COMMONWEALTH OF PENNSYLVANIA

pennsylvania
DEPARTMENT OF TRANSPORTATION

DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

STANDARDS
FOR
HARDWOOD GLULAM TIMBER BRIDGE DESIGN

SERIES BLC-560M
HARDWOOD GLULAM TIMBER SPANS 18′-0" TO 98′-5"

PUB 6M (4-13)

APRIL 2013 EDITION

BLC-560M

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COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

HARDWOOD GLULAM TIMBER BRIDGE DESIGN
INDEX OF SHEETS

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

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

SHEET 1 OF 3

BLC-560M

1. USE THIS SERIES OF STANDARD DRAWINGS TO PROVIDE A RAPID MEANS OF PRODUCING DESIGN DRAWINGS FOR SINGLE SPAN TIMBER BRIDGES IN THE 18′-0" TO 98′-5" SPAN RANGE. BY SELECTING THE APPROPRIATE STANDARD FORMAT PLAN SHEETS AND INSERTING BASIC GEOMETRY AND JOB SPECIFIC INFORMATION, THE DESIGNER GENERATES A COMPLETE SET OF CONTRACT DRAWINGS READY FOR CONSTRUCTION.

2. THE BRIDGES PROVIDED FOR IN THIS SERIES UTILIZE HARDWOOD GLULAM TIMBER COMPONENTS AS BASIC ELEMENTS OF THE SUPERSTRUCTURE. STANDARDIZED ABUTMENTS ARE PROVIDED WITH HEIGHTS (BOTTOM OF FOOTING TO TOP OF STEM) RANGING FROM 3′-3" MINIMUM TO 20′-0" MAXIMUM. WITH THREE TYPES OF SUPERSTRUCTURES AND VARIOUS COMPATIBLE AND INTERCHANGEABLE ABUTMENTS FROM WHICH TO CHOOSE, THE DESIGNER SHOULD BE ABLE TO ADAPT THE STANDARDS TO FIT MOST SINGLE SPAN APPLICATIONS.

3. THE LAMINATION PROCESS UTILIZED IN HARDWOOD GLULAM PRODUCTION ENHANCES THE STRUCTURAL EFFICIENCY OF THE TIMBER BRIDGE DESIGN. THE PROCESS PERMITS OPTIMUM USE OF HIGHER GRADE LUMBER MATERIAL IN THE BEAM'S HIGHLY STRESSED CROSS-SECTIONAL ZONES. USE OF EFFECTIVE CREOSOTE TREATMENTS MAINTAINS MAXIMUM SERVICE LIFE OR EXPOSURE DURABILITY BY RESISTING AND CONTROLLING DECAY, INSECT ATTACK, AND OTHER ENVIRONMENTAL WEATHERING FACTORS. FURTHERMORE, A BITUMINOUS WEARING SURFACE PROLONGS HARDWOOD GLULAM TIMBER DECK LIFE BY MINIMIZING ADVERSE ABRASION AND MECHANICAL WEAR, AND PROVIDES ADDED VEHICLE TRACTION UPON WET OR ICY DECK SURFACES.

4. USE THESE HARDWOOD GLULAM TIMBER STANDARDS FOR SECONDARY ROADWAY STREAM CROSSINGS WITH THE FOLLOWING GENERAL LIMITATIONS.

   1. AVERAGE DAILY TRAFFIC (ADT) LESS THAN 750 VEHICLES OR AVERAGE DAILY TRUCK TRAFFIC (ADTT) OF LESS THAN 25 VEHICLES. FOR TIMBER DECKS ON STEEL BEAM SUPERSTRUCTURE, ADTT LESS THAN 100 VEHICLES.
   2. ROADWAY WIDTHS OF 23′-7" TO 31′-6".
   3. ANGLES OF INTERSECTION (SKEW) NOT LESS THAN 45 DEGREES
   4. DO NOT EXCEED 10′-0" OF EXPOSED HEIGHT FOR ABUTMENT TIMBER PILES. USE STEEL PILES FOR ANY HEIGHT, BUT DESIGN STEEL PILES ACCORDINGLY.
   5. SPANS 18′-0" TO 98′-5".

5. SELECT ONE OF THE THREE POSSIBLE ASSEMBLY TYPES FOR THE BRIDGE SUPERSTRUCTURE: GLULAM BEAM WITH TRANSVERSE GLULAM DECK (BLC-562M), GLULAM LONGITUDINAL PANEL (BLC-563M), OR STEEL BEAM WITH TRANSVERSE GLULAM DECK (BLC-564M).

   USE THE FIRST BRIDGE SUPERSTRUCTURE, GLULAM BEAM, FOR SPANS 18′-0" TO 98′-5". THIS SUPERSTRUCTURE COMPOSITION CONSISTS OF HARDWOOD GLULAM TIMBER BEAMS AND A TRANSVERSE HARDWOOD GLULAM TIMBER DECK. THE GLULAM BEAM SYSTEM CHARACTERISTICALLY HAS A LARGE DEPTH-TO-SPAN RATIO DUE TO THE RELATIVELY LOW BENDING STRENGTH OF WOOD COMPARED TO STEEL. IN SOME CASES, VERTICAL CLEARANCE RESTRICTIONS MAY RULE OUT THE USE OF THIS STRUCTURE TYPE BECAUSE OF THE EXCESSIVE SUPERSTRUCTURE DEPTH. WHERE VERTICAL CLEARANCE IS A PROBLEM, CONSIDER THE USE OF THE STEEL BEAM OR GLULAM PANEL SUPERSTRUCTURES.

   FOR SHORT SPANS OF 18′-0" TO 23′-0", USE THE SECOND TYPE OF BRIDGE SUPERSTRUCTURE, A LONGITUDINAL HARDWOOD GLULAM PANEL, TO EFFECTIVELY REDUCE THE DEPTH OF THE TIMBER SUPERSTRUCTURE. THE LONGITUDINAL PANEL ACTS AS A TIMBER SLAB STRUCTURE WITH A RELATIVELY SHALLOW PROFILE.

6. USE THE POST AND RAILS, OR SAFETY PARAPETS (SOLID SAWN LUMBER, GLULAM, OR STEEL) WHICH ARE SHOWN ON THE DRAWINGS. USE AN ALTERNATE SAFETY PARAPET ONLY UPON APPROVAL OF THE PENNDOT DISTRICT BRIDGE ENGINEER.

7. THE PILE SUBSTRUCTURE DESIGNS PROVIDED WITH THESE STANDARD DRAWINGS SUPPLY SAFE, LOW COST BRIDGE ABUTMENTS IN MANY CASES. UNFORTUNATELY, FOUNDATION CONDITIONS ARE NOT ALWAYS SUITABLE FOR THIS ABUTMENT TYPE, THEREFORE, CONSIDER AN ALTERNATE SUBSTRUCTURE DESIGN. BE AWARE OF REQUIRED PILE EMBEDMENT LENGTH IN SELECTING PILE ABUTMENT SITES. FAILURE TO ATTAIN THE REQUIRED PILE EMBEDMENT LENGTH DUE TO BEDROCK OR A VERY DENSE SOIL STRATUM CLOSE TO THE GROUND SURFACE CAUSES AN UNACCEPTABLE LATERAL PILE MOVEMENT. TO AVOID SUCH PROBLEMS, VERIFY THE ABILITY TO REACH THE MINIMUM REQUIRED EMBEDMENT LENGTH.

8. CONSIDER THE POTENTIAL FOR PILE DAMAGE DURING DRIVING IN DETERMINING SUITABILITY OF TIMBER PILE ABUTMENTS. USE TIMBER PILES IDEALLY AS FRICTION PILES IN AREAS FREE OF BOULDERS OR OTHER SUCH OBSTRUCTIONS DURING DRIVING. EMPLOY TIMBER PILES WITH CAUTION WHERE PILE TIPS REACH BEDROCK OR A VERY DENSE STRATUM BEFORE ATTAINING THE REQUIRED FRICTION EMBEDMENT LENGTH. WHEN SUCH CONTACT OCCURS, DRIVING RESISTANCE AND THE RISK OF PILE DAMAGE INCREASES RAPIDLY. TO MINIMIZE THE POSSIBILITY OF PILE DAMAGE, DRIVE TIMBER PILES TO THE MAXIMUM PERMITTED DRIVING RESISTANCE (MPDR) AS DEFINED IN PENNDOT PUBLICATION 408. DO NOT DRIVE BEYOND THE MPDR. OBTAIN APPROVAL OF A PILE HAMMER SIZE AND CONTROL OF DRIVING FROM THE DEPARTMENT PRIOR TO THE START OF CONSTRUCTION.

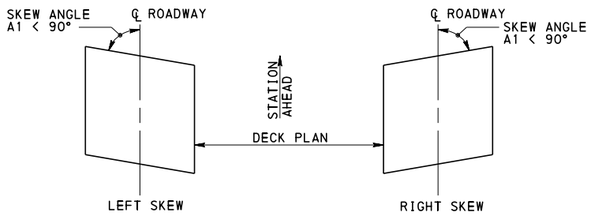
9. SUBMIT A COMPLETED SET OF DRAWINGS ASSEMBLED FROM THESE STANDARDS TO A REGISTERED PROFESSIONAL ENGINEER FOR REVIEW AND APPROVAL TO ENSURE ADEQUATE DESIGN, AND PERFORM A SUBSURFACE INVESTIGATION PRIOR TO BEGINNING THE FOUNDATION DESIGN. PREPARE FULL SIZE 34"x22" REPRODUCIBLE DRAWINGS USING THESE STANDARDS.

BEFORE USING THESE STANDARDS, OBTAIN BASIC SURVEY, GEOMETRIC DATA, AND SOILS INFORMATION FOR THE PROPOSED CONSTRUCTION SITE. IF THE SITE IS SUITABLE FOR A TIMBER BRIDGE, CHOOSE ONE OF THE AVAILABLE TIMBER SUPERSTRUCTURE TYPES. IF VERTICAL CLEARANCE IS A PROBLEM, USE THE LONGITUDINAL PANEL OR STEEL BEAM TYPE, IF FEASIBLE.

DESIGN OF SUBSTRUCTURE UNITS IS BASED ON THE MATERIAL PARAMETERS AND SOIL CONDITIONS SHOWN ON BLC-560M, SHEET 3. COMPUTE SCOUR DEPTH WHEN SUBSTRUCTURE UNITS ARE EXPOSED TO STREAM CURRENTS. PROVIDE ADEQUATE EMBEDMENT FOR SUBSTRUCTURE UNITS TO RESIST THE EFFECTS OF SCOUR AND FROST.

REFERRING TO THE INDEX OF SHEETS (SEE SHEET 1) STANDARDS ARE SEPARATED INTO DESIGN SHEETS AND CONSTRUCTION SHEETS. IN ADDITION TO INFORMATIONAL AND INSTRUCTIONAL MATERIAL, THE DESIGN SHEETS INCLUDE DATA ASSEMBLY SHEETS FOR THE STANDARDIZED TYPES OF SUBSTRUCTURES AND SUPERSTRUCTURES. THESE SHEETS CONTAIN THE BASIC DATA AND THE EQUATIONS NECESSARY TO GENERATE THE INFORMATION REQUIRED FOR THE FILL-IN TYPE CONSTRUCTION SHEETS. SELECT THE APPROPRIATE DATA ASSEMBLY SHEET AND THE APPROPRIATE CONSTRUCTION SHEETS FOR THE SELECTED STRUCTURE TYPE.

SELECT THE APPROPRIATE CONSTRUCTION SHEETS FOR LEFT, 90° , & RIGHT SKEWED STRUCTURES. THE SKEW ANGLE FOR A LEFT SKEWED STRUCTURE IS MEASURED TO THE LEFT OF THE ROADWAY CENTERLINE WHILE A RIGHT SKEW ANGLE IS MEASURED TO THE RIGHT OF THE CENTERLINE. SEE THE FOLLOWING SKETCH.



AFTER SELECTING THE NECESSARY DATA ASSEMBLY AND CONSTRUCTION SHEETS, PRODUCE FINAL CONTRACT DRAWINGS.

COMMONWEALTH OF PENNSYLVANIA
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HARDWOOD GLULAM TIMBER BRIDGE DESIGN GENERAL INFORMATION & INSTRUCTIONS

RECOMMENDED APR. 23, 2013	RECOMMENDED APR. 23, 2013	SHEET 2 OF 3
Thomas P. Macioce CHIEF BRIDGE ENGINEER	ACTING DIR. BUR. OF PROJECT DELIVERY	BLC-560M

DESIGN CRITERIA

DESIGN SPECIFICATIONS - 2010 AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, AND AS SUPPLEMENTED BY THE PENNSYLVANIA DEPARTMENT OF TRANSPORTATION DESIGN MANUAL, PART 4, MAY 2012 EDITION, AND AS NOTED HEREIN WERE USED TO DEVELOP THESE STANDARD DRAWINGS.

SUPERSTRUCTURE

1. LIVE LOAD
   PHL-93 DESIGN LOADING AT STRENGTH I LOAD COMBINATION,
   P82 DESIGN PERMIT LOADING AT STRENGTH II LOAD COMBINATION
2. LIVE LOAD DEFLECTION
   125% OF THE LARGER OF:
   A. ONE DESIGN TRUCK WITH THE VARIABLE AXLE SPACING SPECIFIED IN AASHTO 3.6.1.2.2
   B. 25% FOR ONE DESIGN TRUCK WITH THE VARIABLE AXLE SPACING COMBINED WITH THE EFFECT OF THE DESIGN LANE.
3. DEAD LOADS
   -BITUMINOUS SURFACE OF 140 lb/ft³
   -FUTURE WEARING SURFACE 30 lb/ft²
   -TIMBER BRIDGE COMPONENTS

NORTHERN RED OAK	55 lb/ft³
RED MAPLE	50 lb/ft³
YELLOW POPLAR	50 lb/ft³
STEEL BRIDGE COMPONENTS	490 lb/ft³

4. TIMBER DESIGN CRITERIA
   A. TRANSVERSE DECK DESIGN
      1. DECK THICKNESS IN ACCORDANCE WITH AASHTO 4.6.2.1 (MIN. DECK THICKNESS OF 6" NOMINAL, AASHTO 9.9.2)
      2. DESIGN VALUES[1] (ksi)

	NORTHERN RED OAK (NRO)	RED MAPLE (RM)	YELLOW POPLAR (YP)
BENDING (Fby) (4 OR MORE LAMS)	1.700	1.450	1.200
SHEAR (Fvy) (4 OR MORE LAMS)	0.175	0.160	0.135
COMP. PERP TO THE GRAIN (Fc⊥)	0.835	0.590	0.405
MODULUS OF ELASTICITY (E)	1500	1300	1200

      1.) DESIGN VALUES BASED ON AITC 119-96 (TABLE 2). VALUES REFLECT H2, H6, AND H10 GLULAM COMBINATIONS OF NO. 2 (N2) GRADE LUMBER FOR NRO, RM, AND YP, RESPECTIVELY.

      3. NOMINAL RESISTANCES AND MODULUS OF ELASTICITY VALUES OBTAINED BY ADJUSTING DESIGN VALUES WITH ALL APPLICABLE MODIFICATION FACTORS ACCORDING TO AASHTO 8.4.4. ASSUME MOISTURE CONTENT >16%.
      4. DEFLECTION LESS THAN OR EQUAL TO SPAN/425 AND EXTREME RELATIVE DEFLECTION BETWEEN ADJACENT DECK PANEL EDGES LESS THAN OR EQUAL TO 3/32".
      5. MAXIMUM DECK OVERHANG IS 2'-3".
   B. BEAM DESIGN
      1. LIVE LOAD DISTRIBUTION FOR MOMENT AND SHEAR IN EXTERIOR BEAMS WITH WOOD DECKS IS BASED ON THE LEVER RULE PER AASHTO TABLE 4.6.2.2.
      2. LIVE LOAD DISTRIBUTION FACTOR (DEFLECTION) = NO. OF LANES / NO. OF BEAMS
      3. DESIGN VALUES[1] (ksi)

	NORTHERN RED OAK (NRO)	RED MAPLE (RM)	YELLOW POPLAR (YP)
BENDING (Fbx)	2.400	2.400	2.400
SHEAR (Fvx)	0.235	0.220	0.155
COMP. PERP. TO THE GRAIN (Fc⊥)	1.075	0.895	0.590
MODULUS OF ELASTICITY (Ex)	1800	1800	1800

      1.) DESIGN VALUES BASED ON AITC 119-96 (TABLE 1) FOR 24F-1.8E GLULAM COMBINATIONS.
      4. DEFLECTION LESS THAN OR EQUAL TO SPAN/425.
      5. NOMINAL RESISTANCES AND MODULUS OF ELASTICITY VALUES OBTAINED BY ADJUSTING DESIGN VALUES WITH ALL APPLICABLE MODIFICATION FACTORS ACCORDING TO AASHTO 8.4.4. ASSUME MOISTURE CONTENT ≥16%.
   C. LONGITUDINAL PANEL DESIGN
      1. LIVE LOAD DISTRIBUTION FOR MOMENT IS BASED ON EQUIVALENT STRIP WIDTHS PER AASHTO 4.6.2.3.
      2. DESIGN VALUES[1] (ksi)

	NORTHERN RED OAK (NRO)	RED MAPLE (RM)	YELLOW POPLAR (YP)
BENDING (Fby) (4 OR MORE LAMS)	1.700	1.450	1.200
SHEAR (Fvy) (4 OR MORE LAMS)	0.175	0.160	0.135
COMP. PERP TO THE GRAIN (Fc⊥)	0.835	0.590	0.405
MODULUS OF ELASTICITY (E)	1500	1300	1200

      1.) DESIGN VALUES BASED ON AITC 119-96 (TABLE 2). VALUES REFLECT H2, H6, AND H10 GLULAM COMBINATIONS OF NO. 2 (N2) GRADE LUMBER FOR NRO, RM, AND YP, RESPECTIVELY.

      3. NOMINAL RESISTANCE AND MODULUS OF ELASTICITY VALUES OBTAINED BY ADJUSTING DESIGN VALUES WITH ALL APPLICABLE MODIFICATION FACTORS ACCORDING TO AASHTO 8.4.4. ASSUME MOISTURE CONTENT > 16%.
      4. DEFLECTION LESS THAN OR EQUAL TO SPAN/425 AND EXTREME RELATIVE DEFLECTION BETWEEN ADJACENT EDGES LESS THAN OR EQUAL TO 3/32".

D. NET DIMENSIONS OF NORTHERN RED OAK, RED MAPLE, & YELLOW POPLAR GLUED LAMINATED TIMBER

NOMINAL DIMENSION IN	NET MINIMUM FINISHED DIMENSION (1) IN	NET MINIMUM FINISHED DIMENSION (2) IN
4	3 1/8	-
6	5 1/8	-
8	6 7/8	-
10	-	8 5/8
12	-	10 3/8
14	-	12 3/8
16	-	14 3/8
18	-	16 1/8

1.) SINGLE MEMBER LAY-UP
2.) COMBINATION LAY-UP

E. PILOT HOLE RECOMMENDATIONS FOR 3/4"Ø LAG SCREWS[1]

CORRESPONDING SPECIES	PILOT HOLE DIAMETER IN
NORTHERN RED OAK	5/8
RED MAPLE	9/16
YELLOW POPLAR	1/2

1.) SWAB PILOT HOLES WITH BITUMINOUS ASPHALT BASED ROOF CEMENT, COPPER NAPHTHENATE PASTE, OR APPROVED PRESERVATIVE SYSTEM.

F. RECOMMENDED TORQUES FOR 3/4"Ø LAG SCREWS AND THROUGH BOLTS[1]

CORRESPONDING SPECIES	USE	CONNECTOR TYPE	CONNECTOR LENGTH IN	TORQUE[2] GUIDELINES lb-ft
NORTHERN RED OAK	DECK TO BEAM	LAG SCREW	12	184
	ALUMINUM DECK CLIP	LAG SCREW	5	184
	DIAPHRAGM	LAG SCREW	VARIABLE	162
	STEEL CROSS BRACE	THROUGH BOLT	VARIABLE	125
	STIFFENER BEAM	ENLARGED DOME HEAD BOLT	VARIABLE	250
	BACKWALL TO BEAM	LAG SCREW	9	140
	OFFSET SHOE	LAG SCREW	5	192
			6	230
RED MAPLE	DECK TO BEAM	LAG SCREW	12	140
	ALUMINUM DECK CLIP	LAG SCREW	5	184
	DIAPHRAGM	LAG SCREW	VARIABLE	140
	STEEL CROSS BRACE	THROUGH BOLT	VARIABLE	110
	STIFFENER BEAM	ENLARGED DOME HEAD BOLT	VARIABLE	220
	BACKWALL TO BEAM	LAG SCREW	9	110
	OFFSET SHOE	LAG SCREW	5	162
			6	192
YELLOW POPLAR	DECK TO BEAM	LAG SCREW	12	118
	ALUMINUM DECK CLIP	LAG SCREW	5	134
	DIAPHRAGM	LAG SCREW	VARIABLE	104
	STEEL CROSS BRACE	THROUGH BOLT	VARIABLE	82
	STIFFENER BEAM	ENLARGED DOME HEAD BOLT	VARIABLE	162
	BACKWALL TO BEAM	LAG SCREW	9	96
	OFFSET SHOE	LAG SCREW	5	118
			6	148

1.) PLACE COMPONENTS IN CONTACT WITH EACH OTHER BEFORE TORQUE IS APPLIED.
2.) TORQUE GUIDELINES INTENDED ONLY FOR ESTIMATING EQUIPMENT REQUIREMENTS. ALL LAGS SHOULD BE TORQUED UNTIL LAG WASHER IS MATED WITH THE SIDE MEMBER. AVOID WOOD CRUSHING.

5. STEEL BEAM DESIGN CRITERIA
   A. MATERIAL
      1. STRUCTURAL STEEL - ASTM A709, GRADE 36 FOR ALL STEEL UNLESS NOTED OTHERWISE
      2. BOLTS - ASTM A325
   B. CONTROL PERMANENT DEFLECTIONS THROUGH FLANGE STRESS CONTROLS AS PER AASHTO 6.10.3.
6. ELASTOMERIC BEARING PADS
   A. MATERIAL
      1. ELASTOMER - 50 DUROMETER HARDNESS ON SHORE A SCALE
7. MAXIMUM ALLOWABLE DECK OVERHANG OF 2'-3" USED FOR DECK AND BEAM DESIGN SHOWN HEREIN.

SUBSTRUCTURE

1. DESIGN DATA
   -DENSITY OF BACKFILL MATERIAL = 120 lb/ft³
   -DENSITY OF CONCRETE = 150 lb/ft³
   -EQUIVALENT FLUID EARTH PRESSURE = 35 lb/ft²/ft OF DEPTH
   -LIVE LOAD SURCHARGE = REFER TO DESIGN MANUAL, PART 4, D3.11.
   -NEGLECT THE EFFECT OF PASSIVE PRESSURE DUE TO SOIL IN FRONT OF WALL.
2. CONCRETE DESIGN CRITERIA
   -CLASS A CEMENT CONCRETE (ABUTMENTS BELOW BRIDGE SEAT, WINGWALLS, AND FOOTINGS). CLASS AA CEMENT CONCRETE (CHEEKWALLS).
   -GRADE 60 REINFORCING STEEL BARS
3. TIMBER SILL SUBSTRUCTURE DESIGN CRITERIA
   -DESIGN AND CONSTRUCT TIMBER SUB-STRUCTURE OUT OF SOFTWOOD, EXCEPT FOR CRIBBING & BEARING SILL WHICH MAY BE CONSTRUCTED OUT OF HARDWOODS.
   A. BEARING SILL
      1. DESIGN TIMBER BEARING SILL TO ACT AS A CONTINUOUS BEAM OVER THE TIMBER PILES. THE PROPOSED METHOD OF TIMBER PILE PLACEMENT IS TO PROVIDE A TIMBER PILE AT EACH ABUTMENT/WINGWALL INTERSECTION AND THEN PLACE THE NECESSARY NUMBER OF INTERIOR PILES AT EQUAL SPACES (SEE PILE DESIGN CRITERIA).
      2. FOR SOLID SAWN LUMBER USE WET-USE BASE RESISTANCE & MOE FROM AASHTO TABLE 8.4.1.1.4-1
      3. HARDWOOD GLULAM WET-USE BASE RESISTANCE & MOE: ksi[a,b]

	NORTHERN RED OAK (NRO)	RED MAPLE (RM)	YELLOW POPLAR (YP)
BENDING (Fbx)	5.28	5.28	5.28
SHEAR (Fvx)	0.647	0.605	0.426
COMP. PERP. TO THE GRAIN (Fcp)	1.45	1.21	0.796
MODULUS OF ELASTICITY (Ex)	1500	1500	1500

      a. IN-SERVICE MOISTURE CONTENT > 16%
      b. DESIGN VALUES BASED ON PUBLISHED AITC 119-96 STRESSES FOR 24F-1.8E GLULAM COMBINATIONS
      4. OBTAIN NOMINAL RESISTANCE AND MODULUS OF ELASTICITY VALUES BY ADJUSTING WET-USE BASE RESISTANCE VALUES WITH APPLICABLE MODIFICATION FACTORS ACCORDING TO AASHTO 8.4.4.
   B. TIMBER LAGGING
      1. USE WET-USE BASE RESISTANCE & MOE FROM AASHTO TABLE 8.4.1.1.4-1
      2. OBTAIN NOMINAL RESISTANCE AND MODULUS OF ELASTICITY VALUES BY ADJUSTING WET-USE BASE RESISTANCE VALUES WITH APPLICABLE MODIFICATION FACTORS ACCORDING TO AASHTO 8.4.4.
   C. TIMBER PILES
      1. PROVIDE PILES IN ACCORDANCE WITH PENNDOT PUBLICATION 408 SECTION 1005.2(a)
      2. USE WET-USE BASE RESISTANCE & MOE FROM AASHTO TABLE 8.4.1.3-1
      3. OBTAIN NOMINAL RESISTANCE AND MODULUS OF ELASTICITY VALUES BY ADJUSTING WET-USE BASE RESISTANCE VALUES WITH APPLICABLE MODIFICATION FACTORS ACCORDING TO AASHTO 8.4.4.
      4. ALL PILES ARE 14" DIAMETER TIMBER (DIA. MEASURED 36" FROM BUTT.)
      5. DRIVE PILES IN ACCORDANCE WITH PENNDOT PUBLICATION 408 SECTION 1005. OBTAIN APPROVAL OF PILE DRIVING CRITERIA FROM PENNDOT PRIOR TO CONSTRUCTION
      6. PROVIDE APPLICABLE PILE DRIVING NOTES IN ACCORDANCE WITH PENNDOT DESIGN MANUAL PART 4 SECTION PP1.7.5.
   D. STEEL PILES
      1. PROVIDE PILES IN ACCORDANCE WITH PENNDOT PUBLICATION 408 SECTION 1005.2(c)
      2. DESIGN PILES IN ACCORDANCE WITH THE PENNDOT DESIGN MANUAL, PART 4, D6.15P.
      3. ALL PILES ARE HP 10x42
      4. DRIVE PILES IN ACCORDANCE WITH PENNDOT PUBLICATION 408 SECTION 1005. OBTAIN APPROVAL OF PILE DRIVING CRITERIA FROM PENNDOT PRIOR TO CONSTRUCTION.
      5. PROVIDE APPLICABLE PILE DRIVING NOTES IN ACCORDANCE WITH PENNDOT DESIGN MANUAL PART 4 SECTION PP1.7.5.

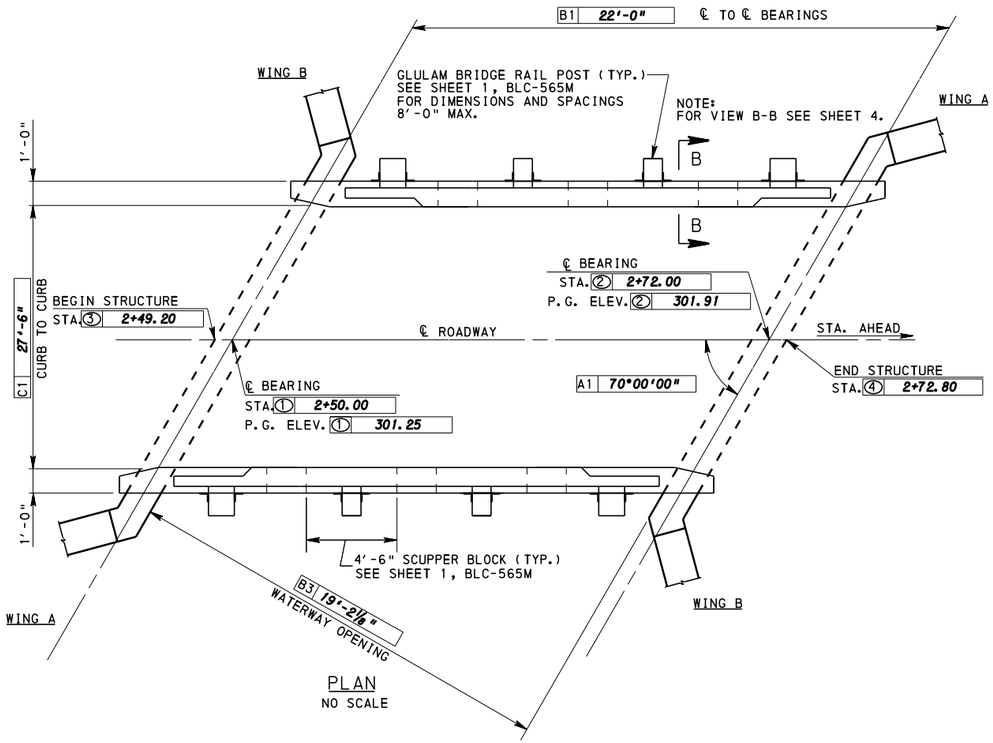
COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

HARDWOOD GLULAM TIMBER BRIDGE DESIGN DESIGN CRITERIA

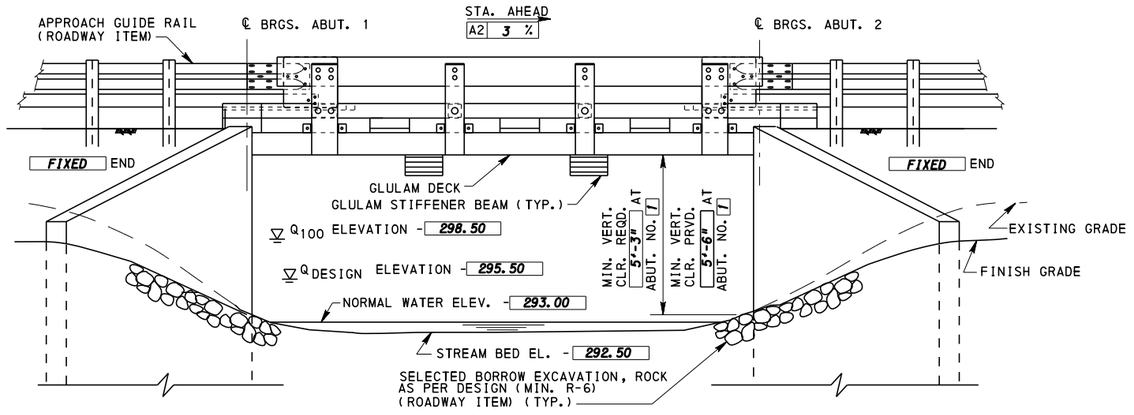
RECOMMENDED APR. 23, 2013
Thomas P. Macioce
CHIEF BRIDGE ENGINEER

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

BLC-560M



PLAN
NO SCALE



ELEVATION
NO SCALE

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	-
	RATING	2.80 M	1.91 V	1.92 M	1.55 M	1.66 M	-
OPERATING RATING (OR)	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	Recm'd	Date
REVISIONS					

S-00001 | SHEET 1 OF 24

ENGINEERING SEAL

COMMONWEALTH OF PENNSYLVANIA
PROFESSIONAL
JOHN DOE
ENGINEER

SIGNATURE & DATE

PREPARED BY:

ABC CONSULTING
123 MAIN ST.
ANYWHERE, PA 12345

Recommended _____

DISTRICT BRIDGE ENGINEER

REFERENCE DRAWING	
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

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

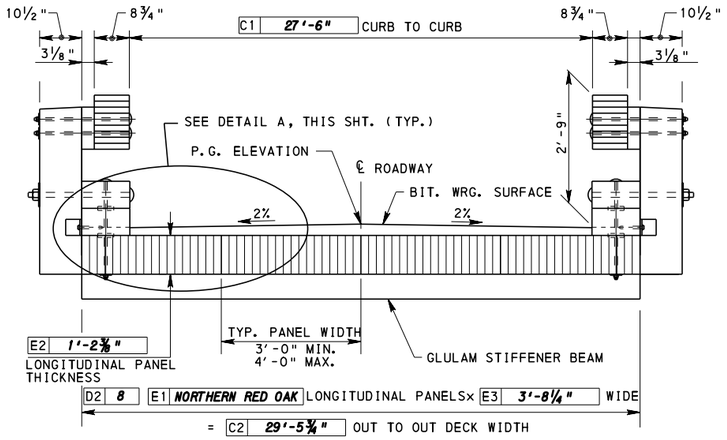
DESIGN EXAMPLE
22'-0" SPAN
GLULAM
LONGITUDINAL PANEL SUPERSTRUCTURE
GENERAL PLAN & ELEVATION - LEFT SKEW

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

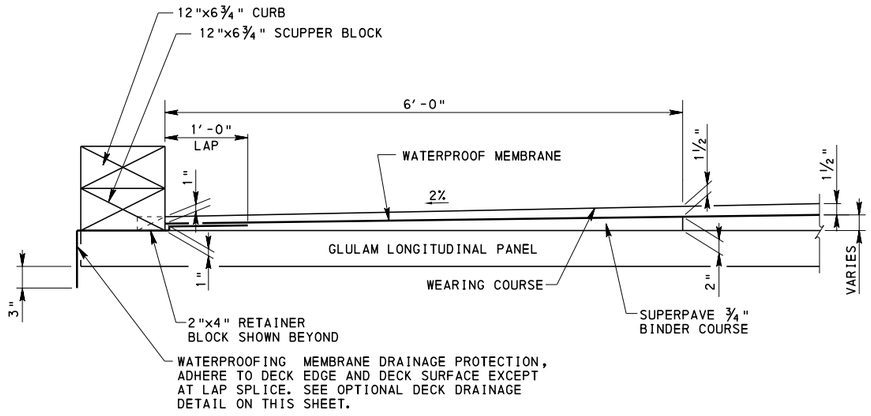
RECOMMENDED APR. 23, 2013
ACTING DIR. BUR. OF PROJECT DELIVERY

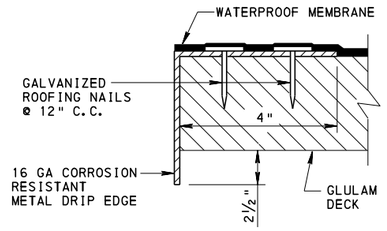
SHEET 1 OF 9

BLC-563M



TYPICAL SECTION
NO SCALE

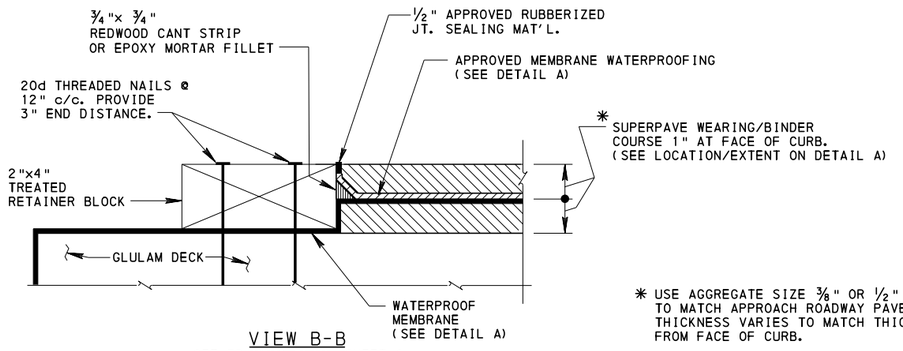




OPTIONAL DECK
DRAINAGE PROTECTION

NOTE:
1. ALLOW FIRST LAYER OF BITUMINOUS MATERIAL TO COOL SUFFICIENTLY SO WATERPROOF MEMBRANE DOES NOT TEAR WHEN APPLYING SECOND LAYER OF BITUMINOUS MATERIAL.
2. SEE VIEW B-B FOR ASPHALT WEARING COURSE TYPE.

DETAIL A
NO SCALE



VIEW B-B
SEE FRAMING PLAN, SHEET 6

* USE AGGREGATE SIZE ⅜" OR ½" FOR WEARING COURSE TO MATCH APPROACH ROADWAY PAVEMENT AGGREGATE, THICKNESS VARIES TO MATCH THICKNESS @ 6'-0" FROM FACE OF CURB.

MEMBRANE WATERPROOFING AT
RETAINER BLOCK
NO SCALE

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, ¾"	TON	-----	-----	*10*	*10*
(1)	BITUMINOUS WEARING COURSE SUPERPAVE, ⅜"/½"	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 2 OF 24

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. Macioce
CHIEF BRIDGE ENGINEER

RECOMMENDED APR. 23, 2013
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 36] 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 35OO.

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	Recm'd	Date
	REVISIONS				

S-00001 | SHEET 3 OF 24

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

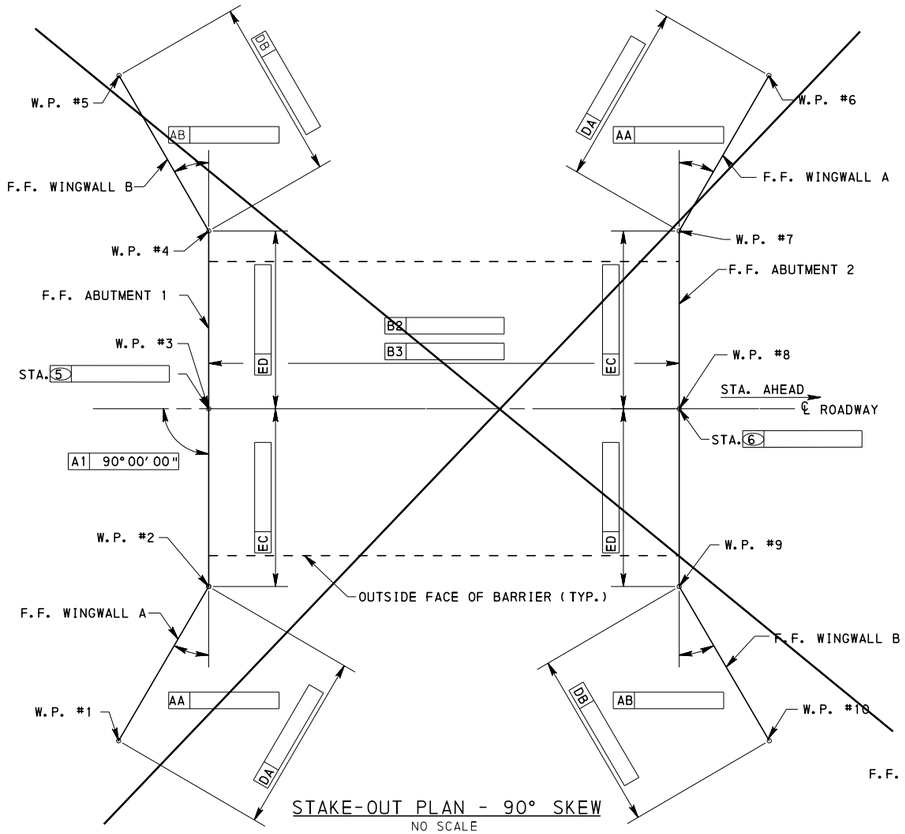
DESIGN EXAMPLE
22'-0" SPAN
GLULAM
LONGITUDINAL PANEL SUPERSTRUCTURE
GENERAL NOTES

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

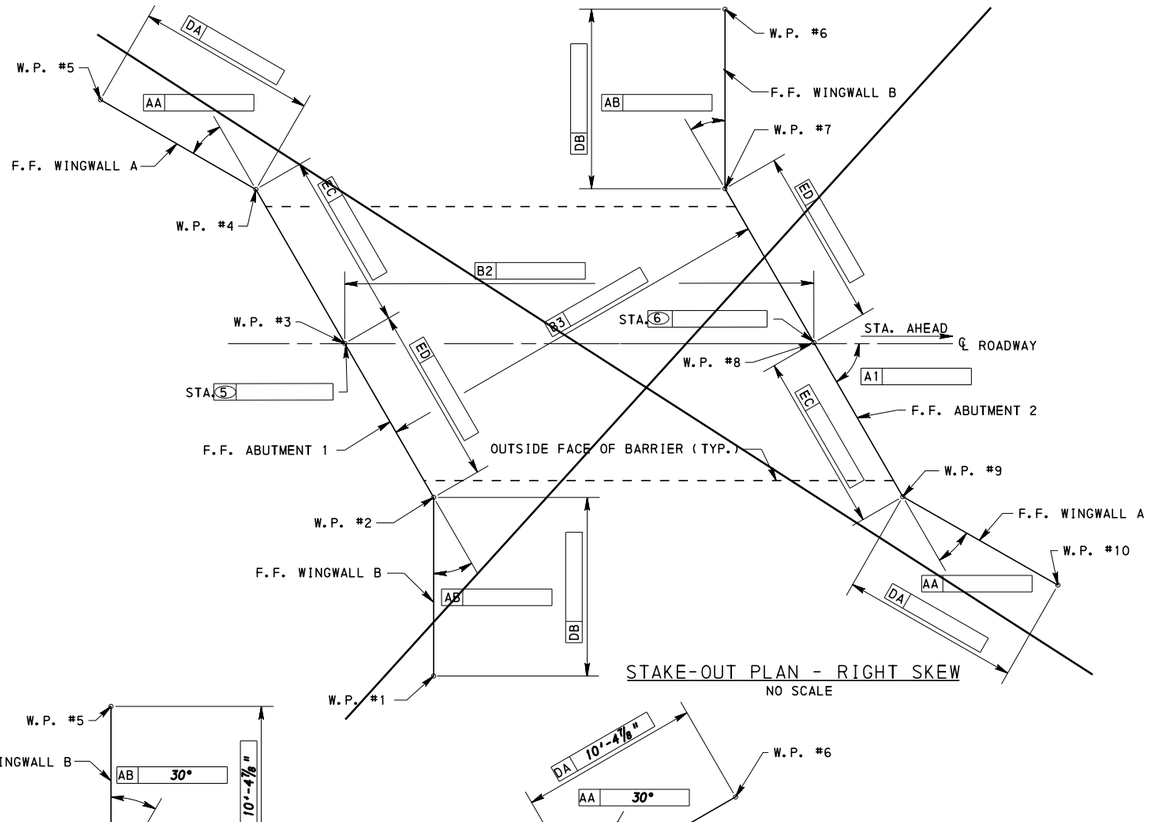
RECOMMENDED APR. 23, 2013
ACTING DIR., BUR. OF PROJECT DELIVERY

SHEET 5 OF 9

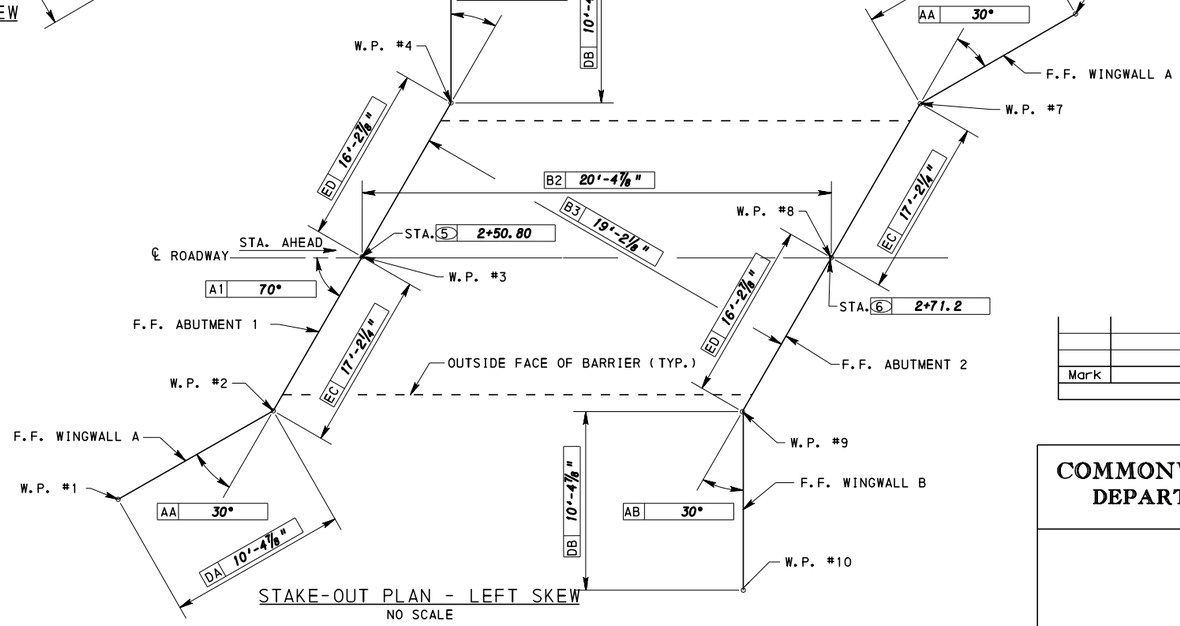
BLC-563M



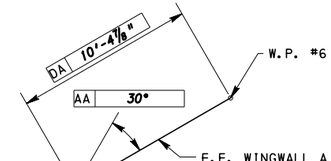
STAKE-OUT PLAN - 90° SKEW
NO SCALE



STAKE-OUT PLAN - RIGHT SKEW
NO SCALE



STAKE-OUT PLAN - LEFT SKEW
NO SCALE



NOTE:
F.F. DENOTES FRONT FACE.

Mark	Description	By	Chk'd	Recm'd	Date
	REVISIONS				

S-00001 SHEET 4 OF 24

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

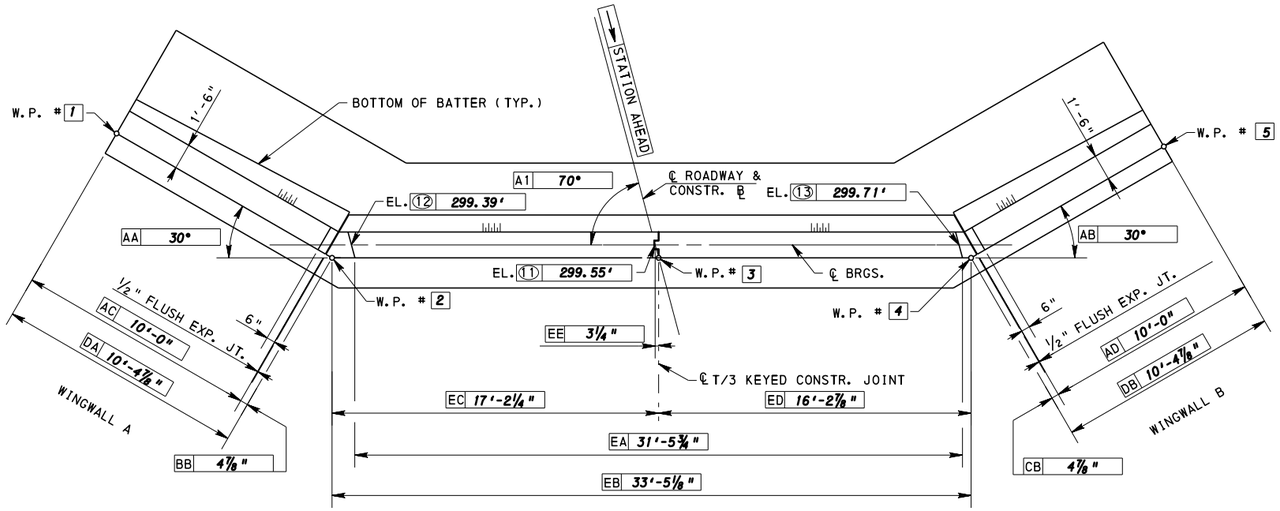
DESIGN EXAMPLE
22'-0" SPAN
SHEETS COMMON TO
BLC 562M, 563M, & 564M
STAKE-OUT PLAN

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

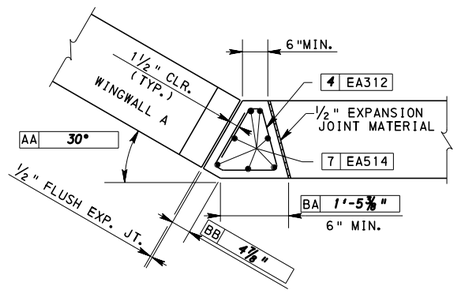
RECOMMENDED APR. 23, 2013
ACTING DIR., BUR. OF PROJECT DELIVERY

SHEET 2 OF 3

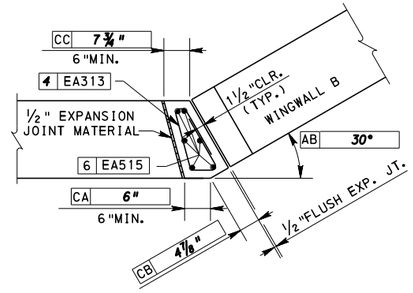
BLC-565M



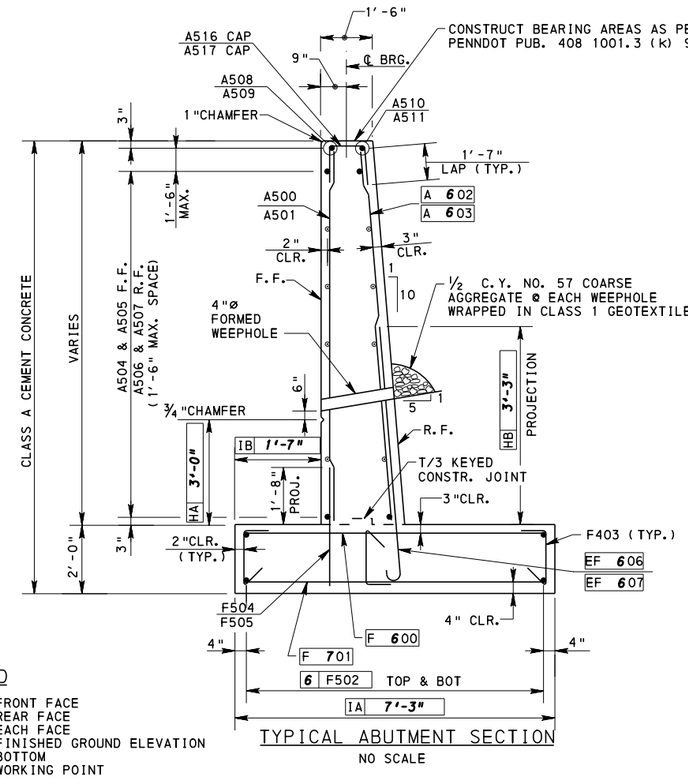
ABUTMENT PLAN
NO SCALE



CHEEKWALL A DETAIL
NO SCALE



CHEEKWALL B DETAIL
NO SCALE



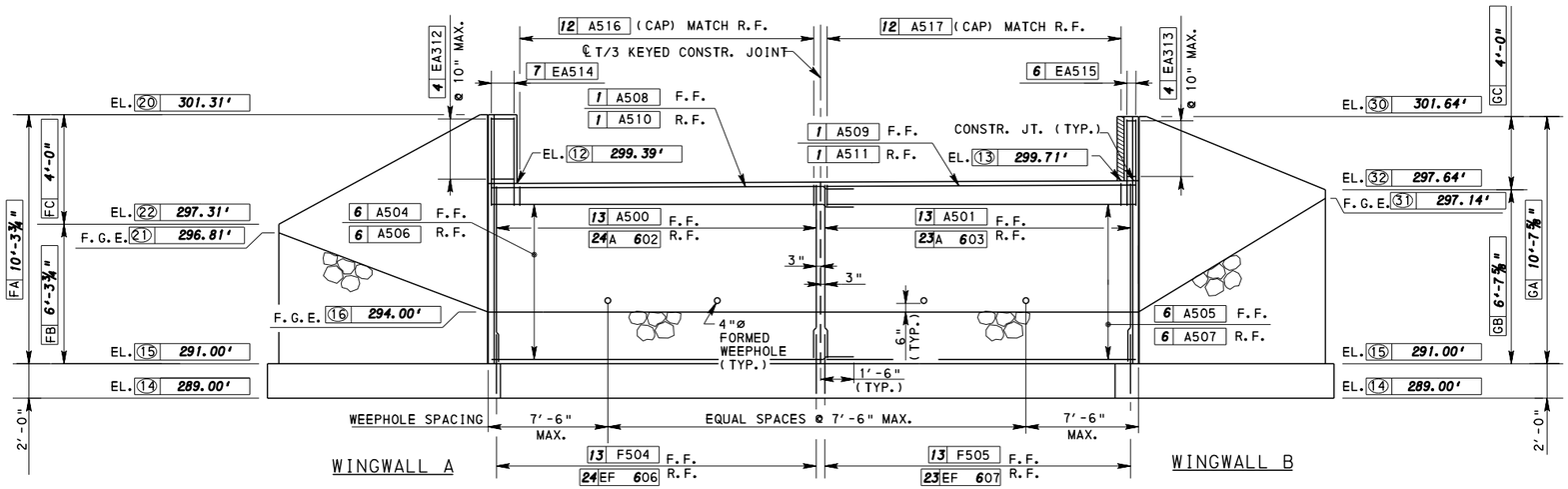
TYPICAL ABUTMENT SECTION
NO SCALE

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



ABUTMENT ELEVATION
NO SCALE

NOTE:

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

Mark	Description	By	Chk'd	Recm'd	Date
	REVISIONS				

S-00001 | SHEET 5 OF 24

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

DESIGN EXAMPLE
22'-0" SPAN

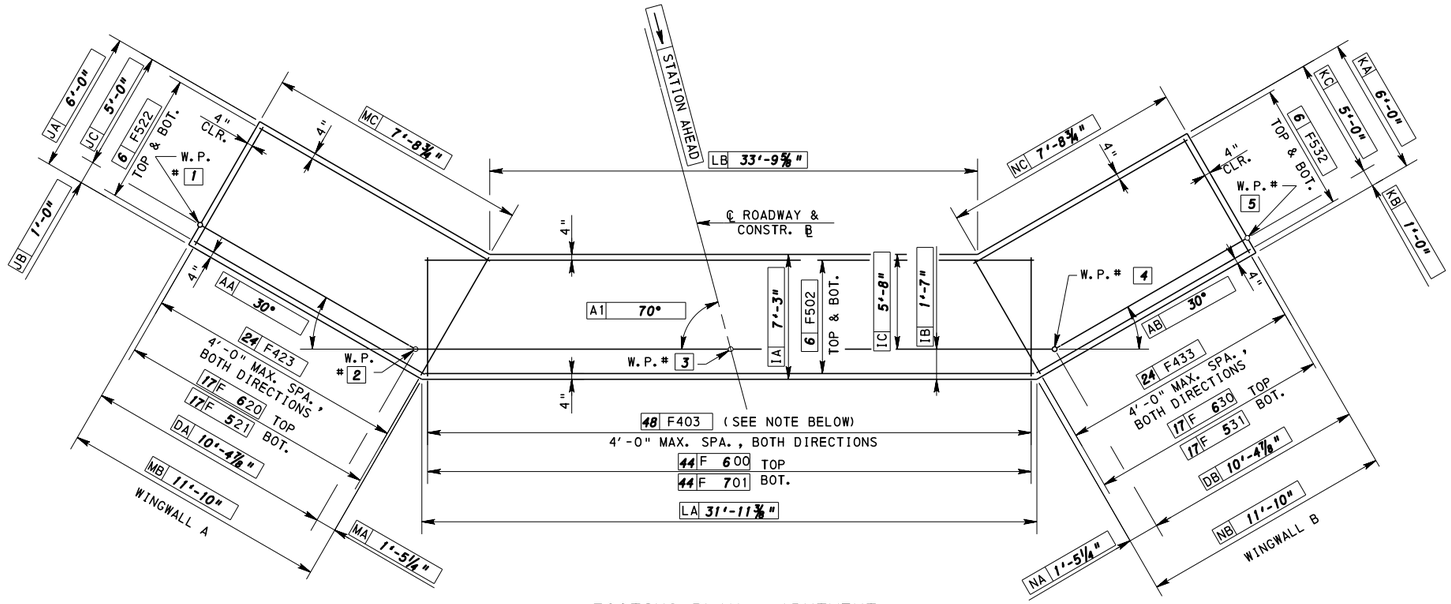
SPREAD FOOTING ABUTMENT
ABUTMENT 1 - LEFT SKEW

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

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

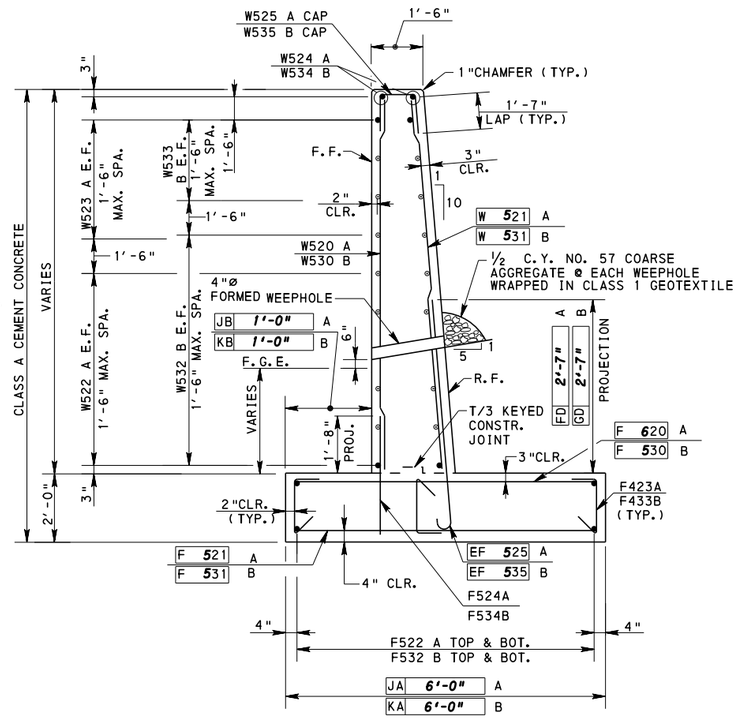
SHEET 1 OF 7

BLC-566M



FOOTING PLAN - ABUTMENT

NO SCALE



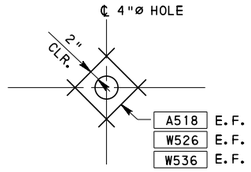
TYPICAL WING SECTION

NO SCALE

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

NOTE:
TIE TOP AND BOTTOM MATS OF REINFORCING STEEL WITH #4 TIE BARS AT A MAXIMUM SPACING OF 4'-0" IN BOTH DIRECTIONS. PROVIDE TIE BARS WITH 90° HOOK AT ONE END AND 135° AT THE OTHER END. ALTERNATE 90° AND 135° AT TOP IN ALTERNATE TIES.



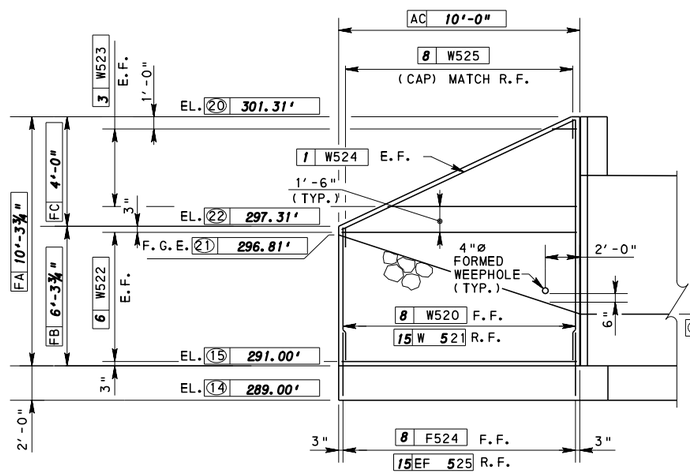
WEEPHOLE REINFORCEMENT DETAIL

NO SCALE

NOTE:
ADJUST REINFORCEMENT AS NECESSARY TO ACCOMMODATE OPENING.

NOTES:

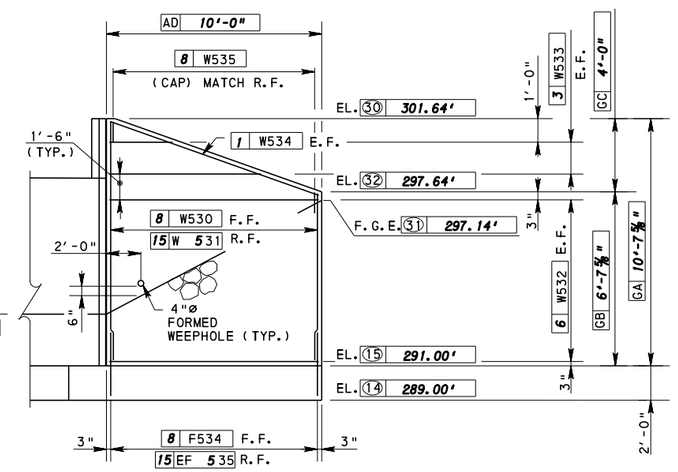
- FOR GENERAL NOTES, SEE SHEET 3
- FOR LOCATION OF WINGWALLS SEE STAKE-OUT SKETCH, SHEET 4
- FOR ABUTMENT 1, SEE SHEET 5
- FOR ABUTMENT 1 BAR SCHEDULE, SEE SHEET 7
- MAX. ALLOWABLE FOUNDATION PRESSURE = 8 kip/FT.²
- MAX DESIGN FOUNDATION PRESSURE = WING A = 6.25 kip/FT.²
  WING B = 6.33 kip/FT.²



WINGWALL A

NO SCALE

F.G.E. 16 294.00'



WINGWALL B

NO SCALE

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

Mark	Description	By	Chk'd	Recm'd	Date
	REVISIONS				

S-00001 | SHEET 6 OF 24

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. Macioce
CHIEF BRIDGE ENGINEER

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

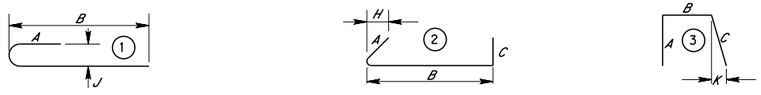
SHEET 4 OF 7

BLC-566M

REINFORCEMENT BAR SCHEDULE*

MARK	SIZE	LENGTH	NO.	TYPE	A	B	C	D	E	F	G	H	J	K	R	REMARKS
A500	5	8'-2⅝" TO 8'-4⅝"	13	STR.												VARY EA. BY 1/8"
A501	5	8'-4⅝" TO 8'-6½"	13	STR.												VARY EA. BY 1/8"
A_6_02	6	8'-2⅝" TO 8'-4⅝"	24	STR.												VARY EA. BY 1/8"
A_6_03	6	8'-4⅝" TO 8'-6½"	23	STR.												VARY EA. BY 1/8"
A504	5	18'-11¼"	6	STR.												
A505	5	16'-0⅞"	6	STR.												
A506	5	18'-4⅜"	6	STR.												
A507	5	15'-6"	6	STR.												
A508	5	18'-11¼"	1	STR.												
A509	5	16'-0⅞"	1	STR.												
A510	5	18'-4⅜"	1	STR.												
A511	5	15'-6"	1	STR.												
EA312	3	5'-2"	4	STR.												BEND IN FIELD
EA313	3	4'-4⅜"	4	STR.												BEND IN FIELD
EA514	5	3'-5"	7	STR.												
EA515	5	3'-5⅛"	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'-1¾" TO 10'-1¾"	8	STR.												VARY EA. BY 6"
W_5_21	5	6'-1¾" TO 10'-1¾"	15	STR.												VARY EA. BY 3¼"
W522	5	9'-8"	6	STR.												
W523	5	6'-7¾" TO 2'-5"	3	STR.												VARY 2 EA. BY 1'-4⅞"
W524	5	10'-5¼"	2	STR.												
W525	5	4'-3"	8	③	1'-7"	1'-1"	1'-7"							2"		
W526	5	1'-0"	8	STR.												
W530	5	6'-5⅝" TO 10'-5⅝"	8	STR.												VARY EA. BY 6"
W_5_31	5	6'-5⅝" TO 10'-5⅝"	15	STR.												VARY EA. BY 3¼"
W532	5	9'-8"	6	STR.												
W533	5	6'-7¾" TO 2'-5"	3	STR.												VARY 2 EA. BY 1'-4⅞"
W534	5	10'-5¼"	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'-3⅜"	6	STR.												
F403	4	2'-3"	48	②	4½"	1'-6"	4½"					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	4½"	1'-6"	4½"					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	4½"	1'-6"	4½"					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	Recm'd	Date
	REVISIONS				

S- 00001 | SHEET 7 OF 24

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

DESIGN EXAMPLE
22'-0" SPAN

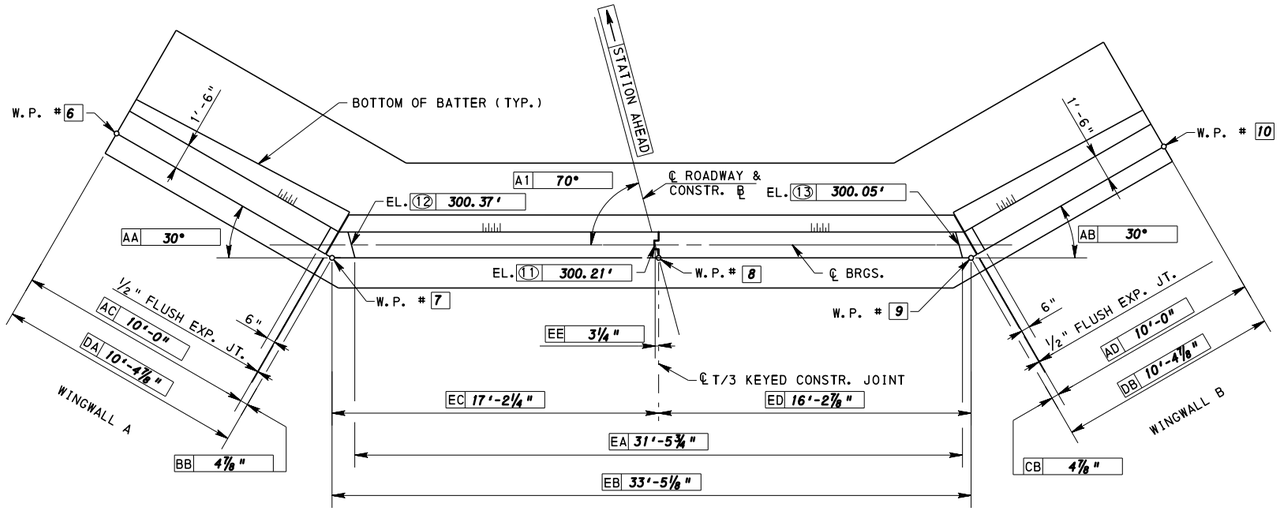
SPREAD FOOTING ABUTMENT
ABUTMENT 1 - BAR SCHEDULE

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

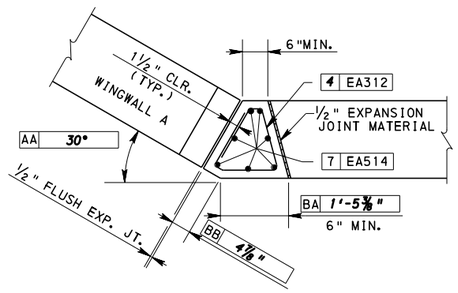
RECOMMENDED APR. 23, 2013
ACTING DIR., BUR. OF PROJECT DELIVERY

SHEET 7 OF 7

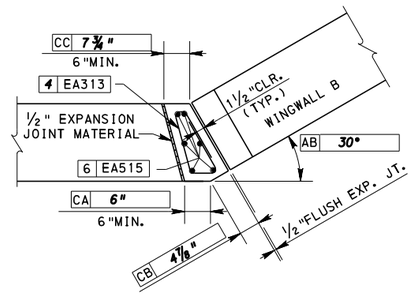
BLC-566M



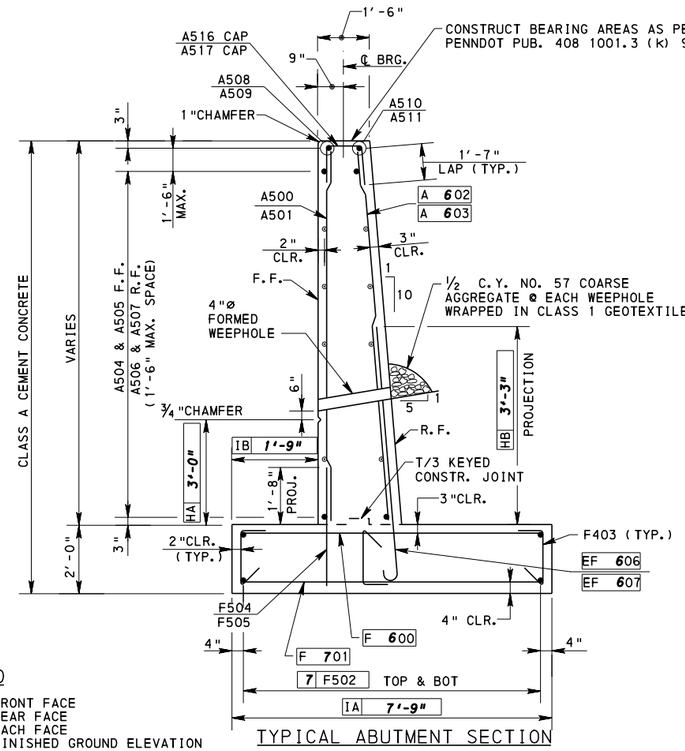
ABUTMENT PLAN
NO SCALE



CHEEKWALL A DETAIL
NO SCALE



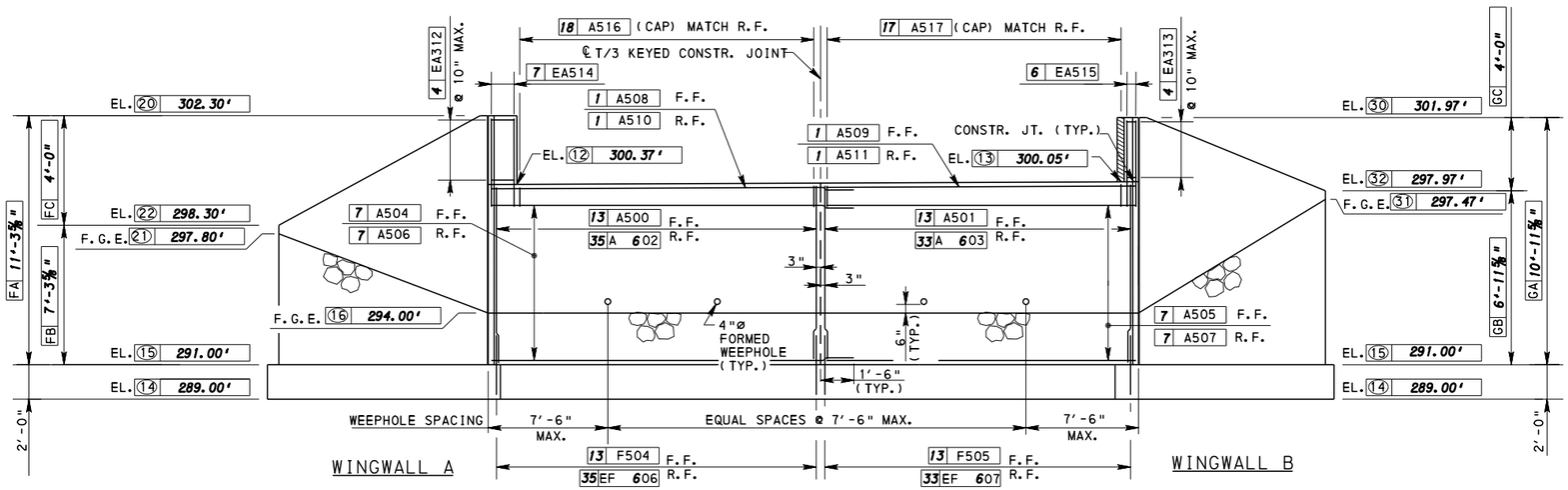
CHEEKWALL B DETAIL
NO SCALE



TYPICAL ABUTMENT SECTION
NO SCALE

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



ABUTMENT ELEVATION
NO SCALE

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

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 8 OF 24

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

DESIGN EXAMPLE
22'-0" SPAN

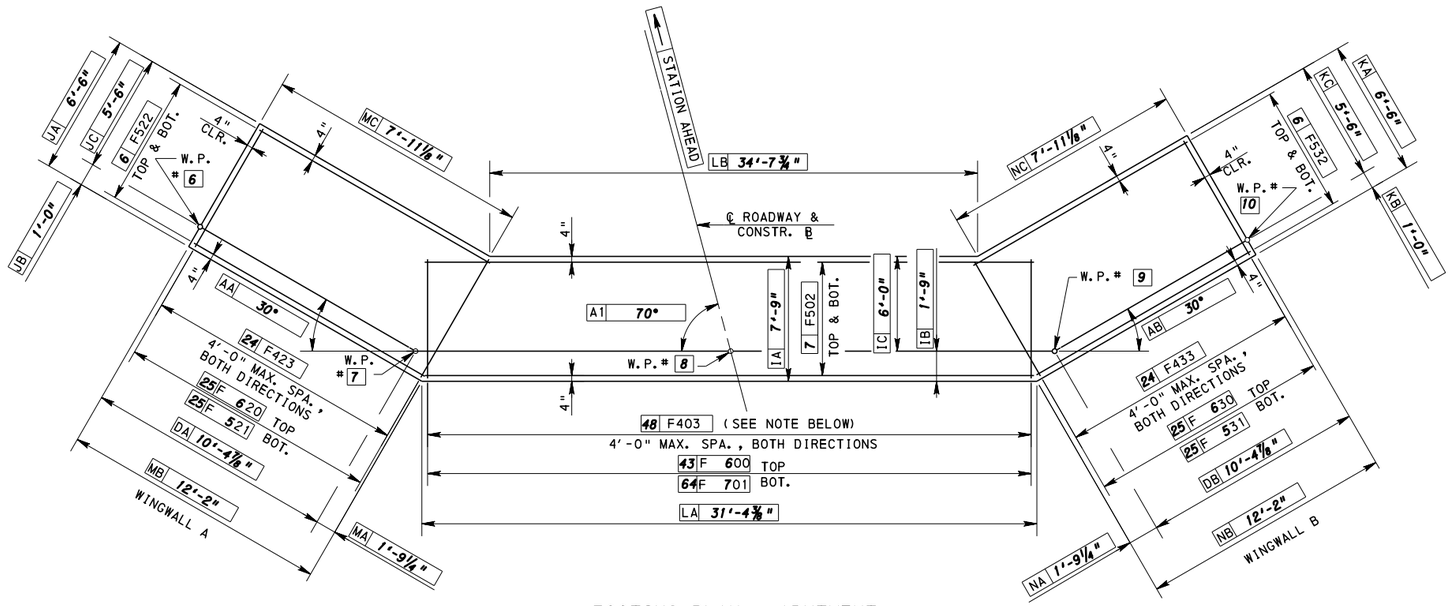
SPREAD FOOTING ABUTMENT
ABUTMENT 2 - LEFT SKEW

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

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

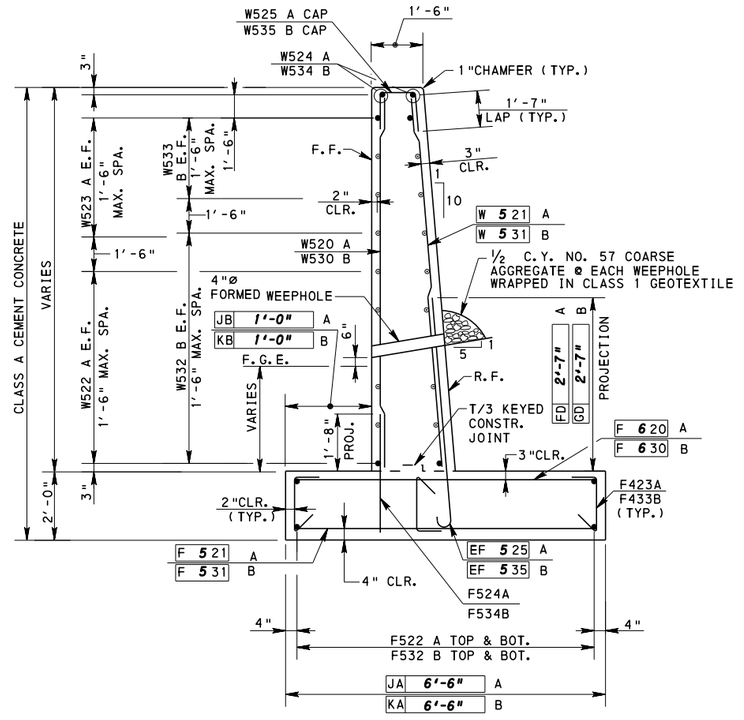
SHEET 1 OF 7

BLC-566M



FOOTING PLAN - ABUTMENT

NO SCALE



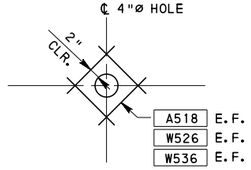
TYPICAL WING SECTION

NO SCALE

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

NOTE:
TIE TOP AND BOTTOM MATS OF REINFORCING STEEL WITH #4 TIE BARS AT A MAXIMUM SPACING OF 4'-0" IN BOTH DIRECTIONS. PROVIDE TIE BARS WITH 90° HOOK AT ONE END AND 135° AT THE OTHER END. ALTERNATE 90° AND 135° AT TOP IN ALTERNATE TIES.



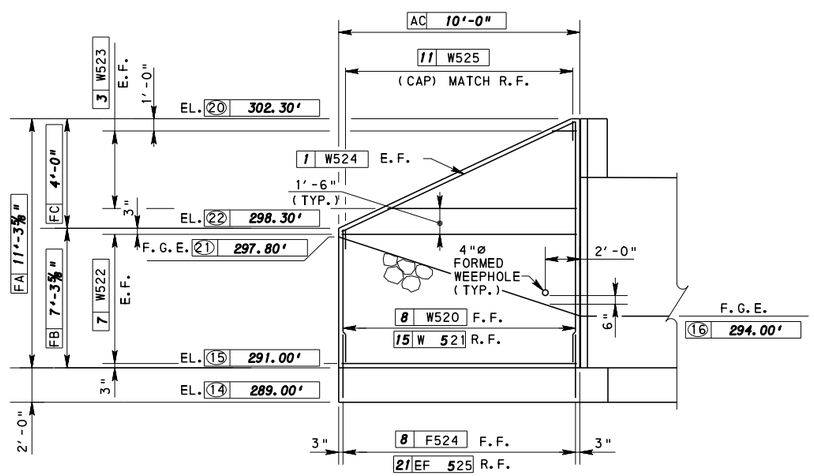
WEEPHOLE REINFORCEMENT DETAIL

NO SCALE

NOTE:
ADJUST REINFORCEMENT AS NECESSARY TO ACCOMMODATE OPENING.

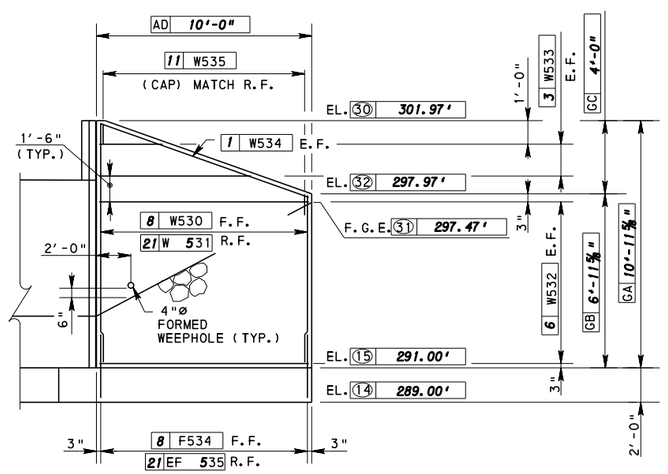
NOTES:

- 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



WINGWALL A

NO SCALE



WINGWALL B

NO SCALE

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

Mark	Description	By	Chk'd	Recm'd	Date
REVISIONS					

S- 00001 | SHEET 9 OF 24

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. Macioce
CHIEF BRIDGE ENGINEER

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

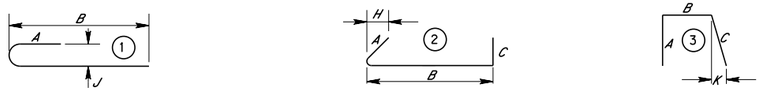
SHEET 4 OF 7

BLC-566M

REINFORCEMENT BAR SCHEDULE*

MARK	SIZE	LENGTH	NO.	TYPE	A	B	C	D	E	F	G	H	J	K	R	REMARKS
A500	5	9'-2⅜" TO 9'-0½"	13	STR.												VARY EA. BY 1/8"
A501	5	9'-0½" TO 8'-10⅝"	13	STR.												VARY EA. BY 1/8"
A602	6	9'-2⅜" TO 9'-0½"	35	STR.												VARY EA. BY 1/8"
A603	6	9'-0½" TO 8'-10⅝"	33	STR.												VARY EA. BY 1/8"
A504	5	18'-11¼"	7	STR.												
A505	5	16'-0⅞"	7	STR.												
A506	5	18'-4⅜"	7	STR.												
A507	5	15'-6"	7	STR.												
A508	5	18'-11¼"	1	STR.												
A509	5	16'-0⅞"	1	STR.												
A510	5	18'-4⅜"	1	STR.												
A511	5	15'-6"	1	STR.												
EA312	3	5'-2"	4	STR.												BEND IN FIELD
EA313	3	4'-4⅜"	4	STR.												BEND IN FIELD
EA514	5	3'-5⅛"	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'-1⅜" TO 11'-1⅝"	8	STR.												VARY EA. BY 6"
W521	5	7'-1⅜" TO 11'-1⅝"	21	STR.												VARY EA. BY 2¼"
W522	5	9'-8"	7	STR.												
W523	5	6'-7¾" TO 2'-5"	3	STR.												VARY 2 EA. BY 1'-4⅞"
W524	5	10'-5¼"	2	STR.												
W525	5	4'-3"	11	③	1'-7"	1'-1"	1'-7"							2"		
W526	5	1'-0"	8	STR.												
W530	5	6'-9⅝" TO 10'-9⅝"	8	STR.												VARY EA. BY 6"
W531	5	6'-9⅝" TO 10'-9⅝"	21	STR.												VARY EA. BY 2¼"
W532	5	9'-8"	6	STR.												
W533	5	6'-7¾" TO 2'-5"	3	STR.												VARY 2 EA. BY 1'-4⅞"
W534	5	10'-5¼"	2	STR.												
W535	5	4'-3"	11	③	1'-7"	1'-1"	1'-7"							2"		
W536	5	1'-0"	8	STR.												
F600	6	7'-1"	43	STR.												
F701	7	7'-1"	64	STR.												
F502	5	30'-8⅜"	7	STR.												
F403	4	2'-3"	48	②	4½"	1'-6"	4½"					3"				
F504	5	3'-6"	13	STR.												
F505	5	3'-6"	13	STR.												
EF606	6	5'-7"	35	①	8"	4'-11"							6"			
EF607	6	5'-7"	33	①	8"	4'-11"							6"			
F620	6	5'-10"	25	STR.												
F521	5	5'-10"	25	STR.												
F522	5	11'-6"	6	STR.												
F423	4	2'-3"	24	②	4½"	1'-6"	4½"					3"				
F524	5	3'-6"	8	STR.												
EF525	5	4'-10"	21	①	7"	4'-3"							5"			
F630	6	5'-10"	25	STR.												
F531	5	5'-10"	25	STR.												
F532	5	11'-6"	6	STR.												
F433	4	2'-3"	24	②	4½"	1'-6"	4½"					3"				
F534	5	3'-6"	8	STR.												
EF535	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	Recm'd	Date
	REVISIONS				

S- 00001 | SHEET 10 OF 24

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

DESIGN EXAMPLE
22'-0" SPAN

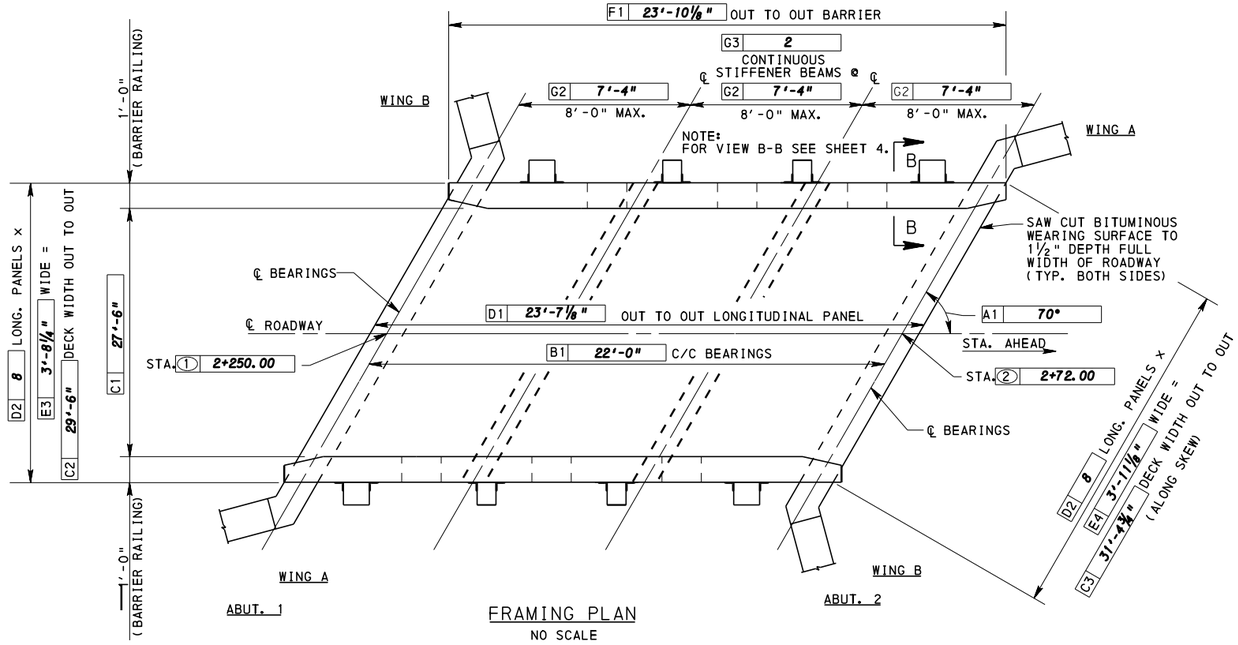
SPREAD FOOTING ABUTMENT
ABUTMENT 2 - BAR SCHEDULE

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

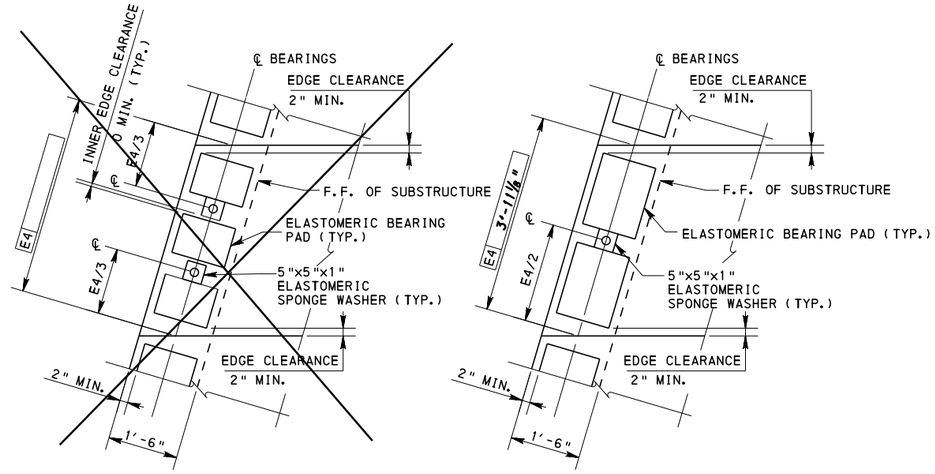
RECOMMENDED APR. 23, 2013
ACTING DIR., BUR. OF PROJECT DELIVERY

SHEET 7 OF 7

BLC-566M

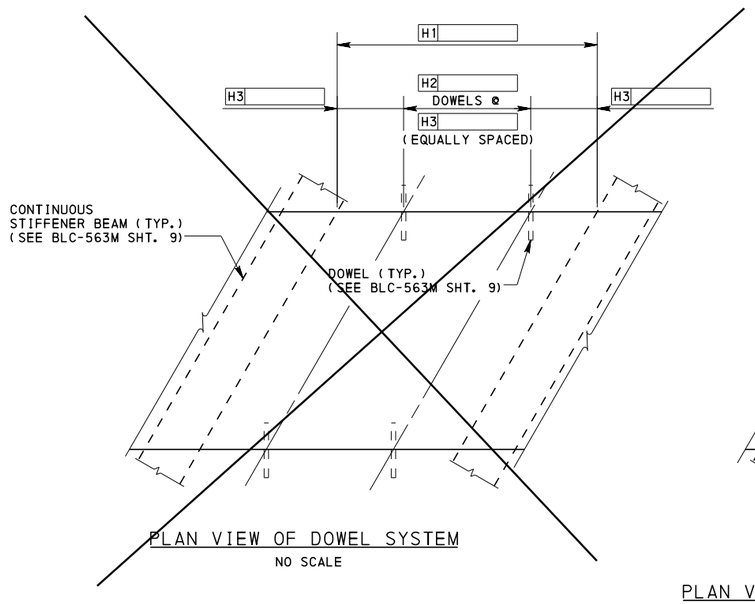


FRAMING PLAN
NO SCALE

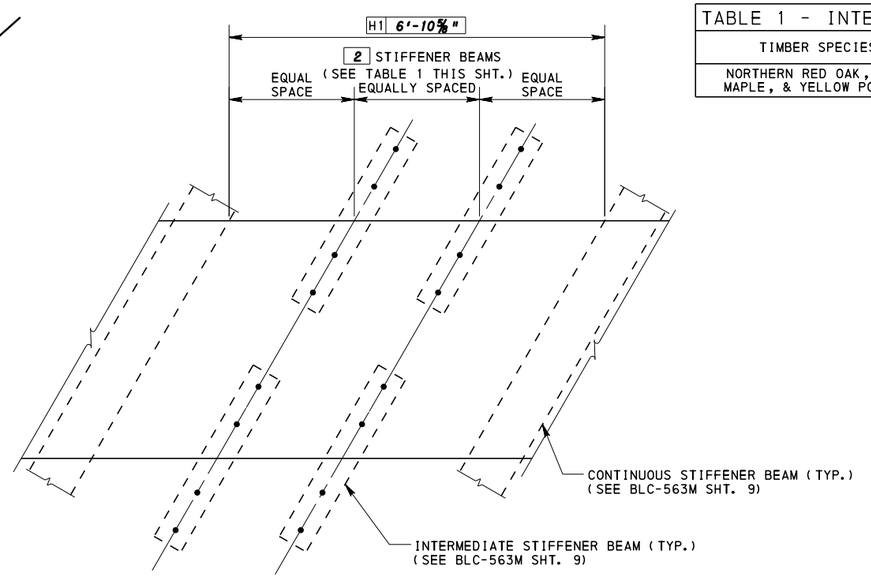


TIMBER SILL — CONCRETE ABUTMENT

ELASTOMERIC BEARING PAD ARRANGEMENTS
NO SCALE



PLAN VIEW OF DOWEL SYSTEM
NO SCALE



PLAN VIEW OF ALTERNATE INTERMEDIATE STIFFENER BEAM SYSTEM
NO SCALE

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	Recm'd	Date
	REVISIONS				

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COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

DESIGN EXAMPLE
22'-0" SPAN

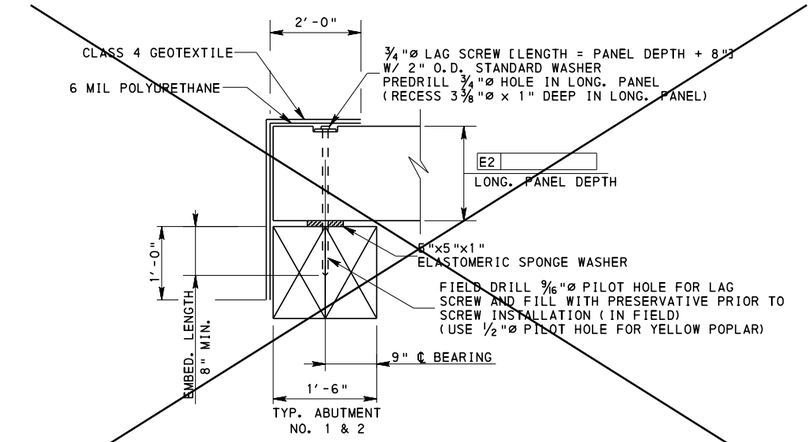
GLULAM
LONGITUDINAL PANEL SUPERSTRUCTURE
FRAMING PLAN - LEFT SKEW

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

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

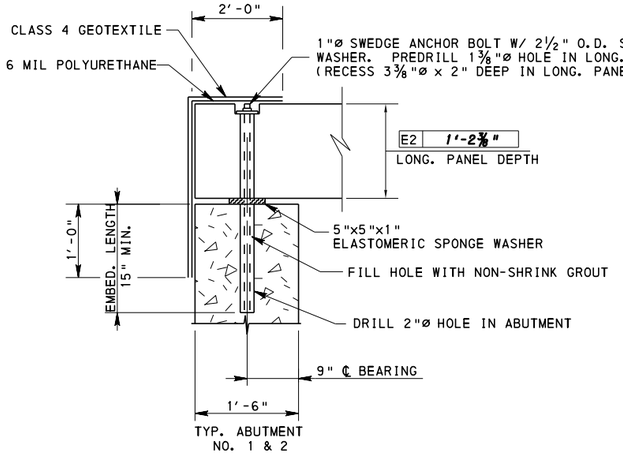
SHEET 6 OF 9

BLC-563M



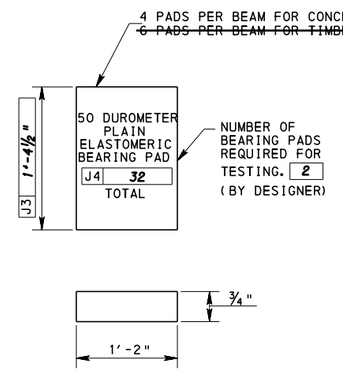
TYPICAL BEARING DETAIL - TIMBER SILL ABUTMENT

NO SCALE



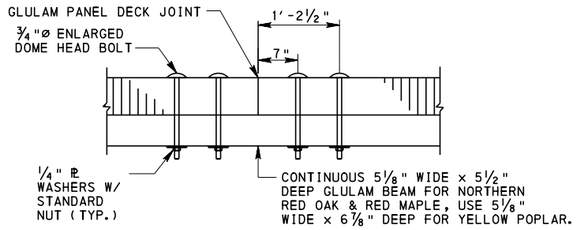
TYPICAL BEARING DETAIL - CONCRETE ABUTMENT

NO SCALE



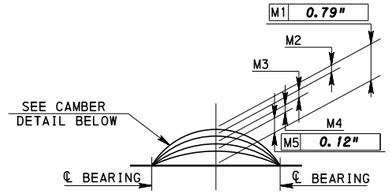
TYPICAL ELASTOMERIC BEARING PAD DETAIL

NO SCALE



CONTINUOUS STIFFENER BEAM DETAIL

NO SCALE



PANEL CAMBER DIAGRAM

M1 = PRE-FABRICATED CAMBER = 3[M2 + M3]

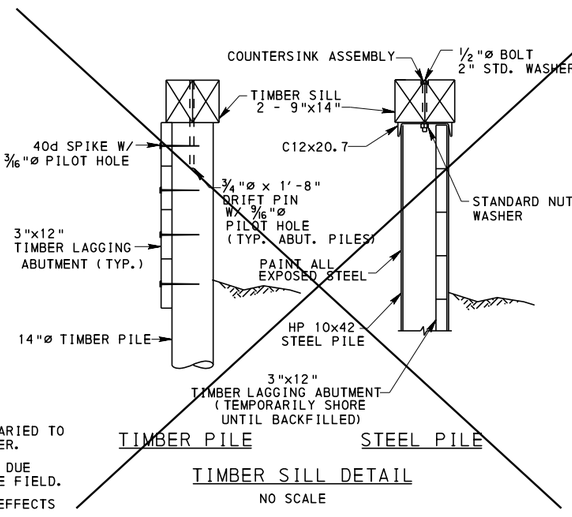
M2 = DEFLECTION DUE TO DEAD LOAD OF BEAM

M3 = DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD

M4 = DEFLECTION DUE TO CREEP = 1.5 [M2 + M3]

M5 = NET FINAL CAMBER = M1 - 2.5 [M2 + M3]

- THE THICKNESS OF THE WEARING COURSE WILL BE VARIED TO COMPENSATE FOR ANY INACCURACIES IN PANEL CAMBER.
- THE PRE-FABRICATED CAMBER LESS THE DEFLECTION DUE TO DEAD LOAD OF PANEL SHOULD BE CHECKED IN THE FIELD.
- DEFLECTION CALCULATIONS DO NOT CONSIDER LOAD EFFECTS DUE TO FUTURE WEARING SURFACE.

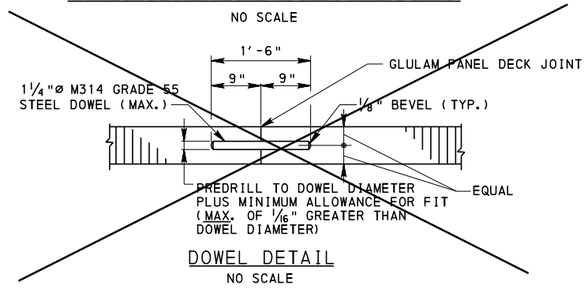


TIMBER SILL DETAIL

NO SCALE

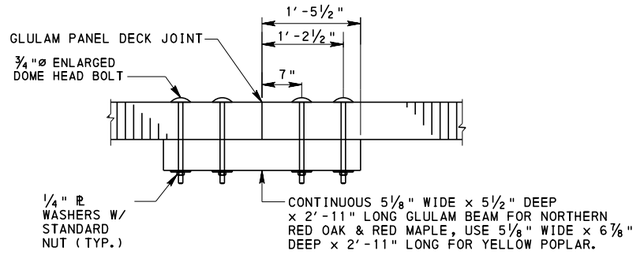
ELASTOMERIC BEARING PAD NOTES:

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.



