SCI-823-0.00

PID No. 77366

SR 823 over CSXT Railroad

Preliminary Design Report Submittal

Prepared for:

Ohio Department of Transportation
District 9
650 Eastern Ave.
Chillicothe, Ohio 45601

January 14, 2008

Prepared by:

TranSystems

TranSystems

5747 Perimeter Drive
Suite 240
Columbus, Ohio 43017
Tel 614 336 8480
Fax 614 336 8540

www.transystems.com

January 14, 2008

Mr. Jawdat Siddiqi, PE
Office of Structural Engineering
Ohio Department of Transportation
1980 W. Broad Street
Columbus, Ohio 43223

SUBJECT: **Preliminary Design Report Submittal**
SR 823 over CSXT Railroad
SCI-823-0.00 Portsmouth Bypass
PID#77366

Dear Mr. Siddiqi:

Submitted for review and comment is the Preliminary Design Report for SR 823 over the CSXT railroad. Included are The TS&L drawings, Railroad Supplemental Site Plan and the Final Geotechnical Report by DLZ, Ohio, dated September 13, 2007. Plans detailing special embankment construction methods and controls have been prepared by DLZ and are included in the Stage 1 submittal. Please find below our disposition to the March 5, 2007 comments by Jeff Crace, PE regarding the STS submittal.

1. *We agree that Alternate 1 should be the recommended structure type. The superstructure is comprised of three span continuous steel I-girders made composite with the reinforced concrete deck. The substructure consists of stub abutments supported on spread footing and the piers consist of reinforced concrete T-type supported by piling.*

   Alternative 1 has been carried forward to the TS&L drawings shown.

2. *For alternative 2 it is stated that the girders as designed meet the strength design requirements and also satisfy the differential deflection criteria of ½" between adjacent beams. Does the proposed alternative (alternate 1) also meet this criterion? If not, concerns associated with the differential deflection will need to be addressed either by reducing the skew, increasing the beam section modulus or by alternate means.*

   Alternative 1 also satisfies the differential deflection criteria between adjacent girders, as mentioned in the Type Study dated 11/20/06.

3. *Verify the height of the T-type pier stems shown on Transverse Section – Alternative 1.*

The heights of the pier have been checked and revised as required.

Please don't hesitate to call me or Dr. Michael Lenett (513 621 1981) if there are any questions.

Sincerely,

Michael D. Weeks by AAP

Michael D. Weeks, P.E., P.S.
Project Manager

Cc: T. Barnitz, P.E.

TABLE OF CONTENTS

TranSystems

PRELIMINARY DESIGN REPORT

1. Introduction

TranSystems Corporation is providing engineering services to the Ohio Department of Transportation for the design of a new overpass structure that will carry the proposed S.R. 823 bypass over 3 CSX tracks and a service road. As requested by the Scope of Services, a Preliminary Design Report is to be submitted as part of Step 8 of the Major PDP process. The purpose of this report is to summarize the structure type selected for final design. A revised Type Study was submitted on 11/20/06 and comments from ODOT OSE were received on 12/15/06. The comments were addressed in an addendum to the type study submitted on 2/19/07. Approval of the structure type presented in this report was received on 3/5/07.

2. Design Criteria

The proposed structure will be designed according to the most current version of the Ohio Department of Transportation Bridge Design Manual (BDM) and the 2002 AASHTO Standard Specifications for Highway Bridges, 17th Edition. Horizontal clearances (clear zone width and horizontal sight distance) are based on the Ohio Department of Transportation Location and Design (L&D) Manual, Volume One – Roadway Design. Additional railroad clearances are from the *CSX Criteria for Overhead Bridges* dated 10/1/99

3. Subsurface Conditions and Foundation Recommendation

DLZ Ohio, Inc. performed the subsurface exploration for the proposed bridge and prepared the Final Bridge Foundation Recommendations dated September 13, 2007. Please reference their report for additional geotechnical information.

In summary, six test borings (B-37, B-38, TR-39, TR-40, TR-41, and TR-42) were drilled and all of them encountered sandstone bedrock between 83 and 95 feet below the existing ground surface. Beneath the topsoil, generally cohesive soil (sandy silt and clay) was encountered to top of bedrock with intermittent layers of granular soil.

DLZ recommends that friction type driven H-piles or CIP piles are the best suited foundation type for support of the proposed piers. Shallow foundations in the proposed embankments are recommended to support the abutments, consistent with the 12/15/06 ODOT comments. The stability of the spill-through slopes has also been investigated by DLZ. The analysis indicates that 2:1 slopes will have adequate factors of safety for stability. The analysis also indicates that settlement is a concern in this area. The calculated settlements given in DLZ's report indicate that the amount of settlement following a waiting period of 95% primary consolidation is within the limits given in AASHTO Section 4.4.7.2.5 on tolerable movements. DLZ recommends that construction of the pier or abutment foundations not precede until a minimum of 95% of the calculated primary consolidation has occurred and furthermore concurs with ODOT that 98% consolidation be specified in the plans. Wick drains are recommended for use at this location to accelerate the consolidation. DLZ presents multiple triangular spacing options for the wick drains and has calculated the time rate of consolidation for each spacing presented (see DLZ's 9/13/07 report). Waiting periods to reach 95% consolidation will therefore be a function of the wick drain spacing. The final design should incorporate requirements or waiting periods associated with the spacing selected if the contractor is allowed to select the wick drain spacing. Additional information regarding embankment construction is available in the DLZ report for the Highland Bend Embankments dated August 2, 2007. DLZ has also prepared plans to indicate the locations of wick drain treatment and settlement monitoring locations and they are included in this submittal.

4. Roadway

The purpose of this project is to construct a new bypass state route around the town of Portsmouth, Ohio. The proposed alignment will carry two lanes of traffic, 15 plus miles in either direction, from an interchange with US 52 just east of Portsmouth to another interchange with US 23, located north of Portsmouth in Valley Township. For the proposed mainline structure over CSX, two lanes of northbound traffic and two lanes of southbound traffic will be carried on separate bridge sections. Both the proposed northbound and southbound bridge sections will consist of 2-12'-0" travel lanes with 6'-0" median shoulders and 12'-0" outside shoulders. Each bridge deck will be 44'-11½" out-to-out with a 1'-6" outside straight face deflector parapet (SBR-1-99) and a 1'-5 ½" inside straight face deflector parapet (similar to a Type B1 or C1 barrier from Roadway Standard Construction Drawing RM-4.3 but using a base width of 1'-5 ½" and top width of 6 5/8"). The northbound and southbound bridge sections will be separated from one another, along their inside fascia, by 1". The profile grade line for both bridge sections will be located at the inside edge of pavement, which is 7'-6" from the centerline of construction of S.R. 823. Noise Barriers are required on the structures in compliance with the noise analysis and environmental documentation. Horizontal and vertical sight distances, in accordance with the design standards, have been provided over the bridge for all alternatives considered.

Vertical and Horizontal Clearances – Since the proposed vertical alignment for all overpass structures on this project was dictated by the overall design of the new bypass profile, vertical clearance was not a critical design issue. CSXT standard clearances for overhead structures are obtained form the *CSX Criteria for Overhead Bridges* dated 10/1/99:

(1) a minimum vertical clearance of 23'-0" from top of high rail to lowest point of overhead structure in the horizontal clearance area (6' to either side); and,

(2) a horizontal clearance of 25'-0" measured perpendicular from centerline of track to face of pier or abutment (or wall). This 25'-0" distance applies to railroad tracks with ditches.

More than 23'-0" of vertical clearance is provided for the recommended structure.

Horizontal clearance of 10' was maintained between the existing service road and the proposed pier to allow for drainage and construction clearance.

Alignment & Profile: The proposed horizontal geometry of S.R. 823 is along a tangent alignment across the length of structure. The cross section has a normal crown with a pavement cross slope of 0.016ft/ft carried across the lanes and outside shoulder and a median shoulder slope of 0.040ft/ft. The proposed profile grade line is located at the inside edge of pavement which is 7'-6" from the centerline of survey and construction S.R. 823. The profile of S.R. 823 is along a constant sloping grade of -4.10%.

Drainage Design - The collection of storm water runoff will be addressed off of the bridge, thus scuppers will not be required. Catch basins and Inlets have been shown on the plans to collect drainage off the ends of the bridge.

A drainage ditch will be required along the toe of the roadway embankment where it intersects the railroad embankment. Details of the ditch are included in this submittal and in the railroad coordination package.

Utilities - No utilities will be placed on the bridge. However, lighting and ITS conduits will be provided as necessary. An existing Sprint fiber optic line runs under the existing service road. This line is not in

conflict with the proposed pier location however caution will be required during construction to avoid impacting this utility.

Maintenance of Traffic - Rail traffic will be maintained on the tracks while the new bridge is under construction. It is anticipated that there will be no track closures during construction of the new structure. Some disruptions to the service road traffic may be required during pier construction.

5. Proposed Structure Configuration

Span configuration: This three-span alternative consists of a 140'-0", 195'-0", 140'-0" span, for an overall bridge length of 475'-0" from centerline bearings at abutments. This span arrangement allows for the use of stub abutments and meets the horizontal clearances required at the piers. The spill-through slope at the rear span allows for the 2' deep standard ditch as shown in CSX's design criteria. The location of the toe of spill-through slope is approximately in the location recommended in ODOT's 9/26/05 comments. The spill through slope at the rear span will place fill up against the wingwall of a railroad bridge over the abandoned tracks. Similarly, the grading at the forward span allows for a minimal swale adjacent to the service road. Due to the height of the embankments the pier locations and the toe of the embankment are not the same to provide for more balanced span lengths. The abutments and piers are oriented with a 38°00'00" RF skew parallel to tracks 1 and 2.

Substructure:

I. *Abutments:* The abutments will be conventional or stub type (ODOT Std. Dwg. A-1-69) due to the length of the structure being greater than 400', in accordance with the BDM. The abutments will be founded on spread footings. Spill-through slopes will be used to provide the embankment for the approach roadways. The details of the abutments will follow ODOT Standard Construction drawings.

I. *Pier:* The piers will be T-type supported on pile foundations. The recommendation of a T-type pier is consistent with Section 204.5 of the BDM for use at railroads. Additionally the wide stem of a T-type pier is useful to minimize/eliminate slenderness effects anticipated for the 60' & 65' tall piers. It is recommended that one of the piers be a fixed design (i.e. fixed bearings) and designed to resolve reactions associated with constructing the structure on a 4.10% grade. Discussions with OSE staff indicated that it is also important to check the superstructure to substructure connection and that it may be a weak point. We have investigated the horizontal force due to the self weight of the structure and found that it will add considerably to the longitudinal design forces at the fixed pier. The analysis used supports with stiffness in the longitudinal direction equivalent to preliminary bearing/substructure stiffness. It is recommended that the final design calculate and account for the force in a similar manner.

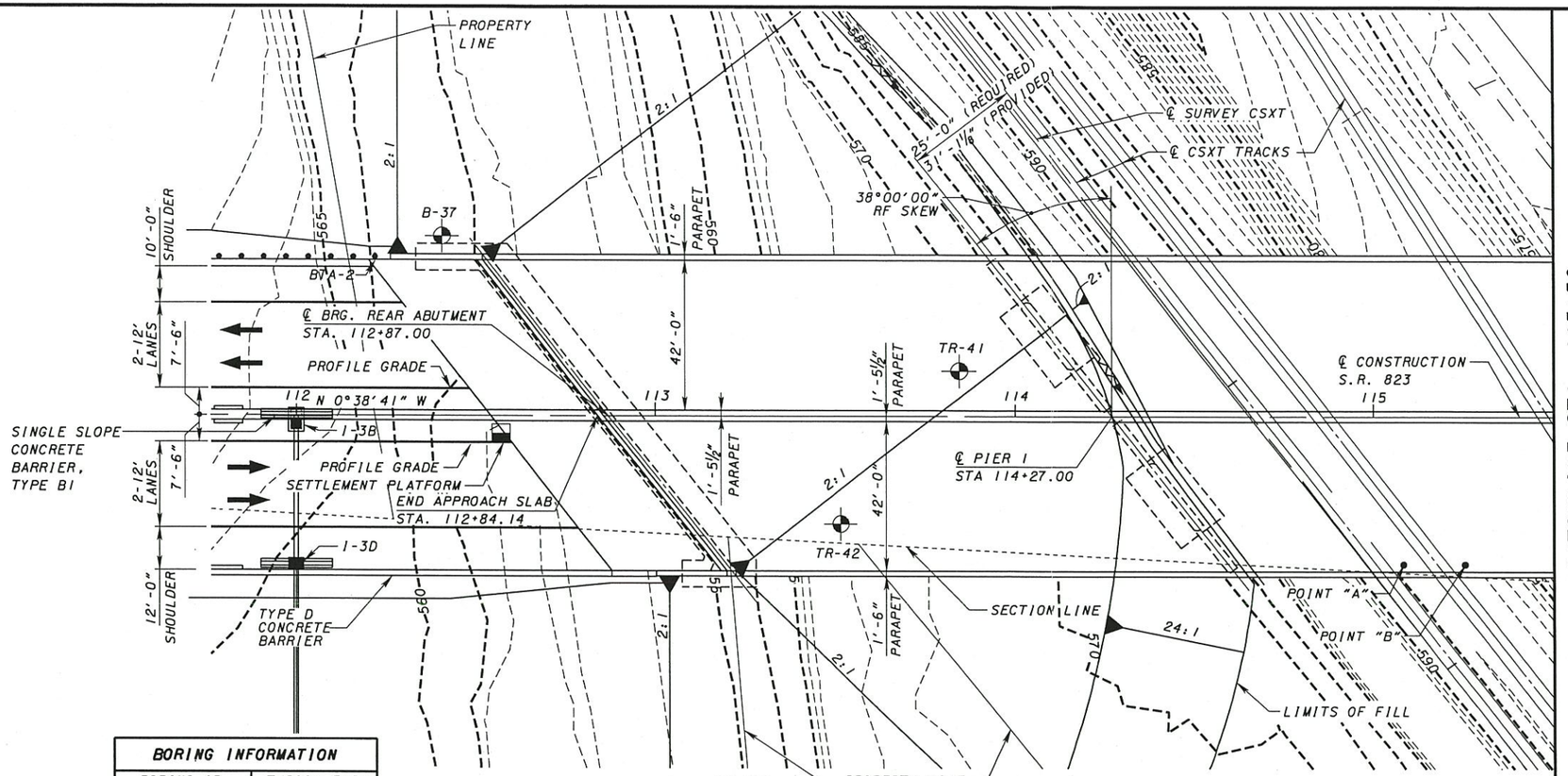
Superstructure: The superstructure for both the left and right bridge of this alternative consists of 5-continuous welded steel plate girders, Grade 50W, with 74" deep webs. The girders were spaced at 9'-6", with 3'-5 3/4" overhangs to satisfy the HS-25 (Case I), Alternate Military and 60psf future wearing surface loads. The differential deflections due to the total slab weight were investigated in accordance with Section 302.2.7 of the BDM and ODOT's Skewed Bridge Design Process. The preliminary analysis indicates that a girder design that satisfies the strength requirements has adequate stiffness to limit the differential deflections to the s/100 tolerance. The preliminary analysis only considered the weight of the concrete applied to the whole structure and not the pour sequence. It is recommended that the pour

sequence also be given consideration in the final girder design. Hybrid girders were not considered due to the stiffness requirements of a skewed bridge. Expansion devices are per standard drawing EXJ-4-87. Elastomeric bearings are anticipated at the substructures. Both the left and right bridge have a 42'-0" width from toe-to-toe of parapet with an overall bridge deck width of 44'-11 ½". Deck thickness, including a 1" monolithic wearing surface, is 8 3/4".

APPENDIX A

Structure Plans

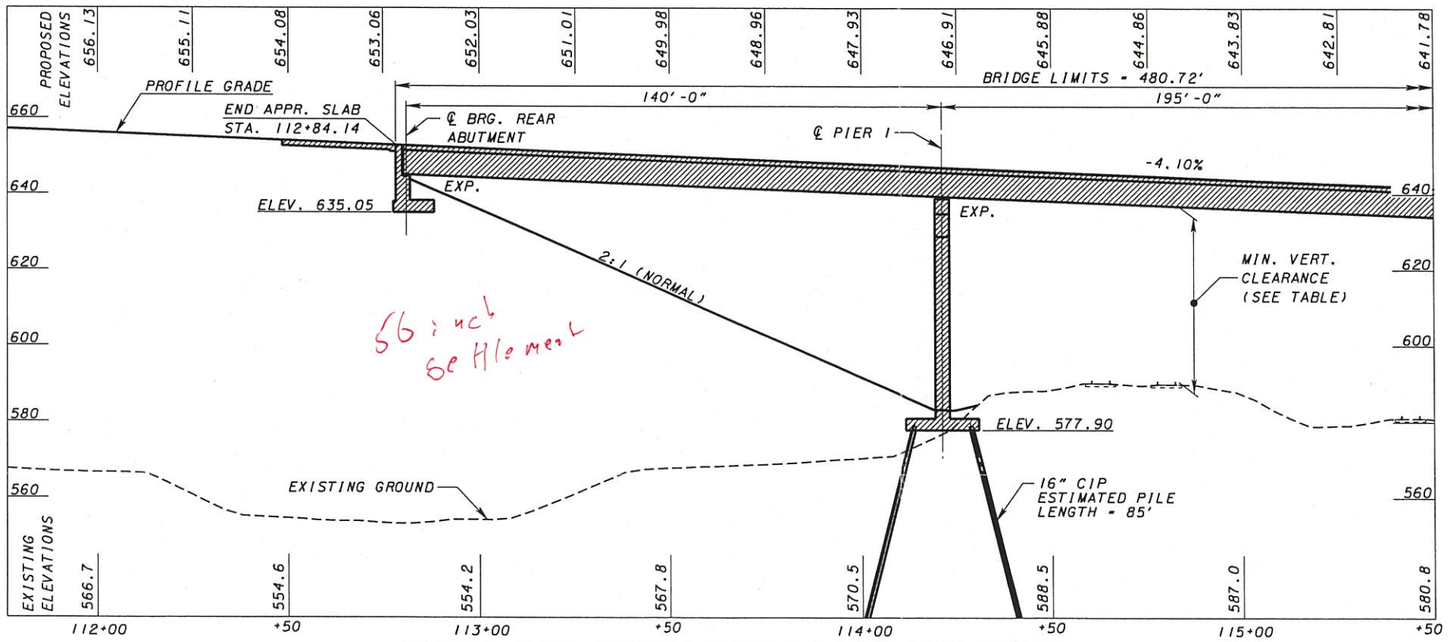
TranSystems



PLAN

MATCHLINE STA. 115+50

BORING INFORMATION	
BORING ID	T/ROCK ELEV.
TR-41	482.4
TR-42	476.0
B-37	472.2



PROFILE ALONG PROFILE GRADE S.R. 823 LEFT BRIDGE

FIRST GUARDRAIL POST OFF BRIDGE LOCATIONS	
LOCATION	STATION
REAR ABUT. (SB)	112+22.11
FWD. ABUT. (SB)	117+48.15

TABLE OF VERTICAL CLEARANCES		
LOCATION	"A"	"B"
PROPOSED	44.69'	44.15'
REQUIRED	23.0'	23.0'

BENCHMARK 1	BENCHMARK 2
(TO BE PROVIDED LATER)	(TO BE PROVIDED LATER)

TRAFFIC DATA

S.R. 823
CURRENT YEAR ADT (2010) - 21,200
DESIGN YEAR ADT (2030) - 31,200
CURRENT YEAR ADTT (2010) - 2,968
DESIGN YEAR ADTT (2030) - 4,368

LEGEND

BTA-1 - BRIDGE TERMINAL ASSEMBLY TYPE 1
BTA-2 - BRIDGE TERMINAL ASSEMBLY TYPE 2
⊕ - BORING LOCATION

NOTES:

1. ALL SHEETS WITH PLAN DIMENSIONS ARE SHOWN HORIZONTAL.
2. EARTHWORK LIMITS SHOWN ARE APPROXIMATE. ACTUAL SLOPES SHALL CONFORM TO PLAN CROSS SECTIONS.

PROPOSED STRUCTURE

TYPE: 3 SPAN CONTINUOUS 74" WEB A709 GRADE 50W STEEL PLATE GIRDER WITH COMPOSITE REINFORCED CONCRETE DECK SUPPORTED BY REINFORCED CONCRETE T-TYPE PIERS AND STUB TYPE ABUTMENTS.

