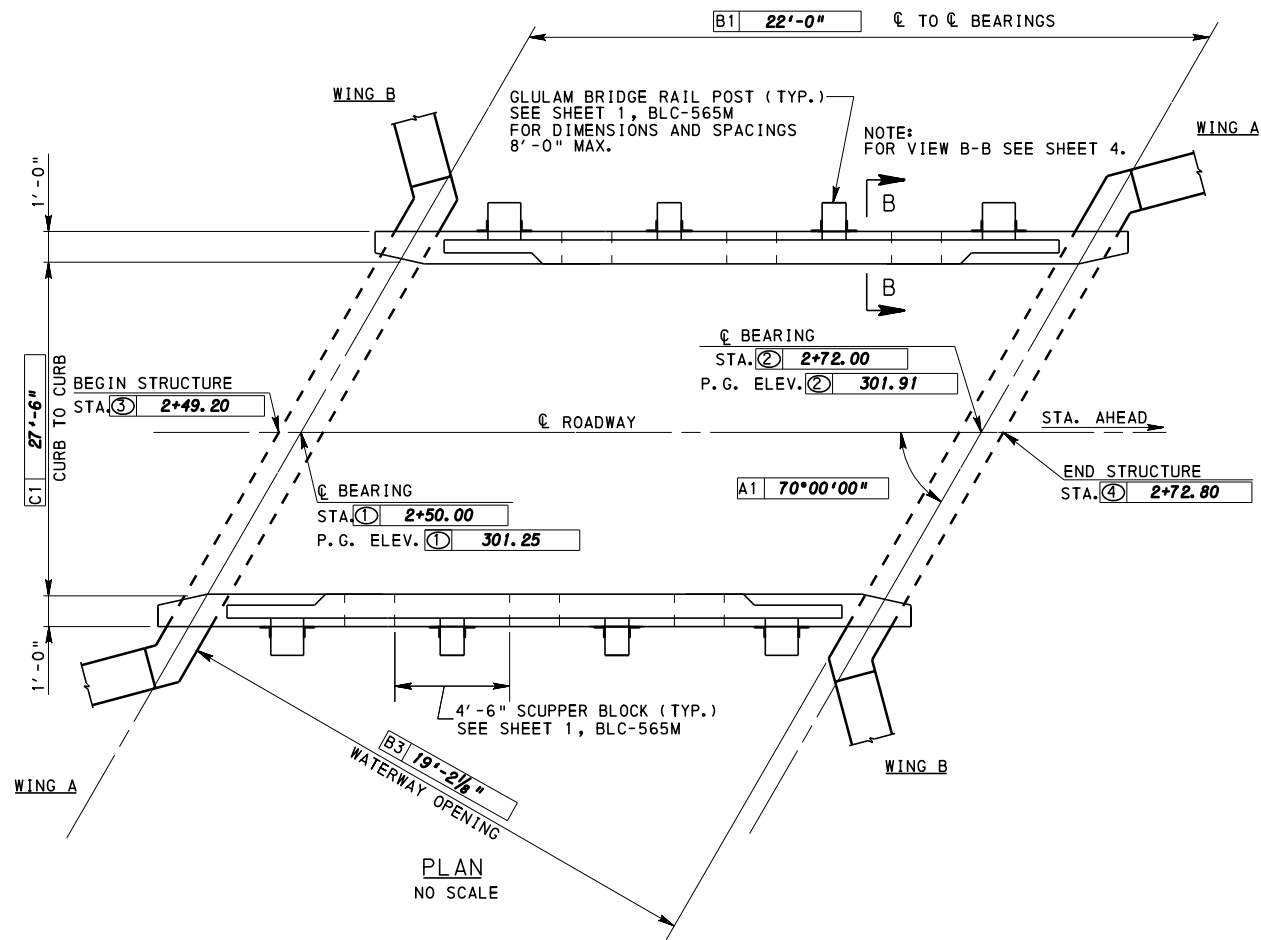
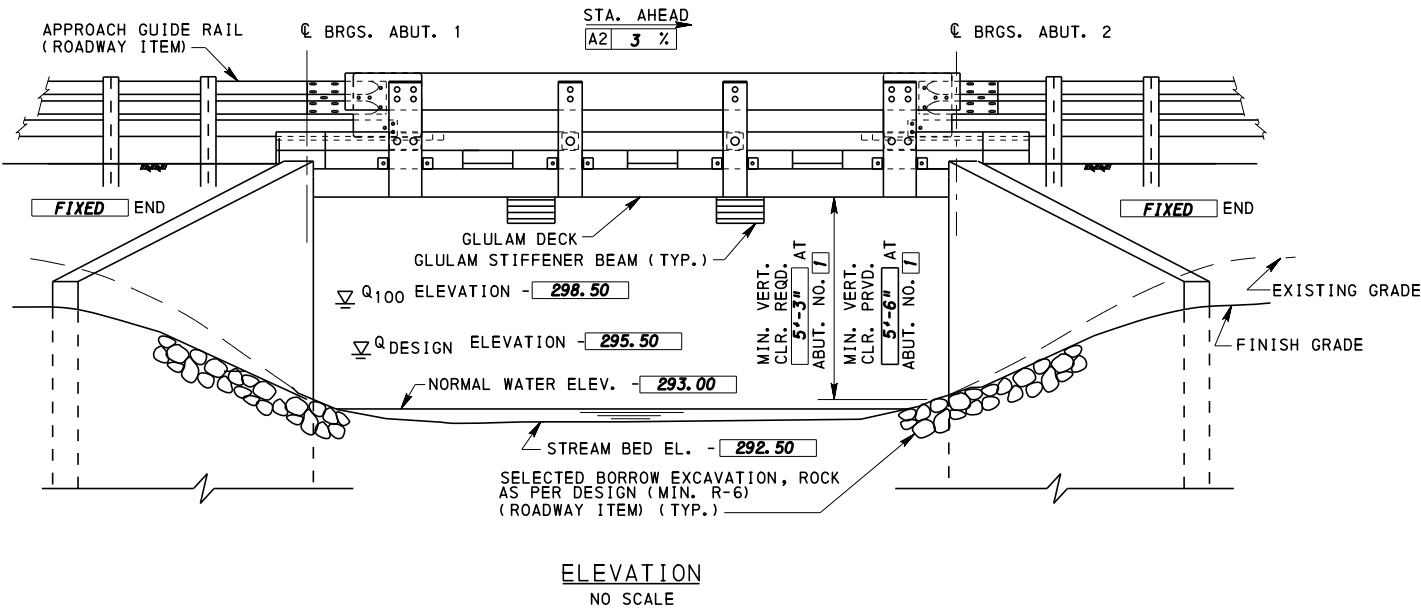




HYDRAULIC DATA
(DESIGNER)
DRAINAGE AREA - 8.42 SQ. MILES
DESIGN FLOOD
DISCHARGE - 705 CFS
FREQUENCY - 25 YEARS
ELEVATION - 295.50
100 YEAR FLOOD
DISCHARGE - 2008 CFS
ELEVATION - 298.50



INDEX OF DRAWINGS			
SHT. NO.	TITLE	SHT. NO.	TITLE
1	GENERAL PLAN AND ELEVATION - LEFT SKEW	16	GLULAM LONGIT. PANELS (DATA ASSY. SHTS.)
2	TYPICAL SECTION AND QUANTITIES	17	SPREAD FOOTING ABUT. 1 (DATA ASSY. SHTS.)
3	GENERAL NOTES	18	SPREAD FOOTING ABUT. 1 (DATA ASSY. SHTS.)
4	STAKE-OUT PLAN	19	SPREAD FOOTING ABUT. 1 (DATA ASSY. SHTS.)
5	ABUTMENT 1	20	SPREAD FOOTING ABUT. 1 (DATA ASSY. SHTS.)
6	ABUTMENT 1 - FOOTING PLAN	21	SPREAD FOOTING ABUT. 2 (DATA ASSY. SHTS.)
7	ABUTMENT 1 - BAR SCHEDULE	22	SPREAD FOOTING ABUT. 2 (DATA ASSY. SHTS.)
8	ABUTMENT 2	23	SPREAD FOOTING ABUT. 2 (DATA ASSY. SHTS.)
9	ABUTMENT 2 - FOOTING PLAN	24	SPREAD FOOTING ABUT. 2 (DATA ASSY. SHTS.)
10	ABUTMENT 2 - BAR SCHEDULE		
11	FRAMING PLAN - LEFT SKEW		
12	SUPERSTRUCTURE DETAILS		
13	BRIDGE RAIL DETAILS		
14	TYPICAL HARDWARE DETAILS		
15	GLULAM LONGIT. PANELS (DATA ASSY SHTS)		

BRIDGE RATING ⁽¹⁾							
REFER TO TABLE 2, BLC-561M SHEET 9							
SIMPLE SPAN		GLULAM TIMBER LONGITUDINAL PANEL ⁽²⁾					
		H	HS	ML	PHL93	TK-527	P82
INVENTORY RATING (IR)	LOCATION	0.50 L	0.16 L	0.50 L	0.45 L	0.50 L	-
	LIMIT STATE	STR. I	STR. I	STR. I	STR. I	STR. I	-
OPERATING RATING (OR)	RATING	2.80 M	1.91 V	1.92 M	1.55 M	1.66 M	-
	LOCATION	0.50 L	0.25 L	0.50 L	0.45 L	0.50 L	0.45 L
	LIMIT STATE	STR. II	STR. II	STR. II	STR. IA	STR. II	STR. II
	RATING	3.63 M	2.48 V	2.50 M	2.47 M	2.88 M	1.93 M

MOMENT CAPACITY - kip-ft. 1197.8
LOCATION 1.45 L
SHEAR CAPACITY - kip 238.1
LOCATION 0.16 L

NOTES FOR BRIDGE RATING TABLE:
1.) FLEXURAL RATING FACTORS "M" ARE SHOWN & GOVERN UNLESS OTHERWISE DENOTED BY A "V" FOR SHEAR, "D" FOR DEFLECTION OR "B" FOR BEARING.
2.) VALUES SHOWN ARE BASED ON LOAD AND RESISTANCE FACTOR DESIGN.

Mark	Description	By	Chk'd	Rec'd	Date
REVISIONS					

S- 00001 SHEET 1 OF 24

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

DESIGN EXAMPLE
22'-0" SPAN
GLULAM
LONGITUDINAL PANEL SUPERSTRUCTURE
GENERAL PLAN & ELEVATION - LEFT SKEW

RECOMMENDED APR. 23, 2013
THOMAS P. MACIEIRA
CHIEF BRIDGE ENGINEER

RECOMMENDED APR. 23, 2013
[Signature]
ACTING DIR. BUR. OF PROJECT DELIVERY

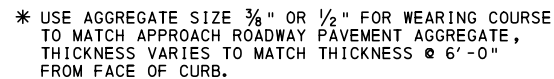
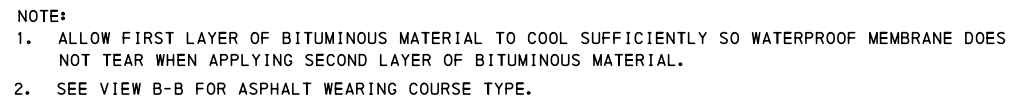
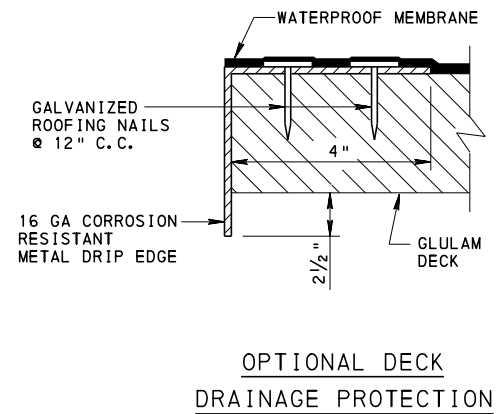
SHEET 1 OF 9
BLC-563M

ENGINEERING SEAL
[Seal]
SIGNATURE & DATE

PREPARED BY:
ABC CONSULTING
123 MAIN ST.
ANYWHERE, PA 12345

Recommended _____
DISTRICT BRIDGE ENGINEER

RC-11M	CLASSIFICATION OF EARTHWORK FOR STRUCTURES
RC-12M	BACKFILL AT STRUCTURES
BC-735M	WALL CONSTRUCTION & EXPANSION JOINT DETAILS
BC-736M	REINFORCEMENT BAR FABRICATION DETAILS
BC-739M	BRIDGE BARRIER TO GUIDE RAIL TRANSITION
BC-755M	BEARINGS
REFERENCE DRAWING	



APPROXIMATE QUANTITIES - BRIDGE STRUCTURE, AS DESIGNED						
ITEM NO.	ITEM	UNIT	ABUT. 1	ABUT. 2	SUPERSTRUCTURE	TOTAL
8030-0001	BRIDGE STRUCTURE AS DESIGNED, S-	LS				LS
(1)	GLUE LAMINATED LONGITUDINAL PANELS	F. B. M.	-----	-----	10.006	10.006
(1)	GLUE LAMINATED CONT. STIFFENER BEAMS	F. B. M.	-----	-----	0.148	0.148
(1)	GLUE LAMINATED TIMBER BRIDGE RAIL	F. B. M.	-----	-----	1.1	.1
(1)	GLUE LAMINATED INTER. STIFFENER BEAMS	F. B. M.	-----	-----	0.432	0.432
(1)	WATERPROOF MEMBRANE	S. Y.	-----	-----	93.4	93.4
(1)	CLASS 4 GEOTEXTILE	S. Y.	-----	-----	30	30
(1)	BITUMINOUS BINDER COURSE SUPERPAVE, $\frac{3}{4}$ "	TON	-----	-----	10	10
(1)	BITUMINOUS WEARING COURSE SUPERPAVE, $\frac{3}{8}$ " / $\frac{1}{2}$ "	TON	-----	-----	6	6
(1)	TREATED RETAINER BLOCK	F. B. M.	-----	-----		
(1)	OPTIONAL METAL DRIP EDGE	S. Y.				
(1)	CLASS 3 EXCAVATION	C. Y.	142	149	---	291
(1)	CLASS AA CEMENT CONCRETE	C. Y.	0.2	0.2	---	0.4
(1)	CLASS A CEMENT CONCRETE	C. Y.	58.8	64.3	---	123.1
(1)	SELECTED BORROW EXCAVATION, STRUCTURE BACKFILL	C. Y.	45	51	---	96
(1)	NO. 57 COARSE AGGREGATE	C. Y.	3.0	3.0	---	6.0
(1)	REINFORCEMENT BARS	LB.	4748	6112	---	10860
(1)	REINFORCEMENT BARS, EPOXY COATED	LB.	606	843	---	1449

1. ITEMS IN BRIDGE STRUCTURE LUMP SUM ITEM 8030-0001 GIVEN FOR INFORMATION ONLY.

Mark	Description	By	Chk' d	Recm' d	Date
REVISIONS					

S- 00001	SHEET <u>2</u> OF <u>24</u>
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**COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY**

DESIGN EXAMPLE
22'-0" SPAN
GLULAM
LONGITUDINAL PANEL SUPERSTRUCTURE
TYPICAL SECTION AND QUANTITIES

RECOMMENDED APR. 23, 2013
Thomas P. MacIsaac
 CHIEF BRIDGE ENGINEER

RECOMMENDED APR. 23, 2013
 [Signature]
 ACTING DIR. BUR. OF PROJECT DELIVERY

SHEET 4 OF 9

BLC-563M

GENERAL NOTES:

DESIGN SPECIFICATIONS

AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS (2010) AND AS SUPPLEMENTED BY DESIGN MANUAL, PART 4, MAY 2012 EDITION.

LIVE LOAD DISTRIBUTED TO BEAMS IS BASED UPON DM-4 DISTRIBUTION FACTORS.

DESIGN IS IN ACCORDANCE WITH THE LOAD AND RESISTANCE FACTOR DESIGN METHOD.

DESIGN LIVE LOADS

PHL-93 OR P-82 [204 KIPS PERMIT LOAD]

DEAD LOADS

INCLUDES SURFACE AREA DENSITY OF 30 LBS./SQ. FT. FOR FUTURE WEARING SURFACE ON THE DECK.

GENERAL

PROVIDE MATERIALS AND WORKMANSHIP IN ACCORDANCE WITH SPECIFICATIONS, PUBLICATION 408, AASHTO/AWS/D1.5 BRIDGE WELDING CODE, AND CONTRACT SPECIAL PROVISIONS.

NOTIFY THE REGIONAL HEADQUARTERS OF THE FISH COMMISSION PRIOR TO CONSTRUCTION AND COOPERATE WITH FISH COMMISSION DURING CONSTRUCTION.

ALL DIMENSIONS SHOWN ARE HORIZONTAL UNLESS OTHERWISE NOTED.

SUPERSTRUCTURE DIMENSIONS SHOWN ARE FOR NORMAL TEMPERATURE OF 68°F.

SPREAD FOOTINGS MAY BE ORDERED BY THE ENGINEER TO BE AT ANY ELEVATION OR OF ANY DIMENSIONS NECESSARY TO PROVIDE A PROPER FOUNDATION.

CONCRETE

PROVIDE 2" CONCRETE COVER ON REINFORCEMENT BARS, EXCEPT AS NOTED.

USE CLASS A CEMENT CONCRETE IN ABUTMENTS BELOW BRIDGE SEAT, WINGWALLS, AND FOOTINGS.

USE CLASS AA CEMENT CONCRETE IN CHEEKWALLS.

A HIGHER CLASS CONCRETE MAY BE SUBSTITUTED FOR A LOWER CLASS CONCRETE AT NO ADDITIONAL COST TO THE DEPARTMENT.

PREPARE BEARING AREAS AS SPECIFIED IN PUBLICATION 408, SECTION 1001.3(K)9.

SET ANCHOR BOLTS TO TEMPLATE OR IN PREFORMED HOLES. DO NOT DRILL UNLESS SPECIFICALLY INDICATED ON PLANS. FILL THE PREFORMED HOLES WITH NON-SHRINK GROUT. FILL THE CLEARANCE BETWEEN ANCHOR BOLTS AND HOLES IN MASONRY PLATES WITH APPROVED NONHARDENING CAULKING COMPOUND CONFORMING TO PUBLICATION 408, SECTION 705.8.

PROVIDE GRADE 60 REINFORCING STEEL BARS THAT MEET THE REQUIREMENTS OF ASTM A 615/A 615M, A 996/A 996M, AND A 706/A 706M. DO NOT WELD GRADE 60 REINFORCING STEEL BARS UNLESS SPECIFIED. GRADE 40 REINFORCING STEEL BARS MAY BE SUBSTITUTED WITH A PROPORTIONAL INCREASE IN CROSS-SECTIONAL AREA, IF APPROVED BY THE CHIEF BRIDGE ENGINEER. DO NOT USE RAIL STEEL A 996/A 996M REINFORCEMENT BARS IN BRIDGE PIERS, ABUTMENTS, SHEAR BLOCKS, BEAMS, FOOTINGS, PILES, BARRIERS AND WHERE BENDING OR WELDING OF THE REINFORCEMENT BARS IS INDICATED.

EPOXY-COAT SUBSTRUCTURE REINFORCEMENT BARS AS INDICATED.

GALVANIZED REINFORCING STEEL BARS MAY BE SUBSTITUTED FOR EPOXY-COATED STEEL BARS AT NO ADDITIONAL COST TO THE DEPARTMENT.

RAKE-FINISH ALL HORIZONTAL CONSTRUCTION JOINTS, EXCEPT AS INDICATED.

PLACE CHEEKWALL CONCRETE AFTER BEAMS ARE SET IN POSITION.

CHAMFER EXPOSED CONCRETE EDGES 1" BY 1", EXCEPT AS NOTED.

PROVIDE MINIMUM LAP AND EMBEDMENT LENGTH OF 30 DIAMETERS OR IN ACCORDANCE WITH A5.11 AND D5.11, WHICHEVER IS GREATER.

STEEL

GALVANIZE ALL TIMBER CONNECTION HARDWARE AS SPECIFIED IN PUBLICATION 408, SECTION 1105.02(s).

PROVIDE STRUCTURAL STEEL CONFORMING TO AASHTO M 270/M 270M, GRADE 36 (ASTM A 709/A 709M, GRADE 36J DESIGNATION, EXCEPT WHEN NOTED OTHERWISE.

PROVIDE BOLTS AND LAG SCREWS CONFORMING TO ASTM A 307 DESIGNATION, EXCEPT WHEN NOTED OTHERWISE.

PROVIDE BOLTS, NUTS, AND WASHERS IN ACCORDANCE WITH AASHTO LRFD BRIDGE DESIGN SPECIFICATION AND AS SUPPLEMENTED BY DESIGN MANUAL PART 4, SECTION 6.4.3.

PROVIDE MALLEABLE IRON WASHER CONFORMING TO ASTM A 47/A 47M, GRADE 3500.

PROVIDE LAG SCREWS CONFORMING TO ANSI B18.2.1 - 1981.

UTILITIES

COORDINATE THE REQUIREMENTS FOR PROTECTION AND/OR RELOCATION OF UTILITIES WITH THE UTILITY OWNER PRIOR TO STARTING WORK.

VERIFY AND LOCATE ALL EXISTING UTILITIES PRIOR TO STARTING WORK; CONDUCT OPERATIONS IN A MANNER WHICH ENSURES THAT THE UTILITIES WILL NOT BE DISTURBED OR ENDANGERED, AND ASSUME FULL RESPONSIBILITY FOR ANY DAMAGE TO UTILITIES DURING CONSTRUCTION. THE DEPARTMENT DOES NOT ASSUME RESPONSIBILITY FOR REIMBURSEMENT, PARTICIPATION IN DESIGN AND/OR REVISIONS, OR LIABILITY FOR ACCURACY OF TYPE, SIZE, AND LOCATION OF ANY UTILITY.

GENERAL NOTES CONTINUED:

TIMBER

USE ONLY GLUE LAMINATED TIMBER FABRICATED WITH EITHER NORTHERN RED OAK, RED MAPLE OR YELLOW POPLAR LUMBER GRADED PER NORTHEASTERN LUMBER MANUFACTURER'S ASSOCIATION (NORTHERN RED OAK AND RED MAPLE) OR NORTHERN SOFTWOOD LUMBER BUREAU (YELLOW POPLAR) STANDARDS AND MANUFACTURED FOLLOWING AITC 119-96 OR CURRENT SPECIFICATIONS.

PROVIDE MINIMUM WET-USE BASE RESISTANCES AND MOE VALUES IN ACCORDANCE WITH BLC-560M SHEET 3.

TREAT ALL LUMBER AND GLULAM COMPONENTS WITH OIL-BORNE PRESERVATIVE(S) IN ACCORDANCE WITH PENNDOT PUBLICATION 408.

FIELD CUTTING IS NOT PERMITTED UNLESS APPROVED BY THE ENGINEER.

WHEN FIELD CUTTING, TREAT WITH BITUMINOUS ASPHALT BASED ROOF CEMENT, COPPER NAPHTHENATE PASTE, OR APPROVED PRESERVATIVE SYSTEM.

ALWAYS COAT LAG SCREW THREADS WITH BITUMINOUS ASPHALT BASED ROOF CEMENT, COPPER NAPHTHENATE PASTE, OR APPROVED PRESERVATIVE SYSTEM BEFORE INSTALLING LAG SCREW.

DO NOT DRIVE LAG SCREW WITH HAMMER. SCREW OR TORQUE LAG SCREWS.

PROVIDE SUFFICIENT LAG SCREW LENGTH SO LAG SCREW SHANK WILL PENETRATE RECEIVING MEMBER.

SUBMIT SHOP DRAWINGS SHOWING DETAILS OF ALL GLULAM CONSTRUCTION FOR APPROVAL TO THE ENGINEER PRIOR TO FABRICATION OPERATIONS.

ALL TIMBER DIMENSIONS SHOWN ARE ACTUAL.

