Structure Type Study

BRIDGE NO. FRA-CO376-0327
WINCHESTER PIKE OVER BLACKLICK CREEK

December, 2013

Prepared by:

ms consultants, inc.
engineers, architects, planners

Prepared for: **Franklin County Engineer's Office**
970 Dublin Road
Columbus, Ohio 43215

TABLE OF CONTENTS

I. INTRODUCTION

This report addresses the development of the preferred bridge alternative for Bridge No. FRA-CO376-0327, Winchester Pike over Blacklick Creek for the County of Franklin.

The existing bridge is a three-span, continuous steel beam structure with a reinforced concrete deck (non-composite) on cap-and-column piers and stub abutments with spill-through slopes. Each substructure includes 12" diameter cast-in-place reinforced concrete piles. The bridge was constructed in 1954 and rehabilitated in 1992. The bridge is located in the Southeast Franklin County and Canal Winchester region. In recent years, the Blacklick Creek Greenway Trail was constructed underneath the bridge adjacent to the east abutment.

Two options for widening the existing structure to accommodate a turning lane were presented in the initial Scope of Work: a Low Speed Design and a High Speed Design. A meeting on February 28, 2013 with the Franklin County Engineer's resulted in selection of the High-Speed Design option, which provides for wider lanes and shoulders. Further, asymmetrical versus symmetrical widening was considered the most cost-effective for this option due to fewer impacts to the trail way, no additional right-of-way impacts, and fewer pier columns in the creek. The High-Speed option will utilize widening on the north side only.

The general appraisal on the most recent bridge inspection report indicates the existing structure is in very good condition. Therefore, widening will be performed utilizing the existing superstructure and substructures to their fullest extent with no rehabilitation to these units anticipated. Additional work includes widening the existing approach slabs and any necessary for the sustained use of the trail way.

The Structure Type Study follows Section 201.2 of the ODOT Bridge Design Manual. A preliminary site plan, transverse section, typical abutment section, preliminary phase construction details, narrative of bridge work, cost estimate, and foundation recommendations are presented. The Hydraulic Report, Geotechnical Exploration Report and Preliminary Maintenance of Traffic Plan are contained under separate cover.

II. DESIGN CONSIDERATIONS

The FRA-CO376-0327 Bridge spans Blacklick Creek, which is a waterway with a defined floodplain and floodway. The proposed widening with new pier columns added in the creek will not result in a post-project rise in the base flood profile for Blacklick Creek. This is further addressed in the Hydraulic Report.

In the cross frame bay between the existing north exterior beam and adjacent interior beam are nine 3½" diameter AT&T telephone ducts. These ducts also pass through each abutment

backwall and under the approach slabs. The lines are likely to contain asbestos and are to remain in service with no disturbance during construction.

As per ODOT BDM Section 304.3.3, the new railing at the widening is to be Twin Steel Tube Bridge Railing as per ODOT Standard TST-1-99. This railing has an acceptance level equal to NCHRP Test Level 4 (TL-4). The minimum acceptable level is TL-3. The existing railing on the opposite side of the bridge, where no widening is proposed, is Deep Beam Bridge Guardrail as per ODOT Standard DBR-2-73. The NCHRP test level for this railing is TL-2. To accommodate TL-3, this existing DBR-2-73 guardrail will require replacement with new TST-1-99 railing or be upgraded to DBR-3-11, Deep Beam Bridge Retrofit Railing. To compliment the new TST-1-99 railing at the widening, it is recommended to replace the existing railing with TST-1-99. This would require removing a portion of the existing deck overhang to construct a new overhang to attach the new railing. As a cost savings, Franklin County may suggest retrofitting with the DBR-3-11.

III. NARRATIVE OF PROPOSED BRIDGE WORK

Per the Scope of Work, additional structure types, such as concrete, were not considered. The most practical solution would be to widen the existing structure with a reinforced concrete deck non-composite with steel beams, on widened substructures.

Preliminary analysis indicates that the new superstructure widening could be accomplished utilizing one new beam line. A 4'-0" maximum deck overhang, per BDM recommendations, was used to minimize the new 10'-4" beam spacing. During deck pour, the bottom flange will require bracing at some locations to eliminate potential beam warping due to the dead load on the large overhang. Consideration was given to using two lighter beams with a smaller beam spacing and overhang, to eliminate the need for bracing during the deck pour. A comparative cost analysis (not included) was performed to justify using the one beam option. Results showed that using two beams would be $24,350 more. This included quantity differences between steel, concrete, painting, bearings and additional bracing. Because of this cost savings, it is recommended to use the one beam option, and for this reason, only one alternative is presented.

The widened bridge will accommodate three (3) lanes of traffic: one in each direction and one turning lane. The existing horizontal and vertical alignment is to be maintained as close as possible.

The design method for the widened alternative follows the AASHTO LFD Specifications and the 2004 ODOT Bridge Design Manual. The design loading is HS20-44 for both the Superstructure and Substructures. The design loading includes Case II and the Alternate Military Loading with a 60 P.S.F. future wearing surface.

Two phases will be incorporated into construction of the widening. Traffic will first be shifted to the south side of the bridge deck to accommodate construction of the north widening. Then traffic will be shifted to the newly constructed north side to allow the replacement of the south edge of the deck and installment of the new railing. Sheet piling left-in-place will be used at the approaches behind the abutment backwall during construction of the widening. The portion of the Greenway Trail under the bridge will most likely be closed during construction.

The following provides information regarding specific design considerations. Preliminary Structure Site Plan and Profile, Typical Sections and Phase Construction Details can be found in the Preliminary Bridge Details Section (Section V).

Foundation Recommendations

The subsurface investigation for this project site consisted of 16 test borings made between July 8 and July 15, 2013, to accommodate widening existing abutments and piers. Four borings were investigated for the proposed bridge widening, one at each substructure unit. Existing fill materials were encountered at each boring location ranging from 7.5 to 18 feet deep. Underlying the existing fill materials, the borings encountered natural, primarily cohesive soils. Bedrock was not encountered. Laboratory tests were performed to determine soil classification and engineering characteristics.

Based on the information provided in the Geotechnical Exploration Report, we recommend the proposed widening of the existing abutment substructures be supported on 12" cast-in-place concrete friction-type piles. The proposed widening of the existing pier substructures are recommended to be supported on 14" cast-in-place concrete friction-type piles. Four piles are suggested for each abutment and four piles for each pier.

The estimated lengths rounded to the nearest 5 feet for the Rear Abutment are 50 feet and 60 feet for the Forward Abutment. The estimated length rounded to the nearest 5 feet for each pier is 45 feet.

Proposed Structure (Widening)

- Reference Chord and Skew: The existing bridge was constructed on a tangent alignment utilizing the existing reference chord, which is a line between the intersections of the existing abutment bearings and existing Beam 3. The proposed widening will be constructed with this same reference chord. The proposed skew of 30˚-00'-00" Left Forward, which is the same as existing, is measured to the reference chord.