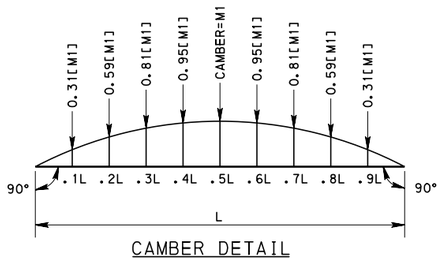
DOWEL DETAIL

NO SCALE



ALTERNATE INTERMEDIATE STIFFENER BEAM DETAIL

NO SCALE



CAMBER DETAIL

Mark	Description	By	Chk'd	Recm'd	Date
	REVISIONS				

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COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

DESIGN EXAMPLE
22'-0" SPAN

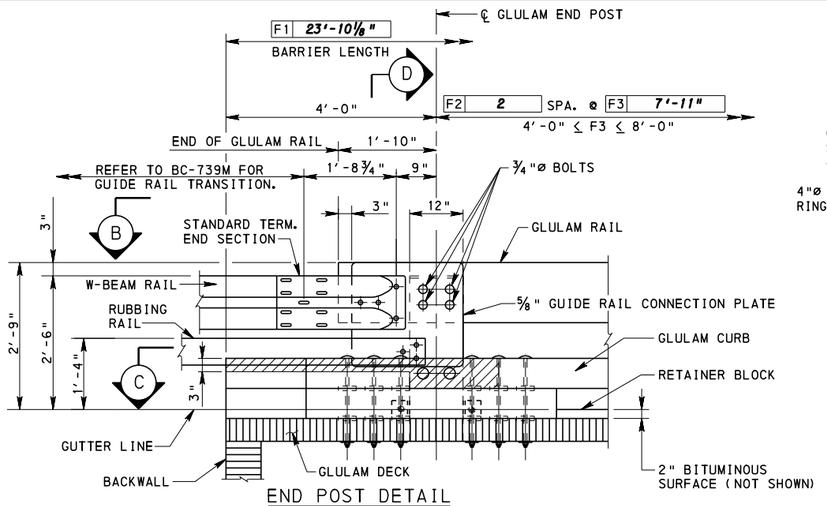
GLULAM
LONGITUDINAL PANEL SUPERSTRUCTURE
SUPERSTRUCTURE DETAILS

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

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

SHEET 9 OF 9

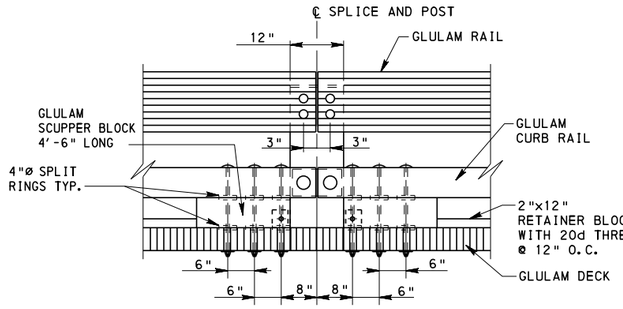
BLC-563M



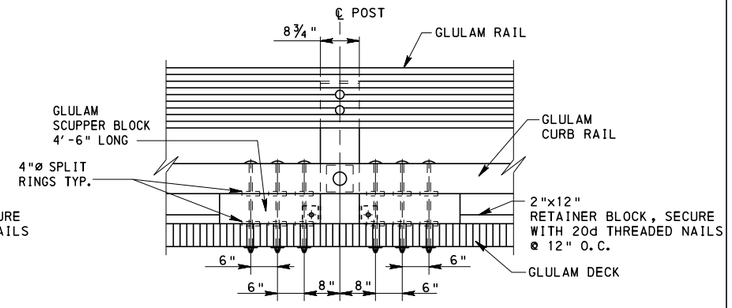
END POST DETAIL

NO SCALE

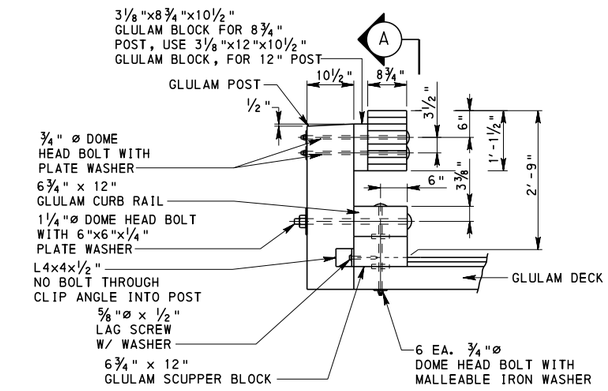
▨ INDICATES NOTCHED PORTION OF CURB



SPLICE POST DETAIL

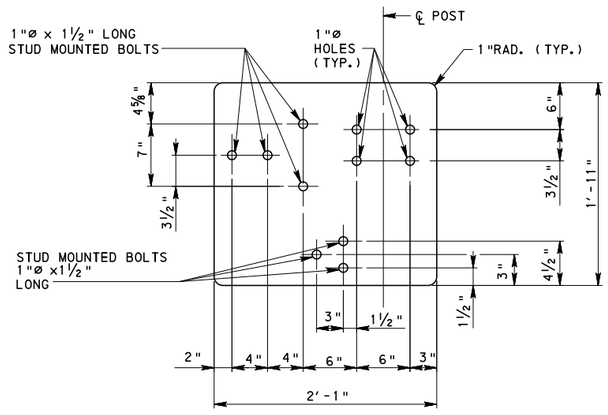


STANDARD POST DETAIL



TIMBER POST, BRIDGE RAIL, AND CURB DETAIL

NO SCALE

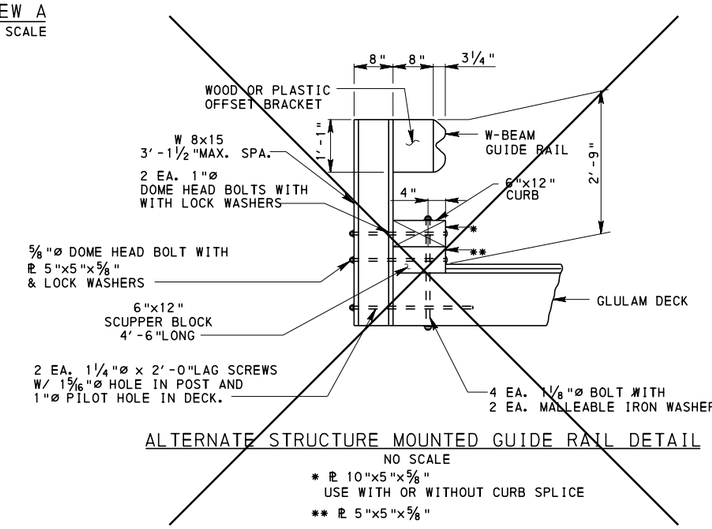


⅝" GUIDE RAIL CONNECTION PLATE

NO SCALE

VIEW A

NO SCALE



ALTERNATE STRUCTURE MOUNTED GUIDE RAIL DETAIL

NO SCALE

* ℙ 10"x5"x⅝" USE WITH OR WITHOUT CURB SPLICE

** ℙ 5"x5"x⅝"

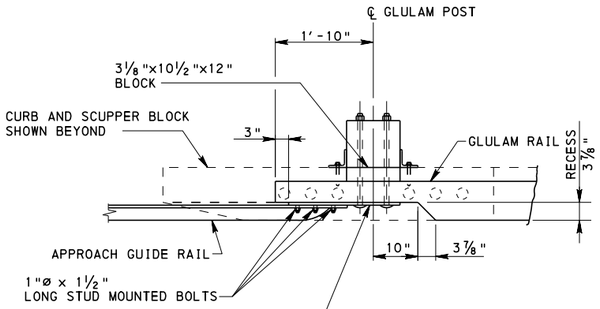
NOTES:

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.

NOTES:

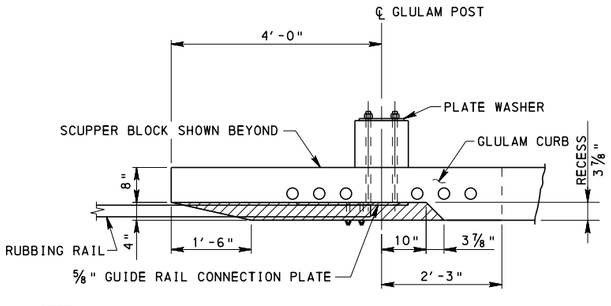
APPROACH GUIDE RAIL AND CONNECTION DEVICES ARE ROADWAY ITEMS.

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



VIEW B

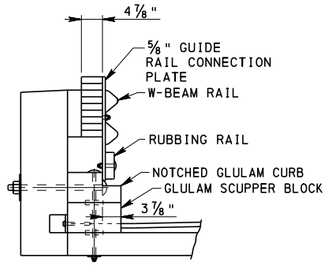
NO SCALE



▨ INDICATES NOTCHED PORTION OF CURB

VIEW C

NO SCALE



VIEW D

NO SCALE

Mark	Description	By	Chk'd	Recm'd	Date
	REVISIONS				

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COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

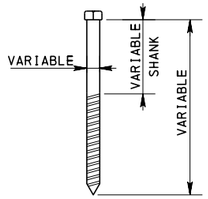
DESIGN EXAMPLE
22'-0" SPAN
SHEETS COMMON TO BLC 562M, 563M, & 564M BRIDGE RAIL DETAILS

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

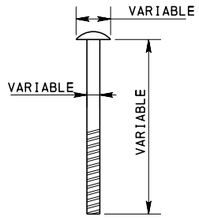
RECOMMENDED APR. 23, 2013
ACTING DIR., BUR. OF PROJECT DELIVERY

SHEET 1 OF 3

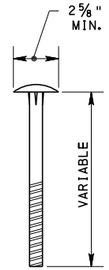
BLC-565M



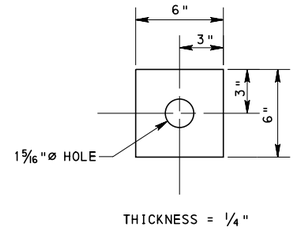
LAG SCREW



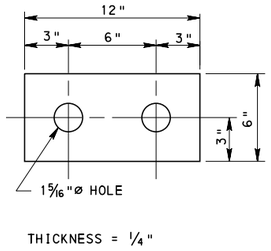
DOME HEAD BOLT



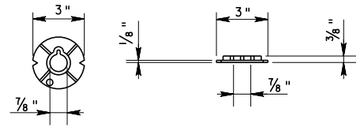
3/4"ø ENLARGED DOMED HEAD BOLT



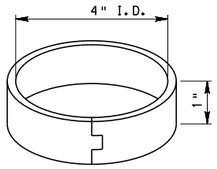
1/4" PLATE WASHER A



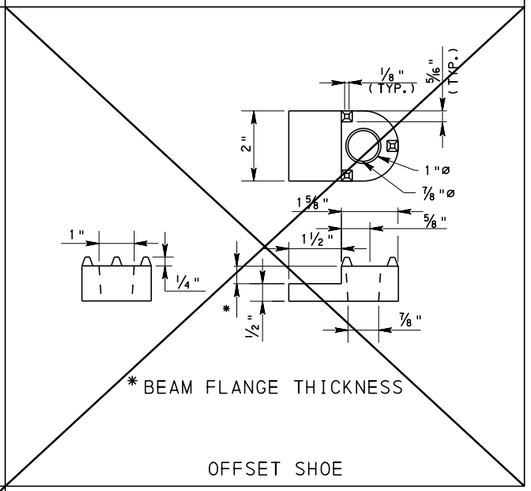
1/4" PLATE WASHER B



MALLEABLE IRON WASHER

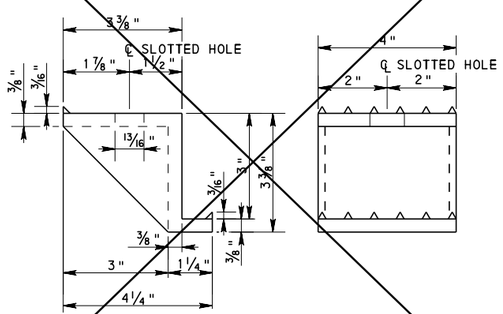


4" DIAMETER SPLIT RING

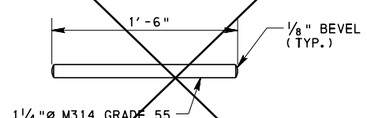


*BEAM FLANGE THICKNESS

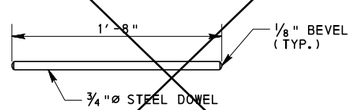
OFFSET SHOE



ALUMINUM CLIP



DOWEL



DRIFT PIN

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

Mark	Description	By	Chk'd	Recm'd	Date
	REVISIONS				

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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. Macioce
CHIEF BRIDGE ENGINEER

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

SHEET 3 OF 3

BLC-565M

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	$\left(B1-\frac{1.50}{SIN(A1)}\right)$		20.4037	20'-4⅞"
B3	WATERWAY OPENING	(B2) SIN(A1)		19.1732	19'-2⅛"
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'-4¾"
D1	OUT TO OUT LONGITUDINAL PANEL LENGTH	$B1+\frac{1.50}{SIN(A1)}$		23.5963	23'-7⅛"
D2	NUMBER OF LONGITUDINAL PANELS	$\left\{\frac{C2}{4.00}\right\}$	(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'-2⅜"
E3	LONGITUDINAL PANEL WIDTH (NORMAL)	$\frac{C2}{D2}$		3.6875	3'-8¼"
E4	LONGITUDINAL PANEL WIDTH ALONG SKEW	$\frac{C3}{D2}$		3.9242	3'-11⅛"
F1	OUT TO OUT BARRIER LENGTH	$D1+\frac{0.6667}{TAN(A1)}$		23.8390	23'-10⅛"
F2	NUMBER OF GUIDE RAIL TIMBER POST SPACES	$\left\{\frac{F1-8.00}{8.00}\right\}$	(1)	1.9799	2
F3	GUIDE RAIL POST SPACING	$\frac{F1-8.00}{F2}$		7.9195	7'-11"
G1	NUMBER OF SPACES BETWEEN ℄ BEARINGS	$\left\{\frac{B1}{8.00}\right\}$	(1)	2.7500	3
		IF B1 ≤ 8.00 THEN G1 = 2			
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'-10⅝"
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)	6.86	6.86
		8.57 F.B.M. YELLOW POPLAR	(5)		
J1	BEARING PAD LENGTH CONSTRAINT #1	$\frac{E4}{2}-\frac{0.4167}{2}-\frac{0.5833}{TAN(A1)}-0.1667$	(CONCRETE ABUTMENT)	1.3748	1'-4½"
		$\frac{E4}{3}-\frac{0.4167}{2}-\frac{0.5833}{TAN(A1)}-0.1667$	(TIMBER SILL ABUTMENT)	--	----
J2	BEARING PAD LENGTH CONSTRAINT #2	$\frac{E4}{3}-0.4167$	(TIMBER SILL ABUTMENT)	--	----
J3	BEARING PAD LENGTH	USE THE VALUE J1	(CONCRETE ABUTMENT)	1.3748	1'-4½"
		USE THE LESSER VALUE BTWN. J1 & J2	(TIMBER SILL ABUTMENT)	--	----
J4	NUMBER OF BEARING PADS	D2*4	(CONCRETE ABUTMENT)	32	32
		D2*6	(TIMBER SILL ABUTMENT)	--	----

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		$(D1)(C1)\left(\frac{1yd^2}{9ft^2}\right)$		S.Y.	72.10	72
CLASS 4 GEOTEXTILE		$(E2+3.00)(2)(C3)\left(\frac{1yd^2}{9ft^2}\right)$		S.Y.	29.29	29
WATERPROOF MEMBRANE, EDGE PROTECTION		$\left[2(E2+2.25)(D1)+(E2+3.00)(2)(C3)\right]\left(\frac{1yd^2}{9ft^2}\right)$		S.Y.	47.37	47
BITUMINOUS WEARING COURSE		$(0.1667*C1+0.005*C1^2)(D1)\left(140\ \frac{lb}{ft^3}\right)\left(\frac{1TON}{2000lb}\right)$		TON	13.82	14

CONTROL STATIONS AND ELEVATIONS

CODE	LOCATION	SOURCE	VALUE (ft.) STATION	VALUE (ft.) 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	Recm'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
Thomas P. Macioce
CHIEF BRIDGE ENGINEER

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

SHEET 8 OF 20

BLC-561M

TABLE 2 - NORTHERN RED OAK COMBINATION LAY-UP (E1)(1,2)

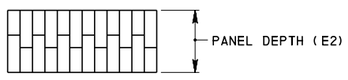
DESIGN DATA					BRIDGE RATINGS(3)																									
					H20				HS20				ML80				PHL-93				TK527				P82		FACTORED RESISTANCE			
SPAN (B1) FT.-IN.	CURB TO CURB (C1) FT.-IN.	PANEL DEPTH (E2) IN.	PRE-FABRICATED CAMBER (M1) IN.	NET FINAL CAMBER (M5) IN.	LOC.	I.R.	LOC.	O.R.	LOC.	I.R.	LOC.	O.R.	LOC.	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)																									
					H20				HS20				ML80				PHL-93				TK527				P82		FACTORED RESISTANCE			
SPAN (B1) FT.-IN.	CURB TO CURB (C1) FT.-IN.	PANEL DEPTH (E2) IN.	PRE-FABRICATED CAMBER (M1) IN.	NET FINAL CAMBER (M5) IN.	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)																									
					H20				HS20				ML80				PHL-93				TK527				P82		FACTORED RESISTANCE			
SPAN (B1) FT.-IN.	CURB TO CURB (C1) FT.-IN.	PANEL DEPTH (E2) IN.	PRE-FABRICATED CAMBER (M1) IN.	NET FINAL CAMBER (M5) IN.	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.

2.) DESIGN TABLES DO NOT ACCOUNT FOR VERTICAL OR HORIZONTAL CURVES ON BRIDGE DECK.

3.) FLEXURAL RATING FACTORS "M" ARE SHOWN & GOVERN UNLESS OTHERWISE DENOTED BY A "V" FOR SHEAR, "D" FOR DEFLECTION OR "B" FOR BEARING.

Mark	Description	By	Chk'd	Recm'd	Date
	REVISIONS				

S- 00001 | SHEET 16 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
Thomas P. Macioce
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RECOMMENDED APR.23, 2013
ACTING DIR. BUR. OF PROJECT DELIVERY

SHEET 9 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'-2⅜"
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	¾"
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"	$0.5+\left(\frac{1.5}{TAN(A1)}\right)+1.5\left(TAN\left(\frac{AA}{2}\right)\right)$	1.4479	1'-5⅜"
BB	CHEEKWALL "A"	$1.5\left(TAN\left(\frac{AA}{2}\right)\right)$	.4019	4⅞"
CA	CHEEKWALL "B"	$0.5-\left(\frac{1.5}{TAN(A1)}\right)+1.5\left(TAN\left(\frac{AB}{2}\right)\right)$	.3560	4¼"
IF CA ≥ 6" USE CONDITION 1 EQUATIONS, OTHERWISE USE CONDITION 2 EQUATIONS				
CONDITION 1 EQUATIONS				
CA	CHEEKWALL "B"	AS CALCULATED ABOVE	-	-
CB	CHEEKWALL "B"	$1.5\left(TAN\left(\frac{AB}{2}\right)\right)$	-	-
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	4⅞"
CC	CHEEKWALL "B"	$0.5+\left(\frac{1.5}{TAN(A1)}\right)-1.5\left(TAN\frac{AB}{(2)}\right)$	.6440	7¾"
DA	WINGWALL "A" LENGTH	AC+BB	10.4019	10'-4⅞"
DB	WINGWALL "B" LENGTH	AD+CB	10.4019	10'-4⅞"
EA	ABUTMENT LENGTH	$\frac{C2+0.0833}{SIN(A1)}$	31.4819	31-5¾"
EB	ABUTMENT LENGTH	EA+BA+CA	33.4300	33'-5⅛"
EC	ABUTMENT LENGTH	$\frac{EA}{2}$+BA	17.1889	17'-2¼"
ED	ABUTMENT LENGTH	$\frac{EA}{2}$+CA	16.2410	16'-2⅞"
EE	ABUTMENT LENGTH	$\frac{0.75}{TAN(A1)}$	.2730	3¼"
FA	WINGWALL "A" HEIGHT	(⑳ - ⑮) (2)	10.3100	10'-3¾"
FB	WINGWALL "A" HEIGHT	(㉒ - ⑮) (2)	6.3100	6'-3¾"
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'-7⅝"
GB	WINGWALL "B" HEIGHT	(㉜ - ⑮) (2)	6.6400	6'-7⅝"
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'-11⅜"
LB	ABUTMENT FOOTING LENGTH	$EB-\frac{IC}{TAN(AA)}+\frac{JC}{SIN(AA)}-\frac{IC}{TAN(AB)}+\frac{KC}{SIN(AB)}$	33.8000	33'-9⅝"
MA	WINGWALL "A" FOOTING LENGTH	$\frac{IB}{SIN(AA)}-\frac{JB}{TAN(AA)}$	1.4345	1'-5¼"
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'-8¾"
NA	WINGWALL "B" FOOTING LENGTH	$\frac{IB}{SIN(AB)}-\frac{KB}{TAN(AB)}$	1.4345	1'-5¼"
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'-8¾"

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	Recm'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. Macioce
CHIEF BRIDGE ENGINEER

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

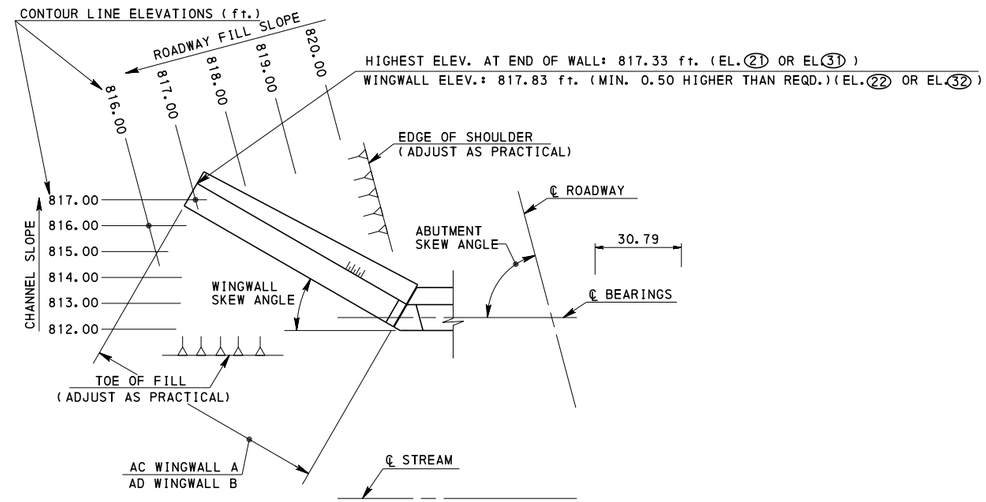
SHEET 11 OF 20

BLC-561M

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
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	301.64
		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)		297.14
㉜	WINGWALL "B" ELEVATION	㉛+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

QUANTITIES

ITEM		QUANTITY FORMULA		UNIT	SUBTOTAL	TOTAL
CLASS 3 EXCAVATION		DESIGNER		C.Y.	142	142
CHEEKWALL A	CLASS AA CEMENT CONCRETE	$(BB+0.5+\frac{BA-0.5-BB}{2})1.5\ (⑳-⑫)(\frac{1yd^3}{27ft^3})$		C.Y.	0.13	0.2
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.	0.06	
ABUTMENT	CLASS A CEMENT CONCRETE	$[1.5\ (⑪-⑮)+(\frac{1}{2})(\frac{1}{10})(⑪-⑮)^2](EB)(\frac{1yd^3}{27ft^3})$		C.Y.	20.40	58.8
WINGWALL A		$[1.5\ (㉒+\frac{⑳-㉒}{2}-⑮)+(\frac{1}{2})(\frac{1}{10})(㉒+\frac{⑳-㉒}{2}-⑮)^2](AC)(\frac{1yd^3}{27ft^3})$		C.Y.	5.90	
WINGWALL B		$[1.5\ (㉜+\frac{㉚-㉜}{2}-⑮)+(\frac{1}{2})(\frac{1}{10})(㉜+\frac{㉚-㉜}{2}-⑮)^2](AD)(\frac{1yd^3}{27ft^3})$		C.Y.	6.18	
FOOTING		$(\frac{1}{2})(2.00)(LA+LB)(IA)+(MB+MC)(JA)+(NB+NC)(KA)(\frac{1yd^3}{27ft^3})$		C.Y.	26.35	
SELECTED BORROW EXCAVATION, STRUCTURE BACKFILL		DESIGNER		C.Y.	45	45
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	4748	4748
REINFORCEMENT BARS, EPOXY COATED		DESIGNER - CALCULATE BAR WEIGHT FROM SHEETS 13 & 14 OF BLC-561M		lb	606	606

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	Recm'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. Macioce
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'-2⅝" (⑫-⑮)-0.1667 TO 8'-4⅝" (⑪-⑮)-0.1667		13	{(EC-0.25)/1.50 +0.99}+1 (1)	STR.								VARIES BY 1/8"	|⑪-⑫| / NO. OF BARS (3)	1.043	112.6
A501	5		FROM 8'-4⅝" (⑪-⑮)-0.1667 TO 8'-6½" (⑬-⑮)-0.1667		13	{(ED-0.25)/1.50 +0.99}+1 (1)	STR.								VARIES BY 1/8"	|⑬-⑪| / NO. OF BARS (3)	1.043	114.7
A 6 02	6	DESIGNER (2)	FROM 8'-2⅝" (⑫-⑮)-0.1667 TO 8'-4⅝" (⑪-⑮)-0.1667		24	{(EC-1.00(TAN(AA))-0.25)/REQ. SPA. (DESIGNER) +0.99}+1 (1)(2)	STR.								VARIES BY 1/8"	|⑪-⑫| / NO. OF BARS (3)	1.502	299.3
A 6 03	6	DESIGNER (2)	FROM 8'-4⅝" (⑪-⑮)-0.1667 TO 8'-6½" (⑬-⑮)-0.1667		23	{(ED-1.00(TAN(AB))-0.25)/REQ. SPA. (DESIGNER) +0.99}+1 (1)(2)	STR.								VARIES BY 1/8"	|⑬-⑪| / NO. OF BARS (3)	1.502	292.4
A504	5		18'-11¼"	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'-0⅞"	ED-0.1667	6	SAME AS A504	STR.										1.043	100.6
A506	5		18'-4⅜"	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 A504	STR.										1.043	97.0
A508	5		18'-11¼"	$\sqrt{(⑪-⑫)^2+(EC)^2}$ +1.75	1		STR.										1.043	19.8
A509	5		16'-0⅞"	$\sqrt{(⑬-⑪)^2+(ED)^2}$ -0.1667	1		STR.										1.043	16.8
A510	5		18'-4⅜"	$\sqrt{(⑪-⑫)^2+(EC-1.00(TAN(AA)))^2}$ +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+(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'-4¾"	(CA-0.125)+(CC-0.25)+2.25+(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'-5⅛"	(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'-5⅛"	(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'-1¾" FB-0.1667 TO 10'-1¾" FA-0.1667		8	{(AC-0.50)/1.50 +0.99}+1 (1)	STR.								VARIES BY 6"	FC / NO. OF BARS	1.043	67.9
W 5 21	5	DESIGNER (2)	FROM 6'-1¾" FB-0.1667 TO 10'-1¾" FA-0.1667		15	{(AC-0.50)/REQ. SPA. (DESIGNER) +0.99}+1 (1)(2)	STR.								VARIES BY 3¼"	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'-7¾" (FC-1.25)(AC-0.3333)/FC TO 2'-5" 1.00(AC-0.3333)/FC		3	{(FC-2.25)/1.50 +0.99}+1 SHOW ON DRAWINGS (1)(6)	STR.								VARIES BY 1'-4⅛"	(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-56OM 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 | | .

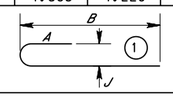
(4) USE TABLE 1 ON THIS SHEET TO COMPLETE BAR WEIGHT QUANTITIES.

(5) TOTAL BAR WEIGHT = (BAR LENGTH OR AVERAGE BAR LENGTH) x (TOTAL NO. OF BARS) x (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) 180° HOOKS A	J	BAR WEIGHT lb/ft
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	Recm'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. Macioce
CHIEF BRIDGE ENGINEER

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

SHEET 13 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)
W524	5		10'-5¼"	$\sqrt{FC^2+AC^2}-0.333$	1	SHOW ON DRAWINGS	STR.										1.043	21.8
					2	SHOWN ON BAR SCHEDULE (TOTAL NO. OF BARS)												
W525	5		4.25		8	$\{\frac{\text{NO. OF BARS FROM W}\_\_ 21+1}{2}\}$ (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'-5⅝" TO 10'-5⅝"	GB-0.1667 GA-0.1667	8	$\{\frac{AD-0.5}{1.50}+0.99\}+1$ (1)	STR.								VARIES BY 6"	$\frac{GC}{\text{NO. OF BARS}}$	1.043	70.7
W5_31	5	DESIGNER (2)	FROM 6'-5⅝" TO 10'-5⅝"	GB-0.1667 GA-0.1667	15	$\{\frac{AD-0.5}{\text{REQ. SPA. (DESIGNER)}}+0.99\}+1$ (1)(2)	STR.								VARIES BY 3¼"	$\frac{GC}{\text{NO. OF BARS}}$	1.043	132.6
W532	5		9'-8"	AD-0.333	6	$\{\frac{GB-0.50}{1.50}+0.99\}+1$ SHOW ON DRAWINGS (1)(6)	STR.										1.043	121.0
W533	5		FROM 6'-7¾" TO 2'-5"	$\frac{(GC-1.25)(AD-0.333)}{GC}$ $\frac{1.00(AD-0.333)}{GC}$	3	$\{\frac{GC-2.25}{1.50}+0.99\}+1$ SHOW ON DRAWINGS (1)(6)	STR.								VARIES BY 1'-4⅞"	$\frac{(\text{LENGTH FROM}\_\_\_\_\_)-(\text{LENGTH TO}\_\_\_\_\_)}{\text{NO. OF BARS SHOWN ON DRAWINGS}}$	1.043	28.4
W534	5		10'-5¼"	$\sqrt{GC^2+AD^2}-0.333$	1	SHOW ON DRAWINGS	STR.										1.043	21.8
					2	SHOWN ON BAR SCHEDULE (TOTAL NO. OF BARS)												
W535	5		4.25		8	$\{\frac{\text{NO. OF BARS FROM W}\_\_ 31+1}{2}\}$ (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	$\{\frac{LA-0.50}{\text{REQ. SPA. (DESIGNER)}}+0.99\}+1$ (1)(2)	STR.										1.502	435.1
F_7_01	7	DESIGNER (2)	6'-7"	IA-0.667	44	$\{\frac{LA-0.50}{\text{REQ. SPA. (DESIGNER)}}+0.99\}+1$ (1)(2)	STR.										2.044	592.0
F502	5		31'-3⅜"	LA-0.667	6	$\{\frac{IA-0.667}{1.50}+0.99\}+1$ (1)(6)	STR.										1.043	391.5
F403	4		2.25		48	$(\{\frac{IA-0.667}{3.00}+0.99\}+1)(\{\frac{LA-0.5}{3.0}+0.99\}+1)$ (1)	②	0.375	1.5	0.375	0.250						0.668	72.1
F504	5		3.50		13	$\{\frac{EC-0.25}{1.50}+0.99\}+1$ (1)	STR.										1.043	47.5
F505	5		3.50		13	$\{\frac{ED-0.25}{1.50}+0.99\}+1$ (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	$\{\frac{EC-1.00(TAN(AA))-0.25}{\text{REQ. SPA. (DESIGNER)}}+0.99\}+1$ (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	$\{\frac{ED-1.00(TAN(AB))-0.25}{\text{REQ. SPA. (DESIGNER)}}+0.99\}+1$ (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	$\{\frac{MB-0.50}{\text{REQ. SPA. (DESIGNER)}}+0.99\}+1$ (1)(2)	STR.										1.502	136.2
F_5_21	5	DESIGNER (2)	5'-4"	JA-0.667	17	$\{\frac{MB-0.50}{\text{REQ. SPA. (DESIGNER)}}+0.99\}+1$ (1)(2)	STR.										1.043	94.6
F522	5		11'-2"	MB-0.667	6	$\{\frac{JA-0.667}{1.50}+0.99\}+1$ SHOW ON DRAWINGS (1)(6)	STR.										1.043	139.8
F423	4		2.25		24	$(\{\frac{JA-0.667}{3.00}+0.99\}+1)(\{\frac{MB-0.50}{3.00}+0.99\}+1)$ (1)	②	0.375	1.5	0.375	0.250						0.668	36.1
F524	5		3.50		8	$\{\frac{AC-0.50}{1.50}+0.99\}+1$ (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	$\{\frac{AC-0.50}{\text{REQ. SPA. (DESIGNER)}}+0.99\}+1$ (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	$\{\frac{NB-0.50}{\text{REQ. SPA. (DESIGNER)}}+0.99\}+1$ (1)(2)	STR.										1.502	136.2
F_5_31	5	DESIGNER (2)	5'-4"	KA-0.667	17	$\{\frac{NB-0.50}{\text{REQ. SPA. (DESIGNER)}}+0.99\}+1$ (1)(2)	STR.										1.043	94.6
F532	5		11'-2"	NB-0.667	6	$\{\frac{KA-0.667}{1.50}+0.99\}+1$ SHOW ON DRAWINGS (1)(6)	STR.										1.043	139.8
F433	4		2.25		24	$(\{\frac{KA-0.667}{3.00}+0.99\}+1)(\{\frac{NB-0.5}{3.00}+0.99\}+1)$ (1)	②	0.375	1.5	0.375	0.250						0.668	36.1
F534	5		3.50		8	$\{\frac{AD-0.50}{1.50}+0.99\}+1$ (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	$\{\frac{AD-0.50}{\text{REQ. SPA. (DESIGNER)}}+0.99\}+1$) (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 | | .

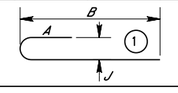
(4) USE TABLE 1 ON THIS SHEET TO COMPLETE BAR WEIGHT QUANTITIES.

(5) TOTAL BAR WEIGHT = (BAR LENGTH OR AVERAGE BAR LENGTH) x (TOTAL NO. OF BARS) x (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) 180° HOOKS A	J	BAR WEIGHT lb/ft
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



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.

Mark	Description	By	Chk'd	Recm'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. Macioce
CHIEF BRIDGE ENGINEER

RECOMMENDED APR. 23, 2013
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'-2⅜"
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	¾"
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"	$0.5+\left(\frac{1.5}{\tan(A1)}\right)+1.5\left(\tan\left(\frac{AA}{2}\right)\right)$		1.4480	1'-5⅜"
BB	CHEEKWALL "A"	$1.5\left(\tan\left(\frac{AA}{2}\right)\right)$		.4020	4⅞"
CA	CHEEKWALL "B"	$0.5-\left(\frac{1.5}{\tan(A1)}\right)+1.5\left(\tan\left(\frac{AB}{2}\right)\right)$		.3560	4¼"
IF CA ≥ 6" USE CONDITION 1 EQUATIONS, OTHERWISE USE CONDITION 2 EQUATIONS					
CONDITION 1 EQUATIONS					
CA	CHEEKWALL "B"	AS CALCULATED ABOVE		-	-
CB	CHEEKWALL "B"	$1.5\left(\tan\left(\frac{AB}{2}\right)\right)$		-	-
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	4⅞"
CC	CHEEKWALL "B"	$0.5+\left(\frac{1.5}{\tan(A1)}\right)-1.5\left(\tan\frac{AB}{(2)}\right)$		.6440	7¾"
DA	WINGWALL "A" LENGTH	AC+BB		10.4020	10'-4⅞"
DB	WINGWALL "B" LENGTH	AD+CB		10.4020	10'-4⅞"
EA	ABUTMENT LENGTH	$\frac{C2+0.0833}{\sin(A1)}$		31.4820	31-5¾"
EB	ABUTMENT LENGTH	EA+BA+CA		33.4300	33'-5⅛"
EC	ABUTMENT LENGTH	$\frac{EA}{2}$+BA		17.1890	17'-2¼"
ED	ABUTMENT LENGTH	$\frac{EA}{2}$+CA		16.2410	16'-2⅞"
EE	ABUTMENT LENGTH	$\frac{0.75}{\tan(A1)}$		.2730	3¼"
FA	WINGWALL "A" HEIGHT	(⑳ - ⑮)	(2)	11.3000	11'-3⅝"
FB	WINGWALL "A" HEIGHT	(㉒ - ⑮)	(2)	7.3000	7'-3⅝"
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'-11⅝"
GB	WINGWALL "B" HEIGHT	(㉜ - ⑮)	(2)	6.9700	6'-11⅝"
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'-4⅜"
LB	ABUTMENT FOOTING LENGTH	$EB-\frac{IC}{\tan(AA)}+\frac{JC}{\sin(AA)}-\frac{IC}{\tan(AB)}+\frac{KC}{\sin(AB)}$		34.6450	34'-7¾"
MA	WINGWALL "A" FOOTING LENGTH	$\frac{IB}{\sin(AA)}-\frac{JB}{\tan(AA)}$		1.7680	1'-9¼"
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'-11⅛"
NA	WINGWALL "B" FOOTING LENGTH	$\frac{IB}{\sin(AB)}-\frac{KB}{\tan(AB)}$		1.7680	1'-9¼"
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'-11⅛"

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	Recm'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. Macieca
CHIEF BRIDGE ENGINEER

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

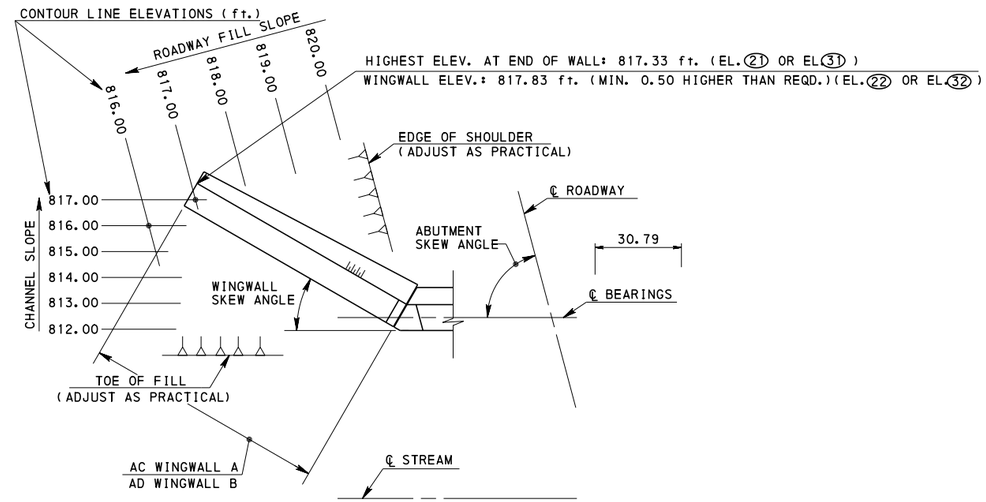
SHEET 11 OF 20

BLC-561M

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*

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

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	$[1.5\ (11-15)+(\frac{1}{2})(\frac{1}{10})(11-15)^2](EB)(\frac{1yd^3}{27ft^3})$		C.Y.	*22.40*	*64.3*
WINGWALL A		$[1.5\ (22+\frac{20-22}{2}-15)+(\frac{1}{2})(\frac{1}{10})(22+\frac{20-22}{2}-15)^2](AC)(\frac{1yd^3}{27ft^3})$		C.Y.	*6.80*	
WINGWALL B		$[1.5\ (32+\frac{30-32}{2}-15)+(\frac{1}{2})(\frac{1}{10})(32+\frac{30-32}{2}-15)^2](AD)(\frac{1yd^3}{27ft^3})$		C.Y.	*6.50*	
FOOTING		$(\frac{1}{2})(2.00)(LA+LB)(IA)+(MB+MC)(JA)+(NB+NC)(KA)(\frac{1yd^3}{27ft^3})$		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	Recm'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. Macioce
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 9'-2⅜" (⑫-⑮)-0.1667 TO 9'-0½" (⑪-⑮)-0.1667		13	{(EC-0.25)/1.50 +0.99}+1 (1)	STR.								VARIES BY 1/8"	|⑪-⑫| / NO. OF BARS (3)	1.043	123.7
A501	5		FROM 9'-0½" (⑪-⑮)-0.1667 TO 8'-10⅝" (⑬-⑮)-0.1667		13	{(ED-0.25)/1.50 +0.99}+1 (1)	STR.								VARIES BY 1/8"	|⑬-⑪| / NO. OF BARS (3)	1.043	121.5
A 6 02	6	DESIGNER (2)	FROM 9'-2⅜" (⑫-⑮)-0.1667 TO 9'-0½" (⑪-⑮)-0.1667		35	{(EC-1.00(TAN(AA))-0.25)/REQ. SPA. (DESIGNER) +0.99}+1 (1)(2)	STR.								VARIES BY 1/16"	|⑪-⑫| / NO. OF BARS (3)	1.502	479.6
A 6 03	6	DESIGNER (2)	FROM 9'-0½" (⑪-⑮)-0.1667 TO 8'-10⅝" (⑬-⑮)-0.1667		33	{(ED-1.00(TAN(AB))-0.25)/REQ. SPA. (DESIGNER) +0.99}+1 (1)(2)	STR.								VARIES BY 1/16"	|⑬-⑪| / NO. OF BARS (3)	1.502	444.3
A504	5		18'-11¼"	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'-0⅞"	ED-0.1667	7	SAME AS A504	STR.										1.043	117.4
A506	5		18'-4⅜"	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'-11¼"	$\sqrt{(⑪-⑫)^2+(EC)^2}$ +1.75	1		STR.										1.043	19.8
A509	5		16'-0⅞"	$\sqrt{(⑬-⑪)^2+(ED)^2}$ -0.1667	1		STR.										1.043	16.8
A510	5		18'-4⅜"	$\sqrt{(⑪-⑫)^2+(EC-1.00(TAN(AA)))^2}$ +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+(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'-4⅜"	(CA-0.125)+(CC-0.25)+2.25+(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'-5⅛"	(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	{NO. OF BARS FROM A 6 02+1)/2} (1)	③	1.583	1.083	1.583			0.167				1.043	79.8
A517	5		4.25		17	{NO. OF BARS FROM A 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'-1⅝" FB-0.1667 TO 11'-1⅝" FA-0.1667		8	{(AC-0.50)/1.50 +0.99}+1 (1)	STR.								VARIES BY 6"	FC / NO. OF BARS	1.043	76.2
W 5 21	5	DESIGNER (2)	FROM 7'-1⅝" FB-0.1667 TO 11'-1⅝" FA-0.1667		21	{(AC-0.50)/REQ. SPA. (DESIGNER) +0.99}+1 (1)(2)	STR.								VARIES BY 2¼"	FC / NO. OF BARS	1.043	200.0
W522	5		9'-8"	AC-0.3333	7	{(FB-0.50)/1.50 +0.99}+1 SHOW ON DRAWINGS (1)(6)	STR.										1.043	141.2
W523	5		FROM 6'-7¾" (FC-1.25)(AC-0.3333)/FC TO 2'-5" 1.00(AC-0.3333)/FC		3	{(FC-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

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-56OM 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) x (TOTAL NO. OF BARS) x (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) 180° HOOKS A	J	BAR WEIGHT lb/ft
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
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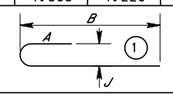
9	1.250	0.979	3.400
10	1.417	1.104	4.303
11	1.583	1.229	5.313



Mark	Description	By	Chk'd	Recm'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
Thomas P. Macioce
CHIEF BRIDGE ENGINEER

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

SHEET 13 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)
W524	5		10'-5¼"	$\sqrt{FC^2+AC^2}-0.333$	1	SHOW ON DRAWINGS	STR.										1.043	21.8
					2	SHOWN ON BAR SCHEDULE (TOTAL NO. OF BARS)												
W525	5		4.25		11	$\{\frac{\text{NO. OF BARS FROM W 5 21+1}}{2}\}$ (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'-9⅜" TO 10'-9⅜"	GB-0.1667 GA-0.1667	8	$\{\frac{AD-0.5}{1.50}+0.99\}+1$ (1)	STR.								VARIES BY 6"	$\frac{GC}{\text{NO. OF BARS}}$	1.043	73.5
W531	5	DESIGNER (2)	FROM 6'-9⅜" TO 10'-9⅜"	GB-0.1667 GA-0.1667	21	$\{\frac{AD-0.5}{\text{REQ. SPA. (DESIGNER)}}+0.99\}+1$ (1)(2)	STR.								VARIES BY 2¼"	$\frac{GC}{\text{NO. OF BARS}}$	1.043	192.8
W532	5		9'-8"	AD-0.333	6	$\{\frac{GB-0.50}{1.50}+0.99\}+1$ SHOW ON DRAWINGS (1)(6)	STR.										1.043	121.0
W533	5		FROM 6'-7¾" TO 2'-5"	$\frac{(GC-1.25)(AD-0.333)}{GC}$ $\frac{1.00(AD-0.333)}{GC}$	3	$\{\frac{GC-2.25}{1.50}+0.99\}+1$ SHOW ON DRAWINGS (1)(6)	STR.								VARIES BY 1'-4⅞"	$\frac{(\text{LENGTH FROM } 6.646) - (\text{LENGTH TO } 2.417)}{\text{NO. OF BARS SHOWN ON DRAWINGS}}$	1.043	28.4
W534	5		10'-5¼"	$\sqrt{GC^2+AD^2}-0.333$	1	SHOW ON DRAWINGS	STR.										1.043	21.8
					2	SHOWN ON BAR SCHEDULE (TOTAL NO. OF BARS)												
W535	5		4.25		11	$\{\frac{\text{NO. OF BARS FROM W 5 31+1}}{2}\}$ (1)	③	1.583	1.0833	1.583			0.1667				1.043	48.8
W536	5		1.00		8		STR.										1.043	8.3
F600	6	DESIGNER (2)	7'-1"	LA-0.667	43	$\{\frac{LA-0.50}{\text{REQ. SPA. (DESIGNER)}}+0.99\}+1$ (1)(2)	STR.										1.502	457.5
F701	7	DESIGNER (2)	7'-1"	IA-0.667	64	$\{\frac{LA-0.50}{\text{REQ. SPA. (DESIGNER)}}+0.99\}+1$ (1)(2)	STR.										2.044	926.6
F502	5		30'-8⅜"	LA-0.667	7	$\{\frac{IA-0.667}{1.50}+0.99\}+1$ (1)(6)	STR.										1.043	448.3
F403	4		2.25		48	$(\{\frac{IA-0.667}{3.00}+0.99\}+1)(\{\frac{LA-0.5}{3.0}+0.99\}+1)$ (1)	②	0.375	1.5	0.375	0.250						0.668	72.1
F504	5		3.50		13	$\{\frac{EC-0.25}{1.50}+0.99\}+1$ (1)	STR.										1.043	47.5
F505	5		3.50		13	$\{\frac{ED-0.25}{1.50}+0.99\}+1$ (1)	STR.										1.043	47.5
EF606	6	DESIGNER (2)	5'-7"	HB+1.667+A FOR "A" VARIABLE SEE TABLE 1	35	$\{\frac{EC-1.00(TAN(AA))-0.25}{\text{REQ. SPA. (DESIGNER)}}+0.99\}+1$ (1)(2)	①	.667	4.917				.500	SEE TABLE 1 (B = HB + 1.667)			1.502	293.6
EF607	6	DESIGNER (2)	5'-7"	HB+1.667+A FOR "A" VARIABLE SEE TABLE 1	33	$\{\frac{ED-1.00(TAN(AB))-0.25}{\text{REQ. SPA. (DESIGNER)}}+0.99\}+1$ (1)(2)	①	.667	4.917				.500	SEE TABLE 1 (B = HB + 1.667)			1.502	276.8
F620	6	DESIGNER (2)	5'-10"	JA-0.667	25	$\{\frac{MB-0.50}{\text{REQ. SPA. (DESIGNER)}}+0.99\}+1$ (1)(2)	STR.										1.502	219.0
F521	5	DESIGNER (2)	5'-10"	JA-0.667	25	$\{\frac{MB-0.50}{\text{REQ. SPA. (DESIGNER)}}+0.99\}+1$ (1)(2)	STR.										1.043	152.1
F522	5		11'-6"	MB-0.667	6	$\{\frac{JA-0.667}{1.50}+0.99\}+1$ SHOW ON DRAWINGS (1)(6)	STR.										1.043	144.0
F423	4		2.25		24	$(\{\frac{JA-0.667}{3.00}+0.99\}+1)(\{\frac{MB-0.50}{3.00}+0.99\}+1)$ (1)	②	0.375	1.5	0.375	0.250						0.668	36.1
F524	5		3.50		8	$\{\frac{AC-0.50}{1.50}+0.99\}+1$ (1)	STR.										1.043	29.2
EF525	5	DESIGNER (2)	4'-10"	FD+1.667+A FOR "A" VARIABLE SEE TABLE 1	21	$\{\frac{AC-0.50}{\text{REQ. SPA. (DESIGNER)}}+0.99\}+1$ (1)(2)	①	.583	4.250				.417	SEE TABLE 1 (B = FD + 1.667)			1.043	105.9
F630	6	DESIGNER (2)	5'-10"	KA-0.667	25	$\{\frac{NB-0.50}{\text{REQ. SPA. (DESIGNER)}}+0.99\}+1$ (1)(2)	STR.										1.502	219.0
F531	5	DESIGNER (2)	5'-10"	KA-0.667	25	$\{\frac{NB-0.50}{\text{REQ. SPA. (DESIGNER)}}+0.99\}+1$ (1)(2)	STR.										1.043	152.1
F532	5		11'-6"	NB-0.667	6	$\{\frac{KA-0.667}{1.50}+0.99\}+1$ SHOW ON DRAWINGS (1)(6)	STR.										1.043	144.0
F433	4		2.25		24	$(\{\frac{KA-0.667}{3.00}+0.99\}+1)(\{\frac{NB-0.5}{3.00}+0.99\}+1)$ (1)	②	0.375	1.5	0.375	0.250						0.668	36.1
F534	5		3.50		8	$\{\frac{AD-0.50}{1.50}+0.99\}+1$ (1)	STR.										1.043	29.2
EF535	5	DESIGNER (2)	4'-10"	GD+1.667+A FOR "A" VARIABLE SEE TABLE 1	21	$\{\frac{AD-0.50}{\text{REQ. SPA. (DESIGNER)}}+0.99\}+1$ (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.

(3) TAKE THE ABSOLUTE VALUE OF THE QUANTITY WITHIN THE | | .

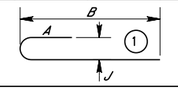
(4) USE TABLE 1 ON THIS SHEET TO COMPLETE BAR WEIGHT QUANTITIES.

(5) TOTAL BAR WEIGHT = (BAR LENGTH OR AVERAGE BAR LENGTH) x (TOTAL NO. OF BARS) x (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) 180° HOOKS A	180° HOOKS J	BAR WEIGHT lb/ft
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	Recm'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. Macioce
CHIEF BRIDGE ENGINEER

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

SHEET 14 OF 20

BLC-561M

CONTROL DIMENSIONS

CODE	DESCRIPTION	SOURCE	VALUE (4)	
A1	SKEW ANGLE	DESIGNER		DEG.
A2	% GRADE (LOOKING STATIONS AHEAD)	DESIGNER		%
B1	SPAN LENGTH- ℄ TO ℄ BEARING	DESIGNER		
B2	FRONT FACE TO FRONT FACE OF ABUTMENTS	$\left(B1-\frac{1.5}{SIN(A1)}\right)$		
B3	WATERWAY OPENING	(B2) SIN(A1)		
C1	CURB TO CURB ROADWAY WIDTH (NORMAL)	TABLE 2a OR 2b (SEE SHTS. 2 THROUGH 17 OF BLC-561M)		
C2	DECK WIDTH OUT TO OUT	C1+2.00		
D1	OUT TO OUT DECKING ALONG ℄ OF ROADWAY	$B1+\frac{2.00}{SIN(A1)}$		
D2	NUMBER OF DECK PANELS	$\left\{\frac{D1*SIN(A1)}{4.00}\right\}$ (1)		
E1	DECK THICKNESS	TABLE 2a OR 2b (SEE SHTS. 2 THROUGH 17 OF BLC-561M)		
E2	DECK PANEL WIDTH ALONG ℄ OF ROADWAY	$\frac{D1}{D2}$		
E3	DECK PANEL WIDTH (NORMAL)	E2*SIN(A1)		
E4	NUMBER OF LAG SCREWS (OR ALUMINUM CLIPS) PER DECK PANEL PER BEAM	$\left\{\frac{E2-1.00}{1.00}+1\right\}$ (1)		
E5	LAG SCREW SPACING	$\frac{E2-1.00}{E4-1}$		
F1	OUT TO OUT BARRIER LENGTH	$D1+\frac{0.667}{TAN(A1)}$		
F2	NUMBER OF GUIDE RAIL TIMBER POST SPACES	$\left\{\frac{F1-8.00}{8.00}\right\}$ (1)		
F3	GUIDE RAIL POST SPACING	$\frac{F1-8.00}{F2}$		
G1	NUMBER OF SPACES BETWEEN ℄ BEARINGS	$\left\{\frac{B1}{19.6875}\right\}$ (1) IF B1 ≤ 19.6875 THEN G1 = 2		
H1	BEAM SPACING (NORMAL)	TABLE 2a OR 2b (SEE SHTS. 2 THROUGH 17 OF BLC-561M)		
H2	BEAM SPACING ALONG SKEW	$\frac{H1}{SIN(A1)}$		
J1	NUMBER OF BEAMS (AND 1/2 NO. OF BRG. PADS)	TABLE 2a OR 2b (SEE SHTS. 2 THROUGH 17 OF BLC-561M)		
J2	NUMBER OF BEAM SPACES	J1-1		

CONTROL STATIONS AND ELEVATIONS

CODE	LOCATION	SOURCE	VALUE (ft.) STATION	VALUE (ft.) P.G. ELEV.
①	℄ ROADWAY AT ℄ BRG. ABUT. 1	DESIGNER		
②	℄ ROADWAY AT ℄ BRG. ABUT. 2	DESIGNER		
③	℄ ROADWAY AT BEGIN OF STR.	STA① $-\frac{(0.75+0.250)}{SIN(A1)}$		_____
④	℄ ROADWAY AT END OF STR.	STA② $+\frac{(0.75+0.250)}{SIN(A1)}$		_____
⑤	℄ ROADWAY AT FRONT FACE ABUT. 1	STA① $+\frac{0.75}{SIN(A1)}$		_____
⑥	℄ ROADWAY AT FRONT FACE ABUT. 2	STA② $-\frac{0.75}{SIN(A1)}$		_____

TABLE 1 - DOWEL DESIGN DATA

TIMBER SPECIES	MAXIMUM DESIGN SPAN (T2)	NO. OF (3) DOWELS (T3)
NORTHERN RED OAK & RED MAPLE	2'-2"	1
	3'-2"	2
	3'-11"	3
	4'-7"	4
	5'-2"	5
YELLOW POPLAR	1'-8"	1
	2'-5"	2
	3'-1"	3
	3'-7"	4
	4'-1"	5

FOOTNOTES FOR TABLES

(1) ROUND TO THE NEXT WHOLE NUMBER - ONLY WITHIN { }.

(2) SEE BLC-561M SHEET 19 FOR VARIABLES "AA" AND "AB"

(3) NO. OF DOWELS IS BASED ON THE USE OF AASHTO M314, GRADE 55 SMOOTH STEEL DOWELS

(4) SHOW ALL DIMENSIONS IN FEET AND INCHES UNLESS NOTED OTHERWISE.

(5) 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.

(6) DESIGNER CHOOSES EITHER STEEL DOWELS OR ALTERNATE STIFFENER BEAM SYSTEM TO PROVIDE CONNECTION OF TRANSVERSE GLULAM DECK PANELS. CROSS OUT APPROPRIATE DETAILS ON BLC-562M SHEETS 12, 13, 14 AND 15 AS REQUIRED.

(7) QUANTITY BASED ON 12" WIDE POSTS AT ALL END LOCATIONS.

(8) QUANTITY BASED ON 8¾" WIDE POSTS AT ALL INTERMEDIATE LOCATIONS.

(9) QUANTITY INCLUDES RAIL SPACER BLOCK.

CONTROL DIMENSIONS

CODE	DESCRIPTION	SOURCE	VALUE (4)	
K1	℄ FASCIA BEAM TO ℄ FASCIA BEAM	H1*J2		
K2	℄ FASCIA BEAM TO ℄ FASCIA BEAM ALONG SKEW	H2*J2		
K3	℄ FASCIA BEAM TO OUTSIDE FACE OF DECK	$\frac{1}{2}$(C2-K1)		
L1	BEAM LENGTH (OUT TO OUT OF BEAM)	$B1+\frac{1.5}{SIN(A1)}$		
L2	GLULAM BEAM SPECIES COMBINATION	TABLE 2a OR 2b (SEE SHTS. 2 THROUGH 7 OF BLC-561M)		
L3	BEAM WIDTH	TABLE 2a OR 2b (SEE SHTS. 2 THROUGH 7 OF BLC-561M)		
L4	BEAM DEPTH	TABLE 2a OR 2b (SEE SHTS. 2 THROUGH 7 OF BLC-561M)		
M1	PRE-FABRICATED CAMBER	TABLE 2a OR 2b (SEE SHTS. 2 THROUGH 7 OF BLC-561M)		
M5	NET FINAL CAMBER	TABLE 2a OR 2b (SEE SHTS. 2 THROUGH 7 OF BLC-561M)		
N1	FIXED BEARING PAD WIDTH	TABLE 2a OR 2b (SEE SHTS. 2 THROUGH 7 OF BLC-561M)		
N2	FIXED BEARING PAD LENGTH	TABLE 2a OR 2b (SEE SHTS. 2 THROUGH 7 OF BLC-561M)		
N3	FIXED BEARING PAD THICKNESS	TABLE 2a OR 2b (SEE SHTS. 2 THROUGH 7 OF BLC-561M)		
N4	NUMBER OF INTERIOR LAYERS	TABLE 2a OR 2b (SEE SHTS. 2 THROUGH 7 OF BLC-561M)		
P1	EXPANSION BEARING PAD WIDTH	TABLE 2a OR 2b (SEE SHTS. 2 THROUGH 7 OF BLC-561M)		
P2	EXPANSION BEARING PAD LENGTH	TABLE 2a OR 2b (SEE SHTS. 2 THROUGH 7 OF BLC-561M)		
P3	EXPANSION BEARING PAD THICKNESS	TABLE 2a OR 2b (SEE SHTS. 2 THROUGH 7 OF BLC-561M)		
P4	NUMBER OF INTERIOR LAYERS	TABLE 2a OR 2b (SEE SHTS. 2 THROUGH 7 OF BLC-561M)		
Q1	BEARING ℙ CONSTRAINT DUE TO BEARING PAD	N1+0.8333		
Q2	BEARING ℙ CONSTRAINT DUE TO BEAM WIDTH	L3+0.9167		
Q3	FIXED BEARING PLATE WIDTH	(USE THE GREATER VALUE BETWEEN Q1 & Q2)/SIN A1		
Q4	FIXED BEARING PLATE LENGTH	(N1)COS(A1) + (N2)SIN(A1) + 0.1667		
R1	BEARING ℙ CONSTRAINT DUE TO EXP. BEARING PAD	P1+0.8333		
R2	EXPANSION BEARING PLATE WIDTH	(USE THE GREATER VALUE BETWEEN Q2 & R1)/SIN A1		
R3	EXPANSION BEARING PLATE LENGTH	(P1)COS(A1) + (P2)SIN(A1) + 0.1667		
S1	FIXED END BACKWALL DEPTH	L4+0.0417+N3-0.0208		
S2	EXPANSION END BACKWALL DEPTH	L4+0.0417+P3-0.0208		
S3	BACKWALL LENGTH — CONCRETE ABUTMENTS	$\frac{C2+0.2625}{SIN(A1)}$		
	BACKWALL LENGTH — TIMBER SILL ABUTMENTS	$\frac{C2}{SIN(A1)}+\frac{0.25}{SIN(AA)}+\frac{0.25}{SIN(AB)}+0.6667$ (2)		
T1	CLEAR SPAN BETWEEN BEAMS	H1-L3		
T2	DESIGN SPAN	$E1+\frac{T1}{SIN(A1)}$		
T3	NUMBER OF DOWELS	TABLE 1 (SEE THIS SHEET) (6)		
T4	DOWEL SPACING	$\frac{T1}{(T3+1)}$ (6)		
	NUMBER OF STIFFENER BEAMS PER BAY AT EACH DECK PANEL JOINT	SEE TABLE ON BLC-562M, SHTS. 12, 13, OR 14 (6)		
T6	STIFFENER BEAM QUANTITY (PER STIFFENER)	6.86 F.B.M. NORTHERN RED OAK AND RED MAPLE (6) 8.57 F.B.M. YELLOW POPLAR (6)		

QUANTITIES T5

ITEM		QUANTITY FORMULA	UNIT	SUBTOTAL	TOTAL
GLUE LAMINATED TIMBER BEAMS		J1*L1*L3*L4 (5)	F.B.M.		
GLUE LAMINATED TIMBER DECK		C2*E1*E2*D2 (5)	F.B.M.		
GLUE LAMINATED TIMBER STIFFENER BEAMS		(D2-1)(J2)(T5)(T6) (5)	F.B.M.		
GLUE LAMINATED TIMBER RAILING END POST (7) (9)	GLUE LAMINATED TIMBER BRIDGE RAIL	4(1.00*0.875)(E1+2.917)+4(0.26*0.875*12.0") (5)	F.B.M.		
GLUE LAMINATED TIMBER RAILING INTERMEDIATE POST (8) (9)		2(F2-1)(0.875*0.729)(E1+35.0")+2(F2-1)(0.26*0.875*8.75") (5)	F.B.M.		
GLUE LAMINATED TIMBER RAILING		2(F2*F3+3.667)(1.125)(8.75") (5)	F.B.M.		
GLUE LAMINATED TIMBER CURB		2*F1(1.00)(6.75") (5)	F.B.M.		
GLUE LAMINATED TIMBER SCUPPER BLOCK		2(F2+1)(4.50)(1.00)(6.75")+(7.0)(1.0)(6.75") (5)	F.B.M.		
GLUE LAMINATED TIMBER BACKWALL	GLUE LAMINATED TIMBER BACKWALL AND DIAPHRAGMS	2(S3)(3.1")$\left(\frac{S1+S2}{2}\right)$ (5)	F.B.M.		
GLUE LAMINATED TIMBER DIAPHRAGMS		(G1-1)J2(L4-4"-1")0.250(H1-L3) (5)	F.B.M.		
FABRICATED STRUCTURAL STEEL (SOLE PLATES)		J1(Q3*Q4+R2*R3)(0.0417)$\left(490\ \frac{lb}{ft^3}\right)$	lb		
WATERPROOF MEMBRANE		(D1)(C1)$\left(\frac{1yd^2}{9ft^2}\right)$	S.Y.		
CLASS 4 GEOTEXTILE		[S1+S2+(2*E1)+6.0](S3+0.5)$\left(\frac{1yd^2}{9ft^2}\right)$	S.Y.		
6 MIL POLYURETHANE		[2(E1+2.33)(D1)+[S1+S2+(2*E1)+6.0](S3+0.5)]$\left(\frac{1yd^2}{9ft^2}\right)$	S.Y.		
BITUMINOUS WEARING COURSE		(0.1667*C1+0.005*C1²)D1*$\left(140\ \frac{lb}{ft^3}\right)\left(\frac{1TON}{2000lb}\right)$	TON		

Mark	Description	By	Chk'd	Recm'd	Date
REVISIONS					

S- | SHEET ___ OF ___

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

DATA ASSEMBLY SHEETS GLULAM BEAM

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

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

SHEET 1 OF 20

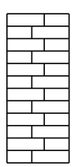
BLC-561M

TABLE 2a - NORTHERN RED OAK - COMBINATION LAY-UP (L2) (1,2,5)

DESIGN DATA																	BRIDGE RATINGS (3)																							
SPAN (B1) FT.-IN.	CURB TO CURB (C1) FT.-IN.	DECK THICK. (E1) IN.	BEAM SPA. (H1) FT.-IN.	NO. OF BEAMS (J1) #	BEAM WIDTH (L3) IN.	BEAM DEPTH (L4) IN.	PRE-FABRICATED CAMBER (M1) IN.	NET FINAL CAMBER (M5) IN.	FIXED BRG. PAD WIDTH (N1) IN.	FIXED BRG. PAD LENGTH (N2) IN.	FIXED BRG. PAD THICK (N3) IN.	NO. OF INTERIOR LAYERS (N4) #	EXP. BRG. PAD WIDTH (P1) IN.	EXP. BRG. PAD LENGTH (P2) IN.	EXP. BRG. PAD THICK (P3) IN.	NO. OF INTERIOR LAYERS (P4) #	D.F.	H20			HS20			ML80			PHL-93			TK527			P82		FACTORED RESISTANCE (4)			
																		LOC.	I.R.	O.R.	LOC.	I.R.	O.R.	LOC.	I.R.	O.R.	LOC.	I.R.	O.R.	LOC.	I.R.	O.R.	LOC.	O.R.	MOMENT Mr (K-FT.)	LOC.	SHEAR Vr (K)	LOC.
18'-0"	23'-7"	5 1/8	2'-9"	9	8 5/8	20 5/8	0.21	0.04	9	8	1	1	9	8	2 1/2	4	0.336	0.50L	1.88 M	3.12 M	0.50L	1.88 M	3.12 M	0.50L	1.39 M	2.30 M	0.45L	1.10 M	1.74 M	0.50L	1.60 M	2.66 M	0.45L	1.63 M	178.7	0.45L	48.8	0.25L
	27'-6"	5 1/8	2'-7"	11	8 5/8	20 5/8	0.20	0.03	9	8	1	1	9	8	2 1/2	4	0.329	0.50L	1.93 M	3.21 M	0.50L	1.93 M	3.21 M	0.50L	1.42 M	2.36 M	0.45L	1.13 M	1.79 M	0.50L	1.65 M	2.73 M	0.45L	1.67 M	178.7	0.45L	48.8	0.25L
	31'-6"	5 1/8	2'-9"	12	8 5/8	19 1/4	0.26	0.04	9	8	1	1	9	8	2 1/2	4	0.300	0.50L	1.82 M	3.03 M	0.50L	1.82 M	3.03 M	0.50L	1.34 M	2.23 M	0.45L	1.06 M	1.68 M	0.50L	1.55 M	2.58 M	0.45L	1.58 M	156.7	0.45L	45.5	0.25L
19'-9"	23'-7"	5 1/8	2'-9"	9	8 5/8	22	0.26	0.04	9	8	1 1/2	2	9	8	2 1/2	4	0.336	0.50L	1.90 M	3.16 M	0.50L	1.90 M	3.16 M	0.50L	1.35 M	2.24 M	0.45L	1.07 M	1.71 M	0.50L	1.55 M	2.57 M	0.45L	1.55 M	200.1	0.45L	52.0	0.25L
	27'-6"	5 1/8	2'-7"	11	8 5/8	22	0.25	0.04	9	8	1 1/2	2	9	8	2 1/2	4	0.329	0.50L	1.95 M	3.25 M	0.50L	1.95 M	3.25 M	0.50L	1.39 M	2.30 M	0.45L	1.10 M	1.76 M	0.50L	1.59 M	2.64 M	0.45L	1.59 M	200.1	0.45L	52.0	0.25L
	31'-6"	5 1/8	2'-9"	12	8 5/8	20 5/8	0.31	0.05	9	8	1 1/2	2	9	8	2 1/2	4	0.300	0.50L	1.85 M	3.09 M	0.50L	1.85 M	3.09 M	0.50L	1.31 M	2.19 M	0.45L	1.05 M	1.66 M	0.50L	1.51 M	2.52 M	0.45L	1.52 M	177.0	0.45L	48.8	0.25L
23'-0"	23'-7"	5 1/8	2'-9"	9	8 5/8	24 3/4	0.35	0.06	10	7	1	1	10	7	2	3	0.336	0.50L	1.98 M	3.30 M	0.50L	1.98 M	3.30 M	0.50L	1.33 M	2.22 M	0.45L	1.07 M	1.70 M	0.50L	1.51 M	2.52 M	0.45L	1.48 M	246.6	0.45L	58.5	0.25L
	27'-6"	5 1/8	2'-7"	11	8 5/8	24 3/4	0.33	0.06	10	7	1	1	10	7	2	3	0.329	0.50L	2.03 M	3.39 M	0.50L	2.03 M	3.39 M	0.50L	1.37 M	2.29 M	0.45L	1.10 M	1.75 M	0.50L	1.55 M	2.59 M	0.45L	1.52 M	246.6	0.45L	58.5	0.25L
	31'-6"	5 1/8	2'-9"	12	8 5/8	23 3/8	0.41	0.07	10	7	1	1	10	7	2	3	0.300	0.50L	1.95 M	3.27 M	0.50L	1.95 M	3.27 M	0.50L	1.32 M	2.21 M	0.45L	1.05 M	1.68 M	0.50L	1.49 M	2.50 M	0.45L	1.47 M	221.2	0.45L	55.3	0.25L
26'-3"	23'-7"	5 1/8	2'-9"	9	8 5/8	27 1/2	0.44	0.07	9	8	1	1	9	8	2	3	0.336	0.50L	2.05 M	3.44 M	0.35L	1.94 M	3.24 M	0.50L	1.33 M	2.24 M	0.45L	1.07 M	1.70 M	0.45L	1.47 M	2.46 M	0.45L	1.46 M	297.2	0.45L	65.0	0.25L
	27'-6"	5 1/8	2'-7"	11	8 5/8	27 1/2	0.42	0.07	9	8	1	1	9	8	2	3	0.329	0.50L	2.11 M	3.54 M	0.35L	2.00 M	3.33 M	0.50L	1.37 M	2.30 M	0.45L	1.10 M	1.75 M	0.45L	1.51 M	2.53 M	0.45L	1.50 M	297.2	0.45L	65.0	0.25L
	31'-6"	5 1/8	2'-9"	12	8 5/8	26 1/8	0.52	0.09	9	8	1	1	9	8	2	3	0.300	0.50L	2.05 M	3.45 M	0.35L	1.94 M	3.26 M	0.50L	1.33 M	2.24 M	0.45L	1.07 M	1.70 M	0.45L	1.47 M	2.47 M	0.45L	1.46 M	269.6	0.45L	61.8	0.25L
29'-6"	23'-7"	5 1/8	2'-9"	9	8 5/8	30 1/4	0.54	0.09	10	8	1	1	10	8	2 1/2	4	0.336	0.45L	2.09 M	3.51 M	0.40L	1.85 M	3.11 M	0.45L	1.32 M	2.22 M	0.45L	1.07 M	1.71 M	0.45L	1.45 M	2.44 M	0.45L	1.45 M	352.1	0.45L	71.5	0.25L
	27'-6"	5 1/8	2'-7"	11	8 5/8	30 1/4	0.52	0.09	10	8	1	1	10	8	2 1/2	4	0.329	0.45L	2.15 M	3.61 M	0.40L	1.91 M	3.19 M	0.45L	1.36 M	2.28 M	0.45L	1.11 M	1.76 M	0.45L	1.49 M	2.51 M	0.45L	1.49 M	352.1	0.45L	71.5	0.25L
	31'-6"	5 1/8	2'-9"	12	8 5/8	28 7/8	0.63	0.10	10	8	1	1	10	8	2 1/2	4	0.300	0.45L	2.10 M	3.55 M	0.40L	1.87 M	3.15 M	0.45L	1.33 M	2.24 M	0.45L	1.08 M	1.72 M	0.45L	1.46 M	2.47 M	0.45L	1.47 M	322.3	0.45L	68.3	0.24L
32'-10"	23'-7"	5 1/8	2'-9"	9	8 5/8	33	0.66	0.11	10	8	1	1	10	8	2 1/2	4	0.336	0.45L	2.11 M	3.56 M	0.40L	1.79 M	3.02 M	0.45L	1.30 M	2.20 M	0.45L	1.08 M	1.71 M	0.45L	1.42 M	2.39 M	0.45L	1.45 M	411.0	0.45L	78.0	0.25L
	27'-6"	5 1/8	2'-7"	11	8 5/8	31 5/8	0.71	0.12	10	8	1	1	10	8	2 1/2	4	0.329	0.45L	1.98 M	3.34 M	0.40L	1.68 M	2.83 M	0.45L	1.22 M	2.06 M	0.45L	1.01 M	1.61 M	0.45L	1.33 M	2.24 M	0.45L	1.36 M	379.1	0.45L	74.8	0.24L
	31'-6"	5 1/8	2'-9"	12	8 5/8	31 5/8	0.76	0.13	10	8	1	1	10	8	2 1/2	4	0.300	0.45L	2.14 M	3.63 M	0.40L	1.82 M	3.08 M	0.45L	1.32 M	2.24 M	0.45L	1.09 M	1.74 M	0.45L	1.44 M	2.44 M	0.45L	1.48 M	379.1	0.45L	74.8	0.24L
36'-1"	23'-7"	5 1/8	2'-9"	9	8 5/8	35 3/4	0.78	0.13	11	7	1	1	11	7	2	3	0.336	0.45L	2.14 M	3.63 M	0.45L	1.73 M	2.93 M	0.45L	1.30 M	2.20 M	0.50L	1.08 M	1.73 M	0.45L	1.40 M	2.38 M	0.45L	1.47 M	474.0	0.50L	84.5	0.25L
	27'-6"	5 1/8	2'-7"	11	8 5/8	34 3/8	0.83	0.14	11	7	1	1	11	7	2	3	0.329	0.45L	2.02 M	3.43 M	0.45L	1.64 M	2.77 M	0.45L	1.23 M	2.08 M	0.50L	1.02 M	1.63 M	0.45L	1.33 M	2.25 M	0.45L	1.39 M	440.0	0.50L	81.3	0.24L
	31'-6"	5 1/8	2'-9"	12	8 5/8	33	0.98	0.16	11	7	1	1	11	7	2	3	0.300	0.45L	1.99 M	3.40 M	0.45L	1.61 M	2.75 M	0.45L	1.21 M	2.07 M	0.50L	1.01 M	1.60 M	0.45L	1.31 M	2.23 M	0.45L	1.38 M	407.1	0.50L	78.0	0.23L
39'-4"	23'-7"	5 1/8	2'-9"	9	8 5/8	37 1/8	1.00	0.17	10	8	1	1	10	8	2 1/2	4	0.336	0.45L	2.01 M	3.42 M	0.45L	1.56 M	2.65 M	0.45L	1.20 M	2.05 M	0.50L	1.00 M	1.60 M	0.45L	1.29 M	2.20 M	0.45L	1.37 M	504.9	0.50L	87.8	0.24L
	27'-6"	5 1/8	2'-7"	11	8 5/8	37 1/8	0.96	0.16	10	8	1	1	10	8	2 1/2	4	0.329	0.45L	2.07 M	3.53 M	0.45L	1.61 M	2.73 M	0.45L	1.24 M	2.11 M	0.50L	1.04 M	1.65 M	0.45L	1.33 M	2.26 M	0.45L	1.41 M	504.9	0.50L	87.8	0.24L
	31'-6"	5 1/8	2'-9"	12	8 5/8	35 3/4	1.12	0.19	10	8	1	1	10	8	2 1/2	4	0.300	0.45L	2.05 M	3.52 M	0.45L	1.59 M	2.73 M	0.45L	1.23 M	2.11 M	0.50L	1.03 M	1.63 M	0.45L	1.32 M	2.26 M	0.45L	1.41 M	469.9	0.50L	84.5	0.23L
45'-11"	23'-7"	5 1/8	2'-9"	9	8 5/8	42 5/8	1.29	0.22	9	9	1	1	9	9	2	3	0.336	0.45L	2.09 M	3.59 M	0.45L	1.52 M	2.62 M	0.45L	1.23 M	2.11 M	0.50L	1.02 M	1.63 M	0.45L	1.30 M	2.24 M	0.50L	1.42 M	646.3	0.50L	100.8	0.23L
	27'-6"	5 1/8	2'-7"	11	8 5/8	42 5/8	1.25	0.21	9	9	1	1	9	9	2	3	0.329	0.45L	2.16 M	3.71 M	0.45L	1.58 M	2.70 M	0.45L	1.27 M	2.17 M	0.50L	1.06 M	1.69 M	0.45L	1.35 M	2.31 M	0.50L	1.46 M	646.3	0.50L	100.8	0.23L
	31'-6"	5 1/8	2'-9"	12	8 5/8	41 1/4	1.43	0.24	9	9	1	1	9	9	2	3	0.300	0.45L	2.16 M	3.73 M	0.45L	1.57 M	2.72 M	0.45L	1.27 M	2.19 M	0.50L	1.06 M	1.68 M	0.45L	1.35 M	2.32 M	0.50L	1.47 M	607.3	0.50L	97.5	0.22L
52'-6"	23'-7"	5 1/8	2'-9"	9	8 5/8	48 1/8	1.61	0.27	11	8	1	1	11	8	2 1/2	4	0.336	0.45L	2.18 M	3.77 M	0.45L	1.52 M	2.63 M	0.50L	1.25 M	2.17 M	0.50L	1.04 M	1.66 M	0.45L	1.33 M	2.30 M	0.50L	1.47 M	803.1	0.50L	113.8	0.23L
	27'-6"	5 1/8	2'-7"	11	8 5/8	46 3/4	1.68	0.28	11	8	1	1	11	8	2 1/2	4	0.329	0.45L	2.10 M	3.64 M	0.45L	1.47 M	2.54 M	0.50L	1.21 M	2.10 M	0.50L	1.01 M	1.60 M	0.45L	1.28 M	2.22 M	0.50L	1.42 M	760.1	0.50L	110.5	0.22L
	31'-6"	5 1/8	2'-9"	12	8 5/8	45 3/8	1.91	0.32	11	8	1	1	11	8	2 1/2	4	0.300	0.45L	2.10 M	3.67 M	0.45L	1.47 M	2.56 M	0.50L	1.21 M	2.11 M	0.50L	1.01 M	1.60 M	0.45L	1.28 M	2.24 M	0.50L	1.43 M	718.2	0.50L	107.3	0.22L
59'-1"	23'-7"	5 1/8	2'-9"	9	8 5/8	53 5/8	1.96	0.33	11	8	1	1	11	8	2	3	0.336	0.50L	2.21 M	3.84 M	0.45L	1.53 M	2.66 M	0.50L	1.28 M	2.24 M	0.50L	1.05 M	1.68 M	0.45L	1.34 M	2.33 M	0.45L	1.49 M	974.9	0.50L	126.8	0.23L
	27'-6"	5 1/8	2'-7"	11	8 5/8	52 1/4	2.02	0.34	11	8	1	1	11	8	2	3	0.329	0.50L	2.14 M	3.74 M	0.45L	1.48 M	2.59 M	0.50L	1.25 M	2.17 M	0.50L	1.02 M	1.63 M	0.45L	1.30 M	2.27 M	0.45L	1.44 M	927.9	0.50L	123.6	0.22L
	31'-6"	5 1/8	2'-9"	12	8 5/8	50 7/8	2.27	0.38	11	8	1	1	11	8	2	3	0.300	0.50L	2.15 M	3.79 M	0.45L	1.49 M	2.63 M	0.50L	1.25 M	2.21 M	0.50L	1.03 M	1.64 M	0.45L	1.31 M	2.30 M	0.45L	1.47 M	882.1	0.50L	120.3	0.22L
65'-7"	23'-7"	5 1/8	2'-9"	9	8 5/8	57 3/4	2.48	0.41	12	8	1	1	12	8	2 1/2	4	0.336	0.50L	2.05 M	3.61 M	0.45L	1.45 M	2.56 M	0.50L	1.24 M	2.18 M	0.50L	1.00 M	1.59 M	0.45L	1.27 M	2.24 M	0.40L	1.38 M	1110.6	0.50L	136.6	0.22L
	27'-6"	5 1/8	2'-7"	11	8 5/8	57 3/4	2.40	0.40	12	8	1	1	12	8	2 1/2	4	0.329	0.50L	2.13 M	3.73 M	0.45L	1.51 M	2.64 M	0.50L	1.28 M	2.25 M	0.50L	1.04 M	1.65 M	0.45L	1.32 M	2.32 M	0.40L	1.42 M	1110.6	0.50L	136.6	0.22L
	31'-6"	5 1/8	2'-9"	12	8 5/8	56 3/8	2.67	0.44	12	8	1	1	12	8	2 1/2	4	0.300	0.50L	2.15 M	3.81 M	0.45L	1.52 M	2.70 M	0.50L	1.29 M	2.30 M	0.50L	1.05 M	1.67 M	0.45L	1.33 M	2.36 M	0.40L	1.45 M	1060.9	0.50L	133.3	0.21L
72'-2"	23'-7"	5 1/8	2'-9"	9	8 5/8	63 1/4	2.89	0.48	12	8	1	1	12	8	2 1/2	4	0.336	0.50L	2.02 M	3.59 M	0.45L	1.47 M	2.61 M	0.50L	1.26 M	2.25 M	0.50L	1.01 M	1.61 M	0.45L	1.29 M	2.29 M	0.40L	1.35 M	1307.6	0.50L	149.6	0.22L
	27'-6"	5 1/8	2'-7"	11	8 5/8	63 1/4	2.80	0.47	12	8	1	1	12	8	2 1/2	4	0.329	0.50L	2.10 M	3.71 M	0.45L	1.53 M	2.70 M	0.50L	1.31 M	2.32 M	0.50L	1.05 M	1.67 M	0.45L	1.34 M	2.37 M	0.40L	1.39 M	1307.6	0.50L	149.6	0.22L
	31'-6"	5 1/8	2'-9"	12	8 5/8	61 7/8	3.09	0.52	12	8	1	1	12	8	2 1/2	4	0.300	0.50L	2.12 M	3.80 M	0.45L	1.55 M	2.76 M	0.50L	1.33 M	2.38 M	0.50L	1.06 M	1.69 M	0.45L	1.36 M	2.42 M	0.40L	1.43 M	1254.1	0.50L	146.3	0.21L
78'-9"	23'-7"	5 1/8	2'-9"	9	8 5/8	68 3/4	3.32	0.55	11	9	1	1	11	9	2 1/2	4	0.336	0.50L	1.98 M	3.56 M	0.45L	1.49 M	2.66 M	0.50L	1.29 M	2.31 M	0.50L	1.01 M	1.61 M	0.45L	1.30 M	2.33 M	0.45L	1.31 M	1518.7	0.50L	162.6	0.22L
	27'-6"	5 1/8	2'-7"	11	8 5/8	68 3/4	3.22	0.54	11	9	1	1	11	9	2 1/2	4	0.329	0.50L	2.06 M	3.68 M	0.45L	1.55 M	2.75 M	0.50L	1.34 M	2.39 M	0.50L	1.05 M	1.68 M	0.45L	1.36 M	2.41 M	0.45L	1.36 M	1518.7	0.50L	162.6	0.22L
	31'-6"	5 1/8	2'-9"	12	8 5/8	66	3.72	0.62	11	9	1	1	11	9	2 1/2	4	0.300	0.50L	1.98 M	3.58 M	0.45L	1.48 M	2.69 M	0.50L	1.29 M	2.33 M	0.50L	1.01 M	1.61 M	0.45L	1.30 M	2.35 M	0.45L	1.33 M	1405.4	0.50L	156.1	0.21L
85'-3"	23'-7"	5 1/8	2'-9"	9	8 5/8	74 1/4	3.78	0.63	13	8	1	1	13	8	2 1/2	4	0.336	0.50L	1.95 M	3.52 M	0.45L	1.50 M	2.71 M	0.50L	1.31 M	2.37 M	0.50L	1.01 M	1.61 M	0.45L	1.32 M	2.38 M	0.45L	1.29 M	1744.0	0.50L	175.6	0.22L
	27'-6"	5 1/8	2'-7"	11	8 5/8	72 7/8	3.85	0.64	13	8	1	1	13	8	2 1/2	4	0.329	0.50L	1.93 M	3.48 M	0.45L	1.49 M	2.68 M	0.50L	1.30 M	2.35 M	0.50L	1.00 M	1.60 M	0.45L	1.30 M	2.35 M	0.45L	1.28 M	1683.1	0.50L	172.3	0.21L
	31'-6"	5 1/8	2'-9"	12	8 5/8	71 1/2	4.20	0.70	13	8	1	1	13	8	2 1/2	4	0.300	0.50L	1.95 M	3.57 M	0.45L	1.51 M	2.75 M	0.50L	1.32 M	2.41 M	0.50L	1.02 M	1.62 M	0.45L	1.32 M	2.41 M	0.45L	1.31 M	1623.3	0.50L	169.1	0.21L
91'-10"	23'-7"	5 1/8	2'-9"	9	10 3/8	74 1/4	4.67	0.78	12	9	1	1	12	9	2 1/2	4	0.336	0.50L	1.94 M	3.54 M	0.45L	1.54 M	2.82 M	0.50L	1.35 M	2.48 M	0.50L	1.03 M	1.64 M	0.45L	1.35 M	2.47 M	0.45L	1.30 M	2044.2	0.50L	211.2	0.20L
	27'-6"	5 1/8	2'-7"	11	10 3/8	72 7/8	4.76	0.79	12	9	1	1	12	9	2 1/2	4	0.329	0.50L	1.91 M	3.50 M	0.45L	1.53 M	2.79 M	0.50L	1.34 M	2.45 M	0.50L	1.02 M	1.62 M	0.45L	1.34 M	2.44 M	0.45L	1.29 M	1972.9	0.50L	207.3	0.20L
	31'-6"	5 1/8	2'-9"	12	10 3/8	71 1/2	5.17	0.86	12	9	1	1	12	9	2 1/2	4	0.300	0.50L	1.94 M	3.59 M	0.45L	1.54 M	2.86 M	0.50L	1.35 M	2.51 M	0.50L	1.03 M	1.64 M	0.45L	1.35 M	2.50 M	0.45L	1.32 M	1902.7	0.50L	203.4	0.19L
98'-5"	23'-7"	5 1/8	2'-9"	9	10 3/8	79 3/4	5.18	0.86	11	10	1	1	11	10	2 1/2	4	0.336	0.50L	1.91 M	3.53 M	0.50L	1.56 M	2.88 M	0.50L	1.39 M	2.56 M	0.50L	1.03 M	1.63 M	0.45L	1.38 M	2.54 M	0.45L	1.31 M	2325.3	0.50L	226.8	0.20L
	27'-6"	5 1/8	2'-7"	11	10 3/8	78 3/8	5.27	0.88	11	10	1	1	11	10	2 1/2	4	0.329	0.50L	1.89 M	3.49 M	0.50L	1.55 M	2.85 M	0.50L	1.37 M	2.53 M	0.50L	1.02 M	1.62 M	0.45L	1.36 M	2.51 M	0.45L	1.30 M	2249.7	0.50L	222.9	0.20L
	31'-6"	5 1/8	2'-9"	12	10 3/8	77	5.69	0.95	11	10	1	1	11	10	2 1/2	4	0.300	0.50L	1.92 M	3.59 M	0.50L	1.57 M	2.93 M	0.50L	1.39 M	2.60 M	0.50L	1.03 M	1.64 M	0.45L	1.38 M	2.58 M	0.45L	1.33 M	2175.3	0.50L	219.0	0.20L

LEGEND OF ABBREVIATIONS

BRG. DENOTES BEARING
D.F. DENOTES DISTRIBUTION FACTOR
EXP. DENOTES EXPANSION
I.R. DENOTES INVENTORY RATING
LOC. DENOTES LOCATION
NO. DENOTES NUMBER
O.R. DENOTES OPERATING RATING
SPA. DENOTES SPACING
THICK. DENOTES THICKNESS



COMBINATION LAY-UP

NOTES:

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

2.) DESIGN TABLES DO NOT ACCOUNT FOR VERTICAL OR HORIZONTAL CURVES ON BRIDGE DECK.

3.) FLEXURAL RATING FACTORS "M" ARE SHOWN & GOVERN UNLESS OTHERWISE DENOTED BY A "V" FOR SHEAR, "D" FOR DEFLECTION OR "B" FOR BEARING.

4.) EXTERIOR BEAM CONTROLS. VALUES SHOWN ARE FACTORED RESISTANCES FOR THE EXTERIOR BEAM BASED ON LOAD AND RESISTANCE FACTOR DESIGN.

5.) FOR SINGLE MEMBER LAYUP DESIGN DATA & BRIDGE RATINGS, SEE TABLE 2b ON THE FOLLOWING SHEET.

Mark	Description	By	Chk'd	Recm'd	Date
	REVISIONS				

S- SHEET ___ OF ___

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

DATA ASSEMBLY SHEETS
GLULAM BEAM

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

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

SHEET 2 OF 20

BLC-561M

TABLE 2b - NORTHERN RED OAK - SINGLE MEMBER LAY-UP(1,2,5)

DESIGN DATA																BRIDGE RATINGS(3)																							
SPAN (B1) FT.-IN.	CURB TO CURB (C1) FT.-IN.	DECK THICK. (E1) IN.	BEAM SPA. (H1) FT.-IN.	NO. OF BEAMS (J1) #	BEAM WIDTH (L3) IN.	BEAM DEPTH (L4) IN.	PRE-FABRICATED CAMBER (M1) IN.	NET FINAL CAMBER (M5) IN.	FIXED BRG. PAD WIDTH (N1) IN.	FIXED BRG. PAD LENGTH (N2) IN.	FIXED BRG. PAD THICK (N3) IN.	NO. OF INTERIOR LAYERS (N4) #	EXP. BRG. PAD WIDTH (P1) IN.	EXP. BRG. PAD LENGTH (P2) IN.	EXP. BRG. PAD THICK (P3) IN.	NO. OF INTERIOR LAYERS (P4) #	D.F.	H20			HS20			ML80			PHL-93			TK527			P82		FACTORED RESISTANCE(4)			
																		LOC.	I.R.	O.R.	LOC.	I.R.	O.R.	LOC.	I.R.	O.R.	LOC.	I.R.	O.R.	LOC.	I.R.	O.R.	LOC.	O.R.	MOMENT Mr (K-FT.)	LOC.	SHEAR Vr (K)	LOC.
18'-0"	23'-7"	5 1/8	2'-9"	9	5 1/8	26 1/8	0.17	0.03	7 1/2	10	1 1/2	2	7 1/2	10	2 1/2	4	0.336	0.50L	1.85 M	3.07 M	0.50L	1.85 M	3.07 M	0.50L	1.36 M	2.26 M	0.45L	1.08 M	1.71 M	0.50L	1.58 M	2.62 M	0.45L	1.60 M	175.3	0.45L	36.7	0.25L
	27'-6"	5 1/8	2'-7"	11	5 1/8	26 1/8	0.16	0.03	7 1/2	10	1 1/2	2	7 1/2	10	2 1/2	4	0.329	0.50L	1.90 M	3.15 M	0.50L	1.90 M	3.15 M	0.50L	1.40 M	2.32 M	0.45L	1.11 M	1.76 M	0.50L	1.62 M	2.68 M	0.45L	1.64 M	175.3	0.45L	36.7	0.25L
	31'-6"	5 1/8	2'-9"	12	5 1/8	24 3/4	0.20	0.03	7 1/2	10	1 1/2	2	7 1/2	10	2 1/2	4	0.300	0.50L	1.85 M	3.07 M	0.50L	1.85 M	3.07 M	0.50L	1.36 M	2.26 M	0.45L	1.07 M	1.71 M	0.50L	1.58 M	2.62 M	0.45L	1.61 M	158.2	0.45L	34.8	0.25L
19'-9"	23'-7"	5 1/8	2'-9"	9	5 1/8	27 1/2	0.21	0.03	7 1/2	10	1 1/2	2	7 1/2	10	2 1/2	4	0.336	0.50L	1.82 M	3.03 M	0.50L	1.82 M	3.03 M	0.50L	1.29 M	2.15 M	0.45L	1.03 M	1.63 M	0.50L	1.48 M	2.46 M	0.45L	1.48 M	191.4	0.45L	38.6	0.25L
	27'-6"	5 1/8	2'-7"	11	5 1/8	27 1/2	0.20	0.03	7 1/2	10	1 1/2	2	7 1/2	10	2 1/2	4	0.329	0.50L	1.87 M	3.10 M	0.50L	1.87 M	3.10 M	0.50L	1.33 M	2.20 M	0.45L	1.05 M	1.68 M	0.50L	1.52 M	2.53 M	0.45L	1.52 M	191.4	0.45L	38.6	0.25L
	31'-6"	5 1/8	2'-9"	12	5 1/8	26 1/8	0.25	0.04	7 1/2	10	1 1/2	2	7 1/2	10	2 1/2	4	0.300	0.50L	1.82 M	3.04 M	0.50L	1.82 M	3.04 M	0.50L	1.29 M	2.16 M	0.45L	1.03 M	1.64 M	0.50L	1.48 M	2.48 M	0.45L	1.49 M	173.7	0.45L	36.7	0.25L
23'-0"	23'-7"	5 1/8	2'-9"	9	5 1/8	31 5/8	0.26	0.04	7 1/2	10	1	1	7 1/2	10	2 1/2	4	0.336	0.50L	1.98 M	3.31 M	0.50L	1.98 M	3.31 M	0.50L	1.34 M	2.23 M	0.45L	1.07 M	1.70 M	0.50L	1.51 M	2.52 M	0.45L	1.49 M	245.9	0.45L	44.4	0.25L
	27'-6"	5 1/8	2'-7"	11	5 1/8	31 5/8	0.26	0.04	7 1/2	10	1	1	7 1/2	10	2 1/2	4	0.329	0.50L	2.04 M	3.39 M	0.50L	2.04 M	3.39 M	0.50L	1.37 M	2.29 M	0.45L	1.10 M	1.75 M	0.50L	1.55 M	2.59 M	0.45L	1.53 M	245.9	0.45L	44.4	0.25L
	31'-6"	5 1/8	2'-9"	12	5 1/8	30 1/4	0.30	0.05	7 1/2	10	1	1	7 1/2	10	2 1/2	4	0.300	0.50L	2.01 M	3.37 M	0.50L	2.01 M	3.37 M	0.50L	1.36 M	2.27 M	0.45L	1.09 M	1.73 M	0.50L	1.54 M	2.57 M	0.45L	1.52 M	226.0	0.45L	42.5	0.25L
26'-3"	23'-7"	5 1/8	2'-9"	9	5 1/8	34 3/8	0.36	0.06	7 1/2	11	1 1/2	2	7 1/2	11	2 1/2	4	0.336	0.50L	1.97 M	3.29 M	0.35L	1.86 M	3.11 M	0.50L	1.28 M	2.14 M	0.45L	1.02 M	1.63 M	0.45L	1.41 M	2.36 M	0.45L	1.40 M	284.3	0.45L	48.3	0.25L
	27'-6"	5 1/8	2'-7"	11	5 1/8	34 3/8	0.35	0.06	7 1/2	11	1 1/2	2	7 1/2	11	2 1/2	4	0.329	0.50L	2.02 M	3.38 M	0.35L	1.91 M	3.19 M	0.50L	1.31 M	2.20 M	0.45L	1.05 M	1.67 M	0.45L	1.45 M	2.42 M	0.45L	1.43 M	284.3	0.45L	48.3	0.25L
	31'-6"	5 1/8	2'-9"	12	5 1/8	33	0.41	0.07	7 1/2	11	1 1/2	2	7 1/2	11	2 1/2	4	0.300	0.50L	2.01 M	3.38 M	0.35L	1.90 M	3.19 M	0.50L	1.31 M	2.20 M	0.45L	1.05 M	1.66 M	0.45L	1.44 M	2.42 M	0.45L	1.43 M	263.1	0.45L	46.4	0.25L
29'-6"	23'-7"	5 1/8	2'-9"	9	5 1/8	38 1/2	0.41	0.07	7 1/2	11	1 1/2	2	7 1/2	11	2 1/2	4	0.336	0.45L	2.08 M	3.49 M	0.40L	1.85 M	3.09 M	0.45L	1.32 M	2.21 M	0.45L	1.07 M	1.71 M	0.45L	1.45 M	2.43 M	0.45L	1.45 M	348.5	0.45L	54.1	0.25L
	27'-6"	5 1/8	2'-7"	11	5 1/8	37 1/8	0.44	0.07	7 1/2	11	1 1/2	2	7 1/2	11	2 1/2	4	0.329	0.45L	1.98 M	3.32 M	0.40L	1.75 M	2.94 M	0.45L	1.25 M	2.10 M	0.45L	1.02 M	1.62 M	0.45L	1.37 M	2.31 M	0.45L	1.37 M	325.2	0.45L	52.2	0.25L
	31'-6"	5 1/8	2'-9"	12	5 1/8	35 3/4	0.51	0.09	7 1/2	11	1 1/2	2	7 1/2	11	2 1/2	4	0.300	0.45L	1.97 M	3.33 M	0.40L	1.75 M	2.95 M	0.45L	1.25 M	2.10 M	0.45L	1.02 M	1.62 M	0.45L	1.37 M	2.31 M	0.45L	1.38 M	302.7	0.45L	50.2	0.25L
32'-10"	23'-7"	5 1/8	2'-9"	9	5 1/8	41 1/4	0.53	0.09	7 1/2	11	1 1/2	2	7 1/2	11	2 1/2	4	0.336	0.45L	2.02 M	3.41 M	0.40L	1.72 M	2.90 M	0.45L	1.25 M	2.11 M	0.45L	1.03 M	1.65 M	0.45L	1.36 M	2.29 M	0.45L	1.39 M	393.1	0.45L	58.0	0.25L
	27'-6"	5 1/8	2'-7"	11	5 1/8	41 1/4	0.51	0.09	7 1/2	11	1 1/2	2	7 1/2	11	2 1/2	4	0.329	0.45L	2.08 M	3.50 M	0.40L	1.77 M	2.97 M	0.45L	1.29 M	2.16 M	0.45L	1.06 M	1.69 M	0.45L	1.40 M	2.35 M	0.45L	1.43 M	393.1	0.45L	58.0	0.25L
	31'-6"	5 1/8	2'-9"	12	5 1/8	39 7/8	0.59	0.10	7 1/2	11	1 1/2	2	7 1/2	11	2 1/2	4	0.300	0.45L	2.10 M	3.54 M	0.40L	1.78 M	3.01 M	0.45L	1.29 M	2.19 M	0.45L	1.07 M	1.71 M	0.45L	1.41 M	2.38 M	0.45L	1.45 M	368.6	0.45L	56.0	0.25L
36'-1"	23'-7"	5 1/8	2'-9"	9	5 1/8	44	0.64	0.11	7 1/2	11	1 1/2	2	7 1/2	11	2 1/2	4	0.336	0.45L	1.99 M	3.37 M	0.45L	1.61 M	2.72 M	0.45L	1.21 M	2.05 M	0.50L	1.01 M	1.60 M	0.45L	1.30 M	2.21 M	0.45L	1.36 M	440.2	0.50L	61.8	0.25L
	27'-6"	5 1/8	2'-7"	11	5 1/8	44	0.62	0.10	7 1/2	11	1 1/2	2	7 1/2	11	2 1/2	4	0.329	0.45L	2.05 M	3.46 M	0.45L	1.66 M	2.80 M	0.45L	1.24 M	2.10 M	0.50L	1.04 M	1.65 M	0.45L	1.34 M	2.27 M	0.45L	1.40 M	440.2	0.50L	61.8	0.25L
	31'-6"	5 1/8	2'-9"	12	5 1/8	42 5/8	0.71	0.12	7 1/2	11	1 1/2	2	7 1/2	11	2 1/2	4	0.300	0.45L	2.07 M	3.52 M	0.45L	1.67 M	2.84 M	0.45L	1.26 M	2.13 M	0.50L	1.05 M	1.66 M	0.45L	1.35 M	2.30 M	0.45L	1.42 M	414.4	0.50L	59.9	0.25L

NOTES:

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

2.) DESIGN TABLES DO NOT ACCOUNT FOR VERTICAL OR HORIZONTAL CURVES ON BRIDGE DECK.

3.) FLEXURAL RATING FACTORS "M" ARE SHOWN & GOVERN UNLESS OTHERWISE DENOTED BY A "V" FOR SHEAR, "D" FOR DEFLECTION OR "B" FOR BEARING.

