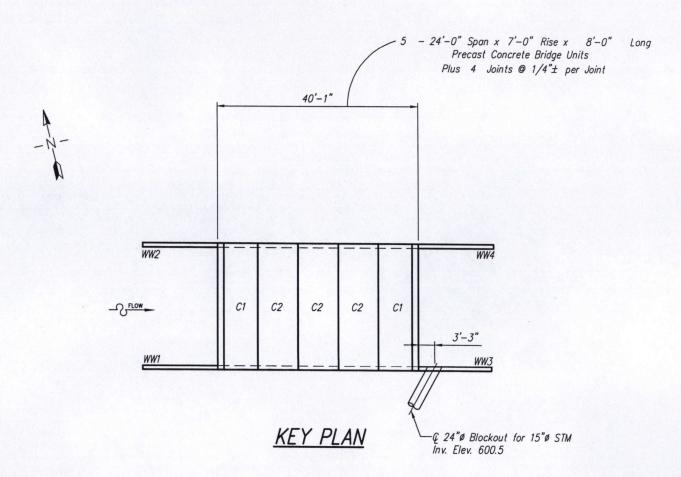


- All edges of Precast to have a 3/4" chamfer





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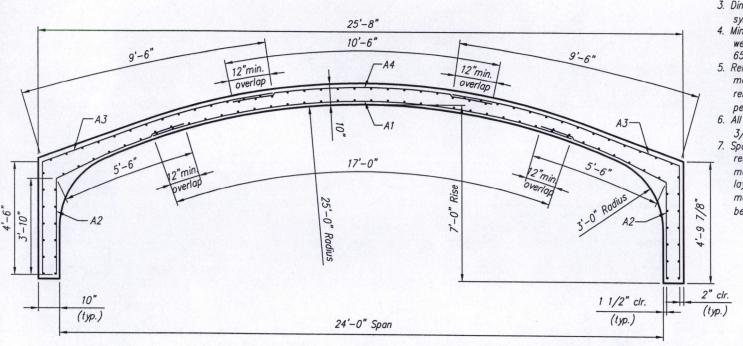
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513-615-7474	4	

ACCESS BRIDGE OVER MIAMI & ERIE CANAL MORRIS FARM

Sheet Title:

Des. By. Job No. DLW 11218 Drawn By: MGS Sheet No.

Chk'd By: S1 KTM Date: 03/15/04



NOTES:

- 1. Minimum 28-Day Concrete Compressive Strength shall be 4000 psi.
- 2. Overlap Length shall be measured from last crosswire.
- 3. Dimensions shown are for form system "A".
- 4. Minimum yield strength for welded wire fabric shall be 65,000 psi.
- 5. Reinforcing shall be limited to a maximum of three layers of reinforcing (WWF or bars) per area (A1, A2, A3 or A4).
- 6. All edges of Precast to have a 3/4" chamfer.
- 7. Spacing of longitudinal reinforcement must be a maximum of 8" o.c. For multiple layers of mesh, only the outer most layer (A1a or A3a) must be a maximum of 8" o.c.

Weight of Required Reinforcement = 179.90 lbs/ft

Sheet no.	Circumferențial Area Req'd (in²/ft)	Longitudinal Area Req'd (in²/ft)	Mesh Size	Length (ft)	Circumferential Area Supl'd (in²/ft)	Longitudinal Area Supl'd (in²/ft)
1	A1 = 0.84	0.17		17'-0"		
2	A2 = 0.24	0.13		9'-4"		
3	A3 = 0.72	0.13		14'-0"		
4	A4 = 0.24	0.24		10'-6"		
5						
6						
7						

BEACH E-50113 A SECISTERED WILLIAM SONAL ENGINEERS

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PRECAST UNIT REINFORCEMENT SHOP DRAWING BRIDGETEK OHIO 513-615-7474 Producer:

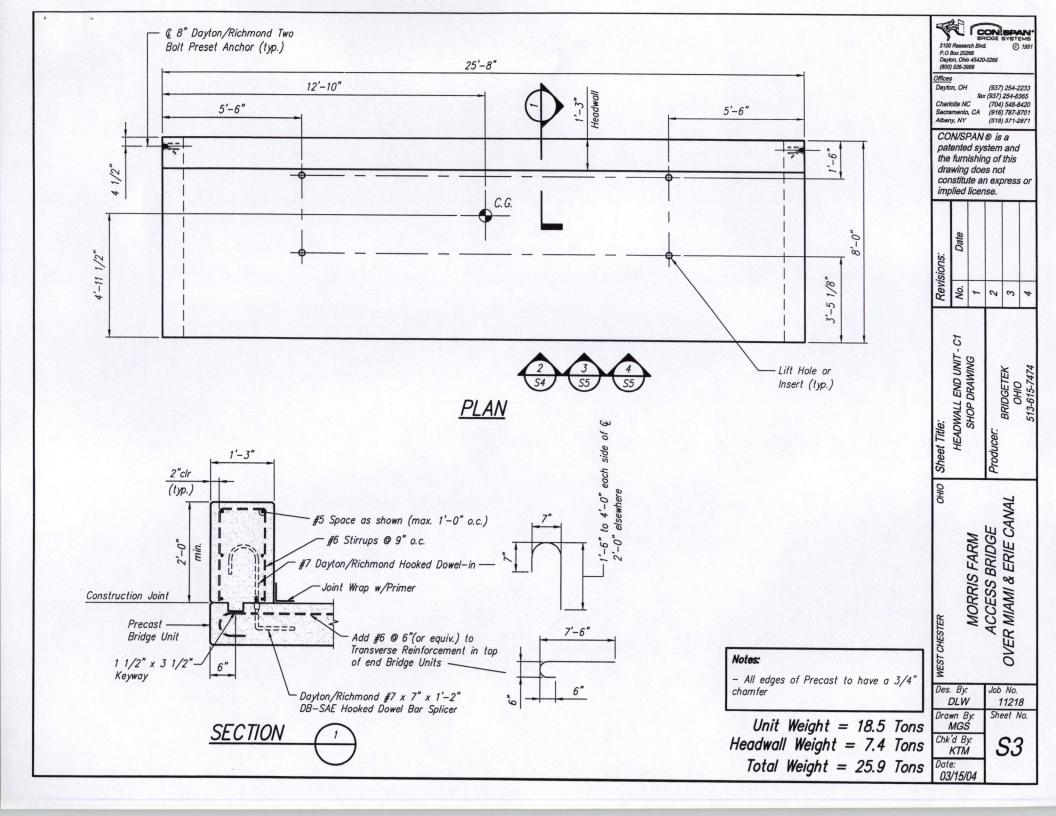
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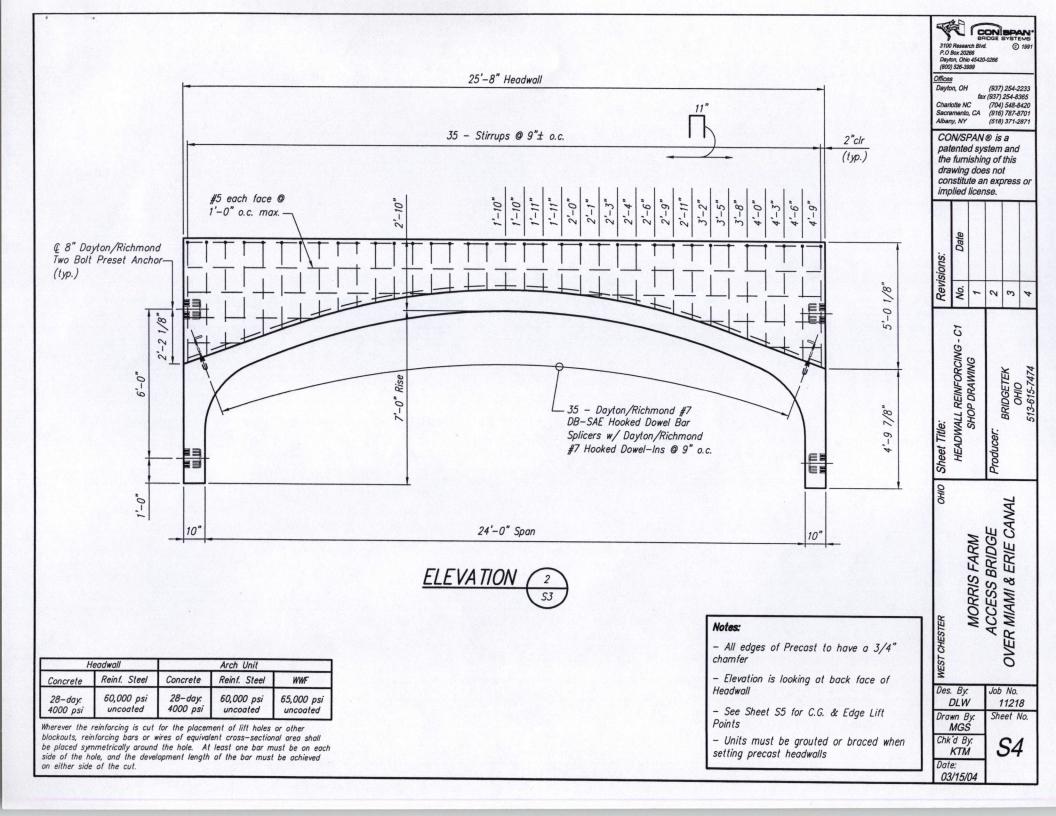
OVER MIAMI & ERIE CANAL ACCESS BRIDGE MORRIS FARM