~~PILES~~

~~DO NOT PERMIT SPLICES IN PILES.~~

~~PROVIDE PILES IN ACCORDANCE WITH BLC-560M SHEET 3.~~

~~PILE SUPPORTED TIMBER SILLS~~

~~THE SUPERSTRUCTURE MUST BE IN PLACE AND CONNECTED TO SUBSTRUCTURE BEFORE ABUTMENTS ARE BACKFILLED.~~

~~BACKFILL BOTH ABUTMENTS CONCURRENTLY. MAINTAIN SYMMETRICAL LOADING.~~

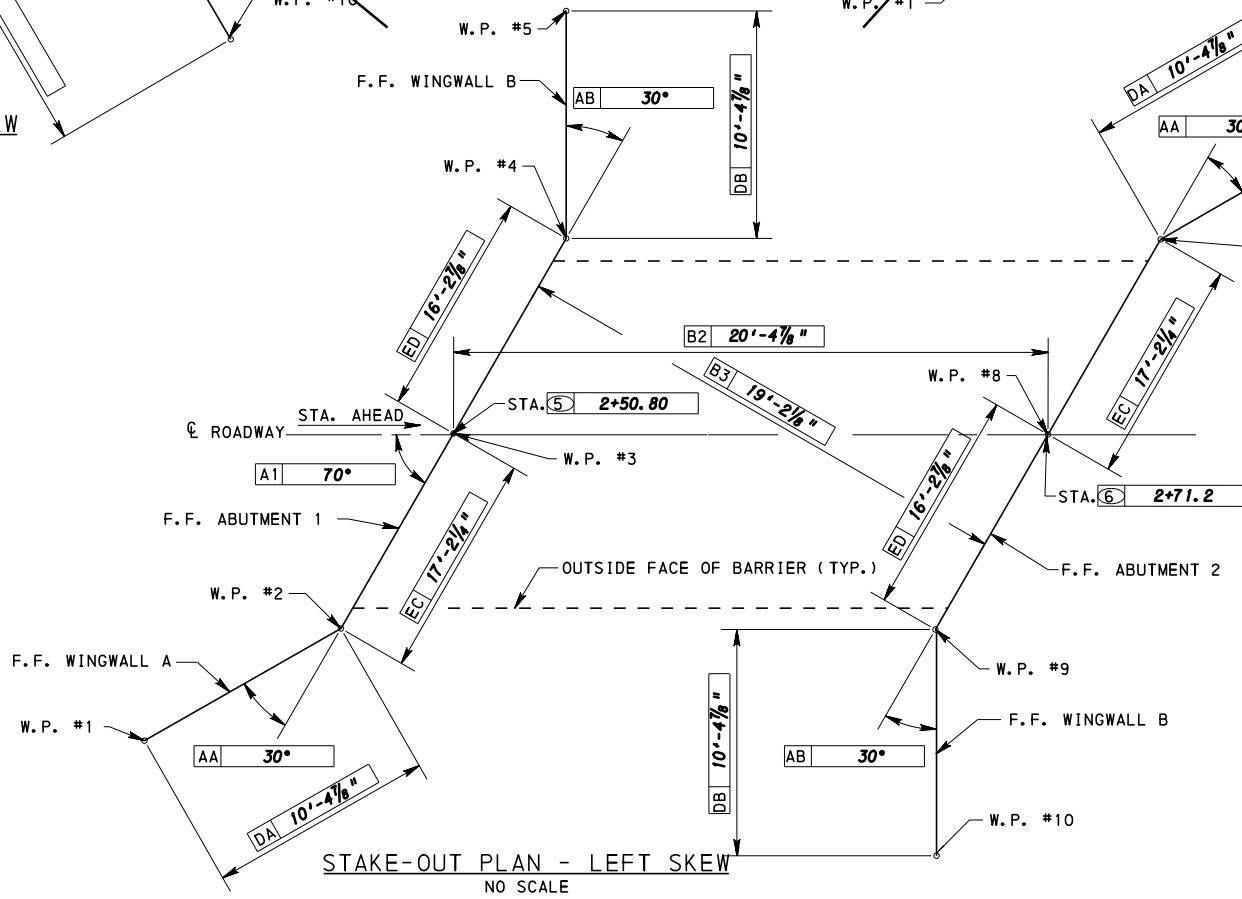
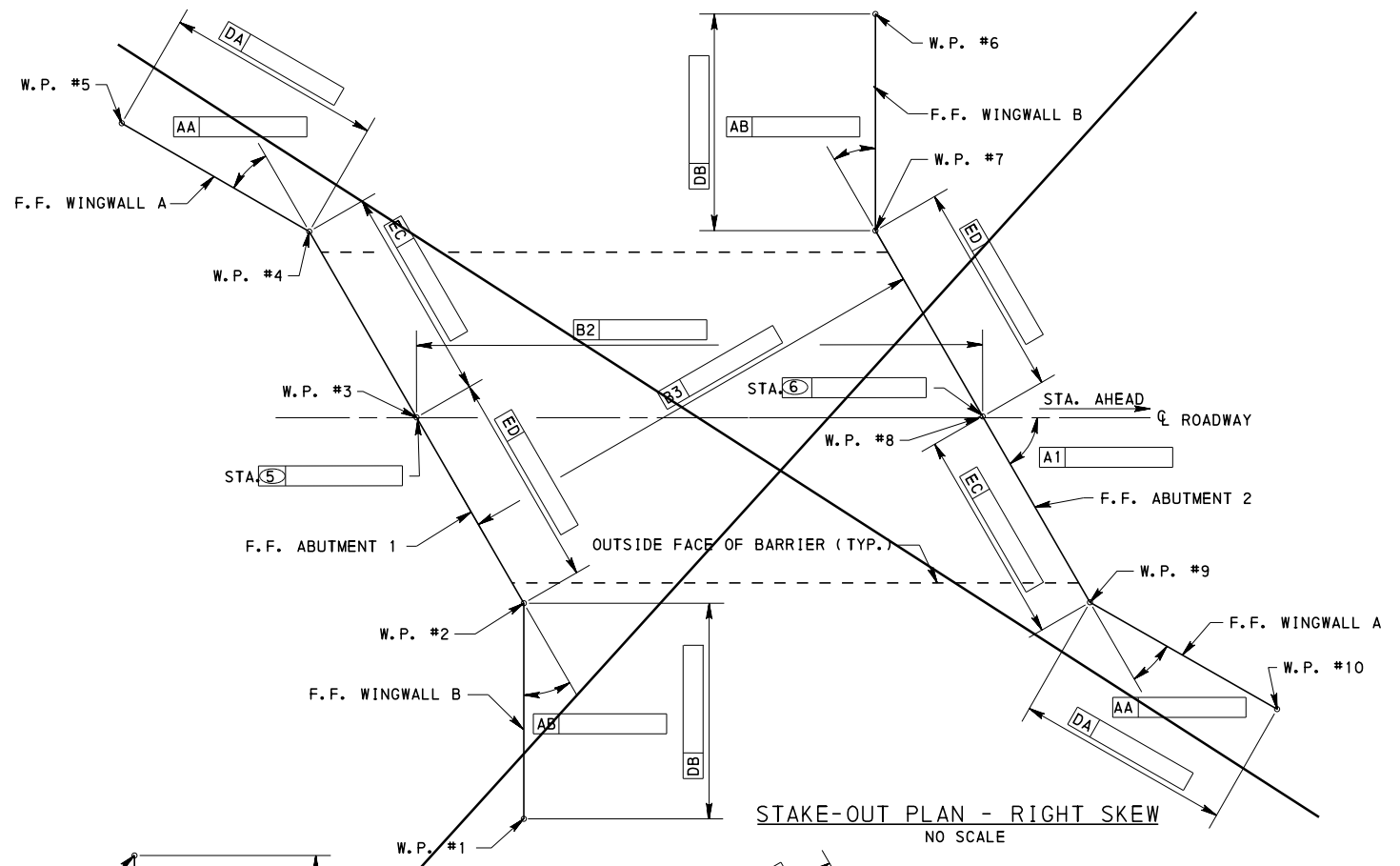
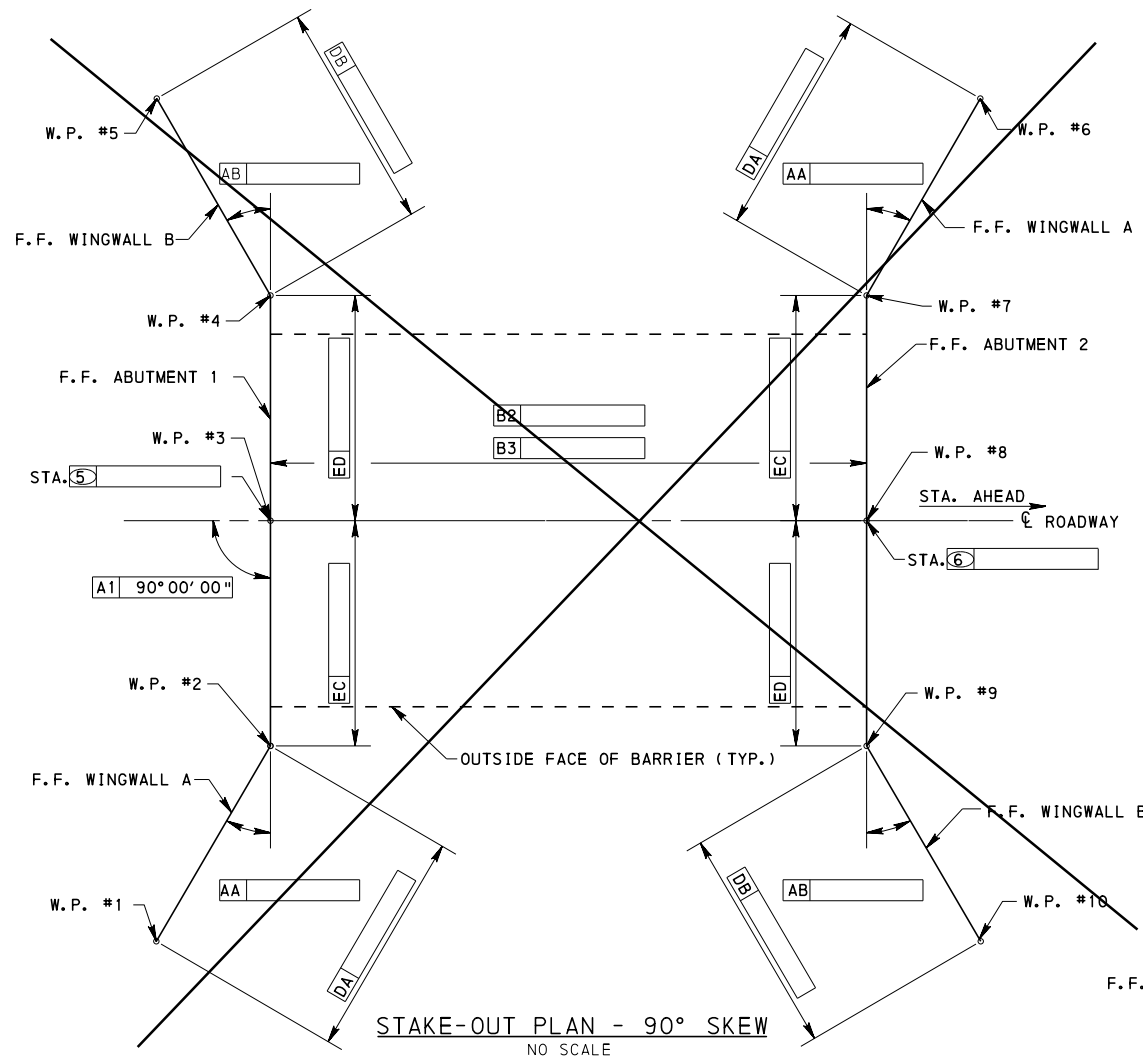
Mark	Description	By	Chk'd	Rec'd	Date
REVISIONS					

S-00001 SHEET 3 OF 24

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

DESIGN EXAMPLE
22'-0" SPAN
GLULAM
LONGITUDINAL PANEL SUPERSTRUCTURE
GENERAL NOTES

RECOMMENDED APR. 23, 2013 Thomas P. Macieira CHIEF BRIDGE ENGINEER	RECOMMENDED APR. 23, 2013 [Signature] ACTING DIR. BUR. OF PROJECT DELIVERY	SHEET 5 OF 9 BLC-563M
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NOTE:
F.F. DENOTES FRONT FACE.

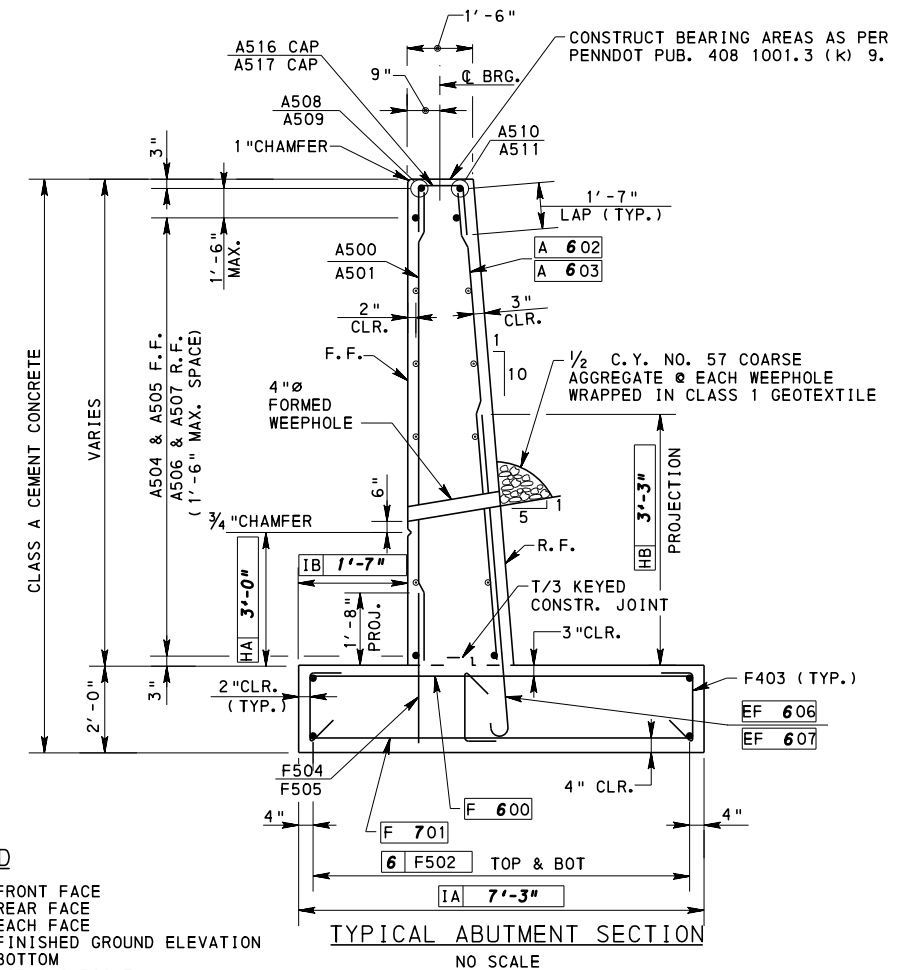
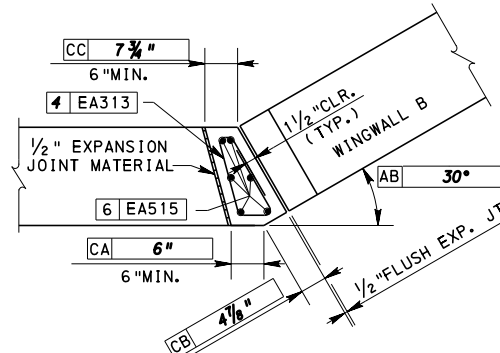
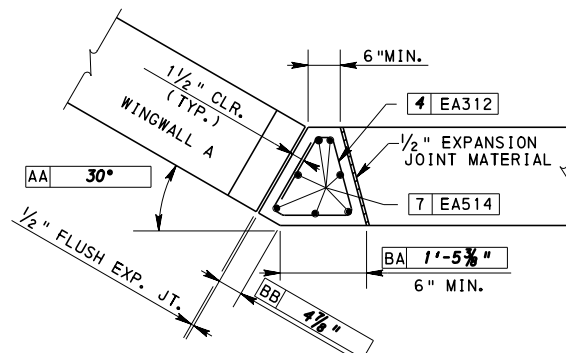
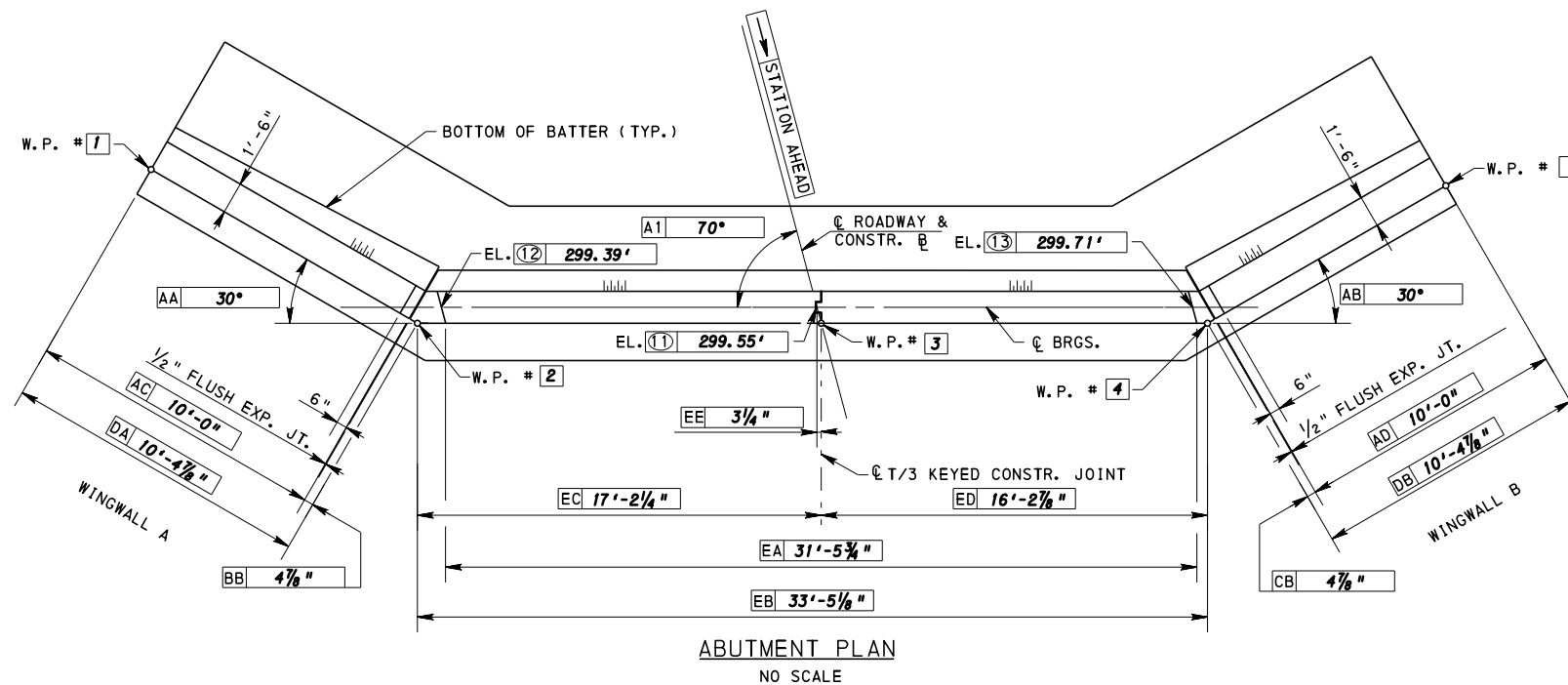
Mark	Description	By	Chk'd	Rec'd	Date
REVISIONS					

S-00001 SHEET 4 OF 24

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

DESIGN EXAMPLE
22'-0" SPAN
SHEETS COMMON TO
BLC 562M, 563M, & 564M
STAKE-OUT PLAN

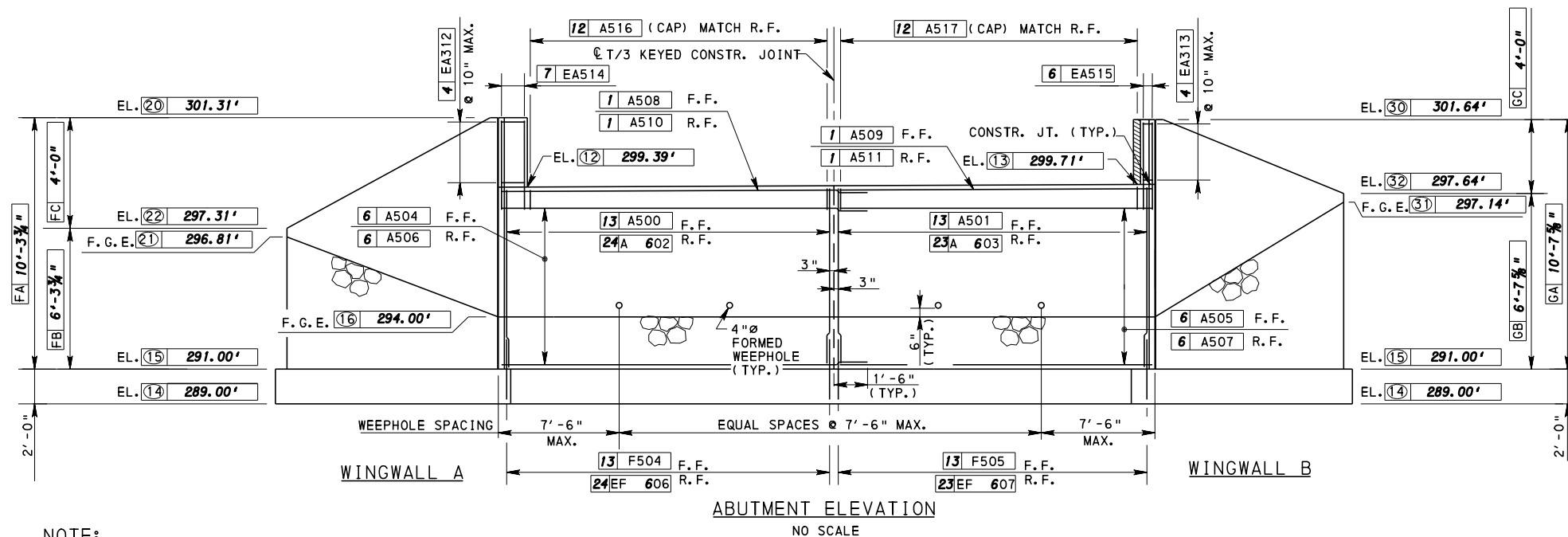
RECOMMENDED APR. 23, 2013 <i>Thomas P. Macieira</i> CHIEF BRIDGE ENGINEER	RECOMMENDED APR. 23, 2013 <i>David A. Kelly</i> ACTING DIR. BUR. OF PROJECT DELIVERY	SHEET 2 OF 3 BLC-565M
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LEGEND

F.F. DENOTES FRONT FACE
R.F. DENOTES REAR FACE
E.F. DENOTES EACH FACE
F.G.E. DENOTES FINISHED GROUND ELEVATION
BOT. DENOTES BOTTOM
W.P. DENOTES WORKING POINT
EQ. SPA. DENOTES EQUAL SPACE

- NOTES:**
- FOR GENERAL NOTES, SEE SHEET 3
 - FOR LOCATION OF ABUTMENT SEE STAKE-OUT SKETCH, SHEET 4
 - FOR ABUTMENT 1 FOOTING PLAN SEE SHEET 6
 - FOR ABUTMENT 1 BAR SCHEDULE, SEE SHEET 7
 - MAX. ALLOWABLE FOUNDATION PRESSURE = 8 kip/FT²
 - MAX DESIGN FOUNDATION PRESSURE = 7.37 kip/FT²



NOTE:
SEE BC-788M FOR ABUTMENT AND WINGWALL WATERPROOFING DETAIL.

Mark	Description	By	Chk'd	Rec'd	Date
REVISIONS					

S-00001 SHEET 5 OF 24

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

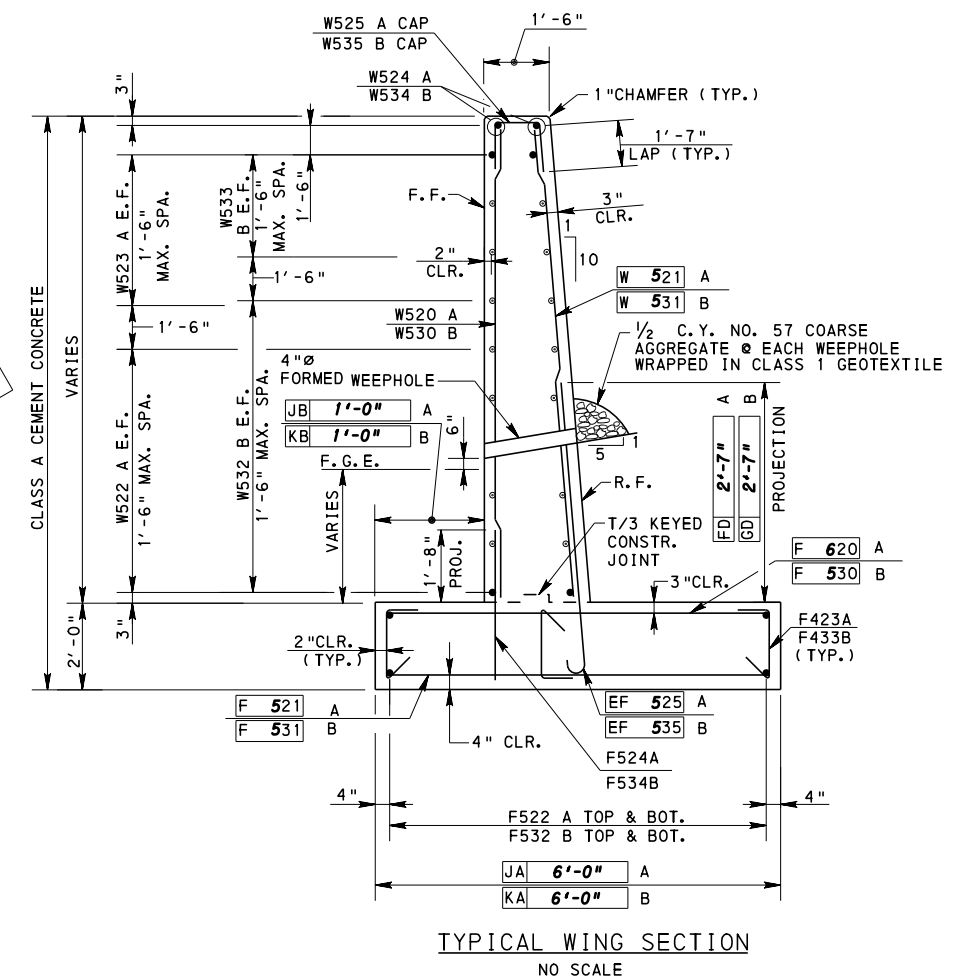
DESIGN EXAMPLE
22'-0" SPAN

SPREAD FOOTING ABUTMENT
ABUTMENT 1 - LEFT SKEW

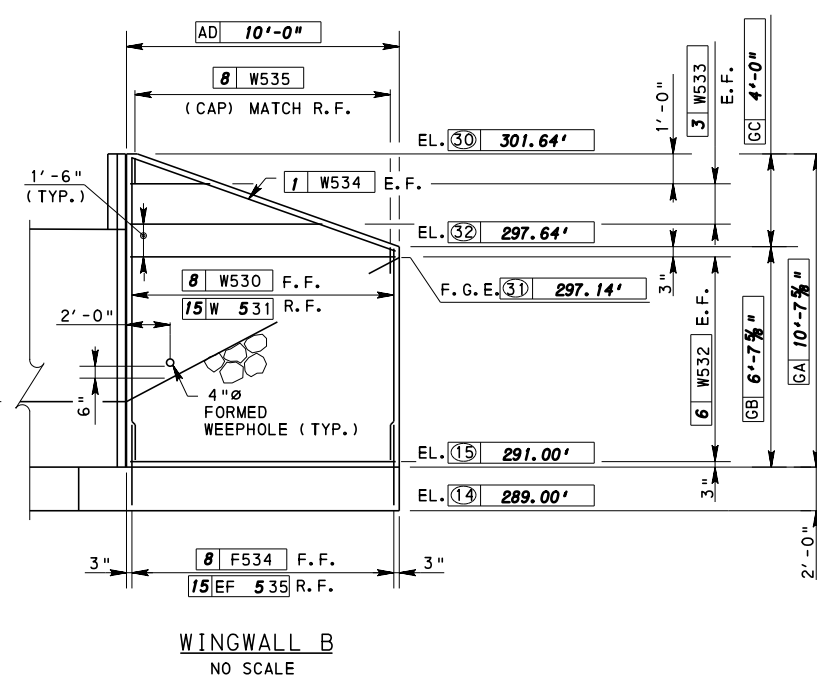
RECOMMENDED APR. 23, 2013
Thomas P. Macieira
CHIEF BRIDGE ENGINEER

RECOMMENDED APR. 23, 2013
David P. Kelly
ACTING DIR. BUR. OF PROJECT DELIVERY

SHEET 1 OF 7
BLC-566M



- FOR GENERAL NOTES, SEE SHEET 3
- FOR LOCATION OF WINGWALLS
SEE STAKE-OUT SKETCH, SHEET 4
- FOR ABUTMENT 1, SEE SHEET 5
- FOR ABUTMENT 1 BAR SCHEDULE, SEE SHEET 7
- MAX. ALLOWABLE FOUNDATION PRESSURE = 8 kip/ft.²
- MAX DESIGN FOUNDATION PRESSURE = WING A = 6.25 kip/ft.²
WING B = 6.33 kip/ft.²



SEE BC-788M FOR ABUTMENT AND WINGWALL WATERPROOFING DETAIL.