SPANS: 140'-0" - 195'-0" - 140'-0" C/C BRGS

ROADWAY: 2 - 42'-0" T/T OF PARAPETS

LOADING: HS-25 (CASE 1) AND ALTERNATE MILITARY LOADING, FUTURE WEARING SURFACE = 60 PSF

SKEW: 38°00'00" RF

CROWN: 0.016 FT/FT

ALIGNMENT: TANGENT

WEARING SURFACE: MONOLITHIC CONCRETE

APPROACH SLABS: AS-1-81 (30' LONG)

LATITUDE: 38°46'06" N

LONGITUDE: 82°52'36" W

DESIGN AGENCY: TranSystems, 5747 PERIMETER DRIVE, SUITE 140, DUBLIN, OHIO 43017

DATE: 9/28/07
REVIEWED: MSL
STRUCTURE FILE NUMBER: 7306326
DRAWN: PJP
REVISED:
DESIGNED: PJP
CHECKED: MSL

SCIOTO COUNTY
STA. 112+84.14
STA. 117+64.86

SITE PLAN
BRIDGE NO. SCI-823-0214 L
S.R. 823 OVER CSXT RAILROAD

SCI-823-0.00
PID 77366

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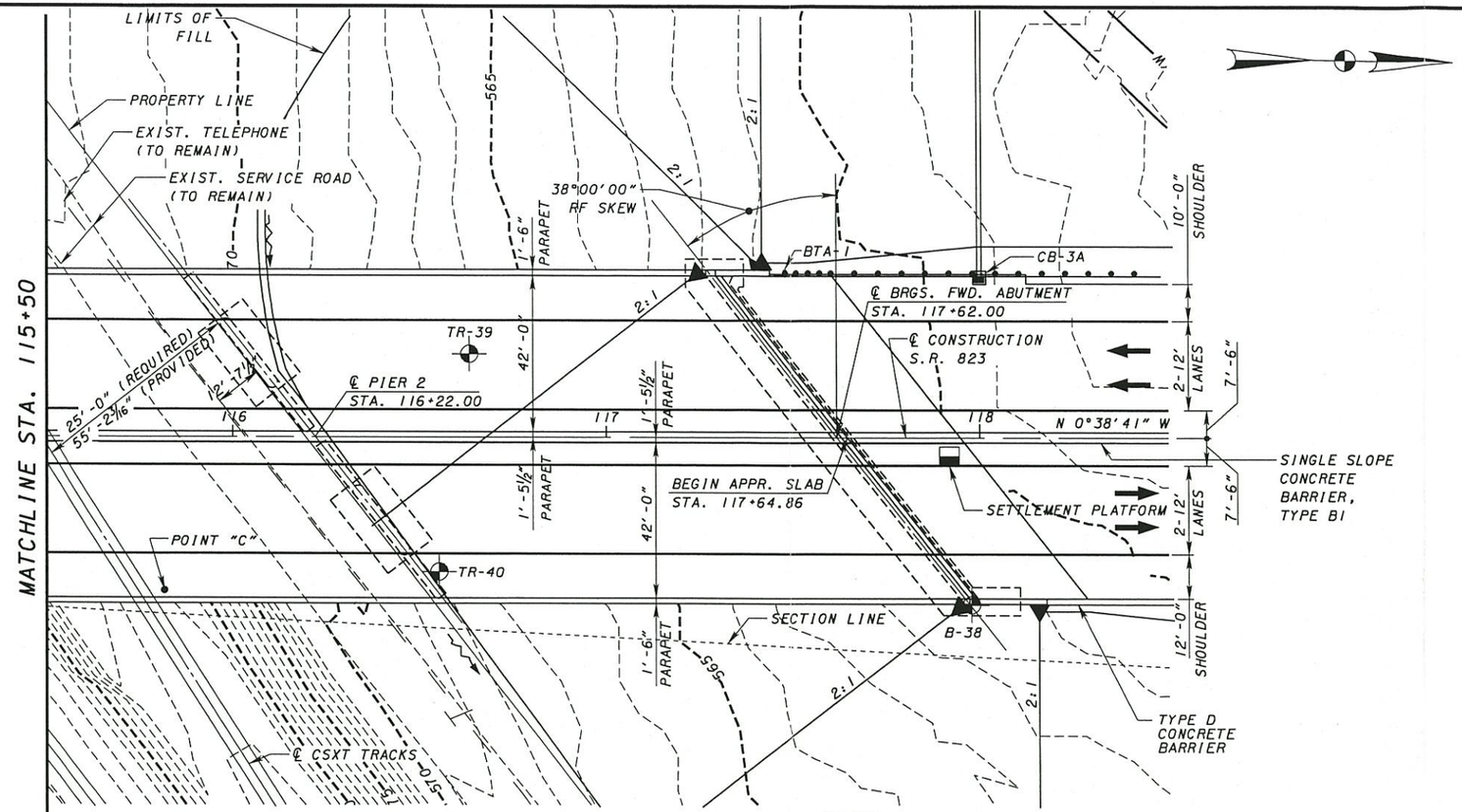

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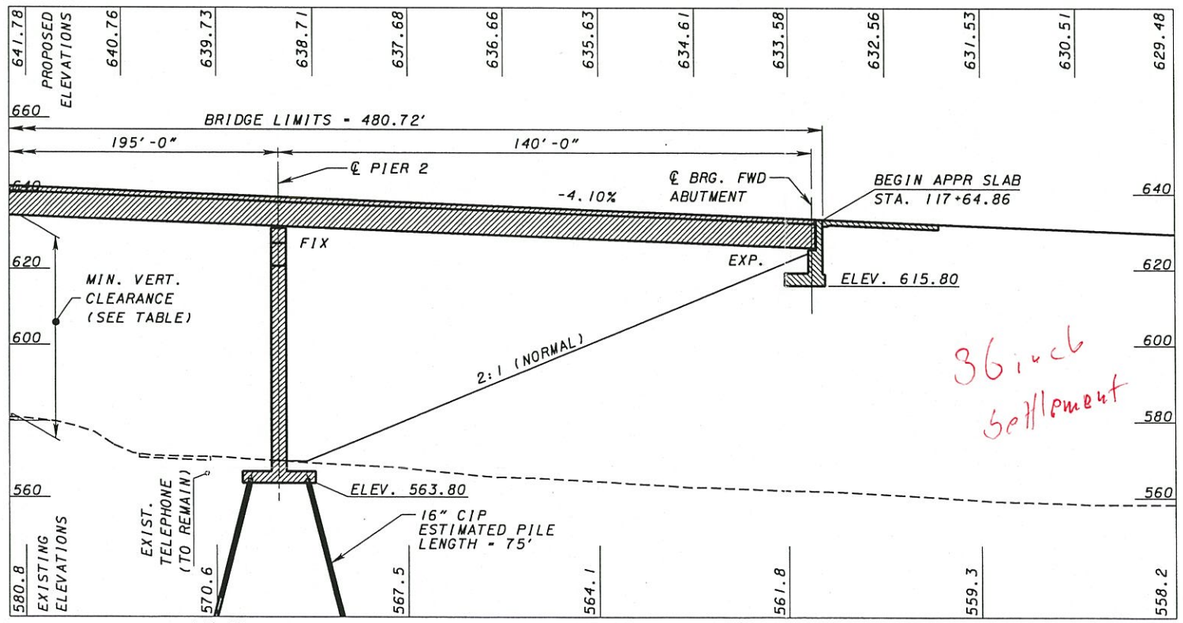

PROFILE ALONG PROFILE GRADE S.R. 823 LEFT BRIDGE

BORING INFORMATION	
BORING ID	T/ROCK ELEV.
TR-39	479.2
TR-40	472.9
B-38	476.2

TABLE OF VERTICAL CLEARANCES		
LOCATION	"C"	
PROPOSED	49.62'	
REQUIRED	23.0'	

NOTES:

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DESIGN AGENCY: TranSystems, 5747 PERIMETER DRIVE, SUITE 240, DUBLIN, OHIO 43017

DESIGNED PJP | DRAWN PJP | REVIEWED MSL | DATE 9/24/07

CHECKED MSL | REVISED | STRUCTURE FILE NUMBER 7306326

SCIOTO COUNTY
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SITE PLAN
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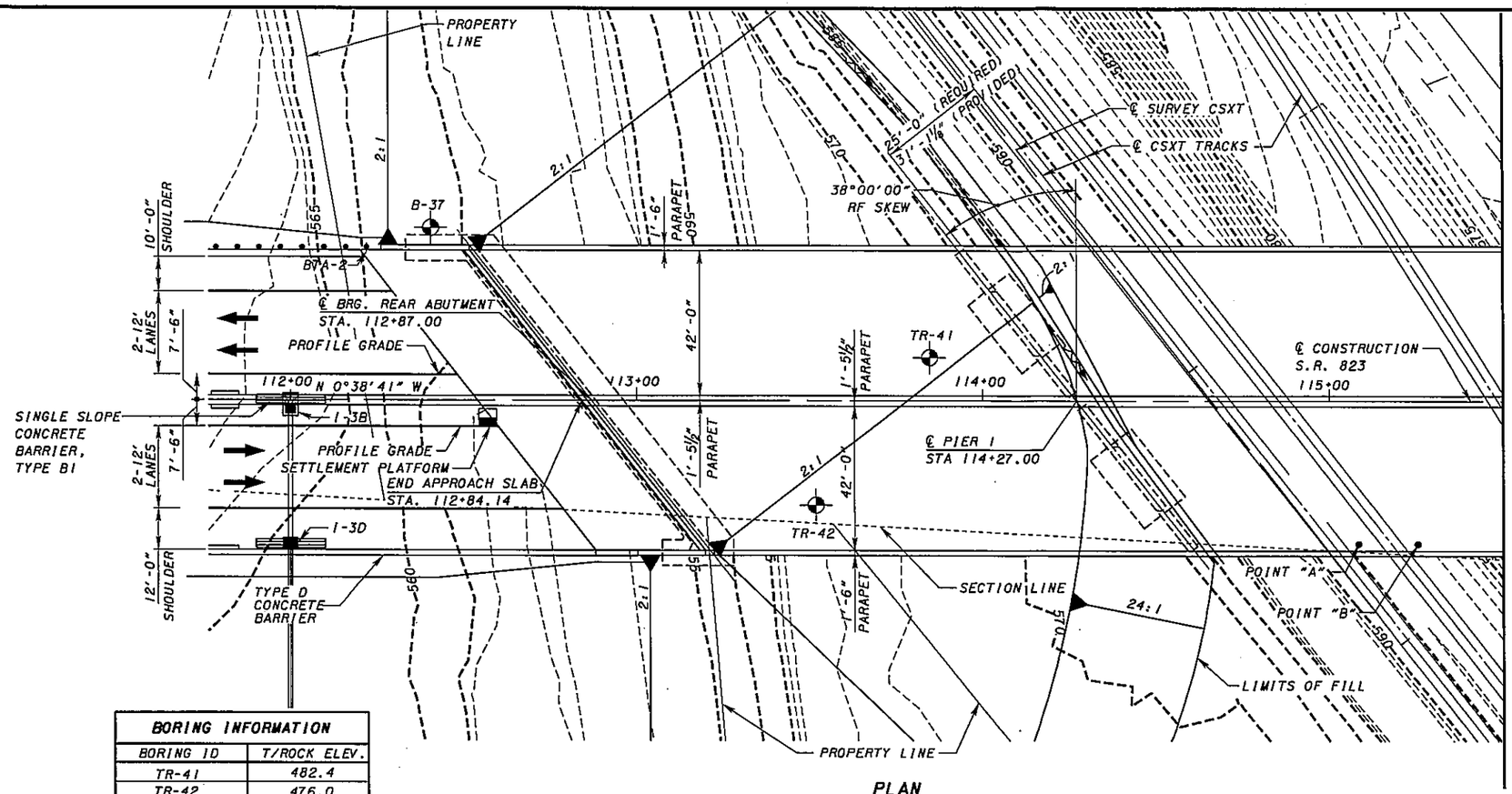
2 / 8

821 / 847



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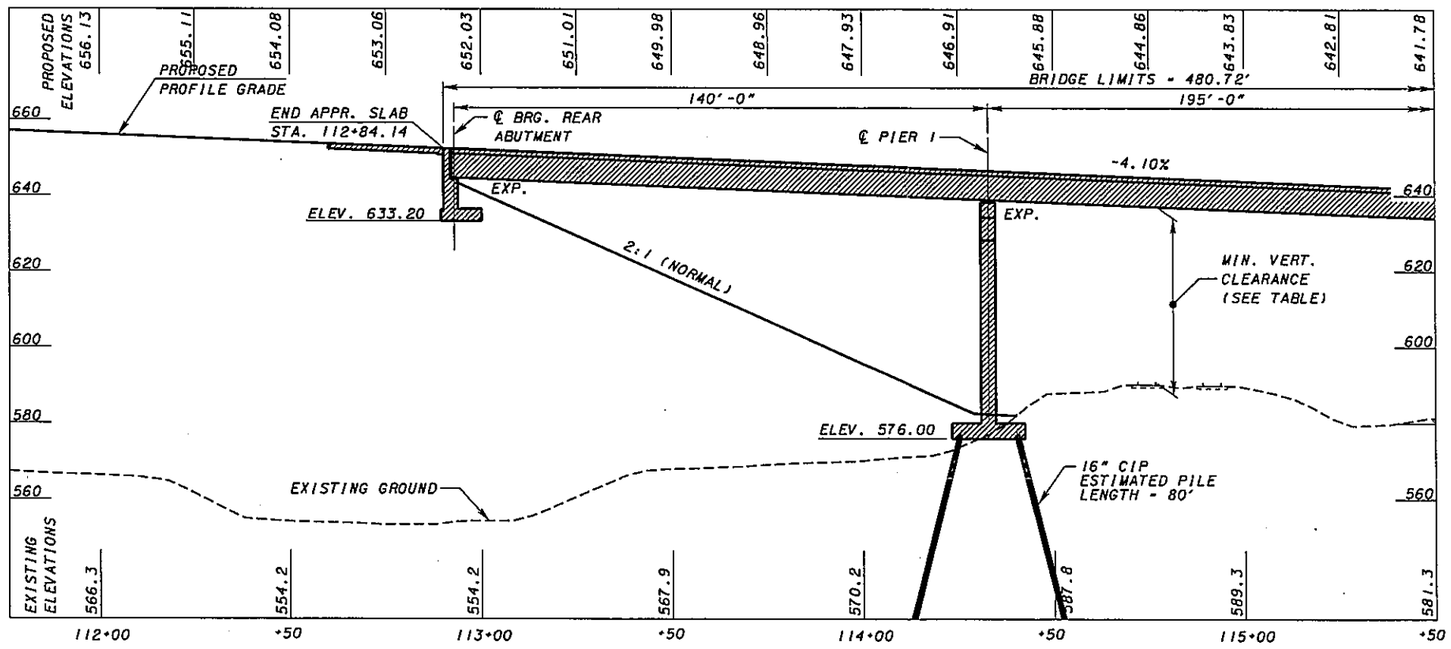

PROFILE ALONG PROFILE GRADE S.R. 823 RIGHT BRIDGE

MATCHLINE STA. 115+50

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FWD. ABUT. (SB)	117+48.15

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DATE: 9/24/07
REVIEWED: MSL
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REVISED:
DESIGNED: PJP
CHECKED: MSL

SCIOTO COUNTY
STA. 112+84.14
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S.R. 823 OVER CSXT RAILROAD

SCI-823-0.00
PID 77366

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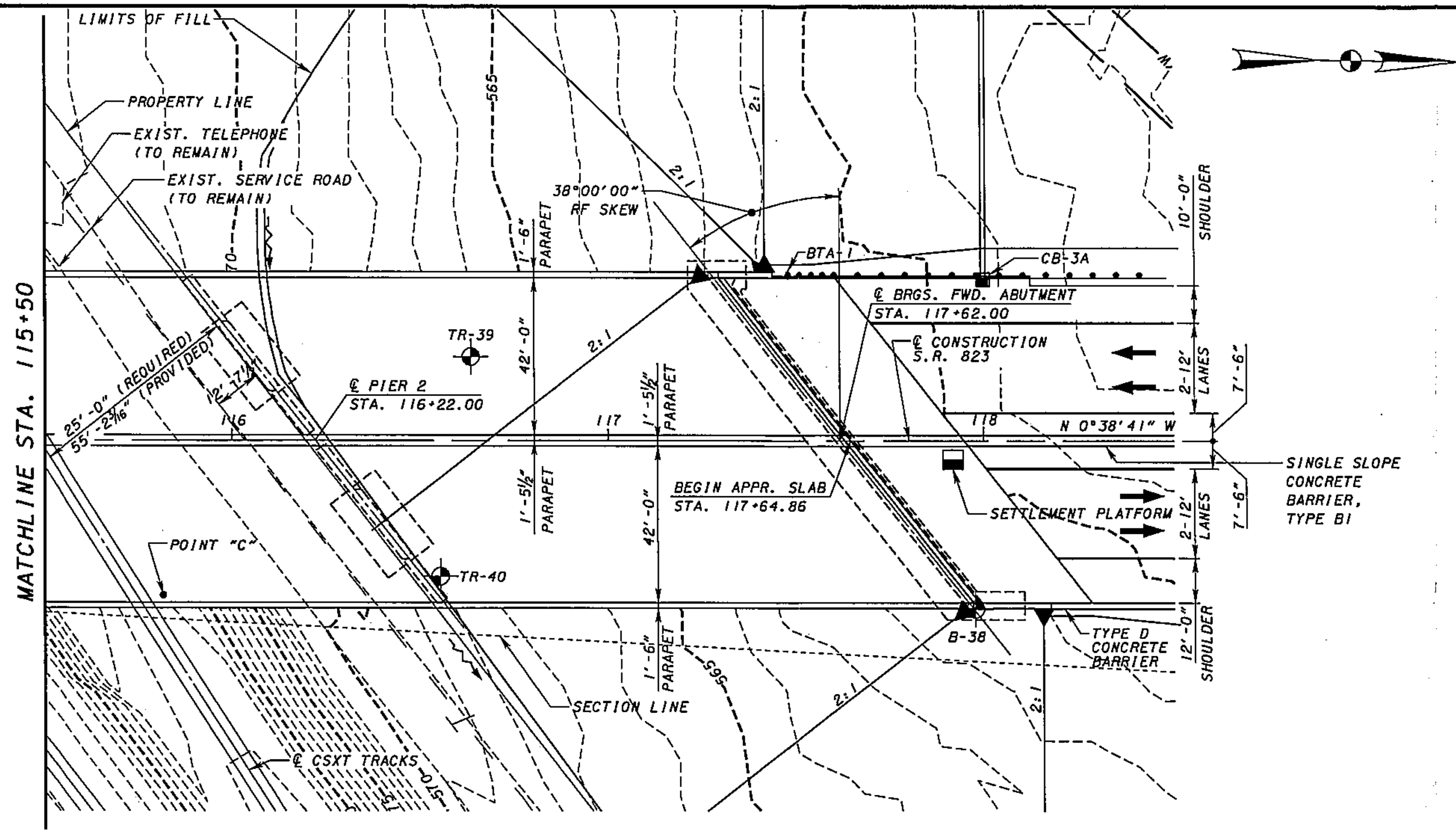

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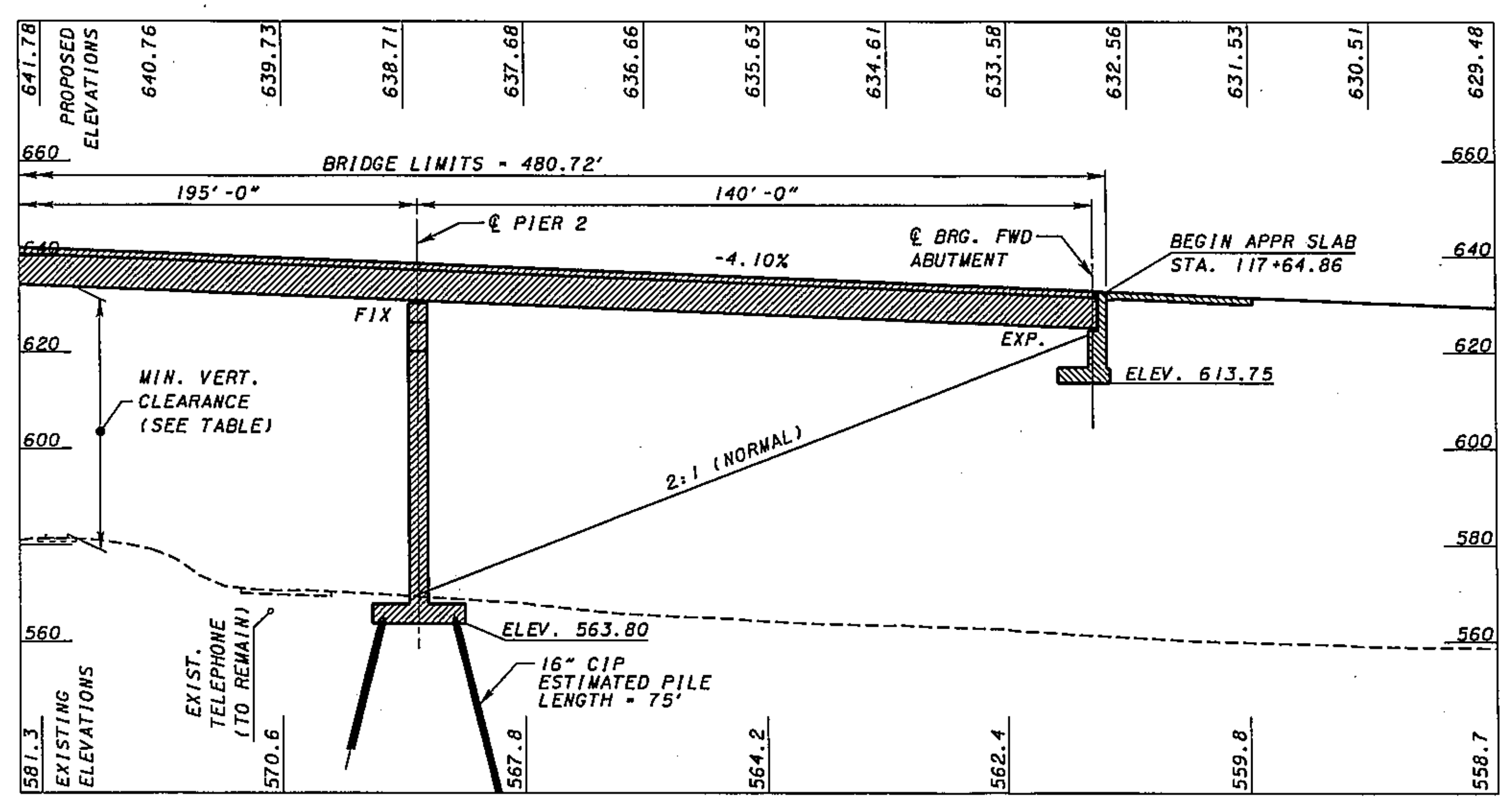

PROFILE ALONG PROFILE GRADE S.R. 823 RIGHT BRIDGE

BORING INFORMATION

BORING ID	T/ROCK ELEV.
TR-39	479.2
TR-40	472.9
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TABLE OF VERTICAL CLEARANCES

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DESIGN AGENCY: TranSystems

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PJP	PJP	MSL	9/24/07
CHECKED	REVISED	STRUCTURE FILE NUMBER	
MSL		7306334	