4.) EXTERIOR BEAM CONTROLS. VALUES SHOWN ARE FACTORED RESISTANCES FOR THE EXTERIOR BEAM BASED ON LOAD AND RESISTANCE FACTOR DESIGN.

5.) FOR COMBINATION MEMBER LAYUP DESIGN DATA & BRIDGE RATINGS, SEE TABLE 2a ON THE PREVIOUS SHEET.

LEGEND OF ABBREVIATIONS

BRG.	DENOTES BEARING
D.F.	DENOTES DISTRIBUTION FACTOR
EXP.	DENOTES EXPANSION
I.R.	DENOTES INVENTORY RATING
LOC.	DENOTES LOCATION
NO.	DENOTES NUMBER
O.R.	DENOTES OPERATING RATING
SPA.	DENOTES SPACING
THICK.	DENOTES THICKNESS

SINGLE MEMBER LAY-UP

Mark	Description	By	Chk'd	Recm'd	Date
	REVISIONS				

S-

SHEET ___ OF ___

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

DATA ASSEMBLY SHEETS
GLULAM BEAM

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

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

SHEET 3 OF 20

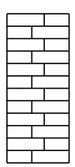
BLC-561M

TABLE 2a - RED MAPLE - COMBINATION LAY-UP (1,2,5)

DESIGN DATA																	BRIDGE RATINGS (3)																							
SPAN (B1) FT.-IN.	CURB TO CURB (C1) FT.-IN.	DECK THICK. (E1) IN.	BEAM SPA. (H1) FT.-IN.	NO. OF BEAMS (J1) #	BEAM WIDTH (L3) IN.	BEAM DEPTH (L4) IN.	PRE-FABRICATED CAMBER (M1) IN.	NET FINAL CAMBER (M5) IN.	FIXED BRG. PAD WIDTH (N1) IN.	FIXED BRG. PAD LENGTH (N2) IN.	FIXED BRG. PAD THICK (N3) IN.	NO. OF INTERIOR LAYERS (N4) #	EXP. BRG. PAD WIDTH (P1) IN.	EXP. BRG. PAD LENGTH (P2) IN.	EXP. BRG. PAD THICK (P3) IN.	NO. OF INTERIOR LAYERS (P4) #	D.F.	H20			HS20			ML80			PHL-93			TK527			P82		FACTORED RESISTANCE (4)				
																		LOC.	I.R.	O.R.	LOC.	I.R.	O.R.	LOC.	I.R.	O.R.	LOC.	I.R.	O.R.	LOC.	I.R.	O.R.	LOC.	O.R.	MOMENT Mr (K-FT.)	LOC.	SHEAR Vr (K)	LOC.
18'-0"	23'-7"	5 1/8	2'-9"	9	8 5/8	20 5/8	0.20	0.03	9	8	1	1	9	8	2 1/2	4	0.336	0.50L	1.89 M	3.14 M	0.50L	1.89 M	3.14 M	0.50L	1.39 M	2.31 M	0.45L	1.10 M	1.75 M	0.50L	1.61 M	2.67 M	0.45L	1.64 M	178.7	0.45L	45.7	0.25L
	27'-6"	5 1/8	2'-7"	11	8 5/8	20 5/8	0.19	0.03	9	8	1	1	9	8	2 1/2	4	0.329	0.50L	1.94 M	3.22 M	0.50L	1.94 M	3.22 M	0.50L	1.43 M	2.37 M	0.45L	1.13 M	1.80 M	0.50L	1.66 M	2.74 M	0.45L	1.68 M	178.7	0.45L	45.7	0.25L
	31'-6"	5 1/8	2'-9"	12	8 5/8	19 1/4	0.25	0.04	9	8	1	1	9	8	2 1/2	4	0.300	0.50L	1.83 M	3.04 M	0.50L	1.83 M	3.04 M	0.50L	1.35 M	2.24 M	0.45L	1.06 M	1.69 M	0.50L	1.56 M	2.59 M	0.45L	1.59 M	156.7	0.45L	42.6	0.25L
19'-9"	23'-7"	5 1/8	2'-9"	9	8 5/8	22	0.24	0.04	9	8	1 1/2	2	9	8	2 1/2	4	0.336	0.50L	1.91 M	3.18 M	0.50L	1.91 M	3.18 M	0.50L	1.36 M	2.25 M	0.45L	1.08 M	1.72 M	0.50L	1.56 M	2.58 M	0.45L	1.56 M	200.1	0.45L	48.7	0.25L
	27'-6"	5 1/8	2'-7"	11	8 5/8	22	0.23	0.04	9	8	1 1/2	2	9	8	2 1/2	4	0.329	0.50L	1.97 M	3.26 M	0.50L	1.97 M	3.26 M	0.50L	1.39 M	2.31 M	0.45L	1.11 M	1.77 M	0.50L	1.60 M	2.65 M	0.45L	1.60 M	200.1	0.45L	48.7	0.25L
	31'-6"	5 1/8	2'-9"	12	8 5/8	20 5/8	0.30	0.05	9	8	1 1/2	2	9	8	2 1/2	4	0.300	0.50L	1.86 M	3.11 M	0.50L	1.86 M	3.11 M	0.50L	1.32 M	2.20 M	0.45L	1.05 M	1.67 M	0.50L	1.52 M	2.53 M	0.45L	1.52 M	177.0	0.45L	45.7	0.25L
23'-0"	23'-7"	5 1/8	2'-9"	9	8 5/8	24 3/4	0.33	0.05	10	7	1	1	10	7	2	3	0.336	0.50L	1.99 M	3.32 M	0.50L	1.99 M	3.32 M	0.50L	1.34 M	2.24 M	0.45L	1.07 M	1.71 M	0.50L	1.52 M	2.53 M	0.45L	1.49 M	246.6	0.45L	54.8	0.25L
	27'-6"	5 1/8	2'-7"	11	8 5/8	24 3/4	0.31	0.05	10	7	1	1	10	7	2	3	0.329	0.50L	2.05 M	3.41 M	0.50L	2.05 M	3.41 M	0.50L	1.38 M	2.30 M	0.45L	1.10 M	1.76 M	0.50L	1.56 M	2.60 M	0.45L	1.53 M	246.6	0.45L	54.8	0.25L
	31'-6"	5 1/8	2'-9"	12	8 5/8	23 3/8	0.39	0.06	10	7	1	1	10	7	2	3	0.300	0.50L	1.97 M	3.29 M	0.50L	1.97 M	3.29 M	0.50L	1.33 M	2.22 M	0.45L	1.06 M	1.69 M	0.50L	1.50 M	2.51 M	0.45L	1.48 M	221.2	0.45L	51.7	0.25L
26'-3"	23'-7"	5 1/8	2'-9"	9	8 5/8	27 1/2	0.42	0.07	9	8	1	1	9	8	2	3	0.336	0.50L	2.07 M	3.46 M	0.35L	1.96 M	3.26 M	0.50L	1.34 M	2.25 M	0.45L	1.08 M	1.71 M	0.45L	1.48 M	2.48 M	0.45L	1.47 M	297.2	0.45L	60.9	0.25L
	27'-6"	5 1/8	2'-7"	11	8 5/8	27 1/2	0.40	0.07	9	8	1	1	9	8	2	3	0.329	0.50L	2.13 M	3.56 M	0.35L	2.01 M	3.35 M	0.50L	1.38 M	2.31 M	0.45L	1.11 M	1.76 M	0.45L	1.52 M	2.54 M	0.45L	1.51 M	297.2	0.45L	60.9	0.25L
	31'-6"	5 1/8	2'-9"	12	8 5/8	26 1/8	0.49	0.08	9	8	1	1	9	8	2	3	0.300	0.50L	2.07 M	3.47 M	0.35L	1.96 M	3.28 M	0.50L	1.34 M	2.26 M	0.45L	1.08 M	1.71 M	0.45L	1.48 M	2.48 M	0.45L	1.47 M	269.6	0.45L	57.8	0.25L
29'-6"	23'-7"	5 1/8	2'-9"	9	8 5/8	30 1/4	0.51	0.09	10	8	1	1	10	8	2 1/2	4	0.336	0.45L	2.10 M	3.53 M	0.40L	1.87 M	3.13 M	0.45L	1.33 M	2.23 M	0.45L	1.08 M	1.73 M	0.45L	1.46 M	2.45 M	0.45L	1.46 M	352.1	0.45L	67.0	0.25L
	27'-6"	5 1/8	2'-7"	11	8 5/8	28 7/8	0.56	0.09	10	8	1	1	10	8	2 1/2	4	0.329	0.45L	1.96 M	3.29 M	0.40L	1.74 M	2.91 M	0.45L	1.24 M	2.08 M	0.45L	1.01 M	1.60 M	0.45L	1.36 M	2.28 M	0.45L	1.36 M	322.3	0.45L	63.9	0.24L
	31'-6"	5 1/8	2'-9"	12	8 5/8	28 7/8	0.59	0.10	10	8	1	1	10	8	2 1/2	4	0.300	0.45L	2.12 M	3.57 M	0.40L	1.88 M	3.17 M	0.45L	1.34 M	2.26 M	0.45L	1.09 M	1.74 M	0.45L	1.47 M	2.48 M	0.45L	1.48 M	322.3	0.45L	63.9	0.24L
32'-10"	23'-7"	5 1/8	2'-9"	9	8 5/8	33	0.62	0.10	10	8	1	1	10	8	2 1/2	4	0.336	0.45L	2.13 M	3.58 M	0.40L	1.81 M	3.04 M	0.45L	1.31 M	2.21 M	0.45L	1.09 M	1.73 M	0.45L	1.43 M	2.41 M	0.45L	1.46 M	411.0	0.45L	73.1	0.25L
	27'-6"	5 1/8	2'-7"	11	8 5/8	31 5/8	0.67	0.11	10	8	1	1	10	8	2 1/2	4	0.329	0.45L	2.00 M	3.36 M	0.40L	1.70 M	2.85 M	0.45L	1.23 M	2.08 M	0.45L	1.02 M	1.62 M	0.45L	1.34 M	2.26 M	0.45L	1.37 M	379.1	0.45L	70.0	0.24L
	31'-6"	5 1/8	2'-9"	12	8 5/8	31 5/8	0.71	0.12	10	8	1	1	10	8	2 1/2	4	0.300	0.45L	2.16 M	3.65 M	0.40L	1.84 M	3.10 M	0.45L	1.34 M	2.26 M	0.45L	1.11 M	1.76 M	0.45L	1.45 M	2.45 M	0.45L	1.49 M	379.1	0.45L	70.0	0.24L
36'-1"	23'-7"	5 1/8	2'-9"	9	8 5/8	34 3/8	0.81	0.14	11	7	1	1	11	7	2	3	0.336	0.45L	1.98 M	3.36 M	0.45L	1.60 M	2.72 M	0.45L	1.20 M	2.04 M	0.50L	1.00 M	1.60 M	0.45L	1.30 M	2.20 M	0.45L	1.36 M	440.0	0.50L	76.1	0.24L
	27'-6"	5 1/8	2'-7"	11	8 5/8	34 3/8	0.78	0.13	11	7	1	1	11	7	2	3	0.329	0.45L	2.05 M	3.46 M	0.45L	1.65 M	2.80 M	0.45L	1.24 M	2.10 M	0.50L	1.03 M	1.65 M	0.45L	1.34 M	2.27 M	0.45L	1.40 M	440.0	0.50L	76.1	0.24L
	31'-6"	5 1/8	2'-9"	12	8 5/8	33	0.92	0.15	11	7	1	1	11	7	2	3	0.300	0.45L	2.02 M	3.44 M	0.45L	1.63 M	2.78 M	0.45L	1.23 M	2.09 M	0.50L	1.02 M	1.62 M	0.45L	1.32 M	2.25 M	0.45L	1.39 M	407.1	0.50L	73.1	0.23L
39'-4"	23'-7"	5 1/8	2'-9"	9	8 5/8	37 1/8	0.93	0.16	10	8	1	1	10	8	2 1/2	4	0.336	0.45L	2.03 M	3.46 M	0.45L	1.58 M	2.68 M	0.45L	1.22 M	2.07 M	0.50L	1.02 M	1.62 M	0.45L	1.31 M	2.22 M	0.45L	1.39 M	504.9	0.50L	82.2	0.24L
	27'-6"	5 1/8	2'-7"	11	8 5/8	37 1/8	0.90	0.15	10	8	1	1	10	8	2 1/2	4	0.329	0.45L	2.10 M	3.56 M	0.45L	1.63 M	2.76 M	0.45L	1.26 M	2.13 M	0.50L	1.05 M	1.67 M	0.45L	1.35 M	2.28 M	0.45L	1.43 M	504.9	0.50L	82.2	0.24L
	31'-6"	5 1/8	2'-9"	12	8 5/8	35 3/4	1.05	0.18	10	8	1	1	10	8	2 1/2	4	0.300	0.45L	2.08 M	3.55 M	0.45L	1.61 M	2.75 M	0.45L	1.25 M	2.13 M	0.50L	1.04 M	1.66 M	0.45L	1.34 M	2.28 M	0.45L	1.42 M	469.9	0.50L	79.1	0.23L
45'-11"	23'-7"	5 1/8	2'-9"	9	8 5/8	42 5/8	1.21	0.20	9	9	1	1	9	9	2	3	0.336	0.45L	2.13 M	3.64 M	0.45L	1.55 M	2.65 M	0.45L	1.25 M	2.13 M	0.50L	1.04 M	1.66 M	0.45L	1.32 M	2.26 M	0.50L	1.43 M	646.3	0.50L	94.4	0.23L
	27'-6"	5 1/8	2'-7"	11	8 5/8	42 5/8	1.17	0.19	9	9	1	1	9	9	2	3	0.329	0.45L	2.20 M	3.75 M	0.45L	1.60 M	2.73 M	0.45L	1.29 M	2.20 M	0.50L	1.07 M	1.71 M	0.45L	1.37 M	2.33 M	0.50L	1.48 M	646.3	0.50L	94.4	0.23L
	31'-6"	5 1/8	2'-9"	12	8 5/8	41 1/4	1.34	0.22	9	9	1	1	9	9	2	3	0.300	0.45L	2.20 M	3.77 M	0.45L	1.60 M	2.75 M	0.45L	1.29 M	2.21 M	0.50L	1.07 M	1.71 M	0.45L	1.37 M	2.35 M	0.50L	1.49 M	607.3	0.50L	91.3	0.22L
52'-6"	23'-7"	5 1/8	2'-9"	9	8 5/8	48 1/8	1.51	0.25	11	8	1	1	11	8	2 1/2	4	0.336	0.45L	2.22 M	3.82 M	0.45L	1.55 M	2.66 M	0.50L	1.28 M	2.20 M	0.50L	1.06 M	1.69 M	0.45L	1.35 M	2.33 M	0.50L	1.49 M	803.1	0.50L	106.5	0.23L
	27'-6"	5 1/8	2'-7"	11	8 5/8	46 3/4	1.57	0.26	11	8	1	1	11	8	2 1/2	4	0.329	0.45L	2.14 M	3.68 M	0.45L	1.49 M	2.57 M	0.50L	1.23 M	2.12 M	0.50L	1.02 M	1.63 M	0.45L	1.30 M	2.25 M	0.50L	1.44 M	760.1	0.50L	103.5	0.22L
	31'-6"	5 1/8	2'-9"	12	8 5/8	45 3/8	1.79	0.30	11	8	1	1	11	8	2 1/2	4	0.300	0.45L	2.14 M	3.72 M	0.45L	1.50 M	2.60 M	0.50L	1.23 M	2.15 M	0.50L	1.02 M	1.63 M	0.45L	1.31 M	2.27 M	0.50L	1.45 M	718.2	0.50L	100.4	0.22L
59'-1"	23'-7"	5 1/8	2'-9"	9	8 5/8	52 1/4	1.95	0.33	11	8	1	1	11	8	2	3	0.336	0.50L	2.11 M	3.67 M	0.45L	1.46 M	2.54 M	0.50L	1.23 M	2.14 M	0.50L	1.01 M	1.61 M	0.45L	1.28 M	2.23 M	0.45L	1.42 M	927.9	0.50L	115.7	0.22L
	27'-6"	5 1/8	2'-7"	11	8 5/8	52 1/4	1.89	0.32	11	8	1	1	11	8	2	3	0.329	0.50L	2.19 M	3.79 M	0.45L	1.51 M	2.62 M	0.50L	1.27 M	2.21 M	0.50L	1.05 M	1.66 M	0.45L	1.33 M	2.30 M	0.45L	1.47 M	927.9	0.50L	115.7	0.22L
	31'-6"	5 1/8	2'-9"	12	8 5/8	50 7/8	2.13	0.35	11	8	1	1	11	8	2	3	0.300	0.50L	2.20 M	3.85 M	0.45L	1.53 M	2.67 M	0.50L	1.28 M	2.24 M	0.50L	1.05 M	1.68 M	0.45L	1.34 M	2.34 M	0.45L	1.49 M	882.1	0.50L	112.6	0.22L
65'-7"	23'-7"	5 1/8	2'-9"	9	8 5/8	57 3/4	2.31	0.38	12	8	1	1	12	8	2 1/2	4	0.336	0.50L	2.10 M	3.68 M	0.45L	1.49 M	2.60 M	0.50L	1.27 M	2.22 M	0.50L	1.03 M	1.63 M	0.45L	1.30 M	2.28 M	0.40L	1.40 M	1110.6	0.50L	127.8	0.22L
	27'-6"	5 1/8	2'-7"	11	8 5/8	56 3/8	2.38	0.40	12	8	1	1	12	8	2 1/2	4	0.329	0.50L	2.05 M	3.59 M	0.45L	1.45 M	2.54 M	0.50L	1.23 M	2.16 M	0.50L	1.00 M	1.59 M	0.45L	1.27 M	2.23 M	0.40L	1.36 M	1060.9	0.50L	124.8	0.21L
	31'-6"	5 1/8	2'-9"	12	8 5/8	55	2.66	0.44	12	8	1	1	12	8	2 1/2	4	0.300	0.50L	2.06 M	3.65 M	0.45L	1.46 M	2.59 M	0.50L	1.24 M	2.20 M	0.50L	1.01 M	1.61 M	0.45L	1.28 M	2.27 M	0.40L	1.39 M	1012.3	0.50L	121.8	0.21L
72'-2"	23'-7"	5 1/8	2'-9"	9	8 5/8	63 1/4	2.69	0.45	12	8	1	1	12	8	2 1/2	4	0.336	0.50L	2.07 M	3.66 M	0.45L	1.51 M	2.66 M	0.50L	1.30 M	2.29 M	0.50L	1.04 M	1.65 M	0.45L	1.32 M	2.33 M	0.40L	1.37 M	1307.6	0.50L	140.0	0.22L
	27'-6"	5 1/8	2'-7"	11	8 5/8	61 7/8	2.76	0.46	12	8	1	1	12	8	2 1/2	4	0.329	0.50L	2.03 M	3.59 M	0.45L	1.48 M	2.61 M	0.50L	1.27 M	2.25 M	0.50L	1.02 M	1.62 M	0.45L	1.30 M	2.29 M	0.40L	1.35 M	1254.1	0.50L	137.0	0.21L
	31'-6"	5 1/8	2'-9"	12	8 5/8	60 1/2	3.06	0.51	12	8	1	1	12	8	2 1/2	4	0.300	0.50L	2.06 M	3.67 M	0.45L	1.50 M	2.67 M	0.50L	1.29 M	2.30 M	0.50L	1.03 M	1.64 M	0.45L	1.31 M	2.34 M	0.40L	1.38 M	1201.7	0.50L	133.9	0.21L
78'-9"	23'-7"	5 1/8	2'-9"	9	8 5/8	68 3/4	3.09	0.51	11	9	1	1	11	9	2 1/2	4	0.336	0.50L	2.04 M	3.63 M	0.45L	1.53 M	2.72 M	0.50L	1.33 M	2.36 M	0.50L	1.04 M	1.66 M	0.45L	1.34 M	2.38 M	0.45L	1.34 M	1518.7	0.50L	152.2	0.22L
	27'-6"	5 1/8	2'-7"	11	8 5/8	67 3/8	3.16	0.53	11	9	1	1	11	9	2 1/2	4	0.329	0.50L	2.01 M	3.58 M	0.45L	1.51 M	2.68 M	0.50L	1.31 M	2.33 M	0.50L	1.03 M	1.64 M	0.45L	1.32 M	2.35 M	0.45L	1.32 M	1461.6	0.50L	149.2	0.21L
	31'-6"	5 1/8	2'-9"	12	8 5/8	66	3.47	0.58	11	9	1	1	11	9	2 1/2	4	0.300	0.50L	2.04 M	3.67 M	0.45L	1.53 M	2.75 M	0.50L	1.33 M	2.39 M	0.50L	1.04 M	1.66 M	0.45L	1.34 M	2.41 M	0.45L	1.36 M	1405.4	0.50L	146.1	0.21L
85'-3"	23'-7"	5 1/8	2'-9"	9	10 3/8	67 3/8	4.08	0.68	13	8	1	1	13	8	2 1/2	4	0.336	0.50L	1.92 M	3.46 M	0.45L	1.48 M	2.67 M	0.50L	1.29 M	2.34 M	0.50L	1.00 M	1.59 M	0.45L	1.30 M	2.34 M	0.45L	1.27 M	1712.3	0.50L	179.4	0.20L
	27'-6"	5 1/8	2'-7"	11	10 3/8	67 3/8	3.97	0.66	13	8	1	1	13	8	2 1/2	4	0.329	0.50L	1.99 M	3.58 M	0.45L	1.54 M	2.76 M	0.50L	1.35 M	2.42 M	0.50L	1.04 M	1.65 M	0.45L	1.35 M	2.42 M	0.45L	1.32 M	1712.3	0.50L	179.4	0.20L
	31'-6"	5 1/8	2'-9"	12	10 3/8	66	4.35	0.73	13	8	1	1	13	8	2 1/2	4	0.300	0.50L	2.02 M	3.67 M	0.45L	1.56 M	2.83 M	0.50L	1.36 M	2.48 M	0.50L	1.05 M	1.67 M	0.45L	1.37 M	2.48 M	0.45L	1.35 M	1646.5	0.50L	175.8	0.19L
91'-10"	23'-7"	5 1/8	2'-9"	9	10 3/8	72 7/8	4.53	0.76	12	9	1	1	12	9	2 1/2	4	0.336	0.50L	1.91 M	3.48 M	0.45L	1.52 M	2.77 M	0.50L	1.34 M	2.43 M	0.50L	1.02 M	1.62 M	0.45L	1.34 M	2.42 M	0.45L	1.28 M	1972.9	0.50L	194.1	0.20L
	27'-6"	5 1/8	2'-7"	11	10 3/8	71 1/2	4.63	0.77	12	9	1	1	12	9	2 1/2	4	0.329	0.50L	1.89 M	3.43 M	0.45L	1.50 M	2.73 M	0.50L	1.32 M	2.40 M	0.50L	1.00 M	1.60 M	0.45L	1.32 M	2.39 M	0.45L	1.26 M	1902.7	0.50L	190.4	0.19L
	31'-6"	5 1/8	2'-9"	12	10 3/8	70 1/8	5.05	0.84	12	9	1	1	12	9	2 1/2	4	0.300	0.50L	1.91 M	3.51 M	0.45L	1.52 M	2.80 M	0.50L	1.34 M	2.46 M	0.50L	1.01 M	1.61 M	0.45L	1.33 M	2.45 M	0.45L	1.29 M	1833.8	0.50L	186.7	0.19L
98'-5"	23'-7"	5 1/8	2'-9"	9	12 3/8	72 7/8	5.49	0.91	11	10	1	1	11	10	2 1/2	4	0.336	0.50L	1.91 M	3.51 M	0.50L	1.56 M	2.87 M	0.50L	1.38 M	2.55 M	0.50L	1.03 M	1.63 M	0.45L	1.38 M	2.53 M	0.45L	1.30 M	2296.1	0.50L	231.5	0.19L
	27'-6"	5 1/8	2'-7"	11	12 3/8	71 1/2	5.66	0.94	11	10	1	1	11	10	2 1/2	4	0.329	0.50L	1.87 M	3.45 M	0.50L	1.53 M	2.82 M	0.50L	1.36 M	2.50 M	0.50L	1.01 M	1.60 M	0.45L	1.35 M	2.48 M	0.45L	1.28 M	2214.5	0.50L	227.1	0.18L
	31'-6"	5 1/8	2'-9"	12	12 3/8	70 1/8	6.09	1.02	11	10	1	1	11	10	2 1/2	4	0.300	0.50L	1.90 M	3.55 M	0.50L	1.55 M	2.89 M	0.50L	1.38 M	2.57 M	0.50L	1.02 M	1.62 M	0.45L	1.37 M	2.55 M	0.45L	1.31 M	2134.3	0.50L	222.7	0.18L

LEGEND OF ABBREVIATIONS

BRG.	DENOTES BEARING
D.F.	DENOTES DISTRIBUTION FACTOR
EXP.	DENOTES EXPANSION
I.R.	DENOTES INVENTORY RATING
LOC.	DENOTES LOCATION
NO.	DENOTES NUMBER
O.R.	DENOTES OPERATING RATING
SPA.	DENOTES SPACING
THICK.	DENOTES THICKNESS



COMBINATION LAY-UP

NOTES:

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

2.) DESIGN TABLES DO NOT ACCOUNT FOR VERTICAL OR HORIZONTAL CURVES ON BRIDGE DECK.

3.) FLEXURAL RATING FACTORS "M" ARE SHOWN & GOVERN UNLESS OTHERWISE DENOTED BY A "V" FOR SHEAR, "D" FOR DEFLECTION OR "B" FOR BEARING.

4.) EXTERIOR BEAM CONTROLS. VALUES SHOWN ARE FACTORED RESISTANCES FOR THE EXTERIOR BEAM BASED ON LOAD AND RESISTANCE FACTOR DESIGN.

5.) FOR SINGLE MEMBER LAYUP DESIGN DATA & BRIDGE RATINGS, SEE TABLE 2b ON THE FOLLOWING SHEET.

Mark	Description	By	Chk'd	Recm'd	Date
	REVISIONS				

S-

SHEET ___ OF ___

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

DATA ASSEMBLY SHEETS
GLULAM BEAM

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

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

SHEET 4 OF 20

BLC-561M

TABLE 2b - RED MAPLE - SINGLE MEMBER LAY-UP(1,2,5)

DESIGN DATA																	BRIDGE RATINGS(3)																							
SPAN (B1) FT.-IN.	CURB TO CURB (C1) FT.-IN.	DECK THICK. (E1) IN.	BEAM SPA. (H1) FT.-IN.	NO. OF BEAMS (J1) #	BEAM WIDTH (L3) IN.	BEAM DEPTH (L4) IN.	PRE-FABRICATED CAMBER (M1) IN.	NET FINAL CAMBER (M5) IN.	FIXED BRG. PAD WIDTH (N1) IN.	FIXED BRG. PAD LENGTH (N2) IN.	FIXED BRG. PAD THICK (N3) IN.	NO. OF INTERIOR LAYERS (N4) #	EXP. BRG. PAD WIDTH (P1) IN.	EXP. BRG. PAD LENGTH (P2) IN.	EXP. BRG. PAD THICK (P3) IN.	NO. OF INTERIOR LAYERS (P4) #	D.F.	H20			HS20			ML80			PHL-93			TK527			P82		FACTORED RESISTANCE(4)				
																		LOC.	I.R.	O.R.	LOC.	I.R.	O.R.	LOC.	I.R.	O.R.	LOC.	I.R.	O.R.	LOC.	I.R.	O.R.	LOC.	O.R.	MOMENT Mr (K-FT.)	LOC.	SHEAR Vr (K)	LOC.
18'-0"	23'-7"	5 1/8	2'-9"	9	5 1/8	26 1/8	0.16	0.03	7 1/2	10	1 1/2	2	7 1/2	10	2 1/2	4	0.336	0.50L	1.86 M	3.08 M	0.50L	1.86 M	3.08 M	0.50L	1.37 M	2.27 M	0.45L	1.08 M	1.72 M	0.50L	1.59 M	2.63 M	0.45L	1.61 M	175.3	0.45L	34.4	0.25L
	27'-6"	5 1/8	2'-7"	11	5 1/8	26 1/8	0.15	0.03	7 1/2	10	1 1/2	2	7 1/2	10	2 1/2	4	0.329	0.50L	1.91 M	3.16 M	0.50L	1.91 M	3.16 M	0.50L	1.40 M	2.32 M	0.45L	1.11 M	1.77 M	0.50L	1.63 M	2.69 M	0.45L	1.65 M	175.3	0.45L	34.4	0.25L
	31'-6"	5 1/8	2'-9"	12	5 1/8	24 3/4	0.19	0.03	7 1/2	10	1 1/2	2	7 1/2	10	2 1/2	4	0.300	0.50L	1.86 M	3.09 M	0.50L	1.86 M	3.09 M	0.50L	1.37 M	2.27 M	0.45L	1.08 M	1.72 M	0.50L	1.58 M	2.63 M	0.45L	1.61 M	158.2	0.45L	32.6	0.25L
19'-9"	23'-7"	5 1/8	2'-9"	9	5 1/8	27 1/2	0.20	0.03	7 1/2	10	1 1/2	2	7 1/2	10	2 1/2	4	0.336	0.50L	1.83 M	3.04 M	0.50L	1.83 M	3.04 M	0.50L	1.30 M	2.16 M	0.45L	1.03 M	1.64 M	0.50L	1.49 M	2.47 M	0.45L	1.49 M	191.4	0.45L	36.2	0.25L
	27'-6"	5 1/8	2'-7"	11	5 1/8	27 1/2	0.19	0.03	7 1/2	10	1 1/2	2	7 1/2	10	2 1/2	4	0.329	0.50L	1.88 M	3.12 M	0.50L	1.88 M	3.12 M	0.50L	1.33 M	2.21 M	0.45L	1.06 M	1.69 M	0.50L	1.53 M	2.54 M	0.45L	1.53 M	191.4	0.45L	36.2	0.25L
	31'-6"	5 1/8	2'-9"	12	5 1/8	26 1/8	0.23	0.04	7 1/2	10	1 1/2	2	7 1/2	10	2 1/2	4	0.300	0.50L	1.83 M	3.06 M	0.50L	1.83 M	3.06 M	0.50L	1.30 M	2.17 M	0.45L	1.04 M	1.65 M	0.50L	1.49 M	2.49 M	0.45L	1.50 M	173.7	0.45L	34.4	0.25L
23'-0"	23'-7"	5 1/8	2'-9"	9	5 1/8	31 5/8	0.25	0.04	7 1/2	10	1	1	7 1/2	10	2 1/2	4	0.336	0.50L	2.00 M	3.32 M	0.50L	2.00 M	3.32 M	0.50L	1.35 M	2.24 M	0.45L	1.08 M	1.71 M	0.50L	1.52 M	2.54 M	0.45L	1.49 M	245.9	0.45L	41.6	0.25L
	27'-6"	5 1/8	2'-7"	11	5 1/8	30 1/4	0.27	0.05	7 1/2	10	1	1	7 1/2	10	2 1/2	4	0.329	0.50L	1.86 M	3.11 M	0.50L	1.86 M	3.11 M	0.50L	1.26 M	2.09 M	0.45L	1.01 M	1.60 M	0.50L	1.42 M	2.37 M	0.45L	1.40 M	226.0	0.45L	39.8	0.25L
	31'-6"	5 1/8	2'-9"	12	5 1/8	30 1/4	0.29	0.05	7 1/2	10	1	1	7 1/2	10	2 1/2	4	0.300	0.50L	2.03 M	3.39 M	0.50L	2.03 M	3.39 M	0.50L	1.37 M	2.28 M	0.45L	1.09 M	1.74 M	0.50L	1.55 M	2.59 M	0.45L	1.52 M	226.0	0.45L	39.8	0.25L
26'-3"	23'-7"	5 1/8	2'-9"	9	5 1/8	34 3/8	0.33	0.06	7 1/2	11	1 1/2	2	7 1/2	11	2 1/2	4	0.336	0.50L	1.98 M	3.31 M	0.35L	1.87 M	3.12 M	0.50L	1.29 M	2.15 M	0.45L	1.03 M	1.64 M	0.45L	1.42 M	2.37 M	0.45L	1.40 M	284.3	0.45L	45.2	0.25L
	27'-6"	5 1/8	2'-7"	11	5 1/8	34 3/8	0.33	0.05	7 1/2	11	1 1/2	2	7 1/2	11	2 1/2	4	0.329	0.50L	2.04 M	3.40 M	0.35L	1.92 M	3.20 M	0.50L	1.32 M	2.21 M	0.45L	1.06 M	1.68 M	0.45L	1.46 M	2.43 M	0.45L	1.44 M	284.3	0.45L	45.2	0.25L
	31'-6"	5 1/8	2'-9"	12	5 1/8	33	0.38	0.06	7 1/2	11	1 1/2	2	7 1/2	11	2 1/2	4	0.300	0.50L	2.03 M	3.40 M	0.35L	1.92 M	3.21 M	0.50L	1.32 M	2.21 M	0.45L	1.05 M	1.68 M	0.45L	1.45 M	2.43 M	0.45L	1.44 M	263.1	0.45L	43.4	0.25L
29'-6"	23'-7"	5 1/8	2'-9"	9	5 1/8	38 1/2	0.39	0.06	7 1/2	11	1 1/2	2	7 1/2	11	2 1/2	4	0.336	0.45L	2.10 M	3.51 M	0.40L	1.86 M	3.11 M	0.45L	1.33 M	2.22 M	0.45L	1.08 M	1.72 M	0.45L	1.46 M	2.44 M	0.45L	1.46 M	348.5	0.45L	50.6	0.25L
	27'-6"	5 1/8	2'-7"	11	5 1/8	37 1/8	0.42	0.07	7 1/2	11	1 1/2	2	7 1/2	11	2 1/2	4	0.329	0.45L	1.99 M	3.34 M	0.40L	1.77 M	2.96 M	0.45L	1.26 M	2.11 M	0.45L	1.03 M	1.63 M	0.45L	1.38 M	2.32 M	0.45L	1.38 M	325.2	0.45L	48.8	0.25L
	31'-6"	5 1/8	2'-9"	12	5 1/8	35 3/4	0.49	0.08	7 1/2	11	1 1/2	2	7 1/2	11	2 1/2	4	0.300	0.45L	1.99 M	3.35 M	0.40L	1.77 M	2.97 M	0.45L	1.26 M	2.12 M	0.45L	1.03 M	1.63 M	0.45L	1.38 M	2.33 M	0.45L	1.39 M	302.7	0.45L	47.0	0.25L
32'-10"	23'-7"	5 1/8	2'-9"	9	5 1/8	41 1/4	0.49	0.08	7 1/2	11	1 1/2	2	7 1/2	11	2 1/2	4	0.336	0.45L	2.04 M	3.44 M	0.40L	1.74 M	2.91 M	0.45L	1.26 M	2.12 M	0.45L	1.04 M	1.66 M	0.45L	1.37 M	2.31 M	0.45L	1.40 M	393.1	0.45L	54.3	0.25L
	27'-6"	5 1/8	2'-7"	11	5 1/8	41 1/4	0.48	0.08	7 1/2	11	1 1/2	2	7 1/2	11	2 1/2	4	0.329	0.45L	2.10 M	3.53 M	0.40L	1.78 M	2.99 M	0.45L	1.30 M	2.18 M	0.45L	1.07 M	1.71 M	0.45L	1.41 M	2.37 M	0.45L	1.44 M	393.1	0.45L	54.3	0.25L
	31'-6"	5 1/8	2'-9"	12	5 1/8	39 7/8	0.55	0.09	7 1/2	11	1 1/2	2	7 1/2	11	2 1/2	4	0.300	0.45L	2.11 M	3.57 M	0.40L	1.80 M	3.03 M	0.45L	1.31 M	2.20 M	0.45L	1.08 M	1.72 M	0.45L	1.42 M	2.40 M	0.45L	1.46 M	368.6	0.45L	52.5	0.25L
36'-1"	23'-7"	5 1/8	2'-9"	9	5 1/8	44	0.60	0.10	7 1/2	11	1 1/2	2	7 1/2	11	2 1/2	4	0.336	0.45L	2.01 M	3.40 M	0.45L	1.63 M	2.74 M	0.45L	1.22 M	2.06 M	0.50L	1.02 M	1.62 M	0.45L	1.32 M	2.22 M	0.45L	1.37 M	440.2	0.50L	57.9	0.25L
	27'-6"	5 1/8	2'-7"	11	5 1/8	44	0.59	0.10	7 1/2	11	1 1/2	2	7 1/2	11	2 1/2	4	0.329	0.45L	2.07 M	3.49 M	0.45L	1.67 M	2.82 M	0.45L	1.26 M	2.12 M	0.50L	1.05 M	1.66 M	0.45L	1.35 M	2.28 M	0.45L	1.41 M	440.2	0.50L	57.9	0.25L
	31'-6"	5 1/8	2'-9"	12	5 1/8	42 5/8	0.67	0.11	7 1/2	11	1 1/2	2	7 1/2	11	2 1/2	4	0.300	0.45L	2.09 M	3.54 M	0.45L	1.69 M	2.86 M	0.45L	1.27 M	2.15 M	0.50L	1.06 M	1.68 M	0.45L	1.37 M	2.32 M	0.45L	1.43 M	414.4	0.50L	56.1	0.25L

NOTES:

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

2.) DESIGN TABLES DO NOT ACCOUNT FOR VERTICAL OR HORIZONTAL CURVES ON BRIDGE DECK.

3.) FLEXURAL RATING FACTORS "M" ARE SHOWN & GOVERN UNLESS OTHERWISE DENOTED BY A "V" FOR SHEAR, "D" FOR DEFLECTION OR "B" FOR BEARING.

4.) EXTERIOR BEAM CONTROLS. VALUES SHOWN ARE FACTORED RESISTANCES FOR THE EXTERIOR BEAM BASED ON LOAD AND RESISTANCE FACTOR DESIGN.

5.) FOR COMBINATION MEMBER LAYUP DESIGN DATA & BRIDGE RATINGS, SEE TABLE 2a ON THE PREVIOUS SHEET.

LEGEND OF ABBREVIATIONS

BRG.	DENOTES BEARING
D.F.	DENOTES DISTRIBUTION FACTOR
EXP.	DENOTES EXPANSION
I.R.	DENOTES INVENTORY RATING
LOC.	DENOTES LOCATION
NO.	DENOTES NUMBER
O.R.	DENOTES OPERATING RATING
SPA.	DENOTES SPACING
THICK.	DENOTES THICKNESS

SINGLE MEMBER LAY-UP

Mark	Description	By	Chk'd	Recm'd	Date
	REVISIONS				

S-

SHEET ___ OF ___

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

DATA ASSEMBLY SHEETS
GLULAM BEAM

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

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

SHEET 5 OF 20

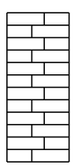
BLC-561M

TABLE 2a - YELLOW POPLAR - COMBINATION LAY-UP (1,2,5)

DESIGN DATA																	BRIDGE RATINGS (3)																							
																		H20			HS20			ML80			PHL-93			TK527			P82		FACTORED RESISTANCE (4)					
SPAN (B1) FT.-IN.	CURB TO CURB (C1) FT.-IN.	DECK THICK. (E1) IN.	BEAM SPA. (H1) FT.-IN.	NO. OF BEAMS (J1) #	BEAM WIDTH (L3) IN.	BEAM DEPTH (L4) IN.	PRE-FABRICATED CAMBER (M1) IN.	NET FINAL CAMBER (M5) IN.	FIXED BRG. PAD WIDTH (N1) IN.	FIXED BRG. PAD LENGTH (N2) IN.	FIXED BRG. PAD THICK (N3) IN.	NO. OF INTERIOR LAYERS (N4) #	EXP. BRG. PAD WIDTH (P1) IN.	EXP. BRG. PAD LENGTH (P2) IN.	EXP. BRG. PAD THICK (P3) IN.	NO. OF INTERIOR LAYERS (P4) #	D.F.	LOC.	I.R.	O.R.	LOC.	I.R.	O.R.	LOC.	I.R.	O.R.	LOC.	I.R.	O.R.	LOC.	I.R.	O.R.	LOC.	O.R.	MOMENT Mr (K-FT.)	LOC.	SHEAR Vr (K)	LOC.
18′-0"	23′-7"	5 1/8	2′-9"	9	8 5/8	20 5/8	0.20	0.03	9	8	1	1	9	8	2 1/2	4	0.336	0.50L	1.89 M	3.13 M	0.50L	1.89 M	3.13 M	0.50L	1.39 M	2.31 M	0.45L	1.10 M	1.75 M	0.50L	1.61 M	2.67 M	0.45L	1.64 M	178.7	0.45L	32.2	0.25L
	27′-6"	5 1/8	2′-7"	11	8 5/8	20 5/8	0.20	0.03	9	8	1	1	9	8	2 1/2	4	0.329	0.50L	1.94 M	3.21 M	0.50L	1.94 M	3.21 M	0.50L	1.43 M	2.36 M	0.45L	1.13 M	1.80 M	0.50L	1.65 M	2.74 M	0.45L	1.68 M	178.7	0.45L	32.2	0.25L
	31′-6"	5 1/8	2′-9"	12	8 5/8	19 1/4	0.25	0.04	9	8	1	1	9	8	2 1/2	4	0.300	0.50L	1.83 M	3.04 M	0.50L	1.83 M	3.04 M	0.50L	1.35 M	2.24 M	0.45L	1.06 M	1.69 M	0.50L	1.56 M	2.59 M	0.45L	1.59 M	156.7	0.45L	30.0	0.25L
19′-9"	23′-7"	5 1/8	2′-9"	9	8 5/8	22	0.24	0.04	9	8	1 1/2	2	9	8	2 1/2	4	0.336	0.50L	1.91 M	3.17 M	0.50L	1.91 M	3.17 M	0.50L	1.36 M	2.25 M	0.45L	1.08 M	1.72 M	0.50L	1.56 M	2.58 M	0.45L	1.56 M	200.1	0.45L	34.3	0.25L
	27′-6"	5 1/8	2′-7"	11	8 5/8	22	0.24	0.04	9	8	1 1/2	2	9	8	2 1/2	4	0.329	0.50L	1.96 M	3.26 M	0.50L	1.96 M	3.26 M	0.50L	1.39 M	2.31 M	0.45L	1.11 M	1.76 M	0.50L	1.60 M	2.65 M	0.45L	1.60 M	200.1	0.45L	34.3	0.25L
	31′-6"	5 1/8	2′-9"	12	8 5/8	20 5/8	0.30	0.05	9	8	1 1/2	2	9	8	2 1/2	4	0.300	0.50L	1.86 M	3.11 M	0.50L	1.86 M	3.11 M	0.50L	1.32 M	2.20 M	0.45L	1.05 M	1.67 M	0.50L	1.52 M	2.53 M	0.45L	1.52 M	177.0	0.45L	32.2	0.25L
23′-0"	23′-7"	5 1/8	2′-9"	9	8 5/8	24 3/4	0.33	0.05	10	7	1	1	10	7	2	3	0.336	0.50L	1.99 M	3.31 M	0.09L	1.98 V	3.30 V	0.50L	1.34 M	2.23 M	0.45L	1.07 M	1.71 M	0.50L	1.52 M	2.53 M	0.45L	1.49 M	246.6	0.45L	38.6	0.25L
	27′-6"	5 1/8	2′-7"	11	8 5/8	24 3/4	0.32	0.05	10	7	1	1	10	7	2	3	0.329	0.50L	2.04 M	3.40 M	0.09L	2.04 V	3.38 V	0.50L	1.38 M	2.29 M	0.45L	1.10 M	1.75 M	0.50L	1.56 M	2.60 M	0.45L	1.53 M	246.6	0.45L	38.6	0.25L
	31′-6"	5 1/8	2′-9"	12	8 5/8	23 3/8	0.39	0.07	10	7	1	1	10	7	2	3	0.300	0.50L	1.96 M	3.29 M	0.50L	1.96 M	3.29 M	0.50L	1.32 M	2.22 M	0.45L	1.06 M	1.69 M	0.50L	1.50 M	2.51 M	0.45L	1.48 M	221.2	0.45L	36.5	0.25L
26′-3"	23′-7"	5 1/8	2′-9"	9	8 5/8	27 1/2	0.42	0.07	9	8	1	1	9	8	2	3	0.336	0.50L	2.07 M	3.46 M	0.35L	1.95 M	3.26 M	0.50L	1.34 M	2.25 M	0.45L	1.08 M	1.71 M	0.45L	1.48 M	2.47 M	0.45L	1.46 M	297.2	0.45L	42.9	0.25L
	27′-6"	5 1/8	2′-7"	11	8 5/8	27 1/2	0.41	0.07	9	8	1	1	9	8	2	3	0.329	0.50L	2.12 M	3.55 M	0.35L	2.01 M	3.34 M	0.50L	1.38 M	2.31 M	0.45L	1.10 M	1.76 M	0.45L	1.52 M	2.54 M	0.45L	1.50 M	297.2	0.45L	42.9	0.25L
	31′-6"	5 1/8	2′-9"	12	8 5/8	26 1/8	0.49	0.08	9	8	1	1	9	8	2	3	0.300	0.50L	2.06 M	3.47 M	0.35L	1.96 M	3.27 M	0.50L	1.34 M	2.25 M	0.45L	1.07 M	1.71 M	0.45L	1.48 M	2.48 M	0.45L	1.47 M	269.6	0.45L	40.7	0.25L
29′-6"	23′-7"	5 1/8	2′-9"	9	8 5/8	30 1/4	0.51	0.09	10	8	1	1	10	8	2 1/2	4	0.336	0.45L	2.10 M	3.53 M	0.40L	1.86 M	3.12 M	0.45L	1.33 M	2.23 M	0.45L	1.08 M	1.72 M	0.45L	1.46 M	2.45 M	0.45L	1.46 M	352.1	0.45L	47.2	0.25L
	27′-6"	5 1/8	2′-7"	11	8 5/8	28 7/8	0.57	0.09	10	8	1	1	10	8	2 1/2	4	0.329	0.45L	1.95 M	3.28 M	0.40L	1.73 M	2.91 M	0.45L	1.23 M	2.07 M	0.45L	1.00 M	1.60 M	0.45L	1.35 M	2.28 M	0.45L	1.36 M	322.3	0.45L	45.0	0.24L
	31′-6"	5 1/8	2′-9"	12	8 5/8	28 7/8	0.60	0.10	10	8	1	1	10	8	2 1/2	4	0.300	0.45L	2.12 M	3.57 M	0.40L	1.88 M	3.17 M	0.45L	1.34 M	2.26 M	0.45L	1.09 M	1.74 M	0.45L	1.47 M	2.48 M	0.45L	1.48 M	322.3	0.45L	45.0	0.24L
32′-10"	23′-7"	5 1/8	2′-9"	9	8 5/8	33	0.63	0.10	10	8	1	1	10	8	2 1/2	4	0.336	0.45L	2.13 M	3.58 M	0.40L	1.81 M	3.04 M	0.45L	1.31 M	2.21 M	0.45L	1.09 M	1.73 M	0.45L	1.43 M	2.40 M	0.45L	1.46 M	411.0	0.45L	51.5	0.25L
	27′-6"	5 1/8	2′-7"	11	8 5/8	31 5/8	0.69	0.11	10	8	1	1	10	8	2 1/2	4	0.329	0.45L	1.99 M	3.35 M	0.40L	1.69 M	2.85 M	0.45L	1.23 M	2.07 M	0.45L	1.02 M	1.62 M	0.45L	1.33 M	2.25 M	0.45L	1.37 M	379.1	0.45L	49.3	0.24L
	31′-6"	5 1/8	2′-9"	12	8 5/8	31 5/8	0.72	0.12	10	8	1	1	10	8	2 1/2	4	0.300	0.45L	2.16 M	3.65 M	0.40L	1.84 M	3.10 M	0.45L	1.33 M	2.25 M	0.45L	1.10 M	1.76 M	0.45L	1.45 M	2.45 M	0.45L	1.49 M	379.1	0.45L	49.3	0.24L
36′-1"	23′-7"	5 1/8	2′-9"	9	8 5/8	34 3/8	0.82	0.14	11	7	1	1	11	7	2	3	0.336	0.45L	1.98 M	3.36 M	0.45L	1.60 M	2.71 M	0.45L	1.20 M	2.04 M	0.50L	1.00 M	1.59 M	0.45L	1.30 M	2.20 M	0.45L	1.36 M	440.0	0.50L	53.6	0.24L
	27′-6"	5 1/8	2′-7"	11	8 5/8	34 3/8	0.80	0.13	11	7	1	1	11	7	2	3	0.329	0.45L	2.04 M	3.45 M	0.45L	1.65 M	2.79 M	0.45L	1.24 M	2.09 M	0.50L	1.03 M	1.64 M	0.45L	1.34 M	2.26 M	0.45L	1.39 M	440.0	0.50L	53.6	0.24L
	31′-6"	5 1/8	2′-9"	12	8 5/8	33	0.93	0.15	11	7	1	1	11	7	2	3	0.300	0.45L	2.02 M	3.43 M	0.45L	1.63 M	2.77 M	0.45L	1.22 M	2.08 M	0.50L	1.02 M	1.62 M	0.45L	1.32 M	2.25 M	0.45L	1.39 M	407.1	0.50L	51.5	0.23L
39′-4"	23′-7"	5 1/8	2′-9"	9	8 5/8	37 1/8	0.94	0.16	10	8	1	1	10	8	2 1/2	4	0.336	0.45L	2.03 M	3.45 M	0.45L	1.57 M	2.67 M	0.45L	1.22 M	2.07 M	0.50L	1.02 M	1.62 M	0.45L	1.30 M	2.22 M	0.45L	1.38 M	504.9	0.50L	57.9	0.24L
	27′-6"	5 1/8	2′-7"	11	8 5/8	37 1/8	0.92	0.15	10	8	1	1	10	8	2 1/2	4	0.329	0.45L	2.09 M	3.55 M	0.45L	1.62 M	2.75 M	0.45L	1.25 M	2.12 M	0.50L	1.05 M	1.66 M	0.45L	1.34 M	2.28 M	0.45L	1.42 M	504.9	0.50L	57.9	0.24L
	31′-6"	5 1/8	2′-9"	12	8 5/8	35 3/4	1.06	0.18	10	8	1	1	10	8	2 1/2	4	0.300	0.45L	2.08 M	3.55 M	0.45L	1.61 M	2.75 M	0.45L	1.24 M	2.13 M	0.50L	1.04 M	1.65 M	0.45L	1.33 M	2.28 M	0.45L	1.42 M	469.9	0.50L	55.8	0.23L
45′-11"	23′-7"	5 1/8	2′-9"	9	8 5/8	42 5/8	1.22	0.20	9	9	1	1	9	9	2	3	0.336	0.45L	2.12 M	3.63 M	0.45L	1.55 M	2.64 M	0.45L	1.24 M	2.13 M	0.50L	1.04 M	1.65 M	0.45L	1.32 M	2.26 M	0.50L	1.43 M	646.3	0.50L	66.5	0.23L
	27′-6"	5 1/8	2′-7"	11	8 5/8	42 5/8	1.19	0.20	9	9	1	1	9	9	2	3	0.329	0.45L	2.19 M	3.73 M	0.45L	1.59 M	2.72 M	0.45L	1.28 M	2.19 M	0.50L	1.07 M	1.70 M	0.45L	1.36 M	2.32 M	0.50L	1.47 M	646.3	0.50L	66.5	0.23L
	31′-6"	5 1/8	2′-9"	12	8 5/8	41 1/4	1.35	0.23	9	9	1	1	9	9	2	3	0.300	0.45L	2.19 M	3.77 M	0.45L	1.60 M	2.74 M	0.45L	1.29 M	2.21 M	0.50L	1.07 M	1.71 M	0.45L	1.37 M	2.35 M	0.50L	1.48 M	607.3	0.50L	64.3	0.22L
52′-6"	23′-7"	5 1/8	2′-9"	9	8 5/8	48 1/8	1.52	0.25	11	8	1	1	11	8	2 1/2	4	0.336	0.45L	2.21 M	3.81 M	0.45L	1.55 M	2.66 M	0.50L	1.27 M	2.20 M	0.50L	1.06 M	1.68 M	0.45L	1.35 M	2.32 M	0.50L	1.49 M	803.1	0.50L	75.1	0.23L
	27′-6"	5 1/8	2′-7"	11	8 5/8	46 3/4	1.60	0.27	11	8	1	1	11	8	2 1/2	4	0.329	0.45L	2.13 M	3.67 M	0.45L	1.49 M	2.56 M	0.50L	1.23 M	2.11 M	0.50L	1.02 M	1.62 M	0.45L	1.30 M	2.24 M	0.50L	1.43 M	760.1	0.50L	72.9	0.22L
	31′-6"	5 1/8	2′-9"	12	8 5/8	45 3/8	1.80	0.30	11	8	1	1	11	8	2 1/2	4	0.300	0.45L	2.14 M	3.72 M	0.45L	1.49 M	2.60 M	0.50L	1.23 M	2.14 M	0.50L	1.02 M	1.63 M	0.45L	1.30 M	2.27 M	0.50L	1.45 M	718.2	0.50L	70.8	0.22L
59′-1"	23′-7"	5 1/8	2′-9"	9	8 5/8	52 1/4	1.96	0.33	11	8	1	1	11	8	2	3	0.336	0.50L	2.11 M	3.67 M	0.45L	1.46 M	2.54 M	0.50L	1.23 M	2.14 M	0.50L	1.01 M	1.60 M	0.45L	1.28 M	2.23 M	0.45L	1.42 M	927.9	0.50L	81.5	0.22L
	27′-6"	5 1/8	2′-7"	11	8 5/8	52 1/4	1.93	0.32	11	8	1	1	11	8	2	3	0.329	0.50L	2.17 M	3.78 M	0.45L	1.51 M	2.61 M	0.50L	1.27 M	2.20 M	0.50L	1.04 M	1.65 M	0.45L	1.32 M	2.29 M	0.45L	1.46 M	927.9	0.50L	81.5	0.22L
	31′-6"	5 1/8	2′-9"	12	8 5/8	50 7/8	2.14	0.36	11	8	1	1	11	8	2	3	0.300	0.50L	2.20 M	3.85 M	0.45L	1.52 M	2.66 M	0.50L	1.28 M	2.24 M	0.50L	1.05 M	1.67 M	0.45L	1.34 M	2.34 M	0.45L	1.49 M	882.1	0.50L	79.3	0.22L
65′-7"	23′-7"	5 1/8	2′-9"	9	8 5/8	57 3/4	2.32	0.39	12	8	1	1	12	8	2 1/2	4	0.336	0.50L	2.09 M	3.67 M	0.45L	1.48 M	2.60 M	0.50L	1.26 M	2.21 M	0.50L	1.02 M	1.63 M	0.45L	1.30 M	2.28 M	0.40L	1.40 M	1110.6	0.50L	90.1	0.22L
	27′-6"	5 1/8	2′-7"	11	8 5/8	57 3/4	2.28	0.38	12	8	1	1	12	8	2 1/2	4	0.329	0.50L	2.16 M	3.78 M	0.45L	1.53 M	2.68 M	0.50L	1.30 M	2.28 M	0.50L	1.06 M	1.68 M	0.45L	1.34 M	2.35 M	0.40L	1.44 M	1110.6	0.50L	90.1	0.22L
	31′-6"	5 1/8	2′-9"	12	8 5/8	55	2.68	0.45	12	8	1	1	12	8	2 1/2	4	0.300	0.50L	2.06 M	3.65 M	0.45L	1.46 M	2.58 M	0.50L	1.24 M	2.20 M	0.50L	1.01 M	1.60 M	0.45L	1.28 M	2.26 M	0.40L	1.39 M	1012.3	0.50L	85.8	0.21L
72′-2"	23′-7"	5 1/8	2′-9"	9	10 3/8	57 3/4	3.08	0.51	12	8	1	1	12	8	2 1/2	4	0.336	0.50L	2.02 M	3.58 M	0.45L	1.47 M	2.60 M	0.50L	1.26 M	2.24 M	0.50L	1.01 M	1.61 M	0.45L	1.29 M	2.28 M	0.40L	1.35 M	1299.0	0.50L	108.3	0.20L
	27′-6"	5 1/8	2′-7"	11	10 3/8	57 3/4	3.03	0.51	12	8	1	1	12	8	2 1/2	4	0.329	0.50L	2.08 M	3.69 M	0.45L	1.52 M	2.68 M	0.50L	1.31 M	2.31 M	0.50L	1.04 M	1.66 M	0.45L	1.33 M	2.35 M	0.40L	1.39 M	1299.0	0.50L	108.3	0.20L
	31′-6"	5 1/8	2′-9"	12	10 3/8	57 3/4	3.13	0.52	12	8	1	1	12	8	2 1/2	4	0.300	0.50L	2.25 M	3.99 M	0.45L	1.64 M	2.91 M	0.50L	1.41 M	2.50 M	0.50L	1.12 M	1.79 M	0.45L	1.43 M	2.55 M	0.40L	1.50 M	1299.0	0.50L	108.3	0.20L
78′-9"	23′-7"	5 1/8	2′-9"	9	10 3/8	63 1/4	3.48	0.58	11	9	1	1	11	9	2 1/2	4	0.336	0.50L	2.02 M	3.61 M	0.45L	1.52 M	2.71 M	0.50L	1.32 M	2.35 M	0.50L	1.03 M	1.65 M	0.45L	1.33 M	2.37 M	0.45L	1.34 M	1530.7	0.50L	118.7	0.20L
	27′-6"	5 1/8	2′-7"	11	10 3/8	61 7/8	3.62	0.60	11	9	1	1	11	9	2 1/2	4	0.329	0.50L	1.97 M	3.53 M	0.45L	1.48 M	2.64 M	0.50L	1.28 M	2.30 M	0.50L	1.01 M	1.60 M	0.45L	1.30 M	2.32 M	0.45L	1.30 M	1468.1	0.50L	116.1	0.20L
	31′-6"	5 1/8	2′-9"	12	10 3/8	61 7/8	3.73	0.62	11	9	1	1	11	9	2 1/2	4	0.300	0.50L	2.12 M	3.82 M	0.45L	1.59 M	2.86 M	0.50L	1.38 M	2.48 M	0.50L	1.09 M	1.73 M	0.45L	1.40 M	2.51 M	0.45L	1.41 M	1468.1	0.50L	116.1	0.20L
85′-3"	23′-7"	5 1/8	2′-9"	9	10 3/8	68 3/4	3.90	0.65	13	8	1	1	13	8	2 1/2	4	0.336	0.50L	2.02 M	3.64 M	0.45L	1.56 M	2.81 M	0.50L	1.36 M	2.45 M	0.50L	1.05 M	1.68 M	0.45L	1.37 M	2.46 M	0.45L	1.34 M	1779.3	0.50L	129.0	0.20L
	27′-6"	5 1/8	2′-7"	11	10 3/8	67 3/8	4.04	0.67	13	8	1	1	13	8	2 1/2	4	0.329	0.50L	1.98 M	3.57 M	0.45L	1.53 M	2.75 M	0.50L	1.34 M	2.41 M	0.50L	1.03 M	1.64 M	0.45L	1.34 M	2.41 M	0.45L	1.31 M	1712.3	0.50L	126.4	0.20L
	31′-6"	5 1/8	2′-9"	12	10 3/8	67 3/8	4.16	0.69	13	8	1	1	13	8	2 1/2	4	0.300	0.50L	2.13 M	3.86 M	0.45L	1.65 M	2.98 M	0.50L	1.44 M	2.60 M	0.50L	1.11 M	1.77 M	0.45L	1.44 M	2.61 M	0.45L	1.42 M	1712.3	0.50L	126.4	0.20L
91′-10"	23′-7"	5 1/8	2′-9"	9	10 3/8	72 7/8	4.55	0.76	12	9	1	1	12	9	2 1/2	4	0.336	0.50L	1.91 M	3.47 M	0.45L	1.52 M	2.76 M	0.50L	1.34 M	2.43 M	0.50L	1.01 M	1.61 M	0.45L	1.33 M	2.42 M	0.45L	1.28 M	1972.9	0.50L	136.7	0.20L
	27′-6"	5 1/8	2′-7"	11	10 3/8	72 7/8	4.48	0.75	12	9	1	1	12	9	2 1/2	4	0.329	0.50L	1.97 M	3.58 M	0.45L	1.57 M	2.85 M	0.50L	1.38 M	2.51 M	0.50L	1.05 M	1.67 M	0.45L	1.38 M	2.49 M	0.45L	1.32 M	1972.9	0.50L	136.7	0.20L
	31′-6"	5 1/8	2′-9"	12	10 3/8	71 1/2	4.83	0.81	12	9	1	1	12	9	2 1/2	4	0.300	0.50L	2.01 M	3.69 M	0.45L	1.61 M	2.94 M	0.50L	1.41 M	2.58 M	0.50L	1.07 M	1.70 M	0.45L	1.41 M	2.57 M	0.45L	1.36 M	1902.7	0.50L	134.1	0.19L
98′-5"	23′-7"	5 1/8	2′-9"	9	10 3/8	78 3/8	5.03	0.84	11	10	1	1	11	10	2 1/2	4	0.336	0.50L	1.89 M	3.47 M	0.50L	1.55 M	2.83 M	0.50L	1.37 M	2.52 M	0.50L	1.02 M	1.62 M	0.45L	1.36 M	2.50 M	0.45L	1.29 M	2249.7	0.50L	147.0	0.20L
	27′-6"	5 1/8	2′-7"	11	10 3/8	77	5.17	0.86	11	10	1	1	11	10	2 1/2	4	0.329	0.50L	1.87 M	3.42 M	0.50L	1.52 M	2.79 M	0.50L	1.35 M	2.48 M	0.50L	1.00 M	1.59 M	0.45L	1.34 M	2.46 M	0.45L	1.27 M	2175.3	0.50L	144.5	0.20L
	31′-6"	5 1/8	2′-9"	12	10 3/8	75 5/8	5.56	0.93	11	10	1	1	11	10	2 1/2	4	0.300	0.50L	1.90 M	3.53 M	0.50L	1.55 M	2.88 M	0.50L	1.38 M	2.56 M	0.50L	1.02 M	1.62 M	0.45L	1.37 M	2.54 M	0.45L	1.31 M	2102.1	0.50L	141.9	0.19L

LEGEND OF ABBREVIATIONS

BRG. DENOTES BEARING
D.F. DENOTES DISTRIBUTION FACTOR
EXP. DENOTES EXPANSION
I.R. DENOTES INVENTORY RATING
LOC. DENOTES LOCATION
NO. DENOTES NUMBER
O.R. DENOTES OPERATING RATING
SPA. DENOTES SPACING
THICK. DENOTES THICKNESS



COMBINATION LAY-UP

NOTES:

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

2.) DESIGN TABLES DO NOT ACCOUNT FOR VERTICAL OR HORIZONTAL CURVES ON BRIDGE DECK.

3.) FLEXURAL RATING FACTORS "M" ARE SHOWN & GOVERN UNLESS OTHERWISE DENOTED BY A "V" FOR SHEAR, "D" FOR DEFLECTION OR "B" FOR BEARING.

4.) EXTERIOR BEAM CONTROLS. VALUES SHOWN ARE FACTORED RESISTANCES FOR THE EXTERIOR BEAM BASED ON LOAD AND RESISTANCE FACTOR DESIGN.

5.) FOR SINGLE MEMBER LAYUP DESIGN DATA & BRIDGE RATINGS, SEE TABLE 2b ON THE FOLLOWING SHEET.

Mark	Description	By	Chk'd	Recm'd	Date
	REVISIONS				

S- SHEET ___ OF ___

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

DATA ASSEMBLY SHEETS
GLULAM BEAM

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

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

SHEET 6 OF 20

BLC-561M

TABLE 2b - YELLOW POPLAR - SINGLE MEMBER LAY-UP (1,2,5)

DESIGN DATA																BRIDGE RATINGS (3)																			
SPAN (B1) FT.-IN.	CURB TO CURB (C1) FT.-IN.	DECK THICK. (E1) IN.	BEAM SPA. (H1) FT.-IN.	NO. OF BEAMS (J1) #	BEAM WIDTH (L3) IN.	BEAM DEPTH (L4) IN.	PRE-FABRICATED CAMBER (M1) IN.	NET FINAL CAMBER (M5) IN.	FIXED BRG. PAD WIDTH (N1) IN.	FIXED BRG. PAD LENGTH (N2) IN.	FIXED BRG. PAD THICK (N3) IN.	NO. OF INTERIOR LAYERS (N4) #	EXP. BRG. PAD WIDTH (P1) IN.	EXP. BRG. PAD LENGTH (P2) IN.	EXP. BRG. PAD THICK (P3) IN.	NO. OF INTERIOR LAYERS (P4) #	D.F.	H20			HS20			ML80			PHL-93			TK527			P82		FACTORED RESISTANCE (4)			
																		LOC.	I.R.	O.R.	LOC.	I.R.	O.R.	LOC.	I.R.	O.R.	LOC.	I.R.	O.R.	LOC.	I.R.	O.R.	LOC.	O.R.	MOMENT Mr (K-FT.)	LOC.	SHEAR Vr (K)	LOC.
18'-0"	23'-7"	5 1/8	2'-9"	9	5 1/8	31 5/8	0.09	0.02	7 1/2	10	1 1/2	2	7 1/2	10	2 1/2	4	0.336	0.15L	1.87 V	3.10 V	0.15L	1.87 V	3.10 V	0.15L	1.38 V	2.28 V	0.15L	1.04 V	1.66 V	0.15L	1.52 V	2.52 V	0.15L	1.65 V	252.0	0.45L	29.3	0.25L
	27'-6"	5 1/8	2'-7"	11	5 1/8	30 1/4	0.10	0.02	7 1/2	10	1 1/2	2	7 1/2	10	2 1/2	4	0.329	0.14L	1.83 V	3.02 V	0.14L	1.83 V	3.02 V	0.14L	1.34 V	2.23 V	0.14L	1.02 V	1.61 V	0.14L	1.48 V	2.46 V	0.14L	1.61 V	231.6	0.45L	28.0	0.25L
	31'-6"	5 1/8	2'-9"	12	5 1/8	28 7/8	0.12	0.02	7 1/2	10	1 1/2	2	7 1/2	10	2 1/2	4	0.300	0.13L	1.89 V	3.14 V	0.13L	1.89 V	3.14 V	0.13L	1.39 V	2.31 V	0.13L	1.05 V	1.67 V	0.13L	1.53 V	2.55 V	0.13L	1.67 V	212.0	0.45L	26.8	0.25L
19'-9"	23'-7"	5 1/8	2'-9"	9	5 1/8	31 5/8	0.13	0.02	7 1/2	10	1 1/2	2	7 1/2	10	2 1/2	4	0.336	0.13L	1.82 V	3.02 V	0.13L	1.75 V	2.90 V	0.13L	1.31 V	2.17 V	0.13L	1.00 V	1.60 V	0.13L	1.44 V	2.39 V	0.13L	1.53 V	249.7	0.45L	29.3	0.25L
	27'-6"	5 1/8	2'-7"	11	5 1/8	31 5/8	0.13	0.02	7 1/2	10	1 1/2	2	7 1/2	10	2 1/2	4	0.329	0.13L	1.87 V	3.10 V	0.13L	1.79 V	2.98 V	0.13L	1.34 V	2.23 V	0.13L	1.03 V	1.64 V	0.13L	1.48 V	2.45 V	0.13L	1.56 V	249.7	0.45L	29.3	0.25L
	31'-6"	5 1/8	2'-9"	12	5 1/8	28 7/8	0.18	0.03	7 1/2	10	1 1/2	2	7 1/2	10	2 1/2	4	0.300	0.12L	1.83 V	3.05 V	0.12L	1.76 V	2.93 V	0.12L	1.32 V	2.20 V	0.12L	1.01 V	1.61 V	0.12L	1.45 V	2.42 V	0.12L	1.54 V	210.0	0.45L	26.8	0.25L
23'-0"	23'-7"	5 1/8	2'-9"	9	5 1/8	34 3/8	0.20	0.03	7 1/2	10	1	1	7 1/2	10	2 1/2	4	0.336	0.12L	1.89 V	3.14 V	0.12L	1.66 V	2.77 V	0.12L	1.33 V	2.22 V	0.12L	1.04 V	1.65 V	0.12L	1.44 V	2.40 V	0.12L	1.49 V	288.1	0.45L	31.9	0.25L
	27'-6"	5 1/8	2'-7"	11	5 1/8	33	0.22	0.04	7 1/2	10	1	1	7 1/2	10	2 1/2	4	0.329	0.12L	1.85 V	3.08 V	0.12L	1.63 V	2.71 V	0.12L	1.30 V	2.17 V	0.12L	1.02 V	1.62 V	0.12L	1.41 V	2.35 V	0.12L	1.46 V	266.6	0.45L	30.6	0.25L
	31'-6"	5 1/8	2'-9"	12	5 1/8	33	0.23	0.04	7 1/2	10	1	1	7 1/2	10	2 1/2	4	0.300	0.12L	2.01 V	3.36 V	0.12L	1.77 V	2.96 V	0.12L	1.42 V	2.37 V	0.12L	1.11 V	1.76 V	0.12L	1.53 V	2.56 V	0.12L	1.60 V	266.6	0.45L	30.6	0.25L
26'-3"	23'-7"	5 1/8	2'-9"	9	5 1/8	35 3/4	0.30	0.05	7 1/2	11	1 1/2	2	7 1/2	11	2 1/2	4	0.336	0.11L	1.88 V	3.14 V	0.11L	1.56 V	2.61 V	0.11L	1.28 V	2.14 V	0.11L	1.03 V	1.64 V	0.11L	1.38 V	2.31 V	0.11L	1.44 V	306.3	0.45L	33.1	0.25L
	27'-6"	5 1/8	2'-7"	11	5 1/8	34 3/8	0.33	0.05	7 1/2	11	1 1/2	2	7 1/2	11	2 1/2	4	0.329	0.11L	1.84 V	3.08 V	0.11L	1.53 V	2.57 V	0.11L	1.25 V	2.10 V	0.11L	1.01 V	1.61 V	0.11L	1.35 V	2.27 V	0.11L	1.41 V	284.3	0.45L	31.9	0.25L
	31'-6"	5 1/8	2'-9"	12	5 1/8	34 3/8	0.35	0.06	7 1/2	11	1 1/2	2	7 1/2	11	2 1/2	4	0.300	0.11L	2.00 V	3.36 V	0.11L	1.67 V	2.79 V	0.11L	1.36 V	2.29 V	0.11L	1.10 V	1.75 V	0.11L	1.47 V	2.47 V	0.11L	1.54 V	284.3	0.45L	31.9	0.25L

NOTES:

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

2.) DESIGN TABLES DO NOT ACCOUNT FOR VERTICAL OR HORIZONTAL CURVES ON BRIDGE DECK.

3.) FLEXURAL RATING FACTORS "M" ARE SHOWN & GOVERN UNLESS OTHERWISE DENOTED BY A "V" FOR SHEAR, "D" FOR DEFLECTION OR "B" FOR BEARING.

4.) EXTERIOR BEAM CONTROLS. VALUES SHOWN ARE FACTORED RESISTANCES FOR THE EXTERIOR BEAM BASED ON LOAD AND RESISTANCE FACTOR DESIGN.

5.) FOR COMBINATION MEMBER LAYUP DESIGN DATA & BRIDGE RATINGS, SEE TABLE 2a ON THE PREVIOUS SHEET.

LEGEND OF ABBREVIATIONS

BRG.	DENOTES BEARING
D.F.	DENOTES DISTRIBUTION FACTOR
EXP.	DENOTES EXPANSION
I.R.	DENOTES INVENTORY RATING
LOC.	DENOTES LOCATION
NO.	DENOTES NUMBER
O.R.	DENOTES OPERATING RATING
SPA.	DENOTES SPACING
THICK.	DENOTES THICKNESS

SINGLE MEMBER LAY-UP

Mark	Description	By	Chk'd	Recm'd	Date
	REVISIONS				

S-

SHEET ___ OF ___

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

DATA ASSEMBLY SHEETS
GLULAM BEAM

RECOMMENDED APR. 23, 2013
CHIEF BRIDGE ENGINEER

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

SHEET 7 OF 20

BLC-561M

CONTROL DIMENSIONS

CODE	DESCRIPTION	SOURCE		VALUE (3)	
A1	SKEW ANGLE	DESIGNER			DEG.
A2	% GRADE (LOOKING STATIONS AHEAD)	DESIGNER			%
B1	SPAN LENGTH- ℄ TO ℄ BEARING	DESIGNER			
B2	FRONT FACE TO FRONT FACE OF ABUTMENTS	$\left(B1-\frac{1.50}{SIN(A1)}\right)$			
B3	WATERWAY OPENING	(B2) SIN(A1)			
C1	CURB TO CURB ROADWAY WIDTH (NORMAL)	TABLE 2			
C2	DECK WIDTH OUT TO OUT	C1+2.00			
C3	DECK WIDTH OUT TO OUT ALONG SKEW	$\frac{C2}{SIN(A1)}$			
D1	OUT TO OUT LONGITUDINAL PANEL LENGTH	$B1+\frac{1.50}{SIN(A1)}$			
D2	NUMBER OF LONGITUDINAL PANELS	$\left\{\frac{C2}{4.00}\right\}$	(1)		
E1	LONGITUDINAL PANEL SPECIES COMBINATION	TABLE 2 - BLC-561M, SHEET 9			
E2	LONGITUDINAL PANEL DEPTH	TABLE 2 - BLC-561M, SHEET 9			
E3	LONGITUDINAL PANEL WIDTH (NORMAL)	$\frac{C2}{D2}$			
E4	LONGITUDINAL PANEL WIDTH ALONG SKEW	$\frac{C3}{D2}$			
F1	OUT TO OUT BARRIER LENGTH	$D1+\frac{0.6667}{TAN(A1)}$			
F2	NUMBER OF GUIDE RAIL TIMBER POST SPACES	$\left\{\frac{F1-8.00}{8.00}\right\}$	(1)		
F3	GUIDE RAIL POST SPACING	$\frac{F1-8.00}{F2}$			
G1	NUMBER OF SPACES BETWEEN ℄ BEARINGS	$\left\{\frac{B1}{8.00}\right\}$	(1)		
		IF B1 ≤ 8.00 THEN G1 = 2			
G2	CONTINUOUS STIFFENER BEAM SPACING/DESIGN SPAN	$\frac{B1}{G1}$			
G3	NUMBER OF CONTINUOUS STIFFENER BEAMS	G1-1			
H1	DESIGN SPAN	$G2-\frac{0.4167}{SIN(A1)}$			
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)		
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)		
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)		
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)		
J4	NUMBER OF BEARING PADS	D2*4	(CONCRETE ABUTMENT)		
		D2*6	(TIMBER SILL ABUTMENT)		

QUANTITIES

ITEM		QUANTITY FORMULA		UNIT	SUBTOTAL	TOTAL
GLUE LAMINATED TIMBER PANELS		C2*E2*D1	(4)	F.B.M.		
GLUE LAMINATED TIMBER CONTINUOUS STIFFENER BEAMS		(G3)(C3)(0.4271)(5.5") (NORTHERN RED OAK AND RED MAPLE)	(4)	F.B.M.		
		(G3)(C3)(0.4271)(6.875") (YELLOW POPLAR)	(4)			
GLUE LAMINATED TIMBER INTERMEDIATE STIFFENER BEAMS		(D2-1)(G1)(H4)(H5)	(4)	F.B.M.		
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.		
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.		
GLUE LAMINATED TIMBER RAILING		2(F2*F3+3.667)(1.125)(8.75")	(4)	F.B.M.		
GLUE LAMINATED TIMBER CURB		2*F1(1.00)(6.75")	(4)	F.B.M.		
GLUE LAMINATED TIMBER SCUPPER BLOCK		2(F2+1)(4.50)(1.00)(6.75")+(7.0)(1.0)(6.75")	(4)	F.B.M.		
WATERPROOF MEMBRANE		$(D1)(C1)\left(\frac{1yd^2}{9ft^2}\right)$		S.Y.		
CLASS 4 GEOTEXTILE		$(E2+3.00)(2)(C3)\left(\frac{1yd^2}{9ft^2}\right)$		S.Y.		
WATERPROOF MEMBRANE, EDGE PROTECTION		$\left[2(E2+2.25)(D1)+(E2+3.00)(2)(C3)\right]\left(\frac{1yd^2}{9ft^2}\right)$		S.Y.		
BITUMINOUS WEARING COURSE		$(0.1667*C1+0.005*C1^2)(D1)\left(140\ \frac{lb}{ft^3}\right)\left(\frac{1TON}{2000lb}\right)$		TON		

CONTROL STATIONS AND ELEVATIONS

CODE	LOCATION	SOURCE	VALUE (ft.) STATION	VALUE (ft.) P.G. ELEV.
①	℄ ROADWAY AT ℄ BRG. ABUT. 1	DESIGNER		
②	℄ ROADWAY AT ℄ BRG. ABUT. 2	DESIGNER		
③	℄ ROADWAY AT BEGIN OF STR.	$STA① -\frac{0.75}{SIN(A1)}$		———
④	℄ ROADWAY AT END OF STR.	$STA② +\frac{0.75}{SIN(A1)}$		———
⑤	℄ ROADWAY AT FRONT FACE ABUT. 1	$STA① +\frac{0.75}{SIN(A1)}$		———
⑥	℄ ROADWAY AT FRONT FACE ABUT. 2	$STA② -\frac{0.75}{SIN(A1)}$		———

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	Recm'd	Date
	REVISIONS				

S- SHEET ___ OF ___

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

DATA ASSEMBLY SHEETS GLULAM LONGITUDINAL PANELS

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

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

SHEET 8 OF 20

BLC-561M

TABLE 2 - NORTHERN RED OAK COMBINATION LAY-UP (E1)(1,2)

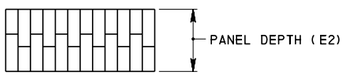
DESIGN DATA					BRIDGE RATINGS(3)																											
SPAN (B1) FT.-IN.	CURB TO CURB (C1) FT.-IN.	PANEL DEPTH (E2) IN.	PRE-FABRICATED CAMBER (M1) IN.	NET FINAL CAMBER (M5) IN.	H20				HS20				ML80				PHL-93				TK527				P82		FACTORED RESISTANCE			
					LOC.	I.R.	LOC.	O.R.	LOC.	I.R.	LOC.	O.R.	LOC.	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.

2.) DESIGN TABLES DO NOT ACCOUNT FOR VERTICAL OR HORIZONTAL CURVES ON BRIDGE DECK.

3.) FLEXURAL RATING FACTORS "M" ARE SHOWN & GOVERN UNLESS OTHERWISE DENOTED BY A "V" FOR SHEAR, "D" FOR DEFLECTION OR "B" FOR BEARING.

Mark	Description	By	Chk'd	Recm'd	Date
	REVISIONS				

S- | SHEET ___ OF ___

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

DATA ASSEMBLY SHEETS
GLULAM LONGITUDINAL PANELS

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

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

SHEET 9 OF 20

BLC-561M

CONTROL DIMENSIONS

CODE	DESCRIPTION	SOURCE		VALUE (7)
A1	SKEW ANGLE	DESIGNER		DEG.
A2	% GRADE (LOOKING STATIONS AHEAD)	DESIGNER		
B1	SPAN LENGTH- ℄ TO ℄ BEARING	DESIGNER		
B2	FRONT FACE TO FRONT FACE OF ABUTMENTS	$\left(B1-\frac{1.50}{SIN(A1)}\right)$	(6)	
B3	WATERWAY OPENING	(B2) SIN(A1)		
C1	CURB TO CURB ROADWAY WIDTH (NORMAL)	DESIGNER		
C2	DECK WIDTH OUT TO OUT	C1+2.00		
D1	OUT TO OUT DECKING ALONG ℄ OF ROADWAY	$B1+\frac{2.00}{SIN(A1)}$	(6)	
D2	NUMBER OF DECK PANELS	$\left\{\frac{D1*SIN(A1)}{4.00}\right\}$	(1)	
E1	DECK THICKNESS	TABLE 1 (SEE THIS SHEET)		
E2	DECK PANEL WIDTH ALONG ℄ OF ROADWAY	$\frac{D1}{D2}$		
E3	DECK PANEL WIDTH (NORMAL)	E2*SIN(A1)		
E4	NUMBER OF OFFSET SHOES PER DECK PANEL PER BEAM ON EACH SIDE OF BEAM	$\left\{\frac{E2-1.00}{1.00}+1\right\}$	(1)	
E5	OFFSET SHOES SPACING	$\frac{E2-1.00}{E4-1}$		
F1	OUT TO OUT BARRIER LENGTH	$D1+\frac{0.6667}{TAN(A1)}$		
F2	NUMBER OF GUIDE RAIL TIMBER POST SPACES	$\left\{\frac{F1-8.00}{8.00}\right\}$	(1)	
F3	GUIDE RAIL POST SPACING	$\frac{F1-8.00}{F2}$		
G1	NUMBER OF SPACES BETWEEN ℄ BEARINGS	$\left\{\frac{B1}{20.0}\right\}$	(1)	
		IF B1 ≤ 20.0 THEN G1 = 2		
H1	MAX. DECK SPAN ALONG SKEW	TABLE 1 (SEE THIS SHEET)		
H2	MAX. BEAM SPACING DUE TO DECK (NORMAL)	H1*SIN(A1)		
H3	BEAM SPACING (NORMAL)	DESIGNER (MUST BE LESS THAN OR EQUAL TO H2)		
H4	BEAM SPACING ALONG SKEW	$\frac{H3}{SIN(A1)}$		
J1	NUMBER OF BEAMS (AND 1/2 NO. OF BRG. PADS)	DESIGNER		
J2	NUMBER OF BEAM SPACES	J1-1		
K1	℄ FASCIA BEAM TO ℄ FASCIA BEAM	H3*J2		
K2	℄ FASCIA BEAM TO ℄ FASCIA BEAM ALONG SKEW	H4*J2		
K3	℄ FASCIA BEAM TO OUTSIDE FACE OF DECK	$\frac{1}{2}$(C2-K1)		
L1	BEAM LENGTH (OUT TO OUT OF BEAM)	$B1+\frac{1.4167}{SIN(A1)}$		

CONTROL DIMENSIONS

CODE	DESCRIPTION		SOURCE		VALUE (7)
L2	STEEL BEAM DESIGNATION		DESIGNER	(2)	
L3	STEEL BEAM FLANGE WIDTH		DESIGNER		
L4	STEEL BEAM WEB THICKNESS		DESIGNER		
L5	STEEL BEAM DEPTH		DESIGNER		
L6	STEEL BEAM BEARING STIFFENER THICKNESS		DESIGNER	(10)	
L7	STEEL BEAM BEARING STIFFENER WIDTH		DESIGNER	(10)	
M1	DEFLECTION DUE TO DEAD LOAD OF STEEL BEAM, DIAPHRAGMS, AND CONNECTION PLATES		DESIGNER	(2)	
M2	DEFLECTION DUE TO DEAD LOAD OF TIMBER DECK, RAILING, AND WEARING SURFACE		DESIGNER	(2)	
M3	TOTAL CAMBER		M1+M2		
N1	FIXED BEARING PAD WIDTH		DESIGNER	(3)	
N2	FIXED BEARING PAD LENGTH		DESIGNER	(3)	
N3	FIXED BEARING PAD THICKNESS		DESIGNER	(3)	
N4	NUMBER OF INTERIOR LAYERS		DESIGNER	(3)	
P1	EXPANSION BEARING PAD WIDTH		DESIGNER	(3)	
P2	EXPANSION BEARING PAD LENGTH		DESIGNER	(3)	
P3	EXPANSION BEARING PAD THICKNESS		DESIGNER	(3)	
P4	NUMBER OF INTERIOR LAYERS		DESIGNER	(3)	
Q1	BEARING ℄ CONSTRAINT DUE TO BEARING STIFFENER		L4+2.0833		
Q2	BEARING ℄ CONSTRAINT DUE TO FLANGE WIDTH		L3+0.8333		
Q3	BEARING ℄ CONSTRAINT DUE TO FIXED BEARING PAD		N1+0.8333		
Q4	FIXED BEARING PLATE WIDTH		(USE THE GREATER VALUE BETWEEN Q1, Q2, & Q3)/SIN A1		
Q5	FIXED BEARING PLATE LENGTH		(N1) COS(A1) + (N2) SIN(A1) + 0.1667		
R1	BEARING ℄ CONSTRAINT DUE TO EXP. BEARING PAD		P1+0.8333		
R2	EXPANSION BEARING PLATE WIDTH		(USE THE GREATER VALUE BETWEEN Q1, Q2, & R1)/SIN A1		
R3	EXPANSION BEARING PLATE LENGTH		(P1) COS(A1) + (P2) SIN(A1) + 0.1667		
S1	FIXED END BACKWALL DEPTH		L5+0.0417+N3-0.0208		
S2	EXPANSION END BACKWALL DEPTH		L5+0.0417+P3-0.0208		
S3	BACKWALL LENGTH	CONCRETE ABUTMENTS	$\frac{C2+0.25}{SIN(A1)}$		
		TIMBER SILL ABUTMENTS	$\frac{C2}{SIN(A1)}+\frac{0.25}{SIN(AA)}+\frac{0.25}{SIN(AB)}+0.6667$	(4)	
T1	CLEAR SPAN BETWEEN BEAMS		H3-L3		
T2	DESIGN SPAN		$E1+\frac{T1}{SIN(A1)}$		
T3	NUMBER OF DOWELS		TABLE 2 (SEE THIS SHEET)	(9)	
T4	DOWEL SPACING		$\frac{T1}{(T3+1)}$	(9)	
T5	NUMBER OF STIFFENER BEAMS PER BAY AT EACH DECK PANEL JOINT		SEE TABLE ON BLC-564M, SHTS. 11, 12, OR 13	(9)	
T6	STIFFENER BEAM QUANTITY (PER STIFFENER)		6.86 F.B.M. NORTHERN RED OAK AND RED MAPLE	(9)	
			8.57 F.B.M. YELLOW POPLAR	(9)	

FOOTNOTES FOR TABLES

(1) ROUND TO THE NEXT WHOLE NUMBER - ONLY WITHIN { }.

(2) USE PENNDOT'S LRFD STEEL GIRDER DESIGN AND RATING (STLRFD) IN CONJUNCTION WITH THE DATA ASSEMBLY SHEETS TO DETERMINE THE STEEL BEAM SIZE.

(3) USE PENNDOT'S LRFD BEARING PAD DESIGN AND ANALYSIS (BPLRFD) IN CONJUNCTION WITH THE DATA ASSEMBLY SHEETS TO DETERMINE THE BEARING PAD SIZE AND DIMENSIONS.

(4) SEE BLC-561M SHEET 19 FOR VARIABLES "AA" AND "AB".

(5) NO. OF DOWELS IS BASED ON THE USE OF AASHTO M314, GRADE 55 SMOOTH STEEL DOWELS.

(6) BY DESIGNER FOR DECK REPLACEMENT WHERE EXISTING BEAMS AND BACKWALL REMAIN IN PLACE.

(7) SHOW DIMENSIONS IN FEET AND INCHES UNLESS NOTED OTHERWISE.

(8) 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.

(9) DESIGNER CHOOSES EITHER STEEL DOWELS OR ALTERNATE STIFFENER BEAM SYSTEM TO PROVIDE CONNECTION OF DECK PANELS. CROSS OUT APPROPRIATE DETAILS ON BLC-564M SHEETS 11, 12, 13, AND 14 AS REQUIRED.

(10) BY DESIGNER, CHECK BEARING STIFFENER WITH PENNDOT'S LRFD STEEL GIRDER DESIGN AND RATING (STLRFD) IN CONJUNCTION WITH THE DATA ASSEMBLY SHEETS TO DETERMINE THE BEARING STIFFENER SIZE.

(11) QUANTITY BASED ON 12" WIDE POSTS AT ALL END LOCATIONS.

(12) QUANTITY BASED ON 8¾" WIDE POSTS AT ALL INTERMEDIATE LOCATIONS.

(13) QUANTITY INCLUDES RAIL SPACER BLOCK.

QUANTITIES

ITEM		QUANTITY FORMULA		UNIT	SUBTOTAL	TOTAL
FABRICATED STRUCTURAL STEEL BEAMS		J1(L1)		L.F.		
STEEL DIAPHRAGMS UNIT MASS	FABRICATED STRUCTURAL STEEL MISCELLANEOUS	SEE TABLE-1 SHEET 9 OR 10 OF BLC-564M		$\frac{lb}{ft}$		
STEEL DIAPHRAGMS		(G1-1)(H3-50)(STEEL DIAPHRAGMS UNIT MASS)(J2)		lb		
STEEL END PLATES		$2*J1*L5*L3(0.0417)\left(490\frac{lb}{ft^3}\right)$		lb		
STEEL CONNECTION PLATES (INTERMEDIATE DIAPHRAGMS)		$(G1+1)[(2*J1)-2](L5)(0.625)(0.0417)\left(490\frac{lb}{ft^3}\right)$		lb		
STEEL BEARING STIFFENERS		$4(J1)(L6)(L7)(L5)\left(490\frac{lb}{ft^3}\right)$		lb		
STEEL SOLE PLATES		$J1(Q4*Q5+R2*R3)(0.0417)\left(490\frac{lb}{ft^3}\right)$		lb		
GLUE LAMINATED TIMBER DECK		C2*E1*E2*D2	(8)	F.B.M.		
GLUE LAMINATED TIMBER STIFFENER BEAMS		(D2-1)(J2)(T5)(T6)	(8)	F.B.M.		
GLUE LAMINATED TIMBER RAILING END POST (11) (13)	GLUE LAMINATED TIMBER BRIDGE RAIL	4(1.00*0.875)(E1+2.917)+4(0.26*0.875*12.0")	(8)			
GLUE LAMINATED TIMBER RAILING INTERMEDIATE POST (12) (13)		2(F2-1)(0.875*0.729)(E1+35.0")+2(F2-1)(0.26*0.875*8.75")	(8)			
GLUE LAMINATED TIMBER RAILING		2(F2*F3+3.667)(1.125)(8.75")	(8)			
GLUE LAMINATED TIMBER CURB		2*F1(1.00)(6.75")	(8)			
GLUE LAMINATED TIMBER SCUPPER BLOCK		2(F2+1)(4.50)(1.00)(6.75")+(7.0)(1.0)(6.75")	(8)			
GLUE LAMINATED TIMBER BACKWALL		$2(S3)(0.25)\left(\frac{S1+S2}{2}\right)$	(8)	F.B.M.		
WATERPROOF MEMBRANE		$(D1)(C1)\left(\frac{1yd^2}{9ft^2}\right)$		S.Y.		
CLASS 4 GEOTEXTILE		$[S1+S2+2(E1)+6.00](S3+1.00)\left(\frac{1yd^2}{9ft^2}\right)$	(6)	S.Y.		
WATERPROOF MEMBRANE, EDGE PROTECTION		$[2(E1+2.33)(D1)+(S1+S2+2*E1+6.00)(S3+1.00)]\left(\frac{1yd^2}{9ft^2}\right)$	(6)	S.Y.		
BITUMINOUS WEARING COURSE		$(0.1667*C1+0.005*C1^2)D1*\left(140\frac{lb}{ft^3}\right)\left(\frac{1\ TON}{2000\ lb}\right)$	(6)	TON		

CONTROL STATIONS AND ELEVATIONS

CODE	LOCATION	SOURCE	VALUE (ft.) STATION	VALUE (ft.) P.G. ELEV.
①	℄ ROADWAY AT ℄ BRG. ABUT. 1	DESIGNER		
②	℄ ROADWAY AT ℄ BRG. ABUT. 2	DESIGNER		
③	℄ ROADWAY AT BEGIN OF STR.	STA① $-\frac{(0.75+0.26)}{SIN(A1)}$ (6)		_____
④	℄ ROADWAY AT END OF STR.	STA② $+\frac{(0.75+0.26)}{SIN(A1)}$ (6)		_____
⑤	℄ ROADWAY AT FRONT FACE ABUT. 1	STA① $+\frac{0.75}{SIN(A1)}$ (6)		_____
⑥	℄ ROADWAY AT FRONT FACE ABUT. 2	STA② $-\frac{0.75}{SIN(A1)}$ (6)		_____

TABLE 2 - DOWEL DESIGN DATA

TIMBER SPECIES	MAXIMUM DESIGN SPAN (T2)	NO. OF (5) DOWELS (T3)
NORTHERN RED OAK & RED MAPLE	3'-2"	2
	3'-11"	3
	4'-7"	4
	5'-2"	5
	5'-10"	6
	6'-5"	7
YELLOW POPLAR	3'-1"	3
	3'-7"	4
	4'-1"	5
	4'-6"	6
	5'-1"	7
	5'-7"	8
	6'-2"	9

TABLE 1 - DECK DESIGN DATA

TIMBER SPECIES	DECK THICKNESS (E1)	MAX. DECK SPAN ALONG SKEW (H1)
NORTHERN RED OAK	5⅛"	6'-0"
RED MAPLE	5⅛"	6'-0"
YELLOW POPLAR	5⅛"	5'-6"

Mark	Description	By	Chk'd	Recm'd	Date
REVISIONS					

S- SHEET ___ OF ___

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

DATA ASSEMBLY SHEETS STEEL BEAM

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

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

SHEET 10 OF 20

BLC-561M

CONTROL DIMENSIONS

CODE	DESCRIPTION	SOURCE		VALUE (5)	
A1	SKEW ANGLE	A1	(1)		DEG.
A2	% GRADE (LOOKING STATIONS AHEAD)	A2	(1)		%
C1	CURB TO CURB ROADWAY WIDTH (NORMAL)	C1	(1)		
C2	DECK WIDTH OUT TO OUT	C2	(1)		
A	DECK OR LONG. PANEL THICKNESS	USE E1 FOR GLULAM & STEEL BEAM OR E2 FOR LONG. PANEL	(1)		
B	BEAM DEPTH	USE L4 FOR GLULAM BEAM, L5 FOR STEEL BEAM OR ZERO (0) FOR LONG. PANEL	(1)		
C	BEARING PAD THICKNESS	USE N3 OR P3 FOR GLULAM AND STEEL BEAM OR 0.0625 FOR LONG. PANEL	(1)		
AA	WINGWALL "A" SKEW ANGLE	DESIGNER (15°00′00" MIN., 45°00′00" MAX.)	(4)		DEG.
AB	WINGWALL "B" SKEW ANGLE	DESIGNER (15°00′00" MIN., 45°00′00" MAX.)	(4)		DEG.
AC	WINGWALL "A" LENGTH	DESIGNER	(4)		
AD	WINGWALL "B" LENGTH	DESIGNER	(4)		
BA	CHEEKWALL "A"	$0.5+\left(\frac{1.5}{\tan(A1)}\right)+1.5\left(\tan\left(\frac{AA}{2}\right)\right)$			
BB	CHEEKWALL "A"	$1.5\left(\tan\left(\frac{AA}{2}\right)\right)$			
CA	CHEEKWALL "B"	$0.5-\left(\frac{1.5}{\tan(A1)}\right)+1.5\left(\tan\left(\frac{AB}{2}\right)\right)$			
IF CA ≥ 6" USE CONDITION 1 EQUATIONS, OTHERWISE USE CONDITION 2 EQUATIONS					
CONDITION 1 EQUATIONS					
CA	CHEEKWALL "B"	AS CALCULATED ABOVE			
CB	CHEEKWALL "B"	$1.5\left(\tan\left(\frac{AB}{2}\right)\right)$			
CC	CHEEKWALL "B"	0.5			
CONDITION 2 EQUATIONS					
CA	CHEEKWALL "B"	0.5			
CB	CHEEKWALL "B"	$\frac{1.5-1.5(\cos(AB))}{\sin(AB)}$			
CC	CHEEKWALL "B"	$0.5+\left(\frac{1.5}{\tan(A1)}\right)-1.5\left(\tan\frac{AB}{(2)}\right)$			
DA	WINGWALL "A" LENGTH	AC+BB			
DB	WINGWALL "B" LENGTH	AD+CB			
EA	ABUTMENT LENGTH	$\frac{C2+0.0833}{\sin(A1)}$			
EB	ABUTMENT LENGTH	EA+BA+CA			
EC	ABUTMENT LENGTH	$\frac{EA}{2}+BA$			
ED	ABUTMENT LENGTH	$\frac{EA}{2}+CA$			
EE	ABUTMENT LENGTH	$\frac{0.75}{\tan(A1)}$			
FA	WINGWALL "A" HEIGHT	(⑳ - ⑮)	(2)		
FB	WINGWALL "A" HEIGHT	(㉒ - ⑮)	(2)		
FC	WINGWALL "A" HEIGHT	(⑳ - ㉒)	(2)		
FD	WINGWALL REINFORCEMENT PROJECTION	DESIGNER	(3)		
GA	WINGWALL "B" HEIGHT	(㉚ - ⑮)	(2)		
GB	WINGWALL "B" HEIGHT	(㉜ - ⑮)	(2)		
GC	WINGWALL "B" HEIGHT	(㉚ - ㉜)	(2)		
GD	WINGWALL REINFORCEMENT PROJECTION	DESIGNER	(3)		
HA	HEIGHT OF FINISH GRADE CHAMFER (ABUTMENT)	(⑯ - ⑮)	(2)		
HB	REAR FACE REINFORCEMENT PROJECTION (ABUTMENT)	DESIGNER	(3)		
IA	ABUTMENT FOOTING WIDTH	DESIGNER	(3)		
IB	ABUTMENT FOOTING WIDTH	DESIGNER	(3)		
IC	ABUTMENT FOOTING WIDTH	IA-IB			
JA	WINGWALL "A" FOOTING WIDTH	DESIGNER	(3)		
JB	WINGWALL "A" FOOTING WIDTH	DESIGNER	(3)		
JC	WINGWALL "A" FOOTING WIDTH	JA-JB			
KA	WINGWALL "B" FOOTING WIDTH	DESIGNER	(3)		
KB	WINGWALL "B" FOOTING WIDTH	DESIGNER	(3)		
KC	WINGWALL "B" FOOTING WIDTH	KA-KB			
LA	ABUTMENT FOOTING LENGTH	$EB-\frac{IB}{\tan(AA)}+\frac{JB}{\sin(AA)}-\frac{IB}{\tan(AB)}+\frac{KB}{\sin(AB)}$			
LB	ABUTMENT FOOTING LENGTH	$EB-\frac{IC}{\tan(AA)}+\frac{JC}{\sin(AA)}-\frac{IC}{\tan(AB)}+\frac{KC}{\sin(AB)}$			
MA	WINGWALL "A" FOOTING LENGTH	$\frac{IB}{\sin(AA)}-\frac{JB}{\tan(AA)}$			
MB	WINGWALL "A" FOOTING LENGTH	$DA+\frac{IB}{\sin(AA)}-\frac{JB}{\tan(AA)}$			
MC	WINGWALL "A" FOOTING LENGTH	$DA+\frac{JC}{\tan(AA)}-\frac{IC}{\sin(AA)}$			
NA	WINGWALL "B" FOOTING LENGTH	$\frac{IB}{\sin(AB)}-\frac{KB}{\tan(AB)}$			
NB	WINGWALL "B" FOOTING LENGTH	$DB+\frac{IB}{\sin(AB)}-\frac{KB}{\tan(AB)}$			
NC	WINGWALL "B" FOOTING LENGTH	$DB+\frac{KC}{\tan(AB)}-\frac{IC}{\sin(AB)}$			

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	Recm'd	Date
REVISIONS					

S-

SHEET___ OF___

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

DATA ASSEMBLY SHEETS
SPREAD FOOTING ABUTMENT ___

RECOMMENDED APR. 23, 2013
CHIEF BRIDGE ENGINEER

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

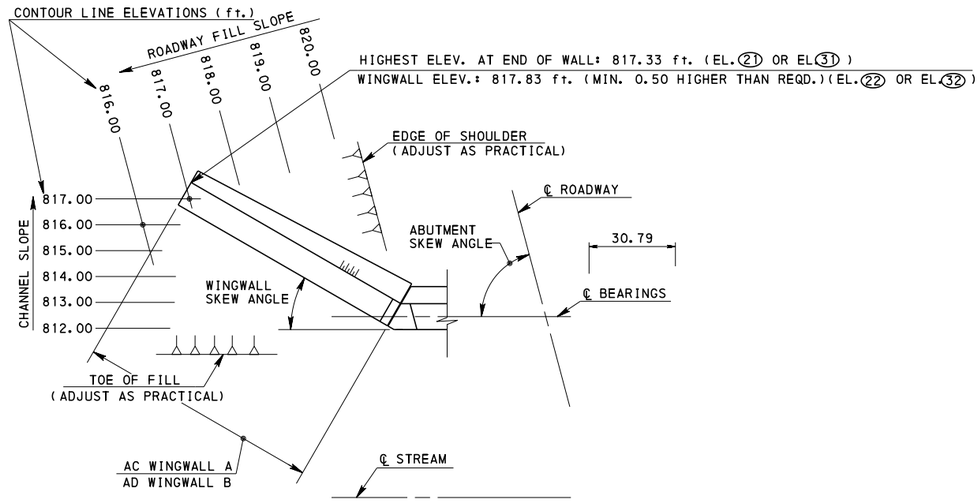
SHEET 11 OF 20

BLC-561M

CONTROL STATIONS AND ELEVATIONS

CODE	DESCRIPTION	SOURCE	VALUE (2)
⑩	ABUTMENT ELEVATION	USE ① FOR ABUT. 1, OR ② FOR ABUT. 2 (1)	
⑪	ABUTMENT ELEVATION	⑩ − (0.125+$\frac{C1}{2}$(0.02)+A+B+C+0.0417)	
⑫	ABUTMENT ELEVATION (USE APPROPRIATE EQUATION DEPENDING ON ABUTMENT NO.)	⑪ − $\frac{A2}{100}$($\frac{EA}{2}$(COS(A1))) ABUTMENT 1 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 ⑪ − $\frac{A2}{100}$($\frac{EA}{2}$(COS(A1))) ABUTMENT 2	
⑭	BOTTOM OF FOOTING ELEVATION	DESIGNER	
⑮	TOP OF FOOTING ELEVATION	⑭+2.00	
⑯	F.G.E./TOP OF SCOUR PROTECTION	DESIGNER (SEE DM-4, PART A, CHAPTER 7 FOR SCOUR REQ.)	
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 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)	
㉒	WINGWALL "A" ELEVATION	㉑+0.50	
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 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)	
㉜	WINGWALL "B" ELEVATION	㉛+0.50	

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

QUANTITIES

ITEM		QUANTITY FORMULA	UNIT	SUBTOTAL	TOTAL
CLASS 3 EXCAVATION		DESIGNER	C.Y.		
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.		
CHEEKWALL B	CLASS AA CEMENT CONCRETE	(CB+0.5+$\frac{0.5+CB-CA}{2}$)1.5(㉚−⑬)($\frac{1yd^3}{27ft^3}$) CONDITION 1 (2(CB)−0.5+$\frac{CC+CB-0.5}{2}$)1.5(㉚−⑬)($\frac{1yd^3}{27ft^3}$) CONDITION 2	C.Y. C.Y.		
ABUTMENT	CLASS A CEMENT CONCRETE	[1.5(⑪−⑮)+($\frac{1}{2}$)($\frac{1}{10}$)(⑪−⑮)^2](EB)($\frac{1yd^3}{27ft^3}$)	C.Y.		
WINGWALL A	CLASS A CEMENT CONCRETE	[1.5(㉒+$\frac{⑳-㉒}{2}$−⑮)+($\frac{1}{2}$)($\frac{1}{10}$)(㉒+$\frac{⑳-㉒}{2}$−⑮)^2](AC)($\frac{1yd^3}{27ft^3}$)	C.Y.		
WINGWALL B	CLASS A CEMENT CONCRETE	[1.5(㉜+$\frac{㉚-㉜}{2}$−⑮)+($\frac{1}{2}$)($\frac{1}{10}$)(㉜+$\frac{㉚-㉜}{2}$−⑮)^2](AD)($\frac{1yd^3}{27ft^3}$)	C.Y.		
FOOTING	CLASS A CEMENT CONCRETE	($\frac{1}{2}$)(2.00)((LA+LB)(IA)+(MB+MC)(JA)+(NB+NC)(KA))($\frac{1yd^3}{27ft^3}$)	C.Y.		
SELECTED BORROW EXCAVATION, STRUCTURE BACKFILL		DESIGNER	C.Y.		
NO. 57 COARSE AGGREGATE		6 WEEPHOLES ($\frac{½cy}{WEEPHOLE}$)	C.Y.	3.0	3.0
REINFORCEMENT BARS		DESIGNER - CALCULATE BAR WEIGHT FROM SHEETS 13 & 14 OF BLC-561M	lb		
REINFORCEMENT BARS, EPOXY COATED		DESIGNER - CALCULATE BAR WEIGHT FROM SHEETS 13 & 14 OF BLC-561M	lb		

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	Recm'd	Date
REVISIONS					

S- SHEET__ OF__

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

DATA ASSEMBLY SHEETS
SPREAD FOOTING ABUTMENT ___

RECOMMENDED APR. 23, 2013
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_____ TO _____	(⑫ - ⑮) - 0.1667 (⑪ - ⑮) - 0.1667		$\{\frac{EC-0.25}{1.50}+0.99\}+1$ (1)	STR.								VARIES BY____	$\frac{\lvert ⑪ - ⑫ \rvert}{\text{NO. OF BARS}}$ (3)	1.043	
A501	5		FROM_____ TO _____	(⑪ - ⑮) - 0.1667 (⑬ - ⑮) - 0.1667		$\{\frac{ED-0.25}{1.50}+0.99\}+1$ (1)	STR.								VARIES BY____	$\frac{\lvert ⑬ - ⑪ \rvert}{\text{NO. OF BARS}}$ (3)	1.043	
A__02		DESIGNER (2)	FROM_____ TO _____	(⑫ - ⑮) - 0.1667 (⑪ - ⑮) - 0.1667		$\{\frac{EC-1.00(\tan(AA))-0.25}{\text{REQ. SPA. (DESIGNER)}}+0.99\}+1$ (1)(2)	STR.								VARIES BY____	$\frac{\lvert ⑪ - ⑫ \rvert}{\text{NO. OF BARS}}$ (3)		
A__03		DESIGNER (2)	FROM_____ TO _____	(⑪ - ⑮) - 0.1667 (⑬ - ⑮) - 0.1667		$\{\frac{ED-1.00(\tan(AB))-0.25}{\text{REQ. SPA. (DESIGNER)}}+0.99\}+1$ (1)(2)	STR.								VARIES BY____	$\frac{\lvert ⑬ - ⑪ \rvert}{\text{NO. OF BARS}}$ (3)		
A504	5			EC+1.75		$\{\frac{(⑪ + \lvert ⑪ - ⑬ \rvert - ⑮) - 2.00}{1.50}+0.99\}+1$ (2)(3)	STR.										1.043	
A505	5			ED-0.1667		SAME AS A504	STR.										1.043	
A506	5			EC-1.00(TAN(AA))+1.75		SAME AS A504	STR.										1.043	
A507	5			ED-1.00(TAN(AB))-0.1667		SAME AS A504	STR.										1.043	
A508	5			$\sqrt{(⑪ - ⑫)^2+(EC)^2}+1.75$	1		STR.										1.043	
A509	5			$\sqrt{(⑬ - ⑪)^2+(ED)^2}-0.1667$	1		STR.										1.043	
A510	5			$\sqrt{(⑪ - ⑫)^2+(EC-1.00(\tan(AA)))^2}+1.75$	1		STR.										1.043	
A511	5			$\sqrt{(⑬ - ⑪)^2+(ED-1.00(\tan(AB)))^2}-0.1667$	1		STR.										1.043	
EA312	3			$(BA-0.125)+2.50+\left(\frac{1.50}{\sin(AT)}-0.25\right)$		$\{\frac{(⑳ - ⑫) - 0.3333}{0.8333}+0.99\}+1$ (1)	STR.								BEND IN FIELD		0.376	
EA313	3			$(CA-0.125)+(CC-0.25)+2.25+\left(\frac{1.50}{\sin(AT)}-0.25\right)$		$\{\frac{(㉚ - ⑬) - 0.3333}{0.8333}+0.99\}+1$ (1)	STR.								BEND IN FIELD		0.376	
EA514	5			⑳ - ⑫ + 1.5		USE 6 BARS FOR 90° SKEWS, AND 7 BARS ALL OTHER SKEWS	STR.										1.043	
EA515	5			㉚ - ⑬ + 1.5	6		STR.										1.043	
A516	5		4.25			$\{\frac{\text{NO. OF BARS FROM A\_\_02}+1}{2}\}$ (1)	③	1.583	1.083	1.583			0.167				1.043	
A517	5		4.25			$\{\frac{\text{NO. OF BARS FROM A\_\_03}+1}{2}\}$ (1)	③	1.583	1.083	1.583			0.167				1.043	
A518	5		1.00		32		STR.										1.043	
W520	5		FROM_____ TO _____	FB-0.1667 FA-0.1667		$\{\frac{AC-0.50}{1.50}+0.99\}+1$ (1)	STR.								VARIES BY____	$\frac{FC}{\text{NO. OF BARS}}$	1.043	
W__21		DESIGNER (2)	FROM_____ TO _____	FB-0.1667 FA-0.1667		$\{\frac{AC-0.50}{\text{REQ. SPA. (DESIGNER)}}+0.99\}+1$ (1)(2)	STR.								VARIES BY____	$\frac{FC}{\text{NO. OF BARS}}$		
W522	5			AC-0.3333		$\{\frac{FB-0.50}{1.50}+0.99\}+1$ SHOW ON DRAWINGS (1)(6)	STR.										1.043	
W523	5		FROM_____ TO _____	$\frac{(FC-1.25)(AC-0.3333)}{FC}$ $1.\frac{00(AC-0.3333)}{FC}$		$\{\frac{FC-2.25}{1.50}+0.99\}+1$ SHOW ON DRAWINGS (1)(6)	STR.								VARIES BY____	$\frac{(\text{LENGTH FROM \_\_\_\_}) - (\text{LENGTH TO \_\_\_\_})}{\text{NO. OF BARS SHOWN ON DRAWINGS}}$	1.043	

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 | | .

