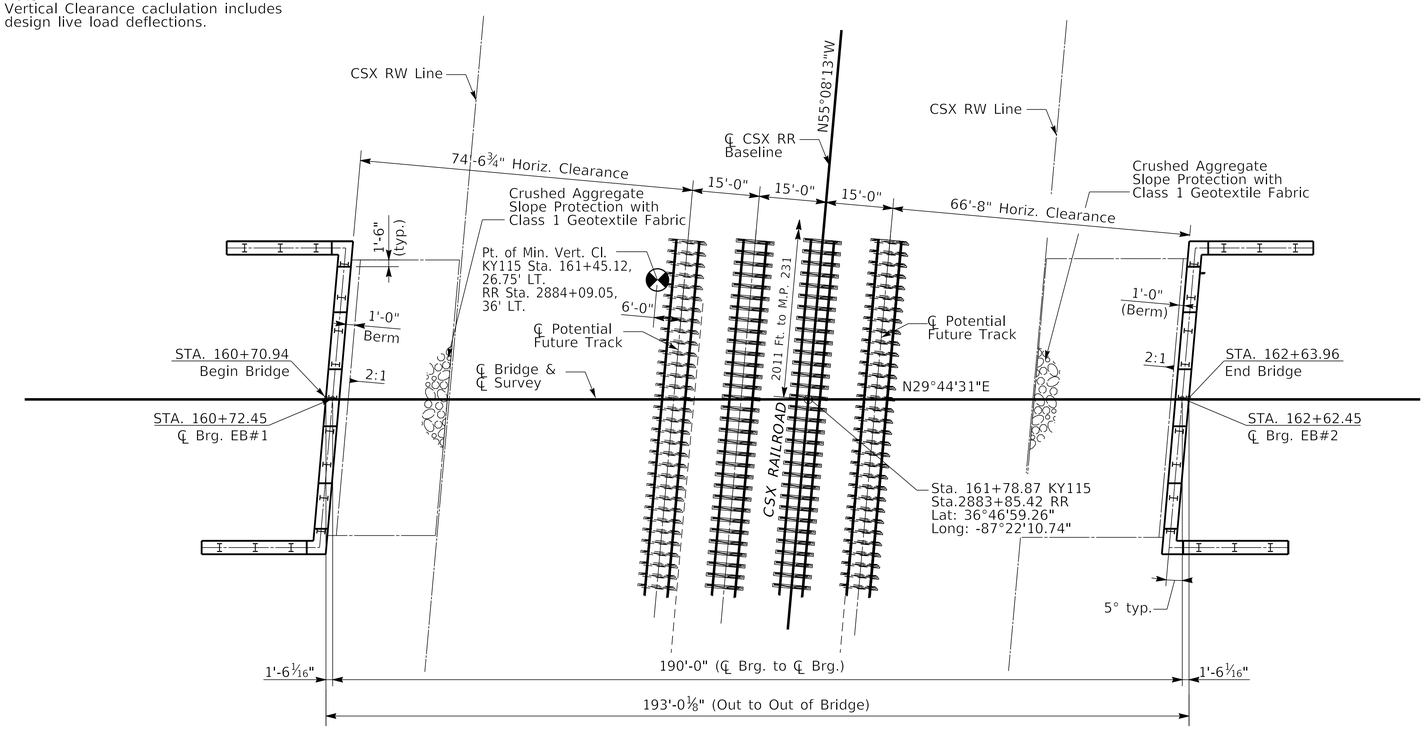
ELEVATION

190'-0" – 70" WSPG, Simple Span
KYHL-93 Live Load ~ 5° Skew Rt.
56'-0" Bridge Roadway Width ~ 2:1 Fill Slopes

End Bent #2 Expansion

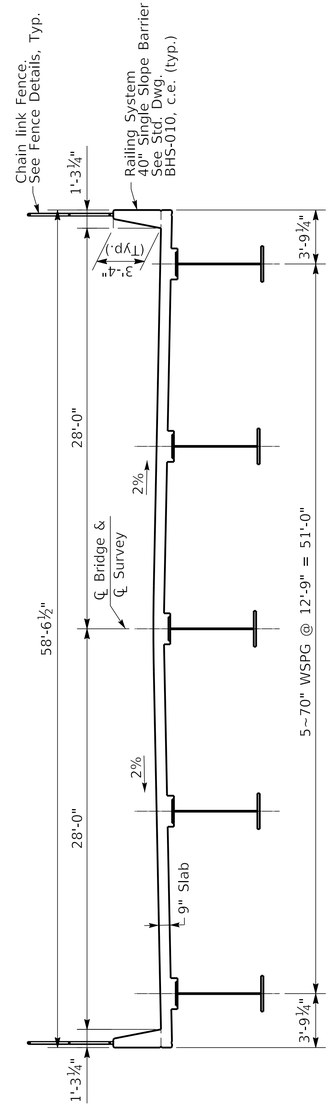


Note:
Vertical Clearance caclulation includes design live load deflections.



PLAN

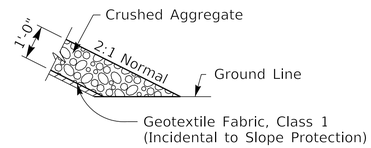
~Superstructure not shown~



TYPICAL SECTION

Notes:
1.) Roadway guardrail is to attach to bridge barriers. See Roadway Plans.

2.) For end bent backfill and method of constuction see Special Provision 69. All geotextile fabric, if required, is incidental to the structure granular backfill.



TOE OF SLOPE DETAILS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
KENTUCKY TRANSPORTATION CABINET

REVISION	DATE

PREPARED BY
Division of Structural Design

DATE:	CHECKED BY
DESIGNED BY:	
DETAILED BY:	

LAYOUT
CROSSING
CSX RAILROAD

ROUTE	ITEM NO.	COUNTY OF
NEW CONNECTOR	2-381.20	CHRISTIAN
	SHEET NO. S4	DRAWING NUMBER 28772

MicroStation v10.16.3.31
DATE PLOTTED: 20-JUL-2023

Exhibit C: Example NS Comment Spreadsheet

STV Incorporated

STV File	4019903-2432	**Location**	Devon, KY
NS File	BR0003990	**Project**	Widen Mt. Zion Rd (KY-536) Bridge over NS
MP	14.21 CNO&TP	**Submittal**	Fianl Plans
Reviewed By:			Salome Uwizerimana, P.E.
Verified By:			George T. Zimmerman, P.E.