- Alignment: In the vicinity of the bridge, a new 0˚-48'-13" right curve alignment is defined along the centerline of construction of Winchester Pike to closely match the geometry of the existing 0˚-48' right curve alignment. The stationing of the centerline of bearings of the substructures is along the centerline of construction of Winchester Pike. The original alignment of the centerline of construction intersected the reference chord at the centerline of the existing abutment bearings. The new alignment places the proposed centerline of construction slightly to the south and consequently results in variable shoulder widths across the bridge.

- Foundation Type: The proposed foundation for the widened abutments consists of 12" diameter cast-in-place concrete piling similar to existing. The proposed foundation for the widened piers consists of 14" diameter cast-in-place concrete piling. As a result of preliminary analysis, it is anticipated that four piles will be required for each abutment widening and four piles for each pier footing cap.

- Substructure Type: The existing abutment widening is proposed to be similar to the existing abutment section, which is a stub abutment cap type with a backwall. The existing piers are proposed to be widened using new caps connected to the existing columns and adding one new square column to each.

- Approach Slabs: The existing full-width approach slabs will be widened to their new full-width requirement. The length will match the existing length of 20'-0".

- Bridge Spans: The spans will remain the same: 48'-0", 60'-0", 48'-0". These spans are measured center-to-center of bearings along the reference chord.

- Bridge Width: The bridge width is comprised of (3) 12'-0" lanes and variable shoulder widths on each side for a total of 52'-1" face-to-face of rails.

- Framing Layout: The new beam shall be ASTM A709 Grade 50W (weathering steel), which complements the existing A588 50 ksi beams. The new beam size will be W36 x 150, which has very similar section properties as the existing W36 x 135. The need for a heavier beam is due to wider proposed spacing and larger overhang.

  The Average Daily Truck Traffic (ADTT) is well below 2500, which places the bridge in a Case II Fatigue category. Although Type 1 intermediate cross frames are typically used for Case II bridges, modified Type 3 are proposed. Top and bottom chords with single erection bolts will be used for stability during the deck pour. Once the deck has cured, the top chords will be removed and diagonals will be added. Both the diagonals and bottom chords will be field welded at this time.

- Bearings: The proposed bearings shall be elastomeric with internal laminates similar to the existing.

- Superstructure Type: The proposed superstructure widening will consist of a concrete deck non-composite (to match existing) with the new beam. The proposed deck thickness is 9 inches. Since the new railing type is Twin Steel Tube Bridge Railing, over-the-side drainage will require a steel drip strip. The existing deck ends utilize a structural expansion joint with an elastomeric strip seal. It is proposed to extend the joint with the same type using Item 516, Horizontal Extension of Structural Expansion Joint.

- Painting: Each end of the new weathering steel beam line will be shop painted for the first ten feet. Shop painting is used to eliminate containment during field painting operations.

Estimated Structure Construction Costs

The following table summarizes the initial construction cost for the bridge widening without any contingencies. Contingencies are included with the C1 estimate that is included with the AER. The construction costs below are derived from a detailed cost estimate that can be found in the Structure Construction Cost Estimate (Section IV) portion of this report. The cost estimate utilized estimated quantities and unit costs that were obtained from the ODOT Office of Estimating and the "Estimator" Program.

CONSTRUCTION COST ESTIMATE

Bridge No.	Alternative No.	Description	Initial Construction Cost
FRA-CO376-0327	Alternative 1	Widen existing deck, abutments, and piers.	$405,725

Conclusion and Recommendation

The information in this report focuses on verifying the recommended alternative as outlined in the Scope of Services. After evaluating the information in this study, it is recommended that the **FRA-CO376-0327 Bridge** be constructed with a widened concrete deck and a new A709 Grade 50W (weathering steel) beam on widened abutments and piers.