Mark	Description	By	Chk'd	Recm'd	Date
REVISIONS					

S- 00001	SHEET <u>6</u> OF <u>24</u>
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COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

DESIGN EXAMPLE
22'-0" SPAN

SPREAD FOOTING ABUTMENT
ABUTMENT 1 - FTG. PLAN - LEFT SKEW

RECOMMENDED APR. 23, 2013
Thomas P. Macieira
 CHIEF BRIDGE ENGINEER

RECOMMENDED APR. 23, 2013
 ACTING DIR. BUR. OF PROJECT DELIVERY

SHEET 4 OF 7

LC-566M

REINFORCEMENT BAR SCHEDULE*																	
MARK	SIZE	LENGTH	NO.	TYPE	A	B	C	D	E	F	G	H	J	K	R	REMARKS	
A500	5	8'-2 5/8" TO 8'-4 5/8"	13	STR.													VARY EA. BY 1/8"
A501	5	8'-4 5/8" TO 8'-6 1/2"	13	STR.													VARY EA. BY 1/8"
A_6_02	6	8'-2 5/8" TO 8'-4 5/8"	24	STR.													VARY EA. BY 1/8"
A_6_03	6	8'-4 5/8" TO 8'-6 1/2"	23	STR.													VARY EA. BY 1/8"
A504	5	18'-11 1/4"	6	STR.													
A505	5	16'-0 5/8"	6	STR.													
A506	5	18'-4 5/8"	6	STR.													
A507	5	15'-6"	6	STR.													
A508	5	18'-11 1/4"	1	STR.													
A509	5	16'-0 5/8"	1	STR.													
A510	5	18'-4 5/8"	1	STR.													
A511	5	15'-6"	1	STR.													
EA312	3	5'-2"	4	STR.													BEND IN FIELD
EA313	3	4'-4 5/8"	4	STR.													BEND IN FIELD
EA514	5	3'-5"	7	STR.													
EA515	5	3'-5 5/8"	6	STR.													
A516	5	4'-3"	12	③	1'-7"	1'-1"	1'-7"								2"		
A517	5	4'-3"	12	③	1'-7"	1'-1"	1'-7"								2"		
A518	5	1'-0"	32	STR.													
W520	5	6'-1 3/4" TO 10'-1 3/4"	8	STR.													VARY EA. BY 6"
W_5_21	5	6'-1 3/4" TO 10'-1 3/4"	15	STR.													VARY EA. BY 3 1/4"
W522	5	9'-8"	6	STR.													
W523	5	6'-7 3/4" TO 2'-5"	3	STR.													VARY 2 EA. BY 1'-4 7/8"
W524	5	10'-5 1/4"	2	STR.													
W525	5	4'-3"	8	③	1'-7"	1'-1"	1'-7"								2"		
W526	5	1'-0"	8	STR.													
W530	5	6'-5 5/8" TO 10'-5 5/8"	8	STR.													VARY EA. BY 6"
W_5_31	5	6'-5 5/8" TO 10'-5 5/8"	15	STR.													VARY EA. BY 3 1/4"
W532	5	9'-8"	6	STR.													
W533	5	6'-7 3/4" TO 2'-5"	3	STR.													VARY 2 EA. BY 1'-4 7/8"
W534	5	10'-5 1/4"	2	STR.													
W535	5	4'-3"	8	③	1'-7"	1'-1"	1'-7"								2"		
W536	5	1'-0"	8	STR.													
F_6_00	6	6'-7"	44	STR.													
F_7_01	7	6'-7"	44	STR.													
F502	5	31'-3 5/8"	6	STR.													
F403	4	2'-3"	48	②	4 1/2"	1'-6"	4 1/2"					3"					
F504	5	3'-6"	13	STR.													
F505	5	3'-6"	13	STR.													
EF_6_06	6	5'-7"	24	①	8"	4'-11"								6"			
EF_6_07	6	5'-7"	23	①	8"	4'-11"								6"			
F_6_20	6	5'-4"	17	STR.													
F_5_21	5	5'-4"	17	STR.													
F522	5	11'-2"	6	STR.													
F423	4	2'-3"	24	②	4 1/2"	1'-6"	4 1/2"					3"					
F524	5	3'-6"	8	STR.													
EF_5_25	5	4'-10"	15	①	7"	4'-3"								5"			
F_6_30	6	5'-4"	17	STR.													
F_5_31	5	5'-4"	17	STR.													
F532	5	11'-2"	6	STR.													
F433	4	2'-3"	24	②	4 1/2"	1'-6"	4 1/2"					3"					
F534	5	3'-6"	8	STR.													
EF_5_35	5	4'-10"	15	①	7"	4'-3"								5"			
BAR TYPE LEGEND STR. DENOTES A STRAIGHT BAR																	
* USE BLC-561M SHEETS 13 AND 14 TO COMPLETE BAR SCHEDULE INFORMATION.																	

Mark	Description	By	Chk'd	Rec'd	Date
REVISIONS					

S- 00001

SHEET 7 OF 24

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

DESIGN EXAMPLE
22'-0" SPAN

SPREAD FOOTING ABUTMENT
ABUTMENT 1 - BAR SCHEDULE

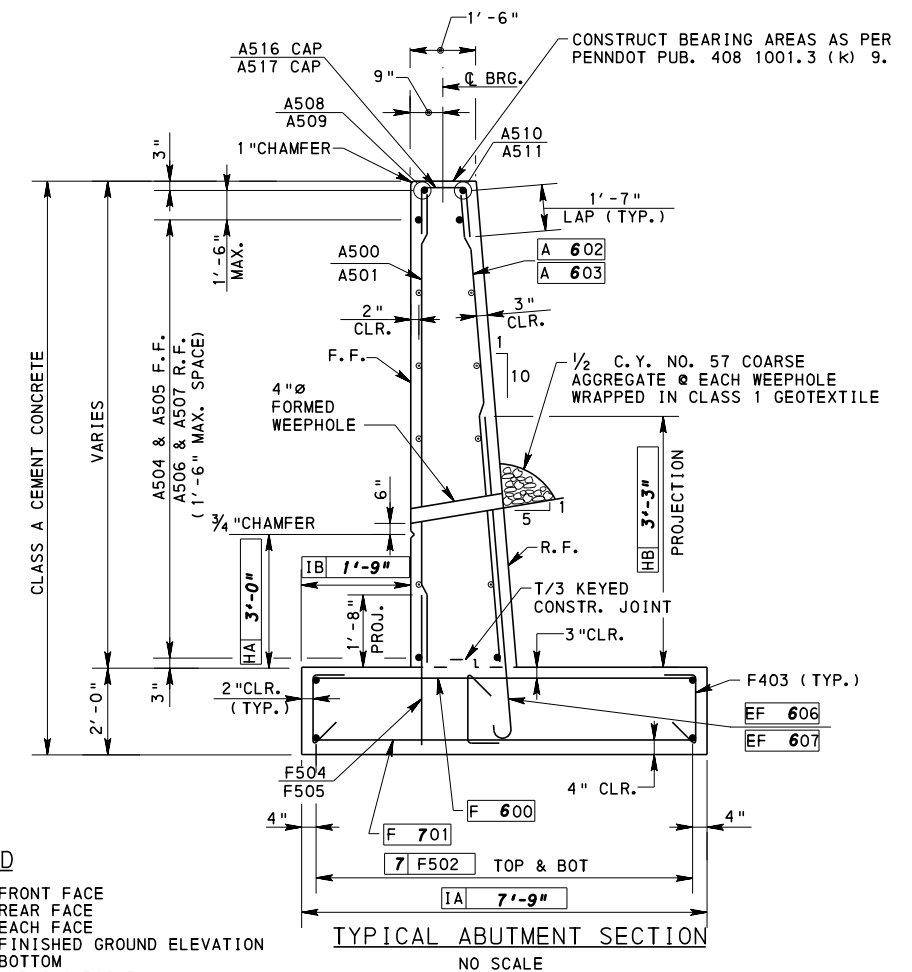
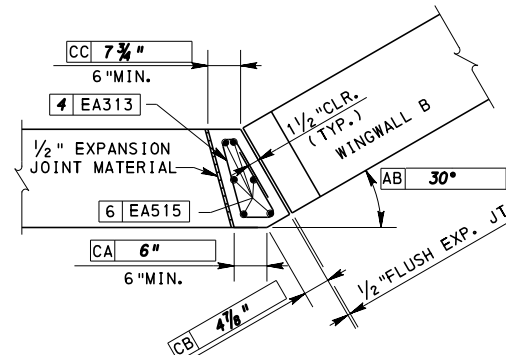
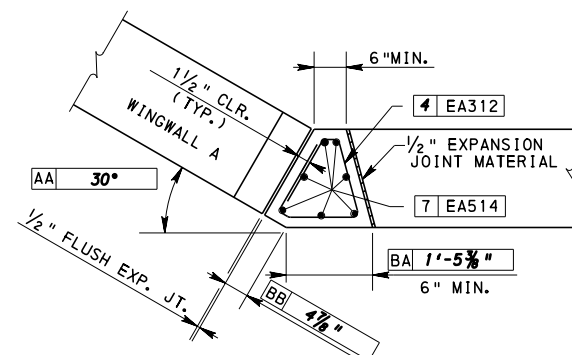
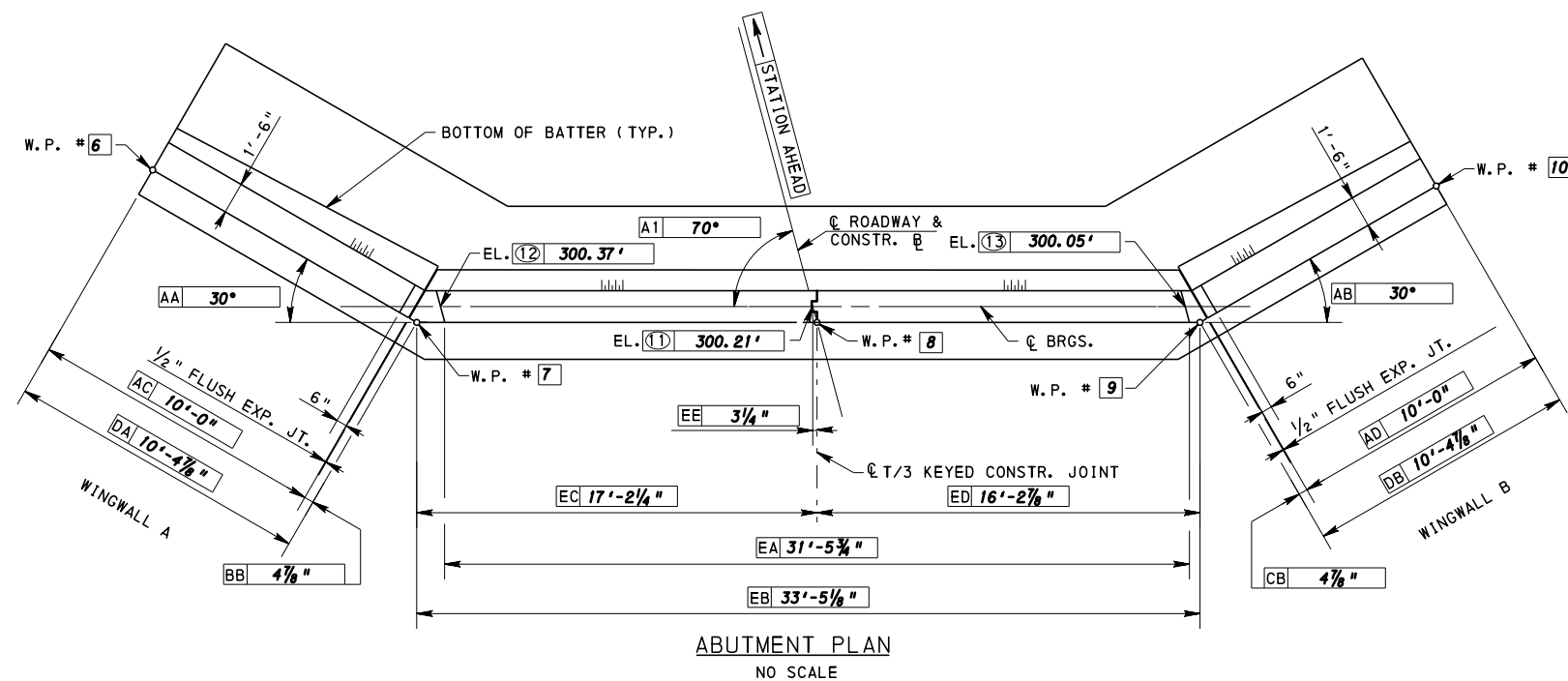
RECOMMENDED APR. 23, 2013

CHIEF BRIDGE ENGINEER

RECOMMENDED APR. 23, 2013

ACTING DIR. BUR. OF PROJECT DELIVERY

SHEET 7 OF 7
BLC-566M



LEGEND

F. F.	DENOTES	FRONT FACE	
R. F.	DENOTES	REAR FACE	
E. F.	DENOTES	EACH FACE	
F. G. E.	DENOTES	FINISHED GROUND ELEVATION	
BOT.	DENOTES	BOTTOM	
W. P.	DENOTES	WORKING POINT	
EQ. SPA.	DENOTES	EQUAL SPACE	

NOTES:

- FOR GENERAL NOTES, SEE SHEET 3
- FOR LOCATION OF ABUTMENT
SEE STAKE-OUT SKETCH, SHEET 4
- FOR ABUTMENT 2 FOOTING PLAN
SEE SHEET 9
- FOR ABUTMENT 2 BAR SCHEDULE, SEE SHEET 10
- MAX. ALLOWABLE FOUNDATION PRESSURE = 8.0 kip/FT²
- MAX DESIGN FOUNDATION PRESSURE = 7.40 kip/FT²

Mark	Description	By	Chk'd	Recm'd	Date
REVISIONS					

S- 00001	SHEET <u>8</u> OF <u>24</u>
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COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

DESIGN EXAMPLE
22'-0" SPAN

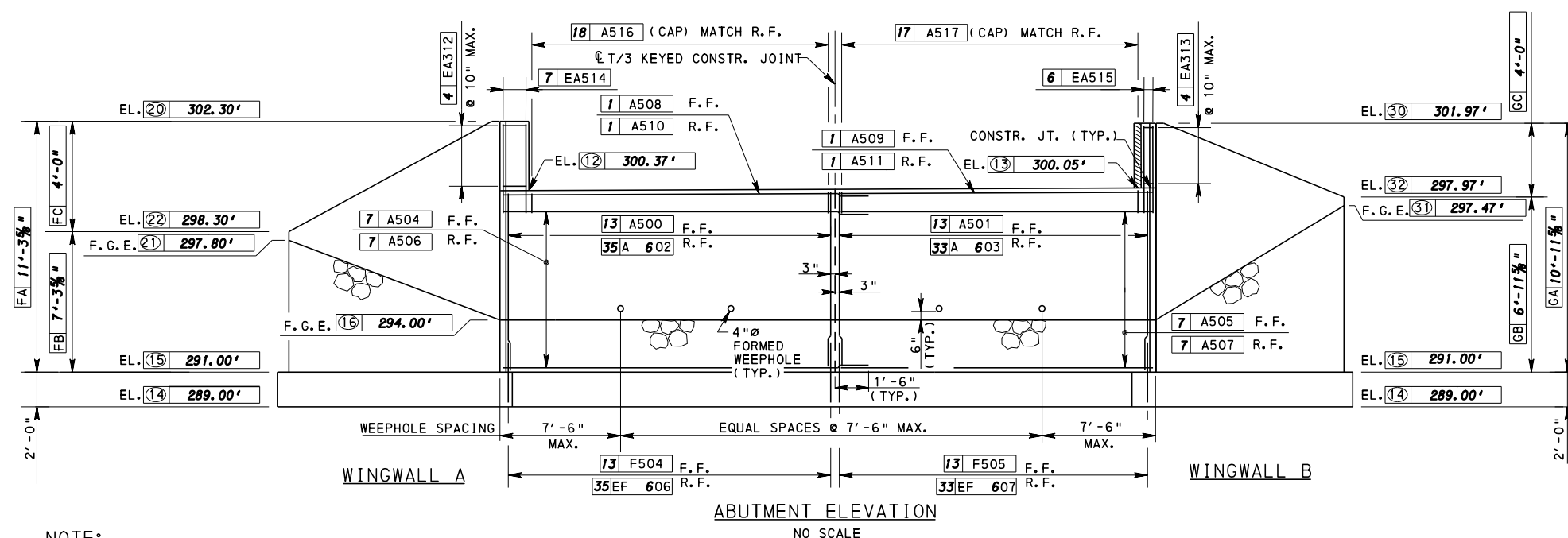
SPREAD FOOTING ABUTMENT
ABUTMENT 2 - LEFT SKEW

RECOMMENDED APR. 23, 2013
Thomas P. MacIsaac
 CHIEF BRIDGE ENGINEER

RECOMMENDED APR. 23, 2013
 ACTING DIR. BUR. OF PROJECT DELIVERY

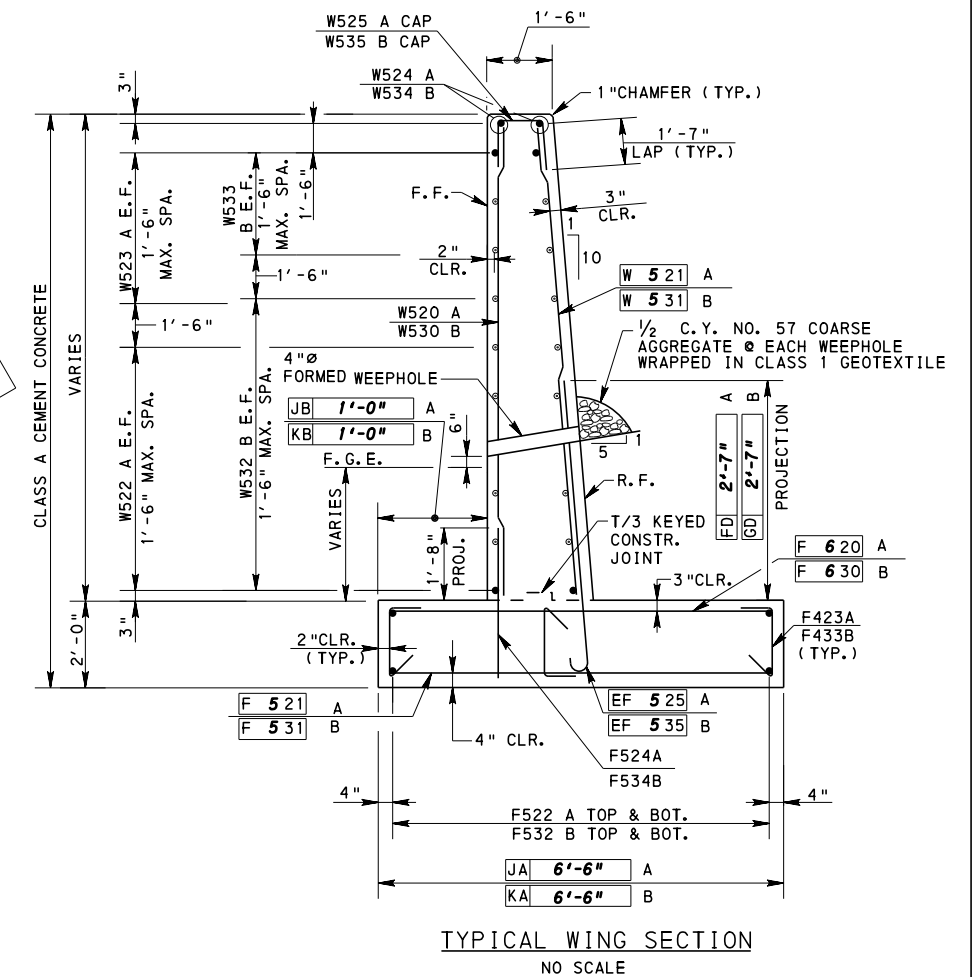
SHEET 1 OF 7

3LC-566M



NOTE:

SEE BC-788M FOR ABUTMENT AND WINGWALL WATERPROOFING DETAIL.



- FOR GENERAL NOTES, SEE SHEET 3
- FOR LOCATION OF WINGWALLS
SEE STAKE-OUT SKETCH, SHEET 4
- FOR ABUTMENT 2, SEE SHEET 8
- FOR ABUTMENT 2 BAR SCHEDULE, SEE SHEET 10
- MAX. ALLOWABLE FOUNDATION PRESSURE = 8 kip/ft.²
- MAX DESIGN FOUNDATION PRESSURE = WING A = 6.32 kip/ft.²
WING B = 6.55 kip/ft.²



Mark	Description	By	Chk' d	Recm' d	Date
REVISIONS					

S- 00001	SHEET <u>9</u> OF <u>24</u>
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**COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY**

DESIGN EXAMPLE
22'-0" SPAN

SPREAD FOOTING ABUTMENT
ABUTMENT 2 - FTG. PLAN - LEFT SKEW

RECOMMENDED APR. 23, 2013
Thomas P. Macias
 CHIEF BRIDGE ENGINEER

RECOMMENDED APR. 23, 2013
 ACTING DIR. BUR. OF PROJECT DELIVERY

SHEET 4 OF 7

LC-566M

REINFORCEMENT BAR SCHEDULE*																	
MARK	SIZE	LENGTH	NO.	TYPE	A	B	C	D	E	F	G	H	J	K	R	REMARKS	
A500	5	9'-2 3/8" TO 9'-0 1/2"	13	STR.													VARY EA. BY 1/8"
A501	5	9'-0 1/2" TO 8'-10 3/8"	13	STR.													VARY EA. BY 1/8"
A_6 02	6	9'-2 3/8" TO 9'-0 1/2"	35	STR.													VARY EA. BY 1/8"
A_6 03	6	9'-0 1/2" TO 8'-10 3/8"	33	STR.													VARY EA. BY 1/8"
A504	5	18'-11 1/4"	7	STR.													
A505	5	16'-0 1/8"	7	STR.													
A506	5	18'-4 3/8"	7	STR.													
A507	5	15'-6"	7	STR.													
A508	5	18'-11 1/4"	1	STR.													
A509	5	16'-0 1/8"	1	STR.													
A510	5	18'-4 3/8"	1	STR.													
A511	5	15'-6"	1	STR.													
EA312	3	5'-2"	4	STR.													BEND IN FIELD
EA313	3	4'-4 3/8"	4	STR.													BEND IN FIELD
EA514	5	3'-5 1/8"	7	STR.													
EA515	5	3'-5"	6	STR.													
A516	5	4'-3"	18	③	1'-7"	1'-1"	1'-7"								2"		
A517	5	4'-3"	17	③	1'-7"	1'-1"	1'-7"								2"		
A518	5	1'-0"	32	STR.													
W520	5	7'-1 3/8" TO 11'-1 3/8"	8	STR.													VARY EA. BY 6"
W_5 21	5	7'-1 3/8" TO 11'-1 3/8"	21	STR.													VARY EA. BY 2 1/4"
W522	5	9'-8"	7	STR.													
W523	5	6'-7 3/4" TO 2'-5"	3	STR.													VARY 2 EA. BY 1'-4 1/8"
W524	5	10'-5 1/4"	2	STR.													
W525	5	4'-3"	11	③	1'-7"	1'-1"	1'-7"								2"		
W526	5	1'-0"	8	STR.													
W530	5	6'-9 3/8" TO 10'-9 3/8"	8	STR.													VARY EA. BY 6"
W_5 31	5	6'-9 3/8" TO 10'-9 3/8"	21	STR.													VARY EA. BY 2 1/4"
W532	5	9'-8"	6	STR.													
W533	5	6'-7 3/4" TO 2'-5"	3	STR.													VARY 2 EA. BY 1'-4 1/8"
W534	5	10'-5 1/4"	2	STR.													
W535	5	4'-3"	11	③	1'-7"	1'-1"	1'-7"								2"		
W536	5	1'-0"	8	STR.													
F_6 00	6	7'-1"	43	STR.													
F_7 01	7	7'-1"	64	STR.													
F502	5	30'-8 3/8"	7	STR.													
F403	4	2'-3"	48	②	4 1/2"	1'-6"	4 1/2"						3"				
F504	5	3'-6"	13	STR.													
F505	5	3'-6"	13	STR.													
EF_6 06	6	5'-7"	35	①	8"	4'-11"								6"			
EF_6 07	6	5'-7"	33	①	8"	4'-11"								6"			
F_6 20	6	5'-10"	25	STR.													
F_5 21	5	5'-10"	25	STR.													
F522	5	11'-6"	6	STR.													
F423	4	2'-3"	24	②	4 1/2"	1'-6"	4 1/2"						3"				
F524	5	3'-6"	8	STR.													
EF_5 25	5	4'-10"	21	①	7"	4'-3"								5"			
F_6 30	6	5'-10"	25	STR.													
F_5 31	5	5'-10"	25	STR.													
F532	5	11'-6"	6	STR.													
F433	4	2'-3"	24	②	4 1/2"	1'-6"	4 1/2"						3"				
F534	5	3'-6"	8	STR.													
EF_5 35	5	4'-10"	21	①	7"	4'-3"								5"			
BAR TYPE LEGEND STR. DENOTES A STRAIGHT BAR																	
* USE BLC-561M SHEETS 13 AND 14 TO COMPLETE BAR SCHEDULE INFORMATION.																	