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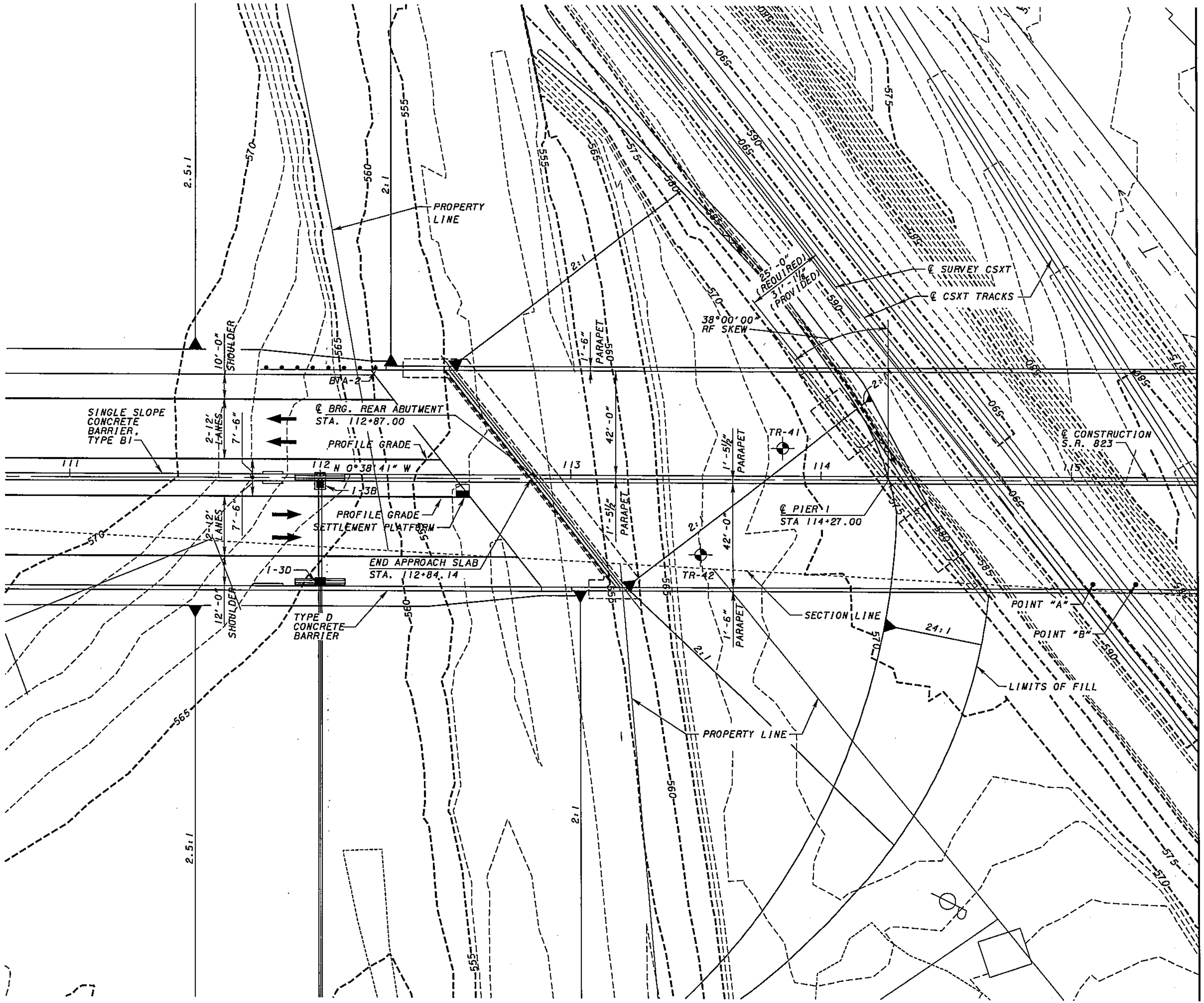

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- DENOTES EXISTING POWERPOLE
- DENOTES EXISTING LIGHTPOLE

BTA-1 - BRIDGE TERMINAL ASSEMBLY TYPE 1
BTA-2 - BRIDGE TERMINAL ASSEMBLY TYPE 2

DESIGN AGENCY: TranSystems

DESIGNED	DRAWN	REVIEWED	DATE
PJP	PJP	MSL	9/24/07
CHECKED	REVISED	STRUCTURE FILE NUMBER	
MSL		7306326	

GENERAL PLAN
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S.R. 823 OVER CSXT RAILROAD

SCI-823-0.00
PID 77366

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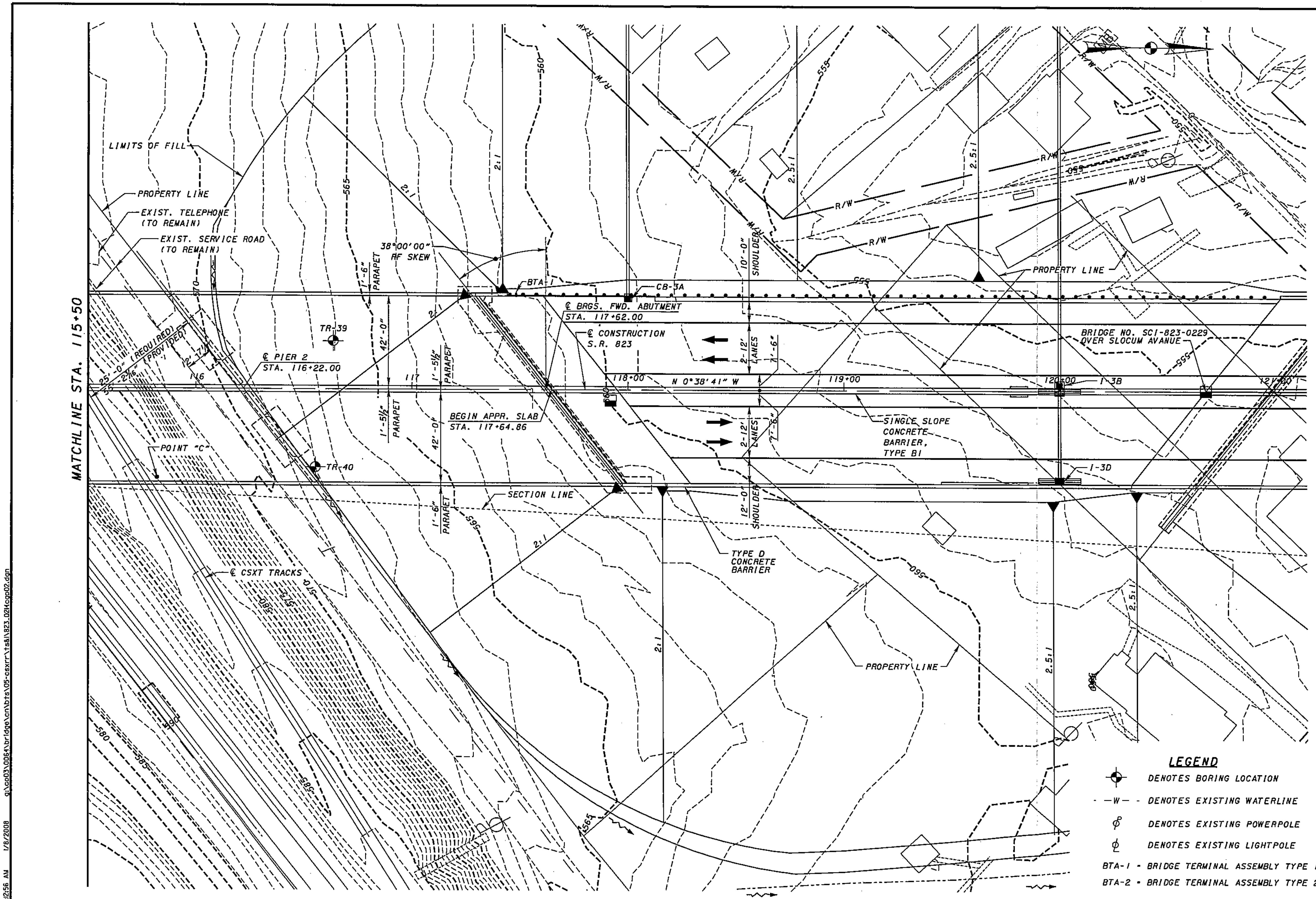

LEGEND

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- DENOTES EXISTING POWERPOLE
- DENOTES EXISTING LIGHTPOLE
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- BTA-2 - BRIDGE TERMINAL ASSEMBLY TYPE 2

DESIGN AGENCY: TranSystems

DESIGNED	DRAWN	REVIEWED	DATE
PJP	PJP	MSL	9/24/07
CHECKED	REVISED	STRUCTURE FILE NUMBER	
MSL		7306326	

GENERAL PLAN

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S.R. 823 OVER CSXT RAILROAD

SCI-823-0.00
PID 77366

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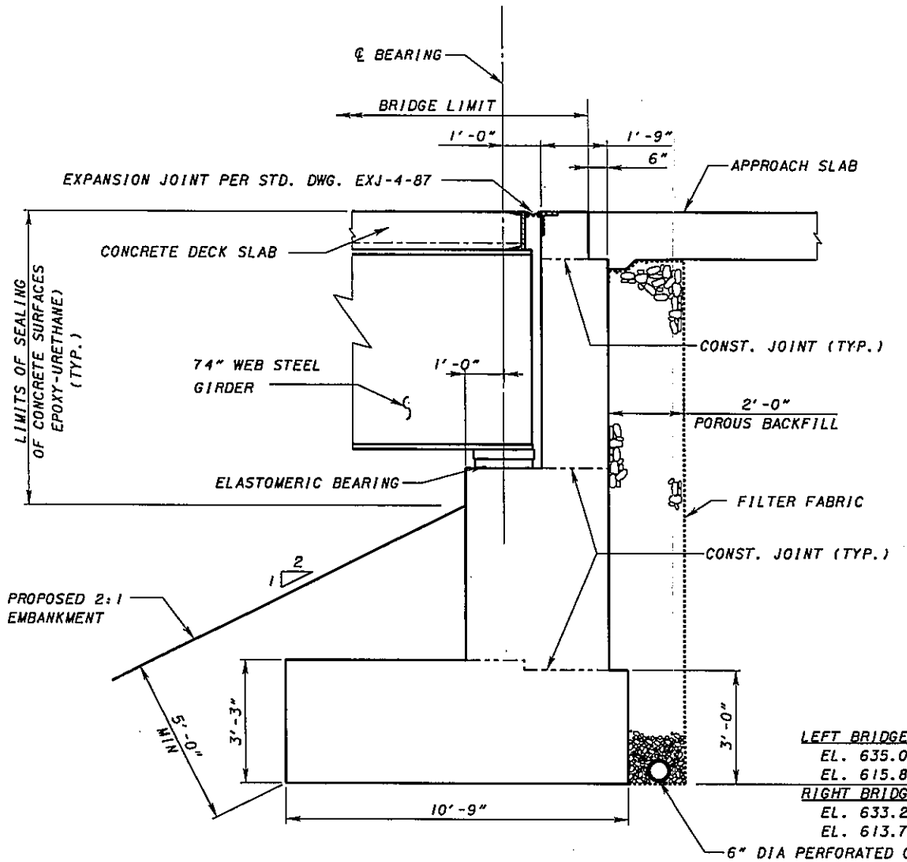
SUPERSTRUCTURE DEPTH	
ITEM	74" WEB STEEL PLATE GIRDER
SLAB (INCLUDING WEARING SURFACE)	8¾"
HAUNCH (BOTTOM OF SLAB TO TOP OF FLANGE)	2"
GIRDER DEPTH	76"
TOP OF WEARING SURFACE TO BOTTOM OF GIRDER FLANGE (INCH)	86.75"
TOP OF WEARING SURFACE TO BOTTOM OF GIRDER FLANGE (FEET)	7.229'



PROPOSED ABUTMENT SECTION

NOTES:

1. WICK DRAINS AND SETTLEMENT MONITORING ARE REQUIRED FOR THE PROPOSED EMBANKMENT CONSTRUCTION. SEE WICK DRAIN AND INSTRUMENTATION PLANS FOR MORE DETAILS.

2. CONSTRUCTION CONSTRAINTS: PRIOR TO CONSTRUCTING THE SPREAD FOOTING FOUNDATIONS, CONSTRUCT THE BRIDGE APPROACH EMBANKMENTS BEHIND THE ABUTMENT UP AT A 1:1 SLOPE FROM THE BOTTOM OF THE HEEL OF THE FOOTING TO SUBGRADE ELEVATION AND FOR A MINIMUM DISTANCE OF 250 FEET BEHIND THE ABUTMENTS. CONSTRUCTION OF THE PIER AND ABUTMENT FOUNDATIONS CAN PROCEEDE AFTER THE GEOTECHNICAL DESIGN COORDINATOR HAS DETERMINED THAT 98% CONSOLIDATION HAS BEEN REACHED. THE ESTIMATED TIME TO 98% CONSOLIDATION DEPENDS UPON THE WICK DRAIN SPACING SELECTED TO CONSTRUCT THE EMBANKMENT. AFTER THE ABUTMENT FOOTING AND BREASTWALL ARE COMPLETED AND PRIOR TO SETTING SUPERSTRUCTURE MEMBERS, CONSTRUCT THE EMBANKMENT IMMEDIATELY BEHIND THE ABUTMENT UP TO THE BEAM SEAT ELEVATION AND ON A 1:1 SLOPE UP TO THE SUBGRADE ELEVATION, WITH TYPE B GRANULAR MATERIAL CONFORMING TO 703.16.C.

3. ITEM 203 EMBANKMENT, AS PER PLAN: PLACE AND COMPACT EMBANKMENT MATERIAL IN 6 INCH LIFTS FOR THE CONSTRUCTION OF THE APPROACH EMBANKMENT BETWEEN STATIONS 111+80 TO 119+30.

DESIGN AGENCY: TranSystems, 5th KENNEDY DRIVE, SUITE 210, FOREST, OHIO 45157
DESIGNED PJP | DRAWN PJP | CHECKED MSL | REVISED | REVISED MSL 9/24/07 | DATE | STRUCTURE FILE NUMBER 7306326L, 7306334R

ABUTMENT SECTION
BRIDGE NO. SCI-823-0214 L&R
SR 823 OVER CSXT RAILROAD

SCI-823-0.00
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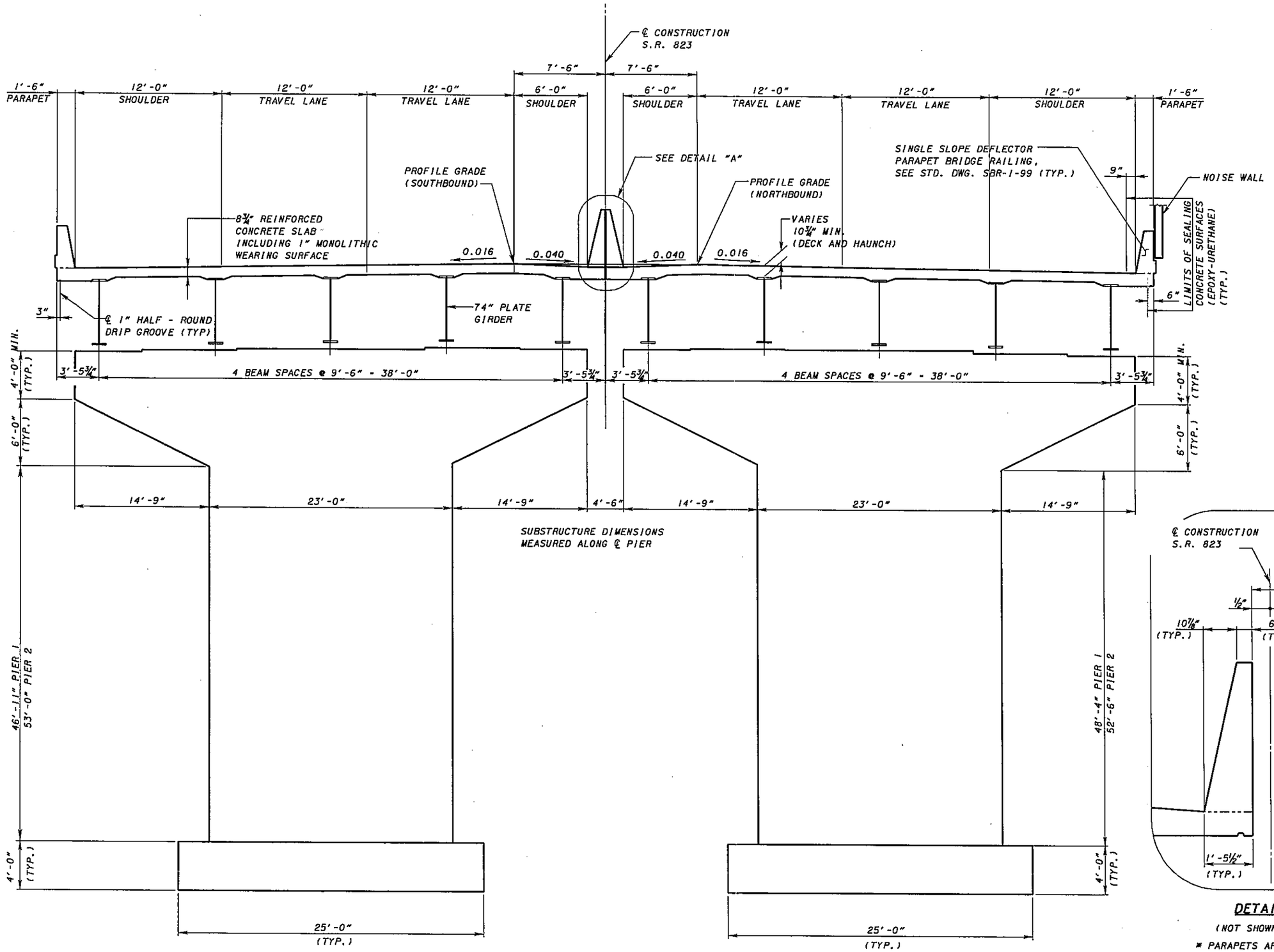
$TIME$ $DATE$ $FILE$



DETAIL "A"

(NOT SHOWN TO SCALE)

* PARAPETS ARE SIMILAR TO ROADWAY CONCRETE MEDIAN BARRIER

TRANSVERSE SECTION

BRIDGE NO. SCI-823-0214 L&R
SR 823 OVER CSXT RAILROAD

DESIGN AGENCY: Tran Systems

DESIGNED	DRAWN	REVIEWED	DATE
PJP	PJP	MSL	9/24/07
CHECKED	REVISED	STRUCTURE FILE NUMBER	
MSL		7306326L, 7306334R	

SCI-823-0.00
PID 77366

8 / 8

827
847

$TIME$ $DATE$ $FILE$

APPENDIX B

Structure Cost Estimate

TranSystems

SCI-823-0.00 - PORTSMOUTH BYPASS

S.R. 823 over CSXT

TS&L SUBMITTAL

By: PJP
Checked: MSL

Date: 2/12/2007
Date:

ALTERNATIVE COST SUMMARY

Alternative No.	Span Arrangement No. Spans	Lengths	Total Span Length (ft.)	Framing Alternative	Proposed Stringer Section	Subtotal Superstructure Cost	Subtotal Substructure Cost	Structure Incidental Cost (16%)	Structure Contingency Cost (20%)	Total Alternative Const. Cost	Life Cycle Maintenance Cost	Total Relative Ownership Cost
1	3	140'-0" - 195'-0" - 140'-0"	475.00	5 Steel Girders /per BRIDGE	74" Web Grade 50W	$3,189,000	$1,566,000	$760,800	$0	$5,520,000	$0	$5,520,000

NOTES:

1. Structure incidental cost allowance includes provision for structure excavation, porous backfill, sealing of concrete surfaces, bearings, and crushed aggregate slope protection costs.
2. Estimated construction cost does not include existing structure removal (if any), which should be quantified seperately, if required.
3. Wick drain and settlement monitoring and other embankment construction costs included in Roadway estimates.

SCI-823-0.00 - PORTSMOUTH BYPASS
S.R. 823 over CSXT
STRUCTURE TYPE STUDY - STEEL PLATE GIRDER ALTERNATIVE 1 - SUPERSTRUCTURE

By: PJP
Checked: JRC

Date: 2/12/2007
Date: 2/13/2007

SUPERSTRUCTURE

Alternative No.	Span Arrangement No. Spans	Span Arrangement Lengths	Total Span Length (ft.)	Deck Length (ft.)	Deck Volume (cu. yd.)	Deck Concrete Cost	Deck Reinforcing Cost	Approach Slab Cost	Approach Roadway Cost	Framing Alternative	Proposed Girder Section	Structural Steel Weight (pounds)	Structural Steel Cost	Expansion Joint Cost	Subtotal Superstructure Cost
1	3	140'-0" - 195'-0" - 140'-0"	475.00	477.00	1593	$873,100	$404,200	$117,600		5 Steel Girders /per BRIDGE	74" Web Grade 50W	1482000	$1,715,700	$78,000	**$3,189,000**

COST SUPPORT CALCULATIONS

Deck Cross-Sectional Area:

Parapets:

	No.	Individual Area (sq. ft.)	Parapet Area (sq. ft.)
Parapets	1	4.26	4.26
Parapets	1	4.77	4.77

Slab:

	T (ft.)	W (ft.)	Slab Area	Haunch & Overhang Area	Total Concrete Area (sq. ft.)
Left Bridge	0.73	44.96	32.8	3.3	45.1
Right Bridge	0.73	44.96	32.8	3.3	45.1

Note: Deck width is out to out
10% of deck area allowed for haunches and overhangs.

QC/QA Concrete, Class QSC2
Unit Cost ($/cu. yd):

	Year 2005	Annual Escalation	Year 2007
Deck	$525.00	5.0%	$579.00
Parapets	$385.00	5.0%	$424.00
Weighted Average =			$548.00

Based on parapet and slab percentages of total concrete area

Epoxy Coated Reinforcing Steel
Unit Cost ($/lb):
Assume 285 lbs of reinforcing steel per cubic yard of deck concrete

	Year 2005	Annual Escalation	Year 2007
Deck Reinforcing	$0.81	5.0%	$0.89

Structural Steel Unit Costs ($/lb.):

	Cost Ratio	Year 2005	Annual Escalation	Year 2007	
Rolled Beams - Grade 50	n/a	$0.95	5.0%	$1.05	
Level 4 Plate Girders - Grade 50W	n/a	$1.05	5.0%	$1.16	Straight Girders
Level 4 Plate Girders - Grade 70W	n/a	$1.20	5.0%	$1.32	Straight Girders

Reinforced Concrete Approach Slabs (T=17")
Unit Cost ($/sq. yd.):
Length = 30 ft. Width = 90 ft
Area = 600 sq. yd.