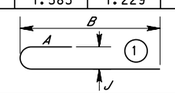
(4) USE TABLE 1 ON THIS SHEET TO COMPLETE BAR WEIGHT QUANTITIES.

(5) TOTAL BAR WEIGHT = (BAR LENGTH OR AVERAGE BAR LENGTH) x (TOTAL NO. OF BARS) x (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) 180° HOOKS A	J	BAR WEIGHT lb/ft
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	Recm'd	Date
	REVISIONS				

S- | SHEET___ OF___

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

DATA ASSEMBLY SHEETS
SPREAD FOOTING ABUTMENT ___

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

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

SHEET 13 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)
W524	5			$\sqrt{FC^2+AC^2}-0.333$	1	SHOW ON DRAWINGS	STR.										1.043	
					2	SHOWN ON BAR SCHEDULE (TOTAL NO. OF BARS)												
W525	5		4.25			$\{\frac{\text{NO. OF BARS FROM W}\_\_ 21+1}{2}\}$ (1)	③	1.583	1.0833	1.583			0.1667				1.043	
W526	5		1.00		8		STR.										1.043	
W530	5		FROM _____ TO _____	GB-0.1667 GA-0.1667		$\{\frac{AD-0.5}{1.50}+0.99\}+1$ (1)	STR.								VARIES BY__	$\frac{GC}{\text{NO. OF BARS}}$	1.043	
W___31		DESIGNER (2)	FROM _____ TO _____	GB-0.1667 GA-0.1667		$\{\frac{AD-0.5}{\text{REQ. SPA. (DESIGNER)}}+0.99\}+1$ (1)(2)	STR.								VARIES BY__	$\frac{GC}{\text{NO. OF BARS}}$		
W532	5			AD-0.333		$\{\frac{GB-0.50}{1.50}+0.99\}+1$ SHOW ON DRAWINGS (1)(6)	STR.										1.043	
W533	5		FROM _____ TO _____	$\frac{(GC-1.25)(AD-0.333)}{GC}$ $\frac{1.00(AD-0.333)}{GC}$		$\{\frac{GC-2.25}{1.50}+0.99\}+1$ SHOW ON DRAWINGS (1)(6)	STR.								VARIES BY__	$\frac{(\text{LENGTH FROM }\_\_\_\_\_) - (\text{LENGTH TO}\_\_\_\_\_)}{\text{NO. OF BARS SHOWN ON DRAWINGS}}$	1.043	
W534	5			$\sqrt{GC^2+AD^2}-0.333$	1	SHOW ON DRAWINGS	STR.										1.043	
					2	SHOWN ON BAR SCHEDULE (TOTAL NO. OF BARS)												
W535	5		4.25			$\{\frac{\text{NO. OF BARS FROM W}\_\_ 31+1}{2}\}$ (1)	③	1.583	1.0833	1.583			0.1667				1.043	
W536	5		1.00		8		STR.										1.043	
F___00		DESIGNER (2)		IA-0.667		$\{\frac{LA-0.50}{\text{REQ. SPA. (DESIGNER)}}+0.99\}+1$ (1)(2)	STR.											
F___01		DESIGNER (2)		IA-0.667		$\{\frac{LA-0.50}{\text{REQ. SPA. (DESIGNER)}}+0.99\}+1$ (1)(2)	STR.											
F502	5			LA-0.667		$\{\frac{IA-0.667}{1.50}+0.99\}+1$ (1)(6)	STR.										1.043	
F403	4		2.25			$(\{\frac{IA-0.667}{3.00}+0.99\}+1)(\{\frac{LA-0.5}{3.0}+0.99\}+1)$ (1)	②	0.375	1.5	0.375	0.250						0.668	
F504	5		3.50			$\{\frac{EC-0.25}{1.50}+0.99\}+1$ (1)	STR.										1.043	
F505	5		3.50			$\{\frac{ED-0.25}{1.50}+0.99\}+1$ (1)	STR.										1.043	
EF___06		DESIGNER (2)		HB+1.667+A FOR "A" VARIABLE SEE TABLE 1		$\{\frac{EC-1.00(TAN(AA))-0.25}{\text{REQ. SPA. (DESIGNER)}}+0.99\}+1$ (1)(2)	①							SEE TABLE 1 (B = HB + 1.667)				
EF___07		DESIGNER (2)		HB+1.667+A FOR "A" VARIABLE SEE TABLE 1		$\{\frac{ED-1.00(TAN(AB))-0.25}{\text{REQ. SPA. (DESIGNER)}}+0.99\}+1$ (1)(2)	①							SEE TABLE 1 (B = HB + 1.667)				
F___20		DESIGNER (2)		JA-0.667		$\{\frac{MB-0.50}{\text{REQ. SPA. (DESIGNER)}}+0.99\}+1$ (1)(2)	STR.											
F___21		DESIGNER (2)		JA-0.667		$\{\frac{MB-0.50}{\text{REQ. SPA. (DESIGNER)}}+0.99\}+1$ (1)(2)	STR.											
F522	5			MB-0.667		$\{\frac{JA-0.667}{1.50}+0.99\}+1$ SHOW ON DRAWINGS (1)(6)	STR.										1.043	
F423	4		2.25			$(\{\frac{JA-0.667}{3.00}+0.99\}+1)(\{\frac{MB-0.50}{3.00}+0.99\}+1)$ (1)	②	0.375	1.5	0.375	0.250						0.668	
F524	5		3.50			$\{\frac{AC-0.50}{1.50}+0.99\}+1$ (1)	STR.										1.043	
EF___25		DESIGNER (2)		FD+1.667+A FOR "A" VARIABLE SEE TABLE 1		$\{\frac{AC-0.50}{\text{REQ. SPA. (DESIGNER)}}+0.99\}+1$ (1)(2)	①							SEE TABLE 1 (B = FD + 1.667)				
F___30		DESIGNER (2)		KA-0.667		$\{\frac{NB-0.50}{\text{REQ. SPA. (DESIGNER)}}+0.99\}+1$ (1)(2)	STR.											
F___31		DESIGNER (2)		KA-0.667		$\{\frac{NB-0.50}{\text{REQ. SPA. (DESIGNER)}}+0.99\}+1$ (1)(2)	STR.											
F532	5			NB-0.667		$\{\frac{KA-0.667}{1.50}+0.99\}+1$ SHOW ON DRAWINGS (1)(6)	STR.										1.043	
F433	4		2.25			$(\{\frac{KA-0.667}{3.00}+0.99\}+1)(\{\frac{NB-0.5}{3.00}+0.99\}+1)$ (1)	②	0.375	1.5	0.375	0.250						0.668	
F534	5		3.50			$\{\frac{AD-0.50}{1.50}+0.99\}+1$ (1)	STR.										1.043	
EF___35		DESIGNER (2)		GD+1.667+A FOR "A" VARIABLE SEE TABLE 1		$\{\frac{AD-0.50}{\text{REQ. SPA. (DESIGNER)}}+0.99\}+1$ (1)(2)	①							SEE TABLE 1 (B = GD + 1.667)				

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-56QM 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) x (TOTAL NO. OF BARS) x (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) 180° HOOKS A	J	BAR WEIGHT lb/ft
3	0.417	0.250	0.376
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9	1.250	0.979	3.400
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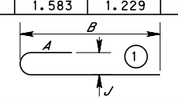


Mark	Description	By	Chk'd	Recm'd	Date
REVISIONS					

S- | SHEET___ OF___

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

DATA ASSEMBLY SHEETS
SPREAD FOOTING ABUTMENT ___

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

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

SHEET 14 OF 20

BLC-561M

CONTROL DIMENSIONS

CODE	DESCRIPTION	SOURCE		VALUE (5)
A1	SKEW ANGLE	A1	(1)	DEG.
A2	% GRADE (LOOKING STATIONS AHEAD)	A2	(1)	%
C1	CURB TO CURB ROADWAY WIDTH (NORMAL)	C1	(1)	
C2	DECK WIDTH OUT TO OUT	C2	(1)	
A	DECK OR LONG. PANEL THICKNESS	USE E1 FOR GLULAM & STEEL BEAM OR E2 FOR LONG. PANEL	(1)	
B	BEAM DEPTH	USE L4 FOR GLULAM BEAM, L5 FOR STEEL BEAM OR ZERO (0) FOR LONG. PANEL	(1)	
C	BEARING PAD THICKNESS	USE N3 OR P3 FOR GLULAM AND STEEL BEAM OR 0.0625 FOR LONG. PANEL	(1)	
AA	WINGWALL "A" SKEW ANGLE	DESIGNER (15°00'00" MIN., 45°00'00" MAX.)	(4)	DEG.
AB	WINGWALL "B" SKEW ANGLE	DESIGNER (15°00'00" MIN., 45°00'00" MAX.)	(4)	DEG.
AC	WINGWALL "A" LENGTH	DESIGNER	(4)	
AD	WINGWALL "B" LENGTH	DESIGNER	(4)	
BA	CHEEKWALL "A"	$0.5+\left(\frac{1.50}{\tan(A1)}\right)+1.50\left(\tan\left(\frac{AA}{2}\right)\right)$		
BB	CHEEKWALL "A"	$1.50\left(\tan\frac{AA}{(2)}\right)$		
CA	CHEEKWALL "B"	$0.5-\left(\frac{1.50}{\tan(A1)}\right)+1.50\left(\tan\left(\frac{AB}{2}\right)\right)$		
IF CA ≥ 6" USE CONDITION 1 EQUATIONS, OTHERWISE USE CONDITION 2 EQUATIONS				
CONDITION 1 EQUATIONS				
CA	CHEEKWALL "B"	AS CALCULATED ABOVE		
CB	CHEEKWALL "B"	$1.50\left(\tan\left(\frac{AB}{2}\right)\right)$		
CC	CHEEKWALL "B"	0.5		
CONDITION 2 EQUATIONS				
CA	CHEEKWALL "B"	0.5		
CB	CHEEKWALL "B"	$\frac{1.5-1.5(\cos(AB))}{\sin(AB)}$		
CC	CHEEKWALL "B"	$0.5+\left(\frac{1.5}{\tan(A1)}\right)-1.5\left(\tan\left(\frac{AB}{2}\right)\right)$		
DA	WINGWALL "A" LENGTH	AC+BB		
DB	WINGWALL "B" LENGTH	AD+CB		
EA	ABUTMENT LENGTH	$\frac{C2+0.0833}{\sin(A1)}$		
EB	ABUTMENT LENGTH	EA+BA+CA		
EC	ABUTMENT LENGTH	$\frac{EA}{2}+BA$		
ED	ABUTMENT LENGTH	$\frac{EA}{2}+CA$		
EE	ABUTMENT LENGTH	$\frac{0.75}{\tan(A1)}$		
FA	WINGWALL "A" HEIGHT	(20) - (15)	(2)	
FB	WINGWALL "A" HEIGHT	(22) - (15)	(2)	
FC	WINGWALL "A" HEIGHT	(20) - (22)	(2)	
FD	WINGWALL REINFORCEMENT PROJECTION	DESIGNER	(3)	
GA	WINGWALL "B" HEIGHT	(30) - (15)	(2)	
GB	WINGWALL "B" HEIGHT	(32) - (15)	(2)	
GC	WINGWALL "B" HEIGHT	(30) - (32)	(2)	
GD	WINGWALL REINFORCEMENT PROJECTION	DESIGNER	(3)	
HA	HEIGHT OF FINISH GRADE CHAMFER (ABUTMENT)	(16) - (15)	(2)	
HB	REAR FACE REINFORCEMENT PROJECTION (ABUTMENT)	DESIGNER	(3)	
IA	ABUTMENT FOOTING WIDTH	DESIGNER	(3)	
IB	ABUTMENT FOOTING WIDTH	DESIGNER	(3)	
IC	ABUTMENT FOOTING WIDTH	IA-IB		
JA	WINGWALL "A" FOOTING WIDTH	DESIGNER	(3)	
JB	WINGWALL "A" FOOTING WIDTH	DESIGNER	(3)	
JC	WINGWALL "A" FOOTING WIDTH	JA-JB		
KA	WINGWALL "B" FOOTING WIDTH	DESIGNER	(3)	
KB	WINGWALL "B" FOOTING WIDTH	DESIGNER	(3)	
KC	WINGWALL "B" FOOTING WIDTH	KA-KB		
LA	ABUTMENT FOOTING LENGTH	$EB-\frac{IB}{\tan(AA)}+\frac{JB}{\sin(AA)}-\frac{IB}{\tan(AB)}+\frac{KB}{\sin(AB)}$		
LB	ABUTMENT FOOTING LENGTH	$EB-\frac{IC}{\tan(AA)}+\frac{JC}{\sin(AA)}-\frac{IC}{\tan(AB)}+\frac{KC}{\sin(AB)}$		
MA	WINGWALL "A" FOOTING LENGTH	$\frac{IB}{\sin(AA)}-\frac{JB}{\tan(AA)}$		
MB	WINGWALL "A" FOOTING LENGTH	$DA+\frac{IB}{\sin(AA)}-\frac{JB}{\tan(AA)}$		
MC	WINGWALL "A" FOOTING LENGTH	$DA+\frac{JC}{\tan(AA)}-\frac{IC}{\sin(AA)}$		
NA	WINGWALL "B" FOOTING LENGTH	$\frac{IB}{\sin(AB)}-\frac{KB}{\tan(AB)}$		
NB	WINGWALL "B" FOOTING LENGTH	$DB+\frac{IB}{\sin(AB)}-\frac{KB}{\tan(AB)}$		
NC	WINGWALL "B" FOOTING LENGTH	$DB+\frac{KC}{\tan(AB)}-\frac{IC}{\sin(AB)}$		

CONTROL DIMENSIONS

CODE	DESCRIPTION	SOURCE		VALUE (5)
OA	ABUTMENT TOE TO FIRST ROW	DESIGNER		
OB	ABUTMENT HEEL TO LAST ROW	DESIGNER		
OC	C/C OF PILE ROWS (ABUTMENT)	$\frac{IA-OA-OB}{2}$		
OD	ABUTMENT PILE BATTER VERTICAL COMPONENT	DESIGNER		
PA	ABUTMENT TO CENTERLINE OF PILE IN FRONT ROW	DESIGNER		
PB	NUMBER OF PILES IN FRONT ROW (ABUTMENT)	DESIGNER	(3)	
PC	C/C OF PILES IN FRONT ROW (ABUTMENT)	$\frac{LA-2(PA)}{PB-1}$		
QA	ABUTMENT TO CENTERLINE OF PILES IN REAR ROWS	DESIGNER		
QB	NUMBER OF PILES IN REAR ROW (ABUTMENT)	DESIGNER	(3)	
QC	C/C OF PILES IN REAR ROWS (ABUTMENT)	$\frac{LB-2(QA)}{QB-1}$		
RA	WINGWALL "A" TOE TO FIRST ROW	DESIGNER		
RB	WINGWALL "A" HEEL TO LAST ROW	DESIGNER		
RC	C/C OF PILE ROWS (WINGWALL "A")	JA-RA-RB		
RD	WINGWALL "A" PILE BATTER VERTICAL COMPONENT	DESIGNER		
SA	WINGWALL "A" TO CENTERLINE OF PILE IN FRONT ROW	DESIGNER		
SB	NUMBER OF PILES IN FRONT ROW (WINGWALL "A")	DESIGNER	(3)	
SC	C/C OF PILES IN FRONT ROW (WINGWALL "A")	$\frac{MB-SA-1.50}{SB-1}$		
TA	WINGWALL"A" TO CENTERLINE OF PILE IN REAR ROW	DESIGNER		
TB	NUMBER OF PILES IN REAR ROW (ABUTMENT)	DESIGNER	(3)	
TC	C/C OF PILES IN REAR ROW (WINGWALL "A")	$\frac{MC-TA-1.50}{TB-1}$		
UA	WINGWALL "B" TOE TO FIRST ROW	DESIGNER		
UB	WINGWALL "B" HEEL TO LAST ROW	DESIGNER		
UC	C/C OF PILE ROWS (WINGWALL "B")	KA-UA-UB		
UD	WINGWALL "B" PILE BATTER VERTICAL COMPONENT	DESIGNER		
VA	WINGWALL "B" TO CENTERLINE OF PILE IN FRONT ROW	DESIGNER		
VB	NUMBER OF PILES IN FRONT ROW (WINGWALL "B")	DESIGNER	(3)	
VC	C/C OF PILES IN FRONT ROW (WINGWALL "B")	$\frac{NB-VA-1.50}{VB-1}$		
WA	WINGWALL"B" TO CENTERLINE OF PILE IN REAR ROW	DESIGNER		
WB	NUMBER OF PILES IN REAR ROW (ABUTMENT)	DESIGNER	(3)	
WC	C/C OF PILES IN REAR ROW (WINGWALL "A")	$\frac{NC-WA-1.50}{WB-1}$		
XA	PILE DESIGNATION	DESIGNER		

FOOTNOTES FOR TABLES

(1) SEE APPROPRIATE SUPERSTRUCTURE DATA ASSEMBLY SHEETS (BLC-561M SHEETS 1 THRU 10).

(2) SEE BLC-561M SHEET 16 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. THIS STANDARD IS SET UP FOR THREE PILE ROWS AT ABUTMENTS (FRONT TWO ROWS BOTH BATTERED OR BOTH VERTICAL) AND TWO PILE ROWS AT WINGWALLS (FRONT ROW BATTERED OR VERTICAL). IF A DIFFERENT PILE CONFIGURATION IS CHOSEN, THEN BLC-567M IS NOT APPLICABLE.

(4) SEE BLC-561M SHEET 16 FOR WINGWALL EXAMPLE.

(5) SHOW ALL VALUES IN FEET AND INCHES UNLESS NOTED OTHERWISE.

Mark	Description	By	Chk'd	Recm'd	Date

REVISIONS

S-

SHEET ___ OF ___

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

DATA ASSEMBLY SHEETS
PILE SUPPORTED ABUTMENT ___

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

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

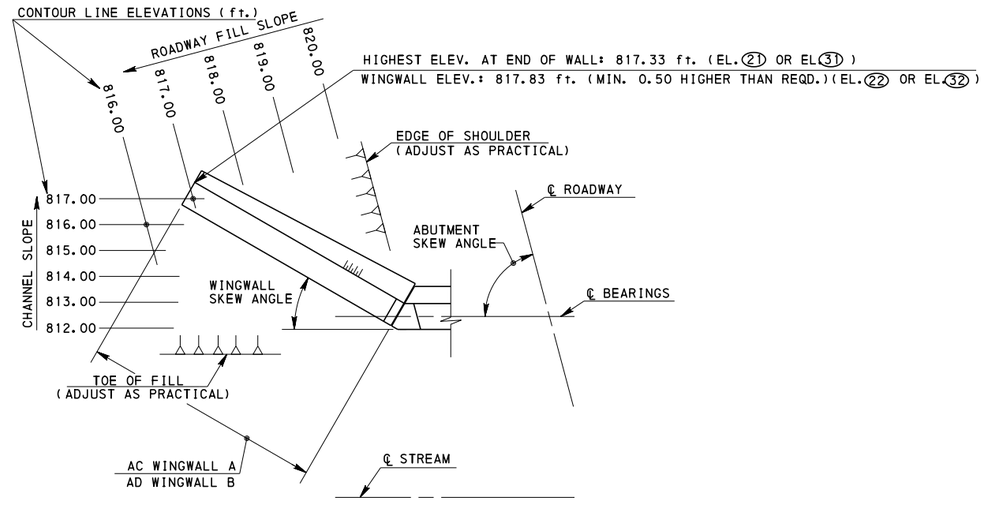
SHEET 15 OF 20

BLC-561M

CONTROL STATIONS AND ELEVATIONS

CODE	DESCRIPTION	SOURCE		VALUE (2)
⑩	ABUTMENT ELEVATION	USE ① FOR ABUT. 1, OR ② FOR ABUT. 2 (1)		
⑪	ABUTMENT ELEVATION	⑩ - (0.125 + $\frac{C1}{2}$ (0.02) + A + B + C + 0.0417)		
⑫	ABUTMENT ELEVATION	⑪ - $\frac{A2}{100}$ ($\frac{EA}{2}$ (COS(A1)))	ABUTMENT 1	
	(USE APPROPRIATE EQUATION DEPENDING ON ABUTMENT NO.)	⑪ + $\frac{A2}{100}$ ($\frac{EA}{2}$ (COS(A1)))	ABUTMENT 2	
⑬	ABUTMENT ELEVATION	⑪ + $\frac{A2}{100}$ ($\frac{EA}{2}$ (COS(A1)))	ABUTMENT 1	
	(USE APPROPRIATE EQUATION DEPENDING ON ABUTMENT NO.)	⑪ - $\frac{A2}{100}$ ($\frac{EA}{2}$ (COS(A1)))	ABUTMENT 2	
⑭	BOTTOM OF FOOTING ELEVATION	DESIGNER		
⑮	TOP OF FOOTING ELEVATION	⑭ + 2.50		
⑯	F.G.E./TOP OF SCOUR PROTECTION	DESIGNER (SEE DM-4, PART A, CHAPTER 7 FOR SCOUR REQ.)		
⑰	ABUTMENT PILE TIP ELEV.	DESIGNER		
⑳	WINGWALL "A" ELEVATION	⑩ - ($\frac{A2}{100}$ ($\frac{EA}{2}$ (COS(A1))) - $\frac{C1}{2}$ (0.02) + 0.50)	ABUTMENT 1	
	(USE APPROPRIATE EQUATION DEPENDING ON ABUTMENT NO.)	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)		
㉒	WINGWALL "A" ELEVATION	㉑ + 0.50		
㉓	WINGWALL "A" PILE TIP ELEV.	DESIGNER		
㉚	WINGWALL "B" ELEVATION	⑩ + ($\frac{A2}{100}$ ($\frac{EA}{2}$ (COS(A1))) - $\frac{C1}{2}$ (0.02) + 0.50)	ABUTMENT 1	
	(USE APPROPRIATE EQUATION DEPENDING ON ABUTMENT NO.)	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)		
㉜	WINGWALL "B" ELEVATION	㉛ + 0.50		
㉝	WINGWALL "B" PILE TIP ELEV.	DESIGNER		

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

QUANTITIES

ITEM		QUANTITY FORMULA	UNIT	SUBTOTAL	TOTAL
CLASS 3 EXCAVATION		DESIGNER	C.Y.		
CHEEKWALL A	CLASS AA CEMENT CONCRETE	(BB + 0.5 + $\frac{BA-0.5-BB}{2}$) 1.50 (⑳ - ⑫) ($\frac{1YD^3}{27ft^3}$)	C.Y.		
CHEEKWALL B		(CB + 0.50 + $\frac{0.50+CB-CA}{2}$) 1.50 (㉚ - ⑬) ($\frac{1YD^3}{27ft^3}$) CONDITION 1	C.Y.		
		(2(CB) - 0.50 + $\frac{CC+CB-0.50}{2}$) 1.50 (㉚ - ⑬) ($\frac{1YD^3}{27ft^3}$) CONDITION 2	C.Y.		
ABUTMENT	CLASS A CEMENT CONCRETE	[1.5 (⑪ - ⑮) + ($\frac{1}{2}$)($\frac{1}{10}$)(⑪ - ⑮)^2] (EB) ($\frac{1YD^3}{27ft^3}$)	C.Y.		
WINGWALL A		[1.5 (㉒ + $\frac{⑳ - ㉒}{2}$ - ⑮) + ($\frac{1}{2}$)($\frac{1}{10}$) (㉒ + $\frac{⑳ - ㉒}{2}$ - ⑮)^2] (AC) ($\frac{1YD^3}{27ft^3}$)	C.Y.		
WINGWALL B		[1.5 (㉜ + $\frac{㉚ - ㉜}{2}$ - ⑮) + ($\frac{1}{2}$)($\frac{1}{10}$) (㉜ + $\frac{㉚ - ㉜}{2}$ - ⑮)^2] (AD) ($\frac{1YD^3}{27ft^3}$)	C.Y.		
FOOTING		($\frac{1}{2}$)(2.50)((LA+LB)(IA) + (MB+MC)(JA) + (NB+NC)(KA)) ($\frac{1YD^3}{27ft^3}$)	C.Y.		
SELECTED BORROW EXCAVATION, STRUCTURE BACKFILL		DESIGNER	C.Y.		
NO. 57 COARSE AGGREGATE		6 WEEPHOLES ($\frac{1/2\ C.Y.}{WEEPHOLE}$)	C.Y.	3.0	3.0
REINFORCEMENT BARS		DESIGNER - CALCULATE BAR WEIGHT FROM SHEETS 37 & 38 OF BLC-561M	lb		
REINFORCEMENT BARS, EPOXY COATED		DESIGNER - CALCULATE BAR WEIGHT FROM SHEETS 37 & 38 OF BLC-561M	lb		
ABUTMENT	BEARING PILES	(PB+QB)(⑭ + 1.00 - ⑰)($\frac{(OD^2+1)^{0.5}}{OD}$) + QB (⑭ + 1.00 - ⑰)	L.F.		
WINGWALL A		SB (⑭ + 1.00 - ㉓)($\frac{(RD^2+1)^{0.5}}{RD}$) + TB (⑭ + 1.00 - ㉓)	L.F.		
WINGWALL B		VB (⑭ + 1.00 - ㉝)($\frac{(UD^2+1)^{0.5}}{UD}$) + WB (⑭ + 1.00 - ㉝)	L.F.		
PILE TIP REINFORCEMENT		PB+2(QB)+SB+TB+VB+WB	EA		

FOOTNOTES FOR TABLES

(1) SEE APPROPRIATE SUPERSTRUCTURE DATA ASSEMBLY SHEETS (BLC-561M SHEETS 1 THRU 10).

(2) SHOW ALL VALUES IN FEET. USE DECIMAL NOTATION TO ACCURACY OF 0.01 FT.

Mark	Description	By	Chk'd	Recm'd	Date
REVISIONS					

S- | SHEET__ OF__

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

DATA ASSEMBLY SHEETS
PILE SUPPORTED ABUTMENT ___

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CHIEF BRIDGE ENGINEER

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ACTING DIR., BUR. OF PROJECT DELIVERY

SHEET 16 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_____ TO _____	(⑫ - ⑮) -0.1667 (⑪ - ⑮) -0.1667		$\{\frac{EC-0.25}{1.50}+0.99\}+1$ (1)	STR.								VARIES BY____	$\frac{(⑪ - ⑫)}{NO.\ OF\ BARS}$	1.043	
A501	5		FROM_____ TO _____	(⑪ - ⑮) -0.1667 (⑬ - ⑮) -0.1667		$\{\frac{ED-0.25}{1.50}+0.99\}+1$ (1)	STR.								VARIES BY____	$\frac{(⑬ - ⑪)}{NO.\ OF\ BARS}$	1.043	
A__02		DESIGNER (2)	FROM_____ TO _____	(⑫ - ⑮) -0.1667 (⑪ - ⑮) -0.1667		$\{\frac{EC-1.00(TAN(AA))-0.25}{REQ.\ SPA.\ (DESIGNER)}+0.99\}+1$ (1)(2)	STR.								VARIES BY____	$\frac{(⑪ - ⑫)}{NO.\ OF\ BARS}$		
A__03		DESIGNER (2)	FROM_____ TO _____	(⑪ - ⑮) -0.1667 (⑬ - ⑮) -0.1667		$\{\frac{ED-1.00(TAN(AA))-0.25}{REQ.\ SPA.\ (DESIGNER)}+0.99\}+1$ (1)(2)	STR.								VARIES BY____	$\frac{(⑬ - ⑪)}{NO.\ OF\ BARS}$		
A504	5			EC+1.75		$\left\{\frac{(⑪+\lvert⑪ - ⑬\rvert - ⑮)-2.00}{1.50}+0.99\right\}+1$ (2)(3)	STR.										1.043	
A505	5			ED-0.1667		SAME AS A504	STR.										1.043	
A506	5			EC-1.00(TAN(AA))+1.75		SAME AS A504	STR.										1.043	
A507	5			ED-1.00(TAN(AB))-0.1667		SAME AS A504	STR.										1.043	
A508	5			$\sqrt{(⑪ - ⑫)^2+(EC)^2}+1.75$	1		STR.										1.043	
A509	5			$\sqrt{(⑬ - ⑪)^2+(ED)^2}-0.1667$	1		STR.										1.043	
A510	5			$\sqrt{(⑪ - ⑫)^2+(EC-1.00(TAN(AA)))^2}+1.75$	1		STR.										1.043	
A511	5			$\sqrt{(⑬ - ⑪)^2+(ED-1.00(TAN(AB)))^2}-0.1667$	1		STR.										1.043	
EA312	3			$(BA-0.125)+2.50+\left(\frac{1.50}{SIN(AT)}-0.25\right)$		$\left\{\frac{(⑳ - ⑫)-0.3333}{0.8333}+0.99\right\}+1$ (1)	STR.								BEND IN FIELD		0.376	
EA313	3			$(CA-.125)+(CC-0.25)+2.25+\left(\frac{1.50}{SIN(AT)}-0.25\right)$		$\left\{\frac{(㉚ - ⑬)-0.3333}{0.8333}+0.99\right\}+1$ (1)	STR.								BEND IN FIELD		0.376	
EA514	5			(⑳ - ⑫)+1.50		USE 6 BARS FOR 90° SKEWS, AND 7 BARS ALL OTHER SKEWS	STR.										1.043	
EA515	5			(㉚ - ⑬)+1.50	6		STR.										1.043	
A516	5		4.25			$\{\frac{NO.\ OF\ BARS\ FROM\ A\_\_02+1}{2}\}$ (1)	③	1.583	1.083	1.583			0.167				1.043	
A517	5		4.25			$\{\frac{NO.\ OF\ BARS\ FROM\ A\_\_03+1}{2}\}$ (1)	③	1.583	1.083	1.583			0.167				1.043	
A518	5		1.00		32		STR.										1.043	
W520	5		FROM_____ TO _____	FB-0.1667 FA-0.1667		$\{\frac{FB-0.50}{1.50}+0.99\}+1$ (1)	STR.								VARIES BY____	$\frac{FC}{NO.\ OF\ BARS}$	1.043	
W__21		DESIGNER (2)	FROM_____ TO _____	FB-0.1667 FA-0.1667		$\{\frac{AC-0.50}{REQ.\ SPA.\ (DESIGNER)}+0.99\}+1$ (1)(2)	STR.								VARIES BY____	$\frac{FC}{NO.\ OF\ BARS}$		
W522	5			AC-0.3333		$\{\frac{FB-0.50}{1.50}+0.99\}+1$ SHOW ON DRAWINGS (1)(6)	STR.										1.043	
W523	5		FROM_____ TO _____	$\frac{(FC-1.25)(AC-0.3333)}{FC}$ $\frac{1.00(AC-0.3333)}{FC}$		$\{\frac{FC-2.25}{1.50}\}+1$ SHOW ON DRAWINGS (1)(6)	STR.								VARIES BY____	$\frac{(LENGTH\ FROM\ \_\_\_\_\_) - (LENGTH\ TO\_\_\_\_\_)}{NO.\ OF\ BARS\ SHOWN\ ON\ DRAWINGS}$	1.043	

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 | | .

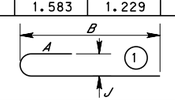
(4) USE TABLE 1 ON THIS SHEET TO COMPLETE BAR WEIGHT QUANTITIES.

(5) TOTAL BAR WEIGHT = (BAR LENGTH OR AVERAGE BAR LENGTH) x (TOTAL NO. OF BARS) x (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) 180° HOOKS A	J	BAR WEIGHT lb/ft
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	Recm'd	Date
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S- | SHEET___ OF___

COMMONWEALTH OF PENNSYLVANIA
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SHEET 17 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)
W524	5			$\sqrt{FC^2+AC^2}-0.333$	1	SHOW ON DRAWINGS	STR.										1.043	
					2	SHOW ON BAR SCHEDULE												
W525	5		4.25			$\{\frac{\text{NO. OF BARS FROM W\_\_ 21+1}}{2}\}$ (1)	③	1.583	1.083	1.583			0.167				1.043	
W526	5		1.00		8		STR.										1.043	
W530	5		FROM _____ TO _____	GB-0.167 GA-0.167		$\{\frac{AD-0.50}{1.50}+0.99\}+1$ (1)	STR.								VARIES BY___	$\frac{GC}{\text{NO. OF BARS}}$	1.043	
W__31		DESIGNER (2)	FROM _____ TO _____	GB-0.167 GA-0.167		$\{\frac{AD-0.50}{\text{REQ. SPA. (DESIGNER)}}+0.99\}+1$ (1)(2)	STR.								VARIES BY___	$\frac{GC}{\text{NO. OF BARS}}$		
W532	5			AD-0.333		$\{\frac{GB-0.50}{1.50}\}+1$ SHOW ON DRAWINGS (1)(6)	STR.										1.043	
W533	5		FROM _____ TO _____	$\frac{(GC-1.25)(AD-0.333)}{GC}$ $\frac{1.00(AD-0.333)}{GC}$		$\{\frac{GC-2.25}{1.50}\}+1$ SHOW ON DRAWINGS (1)(6)	STR.								VARIES BY___	$\frac{(\text{LENGTH FROM \_\_\_\_\_}) - (\text{LENGTH TO\_\_\_\_\_})}{\text{NO. OF BARS SHOWN ON DRAWINGS}}$	1.043	
W534	5			$\sqrt{GC^2+AD^2}-0.333$	1	SHOW ON DRAWINGS	STR.										1.043	
					2	SHOW ON BAR SCHEDULE												
W535	5		4.25			$\{\frac{\text{NO. OF BARS FROM W\_\_ 31+1}}{2}\}$ (1)	③	1.583	1.083	1.583			0.167				1.043	
W536	5		1.00		8		STR.										1.043	
F__00		DESIGNER (2)		IA-0.667		$\{\frac{LA-0.50}{\text{REQ. SPA. (DESIGNER)}}+0.99\}+1$ (1)(2)	STR.											
F__01		DESIGNER (2)		IA-0.667		$\{\frac{LA-0.50}{\text{REQ. SPA. (DESIGNER)}}+0.99\}+1$ (1)(2)	STR.											
F502	5			LA-0.667		$\{\frac{IA-0.667}{1.50}+0.99\}+1$ SHOW ON DRAWINGS (1)(6)	STR.										1.043	
F403	4		2.75			$(\{\frac{IA-0.667}{3.00}+0.99\}+1)(\{\frac{LA-0.50}{3.00}+0.99\}+1)$ (1)	②	0.375	2.00	0.375	0.250						0.668	
F504	5		4.00			$\{\frac{EC-0.25}{1.50}+0.99\}+1$ (1)	STR.										1.043	
F505	5		4.00			$\{\frac{ED-0.25}{1.50}+0.99\}+1$ (1)	STR.										1.043	
EF__06		DESIGNER (2)		HB+2.167+A FOR "A" VARIABLE SEE TABLE 1		$\{\frac{EC-1.00(TAN(AB))-0.25}{\text{REQ. SPA. (DESIGNER)}}+0.99\}+1$ (1)(2)	①							SEE TABLE 1 (B=HB+2.167)				
EF__07		DESIGNER (2)		HB+2.167+A FOR "A" VARIABLE SEE TABLE 1		$\{\frac{ED-1.00(TAN(AB))-0.25}{\text{REQ. SPA. (DESIGNER)}}+0.99\}+1$ (1)(2)	①							SEE TABLE 1 (B=HB+2.167)				
F__20		DESIGNER (2)		JA-0.667		$\{\frac{MB-0.50}{\text{REQ. SPA. (DESIGNER)}}+0.99\}+1$ (1)(2)	STR.											
F__21		DESIGNER (2)		JA-0.667		$\{\frac{MB-0.50}{\text{REQ. SPA. (DESIGNER)}}+0.99\}+1$ (1)(2)	STR.											
F522	5			MB-0.667		$\{\frac{JA-0.667}{1.50}+0.99\}+1$ SHOW ON DRAWINGS (1)(6)	STR.										1.043	
F423	4		2.75			$(\{\frac{JA-0.667}{3.00}+0.99\}+1)(\{\frac{MB-0.50}{3.00}+0.99\}+1)$ (1)	②	0.375	2.00	0.375	0.250						0.668	
F524	5		4.00			$\{\frac{AC-0.50}{1.50}+0.99\}+1$ (1)	STR.										1.043	
EF__25		DESIGNER (2)		FD+2.167+A FOR "A" VARIABLE SEE TABLE 1		$\{\frac{AC-0.50}{\text{REQ. SPA. (DESIGNER)}}+0.99\}+1$ (1)(2)	①							SEE TABLE 1 (B=FD+2.167)				
F__30		DESIGNER (2)		KA-0.667		$\{\frac{NB-0.50}{\text{REQ. SPA. (DESIGNER)}}+0.99\}+1$ (1)(2)	STR.											
F__31		DESIGNER (2)		KA-0.667		$\{\frac{NB-0.50}{\text{REQ. SPA. (DESIGNER)}}+0.99\}+1$ (1)(2)	STR.											
F532	5			NB-0.667		$\{\frac{KA-0.667}{1.50}+0.99\}+1$ SHOW ON DRAWINGS (1)(6)	STR.										1.043	
F433	4		2.75			$(\{\frac{KA-0.667}{3.00}+0.99\}+1)(\{\frac{NB-0.50}{3.00}+0.99\}+1)$ (1)	②	0.375	2.00	0.375	0.250						0.668	
F534	5		4.00			$\{\frac{AD-0.50}{1.50}+0.99\}+1$ (1)	STR.										1.043	
EF__35		DESIGNER (2)		GD+2.167+A FOR "A" VARIABLE SEE TABLE 1		$\{\frac{AD-0.50}{\text{REQ. SPA. (DESIGNER)}}+0.99\}+1)$ (1)(2)	①							SEE TABLE 1 (B=GD+2.167)				

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) x (TOTAL NO. OF BARS) x (BAR WEIGHT)

(6) SHOW TWICE THIS NUMBER ON THE BAR SCHEDULE (TOTAL NO. OF BARS)

TABLE 1
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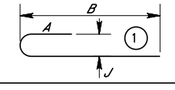

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BLC-561M

CONTROL DIMENSIONS

CODE	DESCRIPTION		SOURCE		VALUE(5)	
A1	SKEW ANGLE		A1	(1)		DEG.
A2	% GRADE (LOOKING STATIONS AHEAD)		A2	(1)		%
C1	CURB TO CURB ROADWAY WIDTH (NORMAL)		C1	(1)		
C2	DECK WIDTH OUT TO OUT		C2	(1)		
A	DECK OR LONG. PANEL THICKNESS		USE E1 FOR GLULAM & STEEL BEAM OR E2 FOR LONG. PANEL	(1)		
B	BEAM DEPTH		USE L4 FOR GLULAM BEAM, L5 FOR STEEL BEAM OR ZERO (0) FOR LONG. PANEL	(1)		
C	BEARING PAD THICKNESS		USE N3 OR P3 FOR GLULAM AND STEEL BEAM OR 0.0625 FOR LONG. PANEL	(1)		
AA	WINGWALL "A" SKEW ANGLE		DESIGNER (15°00′00" MIN., 45°00′00" MAX.)	(2)		DEG.
AB	WINGWALL "B" SKEW ANGLE		DESIGNER (15°00′00" MIN., 45°00′00" MAX.)	(2)		DEG.
AC	WINGWALL "A" LENGTH		DESIGNER	(2)		
AD	WINGWALL "B" LENGTH		DESIGNER	(2)		
BA	WINGWALL "A" CORNER DIMENSIONS		$1.00+\left(\frac{1.50}{TAN(A1)}\right)+1.50\left(TAN\left(\frac{AA}{2}\right)\right)$			
BB	WINGWALL "A" CORNER DIMENSIONS		$1.50\left(TAN\left(\frac{AA}{2}\right)\right)+\left(\frac{0.25}{TAN(AA)}\right)+0.333(COS(AA))$			
CA	WINGWALL "B" CORNER DIMENSIONS		$1.00-\left(\frac{1.50}{TAN(A1)}\right)+1.50\left(TAN\left(\frac{AB}{2}\right)\right)$			
IF CA ≥ 6" USE CONDITION 1 EQUATIONS, OTHERWISE USE CONDITION 2 EQUATIONS						
CONDITION 1 EQUATIONS						
CA	WINGWALL "B" CORNER DIMENSIONS		AS CALCULATED ABOVE			
CB	WINGWALL "B" CORNER DIMENSIONS		$1.50\left(TAN\left(\frac{AB}{2}\right)\right)+\left(\frac{0.25}{TAN(AB)}\right)+0.333(COS(AB))$			
CC	WINGWALL "B" CORNER DIMENSIONS		1.00			
CONDITION 2 EQUATIONS						
CA	WINGWALL "B" CORNER DIMENSIONS		1.00			
CB	WINGWALL "B" CORNER DIMENSIONS		$1.50\left(TAN\left(\frac{AB}{2}\right)\right)+\left(\frac{0.25}{TAN(AB)}\right)+0.333(COS(AB))$			
CC	WINGWALL "B" CORNER DIMENSIONS		$1.00+\left(\frac{1.50}{TAN(A1)}\right)-1.50\left(TAN\left(\frac{AB}{2}\right)\right)$			
DA	WINGWALL "A" OUT TO OUT PILE DIMENSION	TIMBER PILE ABUT.	$AC-0.5+\left(\frac{1.00}{TAN(AA)}\right)-\left(\frac{0.833}{TAN(AA)}\right)$			
DB	WINGWALL "B" OUT TO OUT PILE DIMENSION	TIMBER PILE ABUT.	$AD-0.5+\left(\frac{1.00}{TAN(AB)}\right)-\left(\frac{0.833}{TAN(AB)}\right)$			
EA	ABUTMENT LENGTH	TIMBER PILE ABUT.	$1.00+1.00(TAN(AA))-\left(\frac{1.00}{SIN(AA)\,COS(AA)}\right)+\left(\frac{0.833}{TAN(AA)}\right)$			
EB	ABUTMENT LENGTH	TIMBER PILE ABUT.	$CC+1.00(TAN(AB))-\left(\frac{1.00}{SIN(AB)\,COS(AB)}\right)+\left(\frac{0.833}{TAN(AB)}\right)$			
DA	WINGWALL "A" OUT TO OUT PILE DIMENSION	STEEL PILE ABUT.	$AC-0.50+\left(\frac{1.030}{SIN(AA)}\right)-\left(\frac{DC}{TAN(AA)}\right)-\left(\frac{0.653}{TAN(AA)}\right)$			
DB	WINGWALL "B" OUT TO OUT PILE DIMENSION	STEEL PILE ABUT.	$AD-0.50+\left(\frac{1.030}{SIN(AB)}\right)-\left(\frac{DD}{TAN(AB)}\right)-\left(\frac{0.653}{TAN(AB)}\right)$			
DC	WINGWALL "A" PILE OFFSET	STEEL PILE ABUT.	$0.584(COS(46.1-AA))-0.404$			
DD	WINGWALL "B" PILE OFFSET	STEEL PILE ABUT.	$0.584(COS(46.1-AB))-0.404$			
EA	ABUTMENT LENGTH	STEEL PILE ABUT.	$1.00+1.00(TAN(AA))-\left(\frac{1.00}{SIN(AA)\,COS(AA)}\right)+\left(\frac{DC}{SIN(AA)}\right)+\left(\frac{0.653}{SIN(AA)}\right)$			
EB	ABUTMENT LENGTH	STEEL PILE ABUT.	$CC+1.00(TAN(AB))-\left(\frac{1.00}{SIN(AB)\,COS(AB)}\right)+\left(\frac{DD}{SIN(AB)}\right)+\left(\frac{0.653}{SIN(AB)}\right)$			
EC	ABUTMENT LENGTH		$\left(\frac{C2}{(2)\,SIN(A1)}\right)+EA$			
ED	ABUTMENT LENGTH		$\left(\frac{C2}{(2)\,SIN(A1)}\right)+EB$			
EE	TIMBER BEARING SILL LENGTH		$\left(\frac{C2}{SIN(A1)}\right)+EA+EB+2.00$			
EF	NUMBER OF PILES (ABUTMENT)		DESIGNER	(3)		
EG	PILE SPACING (ABUTMENT)		$\frac{EF}{EC+ED}$			
FA	NUMBER OF PILES (WINGWALL "A")		DESIGNER	(3)		
FB	PILE SPACING (WINGWALL "A")		$\left(\frac{DA}{FA}\right)$			
GA	NUMBER OF PILES (WINGWALL "B")		DESIGNER	(3)		
GB	PILE SPACING (WINGWALL "B")		$\left(\frac{DB}{GA}\right)$			
HA	CHANGE IN WINGWALL "A" HEIGHT		(⑳ - ㉒)			
HB	CHANGE IN WINGWALL "B" HEIGHT		(㉚ - ㉜)			
IA	WINGWALL "A" SLOPE		$10\left(\frac{HA}{AC}\right)$			
IB	WINGWALL "B" SLOPE		$10\left(\frac{HB}{AD}\right)$			
JA	WINGWALL "A" COPING LENGTH		$\left(\frac{(10^2+IA^2)^{0.5}}{10}\right)(AC+0.50)$			
JB	WINGWALL "B" COPING LENGTH		$\left(\frac{(10^2+IB^2)^{0.5}}{10}\right)(AC+0.50)$			
KA	EXPOSED ABUTMENT HEIGHT		(⑪ - ⑭) - 1.167	(4)		
LA	WINGWALL "A" CAP PLATE LENGTH	STEEL PILE ABUT.	$\left(\frac{(10^2+IA^2)^{0.5}}{10}\right)1.01$			
LB	WINGWALL "B" CAP PLATE LENGTH	STEEL PILE ABUT.	$\left(\frac{(10^2+IB^2)^{0.5}}{10}\right)1.01$			

CONTROL STATIONS AND ELEVATIONS

CODE	DESCRIPTION	SOURCE	VALUE (6)
⑩	ABUTMENT ELEVATION	USE ① FOR ABUT. 1, OR ② FOR ABUT. 2 (1)	
⑪	ABUTMENT ELEVATION	$⑩-\left(0.125+\frac{C1}{2}(0.02)+A+B+C+0.0417\right)$	
⑫	ABUTMENT ELEVATION	$⑪-\frac{A2}{100}\left(\frac{C2}{2(TAN(A1))}\right)$ ABUTMENT 1	
	(USE APPROPRIATE EQUATION DEPENDING ON ABUTMENT NO.)	$⑪+\frac{A2}{100}\left(\frac{C2}{2(TAN(A1))}\right)$ ABUTMENT 2	
⑬	ABUTMENT ELEVATION	$⑪+\frac{A2}{100}\left(\frac{C2}{2(TAN(A1))}\right)$ ABUTMENT 1	
	(USE APPROPRIATE EQUATION DEPENDING ON ABUTMENT NO.)	$⑪-\frac{A2}{100}\left(\frac{C2}{2(TAN(A1))}\right)$ ABUTMENT 2	
⑭	F.G.E./TOP OF SCOUR PROTECTION	DESIGNER (SEE DM-4, PART A, CHAPTER 7 FOR SCOUR REQ.)	
⑮	ABUTMENT PILE TIP ELEVATION	DESIGNER	
⑳	WINGWALL "A" ELEVATION	$⑩-\left(\frac{A2}{100}\left(\frac{C2}{2(TAN(A1))}\right)\right)-\frac{C1}{2}(0.02)+0.50\right)$ ABUTMENT 1	
	(USE APPROPRIATE EQUATION DEPENDING ON ABUTMENT NO.)	$⑩+\left(\frac{A2}{100}\left(\frac{C2}{2(TAN(A1))}\right)\right)-\frac{C1}{2}(0.02)+0.50\right)$ ABUTMENT 2	
㉑	WINGWALL "A" ELEVATION	DESIGNER (SEE WINGWALL EXAMPLE)	
㉒	WINGWALL "A" ELEVATION	㉑+0.50	
㉓	WINGWALL "A" PILE TIP ELEVATION	DESIGNER	
㉚	WINGWALL "B" ELEVATION	$⑩+\left(\frac{A2}{100}\left(\frac{C2}{2(TAN(A1))}\right)\right)-\frac{C1}{2}(0.02)-A\right)$ ABUTMENT 1	
	(USE APPROPRIATE EQUATION DEPENDING ON ABUTMENT NO.)	$⑩-\left(\frac{A2}{100}\left(\frac{C2}{2(TAN(A1))}\right)\right)-\frac{C1}{2}(0.02)-A\right)$ ABUTMENT 2	
㉛	WINGWALL "B" ELEVATION	DESIGNER (SEE WINGWALL EXAMPLE)	
㉜	WINGWALL "B" ELEVATION	㉑+0.50	
㉝	WINGWALL "B" PILE TIP ELEVATION	DESIGNER	

FOOTNOTES FOR TABLES

(1) SEE APPROPRIATE SUPERSTRUCTURE DATA ASSEMBLY SHEETS (BLC-561M SHEETS 1 THRU 10).

(2) SEE BLC-561M SHEET 20 FOR WINGWALL EXAMPLE.

(3) DESIGN PILES IN ACCORDANCE WITH BLC-560M SHEET 2 AND 3.

(4) MAXIMUM EXPOSED ABUTMENT HEIGHT SHALL NOT EXCEED 10′-0".

(5) SHOW ALL VALUES IN FEET AND INCHES UNLESS NOTED OTHERWISE.

(6) SHOW ALL VALUES IN FEET. USE DECIMAL NOTATION TO ACCURACY OF 0.01 FT.

Mark	Description	By	Chk'd	Recm'd	Date
REVISIONS					

S- SHEET ___ OF ___

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

DATA ASSEMBLY SHEETS
PILE SUPPORTED TIMBER SILL
___ PILE ABUTMENT ___

RECOMMENDED APR. 23, 2013
CHIEF BRIDGE ENGINEER

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

SHEET 19 OF 20

BLC-561M

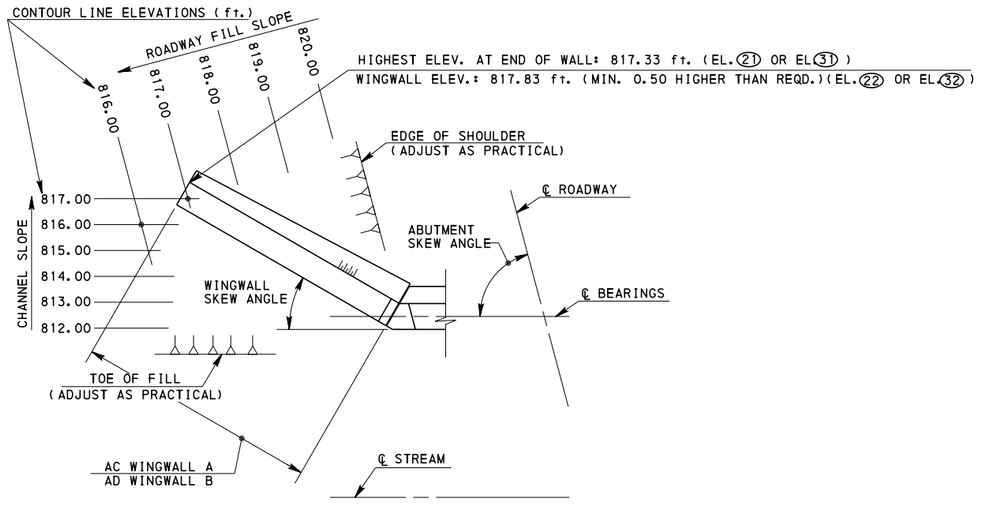
QUANTITIES

ITEM		QUANTITY FORMULA	UNIT	SUBTOTAL	TOTAL
CLASS 3 EXCAVATION		DESIGNER	C.Y.		
TIMBER BEARING SILL		(EE(1.50)(14")) (1)	F.B.M.		
ABUTMENT	PILES	(EF)(⑪-1.167-⑮)	L.F.		
WINGWALL A	PILES	(FA-1)(⅔(HA)+㉒-㉓)	L.F.		
WINGWALL B	PILES	(GA-1)(⅔(HB)+㉜-㉝)	L.F.		
ABUTMENT	TIMBER LAGGING	EE(3")(KA+3.00) (1)	F.B.M.		
WINGWALL A	TIMBER LAGGING	(DA+1.50)(3")(⅔(HA)+㉒-⑭+3.00) (1)	F.B.M.		
WINGWALL B	TIMBER LAGGING	(DB+1.50)(3")(⅔(HB)+㉜-⑭+3.00) (1)	F.B.M.		
WINGWALL A COPING		(5")(1.50)[JA+½(BA+BB+1.00+0.25/TAN(AA)+0.33(COS(AA)))] (1)	F.B.M.		
WINGWALL B COPING		(5")(1.50)[JB+½(CA+CB+CC+0.25/TAN(AB)+0.33(COS(AB)))] (1)	F.B.M.		
SELECTED BORROW EXCAVATION, STRUCTURE BACKFILL		DESIGNER	C.Y.		
PILE TIP REINFORCEMENT		EF+FA+GA-2	EA		

FOOTNOTES FOR TABLE

(1) FOR QUANTITY CALCULATION, TIMBER ELEMENT WIDTH AND LENGTH ARE IN FEET AND ELEMENT DEPTH OR THICKNESS IS IN INCHES, IN ORDER TO OBTAIN FEET BOARD MEASURE.

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

Mark	Description	By	Chk'd	Recm'd	Date
REVISIONS					

S-

SHEET___ OF___

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

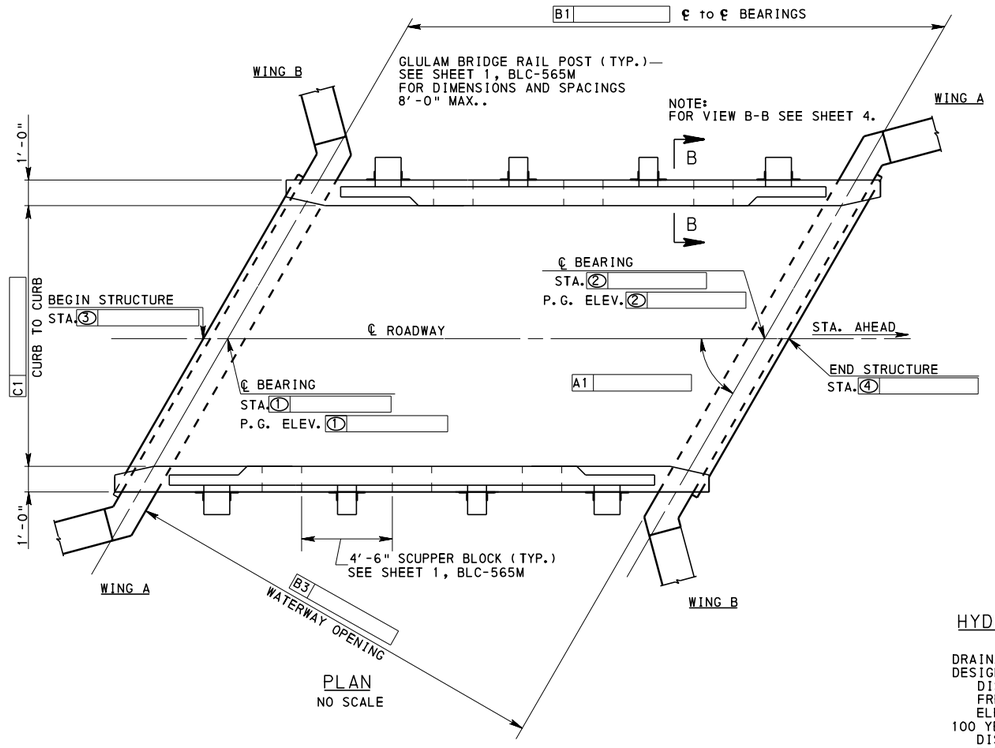
DATA ASSEMBLY SHEETS
PILE SUPPORTED TIMBER SILL
___ PILE ABUTMENT ___

RECOMMENDED APR.23, 2013
CHIEF BRIDGE ENGINEER

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

SHEET 20 OF 20

BLC-561M



PLAN
NO SCALE

HYDRAULIC DATA
(DESIGNER)

DRAINAGE AREA -
DESIGN FLOOD
DISCHARGE -
FREQUENCY -
ELEVATION -
100 YEAR FLOOD
DISCHARGE -
ELEVATION -

INDEX OF DRAWINGS

SHT. NO.	TITLE	SHT. NO.	TITLE

BRIDGE RATING(1)
REFER TO TABLE 2a OR 2b, BLC-561M SHEETS 2 THROUGH 7

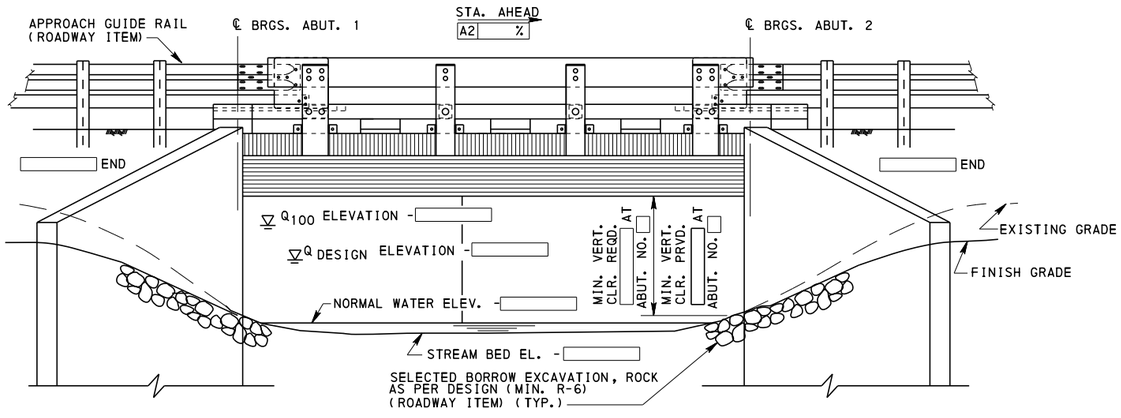
SIMPLE SPAN		GLULAM TIMBER BEAM(2)					
		H	HS	ML	PHL93	TK-527	P82
INVENTORY RATING (IR)	DF						-
	LOCATION						-
	LIMIT STATE	STR. I	STR I	STR. I	STR. I	STR. I	-
	RATING						-
OPERATING RATING (OR)	DF						
	LOCATION						
	LIMIT STATE	STR. II	STR. II	STR. II	STR. IA	STR. II	STR. II
	RATING						

CRITICAL MEMBER INTERIOR
MOMENT CAPACITY - kip-ft. _____
LOCATION _____
SHEAR CAPACITY - kip _____
LOCATION _____

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.



ELEVATION
NO SCALE

Mark	Description	By	Chk'd	Recm'd	Date
	REVISIONS				

S- | SHEET ___ OF ___

Recommended _____
DISTRICT BRIDGE ENGINEER

ENGINEERING SEAL

SIGNATURE & DATE

PREPARED BY:

REFERENCE DRAWING

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

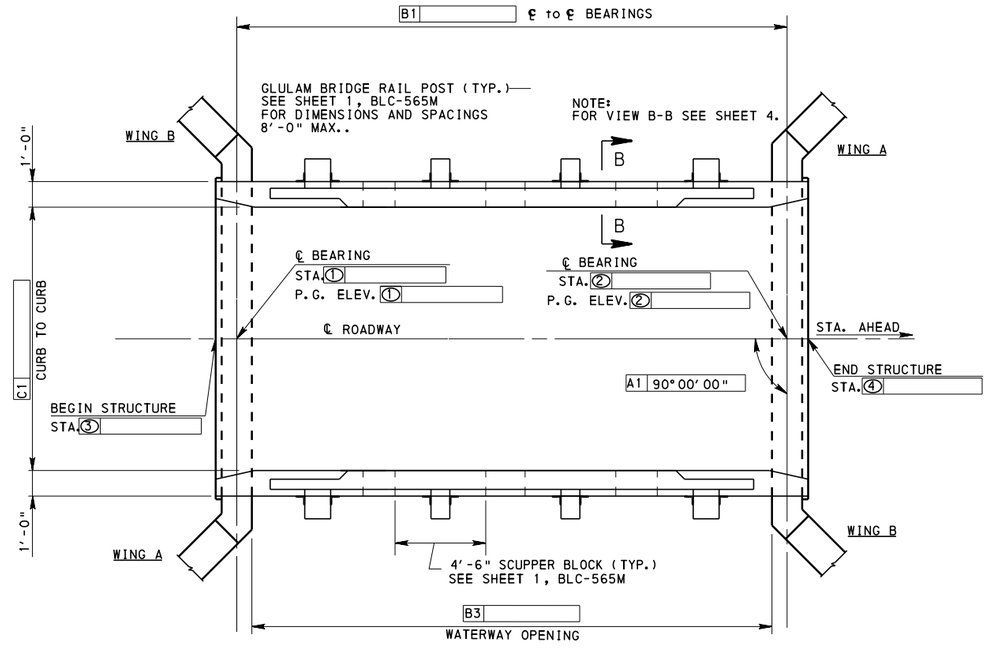
GLULAM BEAM SUPERSTRUCTURE GENERAL PLAN & ELEVATION - LEFT SKEW

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

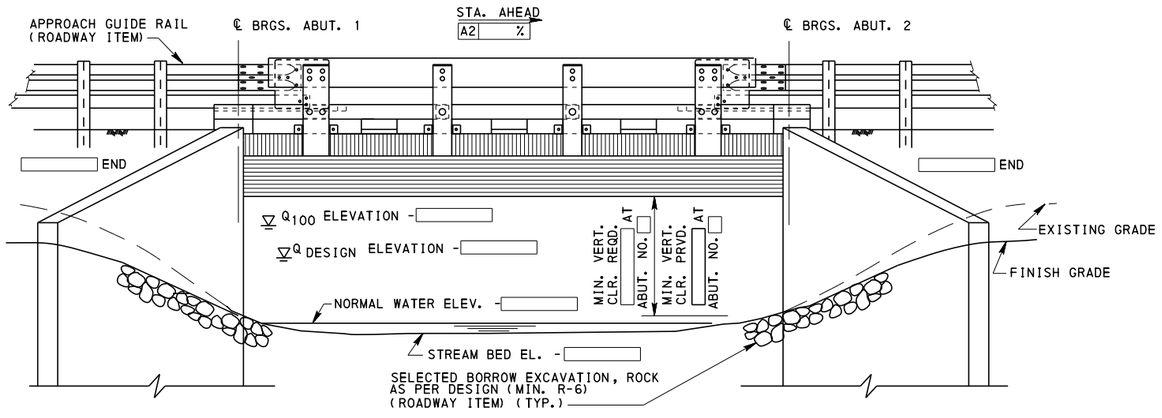
RECOMMENDED APR. 23, 2013
ACTING DIR. BUR. OF PROJECT DELIVERY

SHEET 1 OF 15

BLC-562M



PLAN
NO SCALE



ELEVATION
NO SCALE

HYDRAULIC DATA
(DESIGNER)

DRAINAGE AREA -
DESIGN FLOOD
DISCHARGE -
FREQUENCY -
ELEVATION -
100 YEAR FLOOD
DISCHARGE -
ELEVATION -

INDEX OF DRAWINGS

SHT. NO.	TITLE	SHT. NO.	TITLE

BRIDGE RATING(1)
REFER TO TABLE 2a OR 2b, BLC-561M SHEETS 2 THROUGH 7

SIMPLE SPAN		GLULAM TIMBER BEAM(2) H	HS	ML	PHL93	TK-527	P82
INVENTORY RATING (IR)	DF						-
	LOCATION						-
	LIMIT STATE	STR. I	STR I	STR. I	STR. I	STR. I	-
	RATING						-
OPERATING RATING (OR)	DF						
	LOCATION						
	LIMIT STATE	STR. II	STR. II	STR. II	STR. IA	STR. II	STR. II
	RATING						

CRITICAL MEMBER INTERIOR
MOMENT CAPACITY - kip-ft. _____
LOCATION _____
SHEAR CAPACITY - kip _____
LOCATION _____

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	Recm'd	Date
	REVISIONS				

S- SHEET__ OF__

Recommended _____
DISTRICT BRIDGE ENGINEER

ENGINEERING SEAL

SIGNATURE & DATE

PREPARED BY:

REFERENCE DRAWING

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

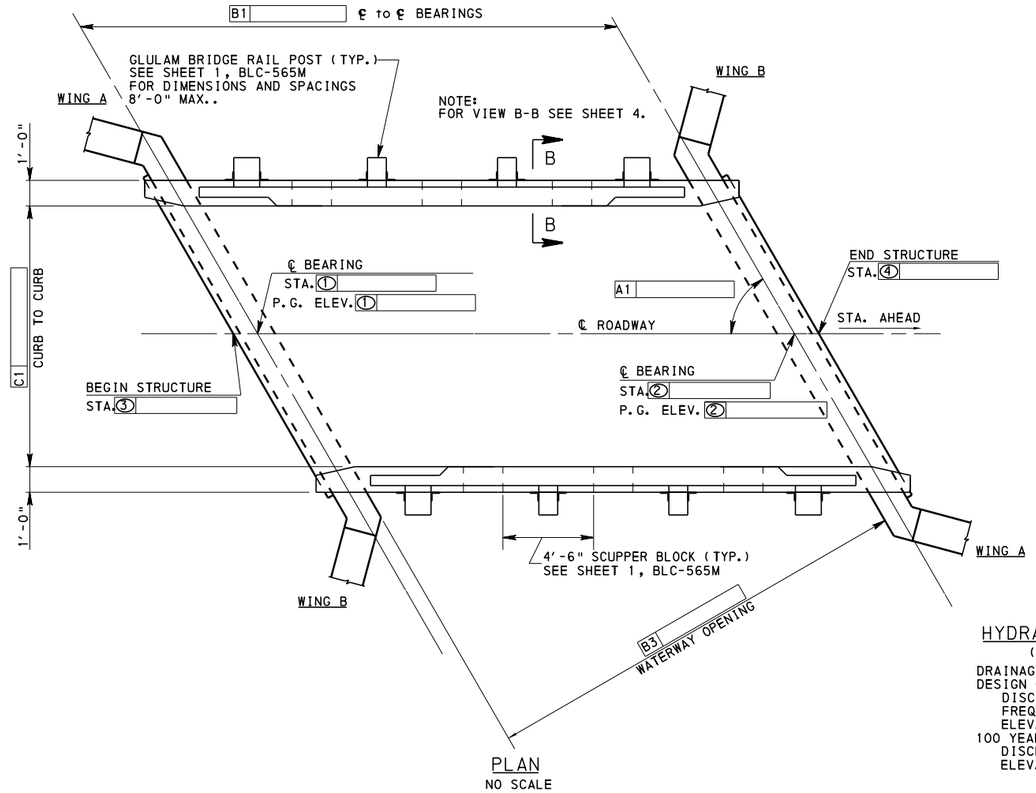
GLULAM BEAM SUPERSTRUCTURE
GENERAL PLAN & ELEVATION - 90° SKEW

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

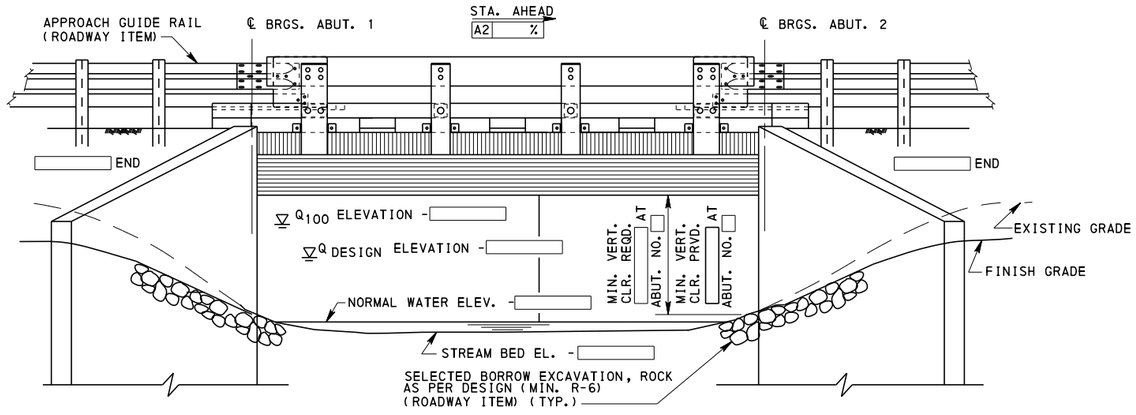
RECOMMENDED APR. 23, 2013
ACTING DIR. BUR. OF PROJECT DELIVERY

SHEET 2 OF 15

BLC-562M



PLAN
NO SCALE



ELEVATION
NO SCALE

HYDRAULIC DATA
(DESIGNER)

DRAINAGE AREA -
DESIGN FLOOD
DISCHARGE -
FREQUENCY -
ELEVATION -
100 YEAR FLOOD
DISCHARGE -
ELEVATION -

INDEX OF DRAWINGS

SHT. NO.	TITLE	SHT. NO.	TITLE

BRIDGE RATING(1)
REFER TO TABLE 2a OR 2b, BLC-561M SHEETS 2 THROUGH 7

SIMPLE SPAN		GLULAM TIMBER BEAM(2)					
		H	HS	ML	PHL93	TK-527	P82
INVENTORY RATING (IR)	DF						-
	LOCATION						-
	LIMIT STATE	STR. I	STR I	STR. I	STR. I	STR. I	-
	RATING						-
OPERATING RATING (OR)	DF						
	LOCATION						
	LIMIT STATE	STR. II	STR. II	STR. II	STR. IA	STR. II	STR. II
	RATING						

CRITICAL MEMBER INTERIOR
MOMENT CAPACITY - kip-ft. _____
LOCATION _____
SHEAR CAPACITY - kip _____
LOCATION _____

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	Recm'd	Date
REVISIONS					

S- SHEET ___ OF ___

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

Recommended _____
DISTRICT BRIDGE ENGINEER

ENGINEERING SEAL

SIGNATURE & DATE

PREPARED BY:

REFERENCE DRAWING

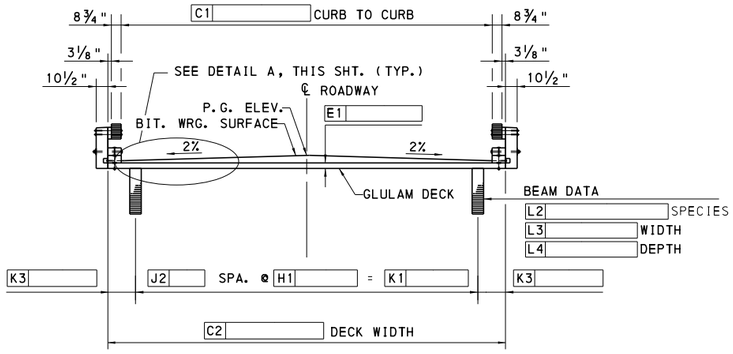
GLULAM BEAM SUPERSTRUCTURE
GENERAL PLAN & ELEVATION - RIGHT SKEW

RECOMMENDED APR. 23, 2013
CHIEF BRIDGE ENGINEER

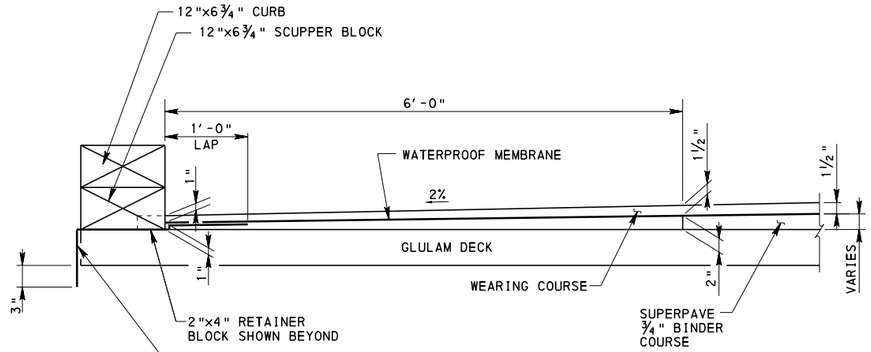
RECOMMENDED APR. 23, 2013
ACTING DIR. BUR. OF PROJECT DELIVERY

SHEET 3 OF 15

BLC-562M

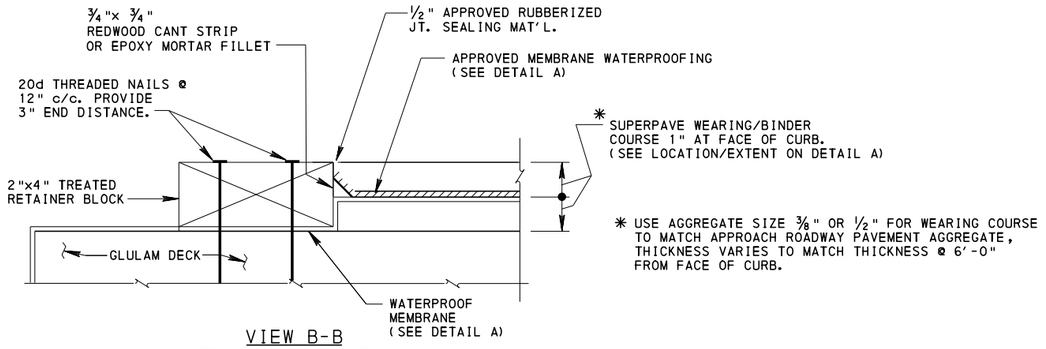


TYPICAL SECTION
NO SCALE



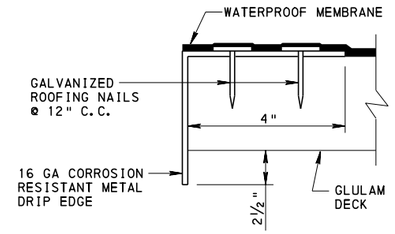
NOTE:
1. ALLOW FIRST LAYER OF BITUMINOUS MATERIAL TO COOL SUFFICIENTLY SO WATERPROOF MEMBRANE DOES NOT TEAR WHEN APPLYING SECOND LAYER OF BITUMINOUS MATERIAL.
2. SEE VIEW B-B FOR ASPHALT WEARING COURSE TYPE.

DETAIL A
NO SCALE



VIEW B-B
SEE FRAMING PLAN, SHEET 6

MEMBRANE WATERPROOFING AT RETAINER BLOCK
NO SCALE



OPTIONAL DECK DRAINAGE PROTECTION

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 TIMBER BEAMS	F.B.M.	-----	-----		
(1)	GLUE LAMINATED TIMBER DECK	F.B.M.	-----	-----		
(1)	GLUE LAMINATED TIMBER BRIDGE RAIL	F.B.M.	-----	-----		
(1)	GLUE LAMINATED TIMBER BACKWALL, AND DIAPHRAGMS	F.B.M.	-----	-----		
(1)	GLUE LAMINATED TIMBER STIFFENER BEAMS	F.B.M.	-----	-----		
(1)(2)	FABRICATED STRUCTURAL STEEL	LB.	-----	-----		
(1)	WATERPROOF MEMBRANE	S.Y.	-----	-----		
(1)	CLASS 4 GEOTEXTILE	S.Y	-----	-----		
(1)	BITUMINOUS BINDER COURSE SUPERPAVE, ¾"	TON	-----	-----		
(1)	BITUMINOUS WEARING COURSE SUPERPAVE, ⅜"/½"	TON	-----	-----		
(1)	TREATED RETAINER BLOCK	F.B.M.	-----	-----		
(1)	OPTIONAL METAL DRIP EDGE	S.Y.				

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

2. QUANTITY DOES NOT INCLUDE STEEL DOWELS & OTHER CONNECTION HARDWARE

Mark	Description	By	Chk'd	Recm'd	Date
REVISIONS					

S- SHEET__ OF__

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

GLULAM BEAM SUPERSTRUCTURE
TYPICAL SECTION AND QUANTITIES

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

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

SHEET 4 OF 15
BLC-562M

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 36] DESIGNATION, EXCEPT WHEN NOTED OTHERWISE.

PROVIDE BOLTS AND LAG SCREWS CONFORMING TO ASTM A307 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 35OO.

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

ALUMINUM

PROVIDE ALUMINUM CLIPS CONFORMING TO ASTM B108, ALLOY A444.0-T4 OR AN APPROVED EQUAL AS PER AASHTO 7.4.6.

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	Recm'd	Date
	REVISIONS				

S-

SHEET__ OF__

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

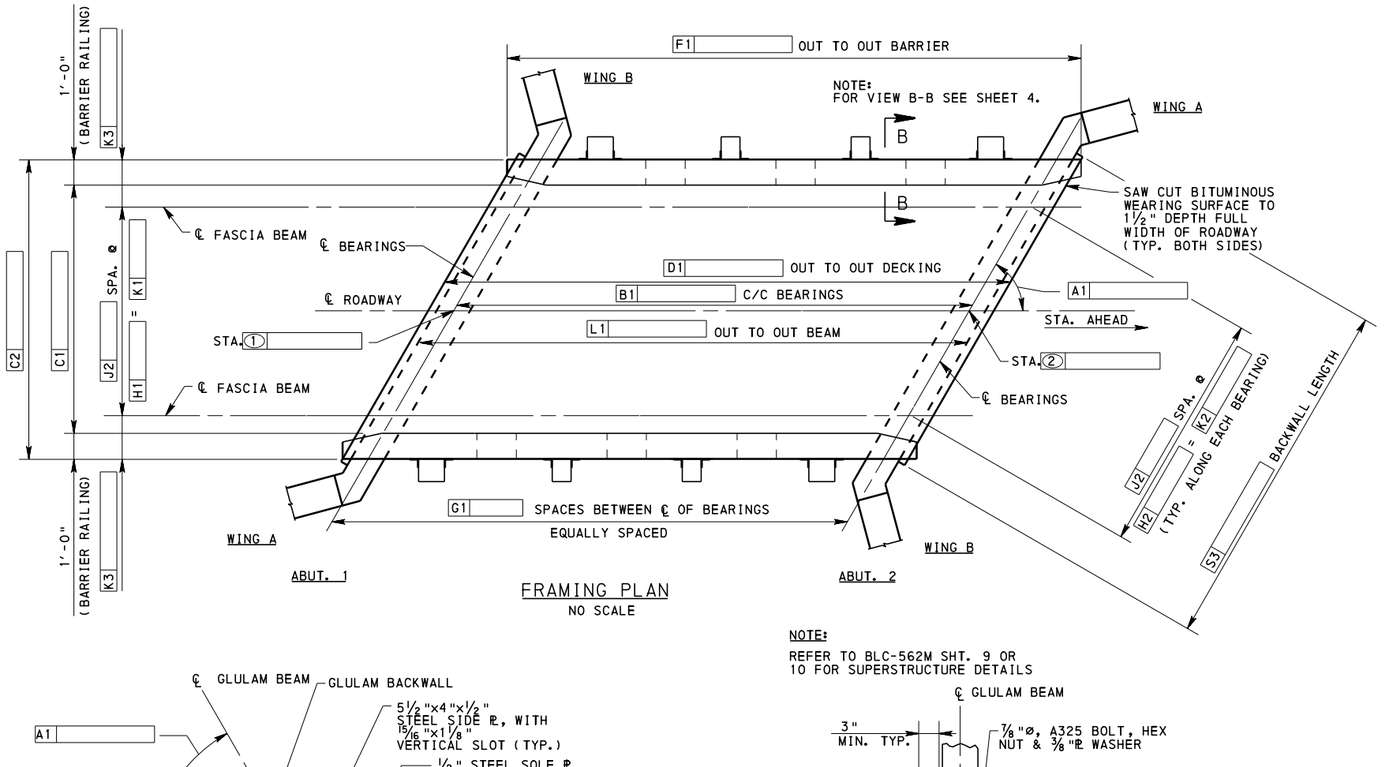
GLULAM BEAM SUPERSTRUCTURE GENERAL NOTES

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

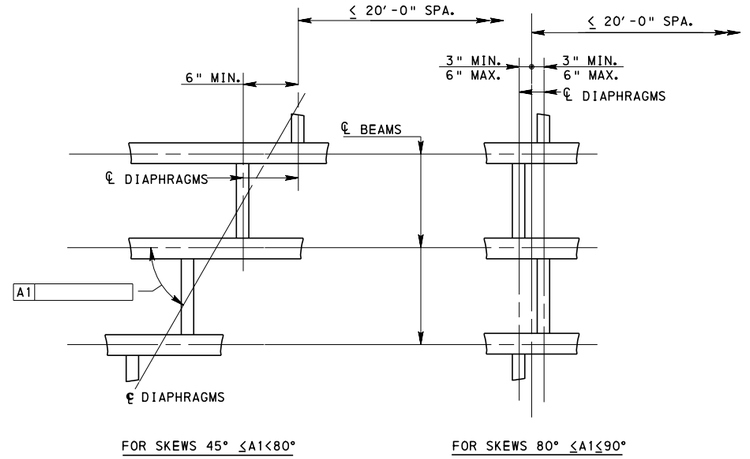
RECOMMENDED APR. 23, 2013
ACTING DIR., BUR. OF PROJECT DELIVERY

SHEET 5 OF 15

BLC-562M



FRAMING PLAN
NO SCALE



DIAPHRAGM PLACEMENT DETAIL
NO SCALE

NOTES:

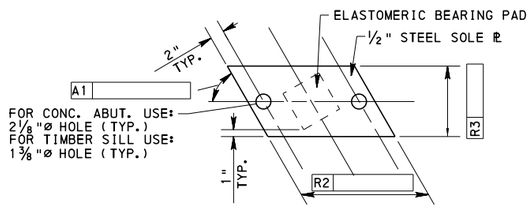
1. PROVIDE MECHANICALLY GALVANIZED SWEDGE OF APPROVED TYPE OF ANCHOR BOLTS. SET IN THE MASONRY AS SHOWN ON THE DESIGN DRAWINGS.
2. PROVIDE MINIMUM SIZE WELD IN ACCORDANCE WITH AASHTO/AWS CODE UNLESS LARGER WELD IS REQUIRED BY DESIGN.
3. PROVIDE PLATE WASHERS OF SUFFICIENT SIZE TO COVER THE ROUND HOLE OR SLOT FOR EXTREMES OF MOVEMENT OF THE BEARINGS. WASHER MAY BE CLIPPED IF REQUIRED.
4. FILL ANCHOR BOLT OR LAG SCREW SOLE PLATE HOLES WITH NON-HARDENING CAULKING COMPOUND AT THE FIXED END.
5. PERMIT DRILLING OF ANCHOR BOLT HOLES AT ABUTMENT ONLY. WASH AND DRY HOLE BEFORE FILLING WITH NON-SHRINK GROUT.
6. BLAST CLEAN CONCRETE BEARING SURFACES TO ACHIEVE ROUGH TEXTURE. DO NOT APPLY EPOXY COATING TO THE BEARING SURFACES WITHIN 2" OF THE BEARING PAD AND SPONGE LOCATION.
7. DO NOT USE ELASTOMERIC MATERIAL WITH A HARDNESS GREATER THAN 60 DUROMETER.
8. DO NOT PROVIDE HOLES IN ELASTOMERIC BEARINGS UNLESS INDICATED ON THE DESIGN DRAWINGS.
9. USE FIXED BEARINGS AT LOWER END OF SPAN UNLESS PERMITTED BY THE CHIEF BRIDGE ENGINEER.

BEARING PLAN DETAIL
NO SCALE

NOTE:
REFER TO BLC-562M SHT. 9 OR 10 FOR SUPERSTRUCTURE DETAILS

VIEW A-A
NO SCALE

*(a) PROVIDE FLATNESS TOLERANCE IN ACCORDANCE WITH PUB. 408, SECTION 1105.03(q)
(b) PROVIDE SOLE PLATE IN ACCORDANCE WITH DM-4, D14.7.6.3.9dP



EXP. BEARING ℞ DETAIL
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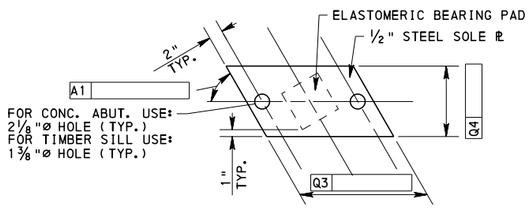


FIXED BEARING ℞ DETAIL
NO SCALE

Mark	Description	By	Chk'd	Recm'd	Date
	REVISIONS				

S- | SHEET___ OF___

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

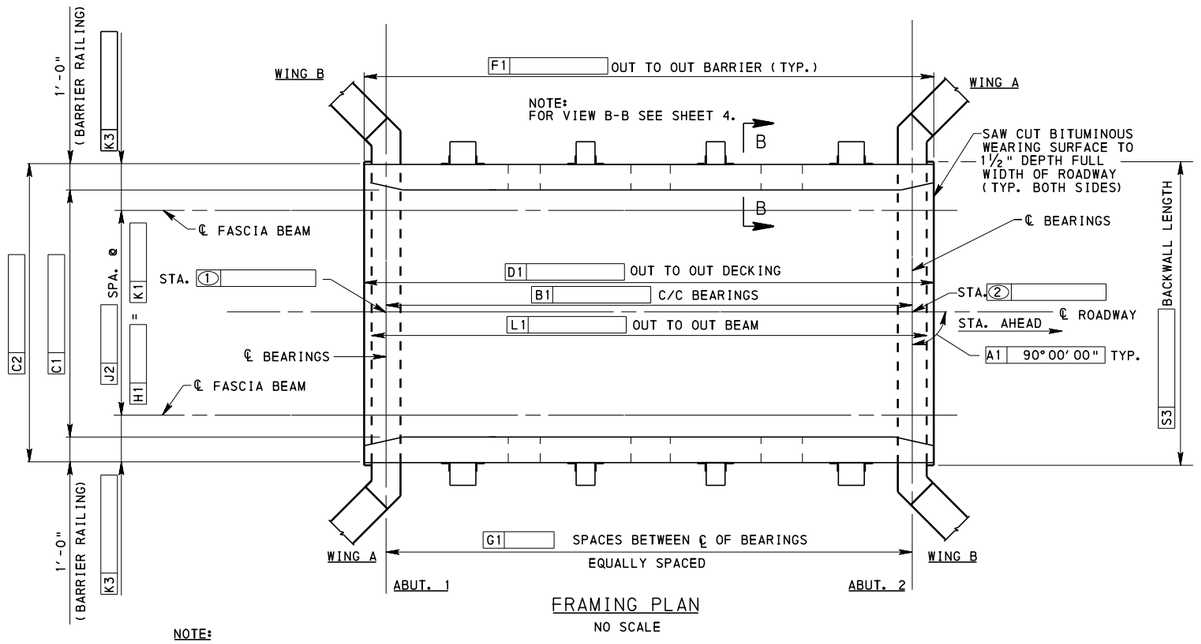
GLULAM BEAM SUPERSTRUCTURE FRAMING PLAN - LEFT SKEW

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

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

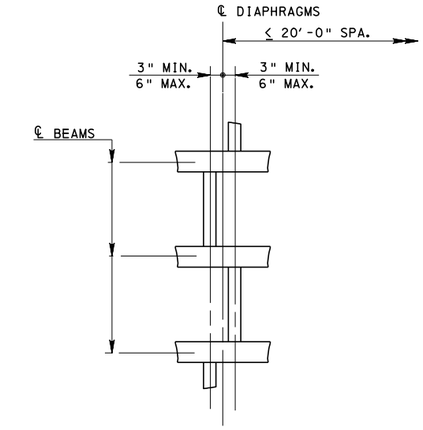
SHEET 6 OF 15

BLC-562M

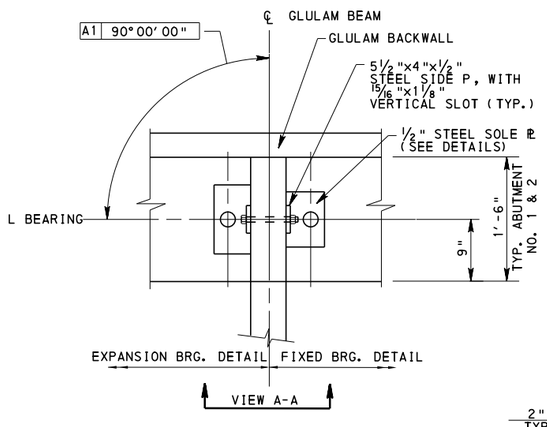


FRAMING PLAN
NO SCALE

NOTE:
REFER TO BLC-562M SHT. 9 OR 10 FOR SUPERSTRUCTURE DETAILS



DIAPHRAGM PLACEMENT DETAIL
NO SCALE



BEARING PLAN DETAIL
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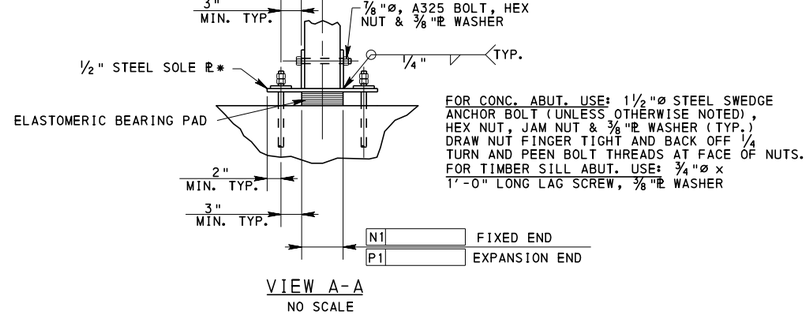
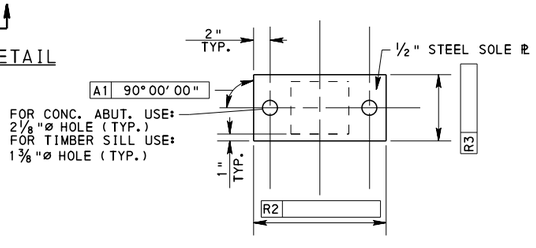


VIEW A-A
NO SCALE

*(a) PROVIDE FLATNESS TOLERANCE IN ACCORDANCE WITH PUB. 408, SECTION 1105.03(q)
(b) PROVIDE SOLE PLATE IN ACCORDANCE WITH DM-4, D14.7.6.3.9dP



EXP. BEARING P DETAIL
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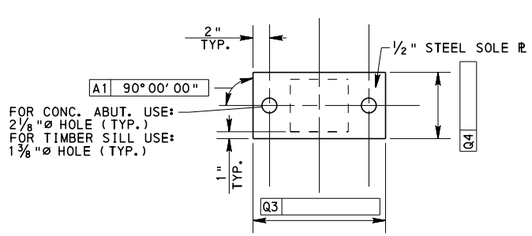

FIXED BEARING P DETAIL
NO SCALE

NOTES:

1. PROVIDE MECHANICALLY GALVANIZED SWEDGE OF APPROVED TYPE OF ANCHOR BOLTS. SET IN THE MASONRY AS SHOWN ON THE DESIGN DRAWINGS.
2. PROVIDE MINIMUM SIZE WELD IN ACCORDANCE WITH AASHTO/AWS CODE UNLESS LARGER WELD IS REQUIRED BY DESIGN.
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7. DO NOT USE ELASTOMERIC MATERIAL WITH A HARDNESS GREATER THAN 60 DUROMETER.
8. DO NOT PROVIDE HOLES IN ELASTOMERIC BEARINGS UNLESS INDICATED ON THE DESIGN DRAWINGS.
9. USE FIXED BEARINGS AT LOWER END OF SPAN UNLESS PERMITTED BY THE CHIEF BRIDGE ENGINEER.