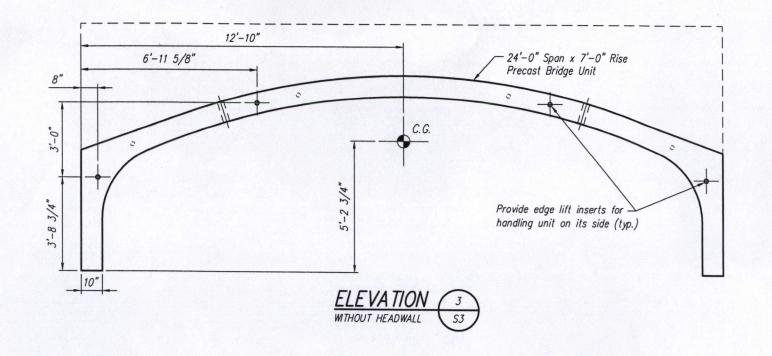
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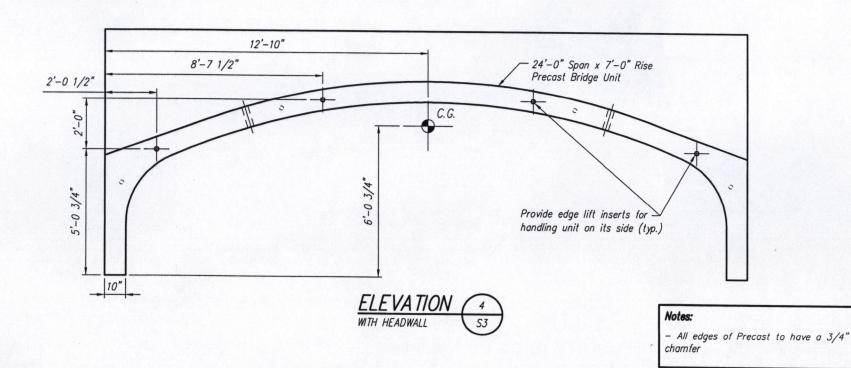
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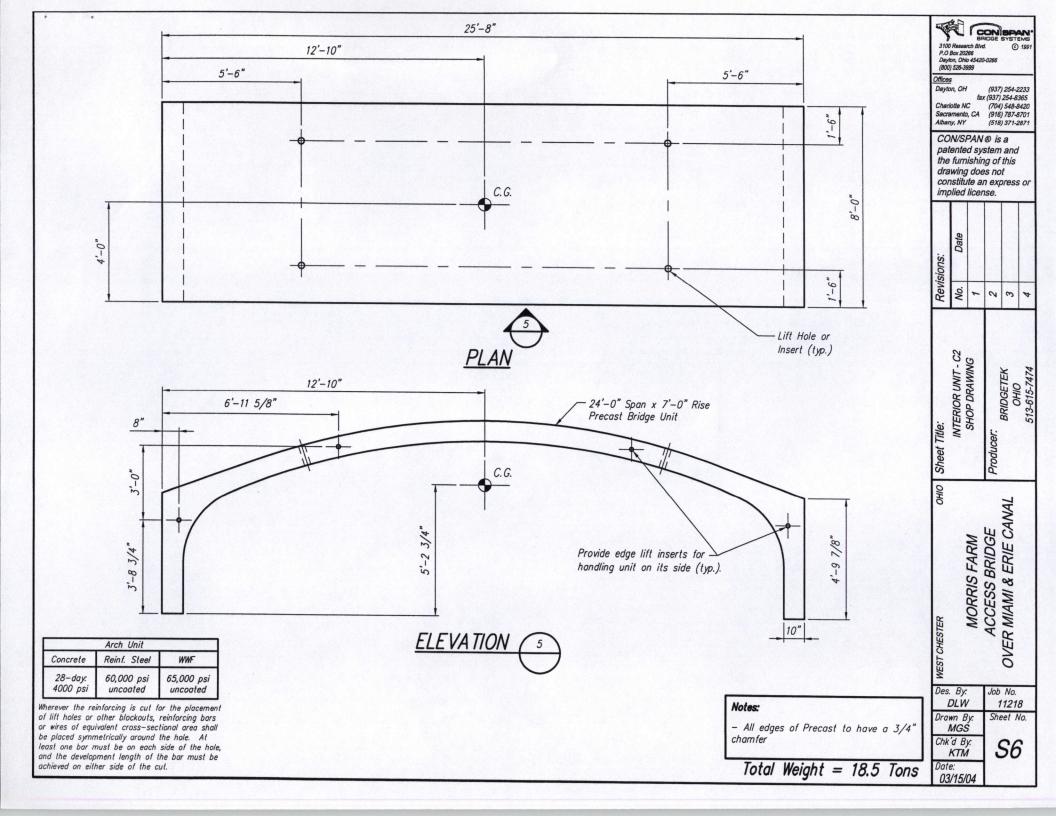


