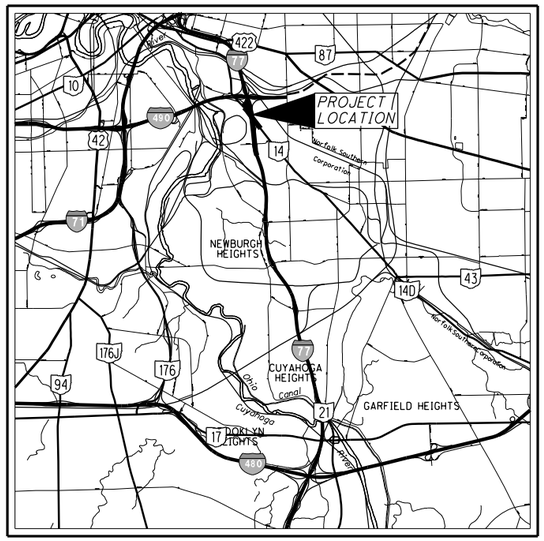


LOCATION MAP

LATITUDE: 41°28'27" LONGITUDE: 81°39'35"

SCALE IN MILES

0 1 2 3 4

N

PORTION TO BE IMPROVED
INTERSTATE HIGHWAY
FEDERAL ROUTES
STATE ROUTES
COUNTY & TOWNSHIP ROADS
OTHER ROADS

STATE OF OHIO

DEPARTMENT OF TRANSPORTATION

CUY-77-13.80 (CCG6B)
BUILDABLE UNIT 5A

CITY OF CLEVELAND

CUYAHOGA COUNTY

INDEX OF SHEETS:

PROJECT DESCRIPTION

REPLACEMENT OF THE CUY-77-1409 STRUCTURE.

PROJECT EARTH DISTURBED AREA: N/A ACRES
ESTIMATED CONTRACTOR EARTH DISTURBED AREA: N/A ACRES
NOTICE OF INTENT EARTH DISTURBED AREA: N/A ACRES
(SEE BU-6 FOR PROJECT EARTH DISTURBED AREA)

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.

2016 SPECIFICATIONS

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

DESIGN DESIGNATION

	I.R. 77 NORTH OF BROADWAY	I.R. 77 SOUTH OF BROADWAY	RAMP J5 & J6	FRONTAGE ROAD	BROADWAY AVENUE
CURRENT ADT (2017)	32,770	54,050	21,280	2,340	18,170
DESIGN YEAR ADT (2037)	41,220	63,300	22,080	2,300	18,410
DESIGN HOURLY VOLUME AM/PM (2037)	2,340/4,970	4,900/6,470	2,560/1,500	110/310	1,580/1,160
DIRECTIONAL DISTRIBUTION AM/PM	55%/61%	57%/60%	N/A	N/A	62%/65%
TRUCKS (24 HOUR B&C)	8%	8%	7%	37%	6%
DESIGN SPEED	60	60	50 (490E), 35 (490W)	40	35
LEGAL SPEED	50	60	N/A	35	35
DESIGN FUNCTIONAL CLASSIFICATION:	URBAN INTERSTATE	URBAN INTERSTATE	DIRECTIONAL RAMP	DIRECTIONAL RAMP	URBAN PRINCIPAL ARTERIAL
NHS PROJECT	YES	YES	YES	YES	YES

DESIGN EXCEPTIONS

NONE

UNDERGROUND UTILITIES

CONTACT BOTH SERVICES TWO WORKING DAYS BEFORE YOU DIG.

OHIO Utilities Protection SERVICE — Call Before You Dig 1-800-362-2764

(Non-members must be called directly)

OIL & GAS PRODUCERS UNDERGROUND PROTECTION SERVICE 1-800-925-0988

PLAN PREPARED BY:

E.L. ROBINSON ENGINEERING
1468 West 9th Street • Cleveland, Ohio 44113
www.elrobinsonengineering.com

kokosing CONSTRUCTION COMPANY INC.

ENGINEERS SEAL:

STATE OF OHIO — CURTIS JAMES WOOD — E-69704 — REGISTERED PROFESSIONAL ENGINEER

SIGNED: Curtis Wood

DATE: 9-28-17

STANDARD CONSTRUCTION DRAWINGS	SUPPLEMENTAL SPECIFICATIONS
	800 7/15/16
	843 1/15/16

SPECIAL PROVISIONS

STRUCTURE MISC.: POST-TENSIONING SYSTEM (PRECAST SEGMENTS) 9-12-17

RELEASED FOR CONSTRUCTION

BU05a_2017-09-28.BU-5a Beams.RFC Set.pdf

10/02/2017 Brian.Link

APPROVED _____
DATE _____ DISTRICT DEPUTY DIRECTOR

APPROVED _____
DATE _____ DIRECTOR, DEPARTMENT OF TRANSPORTATION

BU5A - CUY-77-1409

NO.	DATE	DESCRIPTION
		ISSUE RECORD

FEDERAL PROJECT NO. E131(492)

PID NO. 82388

CONSTRUCTION PROJECT NO. 173001

RAILROAD INVOLVEMENT NONE

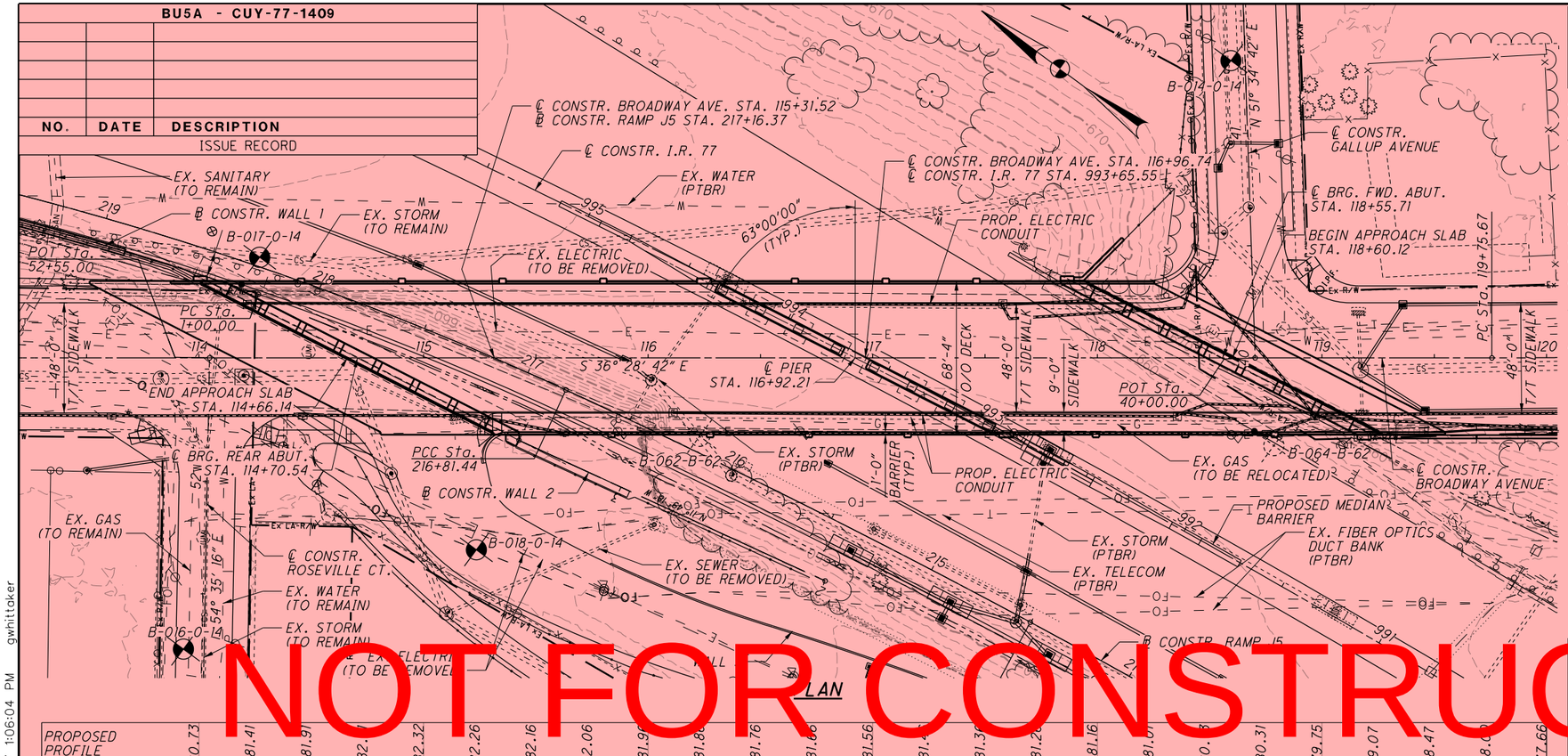
CUY-77-13.80

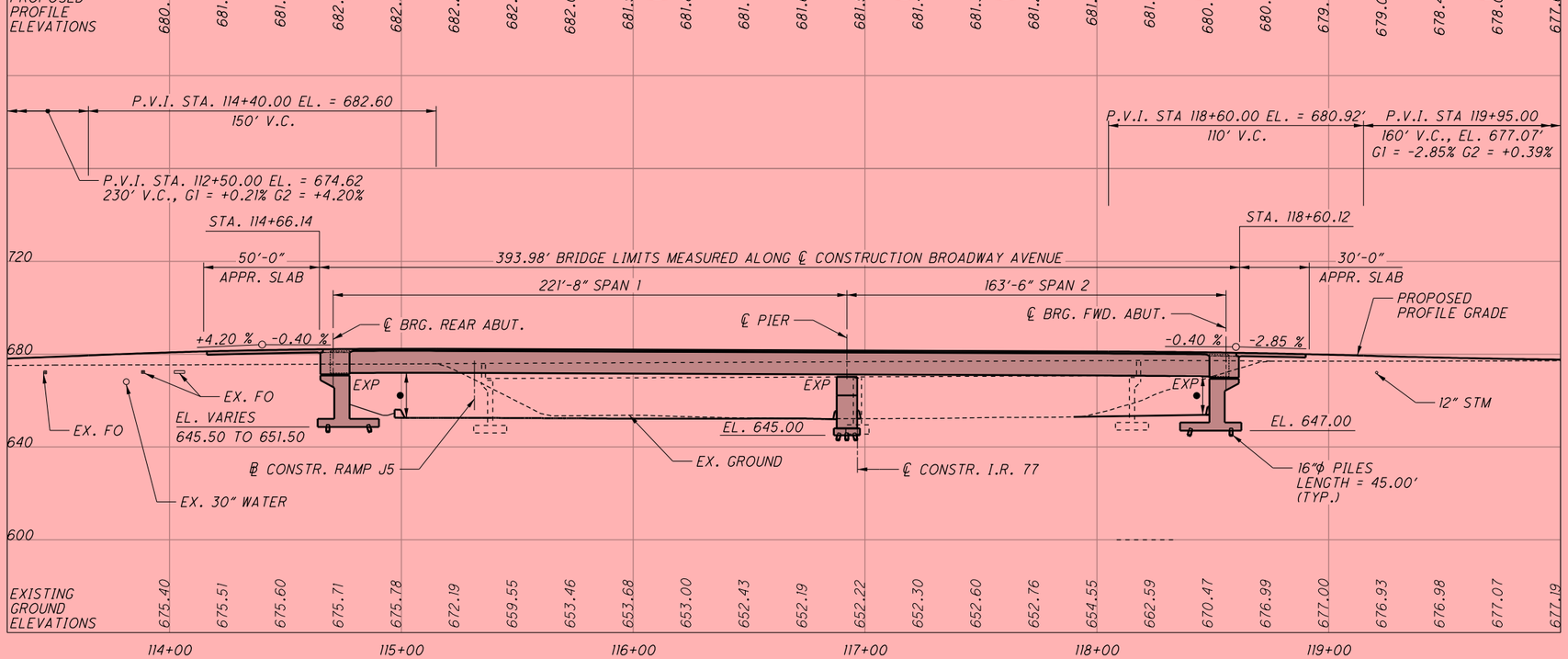
1 / 26

P:\82388_CCG6B\Design\Roadway\Sheets\82388_GT5A01.dgn Sheet 9/28/2017 1:05:59 PM gwhittaker

2017-09-28.BU-5a Beams.RFC

BU5A - CUY-77-1409		
NO.	DATE	DESCRIPTION
		ISSUE RECORD





PROFILE ALONG ℄ CONSTRUCTION BROADWAY AVENUE

BENCHMARK DATA

BM #6 STA. 111+14.49, ELEV. 674.58 , OFFSET 27.22' LT.
BM #7 STA. 122+58.40 , ELEV. 677.91 , OFFSET 54.44' RT.

FOR ADDITIONAL BENCHMARK INFORMATION AND CURVE DATA, SEE BU-4 ROADWAY PLANS.

NOTES

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

DESIGN TRAFFIC:

2017 ADT = 18,170 2017 ADTT = 1090
2037 ADT = 18,410 2037 ADTT = 1105
DIRECTIONAL DISTRIBUTION AM/PM = 62%/65%

LEGEND

BORING LOCATION — HISTORIC BORING LOCATION

PTBR - PORTIONS TO BE RELOCATED

- ● - SB I.R. 77
  16.00' REQUIRED MINIMUM VERTICAL CLEARANCE
  16.50' ACTUAL MINIMUM VERTICAL CLEARANCE
  14.67' EXISTING MINIMUM VERTICAL CLEARANCE

  NB I.R. 77
  16.00' REQUIRED MINIMUM VERTICAL CLEARANCE
  16.25' ACTUAL MINIMUM VERTICAL CLEARANCE
  14.67' EXISTING MINIMUM VERTICAL CLEARANCE
- ⊗ - RAMP J5
  10.00' REQUIRED MINIMUM HORIZONTAL CLEARANCE
  10.00' ACTUAL MINIMUM HORIZONTAL CLEARANCE
  11.60' EXISTING MINIMUM HORIZONTAL CLEARANCE

  RAMP S-E
  12.00' REQUIRED MINIMUM HORIZONTAL CLEARANCE
  12.00' ACTUAL MINIMUM HORIZONTAL CLEARANCE
  12.60' EXISTING MINIMUM HORIZONTAL CLEARANCE

EXISTING STRUCTURE

TYPE: 2-SPAN STEEL BEAMS WITH REINFORCED CONCRETE DECK AND SUBSTRUCTURE
SPANS: 172'-0"±, 121'-0"± MEASURED ALONG ℄ CONSTRUCTION BROADWAY AVENUE
ROADWAY: 46'-0"± TOE/TOE OF CURB WITH TWO 6'-2"± SIDEWALKS
LOADING: CF 400 (57); HS20-44
SKEW: 63°00'00"±
APPROACH SLABS: 40'-0"± REAR ABUT. & 50'-0"± FWD. ABUT.
WEARING SURFACE: 1" MONOLITHIC CONCRETE
ALIGNMENT: TANGENT
CROWN: 0.0156'/FT±
STRUCTURE FILE NUMBER: 1806661
DATE BUILT: 1963
DISPOSITION: TO BE REMOVED

PROPOSED STRUCTURE

TYPE: 2-SPAN PRECAST, PRE-TENSIONED, AND POST-TENSIONED CONCRETE BEAMS ON REINFORCED CONCRETE WALL TYPE SEMI-INTGRAL ABUTMENTS AND REINFORCED CONCRETE PIER.
SPANS: 221'-8" - 163'-6" C/C ABUT. BEARINGS/ ℄ PIERS MEASURED ALONG ℄ CONSTRUCTION BROADWAY AVENUE
ROADWAY: 48'-0" TOE/TOE OF CURB WITH TWO 9'-0" SIDEWALKS
LOADING: HL-93 AND 60 PSF FUTURE WEARING SURFACE
SKEW: 63°00'00"
APPROACH SLABS:
50'-0" LONG REAR (AS-1-15) (AS-2-15) (MODIFIED)
30'-0" LONG FORWARD (AS-1-15) (AS-2-15) (MODIFIED)
WEARING SURFACE: 1" MONOLITHIC CONCRETE
ALIGNMENT: TANGENT
CROWN: 0.02'/FT
COORDINATES: LATITUDE N41°28'34.96" LONGITUDE W81°39'39.30"

E.L. ROBINSON ENGINEERING
1801 Watermark Drive, Suite 310 - Columbus, OHio 43215
www.elrobinsonengineering.com

DESIGNED	DRAWN	REVIEWED	DATE
GMW/CJW	DTA	RER	9/28/2017
CHECKED	REVISED	STRUCTURE FILE NUMBER	
DFT		1806663	

CUYAHOGA
STA. 114+66.14
STA. 118+60.12

SITE PLAN
BRIDGE NO. CUY-77-1409
BROADWAY AVENUE OVER IR 77

CUY-77-13.80
PID No. 82388

2 / 26

P:\82388_CCG6B\Design\Structures\CUY-77-1409\sheets\077_1409C_SP001.dgn Sheet 9/28/2017 1:06:04 PM gwhittaker

STANDARD DRAWINGS AND SUPPLEMENTAL SPECIFICATIONS:

REFER TO THE FOLLOWING STANDARD BRIDGE DRAWINGS:

AS-1-15	REVISED 7-17-15
AS-2-15	REVISED 7-17-15

REFER TO THE FOLLOWING SUPPLEMENTAL SPECIFICATIONS:

800	REVISED 7-15-16
843	DATED 1-15-16

REFER TO THE FOLLOWING SPECIAL PROVISION:
POST TENSIONING DATED 9-12-17

DESIGN SPECIFICATIONS:

THIS STRUCTURE CONFORMS TO THE "LRFD BRIDGE DESIGN SPECIFICATIONS" ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, 2014 - 7th EDITION INCLUDING THE 2015 AND 2016 INTERIM SPECIFICATIONS AND THE ODOT BRIDGE DESIGN MANUAL, 2007.

OPERATIONAL IMPORTANCE:

A LOAD MODIFIER OF 1.00 HAS BEEN ASSUMED FOR THE DESIGN OF THIS STRUCTURE IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, ARTICLE 1.3.5 AND THE ODOT BRIDGE DESIGN MANUAL, 2007.

DESIGN LOADING:

DESIGN LOADING:
HL-93
FUTURE WEARING SURFACE (FWS) OF 0.060 KIPS/SQ. FT.
SIDEWALK LOADING OF 0.075 KIPS/SQ. FT.

DESIGN DATA:

CONCRETE CLASS QC2 - COMPRESSIVE STRENGTH 4.5 KSI (SUPERSTRUCTURE)
CONCRETE CLASS QC1 - COMPRESSIVE STRENGTH 4.0 KSI (SUBSTRUCTURE)
CONCRETE CLASS QC1 - COMPRESSIVE STRENGTH 8.0 KSI (CLOSURE POUR FINAL)
CONCRETE CLASS QC1 - COMPRESSIVE STRENGTH 7.0 PSI (CLOSURE POUR @ POST TENSION STRESSING)
REINFORCING STEEL - MINIMUM YIELD STRENGTH 60 KSI
STRUCTURAL STEEL - ASTM A709 GRADE 50

CONCRETE FOR ALL PRESTRESSED BEAM SEGMENTS:
COMPRESSIVE STRENGTH (FINAL) - 10.0 KSI
COMPRESSIVE STRENGTH (RELEASE) - 7.0 KSI
ASSUMED CONCRETE AGES FOR DESIGN:
AT RELEASE - 1 DAY
AT ERECTION - 181 DAYS
AT POST-TENSIONING - 198 DAYS
AT DECK CASTING - 205 DAYS

WELDED WIRE FABRIC:
YIELD STRENGTH - 70 KSI

PRESTRESSING STRAND:
ASTM A416; 0.6" UNCOATED, SEVEN WIRE LOW RELAXATION; fpu = 270 KSI
AREA = 0.217 SQ. IN.
ULTIMATE STRENGTH = 270 KSI
INITIAL STRESS = 202.5 KSI (LOW RELAXATION STRANDS)

POST-TENSIONING TENDONS:
ASTM A416; 0.6" UNCOATED, SEVEN WIRE LOW RELAXATION; fpu = 270 KSI
STRAND AREA = 0.217 SQ. IN.
MODULUS OF ELASTICITY = 28,500 KSI
MAXIMUM JACKING STRESS: 81% ULTIMATE
MAXIMUM STRESS AT ANCHORAGES IMMEDIATELY AFTER ANCHOR SET: 70% ULTIMATE
MAXIMUM STRESS ELSEWHERE ALONG LENGTH OF MEMBER,
IMMEDIATELY AFTER ANCHOR SET: 74% ULTIMATE
FRICTION COEFFICIENT: 0.15
WOBBLE COEFFICIENT: 0.0008 /FT
ANCHORAGE SET: 3/8"

DESIGN LOADING:

THIS BRIDGE REQUIRED THE USE OF A THREE DIMENSIONAL MODEL USING THE FINITE ELEMENT DESIGN METHOD TO ANALYZE THE STRUCTURE. THE COMPUTER PROGRAM USED FOR STRUCTURAL ANALYSIS WAS MIDAS CIVIL 2018 (v1.2). THE BRIDGE COMPONENTS DESIGNED BY THIS METHOD WERE THE POST-TENSIONED I-BEAMS.

ALL LOADS WERE DISTRIBUTED BASED ON ELEMENT STIFFNESS.

DECK PROTECTION METHOD:

EPOXY COATED REINFORCING STEEL
2 1/2" CONCRETE COVER

MONOLITHIC WEARING SURFACE:

MONOLITHIC WEARING SURFACE IS ASSUMED, FOR DESIGN PURPOSES, TO BE 1 INCH THICK.

EXISTING BRIDGE PLANS:

EXISTING PLANS MAY BE INSPECTED IN THE ODOT DISTRICT 12 OFFICE AT 5500 E. 98TH STREET, GARFIELD HEIGHTS, OH.

MAINTENANCE OF TRAFFIC:

SEE ROADWAY PLANS FOR MAINTENANCE OF TRAFFIC NOTES AND DETAILS.

ERECTION AND LIFTING DEVICES:

THE GIRDER FABRICATOR IS RESPONSIBLE FOR THE DESIGN OF A LIFTING SYSTEM FOR HANDLING I-BEAMS. AS A MINIMUM, THE FABRICATOR SHALL USE TWO LIFT POINTS. THE FABRICATOR SHALL SHOW THE LIFTING SYSTEM ON THE SHOP DRAWINGS AND USE A FACTOR OF SAFETY OF FOUR IN THE DESIGN. REFER TO THE PCI HANDBOOK.

TEMPORARY STABILITY FOR DECK PLACEMENT:

THE ERECTION PROCEDURE SHALL INCLUDE ANY ADDITIONAL TEMPORARY DIAPHRAGMS OR SUPPORTS NEEDED TO ASSURE THE I-BEAMS WILL REMAIN STABLE BEFORE, DURING AND THROUGH COMPLETION OF THE PLACEMENT OF THE CONCRETE DECK.

THE PLACEMENT OF DECK CONCRETE SHALL NOT PROCEED UNTIL ALL INTERMEDIATE DIAPHRAGMS HAVE BEEN PROPERLY INSTALLED.

CAST-IN-PLACE DECK CONCRETE:

EXCEPT FOR THE EXTERIOR 9" THE FABRICATOR SHALL INTENTIONALLY ROUGHEN THE SURFACE OF THE I-BEAM TOP FLANGES TO BE INCORPORATED INTO THE DECK CONCRETE BEFORE THE CONCRETE HAS REACHED ITS INITIAL SET. SEE BEAM DETAILS.

AFTER THE BEAMS HAVE BEEN ERECTED AT THE JOB SITE AND JUST PRIOR TO INSTALLATION OF THE BRIDGE DECK REINFORCEMENT, APPLY TWO COATS OF MEMBRANE CURING COMPOUND, C&MS 705.07 TYPE 1 OR 1D TO THE PORTIONS OF THE TOP SURFACE OF THE BEAMS IDENTIFIED ON "TOP FLANGE FINISHING" DETAIL, SHEET 13/26. THE CONCRETE SURFACE SHALL BE CLEAN OF LOOSE DEBRIS AND DRY FOR A MINIMUM OF 2 HOURS PRIOR TO APPLICATION OF THE CURING COMPOUND. THE TEMPERATURE OF THE CONCRETE AND AIR SHALL BE 40°F OR HIGHER AT THE TIME OF APPLICATION. THE SECOND COAT MAY IMMEDIATELY FOLLOW APPLICATION OF THE FIRST COAT. DO NOT EXPOSE COATING TO PRECIPITATION OR FOOT TRAFFIC FOR A MINIMUM PERIOD OF 4 HOURS AFTER APPLICATION.

STRUCTURAL STEEL HARDWARE:

GALVANIZE ALL STRUCTURAL STEEL, DOWEL BARS, PIPE SLEEVES, BOLTS, STUDS, INSERTS, THREADED RODS, NUTS AND WASHERS, EMBEDDED SOLE PLATES AND BEARING LOAD PLATES ACCORDING TO 711.02.

ALL STRUCTURAL STEEL, INCLUDING BOLTS, NUTS, WASHERS AND PLATE WASHERS FOR INTERMEDIATE DIAPHRAGMS SHALL CONFORM TO THE REQUIREMENTS OF 513.

SEALING OF BEAM ENDS:

SEAL ALL STRANDS AT BEAM ENDS WITH TYPE A WATERPROOFING PER CMS 512.08. WATERPROOFING SHALL EXTEND A MINIMUM OF 2 INCHES SURROUNDING EACH STRAND LOCATION.

INSERTS AND HOLES:

ALL INSERTS AND HOLES REQUIRED IN CONCRETE BEAMS SHALL BE SHOWN IN FABRICATOR'S SHOP DRAWINGS. IF HOLES OR INSERTS ARE PLACED IN THE WEB THEN ADDITIONAL CRACK CONTROL REINFORCING SHALL BE SHOWN IN THE SHOP DRAWINGS. INSERTS OR HOLES ARE NOT PERMITTED IN THE BOTTOM FLANGE ALONG THE ENTIRE LENGTH OF THE BEAM.

ITEM 515, PRESTRESSED CONCRETE BRIDGE I-BEAM MEMBERS

1.0 GENERAL
ALL REQUIREMENTS OF SECTION 515 OF THE CONSTRUCTION AND MATERIALS SPECIFICATIONS APPLY TO THIS SPECIFICATION EXCEPT AS NOTED HEREIN.

2.0 PERFORMANCE
EXCEPT AS MODIFIED OR EXCEEDED BY THESE SPECIFICATIONS, ALL CAST-IN-PLACE STRUCTURAL LIGHT WEIGHT CONCRETE WORK SHALL CONFORM TO ACI 301.

3.0 MATERIALS
3.1 AGGREGATE: EXPANDED SHALE, CLAY, OR SLATE (ESCS) LIGHTWEIGHT AGGREGATE PRODUCED BY THE ROTARY KILN METHOD SHALL MEET ASTM C 330. NORMAL WEIGHT AGGREGATE SHALL MEET ASTM C 33. THE COARSE AGGREGATES SHALL BE WELL GRADED TO MEET OC3 ON TABLE 499.03-1 OF THE 2013 ODOT CMS AND OPTIMAL 2 ON THE COARSENESS FACTOR CHART. ALL COARSE AGGREGATE SHALL HAVE AN ABSORPTION OF 1.00% OR GREATER AS DEFINED PER ASTM C127.