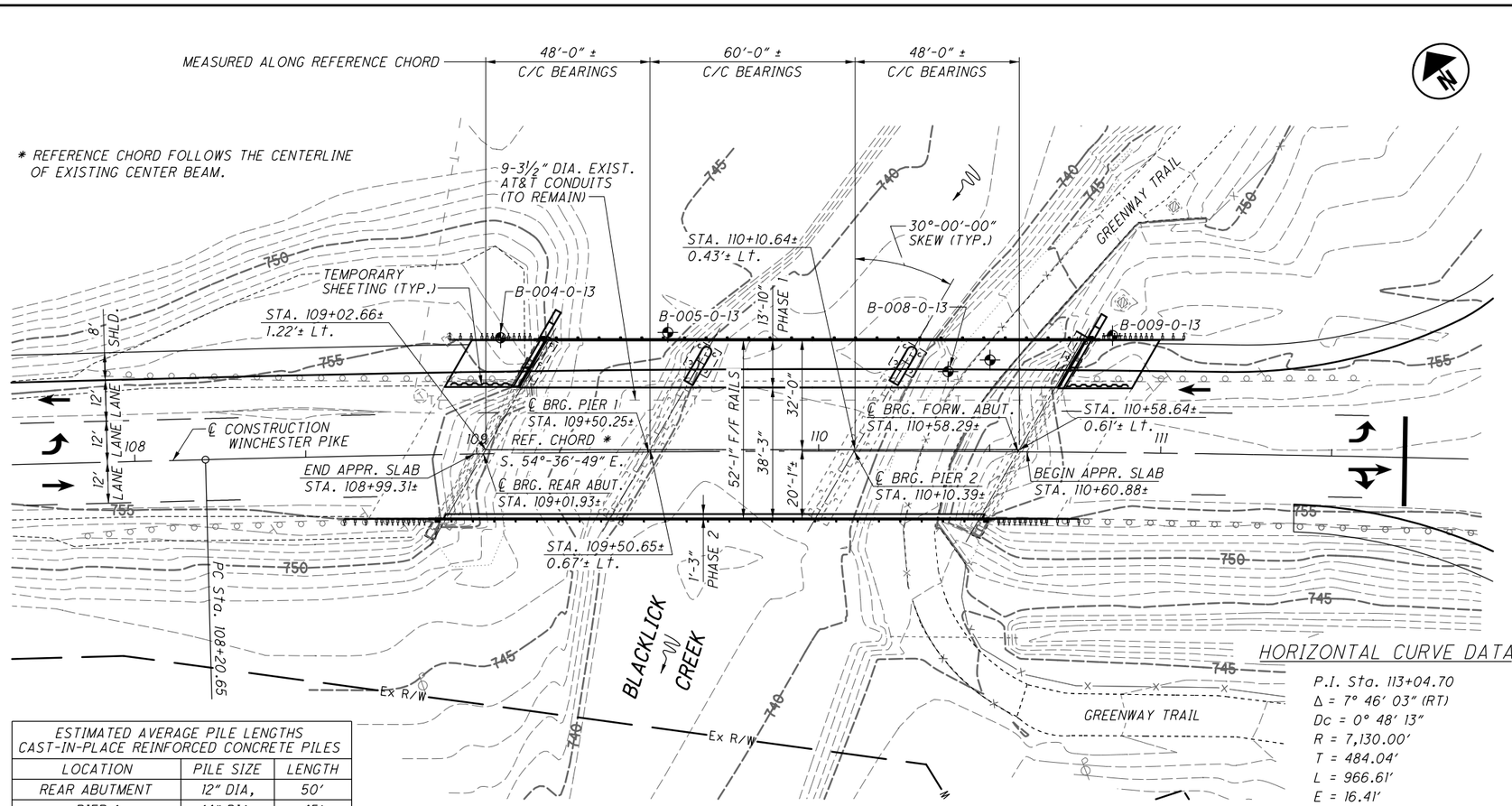
IV. STRUCTURE CONSTRUCTION COST ESTIMATE

ALTERNATIVE 1 - COST ESTIMATE
STRUCTURE TYPE STUDY
Deck Widening

ITEM	ITEM EXT.	DESCRIPTION	QTY	UNIT	UNIT PRICE	TOTAL
202	11203	Item 202 - Portions of Structure Removed, over 20 Foot Span, as per plan	LUMP			$12,000
503	11100	Item 503, Cofferdams and Excavation Bracing	LUMP			$5,000
503	21100	Item 503 - Unclassified Excavation	60	C.Y.	$35.00	$2,101
504	11101	Item 504 - Steel Sheet Piling Left in Place, as per plan	1200	S.F.	$30.00	$36,000
505	11100	Item 505 - Pile Driving Equipment Mobilization	LUMP			$10,000
507	00500	Item 507 - 12" Cast-In-Place Reinforced Concrete Piles, Driven	440	FT.	$12.00	$5,280
507	00550	Item 507 - 12" Cast-In-Place Reinforced Concrete Piles, Furnished	480	FT.	$25.00	$12,000
507	00600	Item 507 - 14" Cast-In-Place Reinforced Concrete Piles, Furnished	400	FT.	$15.00	$6,000
507	00650	Item 507 - 14" Cast-In-Place Reinforced Concrete Piles, Driven	360	FT.	$30.00	$10,800
509	10000	Item 509 - Epoxy Coated Reinforcing Steel	29024	POUND	$0.90	$26,122
509	20001	Item 509 - Reinforcing Steel, Replacement of Existing Reinforcing Steel, as per plan	100	POUND	$2.50	$250
510	10000	Item 510 - Dowel Holes with nonshrink, nonmetallic grout	24	EACH	$15.00	$360
511	34444	Item 511 - Class QC2 Concrete, Bridge Deck	91	C.Y.	$675.00	$61,531
511	41010	Item 511 - Class QC1 Concrete, Pier Above Footings	15	C.Y.	$550.00	$8,511
511	43510	Item 511 - Class QC1 Concrete, Abutment including Footing	40	C.Y.	$480.00	$19,137
511	46510	Item 511 - Class QC1 Concrete, Footings	14	C.Y.	$375.00	$5,333
512	10100	Item 512 - Sealing of Concrete Surfaces (Epoxy-Urethane)	329	S.Y.	$15.00	$4,935
512	33000	Item 512 - Type 2 Waterproofing	13	S.Y.	$27.00	$360
512	74000	Item 512 - Removal of Existing Coatings from Concrete Surfaces	185	S.Y.	$8.35	$1,548
513	10260	Item 513 - Structural Steel Members, Level 3	26900	POUND	$1.40	$37,660
514	80020	Item Special - Shop Painting and Field Touch-up of Structural Steel	328	S.F.	$7.50	$2,462
516	11900	Item 516 - Horizontal Extension of Structural Expansion Joint	32	FT.	$600.00	$19,440
516	44000	Item 516 - Elastomeric Bearing w/Internal Laminates & Load Plate (Neoprene)	4	EACH	$800.00	$3,200
518	21200	Item 518 - Porous Backfill with Filter Fabric	12	C.Y.	$65.00	$780
518	40000	Item 518 - 6" Perforated C.P.P.	40	FT.	$8.00	$320
518	40010	Item 518 - 6" Non-Perforated C.P.P., INCLUDING SPECIALS	16	FT.	$12.00	$192
526	15000	Item 526 - Reinforced Concrete Approach Slabs (T=13")	62	S.Y.	$225.00	$13,950
601	32204	Item 601 - Rock Channel Protection, Type C with Fabric Filter	60	C.Y.	$65.00	$3,900

TOTAL INITIAL COST W/O CONTINGENCY =	**$309,171**
PDP CONTINGENCY =	**10.00%**
SUB-TOTAL COST =	**$340,088**
INFL CONTINGENCY =	**19.30%**
TOTAL COST =	**$405,725**