Mark	Description	By	Chk'd	Rec'd	Date
REVISIONS					

S- 00001

SHEET 10 OF 24

COMMONWEALTH OF PENNSYLVANIA

DEPARTMENT OF TRANSPORTATION

BUREAU OF PROJECT DELIVERY

DESIGN EXAMPLE

22'-0" SPAN

SPREAD FOOTING ABUTMENT

ABUTMENT 2 - BAR SCHEDULE

RECOMMENDED APR. 23, 2013

RECOMMENDED APR. 23, 2013

SHEET 7 OF 7

Thomas P. Macieira

ACTING DIR. BUR. OF PROJECT DELIVERY

BLC-566M

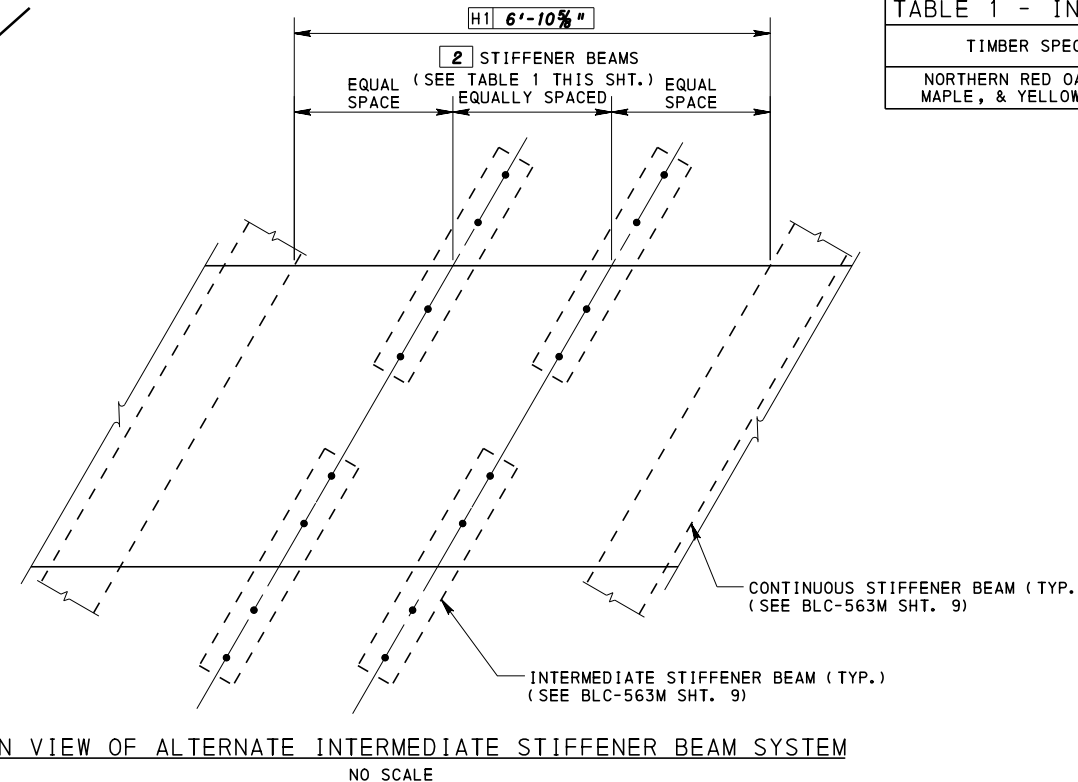
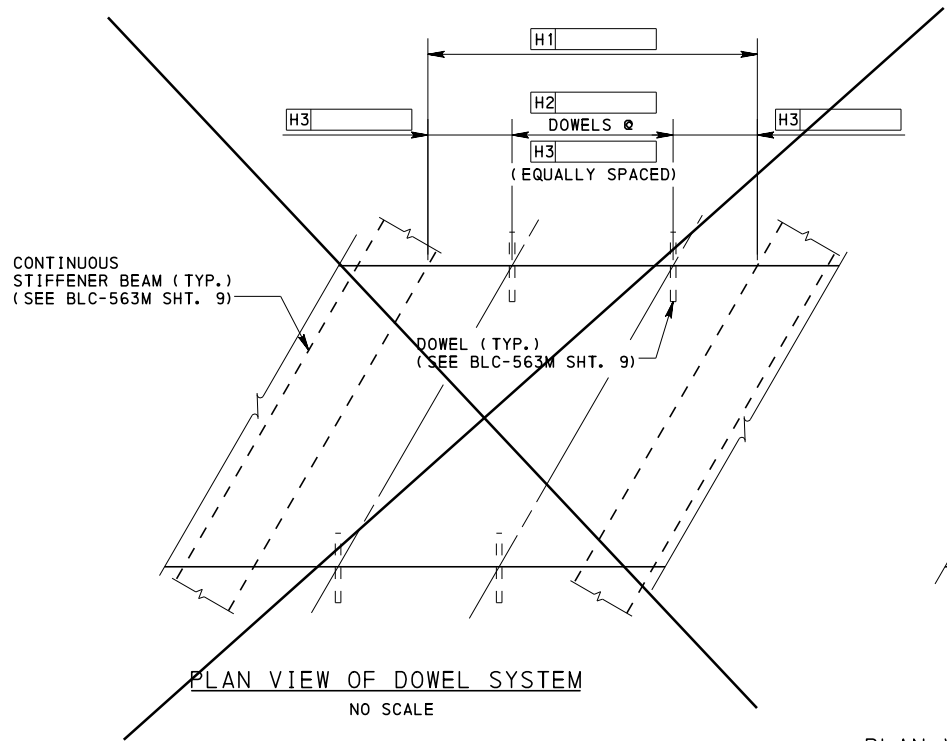
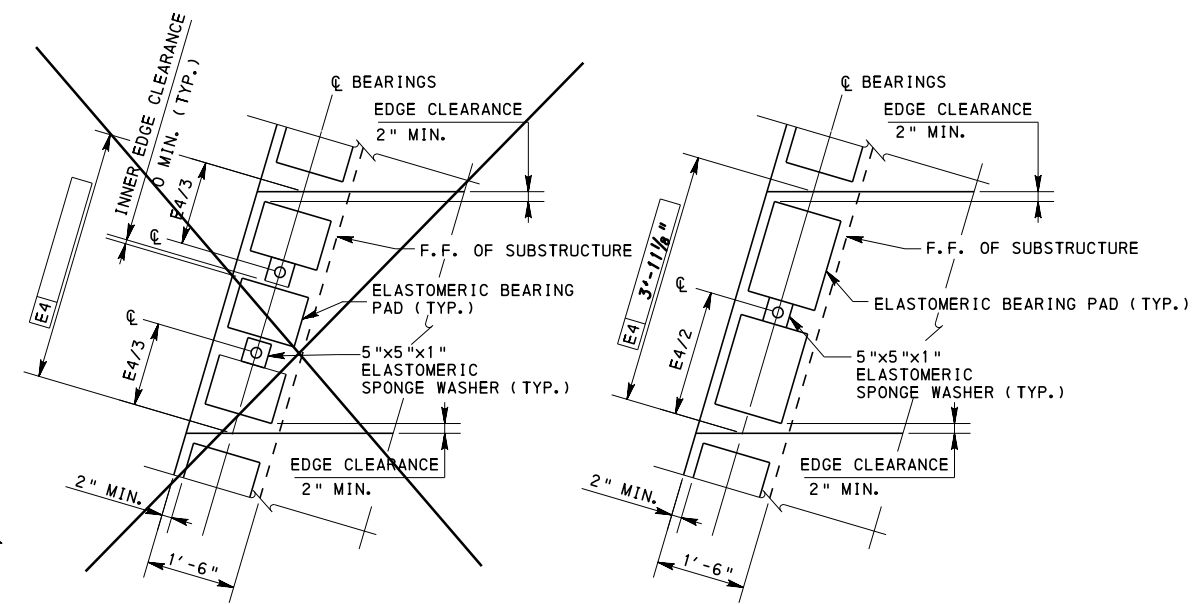
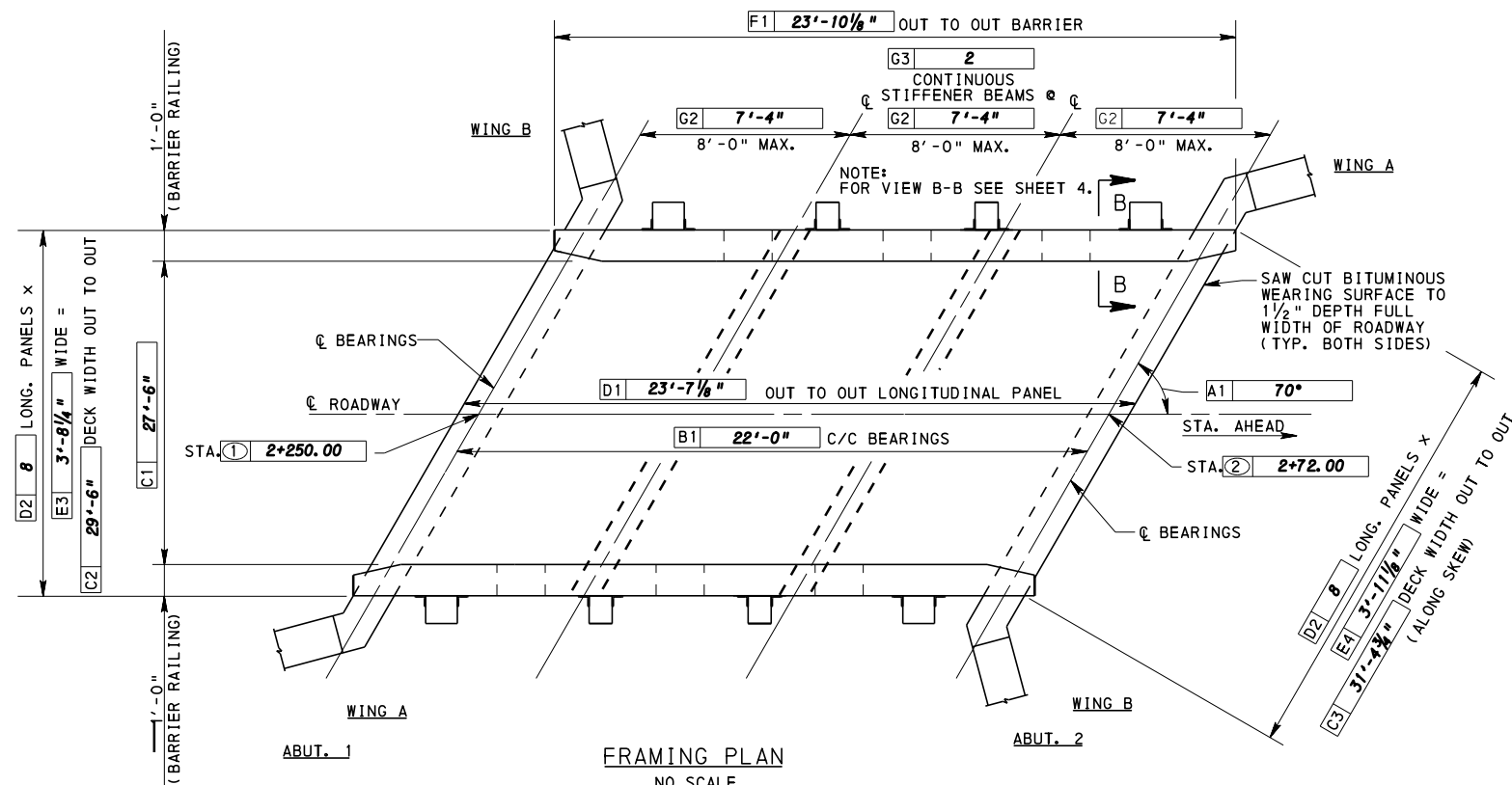


TABLE 1 - INTERMEDIATE STIFFENER BEAM DESIGN DATA		
TIMBER SPECIES	MAXIMUM DESIGN SPAN (H1)	NUMBER OF STIFFENER BEAMS
NORTHERN RED OAK, RED MAPLE, & YELLOW POPLAR	6'-0"	2
	10'-0"	3

Mark	Description	By	Chk'd	Rec'd	Date
REVISIONS					

S- 00001 SHEET 11 OF 24

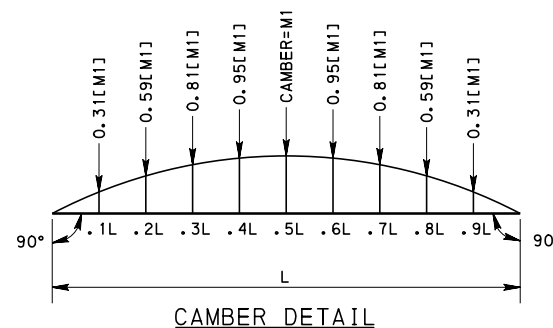
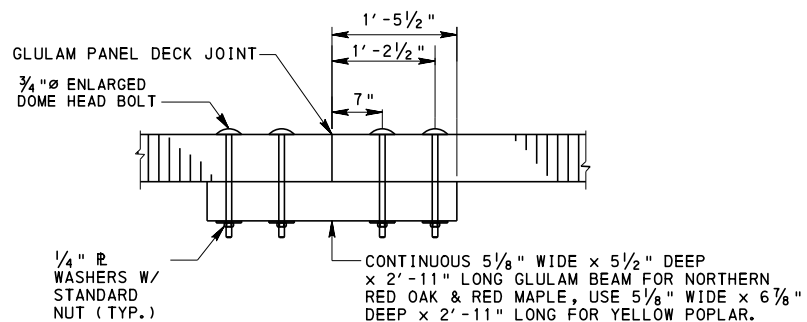
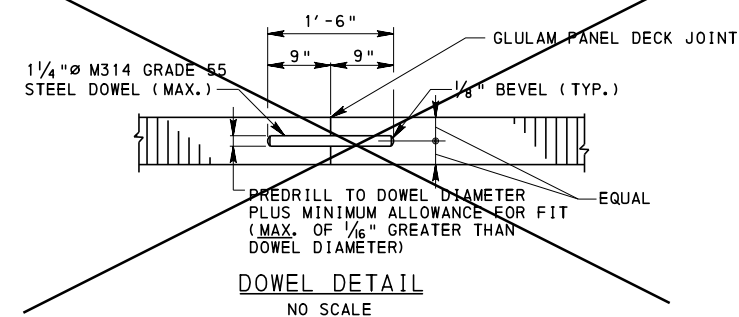
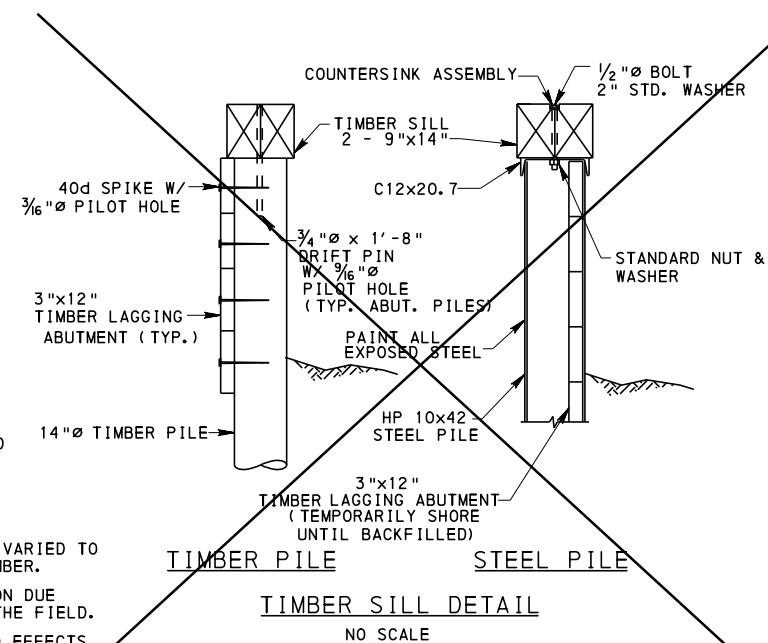
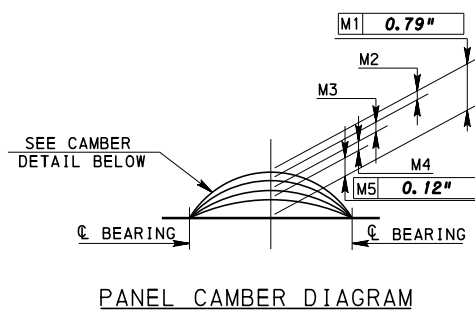
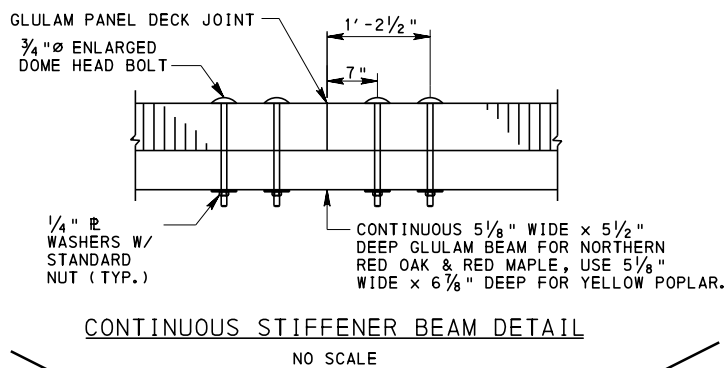
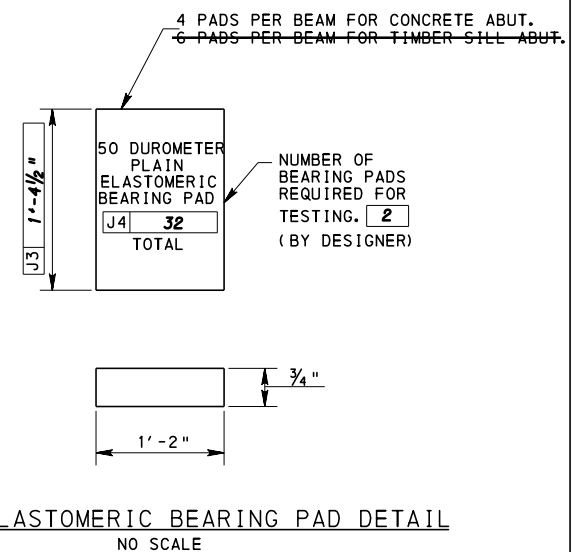
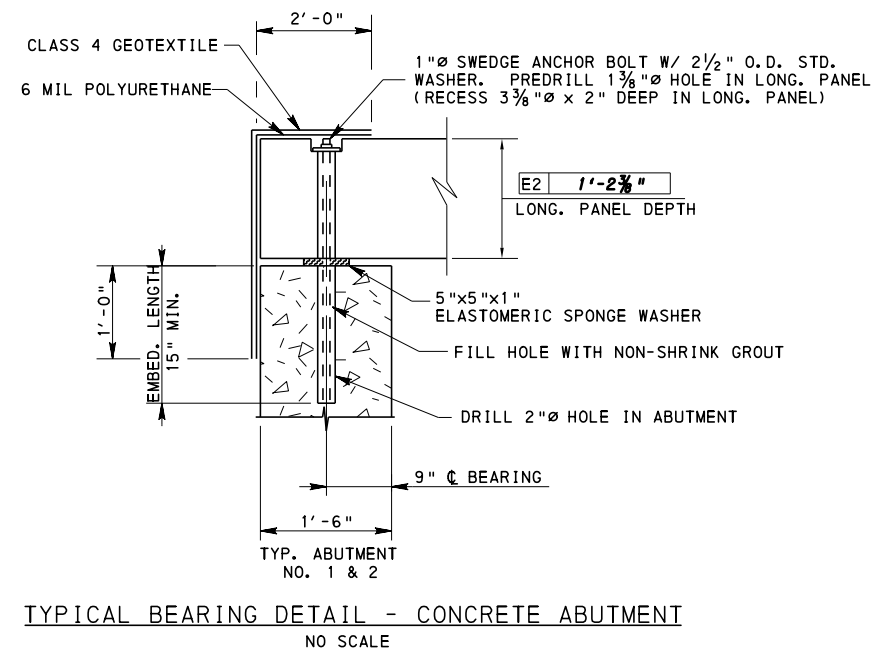
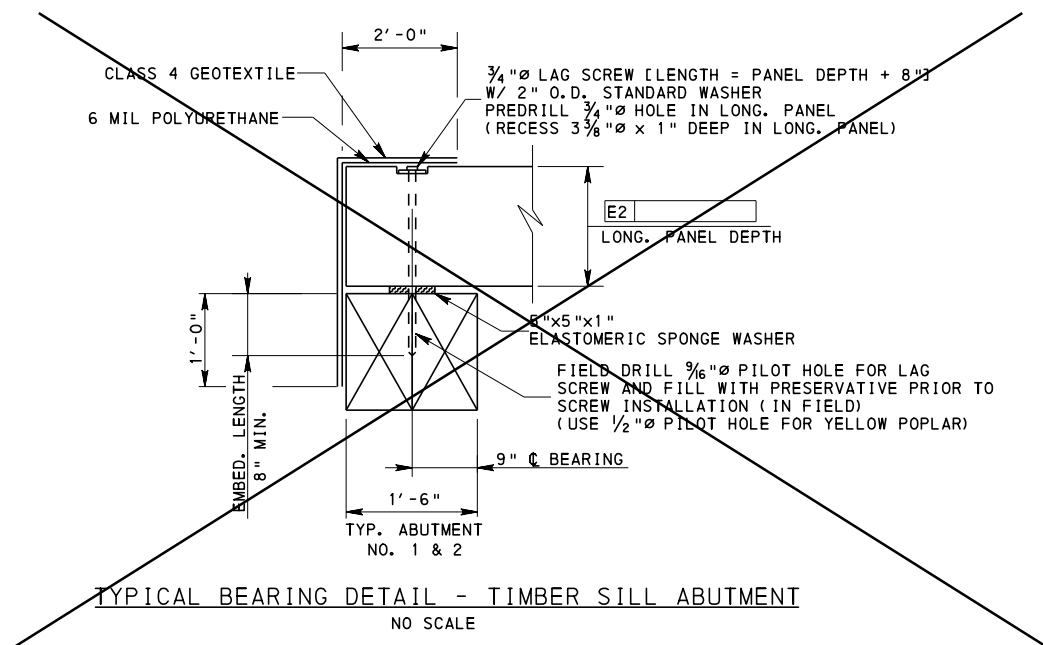
COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

DESIGN EXAMPLE
22'-0" SPAN
GLULAM
LONGITUDINAL PANEL SUPERSTRUCTURE
FRAMING PLAN - LEFT SKEW

RECOMMENDED APR. 23, 2013
 Thomas P. Maciver
 CHIEF BRIDGE ENGINEER

RECOMMENDED APR. 23, 2013
 [Signature]
 ACTING DIR. BUR. OF PROJECT DELIVERY

SHEET 6 OF 9
BLC-563M



- ### ELASTOMERIC BEARING PAD NOTES:

1. MANUFACTURE ALL BEARINGS IN ACCORDANCE WITH THE COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF TRANSPORTATION PLANS AND SPECIFICATIONS (PUB. 408) SECTION 1113 AND DM-4.
2. ALL BEARING PADS ARE TO BE MOLDED TO DESIGN DIMENSIONS. CUTTING TO SIZE AFTER FABRICATION IS PROHIBITED.
3. PROVIDE NEOPRENE 50 ± 5 DUROMETER.
4. VULCANIZE PATCH PIN GROOVES.

Mark	Description	By	Chk'd	Recm'd	Date
REVISIONS					

S- 00001	SHEET <u>12</u> OF <u>24</u>
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COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

DESIGN EXAMPLE
22'-0" SPAN

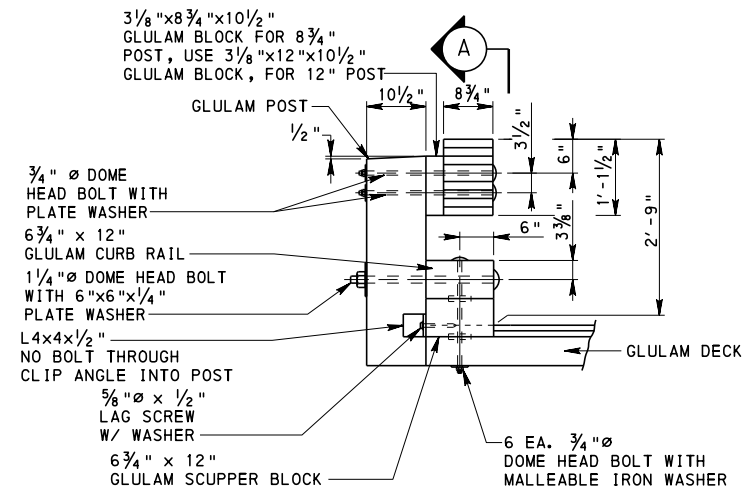
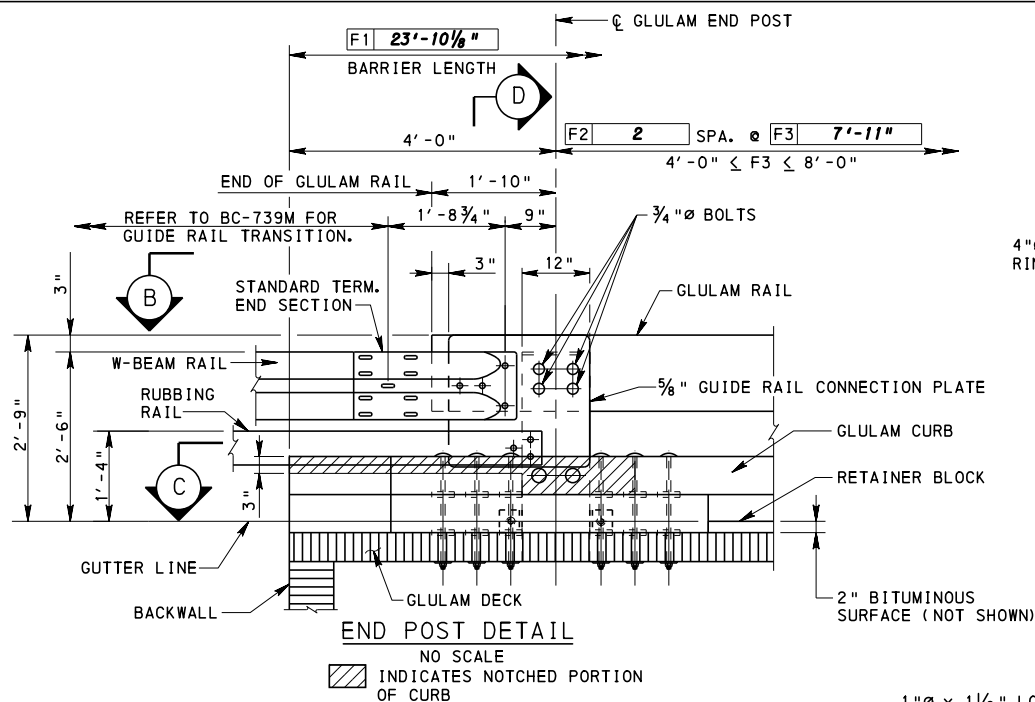
GLULAM
LONGITUDINAL PANEL SUPERSTRUCTURE
SUPERSTRUCTURE DETAILS