4.0 CONCRETE PROPERTIES
4.1 STRENGTH: MATERIALS SHALL BE PROPORTIONED TO PRODUCE CONCRETE WITH A MINIMUM COMPRESSIVE STRENGTH OF 10.0 KSI AT FINAL.
4.2 DENSITY: MATERIALS SHALL BE PROPORTIONED TO PRODUCE CONCRETE WITH A CALCULATED EQUILIBRIUM DENSITY OF 125 PCF ±3 PCF AS DETERMINED BY ASTM C 567-00, SECTION 9.2.
4.3 MIXTURE PROPORTIONS: THE CONTRACTOR SHALL FURNISH THE MIXTURE PROPORTIONS THAT WILL MEET THE STRENGHT AND FRESH AND EQUILIBRIUM DENSITY REQUIREMENTS OF THE CONCRETE SPECIFIED. THE MIXTURE PROPORTION SHALL BE PREPARED IN ACCORDANCE WITH ACI 318, AND SUBJECT TO THE APPROVAL OF THE ENGINEER.
4.4 BATCHING AND MIXING: THE CONCRETE SHALL BE BATCHED AND MIXED IN ACCORDANCE WITH THE APPLICABLE SECTION OF ACI 301 AND ASTM C 94.

5.0 FIELD CONTROL
5.1 FRESH DENSITY: THE CONCRETE SHALL HAVE A MAXIMUM FRESS DENSITY OF 135 PDF.
5.2 PUMPING: IF CONCRETE IS TO BE PUMPED, FOLLOW THE RECOMMENDATIONS OF ESCI INFORMATION SHEET 4770.1. PUMPING STRUCTURAL LIGHTWEIGHT CONCRETE - THE TEAM APPROACH AND ACI 304-2R.
5.3 CONCRETE SPECIMENS: COMPRESSIVE STRENGTH SPECIMENS SHALL BE MADE IN ACCORDANCE WITH ASTM C 31 AND TESTED IN ACCORDANCE WITH ASTM C 39. DENSITY, SLUMP, AND AIR CONTENT SHALL BE DETERMINED BY ASTM C 138, C 143, AND C 173 RESPECTIVELY. EQUILIBRIUM DENSITY SHALL BE DETERMINED BY ASTM C 567.

RELEASED FOR CONSTRUCTION
BU05a_2017-09-28.BU-5a Beams.RFC Set.pdf
10/02/2017 | Brian.Link

BU5A - CUY-77-1409		
NO.	DATE	DESCRIPTION
ISSUE RECORD		

E.L. ROBINSON ENGINEERING
1001 Watermark Drive, Suite 310 • Columbus, Ohio 43215
www.elrobinsonengineering.com

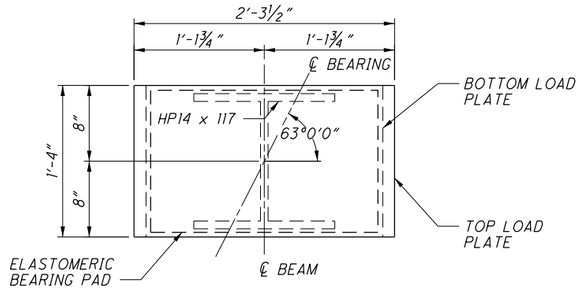
DESIGNED	DRAWN	REVIEWED	DATE
GMW/CJW	DTA	RER	9/28/2017
CHECKED	REVISED	STRUCTURE FILE NUMBER	
DFT		1806663	

GENERAL NOTES
BRIDGE NO. CUY-77-1409
BROADWAY AVENUE OVER IR 77

CUY-77-13.80
PID No. 82388

3 / 26

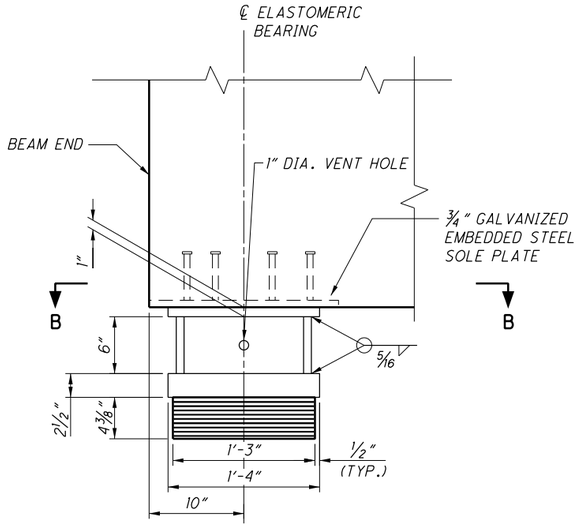
0
0



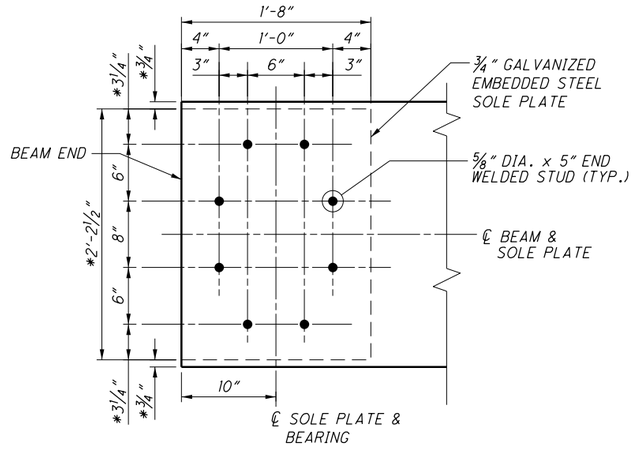
SECTION A-A

LAMINATED ELASTOMERIC BEARINGS AT REAR ABUTMENT										
BEARING DIMENSIONS					REACTIONS		MAXIMUM DESIGN LOAD	UNFACTORED ROTATIONS		
ti	*te*	*T*	*n*	*N*	*DL*	*LL W/O IMPACT*		*Max.* θ_{FWS}	*Max.* $\theta_{DC1 + DC2}$	θ_{LL}
0.375"	0.25"	4.375"	9	9	585 K	167 K	785 K	0.03312°	0.5266°	0.04973°

ti = THICKNESS OF INTERNAL LAYER
te = THICKNESS OF EXTERNAL LAYER
T = TOTAL THICKNESS OF ELASTOMERIC BEARING
n = NUMBER OF INTERNAL ELASTOMER LAYERS
N = NO. OF STEEL LAMINATES
INTERNAL STEEL LAMINATE THICKNESS = 0.0747"
DUROMETER OF ELASTOMER = 60 DUROMETER

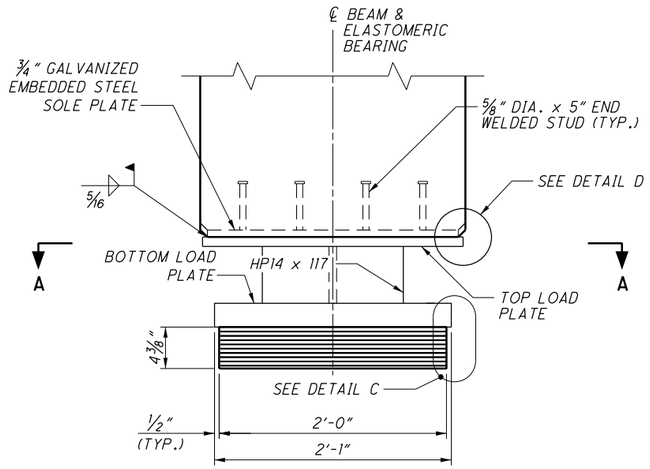


SIDE VIEW



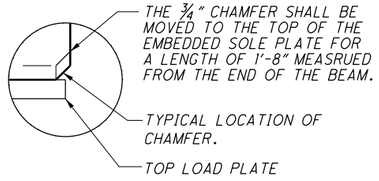
SECTION B-B

(TOP LOAD PLATE NOT SHOWN)

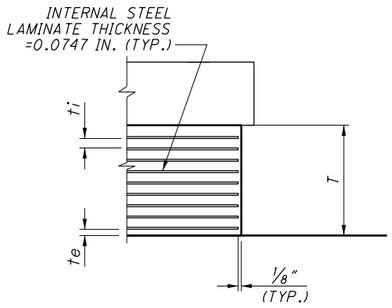


END VIEW

ELASTOMERIC EXPANSION BEARING



DETAIL D



DETAIL C

RELEASED FOR CONSTRUCTION

BU05a_2017-09-28.BU-5a Beams.RFC Set.pdf	
10/02/2017	Brian.Link

LEGEND:

* THE SOLE PLATE WIDTH MAY BE DECREASED BY ⅜" TO ALLOW FOR FIT-UP. THE 3¼" DIMENSION SHOULD BE ADJUSTED ACCORDINGLY.

NOTES:

1. ELASTOMERIC BEARINGS: THE ELASTOMER SHALL HAVE A HARDNESS OF 60 DUROMETER. THE BEARINGS WERE DESIGNED IN ACCORDANCE WITH SECTION 14.7.5 (METHOD B) OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS. PERFORM THE LONG-TERM COMPRESSIVE PROOF LOAD TEST IN ACCORDANCE WITH THE AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, DIVISION II, SECTION 18.7.2.6 AND 18.7.4.5.

2. BEARING ASSEMBLIES SHALL HAVE ADEQUATE BLOCKING PLACED TO STABILIZE THE BEAM DURING ERECTION AND PLACEMENT OF THE CONCRETE DECK. THIS BLOCKING SHALL BE REMOVED ONCE THE CONCRETE DECK HAS HARDENED TO LIMITS ESTABLISHED IN CMS 511.14.

3. STEEL LOAD PLATES: DURING FIELD WELDING, CONTROL THE TEMPERATURE AT THE ELASTOMER BONDED SURFACE TO A MAXIMUM OF 300°F AS DETERMINED BY THE USE OF PYROMETRIC STICKS OR OTHER TEMPERATURE MONITORING DEVICES.

4. THE STEEL LOAD PLATES AND HP14 x 117 SHALL CONFORM TO THE REQUIREMENTS ASTM A709 GRADE 50 STEEL AND SHALL BE GALVANIZED PER CMS 711.02. THE STEEL LOAD PLATES SHALL BE BONDED BY VULCANIZATION TO THE ELASTOMER DURING THE MOLDING PROCESS.

BU5A - CUY-77-1409		
NO.	DATE	DESCRIPTION
ISSUE RECORD		

E.L. ROBINSON ENGINEERING
1001 Watermark Drive, Suite 310 • Columbus, Ohio 43215
www.elrobinsonengineering.com

DESIGNED CJW | DRAWN MGB | REVIEWED RER | DATE 9/28/2017
CHECKED DFT | REVISED | STRUCTURE FILE NUMBER 1806663

BEARING DETAILS - REAR ABUTMENT
BRIDGE NO. CUY-77-1409
BROADWAY AVENUE OVER IR 77

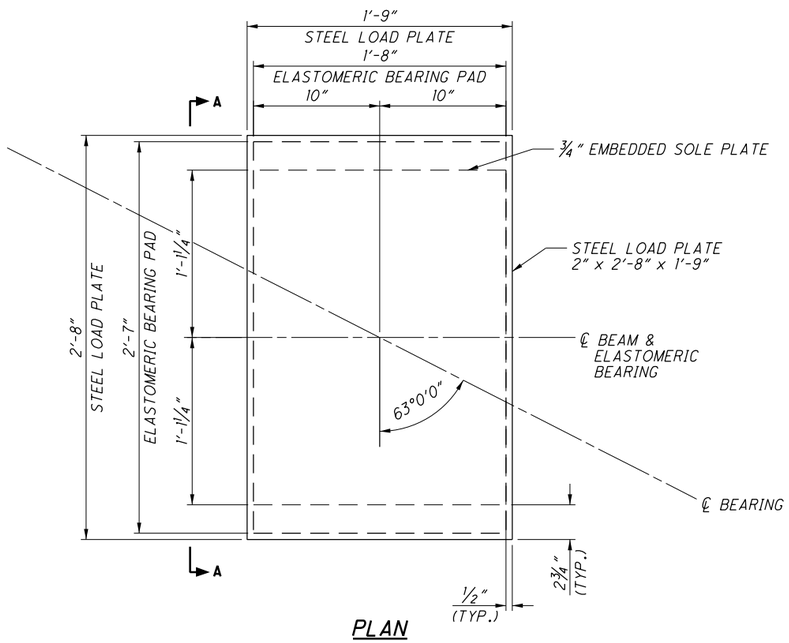
CUY-77-13.80
PID No. 82388

4 / 26

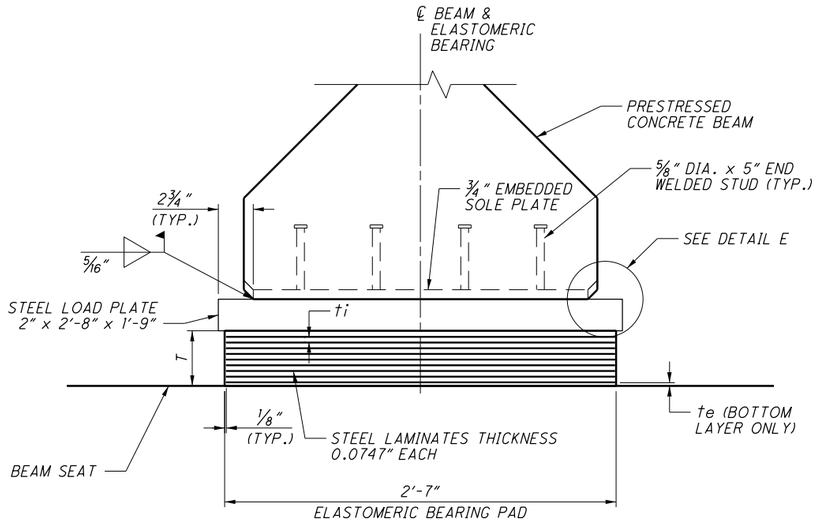
0
0

LAMINATED ELASTOMERIC BEARINGS AT PIER										
BEARING DIMENSIONS					REACTIONS		MAXIMUM DESIGN LOAD	UNFACTORED ROTATIONS		
t_i	t_e	T	n	N	DL	LL W/O IMPACT		$Max.\theta_{FWS}$	$Max.\theta_{DC1+DC2}$	θ_{LL}
0.375"	0.25"	4.375"	9	9	972 K	273 K	1244 K	0.01375°	0.1797°	0.00573°

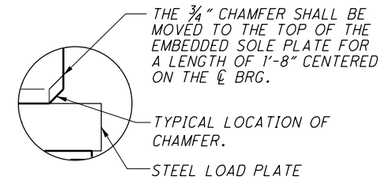
t_i = THICKNESS OF INTERNAL LAYER
t_e = THICKNESS OF EXTERNAL LAYER
T = TOTAL THICKNESS OF ELASTOMERIC BEARING
n = NUMBER OF INTERNAL ELASTOMER LAYERS
N = NO. OF STEEL LAMINATES
INTERNAL STEEL LAMINATE THICKNESS = 0.0747"
DUROMETER OF ELASTOMER = 60 DUROMETER



PLAN



SECTION A-A



DETAIL E

RELEASED FOR CONSTRUCTION

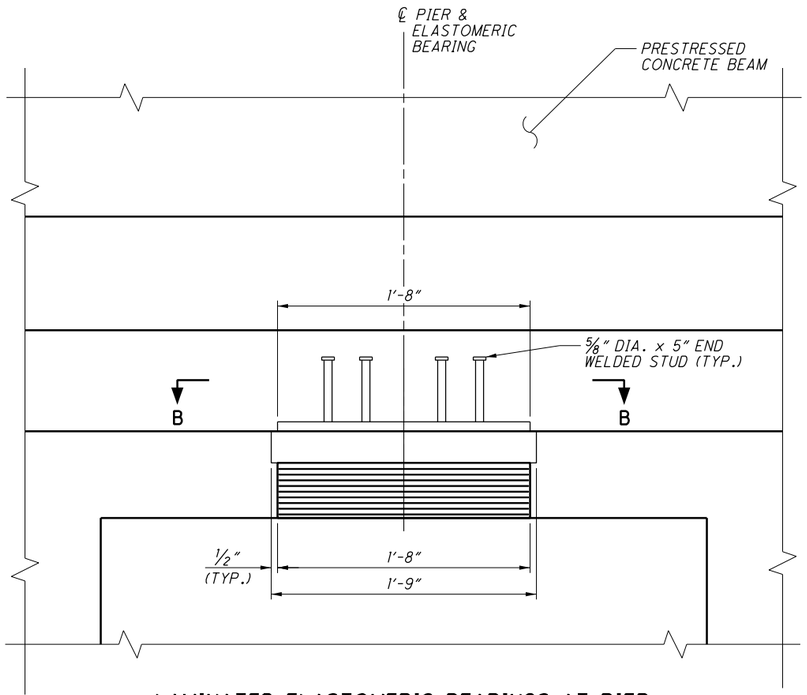
BU05a_2017-09-28.BU-5a Beams.RFC Set.pdf	
10/02/2017	Brian.Link

LEGEND:

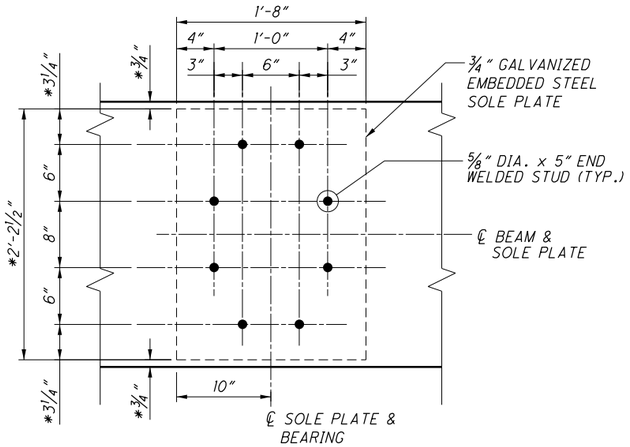
* THE SOLE PLATE WIDTH MAY BE DECREASED BY ⅜" TO ALLOW FOR FIT-UP. THE 3¼" DIMENSION SHOULD BE ADJUSTED ACCORDINGLY.

NOTES:

1. ELASTOMERIC BEARINGS: THE ELASTOMER SHALL HAVE A HARDNESS OF 60 DUROMETER. THE BEARINGS WERE DESIGNED IN ACCORDANCE WITH SECTION 14.7.5 (METHOD B) OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS. PERFORM THE LONG-TERM COMPRESSIVE PROOF LOAD TEST IN ACCORDANCE WITH THE AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, DIVISION II, SECTION 18.7.2.6 AND 18.7.4.5.
2. STEEL LOAD PLATES: DURING FIELD WELDING, CONTROL THE TEMPERATURE AT THE ELASTOMER BONDED SURFACE TO A MAXIMUM OF 300°F AS DETERMINED BY THE USE OF PYROMETRIC STICKS OR OTHER TEMPERATURE MONITORING DEVICES.
3. THE STEEL LOAD PLATES SHALL MEET THE GRADE 50 REQUIREMENTS OF STRUCTURAL STEEL ASTM A709 AND SHALL BE METALIZED PER CMS 711.02.
4. THE STEEL LOAD PLATE SHALL BE BONDED BY VULCANIZATION TO THE ELASTOMER DURING THE MOLDING PROCESS.
5. ALL BEARINGS SHALL BE MARKED PRIOR TO SHIPPING. THE MARKS SHALL INCLUDE THE BEARING LOCATION ON THE BRIDGE, AND A DIRECTION ARROW THAT POINTS UP-STATION. ALL MARKS SHALL BE PERMANENT AND BE VISIBLE AFTER THE BEARING IS INSTALLED.
6. TOTAL DESIGN LOAD FOR BEARINGS EQUALS THE SUM OF THE DEAD LOADS AND LIVE LOADS TABULATED IN THE BEARING TABLE. IMPACT IS NOT INCLUDED. LOADS ARE UNFACTORED.



LAMINATED ELASTOMERIC BEARINGS AT PIER



SECTION B-B
(TOP LOAD PLATE NOT SHOWN)

BU5A - CUY-77-1409		
NO.	DATE	DESCRIPTION
ISSUE RECORD		

E.L. ROBINSON ENGINEERING
1801 Watermark Drive, Suite 310 - Columbus, Ohio 43215
www.elrobinsonengineering.com

DESIGNED	DRAWN	REVIEWED	DATE
CJW	MGB	RER	9/28/2017
CHECKED	REVISED	STRUCTURE FILE NUMBER	
DFT		1806663	

BEARING DETAILS - PIER
BRIDGE NO. CUY-77-1409
BROADWAY AVENUE OVER IR 77

CUY-77-13.80
PID No. 82388

5 / 26

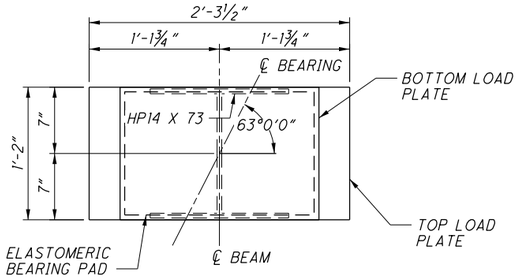
0
0

P:\82388_CCG6B\Design\Structures\CUY-77-1409\sheets\077_1409C_SB002.dgn Sheet 9/28/2017 1:06:10 PM gwhittaker

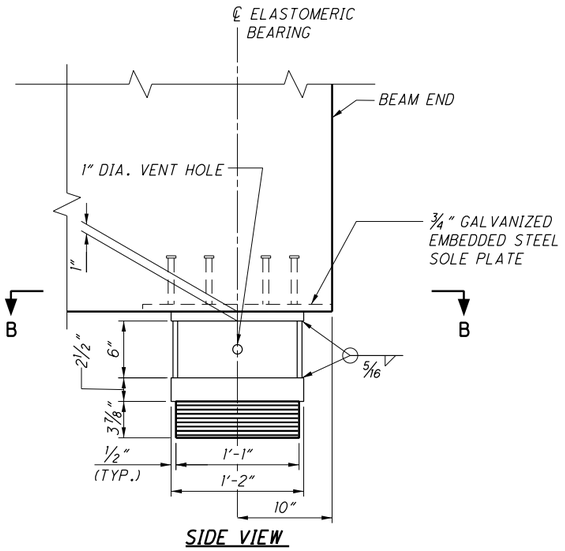
2017-09-28.BU-5a Beams.RFC

LAMINATED ELASTOMERIC BEARINGS AT FORWARD ABUTMENT										
BEARING DIMENSIONS					REACTIONS		MAXIMUM DESIGN LOAD	UNFACTORED ROTATIONS		
t_i	t_e	T	n	N	DL	LL W/O IMPACT		$Max.\theta_{FWS}$	$Max.\theta_{DC1+DC2}$	θ_{LL}
0.375"	0.25"	3.875"	8	8	363 K	138 K	508 K	0.00997°	0.12834°	0.0628°

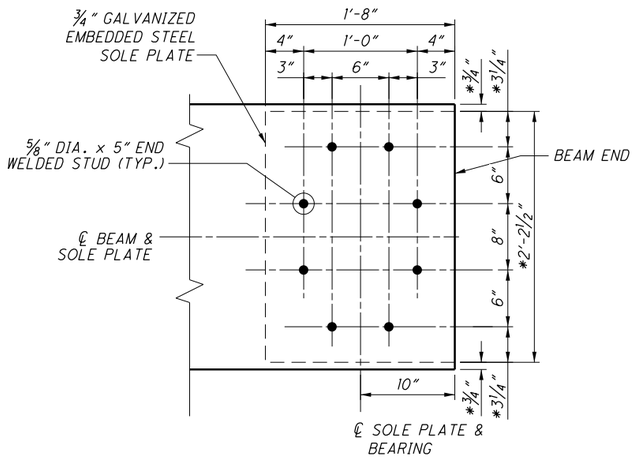
t_i = THICKNESS OF INTERNAL LAYER
t_e = THICKNESS OF EXTERNAL LAYER
T = TOTAL THICKNESS OF ELASTOMERIC BEARING
n = NUMBER OF INTERNAL ELASTOMER LAYERS
N = NO. OF STEEL LAMINATES
INTERNAL STEEL LAMINATE THICKNESS = 0.0747"
DUROMETER OF ELASTOMER = 60 DUROMETER



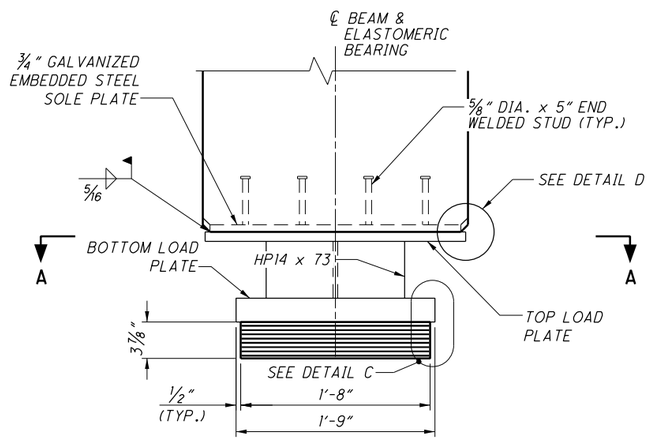
SECTION A-A



SIDE VIEW

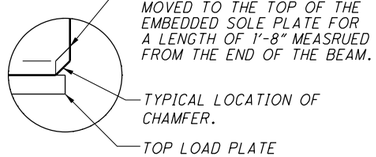


SECTION B-B
(TOP LOAD PLATE NOT SHOWN)

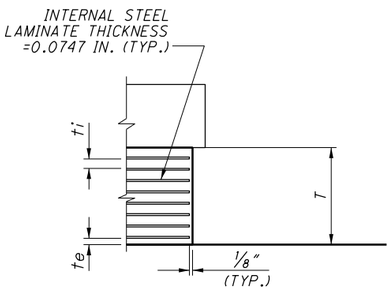


END VIEW

ELASTOMERIC EXPANSION BEARING



DETAIL D



DETAIL C

RELEASED FOR CONSTRUCTION

BU05a_2017-09-28.BU-5a Beams.RFC Set.pdf	
10/02/2017	Brian.Link

LEGEND:

* THE SOLE PLATE WIDTH MAY BE DECREASED BY ⅜" TO ALLOW FOR FIT-UP. THE 3¼" DIMENSION SHOULD BE ADJUSTED ACCORDINGLY.

NOTES:

1. ELASTOMERIC BEARINGS: THE ELASTOMER SHALL HAVE A HARDNESS OF 60 DUROMETER. THE BEARINGS WERE DESIGNED IN ACCORDANCE WITH SECTION 14.7.5 (METHOD B) OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS. PERFORM THE LONG-TERM COMPRESSIVE PROOF LOAD TEST IN ACCORDANCE WITH THE AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, DIVISION II, SECTION 18.7.2.6 AND 18.7.4.5.