V. PRELIMINARY BRIDGE DETAILS

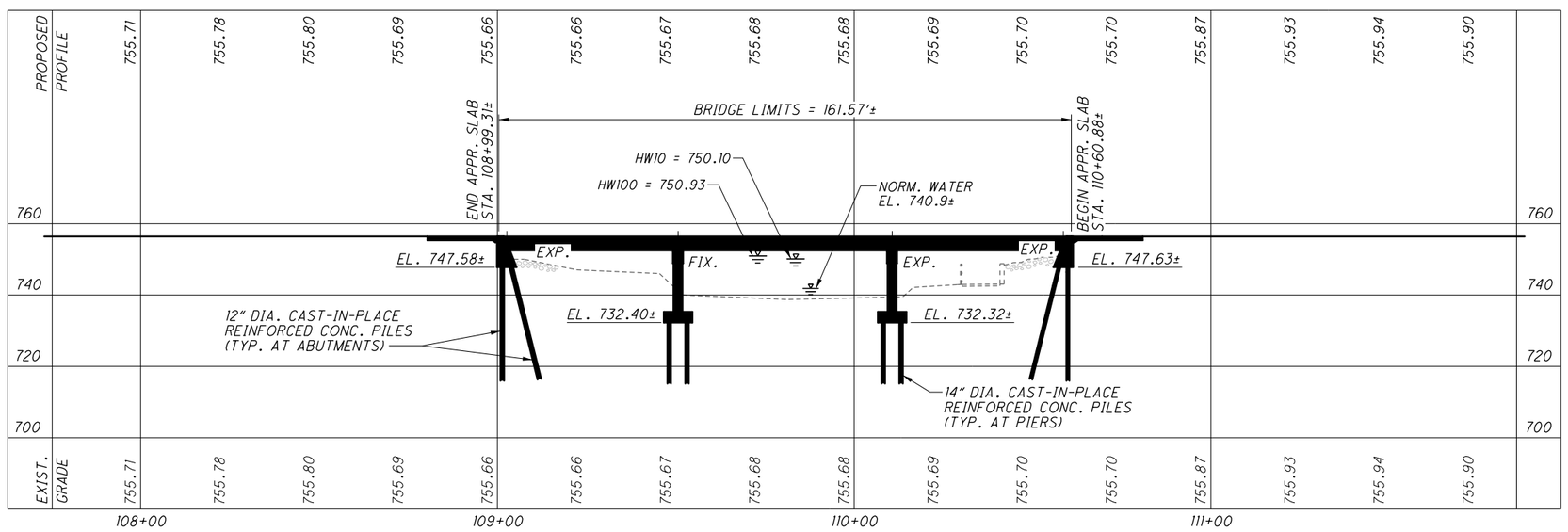


ESTIMATED AVERAGE PILE LENGTHS CAST-IN-PLACE REINFORCED CONCRETE PILES		
LOCATION	PILE SIZE	LENGTH
REAR ABUTMENT	12" DIA,	50'
PIER 1	14" DIA,	45'
PIER 2	14" DIA,	45'
FORWARD ABUTMENT	12" DIA,	60'

PLAN

HORIZONTAL CURVE DATA

P.I. Sta. 113+04.70
Δ = 7° 46' 03" (RT)
Dc = 0° 48' 13"
R = 7,130.00'
T = 484.04'
L = 966.61'
E = 16.41'
C = 965.87'



PROFILE AT ℄ CONSTRUCTION WINCHESTER PIKE

(NEW CONSTRUCTION SHOWN)

BENCHMARK DATA

BM #1:

BM #2:

FOR ADDITIONAL BENCHMARK INFORMATION. SEE ROADWAY PLAN SHEET ⊖

NOTES

EARTHWORK LIMITS SHOWN ARE APPROXIMATE. ACTUAL SLOPES SHALL CONFORM TO PLAN CROSS SECTIONS.

LEGEND

⊕ BORING LOCATION

DESIGN TRAFFIC:
2015 ADT = 2015 ADTT =
2035 ADT = 21,000 2035 ADTT = 208
DIRECTIONAL DISTRIBUTION = 0.52

HYDRAULIC DATA

DRAINAGE AREA = 57.4 SQ. MILES
Q (100) = 8700 CFS HW (100) = 750.93 V (100) = 5.73 FT/S
Q (10) = 7250 CFS HW (10) = 750.10 V (10) = 5.53 FT/S
STRUCTURE CLEARS THE 10 YEAR DESIGN HW BY 2.07 FEET.

EXISTING STRUCTURE

TYPE: THREE SPAN CONTINUOUS NON-COMPOSITE STEEL BEAM WITH REINFORCED CONCRETE DECK ON STUB ABUTMENTS AND CAP AND COLUMN PIERS

SPANS: 48'-0"±, 60'-0"±, 48-0"± c/c BEARINGS ALONG REFERENCE CHORD

ROADWAY: 40'-2" FACE TO FACE OF RAILS

LOADING: HS20-44 CASE II AND ALTERNATE MILITARY LOADING

SKEW: 30°-00'-00" LF TO REFERENCE CHORD

APPROACH SLABS: AS-1-81 (20' LONG)

ALIGNMENT: 0°-48'-00" CURVE RT.

SUPERELEVATION: 0.026

STRUCTURAL FILE NUMBER: 2532476

DATE BUILT: 1954 REHABILITATED: 1992

DISPOSITION: TO BE WIDENED

PROPOSED STRUCTURE

PROPOSED WORK: WIDEN EXISTING CONCRETE DECK NON-COMPOSITE WITH NEW STEEL BEAM, WIDEN ABUTMENTS ON NEW CONCRETE PILES, ADD NEW PIER FOOTINGS ON CONCRETE PILES FOR NEW WIDENED CAP AND COLUMN PIERS, NEW ELASTOMERIC BEARINGS, SEAL SUB-STRUCTURES AND WIDEN APPROACH SLABS

TYPE: THREE SPAN CONTINUOUS STEEL BEAM, ASTM A709 GR. 50W (NEW BEAM) AND A588 (EXISTING BEAMS), NON-COMPOSITE WITH REINFORCED CONCRETE DECK ON WIDENED ABUTMENTS AND CAP AND COLUMN PIERS

SPANS: 48'-0"±, 60'-0"±, 48-0"± c/c BEARINGS ALONG REFERENCE CHORD

ROADWAY: 52'-1" FACE TO FACE OF RAILS

LOADING: HS20-44 CASE II AND ALTERNATE MILITARY LOADING FWS = 60 PSF

SKEW: 30°-00'-00" LF TO REFERENCE CHORD

APPROACH SLABS: AS-1-81 (20' LONG)

ALIGNMENT: 0°-48'-13" CURVE RT.

SUPERELEVATION: 0.026

COORDINATES: LATITUDE N. 39°-53'-26"
LONGITUDE W. 82°-51'-49"

DESIGN AGENCY
ms consultants, inc.
2221 Schrock Road
Columbus, Ohio 43229

DRAWN SJR | REVIEWED - | DATE 12-06-13 | STRUCTURE FILE NUMBER 2532476
DESIGNED SJR | CHECKED - | REVISED

FRANKLIN COUNTY
STA. 108+99.31±
STA. 110+60.88±

SITE PLAN
BRIDGE NO. FRA-CO376-0327
WINCHESTER PIKE OVER BLACKLICK CREEK

PID No. -

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PLOT.CEL

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Ohio DOT Workspace
Winchester Pike & Ebright Road

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0.5"
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PCF: 60-06735_Columbus

34" x 22"