Mark	Description	By	Chk'd	Recm'd	Date
REVISIONS					

S- | SHEET___ OF___

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

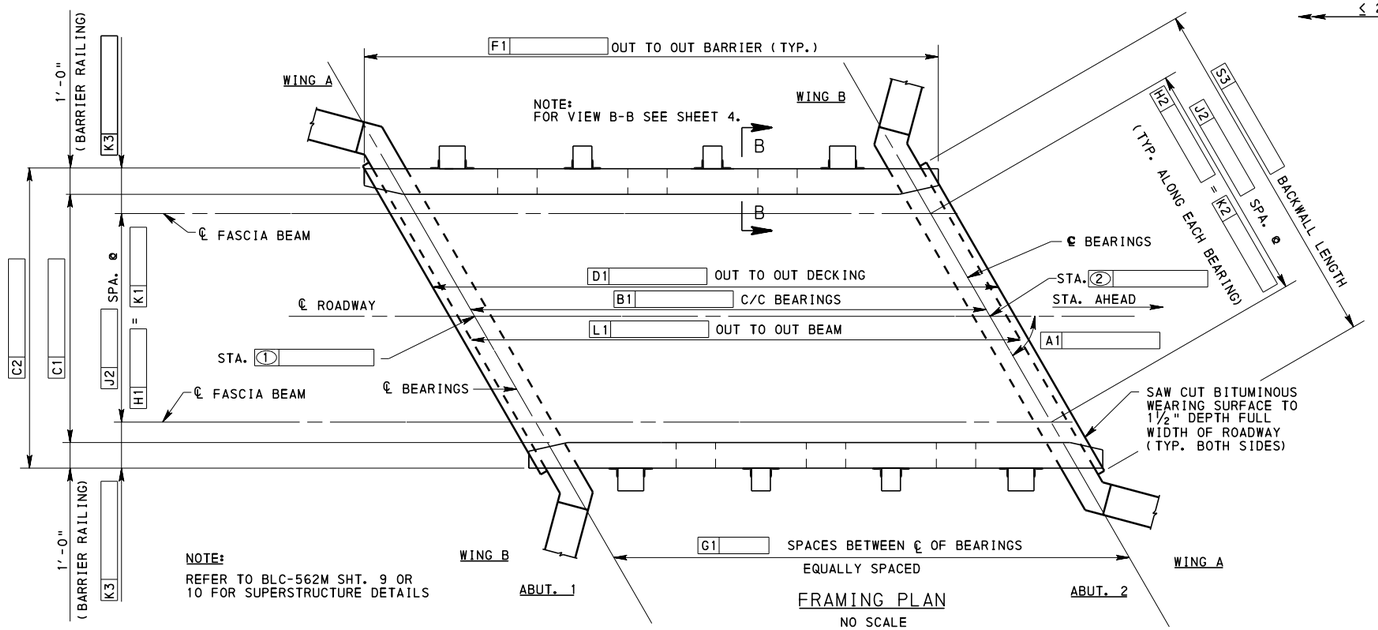
GLULAM BEAM SUPERSTRUCTURE FRAMING PLAN - 90° SKEW

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

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

SHEET 7 OF 15

BLC-562M



FRAMING PLAN
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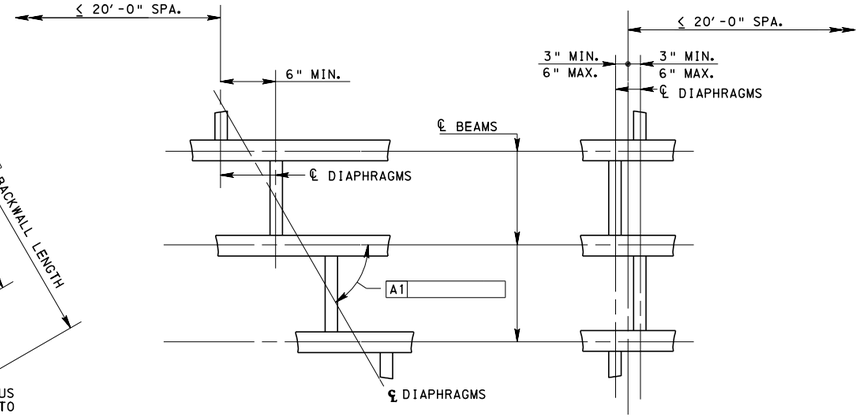
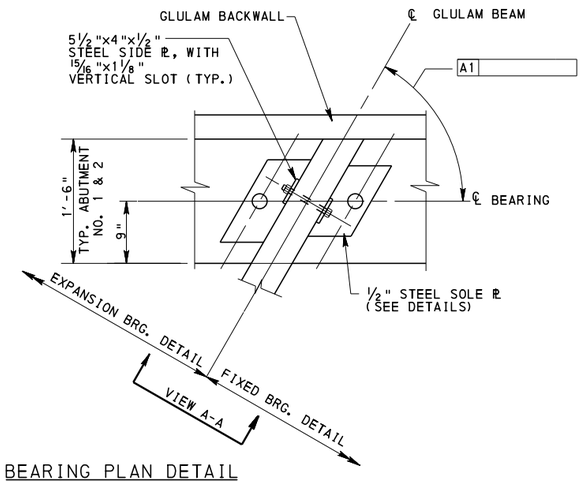


DIAPHRAGM PLACEMENT DETAIL
NO SCALE



BEARING PLAN DETAIL
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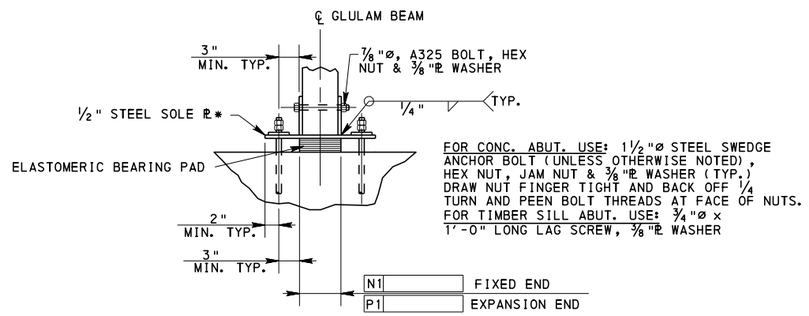
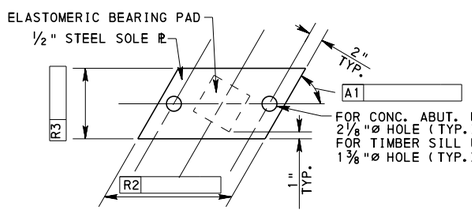


VIEW A-A
NO SCALE

*(a) PROVIDE FLATNESS TOLERANCE IN ACCORDANCE WITH PUB. 408, SECTION 1105.03(q)
(b) PROVIDE SOLE PLATE IN ACCORDANCE WITH DM-4, D14.7.6.3.9dP



EXP. BEARING ℞ DETAIL
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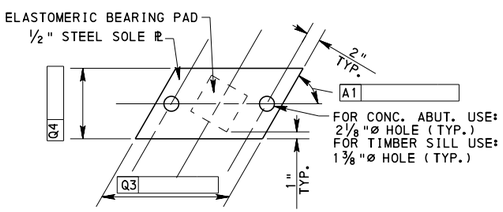

FIXED BEARING ℞ DETAIL
NO SCALE

NOTES:

1. PROVIDE MECHANICALLY GALVANIZED SWEDGE OF APPROVED TYPE OF ANCHOR BOLTS. SET IN THE MASONRY AS SHOWN ON THE DESIGN DRAWINGS.
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4. FILL ANCHOR BOLT OR LAG SCREW SOLE PLATE HOLES WITH NON-HARDENING CAULKING COMPOUND AT THE FIXED END.
5. PERMIT DRILLING OF ANCHOR BOLT HOLES AT ABUTMENT ONLY. WASH AND DRY HOLE BEFORE FILLING WITH NON-SHRINK GROUT.
6. BLAST CLEAN CONCRETE BEARING SURFACES TO ACHIEVE ROUGH TEXTURE. DO NOT APPLY EPOXY COATING TO THE BEARING SURFACES WITHIN 2" OF THE BEARING PAD AND SPONGE LOCATION.
7. DO NOT USE ELASTOMERIC MATERIAL WITH A HARDNESS GREATER THAN 60 DUROMETER.
8. DO NOT PROVIDE HOLES IN ELASTOMERIC BEARINGS UNLESS INDICATED ON THE DESIGN DRAWINGS.
9. USE FIXED BEARINGS AT LOWER END OF SPAN UNLESS PERMITTED BY THE CHIEF BRIDGE ENGINEER.

Mark	Description	By	Chk'd	Recm'd	Date
	REVISIONS				

S- | SHEET___ OF___

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

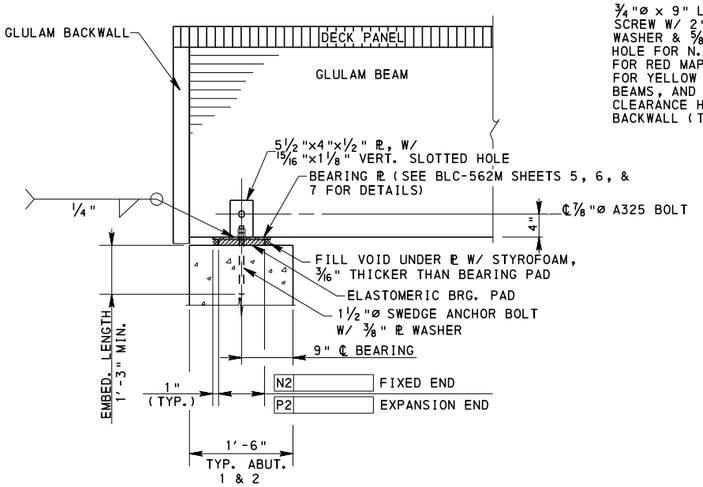
GLULAM BEAM SUPERSTRUCTURE FRAMING PLAN - RIGHT SKEW

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

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

SHEET 8 OF 15

BLC-562M



TYPICAL BEARING CONNECTION

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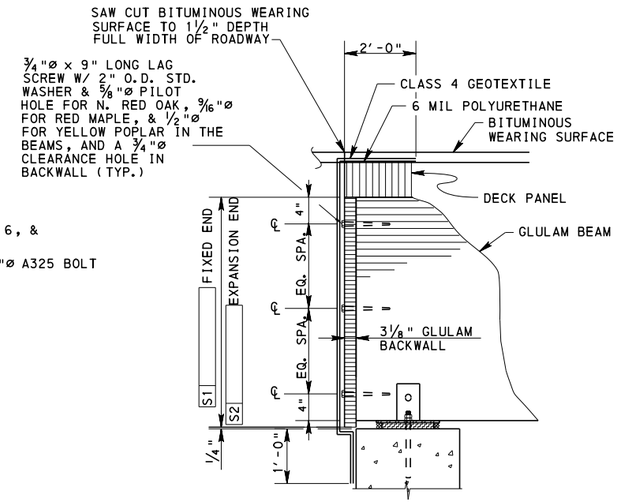
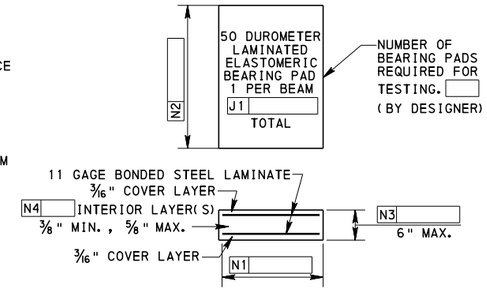


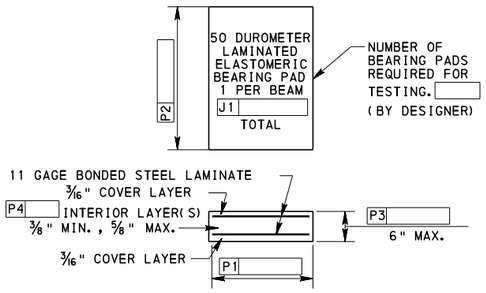
GLULAM BACKWALL DETAIL

NO SCALE



FIXED END BEARING PAD DETAIL

NO SCALE

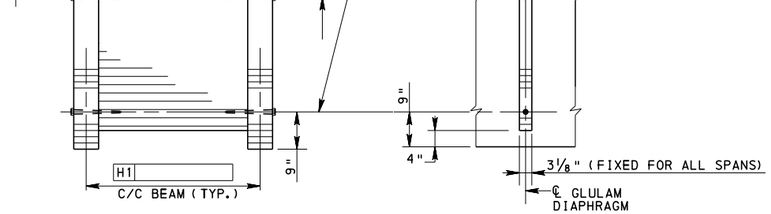


EXPANSION END BEARING PAD DETAIL

NO SCALE

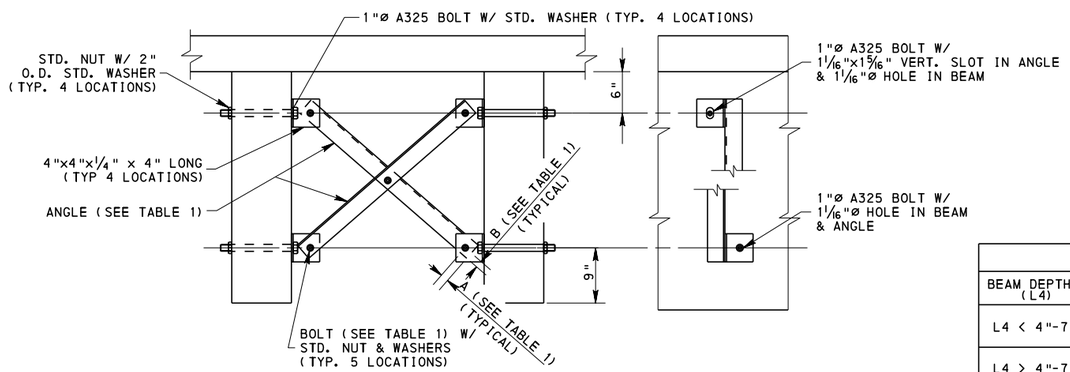
ELASTOMERIC BEARING PAD NOTES:

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.
5. PROVIDE MINIMUM LOW-TEMP NEOPRENE GRADE 3.



DIAPHRAGM DETAILS

NO SCALE



ALTERNATE STEEL CROSS BRACE DETAILS

NO SCALE

TABLE 1				
BEAM DEPTH (L4)	ANGLE	BOLT	DIMENSIONS A	DIMENSIONS B
L4 < 4"-7"	2½"×2½"×3/16"	⅞"ø A307 BOLT W/ 15/16"ø HOLE	1⅛"	1"
L4 ≥ 4"-7"	3"×3"×5/16"	1"ø A325 BOLT W/ 1 1/16"ø HOLE	1¼"	1⅜"

Mark	Description	By	Chk'd	Recm'd	Date
	REVISIONS				

S- | SHEET__ OF__

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

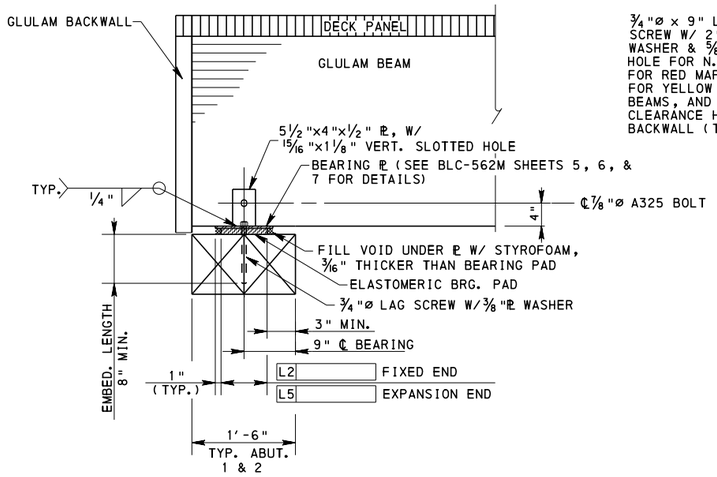
GLULAM BEAM SUPERSTRUCTURE SUPERSTRUCTURE DETAILS - CONC. ABUT.

RECOMMENDED APR. 23, 2013
CHIEF BRIDGE ENGINEER

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

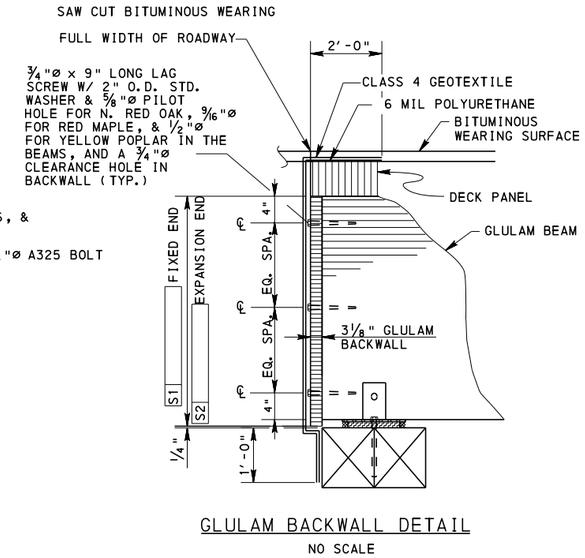
SHEET 9 OF 15

BLC-562M



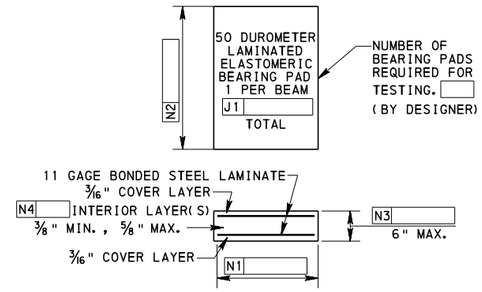
TYPICAL BEARING CONNECTION

NO SCALE



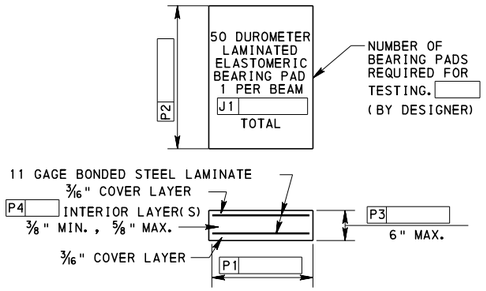
GLULAM BACKWALL DETAIL

NO SCALE



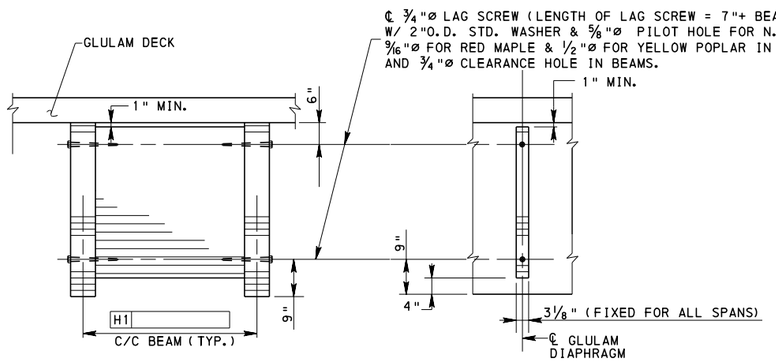
FIXED END BEARING PAD DETAIL

NO SCALE



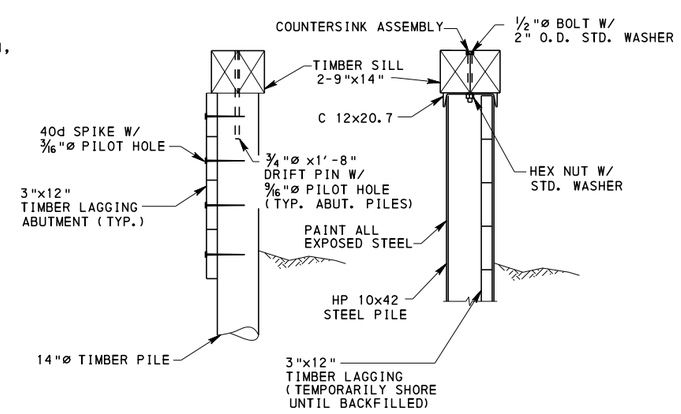
EXPANSION END BEARING PAD DETAIL

NO SCALE



DIAPHRAGM DETAILS

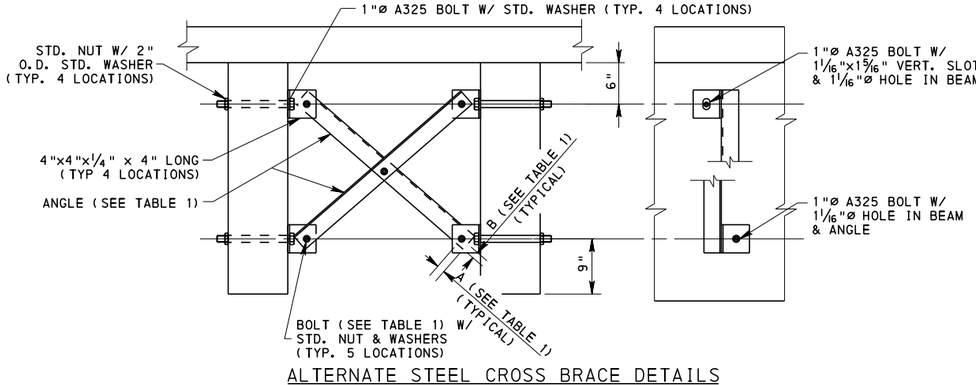
NO SCALE



TIMBER PILE STEEL PILE

TIMBER SILL DETAIL

NO SCALE



ALTERNATE STEEL CROSS BRACE DETAILS

NO SCALE

TABLE 1

BEAM DEPTH (L4)	ANGLE	BOLT	DIMENSIONS A	DIMENSIONS B
L4 < 4"-7"	2½"x2½"x3/16"	⅞"ø A307 BOLT W/ 15/16"ø HOLE	1⅛"	1"
L4 ≥ 4"-7"	3"x3"x5/16"	1"ø A325 BOLT W/ 1 1/16"ø HOLE	1¼"	1⅜"

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.
5. PROVIDE MINIMUM LOW-TEMP NEOPRENE GRADE 3.

Mark	Description	By	Chk'd	Recm'd	Date
REVISIONS					

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COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

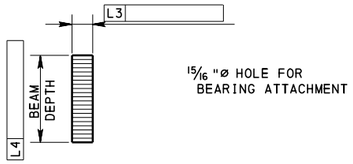
GLULAM BEAM SUPERSTRUCTURE
SUPERSTRUCTURE DETAILS - TIMBER ABUT.

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

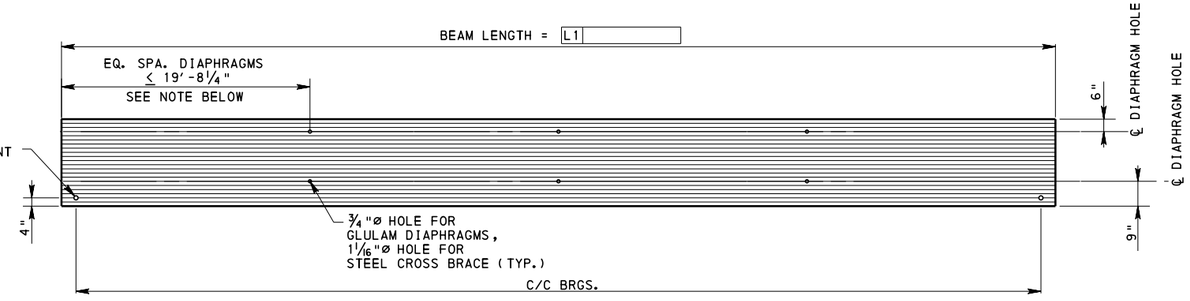
RECOMMENDED APR. 23, 2013
ACTING DIR. BUR. OF PROJECT DELIVERY

SHEET 10 OF 15

BLC-562M



SECTION
NO SCALE

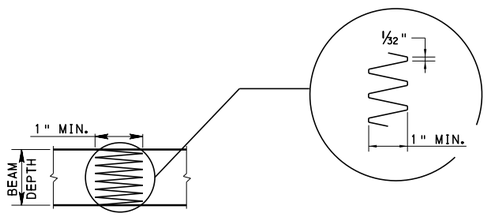


ELEVATION
NO SCALE

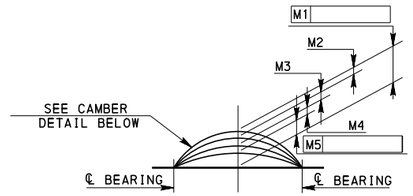
NOTE

FOR SPANS:
18′-0" < B1 ≤ 39′-4", USE 1 DIAPHRAGM ▲
39′-4" < B1 ≤ 59′-1", USE 2 DIAPHRAGM ▲
59′-1" < B1 ≤ 78′-9", USE 3 DIAPHRAGMS▲
78′-9" < B1 ≤ 98′-5", USE 4 DIAPHRAGMS▲

▲ WHEN VALUES OF B1 ARE CLOSE TO THE LIMITS SHOWN HERE, VERIFY THAT G1 MATCHES THE NO. OF SPACES FOR THE NUMBER OF DIAPHRAGMS SHOWN HERE.



TYPICAL FINGER CONSTRUCTION JOINT DETAIL
NO SCALE



BEAM CAMBER DIAGRAM

M1 = PRE-FABRICATED CAMBER = 3[M2 + M3]

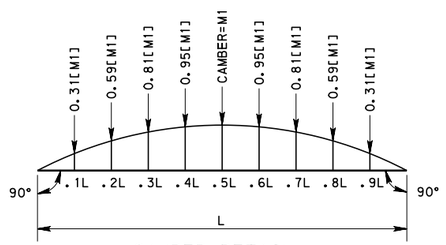
M2 = DEFLECTION DUE TO DEAD LOAD OF BEAM

M3 = DEFLECTION DUE TO ALL DEAD LOAD EXCEPT BEAM AND FWS

M4 = DEFLECTION DUE TO CREEP = 1.5 [M2 + M3]

M5 = NET FINAL CAMBER = M1 - 2.5 [M2 + M3]

- THE THICKNESS OF THE WEARING COURSE WILL BE VARIED TO COMPENSATE FOR ANY INACCURACIES IN BEAM CAMBER.
- THE PRE-FABRICATED CAMBER LESS THE DEFLECTION DUE TO DEAD LOAD OF BEAM SHOULD BE CHECKED IN THE FIELD.
- DEFLECTION CALCULATIONS DO NOT CONSIDER LOAD EFFECTS DUE TO FUTURE WEARING SURFACE.



CAMBER DETAIL

NOTES:

1. SHOW DESIGN LENGTH OF BEAM ON SHOP DRAWINGS.
2. SHOW PLAN, ELEVATION, SECTIONS AND ALL DETAILS ON SHOP DRAWINGS.
3. SHOW ANY MODIFICATIONS TO FINGER JOINT DETAILS ON SHOP DRAWINGS.
4. SHOW THE FOLLOWING DATA ON THE SHOP DRAWINGS:
   1. THE SIZE AND LOCATION OF THE TEMPORARY STORAGE SUPPORTS.
   2. THE TYPE AND LOCATION OF THE BRACING AND TEMPORARY SUPPORTS USED FOR THE TRANSPORTATION OF THE BEAMS.
5. FABRICATOR CHECKS STABILITY FOR HANDLING AND TRANSPORTING OF THE MEMBERS.
6. DO NOT EXCEED MAXIMUM SPACING OF 19′-8¼" FOR GLULAM DIAPHRAGM OR STEEL CROSS BRACING.
7. CAMBER BEAMS 3 TIMES DEAD LOAD DEFLECTION.
8. SEE BLC-562M SHEET 9 OR 10 FOR DIAPHRAGM BOLT HOLE LOCATIONS.

   SEE BLC-562M SHEET 9 OR 10 FOR BEARING ATTACHMENT HOLE LOCATIONS.
9. CONSTRUCT BEAMS IN ACCORDANCE WITH CURRENT INSPECTION MANUAL, AITC 200 & CURRENT AITC 119. ALL BEAMS TO BE MANUFACTURED WITH 2400 PSI Fb AND 1.8x10E6 PSI MOE.
10. FOR HANDLING REFER TO PUBLICATION 408, SECTION 1031.3(a) SPECIFICATIONS FOR GLULAM TIMBERS.
11. SPLICE JOINT LOCATION ON OUTER LAMINATIONS IS NOT CRITICAL.
12. MAXIMUM LAMINATION THICKNESS IS 2".
13. MINIMUM LAMINATION THICKNESS IS ¾".

Mark	Description	By	Chk'd	Recm'd	Date
	REVISIONS				

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COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

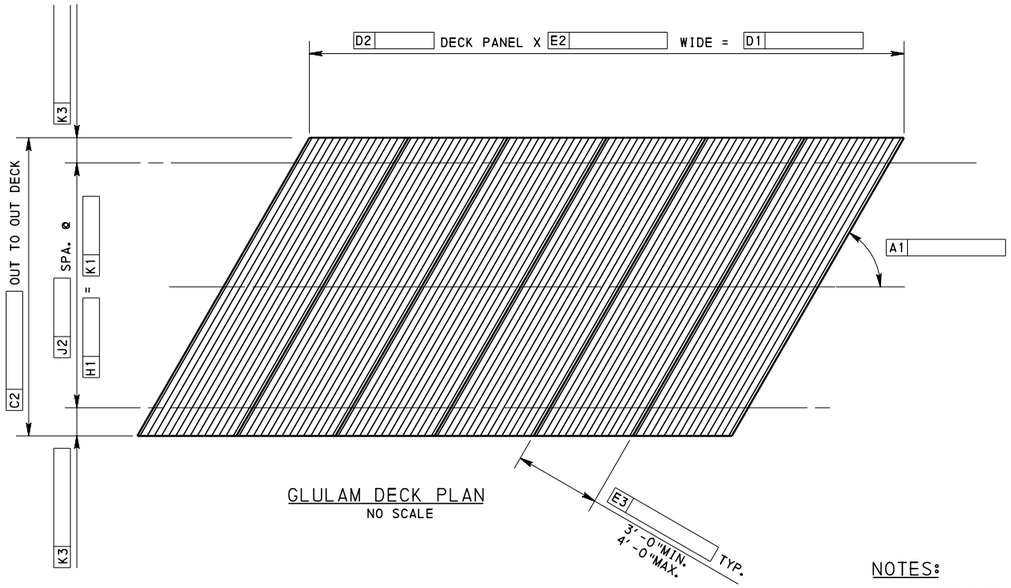
GLULAM BEAM SUPERSTRUCTURE
BEAM DETAILS

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

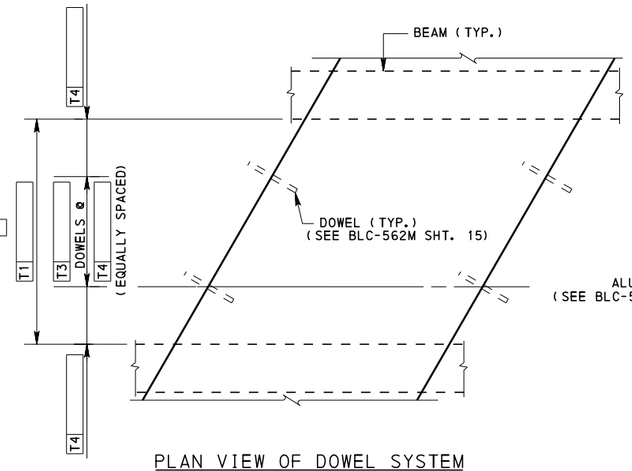
RECOMMENDED APR. 23, 2013
ACTING DIR. BUR. OF PROJECT DELIVERY

SHEET 11 OF 15

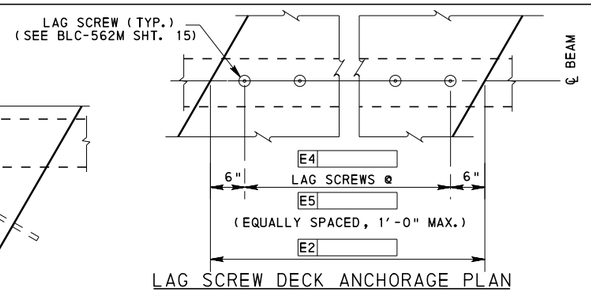
BLC-562M



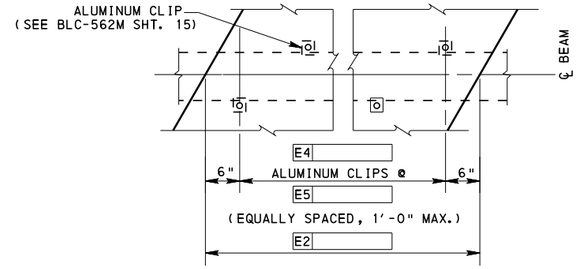
GLULAM DECK PLAN
NO SCALE



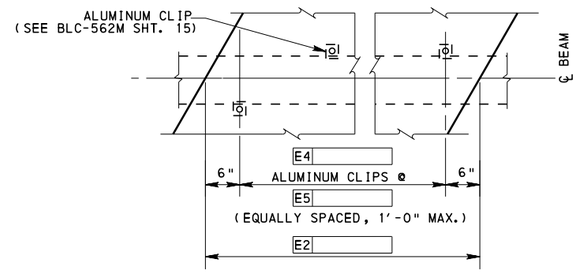
PLAN VIEW OF DOWEL SYSTEM
NO SCALE



LAG SCREW DECK ANCHORAGE PLAN
NO SCALE



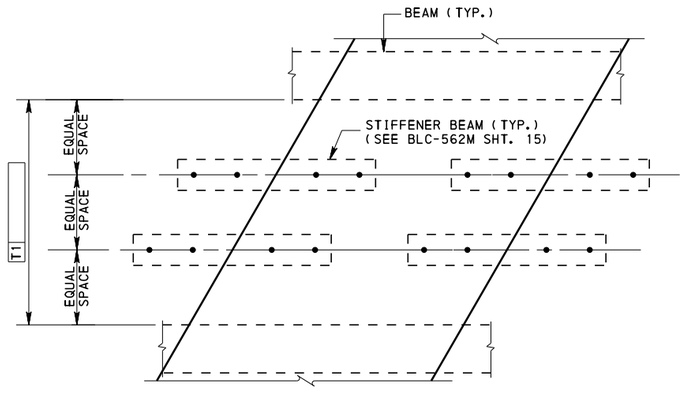
ALTERNATE ALUMINUM CLIP DECK ANCHORAGE PLAN
(EVEN NUMBER CONFIGURATION)
NO SCALE



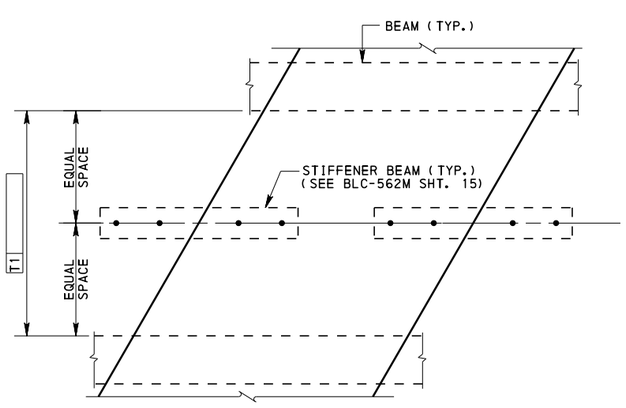
ALTERNATE ALUMINUM CLIP DECK ANCHORAGE PLAN
(ODD NUMBER CONFIGURATION)
NO SCALE

NOTES:

1.) NO DOWELS OR STIFFENER BEAMS NEEDED BETWEEN FACIA BEAM AND OUTSIDE OF DECK.
2.) PRELOAD DECK PANEL WHILE FASTENING PANEL TO BEAM.
3.) PROVIDE ADEQUATE SPACING BETWEEN THE DECK ANCHORAGE AND THE DOWEL SYSTEM. ADJUSTMENTS TO THE DOWEL SYSTEM AND/OR DECK ANCHORAGE'S SPACING MAY BE NECESSARY.



DUAL (2) STIFFENER BEAM SYSTEM



SINGLE (1) STIFFENER BEAM SYSTEM

PLAN VIEWS OF ALTERNATE STIFFENER BEAM SYSTEMS
NO SCALE

STIFFENER BEAM DESIGN DATA		
TIMBER SPECIES	MAXIMUM DESIGN SPAN (T2)	NUMBER OF STIFFENER BEAMS
NORTHERN RED OAK & RED MAPLE	3'-1"	1
	6'-0"	2
YELLOW POPLAR	2'-6"	1
	6'-0"	2

Mark	Description	By	Chk'd	Recm'd	Date
REVISIONS					

S-

SHEET__ OF__

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

GLULAM BEAM SUPERSTRUCTURE
DECK PLAN - LEFT SKEW

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

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

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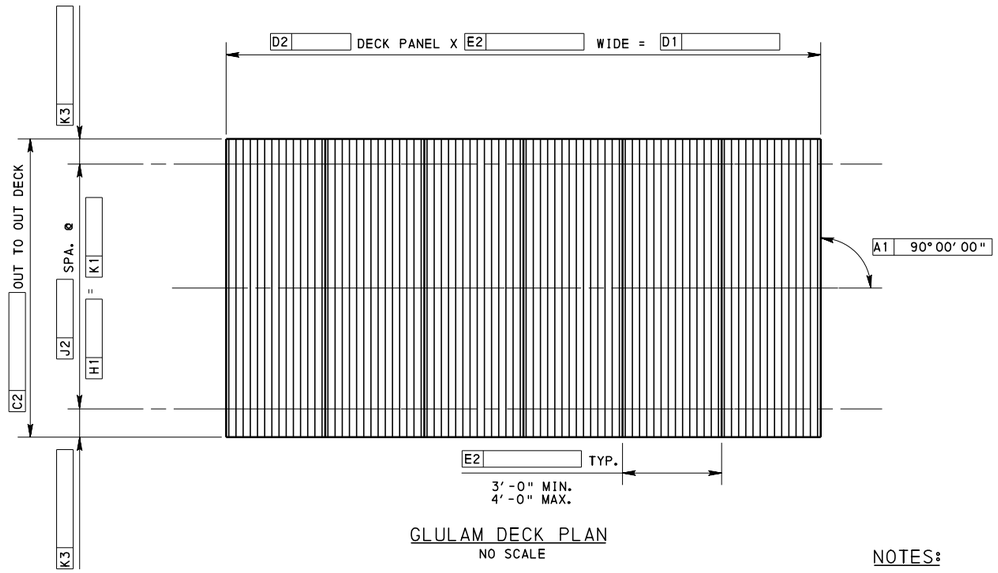
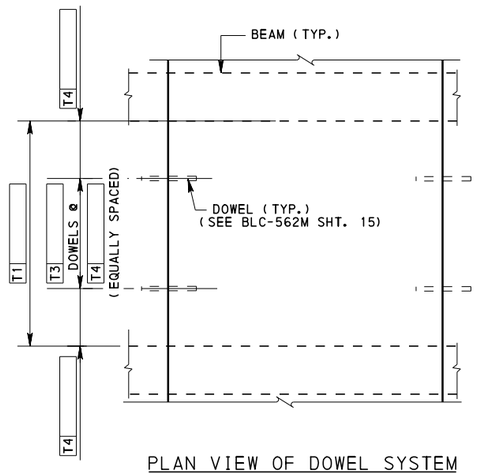
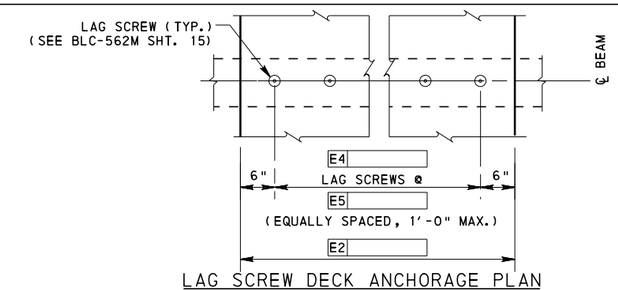


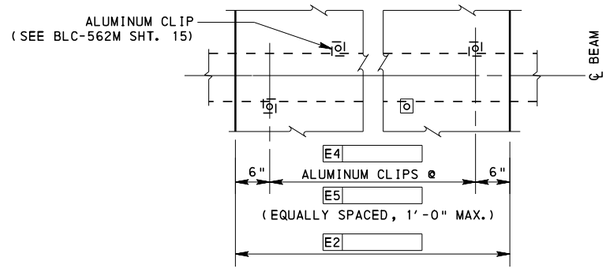
GLULAM DECK PLAN
NO SCALE



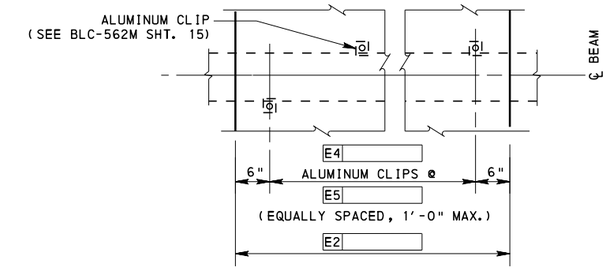
PLAN VIEW OF DOWEL SYSTEM
NO SCALE



LAG SCREW DECK ANCHORAGE PLAN
NO SCALE



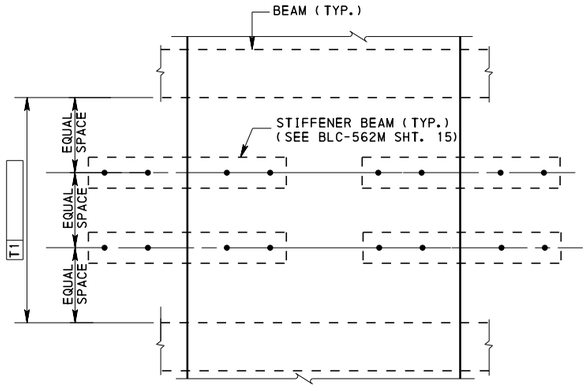
ALTERNATE ALUMINUM CLIP DECK ANCHORAGE PLAN
(EVEN NUMBER CONFIGURATION)
NO SCALE



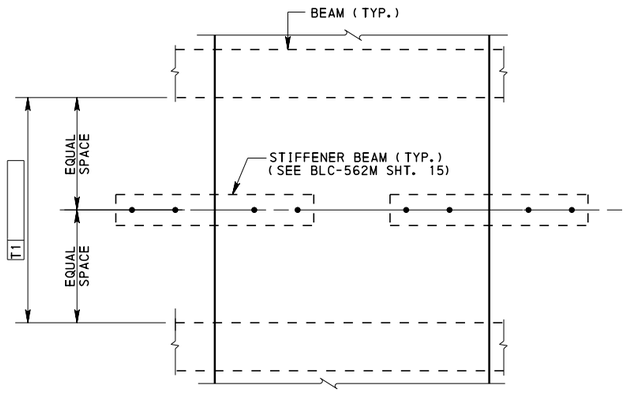
ALTERNATE ALUMINUM CLIP DECK ANCHORAGE PLAN
(ODD NUMBER CONFIGURATION)
NO SCALE

NOTES:

1.) NO DOWELS OR STIFFENER BEAMS NEEDED BETWEEN FACIA BEAM AND OUTSIDE OF DECK.
2.) PRELOAD DECK PANEL WHILE FASTENING PANEL TO BEAM.
3.) PROVIDE ADEQUATE SPACING BETWEEN THE DECK ANCHORAGE AND THE DOWEL SYSTEM. ADJUSTMENTS TO THE DOWEL SYSTEM AND/OR DECK ANCHORAGE'S SPACING MAY BE NECESSARY.



DUAL (2) STIFFENER BEAM SYSTEM



SINGLE (1) STIFFENER BEAM SYSTEM

PLAN VIEWS OF ALTERNATE STIFFENER BEAM SYSTEMS
NO SCALE

STIFFENER BEAM DESIGN DATA		
TIMBER SPECIES	MAXIMUM DESIGN SPAN (T2)	NUMBER OF STIFFENER BEAMS
NORTHERN RED OAK & RED MAPLE	3'-1"	1
	6'-0"	2
YELLOW POPLAR	2'-6"	1
	6'-0"	2

Mark	Description	By	Chk'd	Recm'd	Date
	REVISIONS				

S-

SHEET___ OF___

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

GLULAM BEAM SUPERSTRUCTURE
DECK PLAN - 90° SKEW

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

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

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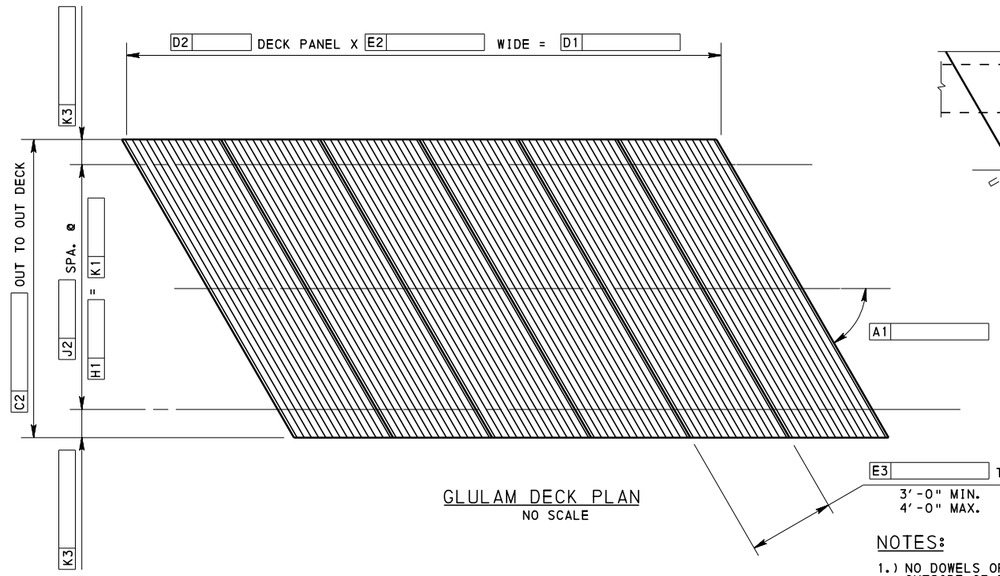
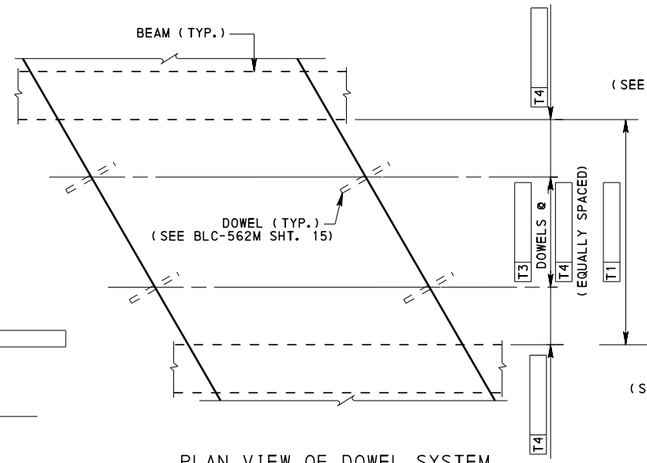
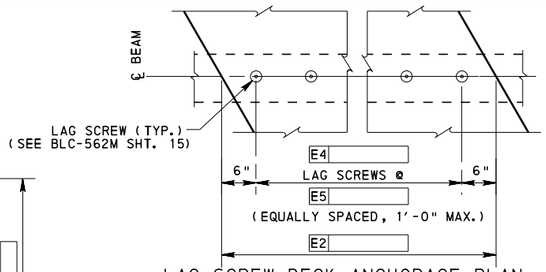


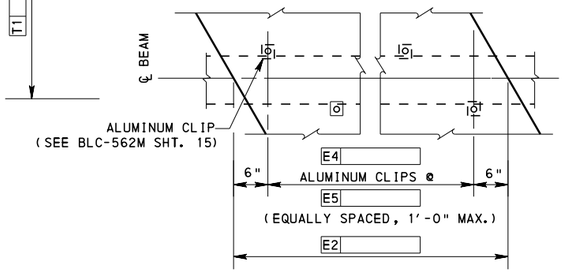
GLULAM DECK PLAN
NO SCALE



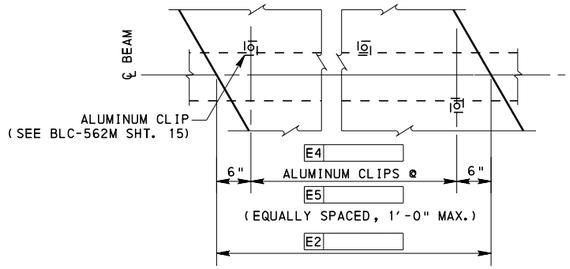
PLAN VIEW OF DOWEL SYSTEM
NO SCALE



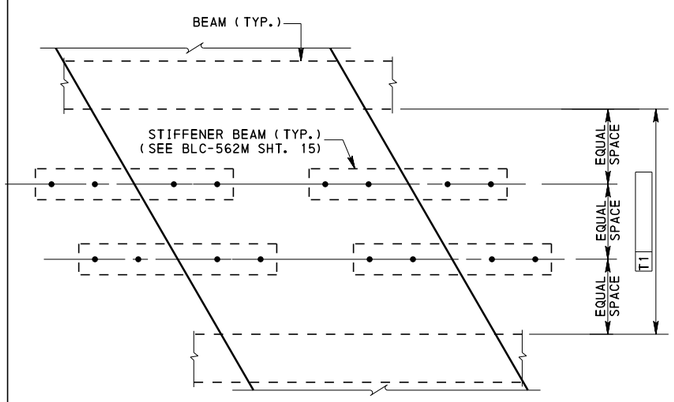
LAG SCREW DECK ANCHORAGE PLAN
NO SCALE



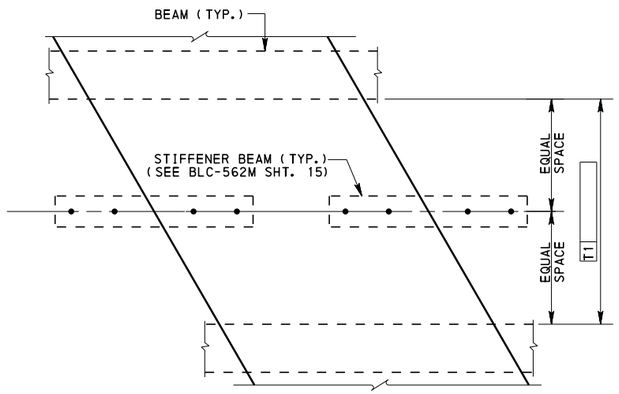
ALTERNATE ALUMINUM CLIP DECK ANCHORAGE PLAN
(EVEN NUMBER CONFIGURATION)
NO SCALE



ALTERNATE ALUMINUM CLIP DECK ANCHORAGE PLAN
(ODD NUMBER CONFIGURATION)
NO SCALE



DUAL (2) STIFFENER BEAM SYSTEM



SINGLE (1) STIFFENER BEAM SYSTEM

PLAN VIEWS OF ALTERNATE STIFFENER BEAM SYSTEMS
NO SCALE

NOTES:

1.) NO DOWELS OR STIFFENER BEAMS NEEDED BETWEEN FACIA BEAM AND OUTSIDE OF DECK.
2.) PRELOAD DECK PANEL WHILE FASTENING PANEL TO BEAM.
3.) PROVIDE ADEQUATE SPACING BETWEEN THE DECK ANCHORAGE AND THE DOWEL SYSTEM. ADJUSTMENTS TO THE DOWEL SYSTEM AND/OR DECK ANCHORAGE'S SPACING MAY BE NECESSARY.

STIFFENER BEAM DESIGN DATA		
TIMBER SPECIES	MAXIMUM DESIGN SPAN (T2)	NUMBER OF STIFFENER BEAMS
NORTHERN RED OAK & RED MAPLE	3'-1"	1
	6'-0"	2
YELLOW POPLAR	2'-6"	1
	6'-0"	2

Mark	Description	By	Chk'd	Recm'd	Date
REVISIONS					

S-

SHEET___ OF___

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

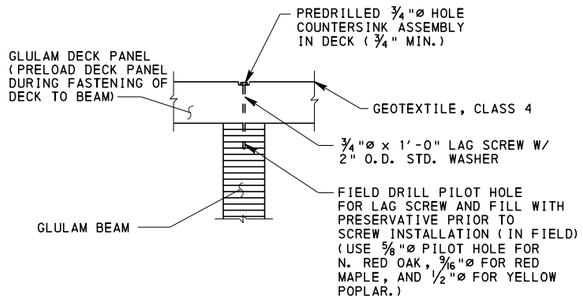
GLULAM BEAM SUPERSTRUCTURE
DECK PLAN - RIGHT SKEW

RECOMMENDED APR. 23, 2013
CHIEF BRIDGE ENGINEER

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

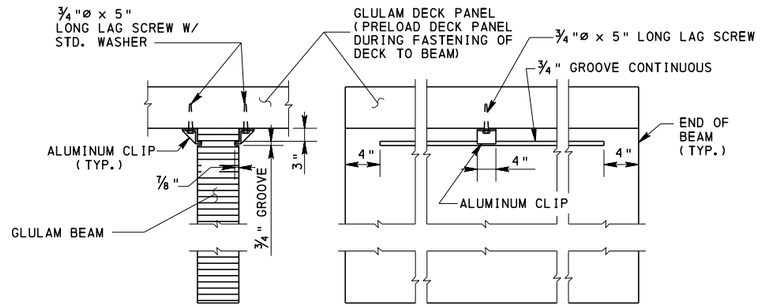
SHEET 14 OF 15

BLC-562M



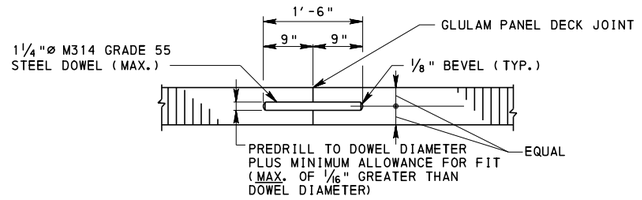
LAG SCREW DECK ANCHORAGE DETAIL

NO SCALE



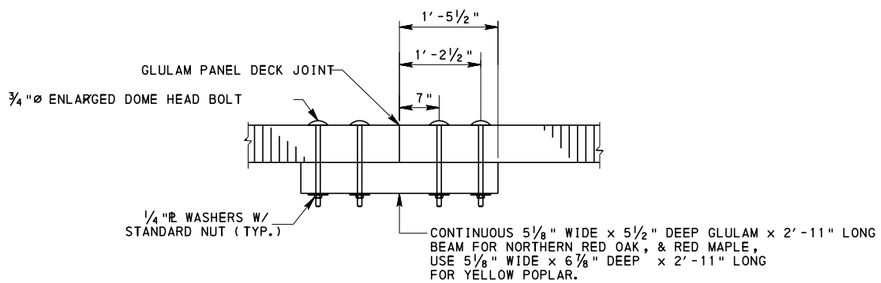
ALTERNATE ALUMINUM CLIP DECK ANCHORAGE DETAIL

NO SCALE



DOWEL DETAIL

NO SCALE



ALTERNATE INTERMEDIATE STIFFENER BEAM DETAIL

NO SCALE

Mark	Description	By	Chk'd	Recm'd	Date
	REVISIONS				

S- | SHEET ___ OF ___

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

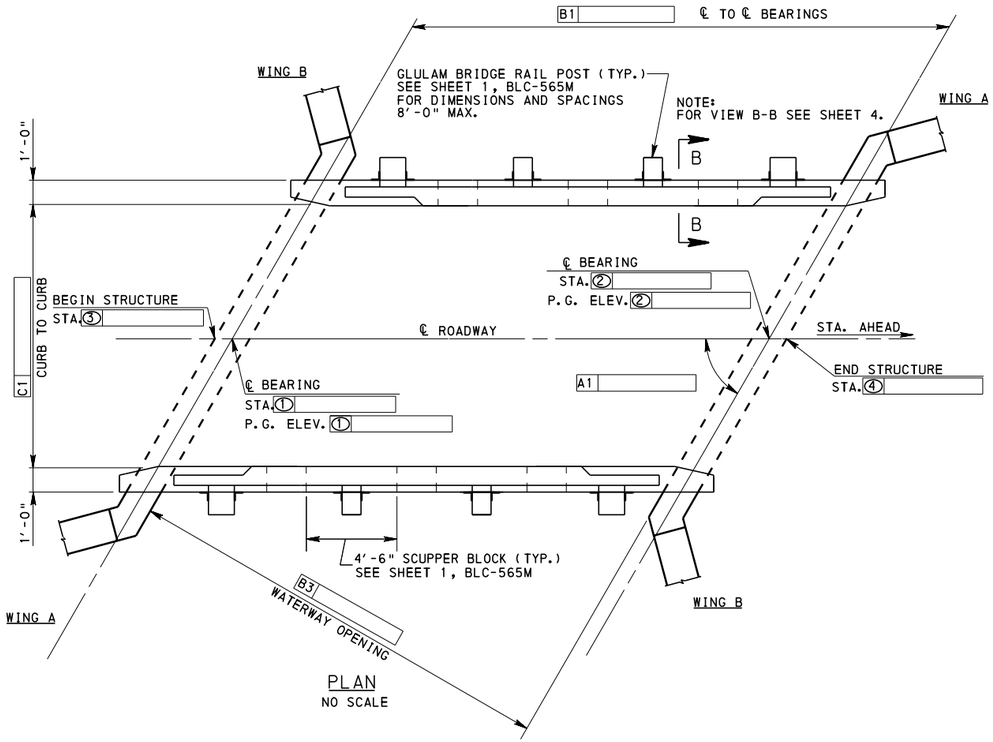
GLULAM BEAM SUPERSTRUCTURE DECK DETAILS

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

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

SHEET 15 OF 15

BLC-562M



PLAN
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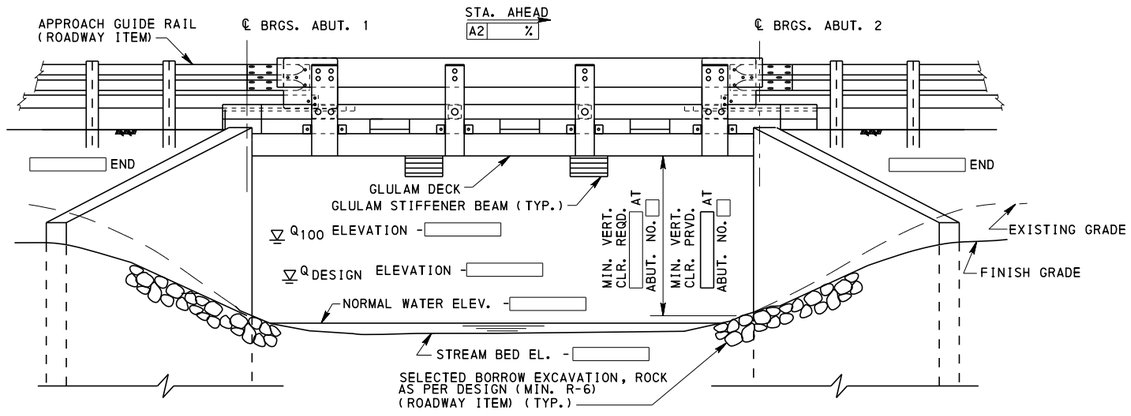


ELEVATION
NO SCALE

HYDRAULIC DATA
(DESIGNER)

DRAINAGE AREA -
DESIGN FLOOD
DISCHARGE -
FREQUENCY -
ELEVATION -
100 YEAR FLOOD
DISCHARGE -
ELEVATION -

INDEX OF DRAWINGS

SHT. NO.	TITLE	SHT. NO.	TITLE

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						-
	LIMIT STATE	STR. I	STR I	STR. I	STR. I	STR. I	-
	RATING						-
OPERATING RATING (OR)	LOCATION						
	LIMIT STATE	STR. II	STR. II	STR. II	STR. IA	STR. II	STR. II
	RATING						

MOMENT CAPACITY - kip-ft. _____
LOCATION _____
SHEAR CAPACITY - kip _____
LOCATION _____

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	Recm'd	Date
REVISIONS					

S- | SHEET __ OF __

Recommended _____
DISTRICT BRIDGE ENGINEER

ENGINEERING SEAL

SIGNATURE & DATE

PREPARED BY:

REFERENCE DRAWING

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

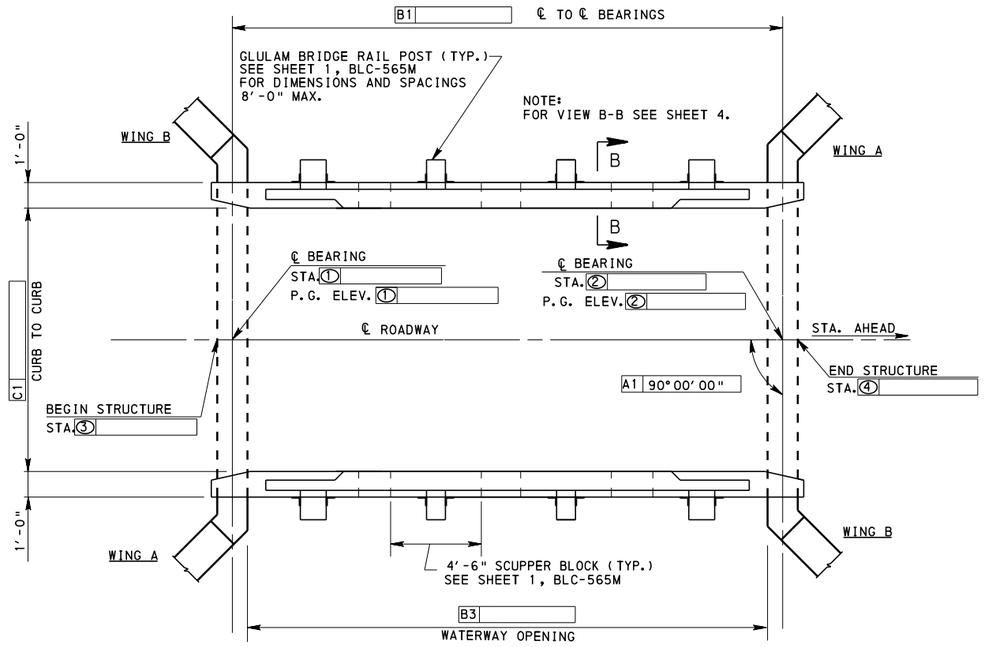
GLULAM
LONGITUDINAL PANEL SUPERSTRUCTURE
GENERAL PLAN & ELEVATION - LEFT SKEW

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

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

SHEET 1 OF 9

BLC-563M



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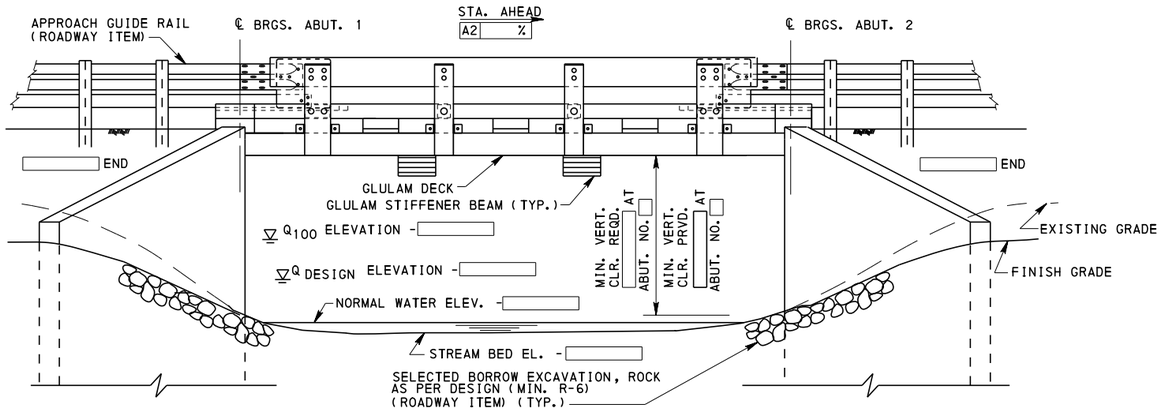

ELEVATION
NO SCALE

HYDRAULIC DATA
(DESIGNER)

DRAINAGE AREA -
DESIGN FLOOD
DISCHARGE -
FREQUENCY -
ELEVATION -
100 YEAR FLOOD
DISCHARGE -
ELEVATION -

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INVENTORY RATING (IR)	LOCATION						-
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	RATING						-
OPERATING RATING (OR)	LOCATION						
	LIMIT STATE	STR. II	STR. II	STR. II	STR. IA	STR. II	STR. II
	RATING						

MOMENT CAPACITY - kip-ft. _____
LOCATION _____
SHEAR CAPACITY - kip _____
LOCATION _____

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	Recm'd	Date

REVISIONS

S- | SHEET ___ OF ___

Recommended _____
DISTRICT BRIDGE ENGINEER

ENGINEERING SEAL

SIGNATURE & DATE

PREPARED BY:

REFERENCE DRAWING

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

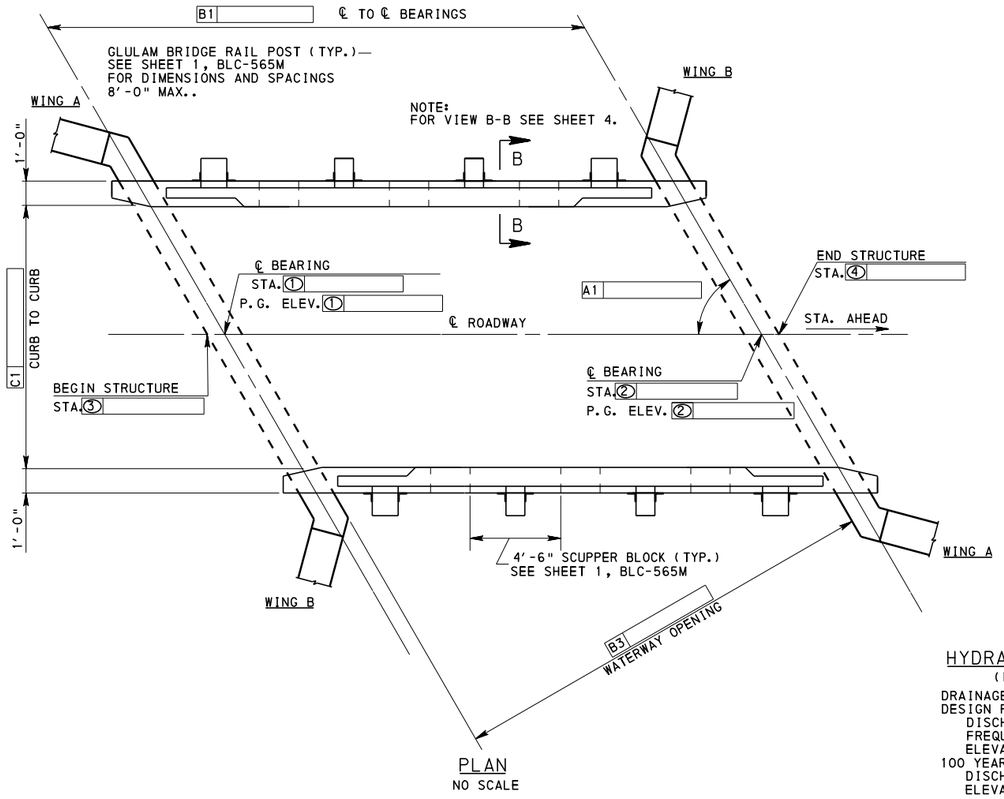
GLULAM
LONGITUDINAL PANEL SUPERSTRUCTURE
GENERAL PLAN & ELEVATION - 90° SKEW

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

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

SHEET 2 OF 9

BLC-563M



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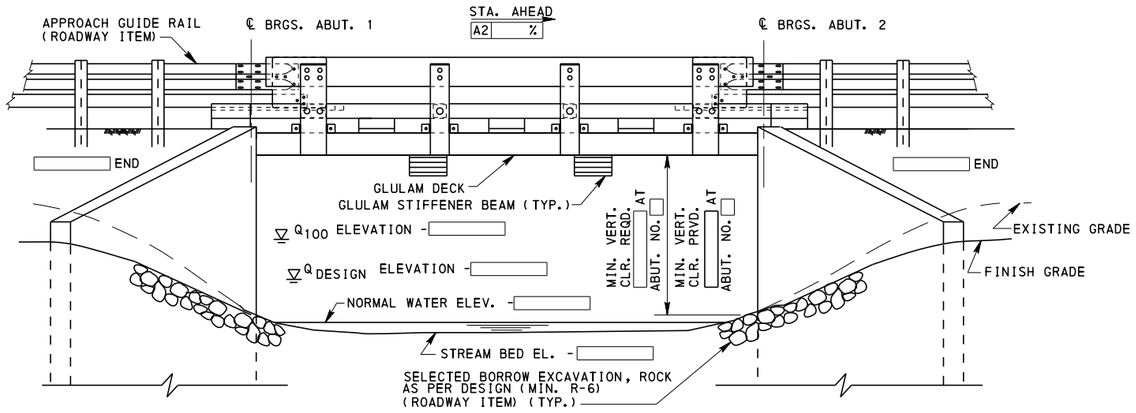

ELEVATION
NO SCALE

HYDRAULIC DATA

(DESIGNER)

DRAINAGE AREA -
DESIGN FLOOD
DISCHARGE -
FREQUENCY -
ELEVATION -
100 YEAR FLOOD
DISCHARGE -
ELEVATION -

INDEX OF DRAWINGS

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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						-
	LIMIT STATE	STR. I	STR I	STR. I	STR. I	STR. I	-
	RATING						-
OPERATING RATING (OR)	LOCATION						
	LIMIT STATE	STR. II	STR. II	STR. II	STR. IA	STR. II	STR. II
	RATING						

MOMENT CAPACITY - kip-ft. _____
LOCATION _____
SHEAR CAPACITY - kip _____
LOCATION _____

NOTES FOR BRIDGE RATING TABLE:

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2.) VALUES SHOWN ARE BASED ON LOAD AND RESISTANCE FACTOR DESIGN.

Mark	Description	By	Chk'd	Recm'd	Date
REVISIONS					

S- | SHEET ___ OF ___

ENGINEERING SEAL

SIGNATURE & DATE

PREPARED BY:

Recommended _____

DISTRICT BRIDGE ENGINEER

REFERENCE DRAWING

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

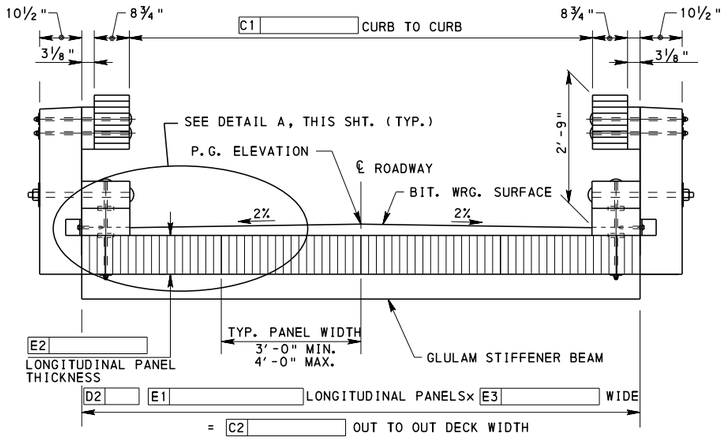
GLULAM
LONGITUDINAL PANEL SUPERSTRUCTURE
GENERAL PLAN & ELEVATION- RIGHT SKEW

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

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

SHEET 3 OF 9

BLC-563M



TYPICAL SECTION

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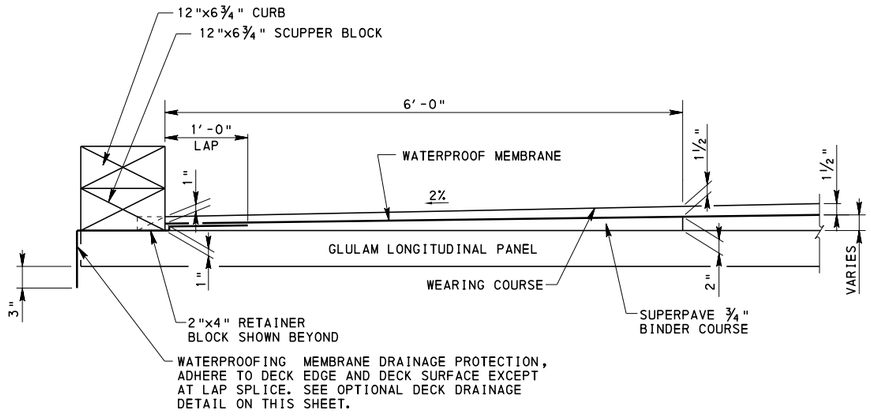
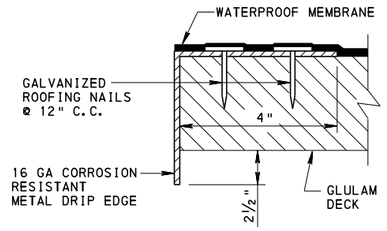




OPTIONAL DECK DRAINAGE PROTECTION

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.	-----	-----		
(1)	GLUE LAMINATED CONT. STIFFENER BEAMS	F.B.M.	-----	-----		
(1)	GLUE LAMINATED TIMBER BRIDGE RAIL	F.B.M.	-----	-----		
(1)	GLUE LAMINATED INTER. STIFFENER BEAMS	F.B.M.	-----	-----		
(1)	WATERPROOF MEMBRANE	S.Y.	-----	-----		
(1)	CLASS 4 GEOTEXTILE	S.Y.	-----	-----		
(1)	BITUMINOUS BINDER COURSE SUPERPAVE, ¾"	TON	-----	-----		
(1)	BITUMINOUS WEARING COURSE SUPERPAVE, ⅜"/½"	TON	-----	-----		
(1)	TREATED RETAINER BLOCK	F.B.M.	-----	-----		
(1)	OPTIONAL METAL DRIP EDGE	S.Y.				

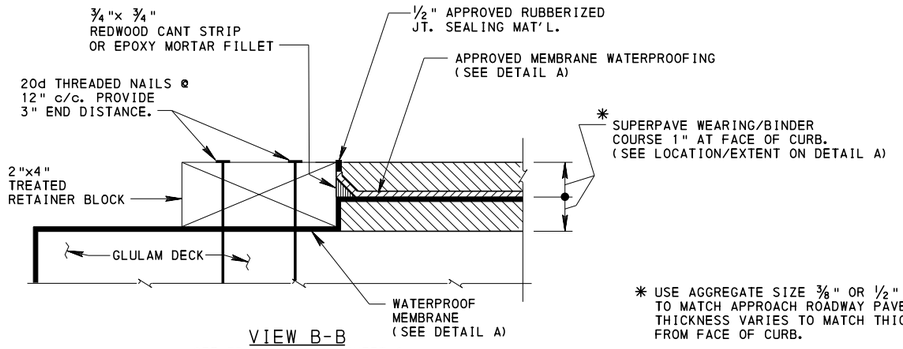
1. ITEMS IN BRIDGE STRUCTURE LUMP SUM ITEM 8030-0001 GIVEN FOR INFORMATION ONLY.

NOTE:

1. ALLOW FIRST LAYER OF BITUMINOUS MATERIAL TO COOL SUFFICIENTLY SO WATERPROOF MEMBRANE DOES NOT TEAR WHEN APPLYING SECOND LAYER OF BITUMINOUS MATERIAL.
2. SEE VIEW B-B FOR ASPHALT WEARING COURSE TYPE.

DETAIL A

NO SCALE



VIEW B-B

SEE FRAMING PLAN, SHEET 6

* USE AGGREGATE SIZE ⅜" OR ½" FOR WEARING COURSE TO MATCH APPROACH ROADWAY PAVEMENT AGGREGATE, THICKNESS VARIES TO MATCH THICKNESS @ 6'-0" FROM FACE OF CURB.

MEMBRANE WATERPROOFING AT RETAINER BLOCK

NO SCALE

Mark	Description	By	Chk'd	Recm'd	Date
	REVISIONS				

S- | SHEET ___ OF ___

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

GLULAM LONGITUDINAL PANEL SUPERSTRUCTURE TYPICAL SECTION AND QUANTITIES

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

RECOMMENDED APR. 23, 2013
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 36] 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 35OO.

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	Recm'd	Date
	REVISIONS				

S-

SHEET ___ OF ___

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

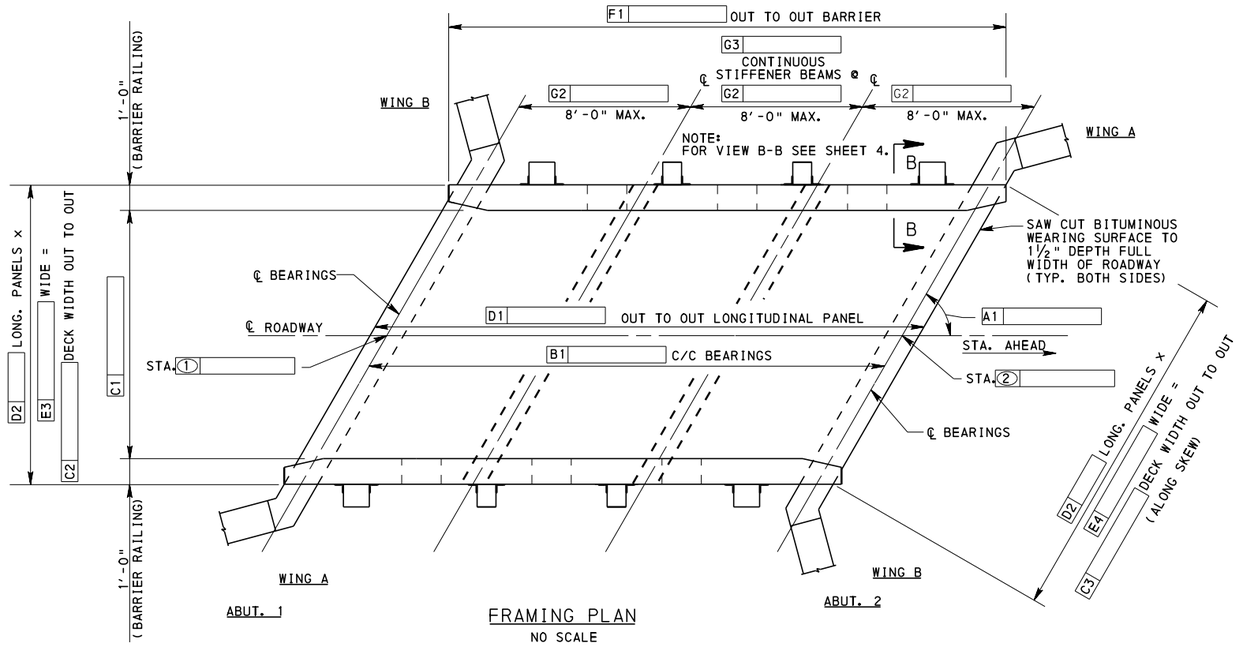
GLULAM
LONGITUDINAL PANEL SUPERSTRUCTURE
GENERAL NOTES

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

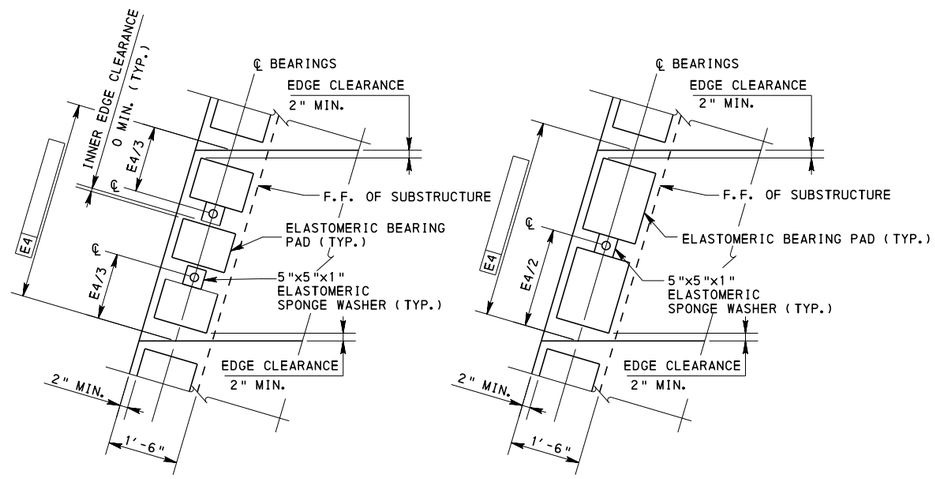
RECOMMENDED APR. 23, 2013
ACTING DIR. BUR. OF PROJECT DELIVERY

SHEET 5 OF 9

BLC-563M



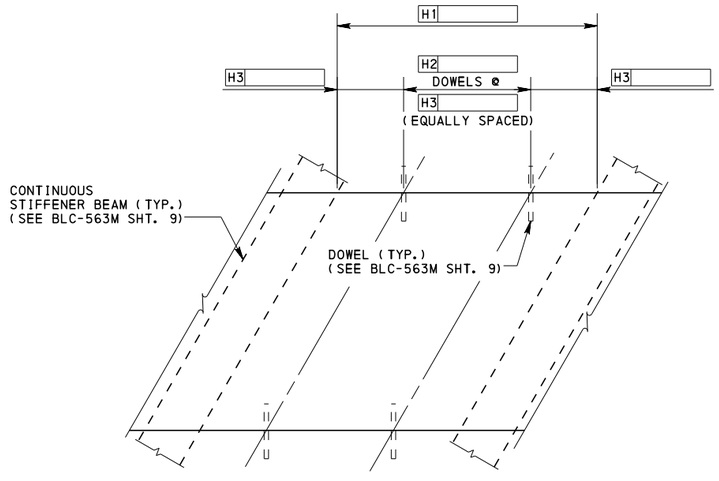
FRAMING PLAN
NO SCALE



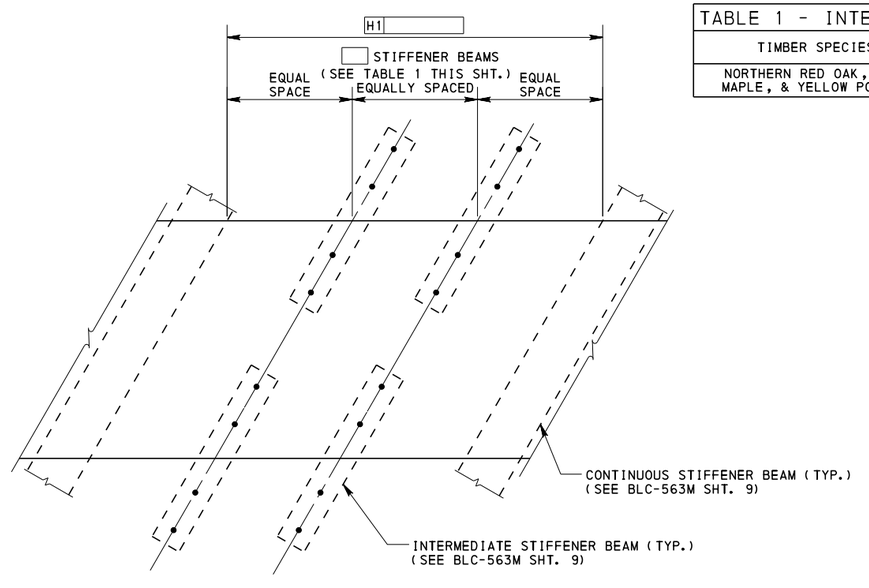
TIMBER SILL

CONCRETE ABUTMENT

ELASTOMERIC BEARING PAD ARRANGEMENTS
NO SCALE



PLAN VIEW OF DOWEL SYSTEM
NO SCALE



PLAN VIEW OF ALTERNATE INTERMEDIATE STIFFENER BEAM SYSTEM
NO SCALE

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	Recm'd	Date
	REVISIONS				

S-

SHEET ___ OF ___

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

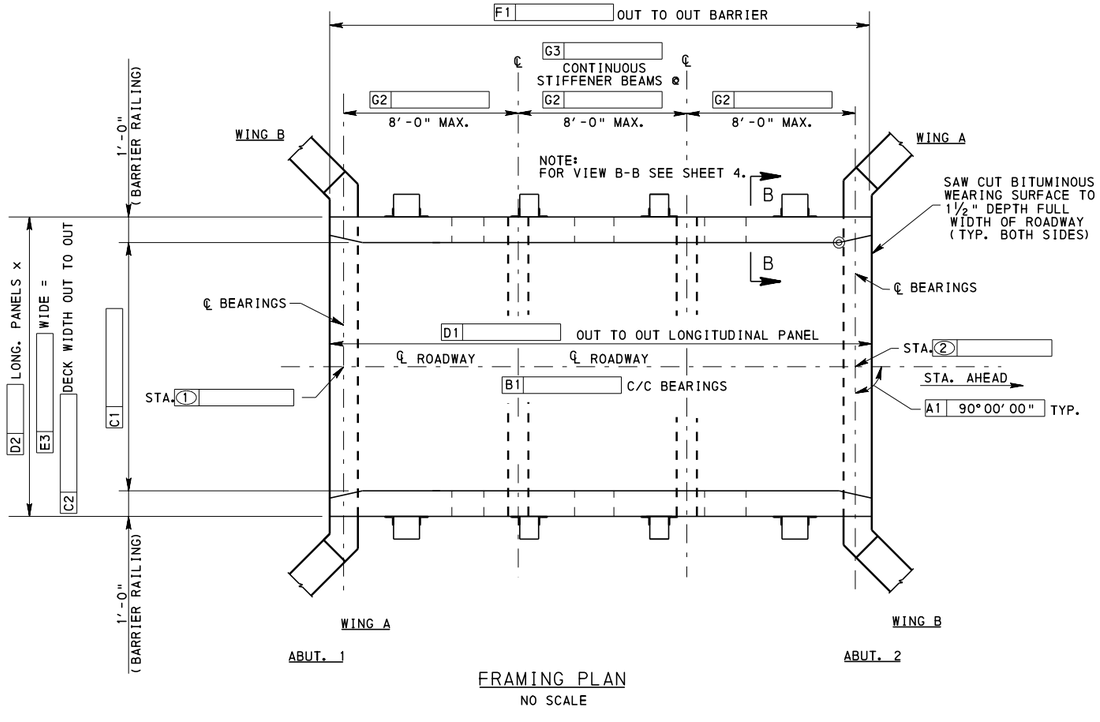
GLULAM
LONGITUDINAL PANEL SUPERSTRUCTURE
FRAMING PLAN - LEFT SKEW

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

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

SHEET 6 OF 9

BLC-563M



FRAMING PLAN
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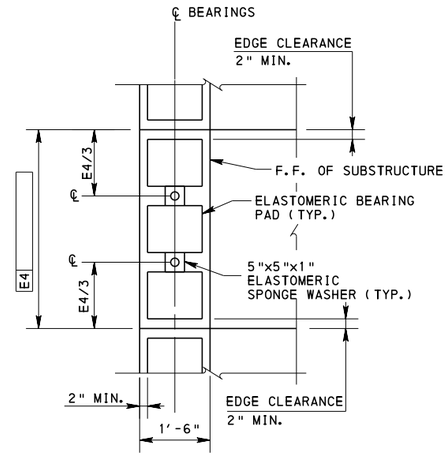
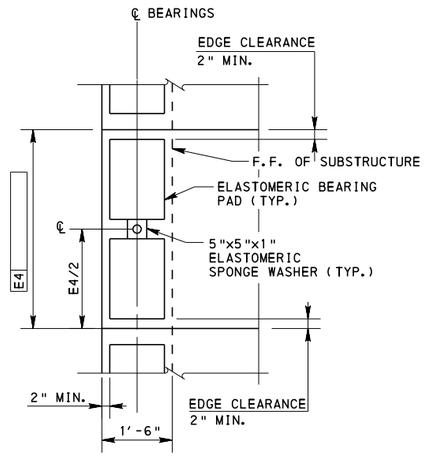


TIMBER SILL



CONCRETE ABUTMENT

ELASTOMERIC BEARING PAD ARRANGEMENTS
NO SCALE

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
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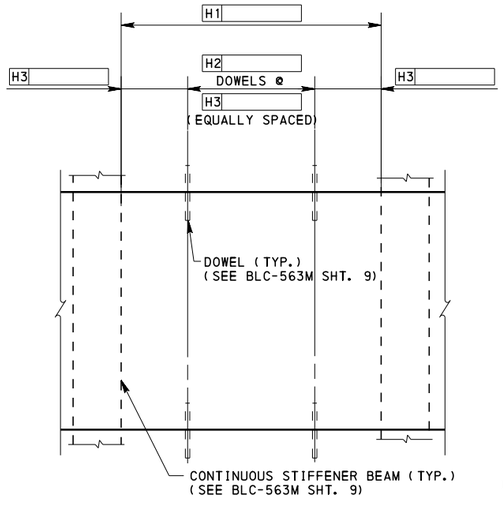
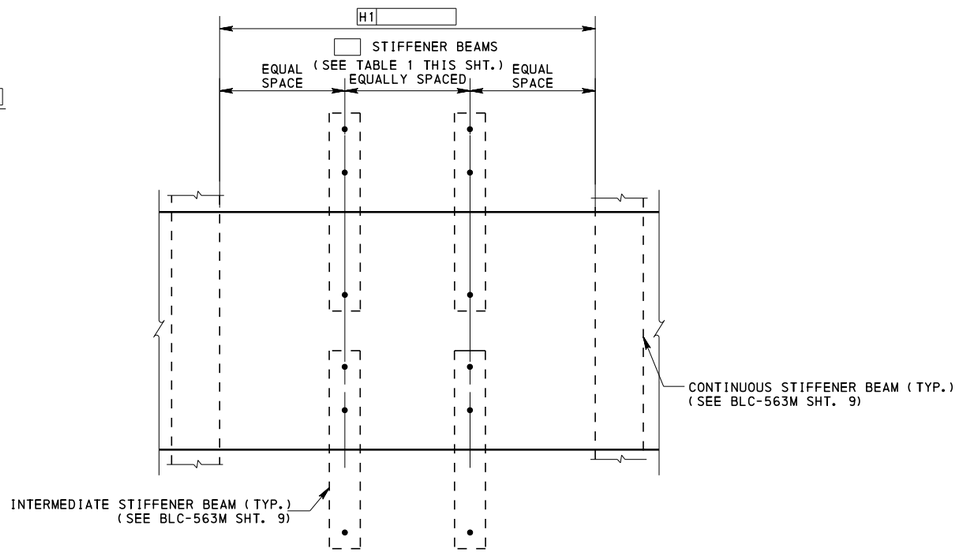


PLAN VIEW OF DOWEL SYSTEM
NO SCALE



PLAN VIEW OF ALTERNATE INTERMEDIATE STIFFENER BEAM SYSTEM
NO SCALE

Mark	Description	By	Chk'd	Recm'd	Date
	REVISIONS				

S- SHEET ___ OF ___

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

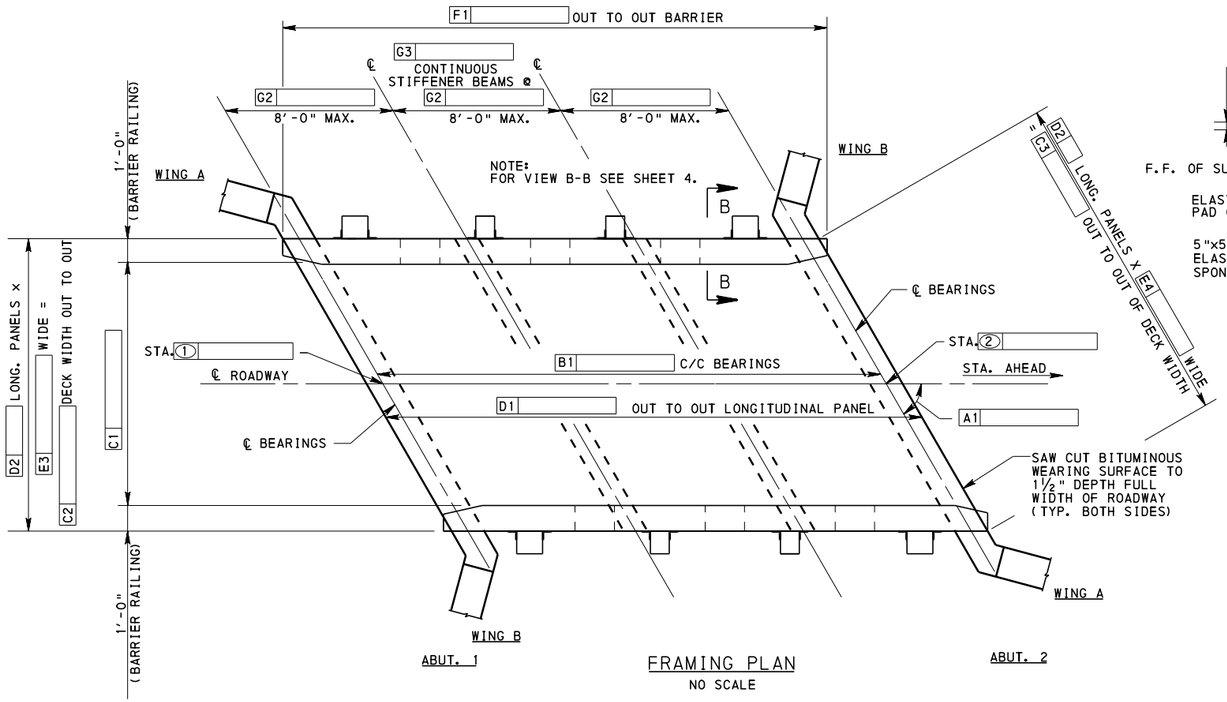
GLULAM
LONGITUDINAL PANEL SUPERSTRUCTURE
FRAMING PLAN - 90° SKEW

RECOMMENDED APR. 23, 2013
CHIEF BRIDGE ENGINEER

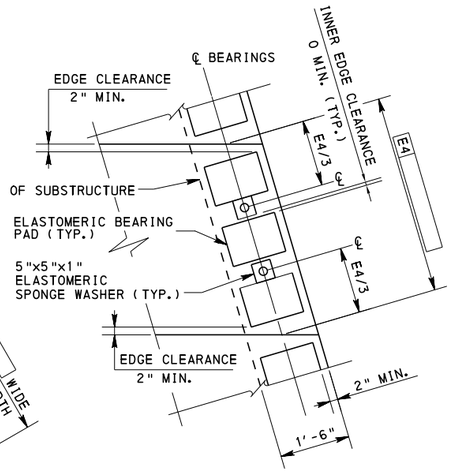
RECOMMENDED APR. 23, 2013
ACTING DIR. BUR. OF PROJECT DELIVERY

SHEET 7 OF 9

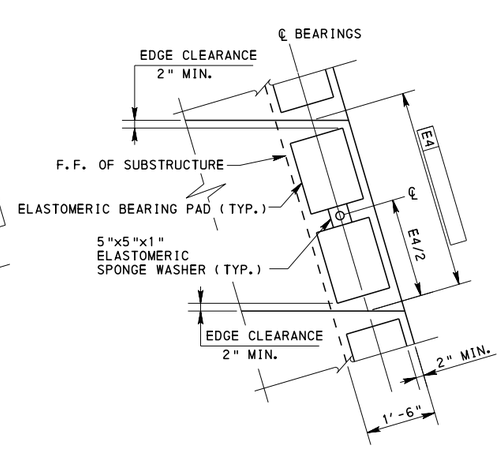
BLC-563M



FRAMING PLAN
NO SCALE



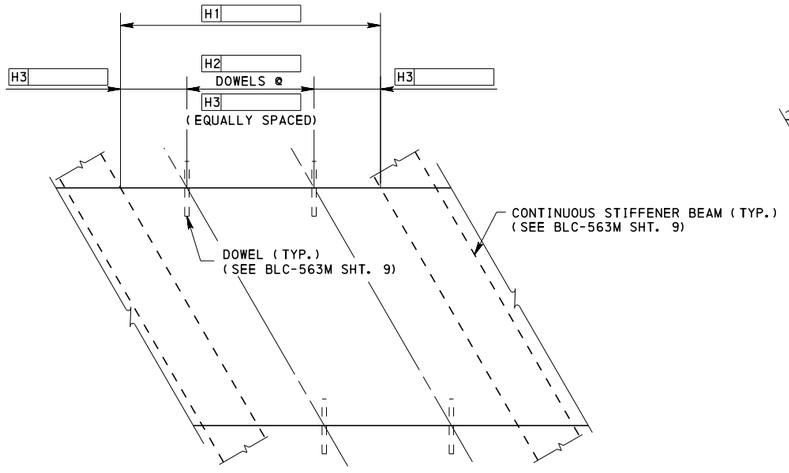
TIMBER SILL



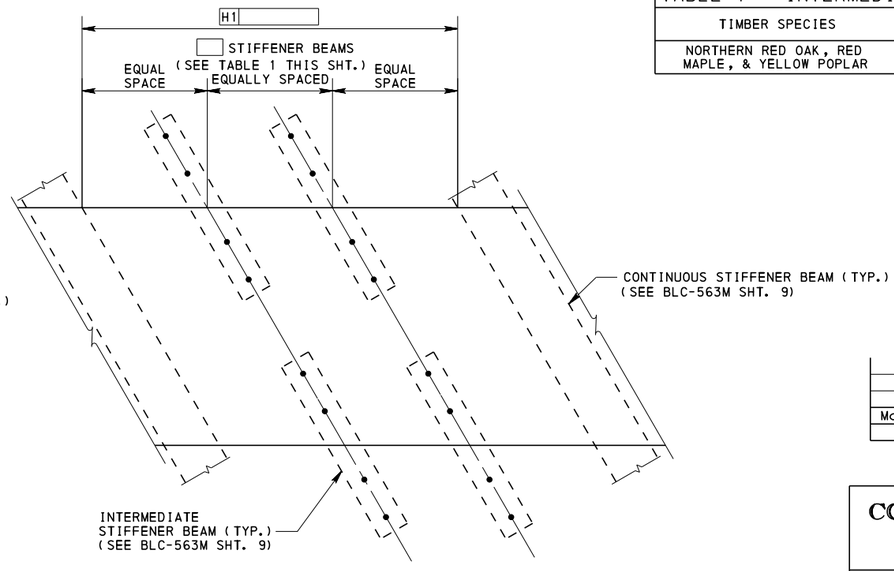
CONCRETE ABUTMENT

ELASTOMERIC BEARING PAD ARRANGEMENTS
NO SCALE

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



PLAN VIEW OF DOWEL SYSTEM
NO SCALE



PLAN VIEW OF ALTERNATE INTERMEDIATE STIFFENER BEAM SYSTEM
NO SCALE

Mark	Description	By	Chk'd	Recm'd	Date
REVISIONS					

S- SHEET__ OF__

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

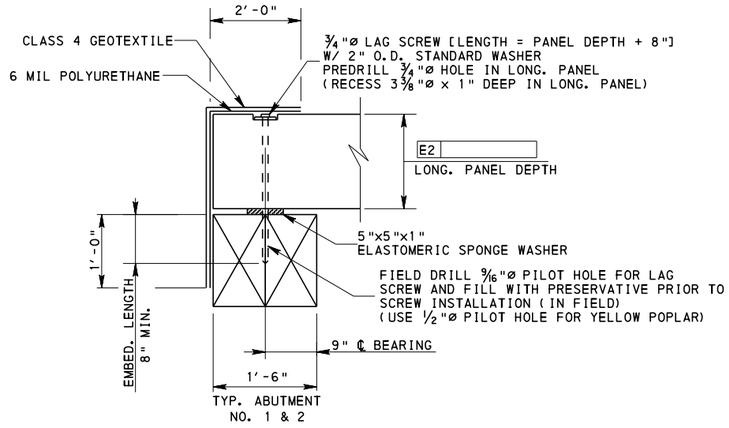
GLULAM
LONGITUDINAL PANEL SUPERSTRUCTURE
FRAMING PLAN - RIGHT SKEW

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

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

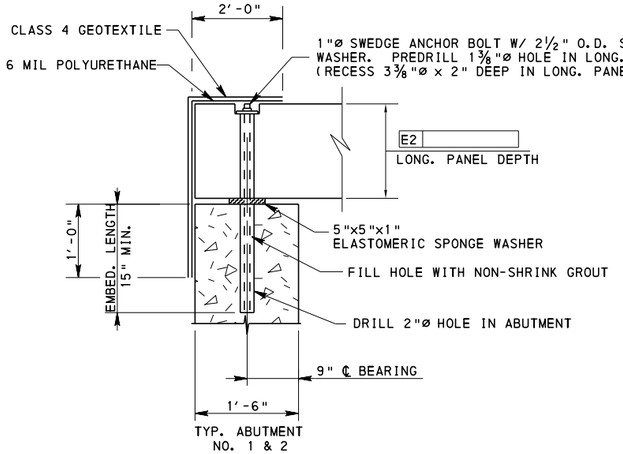
SHEET 8 OF 9

BLC-563M



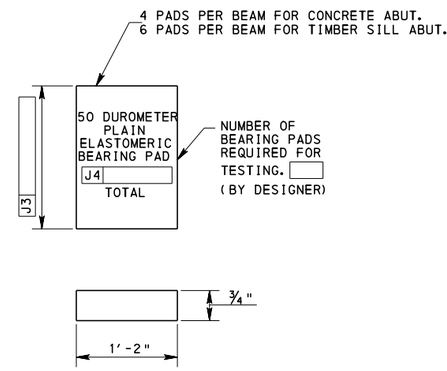
TYPICAL BEARING DETAIL - TIMBER SILL ABUTMENT

NO SCALE



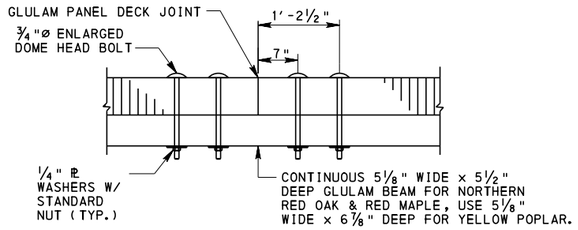
TYPICAL BEARING DETAIL - CONCRETE ABUTMENT

NO SCALE



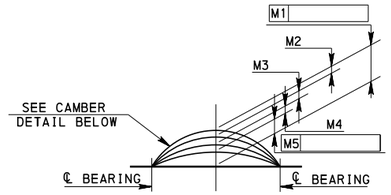
TYPICAL ELASTOMERIC BEARING PAD DETAIL

NO SCALE



CONTINUOUS STIFFENER BEAM DETAIL

NO SCALE



PANEL CAMBER DIAGRAM

M1 = PRE-FABRICATED CAMBER = 3[M2 + M3]

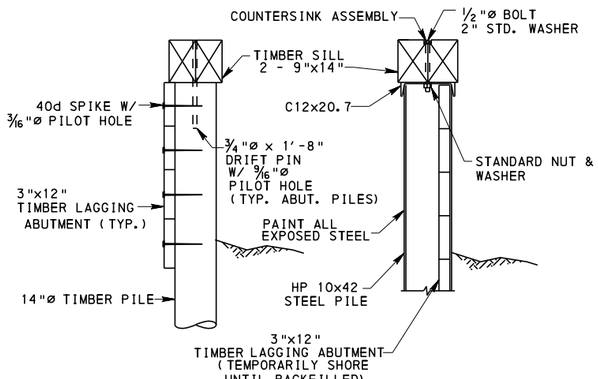
M2 = DEFLECTION DUE TO DEAD LOAD OF BEAM

M3 = DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD

M4 = DEFLECTION DUE TO CREEP = 1.5 [M2 + M3]

M5 = NET FINAL CAMBER = M1 - 2.5 [M2 + M3]

- THE THICKNESS OF THE WEARING COURSE WILL BE VARIED TO COMPENSATE FOR ANY INACCURACIES IN PANEL CAMBER.
- THE PRE-FABRICATED CAMBER LESS THE DEFLECTION DUE TO DEAD LOAD OF PANEL SHOULD BE CHECKED IN THE FIELD.
- DEFLECTION CALCULATIONS DO NOT CONSIDER LOAD EFFECTS DUE TO FUTURE WEARING SURFACE.