2. BEARING ASSEMBLIES SHALL HAVE ADEQUATE BLOCKING PLACED TO STABILIZE THE BEAM DURING ERECTION AND PLACEMENT OF THE CONCRETE DECK. THIS BLOCKING SHALL BE REMOVED ONCE THE CONCRETE DECK HAS HARDENED TO LIMITS ESTABLISHED IN CMS 511.14.

3. STEEL LOAD PLATES: DURING FIELD WELDING, CONTROL THE TEMPERATURE AT THE ELASTOMER BONDED SURFACE TO A MAXIMUM OF 300°F AS DETERMINED BY THE USE OF PYROMETRIC STICKS OR OTHER TEMPERATURE MONITORING DEVICES.

4. THE STEEL LOAD PLATES AND HP14 x 73 SHALL CONFORM TO THE REQUIREMENTS ASTM A709 GRADE 50 STEEL AND SHALL BE GALVANIZED PER CMS 711.02. THE STEEL LOAD PLATES SHALL BE BONDED BY VULCANIZATION TO THE ELASTOMER DURING THE MOLDING PROCESS.

BU5A - CUY-77-1409		
NO.	DATE	DESCRIPTION
ISSUE RECORD		

E.L. ROBINSON ENGINEERING
1601 Watermark Drive, Suite 310 • Columbus, Ohio 43215
www.elrobinsonengineering.com

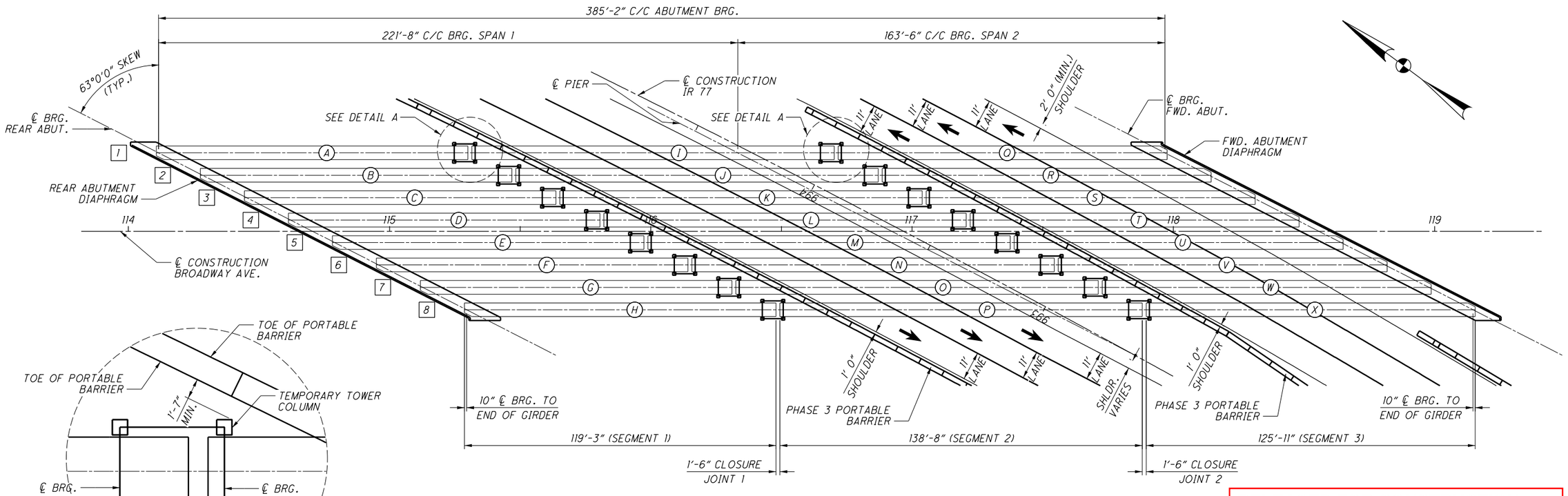
DESIGNED CJW | DRAWN MGB | REVIEWED RER | DATE 9/28/2017
CHECKED DFT | REVISED | STRUCTURE FILE NUMBER 1806663

BEARING DETAILS - FORWARD ABUTMENT
BRIDGE NO. CUY-77-1409
BROADWAY AVENUE OVER IR 77

CUY-77-13.80
PID No. 82388

6 / 26

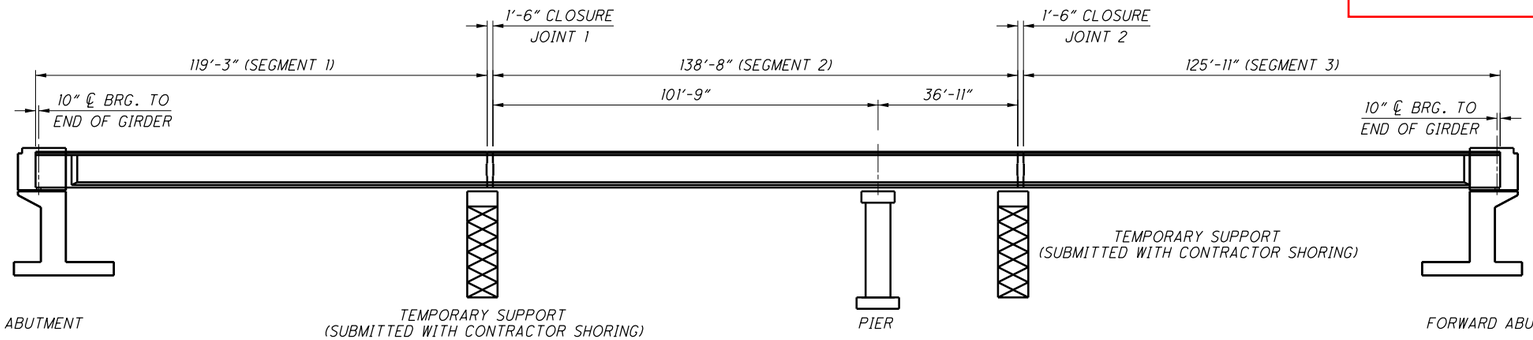
0
0



DETAIL A

(TYPICAL AT JOINT 1 AND JOINT 2)

FRAMING PLAN - PHASE 3 CONSTRUCTION



ELEVATION

RELEASED FOR CONSTRUCTION

BU05a_2017-09-28.BU-5a Beams.RFC Set.pdf

10/02/2017 | Brian.Link

ERECTION SEQUENCE:

1. AFTER PHASE 3 PORTABLE BARRIER IS INSTALLED, ERECT TEMPORARY TOWER AT CLOSURE JOINT 1 AND 2.

   * - MAINTAIN A HORIZONTAL OFFSET OF AT LEAST 19" FROM THE BACK OF THE TEMPORARY BARRIERS TO THE TEMPORARY TOWER AND MINIMUM 3" OFFSET TO THE TOWER FOUNDATION.

   * - THE TEMPORARY TOWER SHALL BE DESIGNED PER THE AASHTO GUIDE DESIGN SPECIFICATIONS FOR BRIDGE TEMPORARY WORKS - 2ND EDITION 2017, INCLUDING THE INCREASED LOAD REQUIREMENTS FOR SHORING LOCATED NEAR TRAFFIC OPENINGS. THEY SHALL BE DESIGNED TO PROVIDE NO UPLIFT RESTRAINT. CONTRACTOR SHALL SUPPLY SHIMS OR OTHER ADJUSTMENT TO ENSURE CONTACT AND ALIGNMENT IS MAINTAINED PRIOR TO POST-TENSIONING.

   * - ALL PORTABLE BARRIER ALONG THE TEMPORARY TOWERS SHALL BE ANCHORED WITH A MINIMUM OF 4 BOLTS.

2. ERECT SEGMENTS 1, 2 AND 3 AND CROSSFRAMES. CONTRACTOR SHALL TEMPORARILY BRACE BEAMS AT ABUTMENTS.
3. CAST CLOSURE JOINTS 1 AND 2.
4. ONCE CLOSURE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF 7.0 KSI, STRESS AND GROUT POST-TENSION TENDONS. THE TENDONS SHALL BE STRESSED IN THE FOLLOWING ORDER: TENDON 3 FOR ALL GIRDER LINES, TENDON 2 FOR ALL GIRDER LINES, TENDON 4 FOR ALL GIRDER LINES, AND TENDON 1 FOR ALL GIRDER LINES.
5. REMOVE TEMPORARY TOWERS.
6. CAST DECK TO WITHIN 1 FOOT OF SEMI-INTEGRAL DIAPHRAGMS AT EACH ABUTMENT. BEGIN DECK POUR AT FORWARD ABUTMENT END OF THE DECK AND MOVE DOWNSTATION.
7. CAST SEMI-INTEGRAL DIAPHRAGMS IN A MAXIMUM OF 4'-6" LIFTS.

LEGEND:

(X) - BEAM SEGMENT DESIGNATION

[#] - BEAM LINE DESIGNATION

NOTES:

1. ANY DEVIATION FROM THE PROVIDED ERECTION SEQUENCE SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.

BU5A - CUY-77-1409		
NO.	DATE	DESCRIPTION
ISSUE RECORD		

E.L. ROBINSON ENGINEERING
1801 Watermark Drive, Suite 310 - Columbus, Ohio 43215
www.elrobinsonengineering.com

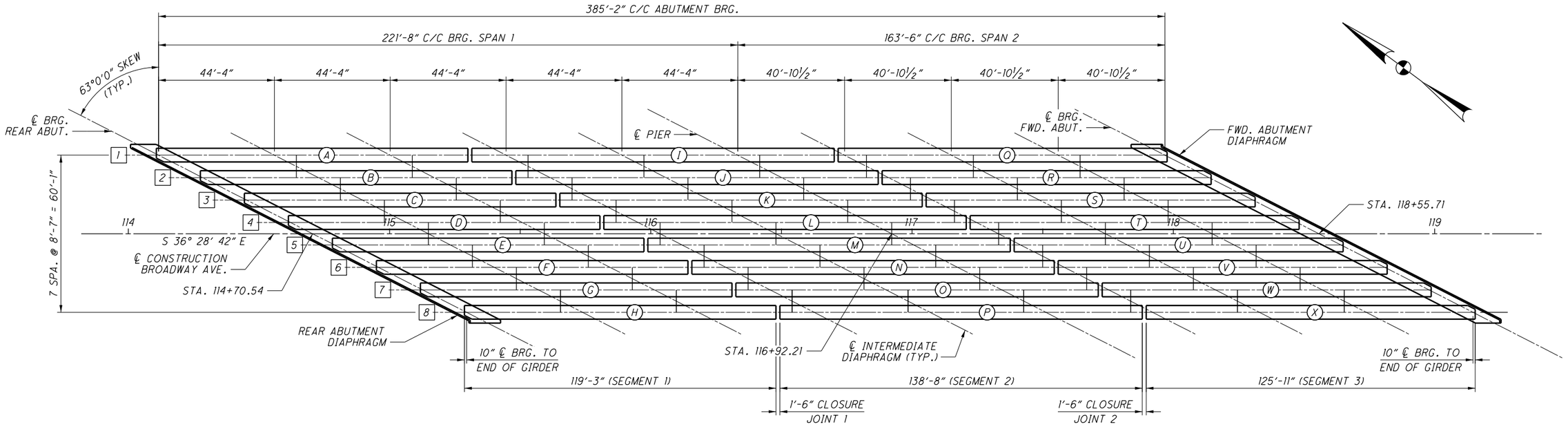
DESIGNED GMW/CJW | DRAWN FIB | REVIEWED RER | DATE 9/28/2017 | STRUCTURE FILE NUMBER 1806663 | CHECKED DFT | REVISED

BEAM ERECTION SEQUENCE
BRIDGE NO. CUY-77-1409
BROADWAY AVENUE OVER IR 77

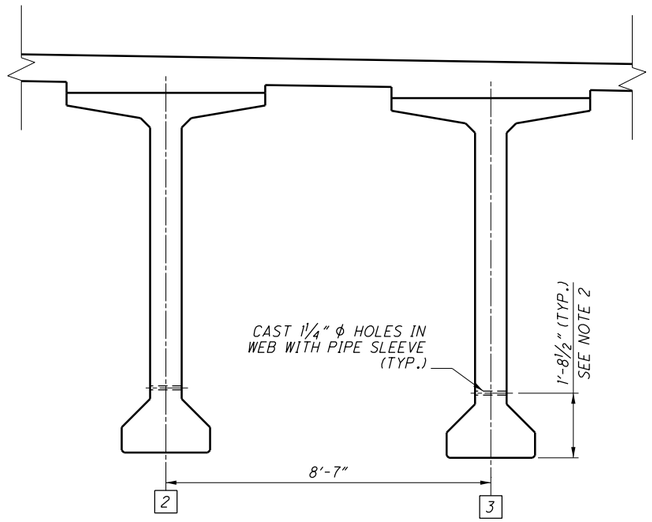
CUY-77-13.80
PID No. 82388

7 / 26

0 / 0



FRAMING PLAN



UTILITY INSERTS
(THIS BAY ONLY)

BU5A - CUY-77-1409		
NO.	DATE	DESCRIPTION
ISSUE RECORD		

RELEASED FOR CONSTRUCTION

BU05a_2017-09-28.BU-5a Beams.RFC Set.pdf	
10/02/2017	Brian.Link

LEGEND:

(X) - BEAM SEGMENT DESIGNATION

[#] - BEAM LINE DESIGNATION

NOTES:

1. NO UTILITY CROSSFRAMES SHALL BE FURNISHED FOR THIS PROJECT. THE UTILITY INSERTS SHALL BE PROVIDED TO ACCOMODATE FUTURE UTILITIES.
2. ADJUST UTILITY INSERT LOCATION VERTICALLY IN THE I-BEAM WEBS AS NECESSARY TO AVOID POST-TENSION DUCTS.
3. UTILITY INSERT SIZES AND SPACINGS ARE DESIGNED FOR A UNIFORM LOAD OF 90 LB/FT. INSERT SPACING ALONG THE BEAM SHALL NOT EXCEED 12'-0". NO INSERTS SHALL BE LOCATED WITHIN 2'-8" OF THE SEGMENT ENDS OR 2'-0" OF ANY OTHER HOLES THROUGH THE BEAM WEB.

E.L. ROBINSON ENGINEERING
1801 Watermark Drive, Suite 310 - Columbus, OHio 43215
www.elrobinsonengineering.com

DESIGNED GMW/CJW | DRAWN FIB | CHECKED DFT | REVIEWED RER | DATE 9/28/2017 | REVISED | STRUCTURE FILE NUMBER 1806663

FRAMING PLAN
BRIDGE NO. CUY-77-1409
BROADWAY AVENUE OVER IR 77

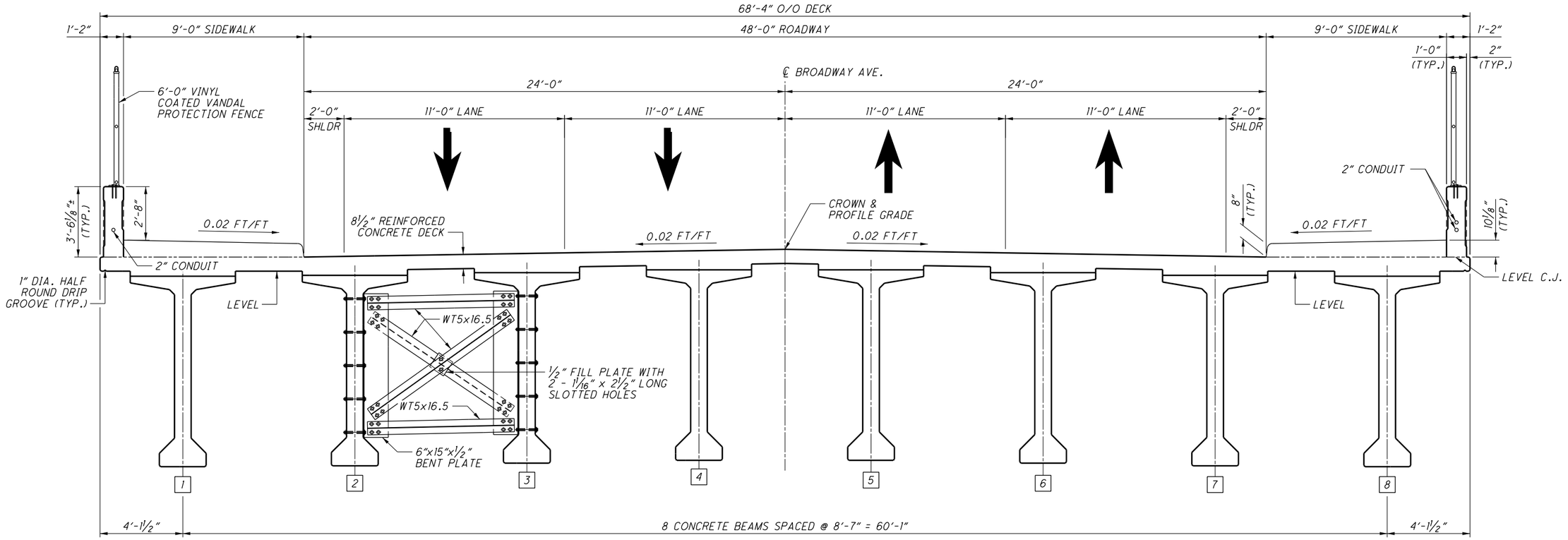
CUY-77-13.80
PID No. 82388

8 / 26

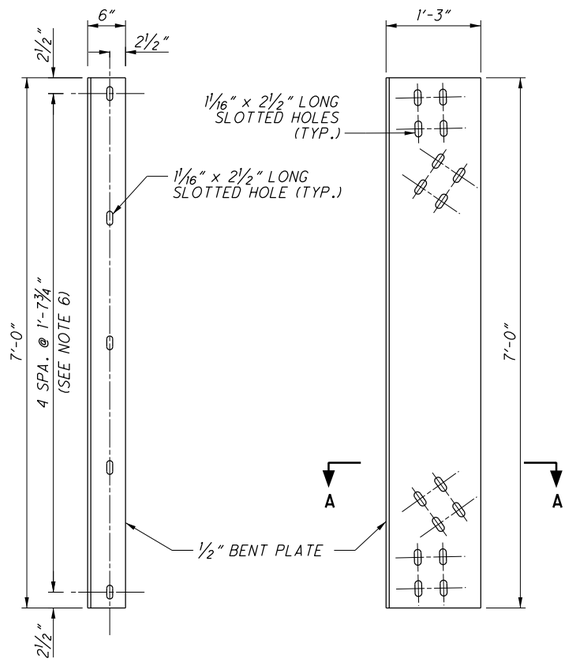
0
0

P:\82388_CCG6B\Design\Structures\CUY-77-1409\sheets\077_1409C_SS001.dgn Sheet 9/28/2017 1:06:15 PM gwhittaker

2017-09-28.BU-5a Beams.RFC

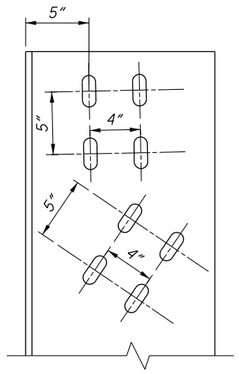


TRANSVERSE SECTION

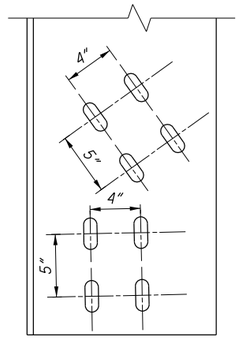


STEEL DIAPHRAGM SUPPORT

SECTION A-A



DIAPHRAGM CONNECTION - TOP



DIAPHRAGM CONNECTION - BOTTOM

RELEASED FOR CONSTRUCTION

BU05a_2017-09-28.BU-5a Beams.RFC Set.pdf	
10/02/2017	Brian.Link

LEGEND:

[#] - BEAM LINE DESIGNATION

NOTES:

1. THE TYPICAL CROSSFRAME ASSEMBLY (FOR THE 6 BAYS NOT SHOWN) SHALL MATCH DETAILS BETWEEN GIRDER 2 AND GIRDER 3.
2. ALL STRUCTURAL STEEL, INCLUDING BOLTS, NUTS AND WASHERS, SHALL MEET THE FABRICATION AND ERECTION REQUIREMENTS SPECIFIED IN 513.
3. ALL STRUCTURAL STEEL SHALL BE ASTM A709, GRADE 50, GALVANIZED ACCORDING TO 711.02.
4. ALL BOLTS ARE 1" DIAMETER, ASTM A325, TYPE 1. ALL BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED ACCORDING TO 711.02.
5. THE FABRICATOR SHALL ADJUST THE LOCATION OF THE BOLT HOLES IN THE I-BEAM WEBS AS NECESSARY TO AVOID THE POST TENSION DUCTS AND PRESTRESSING STRANDS. THE MINIMUM CLEAR DISTANCE SHALL BE 1 1/2".
6. THE HOLE SPACING IN THE BEAM FACE OF THE STEEL DIAPHRAGM SUPPORT SHALL MATCH UP WITH THE BOLT HOLES IN THE I-BEAM WEB.

BU5A - CUY-77-1409		
NO.	DATE	DESCRIPTION
ISSUE RECORD		

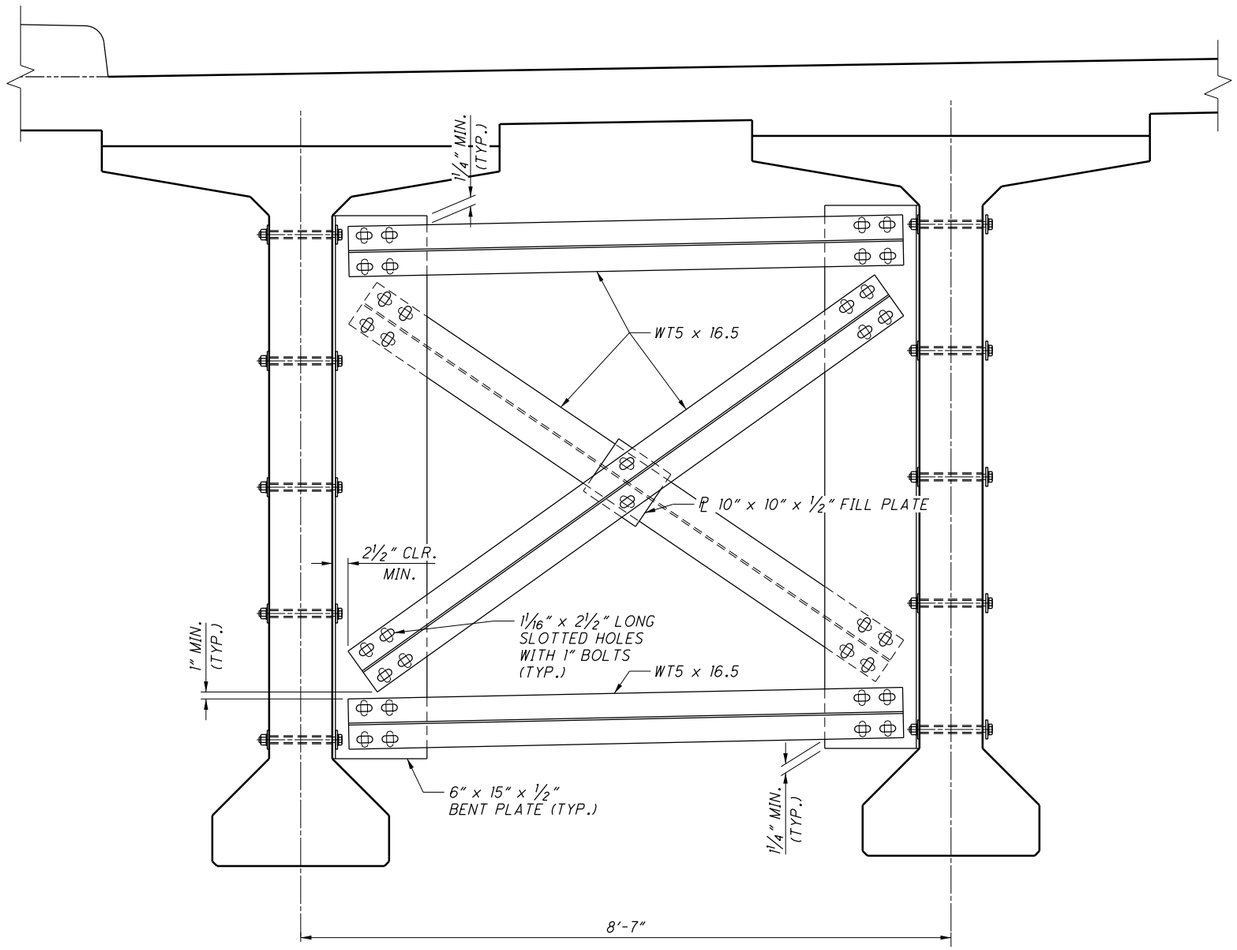
E.L. ROBINSON ENGINEERING
1801 Watermark Drive, Suite 310 - Columbus, Ohio 43215
www.elrobinsonengineering.com

DESIGNED	DRAWN	REVIEWED	DATE
GMW/CJW	FIB	RER	9/28/2017
CHECKED	REVISED	STRUCTURE FILE NUMBER	
DFT		1806663	

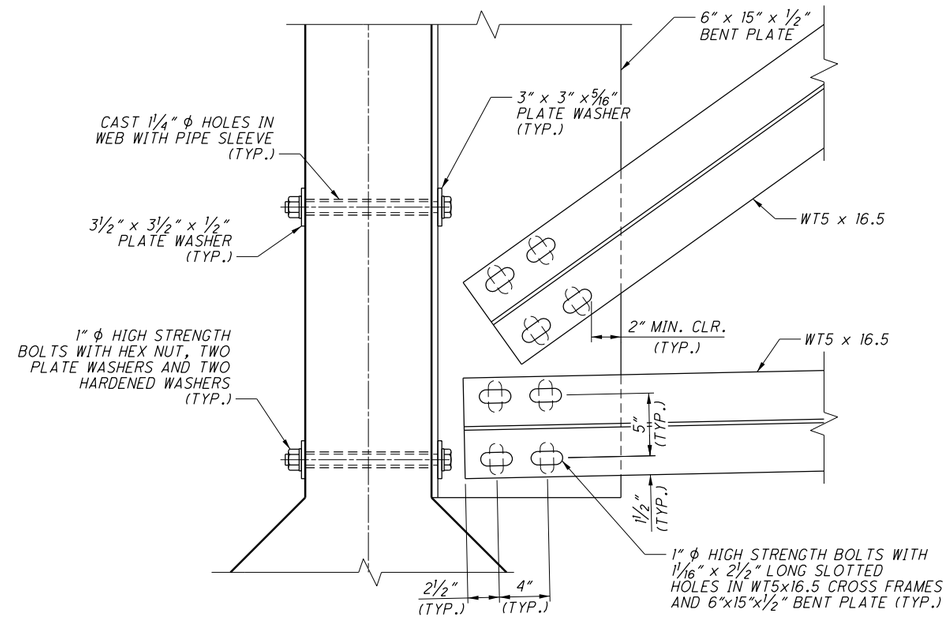
TRANSVERSE SECTION
BRIDGE NO. CUY-77-1409
BROADWAY AVENUE OVER IR 77

CUY-77-13.80
PID No. 82388

0 0



TYPICAL CROSS FRAME



CONNECTION DETAIL

(4 LOCATIONS)