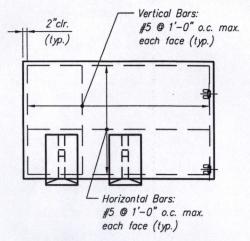


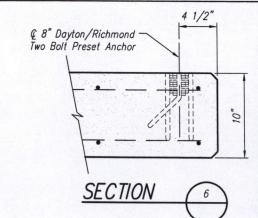


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Dayton, OH (937) 254-2233 fax (937) 254-8365 (704) 548-8420 Sacramento, CA (916) 787-8701 Albany, NY CON/SPAN® is a patented system and the furnishing of this drawing does not constitute an express or implied license. Revisions: No. 0 3 C.G. & EDGE LIFT POINTS - C1 SHOP DRAWING BRIDGETEK OHIO 513-615-7474 Sheet Title: OHIO ACCESS BRIDGE OVER MIAMI & ERIE CANAL MORRIS FARM WEST CHESTER Des. By. Job No. DLW 11218 Drawn By: MGS Sheet No. Chk'd By. *S5* 

KTM
Date:
03/15/04

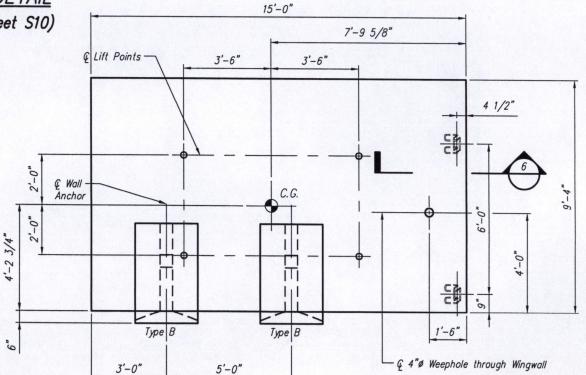






REINFORCING DETAIL

(See Section - Sheet S10)



W	lingwall
Concrete	Reinf. Steel
28-day: 4000 psi	60,000 psi uncoated

Wherever the reinforcing is cut for the placement of lift holes or other blockouts, reinforcing bars or wires of equivalent cross-sectional area shall be placed symmetrically around the hole. At least one bar must be on each side of the hole, and the development length of the bar must be achieved on either side of the cut.

**ELEVATION** 

# Notes:

All edges of Precast to have a 3/4" chamfer

Total Weight = 10.3 Tons

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Des. By: Job No. 11218

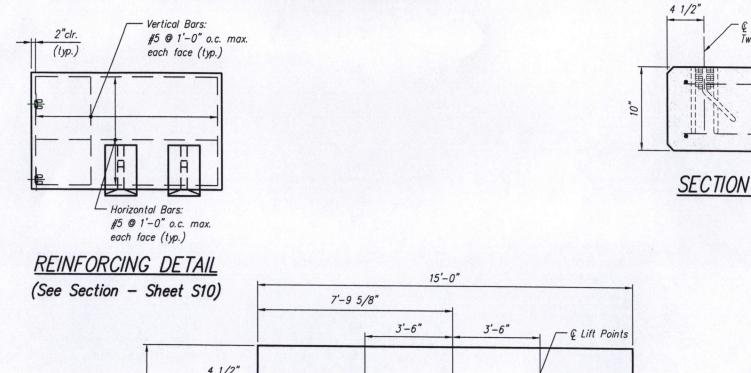
Drawn By: MGS

Chk'd By: KTM

Dob No. 11218

Sheet No. S7

Date: 03/15/04



4 1/2" & Wall Anchor C.G. 0-,9 2,-0" 3/4" 4'-0" 6 1'-6" Type B Type B & 4"ø Weephole through Wingwall-5'-0" 3'-0"

١	W	ingwall
	Concrete	Reinf. Steel
	28-day:	60,000 psi

Wherever the reinforcing is cut for the placement of lift holes or other blockouts, reinforcing bars or wires of equivalent cross-sectional area shall be placed symmetrically around the hole. At least one bar must be on each side of the hole, and the development length of the bar must be achieved on either side of the cut.

# **ELEVATION**

## Notes:

- All edges of Precast to have a 3/4" chamfer

Total Weight = 10.3 Tons

	CON BPAN'		
€ 8" Dayton/Richmond	3100 Research Blvd. P.O Box 20266	© 1991	
Two Bolt Preset Anchor	Dayton, Ohio 45420-0266		

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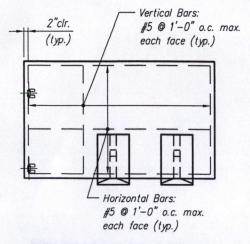
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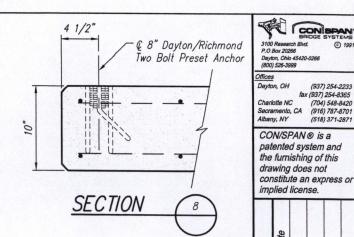
OHIO

OVER MIAMI & ERIE CANAL ACCESS BRIDGE MORRIS FARM

Producer:

WEST CHESTER	AC OVER M
Des. By: DLW	Job No. 11218
Drawn By: MGS	Sheet No.
Chk'd By: KTM	S8
Date: 03/15/04	





# REINFORCING DETAIL

(See Section - Sheet S10)

15'-0" 7'-11 1/4" 3'-0" 3'-0" & Lift Points 4 1/2" 2'-0" · & Wall C.G. Anchor 2'-0" 2/8" 4'-0" .6 2'-8 1/8" 1'-6" Type B Type B .9 Q 4"Ø Weephole through Wingwall-5'-0" 3'-0"

W	lingwall
Concrete	Reinf. Steel
28-day: 4000 psi	60,000 psi uncoated

Wherever the reinforcing is cut for the placement of lift holes or other blockouts, reinforcing bars or wires of equivalent cross-sectional area shall be placed symmetrically around the hole. At least one bar must be on each side of the hole, and the development length of the bar must be achieved on either side of the cut.

# **ELEVATION**

# Notes:

- All edges of Precast to have a 3/4" chamfer

Total Weight = 10.1 Tons

SOLO COLOCA

WEST CHESTER

Des. By. Job No. DLW 11218

OVER MIAMI & ERIE CANAL

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Sheet Title:

No.

WINGWALL WW3 SHOP DRAWING

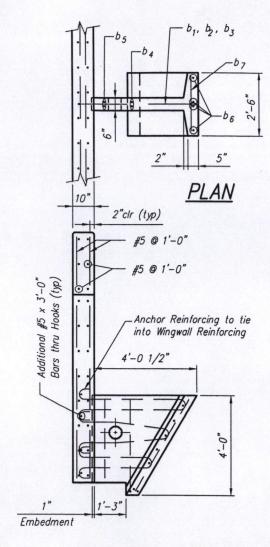
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BRIDGETEK OHIO 513-615-7474

Sheet No. Drawn By: MGŚ

Chk'd By: *S9* KTM Date: 03/15/04



SECTION

MARK	QTY.	SIZE	L	Туре	LENGTH
b1	1	#5	2'-10"	1	
b2	1	#5	3'-6"	3	
b3	1	#5	4'-2"	1	<del></del>
64	2	#5	3'-8"	2	
b5	2	#5		Str.	3'-2"
b6	4	#5		Str.	4'-2"
b7	7	#5		Str.	2'-2"

4'-1 1/2"

1/2"

1'-2"

1'-3 1/2"

3'-5 3/8"

1'-0"

6"ø Hole

3,-6"

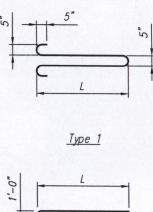
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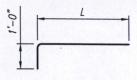
2'-0"

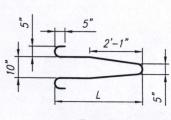
62

(typ.) 2"ctr.