	Year 2005	Annual Escalation	Year 2007
Approach Slabs	$178.00	5.0%	$196.00

Expansion Joints
Unit Costs ($/Lin.Ft.):

	Cost Ratio	Year 2005	Annual Escalation	Year 2007
Modular Expansion Joints	1.00	$910.00	5.0%	$1,003.28
Strip Seal Expansion Joints	1.00	$310.00	5.0%	$341.78

SCI-823-0.00 - PORTSMOUTH BYPASS

S.R. 823 over CSXT

STRUCTURE TYPE STUDY - STEEL PLATE GIRDER ALTERNATIVE 1 - SUBSTRUCTURE

By: PJP
Checked: JRC

Date: 2/12/2007
Date: 2/13/2007

SUBSTRUCTURE

Alternative No.	Span Arrangement No. Spans	Lengths	Framing Alternative	Proposed Stringer Section	Pier Concrete Cost	Pier Reinforcing Cost	Abutment Concrete Cost	Abutment Reinforcing Cost	Pile Foundation Cost	MSE Wall Cost	Additional Crane Cost	Subtotal Substructure Cost
1	3	140'-0" - 195'-0" - 140'-0"	5 Steel Girders /per BRIDGE	74" Web Grade 50W	$595,900	$116,400	$361,100	$62,500	$430,200	$0	$0	**$1,566,000**

COST SUPPORT CALCULATIONS

Pier QC/QA Concrete, Class QSC1 Cost: (Spread Footing)

Component	Volume (cu. yd.)	Year 2005	Annual Escalation	Year 2007	Total Cost
Cap	226	$575.00	5.0%	$634.00	$143,280
Stem	598	$575.00	5.0%	$634.00	$379,130
Footings	222	$300.00	5.0%	$331.00	$73,480
Total	1046				$595,900

Pier QC/QA Concrete, Class QSC1 Cost: (Drilled Shaft)

Component	Volume (cu. yd.)	Year 2005	Annual Escalation	Year 2007	Total Cost
Cap	0	$575.00	5.0%	$634.00	$0
Columns	0	$575.00	5.0%	$634.00	$0
Footings	0	$300.00	5.0%	$331.00	$0
Total					$0

Abutment QC/QA Concrete, Class QSC1 Cost:

Component	Volume (cu. yd.)	Year 2005	Annual Escalation	Year 2007	Total Cost
Abutment	780	$420.00	5.0%	$463.00	$361,100

Quantity includes wingwalls.

Epoxy Coated Reinforcing Steel Unit Cost ($/lb):

Assume 125 lbs of reinforcing steel per cubic yard of pier concrete.
Assume 90 lbs of reinforcing steel per cubic yard of abutment concrete.

	Year 2005	Annual Escalation	Year 2007
Pier	$0.81	5.0%	$0.89
Abutment	$0.81	5.0%	$0.89

MSE Abutment Unit Cost ($/sq. ft.):

	Total Area (sq. ft.)	Year 2005 Unit Cost	Annual Escalation	Year 2007
Alt. 1	0	$50.00	5.0%	$55.10

Pile Foundation Unit Cost ($/ft.): *16" CIP Piles, Furnished & Driven*

Number of Piles		Total Pile Length
96	SEE QUANTITY CALCULATIONS	7,560

Pile Foundation Unit Cost ($/ft.):

	Year 2005 Unit Cost	Annual Escalation	Year 2007
Furnished	$37.05	5.0%	$40.80
Driven	$14.62	5.0%	$16.10
Total			$56.90

Shaft Foundation Unit Cost ($/ft.): 36" Drilled Shaft

Number of Shafts		Total Shaft Length
Alt. 1 0	SEE QUANTITY CALCULATIONS	0

Shaft Foundation Unit Cost ($/ft.):

Unit Cost	Escalation	2007
$125.00	5.0%	$145.00

Cost of Shafts: $ -

Temporary Shoring and Support Unit Costs ($/sq. ft.):

	Temp. Shoring Area (sq. ft.)	Temp. Girder Support (lump sum)
Alt. 1	0	$ -

	Year 2004 Unit Cost	Annual Escalation	Year 2007
Temporary Shoring	$22.50	5.0%	$26.00
Cofferdam	$32.00	5.0%	$37.00

Additional Crane Cost

$ -

SCI-823-0.00 - PORTSMOUTH BYPASS

S.R. 823 over CSXT

STRUCTURE TYPE STUDY - STEEL PLATE GIRDER ALTERNATIVE 1 - QUANTITY CALCULATIONS

By: PJP
Checked: JRC

Date: 2/12/2007
Date: 2/13/2007

Pier Quantities

Pier Location	Length	Cap				Stem					Footing					Total Volume
		Width	*Depth*	*Area*	*Volume*	*Width*	*Height*	*Length*		*Volume*	*Width*	*Depth*	*Length*		*Volume*	
Pier 1 (Pile)	52.5	3.5	8.31	29.09	1527	3.5	47.625	23.00		3834	15	4	25.00		1500	6861
Pier 2 (Pile)	52.5	3.5	8.31	29.09	1527	3.5	52.75	23.00		4246	15	4	25.00		1500	7273
Pier 3																0
Pier 4																0
Pier 5																0
Pier 6																0
Pier 7																0
Total (Cu.Ft.)					3054					8080					3000	14134
Total (Cu.Yd.)					113					299					111	523
			Qty x 2 (L/R)		226					598					222	1046

Abutment Quantities

Abut Location	Length (feet)	Backwall				Beam Seat					Footing					Total Volume
		Width	*Depth*	*Area*	*Volume*	*Width*	*Height*	*Area*		*Volume*	*Width*	*Depth*	*Area*	*# Footi*	*Volume*	
Rear Abut																
Fwd. Abut																
Total (Cu.Ft.)					0					0					0	0
Total (Cu.Yd.)					0					0					0	0
			Qty x 2 (L/R)		0					0					0	780

MSE Abutment Wall Quantities

Abut Location		Wall			
		Height	*Length*	*Area*	*Volume*
Rear Abut		0	0	0	
RA Wing (L)		0	0	0	
RA Wing (R)		0	0	0	
Fwd Abut		0	0	0	
FA Wing (L)		0	0	0	
FA Wing (R)		0	0	0	
Total (Sq.Ft.)				0	

Pile Quantities

Location	Load/girder (Kips)	# Girders	Total Girder Load	Subst Wt (kips)	Pile Cap.(Kips)	No. Piles	Increase Factor	Total Piles	Top Elev.	Bot Elev.	Pile Length	Total Pile Length (Feet)
Rear Abut.	0	0	0	0	140	0	1	*0*	0.0	0.0	0.0	*0*
Pier 1	0	0	0	0	140	0	1	*24*	577.95	497.9	82.5	*1980*
Pier 2	0	0	0	0	140	0	1	*24*	564.8	491.8	75.0	*1800*
Pier 3	0	0	0	0	140	0	1	*0*	0	0	0.0	*0*
Pier 4	0	0	0	0	140	0	1	*0*	0	0	0.0	*0*
Pier 5	0	0	0	0	140	0	1	*0*	0	0	0.0	*0*
Pier 6	0	0	0	0	140	0	1	*0*	0	0	0.0	*0*
Pier 7	0	0	0	0	140	0	1	*0*	0	0	0.0	*0*
Fwd. Abut.	0	0	0	0	140	0	1	*0*	0	0	0.0	*0*
Total								48				3780
							Qty x 2 (L/R)	96				7560

36" Drilled Shafts

Location	Load/girder (Kips)	# Girders	Total Load	Subst Wt (kips)	Pile Cap.(Kips)	No. Piles	Increase Factor	Total Shafts	Top Elev.	Bot Elev.	Pile Length	Total Shaft Length (Feet)
Rear Abut.	0	0	0	0	0	0	1	*0*	0	0	0.0	*0*
Pier 1	0	0	0	0	0	0	1	*0*	0	0	0.0	*0*
Pier 2	0	0	0	0	0	0	1	*0*	0	0	0.0	*0*
Pier 3	0	0	0	0	0	0	1	*0*	0	0	0.0	*0*
Pier 4	0	0	0	0	0	0	1	*0*	0	0	0.0	*0*
Pier 5	0	0	0	0	0	0	1	*0*	0	0	0.0	*0*
Pier 6	0	0	0	0	0	0	1	*0*	0	0	0.0	*0*
Pier 7	0	0	0	0	0	0	1	*0*	0	0	0.0	*0*
Fwd. Abut.	0	10	0	0	0	0	1	*0*	0	0	0.0	*0*
Total								0				0
							Qty x 2 (L/R)	0				0

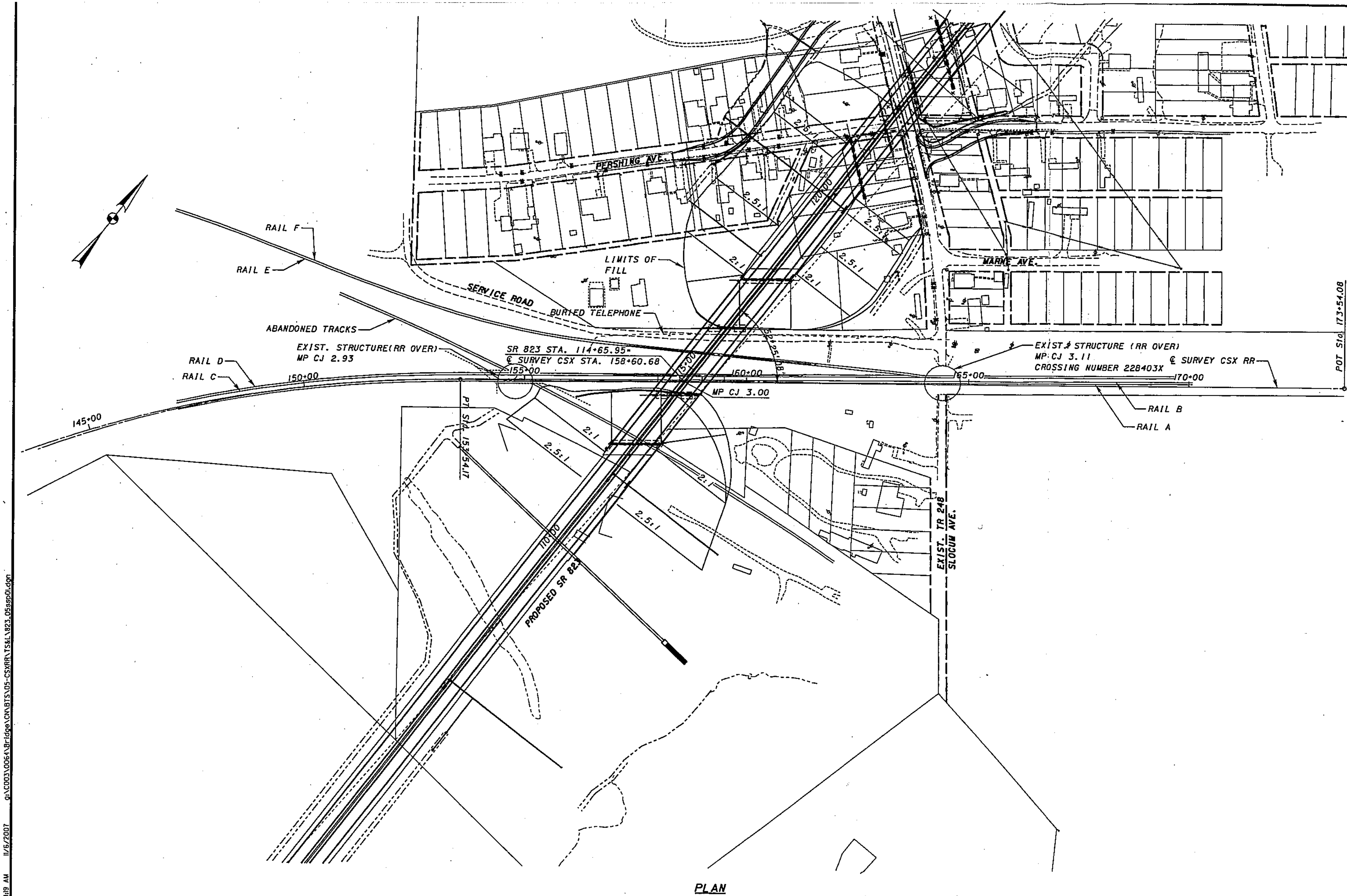
Superstructure Steel Quantities

Location	Wt.of girder (lb)/ft	# Girders	Span Length	Total Weight
Span 1	312	10	140	436800
Span 2	312	10	195	608400
Span 3	312	10	140	436800
Span 4		0	0	0
Span 5		0	0	0
Span 6		0	0	0
Span 7		0	0	0
Span 8		0	0	0
Total			475	1482000

APPENDIX C

Supplemental Site Plan
Railroad correspondence

TranSystems



PLAN

SUPPLEMENTAL SITE PLAN
PROPOSED SR 823 OVER CSXT
MILEPOST CJ 3.00

SCI-823-0.00
PID 77366

1/2

DESIGNED	DRAWN	REVIEWED	DATE
PJP	PJP	RH	12/29/06
CHECKED	REVISED	STRUCTURE FILE NUMBER	
		7306326L, 7306334R	

DESIGN AGENCY: TranSystems

10:58:19 AM 11/6/2007 g:\C003\0064\Bridge\CN\BTS\05-CSXRR\TS&L\823_05ssp01.dgn

PROFILE ALONG TOP OF RAILS

DESIGNED PJP	DRAWN PJP	REVIEWED RH	DATE 12/29/06
CHECKED	REVISED		STRUCTURE FILE NUMBER 7306326L, 7306334R

DESIGN AGENCY
Systems
5747 PERIMETER DRIVE, SUITE 200
DUBLIN, OHIO 43017

RAIL PROFILES
PROPOSED SR 823 OVER CSXT
MILEPOST CJ 3.00

SCI-823-0.00
PID 77366

2 / 2

2

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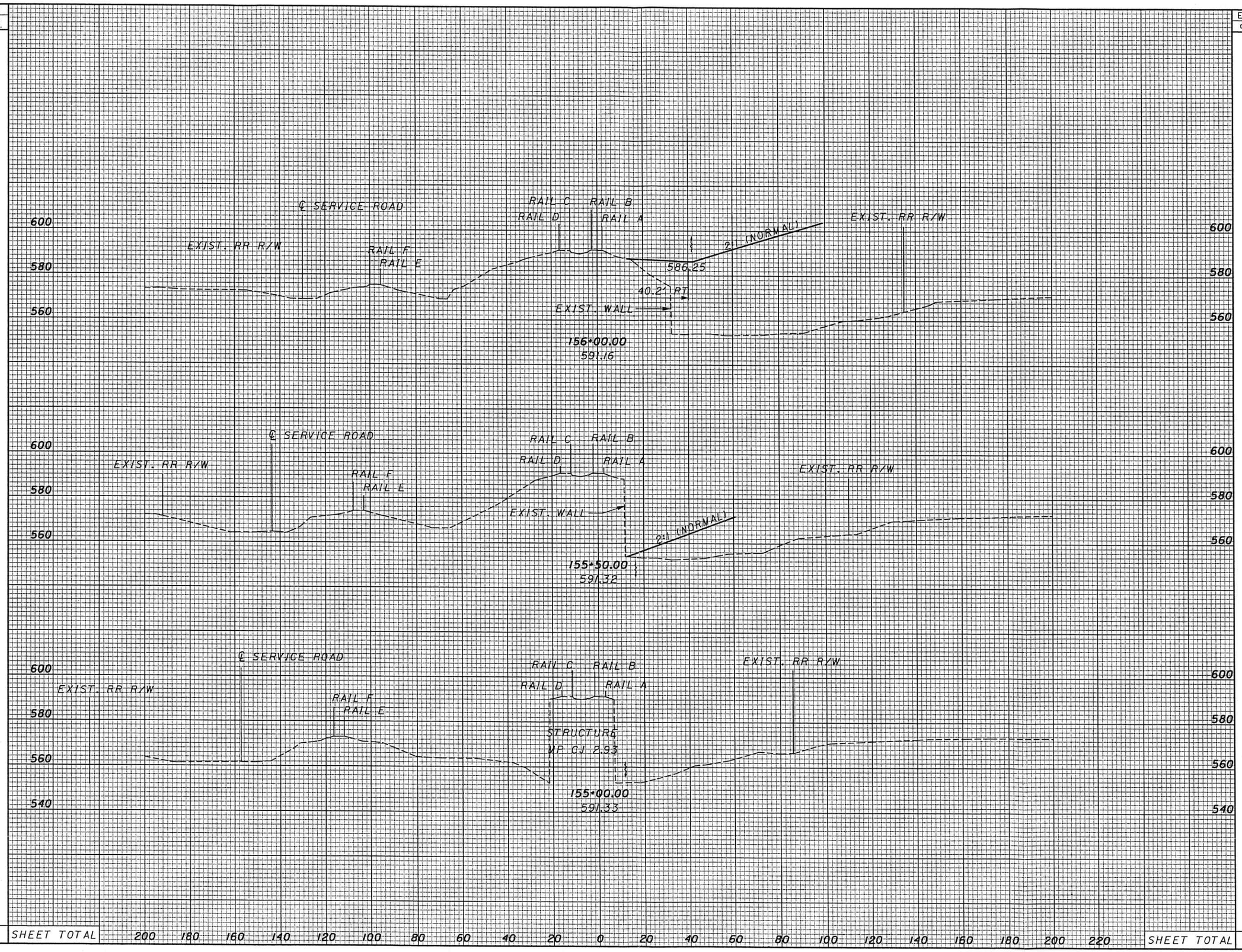
END AREA		VOLUME	
CUT	FILL	CUT	FILL

CALCULATED

CHECKED



CROSS SECTIONS
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SCI-823-0.00

3
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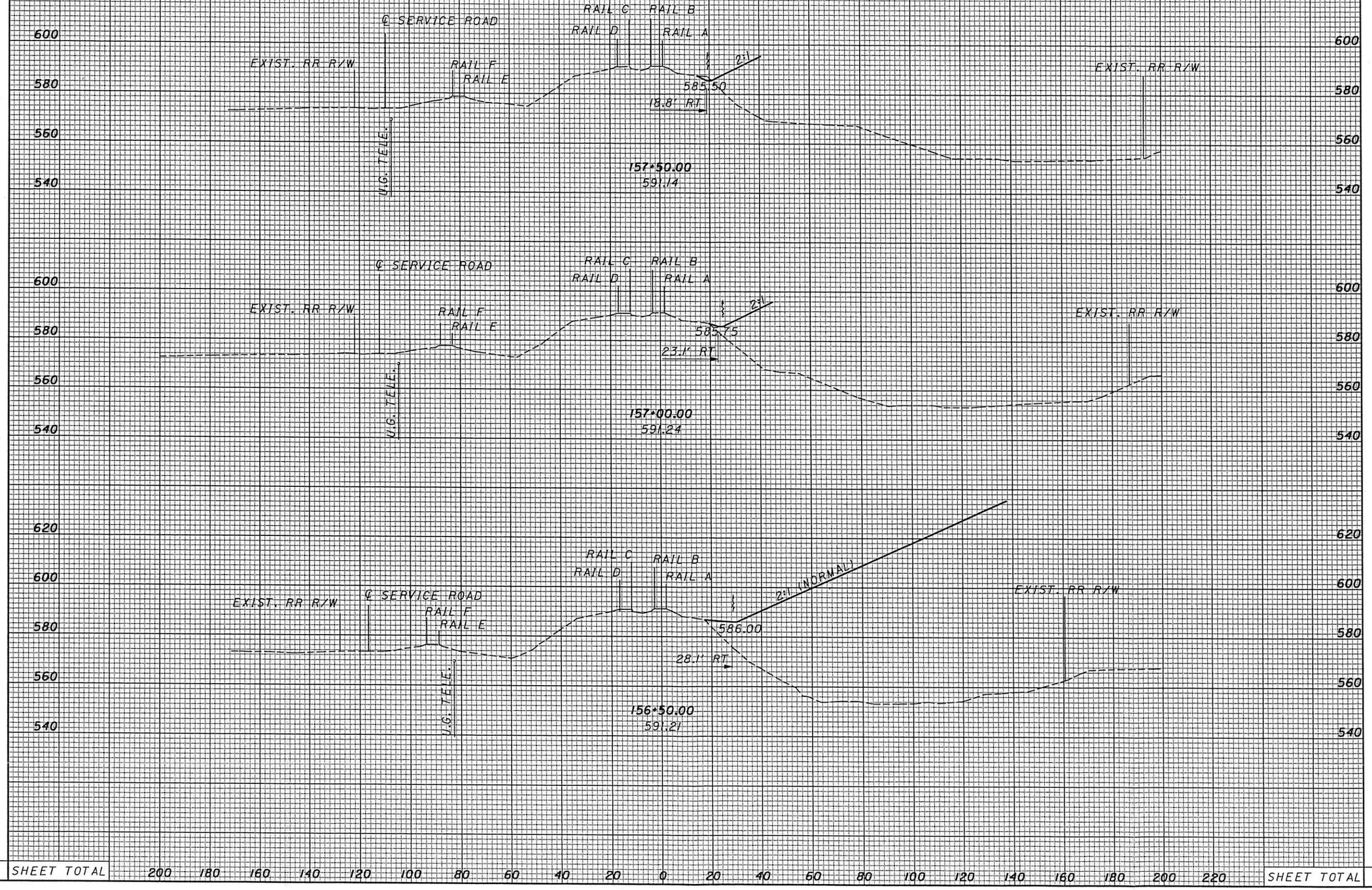
CALCULATED