RELEASED FOR CONSTRUCTION

BU05a_2017-09-28.BU-5a Beams.RFC Set.pdf

10/02/2017 | Brian.Link

BU5A - CUY-77-1409		
NO.	DATE	DESCRIPTION
ISSUE RECORD		

E.L. ROBINSON ENGINEERING
1801 Watermark Drive, Suite 310 • Columbus, Ohio 43215
www.elrobinsonengineering.com

DESIGNED	DRAWN	REVIEWED	DATE
GMW/CJW	DTA	RER	9/28/2017
CHECKED	REVISED	STRUCTURE FILE NUMBER	
DFT		1806663	

CROSS FRAME DETAILS

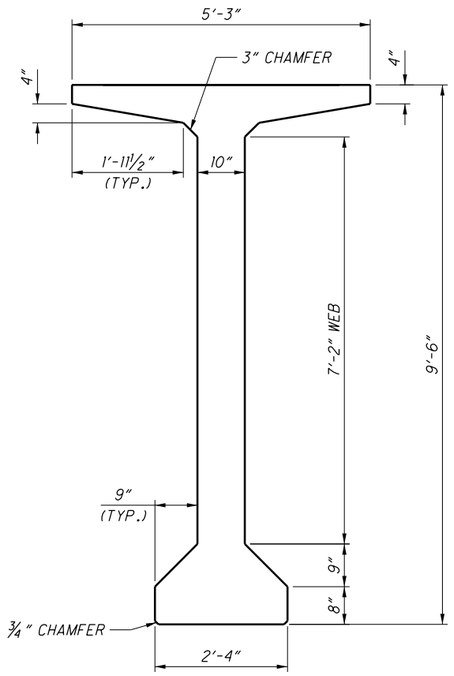
BRIDGE NO. CUY-77-1409
BROADWAY AVENUE OVER IR 77

CUY-77-13.80

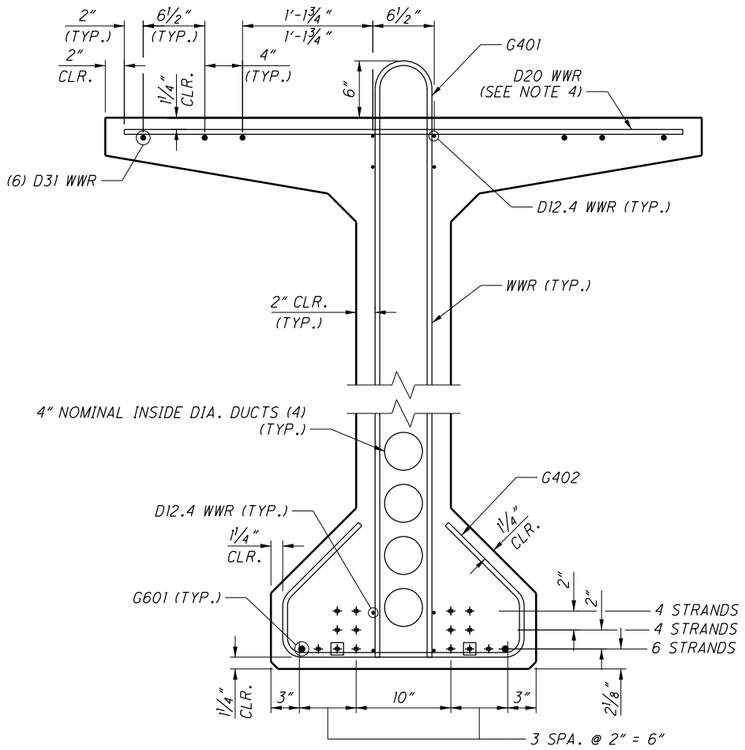
PID No. 82388

10 / 26

0
0

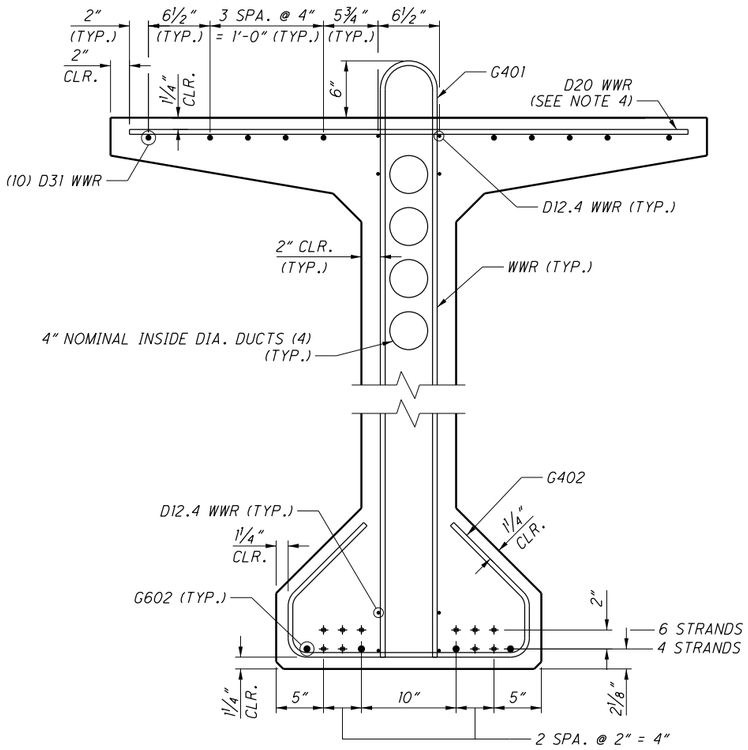


TYPICAL BEAM SECTION

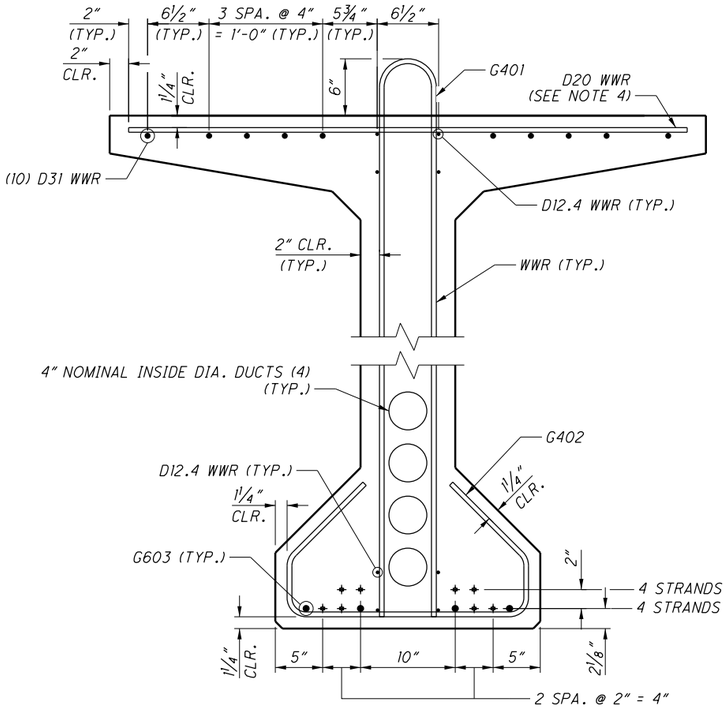


SEGMENT 1 SECTION

□ - DEBOND 6'-0"

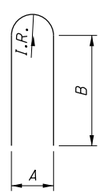


SEGMENT 2 SECTION

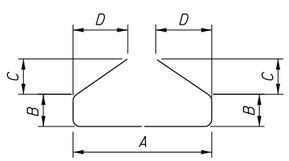


SEGMENT 3 SECTION

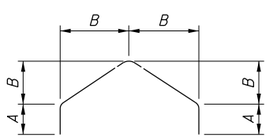
BAR BENDING DIMENSIONS						
		DIMENSIONS				
MARK	TYPE	A	B	C	D	I.R.
G401	1	6"	1'-8"	-	-	2½"
G402	2	2'-1½"	6¼"	8"	8"	-
G403	3	6¼"	1'-0¾"	-	-	-



TYPE-1



TYPE-2



TYPE-3

LAP LENGTH	
SIZE	LENGTH
D12.4	1'-9"
D31	2'-6"
#6	3'-0"

LEGEND:

WWR - WELDED WIRE REINFORCEMENT

NOTES:

1. ONE LONGITUDINAL BAR FROM THE BOTTOM MAT OF DECK REINFORCING SHALL BE PLACED UNDER EACH G401 BAR. THIS BAR IS INCLUDED IN PAYMENT WITH THE DECK REINFORCING STEEL AND SHALL BE EPOXY COATED.
2. THE G401 BARS SHALL BE EPOXY COATED.
3. ALL LONGITUDINAL REINFORCING STEEL SHALL BE CONTINUOUS. ANY LAPS SHALL BE AS SHOWN IN THE LAP LENGTH TABLE.
4. FOR LOCATION AND SPACING OF D20 WWR, SEE SHEET 12/26.

PRESTRESSING STEEL DATA:

AREA = 0.217 SQ. IN.
ULTIMATE STRENGTH = 270 KSI
INITIAL STRESS = 202.5 KSI (LOW RELAXATION STRANDS)

CONCRETE DATA FOR SEGMENT 1, 2 & 3:

COMPRESSIVE STRENGTH (RELEASE) - 7.0 KSI
COMPRESSIVE STRENGTH (POST-TENSION) - 10.0 KSI
UNIT WEIGHT (NO REINFORCING) - 125 PCF
UNIT WEIGHT (INCLUDING REINFORCING) - 130 PCF

POST-TENSIONING NOTES:

1. POST-TENSIONING TENDONS ARE 19-0.6"ϕ LOW RELAXATION STRANDS (EACH DUCT) CONFORMING TO THE REQUIREMENTS OF AASHTO M203, GRADE 270.
2. FOR DESIGN, THE WOBBLE COEFFICIENT IS ASSUMED TO BE 0.0008 /FT AND THE FRICTION COEFFICIENT 0.15. ASSUMED ANCHOR SET IS ⅜".
3. POST-TENSIONING TENDONS ARE TO BE STRESSED FROM THE REAR ABUTMENT END. JACKING FORCE OF 19-0.6"ϕ STRAND TENDON TO BE 870 KIPS.
4. THE ALLOWABLE CONSTRUCTION TOLERANCE FOR ALIGNMENT OF THE SEGMENT ENDS AT THE CLOSURE DIAPHRAGMS SHALL BE ¼".

RELEASED FOR CONSTRUCTION

BU05a_2017-09-28.BU-5a Beams.RFC Set.pdf

10/02/2017

Brian.Link

BU5A - CUY-77-1409		
NO.	DATE	DESCRIPTION
ISSUE RECORD		

E.L. ROBINSON ENGINEERING
1801 Watermark Drive, Suite 310 - Columbus, Ohio 43215
www.elrobinsonengineering.com

DESIGNED	DRAWN	REVIEWED	DATE
GMW/CJW	FIB	RER	9/28/2017
CHECKED	REVISED	STRUCTURE FILE NUMBER	
DFT		1806663	

POST-TENSIONED I-BEAM DETAILS
BRIDGE NO. CUY-77-1409
BROADWAY AVENUE OVER IR 77

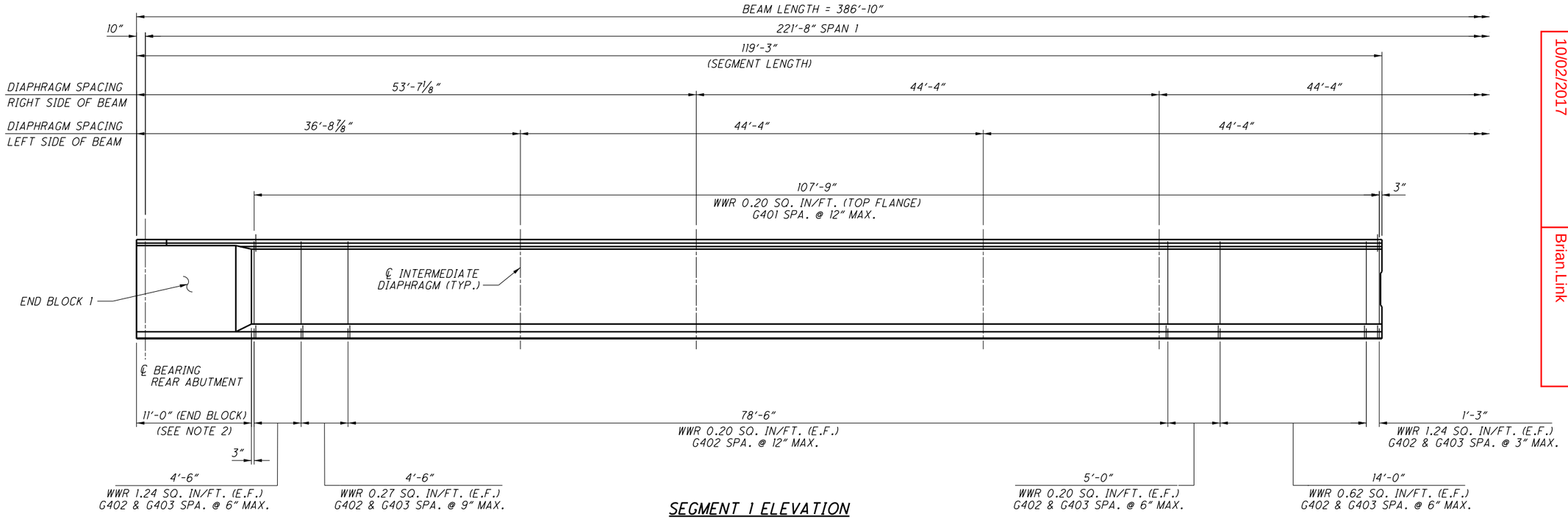
CUY-77-13.80
PID No. 82388

11 / 26

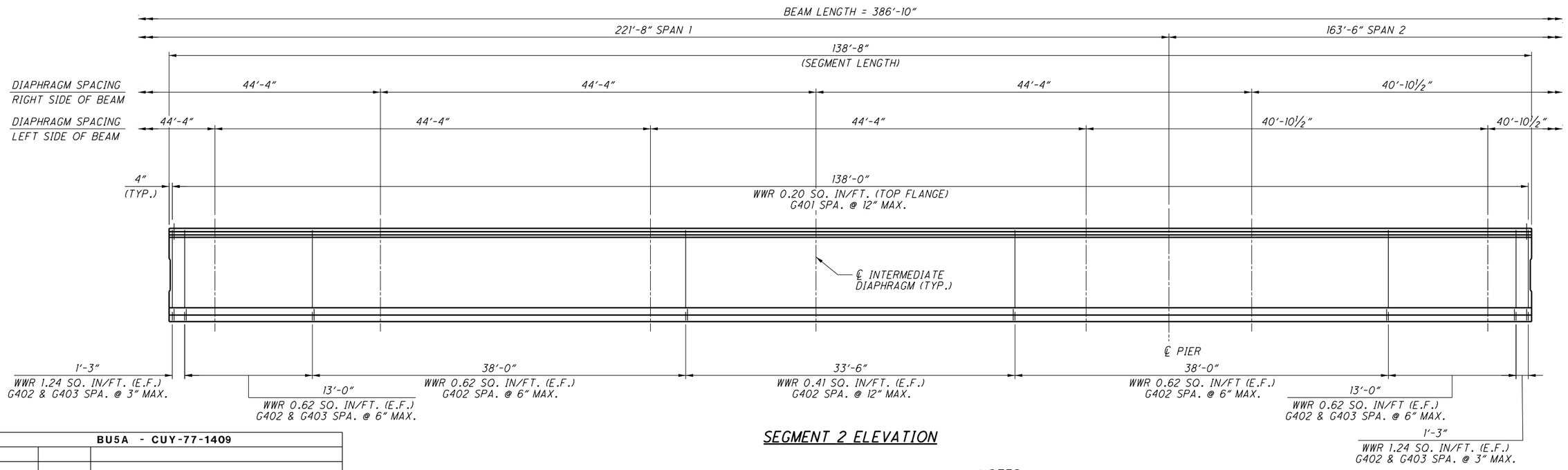
0
0

P:\82388_CCG6B\Design\Structures\CUY-77-1409\sheets\077_1409C_SS003.dgn Sheet 9/28/2017 1:06:19 PM gwhittoker

2017-09-28.BU-5a Beams.RFC



SEGMENT 1 ELEVATION



SEGMENT 2 ELEVATION

NOTES:

1. SEE CLOSURE JOINT DETAILS FOR ADDITIONAL REBAR PROTRUDING FROM BEAM INTO CLOSURE JOINT.
2. FOR END BLOCK DETAILS, SEE SHEET 17/26
3. ALL DIMENSIONS ARE HORIZONTAL AND DO NOT ACCOUNT FOR VERTICAL CURVE OR ELASTIC SHORTENING.

BU5A - CUY-77-1409		
NO.	DATE	DESCRIPTION
ISSUE RECORD		

RELEASED FOR CONSTRUCTION
BU05a_2017-09-28.BU-5a Beams.RFC Set.pdf
10/02/2017
Brian.Link

E.L. ROBINSON ENGINEERING
1001 Watermark Drive, Suite 310 • Columbus, Ohio 43215
www.elrobinsonengineering.com

DESIGNED	DRAWN	REVIEWED	DATE
GMW/CJW	DTA	RER	9/28/2017
CHECKED	REVISED	STRUCTURE FILE NUMBER	
DFT		1806663	

POST-TENSIONED I-BEAM DETAILS
BRIDGE NO. CUY-77-1409
BROADWAY AVENUE OVER IR 77

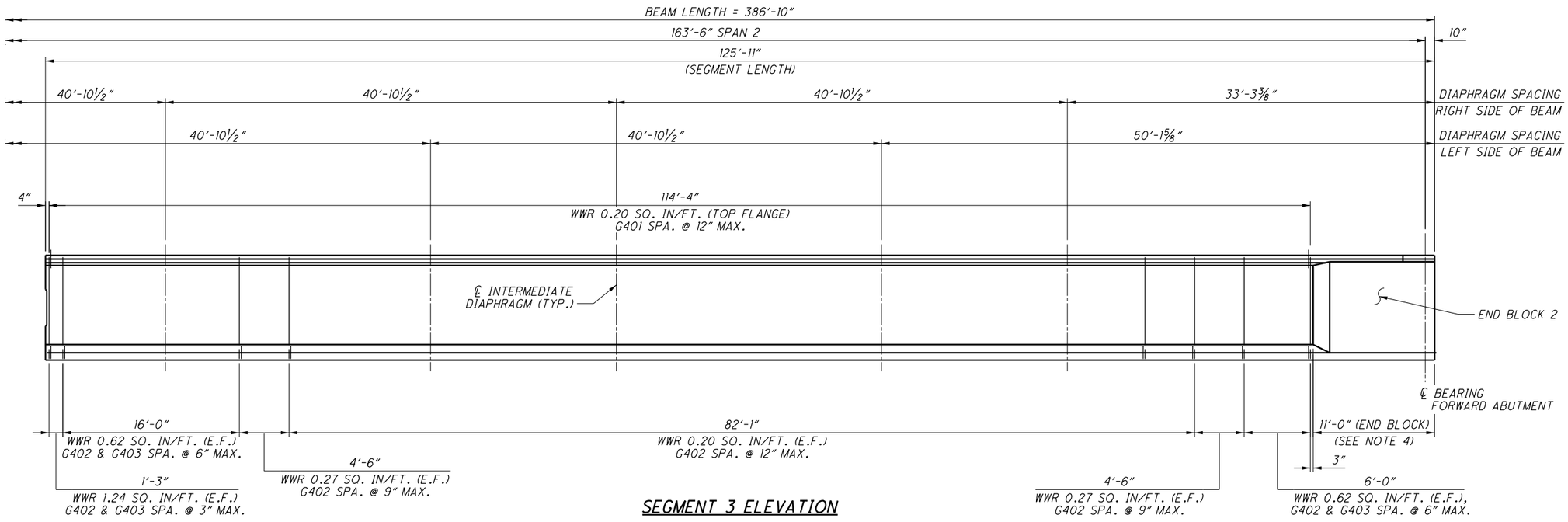
CUY-77-13.80
PID No. 82388

12 / 26

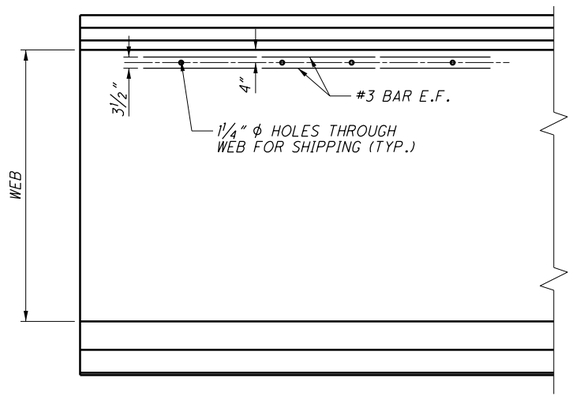
0
0

P:\82388_CCG6B\Design\Structures\CUY-77-1409\sheets\077_1409C_SS008.dgn Sheet 9/28/2017 1:06:21 PM gwhittaker

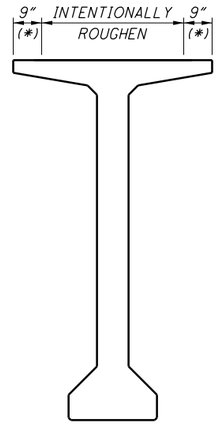
2017-09-28.BU-5a Beams.RFC



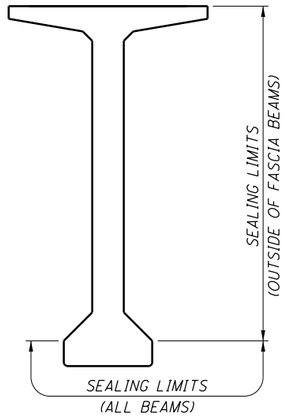
SEGMENT 3 ELEVATION



OPTIONAL SHIPPING HOLES



TOP FLANGE FINISHING



SEALING OF BEAMS

RELEASED FOR CONSTRUCTION

BU05a_2017-09-28.BU-5a Beams.RFC Set.pdf	
10/02/2017	Brian.Link

LEGEND:

(*) SEE NOTE 2

NOTES:

1. IF SHIPPING HOLES ARE UTILIZED, TWO #3 BARS SHALL BE ADDED ON EACH FACE OF THE WEB. THE #3 BARS SHALL BE TIED TO THE OUTSIDE FACE OF THE WWR AND EXTEND FOR A MINIMUM OF 1'-0" BEYOND THE SHIPPING HOLES.
2. TROWEL EXTERIOR 9" OF TOP FLANGE SMOOTH. APPLY TWO COATS OF C&MS 705.07, TYPE I OR ID MEMBRANE CURING COMPOUND WITH A ROLLER TO ACT AS A BOND BREAKER. REFER TO "CAST-IN-PLACE DECK CONCRETE" NOTE, SHEET 3/26.
3. SEE CLOSURE JOINT DETAILS FOR ADDITIONAL REBAR PROTRUDING FROM BEAM INTO CLOSURE JOINT.
4. FOR END BLOCK DETAILS, SEE SHEET 18/26
5. SEAL BEAMS WITH FEDERAL COLOR NO. 595B-25630 (LIGHT GREY, SEMI-GLOSS)
6. ALL DIMENSIONS IN THE SEGMENT 3 ELEVATION ARE HORIZONTAL AND DO NOT ACCOUNT FOR VERTICAL CURVE OR ELASTIC SHORTENING.