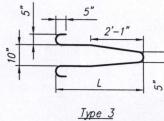
6"







Type 2



<u>PRECAST ANCHOR</u> <u>TYPE B</u>

11"

'sa WEST CHESTER		ACCESS BRIDGE	OVER MIAMI & ERIE CA	
Des. B DL	y.	Job	No. 1218	
DL	77	01	1210	

CON SPAN'

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Date

WINGWALL ANCHOR B SHOP DRAWING

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2 3

> BRIDGETEK OHIO 513-615-7474

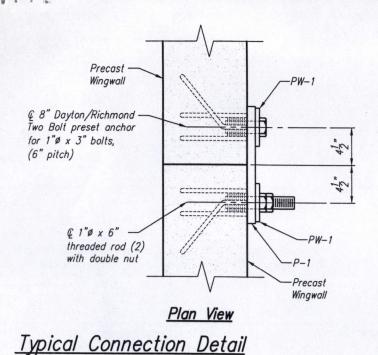
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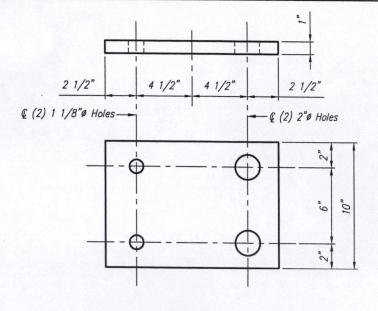
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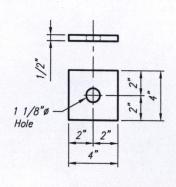
KTM | 510 Date: 03/15/04

5 3/4"





(P, 1" x 10" x 14") (Galvanized as per ASTM A153)



(P. washer, 1/2" x 4" x 4") (Galvanized as per ASTM A153)

45' Bend—for 1" (typ. 2 struts)	eaded insert ————————————————————————————————————
-1/2" Rad. (typ.)	
8"± 1/8"	6"±

Dayton/Richmond Two Bolt Preset Anchor

Front View

Side View

PLATE P-1

Total Required = 8 (4) PW-1 Reg'd. per Plate 3100 Research Blvd. P.O Box 20266 Dayton, Ohio 45420-0266 (800) 526-3999 Dayton, OH (937) 254-2233 fax (937) 254-8365

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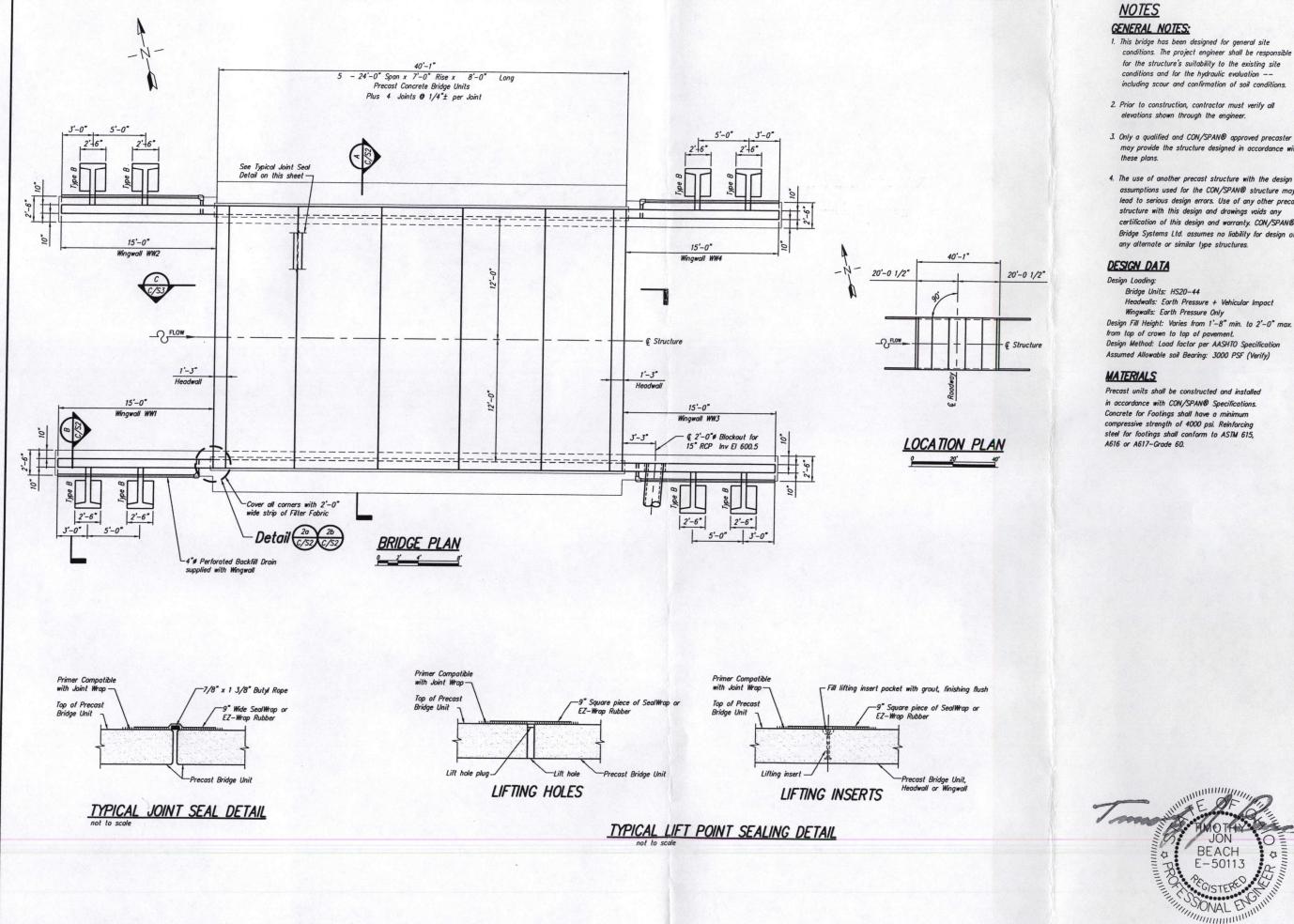
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	10 Sheet Title:	WINGWALL CONNECTION PLATE	SHOP DRAWING	Producer:	BRIDGETEK	513-615-7474
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OVER MIAMI & ERIE CANAL ACCESS BRIDGE MORRIS FARM WEST CHESTER

Des. By. Job No. DLW 11218 Drawn By: MGS Sheet No.