RECOMMENDED APR. 23, 2013
Thomas P. Macias
 CHIEF BRIDGE ENGINEER

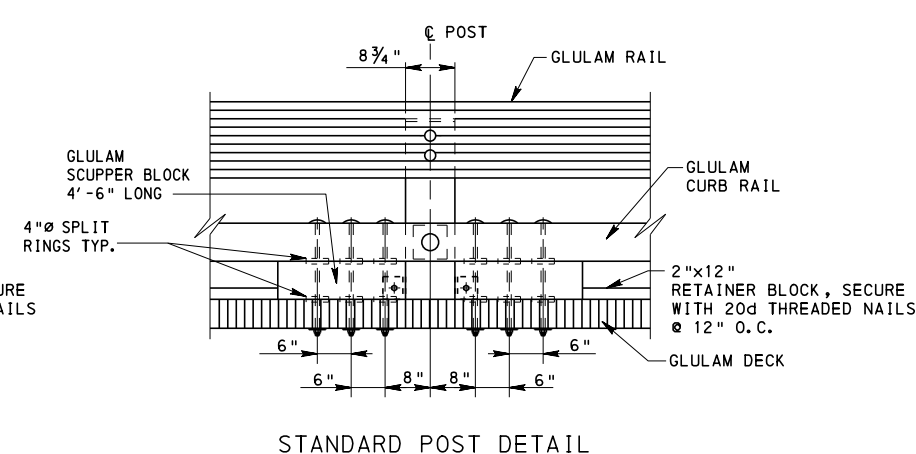
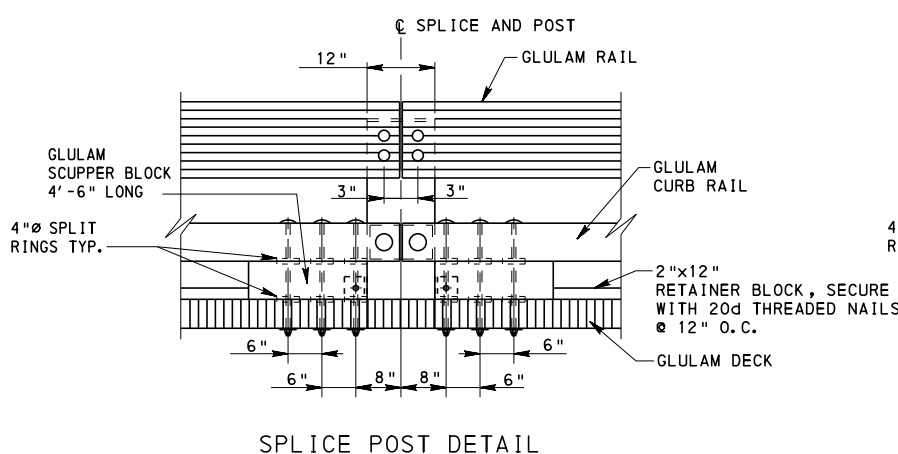
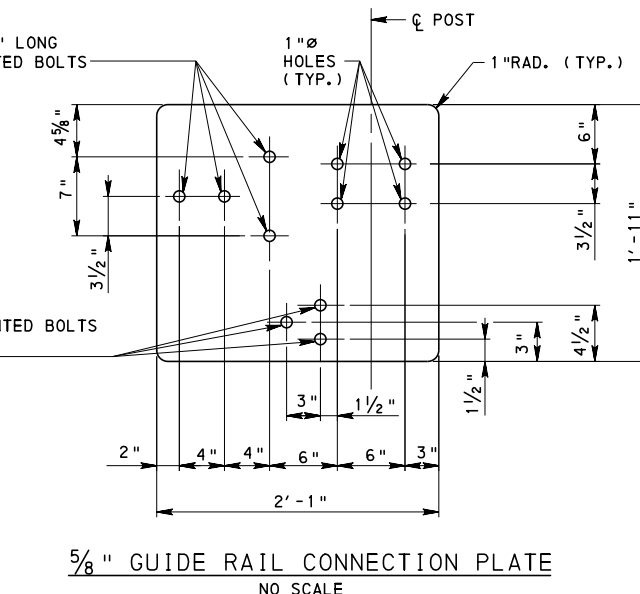
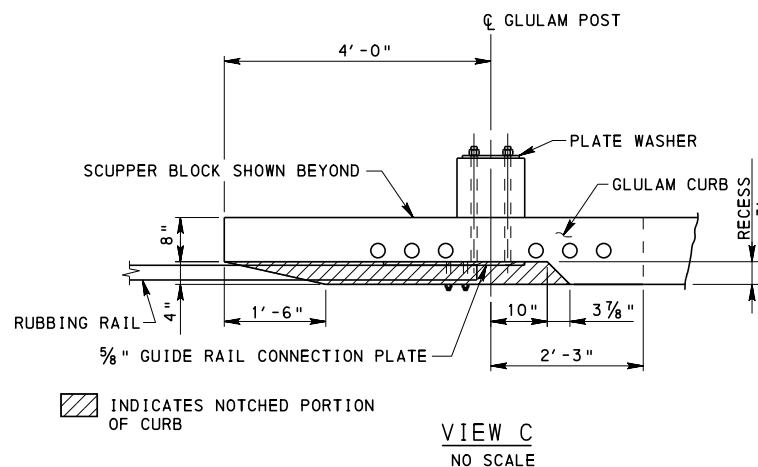
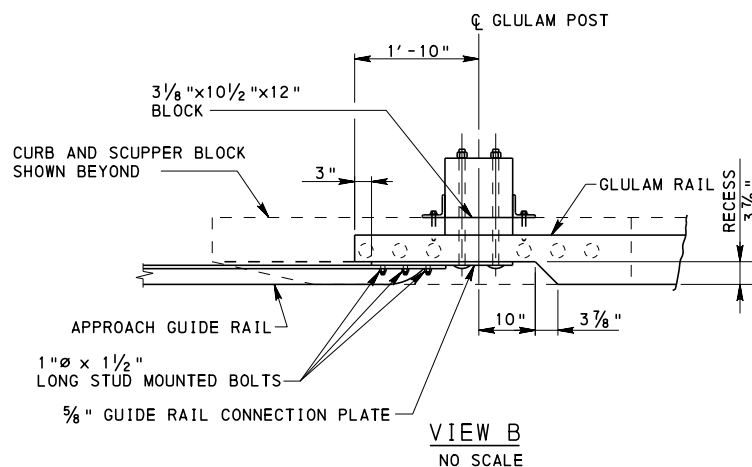
RECOMMENDED APR. 23, 2013
 ACTING DIR. BUR. OF PROJECT DELIVERY

SHEET 9 OF 9

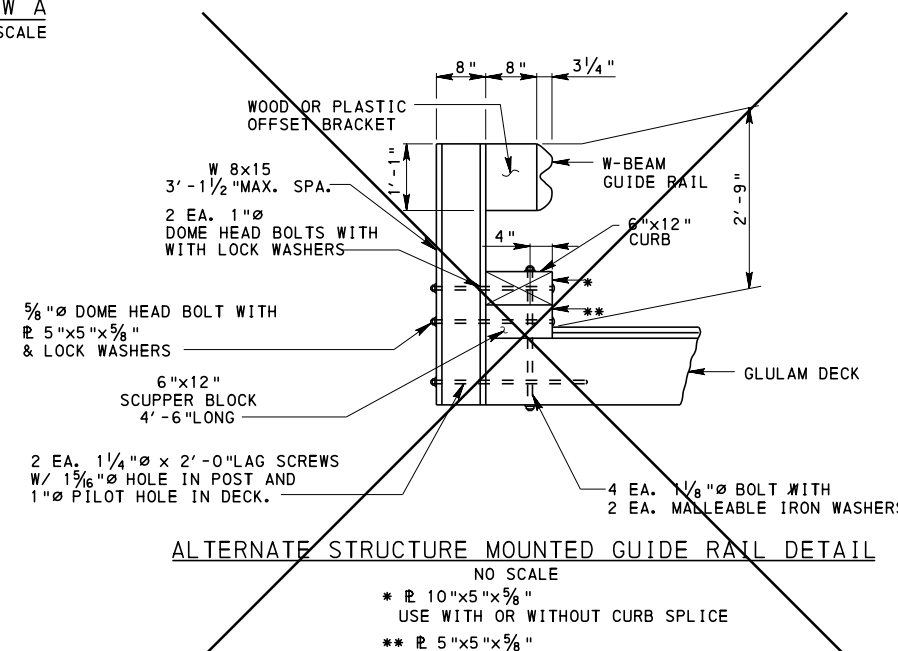
LC-563M



- NOTES:**
1. THIS BARRIER SHOWN ON THE GENERAL PLAN AND FRAMING PLAN SHEET.
 2. DO NOT USE TREATED HARDWOOD GLUE LAMINATED RAILINGS WHERE PROLONGED EXPOSURE TO DIRECT HUMAN CONTACT IS LIKELY WITHOUT APPLICATION OF AN APPROVED FINISH SEALER.



VIEW A
NO SCALE



NOTES:

APPROACH GUIDE RAIL AND CONNECTION DEVICES ARE ROADWAY ITEMS.

IT IS THE DESIGNER'S RESPONSIBILITY TO VERIFY THAT LAG BOLT CONNECTIONS DO NOT VIOLATE MIN. EDGE DISTANCES REQUIREMENTS AT DECK PANEL JOINTS.

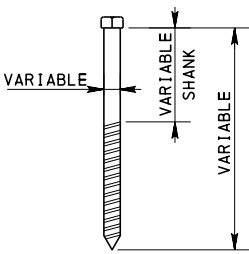
Mark	Description	By	Chk'd	Rec'd	Date
REVISIONS					

S- 00001 SHEET 13 OF 24

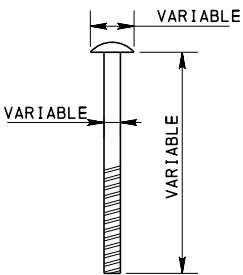
COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

DESIGN EXAMPLE
22'-0" SPAN
SHEETS COMMON TO
BLC 562M, 563M, & 564M
BRIDGE RAIL DETAILS

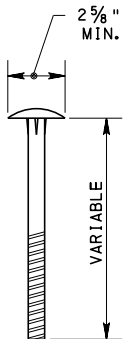
RECOMMENDED APR. 23, 2013
RECOMMENDED APR. 23, 2013
SHEET 1 OF 3
BLC-565M



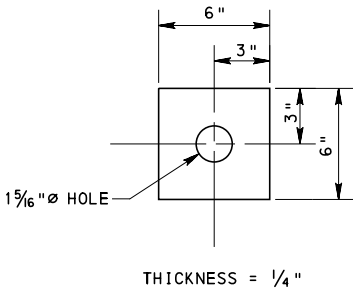
LAG SCREW



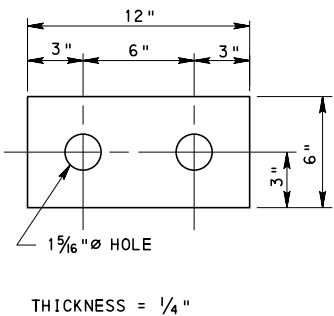
DOME HEAD BOLT



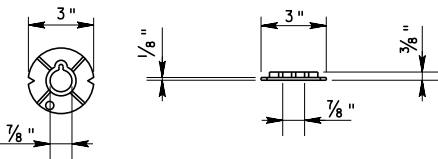
3/4"Ø ENLARGED DOMED HEAD BOLT



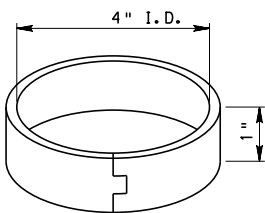
1/4" PLATE WASHER A



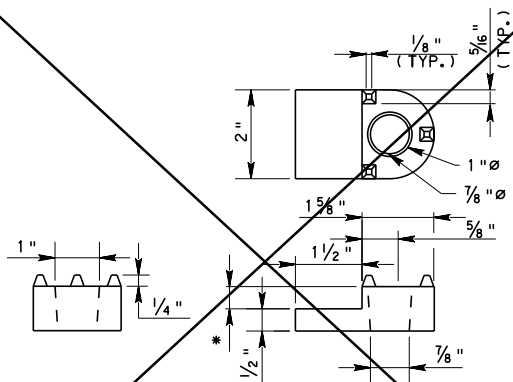
1/4" PLATE WASHER B



MALLEABLE IRON WASHER

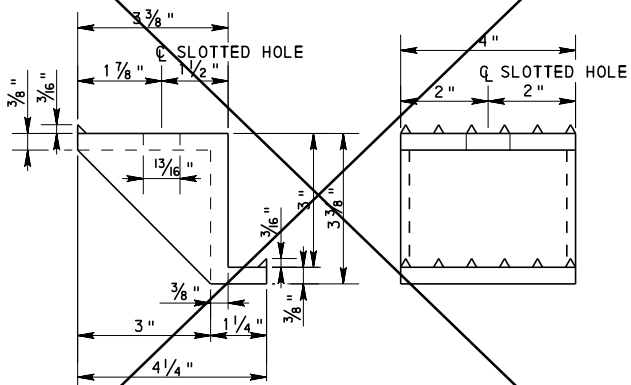


4" DIAMETER SPLIT RING

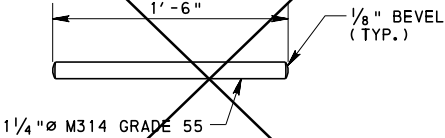


* BEAM FLANGE THICKNESS

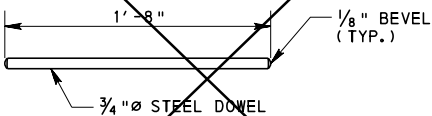
OFFSET SHOE



ALUMINUM CLIP



DOWEL



DRIFT PIN

NOTE:
STANDARD BOLTS, NUTS, AND WASHER NOT SHOWN.

Mark	Description	By	Chk'd	Rec'd	Date
REVISIONS					

S- 00001 SHEET 14 OF 24

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

DESIGN EXAMPLE
22'-0" SPAN
SHEETS COMMON TO
BLC 562M, 563M, & 564M
TYPICAL HARDWARE DETAILS

RECOMMENDED APR. 23, 2013 Thomas P. Macieira CHIEF BRIDGE ENGINEER	RECOMMENDED APR. 23, 2013 [Signature] ACTING DIR. BUR. OF PROJECT DELIVERY	SHEET 3 OF 3 BLC-565M
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CONTROL DIMENSIONS				
CODE	DESCRIPTION	SOURCE	VALUE (3)	
A1	SKEW ANGLE	DESIGNER		70 DEG.
A2	% GRADE (LOOKING STATIONS AHEAD)	DESIGNER		3%
B1	SPAN LENGTH-℄ TO℄ BEARING	DESIGNER		22'-0"
B2	FRONT FACE TO FRONT FACE OF ABUTMENTS	$(B1 - \frac{1.50}{\sin(A1)})$	20.4037	20'-4 $\frac{1}{8}$ "
B3	WATERWAY OPENING	(B2) SIN(A1)	19.1732	19'-2 $\frac{1}{8}$ "
C1	CURB TO CURB ROADWAY WIDTH (NORMAL)	TABLE 2	27.5000	27'-6"
C2	DECK WIDTH OUT TO OUT	C1+2.00	29.5000	29'-6"
C3	DECK WIDTH OUT TO OUT ALONG SKEW	$\frac{C2}{\sin(A1)}$	31.3932	31'-4 $\frac{3}{4}$ "
D1	OUT TO OUT LONGITUDINAL PANEL LENGTH	$B1 + \frac{1.50}{\sin(A1)}$	23.5963	23'-7 $\frac{1}{8}$ "
D2	NUMBER OF LONGITUDINAL PANELS	$\{ \frac{C2}{4.00} \}$ (1)	7.3750	8
E1	LONGITUDINAL PANEL SPECIES COMBINATION	TABLE 2 - BLC-561M, SHEET 9		NORTHERN RED OAK
E2	LONGITUDINAL PANEL DEPTH	TABLE 2 - BLC-561M, SHEET 9	1.1979	1'-2 $\frac{3}{8}$ "
E3	LONGITUDINAL PANEL WIDTH (NORMAL)	$\frac{C2}{D2}$	3.6875	3'-8 $\frac{1}{4}$ "
E4	LONGITUDINAL PANEL WIDTH ALONG SKEW	$\frac{C3}{D2}$	3.9242	3'-11 $\frac{1}{8}$ "
F1	OUT TO OUT BARRIER LENGTH	$D1 + \frac{0.6667}{\tan(A1)}$	23.8390	23'-10 $\frac{1}{8}$ "
F2	NUMBER OF GUIDE RAIL TIMBER POST SPACES	$\{ \frac{F1 - 8.00}{8.00} \}$ (1)	1.9799	2
F3	GUIDE RAIL POST SPACING	$\frac{F1 - 8.00}{F2}$	7.9195	7'-11"
G1	NUMBER OF SPACES BETWEEN ℄ BEARINGS	$\{ \frac{B1}{8.00} \}$ (1) IF B1 ≤ 8.00 THEN G1 = 2	2.7500	3
G2	CONTINUOUS STIFFENER BEAM SPACING/DESIGN SPAN	$\frac{B1}{G1}$	7.3333	7'-4"
G3	NUMBER OF CONTINUOUS STIFFENER BEAMS	G1-1	2.0	2
H1	DESIGN SPAN	$G2 - \frac{0.4167}{\sin(A1)}$	6.8899	6'-10 $\frac{3}{8}$ "
H2	NO. OF DOWELS	TABLE 1 (THIS SHEET) (5)	--	----
H3	DOWEL SPACING	H1/(H2+1) (5)	--	----
H4	NUMBER OF INTERMEDIATE STIFF. BEAMS BETWEEN CONT. STIFF. BEAMS AT EA. DECK PANEL JOINT	SEE TABLE 1 ON BLC-563M SHEETS 6, 7, AND 8 (5)	3.0	3.0
H5	INTERMEDIATE STIFFENER BEAM QUANTITY (PER STIFFENER)	6.86 F.B.M. NORTHERN RED OAK AND RED MAPLE (5) 8.57 F.B.M. YELLOW POPLAR (5)	6.86	6.86
J1	BEARING PAD LENGTH CONSTRAINT #1	$\frac{E4}{2} - \frac{0.4167}{2} - \frac{0.5833}{\tan(A1)} - 0.1667$ (CONCRETE ABUTMENT) $\frac{E4}{3} - \frac{0.4167}{2} - \frac{0.5833}{\tan(A1)} - 0.1667$ (TIMBER SILL ABUTMENT)	1.3748 --	1'-4 $\frac{1}{2}$ " ----
J2	BEARING PAD LENGTH CONSTRAINT #2	$\frac{E4}{3} - 0.4167$ (TIMBER SILL ABUTMENT)	--	----
J3	BEARING PAD LENGTH	USE THE VALUE J1 (CONCRETE ABUTMENT) USE THE LESSER VALUE BTWN. J1 & J2 (TIMBER SILL ABUTMENT)	1.3748 --	1'-4 $\frac{1}{2}$ " ----
J4	NUMBER OF BEARING PADS	D2*4 (CONCRETE ABUTMENT) D2*6 (TIMBER SILL ABUTMENT)	32 --	32 ----

QUANTITIES						
ITEM		QUANTITY FORMULA		UNIT	SUBTOTAL	TOTAL
GLUE LAMINATED TIMBER PANELS		C2*E2*D1 (4)		F. B. M.	10,006.31	10,006
GLUE LAMINATED TIMBER CONTINUOUS STIFFENER BEAMS		(G3) (C3) (0.4271) (5.5 '') (NORTHERN RED OAK AND RED MAPLE) (4)		F. B. M.	147.49	148
		(G3) (C3) (0.4271) (6.875 '') (YELLOW POPLAR) (4)				
GLUE LAMINATED TIMBER INTERMEDIATE STIFFENER BEAMS		(D2-1) (G1) (H4) (H5) (4)		F. B. M.	432.18	432
GLUE LAMINATED TIMBER RAILING END POST (6) (8)	GLUE LAMINATED TIMBER BRIDGE RAIL	4(1.00*0.875) (E2+2.917) +4(0.26*0.875*12.0 '') (4)		F. B. M.	25.32	1028
GLUE LAMINATED TIMBER RAILING INTERMEDIATE POST (7) (8)		2(F2-1) (0.875*0.729) (E2+35.0 '') +2(F2-1) (0.26*0.875*8.75 '') (4)		F. B. M.	66.97	
GLUE LAMINATED TIMBER RAILING		2(F2*F3+3.667) (1.125) (8.75 '') (4)		F. B. M.	383.91	
GLUE LAMINATED TIMBER CURB		2*F1(1.00) (6.75 '') (4)		F. B. M.	321.83	
GLUE LAMINATED TIMBER SCUPPER BLOCK		2(F2+1) (4.50) (1.00) (6.75 '') +(7.0) (1.0) (6.75 '') (4)		F. B. M.	229.50	
WATERPROOF MEMBRANE		(D1) (C1) ($-\frac{1yd^2}{9ft^2}$)		S. Y.	72.10	72
CLASS 4 GEOTEXTILE		(E2+3.00) (2) (C3) ($-\frac{1yd^2}{9ft^2}$)		S. Y.	29.29	29
WATERPROOF MEMBRANE, EDGE PROTECTION		[2(E2+2.25) (D1) + (E2+3.00) (2) (C3)] ($-\frac{1yd^2}{9ft^2}$)		S. Y.	47.37	47
BITUMINOUS WEARING COURSE		(0.1667*C1+0.005*C1²) (D1) ($140\frac{lb}{ft^3}$) ($\frac{1TON}{2000lb}$)		TON	13.82	14

CONTROL STATIONS AND ELEVATIONS				
CODE	LOCATION	SOURCE	VALUE (ft.)	
			STATION	P. G. ELEV.
①	℄ ROADWAY AT ℄ BRG. ABUT. 1	DESIGNER	2+50	301.25
②	℄ ROADWAY AT ℄ BRG. ABUT. 2	DESIGNER	2+72	301.91
③	℄ ROADWAY AT BEGIN OF STR.	STA① - $\frac{0.75}{\sin(A1)}$	2+49.2	
④	℄ ROADWAY AT END OF STR.	STA② + $\frac{0.75}{\sin(A1)}$	2+72.8	
⑤	℄ ROADWAY AT FRONT FACE ABUT. 1	STA① + $\frac{0.75}{\sin(A1)}$	2+50.8	
⑥	℄ ROADWAY AT FRONT FACE ABUT. 2	STA② - $\frac{0.75}{\sin(A1)}$	2+71.2	

TABLE 1 - DOWEL DESIGN DATA		
TIMBER SPECIES	MAXIMUM DESIGN SPAN (H1)	NO. OF(2) DOWELS (H2)
NORTHERN RED OAK & RED MAPLE	3'-11"	3
	4'-7"	4
	5'-2"	5
	5'-10"	6
	6'-5"	7
	7'-1"	8
	7'-9"	9
	8'-5"	10
YELLOW POPLAR	4'-1"	5
	4'-6"	6
	5'-1"	7
	5'-7"	8
	6'-2"	9
	6'-9"	10
	7'-4"	11
	7'-10"	12

FOOTNOTES FOR TABLES

- (1) ROUND TO THE NEXT WHOLE NUMBER - ONLY WITHIN ()
- (2) NO. OF DOWELS IS BASED ON THE USE OF AASHTO M314, GRADE 55 SMOOTH STEEL DOWELS
- (3) SHOW ALL DIMENSIONS IN FEET AND INCHES UNLESS NOTED OTHERWISE.
- (4) FOR QUANTITY CALCULATION, TIMBER ELEMENT WIDTH AND LENGTH ARE IN FEET AND ELEMENT THICKNESS OR DEPTH IS IN INCHES IN ORDER TO OBTAIN FEET BOARD MEASURE.
- (5) DESIGNER CHOOSES EITHER STEEL DOWELS OR ALTERNATE INTERMEDIATE STIFFENER BEAM SYSTEM TO PROVIDE TRANSVERSE CONNECTION OF GLULAM LONGITUDINAL PANELS. CROSS OUT APPROPRIATE DETAILS ON BLC-563M SHEETS 6, 7, 8 AND 9 AS REQUIRED.
- (6) QUANTITY BASED ON 12" WIDE POSTS AT ALL END LOCATIONS.
- (7) QUANTITY BASED ON 8 3/4 " WIDE POSTS AT ALL INTERMEDIATE LOCATIONS.
- (8) QUANTITY INCLUDES RAIL SPACER BLOCK.

Mark	Description	By	Chk'd	Rec'd	Date
REVISIONS					

S-00001

SHEET 15 OF 24

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

DESIGN EXAMPLE
22'-0" SPAN

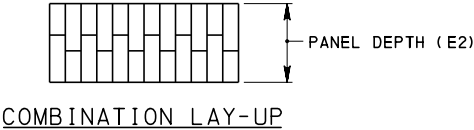
DATA ASSEMBLY SHEETS
GLULAM LONGITUDINAL PANELS

RECOMMENDED APR. 23, 2013 <i>Thomas P. Maciver</i> CHIEF BRIDGE ENGINEER	RECOMMENDED APR. 23, 2013 <i>David A. Kelly</i> ACTING DIR. BUR. OF PROJECT DELIVERY	SHEET 8 OF 20 BLC-561M
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TABLE 2 - NORTHERN RED OAK COMBINATION LAY-UP (E1) (1,2)																														
DESIGN DATA					BRIDGE RATINGS (3)																									
SPAN (B1) FT. - IN.	CURB TO CURB (C1) FT. - IN.	PANEL DEPTH (E2) IN.	PRE- FABRICATED CAMBER (M1) IN.	NET FINAL CAMBER (M5) IN.	H20				HS20				ML80				PHL-93				TK527				P82		FACTORED RESISTANCE			
					LOC.	I. R.	LOC.	O. R.	LOC.	I. R.	LOC.	O. R.	LOC.	I. R.	LOC.	O. R.	LOC.	I. R.	LOC.	O. R.	LOC.	I. R.	LOC.	O. R.	LOC.	O. R.	MOMENT Mr (K-FT)	LOC.	SHEAR Vr (K)	LOC.
18' - 0"	23' - 7"	12 3/8	0.03	0.00	0.50L	2.15 M	0.50L	3.64 M	0.50L	2.15 M	0.50L	3.64 M	0.50L	1.58 M	0.50L	2.68 M	0.45L	1.25 M	0.45L	1.99 M	0.50L	1.83 M	0.50L	3.11 M	0.45L	1.91 M	69.4	0.45L	30.3	0.17L
	27' - 6"	12 3/8	0.02	0.00	0.50L	2.20 M	0.50L	3.72 M	0.50L	2.20 M	0.50L	3.72 M	0.50L	1.62 M	0.50L	2.74 M	0.45L	1.28 M	0.45L	2.04 M	0.50L	1.88 M	0.50L	3.17 M	0.45L	1.95 M	69.4	0.45L	30.3	0.17L
	31' - 6"	12 3/8	0.02	0.00	0.50L	2.24 M	0.50L	3.80 M	0.50L	2.24 M	0.50L	3.80 M	0.50L	1.65 M	0.50L	2.79 M	0.45L	1.31 M	0.45L	2.08 M	0.50L	1.91 M	0.50L	3.24 M	0.45L	1.99 M	69.4	0.45L	30.3	0.17L
19' - 9"	23' - 7"	14 3/8	0.03	0.00	0.50L	2.69 M	0.50L	4.55 M	0.50L	2.69 M	0.50L	4.55 M	0.50L	1.91 M	0.50L	3.23 M	0.45L	1.52 M	0.45L	2.42 M	0.50L	2.19 M	0.50L	3.70 M	0.45L	2.23 M	93.7	0.45L	35.2	0.18L
	27' - 6"	14 3/8	0.02	0.00	0.50L	2.76 M	0.50L	4.66 M	0.50L	2.76 M	0.50L	4.66 M	0.50L	1.96 M	0.50L	3.31 M	0.45L	1.56 M	0.45L	2.48 M	0.50L	2.24 M	0.50L	3.79 M	0.45L	2.29 M	93.7	0.45L	35.2	0.18L
	31' - 6"	14 3/8	0.02	0.00	0.50L	2.82 M	0.50L	4.76 M	0.50L	2.82 M	0.50L	4.76 M	0.50L	2.00 M	0.50L	3.38 M	0.45L	1.59 M	0.45L	2.53 M	0.50L	2.29 M	0.50L	3.87 M	0.45L	2.33 M	93.7	0.45L	35.2	0.18L
23' - 0"	23' - 7"	14 3/8	0.05	0.01	0.50L	2.12 M	0.50L	3.68 M	0.50L	2.12 M	0.50L	3.68 M	0.50L	1.43 M	0.50L	2.48 M	0.45L	1.15 M	0.45L	1.82 M	0.50L	1.62 M	0.50L	2.81 M	0.45L	1.66 M	93.7	0.45L	35.2	0.16L
	27' - 6"	14 3/8	0.05	0.01	0.50L	2.18 M	0.50L	3.78 M	0.50L	2.18 M	0.50L	3.78 M	0.50L	1.47 M	0.50L	2.55 M	0.45L	1.18 M	0.45L	1.87 M	0.50L	1.66 M	0.50L	2.88 M	0.45L	1.70 M	93.7	0.45L	35.2	0.16L
	31' - 6"	14 3/8	0.04	0.01	0.50L	2.23 M	0.50L	3.87 M	0.50L	2.23 M	0.50L	3.87 M	0.50L	1.50 M	0.50L	2.61 M	0.45L	1.21 M	0.45L	1.92 M	0.50L	1.70 M	0.50L	2.95 M	0.45L	1.74 M	93.7	0.45L	35.2	0.16L