BU5A - CUY-77-1409		
NO.	DATE	DESCRIPTION
ISSUE RECORD		

E.L. ROBINSON ENGINEERING
1801 Watermark Drive, Suite 310 • Columbus, Ohio 43215
www.elrobinsonengineering.com

DESIGNED	DRAWN	REVIEWED	DATE
GMW/CJW	DTA	RER	9/28/2017
CHECKED	REVISED	STRUCTURE FILE NUMBER	
DFT		1806663	

POST-TENSIONED I-BEAM DETAILS
BRIDGE NO. CUY-77-1409
BROADWAY AVENUE OVER IR 77

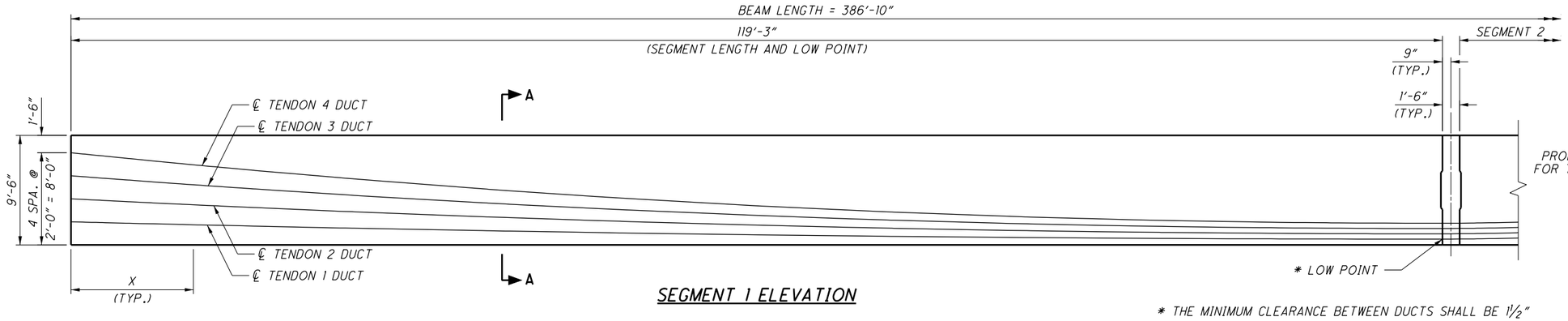
CUY-77-13.80
PID No. 82388

13 / 26

0
0

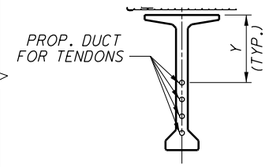
P:\82388_CCG6B\Design\Structures\CUY-77-1409\sheets\077_1409C_SS013.dgn Sheet 9/28/2017 1:06:22 PM gwhittaker

2017-09-28.BU-5a Beams.RFC



SEGMENT 1 ELEVATION

* THE MINIMUM CLEARANCE BETWEEN DUCTS SHALL BE 1½"



SECTION A-A

TENDON 1 OFFSETS

POINT NO.	DIM X	DIM Y	POINT NO.	DIM X	DIM Y
1	0.000	-7.500	36	48.700	-8.556
2	0.833	-7.523	37	59.417	-8.716
3	1.000	-7.527	38	59.625	-8.719
4	1.583	-7.543	39	67.333	-8.817
5	2.547	-7.569	40	70.550	-8.854
6	3.000	-7.581	41	71.133	-8.860
7	3.056	-7.582	42	71.350	-8.863
8	5.000	-7.633	43	71.550	-8.865
9	6.000	-7.659	44	81.475	-8.962
10	6.253	-7.666	45	82.850	-8.974
11	7.958	-7.710	46	83.075	-8.976
12	9.000	-7.736	47	83.475	-8.979
13	9.500	-7.749	48	89.500	-9.024
14	11.000	-7.786	49	92.400	-9.043
15	11.083	-7.788	50	94.567	-9.055
16	11.925	-7.809	51	94.800	-9.057
17	12.550	-7.824	52	95.400	-9.060
18	12.725	-7.828	53	99.497	-9.080
19	15.253	-7.889	54	103.247	-9.096
20	15.833	-7.903	55	103.325	-9.096
21	15.925	-7.905	56	103.997	-9.098
22	16.003	-7.907	57	106.283	-9.106
23	19.753	-7.994	58	106.525	-9.107
24	23.000	-8.066	59	107.325	-9.109
25	23.850	-8.085	60	110.250	-9.116
26	24.267	-8.094	61	111.667	-9.118
27	24.450	-8.098	62	112.997	-9.121
28	26.850	-8.149	63	113.250	-9.121
29	35.775	-8.329	64	114.250	-9.122
30	35.983	-8.333	65	116.194	-9.124
31	36.175	-8.336	66	116.250	-9.124
32	37.775	-8.366	67	116.703	-9.124
33	45.167	-8.498	68	118.000	-9.125
34	47.700	-8.540	69	118.250	-9.125
35	47.900	-8.543	70	119.250	-9.125

TENDON 2 OFFSETS

POINT NO.	DIM X	DIM Y	POINT NO.	DIM X	DIM Y
1	0.000	-5.500	36	48.700	-7.518
2	0.833	-5.543	37	59.417	-7.823
3	1.000	-5.552	38	59.625	-7.828
4	1.583	-5.582	39	67.333	-8.016
5	2.547	-5.631	40	70.550	-8.086
6	3.000	-5.654	41	71.133	-8.099
7	3.056	-5.657	42	71.350	-8.103
8	5.000	-5.755	43	71.550	-8.108
9	6.000	-5.805	44	81.475	-8.293
10	6.253	-5.817	45	82.850	-8.315
11	7.958	-5.901	46	83.075	-8.319
12	9.000	-5.951	47	83.475	-8.325
13	9.500	-5.975	48	89.500	-8.411
14	11.000	-6.046	49	92.400	-8.447
15	11.083	-6.050	50	94.567	-8.471
16	11.925	-6.090	51	94.800	-8.474
17	12.550	-6.119	52	95.400	-8.480
18	12.725	-6.127	53	99.497	-8.519
19	15.253	-6.243	54	103.247	-8.548
20	15.833	-6.270	55	103.325	-8.549
21	15.925	-6.274	56	103.997	-8.553
22	16.003	-6.277	57	106.283	-8.568
23	19.753	-6.443	58	106.525	-8.569
24	23.000	-6.582	59	107.325	-8.573
25	23.850	-6.618	60	110.250	-8.587
26	24.267	-6.635	61	111.667	-8.592
27	24.450	-6.642	62	112.997	-8.596
28	26.850	-6.741	63	113.250	-8.596
29	35.775	-7.083	64	114.250	-8.599
30	35.983	-7.091	65	116.194	-8.602
31	36.175	-7.098	66	116.250	-8.602
32	37.775	-7.155	67	116.703	-8.603
33	45.167	-7.406	68	118.000	-8.604
34	47.700	-7.487	69	118.250	-8.604
35	47.900	-7.493	70	119.250	-8.604

TENDON 3 OFFSETS

POINT NO.	DIM X	DIM Y	POINT NO.	DIM X	DIM Y
1	0.000	-3.500	36	48.700	-6.479
2	0.833	-3.564	37	59.417	-6.930
3	1.000	-3.577	38	59.625	-6.938
4	1.583	-3.621	39	67.333	-7.215
5	2.547	-3.694	40	70.550	-7.319
6	3.000	-3.728	41	71.133	-7.337
7	3.056	-3.732	42	71.350	-7.344
8	5.000	-3.876	43	71.550	-7.350
9	6.000	-3.950	44	81.475	-7.623
10	6.253	-3.968	45	82.850	-7.656
11	7.958	-4.091	46	83.075	-7.662
12	9.000	-4.166	47	83.475	-7.671
13	9.500	-4.201	48	89.500	-7.798
14	11.000	-4.307	49	92.400	-7.851
15	11.083	-4.312	50	94.567	-7.887
16	11.925	-4.371	51	94.800	-7.891
17	12.550	-4.414	52	95.400	-7.900
18	12.725	-4.426	53	99.497	-7.958
19	15.253	-4.598	54	103.247	-8.001
20	15.833	-4.636	55	103.325	-8.002
21	15.925	-4.642	56	103.997	-8.008
22	16.003	-4.648	57	106.283	-8.029
23	19.753	-4.893	58	106.525	-8.031
24	23.000	-5.098	59	107.325	-8.038
25	23.850	-5.150	60	110.250	-8.057
26	24.267	-5.176	61	111.667	-8.065
27	24.450	-5.187	62	112.997	-8.071
28	26.850	-5.332	63	113.250	-8.072
29	35.775	-5.838	64	114.250	-8.075
30	35.983	-5.849	65	116.194	-8.080
31	36.175	-5.859	66	116.250	-8.080
32	37.775	-5.944	67	116.703	-8.081
33	45.167	-6.314	68	118.000	-8.083
34	47.700	-6.433	69	118.250	-8.083
35	47.900	-6.443	70	119.250	-8.083

TENDON 4 OFFSETS

POINT NO.	DIM X	DIM Y	POINT NO.	DIM X	DIM Y
1	0.000	-1.500	36	48.700	-5.441
2	0.833	-1.584	37	59.417	-6.036
3	1.000	-1.601	38	59.625	-6.047
4	1.583	-1.660	39	67.333	-6.413
5	2.547	-1.756	40	70.550	-6.551
6	3.000	-1.801	41	71.133	-6.576
7	3.056	-1.807	42	71.350	-6.584
8	5.000	-1.998	43	71.550	-6.593
9	6.000	-2.095	44	81.475	-6.954
10	6.253	-2.119	45	82.850	-6.998
11	7.958	-2.282	46	83.075	-7.005
12	9.000	-2.381	47	83.475	-7.017
13	9.500	-2.427	48	89.500	-7.185
14	11.000	-2.567	49	92.400	-7.255
15	11.083	-2.575	50	94.567	-7.303
16	11.925	-2.652	51	94.800	-7.308
17	12.550	-2.709	52	95.400	-7.320
18	12.725	-2.725	53	99.497	-7.396
19	15.253	-2.952	54	103.247	-7.453
20	15.833	-3.003	55	103.325	-7.454
21	15.925	-3.011	56	103.997	-7.463
22	16.003	-3.018	57	106.283	-7.491
23	19.753	-3.342	58	106.525	-7.494
24	23.000	-3.613	59	107.325	-7.502
25	23.850	-3.683	60	110.250	-7.528
26	24.267	-3.716	61	111.667	-7.538
27	24.450	-3.731	62	112.997	-7.546
28	26.850	-3.923	63	113.250	-7.547
29	35.775	-4.592	64	114.250	-7.552
30	35.983	-4.607	65	116.194	-7.559
31	36.175	-4.620	66	116.250	-7.559
32	37.775	-4.733	67	116.703	-7.560
33	45.167	-5.223	68	118.000	-7.562
34	47.700	-5.380	69	118.250	-7.562
35	47.900	-5.392	70	119.250	-7.563

RELEASED FOR CONSTRUCTION

BU05a_2017-09-28.BU-5a Beams.RFC Set.pdf

10/02/2017 | Brian.Link

NOTE:

DUCTS SHALL HAVE TEMPORARY SUPPORTS AT 2'-0" CENTER/CENTER MAX.

LEGEND:

DIM X - MEASURED IN FT. FROM LEFT END OF BEAM

DIM Y - MEASURED IN FT. FROM THE TOP FLANGE TO CENTER OF DUCT

NO.	DATE	DESCRIPTION
		ISSUE RECORD

BU5A - CUY-77-1409

E.L. ROBINSON ENGINEERING
1801 Watermark Drive, Suite 310 - Columbus, Ohio 43215
www.elrobinsonengineering.com

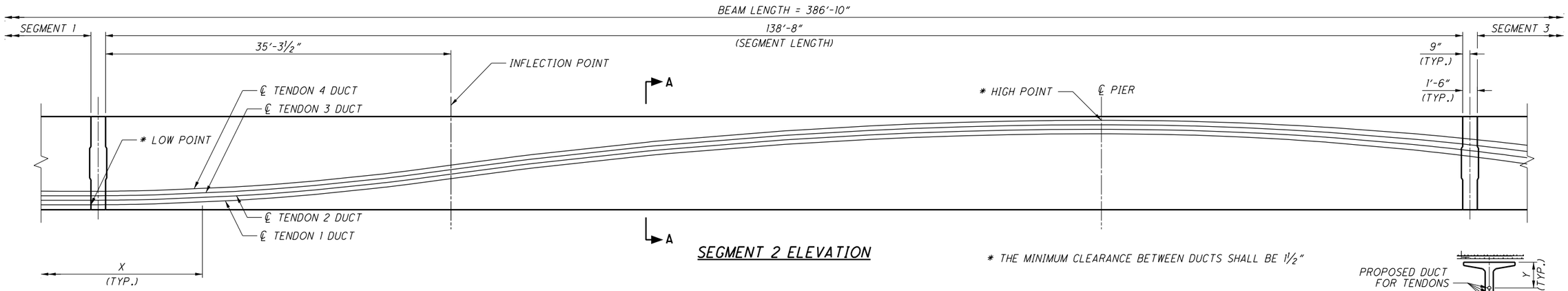
DESIGNED GMW/CJW | DRAWN DTA | REVIEWED RER | DATE 9/28/2017 | STRUCTURE FILE NUMBER 1806663 | CHECKED DFT | REVISED

POST-TENSIONED I-BEAM DETAILS

BRIDGE NO. CUY-77-1409
BROADWAY AVENUE OVER IR 77

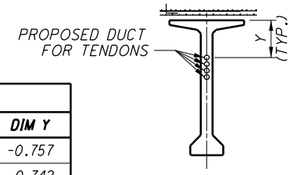
CUY-77-13.80
PID No. 82388

0 / 0



SEGMENT 2 ELEVATION

* THE MINIMUM CLEARANCE BETWEEN DUCTS SHALL BE 1½"



SECTION A-A

TENDON 1 OFFSETS

POINT NO.	DIM X	DIM Y	POINT NO.	DIM X	DIM Y
71	120.750	-9.121	108	203.323	-2.319
72	121.750	-9.113	109	203.696	-2.304
73	122.000	-9.110	110	203.746	-2.302
74	122.278	-9.107	111	203.946	-2.295
75	123.087	-9.097	112	207.073	-2.184
76	123.297	-9.093	113	208.250	-2.148
77	123.750	-9.086	114	213.000	-2.031
78	123.806	-9.085	115	215.812	-1.984
79	125.750	-9.044	116	217.312	-1.965
80	133.833	-8.715	117	217.412	-1.964
81	134.616	-8.670	118	217.812	-1.960
82	135.416	-8.622	119	221.500	-1.939
83	135.616	-8.609	120	222.500	-1.938
84	138.087	-8.441	121	223.500	-1.939
85	138.616	-8.403	122	228.678	-1.998
86	148.482	-7.479	123	230.928	-2.050
87	149.082	-7.411	124	231.078	-2.054
88	149.232	-7.393	125	231.678	-2.071
89	151.482	-7.124	126	232.000	-2.080
90	152.495	-6.996	127	236.750	-2.259
91	152.500	-6.995	128	238.850	-2.360
92	156.000	-6.525	129	241.544	-2.511
93	162.348	-5.691	130	242.073	-2.544
94	162.748	-5.641	131	244.544	-2.706
95	162.848	-5.628	132	244.744	-2.720
96	164.348	-5.445	133	245.544	-2.778
97	173.087	-4.470	134	246.250	-2.830
98	176.214	-4.160	135	254.410	-3.549
99	176.414	-4.141	136	255.199	-3.629
100	176.464	-4.136	137	256.354	-3.751
101	176.837	-4.100	138	256.410	-3.757
102	177.214	-4.065	139	256.863	-3.806
103	178.167	-3.976	140	257.073	-3.829
104	190.080	-3.028	141	257.882	-3.918
105	198.750	-2.523	142	258.160	-3.949
106	200.333	-2.447	143	258.410	-3.978
107	202.946	-2.334	144	259.410	-4.093

TENDON 2 OFFSETS

POINT NO.	DIM X	DIM Y	POINT NO.	DIM X	DIM Y
71	120.750	-8.600	108	203.323	-1.798
72	121.750	-8.592	109	203.696	-1.783
73	122.000	-8.590	110	203.746	-1.782
74	122.278	-8.587	111	203.946	-1.774
75	123.087	-8.576	112	207.073	-1.664
76	123.297	-8.573	113	208.250	-1.627
77	123.750	-8.565	114	213.000	-1.510
78	123.806	-8.564	115	215.812	-1.463
79	125.750	-8.523	116	217.312	-1.445
80	133.833	-8.195	117	217.412	-1.444
81	134.616	-8.149	118	217.812	-1.440
82	135.416	-8.101	119	221.500	-1.418
83	135.616	-8.088	120	222.500	-1.417
84	138.087	-7.921	121	223.500	-1.418
85	138.616	-7.882	122	228.678	-1.474
86	148.482	-6.958	123	230.928	-1.524
87	149.082	-6.890	124	231.078	-1.527
88	149.232	-6.873	125	231.678	-1.543
89	151.482	-6.603	126	232.000	-1.552
90	152.495	-6.475	127	236.750	-1.722
91	152.500	-6.475	128	238.850	-1.819
92	156.000	-6.004	129	241.544	-1.962
93	162.348	-5.170	130	242.073	-1.993
94	162.748	-5.120	131	244.544	-2.147
95	162.848	-5.108	132	244.744	-2.161
96	164.348	-4.924	133	245.544	-2.215
97	173.087	-3.949	134	246.250	-2.265
98	176.214	-3.639	135	254.410	-2.948
99	176.414	-3.620	136	255.199	-3.025
100	176.464	-3.615	137	256.354	-3.140
101	176.837	-3.579	138	256.410	-3.146
102	177.214	-3.544	139	256.863	-3.192
103	178.167	-3.455	140	257.073	-3.214
104	190.080	-2.507	141	257.882	-3.299
105	198.750	-2.002	142	258.160	-3.329
106	200.333	-1.926	143	258.410	-3.356
107	202.946	-1.813	144	259.410	-3.465

TENDON 3 OFFSETS

POINT NO.	DIM X	DIM Y	POINT NO.	DIM X	DIM Y
71	120.750	-8.079	108	203.323	-1.277
72	121.750	-8.071	109	203.696	-1.263
73	122.000	-8.069	110	203.746	-1.261
74	122.278	-8.066	111	203.946	-1.253
75	123.087	-8.055	112	207.073	-1.143
76	123.297	-8.052	113	208.250	-1.107
77	123.750	-8.044	114	213.000	-0.989
78	123.806	-8.043	115	215.812	-0.942
79	125.750	-8.002	116	217.312	-0.924
80	133.833	-7.674	117	217.412	-0.923
81	134.616	-7.629	118	217.812	-0.919
82	135.416	-7.580	119	221.500	-0.897
83	135.616	-7.567	120	222.500	-0.896
84	138.087	-7.400	121	223.500	-0.897
85	138.616	-7.361	122	228.678	-0.950
86	148.482	-6.437	123	230.928	-0.997
87	149.082	-6.369	124	231.078	-1.001
88	149.232	-6.352	125	231.678	-1.016
89	151.482	-6.082	126	232.000	-1.025
90	152.495	-5.954	127	236.750	-1.185
91	152.500	-5.954	128	238.850	-1.277
92	156.000	-5.483	129	241.544	-1.413
93	162.348	-4.649	130	242.073	-1.442
94	162.748	-4.599	131	244.544	-1.589
95	162.848	-4.587	132	244.744	-1.601
96	164.348	-4.404	133	245.544	-1.653
97	173.087	-3.428	134	246.250	-1.700
98	176.214	-3.118	135	254.410	-2.347
99	176.414	-3.099	136	255.199	-2.420
100	176.464	-3.094	137	256.354	-2.530
101	176.837	-3.059	138	256.410	-2.535
102	177.214	-3.023	139	256.863	-2.579
103	178.167	-2.935	140	257.073	-2.600
104	190.080	-1.986	141	257.882	-2.680
105	198.750	-1.481	142	258.160	-2.709
106	200.333	-1.406	143	258.410	-2.734
107	202.946	-1.292	144	259.410	-2.838

TENDON 4 OFFSETS

POINT NO.	DIM X	DIM Y	POINT NO.	DIM X	DIM Y
71	120.750	-7.558	108	203.323	-0.757
72	121.750	-7.551	109	203.696	-0.742
73	122.000	-7.548	110	203.746	-0.740
74	122.278	-7.545	111	203.946	-0.732
75	123.087	-7.534	112	207.073	-0.622
76	123.297	-7.531	113	208.250	-0.586
77	123.750	-7.524	114	213.000	-0.469
78	123.806	-7.523	115	215.812	-0.421
79	125.750	-7.481	116	217.312	-0.403
80	133.833	-7.153	117	217.412	-0.402
81	134.616	-7.108	118	217.812	-0.398
82	135.416	-7.059	119	221.500	-0.376
83	135.616	-7.047	120	222.500	-0.375
84	138.087	-6.879	121	223.500	-0.376
85	138.616	-6.840	122	228.678	-0.426
86	148.482	-5.916	123	230.928	-0.471
87	149.082	-5.848	124	231.078	-0.474
88	149.232	-5.831	125	231.678	-0.489
89	151.482	-5.561	126	232.000	-0.497
90	152.495	-5.433	127	236.750	-0.649
91	152.500	-5.433	128	238.850	-0.735
92	156.000	-4.962	129	241.544	-0.864
93	162.348	-4.128	130	242.073	-0.891
94	162.748	-4.078	131	244.544	-1.030
95	162.848	-4.066	132	244.744	-1.042
96	164.348	-3.883	133	245.544	-1.090
97	173.087	-2.908	134	246.250	-1.135
98	176.214	-2.597	135	254.410	-1.747
99	176.414	-2.578	136	255.199	-1.815
100	176.464	-2.573	137	256.354	-1.919
101	176.837	-2.538	138	256.410	-1.924
102	177.214	-2.502	139	256.863	-1.966
103	178.167	-2.414	140	257.073	-1.985
104	190.080	-1.465	141	257.882	-2.062
105	198.750	-0.960	142	258.160	-2.088
106	200.333	-0.885	143	258.410	-2.112
107	202.946	-0.772	144	259.410	-2.210

NOTE:

DUCTS SHALL HAVE TEMPORARY SUPPORTS AT 2'-0" CENTER/CENTER MAX.

LEGEND:

DIM X - MEASURED IN FT. FROM LEFT END OF BEAM

DIM Y - MEASURED IN FT. FROM THE TOP FLANGE TO CENTER OF DUCT

RELEASED FOR CONSTRUCTION

BU05a_2017-09-28.BU-5a Beams.RFC Set.pdf

10/02/2017 | Brian.Link

NO.	DATE	DESCRIPTION
		ISSUE RECORD

BU5A - CUY-77-1409

E.L. ROBINSON ENGINEERING
1801 Watermark Drive, Suite 310 - Columbus, Ohio 43215
www.elrobinsongroup.com

DESIGNED GMW/CJW | DRAWN DTA | REVIEWED RER | DATE 9/28/2017 | STRUCTURE FILE NUMBER 1806663
CHECKED DFT | REVISED

POST-TENSIONED I-BEAM DETAILS

BRIDGE NO. CUY-77-1409
BROADWAY AVENUE OVER IR 77

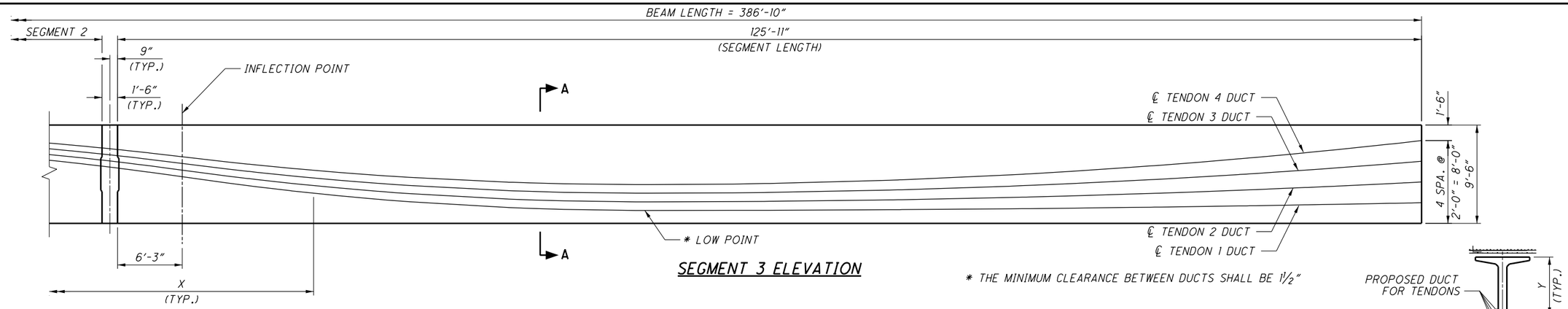
CUY-77-13.80
PID No. 82388

15 / 26

0 / 0

P:\82388_CCG6B\Design\Structures\CUY-77-1409\sheets\077_1409C_SS006.dgn Sheet 9/28/2017 1:06:24 PM gwhittaker

2017-09-28.BU-5a Beams.RFC



SEGMENT 3 ELEVATION

* THE MINIMUM CLEARANCE BETWEEN DUCTS SHALL BE 1½"

SECTION A-A

TENDON 1 OFFSETS					
POINT NO.	DIM X	DIM Y	POINT NO.	DIM X	DIM Y
145	260.910	-4.272	180	335.462	-8.176
146	261.910	-4.395	181	336.262	-8.170
147	262.160	-4.426	182	336.462	-8.169
148	263.163	-4.554	183	336.948	-8.166
149	263.457	-4.591	184	347.054	-8.085
150	263.910	-4.651	185	348.654	-8.069
151	263.966	-4.658	186	348.846	-8.067
152	265.910	-4.919	187	349.054	-8.065
153	271.549	-5.683	188	353.297	-8.021
154	273.502	-5.926	189	358.646	-7.958
155	274.302	-6.022	190	361.046	-7.927
156	274.544	-6.050	191	361.229	-7.925
157	277.502	-6.386	192	361.646	-7.919
158	278.163	-6.457	193	365.077	-7.872
159	278.913	-6.536	194	368.827	-7.817
160	282.663	-6.904	195	369.577	-7.805
161	286.094	-7.202	196	369.647	-7.804
162	286.694	-7.250	197	370.238	-7.795
163	286.927	-7.269	198	370.997	-7.783
164	287.899	-7.344	199	373.438	-7.744
165	289.094	-7.432	200	373.613	-7.741
166	298.500	-7.969	201	374.238	-7.731
167	298.505	-7.969	202	375.747	-7.705
168	298.686	-7.977	203	375.830	-7.704
169	299.086	-7.993	204	377.330	-7.678
170	299.311	-8.002	205	378.872	-7.651
171	300.686	-8.054	206	381.830	-7.597
172	304.248	-8.159	207	383.774	-7.560
173	311.278	-8.250	208	383.830	-7.559
174	311.478	-8.250	209	384.283	-7.550
175	311.695	-8.250	210	384.577	-7.544
176	312.278	-8.250	211	385.247	-7.531
177	320.598	-8.240	212	385.830	-7.520
178	323.870	-8.231	213	385.997	-7.517
179	324.078	-8.230	214	386.830	-7.500

TENDON 2 OFFSETS					
POINT NO.	DIM X	DIM Y	POINT NO.	DIM X	DIM Y
145	260.910	-3.635	180	335.462	-7.226
146	261.910	-3.752	181	336.262	-7.213
147	262.160	-3.782	182	336.462	-7.210
148	263.163	-3.903	183	336.948	-7.202
149	263.457	-3.939	184	347.054	-6.994
150	263.910	-3.995	185	348.654	-6.955
151	263.966	-4.002	186	348.846	-6.950
152	265.910	-4.250	187	349.054	-6.945
153	271.549	-4.977	188	353.297	-6.831
154	273.502	-5.208	189	358.646	-6.670
155	274.302	-5.299	190	361.046	-6.591
156	274.544	-5.326	191	361.229	-6.585
157	277.502	-5.645	192	361.646	-6.571
158	278.163	-5.712	193	365.077	-6.451
159	278.913	-5.787	194	368.827	-6.310
160	282.663	-6.137	195	369.577	-6.280
161	286.094	-6.421	196	369.647	-6.278
162	286.694	-6.467	197	370.238	-6.254
163	286.927	-6.484	198	370.997	-6.224
164	287.899	-6.555	199	373.438	-6.123
165	289.094	-6.639	200	373.613	-6.116
166	298.500	-7.150	201	374.238	-6.090
167	298.505	-7.150	202	375.747	-6.025
168	298.686	-7.157	203	375.830	-6.021
169	299.086	-7.172	204	377.330	-5.955
170	299.311	-7.181	205	378.872	-5.885
171	300.686	-7.230	206	381.830	-5.747
172	304.248	-7.330	207	383.774	-5.653
173	311.278	-7.416	208	383.830	-5.650
174	311.478	-7.417	209	384.283	-5.628
175	311.695	-7.417	210	384.577	-5.613
176	312.278	-7.417	211	385.247	-5.580
177	320.598	-7.391	212	385.830	-5.551
178	323.870	-7.367	213	385.997	-5.542
179	324.078	-7.366	214	386.830	-5.500

TENDON 3 OFFSETS					
POINT NO.	DIM X	DIM Y	POINT NO.	DIM X	DIM Y
145	260.910	-2.999	180	335.462	-6.277
146	261.910	-3.110	181	336.262	-6.256
147	262.160	-3.138	182	336.462	-6.251
148	263.163	-3.253	183	336.948	-6.238
149	263.457	-3.287	184	347.054	-5.903
150	263.910	-3.340	185	348.654	-5.840
151	263.966	-3.347	186	348.846	-5.832
152	265.910	-3.582	187	349.054	-5.824
153	271.549	-4.270	188	353.297	-5.641
154	273.502	-4.489	189	358.646	-5.382
155	274.302	-4.576	190	361.046	-5.256
156	274.544	-4.602	191	361.229	-5.246
157	277.502	-4.904	192	361.646	-5.223
158	278.163	-4.968	193	365.077	-5.029
159	278.913	-5.039	194	368.827	-4.803
160	282.663	-5.371	195	369.577	-4.755
161	286.094	-5.639	196	369.647	-4.751
162	286.694	-5.683	197	370.238	-4.713
163	286.927	-5.699	198	370.997	-4.664
164	287.899	-5.767	199	373.438	-4.503
165	289.094	-5.847	200	373.613	-4.491
166	298.500	-6.330	201	374.238	-4.448
167	298.505	-6.330	202	375.747	-4.344
168	298.686	-6.337	203	375.830	-4.338
169	299.086	-6.352	204	377.330	-4.232
170	299.311	-6.360	205	378.872	-4.120
171	300.686	-6.406	206	381.830	-3.897
172	304.248	-6.501	207	383.774	-3.746
173	311.278	-6.583	208	383.830	-3.742
174	311.478	-6.583	209	384.283	-3.706
175	311.695	-6.583	210	384.577	-3.683
176	312.278	-6.583	211	385.247	-3.629
177	320.598	-6.541	212	385.830	-3.582
178	323.870	-6.504	213	385.997	-3.568
179	324.078	-6.501	214	386.830	-3.500

TENDON 4 OFFSETS					
POINT NO.	DIM X	DIM Y	POINT NO.	DIM X	DIM Y
145	260.910	-2.363	180	335.462	-5.328
146	261.910	-2.467	181	336.262	-5.299
147	262.160	-2.494	182	336.462	-5.292
148	263.163	-2.603	183	336.948	-5.273
149	263.457	-2.635	184	347.054	-4.813
150	263.910	-2.685	185	348.654	-4.726
151	263.966	-2.691	186	348.846	-4.715
152	265.910	-2.914	187	349.054	-4.703
153	271.549	-3.564	188	353.297	-4.451
154	273.502	-3.771	189	358.646	-4.094
155	274.302	-3.853	190	361.046	-3.920
156	274.544	-3.877	191	361.229	-3.906
157	277.502	-4.163	192	361.646	-3.875
158	278.163	-4.223	193	365.077	-3.608
159	278.913	-4.290	194	368.827	-3.296
160	282.663	-4.604	195	369.577	-3.231
161	286.094	-4.858	196	369.647	-3.224
162	286.694	-4.899	197	370.238	-3.172
163	286.927	-4.915	198	370.997	-3.105
164	287.899	-4.979	199	373.438	-2.882
165	289.094	-5.054	200	373.613	-2.866
166	298.500	-5.511	201	374.238	-2.807
167	298.505	-5.511	202	375.747	-2.663
168	298.686	-5.517	203	375.830	-2.655
169	299.086	-5.531	204	377.330	-2.509
170	299.311	-5.539	205	378.872	-2.354
171	300.686	-5.583	206	381.830	-2.048
172	304.248	-5.673	207	383.774	-1.839
173	311.278	-5.750	208	383.830	-1.833
174	311.478	-5.750	209	384.283	-1.784
175	311.695	-5.750	210	384.577	-1.752
176	312.278	-5.750	211	385.247	-1.678
177	320.598	-5.692	212	385.830	-1.613
178	323.870	-5.641	213	385.997	-1.594
179	324.078	-5.637	214	386.830	-1.500

NOTE:

DUCTS SHALL HAVE TEMPORARY SUPPORTS AT 2'-0" CENTER/CENTER MAX.