Chk'd By. KTM

Date: 03/15/04



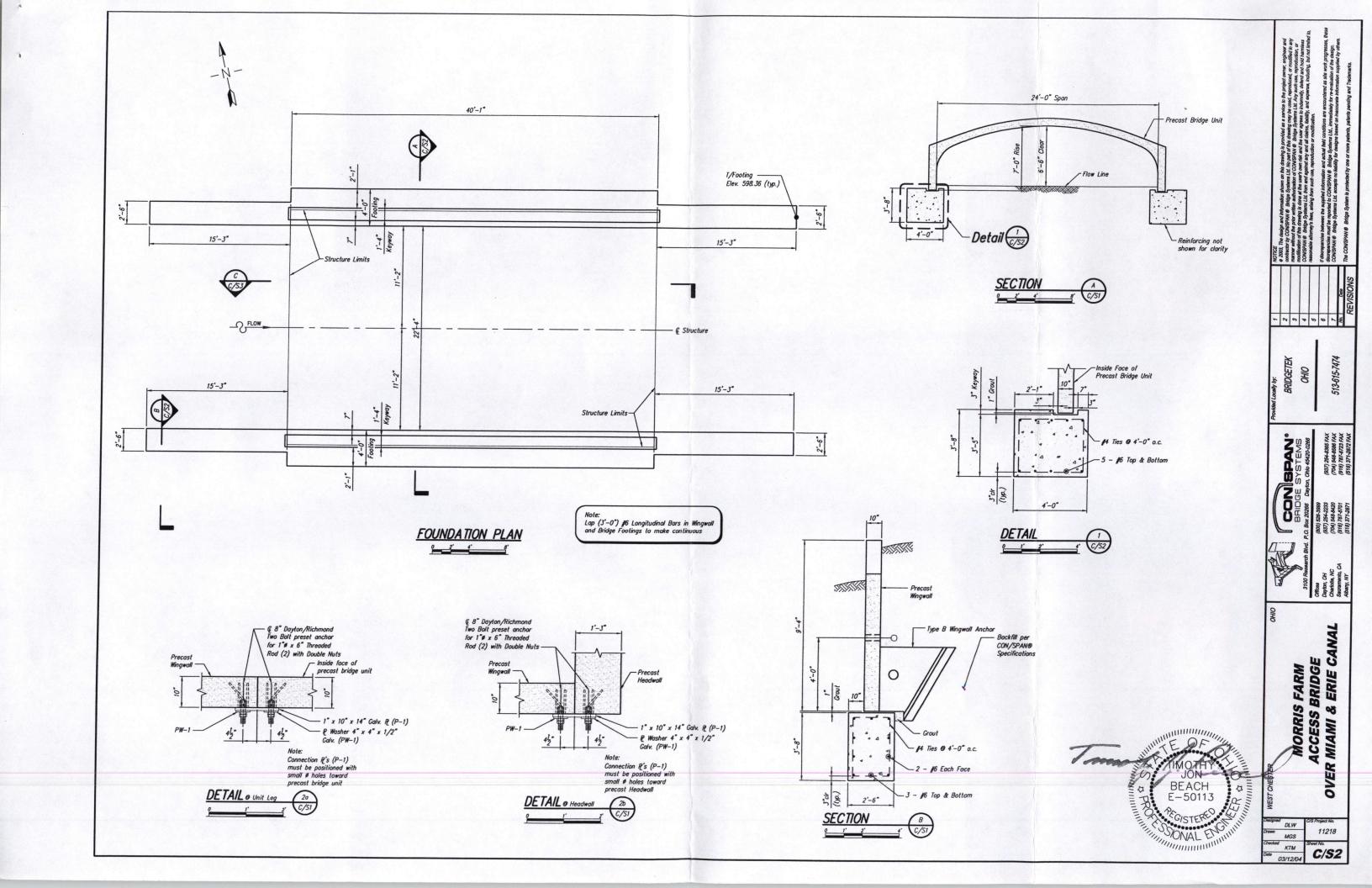
- conditions. The project engineer shall be responsible for the structure's suitability to the existing site conditions and for the hydraulic evaluation -including scour and confirmation of soil conditions.
- 3. Only a qualified and CON/SPAN® approved precaster may provide the structure designed in accordance with
- 4. The use of another precast structure with the design assumptions used for the CON/SPAN® structure may lead to serious design errors. Use of any other precast structure with this design and drawings voids any certification of this design and warranty. CON/SPAN® Bridge Systems Ltd. assumes no liability for design of

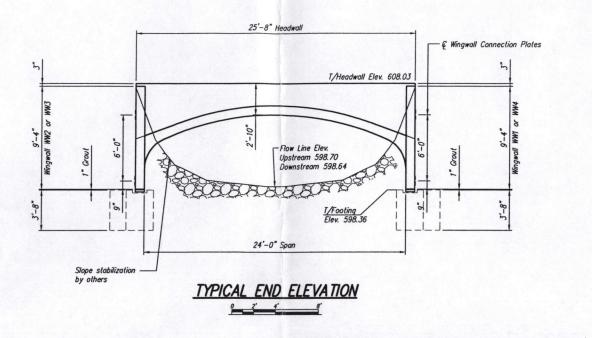
Design Method: Load factor per AASHTO Specification Assumed Allowable soil Bearing: 3000 PSF (Verify)

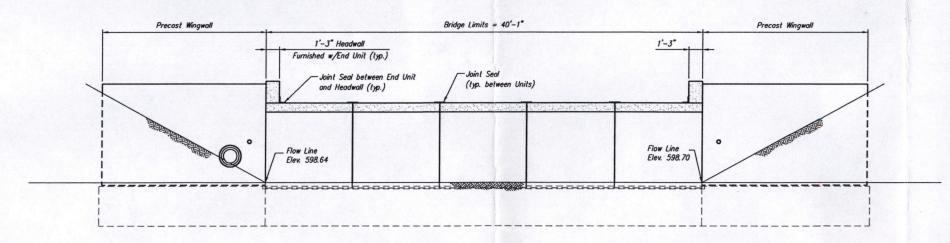
OHIO

OVER MIAMI & ERIE CANAL MORRIS FARM

DLW 11218 MGS ктм C/S1 03/12/0











ocally by: BRIDGETEK OHIO

CON BPAN®
BRIDGE SYSTEMS

ACCESS BRIDGE
OVER MIAMI & ERIE CANAL

DLW MGS KTM

11218 C/S3 03/12/04

# SPECIFICATIONS FOR MANUFACTURE AND INSTALLATION OF CON/SPAN® BRIDGE SYSTEMS

#### 1. DESCRIPTION

This work shall consist of constructing a CON/SPAN @ bridge in accordance with these specifications and in reasonably close conformity with the lines, grades, design and dimensions shown on the plans or as established by the Engineer. In situations where two or more specifications apply to this work, the most stringent requirements

rced concrete CON/SPAN® bridge units manufactured in accordance The Last remarked on the activity of the Control of

# 3. MATERIALS - CONCRETE

The concrete for the precast elements shall be air-entrained when installed in areas subject to freeze-thaw conditions, composed of Potland cement, fine and coarse aggregates, admixtures, and water. Air-entrained concrete shall contain 6 ± 2 percent air, and the air entraining admixture shall conform to AASHTO M154.

- fications C150-Type I, Type II, or Type III cement.
- Coarse Aggregate Shall consist of stone having a maximum size of 1 inch. Aggregate shall meet requirements for ASTM C33.
- Water Reducing Admixture The manufacturer may submit, for approval by the Engineer, a water-reducing admixture for the purpose of increasing workability and reducing the water requirement for the second second
- 3.4 Calcium Chloride The addition to the mix of calcium chloride or

# 4. MATERIALS - STEEL REINFORCEMENT AND HARDWARE

All reinforcing steel and hardware for the precast elements shall be fabricated and

- Steel Reinforcement Reinforcement shall consist of welded wire fabric conforming to AASHTO M 55 (ASTM A 185) or AASHTO M 221 (ASTM A 497), or deformed billet steel bars conforming to AASHTO M 31 (ASTM A 615) Grade 60. Longitudinal distribution reinforcement
- Hardware:
  Botts and threaded rods for wingwall connections shall
  conform to ASTM A 307. Nuts shall conform to AASHTO
  M 292 (ASTM A 194) Grade 2H. All botts, threaded rods
  and nuts used in wingwall connections shall be
  me

Structural Steel for wingwall connection plates and plate washers shall conform to AASHTO M 270 (ASTM A 709) Grade 36 and shall

Anchors as manufactured by Daytor Miamisburg, Ohio, (800) 745-3700.