ITEM NO.	SHEET/ CALC	Date	COMMENT	STATUS
STATUS LEGEND			Previously CLOSED	
			Status Changed/Conforms as Noted	
			OPEN	
1	General	1/20/2021	The project plans have been distributed internally to various departments. As soon as Norfolk Southern (NS) receives comments from all involved departments, NS will advise. In the interim, NS offers the following comments from the Engineering Department. These interim review comments should not be construed as project approval.	**CLOSED**
		1/20/2021	**Communications & Signals Departments: There is a NS detector service meter located 100 feet north of the KY 536. There shall be protection for power cabling. Power shall not be cut off for any extended period of time.**	
2	Sheet S2	1/20/2021	Note on utility installations/relocation shall be revised to remove "AECOM" and states the following: "All utility installations or relocations on Norfolk Southern right-of way that are required in conjunction with this project can be installed or relocated as part of the project provided the construction is performed by the project contractor or project contractor's sub-contractor. However, the utility must submit an application for the installation or relocation for appropriate handling for license agreement and applicable fees. For utility applications go to: www.nscorp.com > Real estate > NS Services > Wire, Pipeline, and Fiber Optics Projects. Note: License agreement must be executed prior to utility being installed or relocated."	**CLOSED**
		2/12/2021	***RESPONSE: The note has been changed. The untility companies will be securing their own crossing permits.***	
		2/24/2021	**STV RESPONSE: No exception taken.**	

1201 PEACHTREE ST. NE, SUITE 1550, BLDG. 400
ATLANTA, GA 30361
(678) 735-7650

Exhibit C: Example NS Comment Spreadsheet

STV Incorporated

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NS File	BR0003990	**Project**	Widen Mt. Zion Rd (KY-536) Bridge over NS
MP	14.21 CNO&TP	**Submittal**	Fianl Plans
Reviewed By:			Salome Uwizerimana, P.E.
Verified By:			George T. Zimmerman, P.E.

ITEM NO.	SHEET/ CALC	Date	COMMENT	STATUS
3	General	1/20/2021	When the proposed construction will increase the quantity and/or character of flow for drainage on the right-of-way, drainage plans and calculations showing the change in drainage flowing into the Norfolk Southern ditches and on the right-of-way should be provided for review. The calculations should be based on a 100-year storm event in accordance with the Norfolk Southern Public Projects Manual. Any increase in quantity or rate of flow should be mitigated either by improvements to the Norfolk Southern ditches and under track drainage structures, or by directing the flow away from the Railway's right-of-way. If the proposed project will not change the quantity and/or character of flow on the Railway's right-of-way or in the ditches and drainage structures, the plans shall include a general note stating this.	**CLOSED**
		2/12/2021	***RESPONSE: Note added to the roadway plan sheets R4A and R5 stating that "The quantity and/or character of flow to the Railroad Right of Way will not be increased by this project"***	
		2/24/2021	**STV RESPONSE: No exception taken.**	
4	General	1/20/2021	Permanent and/or temporary easements will be needed for all permanent facilities or access to facilities located on, over, under or adjacent to the NS right-of-way. All proposed easements should be shown on the plans - whether temporary or permanent. Temporary and Permanent Easements are to be handled by NS Real Estate - Engineering Department, and are NOT to be construed as being granted by the Project Construction Agreement. Plans and Documents in accordance with the NS Real Estate Requirements shall be submitted to the Real Estate Department for review and handling of appropriate Real Estate Agreements.	**CLOSED**
		2/12/2021	***RESPONSE: Existing and Proposed easements are shown on the Roadway Plan Sheets R4A and R5***	
		2/24/2021	**STV RESPONSE: No exception taken. We note that proposed easements are to be handled by NS Real Estate**	

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Verified By:			George T. Zimmerman, P.E.

ITEM NO.	SHEET/ CALC	Date	COMMENT	STATUS
5	General	1/20/2021	The Norfolk Southern (NS) track should be represented by a single centerline. The individual rails should not be shown on the plan views	CLOSED
		2/12/2021	***RESPONSE: The tracks shown have been replaced with a single centerline.***	
		2/24/2021	**STV RESPONSE: No exception taken.**	
6	General	1/20/2021	The right-of-way lines should be clearly shown. The track shall be called out as Norfolk Southern Railway Company and right-of-way should be called out as CN&TP .	CLOSED
		2/12/2021	***RESPONSE: The ownership will be modified on the Roadway plan sheet***	
		2/24/2021	**STV RESPONSE: The track and right of way lines shall be labeled on the final signed and sealed plans.**	
		3/18/2021	**STV RESPONSE: The track and right of way lines have be labeled on the final plans.**	
7	General	1/20/2021	A protective fence shall be installed extending to the NS right-of-way lines, then entire length of the span over the tracks or 25 feet beyond the centerline of the outermost track, whichever is greater. For further details, refer to Typical Drawing No. 3 – Overhead Bridge Details – Bridge Fencing, in the Public Project Manual. (Any fence placed on the NS right of way shall be 10 feet high.)	CLOSED
		2/12/2021	***RESPONSE: It has been changed.***	
		2/24/2021	**STV RESPONSE: No exception taken.**	
8	General	1/20/2021	No bridge scuppers or other deck drains, roadway drainage, catch basins, inlets or outlets are permitted to drain onto Railway property from overhead bridge structures. Drainage from bridge scuppers and deck drains must be conveyed through pipes, preferably to a point off Railroad property. All handling shall be in keeping with requirements of NS "Overhead Grade Separation Design Criteria".	CLOSED
		2/12/2021	***RESPONSE: We removed all new bridge downspout drains.***	
		2/24/2021	**STV RESPONSE: No exception taken.**	

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NS File	BR0003990	**Project**	Widen Mt. Zion Rd (KY-536) Bridge over NS
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Reviewed By:			Salome Uwizerimana, P.E.
Verified By:			George T. Zimmerman, P.E.