LEGEND:

DIM X - MEASURED IN FT. FROM LEFT END OF BEAM

DIM Y - MEASURED IN FT. FROM THE TOP FLANGE TO CENTER OF DUCT

RELEASED FOR CONSTRUCTION

BU05a_2017-09-28.BU-5a Beams.RFC Set.pdf

10/02/2017 | Brian.Link

BU5A - CUY-77-1409		
NO.	DATE	DESCRIPTION
ISSUE RECORD		

E.L. ROBINSON ENGINEERING
1001 Watermark Drive, Suite 310 • Columbus, Ohio 43215
www.elrobinsonengineering.com

DESIGNED	DRAWN	REVIEWED	DATE
GMW/CJW	DTA	RER	9/28/2017
CHECKED	REVISED	STRUCTURE FILE NUMBER	
DFT		1806663	

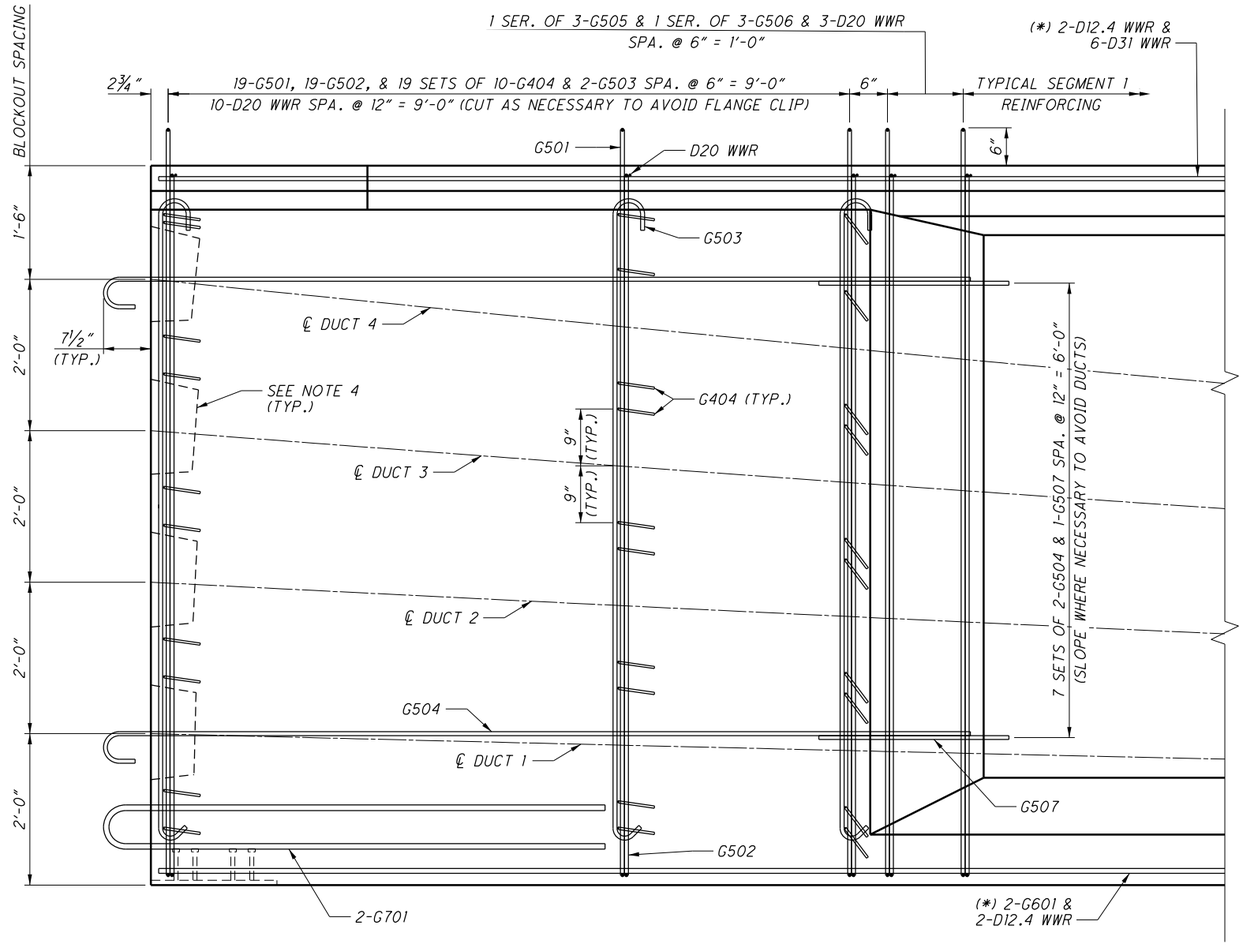
POST-TENSIONED I-BEAM DETAILS

BRIDGE NO. CUY-77-1409
BROADWAY AVENUE OVER IR 77

CUY-77-13.80
PID No. 82388

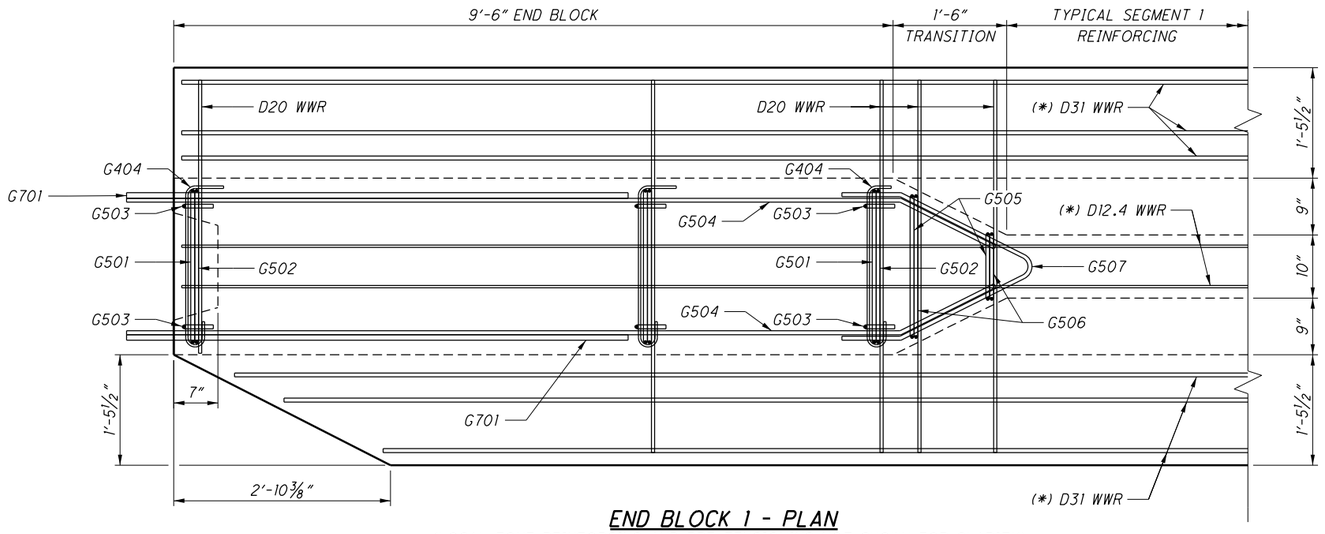
16 / 26

0
0



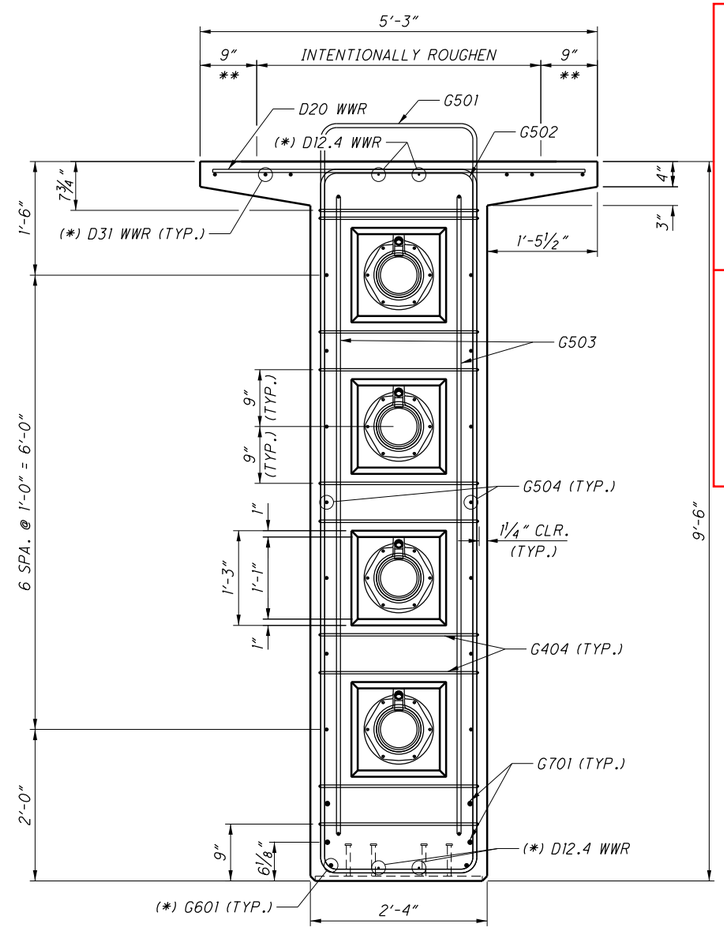
END BLOCK 1 - ELEVATION

(LOCAL ZONE REINFORCING AND PRE-TENSIONING NOT SHOWN FOR CLARITY)



END BLOCK 1 - PLAN

(LOCAL ZONE REINFORCING AND PRE-TENSIONING NOT SHOWN FOR CLARITY)



END BLOCK 1 - TYPICAL SECTION

(LOCAL ZONE REINFORCING AND PRE-TENSIONING NOT SHOWN FOR CLARITY)

LEGEND:

(*) SEE NOTE 1

(**) SEE NOTE 3

NOTES:

1. FABRICATOR SHALL EITHER CONTINUE THIS REINFORCING FROM THE TYPICAL SECTION INTO THE END BLOCK OR PROVIDE LAP SPLICE.
2. THE POST-TENSIONING ANCHORAGE SYSTEM, INCLUDING LOCAL REINFORCING, SHALL BE DSI 19-0.6" SYSTEM 100. ALL LOCAL REINFORCING, ANCHORAGE DETAILS, AND DUCT SPLICE DETAILS WILL BE INCLUDED WITH THE POST-TENSIONING SHOP DRAWING SUBMITTAL.
3. TROWEL EXTERIOR 9" OF TOP FLANGE SMOOTH. APPLY TWO COATS OF C&MS 705.07, TYPE I OR ID MEMBRANE CURING COMPOUND WITH A ROLLER TO ACT AS A BOND BREAKER. REFER TO "CAST-IN-PLACE DECK CONCRETE" NOTE, SHEET 3/26.
4. FOR BLOCK OUT DEPTHS, SEE SHEET 24/26
5. ALL REINFORCING BARS EXTENDING FROM THE PRECAST BEAM SHALL BE EPOXY COATED.

LAP LENGTHS	
NO. 3 BARS	2'-0" MIN.
NO. 4 BARS	2'-0" MIN.
NO. 5 BARS	2'-6" MIN.
NO. 6 BARS	3'-0" MIN.

BU5A - CUY-77-1409		
NO.	DATE	DESCRIPTION
ISSUE RECORD		

RELEASED FOR CONSTRUCTION

BU05a_2017-09-28.BU-5a Beams.RFC Set.pdf

10/02/2017

Brian.Link

E.L. ROBINSON ENGINEERING
1801 Watermark Drive, Suite 310 - Columbus, OHio 43215
www.elrobinsonengineering.com

DESIGNED	DRAWN	REVIEWED	DATE
GMW/CJW	GMW	RER	9/28/2017
CHECKED	REVISED	STRUCTURE FILE NUMBER	
DFT		1806663	

BEAM END BLOCK DETAILS (1 OF 3)
BRIDGE NO. CUY-77-1409
BROADWAY AVENUE OVER IR 77

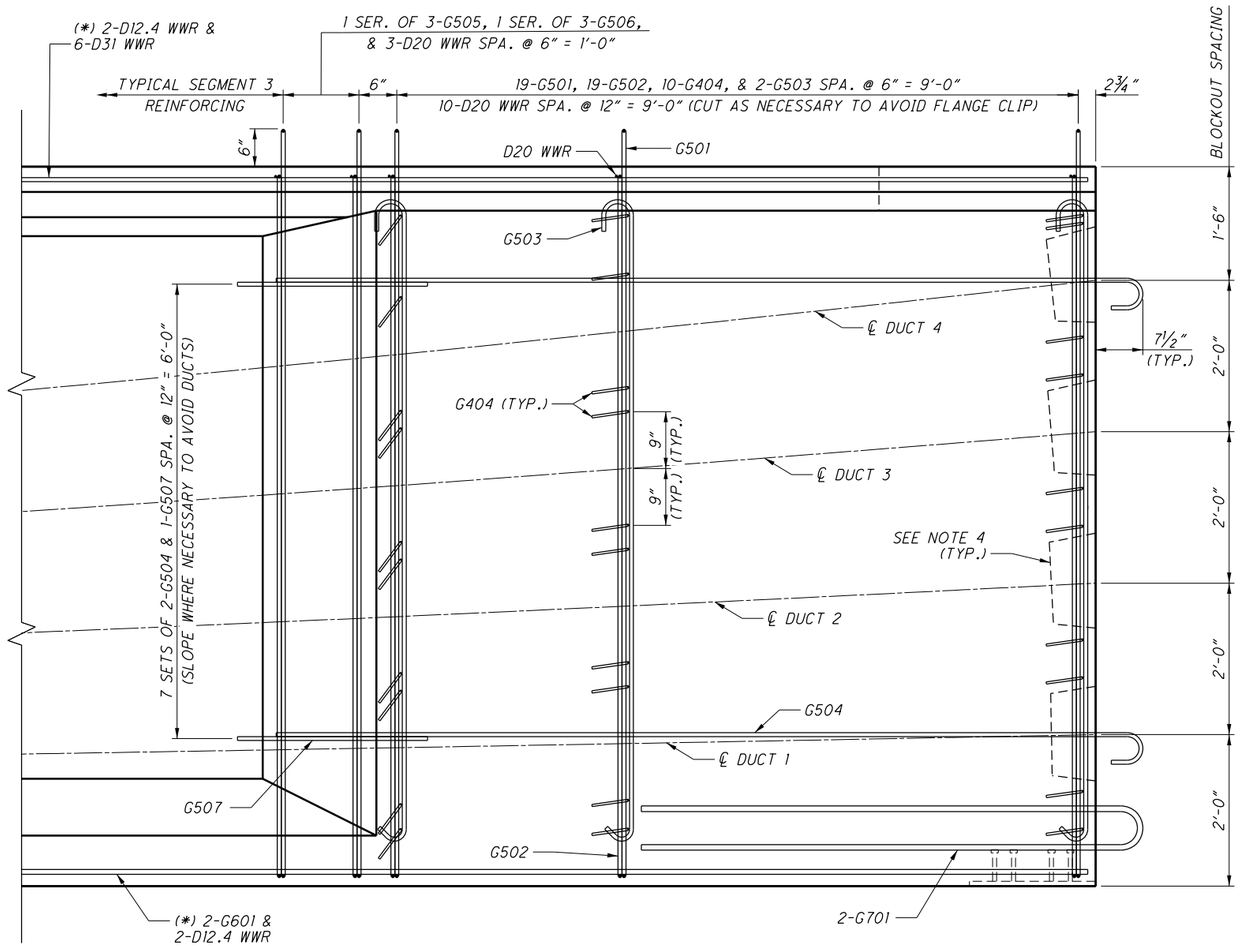
CUY-77-13.80
PID No. 82388

17 / 26

0
0

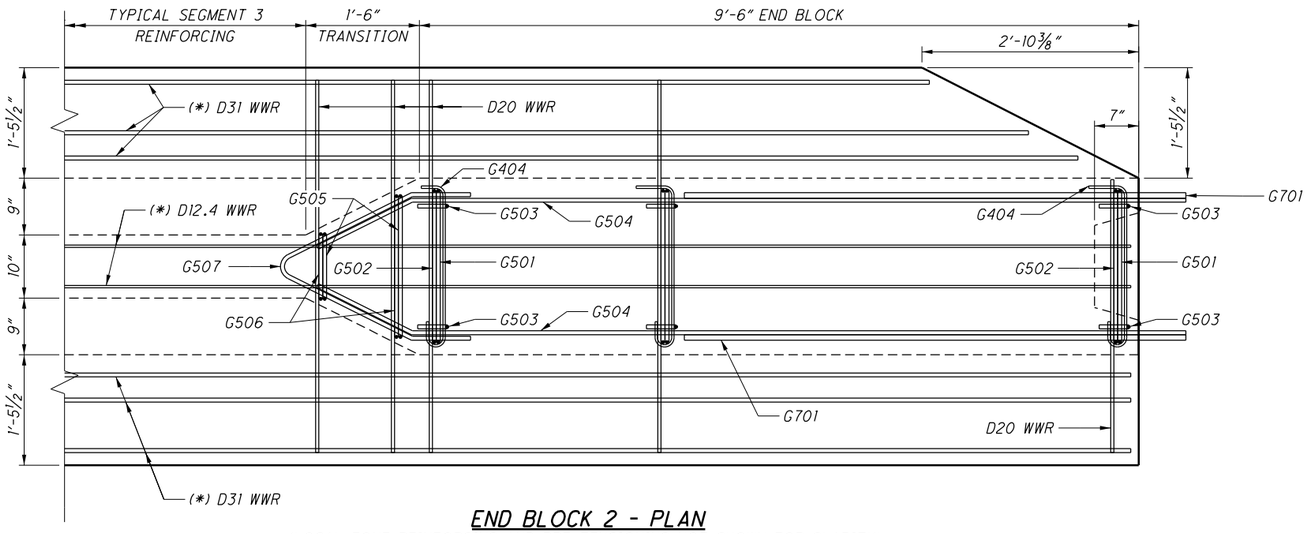
P:\82388_CCG6B\Design\Structures\CUY-77-1409\sheets\077_1409C_SS004.dgn Sheet 9/28/2017 1:06:27 PM gwhittaker

2017-09-28.BU-5a Beams.RFC



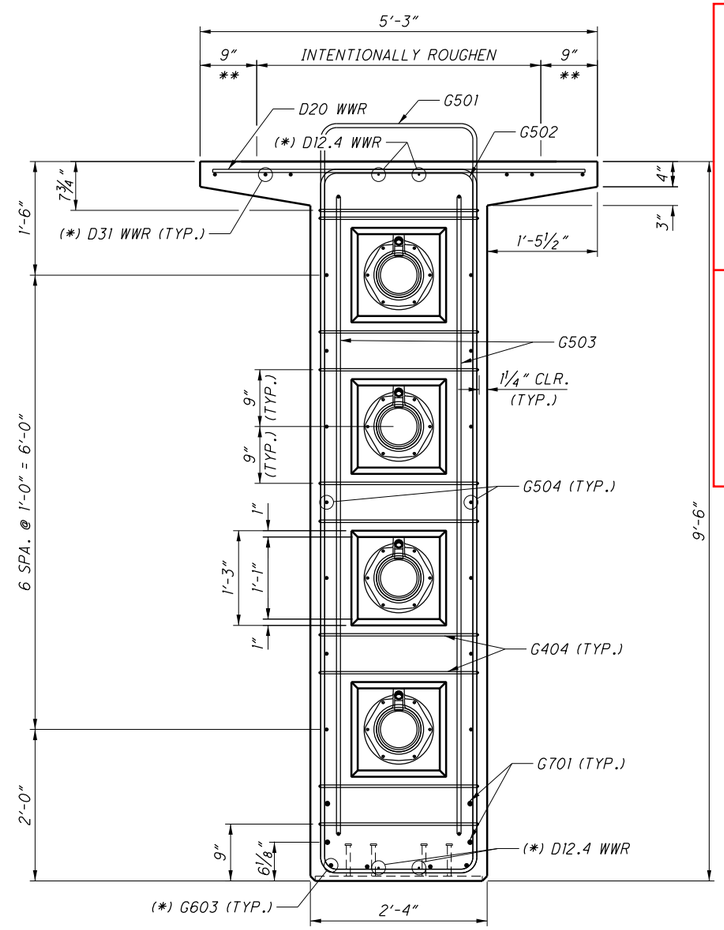
END BLOCK 2 - ELEVATION

(LOCAL ZONE REINFORCING AND PRE-TENSIONING NOT SHOWN FOR CLARITY)



END BLOCK 2 - PLAN

(LOCAL ZONE REINFORCING AND PRE-TENSIONING NOT SHOWN FOR CLARITY)



END BLOCK 2 - TYPICAL SECTION

(LOCAL ZONE REINFORCING AND PRE-TENSIONING NOT SHOWN FOR CLARITY)

LEGEND:

(*) SEE NOTE 1

(**) SEE NOTE 3

NOTES:

1. FABRICATOR SHALL EITHER CONTINUE THIS REINFORCING FROM THE TYPICAL SECTION INTO THE END BLOCK OR PROVIDE LAP SPLICE.
2. THE POST-TENSIONING ANCHORAGE SYSTEM, INCLUDING LOCAL REINFORCING, SHALL BE DSI 19-0.6" SYSTEM 100. ALL LOCAL REINFORCING, ANCHORAGE DETAILS, AND DUCT SPLICE DETAILS WILL BE INCLUDED WITH THE POST-TENSIONING SHOP DRAWING SUBMITTAL.
3. TROWEL EXTERIOR 9" OF TOP FLANGE SMOOTH. APPLY TWO COATS OF C&MS 705.07, TYPE I OR ID MEMBRANE CURING COMPOUND WITH A ROLLER TO ACT AS A BOND BREAKER. REFER TO "CAST-IN-PLACE DECK CONCRETE" NOTE, SHEET 3/26.
4. FOR BLOCK OUT DEPTHS, SEE SHEET 24/26
5. ALL REINFORCING BARS EXTENDING FROM THE PRECAST BEAM SHALL BE EPOXY COATED.

LAP LENGTHS	
NO. 3 BARS	2'-0" MIN.
NO. 4 BARS	2'-0" MIN.
NO. 5 BARS	2'-6" MIN.
NO. 6 BARS	3'-0" MIN.