Ferrule Loop Inserts shall be F-64 Ferrule Loop Inserts as manufactured by Dayton/Richmond Concrete Accessories, Miamisburg, Ohio, (800) 745-3700.

Hook Bolts used in attached headwall connections shall be ASTM A

Inserts for detached headwall connections shall be AISI Type 304 stainless steet, F-56 Expanded Coil inserts as manufactured by Dayton/Richmond Concrete Accessories, Miamisburg, Ohio, (800) 745-3700. Coil rods and nuts used in headwall connections shall be ASI Type 304 stainless steel. Washers used in headwall conne shall be either AISI Type 304 stainless steel plate washers or AASHTO M 270 (ASTM A 709) Grade 36 plate washers hot dip zed as per AASHTO M 111 (ASTM A 153)

Reinforcing bar splices shall be made using the Dowel Bar Splicer System as manufactured by Dayton/Richmond Concrete Accessor Miamisburg, Ohio, (800) 745-3700, and shall consist of the Dowel Bar Splicer (DB-SAE) and Dowel-In (DI).

# 5. MANUFACTURE

- 5.1 Mixture The aggregates, cement and water shall be proportioned and mixed in a batch mixer to produce a homogeneous concrete meeting the strength requirements of this specification. The proportion of Portland cement in the mixture shall not be less than 564 pounds (6
- 5.2 Curing The precast concrete elements shall be cured for a sufficient length of time so that the concrete will develop the specified compressive strength in 28 days or less. Any one of the following methods of curing or combinations thereof shall be used:
  - 5.2.1 Steam Curing The precast elements may be low pressure, steam cured by a system that will maintain a moist atmosphere
  - 5.2.2 Water Curing The precast elements may be water cured by any method that will keep the sections moist.
  - 5.2.3 Membrane Curing A sealing membrane conforming to the requirements of ASTM Specification C 309 may be applied and shall be left intact until the required concrete compressive strength is attained. The concrete temperature at the time of application shall be within + 10 degrees F of the atmospheric temperature. All surfaces shall be kept moist prior to the
- Forms the forms used in manufacture shall be sufficiently rigid and Specifications. All casting surfaces shall be of a smooth nonporous

- 5.4 Handling Handling devices or holes shall be permitted in each precast element for the purpose of handling and
- Storage The precast elements shall be stored in such a manner to prevent cracking or damage. The units shall not be moved until the concrete compressive strength has reached a ninimum of 2500 psi, and they shall not be stored in an pright position until the concrete compressive strength is a

## 6. DESIGN

- 6.1 The precast element dimension and reinforcement details shat be as prescribed in the plan and the shop drawings provided by the manufacturer, subject to the provisions of Section 7, below. The minimum concrete compressive strength shall be as shown on the shop drawings. The minimum steel yield strength shall be 60,000 psi, unless otherwise noted on the shop drawings.
- 6.2 The precast elements are designed in accordance with the "Standard Specifications for Highway Bridges" 16th Edition, adopted by the American Association of State Highway and Transportation Officials, 1996, as amended by the 1997, 1998, 1999, and 2000 Interim Revisions. A minimum of one foot of cover above the crown of the bridge units is required in the installed condition. (Unless noted otherwise on the shop drawings and designed accordingly.)
- 6.3 Placement of Reinforcement in Precast Bridge Units The cover of concrete over the outside circumferential reinforcement shall be 2 inches minimum. The cover of concrete over the inside nent shall be 1 1/2 inch croumerential reinforcement shall be 1 1/2 inches minimum, unless otherwise noted on the shop drawings. The clear distance of the end circumferential wires shall not be less than one inch nor more than two inches from the ends of each section. Reinforcement shall be assembled Ultimg single or multiple layers of welded wire fabric (not to exceed 3 layers), impropries that the chart of deformed the "intersupplemented with a single layer of deformed billet-steel ba when necessary. Welded wire fabric shall be composed of when necessary. Welded were latins shall be composed or circumferential and longitudinal wires meeting the spacing requirements of 6.6, below, and shall contain sufficient longitudinal wires extending through the bridge unit to maintain the shape and position of the reinforcement. Longitudinal distribution reinforcement may be welded wire fabric or deformed bilet-steel bars and shall meet the spacing requirements of 6.6, below. The ends of the longitudinal
- Placement of Reinforcement for Precast Wingwalls and Headwalls The cover of concrete over the longitudinal and everse reinforcement shall be 2 inches minimum. The clear nice from the end of each precast element to the end everse reinforcing steel shall not be less than one inch nor those two inches Delirectment end the accombined more than two inches. Reinforcement shall be assembled utilizing a single layer of welded wire fabric, or a single layer of unitary a single layer of weeder were tarre, or a single layer or deformed billet-steel bars. Welded wire fabric shall be composed of transverse and longitudinal wires meeting the spacing requirements of 8.7, below, and shall contain sufficient longitudinal wires extending through the element to maintain the shape and position of the reinforcement. Longitudinal reinforcement may be welded wire flabric or deformed billet-steel bars and shall meet the spacing requirements of 6.7, below.

  The ends of the longitudinal reinforcement shall be not more than 3 inches and not less than 1 1/2 inches from the ends of
- Bending of Reinforcement for Precast Bridge Units The outside and inside circumferential reinforcing steel for the corners of the bridge shall be bent to such an angle that is approximately equal to the configuration of the bridge's pulsifie corner.
- 6.6 Laps, Welds, and Spacing for Precast Bridge Units Tension splices in the circumferential reinforcement shall be made by lapping. Laps may be tack welded together for assembly purposes. For smooth welded wire labric, the overlap shall meet iapping, Laps may be tack welded together for assembly purposes. For smooth welded wire fabric, the overlap shall mee the requirements of AASHTD 8.30.2 and 8.32.6. For deformed welded with fabric, the overlap shall meet the requirements of AASHTD 8.30.1 and 8.32.5. The overlap of welded wire fabric shall be measured between the outer most longitudinal wires of each fabric shoet. For deformed billed-steel bars, the overlap shall meet the requirements of AASHTD 8.25. For spices other than tension spices, the overlap shall be a minimum of 12" for welded wire fabric or deformed billed-steel bars. The specing center to center of the circumferential wires in a wire fabric sheet shall be not less than 2 inches nor more than 4 inches. The spacing center to center of the circumferential wires in a wire fabric sheet shall be not less than 2 inches nor more than 4 inches. The spacing center to center of the longitudinal wires shall not be more than 8 inches. The spacing center to center of the longitudinal distribution steel for either line of reinforcing in the long stab shall be not more than 10 linches.
- 6.7 Laps, Welds, and Spacing for Precast Wingwalls and Headwalls Splices in the reinforcement shall be made by lapping. Laps may be tack welded together for assembly purposes. For smooth welded wire aboric, the overlag shall meet the requirements of AASHTO 8.30.2 and 8.32.6. For deformed welded wire fabric, the overlap shall meet the requirements of AASHTO 8.30.1 and 8.32.5. For deformed billet-steel bars, the AASHTO 8.3U.1 and 8.32.5. For deformed billet-steet bars, the overlap shall meet the requirements of AASHTO 8.25. The spacing center-to-center of the wires in a wire fabric sheet shall be not less than 2 inches nor more than θ inches.