CHECKED



SHEET TOTAL

SHEET TOTAL

CROSS SECTIONS
156+50.00 TO STA 157+50.00
CSXT RR STA

SCI-823-0.00

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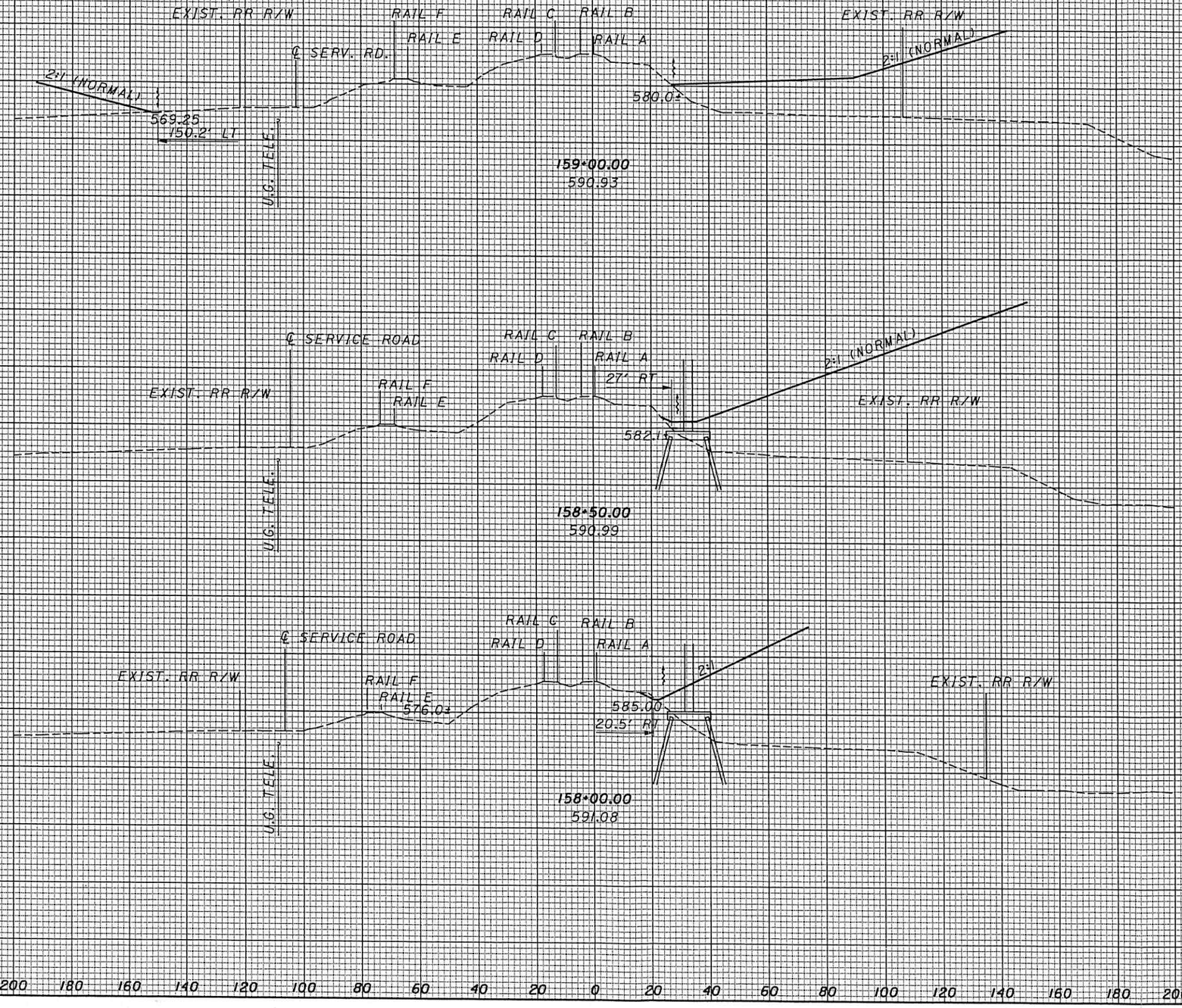
END AREA		VOLUME	
CUT	FILL	CUT	FILL

CALCULATED

CHECKED



SHEET TOTAL

SHEET TOTAL

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CROSS SECTIONS
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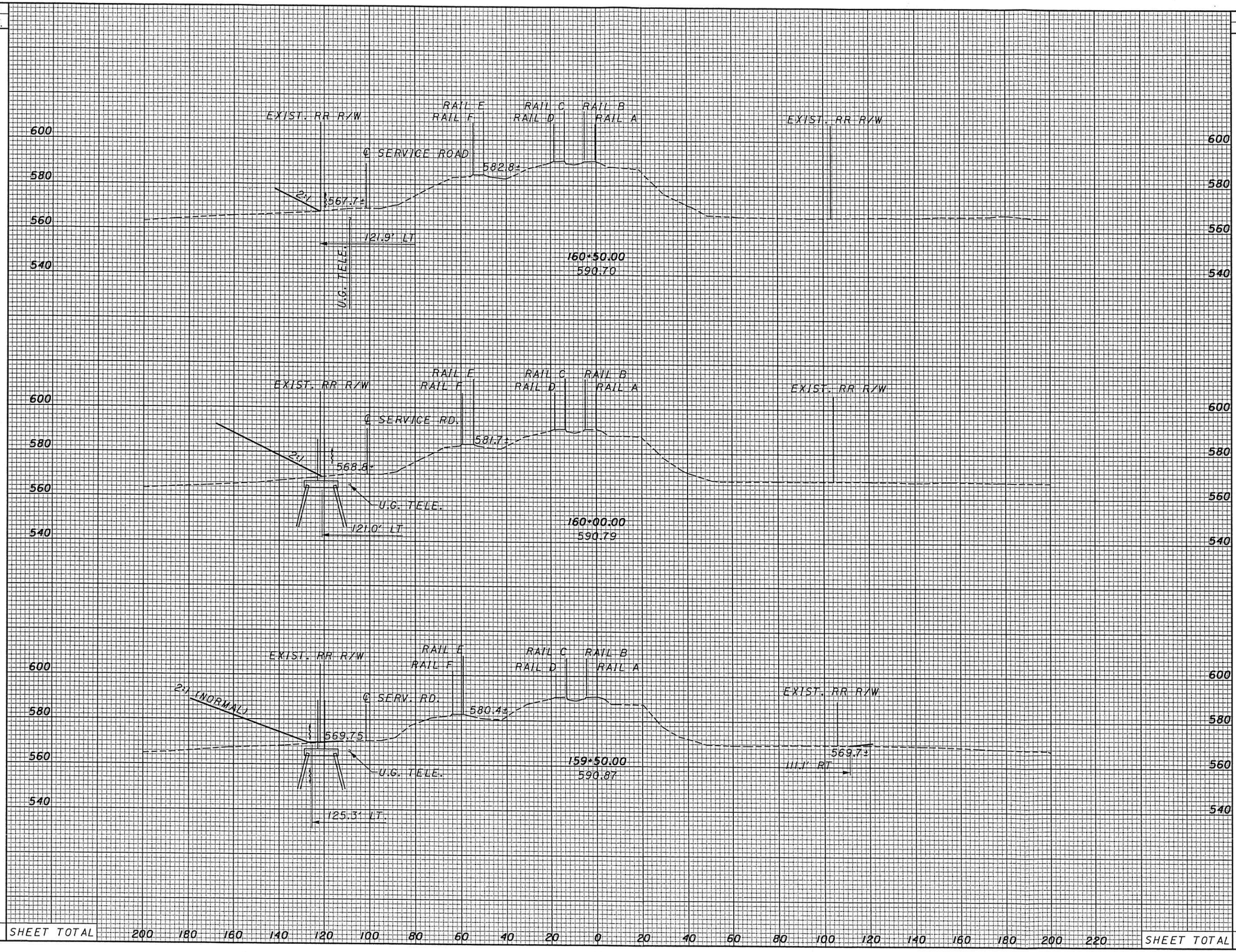
SCI-823-0.00

5

SEEDING	
END WIDTH	SQ. YDS.



END AREA		VOLUME	
CUT	FILL	CUT	FILL

CALCULATED

CHECKED

CROSS SECTIONS
CSXT RR STA 159+50.00 TO STA 160+50.00

SCI-823-0.00

6 / 6

SHEET TOTAL

SHEET TOTAL

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END WIDTH	SQ. YDS.

END AREA		VOLUME		CALCULATED	CHECKED
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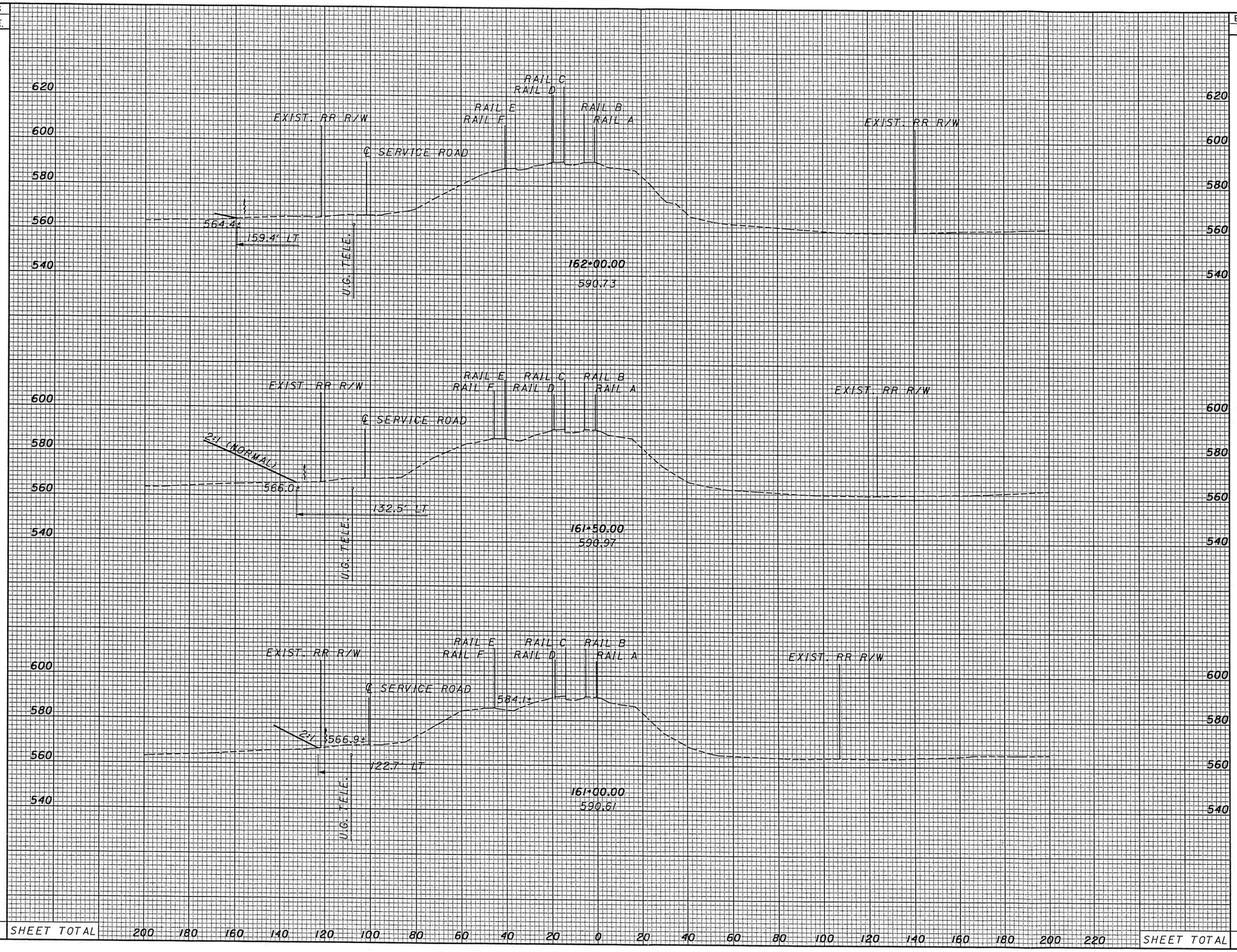

SHEET TOTAL

SHEET TOTAL

CROSS SECTIONS
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SCI-823-0.00

7

8:03:35 AM 9/20/2007 q:\C003\00641\Bridge\CNVBTS\05-CSXRRTS&L\773666XS001.CSXTRR2.dgn

CN-Patrick J. Plews

From: Steve_VanSlyke@URSCorp.com
Sent: Wednesday, January 17, 2007 7:43 AM
To: CN-Patrick J. Plews
Cc: John.Wetzel@dot.state.oh.us; Larry_Shaw@URSCorp.com; CN-Jon Cox; CN-Michael Lenett
Subject: RE: Portsmouth, OH - SR 823 - SCI-823-0.00 over CSXT Railroad (2) - ODOT PID# 19415 - OP# OH0472

Patrick

URS has reviewed previously attached and mailed plan sheets for the most recent scope change of pier locations at the Subject project location forwarded with your trailing e-mail.

We take no exception to this proposal, however reserve the right for future comment in a Stage 1 plan submittal. This should be forwarded to URS - Mr. Larry Shaw through its normal course.

Regarding the abandoned rail roadbed under the CSXT operating line - we take no exceptions to the proposed fill above and adjacent to a structure that appears to be an abutment or retaining wall, as long as proper drainage of the CSXT right-of-way is maintained.

Contact me if you have any questions or need further clarification on any issues.

Stephen G. VanSlyke
URS Corporation
36 East Seventh Street Suite 2300
Cincinnati, OH 45202

Ph: (513) 419-3509
Fax: (513) 651-3452
Cell: (513) 490-9759

<pjplews@transystems.com>

01/03/2007 03:08 PM

To <Steve_VanSlyke@URSCorp.com>
cc <Larry_Shaw@URSCorp.com>, <John.Wetzel@dot.state.oh.us>, <mdweeks@transystems.com>
Subject RE: Portsmouth, OH - SR 823 - SCI-823-0.00 over CSXT Railroad (2) - ODOT PID# 19415 - OP# OH0472

Steve-
Attached is some additional information, including rail profiles and cross sections for your review. The attached plans show the proposed pier construction in between the tracks. We have not carried the relocation of the service road forward into these plans; in accordance with our conversation on 12/21/06. The primary reasons discussed for not considering the service road relocation were the permanent cuts into the track embankment and the real estate complications with lease agreements.

We appreciate your consideration of this additional information and the clarification requested below. If you need any more information or have any questions please don't hesitate to contact me. We will also mail out hard copies (3) of this information to Larry Shaw's attention.
Thanks

Patrick J. Plews, PE
Bridge Engineer
TranSystems
Main 513-621-1981ext 36013

-----Original Message-----
From: CN-Patrick J. Plews
Sent: Friday, December 15, 2006 3:08 PM
To: 'Steve_VanSlyke@URSCorp.com'
Cc: 'Larry_Shaw@URSCorp.com'; 'John Wetzel (John.Wetzel@dot.state.oh.us)'; CO-Michael Weeks
Subject: RE: Portsmouth, OH - SR 823 - SCI-823-0.00 over CSXT Railroad (2) - ODOT PID# 19415 - OP# OH0472

Steve-
We have received comments from ODOT asking us for clarification regarding the responses to our questions. In the same order as previously presented:

1) Mapping of the area indicates that the northernmost track is a spur that serves a nearby industrial facility. If this is accurate, is it possible to consider locating a pier closer to this track? The attached Site Plan presents a structure utilizing a pier(s) (of heavy
construction) in between the previously mentioned tracks. The pier is placed such that greater than 25' of clearance is provided to the mainline tracks and greater than 18' is provided to the spur.
Considering the above, is this acceptable? Also included is a preliminary supplemental site plan for your reference.

2) What is the minimum allowable clearance between the CL of the tracks and the service road? What is the minimum width for the service road?

If you need any more information or have any questions please don't hesitate to contact me.
Thanks

Patrick J. Plews, PE
Bridge Engineer
TranSystems
Main 513-621-1981ext 36013

-----Original Message-----
From: Steve_VanSlyke@URSCorp.com [mailto:Steve_VanSlyke@URSCorp.com]
Sent: Thursday, June 22, 2006 3:10 PM

To: CN-Patrick J. Plews
Cc: david.norris@dot.state.oh.us; Mel_McNichols@csx.com; deborah_baldino@csx.com; Larry_Shaw@URSCorp.com
Subject: Fw: Portsmouth, OH - SR 823 - SCI-823-0.00 over CSXT Railroad (2) - ODOT PID# 19415 - OP# OH0472

Patrick

Regarding your points of discussion for CSXT consideration on the Subject project:

1) CSXT will not consider a scenario where there is a pier constructed between the tracks.

2) URS will entertain review of relocating the existing access road to reduce span length as proposed. Prior to approval, CSXT Property Services will need to amend the lease with the agreement holder and will need to review drawings in plan and profile, that also include cross sections along the near track and proposed road realignment. This set should also contain temporary and permanent drainage considerations along the entire access road realignment and tie-ins.

You may forward 3 sets directly to me for my further handling.

Any other progression of project plans - for either proposed structure or right-of-way impacting CSXT should be forward to Mr. Larry Shaw (Address in trailing e-mail) for his handling and distribution to develop the entire project.

Feel free to contact me if any questions or if any further clarification is needed.

Stephen G. VanSlyke
URS Corporation
36 East Seventh Street Suite 2300
Cincinnati, OH 45202

Ph: (513) 419-3509
Fax: (513) 651-3452
Cell: 314-406-1480

----- Forwarded by Steve VanSlyke/Decatur/URSCorp on 06/22/2006 02:55 PM -----

Larry

Shaw/Indianapolis

/URSCorp

To

steve_vanslyke@urscorp.com

06/13/2006 04:13

cc

PM

pjplews@transystems.com,

david.norris@dot.state.oh.us,

richard.behrendt@dot.state.oh.us,

Mel_McNichols@csx.com,

deborah_baldino@csx.com

Subject

Fw: Portsmouth, OH - SR 823 -

SCI-823-0.00 over CSXT Railroad

(2)

- ODOT PID# 19415 - OP# OH0472

Steve,
Please contact Patrick Plews, TranSystems (ODOT's design consultant) relative his trailing message. Thanks.
NOTE: in addition to the plan sheet provided by Patrick, I have attached select plan sheets recently received from Rich Behrendt.

NOTE: NEW ADDRESS & PHONE
Larry J. Shaw, P.E.
Program Manager
URS Corporation
One Indiana Square, Suite 2100
Indianapolis, IN 46204

Larry_Shaw@urscorp.com
Tel: 317.532.5481
Fax: 317.532.5499

----- Forwarded by Larry Shaw/Indianapolis/URSCorp on 06/13/2006 03:42 PM -----

	<pjplews@transyst ems.com>	
To	06/02/2006 04:56 PM	<larry_shaw@urscorp.com>
cc		<David.Norris@dot.state.oh.us>, <mdweeks@transystems.com>
Subject		FW: SCI-823-0.00 over CSXT Railroad (2)

Larry-
Per our conversation earlier today attached is a pdf of the site plan that was prepared for one of our preliminary submittals. The proposed site is approximately 0.65 miles south of the crossing of with SR 335. The crossing at SR 335 is identified as AARDOT # 228404E and its milepost is listed as 0003.66.

To summarize our discussion and inquiry; TranSystems has received comments from ODOT directing us to investigate some changes and we need to verify CSXT's position on the proposed changes. ODOT has directed us to discuss some options with you, as you can see below. The changes proposed are to minimize bridge spans and therefore cost incurred by ODOT.

> The first comment is to investigate relocating the service road, north of track 3 on the attached plan. The service road is on CSX property with the survey information gathered to date. The relocation would be closer to the existing track to minimize the bridge span. Would CSX recommend that the relocation is acceptable?
>
> The second comment is to place a pier in between the mainline tracks and the side track on the north. We have investigated the clearances an estimate approximately 22' permanent clearance and 17.5' clearance to our footing allowing some distance for temporary shoring. The pier would be of proportion to be used at that clearance. Will construction equipment crossing the siding track be an issue to prevent construction of this option?

I understand that you may not have the contractual issues completely resolved but I wanted

to get the information to you. Please contact me once you are sure of the contract and we can discuss the timeline to resolve them.
Thanks

Patrick J. Plews, EI
Bridge Engineer
TranSystems
Main 513-621-1981ext 36013

From: CO-Michael Weeks
Sent: Thursday, June 01, 2006 3:25 PM
To: 'David.Norris@dot.state.oh.us'
Cc: CN-Jon Cox; CN-Michael Lenett
Subject: RE: SCI-823-0.00 over CSXT Railroad (2)

Dave,

We will contact Larry and advise you of our conversation.

Thanks,
Mike

From: David.Norris@dot.state.oh.us [mailto:David.Norris@dot.state.oh.us]
Sent: Thursday, June 01, 2006 3:12 PM
To: CO-Michael Weeks
Cc: CN-Jon Cox
Subject: Fw: SCI-823-0.00 over CSXT Railroad (2)

Mike,

Go ahead and have your bridge engineer contact Larry Shaw, who reviews railroad work for CSXT.
On our Ross 207 project, we coordinated with him at the following address:

Larry Shaw
URS Corporation
47 South Meridian, Suite 312
Indianapolis, IN 46204
Tel: 317-635-0064
Fax: 317-635-0066
email: Larry_Shaw@urscorp.com

--
David A. Norris, PE
ODOT District 9 DDD Engineering Assistant PO Box 467 Chillicothe, OH 45601 Toll Free: (888) 819-8501 Direct Phone: (740)-774-9061
----- Forwarded by David Norris/Administration/D09/ODOT on 06/01/2006 03:04 PM -----

Richard

Behrendt/RealEstate/CEN/ODOT

To
06/01/2006 02:37 PM

Norris/Administration/D09/ODOT@OD

cc

Subject

David

OT

Re: Fw: SCI-823-0.00 over CSXT

Railroad (2)Link

Dave,
I don't need to be involved...I don't believe Larry would have any difficulty discussing this directly w/your consultant as long as he has a set of plans to refer to...

Thanks for checking...