RELEASED FOR CONSTRUCTION

BU05a_2017-09-28.BU-5a Beams.RFC Set.pdf

10/02/2017

Brian.Link

BU5A - CUY-77-1409		
NO.	DATE	DESCRIPTION
ISSUE RECORD		

E.L. ROBINSON ENGINEERING
1801 Watermark Drive, Suite 310 - Columbus, OHIO 43215
www.elrobinsonengineering.com

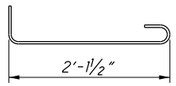
DESIGNED	DRAWN	REVIEWED	DATE
GMW/CJW	GMW	RER	9/28/2017
CHECKED	REVISED	STRUCTURE FILE NUMBER	
DFT		1806663	

BEAM END BLOCK DETAILS (2 OF 3)
BRIDGE NO. CUY-77-1409
BROADWAY AVENUE OVER IR 77

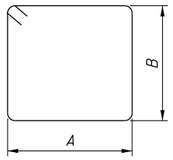
CUY-77-13.80
PID No. 82388

18 / 26

0
0

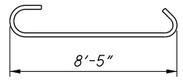


G404

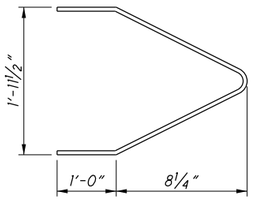


G501, G502, G505, G506

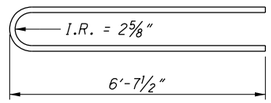
BAR	A	B
G501	2'-1½"	9'-10¾"
G502	2'-1½"	9'-3½"
G505	1'-8¾" TO 8¾"	9'-10¾"
G506	1'-8¾" TO 8¾"	9'-3½"



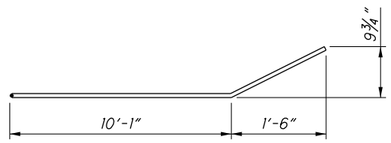
G503



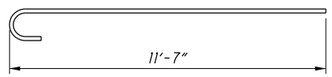
G507



G701



PLAN



ELEVATION

G504

BAR	A	B
G501	2'-1½"	9'-10¾"
G502	2'-1½"	9'-3½"
G505	1'-8¾" TO 8¾"	9'-10¾"
G506	1'-8¾" TO 8¾"	9'-3½"

RELEASED FOR CONSTRUCTION

BU05a_2017-09-28.BU-5a Beams.RFC Set.pdf

10/02/2017 | Brian.Link

BU5A - CUY-77-1409		
NO.	DATE	DESCRIPTION
ISSUE RECORD		

E.L. ROBINSON ENGINEERING
1801 Watermark Drive, Suite 310 - Columbus, OHio 43215
www.elrobinsonengineering.com

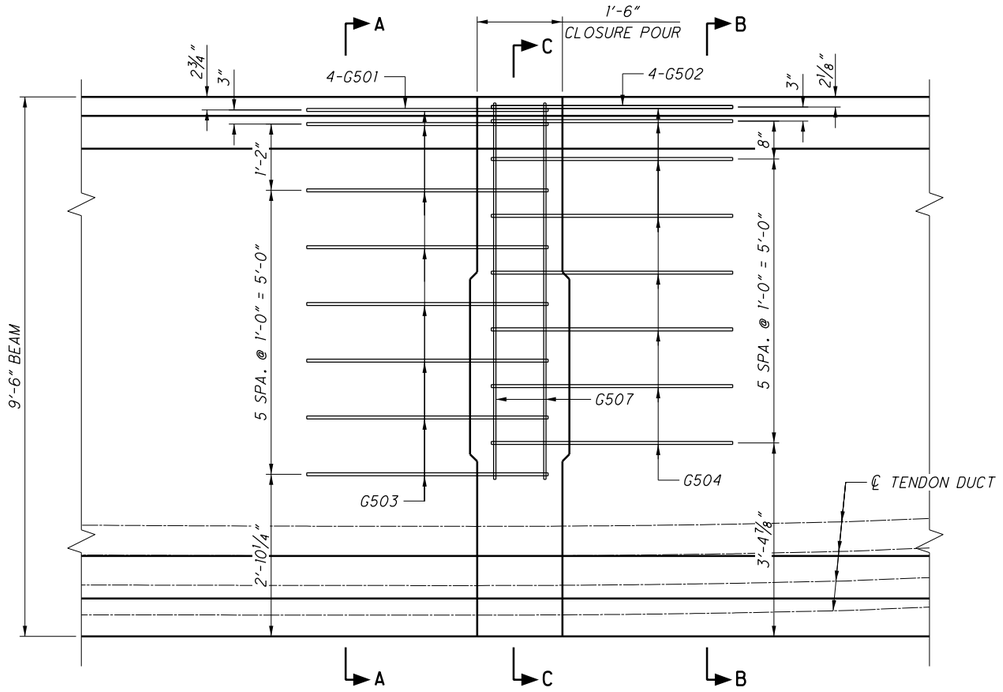
DESIGNED	DRAWN	REVIEWED	DATE
GMW/CJW	GMW	RER	9/28/2017
CHECKED	REVISED	STRUCTURE FILE NUMBER	
DFT		1806663	

BEAM END BLOCK DETAILS (3 OF 3)
BRIDGE NO. CUY-77-1409
BROADWAY AVENUE OVER IR 77

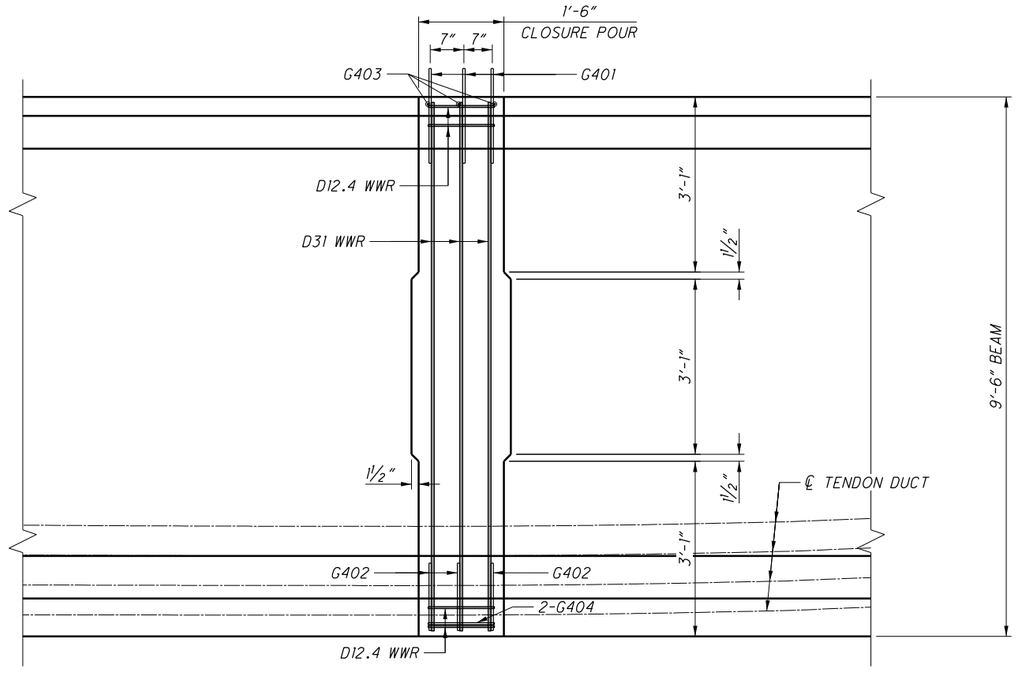
CUY-77-13.80
PID No. 82388

0
0

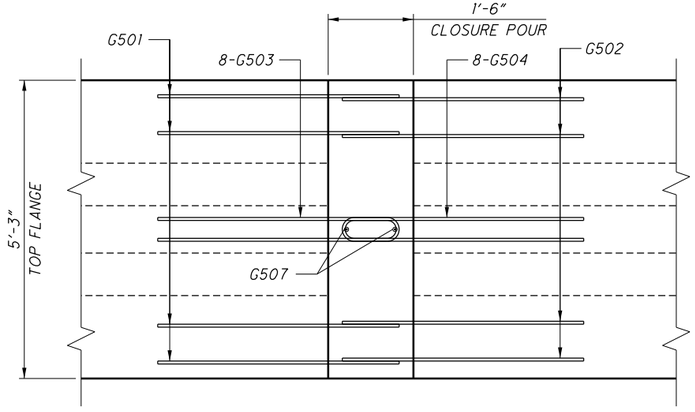
P:\82388_CCG6B\Design\Structures\CUY-77-1409\sheets\077_1409C_SS014.dgn Sheet 9/28/2017 1:06:30 PM gwhittaker



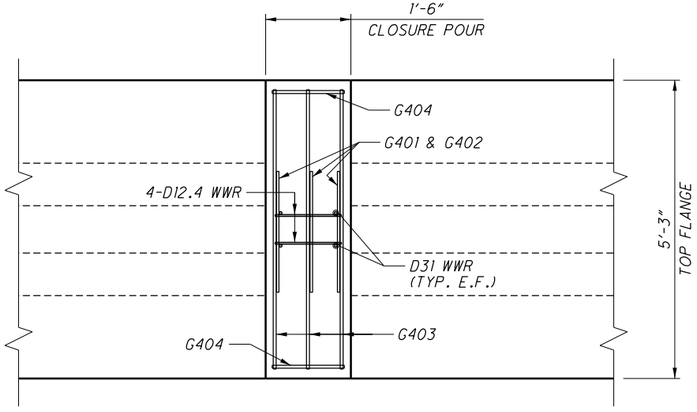
CLOSURE JOINT 1 - ELEVATION 1
(CLOSURE POUR REINFORCING NOT SHOWN FOR CLARITY)



CLOSURE JOINT 1 - ELEVATION 2
(BEAM REINFORCING NOT SHOWN FOR CLARITY)

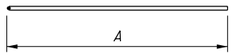


CLOSURE JOINT 1 - PLAN 1
(CLOSURE POUR REINFORCING NOT SHOWN FOR CLARITY)

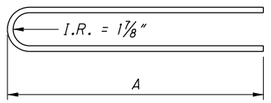


CLOSURE JOINT 1 - PLAN 2
(BEAM REINFORCING NOT SHOWN FOR CLARITY)

BAR	A
G501	4'-3"
G502	4'-3"
G503	4'-3"
G504	4'-3"
G507	6'-8"



G501, G502, G507



G503, G504

NOTES:

1. FOR SECTIONS, A-A, B-B & C-C, SEE SHEET 21/26
2. ALL DIMENSIONS GIVEN ARE TO C/C BARS.
3. ALL CLOSURE JOINT REINFORCING BARS SHALL BE EPOXY COATED OR GALVANIZED.
4. DUCTS SHALL BE PLACED ON A TANGENT BETWEEN THE UPSTATION END OF SEGMENT 1 AND DOWNSTATION END OF SEGMENT 2 AFTER BEAM ERECTION.

RELEASED FOR CONSTRUCTION

BU05a_2017-09-28.BU-5a Beams.RFC Set.pdf

10/02/2017 | Brian.Link

BU5A - CUY-77-1409		
NO.	DATE	DESCRIPTION
ISSUE RECORD		

E.L. ROBINSON ENGINEERING
1801 Watermark Drive, Suite 310 - Columbus, OHio 43215
www.elrobinsonengineering.com

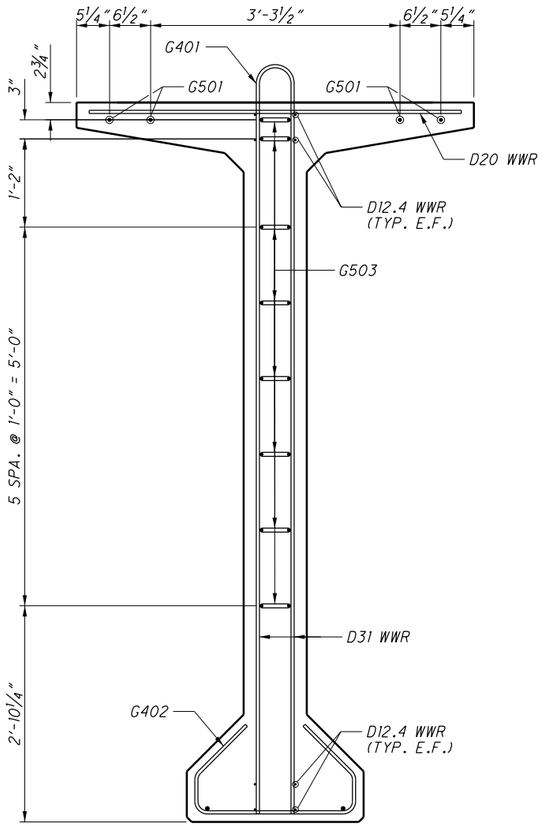
DESIGNED	DRAWN	REVIEWED	DATE
GMW/CJW	FIB	RER	9/28/2017
CHECKED	REVISED	STRUCTURE FILE NUMBER	
DFT		1806663	

CLOSURE JOINT 1 DETAILS (1 OF 2)
BRIDGE NO. CUY-77-1409
BROADWAY AVENUE OVER IR 77

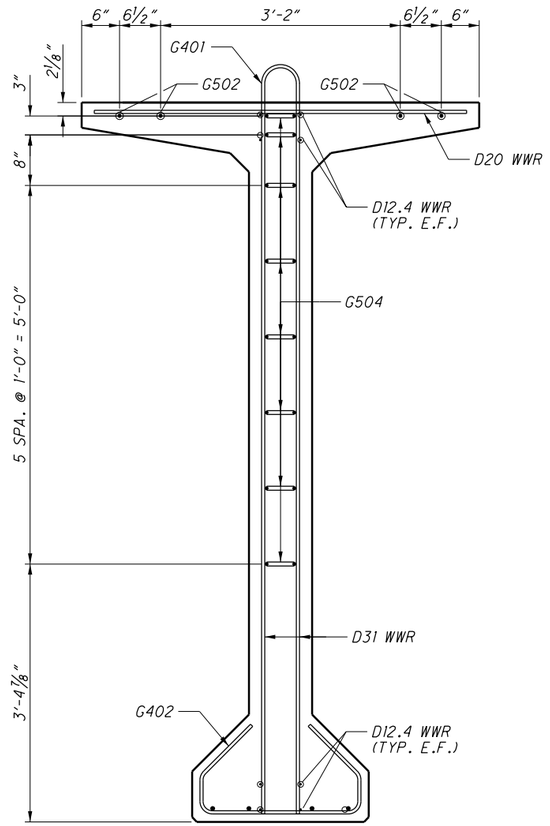
CUY-77-13.80
PID No. 82388

20/26

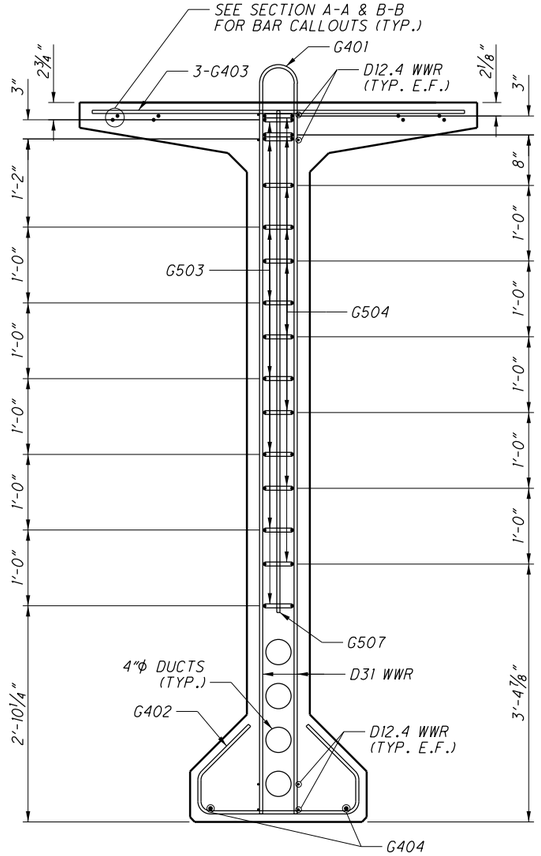
0
0



SECTION A-A
(DUCTS NOT SHOWN FOR CLARITY)



SECTION B-B
(DUCTS NOT SHOWN FOR CLARITY)



SECTION C-C
(AT CLOSURE POUR)

NOTES:

1. FOR BEAM DIMENSIONS, SEE SHEET 11/26
2. FOR LOCATION OF SECTIONS A-A, B-B & C-C, SEE SHEET 20/26
3. FOR EXTENDED STRAND DETAILS, SEE SHEET 23/26

RELEASED FOR CONSTRUCTION

BU05a_2017-09-28.BU-5a Beams.RFC Set.pdf	
10/02/2017	Brian.Link

BU5A - CUY-77-1409		
NO.	DATE	DESCRIPTION
ISSUE RECORD		

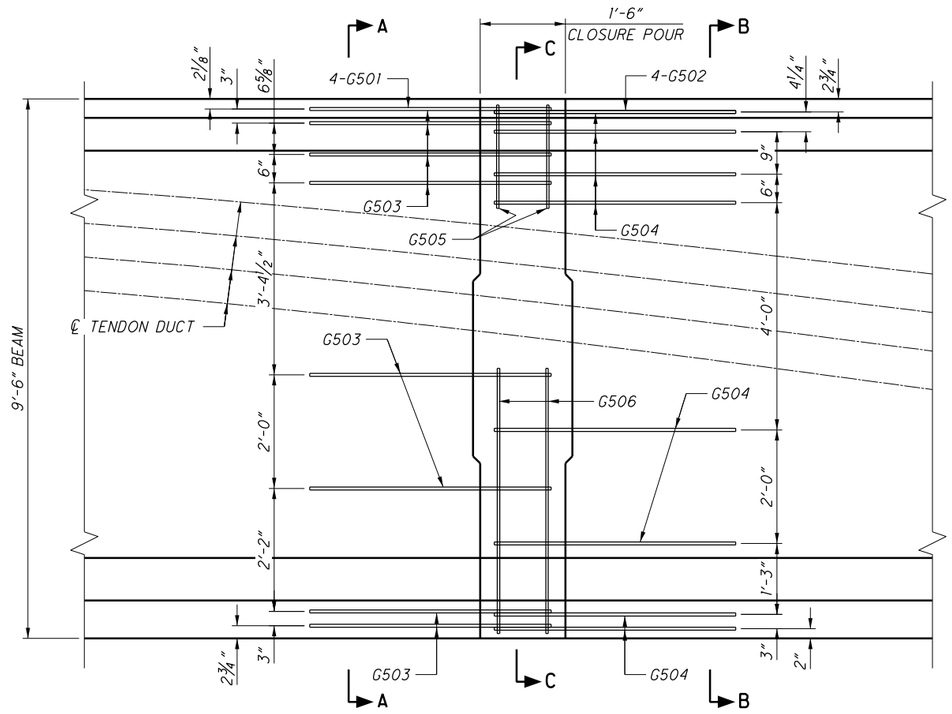
E.L. ROBINSON ENGINEERING
1801 Watermark Drive, Suite 310 - Columbus, Ohio 43215
www.elrobinsonengineering.com

DESIGNED	DRAWN	REVIEWED	DATE
GMW/CJW	FIB	RER	9/28/2017
CHECKED	REVISED	STRUCTURE FILE NUMBER	
DFT		1806663	

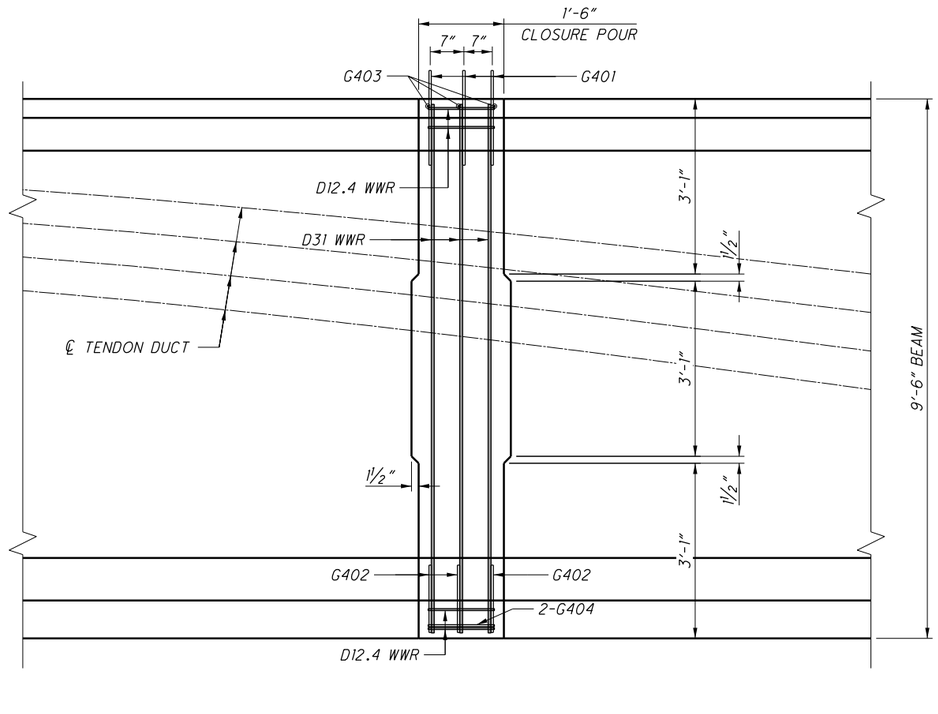
CLOSURE JOINT 1 DETAILS (2 OF 2)
BRIDGE NO. CUY-77-1409
BROADWAY AVENUE OVER IR 77

CUY-77-13.80
PID No. 82388

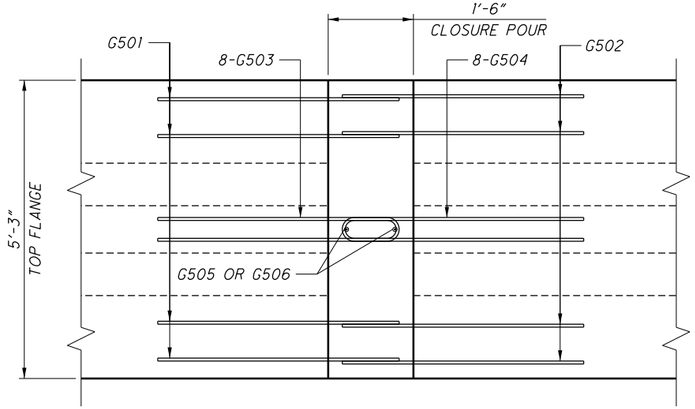
0
0



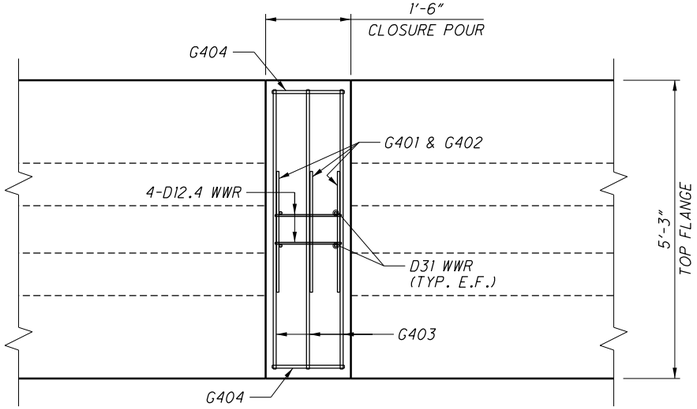
CLOSURE JOINT 2 - ELEVATION 1
(CLOSURE POUR REINFORCING NOT SHOWN FOR CLARITY)



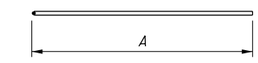
CLOSURE JOINT 2 - ELEVATION 2
(BEAM REINFORCING NOT SHOWN FOR CLARITY)



CLOSURE JOINT 2 - PLAN 1
(CLOSURE POUR REINFORCING NOT SHOWN FOR CLARITY)

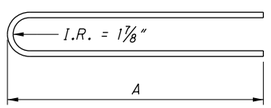


CLOSURE JOINT 2 - PLAN 2
(BEAM REINFORCING NOT SHOWN FOR CLARITY)



G501, G502, G505, G506

BAR	A
G501	4'-3"
G502	4'-3"
G503	4'-3"
G504	4'-3"
G505	1'-10"
G506	4'-8"



G503, G504

NOTES:

1. FOR SECTIONS, A-A, B-B & C-C, SEE SHEET 23/26
2. ALL DIMENSIONS GIVEN ARE TO C/C BARS
3. ALL CLOSURE JOINT REINFORCING BARS SHALL BE EPOXY COATED OR GALVANIZED.
4. DUCTS SHALL BE PLACED ON A TANGENT BETWEEN THE UPSTATION END OF SEGMENT 2 AND DOWNSTATION END OF SEGMENT 3 AFTER BEAM ERECTION.