TABLE 2 - RED MAPLE COMBINATION LAY-UP (E1) (1,2)																														
DESIGN DATA					BRIDGE RATINGS (3)																									
SPAN (B1) FT. - IN.	CURB TO CURB (C1) FT. - IN.	PANEL DEPTH (E2) IN.	PRE- FABRICATED CAMBER (M1) IN.	NET FINAL CAMBER (M5) IN.	H20				HS20				ML80				PHL-93				TK527				P82		FACTORED RESISTANCE			
					LOC.	I. R.	LOC.	O. R.	LOC.	I. R.	LOC.	O. R.	LOC.	I. R.	LOC.	O. R.	LOC.	I. R.	LOC.	O. R.	LOC.	I. R.	LOC.	O. R.	LOC.	O. R.	MOMENT Mr (K-FT)	LOC.	SHEAR Vr (K)	LOC.
18' - 0"	23' - 7"	12 3/8	0.03	0.00	0.50L	1.80 M	0.50L	3.06 M	0.50L	1.80 M	0.50L	3.06 M	0.50L	1.32 M	0.50L	2.25 M	0.45L	1.05 M	0.45L	1.66 M	0.50L	1.53 M	0.50L	2.61 M	0.45L	1.60 M	59.2	0.45L	27.7	0.17L
	27' - 6"	12 3/8	0.02	0.00	0.50L	1.84 M	0.50L	3.12 M	0.50L	1.84 M	0.50L	3.12 M	0.50L	1.35 M	0.50L	2.30 M	0.45L	1.07 M	0.45L	1.70 M	0.50L	1.57 M	0.50L	2.66 M	0.45L	1.63 M	59.2	0.45L	27.7	0.17L
	31' - 6"	12 3/8	0.02	0.00	0.50L	1.87 M	0.50L	3.19 M	0.50L	1.87 M	0.50L	3.19 M	0.50L	1.38 M	0.50L	2.34 M	0.45L	1.09 M	0.45L	1.74 M	0.50L	1.60 M	0.50L	2.72 M	0.45L	1.67 M	59.2	0.45L	27.7	0.17L
19' - 9"	23' - 7"	14 3/8	0.03	0.00	0.50L	2.25 M	0.50L	3.82 M	0.50L	2.25 M	0.50L	3.82 M	0.50L	1.59 M	0.50L	2.71 M	0.45L	1.27 M	0.45L	2.02 M	0.50L	1.83 M	0.50L	3.11 M	0.45L	1.87 M	79.9	0.45L	32.2	0.18L
	27' - 6"	14 3/8	0.02	0.00	0.50L	2.30 M	0.50L	3.91 M	0.50L	2.30 M	0.50L	3.91 M	0.50L	1.63 M	0.50L	2.78 M	0.45L	1.30 M	0.45L	2.07 M	0.50L	1.87 M	0.50L	3.18 M	0.45L	1.92 M	79.9	0.45L	32.2	0.18L
	31' - 6"	14 3/8	0.02	0.00	0.50L	2.35 M	0.50L	4.00 M	0.50L	2.35 M	0.50L	4.00 M	0.50L	1.67 M	0.50L	2.83 M	0.45L	1.33 M	0.45L	2.12 M	0.50L	1.92 M	0.50L	3.25 M	0.45L	1.96 M	79.9	0.45L	32.2	0.18L
23' - 0"	23' - 7"	16 3/8	0.04	0.01	0.50L	2.45 M	0.50L	4.21 M	0.50L	2.45 M	0.50L	4.21 M	0.50L	1.65 M	0.50L	2.84 M	0.45L	1.33 M	0.45L	2.11 M	0.50L	1.87 M	0.50L	3.22 M	0.45L	1.90 M	103.7	0.45L	36.7	0.18L
	27' - 6"	16 3/8	0.03	0.01	0.50L	2.52 M	0.50L	4.32 M	0.50L	2.52 M	0.50L	4.32 M	0.50L	1.70 M	0.50L	2.91 M	0.45L	1.36 M	0.45L	2.17 M	0.50L	1.92 M	0.50L	3.30 M	0.45L	1.95 M	103.7	0.45L	36.7	0.18L
	31' - 6"	16 3/8	0.03	0.00	0.50L	2.58 M	0.50L	4.42 M	0.50L	2.58 M	0.50L	4.42 M	0.50L	1.74 M	0.50L	2.98 M	0.45L	1.39 M	0.45L	2.22 M	0.50L	1.97 M	0.50L	3.37 M	0.45L	1.99 M	103.7	0.45L	36.7	0.18L

TABLE 2 - YELLOW POPLAR COMBINATION LAY-UP (E1) (1,2)																														
DESIGN DATA					BRIDGE RATINGS (3)																									
SPAN (B1) FT. - IN.	CURB TO CURB (C1) FT. - IN.	PANEL DEPTH (E2) IN.	PRE- FABRICATED CAMBER (M1) IN.	NET FINAL CAMBER (M5) IN.	H20				HS20				ML80				PHL-93				TK527				P82		FACTORED RESISTANCE			
					LOC.	I. R.	LOC.	O. R.	LOC.	I. R.	LOC.	O. R.	LOC.	I. R.	LOC.	O. R.	LOC.	I. R.	LOC.	O. R.	LOC.	I. R.	LOC.	O. R.	LOC.	O. R.	MOMENT Mr (K-FT)	LOC.	SHEAR Vr (K)	LOC.
18' - 0"	23' - 7"	14 3/8	0.02	0.00	0.50L	2.01 M	0.50L	3.42 M	0.50L	2.01 M	0.50L	3.42 M	0.50L	1.48 M	0.50L	2.51 M	0.45L	1.17 M	0.45L	1.86 M	0.50L	1.71 M	0.50L	2.91 M	0.45L	1.79 M	66.1	0.45L	27.2	0.20L
	27' - 6"	14 3/8	0.02	0.00	0.50L	2.05 M	0.50L	3.49 M	0.50L	2.05 M	0.50L	3.49 M	0.50L	1.51 M	0.50L	2.57 M	0.45L	1.19 M	0.45L	1.90 M	0.50L	1.75 M	0.50L	2.97 M	0.45L	1.82 M	66.1	0.45L	27.2	0.20L
	31' - 6"	14 3/8	0.02	0.00	0.50L	2.09 M	0.50L	3.56 M	0.50L	2.09 M	0.50L	3.56 M	0.50L	1.54 M	0.50L	2.62 M	0.45L	1.22 M	0.45L	1.94 M	0.50L	1.78 M	0.50L	3.03 M	0.45L	1.86 M	66.1	0.45L	27.2	0.20L
19' - 9"	23' - 7"	16 3/8	0.02	0.00	0.50L	2.40 M	0.50L	4.08 M	0.50L	2.40 M	0.50L	4.08 M	0.50L	1.70 M	0.50L	2.90 M	0.45L	1.35 M	0.45L	2.16 M	0.50L	1.95 M	0.50L	3.32 M	0.45L	2.00 M	85.8	0.45L	30.9	0.21L
	27' - 6"	14 3/8	0.03	0.00	0.50L	1.77 M	0.50L	3.07 M	0.50L	1.77 M	0.50L	3.07 M	0.50L	1.26 M	0.50L	2.17 M	0.45L	1.00 M	0.45L	1.60 M	0.50L	1.44 M	0.50L	2.49 M	0.45L	1.50 M	66.1	0.45L	27.2	0.18L
	31' - 6"	14 3/8	0.02	0.00	0.50L	1.81 M	0.50L	3.13 M	0.50L	1.81 M	0.50L	3.13 M	0.50L	1.29 M	0.50L	2.22 M	0.45L	1.03 M	0.45L	1.63 M	0.50L	1.48 M	0.50L	2.55 M	0.45L	1.54 M	66.1	0.45L	27.2	0.18L
23' - 0"	23' - 7"	18 3/8	0.03	0.01	0.50L	2.50 M	0.50L	4.32 M	0.50L	2.50 M	0.50L	4.32 M	0.50L	1.69 M	0.50L	2.92 M	0.45L	1.35 M	0.45L	2.15 M	0.50L	1.91 M	0.50L	3.30 M	0.45L	1.95 M	108.0	0.45L	34.7	0.20L
	27' - 6"	16 3/8	0.04	0.01	0.50L	1.90 M	0.50L	3.34 M	0.50L	1.90 M	0.50L	3.34 M	0.50L	1.28 M	0.50L	2.25 M	0.45L	1.03 M	0.45L	1.63 M	0.50L	1.45 M	0.50L	2.55 M	0.45L	1.50 M	85.8	0.45L	30.9	0.18L
	31' - 6"	16 3/8	0.03	0.01	0.50L	1.94 M	0.50L	3.41 M	0.50L	1.94 M	0.50L	3.41 M	0.50L	1.31 M	0.50L	2.30 M	0.45L	1.05 M	0.45L	1.67 M	0.50L	1.48 M	0.50L	2.61 M	0.45L	1.54 M	85.8	0.45L	30.9	0.18L



COMBINATION LAY-UP

LEGEND OF ABBREVIATIONS

I. R. - DENOTES INVENTORY RATING
O. R. - DENOTES OPERATING RATING
LOC. - DENOTES LOCATION

NOTES:

- 1.) PANEL DESIGNED WITH APPROPRIATE FORMAT CONVERSION, WET SERVICE, VOLUME AND TIME EFFECT FACTOR

CONTROL DIMENSIONS				
CODE	DESCRIPTION	SOURCE	VALUE (5)	
A1	SKEW ANGLE	A1 (1)		70 DEG.
A2	% GRADE (LOOKING STATIONS AHEAD)	A2 (1)		3 %
C1	CURB TO CURB ROADWAY WIDTH (NORMAL)	C1 (1)	27.5000	27'-6"
C2	DECK WIDTH OUT TO OUT	C2 (1)	29.5000	29'-6"
A	DECK OR LONG. PANEL THICKNESS	USE E1 FOR GLULAM & STEEL BEAM OR E2 FOR LONG. PANEL (1)	1.1979	1'-2 3/8"
B	BEAM DEPTH	USE L4 FOR GLULAM BEAM, L5 FOR STEEL BEAM OR ZERO (0) FOR LONG. PANEL (1)	0	0
C	BEARING PAD THICKNESS	USE N3 OR P3 FOR GLULAM AND STEEL BEAM OR 0.0625 FOR LONG. PANEL (1)	.0625	3/8"
AA	WINGWALL "A" SKEW ANGLE	DESIGNER (15°00'00" MIN. , 45°00'00" MAX.) (4)	-	30 DEG.
AB	WINGWALL "B" SKEW ANGLE	DESIGNER (15°00'00" MIN. , 45°00'00" MAX.) (4)	-	30 DEG.
AC	WINGWALL "A" LENGTH	DESIGNER (4)	10.0000	10'-0"
AD	WINGWALL "B" LENGTH	DESIGNER (4)	10.0000	10'-0"
BA	CHEEKWALL "A"	$0.5 + (\frac{1.5}{\tan(A1)}) + 1.5(\tan(\frac{AA}{2}))$	1.4479	1'-5 3/8"
BB	CHEEKWALL "A"	$1.5(\tan(\frac{AA}{2}))$	.4019	4 7/8"
CA	CHEEKWALL "B"	$0.5 - (\frac{1.5}{\tan(A1)}) + 1.5(\tan(\frac{AB}{2}))$	.3560	4 1/4"
IF CA > 6" USE CONDITION 1 EQUATIONS, OTHERWISE USE CONDITION 2 EQUATIONS				
CONDITION 1 EQUATIONS				
CA	CHEEKWALL "B"	AS CALCULATED ABOVE	-	-
CB	CHEEKWALL "B"	$1.5(\tan(\frac{AB}{2}))$	-	-
CC	CHEEKWALL "B"	0.5	-	-
CONDITION 2 EQUATIONS				
CA	CHEEKWALL "B"	0.5	.5	6"
CB	CHEEKWALL "B"	$\frac{1.5 - 1.5(\cos(AB))}{\sin(AB)}$	.4019	4 7/8"
CC	CHEEKWALL "B"	$0.5 + (\frac{1.5}{\tan(A1)}) - 1.5(\tan(\frac{AB}{2}))$	.6440	7 3/4"
DA	WINGWALL "A" LENGTH	AC+BB	10.4019	10'-4 7/8"
DB	WINGWALL "B" LENGTH	AD+CB	10.4019	10'-4 7/8"
EA	ABUTMENT LENGTH	$\frac{C2 + 0.0833}{\sin(A1)}$	31.4819	31'-5 3/4"
EB	ABUTMENT LENGTH	EA+BA+CA	33.4300	33'-5 1/8"
EC	ABUTMENT LENGTH	$\frac{EA}{2} + BA$	17.1889	17'-2 1/4"
ED	ABUTMENT LENGTH	$\frac{EA}{2} + CA$	16.2410	16'-2 7/8"
EE	ABUTMENT LENGTH	$\frac{0.75}{\tan(A1)}$	.2730	3 1/4"
FA	WINGWALL "A" HEIGHT	(20) - (15) (2)	10.3100	10'-3 3/4"
FB	WINGWALL "A" HEIGHT	(22) - (15) (2)	6.3100	6'-3 3/4"
FC	WINGWALL "A" HEIGHT	(20) - (22) (2)	4.0000	4'-0"
FD	WINGWALL REINFORCEMENT PROJECTION	DESIGNER (3)	2.5833	2'-7"
GA	WINGWALL "B" HEIGHT	(30) - (15) (2)	10.6400	10'-7 7/8"
GB	WINGWALL "B" HEIGHT	(32) - (15) (2)	6.6400	6'-7 3/8"
GC	WINGWALL "B" HEIGHT	(30) - (32) (2)	4.0000	4'-0"
GD	WINGWALL REINFORCEMENT PROJECTION	DESIGNER (3)	2.5833	2'-7"
HA	HEIGHT OF FINISH GRADE CHAMFER (ABUTMENT)	(16) - (15) (2)	3.0000	3'-0"
HB	REAR FACE REINFORCEMENT PROJECTION (ABUTMENT)	DESIGNER (3)	3.2500	3'-3"
IA	ABUTMENT FOOTING WIDTH	DESIGNER (3)	7.2500	7'-3"
IB	ABUTMENT FOOTING WIDTH	DESIGNER (3)	1.5833	1'-7"
IC	ABUTMENT FOOTING WIDTH	IA-IB	5.6667	5'-8"
JA	WINGWALL "A" FOOTING WIDTH	DESIGNER (3)	6.0000	6'-0"
JB	WINGWALL "A" FOOTING WIDTH	DESIGNER (3)	1.0000	1'-0"
JC	WINGWALL "A" FOOTING WIDTH	JA-JB	5.0000	5'-0"
KA	WINGWALL "B" FOOTING WIDTH	DESIGNER (3)	6.0000	6'-0"
KB	WINGWALL "B" FOOTING WIDTH	DESIGNER (3)	1.0000	1'-0"
KC	WINGWALL "B" FOOTING WIDTH	KA-KB	5.0000	5'-0"
LA	ABUTMENT FOOTING LENGTH	$EB - \frac{IB}{\tan(AA)} + \frac{JB}{\sin(AA)} - \frac{IB}{\tan(AB)} + \frac{KB}{\sin(AB)}$	31.9450	31'-11 3/8"
LB	ABUTMENT FOOTING LENGTH	$EB - \frac{IC}{\tan(AA)} + \frac{JC}{\sin(AA)} - \frac{IC}{\tan(AB)} + \frac{KC}{\sin(AB)}$	33.8000	33'-9 5/8"
MA	WINGWALL "A" FOOTING LENGTH	$\frac{IB}{\sin(AA)} - \frac{JB}{\tan(AA)}$	1.4345	1'-5 1/4"
MB	WINGWALL "A" FOOTING LENGTH	$DA + \frac{IB}{\sin(AA)} - \frac{JB}{\tan(AA)}$	11.8364	11'-10"
MC	WINGWALL "A" FOOTING LENGTH	$DA + \frac{JC}{\tan(AA)} - \frac{IC}{\sin(AA)}$	7.7288	7'-8 3/4"
NA	WINGWALL "B" FOOTING LENGTH	$\frac{IB}{\sin(AB)} - \frac{KB}{\tan(AB)}$	1.4345	1'-5 1/4"
NB	WINGWALL "B" FOOTING LENGTH	$DB + \frac{IB}{\sin(AB)} - \frac{KB}{\tan(AB)}$	11.8364	11'-10"
NC	WINGWALL "B" FOOTING LENGTH	$DB + \frac{KC}{\tan(AB)} - \frac{IC}{\sin(AB)}$	7.7288	7'-8 3/4"

FOOTNOTES FOR TABLES

- (1) SEE APPROPRIATE SUPERSTRUCTURE DATA ASSEMBLY SHEETS (BLC-561M SHEETS 1 THRU 10).
- (2) SEE BLC-561M SHEET 12 FOR CONTROL STATIONS AND ELEVATIONS.
- (3) USE PENNDOT'S LRFD ABUTMENT AND RETAINING WALL ANALYSIS AND DESIGN PROGRAM (ABLRFD) IN CONJUNCTION WITH THE DATA ASSEMBLY SHEETS TO CALCULATE THE NECESSARY DIMENSIONS AND REINFORCEMENT FOR THE ABUTMENT (WITHOUT BACKWALL), WINGWALLS, AND FOOTING.
- (4) SEE BLC-561M SHEET 12 FOR WINGWALL EXAMPLE.
- (5) SHOW ALL VALUES IN FEET AND INCHES UNLESS NOTED OTHERWISE.

Mark	Description	By	Chk'd	Rec'd	Date
REVISIONS					

S- 00001 SHEET 17 OF 24

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

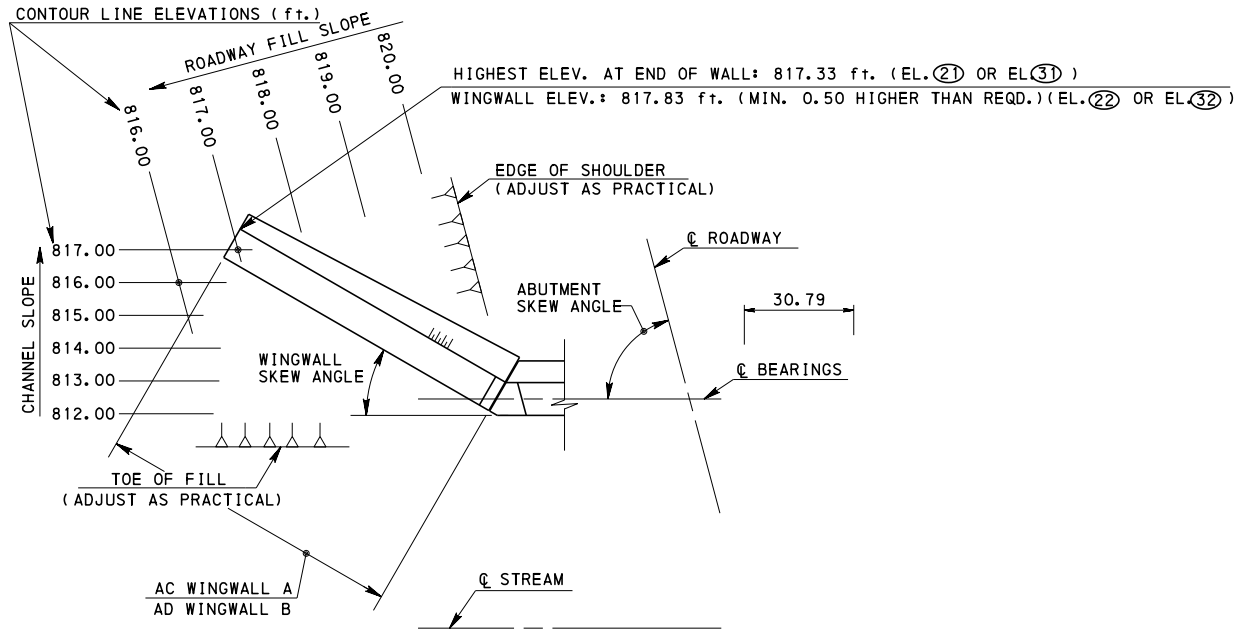
DESIGN EXAMPLE
22'-0" SPAN

DATA ASSEMBLY SHEETS
SPREAD FOOTING ABUTMENT 1

RECOMMENDED APR. 23, 2013 Thomas P. Macieira CHIEF BRIDGE ENGINEER	RECOMMENDED APR. 23, 2013 [Signature] ACTING DIR. BUR. OF PROJECT DELIVERY	SHEET 11 OF 20 BLC-561M
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CONTROL STATIONS AND ELEVATIONS			
CODE	DESCRIPTION	SOURCE	VALUE (2)
⑩	ABUTMENT ELEVATION	USE ① FOR ABUT. 1, OR ② FOR ABUT. 2 (1)	301.25
⑪	ABUTMENT ELEVATION	⑩ - (0.125 + $\frac{C1}{2}$ (0.02) + A+B+C+0.0417)	299.55
⑫	ABUTMENT ELEVATION (USE APPROPRIATE EQUATION DEPENDING ON ABUTMENT NO.)	⑪ - $\frac{A2}{100} (\frac{EA}{2} (\cos(A1)))$ ABUTMENT 1	299.39
		⑪ + $\frac{A2}{100} (\frac{EA}{2} (\cos(A1)))$ ABUTMENT 2	
⑬	ABUTMENT ELEVATION (USE APPROPRIATE EQUATION DEPENDING ON ABUTMENT NO.)	⑪ + $\frac{A2}{100} (\frac{EA}{2} (\cos(A1)))$ ABUTMENT 1	299.71
		⑪ - $\frac{A2}{100} (\frac{EA}{2} (\cos(A1)))$ ABUTMENT 2	
⑭	BOTTOM OF FOOTING ELEVATION	DESIGNER	289.00
⑮	TOP OF FOOTING ELEVATION	⑭+2.00	291.00
⑯	F.G.E./TOP OF SCOUR PROTECTION	DESIGNER (SEE DM-4, PART A, CHAPTER 7 FOR SCOUR REQ.)	294.00
⑳	WINGWALL "A" ELEVATION (USE APPROPRIATE EQUATION DEPENDING ON ABUTMENT NO.)	⑩ - $\frac{A2}{100} (\frac{EA}{2} (\cos(A1))) - \frac{C1}{2} (0.02) + 0.50$ ABUTMENT 1	301.31
		⑩ + $\frac{A2}{100} (\frac{EA}{2} (\cos(A1))) - \frac{C1}{2} (0.02) + 0.50$ ABUTMENT 2	
㉑	WINGWALL "A" ELEVATION	DESIGNER (SEE WINGWALL EXAMPLE)	296.81
㉒	WINGWALL "A" ELEVATION	㉑+0.50	297.31
㉓	WINGWALL "B" ELEVATION (USE APPROPRIATE EQUATION DEPENDING ON ABUTMENT NO.)	⑩ + $\frac{A2}{100} (\frac{EA}{2} (\cos(A1))) - \frac{C1}{2} (0.02) + 0.50$ ABUTMENT 1	301.64
		⑩ - $\frac{A2}{100} (\frac{EA}{2} (\cos(A1))) - \frac{C1}{2} (0.02) + 0.50$ ABUTMENT 2	
㉔	WINGWALL "B" ELEVATION	DESIGNER (SEE WINGWALL EXAMPLE)	297.14
㉕	WINGWALL "B" ELEVATION	㉔+0.50	297.64

IN GENERAL, PROVIDE WINGWALLS OF SUFFICIENT LENGTH TO RETAIN THE ROADWAY EMBANKMENT TO THE REQUIRED EXTENT AND TO FURNISH PROTECTION AGAINST EROSION. COMPUTE WINGWALL LENGTHS USING THE ACTUAL CONDITION AT THE SITE. THE FOLLOWING METHOD IS PROPOSED TO COMPUTE THE REQUIRED LENGTHS.



WINGWALL EXAMPLE
NO SCALE

FOOTNOTES FOR TABLES

- (1) SEE APPROPRIATE SUPERSTRUCTURE DATA ASSEMBLY SHEETS (BLC-561M SHEETS SHEETS 1 THRU 10).
- (2) SHOW ALL VALUES IN FEET. USE DECIMAL NOTATION TO ACCURACY OF 0.01 ft.