Rich Behrendt
Program Mgr./State Rail Coordinator
Ohio Department of Transportation
1980 West Broad St.
Columbus, Ohio 43223
Phone: 614-387-3097
FAX: 614-466-0158
email: richard.behrendt@dot.state.oh.us

David

Norris/Administration/D09/ODOT

To
06/01/2006 02:04 PM

Richard

Behrendt/RealEstate/CEN/ODOT@ODO

T

cc

Subject

Fw: SCI-823-0.00 over CSXT Railroad

Rich,

Should the consultant contact CSXT or Larry Shaw at URS re these questions?

Or would you like to be involved?

--
David A. Norris, PE
ODOT District 9 DDD Engineering Assistant PO Box 467 Chillicothe, OH 45601 Toll Free: (888) 819-8501 Direct Phone: (740)-774-9061
----- Forwarded by David Norris/Administration/D09/ODOT on 06/01/2006 02:01
PM -----

<mdweeks@transystems.com>

06/01/2006 01:05 PM

To <David.Norris@dot.state.oh.us>

cc <jrcox@transystems.com>,
<mslenett@transystems.com>

Subject FW: SCI-823-XXXX over CSXT Railroad

Dave,

Please see our bridge design team's concerns with OSE's comments on SCI-823
over CSXT. I thought you would probably like to check with Richard Behrendt at Central Office to see how we should address these questions to CSXT. Let me know if you have questions or if we should pursue this with CSXT directly.

Thanks,
Mike

From: CN-Michael Lenett
Sent: Thursday, June 01, 2006 10:22 AM
To: CO-Michael Weeks
Cc: CN-Jon Cox; CN-Patrick J. Plews
Subject: SCI-823-XXXX over CSXT Railroad

Hi Mike.

Here are the structural questions regarding SCI-823-xxxx over the CSXT Railroad:

1) ODOT comment #2 (dated 9/26//2005) discusses moving the 2:1 embankment slope of the forward abutment, which requires relocating the existing service

road. This service road is within CSXT's Right-of-Way.
Before this option is seriously investigated, shouldn't we first ensure that CSXT allows infringement onto (i.e., crossing into) their right-of-way and, furthermore, allow relocation of the service road?

2) ODOT comment #3 (dated 9/26/2005) discusses the investigation of
placing a pier between existing sets of tracks. Although placement of a pier in this region will satisfy CSX clearance requirements, construction of the pier will require construction material and equipment within the CSXT Right-of-way and access over CSXT Track 3 (the northernmost track).
Before this option is further pursued, shouldn't we first make sure that CSX is comfortable with construction within their right-of-way as well as construction between existing sets of tracks?

Michael S. Lenett, Ph.D.
Senior Bridge Project Engineer
TranSystems
Main 513-621-1981 ext. 36022
Mobile 513-503-4715

LOCATION MAP

LATITUDE: N 38°50'25" LONGITUDE: W 82°50'50"

SCALE IN MILES

0 1 2 3 4

N

PORTION TO BE IMPROVED

INTERSTATE & DIVIDED HIGHWAY

UNDIVIDED STATE & FEDERAL ROUTES

OTHER ROADS

END PROJECT
STA. 352+00.00
SLM - 6.67

BEGIN PROJECT
STA. 54+11.25
SLM - 1.02

STATE OF OHIO

DEPARTMENT OF TRANSPORTATION

SCI-823-0.00

CITY OF PORTSMOUTH

PORTER & HARRISON TOWNSHIPS

SCIOTO COUNTY

CSXT COORDINATION SUBMISSION

INDEX OF SHEETS

DESIGN DESIGNATION
(SEE SHEET 2)

DESIGN EXCEPTIONS
(SEE SHEET 2)

EARTH DISTURBED AREAS

PROJECT EARTH DISTURBED AREA - XX.XX ACRES

ESTIMATED CONTRACTOR EARTH DISTURBED AREA - XX.XX ACRES

NOTICE OF INTENT EARTH DISTURBED AREA - XXX.XX ACRES

UNDERGROUND UTILITIES
TWO WORKING DAYS
BEFORE YOU DIG
CALL 1-800-362-2764 (TOLL FREE)
OHIO UTILITIES PROTECTION SERVICE
NON-MEMBERS
MUST BE CALLED DIRECTLY

PLAN PREPARED BY:

TranSystems
5747 Perimeter Drive, Suite 240
Dublin, OH 43068
Main: 614-336-8480 | Fax: 614-336-8640
www.transystems.com

ENGINEERS SEAL:

SIGNED:

DATE:

PROJECT DESCRIPTION

CONSTRUCTION OF 5.65 MILES OF FOUR LANE LIMITED ACCESS HIGHWAY (SR 823) FROM THE US 52 INTERCHANGE TO SOUTH OF THE TR234 INTERCHANGE; INTERCHANGES AT US 52 AND SR 140; SR 823 BRIDGES OVER SR 140, CSXT, TR 248 (SLOCUM AVE.) AND SR 335 & LITTLE SCIOTO RIVER; US52 RAMP A BRIDGE OVER CR 503 (OHIO RIVER ROAD); US52 RAMP B BRIDGE OVER US 52 & CR 503.

LIMITED ACCESS

THIS IMPROVEMENT IS ESPECIALLY DESIGNED FOR THROUGH TRAFFIC AND HAS BEEN DECLARED A LIMITED ACCESS HIGHWAY OR FREEWAY BY ACTION OF THE DIRECTOR IN ACCORDANCE WITH THE PROVISIONS OF SECTION 5511.02 OF THE OHIO REVISED CODE.

2005 SPECIFICATIONS

THE STANDARD SPECIFICATIONS OF THE STATE OF OHIO, DEPARTMENT OF TRANSPORTATION, INCLUDING CHANGES AND SUPPLEMENTAL SPECIFICATIONS LISTED IN THE PROPOSAL SHALL GOVERN THIS IMPROVEMENT.

I HEREBY APPROVE THESE PLANS AND DECLARE THAT THE MAKING OF THIS IMPROVEMENT WILL NOT REQUIRE THE CLOSING TO TRAFFIC THE HIGHWAY AND THAT THE PROVISIONS FOR MAINTENANCE AND SAFETY OF TRAFFIC WILL BE SET FORTH ON THE PLANS AND ESTIMATES

UNDER AUTHORITY OF SECTION 4511.21, DIVISION (I) OF THE OHIO REVISED CODE, THE REVISED PRIMA FACIE SPEED LIMITS AS INDICATED HEREIN ARE DETERMINED TO BE REASONABLE AND SAFE, AND ARE HEREBY ESTABLISHED FOR THE DURATION OF THIS PROJECT. THE PRIMA FACIE SPEED LIMIT OR LIMITS HEREBY ESTABLISHED SHALL BECOME EFFECTIVE WHEN APPROPRIATE SIGNS GIVING NOTICE THEREOF ARE ERECTED.

APPROVED _____
DATE _____ DISTRICT DEPUTY DIRECTOR

APPROVED _____
DATE _____ DIRECTOR, DEPARTMENT OF TRANSPORTATION

FEDERAL PROJECT NO.

PID NO. 77366

CONSTRUCTION PROJECT NO. SCI-823-0.00

RAILROAD INVOLVEMENT CSXT & NS

1

CROSS REFERENCES	
SHEET NO.	DESCRIPTION
	PROFILE SR 823

SINGLE SLOPE CONC. BARRIER, TYPE B1

℄ CONSTRUCTION SR 823

SR 823 SB

SR 823 NB

N 0° 38' 4" W

10'
24'
15'
24'
10'

103 104 105 106 107 108 109 110 111 112 113 114

MATCH LINE STA. 102+00 SR 823

MATCH LINE STA. 114+50 SR 823

HORIZONTAL SCALE IN FEET
0 25 50 100

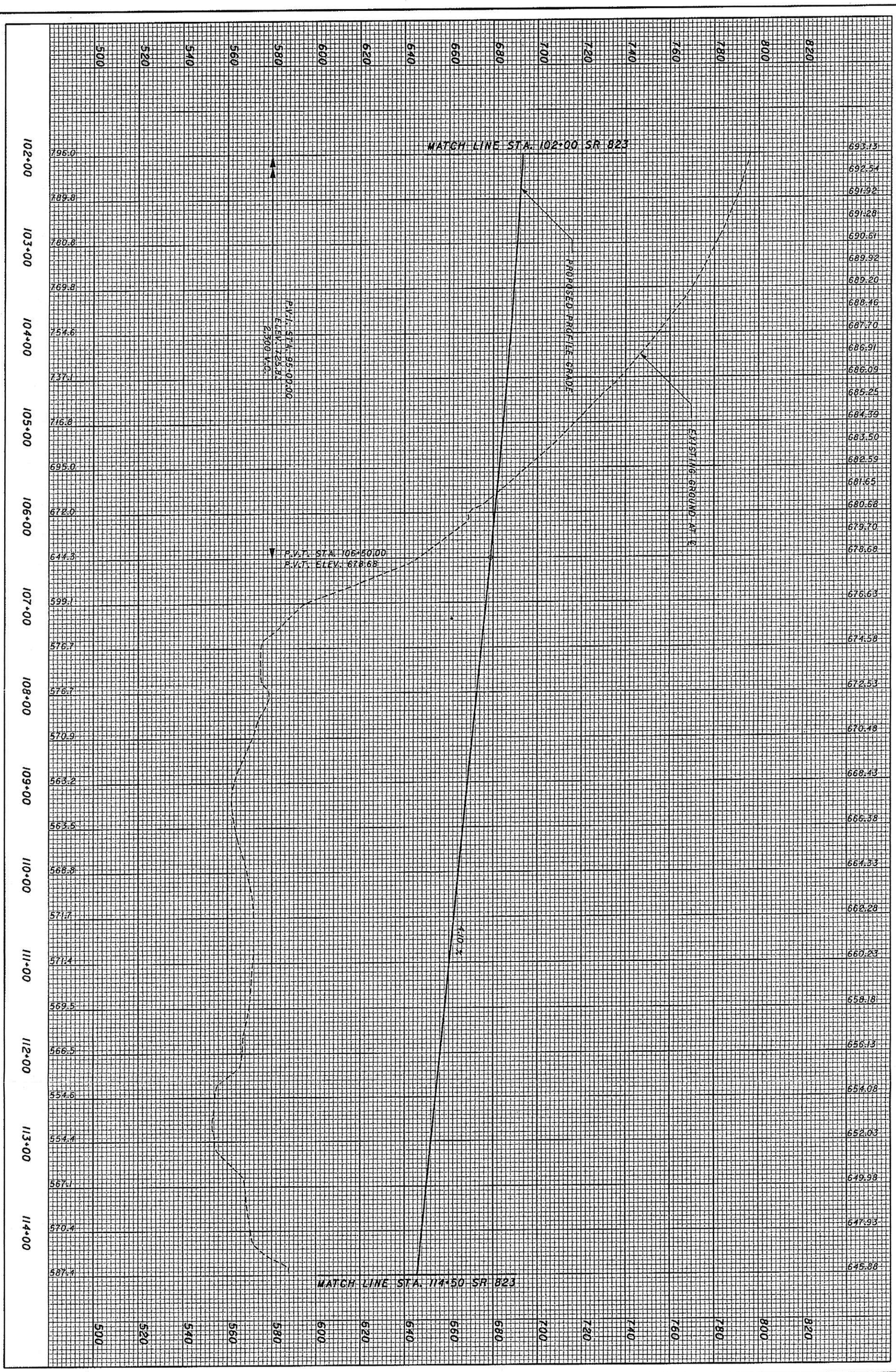
CALCULATED DL
CHECKED RH

PLAN - SR823

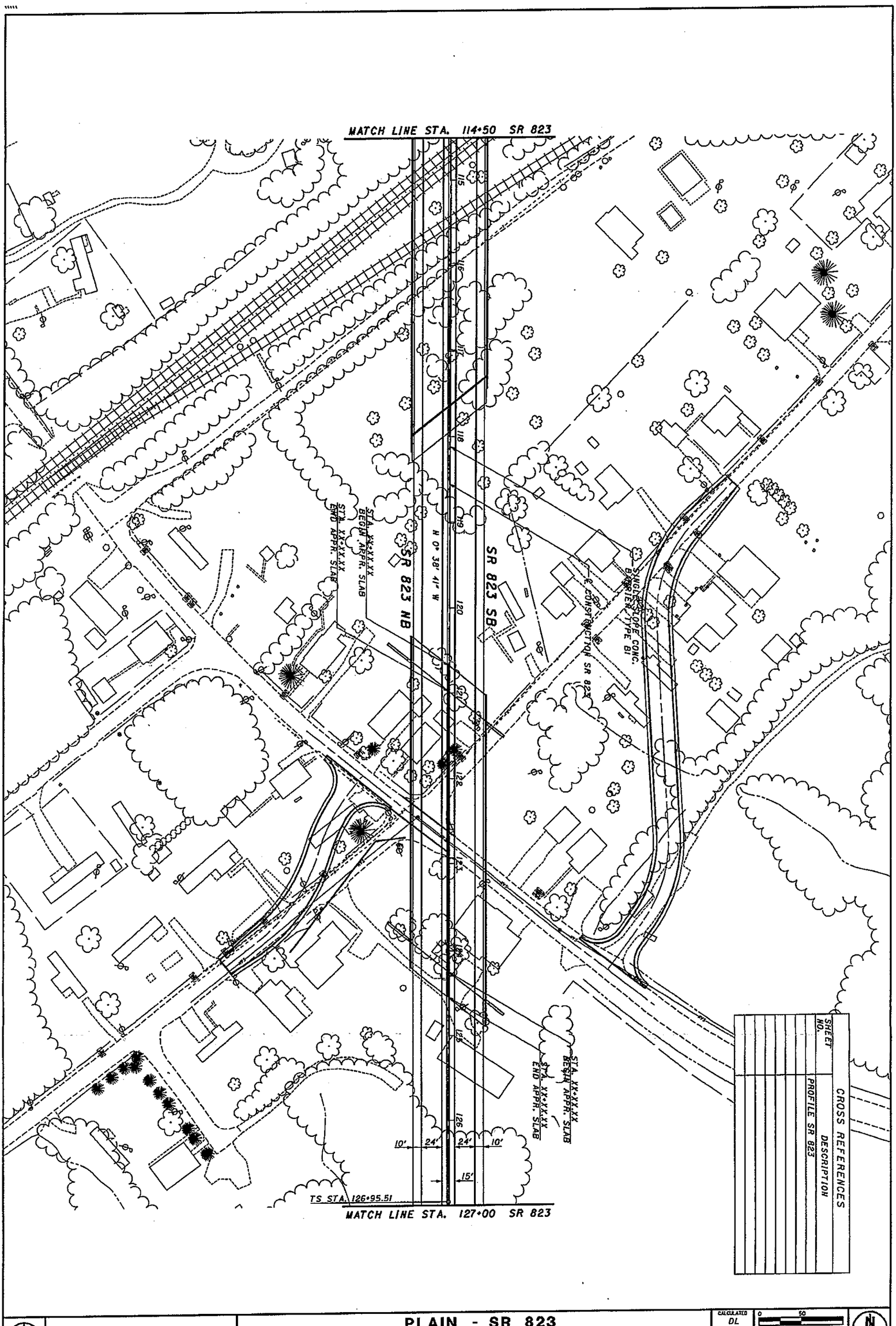
STA. 102+00.00 TO STA. 114+50.00

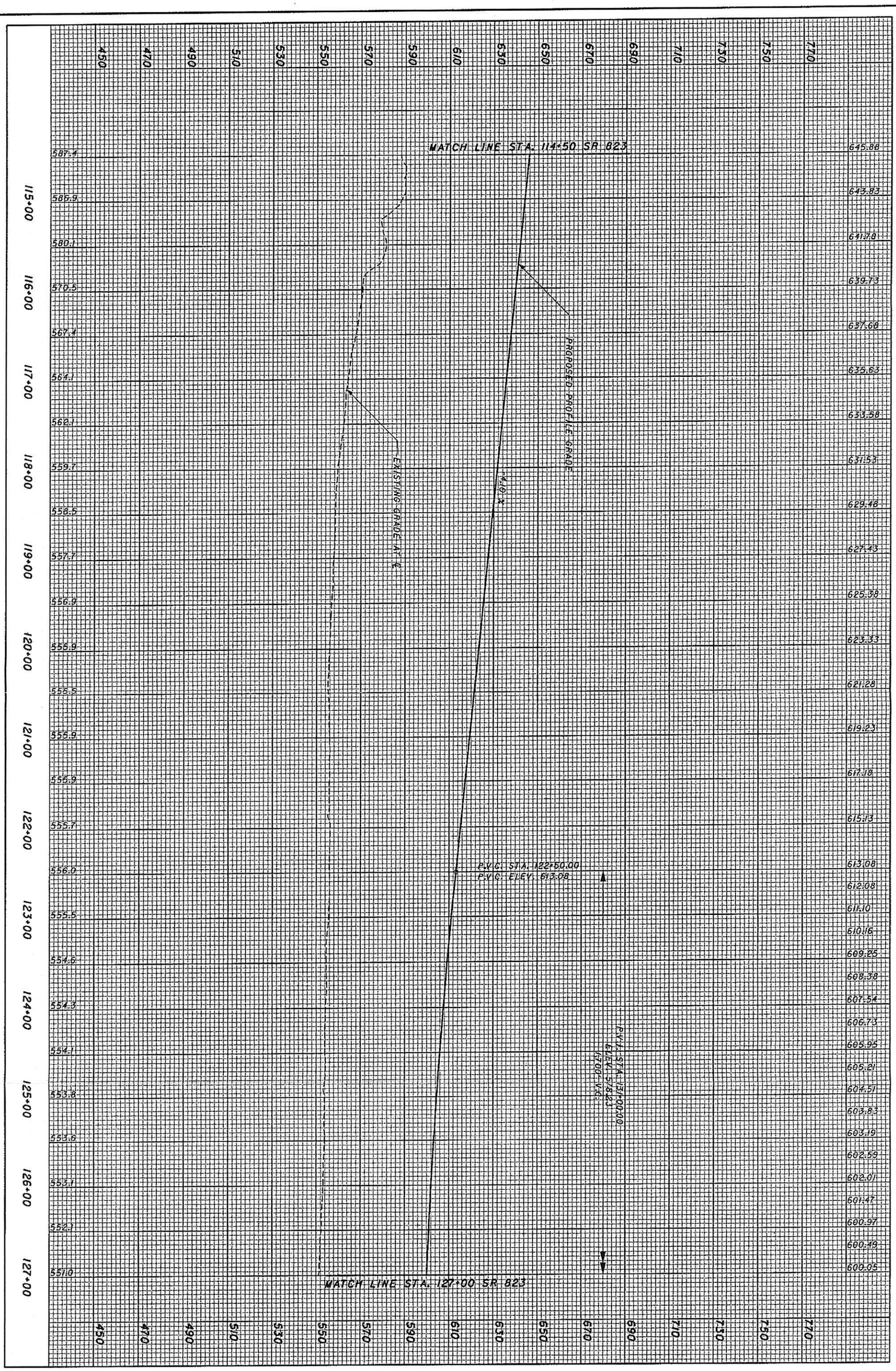
SCI-823-0.00

2

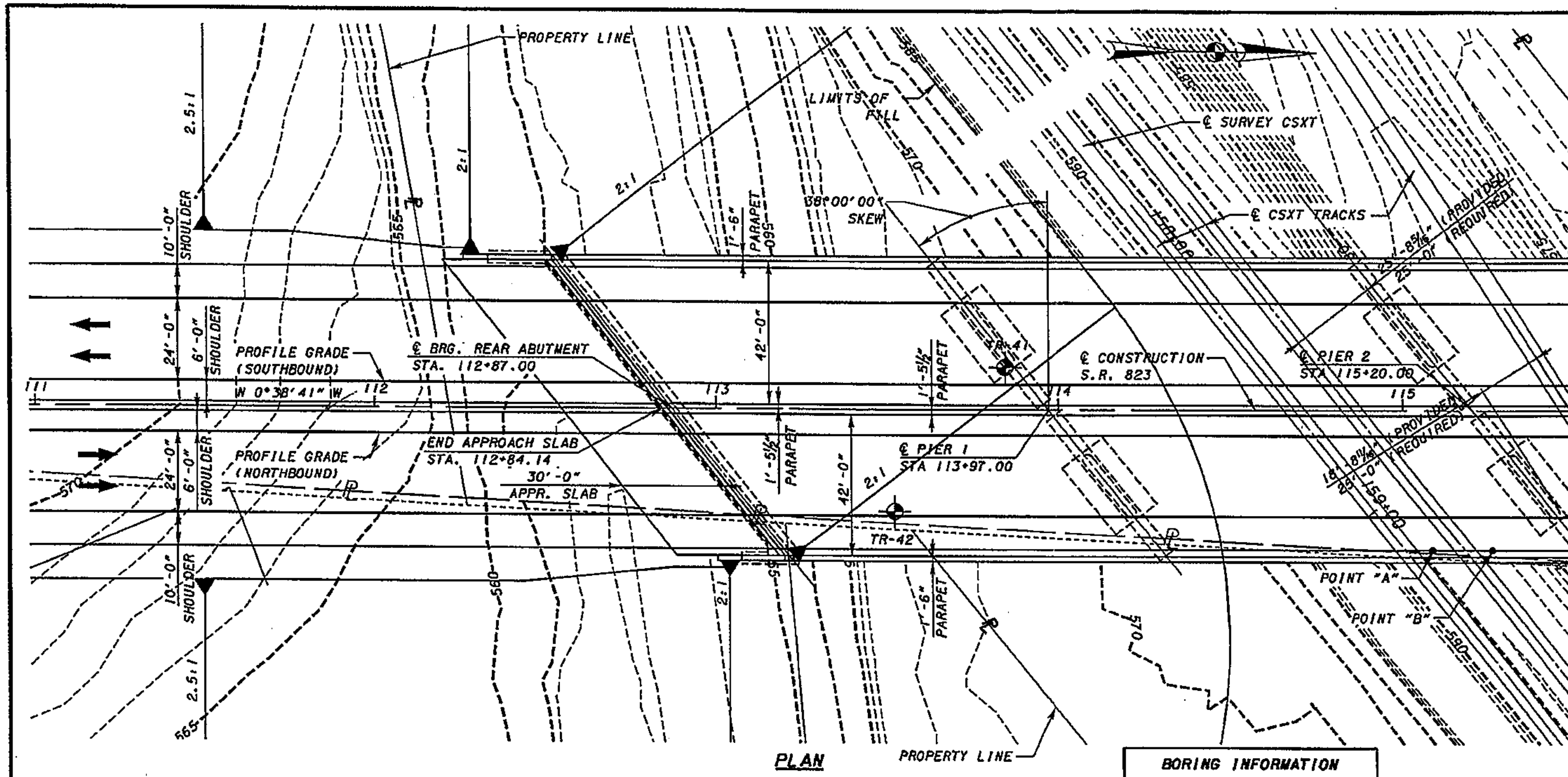


13	SCI-823-0.00	PROFILE- SR 823 STA. 102+00 TO STA. 114+50	CALCULATED JFA CHECKED RN


MATCH LINE STA. 114+50 SR 823
SR 823 NB
SR 823 SB
N 0° 38' 41" W
STA. XX+XX.XX BEGIN APPR. SLAB
STA. XX+XX.XX END APPR. SLAB
CONSTRUCTION SR 823
SINGLE SLOPE CONC. BARRIER TYPE B1
10'
24'
24'
10'
15'
TS STA. 126+95.51
MATCH LINE STA. 127+00 SR 823
CROSS REFERENCES
DESCRIPTION
SHEET NO.
PROFILE SR 823
SCI-823-0.00
PLAIN - SR 823
STA. 114+50.00 TO STA. 127+00.00
CALCULATED DL
CHECKED RN
0 50 100
25
HORIZONTAL SCALE IN FEET
N