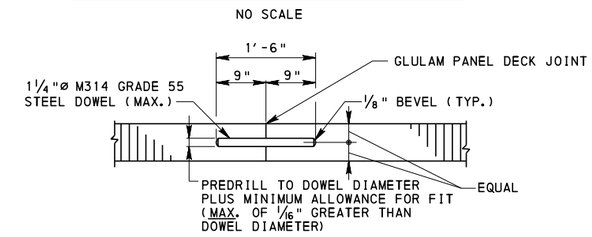
TIMBER PILE STEEL PILE

TIMBER SILL DETAIL

NO SCALE

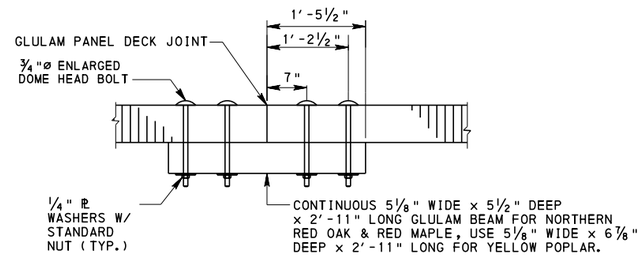
ELASTOMERIC BEARING PAD NOTES:

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.



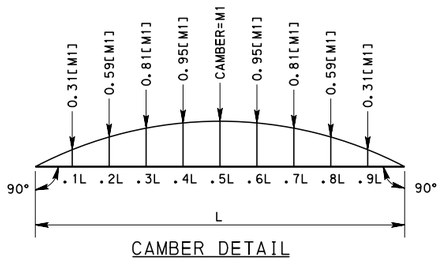
DOWEL DETAIL

NO SCALE



ALTERNATE INTERMEDIATE STIFFENER BEAM DETAIL

NO SCALE



CAMBER DETAIL

Mark	Description	By	Chk'd	Recm'd	Date
	REVISIONS				

S- SHEET ___ OF ___

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

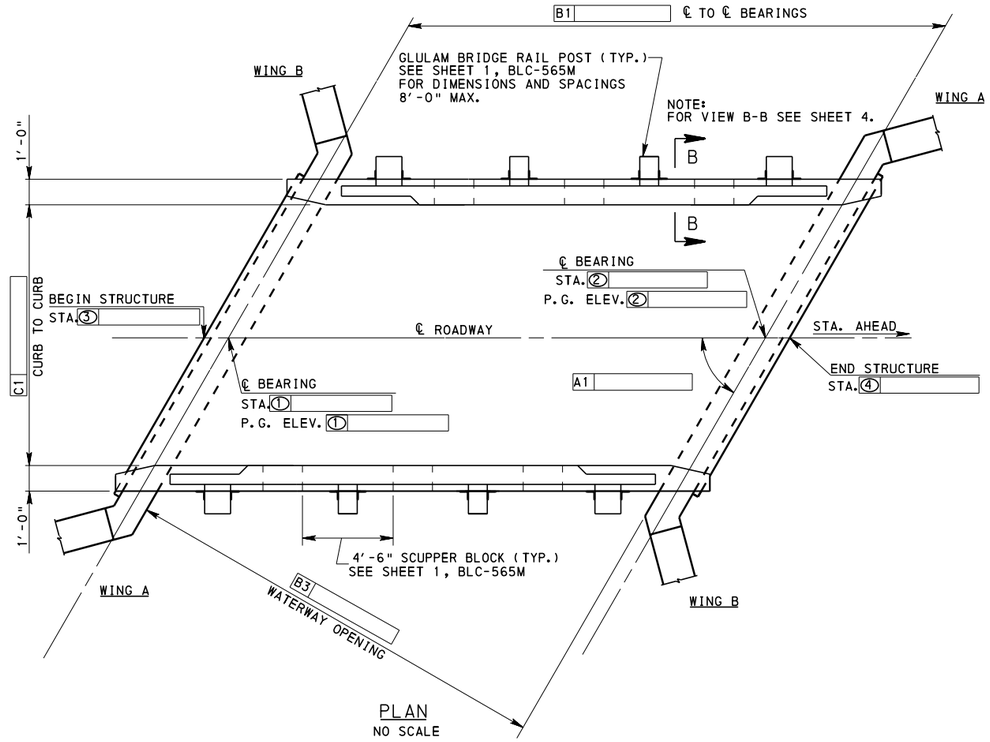
GLULAM
LONGITUDINAL PANEL SUPERSTRUCTURE
SUPERSTRUCTURE DETAILS

RECOMMENDED APR. 23, 2013
CHIEF BRIDGE ENGINEER

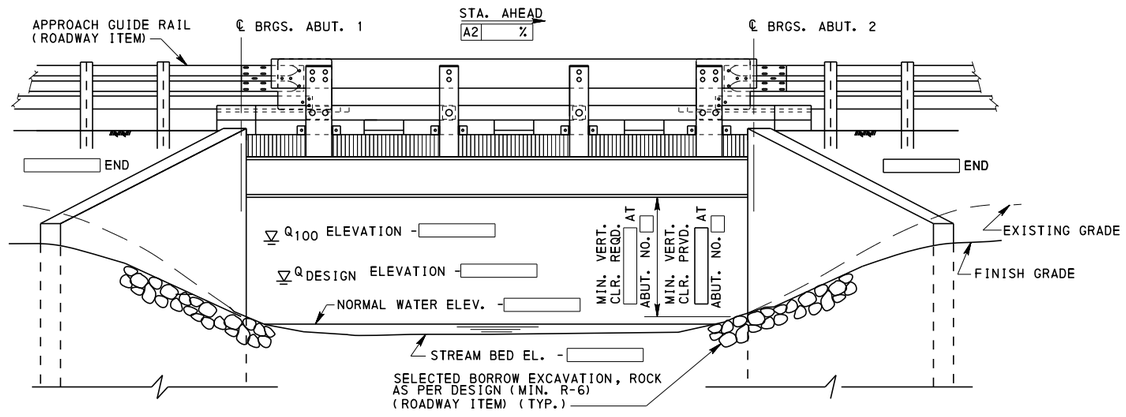
RECOMMENDED APR. 23, 2013
ACTING DIR. BUR. OF PROJECT DELIVERY

SHEET 9 OF 9

BLC-563M



PLAN
NO SCALE



ELEVATION
NO SCALE

HYDRAULIC DATA
(DESIGNER)

DRAINAGE AREA -
DESIGN FLOOD
DISCHARGE -
FREQUENCY -
ELEVATION -
100 YEAR FLOOD
DISCHARGE -
ELEVATION -

INDEX OF DRAWINGS

SHT. NO.	TITLE	SHT. NO.	TITLE

BRIDGE RATING(1)
REFER TO TABLE 2, BLC-561M SHEET 9

SIMPLE SPAN		STEEL BEAM(2)					
		H	HS	ML	PHL93	TK-527	P82
INVENTORY RATING (IR)	LOCATION						-
	LIMIT STATE	STR. I	STR I	STR. I	STR. I	STR. I	-
	RATING						-
OPERATING RATING (OR)	LOCATION						
	LIMIT STATE	STR. II	STR. II	STR. II	STR. IA	STR. II	STR. II
	RATING						

MOMENT CAPACITY - kip-ft. _____
LOCATION _____
SHEAR CAPACITY - kip _____
LOCATION _____

NOTES FOR BRIDGE RATING TABLE:

1.) FLEXURAL RATING FACTORS ARE SHOWN & GOVERN UNLESS OTHERWISE DENOTED BY A "S" 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	Recm'd	Date
	REVISIONS				

S- | SHEET ___ OF ___

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

Recommended _____
DISTRICT BRIDGE ENGINEER

ENGINEERING SEAL	PREPARED BY:
SIGNATURE & DATE	

BC-753M	STEEL GIRDER DETAILS
BC-754M	STEEL DIAPHRAGMS FOR STEEL BEAM/GIRDER STRUCTURES (STRAIGHT GIRDERS ONLY)
BC-755M	BEARINGS

REFERENCE DRAWING

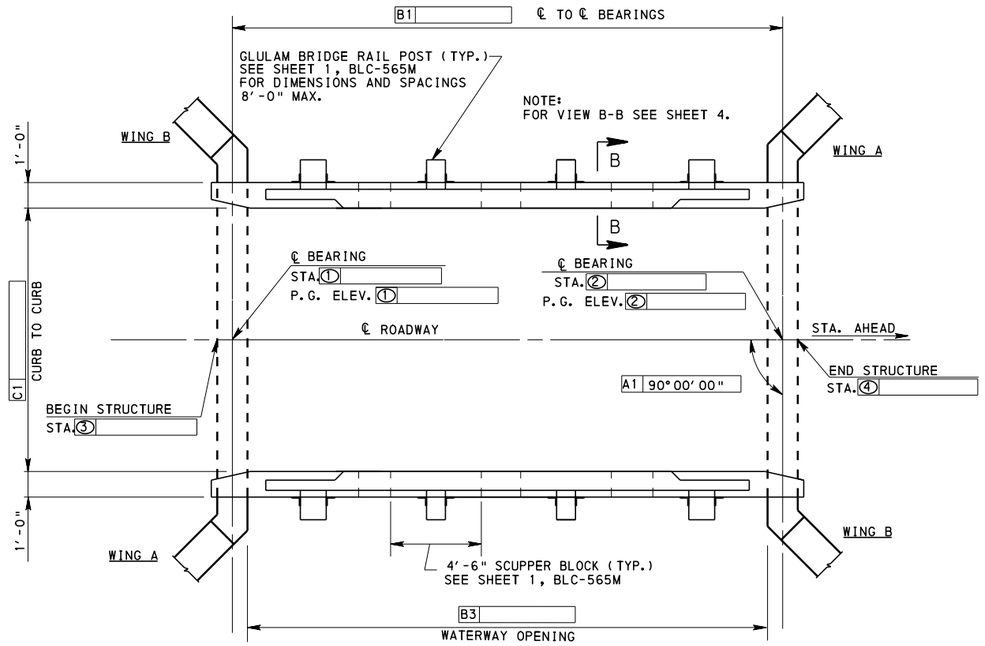
STEEL BEAM SUPERSTRUCTURE GENERAL PLAN & ELEVATION - LEFT SKEW

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

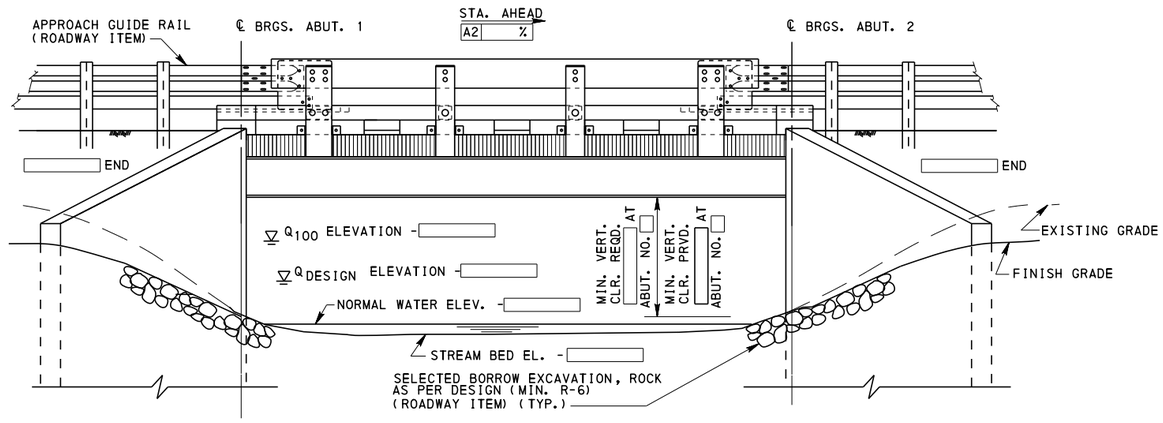
RECOMMENDED APR. 23, 2013
ACTING DIR. BUR. OF PROJECT DELIVERY

SHEET 1 OF 14

BLC-564M



PLAN
NO SCALE



ELEVATION
NO SCALE

HYDRAULIC DATA
(DESIGNER)

DRAINAGE AREA -
DESIGN FLOOD
DISCHARGE -
FREQUENCY -
ELEVATION -
100 YEAR FLOOD
DISCHARGE -
ELEVATION -

INDEX OF DRAWINGS

SHT. NO.	TITLE	SHT. NO.	TITLE

BRIDGE RATING(1)
REFER TO TABLE 2, BLC-561M SHEET 9

SIMPLE SPAN		STEEL BEAM(2)					
		H	HS	ML	PHL93	TK-527	P82
INVENTORY RATING (IR)	LOCATION						-
	LIMIT STATE	STR. I	STR I	STR. I	STR. I	STR. I	-
	RATING						-
OPERATING RATING (OR)	LOCATION						
	LIMIT STATE	STR. II	STR. II	STR. II	STR. IA	STR. II	STR. II
	RATING						

MOMENT CAPACITY - kip-ft. _____
LOCATION _____
SHEAR CAPACITY - kip _____
LOCATION _____

NOTES FOR BRIDGE RATING TABLE:

1.) FLEXURAL RATING FACTORS ARE SHOWN & GOVERN UNLESS OTHERWISE DENOTED BY A "S" 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	Recm'd	Date
	REVISIONS				

S- SHEET ___ OF ___

ENGINEERING SEAL

SIGNATURE & DATE

PREPARED BY:

Recommended _____

DISTRICT BRIDGE ENGINEER

BC-753M	STEEL GIRDER DETAILS
BC-754M	STEEL DIAPHRAGMS FOR STEEL BEAM/GIRDER STRUCTURES (STRAIGHT GIRDERS ONLY)
BC-755M	BEARINGS

REFERENCE DRAWING

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

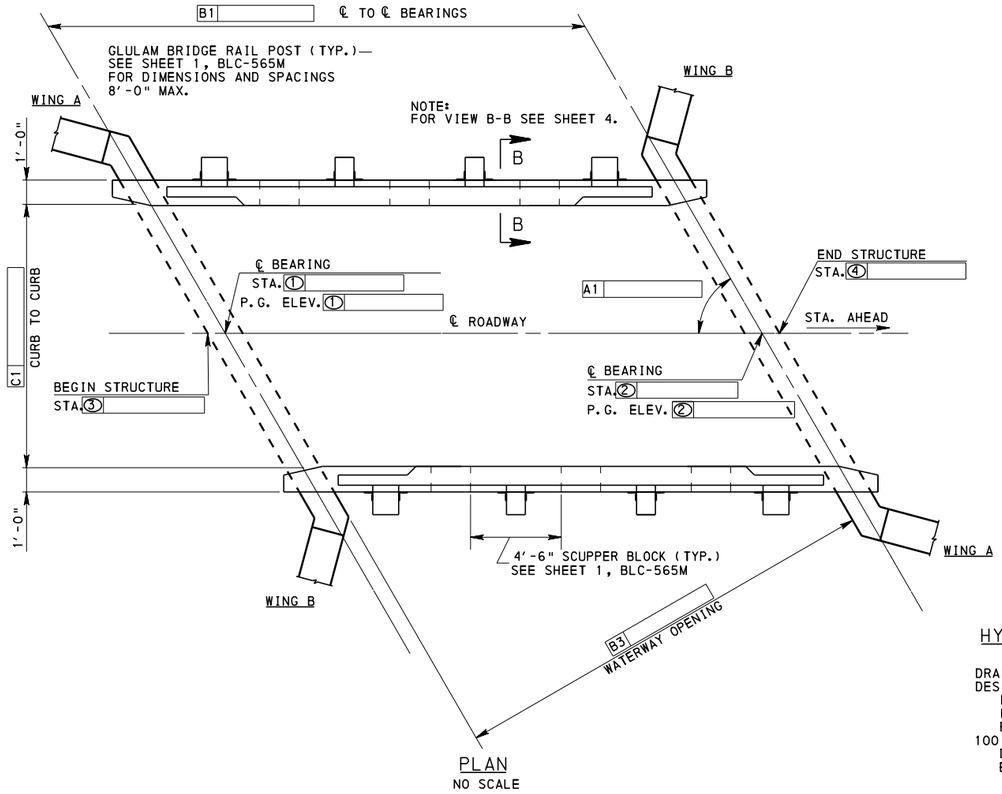
STEEL BEAM SUPERSTRUCTURE
GENERAL PLAN & ELEVATION - 90° SKEW

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

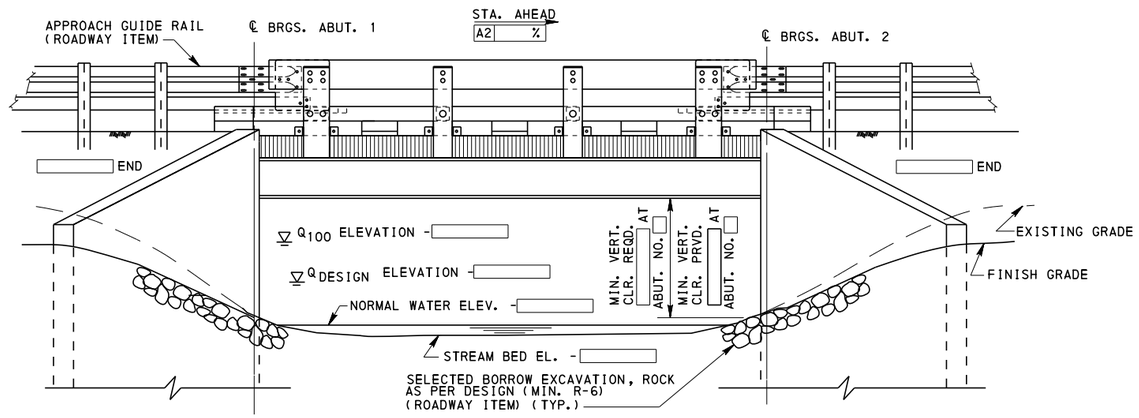
RECOMMENDED APR. 23, 2013
ACTING DIR. BUR. OF PROJECT DELIVERY

SHEET 2 OF 14

BLC-564M



PLAN
NO SCALE



ELEVATION
NO SCALE

HYDRAULIC DATA
(DESIGNER)

DRAINAGE AREA -
DESIGN FLOOD
DISCHARGE -
FREQUENCY -
ELEVATION -
100 YEAR FLOOD
DISCHARGE -
ELEVATION -

INDEX OF DRAWINGS

SHT. NO.	TITLE	SHT. NO.	TITLE

BRIDGE RATING(1)
REFER TO TABLE 2, BLC-561M SHEET 9

SIMPLE SPAN		STEEL BEAM(2)					
		H	HS	ML	PHL93	TK-527	P82
INVENTORY RATING (IR)	LOCATION						-
	LIMIT STATE	STR. I	STR I	STR. I	STR. I	STR. I	-
	RATING						-
OPERATING RATING (OR)	LOCATION						
	LIMIT STATE	STR. II	STR. II	STR. II	STR. IA	STR. II	STR. II
	RATING						

MOMENT CAPACITY - kip-ft. _____
LOCATION _____
SHEAR CAPACITY - kip _____
LOCATION _____

NOTES FOR BRIDGE RATING TABLE:

1.) FLEXURAL RATING FACTORS ARE SHOWN & GOVERN UNLESS OTHERWISE DENOTED BY A "S" 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	Recm'd	Date

REVISIONS

S- | SHEET ___ OF ___

ENGINEERING SEAL

PREPARED BY:

SIGNATURE & DATE

Recommended _____

DISTRICT BRIDGE ENGINEER

BC-753M	STEEL GIRDER DETAILS
BC-754M	STEEL DIAPHRAGMS FOR STEEL BEAM/GIRDER STRUCTURES (STRAIGHT GIRDERS ONLY)
BC-755M	BEARINGS

REFERENCE DRAWING

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

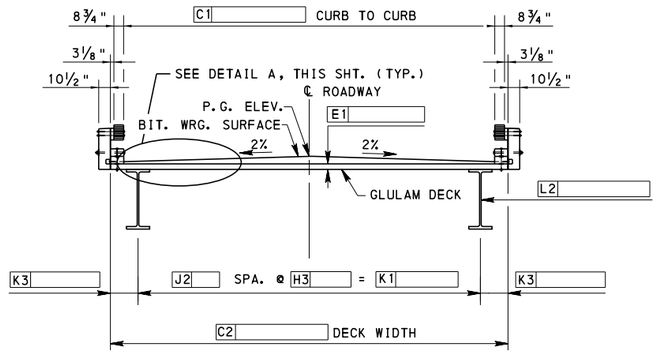
STEEL BEAM SUPERSTRUCTURE
GENERAL PLAN & ELEVATION- RIGHT SKEW

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

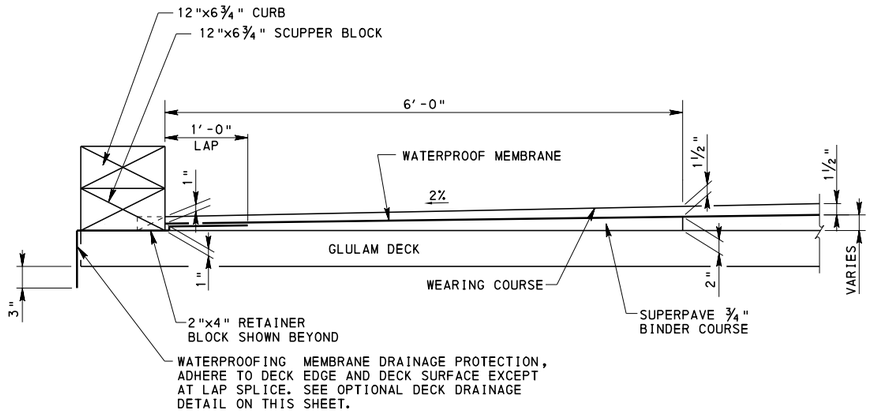
RECOMMENDED APR. 23, 2013
ACTING DIR., BUR. OF PROJECT DELIVERY

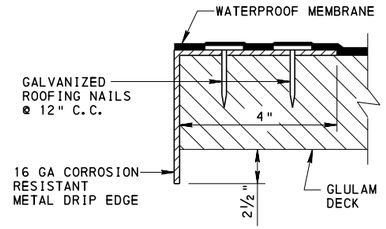
SHEET 3 OF 14

BLC-564M



TYPICAL SECTION
NO SCALE





OPTIONAL DECK
DRAINAGE PROTECTION

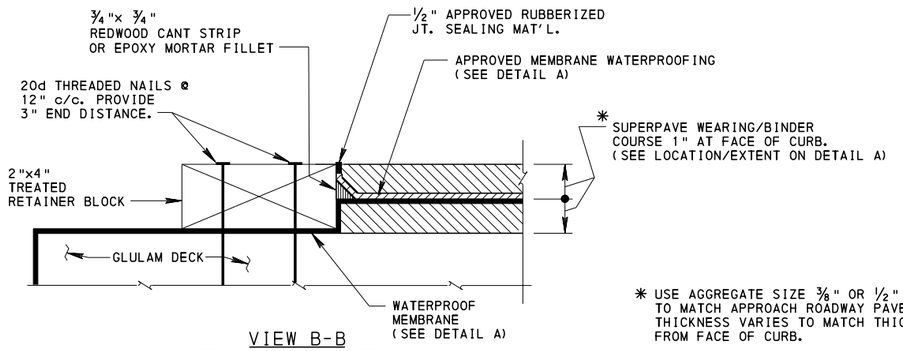
APPROXIMATE QUANTITIES - BRIDGE STRUCTURE, AS DESIGNED						
ITEM NO.	ITEM	UNIT	ABUT. 1	ABUT. 2	SUPERSTRUCTURE	TOTAL
8030-0001	BRIDGE STRUCTURE AS DESIGNED, S-	LS				LS
(1)	FABRICATED STRUCTURAL STEEL BEAMS	F.B.M.	-----	-----		
(1)(2)	FABRICATED STRUCTURAL STEEL MISCELLANEOUS	LB.	-----	-----		
(1)	GLUE LAMINATED TIMBER DECK	F.B.M.	-----	-----		
(1)	GLUE LAMINATED TIMBER BRIDGE RAIL	F.B.M.	-----	-----		
(1)	GLUE LAMINATED TIMBER BACKWALL	F.B.M.	-----	-----		
(1)	GLUE LAMINATED TIMBER STIFFENER BEAMS	F.B.M.	-----	-----		
(1)	WATERPROOF MEMBRANE	S.Y.	-----	-----		
(1)	CLASS 4 GEOTEXTILE	S.Y.	-----	-----		
(1)	BITUMINOUS BINDER COURSE SUPERPAVE, 19mm	TON	-----	-----		
{1}	BITUMINOUS WEARING COURSE SUPERPAVE, ⅜"/ ½"	TON	-----	-----		
(1)	TREATED RETAINER BLOCK	F.B.M.	-----	-----		
(1)	OPTIONAL METAL DRIP EDGE	S.Y.				

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

2. QUANTITY DOES NOT INCLUDE STEEL DOWELS & OTHER CONNECTION HARDWARE.

NOTE:
1. ALLOW FIRST LAYER OF BITUMINOUS MATERIAL TO COOL SUFFICIENTLY SO WATERPROOF MEMBRANE DOES NOT TEAR WHEN APPLYING SECOND LAYER OF BITUMINOUS MATERIAL.
2. SEE VIEW B-B FOR ASPHALT WEARING COURSE TYPE.

DETAIL A
NO SCALE



VIEW B-B
SEE FRAMING PLAN, SHEET 6

* USE AGGREGATE SIZE ⅜" OR ½" FOR WEARING COURSE TO MATCH APPROACH ROADWAY PAVEMENT AGGREGATE, THICKNESS VARIES TO MATCH THICKNESS @ 6'-0" FROM FACE OF CURB.

MEMBRANE WATERPROOFING AT
RETAINER BLOCK
NO SCALE

Mark	Description	By	Chk'd	Recm'd	Date
	REVISIONS				

S- | SHEET ___ OF ___

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

STEEL BEAM SUPERSTRUCTURE
TYPICAL SECTION AND QUANTITIES

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

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

SHEET 4 OF 14

BLC-564M

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.

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

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

PLACE CHEEKWALL CONCRETE AFTER BEAMS ARE SET IN POSITION.

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

STEEL

USE THESE STANDARDS WITH WEATHERING STEEL ONLY AFTER APPROVAL OF DISTRICT ENGINEER.

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 36] 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 35OO.

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

PROVIDE OFFSET SHOES CONFORMING TO AASHTO M105 (ASTM A48), CLASS 30 - STANDARD SPECIFICATION FOR GRAY ALLOY CASTING AS PER AASHTO 6.4.6.3 CAST IRON.

STEEL BEAMS

PAINT STRUCTURAL STEEL IN ACCORDANCE WITH PUBLICATION 408, SECTION 1060. USE WEATHERING STEEL ONLY AFTER APPROVAL OF DISTRICT ENGINEER.

IF BEAMS CANNOT BE SHIPPED IN THE LENGTH SHOWN ON THE PLANS, FIELD SPLICE(S) WILL BE PERMITTED AT THE REQUEST OF THE CONTRACTOR, BUT NO COMPENSATION WILL BE ALLOWED FOR THE SPLICE(S).

DO NOT USE TEMPORARY SUPPORT SYSTEMS THAT WILL CAUSE UNACCEPTABLE OVERSTRESS OR DEFORMATION TO PERMANENT BRIDGE MEMBERS.

MAXIMUM ALLOWABLE DECK OVERHANG IS 2'-3".

GENERAL NOTES CONTINUED:

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.

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	Recm'd	Date
	REVISIONS				

S-

SHEET ___ OF ___

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

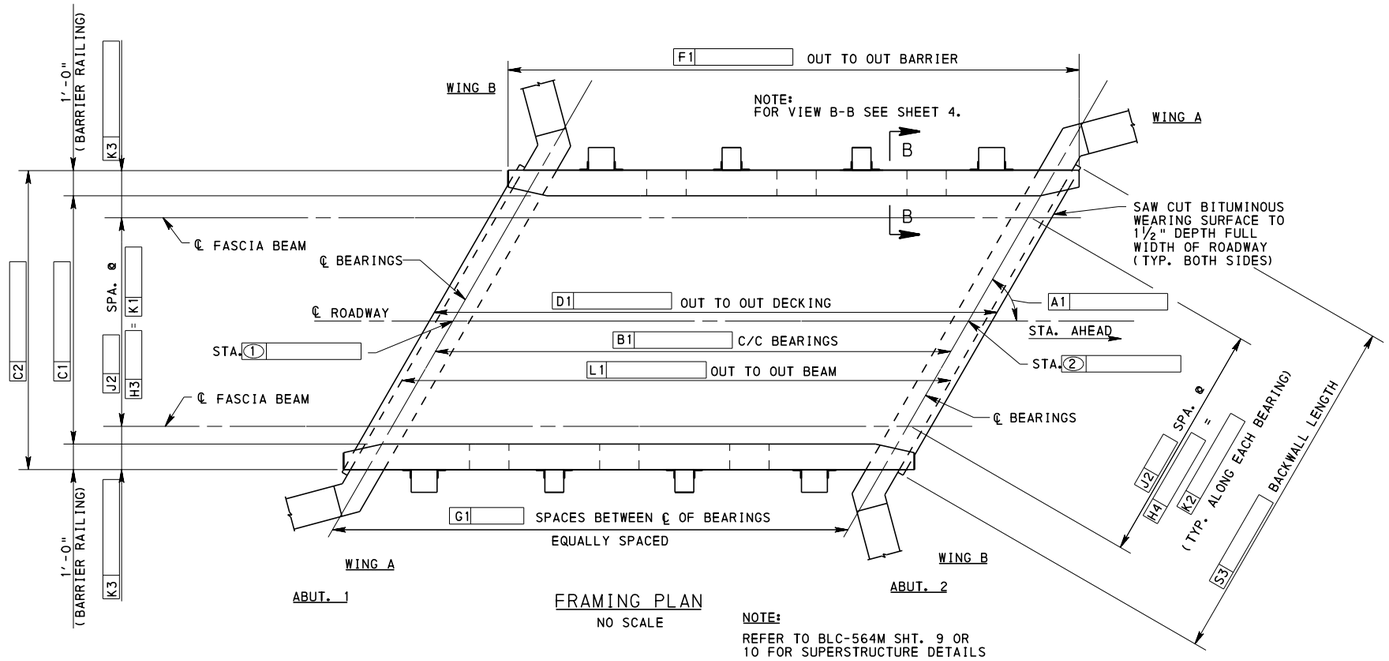
STEEL BEAM SUPERSTRUCTURE GENERAL NOTES

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

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

SHEET 5 OF 14

BLC-564M

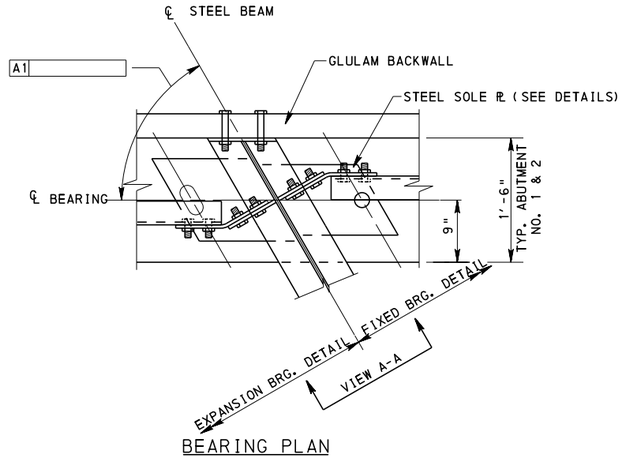


FRAMING PLAN
NO SCALE

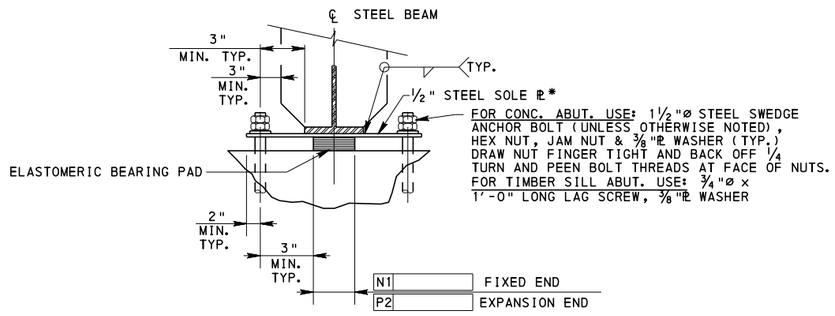
NOTE:
REFER TO BLC-564M SHT. 9 OR 10 FOR SUPERSTRUCTURE DETAILS

NOTES:

1. PROVIDE MECHANICALLY GALVANIZED SWEDGE OF APPROVED TYPE OF ANCHOR BOLTS. SET IN THE MASONRY AS SHOWN ON THE DESIGN DRAWINGS.
2. PROVIDE MINIMUM SIZE WELD IN ACCORDANCE WITH AASHTO/AWS CODE UNLESS LARGER WELD IS REQUIRED BY DESIGN.
3. PROVIDE PLATE WASHERS OF SUFFICIENT SIZE TO COVER THE ROUND HOLE OR SLOT FOR EXTREMES OF MOVEMENT OF THE BEARINGS. WASHER MAY BE CLIPPED IF REQUIRED.
4. FILL ANCHOR BOLT OR LAG SCREW SOLE PLATE HOLES WITH NON-HARDENING CAULKING COMPOUND AT THE FIXED END.
5. PERMIT DRILLING OF ANCHOR BOLT HOLES AT ABUTMENT ONLY. WASH AND DRY HOLE BEFORE FILLING WITH NON-SHRINK GROUT.
6. BLAST CLEAN CONCRETE BEARING SURFACES TO ACHIEVE ROUGH TEXTURE. DO NOT APPLY EPOXY COATING TO THE BEARING SURFACES WITHIN 2" OF THE BEARING PAD AND SPONGE LOCATION.
7. DO NOT USE ELASTOMERIC MATERIAL WITH A HARDNESS GREATER THAN 60 DUROMETER.
8. DO NOT PROVIDE HOLES IN ELASTOMERIC BEARINGS UNLESS INDICATED ON THE DESIGN DRAWINGS.
9. USE FIXED BEARINGS AT LOWER END OF SPAN UNLESS PERMITTED BY THE CHIEF BRIDGE ENGINEER.

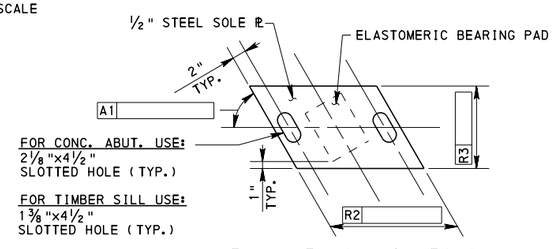


BEARING PLAN
NO SCALE



VIEW A-A
NO SCALE

* (a) PROVIDE FLATNESS TOLERANCE IN ACCORDANCE WITH PUB. 408, SECTION 1105.03(q)
(b) PROVIDE SOLE PLATE IN ACCORDANCE WITH DM-4, D14.7.6.3.9dP



EXP. BEARING PL DETAIL
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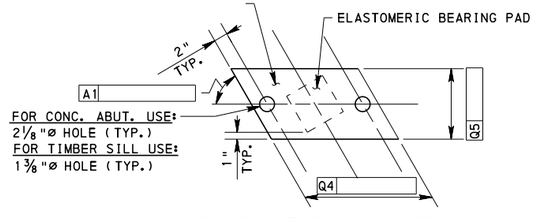


FIXED BEARING PL DETAIL
NO SCALE

Mark	Description	By	Chk'd	Recm'd	Date
	REVISIONS				

S- | SHEET ___ OF ___

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

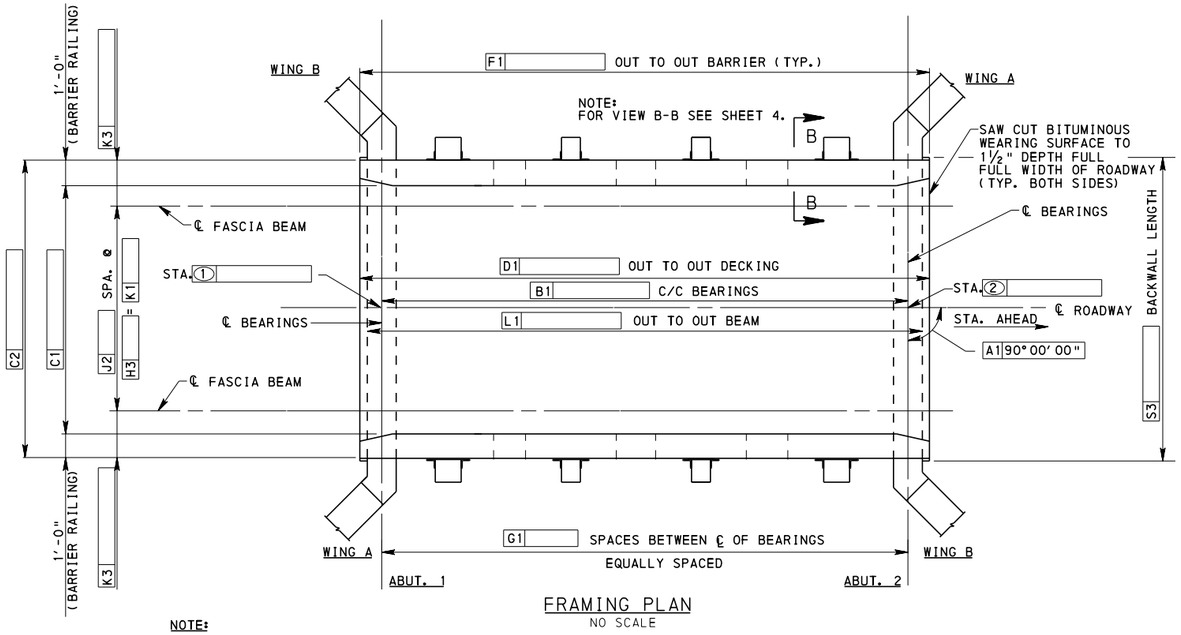
STEEL BEAM SUPERSTRUCTURE
FRAMING PLAN - LEFT SKEW

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

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

SHEET 6 OF 14

BLC-564M

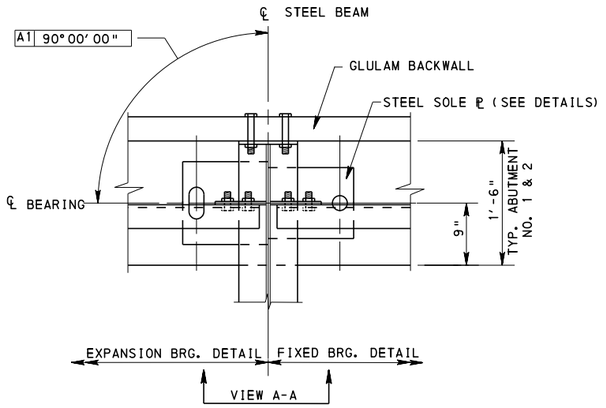


FRAMING PLAN
NO SCALE

NOTE:
REFER TO BLC-564M SHT. 9 OR 10 FOR SUPERSTRUCTURE DETAILS

NOTES:

1. PROVIDE MECHANICALLY GALVANIZED SWEDGE OF APPROVED TYPE OF ANCHOR BOLTS. SET IN THE MASONRY AS SHOWN ON THE DESIGN DRAWINGS.
2. PROVIDE MINIMUM SIZE WELD IN ACCORDANCE WITH AASHTO/AWS CODE UNLESS LARGER WELD IS REQUIRED BY DESIGN.
3. PROVIDE PLATE WASHERS OF SUFFICIENT SIZE TO COVER THE ROUND HOLE OR SLOT FOR EXTREMES OF MOVEMENT OF THE BEARINGS. WASHER MAY BE CLIPPED IF REQUIRED.
4. FILL ANCHOR BOLT OR LAG SCREW SOLE PLATE HOLES WITH NON-HARDENING CAULKING COMPOUND AT THE FIXED END.
5. PERMIT DRILLING OF ANCHOR BOLT HOLES AT ABUTMENT ONLY. WASH AND DRY HOLE BEFORE FILLING WITH NON-SHRINK GROUT.
6. BLAST CLEAN CONCRETE BEARING SURFACES TO ACHIEVE ROUGH TEXTURE. DO NOT APPLY EPOXY COATING TO THE BEARING SURFACES WITHIN 2" OF THE BEARING PAD AND SPONGE LOCATION.
7. DO NOT USE ELASTOMERIC MATERIAL WITH A HARDNESS GREATER THAN 60 DUROMETER.
8. DO NOT PROVIDE HOLES IN ELASTOMERIC BEARINGS UNLESS INDICATED ON THE DESIGN DRAWINGS.
9. USE FIXED BEARINGS AT LOWER END OF SPAN UNLESS PERMITTED BY THE CHIEF BRIDGE ENGINEER.



BEARING PLAN
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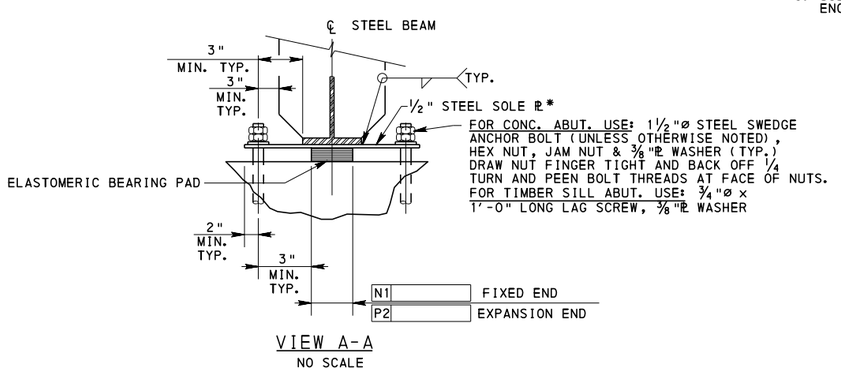
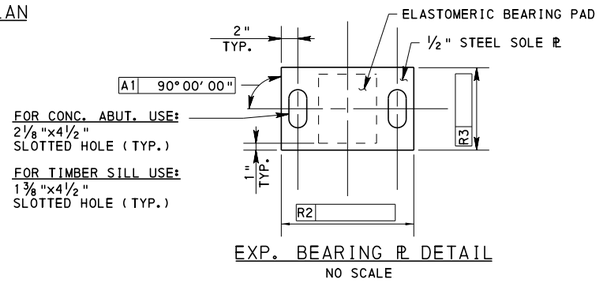


VIEW A-A
NO SCALE

* (a) PROVIDE FLATNESS TOLERANCE IN ACCORDANCE WITH PUB. 408, SECTION 1105.03(q)
(b) PROVIDE SOLE PLATE IN ACCORDANCE WITH DM-4, D14.7.6.3.9dP



EXP. BEARING PL DETAIL
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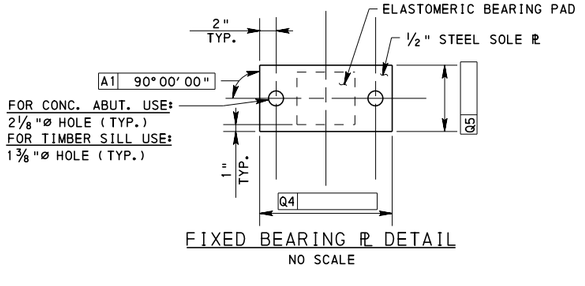


FIXED BEARING PL DETAIL
NO SCALE

Mark	Description	By	Chk'd	Recm'd	Date
	REVISIONS				

S- | SHEET ___ OF___

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

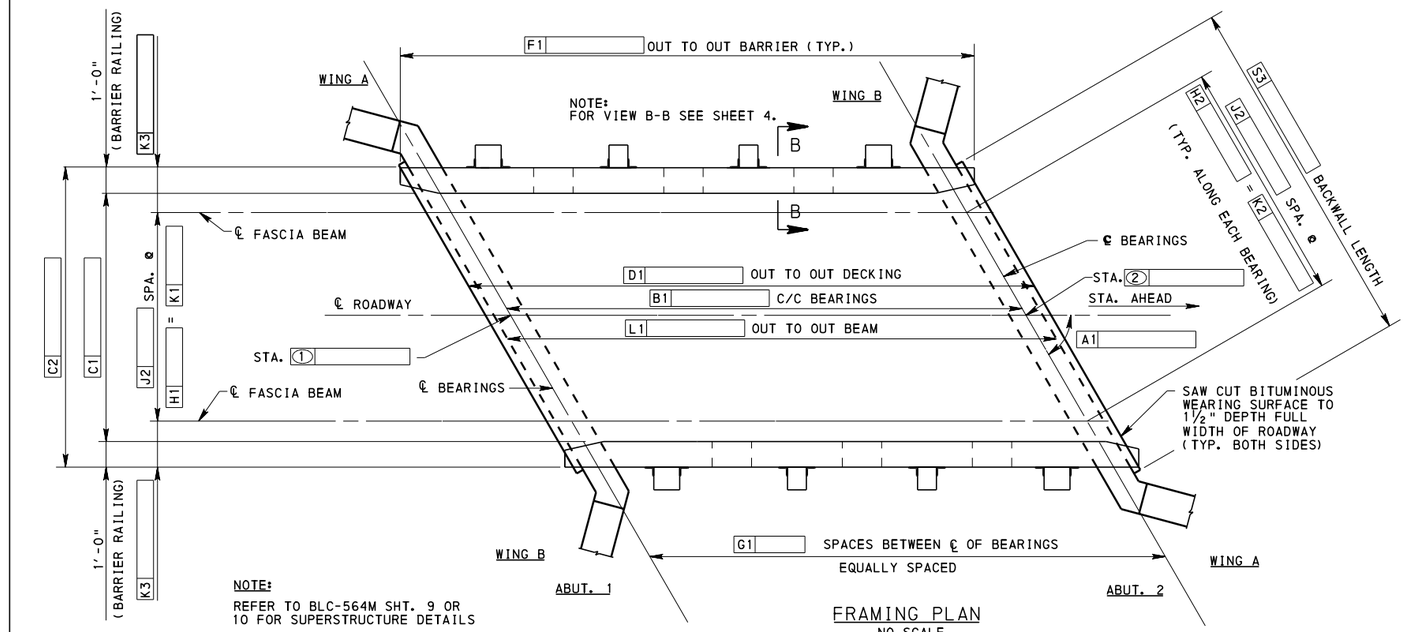
STEEL BEAM SUPERSTRUCTURE FRAMING PLAN - 90° SKEW

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

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

SHEET 7 OF 14

BLC-564M



FRAMING PLAN
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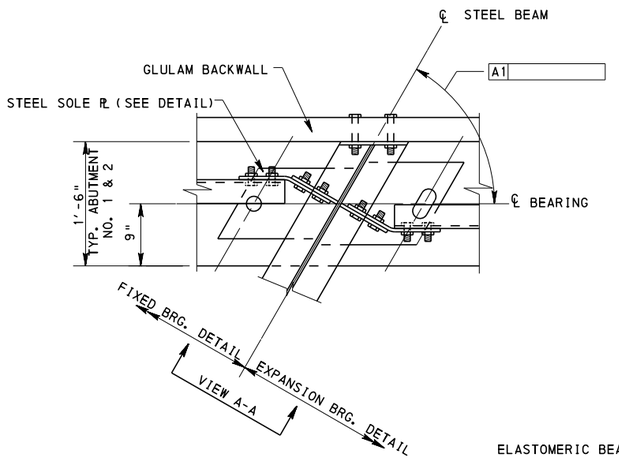

BEARING PLAN
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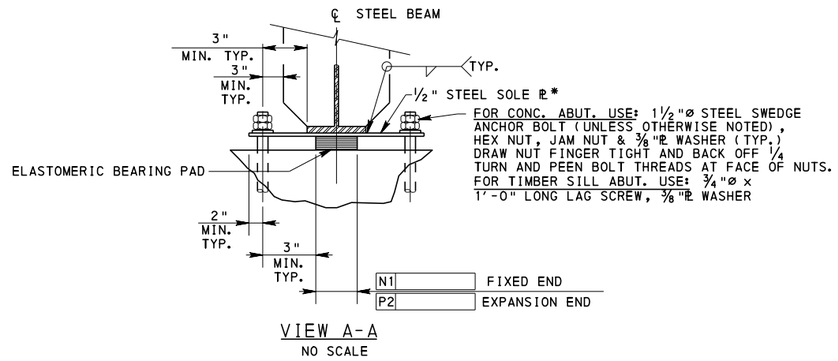

VIEW A-A
NO SCALE

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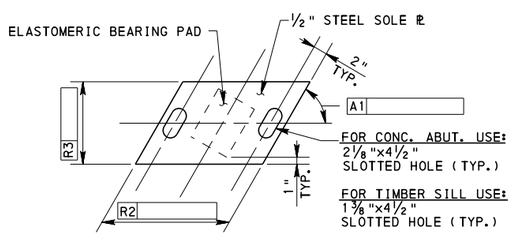
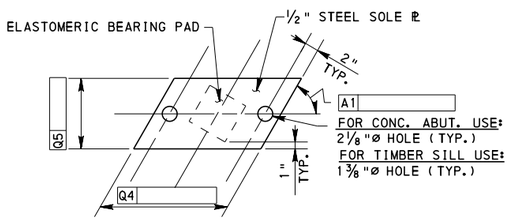
(b) PROVIDE SOLE PLATE IN ACCORDANCE WITH DM-4, D14.7.6.3.9dP



EXP. BEARING PL DETAIL
NO SCALE



FIXED BEARING PL DETAIL
NO SCALE

NOTES:

1. PROVIDE MECHANICALLY GALVANIZED SWEDGE OF APPROVED TYPE OF ANCHOR BOLTS. SET IN THE MASONRY AS SHOWN ON THE DESIGN DRAWINGS.
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9. USE FIXED BEARINGS AT LOWER END OF SPAN UNLESS PERMITTED BY THE CHIEF BRIDGE ENGINEER.

Mark	Description	By	Chk'd	Recm'd	Date
REVISIONS					

S- | SHEET ___ OF ___

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

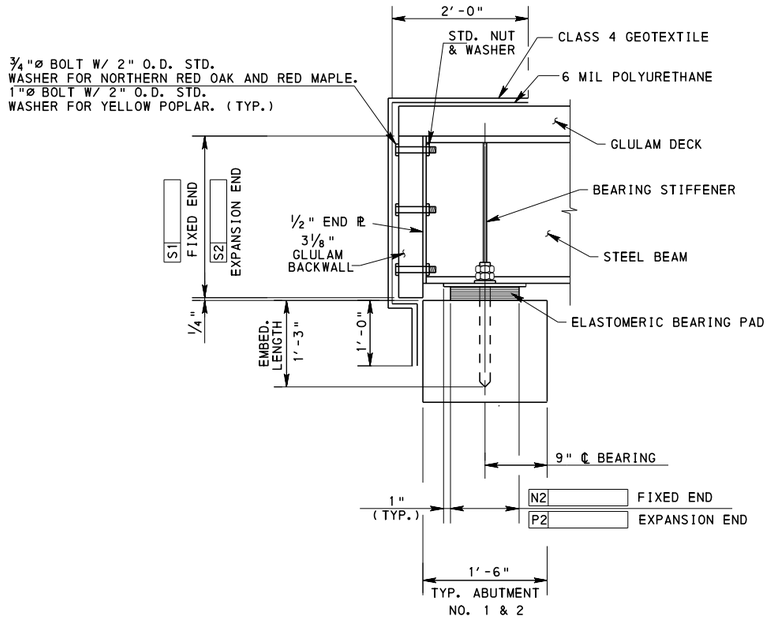
STEEL BEAM SUPERSTRUCTURE FRAMING PLAN - RIGHT SKEW

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

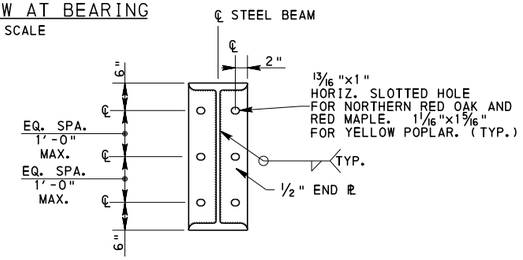
RECOMMENDED APR. 23, 2013
ACTING DIR., BUR. OF PROJECT DELIVERY

SHEET 8 OF 14

BLC-564M



SECTION VIEW AT BEARING
NO SCALE



SECTION VIEW- END ℙ DETAIL
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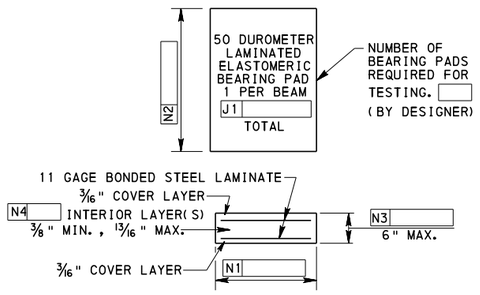
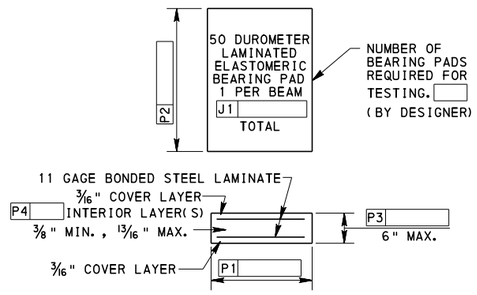
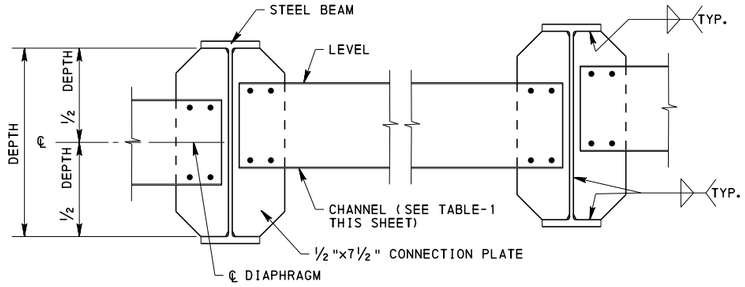


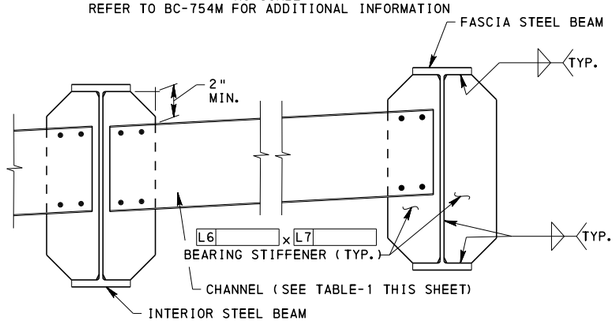
FIXED END BEARING PAD DETAIL
NO SCALE



EXPANSION END BEARING PAD DETAIL
NO SCALE

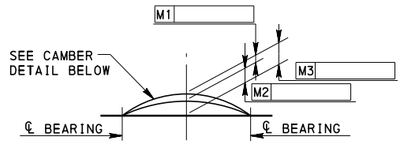


INTERMEDIATE DIAPHRAGM
NO SCALE
REFER TO BC-754M FOR ADDITIONAL INFORMATION



END DIAPHRAGM
NO SCALE
REFER TO BC-754M FOR ADDITIONAL INFORMATION

TABLE-1		
STEEL BEAM SIZE	DIAPHRAGM SIZE	NO. OF BOLTS
≥ 27" DEPTH	C15x33.9	8
≤ 24" DEPTH	C12x25	6



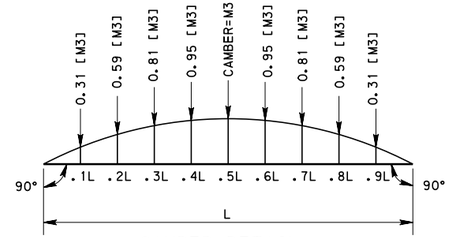
BEAM CAMBER DIAGRAM

M1 = DEFLECTION DUE TO DEAD LOAD OF STEEL BEAM, DIAPHRAGMS, AND CONNECTION PLATES

M2 = DEFLECTION DUE TO DEAD LOAD OF TIMBER DECK, RAILING, AND WEARING SURFACE

M3 = M1+M2 = TOTAL CAMBER

- THE THICKNESS OF THE WEARING COURSE WILL BE VARIED TO COMPENSATE FOR ANY INACCURACIES IN BEAM CAMBER.
- THE PRE-FABRICATED CAMBER LESS THE DEFLECTION DUE TO DEAD LOAD OF BEAM SHOULD BE CHECKED IN THE FIELD.
- DEFLECTION CALCULATIONS DO NOT CONSIDER LOAD EFFECTS DUE TO FUTURE WEARING SURFACE.



CAMBER DETAIL

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.
5. PROVIDE MINIMUM LOW-TEMP NEOPRENE GRADE 3.

Mark	Description	By	Chk'd	Recm'd	Date
REVISIONS					

S- | SHEET ___ OF___

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

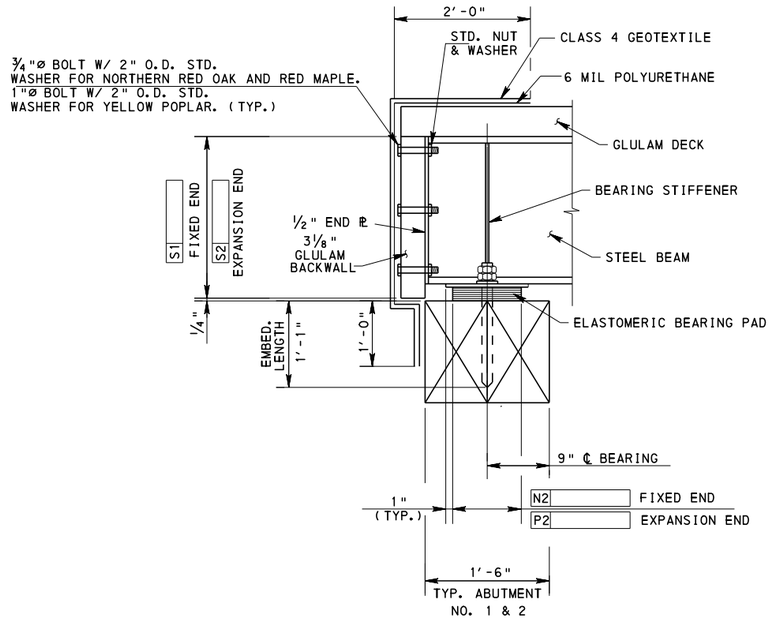
STEEL BEAM SUPERSTRUCTURE
SUPERSTRUCTURE DETAILS - CONC. ABUT.

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

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

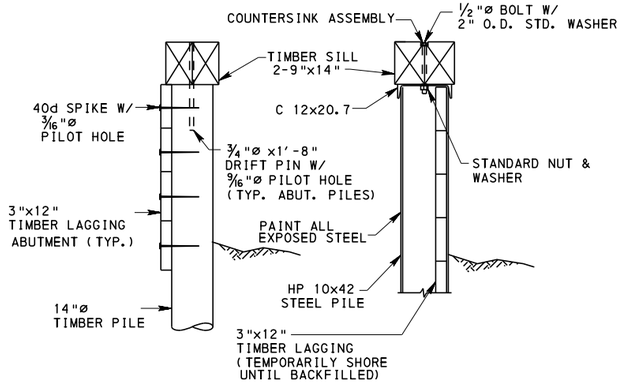
SHEET 9 OF 14

BLC-564M



SECTION VIEW AT BEARING

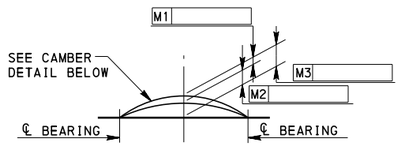
NO SCALE



TIMBER PILE STEEL PILE

TIMBER SILL DETAIL

NO SCALE



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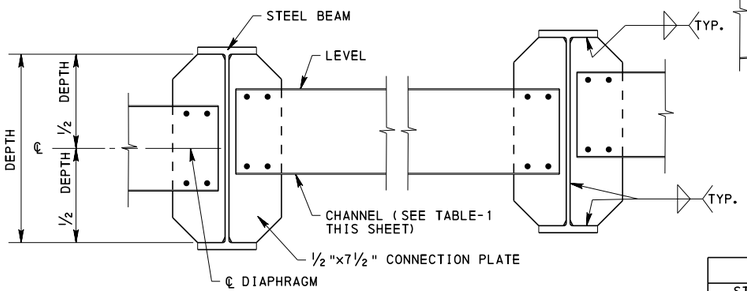
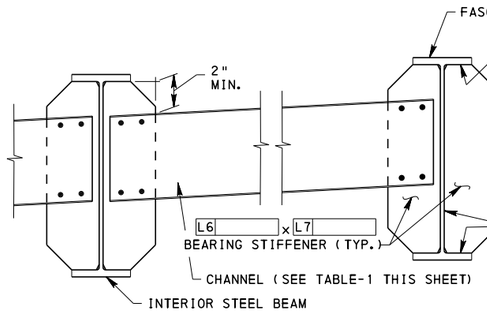


INTERMEDIATE DIAPHRAGM

NO SCALE

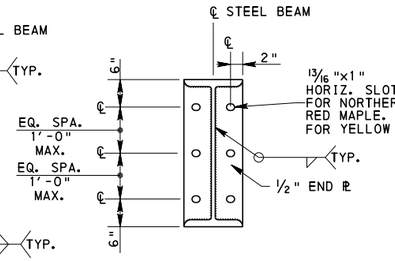
REFER TO BC-754M FOR ADDITIONAL INFORMATION



END DIAPHRAGM

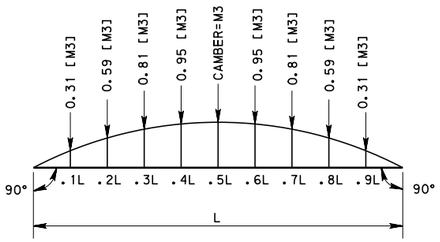
NO SCALE

REFER TO BC-754M FOR ADDITIONAL INFORMATION



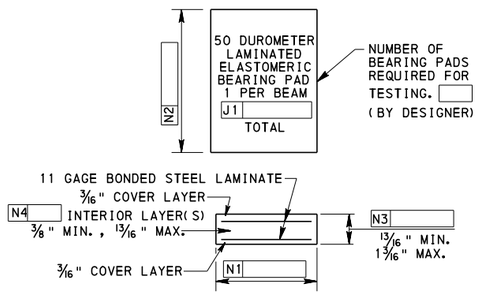
SECTION VIEW- END ℙ DETAIL

NO SCALE



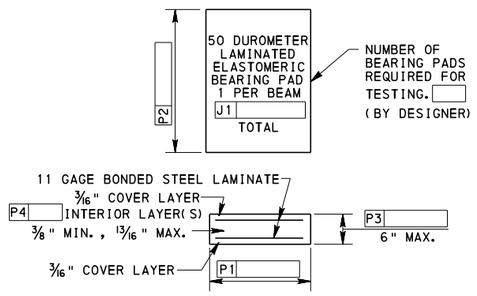
CAMBER DETAIL

TABLE-1		
STEEL BEAM SIZE	DIAPHRAGM SIZE	NO. OF BOLTS
≥ 27" DEPTH	C15x33.9	8
≤ 24" DEPTH	C12x25	6



FIXED END BEARING PAD DETAIL

NO SCALE



EXPANSION END BEARING PAD DETAIL

NO SCALE

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.
5. PROVIDE MINIMUM LOW-TEMP NEOPRENE GRADE 3.

Mark	Description	By	Chk'd	Recm'd	Date
	REVISIONS				

S- SHEET ___ OF___

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

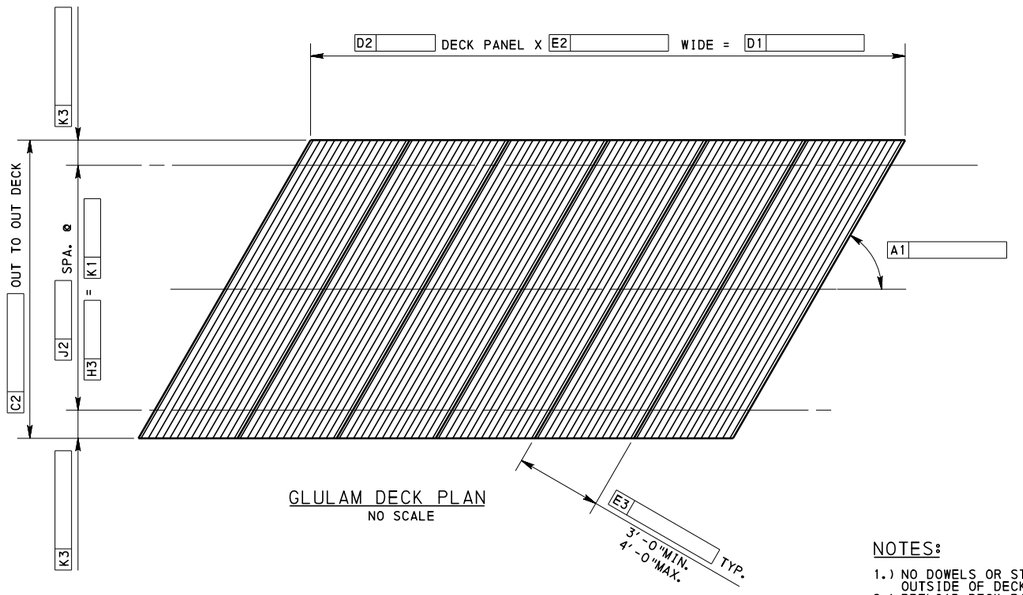
STEEL BEAM SUPERSTRUCTURE
SUPERSTRUCTURE DETAILS - TIMBER ABUT.

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

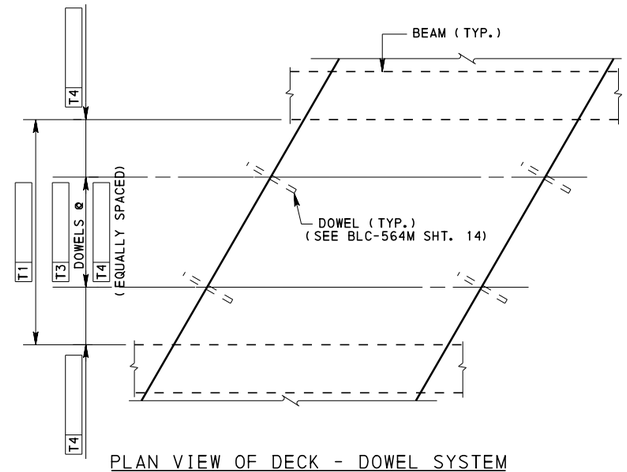
RECOMMENDED APR. 23, 2013
ACTING DIR. BUR. OF PROJECT DELIVERY

SHEET 10 OF 14

BLC-564M



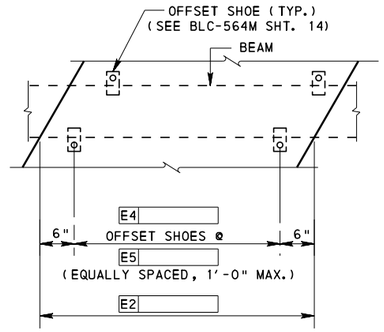
GLULAM DECK PLAN
NO SCALE



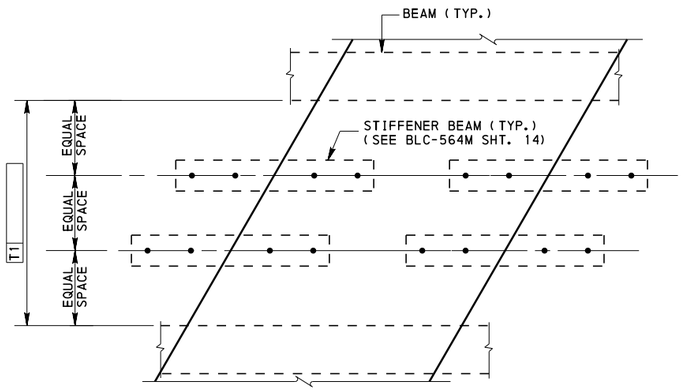
PLAN VIEW OF DECK - DOWEL SYSTEM
NO SCALE

NOTES:

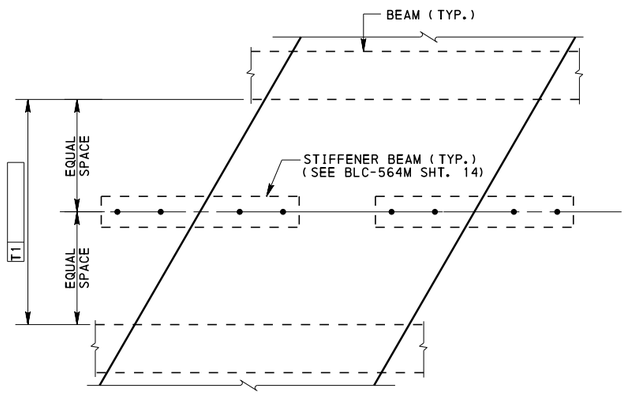
1.) NO DOWELS OR STIFFENER BEAMS NEEDED BETWEEN FACIA BEAM AND OUTSIDE OF DECK.
2.) PRELOAD DECK PANEL WHILE FASTENING PANEL TO BEAM.
3.) PROVIDE ADEQUATE SPACING BETWEEN THE DECK ANCHORAGE AND THE DOWEL SYSTEM. ADJUSTMENTS TO THE DOWEL SYSTEM AND/OR DECK ANCHORAGE'S SPACING MAY BE NECESSARY.



OFFSET SHOE DECK ANCHORAGE PLAN
NO SCALE



DUAL (2) STIFFENER BEAM SYSTEM



SINGLE (1) STIFFENER BEAM SYSTEM

PLAN VIEWS OF ALTERNATE STIFFENER BEAM SYSTEMS
NO SCALE

STIFFENER BEAM DESIGN DATA		
TIMBER SPECIES	MAXIMUM DESIGN SPAN (T2)	NUMBER OF STIFFENER BEAMS
NORTHERN RED OAK & RED MAPLE	3'-1"	1
	6'-0"	2
YELLOW POPLAR	2'-6"	1
	6'-0"	2

Mark	Description	By	Chk'd	Recm'd	Date
REVISIONS					

S- | SHEET ___ OF___

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

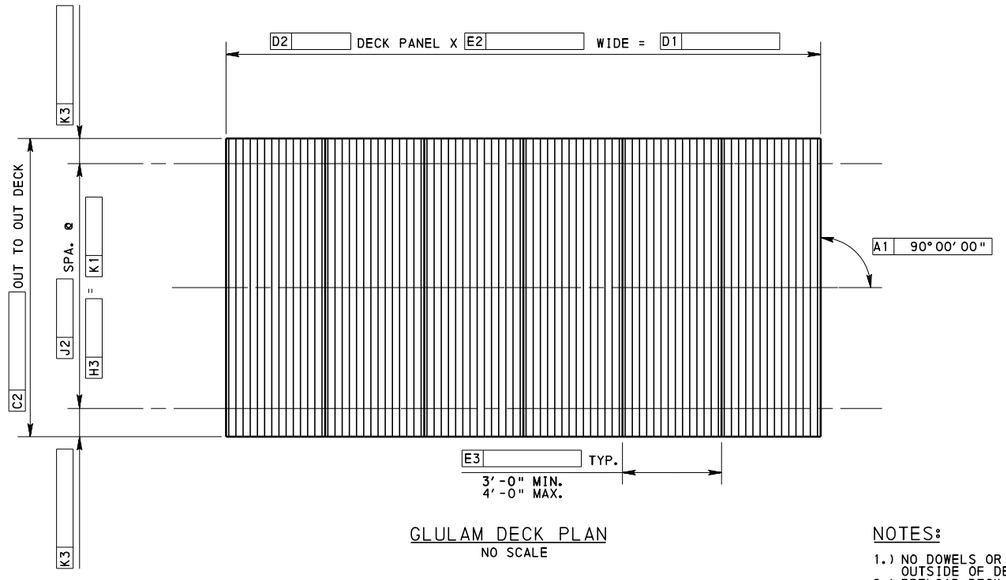
STEEL BEAM SUPERSTRUCTURE
DECK PLAN - LEFT SKEW

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

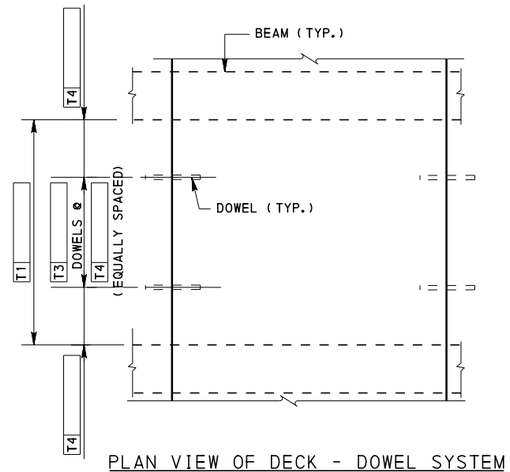
RECOMMENDED APR. 23, 2013
ACTING DIR. BUR. OF PROJECT DELIVERY

SHEET 11 OF 14

BLC-564M



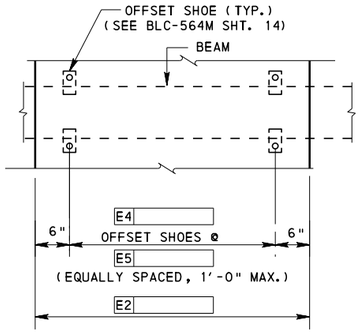
GLULAM DECK PLAN
NO SCALE



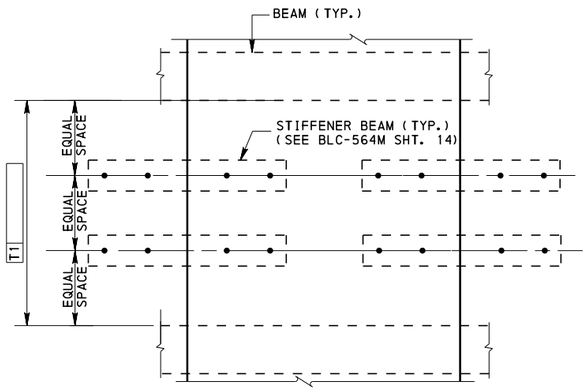
PLAN VIEW OF DECK - DOWEL SYSTEM
NO SCALE

NOTES:

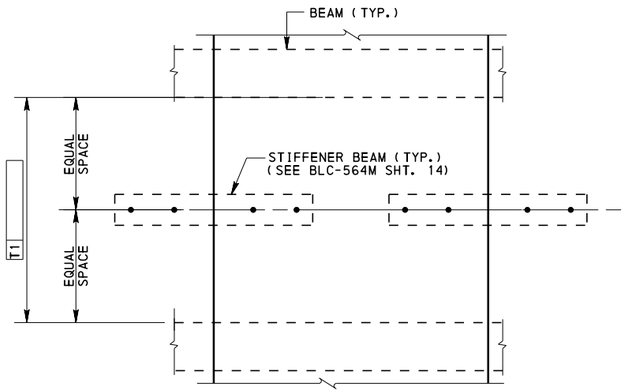
1.) NO DOWELS OR STIFFENER BEAMS NEEDED BETWEEN FACIA BEAM AND OUTSIDE OF DECK.
2.) PRELOAD DECK PANEL WHILE FASTENING PANEL TO BEAM.
3.) PROVIDE ADEQUATE SPACING BETWEEN THE DECK ANCHORAGE AND THE DOWEL SYSTEM. ADJUSTMENTS TO THE DOWEL SYSTEM AND/OR DECK ANCHORAGE'S SPACING MAY BE NECESSARY.



OFFSET SHOE DECK ANCHORAGE PLAN
NO SCALE



DUAL (2) STIFFENER BEAM SYSTEM



SINGLE (1) STIFFENER BEAM SYSTEM

PLAN VIEWS OF ALTERNATE STIFFENER BEAM SYSTEMS
NO SCALE

STIFFENER BEAM DESIGN DATA		
TIMBER SPECIES	MAXIMUM DESIGN SPAN (T2)	NUMBER OF STIFFENER BEAMS
NORTHERN RED OAK & RED MAPLE	3'-1"	1
	6'-0"	2
YELLOW POPLAR	2'-6"	1
	6'-0"	2

Mark	Description	By	Chk'd	Recm'd	Date
	REVISIONS				

S-

SHEET ___ OF___

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

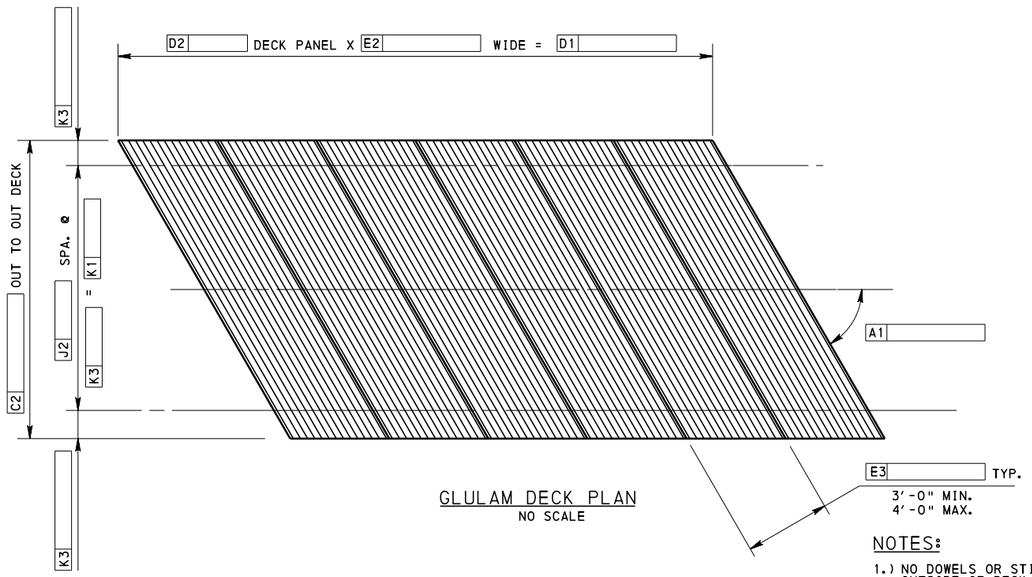
STEEL BEAM SUPERSTRUCTURE
DECK PLAN - 90° SKEW

RECOMMENDED APR. 23, 2013
CHIEF BRIDGE ENGINEER

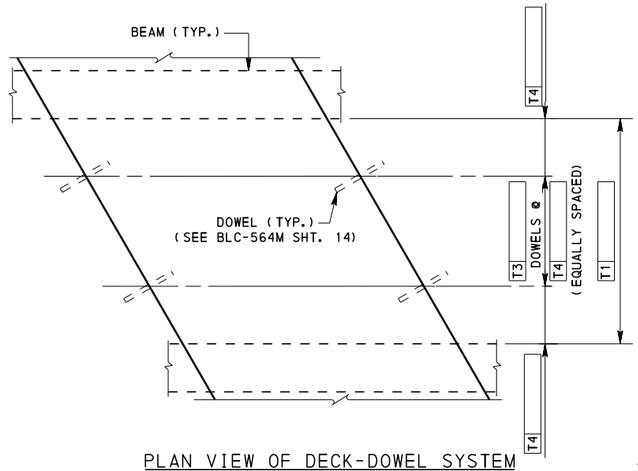
RECOMMENDED APR. 23, 2013
ACTING DIR., BUR. OF PROJECT DELIVERY

SHEET 12 OF 14

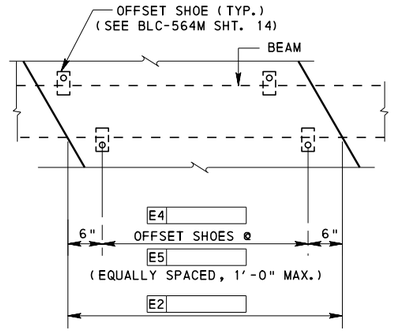
BLC-564M



GLULAM DECK PLAN
NO SCALE



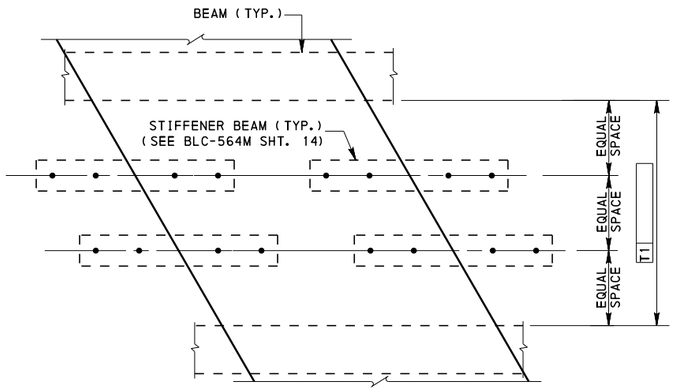
PLAN VIEW OF DECK-DOWEL SYSTEM
NO SCALE



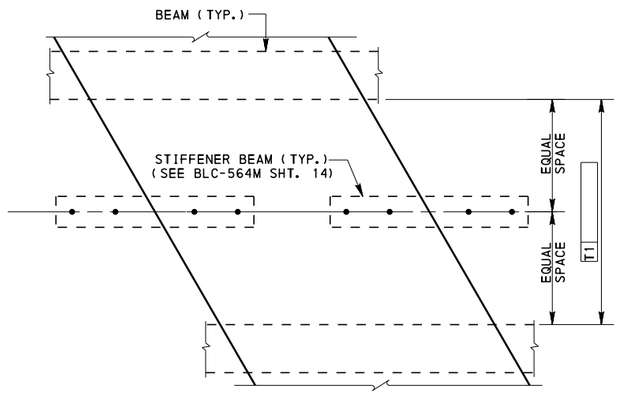
OFFSET SHOE DECK ANCHORAGE PLAN
NO SCALE

NOTES:

1.) NO DOWELS OR STIFFENER BEAMS NEEDED BETWEEN FACIA BEAM AND OUTSIDE OF DECK.
2.) PRELOAD DECK PANEL WHILE FASTENING PANEL TO BEAM.
3.) PROVIDE ADEQUATE SPACING BETWEEN THE DECK ANCHORAGE AND THE DOWEL SYSTEM. ADJUSTMENTS TO THE DOWEL SYSTEM AND/OR DECK ANCHORAGE'S SPACING MAY BE NECESSARY.



DUAL (2) STIFFENER BEAM SYSTEM



SINGLE (1) STIFFENER BEAM SYSTEM

PLAN VIEWS OF ALTERNATE STIFFENER BEAM SYSTEMS
NO SCALE

STIFFENER BEAM DESIGN DATA		
TIMBER SPECIES	MAXIMUM DESIGN SPAN (T2)	NUMBER OF STIFFENER BEAMS
NORTHERN RED OAK & RED MAPLE	3'-1"	1
	6'-0"	2
YELLOW POPLAR	2'-6"	1
	6'-0"	2

Mark	Description	By	Chk'd	Recm'd	Date
	REVISIONS				

S-

SHEET ___ OF___

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

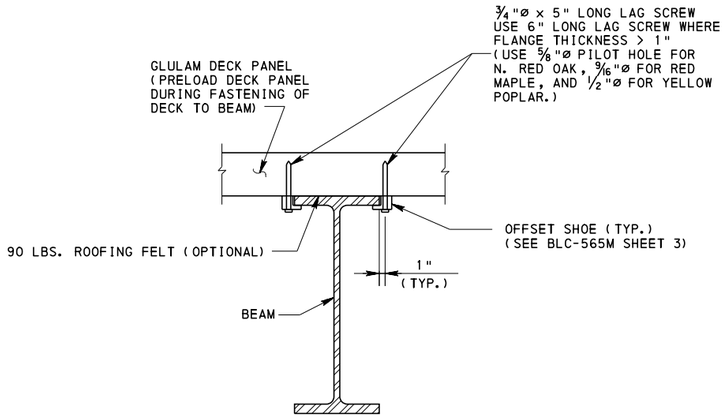
STEEL BEAM SUPERSTRUCTURE
DECK PLAN - RIGHT SKEW

RECOMMENDED APR. 23, 2013
CHIEF BRIDGE ENGINEER

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

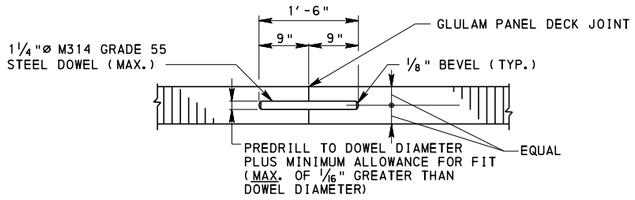
SHEET 13 OF 14

BLC-564M



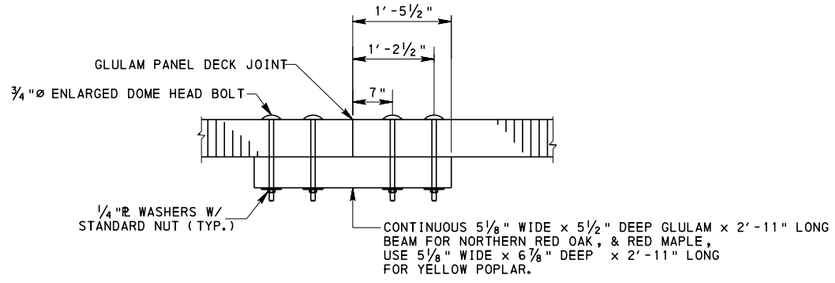
OFFSET SHOE DECK ANCHORAGE DETAIL

NO SCALE



DOWEL DETAIL

NO SCALE



ALTERNATE INTERMEDIATE STIFFENER BEAM DETAIL

NO SCALE

Mark	Description	By	Chk'd	Recm'd	Date
	REVISIONS				

S-

SHEET ___ OF___

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

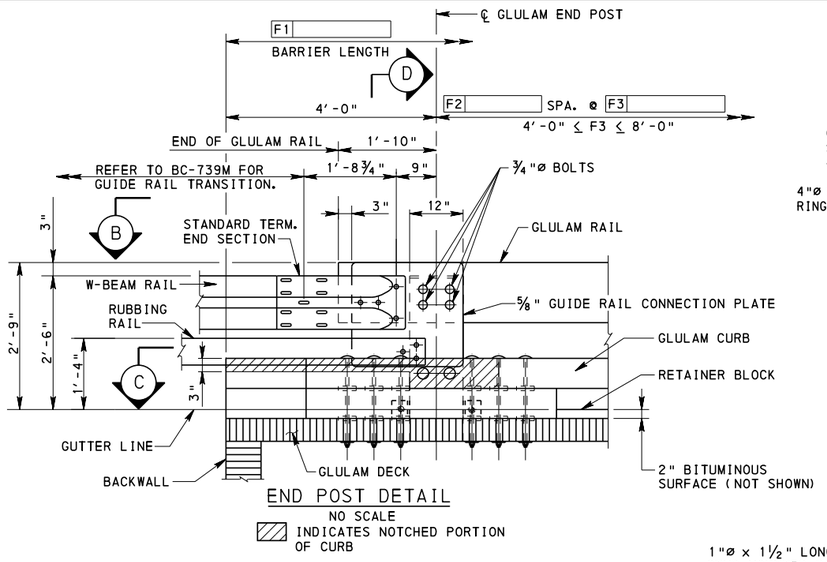
STEEL BEAM SUPERSTRUCTURE DECK DETAILS

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

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

SHEET 14 OF 14

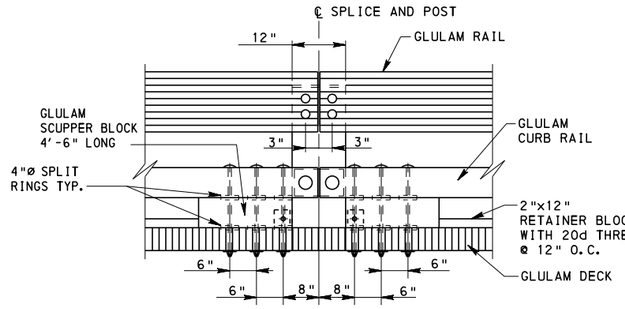
BLC-564M



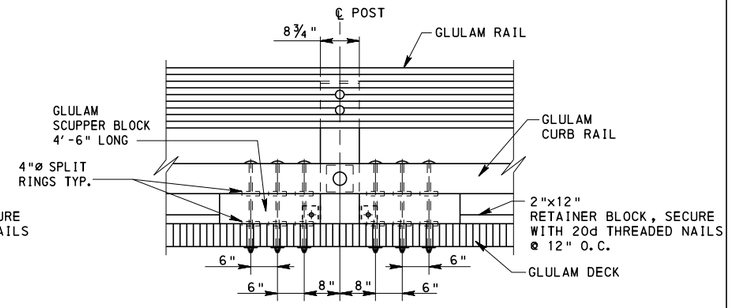
END POST DETAIL

NO SCALE

▨ INDICATES NOTCHED PORTION OF CURB



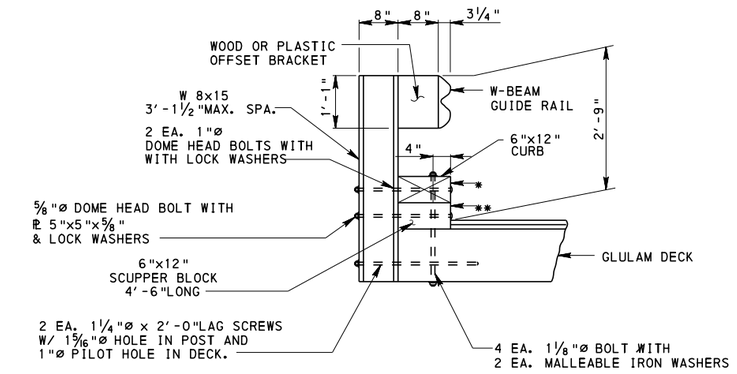
SPLICE POST DETAIL



STANDARD POST DETAIL

VIEW A

NO SCALE

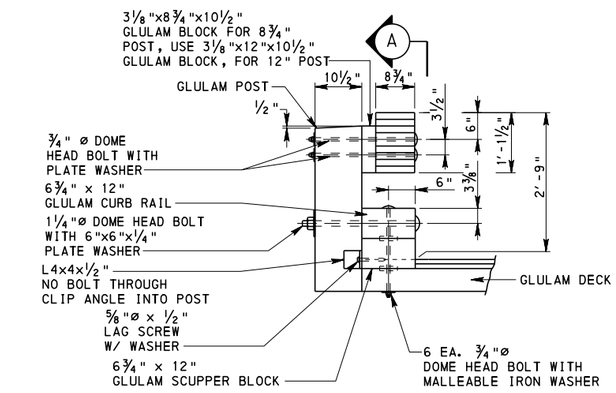


ALTERNATE STRUCTURE MOUNTED GUIDE RAIL DETAIL

NO SCALE

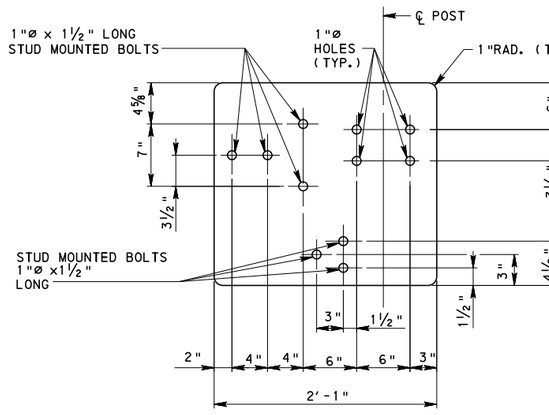
* ℙ 10"x5"x⅝" USE WITH OR WITHOUT CURB SPLICE

** ℙ 5"x5"x⅝"



TIMBER POST, BRIDGE RAIL, AND CURB DETAIL

NO SCALE



⅝" GUIDE RAIL CONNECTION PLATE

NO SCALE

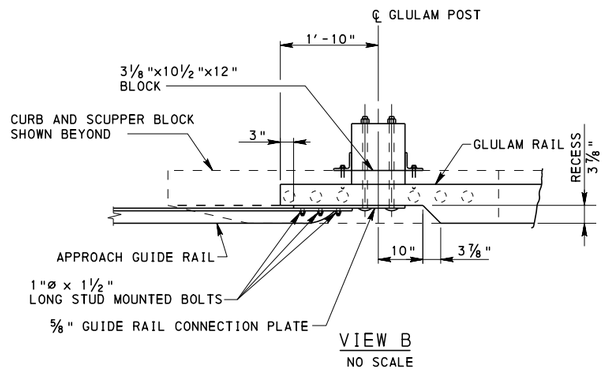
NOTES:

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.

NOTES:

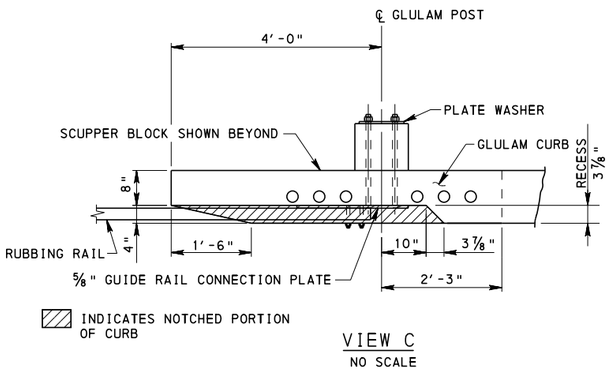
APPROACH GUIDE RAIL AND CONNECTION DEVICES ARE ROADWAY ITEMS.