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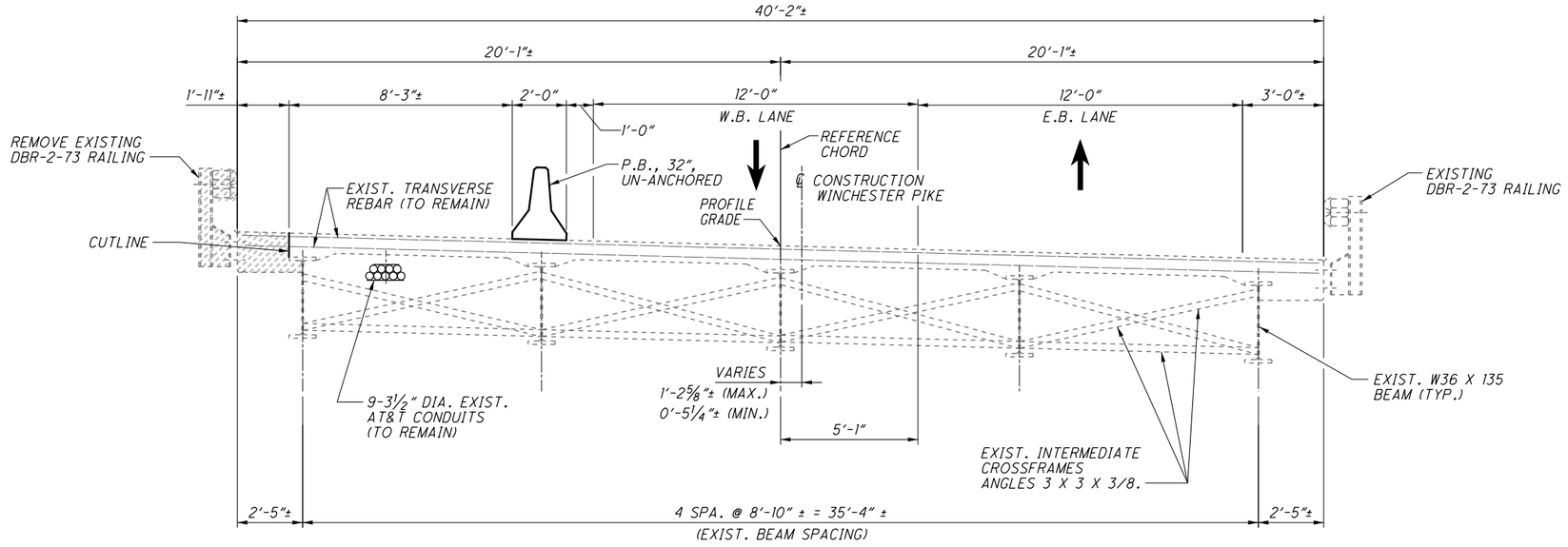
PROPOSED WORK

PHASE 1 CONSTRUCTION

1. PLACE PORTABLE BARRIER. INSTALL TEMPORARY STRIPING.
2. DIVERT AND MAINTAIN ONE LANE OF TRAFFIC IN EACH DIRECTION.
3. INSTALL FALSE DECKING.
4. SAW CUT AND REMOVE PORTIONS OF APPROACH SLAB AND INSTALL TEMPORARY SHEETING AT ABUTMENTS.
5. REMOVE RAILING AND PORTIONS OF EXISTING DECK ON THE LEFT SIDE OF BRIDGE.
6. REMOVE PORTIONS OF THE ABUTMENTS AND PIERS AS NOTED ON THE PLANS.
7. CONSTRUCT NEW ABUTMENT AND PIER CONCRETE.
8. INSTALL NEW ELASTOMERIC BEARINGS, STEEL BEAM, INTERMEDIATE AND END CROSSFRAMES.
9. PLACE CONCRETE DECK, RAILING AND APPROACH SLABS.
10. SEAL LONGITUDINAL JOINT WITH H.M.W.M.

LEGEND

ITEM 202 - PORTIONS OF STRUCTURE REMOVED, OVER 20' SPAN, AS PER PLAN



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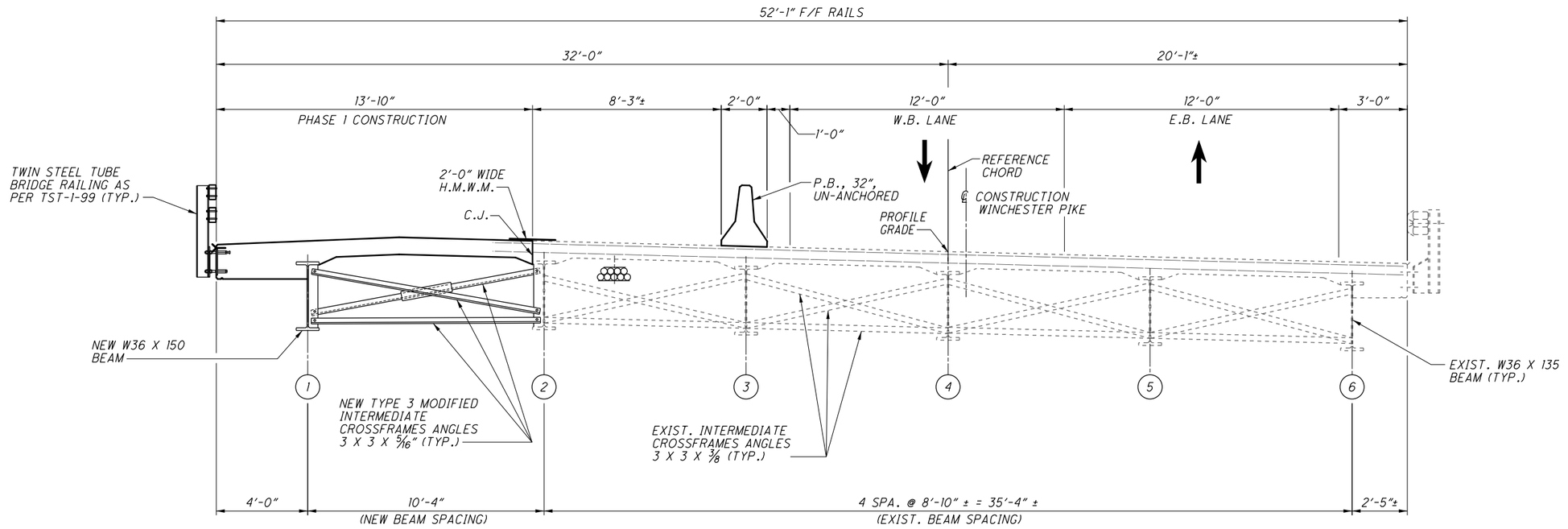

PHASE 1 CONSTRUCTION
(LOOKING EAST)

DESIGN AGENCY
ms consultants, inc.
2221 Schrock Road
Columbus, Ohio 43229

DESIGNED SJR | DRAWN SJR | REVIEWED - | DATE 12-06-13
CHECKED WER | REVISED | STRUCTURE FILE NUMBER 2532476

PHASE 1 REMOVAL AND CONSTRUCTION
BRIDGE NO. FRA-CO376-0327
WINCHESTER PIKE OVER BLACKLICK CREEK

PID No. -

2 / 5

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1"
0.5"
0

UCF: ohdot\V8i
PCF: 60-06735_Columbus

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34" x 22"