ITEM NO.	SHEET/ CALC	Date	COMMENT	STATUS
9	General	2/24/2021	Final plans shall be signed and sealed by a registered engineer licensed in the state of the project work.	**CLOSED**
		3/18/2021	***RESPONSE: Stamped Roadway plans submitted. Final Structure plans are submitted without PE stamp per Mr. Chamber's 3/18/21 email.***	
		3/18/2021	**STV RESPONSE:No exception taken.**	

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Exhibit D: Example CSX Comment Spreadsheet

benesch

Submittal / Plan Review Comments

Project Location:	Pembroke, Christian County, KY	**AAR/DOT No.:**	TBA
Project Description:	New Bridge Construction - Pembroke Connector over CSX	**Milepost:**	00H-230.62
Agency Reference:	KYTC Item No. 02-381.00	**Zone:**	Nashville
Benesch PM Name:	Wayne Bolen	**Subdivision:**	Henderson
Benesch Project No:	00211903.01	**CSXT OSP#:**	KY0489
Date of CSX Comments:	July 17, 2023	**Date of Agency Responses:**	

1) - To Be Completed By Reviewer							*2) - To Be Completed by Responder / Agency*	*3) - To Be Completed By Reviewer*	
Item No.	**Date**	**Reference: Page, Report Section, or Drawing No**	**Reviewer/Host Engineer or Engineer/Firm**	**Review Comment**	**Comment Type (see notes below)**	**Responsible Responder / Agency**	**Responder / Agency Response**	**Reviewer originating the comment enters either: Accept or Reject (provide reason for reject).**	**Open/Closed**
1	10/17/2022	GD&S Plans - Sheet R15	Wayne Bolen/Benesch	CSX's valuation station and distance from the nearest milepost at the intersection of the centerline of track and centerline of the bridge shall be shown on the general plan sheet.	2	KYTC	Please see new sheet R20A which depicts the CSX valuation station and distances requested.	Accept	Closed
2	10/17/2022	GD&S Plans - Sheet R15	Wayne Bolen/Benesch	According to CSX's Overhead Bridge Criteria, drainage from the bridge shall drain away from CSX's Right-of-way. The proposed ditches on the west side of CSX indicate drainage is directed into CSX's ditchline.	1	KYTC	Proposed ditches near the west side bridge abutment have been eliminated. No proposed ditches are directed into CSX ditchlines. Proposed bridge drainage is routed to the south east for the west abutment and will drain to the east exiting the proposed roadway right of way into Hopkinsville Industrial Park Property.	See Comment #9.	Open
3	10/17/2022	GD&S Plans - Sheet R16	Wayne Bolen/Benesch	The proposed minimum horizontal and vertical clearances shall be marked on the general plan sheet.	2	KYTC	Please see new sheet R20A which depicts the vertical clearance requested. Please see sheet R16 with CSX ROW shown inside the face of pier. Attached structure plans show new minimum vertical clearance of 23'-0" for a potential future track. Sheet R20A has also been changed with the bridge revision	Accept	Closed
4	10/17/2022	GD&S Plans - Sheet R31	Wayne Bolen/Benesch	CSX's valuation station and distance from the nearest milepost at the intersection of the centerline of track and centerline of the bridge shall be shown on the general plan sheet. The stationing identfied on this plan sheet is not a CSX Valuation Station.	2	KYTC	Please see new sheet R20A which depicts the CSX valuation station and distances requested.	Accept	Closed
5	10/17/2022	GD&S Plans - Sheet R36	Wayne Bolen/Benesch	CSX's valuation station and distance from the nearest milepost at the intersection of the centerline of track and centerline of the bridge shall be shown on the general plan sheet. The stationing identfied on this plan sheet is not a CSX Valuation Station.	2	KYTC	Please see new sheet R20A which depicts the CSX valuation station and distances requested.	Accept	Closed
6	10/17/2022	General	Wayne Bolen/Benesch	When available please share the proposed structure plans during the next submittal.	2	KYTC	Structure plans are attached.	Accept	Closed
7	3/8/2023	General	Benesch	Proposed bridge structure shall clear span the CSX right-of-way. Show / label / dimension the piers relative the CSX right-of-way lines.	2	KYTC	Sheet R20 has been updated to show the CSX right-of-way and priers. This is also shown dimensioned on the structural sheet.	Accept	Closed
8	3/8/2023	General	Benesch	CSX Public Projects Department FINAL acceptance of AGENCY project plans is subject to AGENCY satisfying the CSX Real Estate Department real estate / property rights requirements. Please advise status of KYTC coordination status with CSX Real Estate.	2	KYTC	ROW offer has been submitted into the Porperty Portal.	Accept	Closed
9	**6/22/2023**	**GD&S Plans - Sheet R15, R20A / Structure Plans - Sheet S7**	**Wayne Bolen/Benesch**	**Sheet R15 & R20A shows 18" pipe/drainage ditch exiting CBI#1 in the SE quadrant and CBI#2 tied into this drainage system. However, Sheet S7 on the structure plans show CBI#2 with it's own pipe and drainage ditch on SW quadrant. Both pipes show drainage from the south end of the structure is being diverted to the CSX ditch line (stone blanket / drainage leader arrows). According to CSX's Overhead Bridge Criteria, drainage from the bridge shall drain away from CSX's Right-of-way. This design indicates drainage is being diverted to the CSX property.**	**2**	**KYTC**	Our geotech had used old plan sheets for sheets S5,S6, and S7. These plan sheets have been updated using the latest roadway sheets to match what is currently being proposed regarding drainage.		