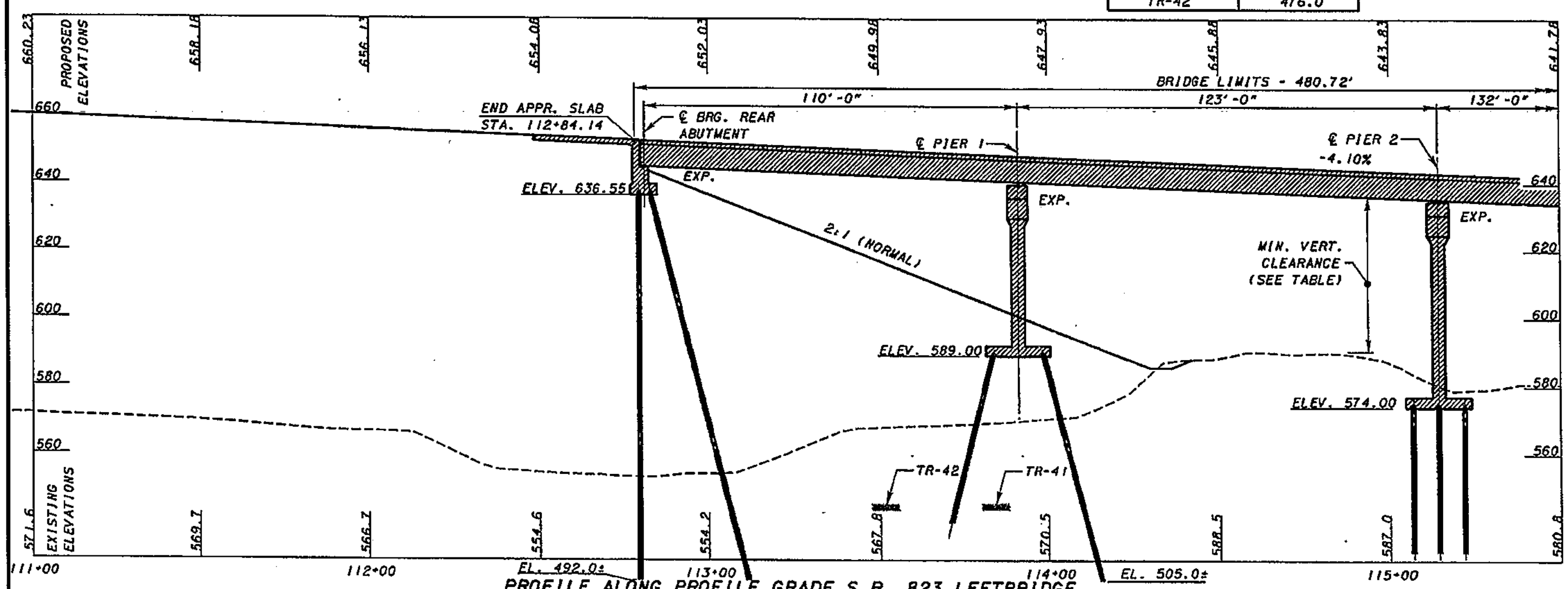


57	SCI-823-0.00	PROFILE- SR 823 STA. 114+50 TO STA. 127+00	CALCULATED JFA CHECKED RN



BORING INFORMATION

BORING ID	T/ROCK ELEV.
TR-41	476.4
TR-42	476.0



FIRST GUARDRAIL POST OFF BRIDGE LOCATIONS

LOCATION	STATION	SIDE
REAR ABUT.	x	RT.
REAR ABUT.	x	LT.
FWD. ABUT.	x	RT.
FWD. ABUT.	x	LT.

TABLE OF VERTICAL CLEARANCES

LOCATION	"A"	"B"
PROPOSED	44.69'	44.15'
REQUIRED	23.0'	23.0'

BENCHMARK 1	BENCHMARK 2
(TO BE PROVIDED LATER)	(TO BE PROVIDED LATER)

TRAFFIC DATA

S.R. 823

CURRENT YEAR ADT (2010) - 21,200
DESIGN YEAR ADT (2030) - 31,200
CURRENT YEAR ADTT (2010) - 2,968
DESIGN YEAR ADTT (2030) - 4,368

NOTES:

1. ALL SHEETS WITH PLAN DIMENSIONS ARE SHOWN HORIZONTAL.
2. EARTHWORK LIMITS SHOWN ARE APPROXIMATE. ACTUAL SLOPES SHALL CONFORM TO PLAN CROSS SECTIONS.

FOUNDATION DATA:

ALL NEW PILES SHALL BE HP 14x73 FRICTION PILES AND HAVE A MAXIMUM CAPACITY OF 95 TONS PER PILE.

PROPOSED STRUCTURE

TYPE: 4 SPAN CONTINUOUS *** GIRDER WITH COMPOSITE REINFORCED CONCRETE DECK SUPPORTED BY REINFORCED CONCRETE T-TYPE PIERS AND STUB TYPE ABUTMENTS.

SPANS: 110'-0" - 123'-0" - 132'-0" - 110'-0"

ROADWAY: 2 - 42'-0" T/T OF PARAPETS

LOADING: HS-25 (CASE I) AND ALTERNATE MILITARY LOADING, FUTURE WEARING SURFACE - 60 PSF

SKEW: 38°00'00" RF

CROWN: 0.016 FT/FT

ALIGNMENT: TANGENT

WEARING SURFACE: MONOLITHIC CONCRETE

APPROACH SLABS: AS-1-81 (30' LONG)

LATITUDE: 38°46'06" N

LONGITUDE: 82°52'36" W

DESIGN AGENCY

DESIGNED PJP | CHECKED MSL | DRAWN PJP | REVISED | REVIEWED JRC | DATE 11/20/06 | STRUCTURE FILE NUMBER

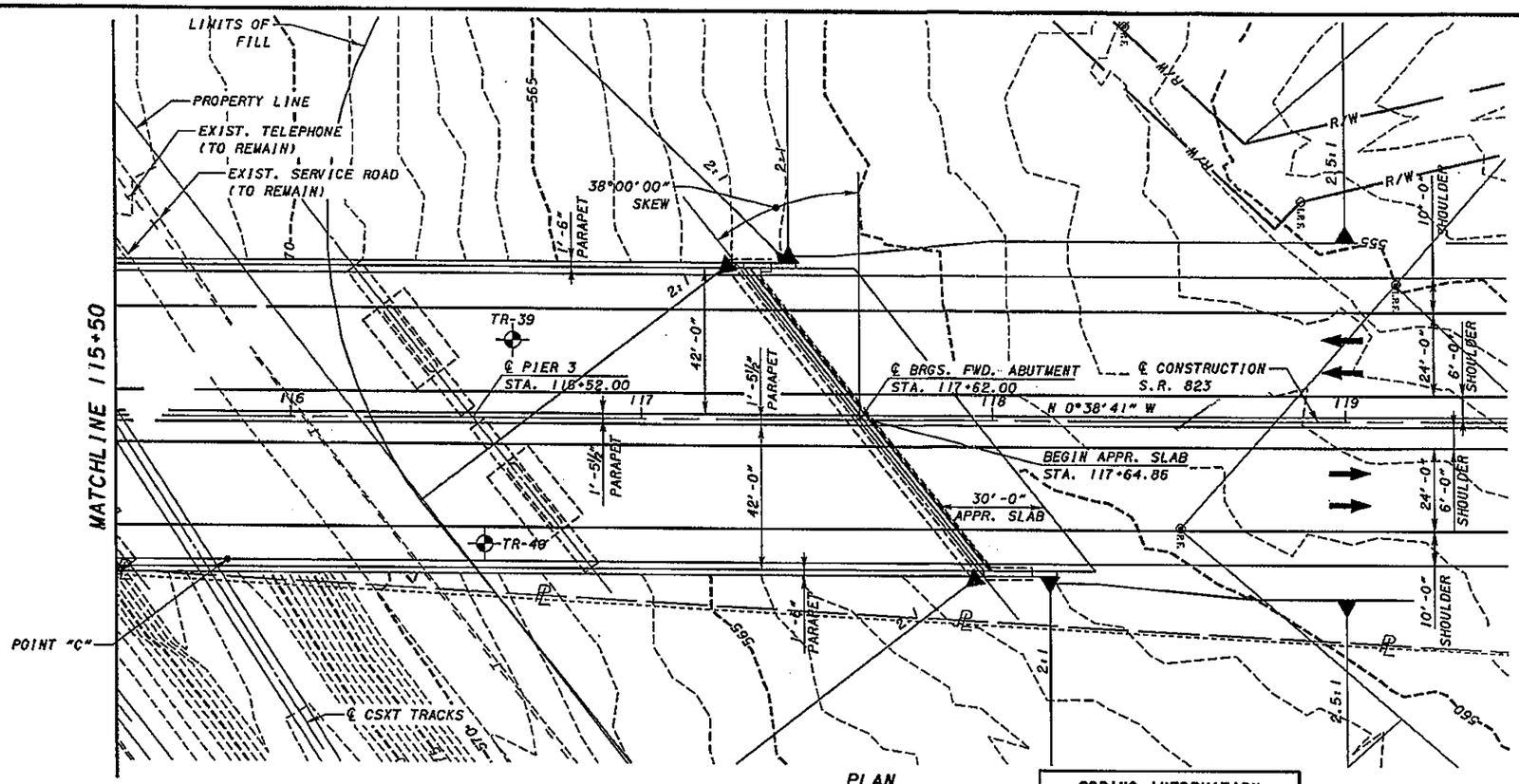
SCIOTO COUNTY
STA. 112+84.14
STA. 117+64.86

SITE PLAN - ALTERNATIVE 2
BRIDGE NO. SCI-823-0214 L&R
S.R. 823 OVER CSXT RAILROAD

SCI-823-0.00
PID 77366

1 / 4

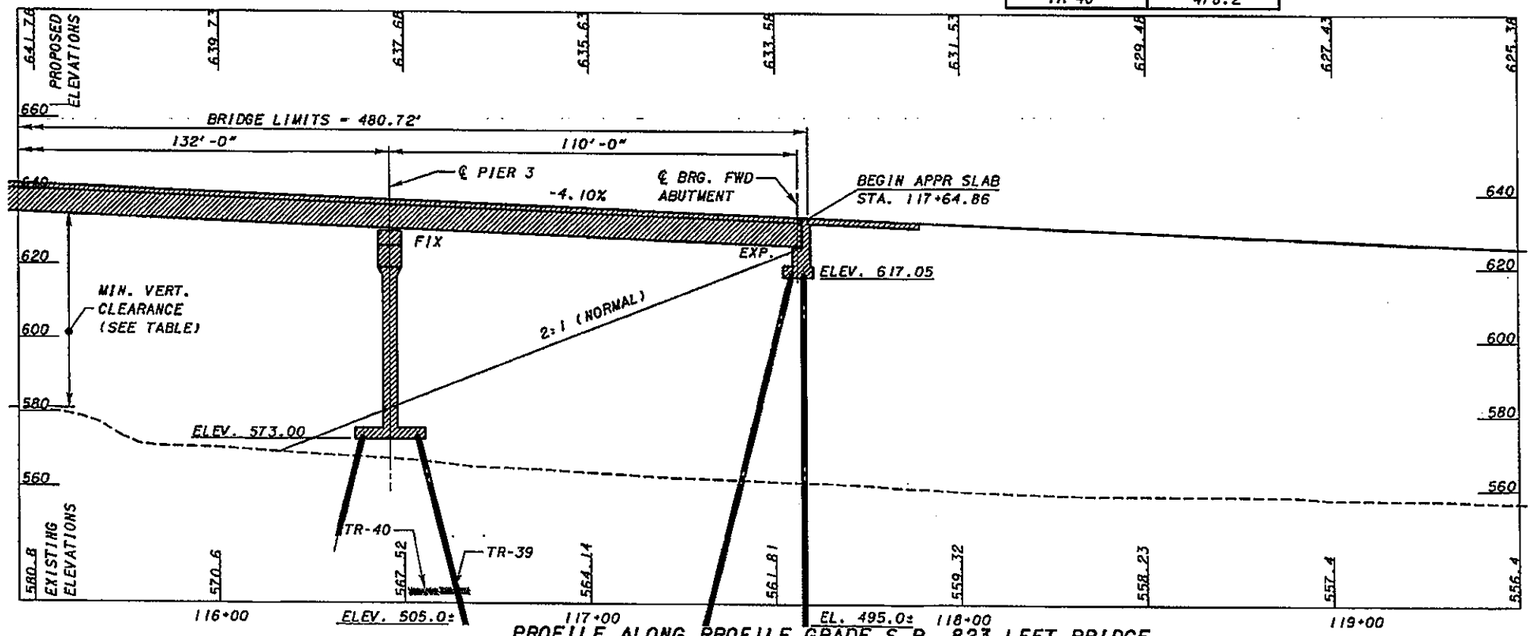
6



PLAN

TABLE OF VERTICAL CLEARANCES		
LOCATION	"C"	
PROPOSED	49.62'	
REQUIRED	23.0'	

BORING INFORMATION	
BORING ID	T/ROCK ELEV.
TR-39	474.2
TR-40	476.2



PROFILE ALONG PROFILE GRADE S.R. 823 LEFT BRIDGE

NOTES:

1. ALL SHEETS WITH PLAN DIMENSIONS ARE SHOWN HORIZONTAL.
2. EARTHWORK LIMITS SHOWN ARE APPROXIMATE. ACTUAL SLOPES SHALL CONFORM TO PLAN CROSS SECTIONS.

DESIGN AGENCY: Systems

DRAWN	REVISED	DATE
PJP	JRC	12/29/06
DESIGNED	REVISED	STRUCTURE FILE NUMBER
PJP		
CHECKED		
WSL		

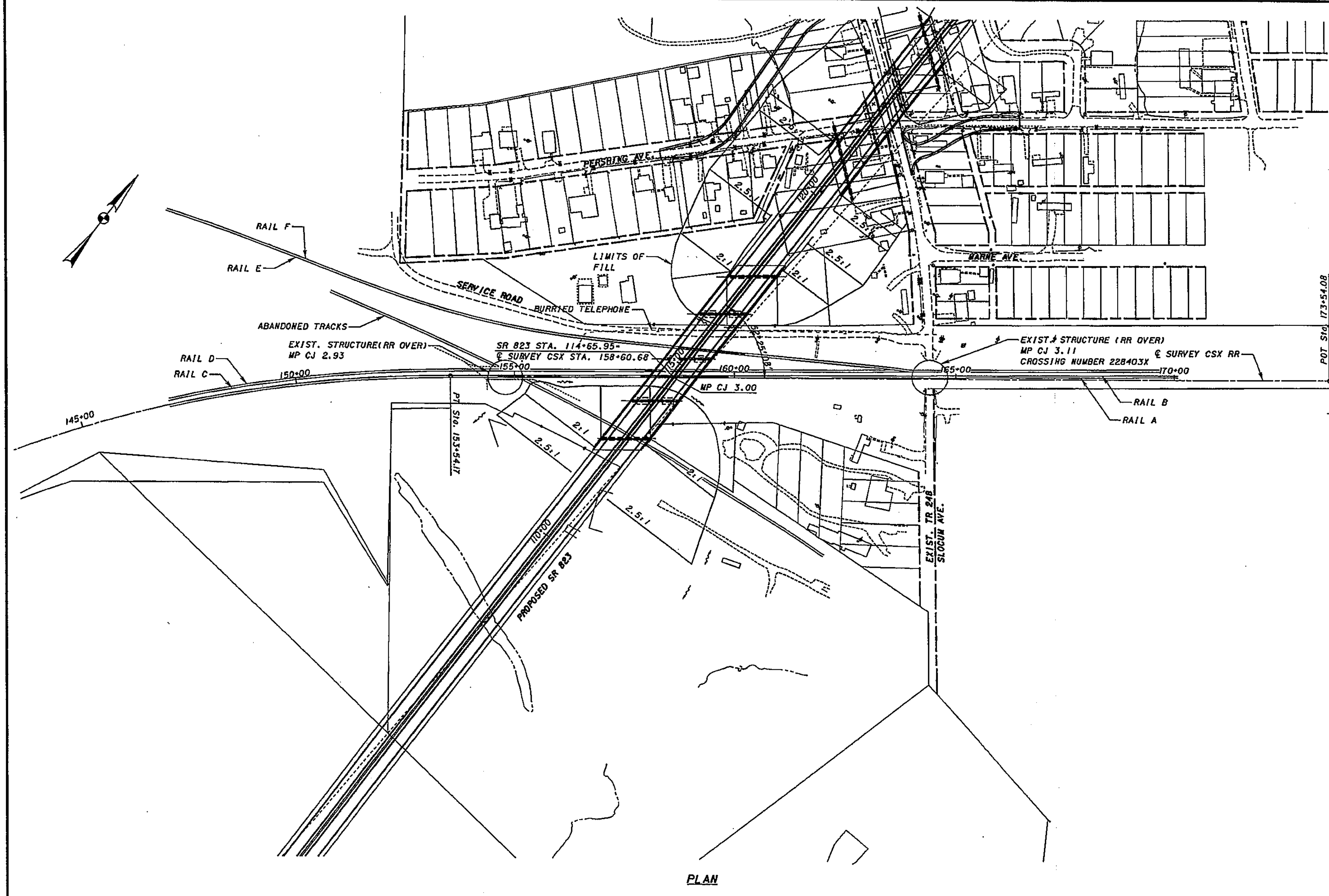
SCIOTO COUNTY
STA. 112+84.14
STA. 117+64.86

SITE PLAN - ALTERNATIVE 2
BRIDGE NO. SCI-823-0214 L&R
S.R. 823 OVER CSXT RAILROAD

SCI-823-0.00
PID 77366

2 | 4

7



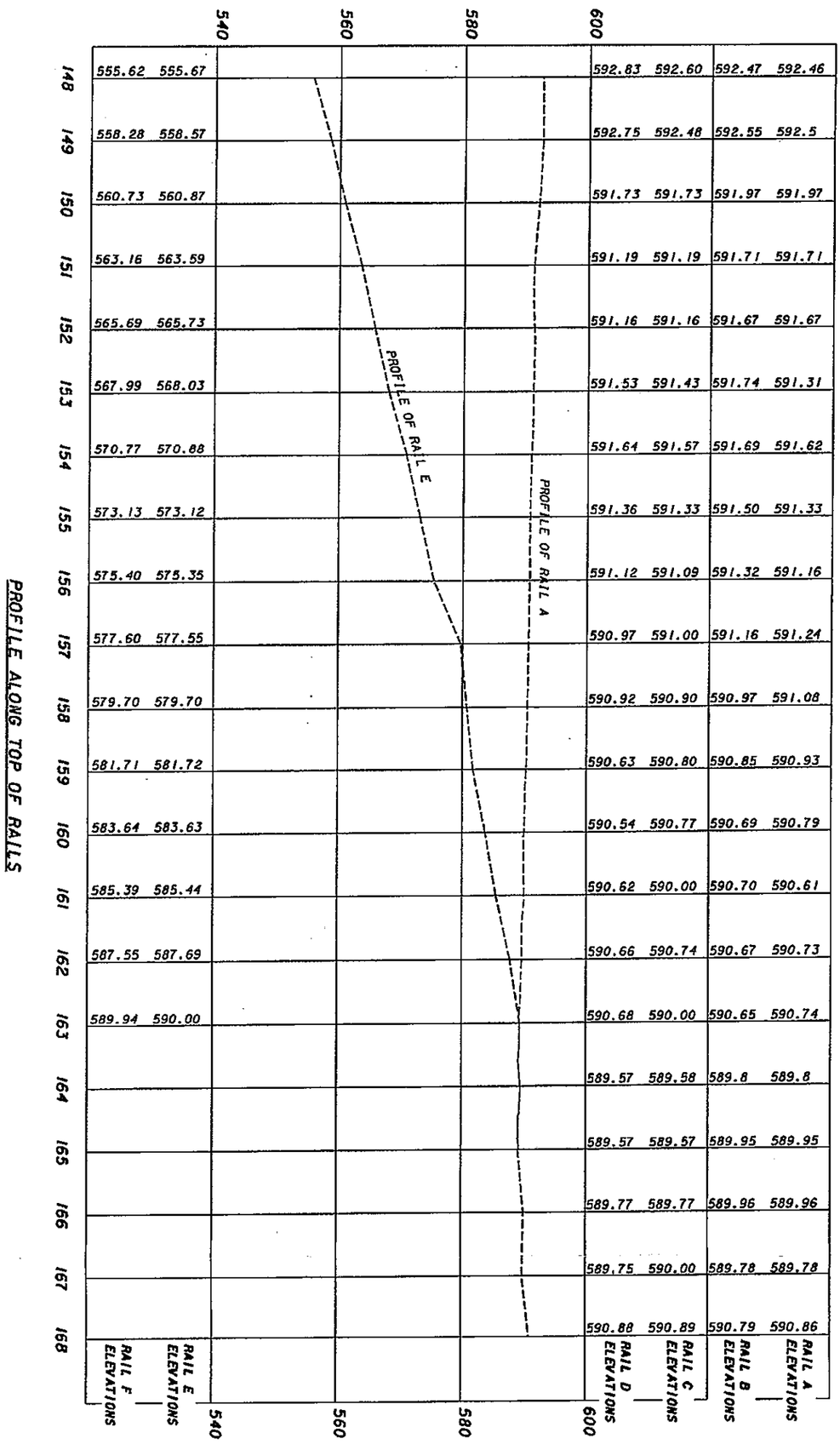
DESIGN AGENCY
Systems

DESIGNED	DRAWN	REVIEWED	DATE
PJP	PJP	RH	12/29/06
CHECKED	REVISED	STRUCTURE FILE NUMBER	

SUPPLEMENTAL SITE PLAN
PROPOSED SR 823 OVER CSXT
MILEPOST CJ 3.00

SCI-823-0.00
PID 77366

1/



PROFILE ALONG TOP OF RAILS

9 / 22	SCI-823-0.00 PID 77366	RAIL PROFILES PROPOSED SR 823 OVER CSXT MILEPOST CJ 3.00	DESIGNED PJP CHECKED	DRAWN PJP REVISED	REVIEWED RH DATE 12/29/06 STRUCTURE FILE NUMBER	DESIGN AGENCY Systems 5160 MEMORIAL DRIVE, SUITE 240 DUBLIN, OHIO 43017

SEEDING	
END WIDTH	SQ. YDS.