# 7. PERMISSIBLE VARIATIONS

7.1.1 Internal Dimensions - The internal dimension shall vary not more than 1 % from the design dimensions nor more than I-1/2 inches whichever is less. The haunch dimensions

- 7.1.2 Slab and Wall Thickness The slab and wall thickness shall not be less than that shown in the design by more than 1/4 inch. A thickness more than that required in the design shall not be cause for rejection.
- 7.1.3 Length of Opposite Surfaces Variations in laying lengths of two opposite surfaces of the bridge unit shall not be more than 1/2 inch in any section, except where bevelo
- 7.1.4 Length of Section The underrun in length of a section shall not be more than 1/2 inch in any bridge unit.
- Position of Reinforcement The maximum variation in position of the reinforcement shall be ± 1/2 inch. In no case shall the cover over the reinforcement be less than 1 1/2 inches for the outside circumferential steel as measure than 1 inch for the inside circumferential steel as measure to the external or internal surface of the bridge. These tolerances or cover requirements do not apply to mating
- 7.1.6 Area of Reinforcement The areas of steel reinforcement shall be the design steel areas as shown in the snal be the design steel areas as shown in the manufacture's shop drawings. Steel areas greater than those required shall not be cause for rejection. The permissible variation in diameter of any reinforcement sh conform to the loterances prescribed in the ASTM Specification for that type of reinforcement.
- 7.2 Wingwalls and Headwalls
  - 7.2.1 Wall Thickness The wall thickness shall not vary from that shown in the design by more than 1/2 inch.
  - 7.2.2 Length/ Height of Wall sections The length and height of the wall shall not vary from that shown in the design by more than 1/2 inch.
  - 7.2.3 Position of Reinforcement The maximum variation in the position of the reinforcement shall be + 1/2 inch. In no case shall the cover over the reinforcement be less than 1
  - 7.2.4 Size of Reinforcement The permissible variation in eter of any reinforcing shall conform to the ances prescribed in the ASTM Specification for that

### 8. TESTING AND INSPECTION

- 8.1 Type of Test Specimen Concrete compressive strength shall determined from compression tests made on cylinders or cores. For cylinder testing, a minimum of 4 cylinders shall be taken during each production run. For core testing, one core shall be cut from each of 3 precast elec production run, each production group or fraction thereof shall be production run, search producting copy or inaction transfer state or considered separately for the purpose of testing and acceptance. A production run shall be considered continuous if not interrupted for more than 3 consecutive days.
- 8.2 Compression Testing Cylinders shall be made and tested as prescribed by the ASTM C 39 Specification. Cores shall be obtained and tested for compressive strength in accordance with the provisions of the ASTM C 497 Specification.
- Acceptability of Cylinder Tests When the average compressive strength of all cylinders tested is equal to or greater than the design compressive strength, and not more than 10 % of the cylinders tested have a compressive strength less than the design concrete strength less than 30 % of the design compressive strength less than 30 % of the design compressive strength less than 30 % of the design compressive strength the lest shall be accepted. When the compressive strength of the cylinders tested does not conform to this acceptance. On the cylinders tested does not conform to this acceptance criteria, the acceptability of the let may be determine as described in section 8.4, below. Failure of any of the 28-day. est cylinders to meet 90 percent of the mini

Acceptability of Core Tests - The compressive strength of the concrete in each production group as defined in 8.1 is acceptable when the average core test strength is equal to or greater than the design connecte strength. When the compressive strength of the core tested is less than the design that the core tested is less than the design. compressive strength of the core leasure a least virtue are obsequenced at the concrete strength, the precast element from which that core was laken may be re-cored. When the compressive strength of the re-core is equal to or greater than the design concrete strength, the compressive strength of the concrete in that production

8.4.1 When the compressive strength of any recore is less than the design concrete strength, the precast element from which that core was taken shall be rejected. Two precast than the design concrete strength, the compressive strength of the remainder of that group is acceptable. If the compressive strength of either of the two cores tested the group shall be cored and accepted ind any of these elements that have cores with less than the concrete strength shall be rejected.

8.4.2 Plugging Core Holes - The core holes shall be plugged and sealed by the manufacturer in a manner such that the elements will meet all of the test requirements of this specification.

Precast elements so sealed shall be considered satisfactory for

Test Equipment - Every manufacturer furnishing culverts under the specification shall furnish all facilities and personnel necessary to carryout the test required.

#### **JOINTS**

The bridge units shall be produced with flat butt ends. The ends of the bridge units shall be such that when the sections are laid together they will make a continuous line of with a smooth interior free of appreciable irregularities, all compatible with the permissible variations in Section 7, above. The joint width

## 10. WORKMANSHIP AND FINISH

The bridge units, wingwalls, and headwalls shall be substantially free of fractures. The ends of the bridge units shall be normal to the walls and centerine of the bridge section, within the limits of the variations given in section 7, above, except where bevied ends are specified. The faces of the wingwalls and headwalls shall be parallel to each other, within the limits of wingwais and neadwais shall be paralled to eard over, whith it is limits or variations given in section 7, above. The surface of the precast elements s be a smooth steel form or troweled surface. Trapped air pockets causing surface defects shall be considered as part of a smooth, steel form finish.

#### 11. REPAIRS

Precast elements may be repaired, if necessary, because of imperfections in manufacture or handling damage and will be acceptable if, in the opinion of the purchaser, the repairs are sound, properly finished and cured, and the repaired section conforms to the requirements of this Specification.

# 12. INSPECTION

ufacture, and the finished precasi nts shall be subject to inspection by the purchaser

#### 13. REJECTION

The precast elements shall be subject to rejection because of any of the specification requirements, Individual precast elements may be rejected.

- 13.1 Fractures or cracks passing through the wall, except for a single end crack that does not exceed one half the thickness of the wall.
- 13.2 Defects that indicate proportioning, mixing, and molding not in compliance with Section 5, of these Specifications.
- ecombed or open texture.
- 13.4 Damaged ends, where such damage would prevent making a

# MARKING

Each bridge unit shall be clearly marked by waterproof paint. The following shall be the inside of the vertical leg of the bridge section Bridge Span X Bridge Rise