Exhibit D: Example CSX Comment Spreadsheet

benesch

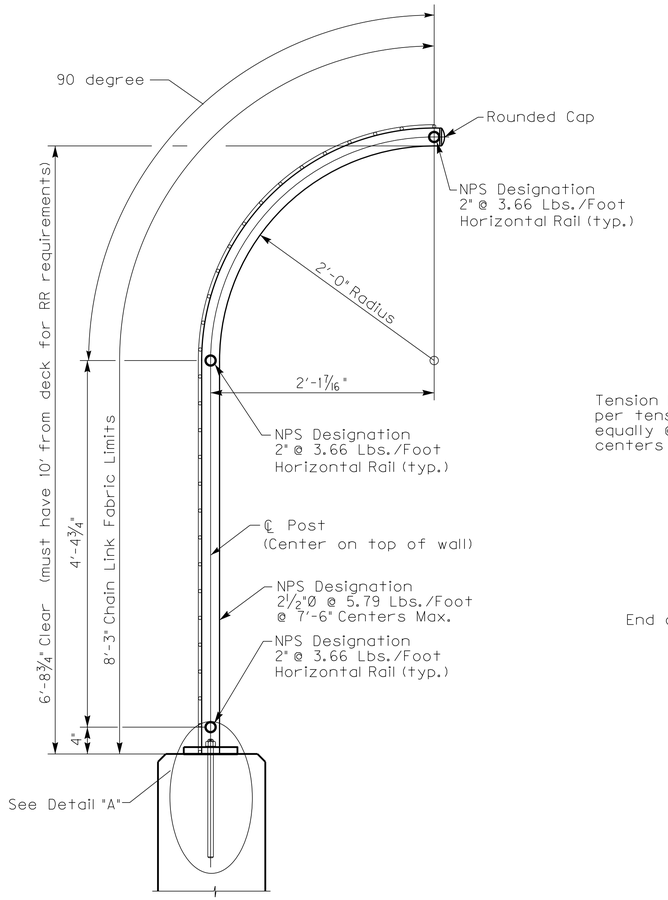
Submittal / Plan Review Comments

Project Location:	Pembroke, Christian County, KY	**AAR/DOT No.:**	TBA
Project Description:	New Bridge Construction - Pembroke Connector over CSX	**Milepost:**	00H-230.62
Agency Reference:	KYTC Item No. 02-381.00	**Zone:**	Nashville
Benesch PM Name:	Wayne Bolen	**Subdivision:**	Henderson
Benesch Project No:	00211903.01	**CSXT OSP#:**	KY0489
Date of CSX Comments:	July 17, 2023	**Date of Agency Responses:**	

1) - To Be Completed By Reviewer							*2) - To Be Completed by Responder / Agency*	*3) - To Be Completed By Reviewer*	
Item No.	**Date**	**Reference: Page, Report Section, or Drawing No**	**Reviewer/Host Engineer or Engineer/Firm**	**Review Comment**	**Comment Type (see notes below)**	**Responsible Responder / Agency**	**Responder / Agency Response**	**Reviewer originating the comment enters either: Accept or Reject (provide reason for reject).**	**Open/Closed**
10	6/22/2023	Structure Plans - Sheet S2	Wayne Bolen/Benesch	Please update the specification date for CSX's Construction Submission Criteria under the RR General Notes section. The new date should be May 2023.	2	KYTC	Specification date is updated to May 2023. It appears the appendix was not updated so those sections maintained the date they had before in the bridge plans.		
11	6/22/2023	Structure Plans - Sheet S2	Wayne Bolen/Benesch	Remove the CSX Railroad Contact from the General Notes page. Brad Armstrong, located in Covington KY, now handles Kentucky public projects. The RR Specifications make reference to the CSX	2	KYTC	CSX Contact removed.		
12	6/22/2023	Structure Plans - Sheet S2	Wayne Bolen/Benesch	Remove the following comment from the RR General Notes page. Due to the design, we do not forsee Cofferdams & Dewatering as a requirement. COFFERDAMS/SHORING ADJACENT TO RAILROAD TRACKS: Cofferdams and/or dewatering methods will be required to facilitate foundation construction of pile caps. Temporary slopeing, sheetings, and/or shoring may be required tfor installation of the pile caps. All costs associated with cofferdams and/or dewatering methods shall be included in Foundation Preparation Bit Item.	2	KYTC	Note as indicated to the left has been removed. We left the section regarding excavation, etc. next to RR tracks just in case the contractor has to do so.		
13		General	Shaw/Benesch	Please provide latitude and longitude of intersection of tracks and proposed overhead bridge.	2	KYTC	Added to plans.		
14		General	Shaw/Benesch	CSX Public Projects Department FINAL acceptance of Agency project plans is subject to Agency satisfying the CSX Real Estate Department real estate / property rights requirements.	2	KYTC	acknowledged		
15		General	Shaw/Benesch	See and address July 17, 2023 email comments #2 through #6.	2	KYTC	addressed in email body		

Comment Types:	1 - Requires response and/or correction before acceptance (cause for rejection of current submittal until resolved) 2 - Requires response during next phase of the project (accepted as noted) 3 - Editorial comment - does not require response (accepted)