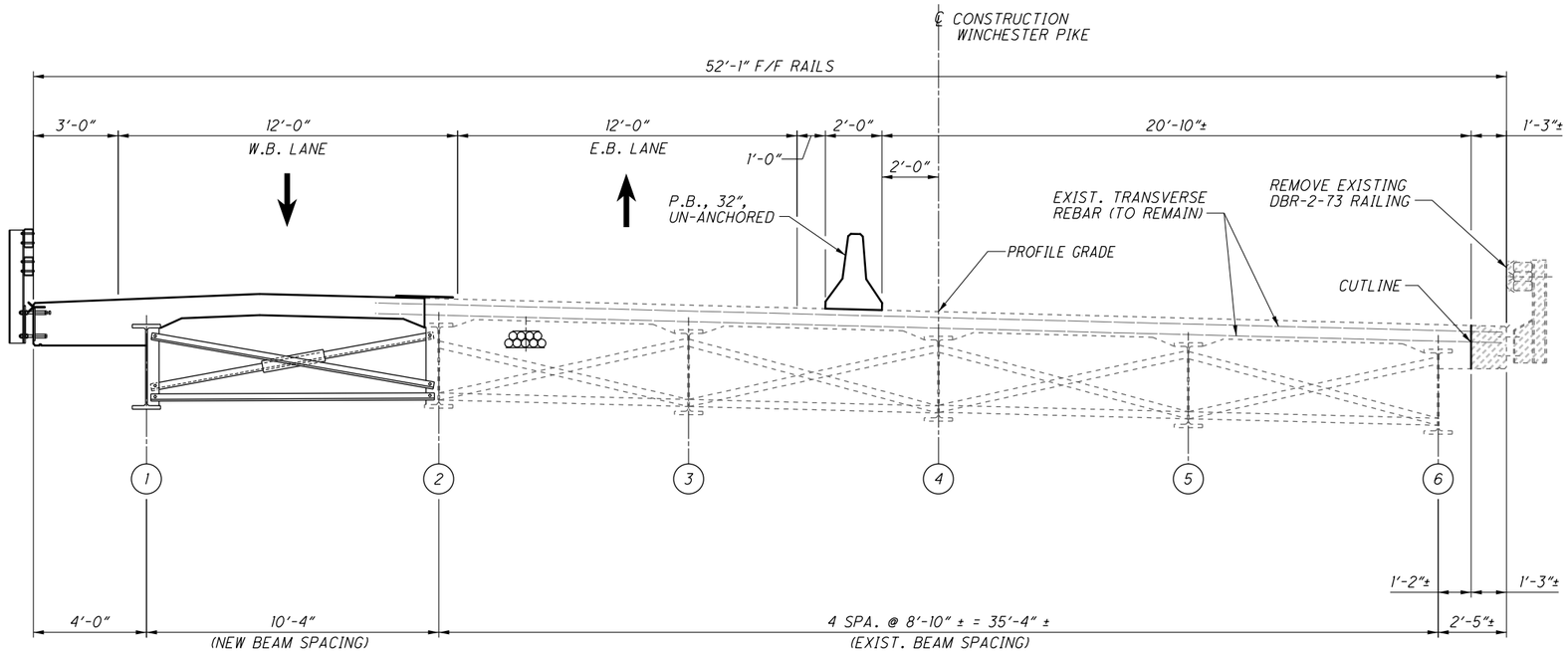
PROPOSED WORK

PHASE 2 CONSTRUCTION

1. PLACE PORTABLE BARRIER. INSTALL TEMPORARY STRIPING.
2. DIVERT AND MAINTAIN ONE LANE OF TRAFFIC IN EACH DIRECTION.
3. INSTALL FALSE DECKING.
4. REMOVE RAILING AND PORTIONS OF EXISTING DECK ON THE RIGHT SIDE OF BRIDGE.
5. REMOVE EXISTING COATING ON EXISTING PIER CAPS AND COLUMNS TO NORMAL WATER ELEVATION. REMOVE EXISTING COATING AT THE FACE OF EXISTING ABUTMENTS FROM BEAM SEAT TO GROUND LEVEL AND AT EXISTING WINGWALLS TO GROUND LEVEL.
6. PLACE NEW CONCRETE AT DECK EDGE.
7. INSTALL NEW RAILING.
8. SEAL LONGITUDINAL JOINT WITH H.M.W.M.
9. SEAL CONCRETE SURFACES.
10. PLACE ROCK CHANNEL PROTECTION.
11. REMOVE PORTABLE BARRIERS AND RESUME NORMAL TRAFFIC.

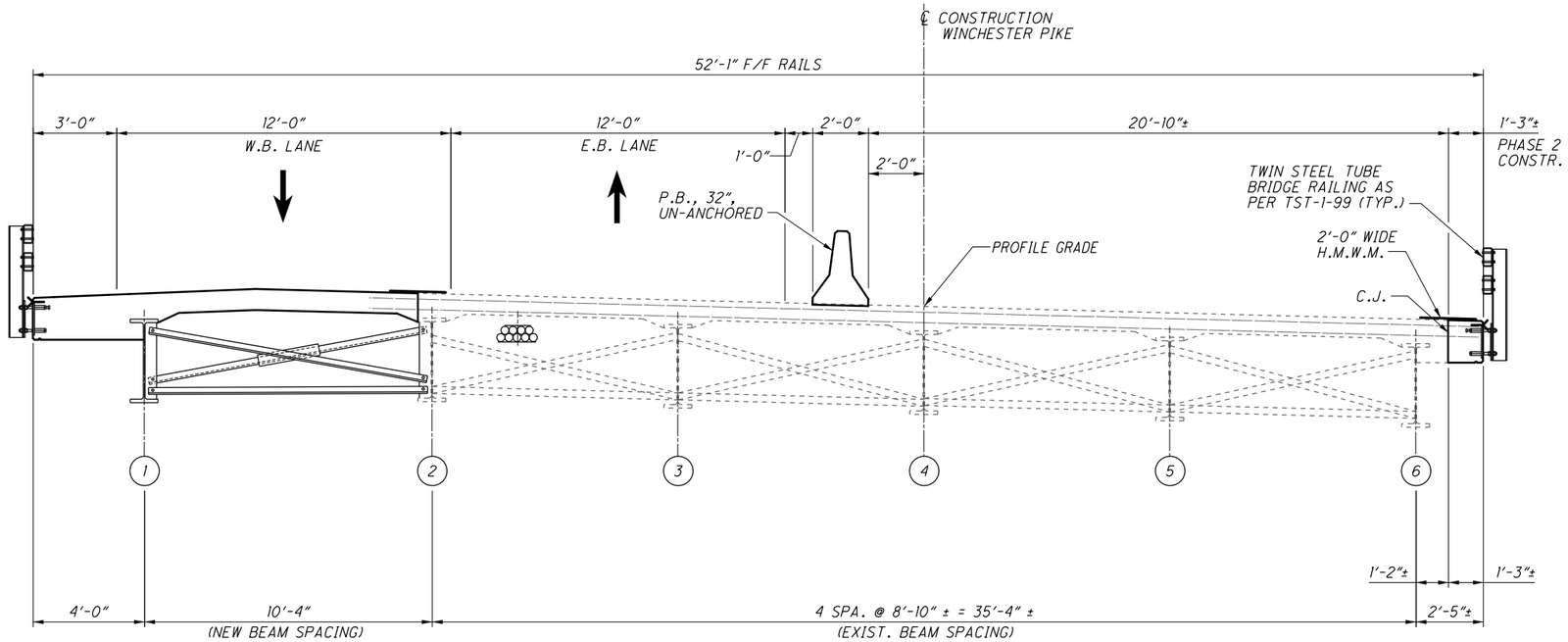
LEGEND

ITEM 202 - PORTIONS OF STRUCTURE REMOVED, OVER 20' SPAN, AS PER PLAN



PHASE 2 REMOVAL

(LOOKING EAST)