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



VIEW B

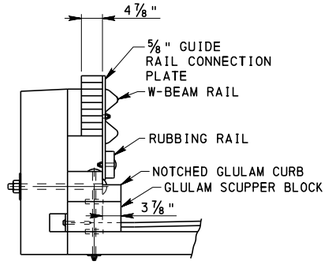
NO SCALE



▨ INDICATES NOTCHED PORTION OF CURB

VIEW C

NO SCALE



VIEW D

NO SCALE

Mark	Description	By	Chk'd	Recm'd	Date
	REVISIONS				

S- | SHEET ___ OF___

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

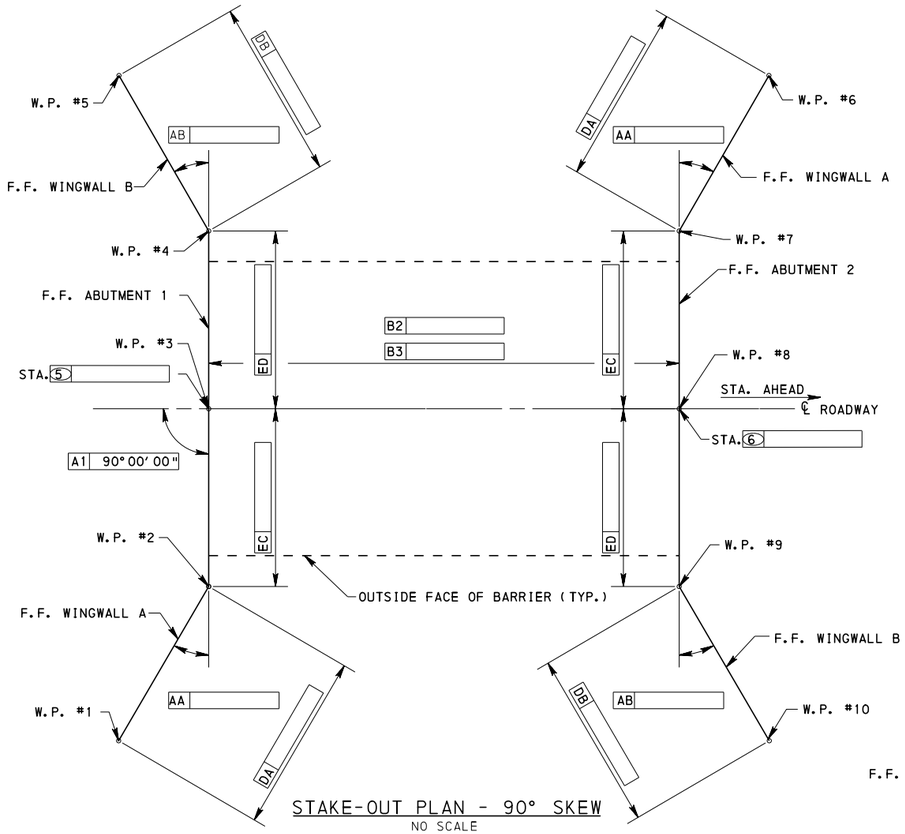
SHEETS COMMON TO BLC 562M, 563M, & 564M BRIDGE RAIL DETAILS

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

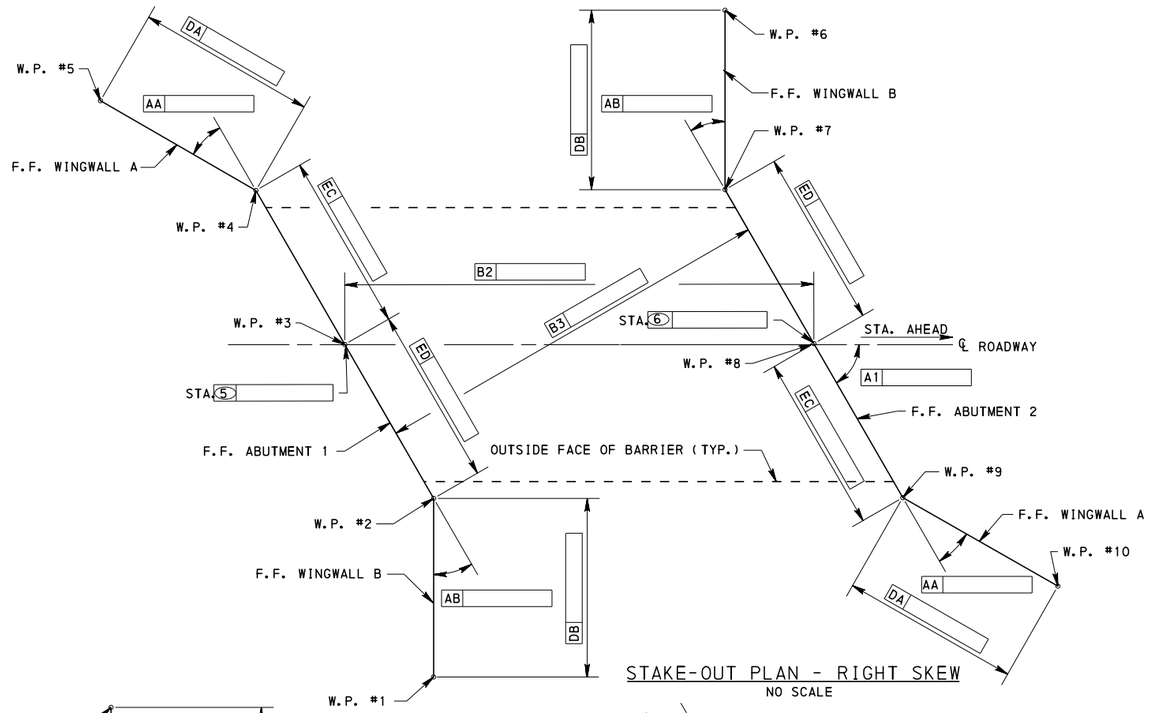
RECOMMENDED APR. 23, 2013
ACTING DIR., BUR. OF PROJECT DELIVERY

SHEET 1 OF 3

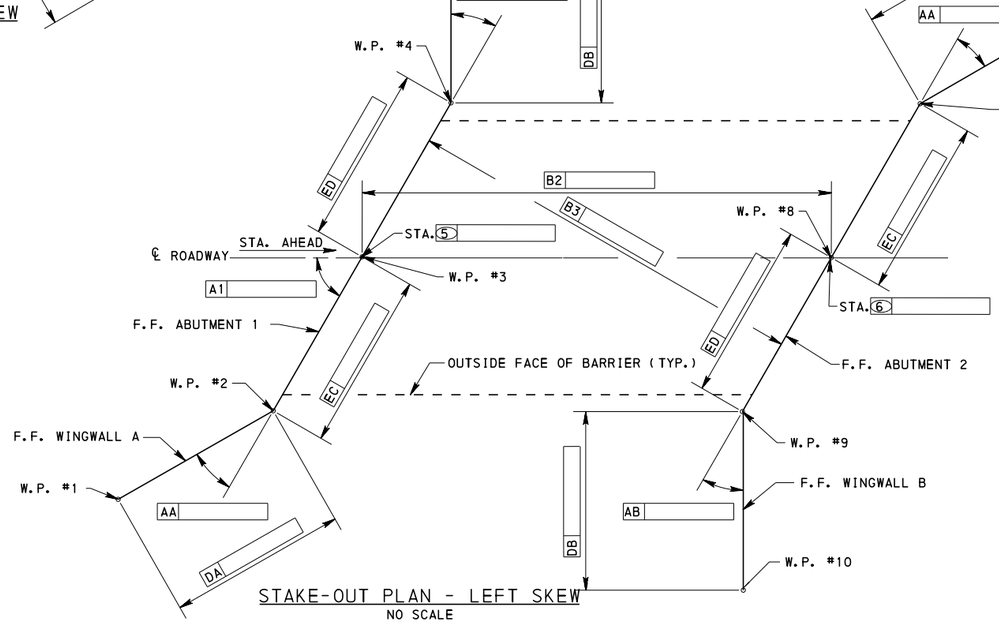
BLC-565M



STAKE-OUT PLAN - 90° SKEW
NO SCALE



STAKE-OUT PLAN - RIGHT SKEW
NO SCALE



STAKE-OUT PLAN - LEFT SKEW
NO SCALE

NOTE:
F.F. DENOTES FRONT FACE.

Mark	Description	By	Chk'd	Recm'd	Date
	REVISIONS				

S-

SHEET __ OF __

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

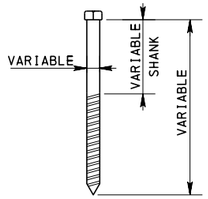
SHEETS COMMON TO BLC 562M, 563M, & 564M STAKE-OUT PLAN

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

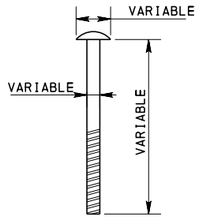
RECOMMENDED APR. 23, 2013
ACTING DIR. BUR. OF PROJECT DELIVERY

SHEET 2 OF 3

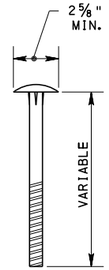
BLC-565M



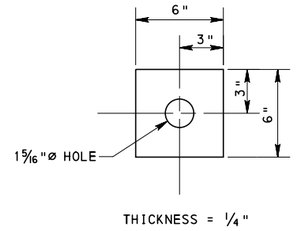
LAG SCREW



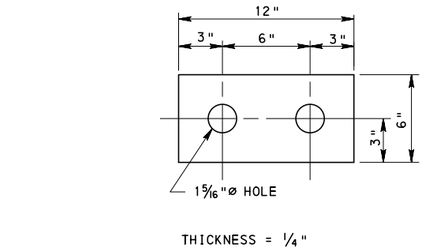
DOME HEAD BOLT



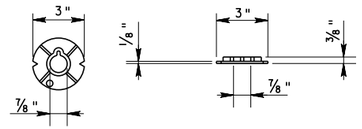
¾"ø ENLARGED DOMED HEAD BOLT



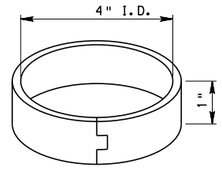
¼" PLATE WASHER A



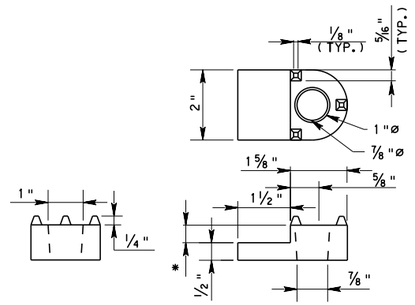
¼" PLATE WASHER B



MALLEABLE IRON WASHER

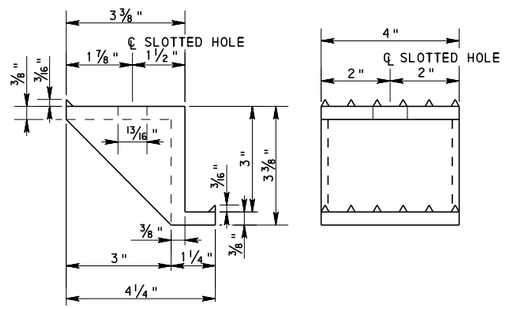


4" DIAMETER SPLIT RING

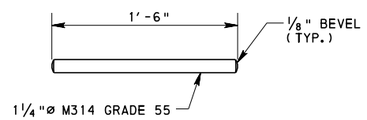


*BEAM FLANGE THICKNESS

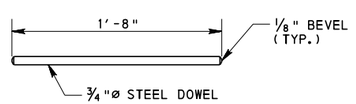
OFFSET SHOE



ALUMINUM CLIP



DOWEL



DRIFT PIN

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

Mark	Description	By	Chk'd	Recm'd	Date
	REVISIONS				

S- | SHEET ___ OF___

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

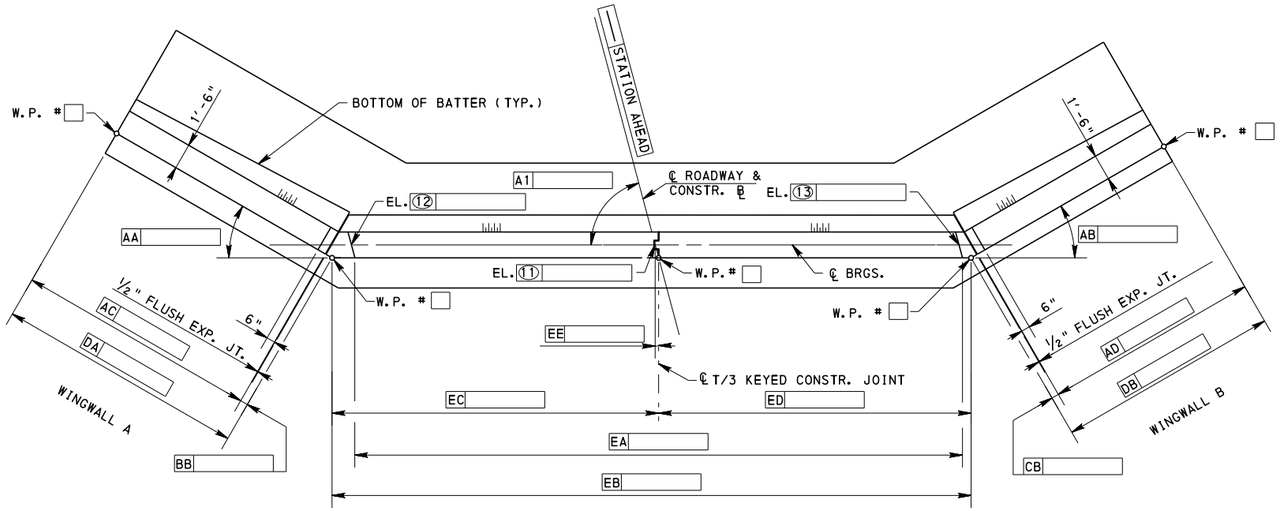
SHEETS COMMON TO BLC 562M, 563M, & 564M TYPICAL HARDWARE DETAILS

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

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

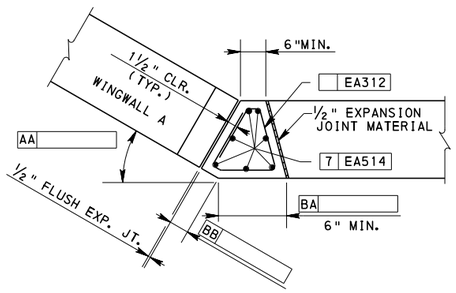
SHEET 3 OF 3

BLC-565M



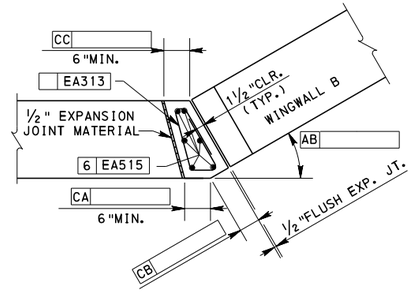
ABUTMENT PLAN

NO SCALE



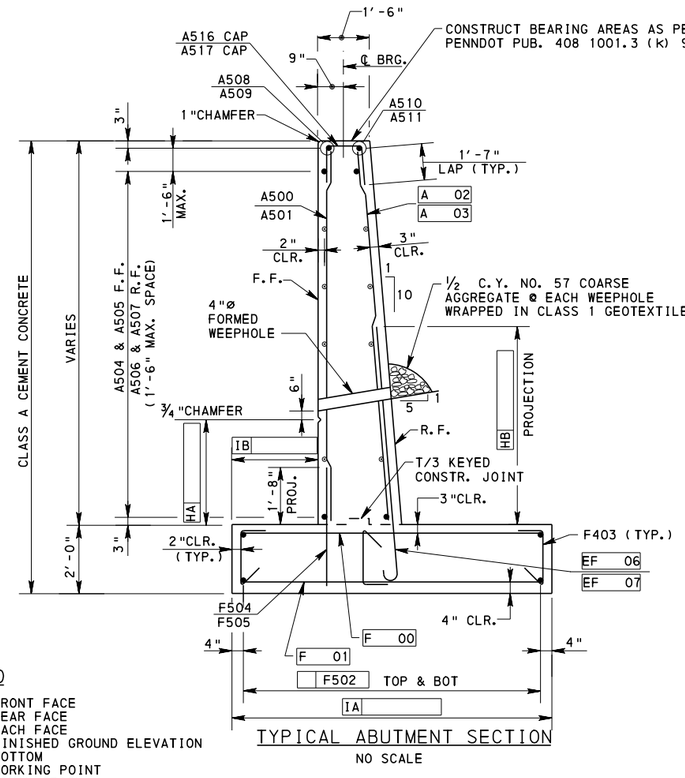
CHEEKWALL A DETAIL

NO SCALE



CHEEKWALL B DETAIL

NO SCALE

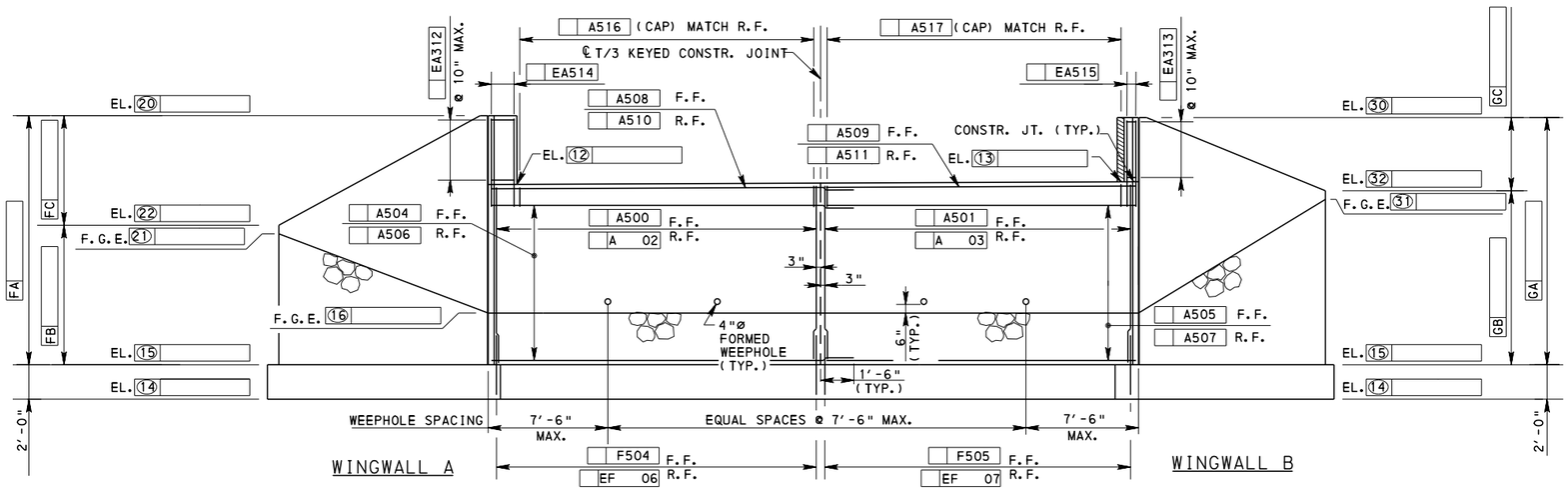


TYPICAL ABUTMENT SECTION

NO SCALE

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



ABUTMENT ELEVATION

NO SCALE

NOTE:

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

NOTES:

- FOR GENERAL NOTES, SEE SHEET ___
- FOR LOCATION OF ABUTMENT SEE STAKE-OUT SKETCH, SHEET ___
- FOR ABUTMENT ___ FOOTING PLAN SEE SHEET ___
- FOR ABUTMENT ___ BAR SCHEDULE, SEE SHEET ___
- MAX. ALLOWABLE FOUNDATION PRESSURE = ___ kip/FT^2
- MAX DESIGN FOUNDATION PRESSURE = ___ kip/FT^2

Mark	Description	By	Chk'd	Recm'd	Date
REVISIONS					

S- | SHEET___ OF___

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

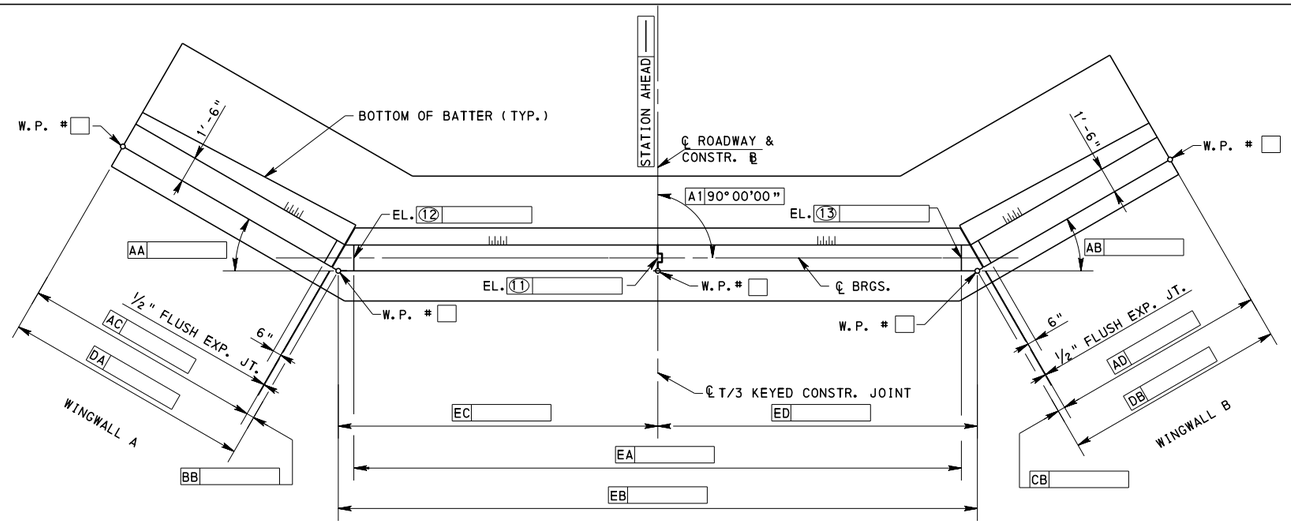
SPREAD FOOTING ABUTMENT
ABUTMENT ___ - LEFT SKEW

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

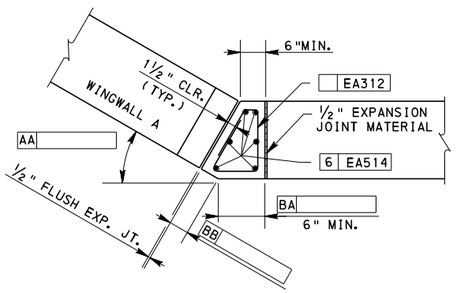
RECOMMENDED APR. 23, 2013
ACTING DIR. BUR. OF PROJECT DELIVERY

SHEET 1 OF 7

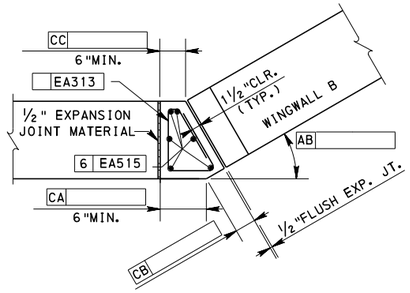
BLC-566M



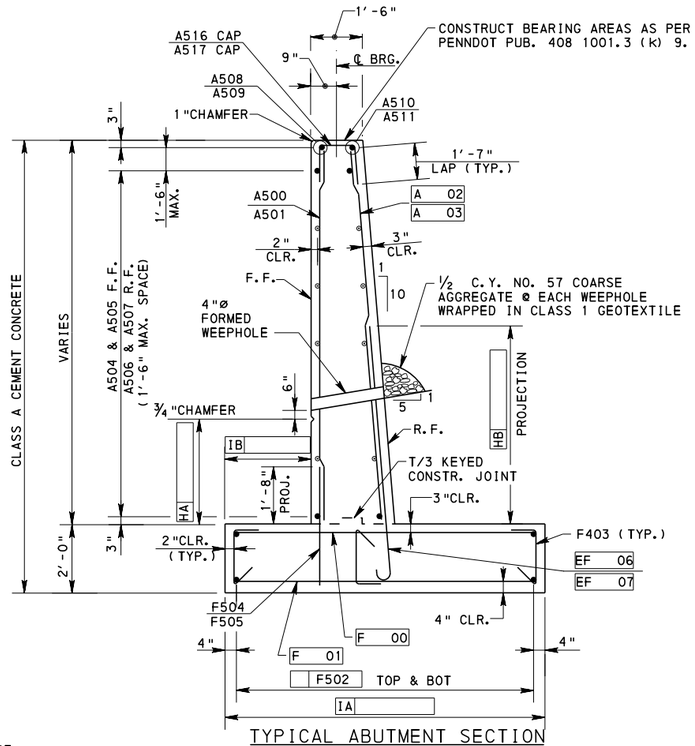
ABUTMENT PLAN
NO SCALE



CHEEKWALL A DETAIL
NO SCALE



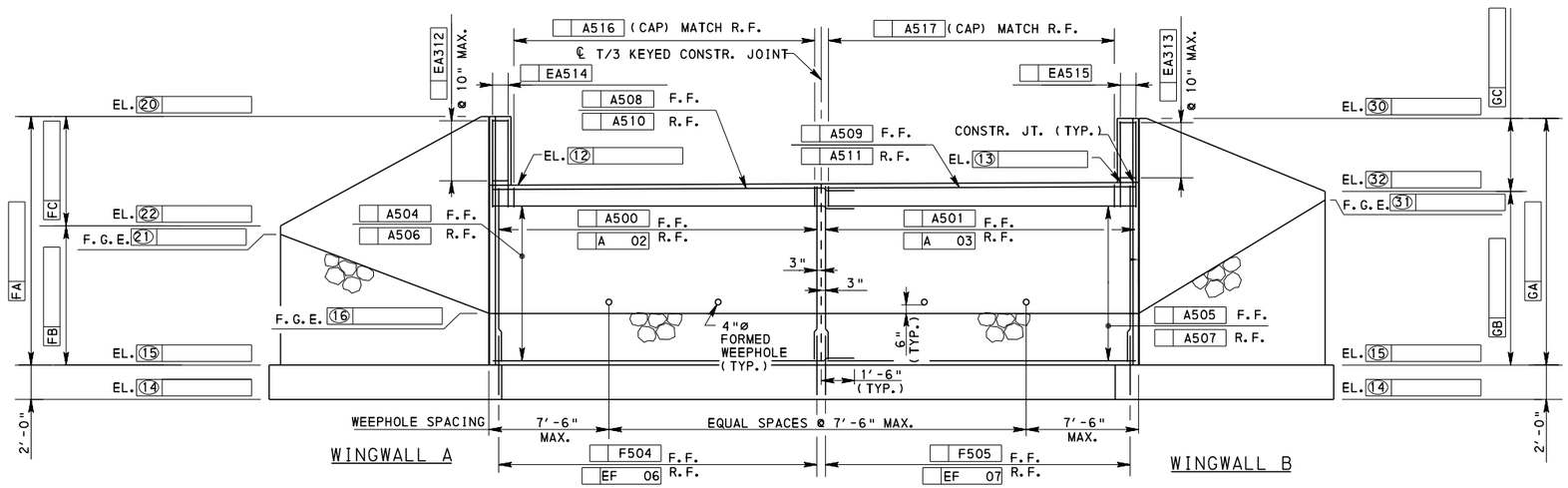
CHEEKWALL B DETAIL
NO SCALE



TYPICAL ABUTMENT SECTION
NO SCALE

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



ABUTMENT ELEVATION
NO SCALE

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

NOTES:
- FOR GENERAL NOTES, SEE SHEET ___
- FOR LOCATION OF ABUTMENT SEE STAKE-OUT SKETCH, SHEET ___
- FOR ABUTMENT ___ FOOTING PLAN SEE SHEET ___
- FOR ABUTMENT ___ BAR SCHEDULE, SEE SHEET ___
- MAX. ALLOWABLE FOUNDATION PRESSURE = ___ kip/FT.^{2}
- MAX DESIGN FOUNDATION PRESSURE = ___ kip/FT.^{2}

Mark	Description	By	Chk'd	Recm'd	Date
REVISIONS					

S- | SHEET ___ OF ___

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

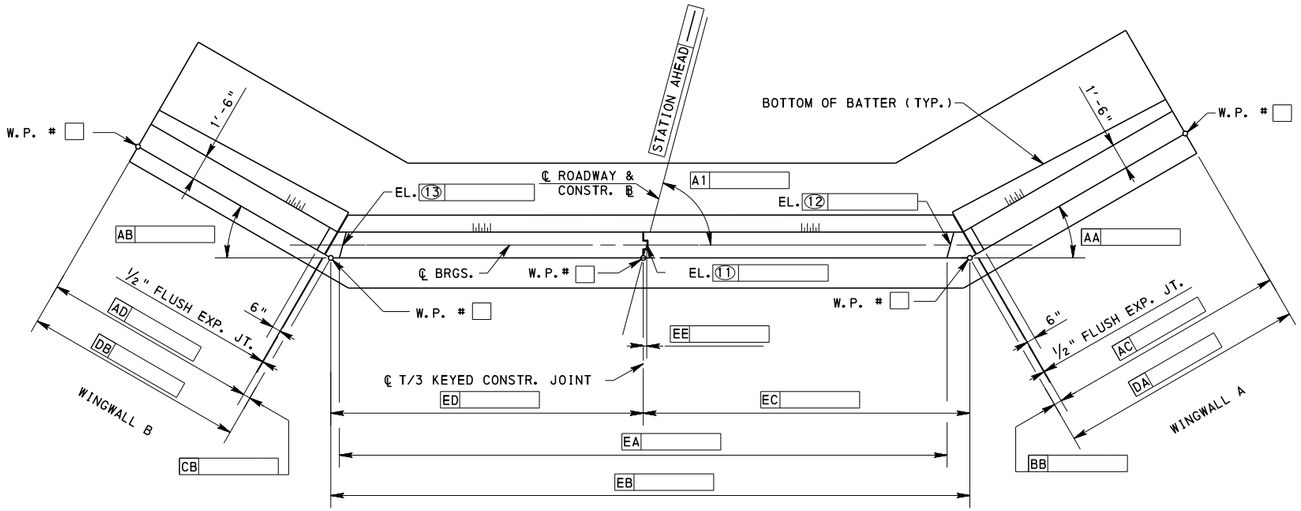
SPREAD FOOTING ABUTMENT
ABUTMENT ___ - 90° SKEW

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

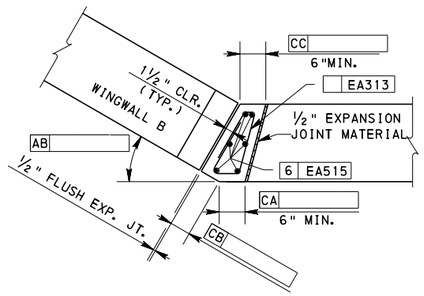
RECOMMENDED APR. 23, 2013
ACTING DIR. BUR. OF PROJECT DELIVERY

SHEET 2 OF 7

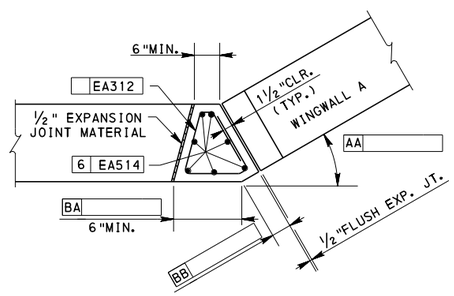
BLC-566M



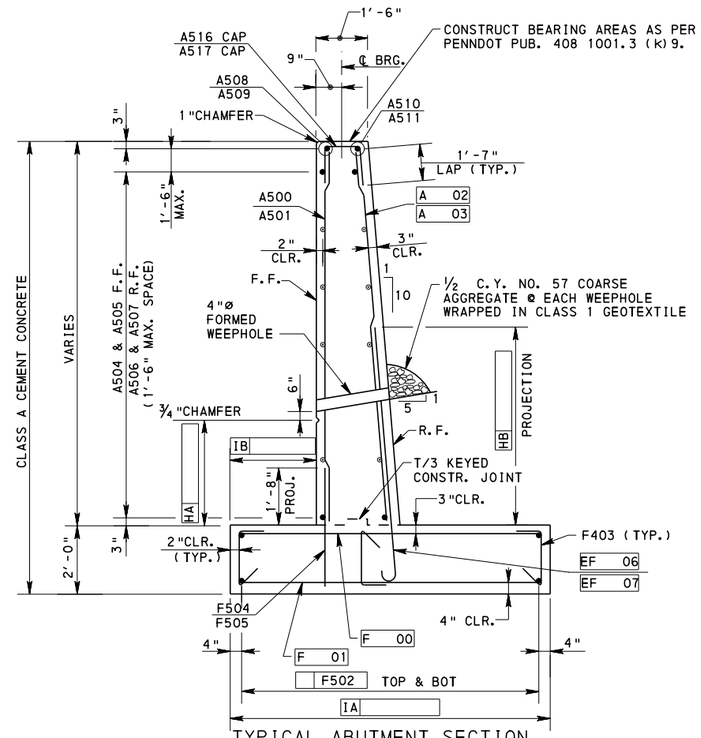
ABUTMENT PLAN
NO SCALE



CHEEKWALL B DETAIL
NO SCALE



CHEEKWALL A DETAIL
NO SCALE



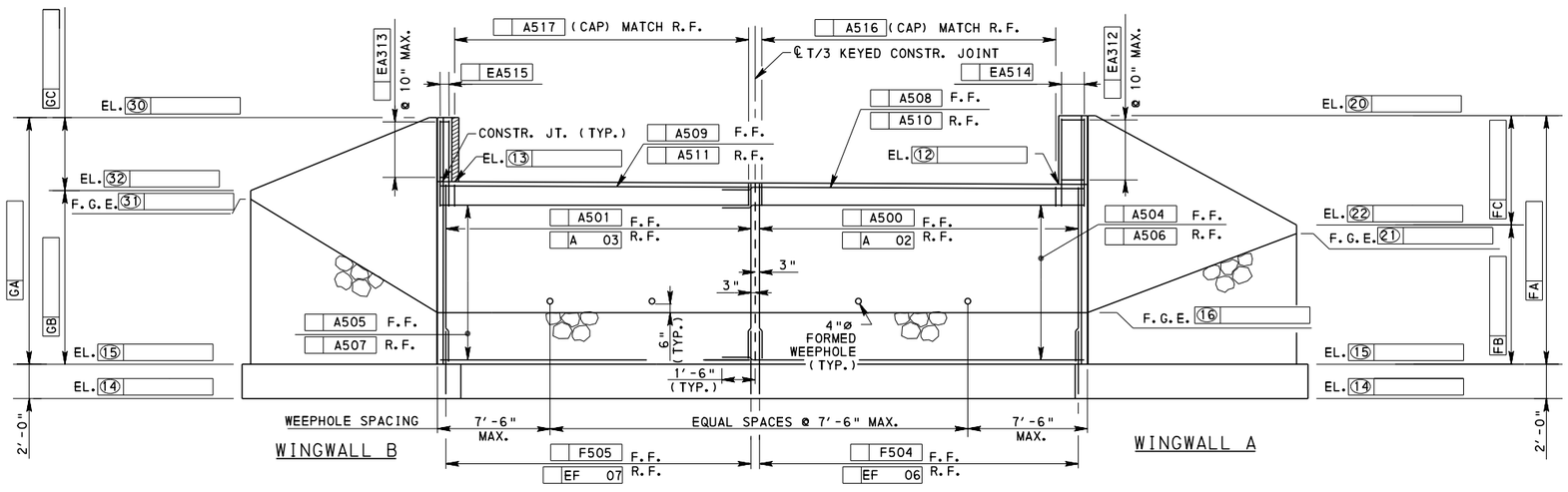
TYPICAL ABUTMENT SECTION
NO SCALE

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 ___
- FOR LOCATION OF ABUTMENT SEE STAKE-OUT SKETCH, SHEET ___
- FOR ABUTMENT ___ FOOTING PLAN SEE SHEET ___
- FOR ABUTMENT ___ BAR SCHEDULE, SEE SHEET ___
- MAX. ALLOWABLE FOUNDATION PRESSURE = ___ kip/FT²
- MAX DESIGN FOUNDATION PRESSURE = ___ kip/FT²



ABUTMENT ELEVATION
NO SCALE

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

Mark	Description	By	Chk'd	Recm'd	Date
REVISIONS					

S- | SHEET ___ OF ___

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

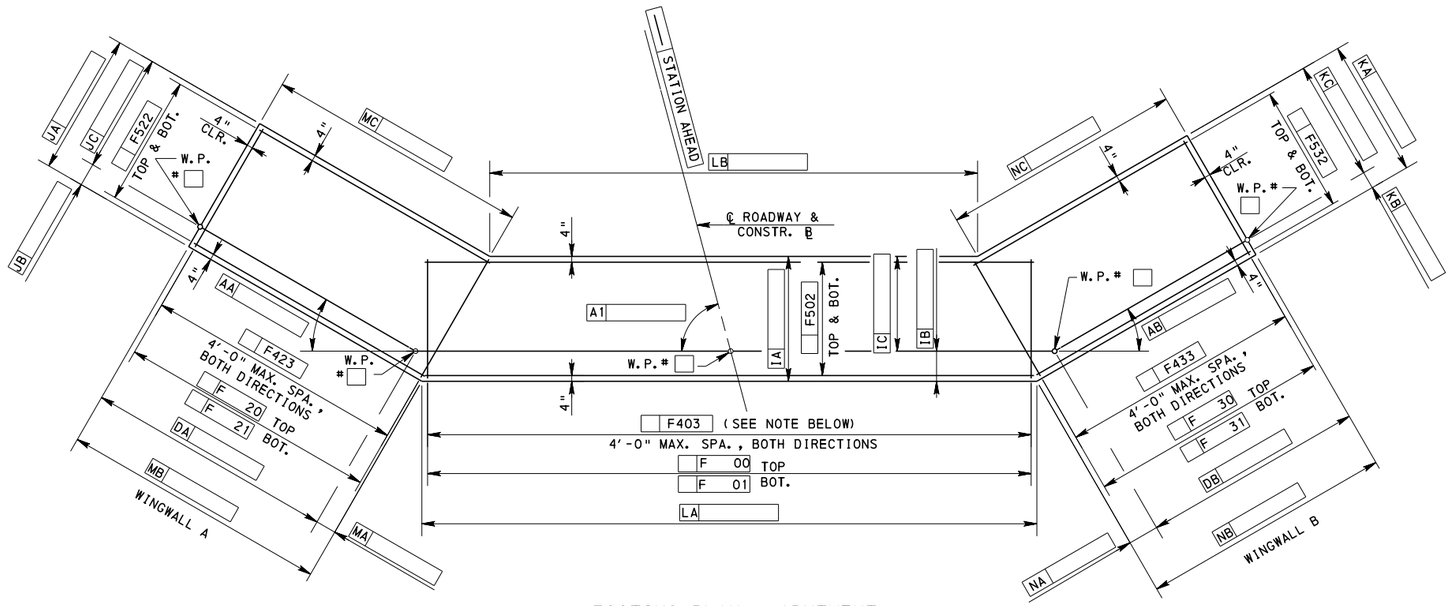
SPREAD FOOTING ABUTMENT
ABUTMENT ___ - RIGHT SKEW

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

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

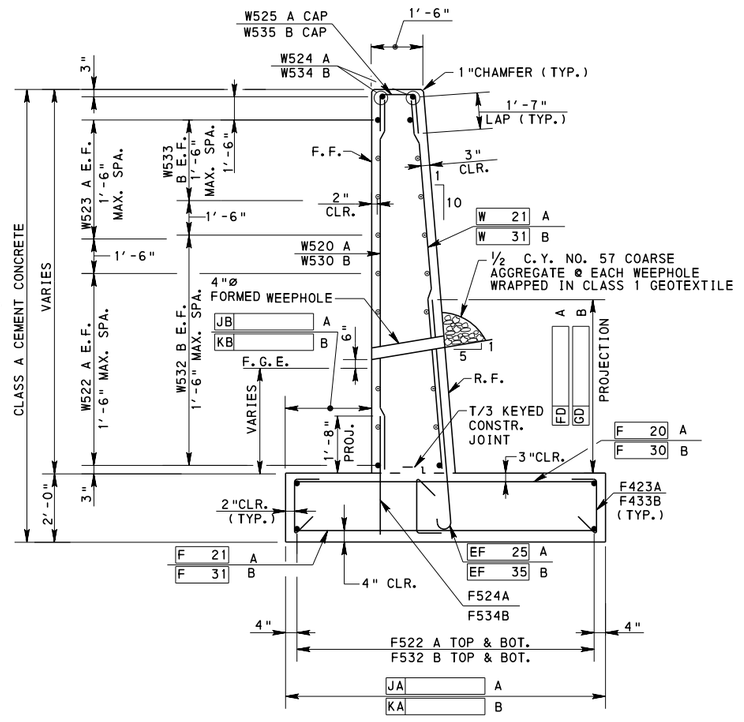
SHEET 3 OF 7

BLC-566M



FOOTING PLAN - ABUTMENT

NO SCALE



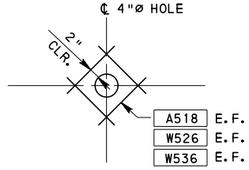
TYPICAL WING SECTION

NO SCALE

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

NOTE:
TIE TOP AND BOTTOM MATS OF REINFORCING STEEL WITH #4 TIE BARS AT A MAXIMUM SPACING OF 4'-0" IN BOTH DIRECTIONS. PROVIDE TIE BARS WITH 90° HOOK AT ONE END AND 135° AT THE OTHER END. ALTERNATE 90° AND 135° AT TOP IN ALTERNATE TIES.



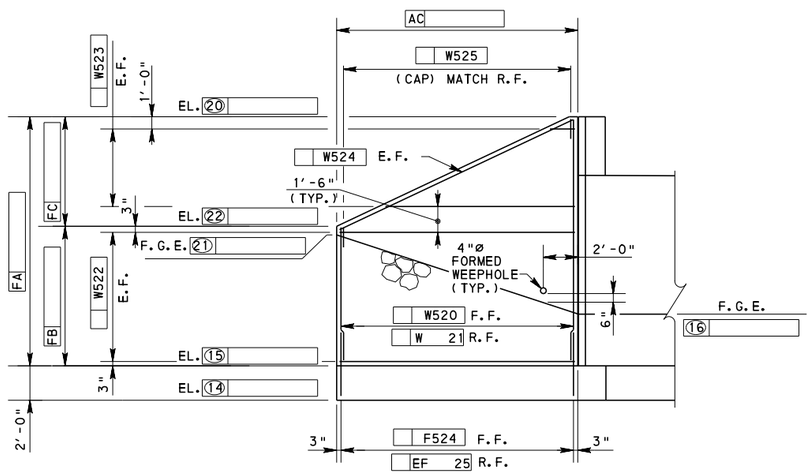
WEEPHOLE REINFORCEMENT DETAIL

NO SCALE

NOTE:
ADJUST REINFORCEMENT AS NECESSARY TO ACCOMMODATE OPENING.

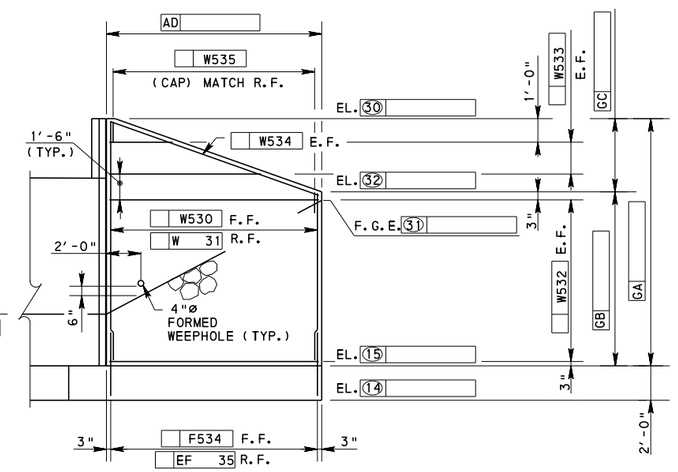
NOTES:

- FOR GENERAL NOTES, SEE SHEET ____
- FOR LOCATION OF WINGWALLS SEE STAKE-OUT SKETCH, SHEET ____
- FOR ABUTMENT ____ , SEE SHEET ____
- FOR ABUTMENT ____ BAR SCHEDULE, SEE SHEET ____
- MAX. ALLOWABLE FOUNDATION PRESSURE = ____ kip/FT.^{2}
- MAX DESIGN FOUNDATION PRESSURE = WING A = ____ kip/FT.^{2}
  WING B = ____ kip/FT.^{2}



WINGWALL A

NO SCALE



WINGWALL B

NO SCALE

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

Mark	Description	By	Chk'd	Recm'd	Date
	REVISIONS				

S- SHEET__ OF__

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

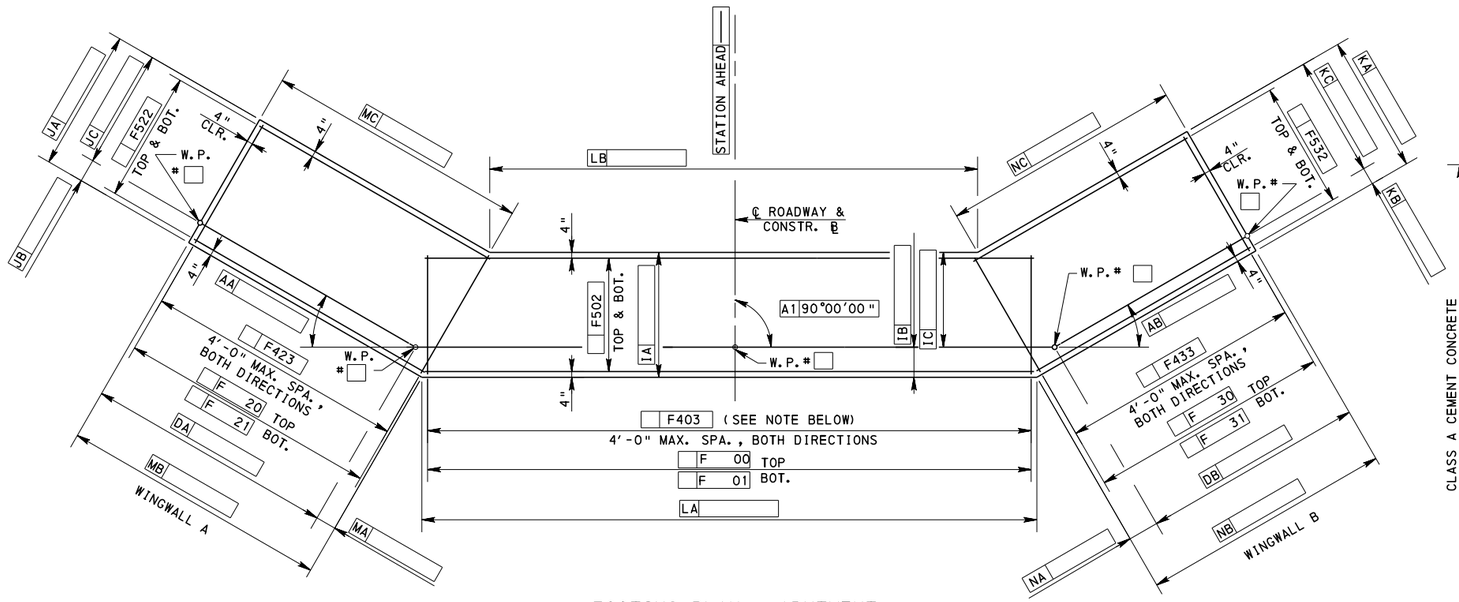
SPREAD FOOTING ABUTMENT
ABUTMENT __ - FTG. PLAN - LEFT SKEW

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

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

SHEET 4 OF 7

BLC-566M



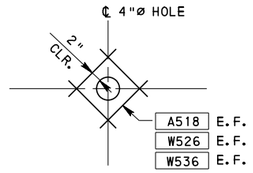
FOOTING PLAN - ABUTMENT

NO SCALE

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

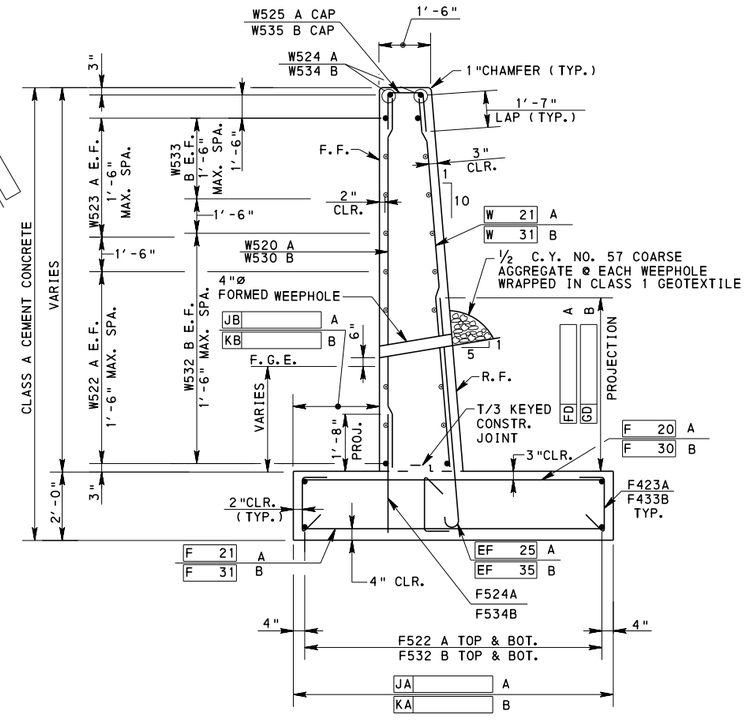
NOTE:
TIE TOP AND BOTTOM MATS OF REINFORCING STEEL WITH #4 TIE BARS AT A MAXIMUM SPACING OF 4'-0" IN BOTH DIRECTIONS. PROVIDE TIE BARS WITH 90° HOOK AT ONE END AND 135° AT THE OTHER END. ALTERNATE 90° AND 135° AT TOP IN ALTERNATE TIES.



WEEPHOLE REINFORCEMENT DETAIL

NO SCALE

NOTE:
ADJUST REINFORCEMENT AS NECESSARY TO ACCOMMODATE OPENING.

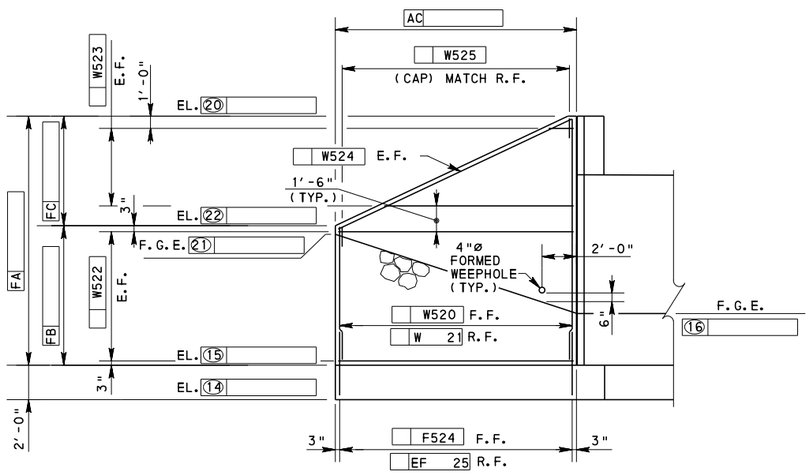


TYPICAL WING SECTION

NO SCALE

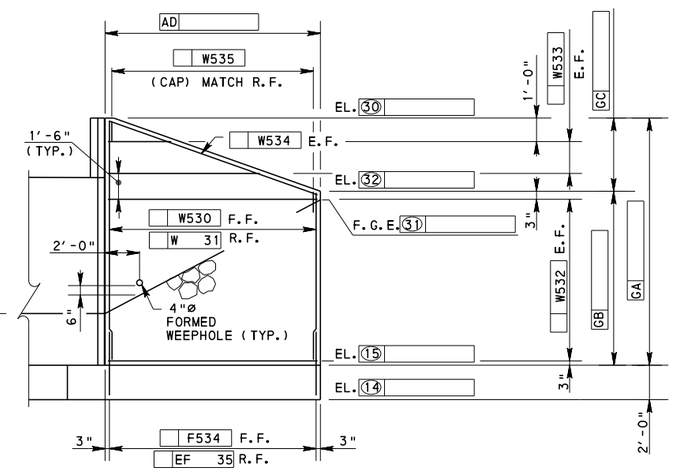
NOTES:

- FOR GENERAL NOTES, SEE SHEET ____
- FOR LOCATION OF WINGWALLS SEE STAKE-OUT SKETCH, SHEET ____
- FOR ABUTMENT ____ , SEE SHEET ____
- FOR ABUTMENT ____ BAR SCHEDULE, SEE SHEET ____
- MAX. ALLOWABLE FOUNDATION PRESSURE = ____ kip/FT.^{2}
- MAX DESIGN FOUNDATION PRESSURE = WING A = ____ kip/FT.^{2} WING B = ____ kip/FT.^{2}



WINGWALL A

NO SCALE



WINGWALL B

NO SCALE

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

Mark	Description	By	Chk'd	Recm'd	Date
REVISIONS					

S- | SHEET__ OF__

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

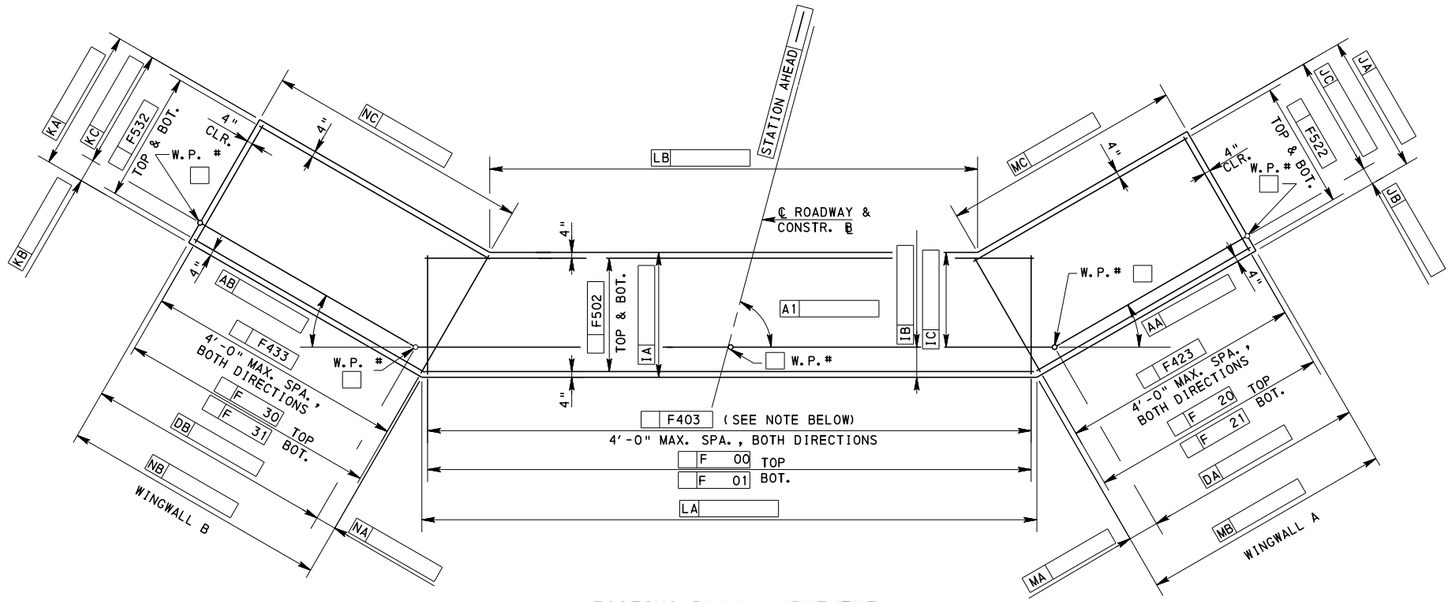
SPREAD FOOTING ABUTMENT
ABUTMENT __ - FTG. PLAN - 90° SKEW

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

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

SHEET 5 OF 7

BLC-566M



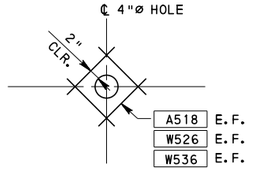
FOOTING PLAN - ABUTMENT

NO SCALE

NOTE:
TIE TOP AND BOTTOM MATS OF REINFORCING STEEL WITH #4 TIE BARS AT A MAXIMUM SPACING OF 4'-0" IN BOTH DIRECTIONS. PROVIDE TIE BARS WITH 90° HOOK AT ONE END AND 135° AT THE OTHER END. ALTERNATE 90° AND 135° AT TOP IN ALTERNATE TIES.

LEGEND

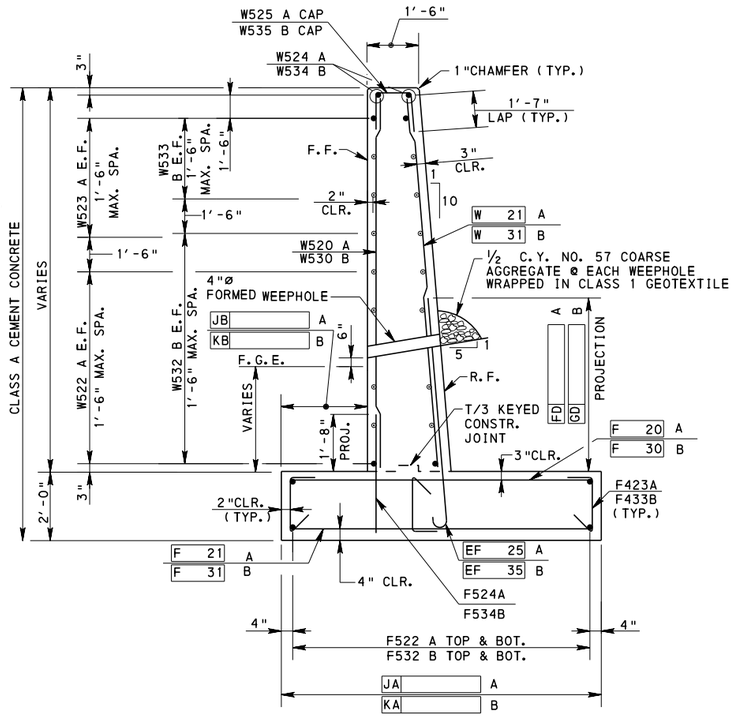
F.F.	DENOTES FRONT FACE
R.F.	DENOTES REAR FACE
E.F.	DENOTES EACH FACE
F.G.E.	DENOTES FINISHED GROUND ELEVATION
BOT.	DENOTES BOTTOM
W.P.	DENOTES WORKING POINT
EQ. SPA.	DENOTES EQUAL SPACE



WEEPHOLE REINFORCEMENT DETAIL

NO SCALE

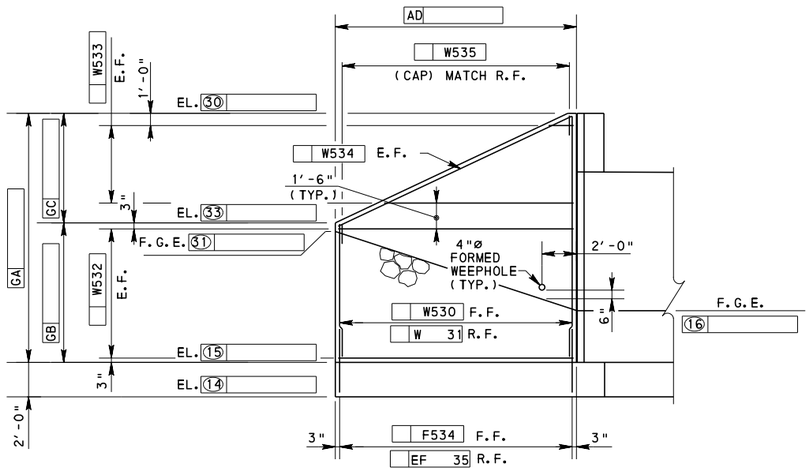
NOTE:
ADJUST REINFORCEMENT AS NECESSARY TO ACCOMMODATE OPENING.



TYPICAL WING SECTION

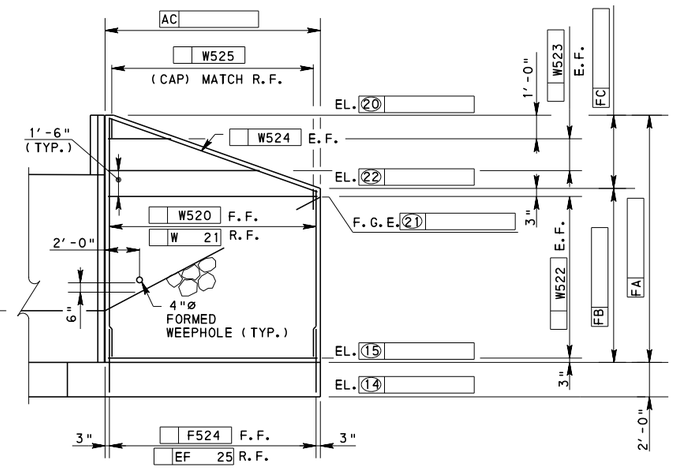
NO SCALE

NOTES:
- FOR GENERAL NOTES, SEE SHEET ____
- FOR LOCATION OF WINGWALLS SEE STAKE-OUT SKETCH, SHEET ____
- FOR ABUTMENT ____ , SEE SHEET ____
- FOR ABUTMENT ____ BAR SCHEDULE, SEE SHEET ____
- MAX. ALLOWABLE FOUNDATION PRESSURE = ____ kip/FT.^{2}
- MAX DESIGN FOUNDATION PRESSURE = WING A = ____ kip/FT.^{2} WING B = ____ kip/FT.^{2}



WINGWALL B

NO SCALE



WINGWALL A

NO SCALE

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

Mark	Description	By	Chk'd	Recm'd	Date
REVISIONS					

S- | SHEET ___ OF ___

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

SPREAD FOOTING ABUTMENT
ABUTMENT ___ - FTG. PLAN - RIGHT SKEW

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

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

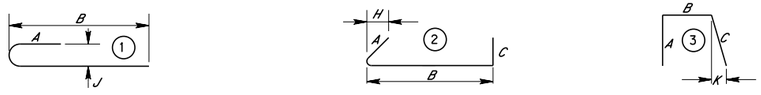
SHEET 6 OF 7

BLC-566M

REINFORCEMENT BAR SCHEDULE*

MARK	SIZE	LENGTH	NO.	TYPE	A	B	C	D	E	F	G	H	J	K	R	REMARKS
A500	5			STR.												VARY EA. BY ____
A501	5			STR.												VARY EA. BY ____
A__02				STR.												VARY EA. BY ____
A__03				STR.												VARY EA. BY ____
A504	5			STR.												
A505	5			STR.												
A506	5			STR.												
A507	5			STR.												
A508	5		1	STR.												
A509	5		1	STR.												
A510	5		1	STR.												
A511	5		1	STR.												
EA312	3			STR.												BEND IN FIELD
EA313	3			STR.												BEND IN FIELD
EA514	5			STR.												
EA515	5		6	STR.												
A516	5	4'-3"		③	1'-7"	1'-1"	1'-7"							2"		
A517	5	4'-3"		③	1'-7"	1'-1"	1'-7"							2"		
A518	5	1'-0"	32	STR.												
W520	5			STR.												VARY EA. BY ____
W__21				STR.												VARY EA. BY ____
W522	5			STR.												
W523	5			STR.												VARY 2 EA. BY ____
W524	5		2	STR.												
W525	5	4'-3"		③	1'-7"	1'-1"	1'-7"							2"		
W526	5	1'-0"	8	STR.												
W530	5			STR.												VARY EA. BY ____
W__31				STR.												VARY EA. BY ____
W532	5			STR.												
W533	5			STR.												VARY 2 EA. BY ____
W534	5		2	STR.												
W535	5	4'-3"		③	1'-7"	1'-1"	1'-7"							2"		
W536	5	1'-0"	8	STR.												
F__00				STR.												
F__01				STR.												
F502	5			STR.												
F403	4	2'-3"		②	4½"	1'-6"	4½"					3"				
F504	5	3'-6"		STR.												
F505	5	3'-6"		STR.												
EF__06				①												
EF__07				①												
F__20				STR.												
F__21				STR.												
F522	5			STR.												
F423	4	2'-3"		②	4½"	1'-6"	4½"					3"				
F524	5	3'-6"		STR.												
EF__25				①												
F__30				STR.												
F__31				STR.												
F532	5			STR.												
F433	4	2'-3"		②	4½"	1'-6"	4½"					3"				
F534	5	3'-6"		STR.												
EF__35				①												

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	Recm'd	Date
	REVISIONS				

S- | SHEET__ OF__

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

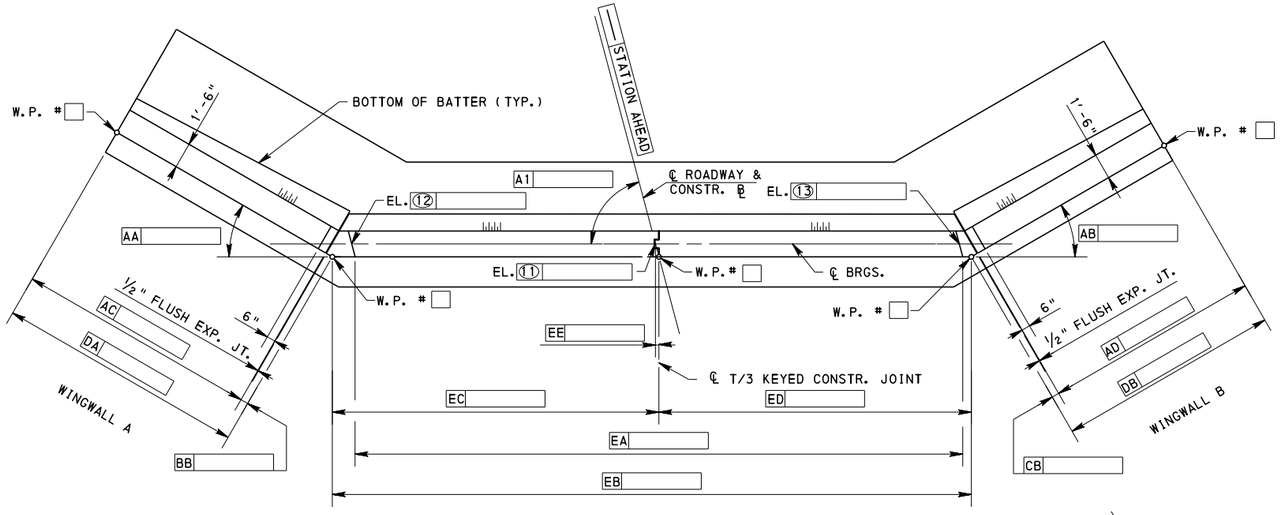
SPREAD FOOTING ABUTMENT
ABUTMENT__ - BAR SCHEDULE

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

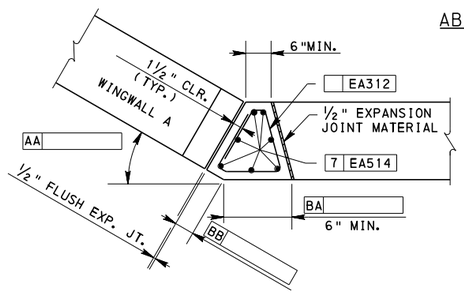
RECOMMENDED APR. 23, 2013
ACTING DIR., BUR. OF PROJECT DELIVERY

SHEET 7 OF 7

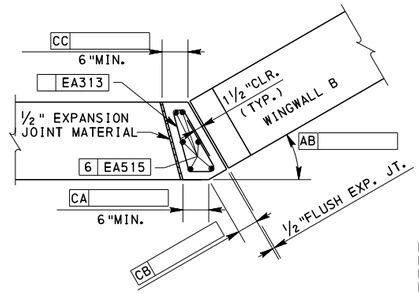
BLC-566M



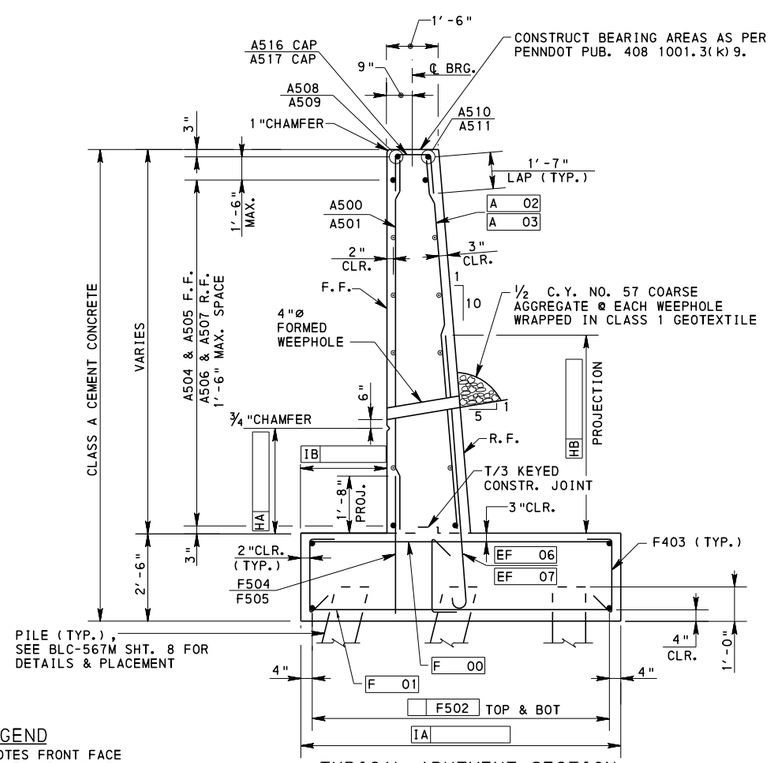
ABUTMENT PLAN
NO SCALE



CHEEKWALL A DETAIL
NO SCALE



CHEEKWALL B DETAIL
NO SCALE



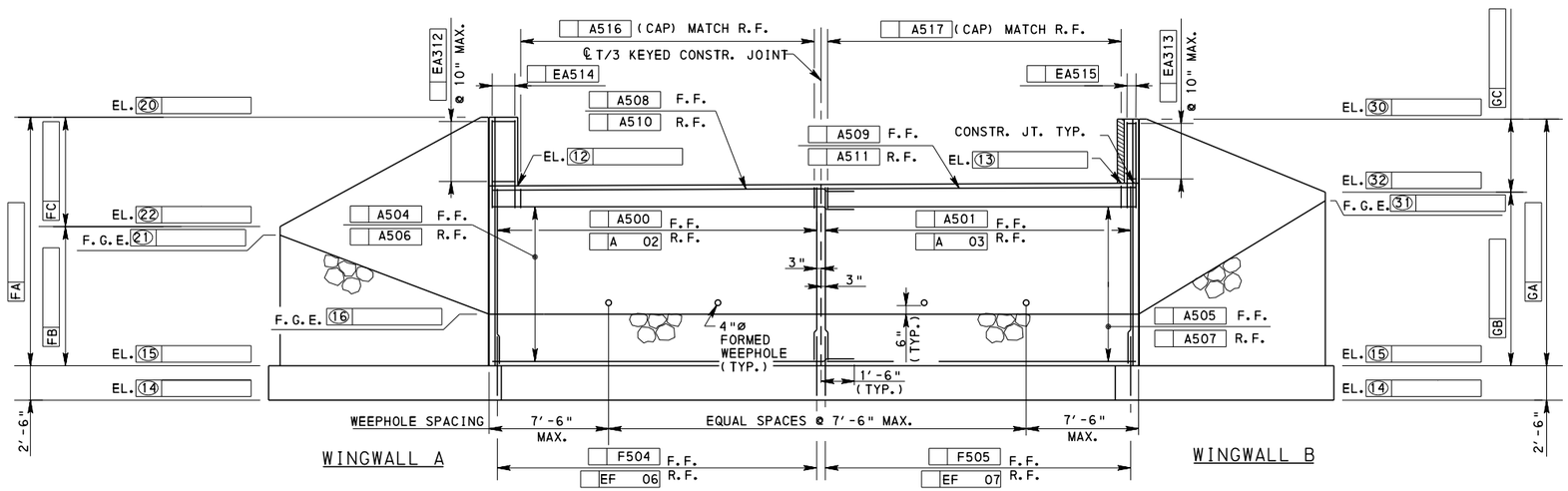
TYPICAL ABUTMENT SECTION
NO SCALE

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 ___
- FOR LOCATION OF ABUTMENT SEE STAKE-OUT SKETCH, SHEET ___
- FOR ABUTMENT ___ FOOTING PLAN SEE SHEET ___
- FOR ABUTMENT ___ BAR SCHEDULE, SEE SHEET ___
- MAX. ALLOWABLE PILE LOAD = ___ kips
- MAX DESIGN PILE LOAD = ___ kips



ABUTMENT ELEVATION
NO SCALE

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

Mark	Description	By	Chk'd	Recm'd	Date
	REVISIONS				

S- | SHEET ___ OF ___

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

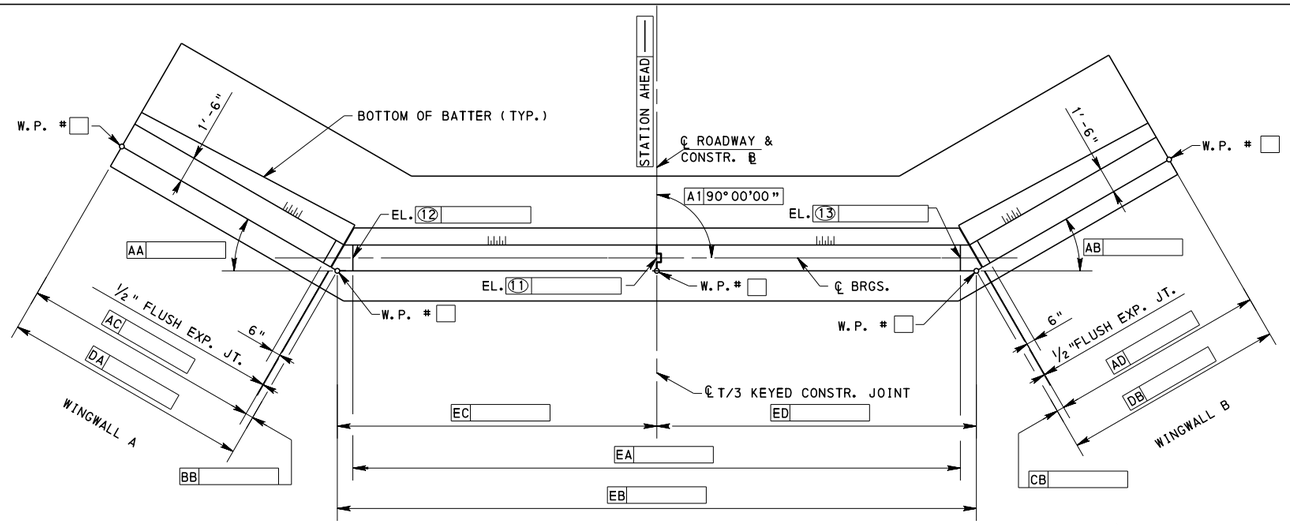
PILE SUPPORTED ABUTMENT
ABUTMENT ___ - LEFT SKEW

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

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

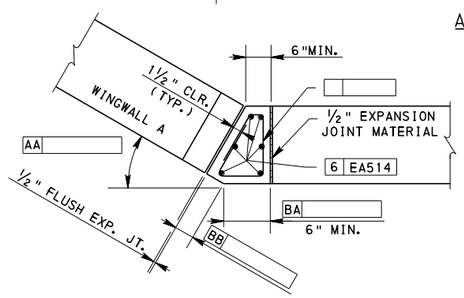
SHEET 1 OF 9

BLC-567M



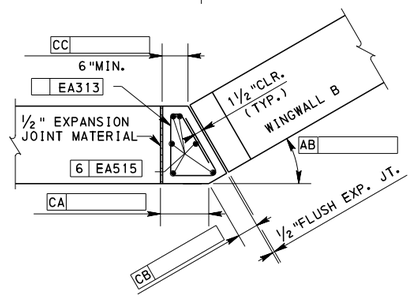
ABUTMENT PLAN

NO SCALE



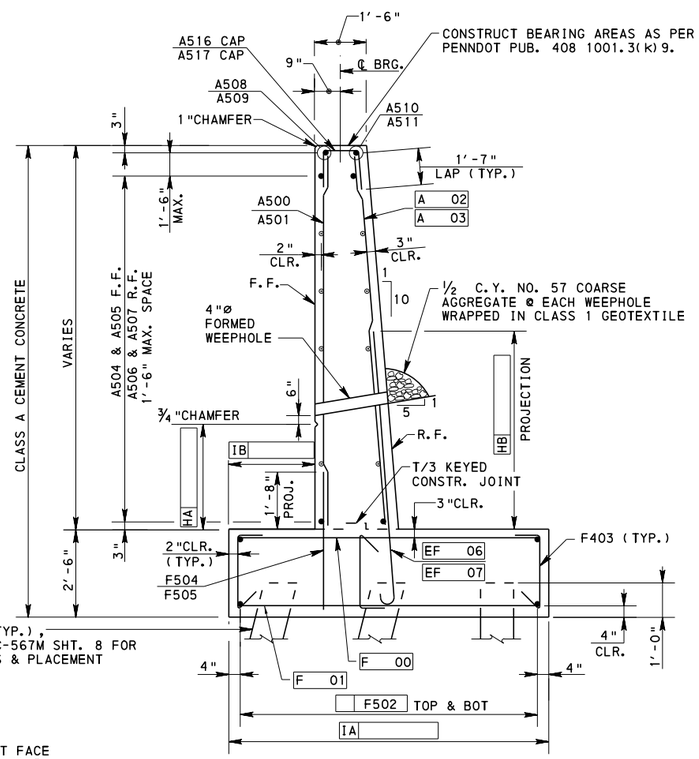
CHEEKWALL A DETAIL

NO SCALE



CHEEKWALL B DETAIL

NO SCALE



TYPICAL ABUTMENT SECTION

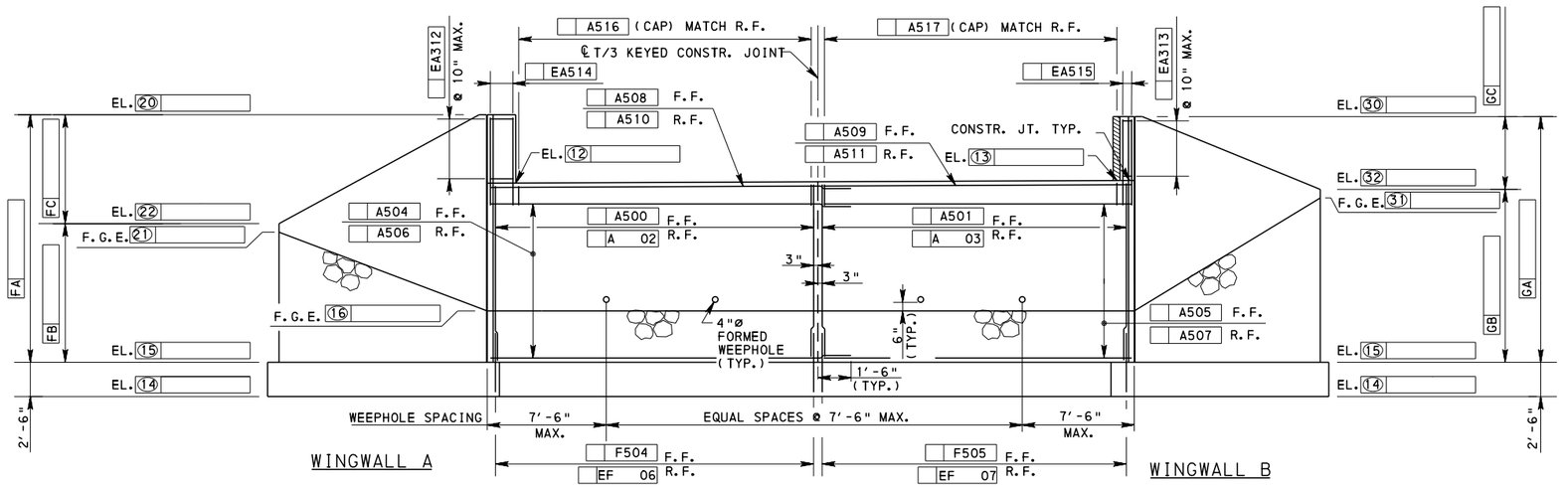
NO SCALE

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 ___
- FOR LOCATION OF ABUTMENT SEE STAKE-OUT SKETCH, SHEET ___
- FOR ABUTMENT ___ FOOTING PLAN SEE SHEET ___
- FOR ABUTMENT ___ BAR SCHEDULE, SEE SHEET ___
- MAX. ALLOWABLE PILE LOAD = ___ kips
- MAX DESIGN PILE LOAD = ___ kips



ABUTMENT ELEVATION

NO SCALE

NOTE:

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

Mark	Description	By	Chk'd	Recm'd	Date
	REVISIONS				

S- | SHEET ___ OF ___

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

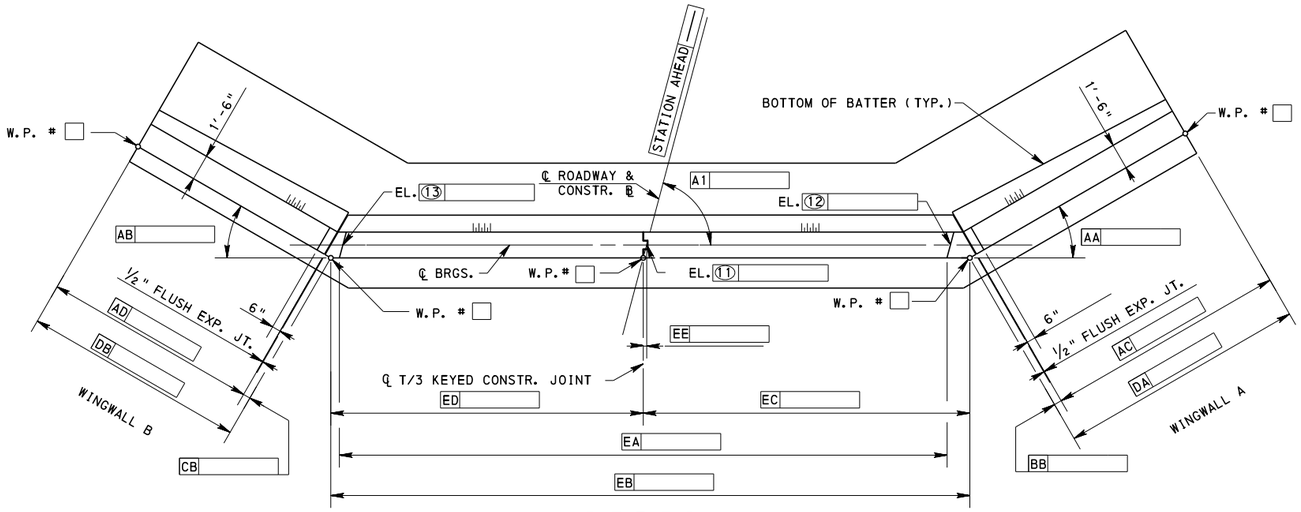
PILE SUPPORTED ABUTMENT
ABUTMENT ___ - 90° SKEW

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

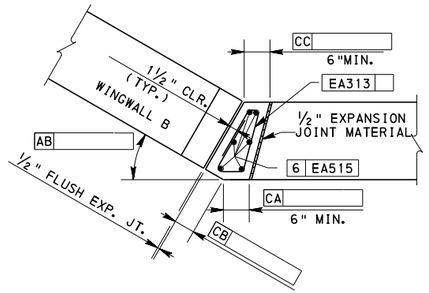
RECOMMENDED APR. 23, 2013
ACTING DIR. BUR. OF PROJECT DELIVERY

SHEET 2 OF 9

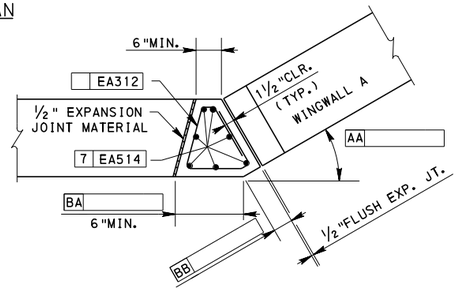
BLC-567M



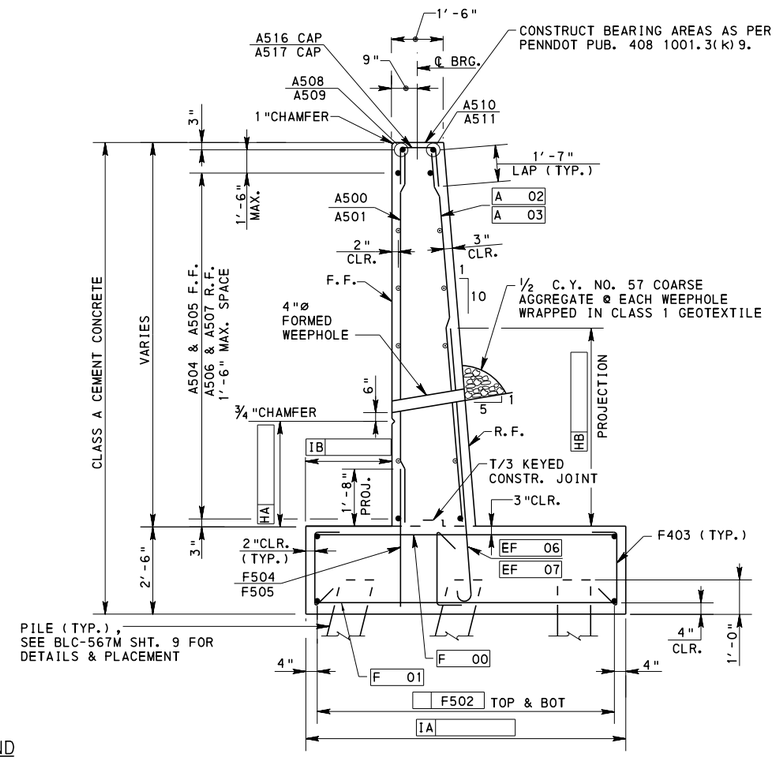
ABUTMENT PLAN
NO SCALE



CHEEKWALL B DETAIL
NO SCALE



CHEEKWALL A DETAIL
NO SCALE



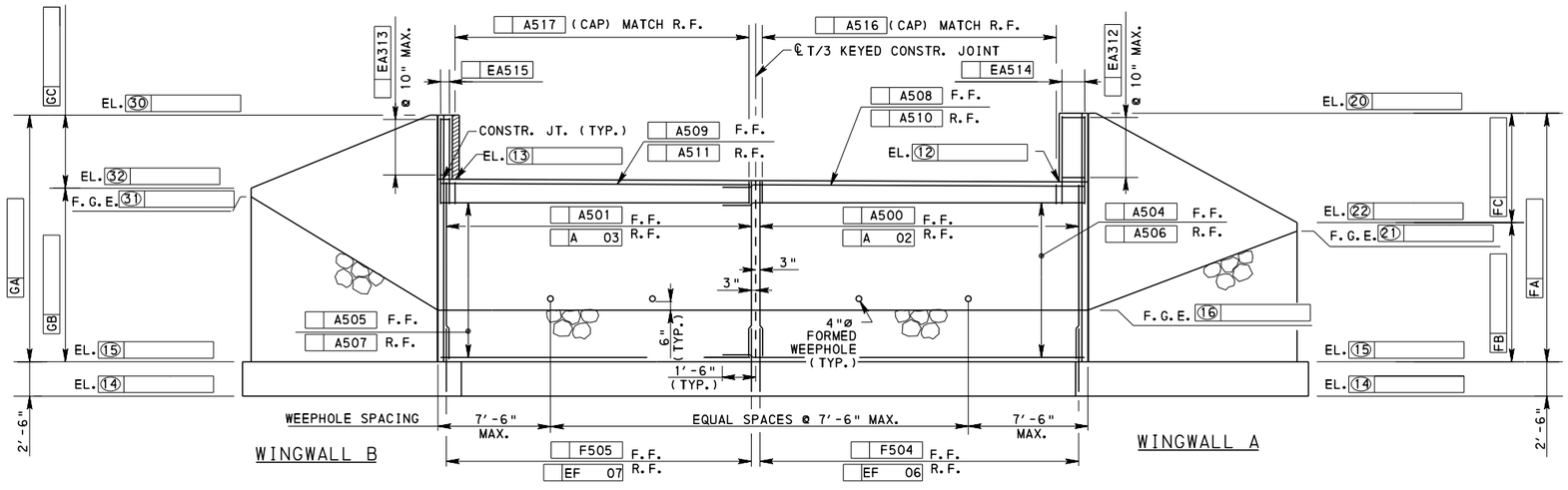
TYPICAL ABUTMENT SECTION
NO SCALE

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 ___
- FOR LOCATION OF ABUTMENT SEE STAKE-OUT SKETCH, SHEET ___
- FOR ABUTMENT ___ FOOTING PLAN SEE SHEET ___
- FOR ABUTMENT ___ BAR SCHEDULE, SEE SHEET ___
- MAX. ALLOWABLE PILE LOAD = ___ kips
- MAX DESIGN PILE LOAD = ___ kips



ABUTMENT ELEVATION
NO SCALE

NOTE:

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

Mark	Description	By	Chk'd	Recm'd	Date
REVISIONS					

S- | SHEET ___ OF ___

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

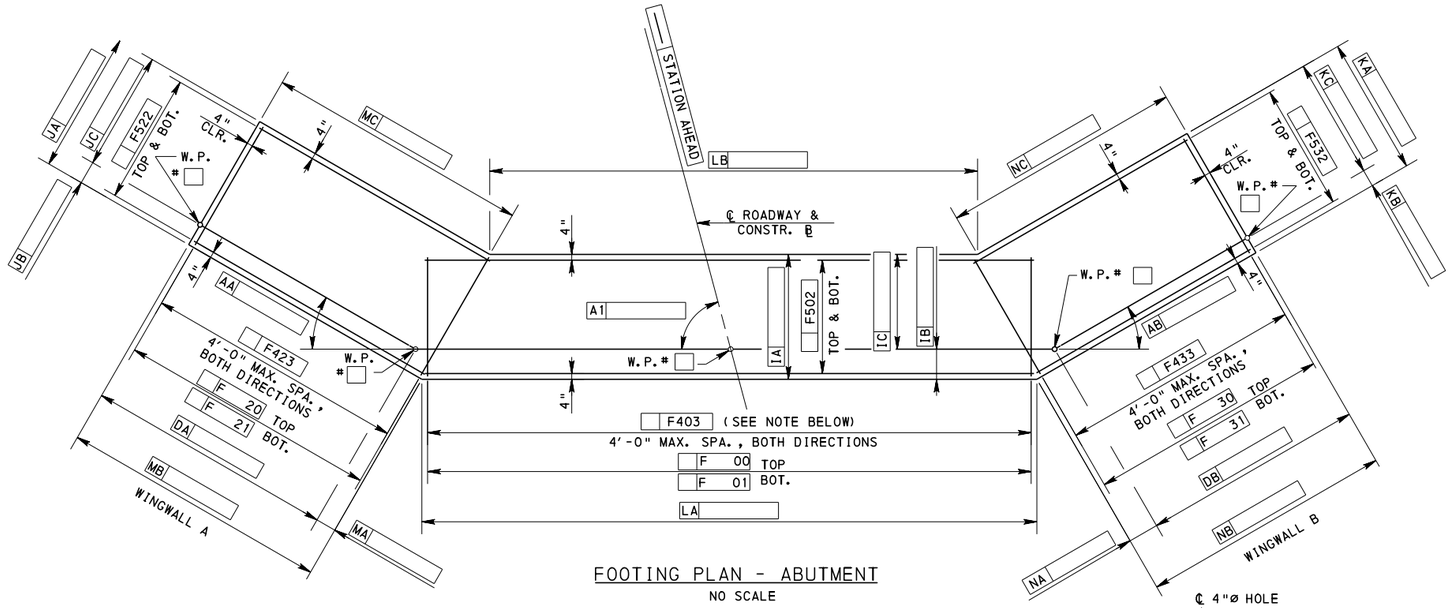
PILE SUPPORTED ABUTMENT
ABUTMENT ___ - RIGHT SKEW

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

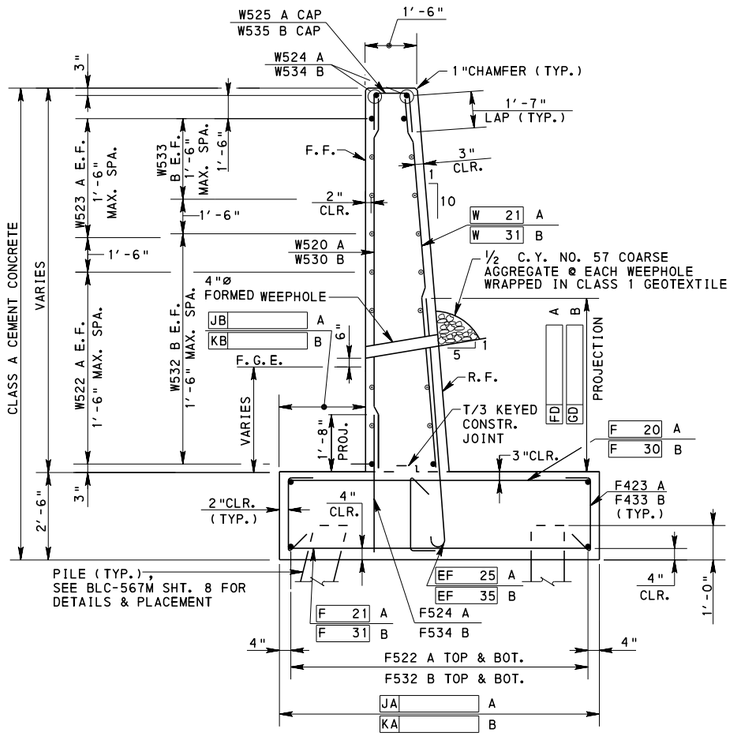
RECOMMENDED APR. 23, 2013
ACTING DIR. BUR. OF PROJECT DELIVERY

SHEET 3 OF 9

BLC-567M



FOOTING PLAN - ABUTMENT
NO SCALE

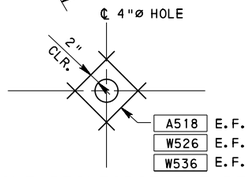


TYPICAL WING SECTION
NO SCALE

LEGEND

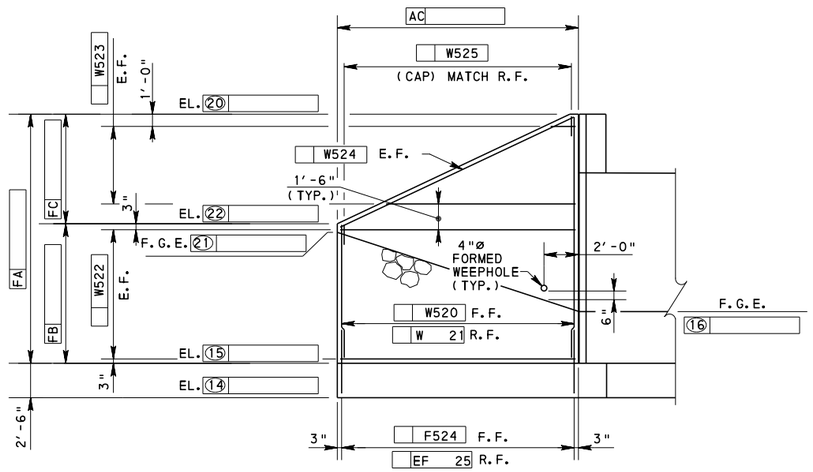
F.F.	DENOTES FRONT FACE
R.F.	DENOTES REAR FACE
E.F.	DENOTES EACH FACE
F.G.E.	DENOTES FINISHED GROUND ELEVATION
BOT.	DENOTES BOTTOM
W.P.	DENOTES WORKING POINT
EQ. SPA.	DENOTES EQUAL SPACE

NOTE:
TIE TOP AND BOTTOM MATS OF REINFORCING STEEL WITH #4 TIE BARS AT A MAXIMUM SPACING OF 4'-0" IN BOTH DIRECTIONS. PROVIDE TIE BARS WITH 90° HOOK AT ONE END AND 135° AT THE OTHER END. ALTERNATE 90° AND 135° AT TOP IN ALTERNATE TIES.

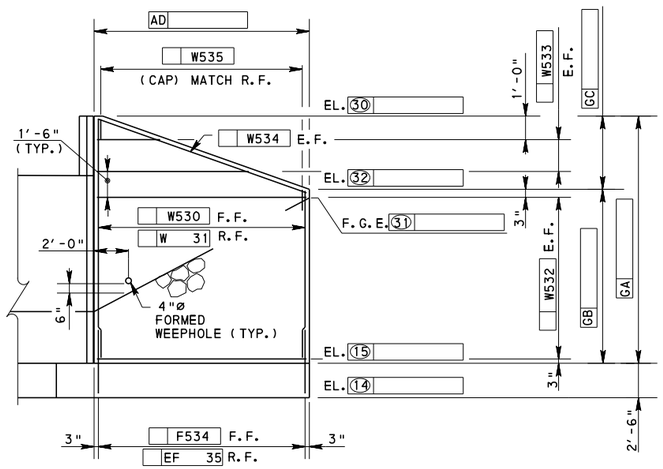


WEEPHOLE REINFORCEMENT DETAIL
NO SCALE

NOTE:
ADJUST REINFORCEMENT AS NECESSARY TO ACCOMMODATE OPENING.