Exhibit E: Example Fence Detail Sheets

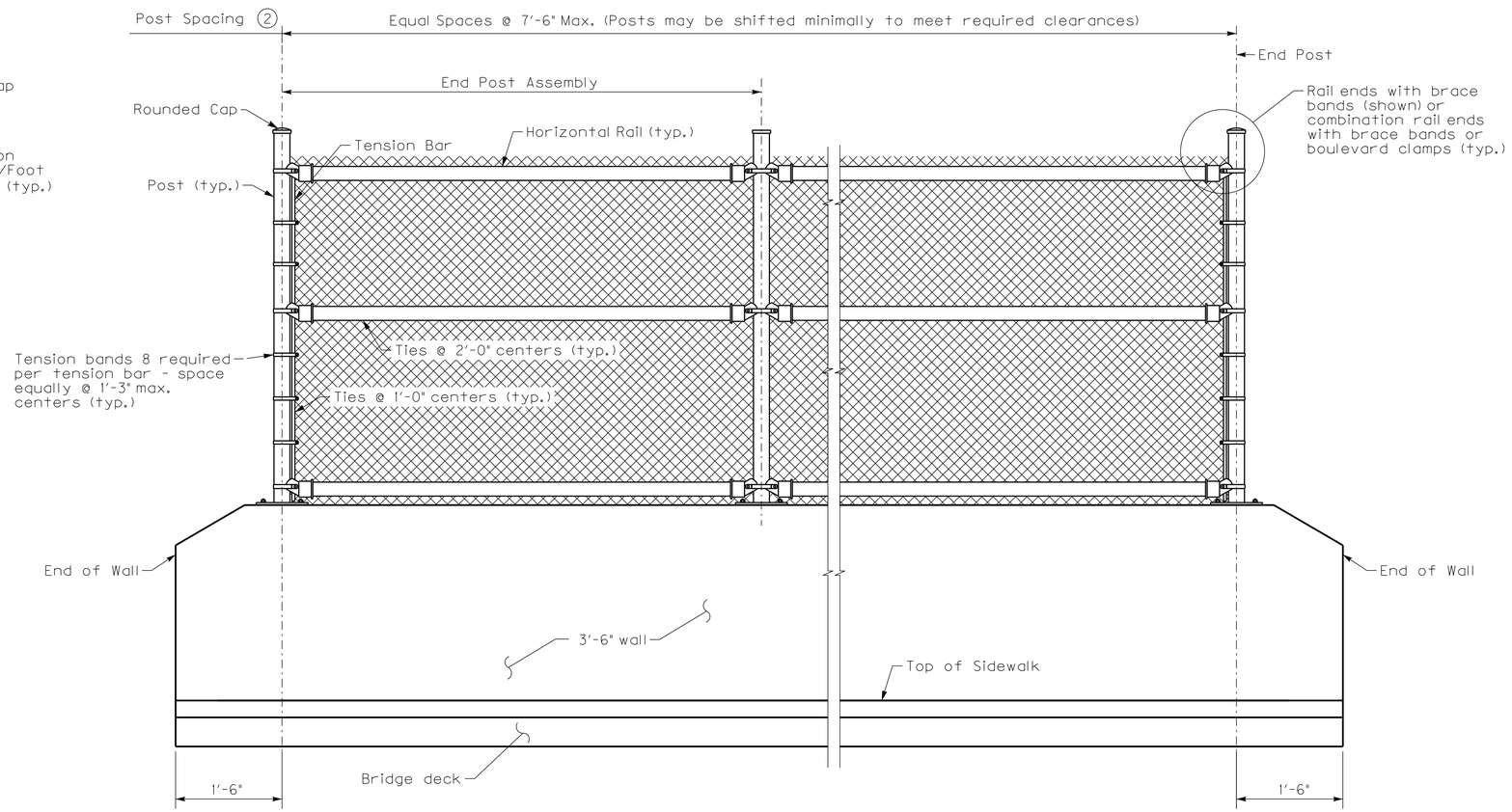


LEFT PLINTH

Note that we need at least 10'-0" clear from top of deck.
Other dimensions may need to vary from drawing minimally.

TYPICAL SECTION

(1) Do not anchor chain link fabric to top of traffic railing.



ELEVATION

FENCING NOTES

FENCE INSTALLATION:
Install posts plumb (within a tolerance of 1" ±). Use shim plates as required to achieve plumb. The required quantity and thickness of shim plates will be determined in the field. Install chain link fence in accordance with ASTM F567 as applicable.

LIMITS OF FENCING:
Limits of fencing are from end of bridge to end of bridge.

PAYMENT:
Payment at the contract unit price for "Fence-7 ft Chain Link" includes full payment for posts, horizontal and expansion rails, brace bands, rail ends, combination rail ends, boulevard clamps, chain link fabric, ties, tension bars and bands, post and loop caps, base plates, anchor rods, bolts, nuts, washers, shim plates, neoprene pads, miscellaneous fence fittings and hardware and all incidental materials and labor required to complete installation of the fencing.

CROSS REFERENCE:
For Table of Fence Components and Pull Post Assembly Detail see next sheet.
For Table of Post Attachment Components and Detail "A" see next sheet.

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
KENTUCKY TRANSPORTATION CABINET

REVISION	DATE

PREPARED BY
Division of Structural Design

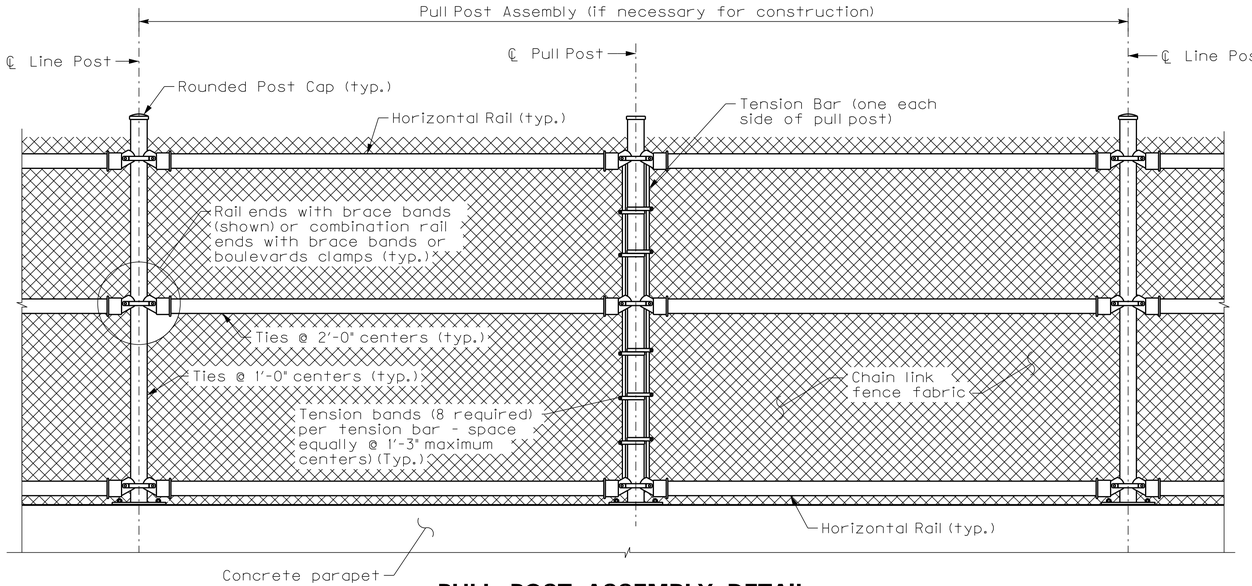
DATE:	CHECKED BY
DESIGNED BY:	
DETAILED BY:	