PHASE 2 CONSTRUCTION

(LOOKING EAST)

DESIGN AGENCY
ms consultants, inc.
2221 Schrock Road
Columbus, Ohio 43229

DESIGNED	DRAWN	REVIEWED	DATE
SJR	SJR	-	12-06-13
CHECKED	REVISED	STRUCTURE FILE NUMBER	
WER		2532476	

PHASE 2 REMOVAL AND CONSTRUCTION
BRIDGE NO. FRA-CO376-0327
WINCHESTER PIKE OVER BLACKLICK CREEK

PID No. -

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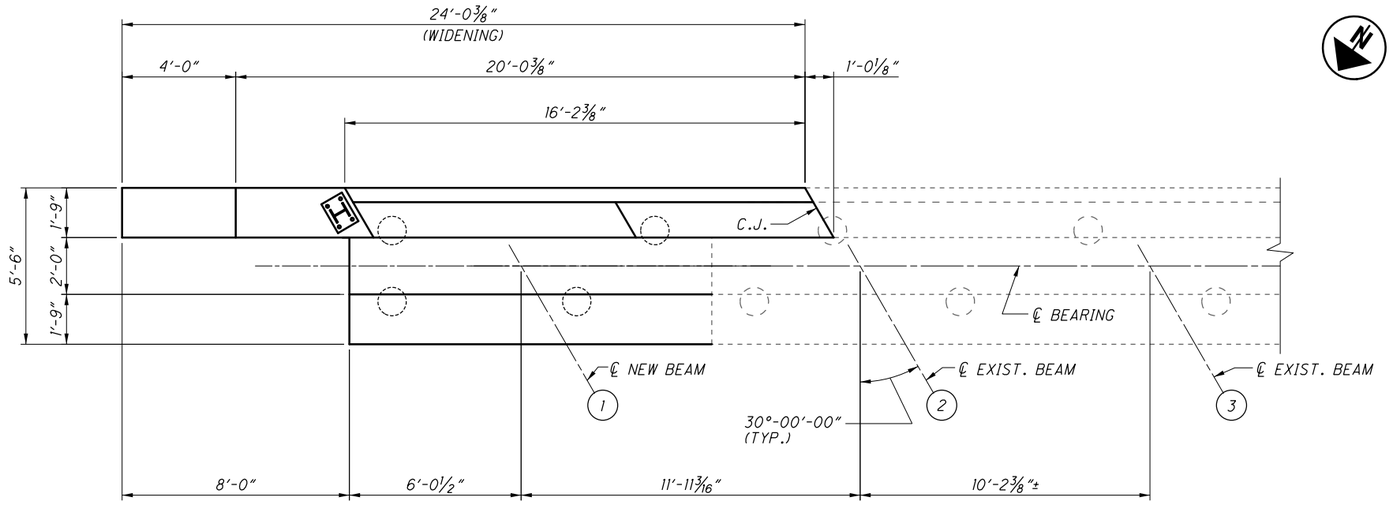
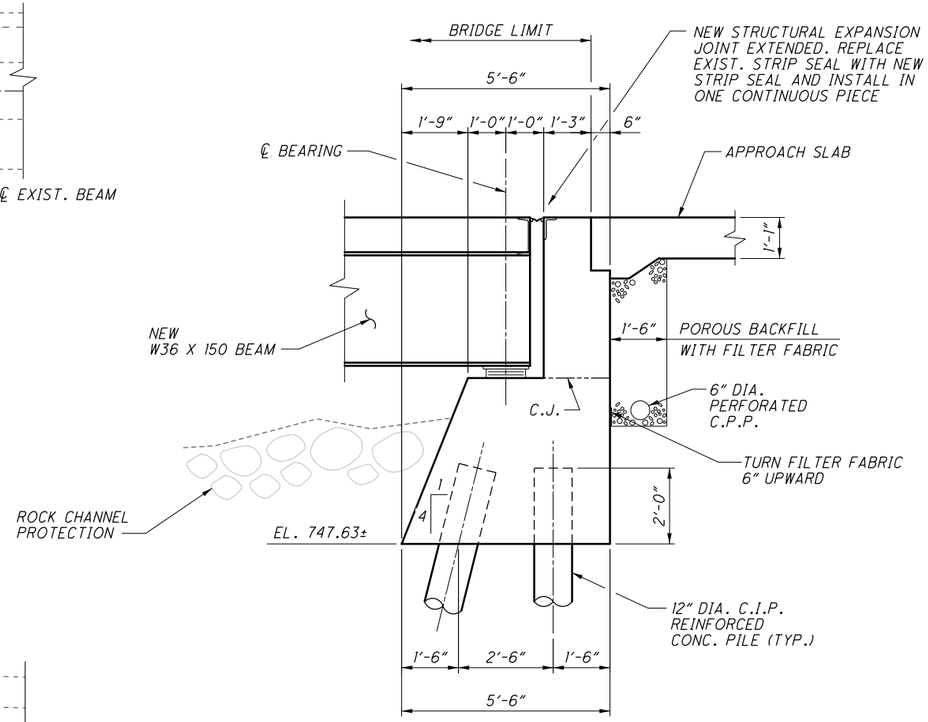
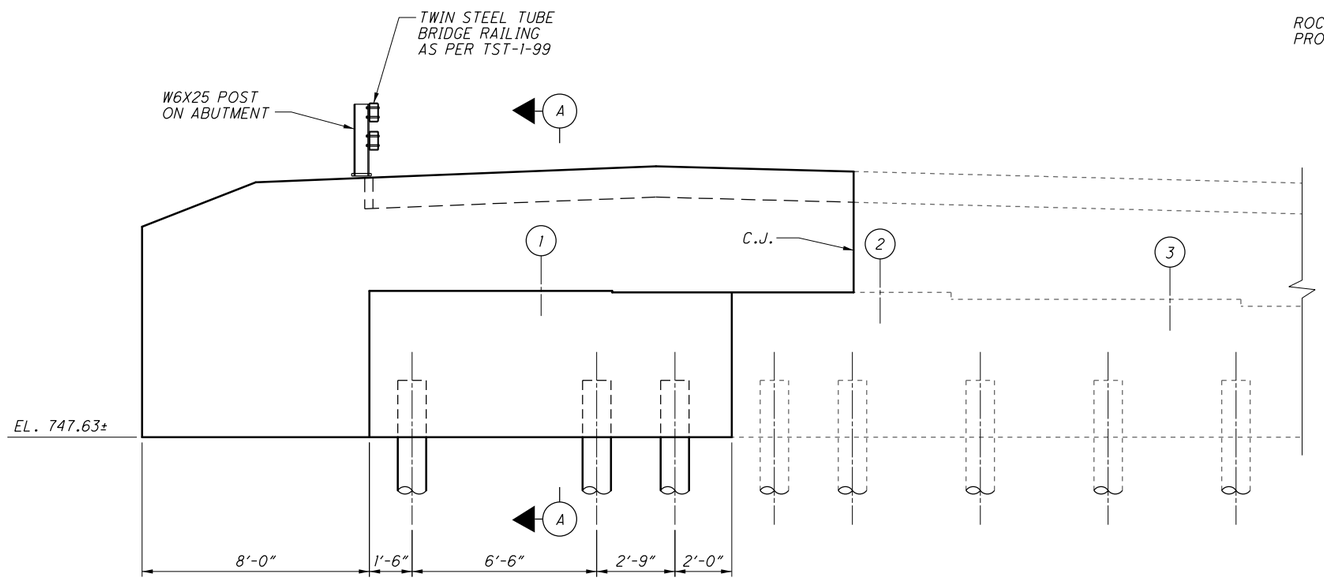