WINGWALL A
NO SCALE



WINGWALL B
NO SCALE

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

NOTES:

- FOR GENERAL NOTES, SEE SHEET ___
- FOR LOCATION OF ABUTMENT SEE STAKE-OUT SKETCH, SHEET ___
- FOR ABUTMENT ___ , SEE SHEET ___
- FOR ABUTMENT ___ BAR SCHEDULE, SEE SHEET ___
- MAX. ALLOWABLE PILE LOAD = ___ Kips
- MAX DESIGN PILE LOAD = ___ Kips

Mark	Description	By	Chk'd	Recm'd	Date
	REVISIONS				

S- | SHEET ___ OF ___

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

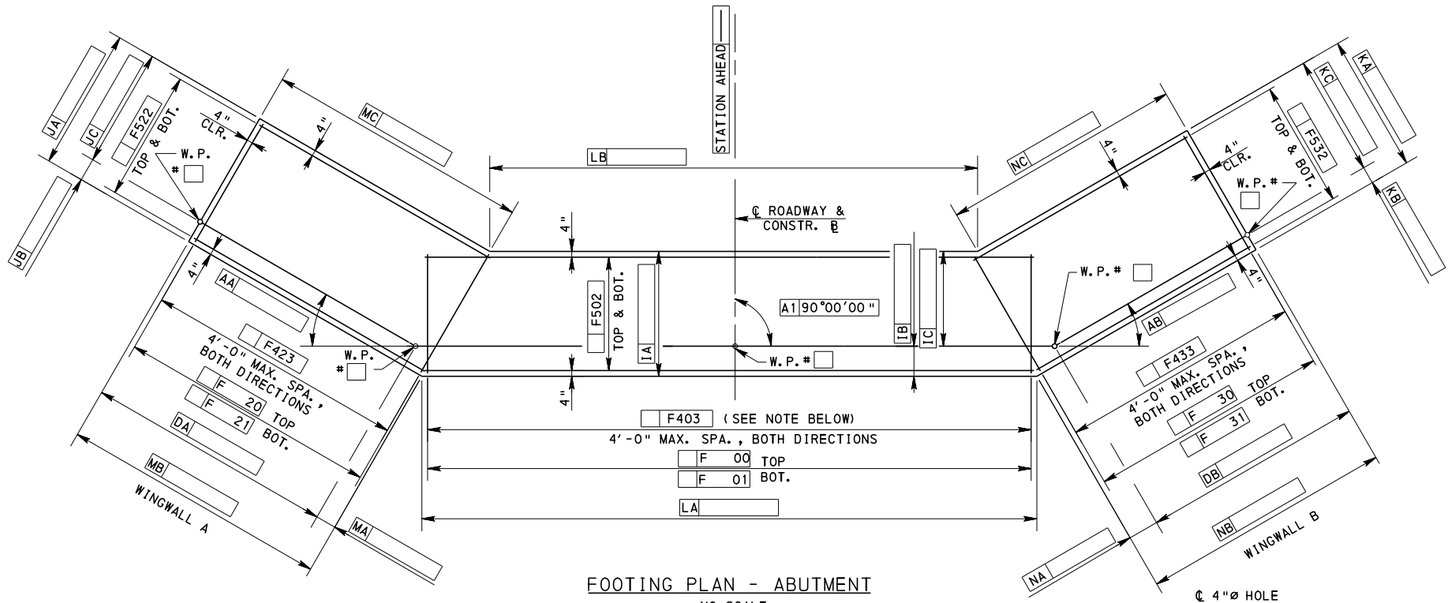
PILE SUPPORTED ABUTMENT
ABUTMENT ___ - FTG. PLAN - LEFT SKEW

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

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

SHEET 4 OF 9

BLC-567M



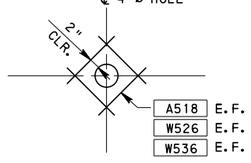
FOOTING PLAN - ABUTMENT

NO SCALE

NOTE:
TIE TOP AND BOTTOM MATS OF REINFORCING STEEL WITH #4 TIE BARS AT A MAXIMUM SPACING OF 4'-0" IN BOTH DIRECTIONS. PROVIDE TIE BARS WITH 90° HOOK AT ONE END AND 135° AT THE OTHER END. ALTERNATE 90° AND 135° AT TOP IN ALTERNATE TIES.

LEGEND

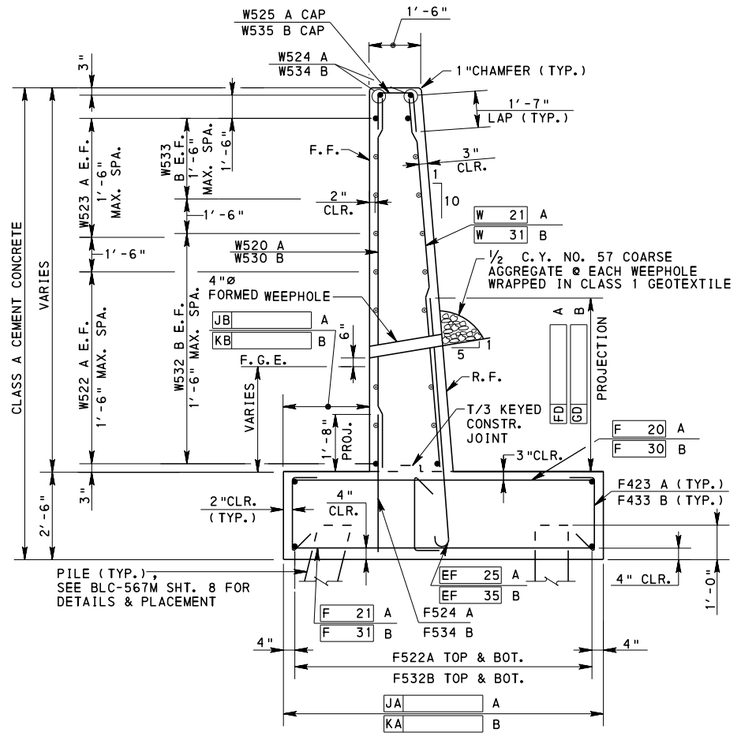
F.F.	DENOTES FRONT FACE
R.F.	DENOTES REAR FACE
E.F.	DENOTES EACH FACE
F.G.E.	DENOTES FINISHED GROUND ELEVATION
BOT.	DENOTES BOTTOM
W.P.	DENOTES WORKING POINT
EQ. SPA.	DENOTES EQUAL SPACE



WEEPHOLE REINFORCEMENT DETAIL

NO SCALE

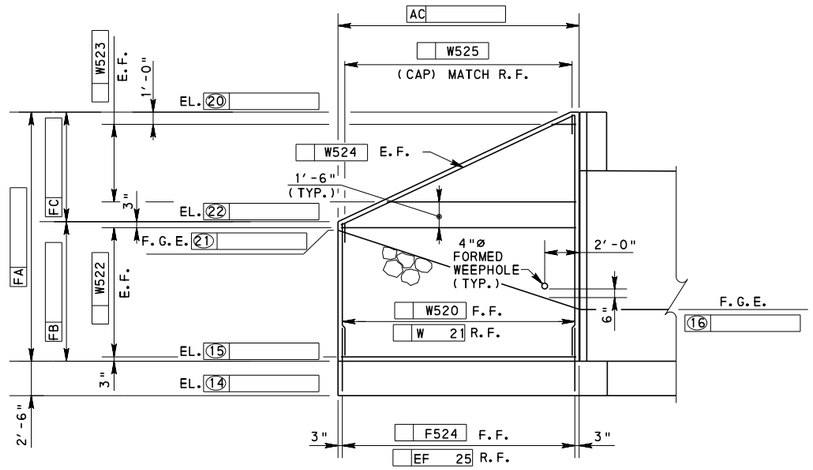
NOTE:
ADJUST REINFORCEMENT AS NECESSARY TO ACCOMMODATE OPENING.



TYPICAL WING SECTION

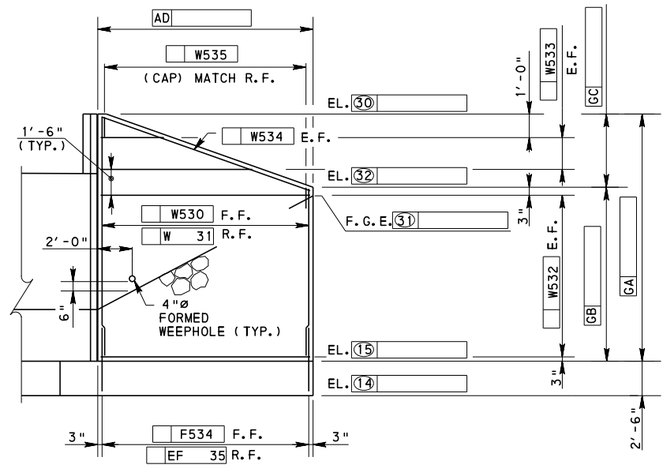
NO SCALE

NOTES:
- FOR GENERAL NOTES, SEE SHEET ___
- FOR LOCATION OF ABUTMENT SEE STAKE-OUT SKETCH, SHEET ___
- FOR ABUTMENT ___ , SEE SHEET ___
- FOR ABUTMENT ___ BAR SCHEDULE, SEE SHEET ___
- MAX. ALLOWABLE PILE LOAD = ___ kips
- MAX DESIGN PILE LOAD = ___ kips



WINGWALL A

NO SCALE



WINGWALL B

NO SCALE

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

Mark	Description	By	Chk'd	Recm'd	Date
REVISIONS					

S- SHEET ___ OF ___

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

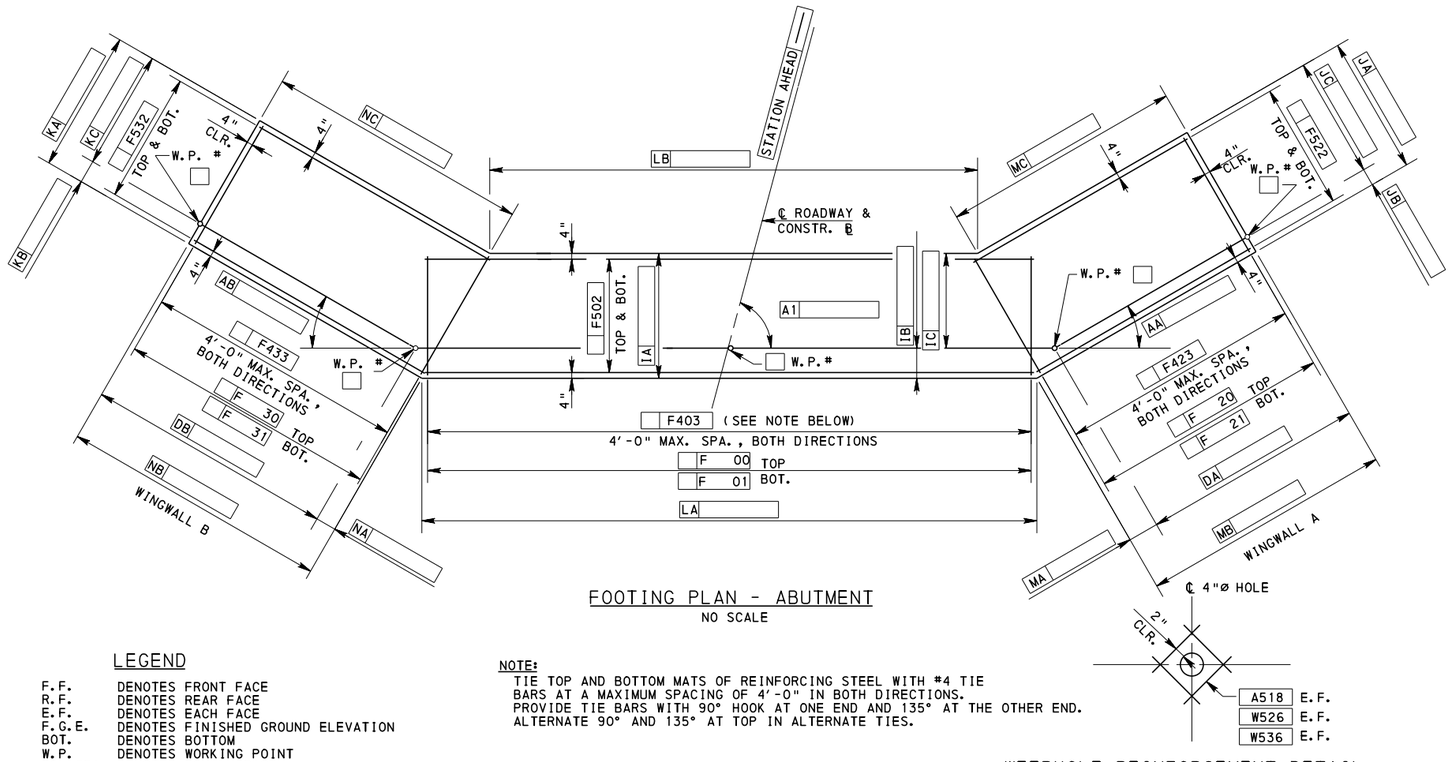
PILE SUPPORTED ABUTMENT
ABUTMENT ___ - FTG. PLAN - 90° SKEW

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

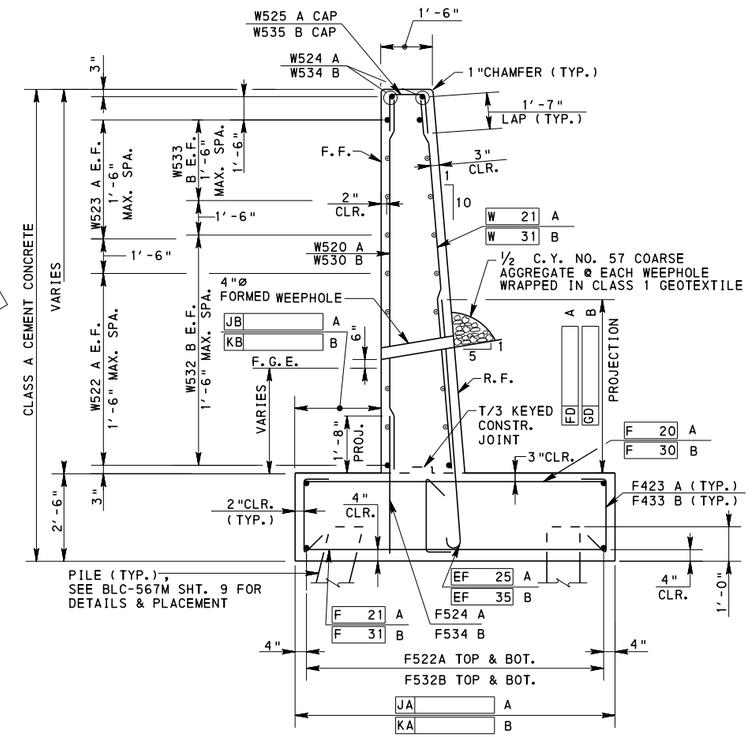
RECOMMENDED APR.23, 2013
ACTING DIR. BUR. OF PROJECT DELIVERY

SHEET 5 OF 9

BLC-567M



FOOTING PLAN - ABUTMENT
NO SCALE



TYPICAL WING SECTION
NO SCALE

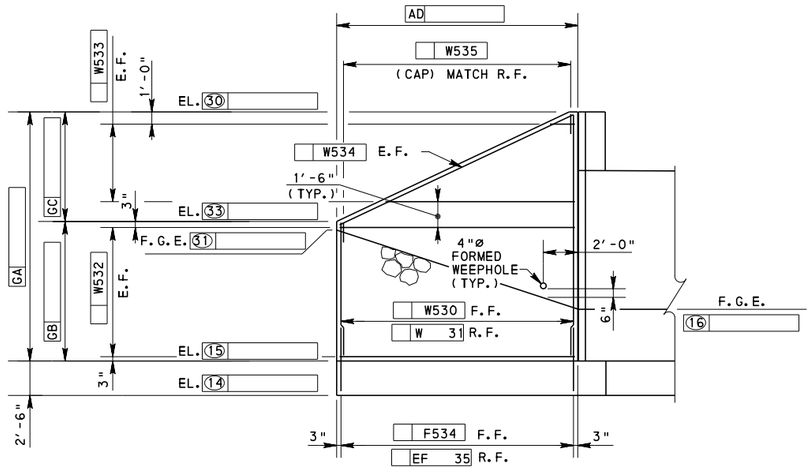
LEGEND

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

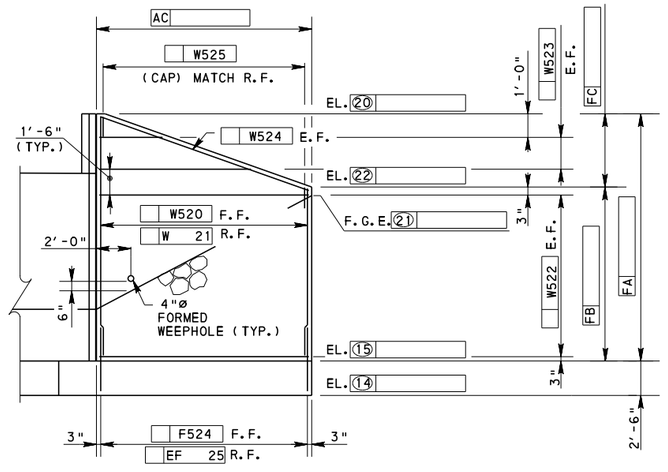
NOTE:
TIE TOP AND BOTTOM MATS OF REINFORCING STEEL WITH #4 TIE BARS AT A MAXIMUM SPACING OF 4'-0" IN BOTH DIRECTIONS. PROVIDE TIE BARS WITH 90° HOOK AT ONE END AND 135° AT THE OTHER END. ALTERNATE 90° AND 135° AT TOP IN ALTERNATE TIES.

WEEPHOLE REINFORCEMENT DETAIL
NO SCALE

NOTE:
ADJUST REINFORCEMENT AS NECESSARY TO ACCOMMODATE OPENING.



WINGWALL B
NO SCALE



WINGWALL A
NO SCALE

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

NOTES:
- FOR GENERAL NOTES, SEE SHEET ___
- FOR LOCATION OF ABUTMENT SEE STAKE-OUT SKETCH, SHEET ___
- FOR ABUTMENT ___ , SEE SHEET ___
- FOR ABUTMENT ___ BAR SCHEDULE, SEE SHEET ___
- MAX. ALLOWABLE PILE LOAD = ___ kips
- MAX DESIGN PILE LOAD = ___ kips

Mark	Description	By	Chk'd	Recm'd	Date
	REVISIONS				

S- SHEET ___ OF ___

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

PILE SUPPORTED ABUTMENT
ABUTMENT ___ - FTG. PLAN - RIGHT SKEW

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

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

SHEET 6 OF 9

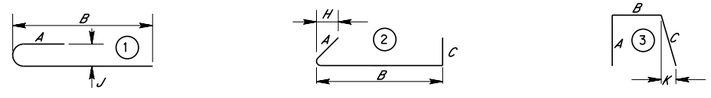
BLC-567M

REINFORCEMENT BAR SCHEDULE*

MARK	SIZE	LENGTH	NO.	TYPE	A	B	C	D	E	F	G	H	J	K	R	REMARKS
A500	5			STR.												VARY EA. BY ____
A501	5			STR.												VARY EA. BY ____
A__02				STR.												VARY EA. BY ____
A__03				STR.												VARY EA. BY ____
A504	5			STR.												
A505	5			STR.												
A506	5			STR.												
A507	5			STR.												
A508	5		1	STR.												
A509	5		1	STR.												
A510	5		1	STR.												
A511	5		1	STR.												
EA312	3			STR.												BEND IN FIELD
EA313	3			STR.												BEND IN FIELD
EA514	5			STR.												
EA515	5		6	STR.												
A516	5	4'-3"		③	1'-7"	1'-1"	1'-7"							2"		
A517	5	4'-3"		③	1'-7"	1'-1"	1'-7"							2"		
A518	5	1'-0"	32	STR.												
W520	5			STR.												VARY EA. BY ____
W__21				STR.												VARY EA. BY ____
W522	5			STR.												
W523	5			STR.												VARY 2 EA. BY ____
W524	5		2	STR.												
W525	5	4'-3"		③	1'-7"	1'-1"	1'-7"							2"		
W526	5	1'-0"	8	STR.												
W530	5			STR.												VARY EA. BY ____
W__31				STR.												VARY EA. BY ____
W532	5			STR.												
W533	5			STR.												VARY 2 EA. BY ____
W534	5		2	STR.												
W535	5	4'-3"		③	1'-7"	1'-1"	1'-7"							2"		
W536	5	1'-0"	8	STR.												
F__00				STR.												
F__01				STR.												
F502	5			STR.												
F403	4	2'-9"		②	4½"	2'-0"	4½"					3"				
F504	5	4'-0"		STR.												
F505	5	4'-0"		STR.												
EF__06				①												
EF__07				①												
F__20				STR.												
F__21				STR.												
F522	5			STR.												
F423	4	2'-9"		②	4½"	2'-0"	4½"					3"				
F524	5	4'-0"		STR.												
EF__25				①												
F__30				STR.												
F__31				STR.												
F532	5			STR.												
F433	4	2'-9"		②	4½"	2'-0"	4½"					3"				
F534	5	4'-0"		STR.												
EF__35				①												

BAR TYPE LEGEND

STR. DENOTES A STRAIGHT BAR



* USE BLC-561M SHEETS 17 AND 18 TO COMPLETE BAR SCHEDULE INFORMATION.

Mark	Description	By	Chk'd	Recm'd	Date
	REVISIONS				

S- | SHEET __ OF __

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

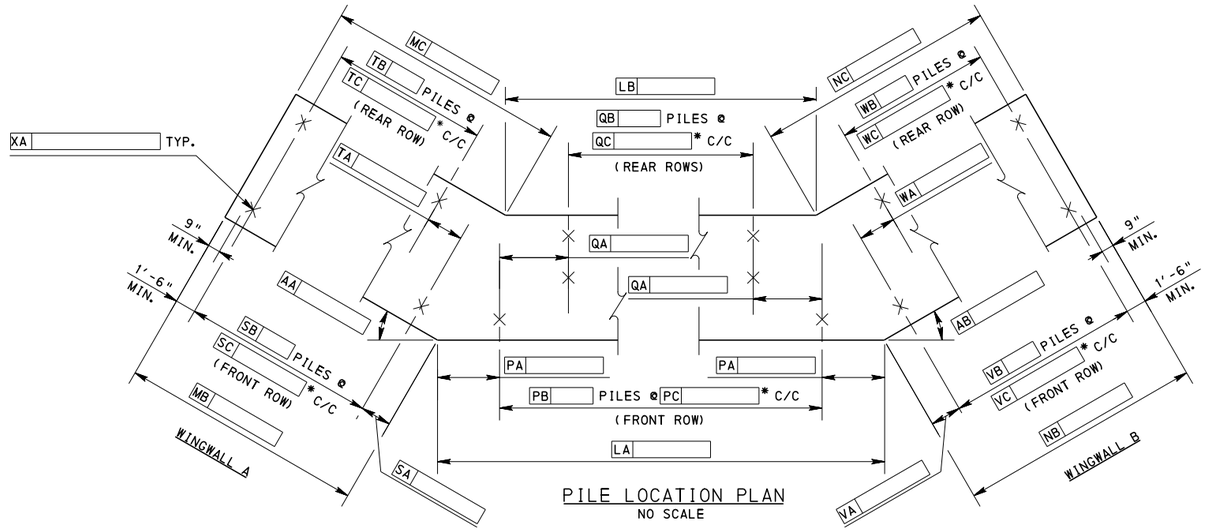
PILE SUPPORTED ABUTMENT
ABUTMENT __ - BAR SCHEDULE

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

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

SHEET 7 OF 9

BLC-567M



PILE LOCATION PLAN
NO SCALE

* 15'-0" MAX., 3'-0" MIN. OR TWO AND ONE-HALF TIMES THE DIAMETER FOR ROUND OR OCTAGONAL PILES AND TWO TIMES THE DIAGONAL DIMENSION FOR SQUARE PILES.

LEGEND

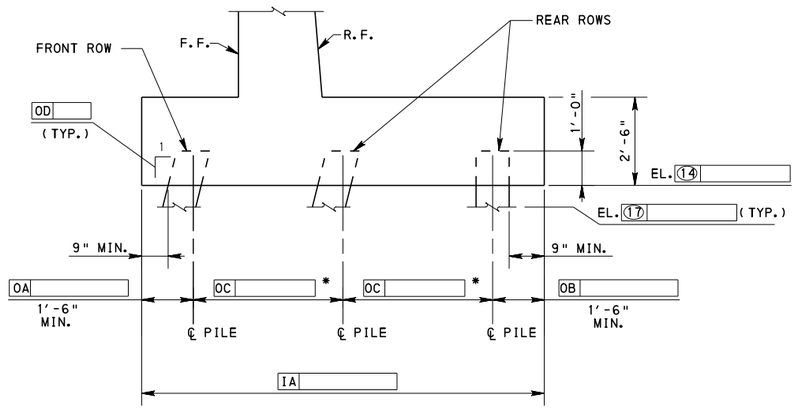
× DENOTES H PILE LOCATION. SHOW ORIENTATION OF H PILE BY DRAWING SHAPE ON PLAN.

F.F. DENOTES FRONT FACE

R.F. DENOTES REAR FACE

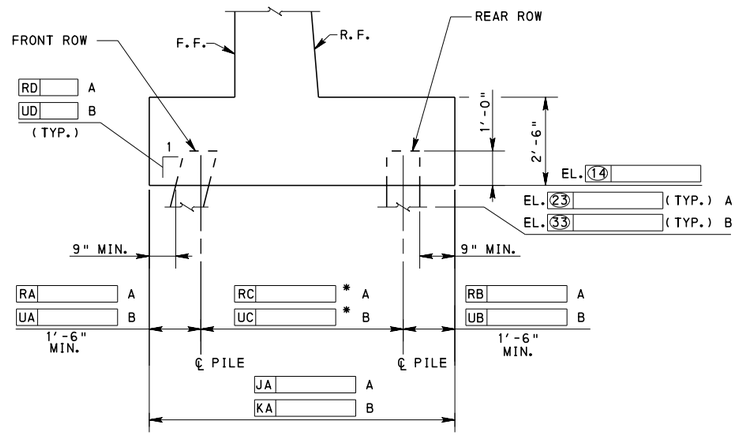
NOTE:

SEE BC-757M FOR STANDARD STEEL PILE TIP REINFORCEMENTS AND SPLICES.



TYPICAL ABUTMENT SECTION
NO SCALE

* 15'-0" MAX., 3'-0" MIN. OR TWO AND ONE-HALF TIMES THE DIAMETER FOR ROUND OR OCTAGONAL PILES AND TWO TIMES THE DIAGONAL DIMENSION FOR SQUARE PILES.



TYPICAL WINGWALL SECTION
NO SCALE

* 15'-0" MAX., 3'-0" MIN. OR TWO AND ONE-HALF TIMES THE DIAMETER FOR ROUND OR OCTAGONAL PILES AND TWO TIMES THE DIAGONAL DIMENSION FOR SQUARE PILES.

Mark	Description	By	Chk'd	Recm'd	Date
REVISIONS					

S-

SHEET ___ OF ___

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

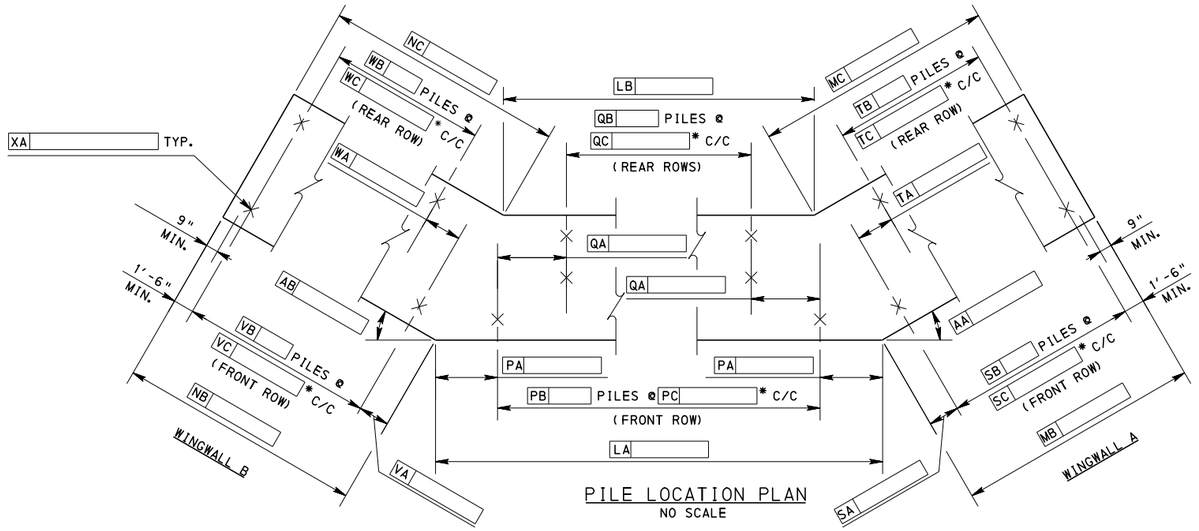
PILE SUPPORTED ABUTMENT
ABUTMENT___ - PILE DETAILS-
90° & LEFT SKEW

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

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

SHEET 8 OF 9

BLC-567M



PILE LOCATION PLAN
NO SCALE

* 15'-0" MAX., 3'-0" MIN. OR TWO AND ONE-HALF TIMES THE DIAMETER FOR ROUND OR OCTAGONAL PILES AND TWO TIMES THE DIAGONAL DIMENSION FOR SQUARE PILES.

LEGEND

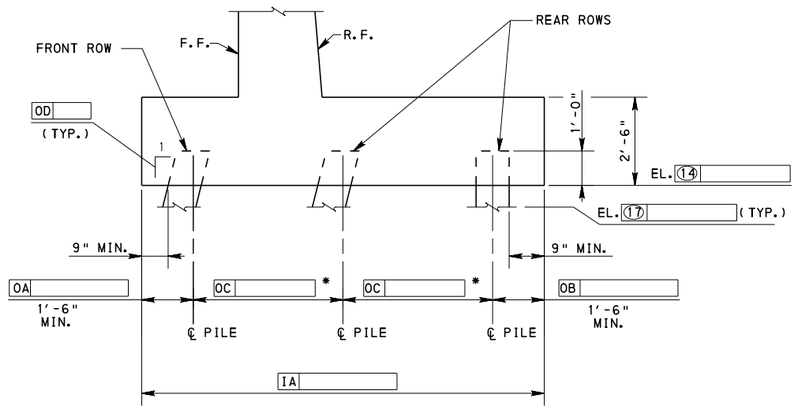
× DENOTES H PILE LOCATION. SHOW ORIENTATION OF H PILE BY DRAWING SHAPE ON PLAN.

F.F. DENOTES FRONT FACE

R.F. DENOTES REAR FACE

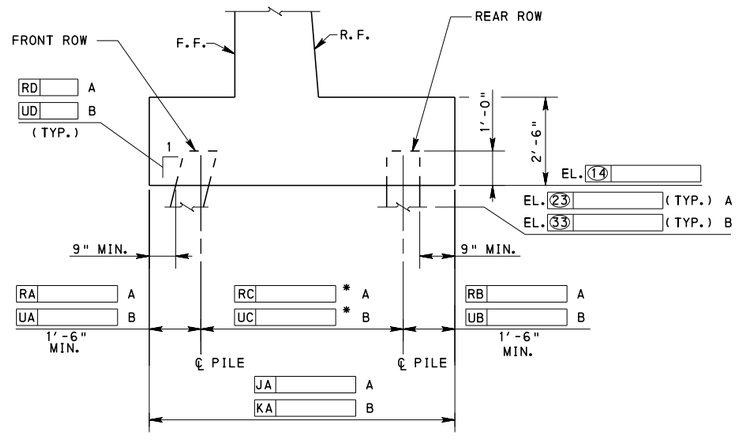
NOTE:

SEE BC-757M FOR STANDARD STEEL PILE TIP REINFORCEMENTS AND SPLICES.



TYPICAL ABUTMENT SECTION
NO SCALE

* 15'-0" MAX., 3'-0" MIN. OR TWO AND ONE-HALF TIMES THE DIAMETER FOR ROUND OR OCTAGONAL PILES AND TWO TIMES THE DIAGONAL DIMENSION FOR SQUARE PILES.



TYPICAL WINGWALL SECTION
NO SCALE

* 15'-0" MAX., 3'-0" MIN. OR TWO AND ONE-HALF TIMES THE DIAMETER FOR ROUND OR OCTAGONAL PILES AND TWO TIMES THE DIAGONAL DIMENSION FOR SQUARE PILES.

Mark	Description	By	Chk'd	Recm'd	Date
REVISIONS					

S-

SHEET ___ OF ___

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

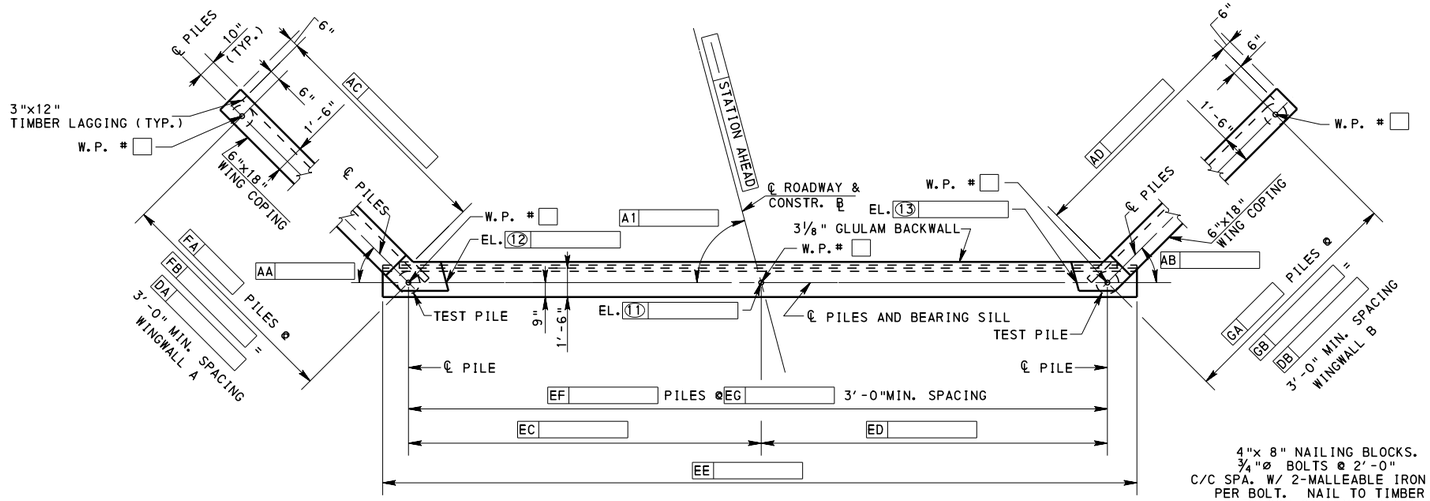
PILE SUPPORTED ABUTMENT
ABUTMENT ___ -PILE DETAILS-RIGHT SKEW

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

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

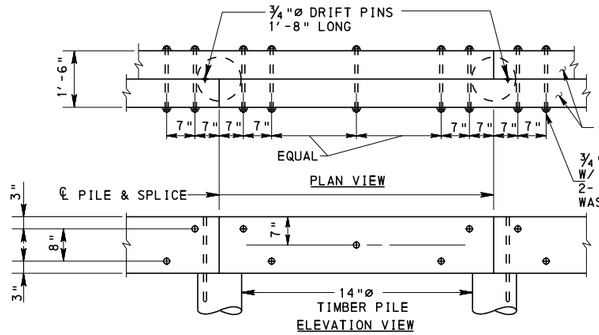
SHEET 9 OF 9

BLC-567M



ABUTMENT PLAN

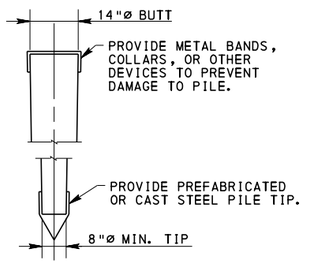
NO SCALE



BEARING SILL: 2-9"x14"

BEARING SILL SPLICE DETAILS

NO SCALE



TYP. PILE DETAIL

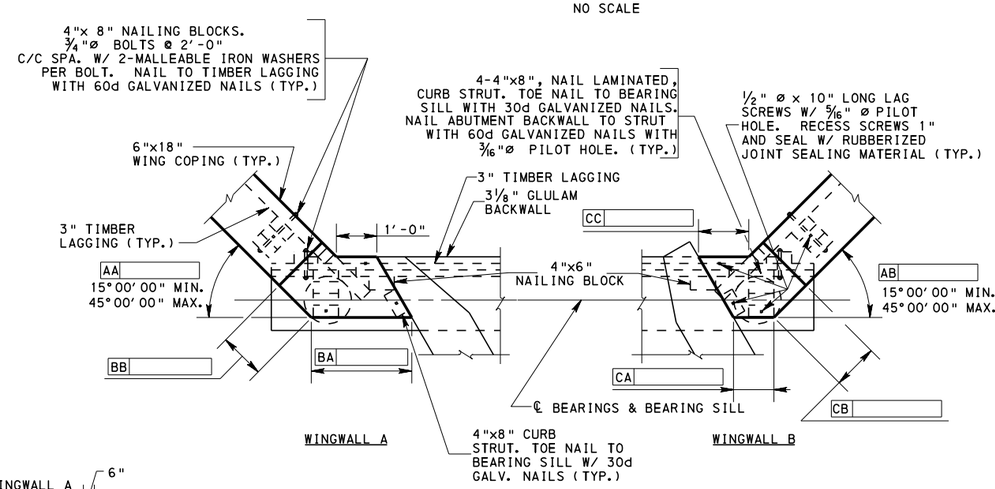
NO SCALE

LEGEND

F.G.E. DENOTES FINISHED GROUND ELEVATION
W.P. DENOTES WORKING POINT

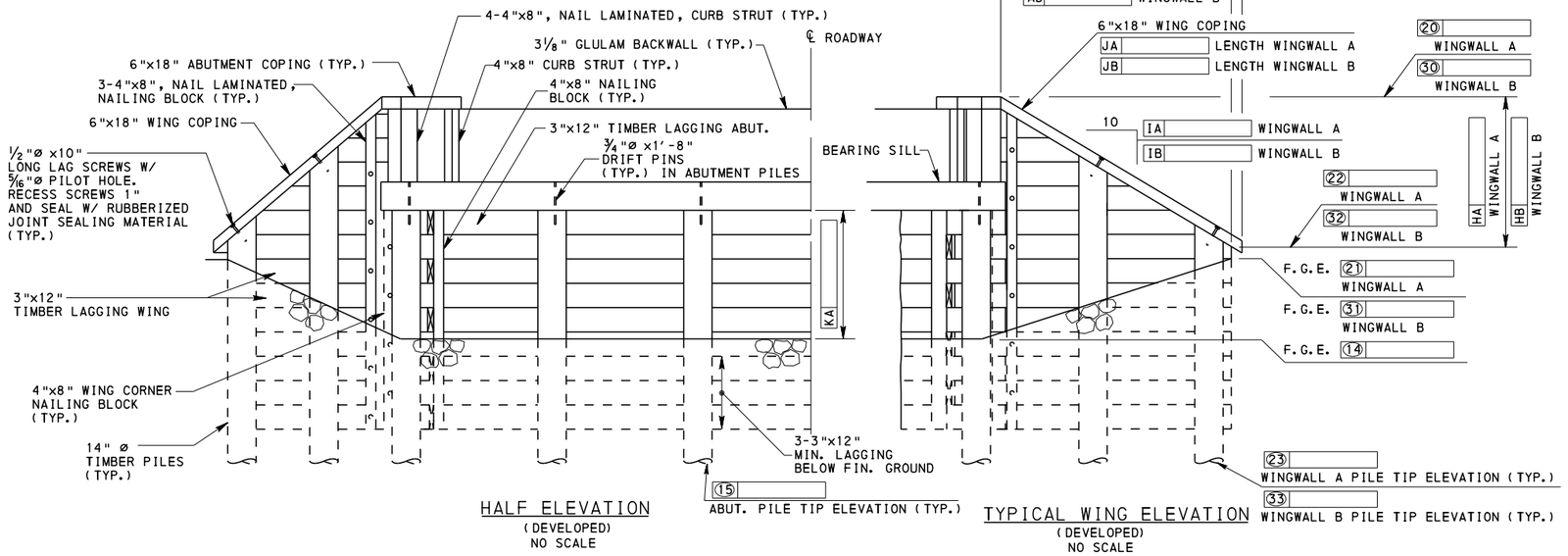
NOTES:

- NOMINAL DIMENSION ARE SHOWN FOR SOLID SAWN TIMBER
- ACTUAL DIMENSION ARE SHOWN FOR GLULAM TIMBER
- FOR GENERAL NOTES, SEE SHEET ___
- FOR LOCATION OF ABUTMENT SEE STAKE-OUT SKETCH, SHEET ___
- MAX. ALLOWABLE PILE LOAD = ____ kips
- MAX. DESIGN PILE LOAD = ____ kips



SKEWED CORNER DETAIL

NO SCALE



HALF ELEVATION
(DEVELOPED)
NO SCALE

TYPICAL WING ELEVATION
(DEVELOPED)
NO SCALE

Mark	Description	By	Chk'd	Recm'd	Date
REVISIONS					

S- | SHEET___ OF___

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

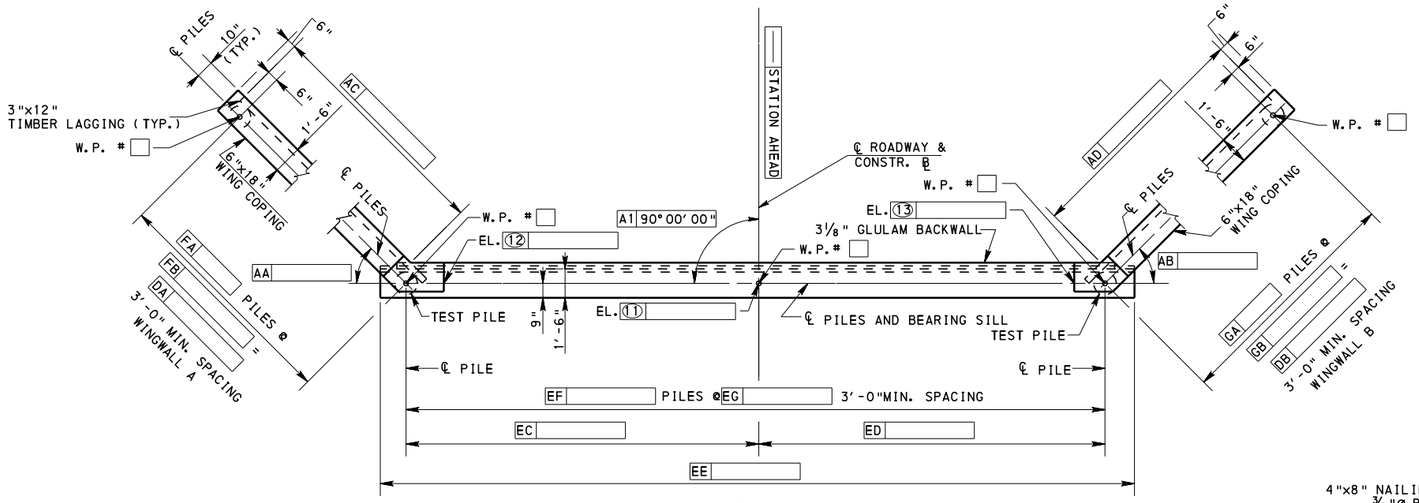
PILE SUPPORTED TIMBER SILL WOOD PILE ABUTMENT___ - LEFT SKEW

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

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

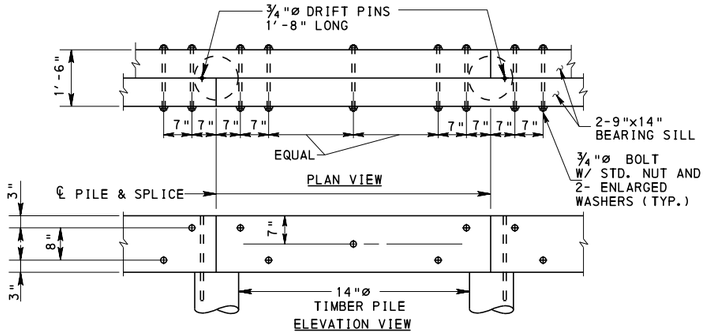
SHEET 1 OF 6

BLC-568M



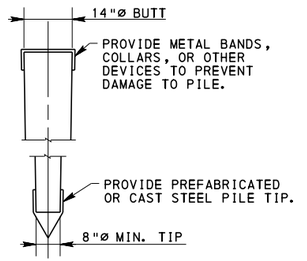
ABUTMENT PLAN

NO SCALE



BEARING SILL SPLICE DETAILS

NO SCALE



TYP. PILE DETAIL

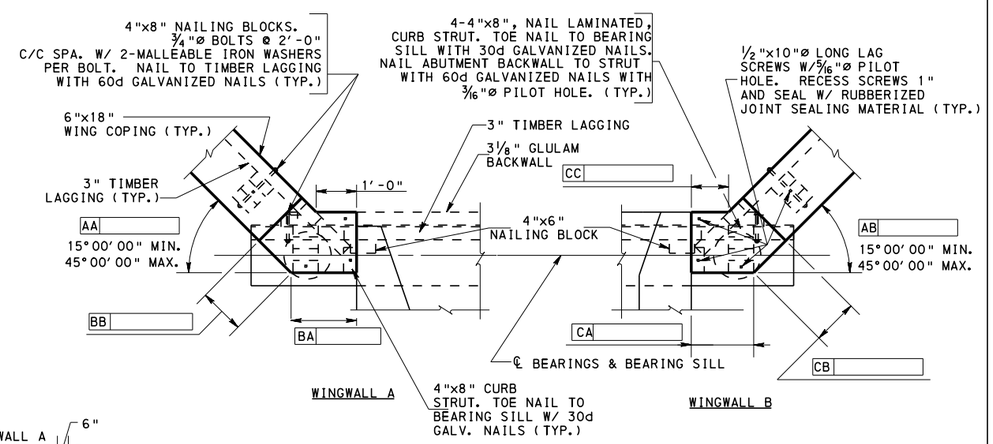
NO SCALE

LEGEND

F.G.E. DENOTES FINISHED GROUND ELEVATION
W.P. DENOTES WORKING POINT

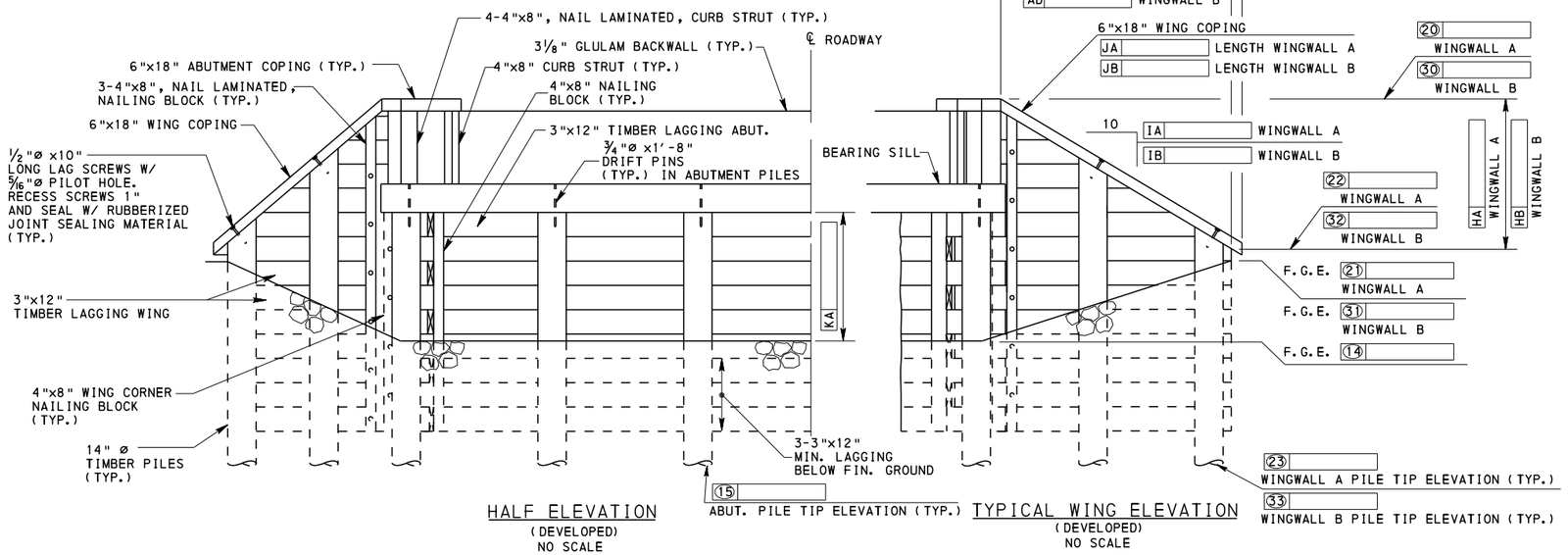
NOTES:

- NOMINAL DIMENSION ARE SHOWN FOR SOLID SAWN TIMBER
- ACTUAL DIMENSION ARE SHOWN FOR GLULAM TIMBER
- FOR GENERAL NOTES, SEE SHEET ___
- FOR LOCATION OF ABUTMENT SEE STAKE-OUT SKETCH, SHEET ___
- MAX. ALLOWABLE PILE LOAD = ____ kips
- MAX. DESIGN PILE LOAD = ____ kips



SKEWED CORNER DETAIL

NO SCALE



HALF ELEVATION
(DEVELOPED)
NO SCALE

TYPICAL WING ELEVATION
(DEVELOPED)
NO SCALE

Mark	Description	By	Chk'd	Recm'd	Date
REVISIONS					

S- | SHEET ___ OF ___

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

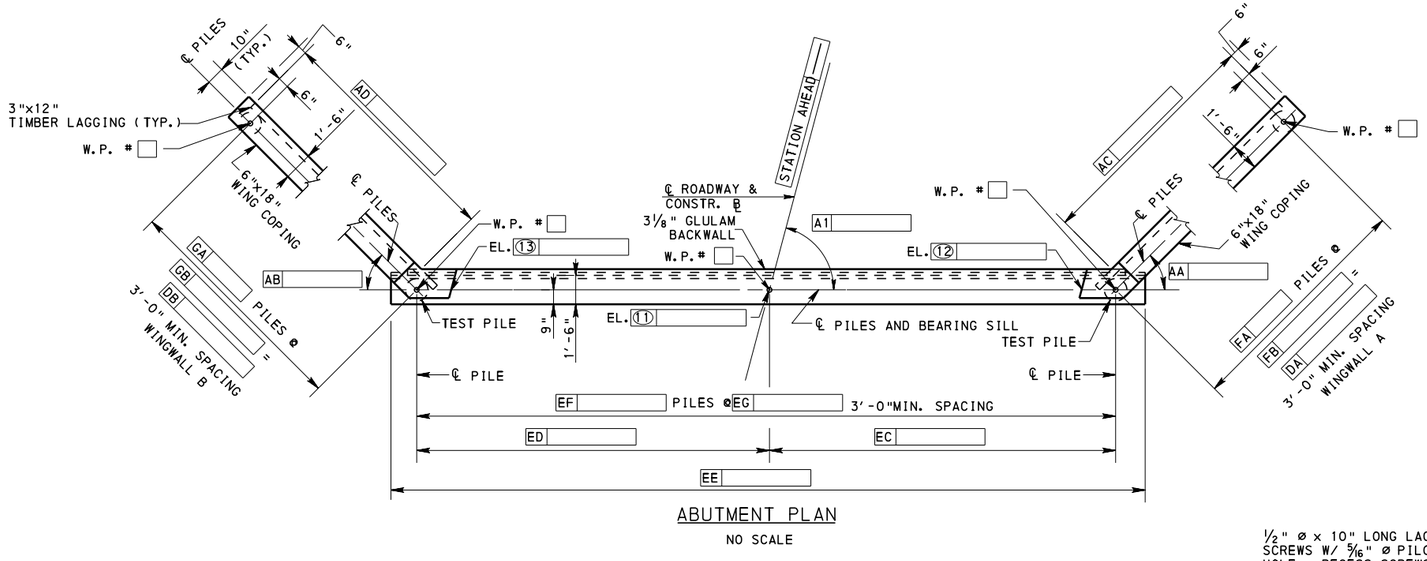
PILE SUPPORTED TIMBER SILL WOOD PILE ABUTMENT ___ - 90° SKEW

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

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

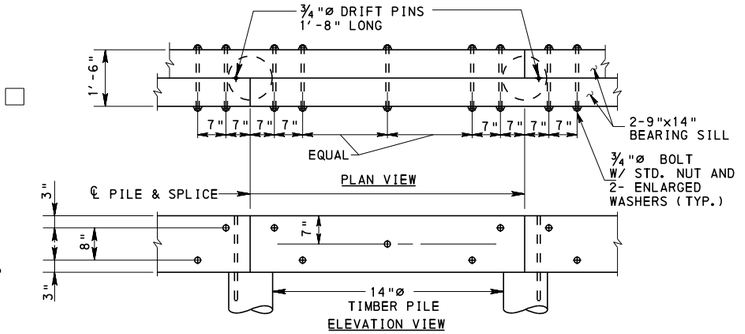
SHEET 2 OF 6

BLC-568M



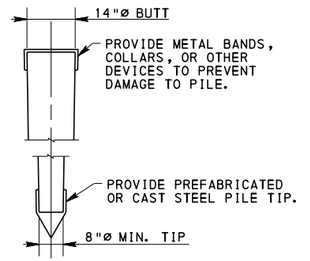
ABUTMENT PLAN

NO SCALE



BEARING SILL SPLICE DETAILS

NO SCALE



TYP. PILE DETAIL

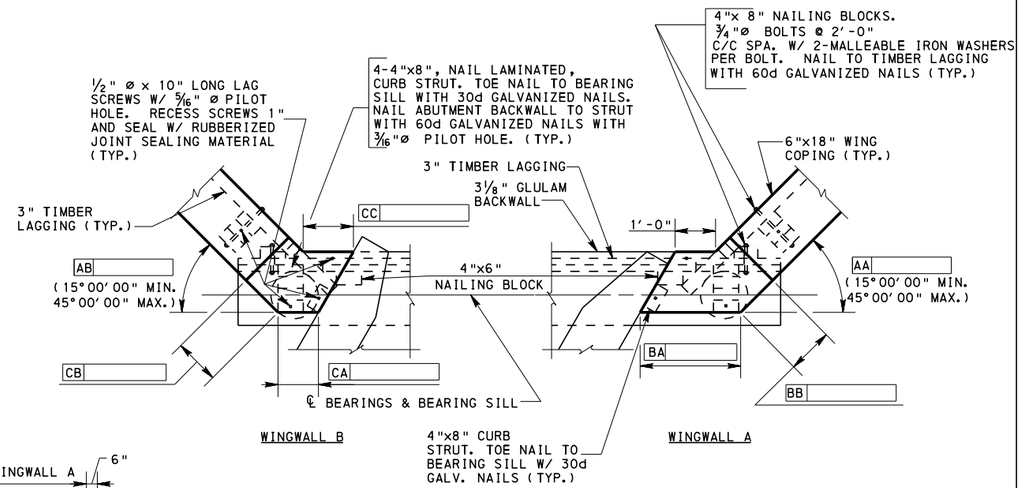
NO SCALE

LEGEND

F.G.E. DENOTES FINISHED GROUND ELEVATION
W.P. DENOTES WORKING POINT

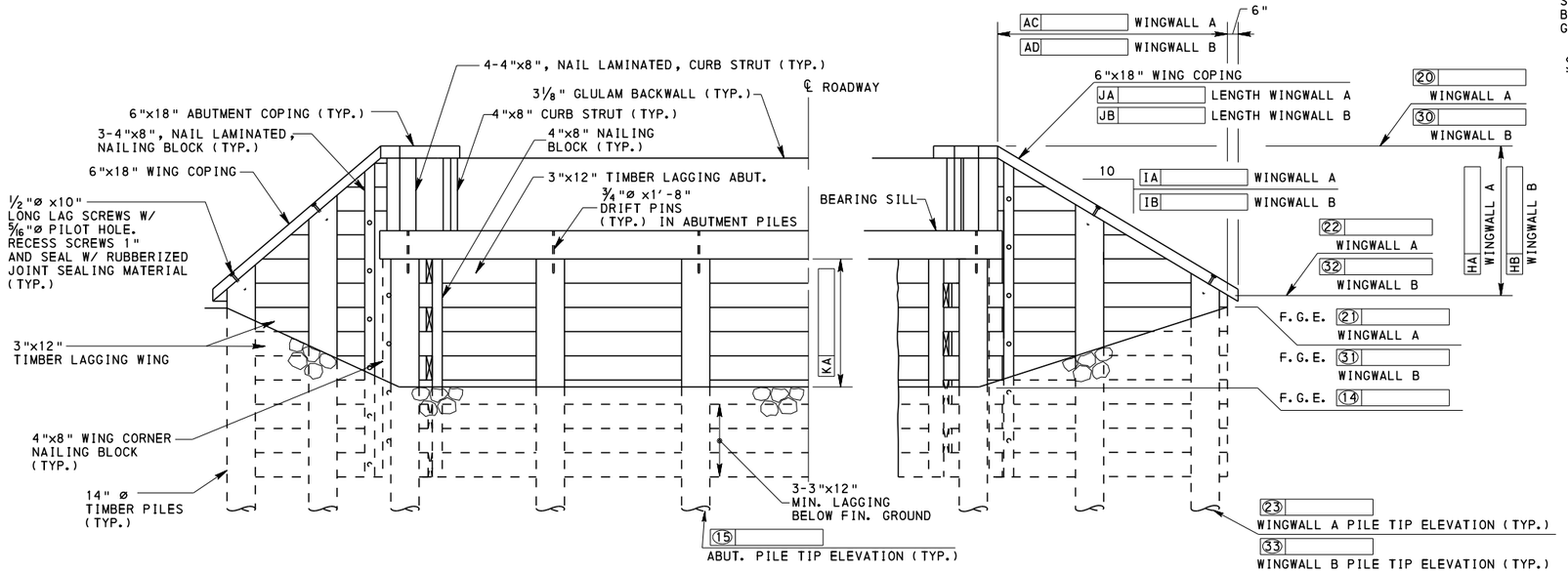
NOTES:

- NOMINAL DIMENSION ARE SHOWN FOR SOLID SAWN TIMBER
- ACTUAL DIMENSION ARE SHOWN FOR GLULAM TIMBER
- FOR GENERAL NOTES, SEE SHEET ___
- FOR LOCATION OF ABUTMENT SEE STAKE-OUT SKETCH, SHEET ___
- MAX. ALLOWABLE PILE LOAD = ____ kips
- MAX. DESIGN PILE LOAD = ____ kips



SKEWED CORNER DETAIL

NO SCALE



HALF ELEVATION

(DEVELOPED)
NO SCALE

TYPICAL WING ELEVATION

(DEVELOPED)
NO SCALE

Mark	Description	By	Chk'd	Recm'd	Date
REVISIONS					

S- | SHEET ___ OF ___

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

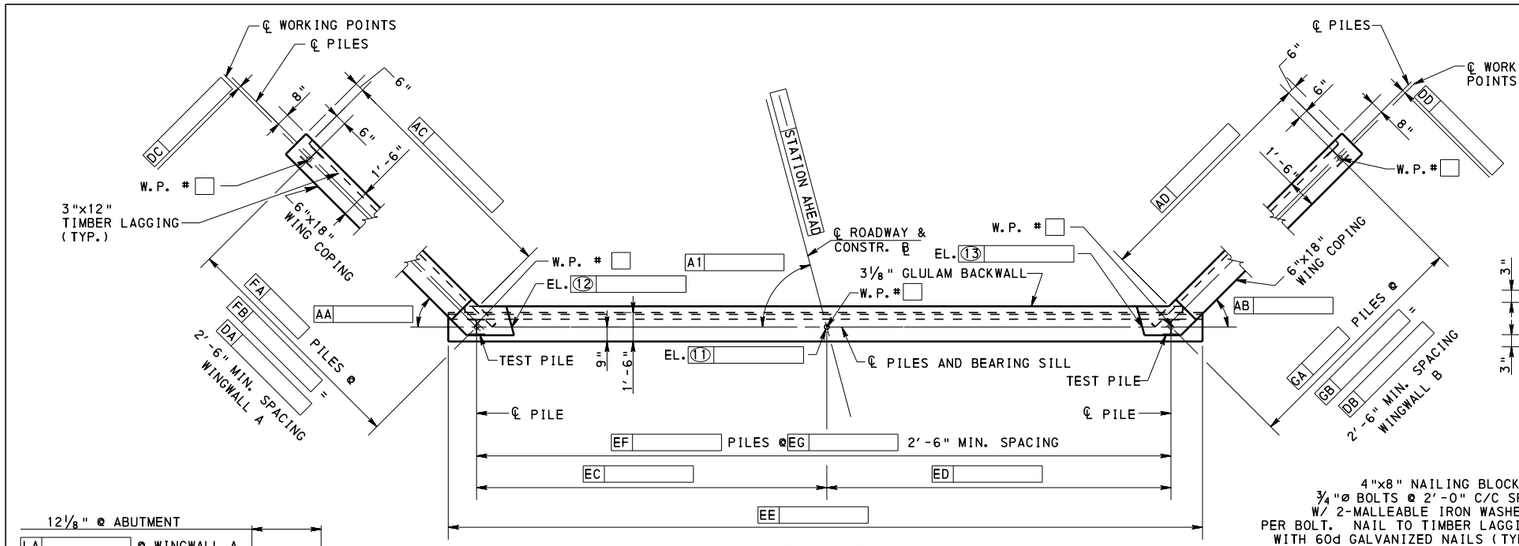
PILE SUPPORTED TIMBER SILL WOOD PILE ABUTMENT ___ - RIGHT SKEW

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

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

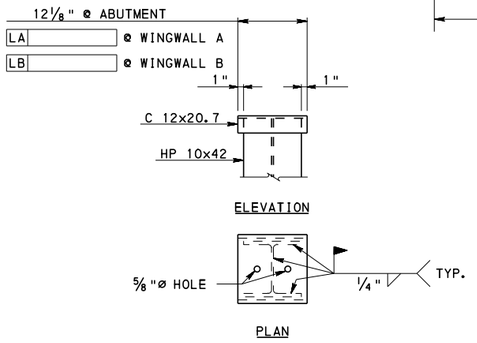
SHEET 3 OF 6

BLC-568M



ABUTMENT PLAN

NO SCALE



CAP CHANNEL DETAIL

AT ABUTMENT SHOWN
AT WINGWALLS SIMILAR
NO SCALE

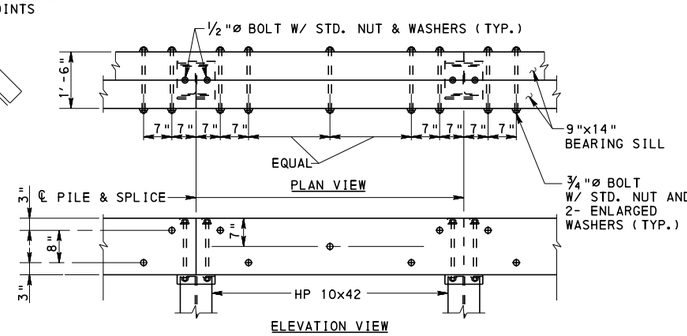
LEGEND

F.G.E. DENOTES FINISHED GROUND ELEVATION
W.P. DENOTES WORKING POINT

NOTES:

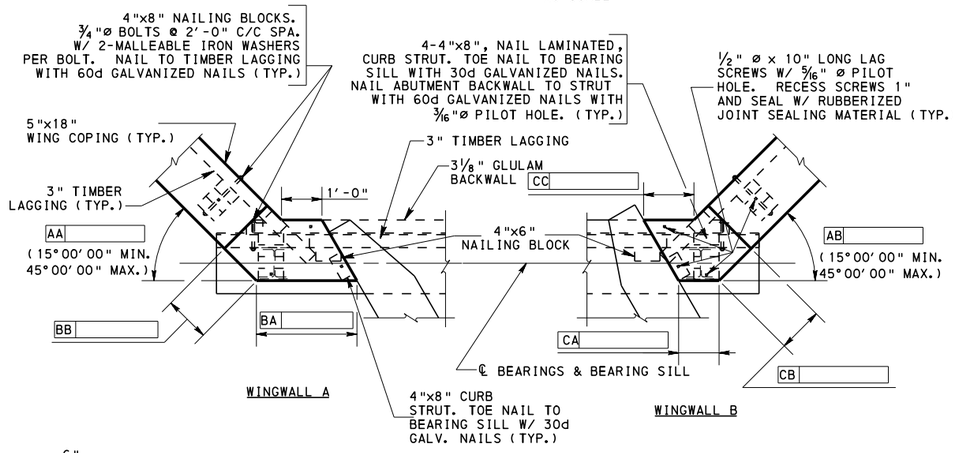
- NOMINAL DIMENSION ARE SHOWN FOR SOLID SAWN TIMBER
- ACTUAL DIMENSION ARE SHOWN FOR GLULAM TIMBER
- FOR GENERAL NOTES, SEE SHEET ___
- FOR LOCATION OF ABUTMENT SEE STAKE-OUT SKETCH, SHEET ___
- MAX. ALLOWABLE PILE LOAD = ___ kips
- MAX. DESIGN PILE LOAD = ___ kips

NOTE:
SEE BC-757M FOR STANDARD STEEL PILE TIP REINFORCEMENTS AND SPLICES.



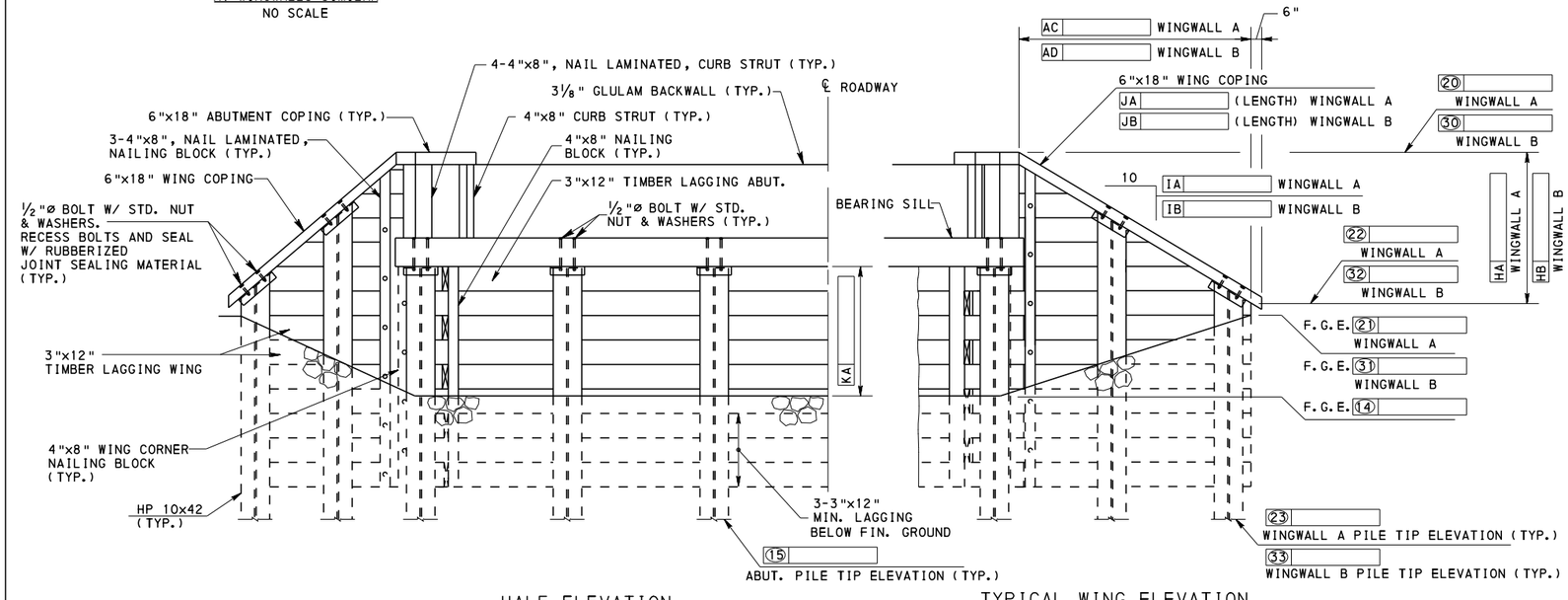
BEARING SILL SPLICE DETAILS

NO SCALE



SKEWED CORNER DETAIL

NO SCALE



HALF ELEVATION

(DEVELOPED)
NO SCALE

TYPICAL WING ELEVATION

(DEVELOPED)
NO SCALE

Mark	Description	By	Chk'd	Recm'd	Date
REVISIONS					

S- | SHEET ___ OF ___

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

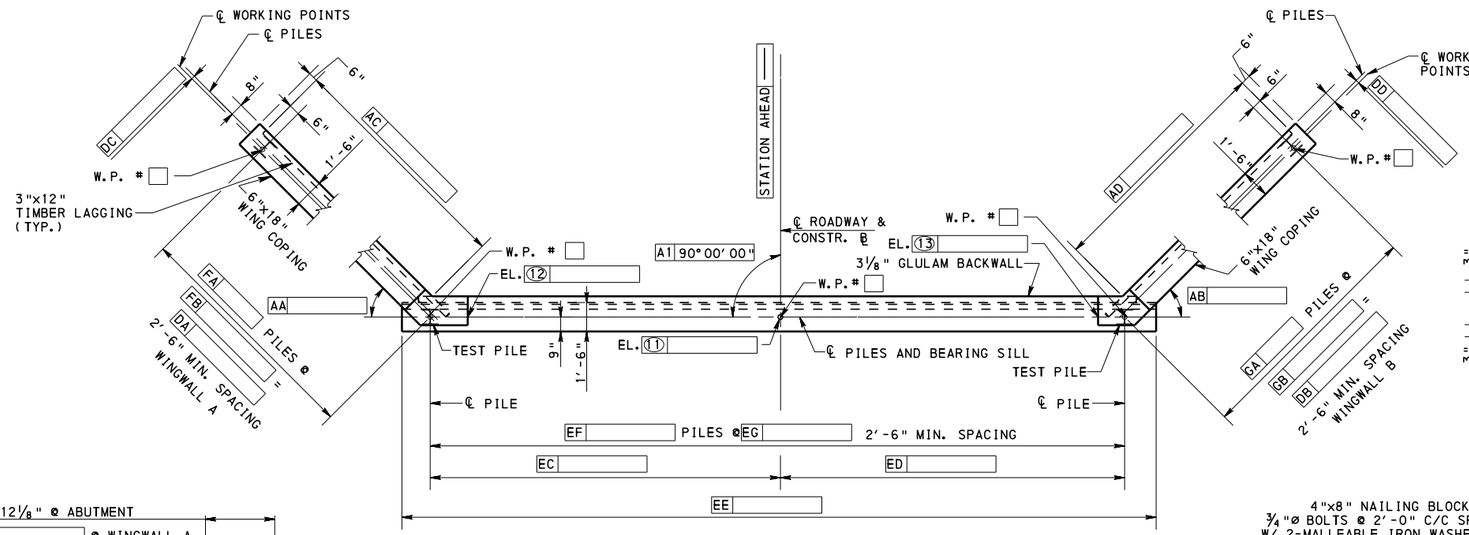
PILE SUPPORTED TIMBER SILL STEEL PILE ABUTMENT ___ - LEFT SKEW

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

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

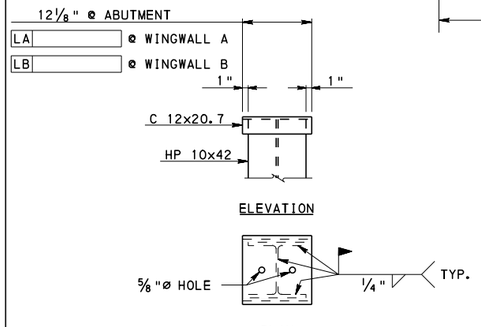
SHEET 4 OF 6

BLC-568M



ABUTMENT PLAN

NO SCALE



CAP CHANNEL DETAIL

AT ABUTMENT SHOWN
AT WINGWALLS SIMILAR

NO SCALE

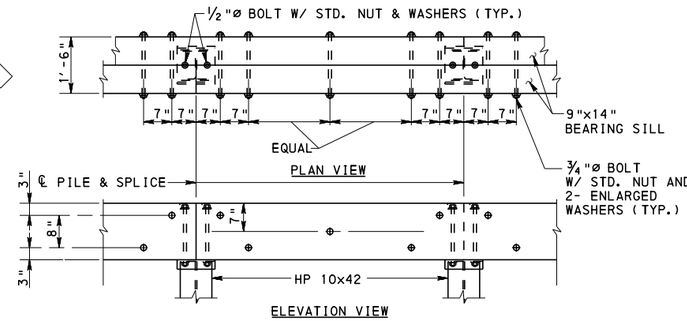
LEGEND

F.G.E. DENOTES FINISHED GROUND ELEVATION
W.P. DENOTES WORKING POINT

NOTES:

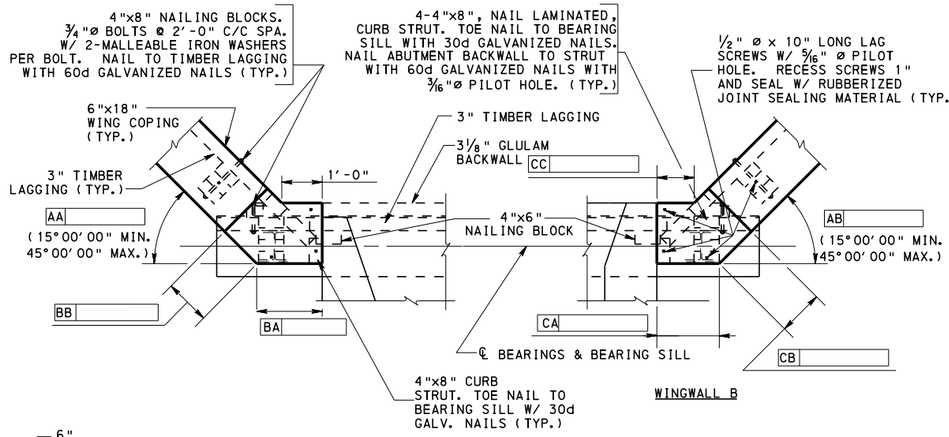
- NOMINAL DIMENSION ARE SHOWN FOR SOLID SAWN TIMBER
- ACTUAL DIMENSION ARE SHOWN FOR GLULAM TIMBER
- FOR GENERAL NOTES, SEE SHEET ___
- FOR LOCATION OF ABUTMENT SEE STAKE-OUT SKETCH, SHEET ___
- MAX. ALLOWABLE PILE LOAD = ___ kips
- MAX. DESIGN PILE LOAD = ___ kips

NOTE:
SEE BC-757M FOR STANDARD STEEL PILE TIP REINFORCEMENTS AND SPLICES.



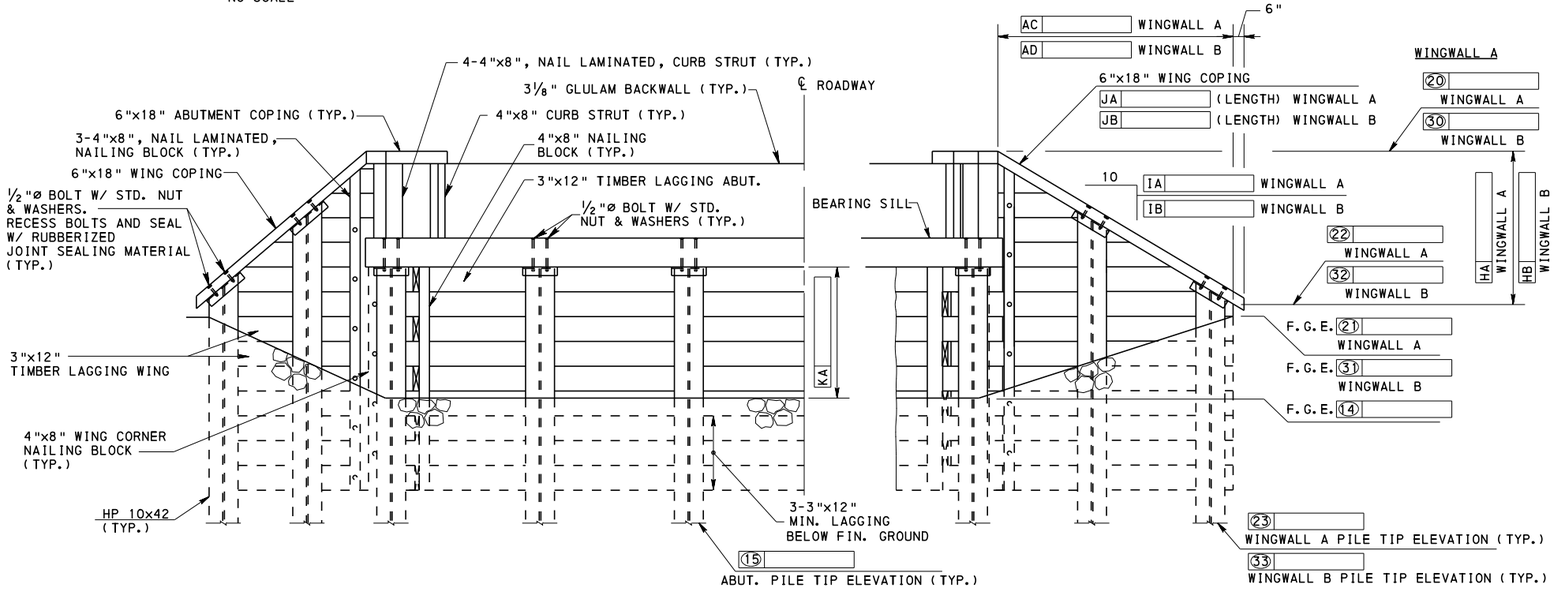
BEARING SILL SPLICE DETAILS

NO SCALE



SKEWED CORNER DETAIL

NO SCALE



HALF ELEVATION
(DEVELOPED)
NO SCALE

TYPICAL WING ELEVATION
(DEVELOPED)
NO SCALE

Mark	Description	By	Chk'd	Recm'd	Date
	REVISIONS				

S- SHEET ___ OF ___

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

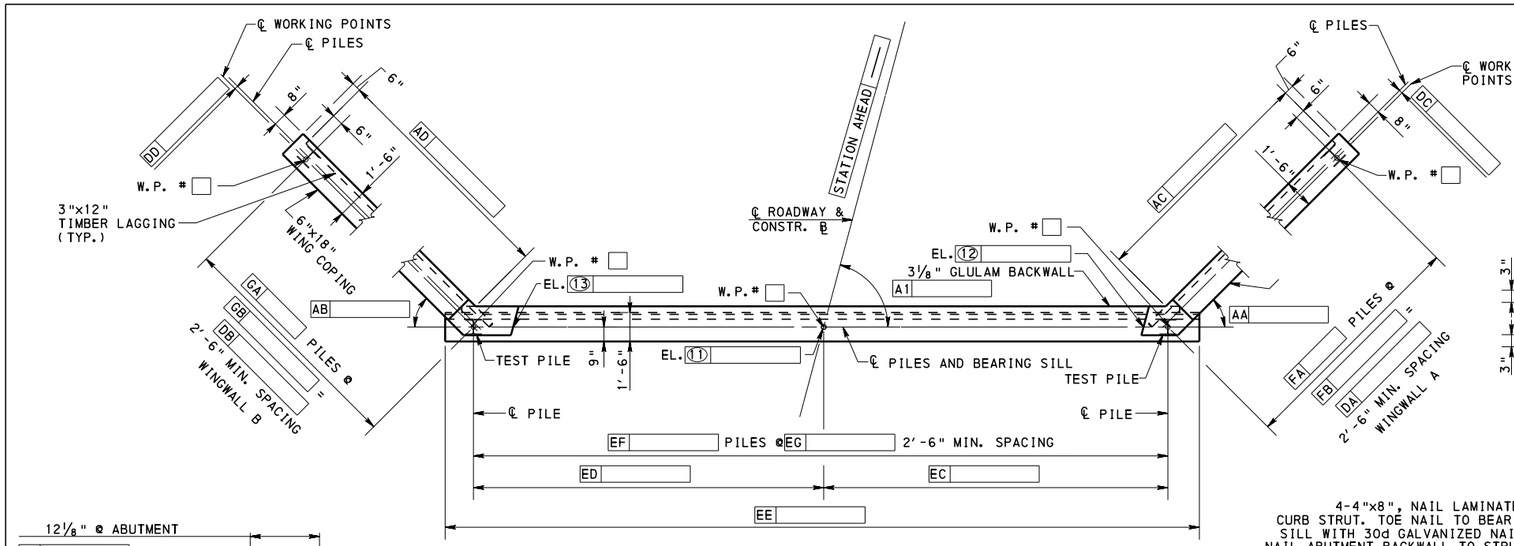
PILE SUPPORTED TIMBER SILL STEEL PILE ABUTMENT ___ - 90° SKEW

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

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

SHEET 5 OF 6

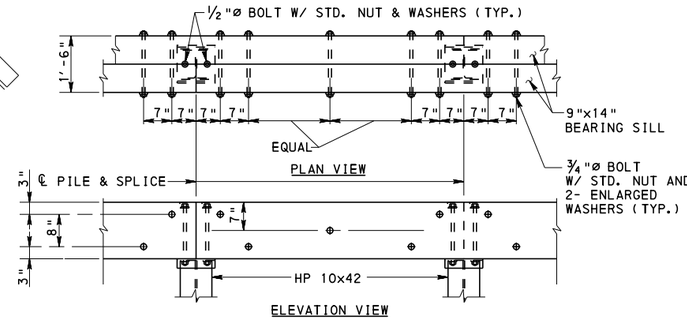
BLC-568M



ABUTMENT PLAN

NO SCALE

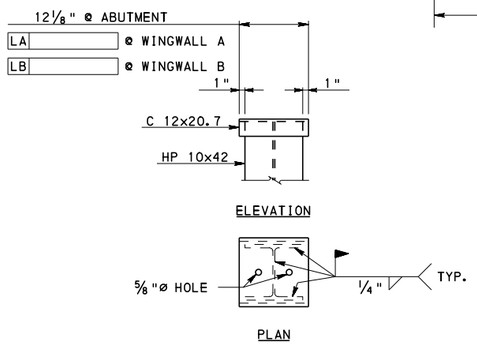
NOTE:
SEE BC-757M FOR STANDARD STEEL PILE TIP REINFORCEMENTS AND SPLICES.



ELEVATION VIEW
BEARING SILL: 2-9"x14"

BEARING SILL SPLICE DETAILS

NO SCALE



CAP CHANNEL DETAIL

AT ABUTMENT SHOWN
AT WINGWALLS SIMILAR

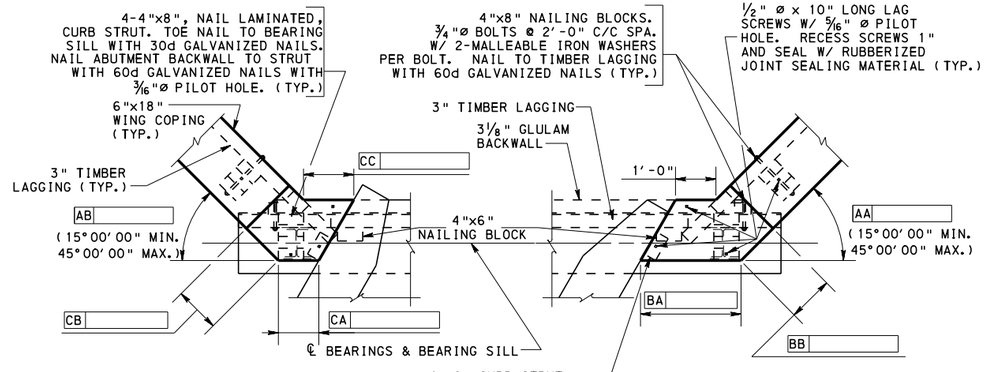
NO SCALE

LEGEND

F.G.E. DENOTES FINISHED GROUND ELEVATION
W.P. DENOTES WORKING POINT

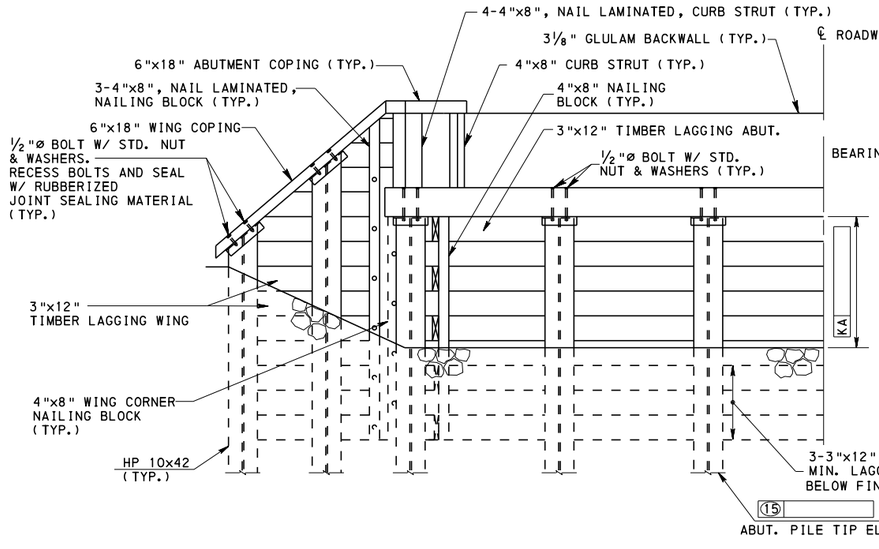
NOTES:

- NOMINAL DIMENSION ARE SHOWN FOR SOLID SAWN TIMBER
- ACTUAL DIMENSION ARE SHOWN FOR GLULAM TIMBER
- FOR GENERAL NOTES, SEE SHEET___
- FOR LOCATION OF ABUTMENT SEE STAKE-OUT SKETCH, SHEET ___
- MAX. ALLOWABLE PILE LOAD = ___ Kips
- MAX. DESIGN PILE LOAD = ___ Kips



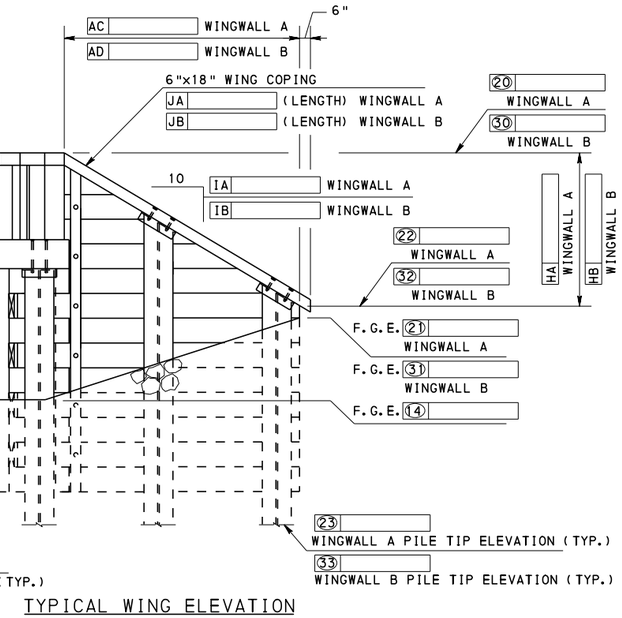
SKEWED CORNER DETAIL

NO SCALE



HALF ELEVATION

(DEVELOPED)
NO SCALE



TYPICAL WING ELEVATION

(DEVELOPED)
NO SCALE

Mark	Description	By	Chk'd	Recm'd	Date
REVISIONS					

S- | SHEET__ OF__

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

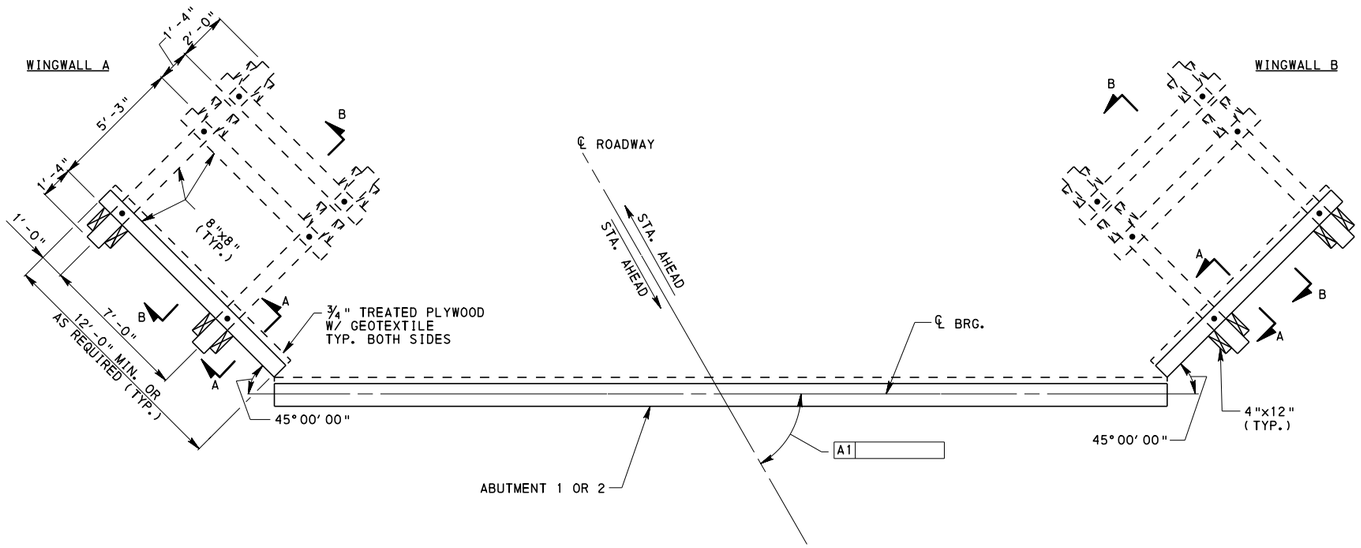
PILE SUPPORTED TIMBER SILL STEEL PILE ABUTMENT__ - RIGHT SKEW

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

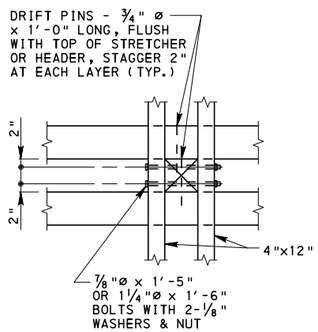
RECOMMENDED APR. 23, 2013
ACTING DIR. BUR. OF PROJECT DELIVERY

SHEET 6 OF 6

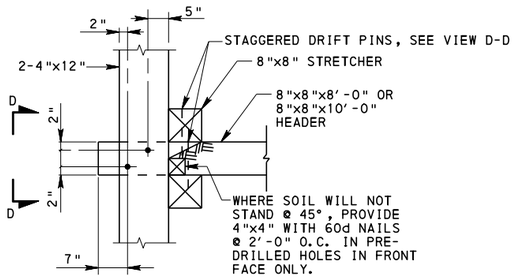
BLC-568M



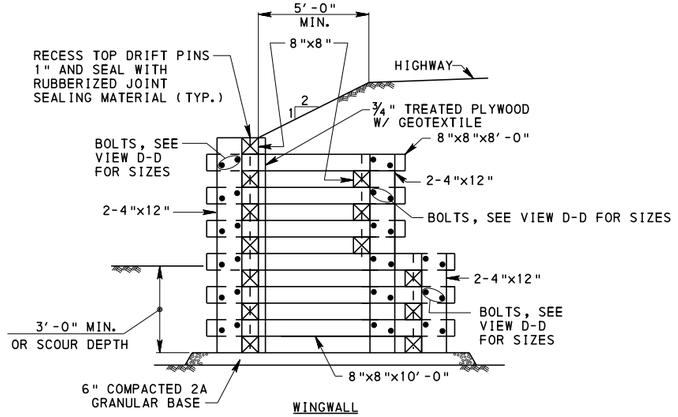
PLAN
NO SCALE



VIEW D-D
NO SCALE



SECTION A-A
NO SCALE



WINGWALL
SECTION B-B
NO SCALE

CRIBBING NOTES

USE TREATED HARDWOOD OR SOFTWOOD TIMBER (EXCEPT WHITE OAK) FOR CRIB WALL.

LAY ALL STRETCHERS HORIZONTALLY.

USE MACHINE BOLT FASTENERS TO MATCH ASTM A-307 SPECIFICATIONS. HOT-DIP GALVANIZE ALL HARDWARE.

SOIL CONDITIONS:
DETERMINE THE SOIL & GROUNDWATER CONDITIONS & THE STABILITY OF THE CRIB WALL FOR EACH SPECIFIC CRIB WALL SITE.

THE SECTIONS SHOW PROPORTIONS & DETAILS FOR CRIB WALLS FOR THE FOLLOWING CONDITIONS:

A. FOUNDATION CONSISTS OF SAND, SAND & GRAVEL, OR OTHER GRANULAR SOIL WHICH DOES NOT SETTLE SIGNIFICANTLY UNDER THE WEIGHT OF THE CRIB & FILL.

B. FILL WITHIN CRIBS & BEHIND CRIBS CONSISTS OF SAND, SAND & GRAVEL, OR OTHER FREE DRAINING GRANULAR MATERIAL PLACED IN 6" LAYERS & COMPACTED WITH VIBRATORY COMPACTORS.

C. LOCATE BASE OF CRIB ABOVE GROUNDWATER TABLE.

FOR OTHER SOIL OR GROUNDWATER CONDITIONS, ADJUST THE CRIB PROPORTIONS & DETAILS AS NECESSARY TO PROVIDE AN ADEQUATE FACTOR-OF-SAFETY IN ACCORDANCE WITH GOOD ENGINEERING PRACTICE.

DESIGN ASSUMES END OF WALL TERMINATION TO OCCUR AT EXPOSED ABUTMENT HEIGHT (10'-0" MAX.). USE 16'-0" STRETCHERS TOE NAILED TO HEADERS AT ENDS. A HIGHER WALL REQUIRES A SPECIAL DESIGN.

USE NON-GRADE TIMBER TIE SPECIES NORTHERN RED OAK, RED MAPLE, YELLOW POPLAR, OR SOFTWOODS.

MAXIMUM EXPOSED HEIGHT FOR TIMBER CRIB WALL IS 10'-0".

GROUND CONTACT RETENTION PRESSURE TREATMENT EQUIVALENT TO AWPA STANDARD U1 WITH CREOSOTE.

Mark	Description	By	Chk'd	Recm'd	Date
	REVISIONS				

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COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

OPTIONAL WINGWALLS
TIMBER CRIBBING WINGWALLS

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

RECOMMENDED APR. 23, 2013
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SHEET 1 OF 2

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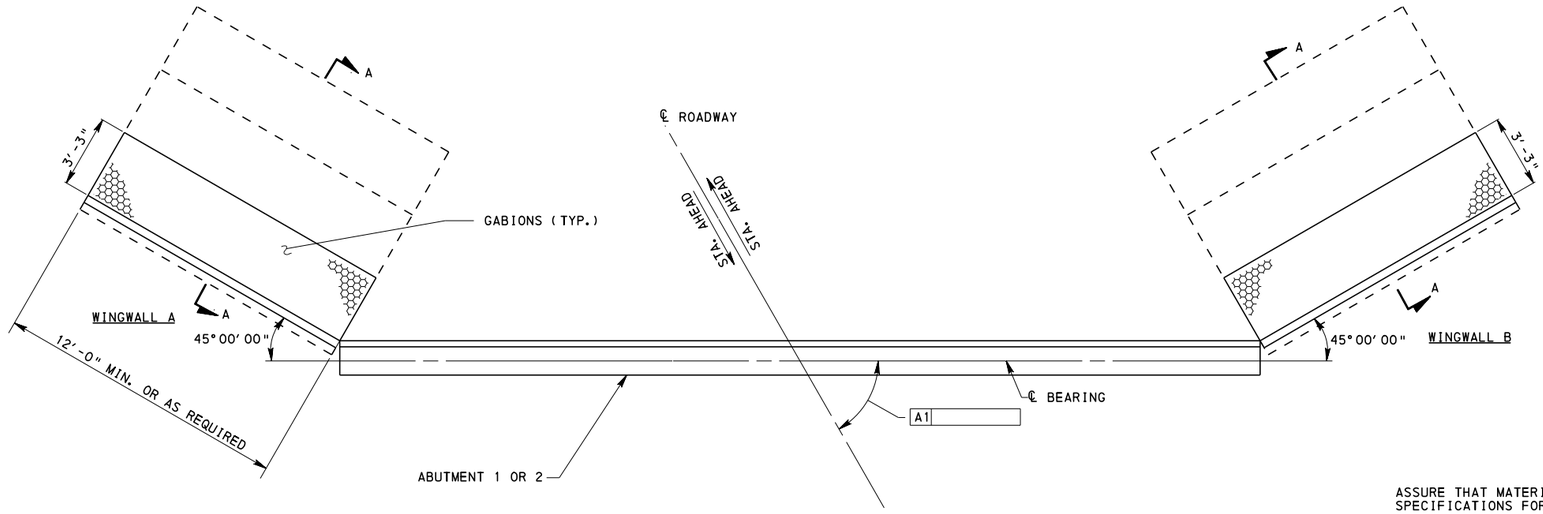


ABUTMENT PLAN
NO SCALE

GABION SIZES

STANDARD		
WG	LG	HG
3'-0"	6'-0"	1'-0"
3'-0"	12'-0"	1'-0"
3'-0"	9'-0"	1'-6"
3'-0"	6'-0"	3'-0"
3'-0"	9'-0"	3'-0"
3'-0"	12'-0"	3'-0"

ADDITIONAL SIZES MAY BE AVAILABLE ON A SPECIAL ORDER BASIS.

GABION NOTES

ASSURE THAT MATERIALS AND CONSTRUCTION MEET THE REQUIREMENTS OF PUBLICATION 408, SPECIFICATIONS FOR HIGHWAY CONSTRUCTION, SECTION 626 GABIONS.

GABIONS CONSIST OF WIRE-MESH BASKETS SHEATHED IN POLYVINYL CHLORIDE PLASTIC AND FILLED BY HAND PLACEMENT OF COARSE AGGREGATE, AT LEAST ALONG THE EXPOSED FACES, FOR A UNIFORM APPEARANCE.

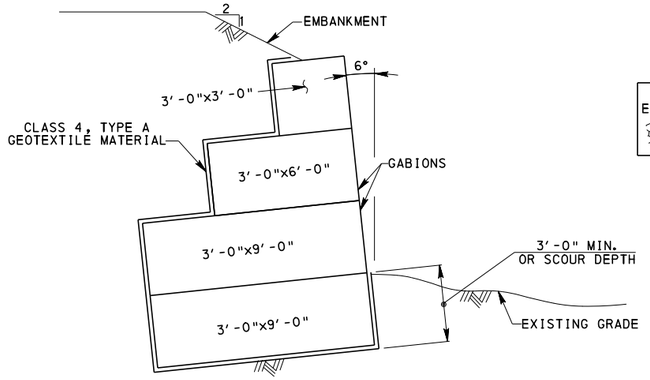
REQUIRE SPECIAL EMBEDMENT WHERE THE WINGWALL IS INSTALLED ADJACENT TO WATER. PROVIDE BASE APPROXIMATELY TWO TIMES AS WIDE AS THE ANTICIPATED DEPTH OF SCOUR AND PROVIDE EMBEDMENT AT LEAST EQUAL TO THE ANTICIPATED DEPTH OF SCOUR.

INSTALL GEOTEXTILE MATERIAL ALONG ALL INTERFACE AREAS WITH SOIL AND/OR CEMENT CONTACT.

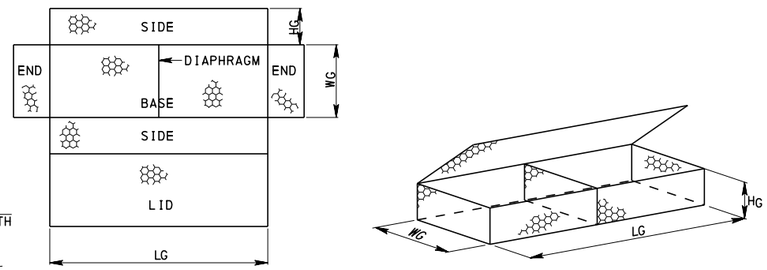
GEOTEXTILE MATERIAL MEETS THE REQUIREMENTS OF PUBLICATION 408, SECTION 212, FOR CONSTRUCTION DETAILS AND SECTION 735 FOR MATERIAL REQUIREMENTS.

USE GABION SLOPE WALL WHERE SPECIFIED OR INDICATED. DO NOT USE GABION SLOPE WALL IN URBAN OR SUBURBAN ENVIRONMENT.

MAXIMUM HEIGHT FOR GABION WINGWALL IS 12'-0".



SECTION A-A
NO SCALE



WIRE MESH BASKETS
NO SCALE

Mark	Description	By	Chk'd	Recm'd	Date

REVISIONS

S-

SHEET ___ OF___

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

OPTIONAL WINGWALLS
GABION WINGWALLS

RECOMMENDED APR. 23, 2013
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SHEET 2 OF 2

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