CHAIN LINK FENCE
CROSSING: Norfolk Southern Railroad

ROUTE	ITEM NO.	COUNTY OF
KY 635	8-9010.00	PULASKI
	SHEET NO.	DRAWING NUMBER
	S24	28676

MicroStation v10.16.3.31
DATE PLOTTED: 20-DEC-2023

Exhibit E: Example Fence Detail Sheets



PULL POST ASSEMBLY DETAIL

(if necessary)

TABLE OF POST ATTACHMENT COMPONENTS (3) (4)		
COMPONENT	ASTM DESIGNATION	COMPONENT INFORMATION
Base Plates	A36 or A709 Grade 36	5/8" Steel PL
Shim Plates	A36 or A709 Grade 36	Plate thicknesses as required, Holes in shim plates will be 1" Ø
Adhesive Anchor Rods	F1554 Grade 36	Fully threaded Headless Anchor Rods ~ 7/8" Ø x 14 1/2"
C-I-P Anchor Rods	F1554 Grade 36	Hex Head Anchor Rods ~ 7/8" Ø x 14 1/2"
Nuts	A563	Hex Nuts for Base Plate Connections
Washers	F436	Flat Washers for Base Plate Connections
Bearing Pads (Plain Neoprene)	-	In Accordance with AASHTO Grade 50 Durameter Polychloroprene.

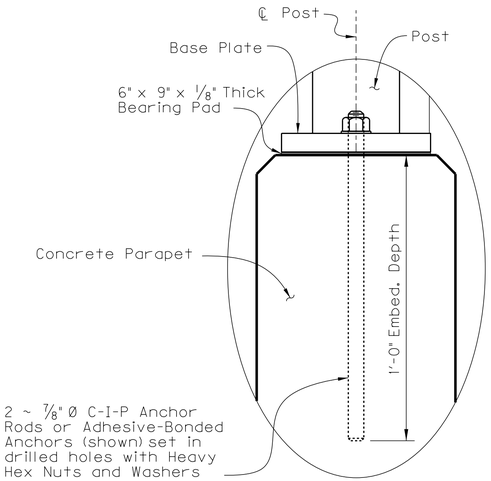
POST ATTACHMENT NOTES

ANCHOR RODS, NUTS AND WASHERS:
After the nuts have been tightened, distort the Anchor Rod threads to prevent removal of the nuts. Coat distorted threads and exposed trimmed ends of anchors with a galvanizing compound in accordance with Specification Section 821.

COATINGS:
Hot-dip galvanize all Nuts, Washers, Bolts, C-I-P Anchor Rods, Adhesive Anchors and Fence Framework (Posts, Internal Sleeves, Shim Plates and Base Plates) in accordance with Specification Section 816.04.01. Hot-dip galvanize Fence Framework after fabrication.

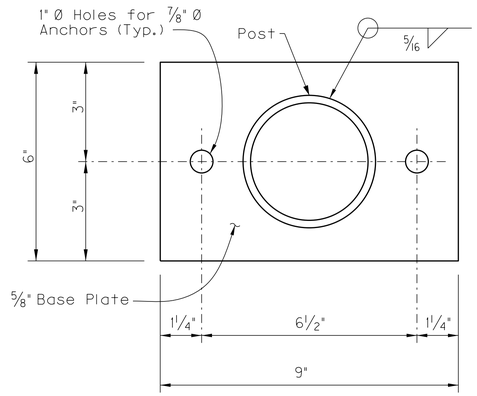
ADHESIVE-BONDED ANCHORS AND DOWELS:
Adhesive Bonding Material Systems for Anchors and Dowels will be selected from the Kentucky Division of Materials pre approved list. Adhesive bonding material system shall comply with Manufacturer Specifications. Adhesive bonded anchors shall be tested per the manufacturers specifications to 11.0 kips pull out strength and be installed in accordance with manufacturers specifications. Cutting of reinforcing steel is permitted for drilled hole installation.

WELDING:
All welding will be in accordance with the American Welding Society Structural Welding Code (Steel) ANSI/AWS D1.1 (current edition). Weld metal will be E60XX or E70XX. Nondestructive testing of welds is not required.



DETAIL "A"

CROSS REFERENCE:
For location of Detail "A" see previous sheet.



BASE PLATE DETAIL

TABLE OF CHAIN LINK FENCE COMPONENTS (3) (4)		
COMPONENT	ASTM DESIGNATION	COMPONENT INFORMATION
Posts	F1083	Galvanized Steel Pipe - 2 1/2" NPS (5.79 lbs/ft.), Schedule 40 Regular Grade
Horizontal Rails	F1083	Galvanized Steel Pipe - 2" NPS (3.66 lbs/ft.), Schedule 40 Regular Grade
Chain Link Fabric (2" mesh with twisted top and knuckled bottom selvage)	A392	Polyvinyl Chloride (PVC) Coated Steel Type IV - No. 9 gauge zinc coated wire (coated wire diameter), Class 2 Coating
Tie Wires	F626	Zinc Coated Steel Wire - 9 gauge
Brace Bands	F626	12 Gage (Min. thickness) x 3/4" (Min. width) Steel Bands (Beveled or Heavy)
Tension Bars	F626	3/16" (Min. thickness) x 3/4" (Min. width) x Variable Height Steel Bars ~ Height = as necessary
Tension Bands	F626	14 Gage (Min. thickness) x 3/4" (width) Steel Bands
Miscellaneous Fence Components	F626	Zinc Coated Steel ~ (includes post or loop caps, horizontal and brace rail ends, combination rail ends, boulevard clamps and all other miscellaneous fittings and hardware)

NOTES:
1. For treatment at the bridge ends, see previous sheet.
2. Contractor may add additional pull posts as needed.
3. For additional information see section 721 of the Standard Specifications for Road and Bridge Construction Current Edition.
4. Vinyl coat all materials used in the fabrication of the bridge fence in accordance with AASHTO standard specification M181, current edition. Color of the coating to be dark green.
5. After the installation of the chain link fence, clean any damaged areas of the fence components by washing with mineral spirit solvent sufficient to remove any contaminents. After cleaning, apply a vinyl washing primer to the surfaces with dry film thickness of 0.3 mil to 0.5 mil before the final vinyl finish coat is applied. Incidental to the cost of the fence.