QUANTITIES						
ITEM		QUANTITY FORMULA		UNIT	SUBTOTAL	TOTAL
CLASS 3 EXCAVATION		DESIGNER		C. Y.	142	142
CHEEKWALL A	CLASS AA CEMENT CONCRETE	$(BB+0.5+\frac{BA-0.5-BB}{2})1.5\left(\textcircled{20}-\textcircled{12}\right)\left(\frac{1yd^3}{27ft^3}\right)$		C. Y.	0.13	0.2
CHEEKWALL B		$(CB+0.5+\frac{0.5+CB-CA}{2})1.5\left(\textcircled{30}-\textcircled{13}\right)\left(\frac{1yd^3}{27ft^3}\right)$	CONDITION 1	C. Y.	-	
		$(2(CB)-0.5+\frac{CC+CB-0.5}{2})1.5\left(\textcircled{30}-\textcircled{13}\right)\left(\frac{1yd^3}{27ft^3}\right)$	CONDITION 2	C. Y.	0.06	
ABUTMENT	CLASS A CEMENT CONCRETE	$[1.5\left(\textcircled{11}-\textcircled{15}\right)+\left(\frac{1}{2}\right)\left(\frac{1}{r0}\right)\left(\textcircled{11}-\textcircled{15}\right)^2](EB)\left(\frac{1yd^3}{27ft^3}\right)$		C. Y.	20.40	58.8
WINGWALL A		$[1.5\left(\textcircled{22}+\frac{\textcircled{20}-\textcircled{22}}{2}-\textcircled{15}\right)+\left(\frac{1}{2}\right)\left(\frac{1}{r0}\right)\left(\textcircled{22}+\frac{\textcircled{20}-\textcircled{22}}{2}-\textcircled{15}\right)^2](AC)\left(\frac{1yd^3}{27ft^3}\right)$		C. Y.	5.90	
WINGWALL B		$[1.5\left(\textcircled{32}+\frac{\textcircled{30}-\textcircled{32}}{2}-\textcircled{15}\right)+\left(\frac{1}{2}\right)\left(\frac{1}{r0}\right)\left(\textcircled{32}+\frac{\textcircled{30}-\textcircled{32}}{2}-\textcircled{15}\right)^2](AD)\left(\frac{1yd^3}{27ft^3}\right)$		C. Y.	6.18	
FOOTING		$\left(\frac{1}{2}\right)(2.00)\left((LA+LB)(IA)+(MB+MC)(JA)+(NB+NC)(KA)\right)\left(\frac{1yd^3}{27ft^3}\right)$		C. Y.	26.35	
SELECTED BORROW EXCAVATION, STRUCTURE BACKFILL		DESIGNER		C. Y.	45	45
NO. 57 COARSE AGGREGATE		6 WEEPHOLES $\left(\frac{1}{2}cy\right)$ (WEEPHOLE)		C. Y.	3.0	3.0
REINFORCEMENT BARS		DESIGNER - CALCULATE BAR WEIGHT FROM SHEETS 13 & 14 OF BLC-561M		lb	4748	4748
REINFORCEMENT BARS, EPOXY COATED		DESIGNER - CALCULATE BAR WEIGHT FROM SHEETS 13 & 14 OF BLC-561M		lb	606	606

Mark	Description	By	Chk'd	Rec'd	Date
REVISIONS					

S- 00001 SHEET 18 OF 24

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

DESIGN EXAMPLE
22'-0" SPAN

DATA ASSEMBLY SHEETS
SPREAD FOOTING ABUTMENT 1

RECOMMENDED APR. 23, 2013
Thomas P. Macieira
CHIEF BRIDGE ENGINEER

RECOMMENDED APR. 23, 2013
ACTING DIR. BUR. OF PROJECT DELIVERY

SHEET 12 OF 20

BLC-561M

BAR SCHEDULE																			
MARK	SIZE	SOURCE	LENGTH	SOURCE	NO.	SOURCE	TYPE	A	B	C	H	J	K	SOURCE	REMARKS	SOURCE	BAR WEIGHT lb/ft (4)	TOTAL BAR WEIGHT (5)	
A500	5		FROM 8'-2 3/4" " TO 8'-4 3/4" "	(12) - (15) - 0.1667 (11) - (15) - 0.1667	13	{ EC - 0.25 1.50 + 0.99 } + 1 (1)	STR.								VARIES BY <u>1/8" "</u>	(11) - (12) NO. OF BARS (3)	1.043	112.6	
A501	5		FROM 8'-4 3/4" " TO 8'-6 1/2" "	(11) - (15) - 0.1667 (13) - (15) - 0.1667	13	{ ED - 0.25 1.50 + 0.99 } + 1 (1)	STR.								VARIES BY <u>1/8" "</u>	(13) - (11) NO. OF BARS (3)	1.043	114.7	
A 6_02	6	DESIGNER (2)	FROM 8'-2 3/4" " TO 8'-4 3/4" "	(12) - (15) - 0.1667 (11) - (15) - 0.1667	24	{ EC - 1.00(TAN(AA)) - 0.25 REQ. SPA. (DESIGNER) + 0.99 } + 1 (1) (2)	STR.								VARIES BY <u>1/8" "</u>	(11) - (12) NO. OF BARS (3)	1.502	299.3	
A 6_03	6	DESIGNER (2)	FROM 8'-4 3/4" " TO 8'-6 1/2" "	(11) - (15) - 0.1667 (13) - (15) - 0.1667	23	{ ED - 1.00(TAN(AB)) - 0.25 REQ. SPA. (DESIGNER) + 0.99 } + 1 (1) (2)	STR.								VARIES BY <u>1/8" "</u>	(13) - (11) NO. OF BARS (3)	1.502	292.4	
A504	5		18'-11 1/4" "	EC + 1.75	6	{ ((11) + (11) - (13) - (15)) - 2.00 1.50 + 0.99 } + 1 (2) (3)	STR.										1.043	118.5	
A505	5		16'-0 3/4" "	ED - 0.1667	6	SAME AS A504	STR.										1.043	100.6	
A506	5		18'-4 3/8" "	EC - 1.00(TAN(AA)) + 1.75	6	SAME AS A504	STR.										1.043	114.9	
A507	5		15'-6" "	ED - 1.00(TAN(AB)) - 0.1667	6	SAME AS A504	STR.										1.043	97.0	
A508	5		18'-11 1/4" "	$\sqrt{((11) - (12))^2 + (EC)^2} + 1.75$	1		STR.										1.043	19.8	
A509	5		16'-0 3/8" "	$\sqrt{((13) - (11))^2 + (ED)^2} - 0.1667$	1		STR.										1.043	16.8	
A510	5		18'-4 3/8" "	$\sqrt{((11) - (12))^2 + (EC - 1.00(TAN(AA)))^2} + 1.75$	1		STR.										1.043	19.2	
A511	5		15'-6" "	$\sqrt{((13) - (11))^2 + (ED - 1.00(TAN(AB)))^2} - 0.1667$	1		STR.										1.043	16.2	
EA312	3		5'-2" "	(BA - 0.125) + 2.50 + ($-\frac{1.50}{\sin(AT)}$ - 0.25)	4	{ ((20) - (12)) - 0.3333 0.8333 + 0.99 } + 1 (1)	STR.								BEND IN FIELD		0.376	7.8	
EA313	3		4'-4 3/8" "	(CA - 0.125) + (CC - 0.25) + 2.25 + ($-\frac{1.50}{\sin(AT)}$ - 0.25)	4	{ ((30) - (13)) - 0.3333 0.8333 + 0.99 } + 1 (1)	STR.								BEND IN FIELD		0.376	6.6	
EA514	5		3'-5 1/8" "	(20) - (12) + 1.5	7	USE 6 BARS FOR 90° SKEWS, AND 7 BARS ALL OTHER SKEWS	STR.										1.043	25.0	
EA515	5		3'-5 1/8" "	(30) - (13) + 1.5	6		STR.										1.043	21.5	
A516	5		4.25		12	{ NO. OF BARS FROM A ____ 02 + 1 2 } (1)	③	1.583	1.083	1.583			0.167				1.043	53.2	
A517	5		4.25		12	{ NO. OF BARS FROM A ____ 03 + 1 2 } (1)	③	1.583	1.083	1.583			0.167				1.043	53.2	
A518	5		1.00		32		STR.										1.043	33.4	
W520	5		FROM 6'-1 3/4" " TO 10'-1 3/4" "	FB - 0.1667 FA - 0.1667	8	{ AC - 0.50 1.50 + 0.99 } + 1 (1)	STR.								VARIES BY <u>6" "</u>	FC NO. OF BARS	1.043	67.9	
W 5_21	5	DESIGNER (2)	FROM 6'-1 3/4" " TO 10'-1 3/4" "	FB - 0.1667 FA - 0.1667	15	{ $\frac{AC - 0.50}{REQ. SPA. (DESIGNER)}$ + 0.99 } + 1 (1) (2)	STR.								VARIES BY <u>3 1/4" "</u>	FC NO. OF BARS	1.043	127.4	
W522	5		9'-8" "	AC - 0.3333	6	{ FB - 0.50 1.50 + 0.99 } + 1 SHOW ON DRAWINGS (1) (6)	STR.										1.043	121.0	
W523	5		FROM 6'-7 3/4" " TO 2'-5" "	(FC - 1.25) (AC - 0.3333) FC 1.00(AC - 0.3333) FC	3	{ FC - 2.25 1.50 + 0.99 } + 1 SHOW ON DRAWINGS (1) (6)	STR.								VARIES BY _____ 1'-4 7/8" "	(LENGTH FROM _____) - (LENGTH TO _____) NO. OF BARS SHOWN ON DRAWINGS	1.043	28.4	

FOOTNOTES FOR TABLE

- (1) TAKE THE INTEGER VALUE OF THE QUANTITY WITHIN THE { } .
- (2) USE THE DEPARTMENT'S LRFD ABUTMENT AND RETAINING WALL ANALYSIS AND DESIGN PROGRAM (ABLRFD) IN CONJUNCTION WITH THE BLC-560M DATA ASSEMBLY AND CONSTRUCTION SHEETS TO CALCULATE THE NECESSARY DIMENSIONS AND REINFORCEMENT FOR THE ABUTMENT (WITHOUT BACKWALL) , WINGWALLS, AND SPREAD FOOTING.
- (3) TAKE THE ABSOLUTE VALUE OF THE QUANTITY WITHIN THE | | .
- (4) USE TABLE 1 ON THIS SHEET TO COMPLETE BAR WEIGHT QUANTITIES.
- (5) TOTAL BAR WEIGHT = (BAR LENGTH OR AVERAGE BAR LENGTH) × (TOTAL NO. OF BARS) × (BAR WEIGHT)
- (6) SHOW TWICE THIS NUMBER ON THE BAR SCHEDULE (TOTAL NO. OF BARS)

TABLE 1 REINFORCEMENT INFORMATION			
BAR SIZE	RECOMMENDED END HOOK DIMENSIONS (ALL GRADES)		BAR WEIGHT lb/ft
	180° HOOKS		
	A	J	
3	0.417	0.250	0.376
4	0.500	0.333	0.668
5	0.583	0.417	1.043
6	0.667	0.500	1.502
7	0.833	0.583	2.044
8	0.917	0.667	2.670
9	1.250	0.979	3.400
10	1.417	1.104	4.303
11	1.583	1.229	5.313

The diagram illustrates a 180-degree hook for reinforcement. It shows a horizontal bar with a U-shaped hook at its end. Dimension 'A' is the horizontal distance from the straight end of the bar to the vertical start of the hook. Dimension 'J' is the vertical height of the hook. A circled number '1' is located within the hook's curve.

Mark	Description	By	Chk'd	Rec'd	Date
REVISIONS					

S- 00001

SHEET 19 OF 24

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

DESIGN EXAMPLE
22'-0" SPAN

DATA ASSEMBLY SHEETS
SPREAD FOOTING ABUTMENT 1

RECOMMENDED APR. 23, 2013 Thomas P. Macieira CHIEF BRIDGE ENGINEER	RECOMMENDED APR. 23, 2013 [Signature] ACTING DIR. BUR. OF PROJECT DELIVERY	SHEET 13 OF 20 BLC-561M
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THESE PLANS ARE ACCOMPANIED BY NO WARRANTIES, EXPRESSED OR IMPLIED. CONSTRUCTION PLANS PREPARED FROM DESIGN AND DETAIL INFORMATION SHOWN HEREIN MUST BE REVIEWED, APPROVED AND SEALED BY A REGISTERED PROFESSIONAL ENGINEER FOR EACH SPECIFIC PROJECT.

BAR SCHEDULE																			
MARK	SIZE	SOURCE	LENGTH	SOURCE	NO.	SOURCE	TYPE	A	B	C	H	J	K	SOURCE	REMARKS	SOURCE	BAR WEIGHT lb/ft (4)	TOTAL BAR WEIGHT(5)	
W524	5		10'-5¼"	√FC²+AC²-0.333	1	SHOW ON DRAWINGS	STR.										1.043	21.8	
					2	SHOWN ON BAR SCHEDULE (TOTAL NO. OF BARS)													
W525	5		4.25		8	{ NO. OF BARS FROM W — 21+1 } 2	(1) ③	1.583	1.0833	1.583			0.1667				1.043	35.5	
W526	5		1.00		8		STR.										1.043	8.3	
W530	5		FROM 6'-5¾" TO 10'-5¾"	GB-0.1667 GA-0.1667	8	{ AD-0.5 1.50 +0.99 } +1	(1) STR.								VARIES BY 6"	GC NO. OF BARS	1.043	70.7	
W 5_31	5	DESIGNER (2)	FROM 6'-5¾" TO 10'-5¾"	GB-0.1667 GA-0.1667	15	{ AD-0.5 REQ. SPA. (DESIGNER) +0.99 } +1	(1) (2) STR.								VARIES BY 3¼"	GC NO. OF BARS	1.043	132.6	
W532	5		9'-8"	AD-0.333	6	{ GB-0.50 1.50 +0.99 } +1	SHOW ON DRAWINGS (1) (6) STR.										1.043	121.0	
W533	5		FROM 6'-7¾" TO 2'-5"	(GC-1.25) (AD-0.333) GC 1.00 (AD-0.333) GC	3	{ GC-2.25 1.50 +0.99 } +1	SHOW ON DRAWINGS (1) (6) STR.								VARIES BY 1'-4⅞"	(LENGTH FROM —) - (LENGTH TO —) NO. OF BARS SHOWN ON DRAWINGS	1.043	28.4	
W534	5		10'-5¼"	√GC²+AD²-0.333	1	SHOW ON DRAWINGS	STR.										1.043	21.8	
					2	SHOWN ON BAR SCHEDULE (TOTAL NO. OF BARS)													
W535	5		4.25		8	{ NO. OF BARS FROM W — 31+1 } 2	(1) ③	1.583	1.0833	1.583			0.1667				1.043	35.5	
W536	5		1.00		8		STR.										1.043	8.3	
F 6_00	6	DESIGNER (2)	6'-7"	IA-0.667	44	{ LA-0.50 REQ. SPA. (DESIGNER) +0.99 } +1	(1) (2) STR.										1.502	435.1	
F 7_01	7	DESIGNER (2)	6'-7"	IA-0.667	44	{ LA-0.50 REQ. SPA. (DESIGNER) +0.99 } +1	(1) (2) STR.										2.044	592.0	
F502	5		31'-3¾"	LA-0.667	6	{ IA-0.667 1.50 +0.99 } +1	(1) (6) STR.										1.043	391.5	
F403	4		2.25		48	({ IA-0.667 3.00 +0.99 } +1) ({ LA-0.5 3.0 +0.99 } +1)	(1) ②	0.375	1.5	0.375	0.250						0.668	72.1	
F504	5		3.50		13	{ EC-0.25 1.50 +0.99 } +1	(1) STR.										1.043	47.5	
F505	5		3.50		13	{ ED-0.25 1.50 +0.99 } +1	(1) STR.										1.043	47.5	
EF 6_06	6	DESIGNER (2)	5'-7"	HB+1.667+A FOR "A" VARIABLE SEE TABLE 1	24	{ EC-1.00(TAN(AA)) -0.25 REQ. SPA. (DESIGNER) +0.99 } +1	(1) (2) ①	.667	4.917			.5		SEE TABLE 1 (B = HB + 1.667)			1.502	201.3	
EF 6_07	6	DESIGNER (2)	5'-7"	HB+1.667+A FOR "A" VARIABLE SEE TABLE 1	23	{ ED-1.00(TAN(AB)) -0.25 REQ. SPA. (DESIGNER) +0.99 } +1	(1) (2) ①	.667	4.917			.5		SEE TABLE 1 (B = HB + 1.667)			1.502	192.9	
F 6_20	6	DESIGNER (2)	5'-4"	JA-0.667	17	{ MB-0.50 REQ. SPA. (DESIGNER) +0.99 } +1	(1) (2) STR.										1.502	136.2	
F 5_21	5	DESIGNER (2)	5'-4"	JA-0.667	17	{ MB-0.50 REQ. SPA. (DESIGNER) +0.99 } +1	(1) (2) STR.										1.043	94.6	
F522	5		11'-2"	MB-0.667	6	{ JA-0.667 1.50 +0.99 } +1	SHOW ON DRAWINGS (1) (6) STR.										1.043	139.8	
F423	4		2.25		24	({ JA-0.667 3.00 +0.99 } +1) ({ MB-0.50 3.00 +0.99 } +1)	(1) ②	0.375	1.5	0.375	0.250						0.668	36.1	
F524	5		3.50		8	{ AC-0.50 1.50 +0.99 } +1	(1) STR.										1.043	29.2	
EF 5_25	5	DESIGNER (2)	4'-10"	FD+1.667+A FOR "A" VARIABLE SEE TABLE 1	15	{ AC-0.50 REQ. SPA. (DESIGNER) +0.99 } +1	(1) (2) ①	.583	4.250			.417		SEE TABLE 1 (B = FD + 1.667)			1.043	75.6	
F 6_30	6	DESIGNER (2)	5'-4"	KA-0.667	17	{ NB-0.50 REQ. SPA. (DESIGNER) +0.99 } +1	(1) (2) STR.										1.502	136.2	
F 5_31	5	DESIGNER (2)	5'-4"	KA-0.667	17	{ NB-0.50 REQ. SPA. (DESIGNER) +0.99 } +1	(1) (2) STR.										1.043	94.6	
F532	5		11'-2"	NB-0.667	6	{ KA-0.667 1.50 +0.99 } +1	SHOW ON DRAWINGS (1) (6) STR.										1.043	139.8	
F433	4		2.25		24	({ KA-0.667 3.00 +0.99 } +1) ({ NB-0.5 3.00 +0.99 } +1)	(1) ②	0.375	1.5	0.375	0.250						0.668	36.1	
F534	5		3.50		8	{ AD-0.50 1.50 +0.99 } +1	(1) STR.										1.043	29.2	
EF 5_35	5	DESIGNER (2)	4'-10"	GD+1.667+A FOR "A" VARIABLE SEE TABLE 1	15	{ AD-0.50 REQ. SPA. (DESIGNER) +0.99 } +1	(1) (2) ①	.583	4.250			.417		SEE TABLE 1 (B = GD + 1.667)			1.043	75.6	

FOOTNOTES FOR TABLE

- (1) TAKE THE INTEGER VALUE OF THE QUANTITY WITHIN THE{ } .
- (2) USE THE DEPARTMENT'S LRFD ABUTMENT AND RETAINING WALL ANALYSIS AND DESIGN PROGRAM (ABLRFD) IN CONJUNCTION WITH THE BLC-560M DATA ASSEMBLY AND CONSTRUCTION SHEETS TO CALCULATE THE NECESSARY DIMENSIONS AND REINFORCEMENT FOR THE ABUTMENT (WITHOUT BACKWALL), WINGWALLS, AND SPREAD FOOTING.
- (3) TAKE THE ABSOLUTE VALUE OF THE QUANTITY WITHIN THE | | .
- (4) USE TABLE 1 ON THIS SHEET TO COMPLETE BAR WEIGHT QUANTITIES.
- (5) TOTAL BAR WEIGHT = (BAR LENGTH OR AVERAGE BAR LENGTH) × (TOTAL NO. OF BARS) × (BAR WEIGHT)
- (6) SHOW TWICE THIS NUMBER ON THE BAR SCHEDULE (TOTAL NO. OF BARS)

TABLE 1

REINFORCEMENT INFORMATION

BAR SIZE	RECOMMENDED END HOOK DIMENSIONS (ALL GRADES)		BAR WEIGHT lb/ft
	180° HOOKS		
	A	J	
3	0.417	0.250	0.376
4	0.500	0.333	0.668
5	0.583	0.417	1.043
6	0.667	0.500	1.502
7	0.833	0.583	2.044
8	0.917	0.667	2.670
9	1.250	0.979	3.400
10	1.417	1.104	4.303
11	1.583	1.229	5.313

The diagram illustrates a 180-degree hook reinforcement. It shows a horizontal bar with a U-shaped hook at the end. Dimension 'A' is the straight length of the bar before the hook. Dimension 'J' is the vertical height of the hook. A circled number '1' is located near the hook.

Mark	Description	By	Chk'd	Rec'd	Date
REVISIONS					

S- 00001 SHEET 20 OF 24

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

DESIGN EXAMPLE
22'-0" SPAN
DATA ASSEMBLY SHEETS
SPREAD FOOTING ABUTMENT 1

RECOMMENDED APR. 23, 2013
Thomas P. Macieira
CHIEF BRIDGE ENGINEER

RECOMMENDED APR. 23, 2013
[Signature]
ACTING DIR. BUR. OF PROJECT DELIVERY

SHEET 14 OF 20
BLC-561M

CONTROL DIMENSIONS				
CODE	DESCRIPTION	SOURCE	VALUE (5)	
A1	SKEW ANGLE	A1 (1)		70 DEG.
A2	% GRADE (LOOKING STATIONS AHEAD)	A2 (1)		3 %
C1	CURB TO CURB ROADWAY WIDTH (NORMAL)	C1 (1)	27.5000	27'-6"
C2	DECK WIDTH OUT TO OUT	C2 (1)	29.5000	29'-6"
A	DECK OR LONG. PANEL THICKNESS	USE E1 FOR GLULAM & STEEL BEAM OR E2 FOR LONG. PANEL (1)	1.1979	1'-2 3/8"
B	BEAM DEPTH	USE L4 FOR GLULAM BEAM, L5 FOR STEEL BEAM OR ZERO (0) FOR LONG. PANEL (1)	0	0
C	BEARING PAD THICKNESS	USE N3 OR P3 FOR GLULAM AND STEEL BEAM OR 0.0625 FOR LONG. PANEL (1)	.0625	3/4"
AA	WINGWALL "A" SKEW ANGLE	DESIGNER (15°00'00" MIN. , 45°00'00" MAX.) (4)		30 DEG.
AB	WINGWALL "B" SKEW ANGLE	DESIGNER (15°00'00" MIN. , 45°00'00" MAX.) (4)		30 DEG.
AC	WINGWALL "A" LENGTH	DESIGNER (4)	10.0000	10'-0"
AD	WINGWALL "B" LENGTH	DESIGNER (4)	10.0000	10'-0"
BA	CHEEKWALL "A"	$0.5 + (\frac{1.5}{\tan(A1)}) + 1.5(\tan(\frac{AA}{2}))$	1.4480	1'-5 3/8"
BB	CHEEKWALL "A"	$1.5(\tan(\frac{AA}{2}))$	.4020	4 7/8"
CA	CHEEKWALL "B"	$0.5 - (\frac{1.5}{\tan(A1)}) + 1.5(\tan(\frac{AB}{2}))$	.3560	4 1/4"
IF CA > 6" USE CONDITION 1 EQUATIONS, OTHERWISE USE CONDITION 2 EQUATIONS				
CONDITION 1 EQUATIONS				
CA	CHEEKWALL "B"	AS CALCULATED ABOVE	-	-
CB	CHEEKWALL "B"	$1.5(\tan(\frac{AB}{2}))$	-	-
CC	CHEEKWALL "B"	0.5	-	-
CONDITION 2 EQUATIONS				
CA	CHEEKWALL "B"	0.5	.5000	6"
CB	CHEEKWALL "B"	$\frac{1.5 - 1.5(\cos(AB))}{\sin(AB)}$	.4020	4 7/8"
CC	CHEEKWALL "B"	$0.5 + (\frac{1.5}{\tan(A1)}) - 1.5(\tan(\frac{AB}{2}))$	.6440	7 3/4"
DA	WINGWALL "A" LENGTH	AC+BB	10.4020	10'-4 7/8"
DB	WINGWALL "B" LENGTH	AD+CB	10.4020	10'-4 7/8"
EA	ABUTMENT LENGTH	$\frac{C2 + 0.0833}{\sin(A1)}$	31.4820	31'-5 3/4"
EB	ABUTMENT LENGTH	EA+BA+CA	33.4300	33'-5 1/8"
EC	ABUTMENT LENGTH	$\frac{EA}{2} + BA$	17.1890	17'-2 1/4"
ED	ABUTMENT LENGTH	$\frac{EA}{2} + CA$	16.2410	16'-2 7/8"
EE	ABUTMENT LENGTH	$\frac{0.75}{\tan(A1)}$	.2730	3/4"
FA	WINGWALL "A" HEIGHT	$(20) - (15)$ (2)	11.3000	11'-3 3/8"
FB	WINGWALL "A" HEIGHT	$(22) - (15)$ (2)	7.3000	7'-3 3/8"
FC	WINGWALL "A" HEIGHT	$(20) - (22)$ (2)	4.000	4'-0"
FD	WINGWALL REINFORCEMENT PROJECTION	DESIGNER (3)	2.5833	2'-7"
GA	WINGWALL "B" HEIGHT	$(30) - (15)$ (2)	10.9700	10'-11 3/8"
GB	WINGWALL "B" HEIGHT	$(32) - (15)$ (2)	6.9700	6'-11 3/8"
GC	WINGWALL "B" HEIGHT	$(30) - (32)$ (2)	4.0000	4'-0"
GD	WINGWALL REINFORCEMENT PROJECTION	DESIGNER (3)	2.5833	2'-7"
HA	HEIGHT OF FINISH GRADE CHAMFER (ABUTMENT)	$(16) - (15)$ (2)	3.0000	3'-0"
HB	REAR FACE REINFORCEMENT PROJECTION (ABUTMENT)	DESIGNER (3)	3.2500	3'-3"
IA	ABUTMENT FOOTING WIDTH	DESIGNER (3)	7.7500	7'-9"
IB	ABUTMENT FOOTING WIDTH	DESIGNER (3)	1.7500	1'-9"
IC	ABUTMENT FOOTING WIDTH	IA-IB	6.0000	6'-0"
JA	WINGWALL "A" FOOTING WIDTH	DESIGNER (3)	6.5000	6'-6"
JB	WINGWALL "A" FOOTING WIDTH	DESIGNER (3)	1.0000	1'-0"
JC	WINGWALL "A" FOOTING WIDTH	JA-JB	5.5000	5'-6"
KA	WINGWALL "B" FOOTING WIDTH	DESIGNER (3)	6.5000	6'-6"
KB	WINGWALL "B" FOOTING WIDTH	DESIGNER (3)	1.0000	1'-0"
KC	WINGWALL "B" FOOTING WIDTH	KA-KB	5.5000	5'-6"
LA	ABUTMENT FOOTING LENGTH	$EB - \frac{IB}{\tan(AA)} + \frac{JB}{\sin(AA)} - \frac{IB}{\tan(AB)} + \frac{KB}{\sin(AB)}$	31.3680	31'-4 3/8"
LB	ABUTMENT FOOTING LENGTH	$EB - \frac{IC}{\tan(AA)} + \frac{JC}{\sin(AA)} - \frac{IC}{\tan(AB)} + \frac{KC}{\sin(AB)}$	34.6450	34'-7 3/4"
MA	WINGWALL "A" FOOTING LENGTH	$\frac{IB}{\sin(AA)} - \frac{JB}{\tan(AA)}$	1.7680	1'-9 1/4"
MB	WINGWALL "A" FOOTING LENGTH	$DA + \frac{IB}{\sin(AA)} - \frac{JB}{\tan(AA)}$	12.1700	12'-2"
MC	WINGWALL "A" FOOTING LENGTH	$DA + \frac{JC}{\tan(AA)} - \frac{IC}{\sin(AA)}$	7.9280	7'-11 1/8"
NA	WINGWALL "B" FOOTING LENGTH	$\frac{IB}{\sin(AB)} - \frac{KB}{\tan(AB)}$	1.7680	1'-9 1/4"
NB	WINGWALL "B" FOOTING LENGTH	$DB + \frac{IB}{\sin(AB)} - \frac{KB}{\tan(AB)}$	12.1700	12'-2"
NC	WINGWALL "B" FOOTING LENGTH	$DB + \frac{KC}{\tan(AB)} - \frac{IC}{\sin(AB)}$	7.9280	7'-11 1/8"

FOOTNOTES FOR TABLES

- (1) SEE APPROPRIATE SUPERSTRUCTURE DATA ASSEMBLY SHEETS (BLC-561M SHEETS 1 THRU 10).
- (2) SEE BLC-561M SHEET 12 FOR CONTROL STATIONS AND ELEVATIONS.
- (3) USE PENNDOT'S LRFD ABUTMENT AND RETAINING WALL ANALYSIS AND DESIGN PROGRAM (ABLRFD) IN CONJUNCTION WITH THE DATA ASSEMBLY SHEETS TO CALCULATE THE NECESSARY DIMENSIONS AND REINFORCEMENT FOR THE ABUTMENT (WITHOUT BACKWALL), WINGWALLS, AND FOOTING.
- (4) SEE BLC-561M SHEET 12 FOR WINGWALL EXAMPLE.
- (5) SHOW ALL VALUES IN FEET AND INCHES UNLESS NOTED OTHERWISE.