END AREA		VOLUME	
CUT	FILL	CUT	FILL

CALCULATED

CHECKED

CROSS SECTIONS

CSXT RR STA 155+00.00 TO 156+00.00

SCI-823-0.00

10

SEEDING	
END WIDTH	SQ. YDS.

END AREA		VOLUME	
CUT	FILL	CUT	FILL

CALCULATED

CHECKED

CROSS SECTIONS

CSXT RR STA 156+50.00 TO STA 157+50.00

SCI-823-0.00

SHEET TOTAL

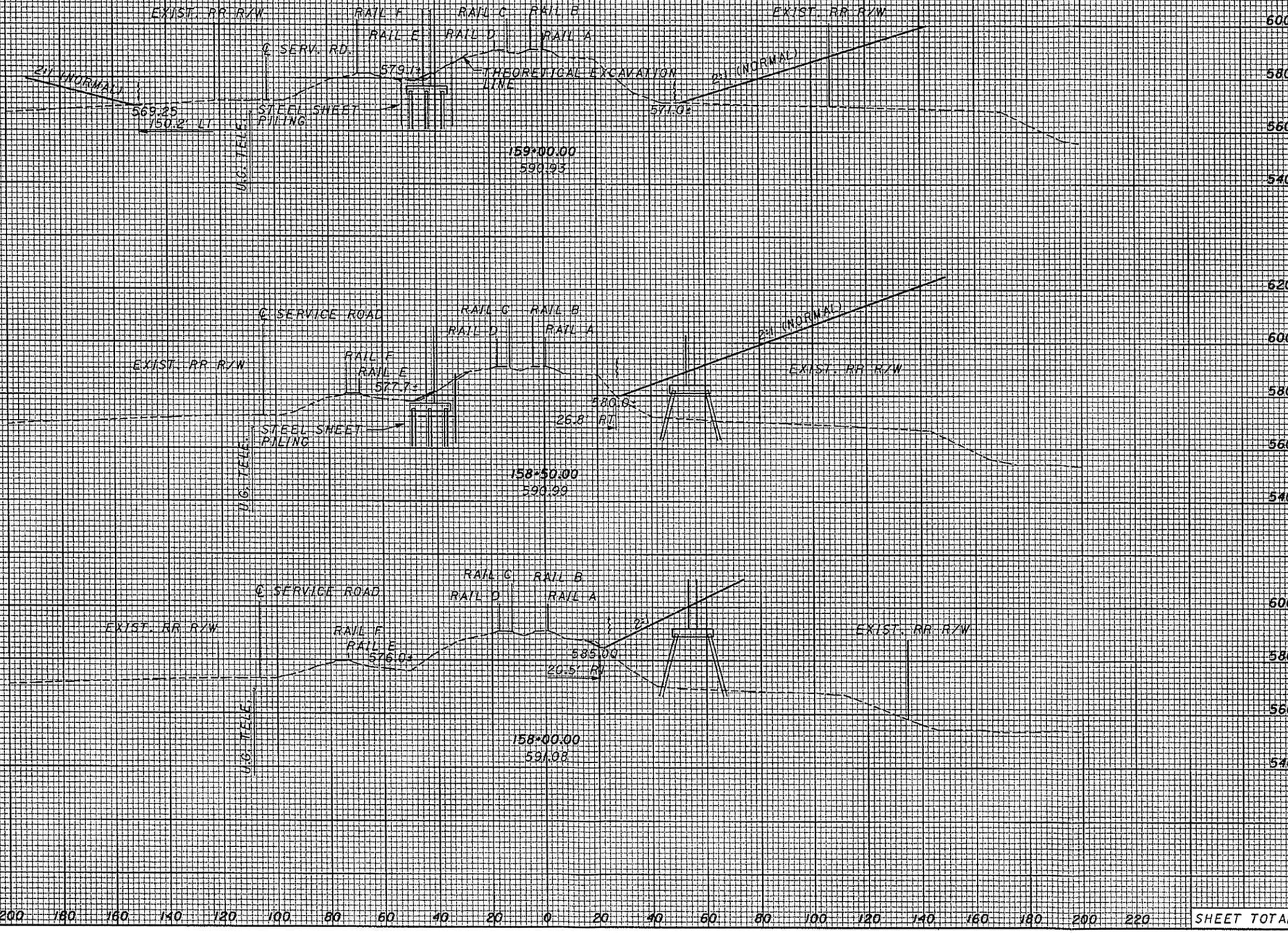
SHEET TOTAL

SEEDING	
END WIDTH	SQ. YDS.

END AREA		VOLUME	
CUT	FILL	CUT	FILL

CALCULATED

CHECKED



SHEET TOTAL	200	180	160	140	120	100	80	60	40	20	0	20	40	60	80	100	120	140	160	180	200	220	SHEET TOTAL

CROSS SECTIONS
STA 158+00.00 TO STA 159+00.00

CSXT RR STA

SCI-823-0.00

12

SEEDING	
END WIDTH	SQ. YDS.

END AREA		VOLUME		
CUT	FILL	CUT	FILL	CALCULATED
				CHECKED

SHEET TOTAL 200 180 160 140 120 100 80 60 40 20 0 20 40 60 80 100 120 140 160 180 200 220 SHEET TOTAL

CROSS SECTIONS
CSXT RR STA 159+50.00 TO STA 160+50.00

SCI-823-0.00

13

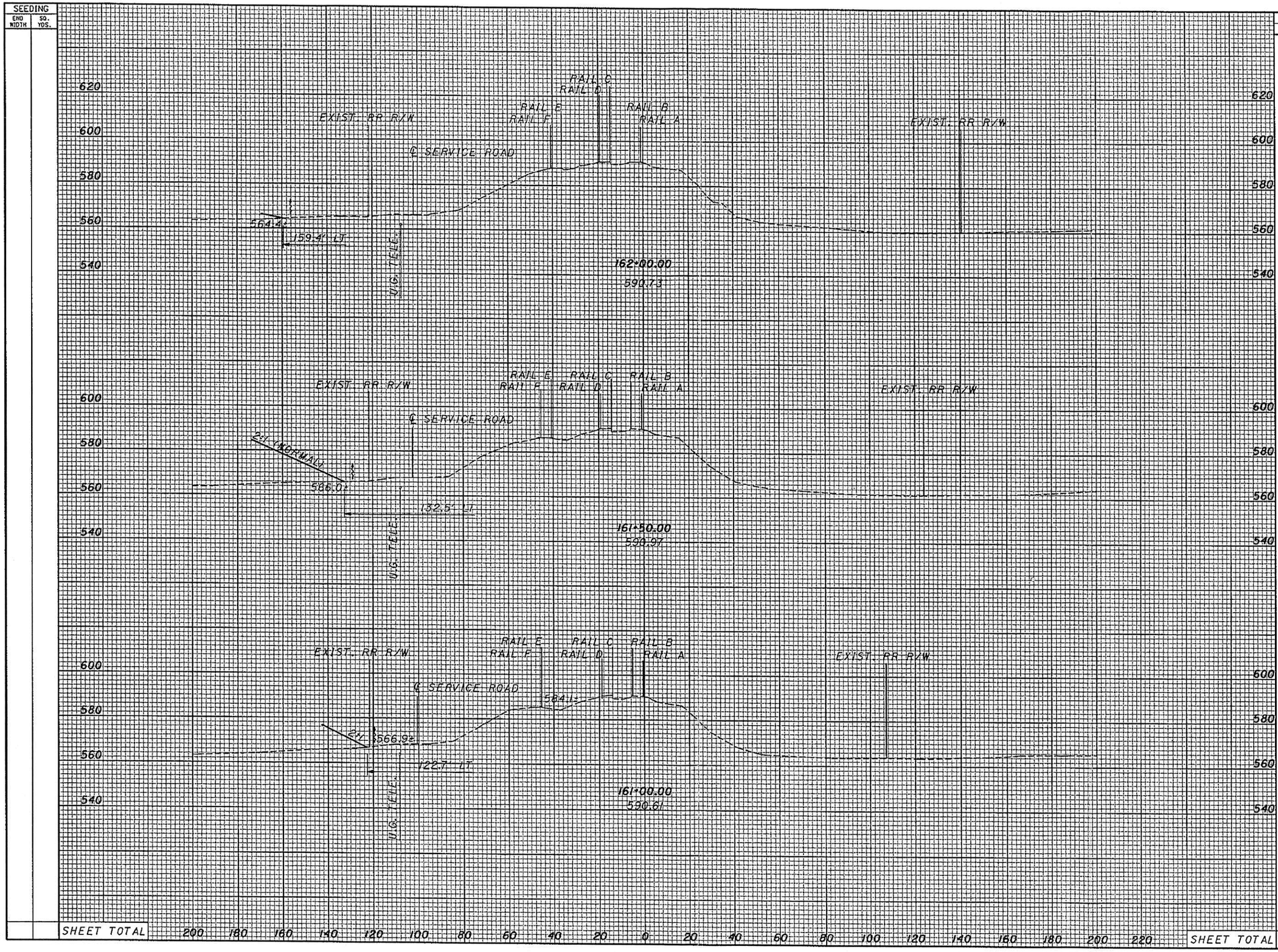
SEEDING		END AREA		VOLUME		CALCULATED	CHECKED
END WIDTH	SQ. YDS.	CUT	FILL	CUT	FILL		

CROSS SECTIONS

CSXT RR STA 161+00.00 TO STA 162+00.00

SCI-823-0.00

14



CN-Patrick J. Plews

From: Steve_VanSlyke@URSCorp.com
Sent: Tuesday, August 01, 2006 1:56 PM
To: CN-Patrick J. Plews
Cc: CN-Jon Cox; Larry_Shaw@urscorp.com; CO-Michael Weeks
Subject: Re: FW: Portsmouth, OH - SR 823 - SCI-823-0.00 over CSXT Railroad (2) - ODOT PID# 19415 - OP# OH0472

Patrick

There are no immediate plans for track expansion at these 2 proposed bridge locations. It appears that the initial design will leave enough room for some anyway.

If further insight or clarification is needed, please call.

Please route all plans requiring engineering review and/or comment to Mr. Larry Shaw. Thanks.

Stephen G. VanSlyke
URS Corporation
36 East Seventh Street Suite 2300
Cincinnati, OH 45202

Ph: (513) 419-3509
Fax: (513) 651-3452
Cell: 314-406-1480

<pjplews@transystems.com>

07/20/2006 11:43 AM

To <steve_vanslyke@urscorp.com>, <Larry_Shaw@urscorp.com>

cc <jrcox@transystems.com>, <mdweeks@transystems.com>

Subject FW: Portsmouth, OH - SR 823 - SCI-823-0.00 over CSXT Railroad (2) - ODOT PID# 19415 - OP# OH0472

Larry and Steve-
According to Jim Shircliff at CSX, engineering addresses any issues of future use for any CSX property. He recommended we verify, with you, that there are no plans for future expansion at the crossings where we have wide R/W corridors and/or abandoned tracks that we are crossing.

Please contact me if this has already been investigated or to discuss any other information you would need.
Thanks

Patrick J. Plews, PE
Bridge Engineer
TranSystems
Main 513-621-1981ext 36013

-----Original Message-----
From: CN-Patrick J. Plews
Sent: Thursday, July 20, 2006 11:33 AM
To: 'jim_shircliff@csx.com'
Cc: CO-Michael Weeks; 'david.norris@dot.state.oh.us'; 'Larry_Shaw@URSCorp.com'
Subject: RE: Portsmouth, OH - SR 823 - SCI-823-0.00 over CSXT Railroad (2) - ODOT PID# 19415 - OP# OH0472

Jim-
Thanks for calling to discuss the proposed crossings and right of way with me this morning. Attached are the plans that I mentioned in our conversation. The first file attached includes the project title sheet and some larger scale plan views. The second file includes drawings showing the property lines at each crossing that our surveyors have determined to date. We have not shown proposed R/W lines but many of the proposed construction features are shown.

The plans indicate property lines that extend well beyond the current track configuration or include abandoned tracks and we would like to verify that the property limits shown are corresponding with your records. I understand that engineering makes the determination of any future use for the property and I will work with URS to determine if this is a possibility at these locations. We would also like to know of any issues that you foresee in the acquisition process in this preliminary design stage.

Please feel free to contact me if you would like more information regarding approximate proposed R/W lines or any other questions. I would suggest that we set up a time at which we can discuss these; perhaps early next week?
Thanks again

Patrick J. Plews, PE
Bridge Engineer
TranSystems
Main 513-621-1981ext 36013

-----Original Message-----
From: Larry_Shaw@URSCorp.com [mailto:Larry_Shaw@URSCorp.com]
Sent: Tuesday, June 13, 2006 4:13 PM
To: steve_vanslyke@urscorp.com
Cc: CN-Patrick J. Plews; david.norris@dot.state.oh.us; richard.behrendt@dot.state.oh.us; Mel_McNichols@csx.com; deborah_baldino@csx.com
Subject: Fw: Portsmouth, OH - SR 823 - SCI-823-0.00 over CSXT Railroad (2) - ODOT PID# 19415 - OP# OH0472

Steve,
Please contact Patrick Plews, TranSystems (ODOT's design consultant) relative his trailing message. Thanks.
NOTE: in addition to the plan sheet provided by Patrick, I have attached select plan sheets recently received from Rich Behrendt.

NOTE: NEW ADDRESS & PHONE
Larry J. Shaw, P.E.
Program Manager
URS Corporation
One Indiana Square, Suite 2100
Indianapolis, IN 46204

Larry_Shaw@urscorp.com
Tel: 317.532.5481
Fax: 317.532.5499

----- Forwarded by Larry Shaw/Indianapolis/URSCorp on 06/13/2006 03:42 PM -----

<pjplews@transyst

ems.com>

To

06/02/2006 04:56 PM <larry_shaw@urscorp.com>

cc <David.Norris@dot.state.oh.us>,

<mdweeks@transystems.com>

Subject FW: SCI-823-0.00 over CSXT Railroad (2)

Larry-
Per our conversation earlier today attached is a pdf of the site plan that was prepared for one of our preliminary submittals. The proposed site is approximately 0.65 miles south of the crossing of with SR 335. The crossing at SR 335 is identified as AARDOT # 228404E and its milepost is listed as 0003.66.

To summarize our discussion and inquiry; TranSystems has received comments from ODOT directing us to investigate some changes and we need to verify CSXT's position on the proposed changes. ODOT has directed us to discuss some options with you, as you can see below. The changes proposed are to minimize bridge spans and therefore cost incurred by ODOT.

> The first comment is to investigate relocating the service road, north of track 3 on the attached plan. The service road is on CSX property with the survey information gathered to date. The relocation would be closer to the existing track to minimize the bridge span. Would CSX recommend that the relocation is acceptable?
>
> The second comment is to place a pier in between the mainline tracks and the side track on the north. We have investigated the clearances an estimate approximately 22' permanent clearance and 17.5' clearance to our footing allowing some distance for temporary shoring. The pier would be of proportion to be used at that clearance. Will construction equipment crossing the siding track be an issue to prevent construction of this option?

I understand that you may not have the contractual issues completely resolved but I wanted to get the information to you. Please contact me once you are sure of the contract and we can discuss the timeline to resolve them.
Thanks

Patrick J. Plews, EI
Bridge Engineer
TranSystems
Main 513-621-1981ext 36013

From: CO-Michael Weeks
Sent: Thursday, June 01, 2006 3:25 PM
To: 'David.Norris@dot.state.oh.us'
Cc: CN-Jon Cox; CN-Michael Lenett
Subject: RE: SCI-823-0.00 over CSXT Railroad (2)

Dave,

We will contact Larry and advise you of our conversation.

Thanks,
Mike

From: David.Norris@dot.state.oh.us [mailto:David.Norris@dot.state.oh.us]
Sent: Thursday, June 01, 2006 3:12 PM
To: CO-Michael Weeks
Cc: CN-Jon Cox
Subject: Fw: SCI-823-0.00 over CSXT Railroad (2)

Mike,

Go ahead and have your bridge engineer contact Larry Shaw, who reviews railroad work for CSXT.
On our Ross 207 project, we coordinated with him at the following address:

Larry Shaw
URS Corporation
47 South Meridian, Suite 312
Indianapolis, IN 46204
Tel: 317-635-0064
Fax: 317-635-0066
email: Larry_Shaw@urscorp.com

--
David A. Norris, PE
ODOT District 9 DDD Engineering Assistant PO Box 467 Chillicothe, OH 45601 Toll Free: (888) 819-8501 Direct Phone: (740)-774-9061
----- Forwarded by David Norris/Administration/D09/ODOT on 06/01/2006 03:04 PM -----

Richard

Behrendt/RealEstate/CEN/ODOT

To
06/01/2006 02:37 PM

David

Norris/Administration/D09/ODOT@OD
OT

cc

Subject

Re: Fw: SCI-823-0.00 over CSXT

Railroad (2)Link

Dave,
I don't need to be involved...I don't believe Larry would have any difficulty discussing this directly w/your consultant as long as he has a set of plans to refer to...

Thanks for checking...

Rich Behrendt

Program Mgr./State Rail Coordinator
Ohio Department of Transportation
1980 West Broad St.
Columbus, Ohio 43223
Phone: 614-387-3097
FAX: 614-466-0158
email: richard.behrendt@dot.state.oh.us

David

Norris/Administration/D09/ODOT

To
06/01/2006 02:04 PM

Richard

Behrendt/RealEstate/CEN/ODOT@ODO

T

cc

Subject

Fw: SCI-823-0.00 over CSXT

Railroad

Rich,

Should the consultant contact CSXT or Larry Shaw at URS re these questions?

Or would you like to be involved?

--
David A. Norris, PE
ODOT District 9 DDD Engineering Assistant PO Box 467 Chillicothe, OH 45601 Toll Free: (888) 819-8501 Direct Phone: (740)-774-9061
----- Forwarded by David Norris/Administration/D09/ODOT on 06/01/2006 02:01 PM -----

<mdweeks@transystems.com>

06/01/2006 01:05 PM

To <David.Norris@dot.state.oh.us>

cc <jrcox@transystems.com>, <mslenett@transystems.com>

Subject FW: SCI-823-XXXX over CSXT Railroad

Dave,

Please see our bridge design team's concerns with OSE's comments on SCI-823
over CSXT. I thought you would probably like to check with Richard Behrendt at Central Office to see how we should address these questions to CSXT. Let me know if you have questions or if we should pursue this with CSXT directly.

Thanks,
Mike

From: CN-Michael Lenett
Sent: Thursday, June 01, 2006 10:22 AM
To: CO-Michael Weeks
Cc: CN-Jon Cox; CN-Patrick J. Plews
Subject: SCI-823-XXXX over CSXT Railroad

Hi Mike.

Here are the structural questions regarding SCI-823-xxxx over the CSXT Railroad:

1) ODOT comment #2 (dated 9/26//2005) discusses moving the 2:1 embankment slope of the forward abutment, which requires relocating the existing service road. This service road is within CSXT's Right-of-Way.
Before this option is seriously investigated, shouldn't we first ensure that CSXT allows infringement onto (i.e., crossing into) their right-of-way and, furthermore, allow relocation of the service road?
2) ODOT comment #3 (dated 9/26/2005) discusses the investigation of
placing a pier between existing sets of tracks. Although placement of a pier in this region will satisfy CSX clearance requirements, construction of the pier will require construction material and equipment within the CSXT Right-of-way and access over CSXT Track 3 (the northernmost track).
Before this option is further pursued, shouldn't we first make sure that CSX is comfortable with construction within their right-of-way as well as construction between existing sets of tracks?

Michael S. Lenett, Ph.D.
Senior Bridge Project Engineer
TranSystems
Main 513-621-1981 ext. 36022
Mobile 513-503-4715
(See attached file: SR 823 over CSX.pdf)(See attached file: 015-plans(051606)oh0472.pdf)

[attachment "015-plans(051606)oh0472.pdf" deleted by Steve VanSlyke/Decatur/URSCorp]
[attachment "SCI-823-0.00-CSX-BRIDGES-OP#OH0472.pdf" deleted by Steve VanSlyke/Decatur/URSCorp]