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

LEGEND: NCA = Normal Crown Axis

KENTUCKY TRANSPORTATION CABINET

REVISION	DATE

PREPARED BY
Division of Structural Design

DATE:	CHECKED BY
DESIGNED BY:	
DETAILED BY:	

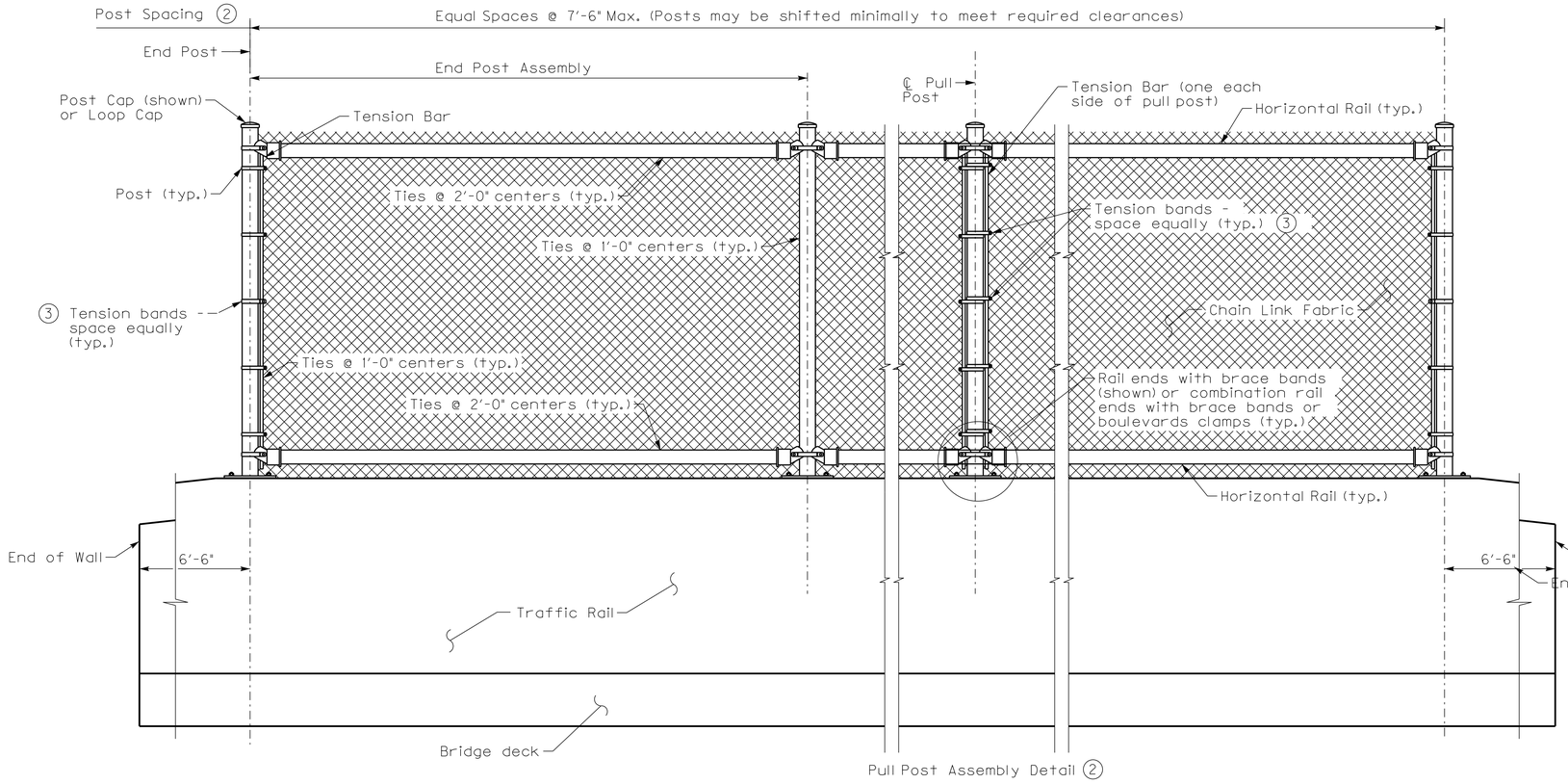
CHAIN LINK FENCE
CROSSING
Norfolk Southern Railroad

ROUTE	ITEM NO.	COUNTY OF
KY 635	8-9010.00	PULASKI
	SHEET NO. S25	DRAWING NUMBER 28676

MicroStation v10.16.3.31

DATE PLOTTED: 20-DEC-2023

Exhibit E: Example Fence Detail Sheets

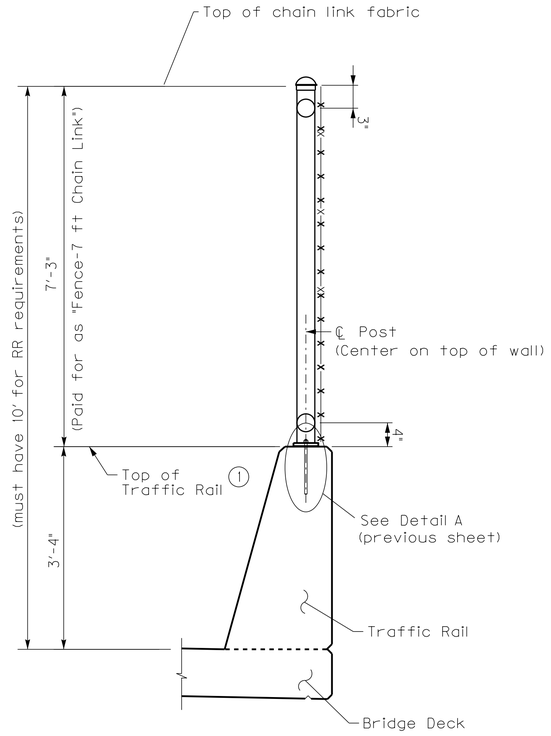


Pull Post Assembly Detail (2)

ELEVATION OF OUTSIDE FACE OF PARAPET

(2) Use pull post assembly as necessary.