Mark	Description	By	Chk'd	Rec'd	Date
REVISIONS					

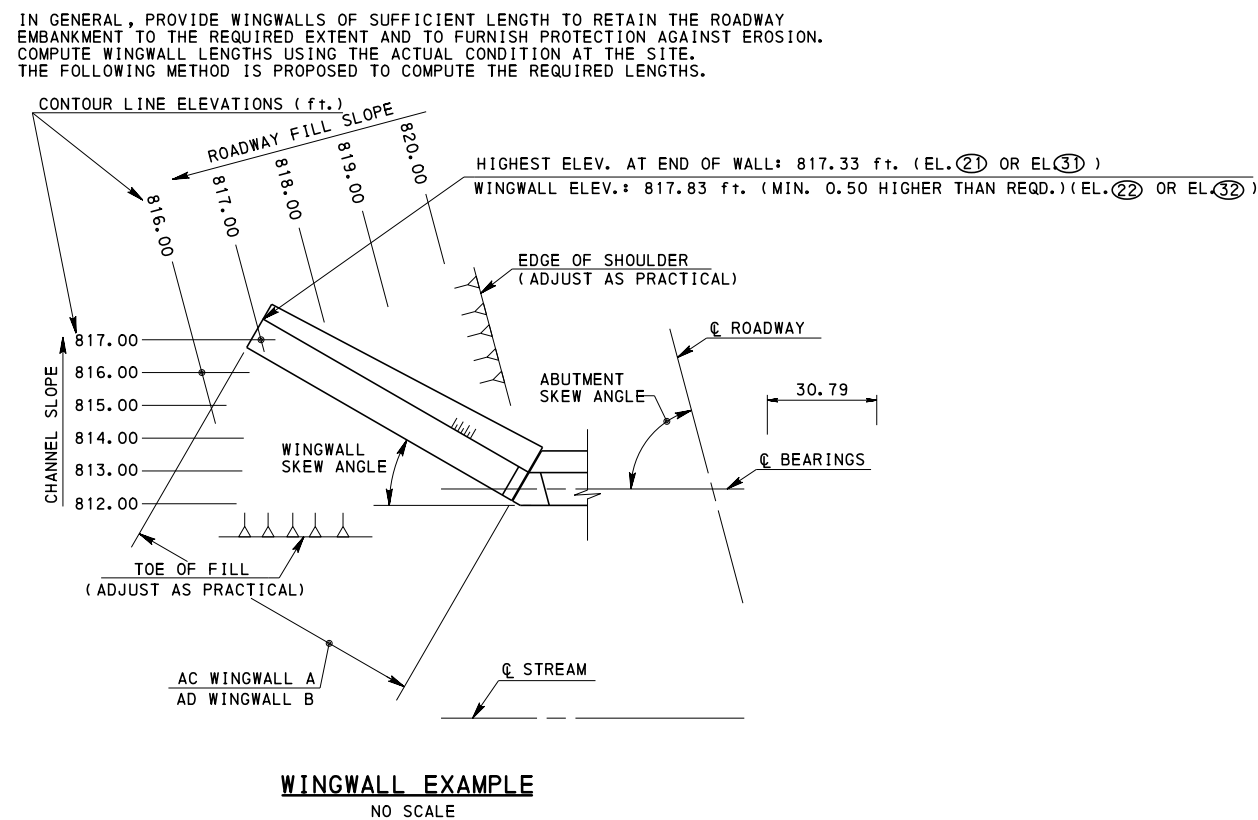
S- 00001 SHEET 21 OF 24

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

DESIGN EXAMPLE
22'-0" SPAN
DATA ASSEMBLY SHEETS
SPREAD FOOTING ABUTMENT 2

RECOMMENDED APR. 23, 2013 Thomas P. Macieira CHIEF BRIDGE ENGINEER	RECOMMENDED APR. 23, 2013 [Signature] ACTING DIR. BUR. OF PROJECT DELIVERY	SHEET 11 OF 20 BLC-561M
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CONTROL STATIONS AND ELEVATIONS			
CODE	DESCRIPTION	SOURCE	VALUE (2)
10	ABUTMENT ELEVATION	USE 1 FOR ABUT. 1, OR 2 FOR ABUT. 2 (1)	301.91
11	ABUTMENT ELEVATION	10 - (0.125 + $\frac{C1}{2}$ (0.02) + A+B+C+0.0417)	300.21
12	ABUTMENT ELEVATION (USE APPROPRIATE EQUATION DEPENDING ON ABUTMENT NO.)	11 - $\frac{A2}{100} (\frac{EA}{2} (\cos(A1)))$ ABUTMENT 1	300.37
		11 + $\frac{A2}{100} (\frac{EA}{2} (\cos(A1)))$ ABUTMENT 2	
13	ABUTMENT ELEVATION (USE APPROPRIATE EQUATION DEPENDING ON ABUTMENT NO.)	11 + $\frac{A2}{100} (\frac{EA}{2} (\cos(A1)))$ ABUTMENT 1	300.05
		11 - $\frac{A2}{100} (\frac{EA}{2} (\cos(A1)))$ ABUTMENT 2	
14	BOTTOM OF FOOTING ELEVATION	DESIGNER	289.00
15	TOP OF FOOTING ELEVATION	14+2.00	291.00
16	F.G.E./TOP OF SCOUR PROTECTION	DESIGNER (SEE DM-4, PART A, CHAPTER 7 FOR SCOUR REQ.)	294.00
20	WINGWALL "A" ELEVATION (USE APPROPRIATE EQUATION DEPENDING ON ABUTMENT NO.)	10 - $\frac{A2}{100} (\frac{EA}{2} (\cos(A1))) - \frac{C1}{2} (0.02) + 0.50$ ABUTMENT 1	302.30
		10 + $\frac{A2}{100} (\frac{EA}{2} (\cos(A1))) - \frac{C1}{2} (0.02) + 0.50$ ABUTMENT 2	
21	WINGWALL "A" ELEVATION	DESIGNER (SEE WINGWALL EXAMPLE)	297.80
22	WINGWALL "A" ELEVATION	21+0.50	298.30
30	WINGWALL "B" ELEVATION (USE APPROPRIATE EQUATION DEPENDING ON ABUTMENT NO.)	10 + $\frac{A2}{100} (\frac{EA}{2} (\cos(A1))) - \frac{C1}{2} (0.02) + 0.50$ ABUTMENT 1	301.97
		10 - $\frac{A2}{100} (\frac{EA}{2} (\cos(A1))) - \frac{C1}{2} (0.02) + 0.50$ ABUTMENT 2	
31	WINGWALL "B" ELEVATION	DESIGNER (SEE WINGWALL EXAMPLE)	297.47
32	WINGWALL "B" ELEVATION	31+0.50	297.97



QUANTITIES						
ITEM		QUANTITY FORMULA		UNIT	SUBTOTAL	TOTAL
CLASS 3 EXCAVATION		DESIGNER		C. Y.	149	149
CHEEKWALL A	CLASS AA CEMENT CONCRETE	$(BB+0.5 + \frac{BA-0.5-BB}{2})1.5 (20 - 12) (\frac{1yd^3}{27ft^3})$		C. Y.	.13	.2
CHEEKWALL B		$(CB+0.5 + \frac{0.5+CB-CA}{2})1.5 (30 - 13) (\frac{1yd^3}{27ft^3})$	CONDITION 1	C. Y.	-	
		$(2(CB) - 0.5 + \frac{CC+CB-0.5}{2})1.5 (30 - 13) (\frac{1yd^3}{27ft^3})$	CONDITION 2	C. Y.	.06	
ABUTMENT	CLASS A CEMENT CONCRETE	$[1.5 (11 - 15) + (\frac{1}{2}) (\frac{1}{r0}) (11 - 15)^2] (EB) (\frac{1yd^3}{27ft^3})$		C. Y.	22.40	64.3
WINGWALL A		$[1.5 (22 + \frac{20 - 22}{2} - 15) + (\frac{1}{2}) (\frac{1}{r0}) (22 + \frac{20 - 22}{2} - 15)^2] (AC) (\frac{1yd^3}{27ft^3})$		C. Y.	6.80	
WINGWALL B		$[1.5 (32 + \frac{30 - 32}{2} - 15) + (\frac{1}{2}) (\frac{1}{r0}) (32 + \frac{30 - 32}{2} - 15)^2] (AD) (\frac{1yd^3}{27ft^3})$		C. Y.	6.50	
FOOTING		$(\frac{1}{2}) (2.00) (LA+LB) (1A) + (MB+MC) (JA) + (NB+NC) (KA) (\frac{1yd^3}{27ft^3})$		C. Y.	28.60	
SELECTED BORROW EXCAVATION, STRUCTURE BACKFILL		DESIGNER		C. Y.	51	51
NO. 57 COARSE AGGREGATE		6 WEEPHOLES ($\frac{1}{2}cy$ WEEPHOLE)		C. Y.	3.0	3.0
REINFORCEMENT BARS		DESIGNER - CALCULATE BAR WEIGHT FROM SHEETS 13 & 14 OF BLC-561M		lb	6112	6112
REINFORCEMENT BARS, EPOXY COATED		DESIGNER - CALCULATE BAR WEIGHT FROM SHEETS 13 & 14 OF BLC-561M		lb	843	843

- FOOTNOTES FOR TABLES
- (1) SEE APPROPRIATE SUPERSTRUCTURE DATA ASSEMBLY SHEETS (BLC-561M SHEETS SHEETS 1 THRU 10).
- (2) SHOW ALL VALUES IN FEET. USE DECIMAL NOTATION TO ACCURACY OF 0.01 ft.

Mark	Description	By	Chk'd	Rec'd	Date
REVISIONS					

S- 00001 SHEET 22 OF 24

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

DESIGN EXAMPLE
22'-0" SPAN

DATA ASSEMBLY SHEETS
SPREAD FOOTING ABUTMENT 2

RECOMMENDED APR. 23, 2013
Thomas P. Macieira
CHIEF BRIDGE ENGINEER

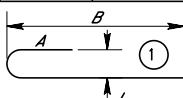
RECOMMENDED APR. 23, 2013
[Signature]
ACTING DIR. BUR. OF PROJECT DELIVERY

SHEET 12 OF 20
BLC-561M

BAR SCHEDULE																			
MARK	SIZE	SOURCE	LENGTH	SOURCE	NO.	SOURCE	TYPE	A	B	C	H	J	K	SOURCE	REMARKS	SOURCE	BAR WEIGHT lb/ft (4)	TOTAL BAR WEIGHT (5)	
A500	5		FROM 9'-2$\frac{3}{8}$" TO 9'-0$\frac{1}{2}$"	(12 - 15) -0.1667 (11 - 15) -0.1667	13	{ $\frac{EC-0.25}{1.50}+0.99$ } +1 (1)	STR.								VARIES BY <u>$\frac{1}{8}$"</u>	11 - 12 NO. OF BARS (3)	1.043	123.7	
A501	5		FROM 9'-0$\frac{1}{2}$" TO 8'-10$\frac{3}{8}$"	(11 - 15) -0.1667 (13 - 15) -0.1667	13	{ $\frac{ED-0.25}{1.50}+0.99$ } +1 (1)	STR.								VARIES BY <u>$\frac{1}{8}$"</u>	13 - 11 NO. OF BARS (3)	1.043	121.5	
A <u>6</u> _02	6	DESIGNER (2)	FROM 9'-2$\frac{3}{8}$" TO 9'-0$\frac{1}{2}$"	(12 - 15) -0.1667 (11 - 15) -0.1667	35	{ $\frac{EC-1.00(TAN(AA)) -0.25}{REQ. SPA. (DESIGNER) }+0.99$ } +1 (1) (2)	STR.								VARIES BY <u>$\frac{1}{16}$"</u>	11 - 12 NO. OF BARS (3)	1.502	479.6	
A <u>6</u> _03	6	DESIGNER (2)	FROM 9'-0$\frac{1}{2}$" TO 8'-10$\frac{3}{8}$"	(11 - 15) -0.1667 (13 - 15) -0.1667	33	{ $\frac{ED-1.00(TAN(AB)) -0.25}{REQ. SPA. (DESIGNER) }+0.99$ } +1 (1) (2)	STR.								VARIES BY <u>$\frac{1}{16}$"</u>	13 - 11 NO. OF BARS (3)	1.502	444.3	
A504	5		18'-11$\frac{1}{4}$"	EC+1.75	7	{ ((11 + 11 - 13 - 15) -2.00 1.50) +0.99 } +1 (2) (3)	STR.										1.043	138.3	
A505	5		16'-0$\frac{7}{8}$"	ED-0.1667	7	SAME AS A504	STR.										1.043	117.4	
A506	5		18'-4$\frac{3}{8}$"	EC-1.00(TAN(AA)) +1.75	7	SAME AS A504	STR.										1.043	134.1	
A507	5		15'-6"	ED-1.00(TAN(AB)) -0.1667	7	SAME AS A504	STR.										1.043	113.1	
A508	5		18'-11$\frac{1}{4}$"	$\sqrt{(11 - 12)^2+(EC)^2}+1.75$	1		STR.										1.043	19.8	
A509	5		16'-0$\frac{7}{8}$"	$\sqrt{(13 - 11)^2+(ED)^2}-0.1667$	1		STR.										1.043	16.8	
A510	5		18'-4$\frac{3}{8}$"	$\sqrt{(11 - 12)^2+(EC-1.00(TAN(AA)))^2}+1.75$	1		STR.										1.043	19.2	
A511	5		15'-6"	$\sqrt{(13 - 11)^2+(ED-1.00(TAN(AB)))^2}-0.1667$	1		STR.										1.043	16.2	
EA312	3		5'-2"	(BA-0.125) +2.50+($\frac{1.50}{\sin(AT) }-0.25$)	4	{ ((20 - 12) -0.3333 0.8333) +0.99 } +1 (1)	STR.								BEND IN FIELD		0.376	7.8	
EA313	3		4'-4$\frac{3}{8}$"	(CA-0.125) +(CC-0.25) +2.25+($\frac{1.50}{\sin(AT) }-0.25$)	4	{ ((30 - 13) -0.3333 0.8333) +0.99 } +1 (1)	STR.								BEND IN FIELD		0.376	6.6	
EA514	5		3'-5$\frac{1}{8}$"	(20 - 12) +1.5	7	USE 6 BARS FOR 90° SKEWS , AND 7 BARS ALL OTHER SKEWS	STR.										1.043	25.0	
EA515	5		3'-5"	(30 - 13) +1.5	6		STR.										1.043	21.4	
A516	5		4.25		18	{ $\frac{NO. OF BARS FROM A \underline{6} 02+1}{2}$ } (1)	③	1.583	1.083	1.583			0.167				1.043	79.8	
A517	5		4.25		17	{ $\frac{NO. OF BARS FROM A \underline{6} 03+1}{2}$ } (1)	③	1.583	1.083	1.583			0.167				1.043	75.4	
A518	5		1.00		32		STR.										1.043	33.4	
W520	5		FROM 7'-1$\frac{3}{8}$" TO 11'-1$\frac{3}{8}$"	FB-0.1667 FA-0.1667	8	{ $\frac{AC-0.50}{1.50}+0.99$ } +1 (1)	STR.								VARIES BY <u>6"</u>	$\frac{FC}{NO. OF BARS}$	1.043	76.2	
W <u>5</u> _21	5	DESIGNER (2)	FROM 7'-1$\frac{3}{8}$" TO 11'-1$\frac{3}{8}$"	FB-0.1667 FA-0.1667	21	{ $\frac{AC-0.50}{REQ. SPA. (DESIGNER) }+0.99$ } +1 (1) (2)	STR.								VARIES BY <u>2$\frac{1}{4}$"</u>	$\frac{FC}{NO. OF BARS}$	1.043	200.0	
W522	5		9'-8"	AC-0.3333	7	{ $\frac{FB-0.50}{1.50}+0.99$ } +1 SHOW ON DRAWINGS (1) (6)	STR.										1.043	141.2	
W523	5		FROM 6'-7$\frac{3}{4}$" TO 2'-5"	($\frac{FC-1.25}{FC}$) (AC-0.3333) 1.00(AC-0.3333) FC	3	{ $\frac{FC-2.25}{1.50}+0.99$ } +1 SHOW ON DRAWINGS (1) (6)	STR.								VARIES BY _____ 1'-4$\frac{7}{8}$"	(LENGTH FROM 6.646) - (LENGTH TO 2.417) NO. OF BARS SHOWN ON DRAWINGS	1.043	28.4	

FOOTNOTES FOR TABLE

- (1) TAKE THE INTEGER VALUE OF THE QUANTITY WITHIN THE{ } .
- (2) USE THE DEPARTMENT'S LRFD ABUTMENT AND RETAINING WALL ANALYSIS AND DESIGN PROGRAM (ABLRFD) IN CONJUNCTION WITH THE BLC-560M DATA ASSEMBLY AND CONSTRUCTION SHEETS TO CALCULATE THE NECESSARY DIMENSIONS AND REINFORCEMENT FOR THE ABUTMENT (WITHOUT BACKWALL) , WINGWALLS, AND SPREAD FOOTING.
- (3) TAKE THE ABSOLUTE VALUE OF THE QUANTITY WITHIN THE | | .
- (4) USE TABLE 1 ON THIS SHEET TO COMPLETE BAR WEIGHT QUANTITIES.
- (5) TOTAL BAR WEIGHT = (BAR LENGTH OR AVERAGE BAR LENGTH) × (TOTAL NO. OF BARS) × (BAR WEIGHT)
- (6) SHOW TWICE THIS NUMBER ON THE BAR SCHEDULE (TOTAL NO. OF BARS)

TABLE 1 REINFORCEMENT INFORMATION			
BAR SIZE	RECOMMENDED END HOOK DIMENSIONS (ALL GRADES)		BAR WEIGHT lb/ft
	180° HOOKS		
	A	J	
3	0.417	0.250	0.376
4	0.500	0.333	0.668
5	0.583	0.417	1.043
6	0.667	0.500	1.502
7	0.833	0.583	2.044
8	0.917	0.667	2.670
9	1.250	0.979	3.400
10	1.417	1.104	4.303
11	1.583	1.229	5.313
			

Mark	Description	By	Chk'd	Rec'd	Date
REVISIONS					

S- 00001

SHEET 23 OF 24

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

DESIGN EXAMPLE
22'-0" SPAN

DATA ASSEMBLY SHEETS
SPREAD FOOTING ABUTMENT 2

RECOMMENDED APR. 23, 2013 <i>Thomas P. Macieira</i> CHIEF BRIDGE ENGINEER	RECOMMENDED APR. 23, 2013 <i>David A. Kelly</i> ACTING DIR. BUR. OF PROJECT DELIVERY	SHEET 13 OF 20 BLC-561M
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THESE PLANS ARE ACCOMPANIED BY NO WARRANTIES, EXPRESSED OR IMPLIED. CONSTRUCTION PLANS PREPARED FROM DESIGN AND DETAIL INFORMATION SHOWN HEREIN MUST BE REVIEWED, APPROVED AND SEALED BY A REGISTERED PROFESSIONAL ENGINEER FOR EACH SPECIFIC PROJECT.

BAR SCHEDULE																			
MARK	SIZE	SOURCE	LENGTH	SOURCE	NO.	SOURCE	TYPE	A	B	C	H	J	K	SOURCE	REMARKS	SOURCE	BAR WEIGHT lb/ft (4)	TOTAL BAR WEIGHT(5)	
W524	5		10'-5¼"	√FC²+AC²-0.333	1	SHOW ON DRAWINGS	STR.										1.043	21.8	
					2	SHOWN ON BAR SCHEDULE (TOTAL NO. OF BARS)													
W525	5		4.25		11	{ NO. OF BARS FROM W_521+1 } 2	(1) ③	1.583	1.0833	1.583			0.1667				1.043	48.8	
W526	5		1.00		8		STR.										1.043	8.3	
W530	5		FROM 6'-9¾" TO 10'-9¾"	GB-0.1667 GA-0.1667	8	{ AD-0.5 1.50 +0.99 } +1	(1) STR.								VARIES BY 6"	GC NO. OF BARS	1.043	73.5	
W_531	5	DESIGNER (2)	FROM 6'-9¾" TO 10'-9¾"	GB-0.1667 GA-0.1667	21	{ AD-0.5 REQ. SPA. (DESIGNER) +0.99 } +1	(1) (2) STR.								VARIES BY 2¼"	GC NO. OF BARS	1.043	192.8	
W532	5		9'-8"	AD-0.333	6	{ GB-0.50 1.50 +0.99 } +1	SHOW ON DRAWINGS (1) (6) STR.										1.043	121.0	
W533	5		FROM 6'-7¾" TO 2'-5"	(GC-1.25) (AD-0.333) GC 1.00 (AD-0.333) GC	3	{ GC-2.25 1.50 +0.99 } +1	SHOW ON DRAWINGS (1) (6) STR.								VARIES BY 1'-4⅞"	(LENGTH FROM 6.646) - (LENGTH TO 2.417) NO. OF BARS SHOWN ON DRAWINGS	1.043	28.4	
W534	5		10'-5¼"	√GC²+AD²-0.333	1	SHOW ON DRAWINGS	STR.										1.043	21.8	
					2	SHOWN ON BAR SCHEDULE (TOTAL NO. OF BARS)													
W535	5		4.25		11	{ NO. OF BARS FROM W_531+1 } 2	(1) ③	1.583	1.0833	1.583			0.1667				1.043	48.8	
W536	5		1.00		8		STR.										1.043	8.3	
F_600	6	DESIGNER (2)	7'-1"	IA-0.667	43	{ LA-0.50 REQ. SPA. (DESIGNER) +0.99 } +1	(1) (2) STR.										1.502	457.5	
F_701	7	DESIGNER (2)	7'-1"	IA-0.667	64	{ LA-0.50 REQ. SPA. (DESIGNER) +0.99 } +1	(1) (2) STR.										2.044	926.6	
F502	5		30'-8¾"	LA-0.667	7	{ IA-0.667 1.50 +0.99 } +1	(1) (6) STR.										1.043	448.3	
F403	4		2.25		48	((IA-0.667 3.00 +0.99) +1) ((LA-0.5 3.0 +0.99) +1)	(1) ②	0.375	1.5	0.375	0.250						0.668	72.1	
F504	5		3.50		13	{ EC-0.25 1.50 +0.99 } +1	(1) STR.										1.043	47.5	
F505	5		3.50		13	{ ED-0.25 1.50 +0.99 } +1	(1) STR.										1.043	47.5	
EF_606	6	DESIGNER (2)	5'-7"	HB+1.667+A FOR "A" VARIABLE SEE TABLE 1	35	{ EC-1.00(TAN(AA)) -0.25 REQ. SPA. (DESIGNER) +0.99 } +1	(1) (2) ①	.667	4.917				.500	SEE TABLE 1 (B = HB + 1.667)			1.502	293.6	
EF_607	6	DESIGNER (2)	5'-7"	HB+1.667+A FOR "A" VARIABLE SEE TABLE 1	33	{ ED-1.00(TAN(AB)) -0.25 REQ. SPA. (DESIGNER) +0.99 } +1	(1) (2) ①	.667	4.917				.500	SEE TABLE 1 (B = HB + 1.667)			1.502	276.8	
F_620	6	DESIGNER (2)	5'-10"	JA-0.667	25	{ MB-0.50 REQ. SPA. (DESIGNER) +0.99 } +1	(1) (2) STR.										1.502	219.0	
F_521	5	DESIGNER (2)	5'-10"	JA-0.667	25	{ MB-0.50 REQ. SPA. (DESIGNER) +0.99 } +1	(1) (2) STR.										1.043	152.1	
F522	5		11'-6"	MB-0.667	6	{ JA-0.667 1.50 +0.99 } +1	SHOW ON DRAWINGS (1) (6) STR.										1.043	144.0	
F423	4		2.25		24	((JA-0.667 3.00 +0.99) +1) ((MB-0.50 3.00 +0.99) +1)	(1) ②	0.375	1.5	0.375	0.250						0.668	36.1	
F524	5		3.50		8	{ AC-0.50 1.50 +0.99 } +1	(1) STR.										1.043	29.2	
EF_525	5	DESIGNER (2)	4'-10"	FD+1.667+A FOR "A" VARIABLE SEE TABLE 1	21	{ AC-0.50 REQ. SPA. (DESIGNER) +0.99 } +1	(1) (2) ①	.583	4.250				.417	SEE TABLE 1 (B = FD + 1.667)			1.043	105.9	
F_630	6	DESIGNER (2)	5'-10"	KA-0.667	25	{ NB-0.50 REQ. SPA. (DESIGNER) +0.99 } +1	(1) (2) STR.										1.502	219.0	
F_531	5	DESIGNER (2)	5'-10"	KA-0.667	25	{ NB-0.50 REQ. SPA. (DESIGNER) +0.99 } +1	(1) (2) STR.										1.043	152.1	
F532	5		11'-6"	NB-0.667	6	{ KA-0.667 1.50 +0.99 } +1	SHOW ON DRAWINGS (1) (6) STR.										1.043	144.0	
F433	4		2.25		24	((KA-0.667 3.00 +0.99) +1) ((NB-0.5 3.00 +0.99) +1)	(1) ②	0.375	1.5	0.375	0.250						0.668	36.1	
F534	5		3.50		8	{ AD-0.50 1.50 +0.99 } +1	(1) STR.										1.043	29.2	
EF_535	5	DESIGNER (2)	4'-10"	GD+1.667+A FOR "A" VARIABLE SEE TABLE 1	21	{ AD-0.50 REQ. SPA. (DESIGNER) +0.99 } +1	(1) (2) ①	.583	4.250				.417	SEE TABLE 1 (B = GD + 1.667)			1.043	105.9	

FOOTNOTES FOR TABLE

- (1) TAKE THE INTEGER VALUE OF THE QUANTITY WITHIN THE{ } .
- (2) USE THE DEPARTMENT'S LRFD ABUTMENT AND RETAINING WALL ANALYSIS AND DESIGN PROGRAM (ABLRFD) IN CONJUNCTION WITH THE BLC-560M DATA ASSEMBLY AND CONSTRUCTION SHEETS TO CALCULATE THE NECESSARY DIMENSIONS AND REINFORCEMENT FOR THE ABUTMENT (WITHOUT BACKWALL), WINGWALLS, AND SPREAD FOOTING.
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TABLE 1

REINFORCEMENT INFORMATION

BAR SIZE	RECOMMENDED END HOOK DIMENSIONS (ALL GRADES)		BAR WEIGHT lb/ft
	180° HOOKS		
	A	J	
3	0.417	0.250	0.376
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The diagram illustrates a 180-degree hook reinforcement. It shows a horizontal bar with a U-shaped hook at its right end. Dimension 'A' is the straight length of the bar from the left end to the start of the hook. Dimension 'J' is the vertical height of the hook's stem. A circled number '1' is located at the end of the hook.

Mark	Description	By	Chk'd	Rec'd	Date
REVISIONS					

S- 00001 SHEET 24 OF 24

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

DESIGN EXAMPLE
22'-0" SPAN

DATA ASSEMBLY SHEETS
SPREAD FOOTING ABUTMENT 2

RECOMMENDED APR. 23, 2013
Thomas P. Macieira
CHIEF BRIDGE ENGINEER

RECOMMENDED APR. 23, 2013
[Signature]
ACTING DIR. BUR. OF PROJECT DELIVERY

SHEET 14 OF 20
BLC-561M