Date of Manufacture

# 15. CONSTRUCTION REQUIREMENTS

- 15.1 Footings The bridge units and wingwalls shall be installed on either precast or cast-in-place concrete footings. The design size and elevation of the footings shall be as determined by the Engineer. A elevation of the foolings shall be as determined by the Engineer. A three inch deep keywy shall be formed in the lop surface of the bridge fooling three inches clear of the inside and outside faces of the bridge units, unless specified otherwise on the plans. No keyway is required in the wingwall foolings, unless otherwise specified on the plans. The foolings shall be given a smooth float finish and shall reach a compressive strength of 2,000 ps before placement of the bridge and wingwall elements. The completed fooling surface shall be constructed in accordance with grades shown on the plans. When lested with a 10 fool straight edge, the surface shall not vary more than 1/4 inch in 10 feet. If a precast concrete fooling is used, the contractor shall prepare a 4 inch thick base layer of compacted granular material the full width of the fooling prior to placing the presess to foling.
- Placement of the Bridge Units, Wingwalls, and Headwalls The bridge units, wingwalls, and headwalls shall be placed as shown on the Engineer's plan drawings. Special care shall be latien in setting the elements to the true line and grade. The bridge units and wingwalls shall be set on 6" X 6" masonite or steel shims. A minimum of 1/2 shall be set on 6 A 6 massed to be seen stimes. A maintain of 12 inch gap shall be provided between the footing and the bottom of bridge's vertical legs or the wingwall. The gap shall be filled with cement grouf (Portland cement and water or cement mortar comp ortland cement and three parts of sand, by volume, and
- 15.3 External Protection of Joints The butt joint made by two adjoining bridge units shall be covered with a 7/8" x 1 3/8" pre bituminous joint seatant and a minimum of a 9 inch wide joint wap, The surface shall be free of dit before applying the joint material. A primer compatible with the joint wrap to be used shall be applied for a minimum width of nine inches on each side of the joint. The external wrap shall be either EZ-WRAP RUBBER by PRESS-SEAL AGNKET CORPORATION, SEAL WRAP by MAR MAC
  MANUFACTURING CO, INC. or approved equal. The joint shall be
  covered continuously from the bottom of one bridge section leg, across
  the lop of the arch and to the opposite bridge section leg. Any laps that result in the joint wrap shall be a minimum of six inches long

In addition to the joints between bridge units, the joint between the end bridge unit and the headwall shall also be sealed as described above. If procast wingwalls are used, the joint between the end bridge unit and the wingwall shall be sealed with a 2-0 stop of filter fabric. Also, lift holds are formed in the arch units, they shall be primed and covered with a 9  $^{\circ}$  x 9  $^{\circ}$ 

During the backfilling operation, care shall be taken to keep the joint wrap in its proper location over the joint.

15.4 Backfill - Backfill shall be considered as all replaced excavation and new embankment adjacent to the CON/SPAN® bridge units, wingwalls, and headwalls. The project construction and material specifications which include the specifications for ex ent construction, shall apply except as modified in this section

No backfill shall be placed against any structural elements until they have been approved by the Engineer

Backfill against a waterproofed surface shall be placed carefully to avoid damage to the waterproofing material.

Mechanical tampers or approved compacting equipment shall be used to compact all backfill and embankment immediately adjacent to each side and over the top of each bridge unit until it is covered to a minimum depth of one foot, unless the design fill height is less than 1-0°. The backfill within the Critical Backfill Zone (shown in the diagrams below) shall be placed in lifts of eight inches or less (loose depth). Heavy compaction equipment shall not be operated in this area or over the bridge until it is covered to a depth of one

Lightweight dozers and graders may be operated over bridge units having one foot of compacted cover, but heavy earth moving equipment (larger than a D-4 Dozer weighing in excess of 12 tons and having track pressures of eight psi or greater) shall require hor feet of cover unless the design cover is less than two feet. In no case shall equipment operating in excess of the design load (HS20 or HS25) be permitted over the bridge units unless approved by COMSPAN®.

As a precaution against introducing unbalanced stresses in the bridge, when placing backfill at no time shall the difference between the heights of fill on opposite sides of the bridge exceed 24".

Backfill in front of wingwalls shall be carried to ground lines shown in the plans

For fill heights over 12 feet, no backfilling may begin until a backfill compaction testing plan has been coordinated with and approve CON/SPAN® Bridge Systems. Cost of the backfill compaction testing shall be included in the cost of the precast units. This include cost applies only to projects with fill heights over 12 feet (as measured from top crown of arch to finished grade).

# 16. QUALITY ASSURANCE

The Precaster shall demonstrate adherence to the standards set forth in the NPCA Quality Control Manual. The Precaster shall meet either Section 16.1

16.1 Certification: The Precaster shall be certified by the Precast/Prestressed Concrete Institute Plant Certification Pro or the National Precast Concrete Association's Plant Certification ram prior to and during production of the products covered

Group Classification

No. 40 Liquid Limit Plasticity Index

Usual Types of Significant Constituent Materials

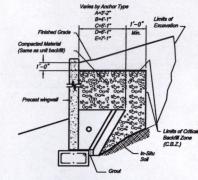
16.2 Qualifications, Testing and Inspection 16.2.1 The Precaster shall have been in the business of I the I recaster shall have been in the dusiness or producing process concrete products similar to those specified fibr a minimum of three years. He shall maintain a permanent qualify control department or retain an independent testing agency on a continuing basis. The agency shall sissue a report, certified by a ficensed engineer, detailing the ability of the Procester to produce walls unout between consistent with industries trendrate.

> 16.2.2 The Precaster shall show that the following tests are restrictions statements and the uncovering tests are performed in accordance with the ASTM standards indicated. Tests shall be performed for each 150 cubic yeards of concrete placed, but not less frequently than once per production run, as defined in \$8 of these

16.2.2.1 Air Content: C231 or C173 16.2.2.2 Compressive Strength: C39, C497

16.2.3 The Precaster shall provide documentation demonstrating compliance with this section to CON/SPAN® Bridge Systems regular intervals or upon request.

16.2.4 The Owner may place an inspector in the plant when the products covered by this specification are being manufactured.



WINGWALL BACKFILL REQUIREMENTS

BACKFILL DESCRIPTION (AASHTO M 145-91) A-4 A-24 A-2-5 A-2-6 A-2-7 A-1-a A-1-b

Sieve Analysis, Percent Passing (100% Passing 3" Sieve)

No. 10 35 max. 35 max. 35 max. 35 max 36 min 40 max. 41 min. 40 max. 41 min. 40 max

General Rating as Subgrad Excellent to Good Fair to Poor - Finished Grade Limits of Compacted Material Backfill Zoni C.B.Z. L. (C.B.Z.) . 100 .... : . 7. ..... .... . 100 :400 Compacted Embankmen ELEVATION Material, by

1. SEE CONISPANO SPECIFICATIONS SECTION 15.4 FOR BACKFILL SPECIFICATIONS. 2. FOR FILL HEIGHTS GREATER THAN 2:0", C.B.Z. LIMIT SHALL BE 2:0" ABOVE ARCH CROWN. FOR FILL HEIGHTS LESS THAN 2"0", THE FINISHED GRADE SHALL BE THE BOUNDARY LINE FOR THE C.B.Z. 3. BACKFILLING OPERATIONS WITHIN THE C.B.Z. SHALL BE PERFORMED IN LIFTS OF 8" OR LESS (LOOSE DEPTH). 4. MAXIMUM DRY DENSITY SHALL BE DETERMINED BY AASHTO T-99 OR OTHER APPROVED METHODS. 5. BACKFIL<mark>L</mark> SHALL BE COMPACTED IN LAYERS UNTIL THE DENSITY IS NOT LESS THAN 95 % OF THE MAXIMUM

SPAN	FILL HEIGHT	ACCEPTABLE MATERIAL INSIDE C.B.Z.	ACCEPTABLE MATERIAL OUTSIDE C.B.Z.
≤24'-0"	≥ 12'-0"	A1, A3	•
≤24'-0"	< 12'-0"	A1, A2, A3, A4	
> 24'-0"	ALL	A1, A3	-

MGS KTM

S BRIOGE

IS FARM S BRIDGE & ERIE CANAL

MORRIS ACCESS B MIAMI & I OVER

11218 C/S4