(3) 7 tension bands required per tension bar for 7'-3" fence.



TYPICAL SECTION

(1) Do not anchor chain link fabric to top of traffic railing.

FENCING NOTES

FENCE INSTALLATION:
Install posts plumb (within a tolerance of 1" ±). Use shim plates as required to achieve plumb. The required quantity and thickness of shim plates will be determined in the field. Install chain link fence in accordance with ASTM F567 as applicable.

LIMITS OF FENCING:
Limits of fence are from end to end of bridge at left and right fascia of bridge.

PAYMENT:
Payment at the contract unit price for "Chain Link Fence 7 Ft." includes full payment for posts, horizontal and expansion rails, brace bands, rail ends, combination rail ends, boulevard clamps, chain link fabric, ties, tension bars and bands, post and loop caps, base plates, anchor rods, bolts, nuts, washers, shim plates, neoprene pads, miscellaneous fence fittings and hardware and all incidental materials and labor required to complete installation of the fencing.

CROSS REFERENCE:
For Table of Fence Components see next sheet .
For Table of Post Attachment Components and Detail "A" see previous sheet.

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
KENTUCKY TRANSPORTATION CABINET

REVISION	DATE

PREPARED BY
Division of Structural Design

DATE:	CHECKED BY
DESIGNED BY:	
DETAILED BY:	

CHAIN LINK FENCE
CROSSING
Norfolk Southern Railroad

ROUTE	ITEM NO.	COUNTY OF
KY 635	8-9010.00	PULASKI
	SHEET NO.	DRAWING NUMBER
	S26	28676

MicroStation v10.16.3.31
DATE PLOTTED: 20-DEC-2023

Exhibit E: Example Fence Detail Sheets

TABLE OF CHAIN LINK FENCE COMPONENTS (1) (2)		
COMPONENT	ASTM DESIGNATION	COMPONENT INFORMATION
Posts	F1083	Galvanized Steel Pipe - 2½" NPS (5.79 lbs/ft.), Schedule 40 Regular Grade
Chain Link Fabric (2" mesh with twisted top and knuckled bottom selvage)	A392	Polyvinyl Chloride (PVC) Coated Steel Type IV - No. 9 gauge zinc coated wire (coated wire diameter), Class 2 Coating
Tie Wires	F626	Zinc Coated Steel Wire - 9 gauge
Brace Bands	F626	12 Gage (Min. thickness) x ¾" (Min. width) Steel Bands (Beveled or Heavy)
Tension Bars	F626	3/16" (Min. thickness) x ¾" (Min. width) x Height of fence
Tension Bands	F626	14 Gage (Min. thickness) x ¾" (Min. width) Steel Bands
Miscellaneous Fence Components	F626	Zinc Coated Steel ~ (includes post or loop caps, horizontal and brace rail ends, combination rail ends, boulevard clamps and all other miscellaneous fittings & hardware)
Horizontal Rails	F1083	Galvanized Steel Pipe - 2" NPS (3.66 lbs/ft.), Schedule 40 Regular Grade

TABLE OF POST ATTACHMENT COMPONENTS (1) (2)		
COMPONENT	ASTM DESIGNATION	COMPONENT INFORMATION
Base Plates	A36 or A709 Grade 36	⅝" Steel PL
Shim Plates	A36 or A709 Grade 36	Plate thicknesses as required; Holes in shim plates will be 1" Ø
Adhesive Anchor Rods	F1554 Grade 36	Fully threaded Headless Anchor Rods ~ ⅞" Ø x 14½"
C-I-P Anchor Rods	F1554 Grade 36	Hex Head Anchor Rods ~ ⅞" Ø x 14½"
Nuts	A563	Hex Nuts for Base Plate Connections
Washers	F436	Flat Washers for Base Plate Connections
Bearing Pads (Plain Neoprene)	-	In accordance with AASHTO Grade 50 Durameter Polychloroprene

POST ATTACHMENT NOTES

ANCHOR RODS, NUTS AND WASHERS:
After the nuts have been tightened, distort the Anchor Rod threads to prevent removal of the nuts. Coat distorted threads and exposed trimmed ends of anchors with a galvanizing compound in accordance with Specification Section 821.

COATINGS:
Hot-dip galvanize all Nuts, Washers, Bolts, C-I-P Anchor Rods, Adhesive Anchors and Fence Framework (Posts, Internal Sleeves, Shim Plates and Base Plates) in accordance with Specification Section 816.04.01. Hot-dip galvanize Fence Framework after fabrication.

ADHESIVE-BONDED ANCHORS AND DOWELS:
Adhesive Bonding Material Systems for Anchors and Dowels will be selected from the Kentucky Division of Materials pre approved list. Adhesive bonding material system shall comply with Manufacturer Specifications. Adhesive bonded anchors shall be tested per the manufacturers specifications to 11.0 kips pull out strength and be installed in accordance with manufacturers specifications. Cutting of reinforcing steel is permitted for drilled hole installation.

WELDING:
All welding will be in accordance with the American Welding Society Structural Welding Code (Steel) ANSI/AWS D1.1 (current edition). Weld metal will be E60XX or E70XX. Nondestructive testing of welds is not required.

1. For additional information see section 721 of the Standard Specifications for Road and Bridge Construction Current Edition.

2. Vinyl coat all materials used in the fabrication of the bridge fence in accordance with AASHTO standard specification M181, current edition. Color of the coating to be dark green.

3. After the installation of the chain link fence, clean any damaged areas of the fence components by washing with mineral spirit solvent sufficient to remove any contaminents. After cleaning, apply a vinyl washing primer to the surfaces with dry film thickness of 0.3 mil to 0.5 mil before the final coat is applied. Incidental to the cost of the fence.

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
KENTUCKY TRANSPORTATION CABINET

REVISION	DATE

PREPARED BY
Division of Structural Design

DATE:	CHECKED BY
DESIGNED BY:	
DETAILED BY:	

CHAIN LINK FENCE
CROSSING
Norfolk Southern Railroad

ROUTE	ITEM NO.	COUNTY OF
KY 635	8-9010.00	PULASKI
	SHEET NO.	DRAWING NUMBER
	S27	28676