RELEASED FOR CONSTRUCTION

BU05a_2017-09-28.BU-5a Beams.RFC Set.pdf

10/02/2017 | Brian.Link

BU5A - CUY-77-1409		
NO.	DATE	DESCRIPTION
ISSUE RECORD		

E.L. ROBINSON ENGINEERING
1801 Watermark Drive, Suite 310 - Columbus, Ohio 43215
www.elrobinsonengineering.com

DESIGNED	DRAWN	REVIEWED	DATE
GMW/CJW	FIB	RER	9/28/2017
CHECKED	REVISED	STRUCTURE FILE NUMBER	
DFT		1806663	

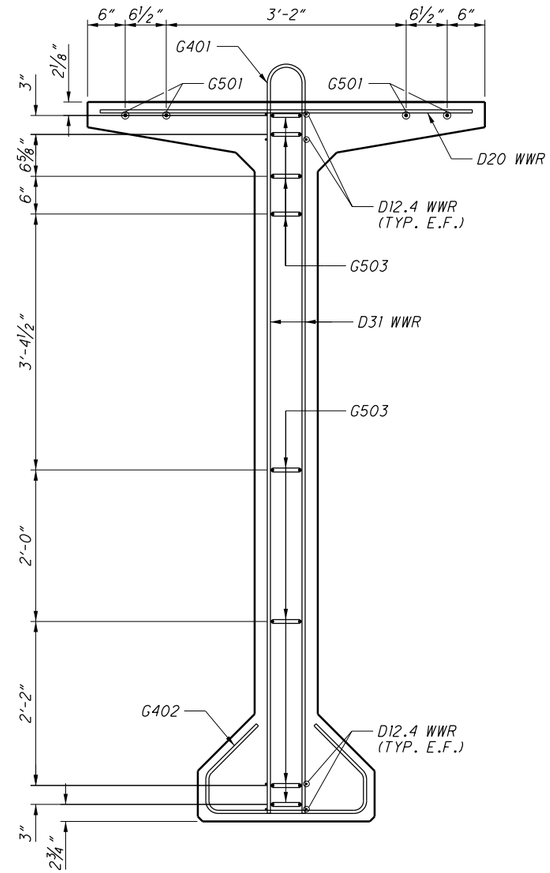
CLOSURE JOINT 2 DETAILS (1 OF 2)
BRIDGE NO. CUY-77-1409
BROADWAY AVENUE OVER IR 77

CUY-77-13.80
PID No. 82388

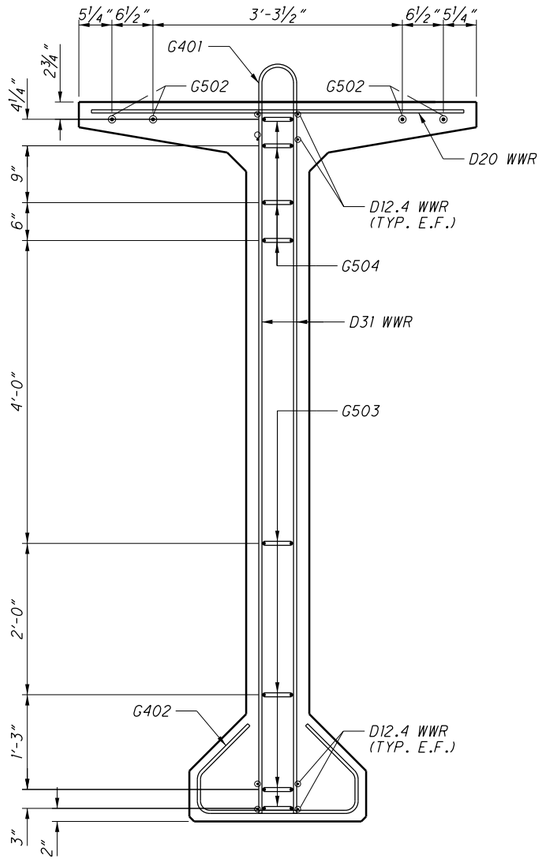
22 / 26

P:\82388_CCG6B\Design\Structures\CUY-77-1409\sheets\077_1409C_SS011.dgn Sheet 9/28/2017 1:06:38 PM gwhittaker

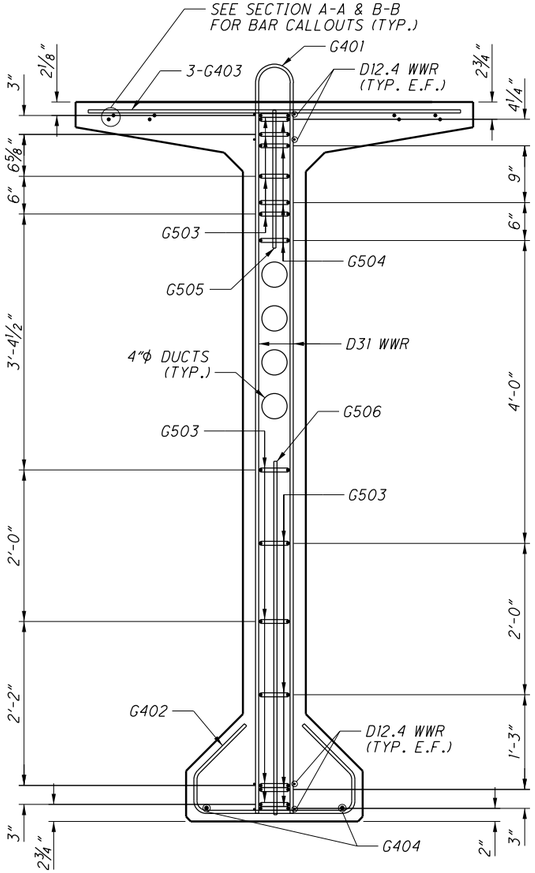
2017-09-28.BU-5a Beams.RFC



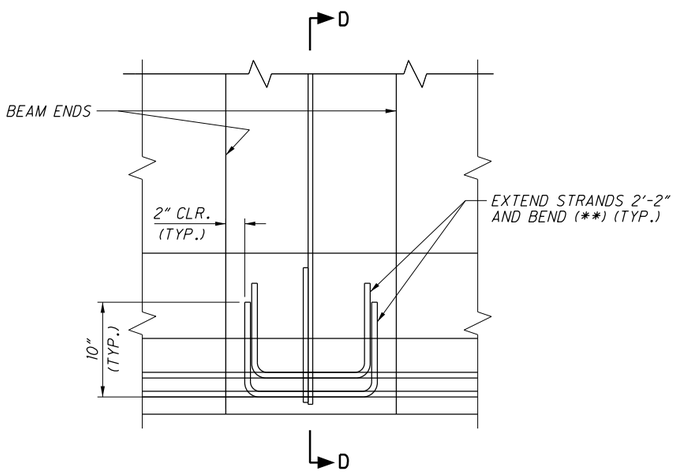
SECTION A-A
(DUCTS NOT SHOWN FOR CLARITY)



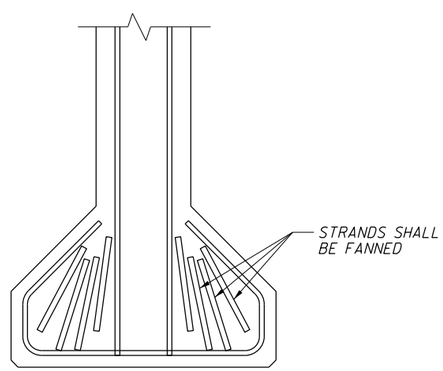
SECTION B-B
(DUCTS NOT SHOWN FOR CLARITY)



SECTION C-C
(AT CLOSURE POUR)



EXTENDED STRAND DETAIL



SECTION D-D

** - BEND UP 4 STRANDS TOTAL FROM EACH BEAM SEGMENT, 2 FROM THE BOTTOM 2 ROWS OF EACH BEAM. ALTERNATE STRANDS FROM EACH BEAM TO AVOID INTERFERENCES

RELEASED FOR CONSTRUCTION

BU05a_2017-09-28.BU-5a Beams.RFC Set.pdf	
10/02/2017	Brian.Link

NOTES:

1. FOR BEAM DIMENSIONS, SEE SHEET 11/26
2. FOR LOCATION OF SECTIONS A-A, B-B & C-C, SEE SHEET 22/26

BU5A - CUY-77-1409		
NO.	DATE	DESCRIPTION
ISSUE RECORD		

E.L. ROBINSON ENGINEERING
1801 Watermark Drive, Suite 310 - Columbus, OHio 43215
www.elrobinsonengineering.com

DESIGNED	DRAWN	REVIEWED	DATE
GMW/CJW	FIB	RER	9/28/2017
CHECKED	REVISED	STRUCTURE FILE NUMBER	
DFT		1806663	

CLOSURE JOINT 2 DETAILS (2 OF 2)
BRIDGE NO. CUY-77-1409
BROADWAY AVENUE OVER IR 77

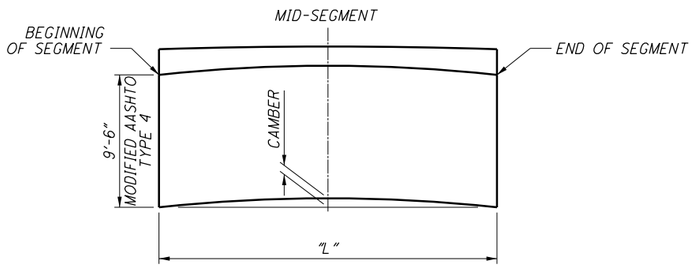
CUY-77-13.80
PID No. 82388

23/26

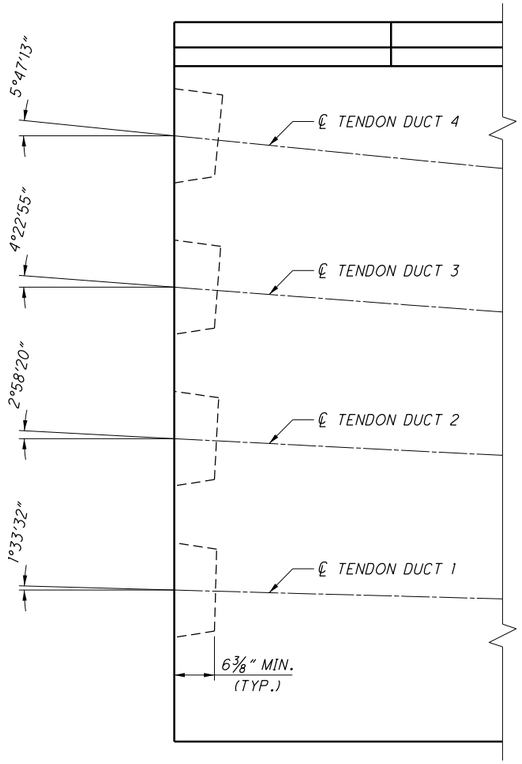
0
0

BEAM MARK	"L" (FEET)	CAMBER (INCHES)	
		AT RELEASE	AT SHIPPING (DAY 180)
A	119.25	0.165	0.184
B	119.25	0.165	0.184
C	119.25	0.165	0.184
D	119.25	0.165	0.184
E	119.25	0.165	0.184
F	119.25	0.165	0.184
G	119.25	0.165	0.184
H	119.25	0.165	0.184
I	138.667	-0.367	-0.593
J	138.667	-0.367	-0.593
K	138.667	-0.367	-0.593
L	138.667	-0.367	-0.593
M	138.667	-0.367	-0.593
N	138.667	-0.367	-0.593
O	138.667	-0.367	-0.593
P	138.667	-0.367	-0.593
Q	125.917	-0.266	-0.428
R	125.917	-0.266	-0.428
S	125.917	-0.266	-0.428
T	125.917	-0.266	-0.428
U	125.917	-0.266	-0.428
V	125.917	-0.266	-0.428
W	125.917	-0.266	-0.428
X	125.917	-0.266	-0.428

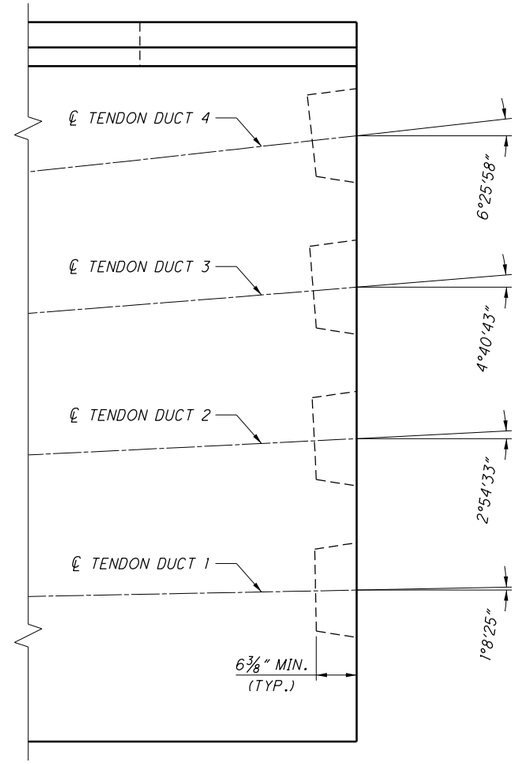
* POSITIVE CAMBER DENOTES UPWARD DEFLECTION AND NEGATIVE CAMBER DENOTES DOWNWARD DEFLECTION



CAMBER DIAGRAM
(TYPICAL EACH SEGMENT)



END BLOCK 1 BLOCK OUTS



END BLOCK 2 BLOCK OUTS

RELEASED FOR CONSTRUCTION

BU05a_2017-09-28.BU-5a Beams.RFC Set.pdf	
10/02/2017	Brian.Link

NOTES:
1. FOR END BLOCK 1 DETAILS, SEE SHEET 17/26
2. FOR END BLOCK 2 DETAILS, SEE SHEET 18/26

BU5A - CUY-77-1409		
NO.	DATE	DESCRIPTION
		ISSUE RECORD

E.L. ROBINSON ENGINEERING
1801 Watermark Drive, Suite 310 - Columbus, OHio 43215
www.elrobinsonengineering.com

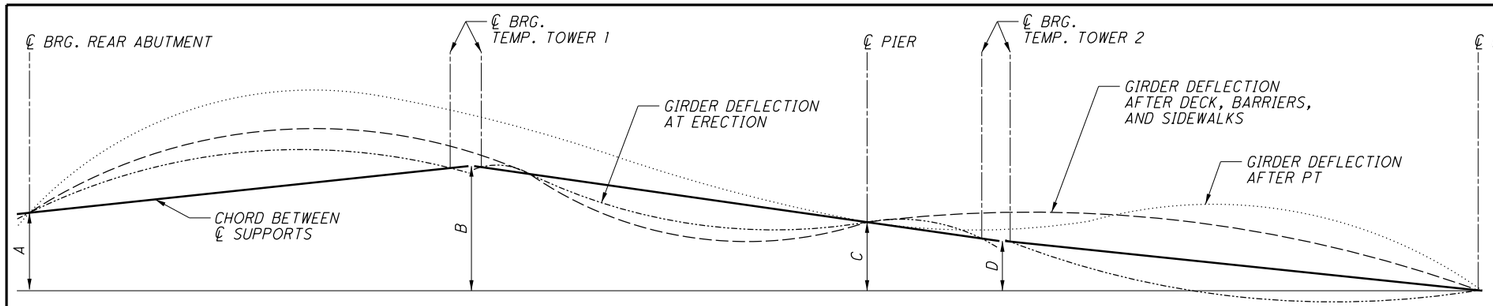
DESIGNED	DRAWN	REVIEWED	DATE
GMW/CJW	DTA	RER	9/28/2017
CHECKED	REVISED	STRUCTURE FILE NUMBER	
DFT		1806663	

CAMBER & MISCELLANEOUS DETAILS
BRIDGE NO. CUY-77-1409
BROADWAY AVENUE OVER IR 77

CUY-77-13.80
PID No. 82388

24/26

0
0



BLOCKING AND CAMBER DIAGRAM

DIMENSION	GIRDER LINE #							
	1	2	3	4	5	6	7	8
A	0.25''	6.50''	11.00''	15.74''	20.78''	24.66''	28.38''	32.57''
B	12.75''	13.00''	12.50''	13.49''	15.78''	18.41''	22.63''	27.82''
C	7.25''	7.75''	7.00''	8.24''	10.78''	13.66''	17.63''	22.32''
D	5.52''	6.10''	5.27''	6.59''	9.20''	12.16''	16.05''	20.59''

GIRDER LINE 1

LOCATION	THEORETICAL DEFLECTION (IN)			MEASURED DEFLECTION AFTER PT (IN)	SCREED ADJUSTMENT (IN)
	AT ERECTION	AFTER PT	REMAINING DL		
CL Brg. R.A.	0.000	0.000	0.000		
0.10L	0.164	1.221	-0.967		
0.20L	0.203	2.158	-1.814		
0.30L	0.205	2.795	-2.444		
0.40L	0.173	3.056	-2.787		
0.50L	0.026	2.834	-2.808		
CL C.J. 1	-0.043	2.650	-2.734		
0.60L	0.000	2.395	-2.517		
0.70L	-0.065	1.596	-1.967		
0.80L	-0.108	0.740	-1.257		
0.90L	-0.077	0.182	-0.533		
CL Brg. Pier 1	0.000	0.000	0.000		
0.10L	0.026	0.021	0.121		
0.20L	-0.005	0.180	0.091		
CL C.J. 2	-0.014	0.268	0.063		
0.30L	-0.069	0.482	-0.020		
0.40L	-0.213	0.732	-0.158		
0.50L	-0.335	0.889	-0.279		
0.60L	-0.393	0.927	-0.353		
0.70L	-0.370	0.852	-0.361		
0.80L	-0.274	0.673	-0.297		
0.90L	-0.132	0.385	-0.168		
CL Brg. F.A.	0.000	0.000	0.000		

GIRDER LINE 2

LOCATION	THEORETICAL DEFLECTION (IN)			MEASURED DEFLECTION AFTER PT (IN)	SCREED ADJUSTMENT (IN)
	AT ERECTION	AFTER PT	REMAINING DL		
CL Brg. R.A.	0.000	0.000	0.000		
0.10L	0.164	1.231	-0.885		
0.20L	0.204	2.151	-1.630		
0.30L	0.205	2.739	-2.146		
0.40L	0.173	2.944	-2.390		
0.50L	0.028	2.681	-2.349		
CL C.J. 1	-0.037	2.491	-2.264		
0.60L	0.000	2.224	-2.049		
0.70L	-0.065	1.441	-1.554		
0.80L	-0.108	0.629	-0.960		
0.90L	-0.077	0.125	-0.391		
CL Brg. Pier 1	0.000	0.000	0.000		
0.10L	0.026	0.052	0.084		
0.20L	-0.005	0.228	0.058		
CL C.J. 2	-0.014	0.316	0.036		
0.30L	-0.069	0.525	-0.025		
0.40L	-0.213	0.755	-0.122		
0.50L	-0.335	0.885	-0.203		
0.60L	-0.393	0.897	-0.247		
0.70L	-0.371	0.809	-0.245		
0.80L	-0.274	0.632	-0.196		
0.90L	-0.132	0.362	-0.109		
CL Brg. F.A.	0.000	0.000	0.000		

GIRDER LINE 3

LOCATION	THEORETICAL DEFLECTION (IN)			MEASURED DEFLECTION AFTER PT (IN)	SCREED ADJUSTMENT (IN)
	AT ERECTION	AFTER PT	REMAINING DL		
CL Brg. R.A.	0.000	0.000	0.000		
0.10L	0.164	1.210	-0.774		
0.20L	0.204	2.113	-1.427		
0.30L	0.205	2.686	-1.874		
0.40L	0.174	2.881	-2.083		
0.50L	0.026	2.607	-2.040		
CL C.J. 1	-0.043	2.413	-1.965		
0.60L	0.001	2.156	-1.778		
0.70L	-0.065	1.379	-1.349		
0.80L	-0.108	0.583	-0.838		
0.90L	-0.077	0.104	-0.346		
CL Brg. Pier 1	0.000	0.000	0.000		
0.10L	0.026	0.062	0.081		
0.20L	-0.005	0.243	0.067		
CL C.J. 2	-0.014	0.332	0.052		
0.30L	-0.069	0.542	0.004		
0.40L	-0.213	0.772	-0.076		
0.50L	-0.335	0.901	-0.145		
0.60L	-0.393	0.911	-0.186		
0.70L	-0.371	0.819	-0.190		
0.80L	-0.274	0.638	-0.156		
0.90L	-0.132	0.365	-0.087		
CL Brg. F.A.	0.000	0.000	0.000		

GIRDER LINE 4

LOCATION	THEORETICAL DEFLECTION (IN)			MEASURED DEFLECTION AFTER PT (IN)	SCREED ADJUSTMENT (IN)
	AT ERECTION	AFTER PT	REMAINING DL		
CL Brg. R.A.	0.000	0.000	0.000		
0.10L	0.164	1.198	-0.696		
0.20L	0.203	2.092	-1.290		
0.30L	0.205	2.659	-1.705		
0.40L	0.173	2.847	-1.908		
0.50L	0.028	2.578	-1.886		
CL C.J. 1	-0.043	2.381	-1.823		
0.60L	0.000	2.123	-1.659		
0.70L	-0.065	1.353	-1.274		
0.80L	-0.108	0.565	-0.800		
0.90L	-0.077	0.095	-0.335		
CL Brg. Pier 1	0.000	0.000	0.000		
0.10L	0.026	0.068	0.085		
0.20L	-0.005	0.254	0.079		
CL C.J. 2	-0.014	0.344	0.065		
0.30L	-0.069	0.556	0.022		
0.40L	-0.213	0.788	-0.054		
0.50L	-0.336	0.918	-0.123		
0.60L	-0.394	0.926	-0.166		
0.70L	-0.371	0.831	-0.174		
0.80L	-0.274	0.647	-0.145		
0.90L	-0.132	0.369	-0.082		
CL Brg. F.A.	0.000	0.000	0.000		

RELEASED FOR CONSTRUCTION

BU05a_2017-09-28.BU-5a Beams.RFC Set.pdf

10/02/2017 | Brian.Link

NOTES:

1. NEGATIVE (-) DEFLECTION INDICATES DOWNWARD DISPLACEMENT OF THE GIRDER. POSITIVE (+) DEFLECTION IS UPWARD.
2. "THEORETICAL DEFLECTION AT ERECTION" IS THE CALCULATED DEFLECTION OF THE GIRDER DUE TO GIRDER SELF WEIGHT, PRETENSIONING, AND CREEP/SHRINKAGE AFTER 120 DAYS OF CURING.
3. "THEORETICAL DEFLECTION AFTER PT" IS THE CALCULATED DEFLECTION OF THE GIRDER DUE TO GIRDER SELF WEIGHT, PRETENSIONING, CREEP/SHRINKAGE AFTER 120 DAYS OF CURING, CROSSFRAME WEIGHT, AND POST-TENSIONING.
4. "THEORETICAL REMAINING DL DEFLECTION" IS THE CALCULATED DEFLECTION OF THE GIRDER DUE TO THE WEIGHT OF THE DECK, SIDEWALKS, AND BARRIERS.

BU5A - CUY-77-1409

NO.	DATE	DESCRIPTION
		ISSUE RECORD

E.L. ROBINSON ENGINEERING
1801 Watermark Drive, Suite 310 • Columbus, Ohio 43215
www.elrobinsonengineering.com

REVIEWED RER | DATE 9/28/2017 | STRUCTURE FILE NUMBER 1806663
DRAWN CMW | REVISED
DESIGNED CMW/CJW | CHECKED DFT

CAMBER DETAILS
BRIDGE NO. CUY-77-1409
BROADWAY AVENUE OVER IR 77

CUY-77-13.80
PID No. 82388

25 / 26

0
0

GIRDER LINE 5

LOCATION	THEORETICAL DEFLECTION (IN)			MEASURED DEFLECTION AFTER PT (IN)	SCREED ADJUSTMENT (IN)
	AT ERECTION	AFTER PT	REMAINING DL		
CL Brg. R.A.	0.000	0.000	0.000		
0.10L	0.164	1.194	-0.664		
0.20L	0.204	2.082	-1.239		
0.30L	0.205	2.645	-1.653		
0.40L	0.173	2.834	-1.869		
0.50L	0.027	2.560	-1.866		
CL C.J. 1	-0.011	2.398	-1.812		
0.60L	0.000	2.108	-1.660		
0.70L	-0.065	1.341	-1.288		
0.80L	-0.108	0.556	-0.819		
0.90L	-0.077	0.090	-0.346		
CL Brg. Pier 1	0.000	0.000	0.000		
0.10L	0.026	0.071	0.090		
0.20L	-0.005	0.260	0.087		
CL C.J. 2	-0.014	0.351	0.073		
0.30L	-0.069	0.564	0.029		
0.40L	-0.214	0.798	-0.051		
0.50L	-0.335	0.926	-0.124		
0.60L	-0.393	0.932	-0.171		
0.70L	-0.371	0.836	-0.182		
0.80L	-0.274	0.650	-0.153		
0.90L	-0.132	0.371	-0.087		
CL Brg. F.A.	0.000	0.000	0.000		

GIRDER LINE 6

LOCATION	THEORETICAL DEFLECTION (IN)			MEASURED DEFLECTION AFTER PT (IN)	SCREED ADJUSTMENT (IN)
	AT ERECTION	AFTER PT	REMAINING DL		
CL Brg. R.A.	0.000	0.000	0.000		
0.10L	0.164	1.194	-0.685		
0.20L	0.203	2.081	-1.285		
0.30L	0.205	2.645	-1.729		
0.40L	0.173	2.831	-1.970		
0.50L	0.026	2.557	-1.982		
CL C.J. 1	-0.043	2.364	-1.930		
0.60L	0.000	2.107	-1.777		
0.70L	-0.065	1.340	-1.388		
0.80L	-0.108	0.555	-0.887		
0.90L	-0.077	0.089	-0.376		
CL Brg. Pier 1	0.000	0.000	0.000		
0.10L	0.026	0.073	0.094		
0.20L	-0.005	0.264	0.084		
CL C.J. 2	-0.014	0.355	0.067		
0.30L	-0.069	0.570	0.013		
0.40L	-0.213	0.804	-0.081		
0.50L	-0.335	0.933	-0.167		
0.60L	-0.393	0.940	-0.221		
0.70L	-0.371	0.843	-0.233		
0.80L	-0.274	0.655	-0.195		
0.90L	-0.132	0.374	-0.111		
CL Brg. F.A.	0.000	0.000	0.000		

GIRDER LINE 7

LOCATION	THEORETICAL DEFLECTION (IN)			MEASURED DEFLECTION AFTER PT (IN)	SCREED ADJUSTMENT (IN)
	AT ERECTION	AFTER PT	REMAINING DL		
CL Brg. R.A.	0.000	0.000	0.000		
0.10L	0.164	1.211	-0.773		
0.20L	0.204	2.113	-1.454		
0.30L	0.205	2.684	-1.959		
0.40L	0.173	2.870	-2.231		
0.50L	0.028	2.592	-2.240		
CL C.J. 1	-0.043	2.391	-2.176		
0.60L	0.000	2.126	-1.996		
0.70L	-0.065	1.347	-1.548		
0.80L	-0.108	0.554	-0.979		
0.90L	-0.077	0.085	-0.409		
CL Brg. Pier 1	0.000	0.000	0.000		
0.10L	0.026	0.080	0.086		
0.20L	-0.005	0.279	0.051		
CL C.J. 2	-0.014	0.374	0.025		
0.30L	-0.068	0.594	-0.050		
0.40L	-0.213	0.832	-0.172		
0.50L	-0.335	0.962	-0.277		
0.60L	-0.393	0.968	-0.338		
0.70L	-0.371	0.868	-0.341		
0.80L	-0.274	0.674	-0.279		
0.90L	-0.132	0.384	-0.157		
CL Brg. F.A.	0.000	0.000	0.000		

GIRDER LINE 8

LOCATION	THEORETICAL DEFLECTION (IN)			MEASURED DEFLECTION AFTER PT (IN)	SCREED ADJUSTMENT (IN)
	AT ERECTION	AFTER PT	REMAINING DL		
CL Brg. R.A.	0.000	0.000	0.000		
0.10L	0.164	1.295	-1.000		
0.20L	0.204	2.259	-1.836		
0.30L	0.205	2.841	-2.404		
0.40L	0.174	2.999	-2.662		
0.50L	0.027	2.659	-2.599		
CL C.J. 1	-0.043	2.436	-2.500		
0.60L	0.000	2.134	-2.253		
0.70L	-0.065	1.309	-1.697		
0.80L	-0.108	0.498	-1.034		
0.90L	-0.077	0.044	-0.408		
CL Brg. Pier 1	0.000	0.000	0.000		
0.10L	0.026	0.115	0.039		
0.20L	-0.005	0.346	-0.054		
CL C.J. 2	-0.014	0.448	-0.098		
0.30L	-0.069	0.682	-0.207		
0.40L	-0.213	0.928	-0.360		
0.50L	-0.335	1.051	-0.473		
0.60L	-0.393	1.036	-0.520		
0.70L	-0.371	0.909	-0.490		
0.80L	-0.273	0.692	-0.382		
0.90L	-0.132	0.390	-0.210		
CL Brg. F.A.	0.000	0.000	0.000		

RELEASED FOR CONSTRUCTION

BU05a_2017-09-28.BU-5a Beams.RFC Set.pdf

10/02/2017 | Brian.Link

NOTES:

1. FOR NOTES, SEE SHEET 25/26.

BU5A - CUY-77-1409		
NO.	DATE	DESCRIPTION
ISSUE RECORD		

E.L. ROBINSON ENGINEERING
1001 Watermark Drive, Suite 310 • Columbus, Ohio 43215
www.elrobinsonengineering.com

DESIGNED	DRAWN	REVIEWED	DATE
GMW/CJW	GMW	RER	9/28/2017
CHECKED	REVISED	STRUCTURE FILE NUMBER	
DFT		1806663	

CAMBER DETAILS
BRIDGE NO. CUY-77-1409
BROADWAY AVENUE OVER IR 77

CUY-77-13.80
PID No. 82388