PARTIAL FORWARD ABUTMENT PLAN

(REAR ABUTMENT SIMILAR)



SECTION A-A



PARTIAL FORWARD ABUTMENT ELEVATION

(REAR ABUTMENT SIMILAR)

DESIGN AGENCY
ms consultants, inc.
2221 Schrock Road
Columbus, Ohio 43229

DESIGNED SJR | DRAWN KRM | REVIEWED - | DATE 12-06-13
CHECKED WER | REVISED | STRUCTURE FILE NUMBER 2532476

FORWARD ABUTMENT PLAN AND ELEVATION

BRIDGE NO. FRA-CO376-0327
WINCHESTER PIKE OVER BLACKLICK CREEK

PID No. -

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Ohio DOT Workspace
Winchester Pike & Ebright Road

UCF: ohdot1V8i
PCF: 60-06735_Columbus

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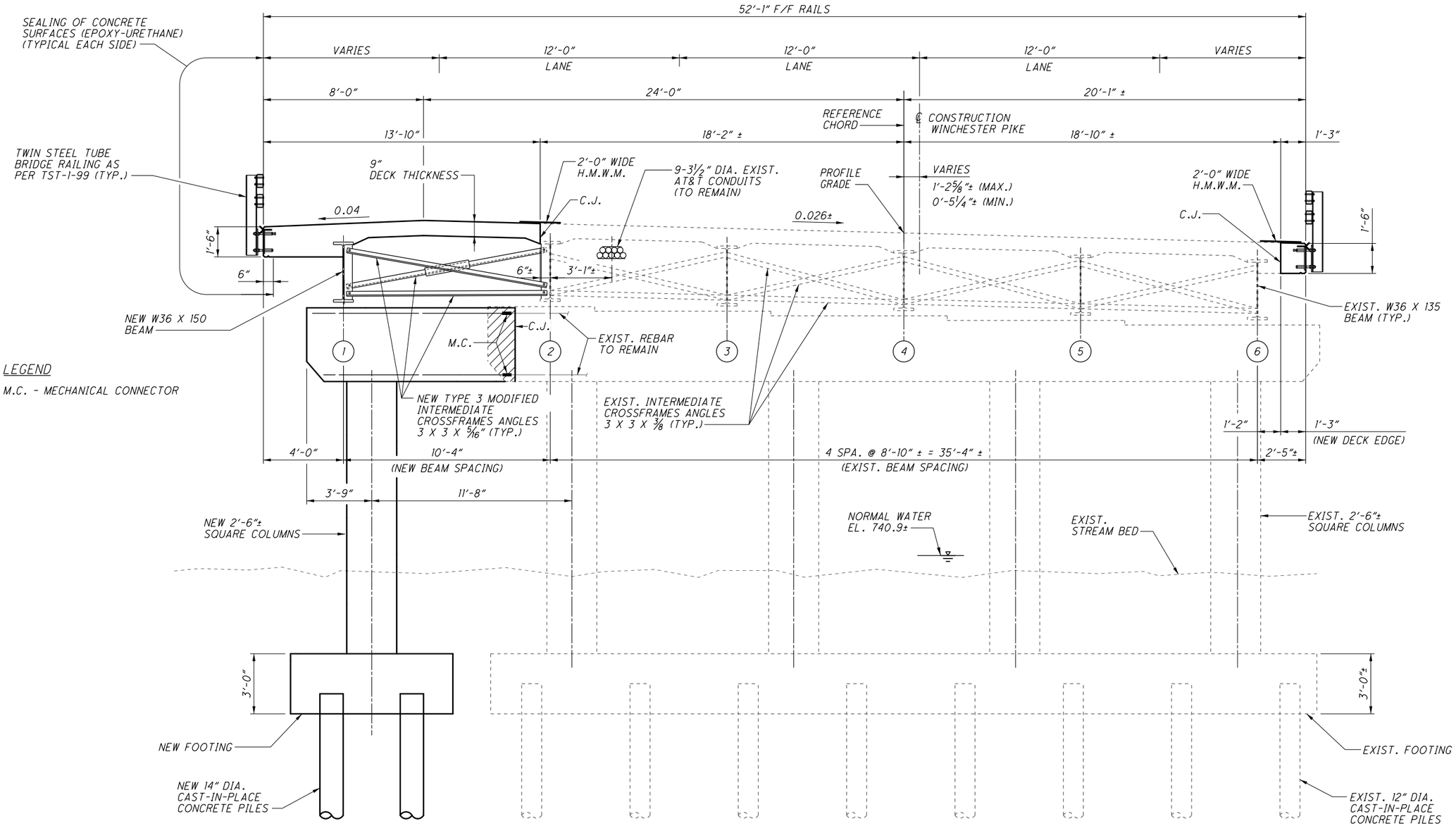
File: \\0330share\rn\60\06735\structures\Sheets\376_0327AF001.dgn By: cobremote1

34" x 22"



LEGEND

M.C. - MECHANICAL CONNECTOR

PROPOSED TRANSVERSE SECTION AT PIER

(LOOKING EAST)

ITEM 202 - PORTIONS OF STRUCTURE REMOVED, OVER 20' SPAN, AS PER PLAN

NOTE: FOOTINGS AND PILES ARE NOT SHOWN AS SKEWED.

DESIGN AGENCY
ms consultants, inc.
2221 Schrock Road
Columbus, Ohio 43229

DESIGNED	DRAWN	REVIEWED	DATE
SJR	SJR	-	12-06-13
CHECKED	REVISED	STRUCTURE FILE NUMBER	
WER		2532476	

TRANSVERSE SECTION AT PIER
BRIDGE NO. FRA-CO376-0327
WINCHESTER PIKE OVER BLACKLICK CREEK

PID No. -

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